Appendices for SMWUs 50 and 59 RFI Report

Final

September 2009

Appendix A

Quality Assurance/

Quality Control

Appendix A-1

Analytical Services and Procedures

ANALYTICAL SERVICES AND PROCEDURES

ANALYTICAL SERVICES

The analytical services for the field investigation program were provided by the following USACE and National Environmental Laboratory Accreditation Conference (NELAC) validated laboratories:

- Accutest Laboratories, Inc. (Accutest), Orlando, FL: Accutest used *USEPA Office of Soil Waste and Emergency Response Test Methods for Evaluating Soil Waste Physical and Chemical Methods, Update IIIB.* (SW-846) (USEPA, 2004) methodologies in providing analytical support for this investigation. Chemical analyses included: volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), polynuclear aromatic hydrocarbons (PAHs), metals, pesticides, polychlorinated biphenyls (PCBs), herbicides, explosives, full toxicity characteristic leaching procedure (TCLP) analysis, ignitability, reactive sulfide, reactive cyanide, and corrosivity as pH. Accutest used *USEPA Methods for Chemical Analysis of Water and Wastes* (MCAWW) (USEPA, 1983) for chemical oxygen demand (COD) and biological oxygen demand (BOD) analysis.
- Datachem Laboratories, Inc. (Datachem), Salt Lake City, UT: Datachem was subcontracted by Accutest to perform analytical support for perchlorates. Datachem used *USEPA Office of Soil Waste and Emergency Response Test Methods for Evaluating Soil Waste Physical and Chemical Methods, Update IIIB* (SW-846) (USEPA, 2004) methodologies for this analysis.
- SGS Environmental Services, Inc. (SGS), Wilmington, NC: SGS was subcontracted by Accutest to perform analytical support for dioxins/furans. SGS used *USEPA Office of Soil Waste and Emergency Response Test Methods for Evaluating Soil Waste Physical and Chemical Methods, Update IIIB* (SW-846) (USEPA, 2004) methodologies for this analysis.

ANALYTICAL PROCEDURES

Analytical protocols used were in accordance with USEPA-approved methods for the analysis of environmental (i.e., organic, and inorganic parameters) and waste characterization samples. All methods performed were within the *DoD Quality Systems Manual for Environmental Laboratories, Final Version 3* (DoD, 2006) and the *DoD Perchlorate Handbook* (DoD, 2006) guidelines. The methodologies for environmental samples are summarized in **Table A-1** and for waste characterization samples in **Table A-2**. A brief discussion of the methodologies is presented in the following sections below.

Organics

Target compound list (TCL) VOCs, TCL SVOCs, TCL pesticides, TCL PCBs, herbicides, explosives, including nitroglycerin (NG) and pentaerythritol tetranitrate (PETN), PAHs, and dioxins/furans were analyzed using USEPA-approved methodologies. The laboratory procedures and methodologies for organic compounds are summarized below.

Table A-1
Summary of Analytical Methods for Environmental Samples

Parameter	Matrix	Analytical Method
Chemical Parameters		
TCL VOCs	Aqueous	USEPA SW-846 5030B/8260B
	Soil	USEPA SW-846 5035/8260B
TCL SVOCs	Aqueous	USEPA SW-846 3510C/8270C
	Soil	USEPA SW-846 3550B/8270C
TCL Pesticides	Aqueous	USEPA SW-846 3510C/8081A
	Soil	USEPA SW-846 3550B/8081A
TCL PCBs	Aqueous	USEPA SW-846 3510C/8082
	Soil	USEPA SW-846 3550B/8082
Herbicides	Aqueous	USEPA SW-846 3510C/8151A
	Soil	USEPA SW-846 3550B/8151A
Explosives	Aqueous	USEPA SW-846 3535A/8330A Modified
	Soil	USEPA SW-846 8330B/8330A Modified
Nitroglycerin & PETN	Aqueous	USEPA SW-846 3535A/8332
	Soil	USEPA SW-846 8330B/8332
Polynuclear Aromatic Hydrocarbons	Aqueous	USEPA SW-846 3510C/8270C SIM
	Soil	USEPA SW-846 3550B/8270C SIM
Perchlorates	Aqueous	USEPA SW-846 LC-MS-CLO_4/6850 SIM
Dioxins/furans	Aqueous	USEPA SW-846 8290
	Soil	USEPA SW-846 8290
TAL Metals	Aqueous	USEPA SW-846 3010A/6010B & 7470A
	Soil	USEPA SW-846 3050B/6010B & 7471A

Table A-2
Summary of Analytical Methods for Waste Characterization Samples

Parameter	Matrix	Analytical Method
TCLP VOCs	Solid	USEPA SW-846 1311/5030B/8260B
TCLP SVOCs	Solid	USEPA SW-846 1311/3510C/8270C
TCLP Pesticides	Solid	USEPA SW-846 1311/3510C/8081A
TCLP Herbicides	Solid	USEPA SW-846 1311/3510C/8151A
TCLP Metals	Solid	USEPA SW-846 1311/3010A/6010B & 1311/7470A
TCL PCBs	Solid	USEPA SW-846 3550B/8082
Explosives	Solid	USEPA SW-846 8330B/8330A Modified
Nitroglycerin & PETN	Solid	USEPA SW-846 8330B/8332
Ignitability	Solid	USEPA SW-846 1010
Reactive Cyanide	Solid	USEPA SW-846 Chapter 7.3.3
Reactive Sulfide	Solid	USEPA SW-846 Chapter 7.3.4
Biological Oxygen Demand	Aqueous	USEPA MCAWW 405.1
Chemical Oxygen Demand	Aqueous	USEPA MCAWW 410.1
Corrosivity as pH	Aqueous	USEPA SW-846 9040C

TCL VOCs: Aqueous and solid samples were analyzed for TCL VOCs using USEPA SW-846 Method 5030B/8260B for aqueous samples and USEPA SW-846 5035/8260B for solid matrices using purge and trap technology. TCLP extracts were analyzed according to USEPA SW-846 Method 1311/5030B/8260B for investigative-derived material (IDM) solid samples. Soil samples were collected using field preservation techniques. Approximately 5 grams of soil sample was added to pre-tared vials containing methanol and/or de-ionized ultra filtered water (DIUF); then sent to the laboratory for analysis. Aqueous samples were sent to the laboratory in zero headspace vials. An inert gas was bubbled through a mixture of reagent water and 5 gram soil sample or through a 25 mL aqueous sample contained in a specifically designed purging chamber at 40°C for soil and ambient temperature for water. The vapor was swept through a sorbent column where the purgeable compounds were trapped. After purging was completed for both solid and aqueous samples, the sorbent column was heated and backflushed with the inert gas to desorb the purgeable compounds onto a gas chromatograph programmed to separate the purgeable compounds, which were then detected with a mass spectrometer. The gas chromatography/mass spectroscopy (GC/MS) instrument was calibrated for a series of target analytes using chemical standards of known concentration and purity. Quantification of these target analytes was performed against specific internal standards as identified in the respective method. Identification of these target analytes was based on a comparison of the analyte to the chemical standards used during calibration based on the analyte's retention time and mass spectra.

TCL SVOCs/PAHs: Aqueous and solid samples were analyzed for TCL SVOCs and PAHs using USEPA SW-846 Method 8270C. The use of selective ion monitoring (SIM) using USEPA SW-846 Method 8270C SIM was employed for PAH analysis to achieve lower quantitation and detection limits in order to meet screening criteria. Soil samples were extracted using ultrasonic extraction according to USEPA SW-846 Method 3550B and aqueous samples were extracted using a separatory funnel liquid-liquid extraction technique according to USEPA SW-846 Method 3510C. TCLP SVOC extracts were extracted using a separatory funnel liquid-liquid extraction technique according to USEPA SW-846 Method 1311/3510C for solid IDM samples. The extracts were injected into a gas chromatograph programmed to separate the compounds, which are then detected with a mass spectrometer. The gas chromatograph/mass spectrometer instrument was calibrated for a series of target analytes using chemical standards of known concentration and purity. Quantification of these target analytes was performed against specific internal standards as identified in the respective method. Identification of these target analytes was based on a comparison of the analyte to the chemical standards used during calibration based on the analyte's retention time and mass spectra.

TCL Pesticides/PCBs: Aqueous and solid samples were analyzed for TCL pesticides using USEPA SW-846 Method 8081A and for TCL PCBs using USEPA SW-846 Method 8082. Samples were prepared for analysis using extraction techniques. Soil samples were extracted using ultrasonic extraction according to USEPA SW-846 Method 3550B and aqueous samples were extracted using a separatory funnel liquid-liquid extraction technique according to USEPA SW-846 Method 3510C. TCLP pesticide extracts were extracted using a separatory funnel liquid-liquid extraction technique according to USEPA SW-846 Method 1311/3510C for solid IDM samples. The extracts were injected onto a gas chromatography programmed to separate the compounds, which are then detected with an electronic capture device (ECD). Sulfur cleanups were employed to aid in the quantification based upon the matrix interferences. Sample concentrations were confirmed on dissimilar columns.

Herbicides: Aqueous and solid samples were analyzed for herbicides according to USEPA SW-846 Method 8151A. Samples were prepared for analysis using extraction techniques. Soil samples were extracted using ultrasonic extraction according to USEPA SW-846 Method 3550B and aqueous samples were extracted using a separatory funnel liquid-liquid extraction technique according to USEPA SW-846 Method 3510C. TCLP herbicide extracts were extracted using a separatory funnel liquid-liquid extraction technique according to USEPA SW-846 Method 1311/3510C for solid IDM samples. Aqueous and solid samples were extracted with diethyl ether and then esterified with diazomethane. The derivatives were determined by gas chromatography with an electron capture detector (GC/ECD). The results were reported as acid equivalents. Sample concentrations were confirmed on dissimilar columns.

Explosives: Aqueous and solid (including IDM) samples were analyzed for explosives using USEPA SW-846 Method 8330A Modified. Aqueous samples were extracted using a Solid-phase Extraction (SPE) procedure USEPA SW-846 3535A. A measured volume of sample was adjusted to a specified pH and then extracted using a SPE device. Target analytes were eluted from the solid-phase media using methylene chloride. The resulting solvent extract was dried using sodium sulfate and concentrated. The concentrated extract were exchanged into a solvent compatible with subsequent cleanup procedures and then measurement of the target analytes separated on a C-18 reverse phase column. The wavelength was set at 254 nanometers and confirmed on a cyanide reverse column. For soil samples, they were homogenized and analyzed using USEPA SW-846 Method 8330B/8330A Modified. Because only a small 2-g portion (sub-sample) of the 10-g or larger sample was taken for analysis, the bulk sample was thoroughly mixed to allow for representative sub-sampling. This was achieved by air-drying at room temperature for 24 hours, sieving through a 30-mesh sieve, grinding, and mixing the bulk sample, after subjectively removing vegetation (organic debris) and pebbles. Soil samples were extracted using acetonitirile in an ultrasonic bath, then filtered and determined similarly to aqueous samples. Sample concentrations were confirmed on dissimilar columns.

Nitroglycerin/PETN: Aqueous and solid (including IDM) samples were analyzed for nitroglycerin and PETN using USEPA SW-846 Method 8332. For soil samples, they were homogenized and analyzed using USEPA SW-846 Method 8330B/8330A Modified. Solid samples were extracted with acetonitrile in an ultrasonic bath, then filtered and mixed with a calcium chloride solution. Aqueous samples were extracted using a Solid-phase Extraction (SPE) procedure USEPA SW-846 3535A, as described for explosives. The concentrations were quantified using an isocratic high pressure liquid chromatography (HPLC) system equipped with a column heater and ultraviolet (UV) detector. Sample concentrations were confirmed on dissimilar columns. Identification of these target analytes was based on a comparison of the analyte to the chemical standards used during calibration based on the analyte's retention time using primary and secondary columns.

Dioxins/Furans: Aqueous and solid samples were analyzed for dioxin/furans using USEPA SW-846 Method 8290. The analytical method used high-resolution gas chromatography and high-resolution mass spectrometry (HRGC/HRMS) on purified sample extracts. This method is specific for the analysis of 2,3,7,8-tetrachlorinated dibenzofuran (2,3,7,8-TCDD), substituted penta-, hexa-, hepta- and octachlorinated dibenzo-p-dioxins and substituted penta-, hexa-, hepta- and octachlorinated dibenzofurans in aqueous and solid samples. The extracts were injected onto a high-resolution gas chromatograph programmed to separate the compounds, which are then detected with a high-resolution mass spectrometer as confirmation.

Inorganics

Target analyte list (TAL) metals and perchlorates were analyzed using USEPA SW-846 methodologies. The laboratory procedures for inorganic compounds are summarized below.

TAL Metals: Aqueous and solid samples were analyzed for TAL metals using a combination of the following methodologies: inductively coupled plasma (ICP) and cold vapor atomic absorption (CVAA). Trace metals were analyzed using USEPA SW-846 3010A/6010B for aqueous samples and USEPA SW-846 Method 3050B/6010B for solid samples. TCLP extracts were digested according to USEPA SW-846 Method 1311/3010A/6010B for the solid IDM samples. The ICP method involved the simultaneous or sequential multi-element determination of trace elements in solution. The basis of the method is the measurement of atomic emission by optical spectrometry. Samples were nebulized and the aerosol that was produced was transported to the plasma torch where excitation occurs. Characteristic atomic-line emission spectra are produced by a radio-frequency ICP. A background correction technique was utilized to compensate for variable background contribution for the determination of trace elements.

Aqueous and solid samples were analyzed for mercury using CVAA according to USEPA SW-846 Method 7470A for aqueous samples and Method 7471A for solid samples. TCLP extracts were digested according to USEPA SW-846 Method 1311/7470A for solid IDM samples. A sample aliquot was initially digested with nitric acid to free combined mercury. The mercury was then reduced to its elemental state and aerated from the solution into a closed system. The mercury vapor was passed through a cell positioned in the path of the mercury light source and the measured abundance was proportional to the concentration of mercury in the sample.

Perchlorate: Perchlorate was analyzed for aqueous samples by using either USEPA SW-846 Method 6850 SIM by HPLC/MS following the *DoD Perchlorate Handbook* (DoD, 2006b) requirements. The HPLC-MS method 6850 uses a second order external standard approach using laboratory ChemStation software. The method provides HPLC-MS conditions for the detection of perchlorate in SIM mode at m/z 83 and 85, which corresponds to the loss of one oxygen atom from the perchlorate molecule. In general, water samples were extracted at a neutral pH with methylene chloride, using LC-MS-CLO_4 method. Sample extracts were injected into the HPLC-MS and the ion ratio of m/z 83 to 85 was used to positively identify the response peak as perchlorate. Quantitation was performed using the m/z 83 peak area. An internal standard of ^{18}O labeled perchlorate was added to each sample to establish the perchlorate peak retention time and used in the quantitation. Confirmation was obtained by the use of the mass spectrometer.

Waste Characterization

Samples collected to characterize IDM were analyzed for hazardous waste characteristics using USEPA-approved methodologies, including TCLP VOCs, TCLP SVOCs, TCLP metals, TCLP pesticides, TCLP herbicides, ignitability, reactive cyanide, reactive sulfide, TCL PCBs, explosives, chemical oxygen demand (COD), biological oxygen demand (BOD), and corrosivity as pH. The laboratory procedures and methodologies are summarized below and in the prior section.

TCLP Extraction: Solid IDM samples were collected for full TCLP waste characterization and extracted using the USEPA SW-846 Method 1311. Aqueous IDM samples were collected for TCLP metals analysis. The final liquid extract was separated from the sample material and combined with the initial liquid phase (if applicable). The sample TCLP extract was then treated as an aqueous sample for analysis for TCLP VOCs, TCLP SVOCs, TCLP pesticides, TCLP herbicides, and TCLP metals. Brief discussions of the procedures and methodologies are presented below and in the prior section.

Explosives/PETN/NG: Solid IDM samples were analyzed for explosives and PETN using USEPA SW-846 Method 8330B/8330A Modified and for NG using USEPA SW-846 Method 8330B/8332 Modified. Brief discussions of these procedures and methodologies are presented in the prior section.

Reactive Cyanide: Solid IDM samples were analyzed for reactive cyanide using USEPA SW-846 Method Chapter 7.3.3. The cyanide as hydrocyanic acid (HCN) was released from cyanide complexes by means of a reflux-distillation operation and absorbed in a scrubber containing sodium hydroxide solution. The cyanide ion in the absorbing solution was then determined colorimetrically. In the colorimetric measurement, the cyanide was converted to cyanogen chloride, CNCl, by reaction with chloramine-T at a pH less than 8.0 without hydrolyzing the cyanate. After the reaction was completed, color was formed on the addition of pyridine-pyrazolone or pyridine-barbituric acid reagent. The absorbance was read at 578 nm for pyridine-barbituric acid. To obtain colors of comparable intensity, the sample and the standards contain the same salt content. The titrimetric measurement uses a standard solution of silver nitrate to titrate cyanide in the presence of a silver sensitive indicator.

Reactive Sulfide: Solid IDM samples were analyzed for reactive sulfide using USEPA SW-846 Method Chapter 7.3.4. This procedure is a colorimetric determination. Sulfide reacts with dimethyl-p-phenylenediamine in the presence of ferric chloride to produce methylene blue.

Flashpoint: Solid IDM samples were analyzed for flashpoint or ignitability using USEPA SW-846 Method 1010. A sample was heated at a slow, constant rate with continual stirring. A small flame was directed into the cup at regular intervals with simultaneous interruption of stirring. The flash point is the lowest temperature at which application of the test flame ignites the vapor above the sample.

TCL PCBs: Solid IDM samples were analyzed for TCL PCBs using USEPA SW-846 Method 3550B/8082. A brief discussion of this procedure and methodology is presented in the prior section.

TCLP VOCs: Solid IDM samples were analyzed for TCLP VOCs using USEPA SW-846 Method 1311/8260B. A brief discussion of this procedure and methodology is presented in the prior section.

TCLP SVOCs: Solid IDM samples were analyzed for TCLP SVOCs using USEPA SW-846 Method 1311/8270C. A brief discussion of this procedure and methodology is presented in the prior section.

TCLP Pesticides: Solid IDM samples were analyzed for TCLP pesticides using USEPA SW-846 Method 1311/8081A. The samples were prepared for analysis using extraction techniques. TCLP pesticide extracts were extracted using a separatory funnel liquid-liquid extraction technique according to USEPA SW-846 Method 1311/3510C for solid IDM samples. The extracts were injected onto a gas chromatography programmed to separate the compounds, which are then detected with an electronic capture device (ECD). Sulfur cleanups were employed to aid in the quantification based upon the matrix interferences. Sample concentrations were confirmed on dissimilar columns.

TCLP Herbicides: Solid IDM samples were analyzed for TCLP herbicides according to USEPA SW-846 Method 1311/8151A. Samples were prepared for analysis using extraction techniques. TCLP herbicide extracts were extracted using a separatory funnel liquid-liquid extraction technique according to USEPA SW-846 Method 1311/3510C for solid IDM samples. The samples were extracted with diethyl ether and then esterified with diazomethane. The derivatives were determined by gas chromatography with an electron capture detector (GC/ECD). The results were reported as acid equivalents. Sample concentrations were confirmed on dissimilar columns.

TCLP Metals: Aqueous and solid IDM samples were analyzed for TCLP metals using a combination of the following methodologies: inductively coupled plasma (ICP) and cold vapor atomic absorption (CVAA). Aqueous IDM samples were extracted using the USEPA SW-846 Method 1311. The final liquid extract was separated from the sample material and combined with the initial liquid phase (if applicable). The sample TCLP extract was then treated as an aqueous sample for analysis for TCLP metals. Brief discussions of these procedures and methodologies are presented in the prior section.

Corrosivity as pH: Aqueous IDM samples were analyzed for corrosivity as pH using USEPA SW-846 Method 9040C. A sample pH was directly measured electrometrically using either a glass electrode in combination with a reference potential or a combination electrode.

BOD: Aqueous IDM samples were analyzed for BOD using USEPA MCAWW Method 405.1. A seeded sample, or an appropriate dilution, was incubated for 5 days at 20 degrees Celsius in the dark. The dilution water or seeded dilution water was added as a buffered salt solution to minimize oxygen uptake. The reduction in dissolved oxygen concentration during the incubation period yields a measure of the biological oxygen demand.

COD: Aqueous IDM samples were analyzed for COD using USEPA MCAWW Method 410.1. Organic and oxidizable inorganic substances were oxidized by potassium dichromate in 50% sulfuric acid solution at reflux temperature. Silver sulfate was used as a catalyst and mercuric sulfate was added to remove chloride interference. The excess dichromate was titrated with standard ferrous ammonium sulfate using orthophenanthroline ferrous complex as an indicator.

Appendix A-2

Quality Assurance/Quality Control Evaluation

QUALITY ASSURANCE/QUALITY CONTROL EVALUATION

The project quality assurance and quality control criteria to perform characterization and remediation activities at eleven Solid Waste Management Units (SWMUs) and Areas of Concern at Radford Army Ammunition Plant (RFAAP) are based on *RFAAP Final Master Work Plan* (MWP) (URS, 2003) as specified in MWP Addendum 019 (Shaw, 2007). The MWP and Addendum 019 were implemented through the integration of well-defined quality control elements for activities associated with the task assignment. The quality control criteria defined for sampling and analysis activities were developed in conjunction with specifications contained in *USACE EM200-1-3, Requirements for the Preparation of Sampling and Analysis Plans*, (USACE, 2001), *DoD Quality Systems Manual for Environmental Laboratories, Final Version 3* (DoD, 2006a), *USEPA Office of Solid Waste and Emergency Response Test Methods for Evaluating Solid Waste Physical/Chemical Methods (SW-846), Update IIIB* (November, 2004), *USEPA Methods for the Chemical Analysis of Water and Wastes* (March, 1983), and *DoD Perchlorate Handbook* (March, 2006b).

Table A-3 outlines the data quality indicators as to their definitions, project goals, sampling and analytical assessments. Data quality was assessed through the evaluation of sampling activities and field measurements associated with the chemical analytical data in order to assess the reliability of the chemical analyses and the accuracy and precision of information acquired from the laboratory.

Table A-3
RFI Data Quality Indicators

Data Quality Indicator	Definition	Goal	Sampling Assessment	Analytical Assessment
Precision	Quantitative measure of the variability of a group of measurements in comparison to the average value	Low relative percent difference	Duplicate samples	MS/MSD or lab sample duplicate; Field sample duplicate
Accuracy	Bias in a measurement system	Low bias	Blank contamination	Analysis spike results (LCS, MS, MSD)
Representativeness	Degree to which the measured results accurately reflect the medium being sampled	100%	Holding times, blanks, associated documentation	Inferred from accuracy, precision, and completeness evaluation
Completeness	Percentage of measurements which are judged to be usable	≥90%	Records review	Data validation
Comparability	Qualitative parameter expressing the confidence with which one data set can be compared with another	High	Work plans, quality documents	Analytical methods
Sensitivity	Quantitative measure of the level of detection and quantitation.	High	Review of analytical method or procedures and instrumentation	Analysis of MDLs and MRLs per analyte, analytical method, and matrix

Review of Documentation

The following documentation was required by the field investigation program in order to provide a quality assessment of data collected during routine investigative activities:

- **Field Logbooks:** Hardback logbooks with numbered pages were used to log daily activities, and data collected during the course of field activities. Designated logbooks were also used to record calibration records and equipment maintenance as they were performed. Entries into field logbooks were evaluated for completeness and accuracy.
- **Field Parameter Table:** Documentation of collected samples was provided to the laboratory on a spreadsheet developed by Shaw specifically for USACE investigations. Field Parameter Tables were electronically generated based on information recorded in field logbooks and Chain-of-Custody for every sample, including QC samples. The completed forms contained the required information for encoding chemical data into Environmental Restoration Information System (ERIS) database.
- **Chain-of-Custody:** Samples were collected and relinquished under stringent Chain-of-Custody protocols as specified in the project MWP. A review of the Chain-of-Custodies identified transcription errors that were corrected by drawing a single line through the incorrect information and subsequently correct information was supplied, dated, and initialed.
- **Sample Tracking Table:** Documentation of collected samples was recorded in an electronic sample tracking table as a tool to track project status. Field entries included the field sample identification, sample depth (where applicable), date collected, laboratory ID, deliverable due dates, and requested laboratory analyses. The status of completeness was tracked from work planning stage through data validation completion.

Sampling activities were performed in compliance with standard operating procedures (SOPs) and each individual performing sampling was aware of the requisite protocols for collection of environmental samples.

Data Reporting

Data packages were provided to Shaw in Shaw Alliance Level 4 CLP-like deliverables with electronic data deliverable files from the laboratory. Detected target compound values above the reporting limit and within the acceptable calibration range were reported as determined to no more than three significant figures. Target analytes detected below the lower calibration standard or the reporting limit (whichever was greater) and above the method detection limit were reported as estimated values “J”. Appropriate data qualifiers were applied during validation process and recorded in an electronic database.

Data Reduction and Validation

Data validation determines the acceptability or unacceptability of the data quality based on a set of pre-defined criteria. Data validation is defined as the systematic process for reviewing a data package against a set of criteria to provide assurance that the data is adequate for its intended uses. These criteria depend upon the type(s) of data involved and the purpose for which data are collected. The intended use of the data and the associated acceptance criteria for data quality was identified before the data collection effort began. Both the organic and inorganic chemical data (except for the waste characterization and natural attenuation data) were validated. The data were validated in accordance with *RFAAP Final Master Work Plan* (URS, 2003) QAP requirements, *DoD Quality Systems Manual for Environmental Laboratories, Final Version 3* (DoD, 2006a), *USEPA Office of Solid Waste and Emergency Response Test Methods for Evaluating Solid Waste Physical/Chemical Methods (SW-846), Update IIIB* (November, 2004), *USEPA Methods for the Chemical Analysis of Water and Wastes* (March, 1983), *DoD Perchlorate Handbook* (March, 2006b), and laboratory SOPs. The data qualifier scheme was consistent with USEPA Region III conventions using the *USEPA Region III Modifications to National Functional Guidelines for Inorganic Data Review* (USEPA, 1993b), *USEPA Region III Modifications to the National Functional Guidelines for Organic Data Review Multi-media, Multi-concentration* (USEPA, 1994c), and the *USEPA Region III Dioxin/Furan Data Validation Guidance* (USEPA, 1999d) as appropriate.

Data packages were validated to ensure compliance with specified analytical, Quality Assurance/Quality Control (QA/QC) requirements, data reduction procedures, data reporting requirements, and required accuracy, precision, and completeness criteria. This includes (as applicable), but is not limited to:

- Sample temperature, preservation, and holding times;
- Instrument performance check (for GC, GC/MS, LC/MS);
- Calibration (initial and continuing);
- Blanks (calibration, preparatory, rinse, trip);
- Matrix spike and spike duplicate recoveries;
- Laboratory and field sample duplicate pairs;
- Surrogate spike recoveries (for organics);
- Laboratory control samples;
- Interference check sample (for metals);
- Serial dilution (for metals);
- Internal standards and retention times (for GC, GC/MS, LC/MS); and,
- Quantitative verification.

Results were assessed for accuracy and precision of laboratory analysis to identify the limitations and quantity of data. The data validation reports are contained in **Appendix A-3**. The quality of the data collected in support of the sampling activity was considered acceptable, unless qualified rejected "R" during the validation process. Samples qualified "B" for blank contamination were considered non-detect at the MRL or level of blank contamination, whichever was greater. Samples qualified "J", "UJ", "L", "UL", or "K" were considered acceptable as estimated or non-detect estimated.

Data Review

Data obtained from both the laboratory and data validation were reviewed by the Shaw Project Chemist to assess whether the project-specific data quality objectives, as defined in the associated MWP, were met.

Data Quality Objectives

Data quality objectives were developed concurrently with the Work Plan to ensure: (1) the reliability of field sampling, chemical analyses, and physical analyses; (2) the collection of sufficient data; (3) the quality of data generated was acceptable for its intended use; and (4) valid assumptions could be inferred from the data. Attainment of data quality objectives was assessed through evaluation of data collected using the following data quality indicators:

- **Precision** - a quantitative measure of the variability of a group of measurements in comparison to the average value;
- **Accuracy** - the bias in a measurement system;
- **Representativeness** - the degree to which the measured results accurately reflect the medium being sampled. Representativeness will be assessed based on accuracy, precision, and completeness;
- **Completeness** - the percentage of measurements which are judged to be useable;
- **Comparability** - defined as a qualitative parameter expressing the confidence with which one data set can be compared with another; and,
- **Sensitivity** - describes the method detection, quantitation, and reporting limits. It also may be expressed as the slope of the analytical curve (intensity verses concentration).

Data quality was assessed through the evaluation of sampling activities and field measurements associated with the chemical data in order to verify the reliability of the chemical analyses and the accuracy and precision of information acquired from the laboratory.

Precision: Method or laboratory precision performed by the laboratory was evaluated during the validation process. Overall sampling or field precision was evaluated during the data review process. Precision is measured by calculating and evaluating the relative percent difference (RPD) between the results of field or laboratory duplicate pairs. The RPD is calculated by the following equation:

$$RPD = \frac{/XA-XB/ * 100}{XM}$$

Where:
XA and XB are duplicate analyses, and
XM is the average value [(XA + XB)/2] of the duplicate analyses.

The RPD was calculated for those analytes which were detected at levels exceeding the method detection limits in both samples of the duplicate pair. Analytes that were rejected (R-qualified) in either sample of the duplicate pair were excluded from the duplicate assessment. Analytical results were qualified as estimated (J) for RPDs exceeding criteria for both the sample and its duplicate pair.

Laboratory duplicate sample determinations were used to demonstrate acceptable method precision by the laboratory at the time of analysis and evaluated. Laboratory precision was performed either on the sample and its duplicate pair or the matrix spike and its spike duplicate pair. Duplicate analyses were performed to generate data in order to assess the long-term precision of the analytical method on various matrices. RPDs must be within established control limits.

- **Laboratory Duplicate Analysis:** Laboratory duplicate pairs (dupe) or laboratory spiked duplicate pairs (MSDs) were evaluated for the SWMU 50 and SWMU 59 samples. Laboratory duplicate pairs or laboratory spiked duplicate pairs were within specified precision criteria for each parameter and/or compound except for those compounds listed in the **Table A-4**. Analytical results were qualified as estimated (J) for RPDs exceeding criteria for where the associated compounds were detected, unless qualified for other QC non-conformances. While these parameters were qualified estimated due to the high RPDs, the data was still considered useable, the precision data quality goal was met, and the qualified data did not impact the data quality for the RFI. Further discussion may be found in the data validation reports located in **Appendix A-3**.

Table A-4
Laboratory Duplicate Analysis

Field ID	Analyte	QC Type	Val Qual.	Comments
50SB06A	Arsenic and Chromium	SD	J	High RPDs in Lab Duplicate
50SB06B	Arsenic and Chromium	SD	J	High RPDs in Lab Duplicate
50SB07A	Arsenic and Chromium	SD	J	High RPDs in Lab Duplicate
50SB07B	Arsenic and Chromium	SD	J	High RPDs in Lab Duplicate
50SB08A	Arsenic and Chromium	SD	J	High RPDs in Lab Duplicate
50SB08B	Arsenic and Chromium	SD	J	High RPDs in Lab Duplicate
50SB09A	Arsenic and Chromium	SD	J	High RPDs in Lab Duplicate
50SB09B	Arsenic and Chromium	SD	J	High RPDs in Lab Duplicate
50SB010A	Arsenic and Chromium	SD	J	High RPDs in Lab Duplicate
50SB010B	Arsenic and Chromium	SD	J	High RPDs in Lab Duplicate
50SB011A	Arsenic and Chromium	SD	J	High RPDs in Lab Duplicate
50SB011B	Arsenic and Chromium	SD	J	High RPDs in Lab Duplicate
50SB012A	Arsenic and Chromium	SD	J	High RPDs in Lab Duplicate

50SB012B	Arsenic and Chromium	SD	J	High RPDs in Lab Duplicate
50SB013A	Arsenic and Chromium	SD	J	High RPDs in Lab Duplicate
50SB013B	Arsenic and Chromium	SD	J	High RPDs in Lab Duplicate
50SB014A	Arsenic and Chromium	SD	J	High RPDs in Lab Duplicate
50SB014B	Arsenic and Chromium	SD	J	High RPDs in Lab Duplicate
50SB015A	Arsenic and Chromium	SD	J	High RPDs in Lab Duplicate
50SB015B	Arsenic and Chromium	SD	J	High RPDs in Lab Duplicate
59SB03A	Arsenic and Calcium	SD	J	High RPDs in Lab Duplicate
59SB03B	Arsenic and Calcium	SD	J	High RPDs in Lab Duplicate
59SB03C	Arsenic and Calcium	SD	J	High RPDs in Lab Duplicate
59SB06A	Antimony, Arsenic, Calcium, Copper, Iron, Lead, Magnesium, and Zinc	SD	J	High RPDs in Lab Duplicate
59SB06B	Antimony, Arsenic, Calcium, Copper, Iron, Lead, Magnesium, and Zinc	SD	J	High RPDs in Lab Duplicate
59SB06C	Antimony, Arsenic, Calcium, Copper, Iron, Lead, Magnesium, and Zinc	SD	J	High RPDs in Lab Duplicate
59SB05A	Antimony, Arsenic, Calcium, Copper, Iron, Lead, Magnesium, and Zinc	SD	J	High RPDs in Lab Duplicate
59SB05B	Antimony, Arsenic, Calcium, Copper, Iron, Lead, Magnesium, and Zinc	SD	J	High RPDs in Lab Duplicate
59SB05C	Antimony, Arsenic, Calcium, Copper, Iron, Lead, Magnesium, and Zinc	SD	J	High RPDs in Lab Duplicate
59SB04A	Antimony, Arsenic, Calcium, Copper, Iron, Lead, Magnesium, and Zinc	SD	J	High RPDs in Lab Duplicate
59SB04B	Antimony, Arsenic, Calcium, Copper, Iron, Lead, Magnesium, and Zinc	SD	J	High RPDs in Lab Duplicate
59SB04C	Antimony, Arsenic, Calcium, Copper, Iron, Lead, Magnesium, and Zinc	SD	J	High RPDs in Lab Duplicate
TMSB04C	Antimony, Arsenic, Calcium, Copper, Iron, Lead, Magnesium, and Zinc	SD	J	High RPDs in Lab Duplicate
59SB02A	Antimony, Arsenic, Calcium, Copper, Iron, Lead, Magnesium, and Zinc	SD	J	High RPDs in Lab Duplicate
59SB02B	Antimony, Arsenic, Calcium, Copper, Iron, Lead, Magnesium, and Zinc	SD	J	High RPDs in Lab Duplicate
TMSB02B	Antimony, Arsenic, Calcium, Copper, Iron, Lead, Magnesium, and Zinc	SD	J	High RPDs in Lab Duplicate
59SB02C	Antimony, Arsenic, Calcium, Copper, Iron, Lead, Magnesium, and Zinc	SD	J	High RPDs in Lab Duplicate

SD = Sample Duplicate
J = Value is estimated due to QC non-conformance. Reported value may be inaccurate or imprecise.

- **Field Duplicate Analysis:** Field duplicates were collected during the RFI on a 10% frequency per matrix to identify the cumulative precision of the sampling and analytical process, which includes the homogenization of soil samples. The RPD was calculated for those analytes that were detected at levels exceeding the method reporting limits in both samples of the duplicate pair. For where values exceeding calibration range, the diluted values were evaluated. If one of the duplicate pair was non-detect and other <MRL, then the field duplicate was not evaluated. Analytes that were rejected (R-qualified) in either sample of the duplicate pair were excluded from the duplicate assessment. Precision control criterion was established at 50% RPD (35% RPD for metals) for the aqueous and solid matrix sample pairs. Field precision frequency was conducted on a site-wide basis. Field duplicate pairs were within specified precision criteria for each parameter and/or compound except for those compounds listed in the **Table A-5**. Analytical results were qualified as estimated "J" for exceeding criteria. While these noted parameters were qualified estimated due to the high RPDs, the data was still considered useable, the precision data quality goal was met, and the qualified data did not impact the data quality for the RFI.

Table A-5
Field Duplicate Analysis

Field ID	Duplicate Pair	Analyte	Val Qual.	Comments
59SB04C	TMSB04C	OCDD	J	High RPD
59SB02B	TMSB02B	1,2,3,4,6,7,8-HpCDD, 1,2,3,4,6,7,8-HpCDF, OCDD, and OCDF	J	High RPD

J = Indicates an estimated value due to QC non-conformance. Reported value may not be accurate or precise.

Accuracy: Accuracy is the measure of bias in a system. The accuracy of the results is measured by percent recovery (%R). Laboratory analytical accuracy was assessed through the use of laboratory blanks (method and calibration), rinse blanks, trip blanks, laboratory control samples (LCSs), and matrix spike samples (MSs). Trip blanks were not required for soil samples, but were collected with associated rinse blank samples and evaluated. Laboratory analytical accuracy was reviewed during the validation of data. Sampling accuracy was assessed by evaluating blank contamination and the impact of contaminant contributions originating from non-point sources, such as field sampling equipment decontamination procedures, or laboratory contamination. QC samples evaluated for this assessment included equipment blanks and laboratory method or preparatory blanks. The data validation qualifiers would be applied for analytical non-conformances as outlined in the USEPA Region III validation guidance. Accuracy was measured as percent recovery by the following equation:

$$\%R = \frac{(\text{test value} - \text{spiked value}) * 100}{(\text{true value amount spiked})}$$

The test value is the concentration of the LCS, MS, or MSD determined from analysis. The spiked value for the MS and MSD is the original un-spiked sample concentration and for the LCS is zero. The true value is the concentration of amount spiked into the MS or MSD and the true concentration for the LCS.

Method and calibration blanks, rinse blanks, trip blanks, laboratory control samples, and matrix spikes were evaluated and discussion follows.

Method and Calibration Blanks: A method blank also known as a preparatory blank is a volume of analyte-free water or soil that is processed through the entire analytical scheme (i.e., extraction, digestion, concentration, and analysis) as with the actual samples. Method blanks monitor potential laboratory-induced contamination. Results were qualified "B" for blank contamination by the laboratory and/or through the data validation process. In accordance with USEPA Region III data validation guidelines, reported sample results were considered "non-detect" and qualified with the letter "B" if the detected sample concentration was within 5 times (10 times for common laboratory contaminants: methylene chloride, acetone, 2-butanone, OCDD, OCDF, and common phthalate esters) the concentration in the associated method blank. The method blank contamination assessment was evaluated during the data validation process and may be found in the data validation reports located in **Appendix A-3**. Method blanks were calculated and compared against the same matrix environmental samples on a batch specific basis. Method (preparatory) blanks were reported in ng/L, mg/L, or µg/L units for aqueous matrices and pg/g, mg/kg, or µg/kg for solid matrices. No unit conversions were necessary for method blanks since they were treated in the same manner as the samples. Calibration blanks were also compared against the environmental samples for select parameters. Calibration blanks are aqueous samples and were reported in aqueous units. Performing blank assessments for solid matrix samples, action levels were calculated and expressed in soil units pg/g, µg/kg, or mg/kg from the given aqueous rinse blank or calibration blanks concentrations to be compared against actual solid sample concentrations. This conversion is dependent upon the method performed, sample amounts used, and final digestate or extract volumes used during the analytical analysis. Action levels were based upon 100% solids and 1x dilution factor and adjusted for each sample as appropriate.

- **Method and Calibration Blank Analysis:** For aqueous matrices, the method and calibration blanks were non-detect for all target parameters and/or compounds of interest except for antimony, copper, lead, potassium, sodium, chloroform, and methylene chloride for select sample delivery groups (SDGs). For solid matrices, the method blanks were non-detect for all target parameters and/or compounds of interest except for antimony, aluminum, beryllium, copper, lead, nickel, magnesium, potassium, selenium, sodium, thallium, zinc, OCDD, 2,3,7,8-TCDF, 2,3,4,7,8-PeCDF, 1,2,3,4,6,7,8-HpCDF, 1,2,3,4,6,7,8-HpCDD, 1,2,3,4,7,8-HxCDF, 1,2,3,6,7,8-HxCDF, 1,2,3,4,6,7,8-HpCDF, OCDF, Total TCDFs, Total PeCDFs, Total HxCDFs, and Total HpCDFs for select SDGs. The "B" flagged sample data from the evaluation of QC blanks is presented in **Table A-6**. Analytical results qualified "B" were considered non-detect at the MRL or level of contamination, whichever was greater. Samples meeting the USEPA Region III condition were qualified. While these noted parameters were qualified "B" due to the blank contamination, the data was still considered useable, the accuracy data quality goal was met, and the qualified data did not impact the data quality for the RFI. For each of the other noted analytes not presented in **Table A-6**, the samples were either non-detect for that compound or greater than the blank action level. Further discussion as to method and calibration blanks may be found in the data validation reports located in **Appendix A-3**.

Rinse blanks: The blank contamination assessment was performed to assess the impact of contaminant contributions originating from non-point sources, such as field sampling equipment decontamination procedures. Rinse blanks were intended to identify cross-contamination between samples as a result of sampling equipment decontamination procedures. Rinse blanks were collected by pouring the required volume of de-ionized, organic-free water over the equipment and collecting the water in the appropriate sample containers. Rinse blanks were performed at a rate of one per 20 samples collected or 5% per matrix per sampling technique. The rinse blank results were evaluated to ascertain the efficiency of decontamination and assess the potential for cross-contamination. Rinse blanks were analyzed for the analytes of concern for the RFI. In accordance with USEPA Region III data validation guidelines, the detected concentration in the sample were qualified "B" for blank contamination and was considered non-detect if the sample concentration was within five times (10 times for common laboratory contaminants such as acetone, 2-butanone, methylene chloride, OCDD, OCDF, and phthalate esters) the concentration in the associated equipment blank. Rinse blanks are aqueous samples and were reported in ng/L, µg/L, or mg/L units. Performing blank assessments for solid matrix samples, action levels were calculated and expressed in soil units pg/g, µg/kg, or mg/kg from the given aqueous rinse blank concentrations to be compared against actual solid sample concentrations. This conversion is dependent upon the method performed, sample amounts used, and final digestate or extract volumes used during the analytical analysis. Action levels were based upon 100% solids and 1x dilution factor and adjusted for each sample as appropriate.

- **Rinse Blank Analysis:** Rinse blank RB083007 (low-flow pump) applies to the groundwater samples collected at SWMU 50 and SWMU 59. Rinse blanks 072407R and 072507R apply to the surface soil samples collected at the SWMU 50 and SWMU 59. These rinse blanks were taken from the stainless steel bowl and trowel used to collect the field soil samples. For rinse blank RB083007, all analytes were non-detect for all target parameters and/or compounds of concern except for potassium and sodium. For rinse blank 072407R, all analytes were non-detect for all target parameters and/or compounds of concern except for lead, magnesium, potassium, and sodium. For rinse blank 072507R, all analytes were non-detect for all target parameters and/or compounds of concern except for potassium, sodium , 1,2,3,4,6,7,8-HpCDF, OCDF, and Total HpCDFs. The "B" flagged sample data from the evaluation of QC blanks is presented in **Table A-6**. Analytical results qualified "B" were considered non-detect at the MRL or level of contamination, whichever was greater. Samples meeting the USEPA Region III condition were qualified. While these noted parameters were qualified "B" due to the blank contamination, the data was still considered useable, the accuracy data quality goal was met, and the qualified data did not impact the data quality for the RFI. For each of the other noted analytes not presented in **Table A-6**, the samples were either non-detect for that compound or greater than the blank action level. Further discussion as to rinse blanks may be found in the data validation reports located in **Appendix A-3**.

Trip Blanks: Trip blanks were prepared by the project contract laboratory and accompanied the samples requiring VOC analysis. One trip blank was transported with each VOC sample cooler to the laboratory for each day of sampling. The trip blanks were prepared by pouring the required volume of de-ionized, organic-free water into appropriate sample containers in the laboratory. The trip blanks were analyzed for the TCL VOCs. The trip blank results were used to assess the potential incidental contamination due to sample transport before, during, and after field operations (i.e., exposure to air) and/or contamination due to the sample container. In accordance with USEPA Region III data validation guidelines, the detected concentration in the sample was considered a "non-detect" (i.e., qualified "B" for blank contamination) and was excluded from consideration if the sample concentration was within five times (10 times for common laboratory contaminants such as acetone, 2-butanone, methylene chloride) the concentration in the associated trip blank. Trip blanks are aqueous samples and were reported in µg/L units. Performing blank assessments for solid matrix samples, action levels were calculated and expressed in soil units µg/kg from the given aqueous rinse blank VOC concentrations to be compared against actual solid sample concentrations. This conversion is dependent upon the method performed, sample amounts used, and final volumes used during the analytical analysis. Action levels were based upon 100% solids and 1x dilution factor and adjusted for each sample as appropriate.

- **Trip Blank Analysis:** The trip blank TB083007 applies to the ground water samples collected on 08/29/07 and 08/30/07. The trip blanks 071907TS and 071907TW apply to the surface and subsurface soil samples collected on 07/19/07. The trip blank TB072307 applies to the surface and subsurface soil samples collected on 07/23/07. The trip blanks TB072507S and TB072507W apply to the surface and subsurface soil samples collected on 07/25/07. The trip blanks TB072407S and TB072407W apply to the surface and subsurface soil samples collected on 07/24/07. For trip blanks TB083007, 071907TS, TB072307, TB072407S, TB072407W, TB072507S, and TB072507W, all target analytes were non-detect for all parameters and/or compounds of concern. Chloroform was detected at trace levels in trip blank 071907TW; however, did not impact any associated samples. The "B" flagged sample data from the evaluation of QC blanks is presented in **Table A-6**. Analytical results qualified "B" were considered non-detect at the MRL or level of contamination, whichever was greater. Samples meeting the USEPA Region III condition were qualified. While these noted parameters were qualified "B" due to the blank contamination, the data was still considered useable, the accuracy data quality goal was met, and the qualified data did not impact the data quality for the RFI. For each of the other noted analytes not presented in **Table A-6**, the samples were either non-detect for that compound or greater than the blank action level. Further discussion as to trip blanks may be found in the data validation reports located in **Appendix A-3**.

Table A-6
B-Qualified Data Summary

Field ID	Analyte	Result	LQ	Units	Field ID	Analyte	Result	LQ	Units
59SB06A	Sodium	109	J	MG/KG	59SS09	2,3,7,8-TCDF	0.424	A	PG/G
59SB06A	1,2,3,4,6,7,8-HpCDF	0.838	A	PG/G	59SS09	2,3,4,7,8-PeCDF	0.292	A, EMPC	PG/G
59SB06A	OCDF	2.11	A	PG/G	59SS10	2,3,7,8-TCDF	0.442	A, EMPC	PG/G
59SB06B	Antimony	0.83	J	MG/KG	59SS10	2,3,4,7,8-PeCDF	0.184	A, EMPC	PG/G
59SB06B	Beryllium	0.45		MG/KG	59MW01	Potassium	2090	J	UG/L
59SB06B	Sodium	162	J	MG/KG	50MW01	Copper	17.8	J	UG/L
59SB06B	1,2,3,4,6,7,8-HpCDF	0.845	A	PG/G	50MW02	Potassium	6940	J	UG/L
59SB06C	Antimony	0.87	J	MG/KG	50MW02	Copper	9.3	J	UG/L
59SB06C	Beryllium	0.42		MG/KG	50SB010A	1,2,3,4,6,7,8-HpCDF	2.44	A	PG/G
59SB06C	Sodium	195	J	MG/KG	50SB010A	2,3,4,7,8-PeCDF	0.232	A	PG/G
59SB06C	1,2,3,4,6,7,8-HpCDF	0.821	A, EMPC	PG/G	50SB010A	2,3,7,8-TCDF	0.483	A, EMPC	PG/G
59SB05A	Antimony	1.0	J	MG/KG	50SB010A	OCDF	6.53	A	PG/G
59SB05A	Beryllium	0.60		MG/KG	50SB010A	Potassium	292	J	MG/KG
59SB05A	Sodium	230	J	MG/KG	50SB010A	Sodium	84.4	J	MG/KG
59SB05A	1,2,3,4,6,7,8-HpCDF	2.00	A	PG/G	50SB010A	Selenium	2.5	J	MG/KG
59SB05A	1,2,3,4,7,8-HxCDF	0.423	A, EMPC	PG/G	50SB010B	1,2,3,4,6,7,8-HpCDF	4.48	A	PG/G
59SB05A	1,2,3,6,7,8-HxCDF	0.125	A	PG/G	50SB010B	2,3,4,7,8-PeCDF	0.107	A, EMPC	PG/G
59SB05A	OCDF	2.83	A	PG/G	50SB010B	2,3,7,8-TCDF	0.244	A	PG/G
59SB05B	Antimony	1.1	J	MG/KG	50SB010B	OCDF	4.89	A	PG/G
59SB05B	Beryllium	0.63		MG/KG	50SB010B	Potassium	924		MG/KG
59SB05B	1,2,3,4,6,7,8-HpCDF	0.723	A	PG/G	50SB011A	1,2,3,4,6,7,8-HpCDF	1.86	A	PG/G
59SB05B	1,2,3,4,7,8-HxCDF	0.137	A	PG/G	50SB011A	2,3,4,7,8-PeCDF	0.146	A, EMPC	PG/G
59SB05C	Antimony	0.63	J	MG/KG	50SB011A	2,3,7,8-TCDF	0.216	A	PG/G
59SB05C	Beryllium	0.61		MG/KG	50SB011A	OCDF	3.06	A	PG/G
59SB05C	Sodium	227	J	MG/KG	50SB011A	Total HpCDFs	3.06		PG/G
59SB05C	OCDF	0.963	A	PG/G	50SB011A	Total TCDFs	0.604	A, EMPC	PG/G
59SB04A	Antimony	0.72	J	MG/KG	50SB011A	Potassium	587		MG/KG
59SB04A	1,2,3,4,6,7,8-HpCDF	2.19	A	PG/G	50SB011A	Sodium	58.0	J	MG/KG
59SB04A	OCDF	5.17	A	PG/G	50SB011B	1,2,3,4,6,7,8-HpCDF	4.01	A	PG/G
59SB04B	Antimony	0.84	J	MG/KG	50SB011B	2,3,7,8-TCDF	0.141	A	PG/G
59SB04B	Beryllium	0.66		MG/KG	50SB011B	OCDF	3.35	A	PG/G
59SB04B	1,2,3,4,6,7,8-HpCDF	0.389	A, EMPC	PG/G	50SB011B	Total HpCDFs	4.35	A, EMPC	PG/G
59SB04B	OCDF	0.661	A, EMPC	PG/G	50SB011B	Total PeCDFs	0.147	A, EMPC	PG/G
59SB04C	Antimony	0.61	J	MG/KG	50SB011B	Total TCDFs	0.141		PG/G
59SB04C	Beryllium	0.67		MG/KG	50SB011B	Potassium	564	J	MG/KG
59SB04C	Sodium	225	J	MG/KG	50SB011B	Sodium	71.8	J	MG/KG
59SB04C	1,2,3,4,6,7,8-HpCDD	1.14	A	PG/G	50SB012A	2,3,7,8-TCDF	0.291	A	PG/G
59SB04C	1,2,3,4,6,7,8-HpCDF	0.593	A	PG/G	50SB012B	Sodium	92.8	J	MG/KG
59SB04C	1,2,3,4,7,8-HxCDF	0.159	A, EMPC	PG/G	50SB013A	2,3,4,7,8-PeCDF	0.199	A	PG/G

59SB04C	1,2,3,6,7,8-HxCDF	0.0807	A	PG/G	50SB013A	2,3,7,8-TCDF	0.394	A	PG/G
59SB02A	Antimony	0.37	J	MG/KG	50SB013A	Sodium	100	J	MG/KG
59SB02A	Sodium	187	J	MG/KG	50SB013B	2,3,7,8-TCDF	0.762	A	PG/G
59SB02A	1,2,3,4,6,7,8-HpCDF	3.51	A	PG/G	50SB013B	Sodium	594	J	MG/KG
59SB02A	1,2,3,6,7,8-HxCDF	0.683	A	PG/G	50SB014A	Potassium	511	J	MG/KG
59SB02A	OCDF	6.93	A	PG/G	50SB014A	Sodium	75.1	J	MG/KG
59SB02B	Antimony	0.76	J	MG/KG	50SB014B	1,2,3,4,6,7,8-HpCDF	1.56	A	PG/G
59SB02B	Beryllium	0.70		MG/KG	50SB014B	OCDF	2.80	A	PG/G
59SB02B	1,2,3,4,6,7,8-HpCDF	0.617	A	PG/G	50SB014B	Total HpCDFs	1.56		PG/G
59SB02B	1,2,3,4,7,8-HxCDF	0.144	A	PG/G	50SB014B	Potassium	935		MG/KG
59SB02B	OCDF	1.30	A	PG/G	50SB014B	Sodium	50.6	J	MG/KG
59SB02C	Antimony	0.86	J	MG/KG	50SB015A	1,2,3,4,6,7,8-HpCDF	1.01	A	PG/G
59SB02C	1,2,3,4,6,7,8-HpCDF	0.984	A	PG/G	50SB015A	OCDF	1.70	A	PG/G
59SB02C	1,2,3,4,7,8-HxCDF	0.177	A	PG/G	50SB015A	Total HpCDFs	1.55		PG/G
59SB02C	OCDF	1.70	A	PG/G	50SB015A	Potassium	649		MG/KG
072507R	Potassium	1770	J	UG/L	50SB015B	1,2,3,4,6,7,8-HpCDF	0.891	A	PG/G
072507R	Sodium	2130	J	UG/L	50SB015B	OCDF	1.28	A	PG/G
59SB03A	1,2,3,4,7,8-HxCDF	1.11	A	PG/G	50SB015B	Total HpCDFs	0.891		PG/G
59SB03C	1,2,3,4,6,7,8-HpCDF	2.75	A	PG/G	50SB015B	Potassium	814		MG/KG
59SB03C	1,2,3,4,7,8-HxCDF	0.239	A	PG/G	50SB015B	Sodium	48.8	J	MG/KG
59SB03C	OCDF	5.74	A	PG/G	50SB06A	2,3,7,8-TCDF	0.599	A	PG/G
59SS06	Potassium	693		MG/KG	50SB06B	Potassium	523	J	MG/KG
59SS06	Sodium	76.5	J	MG/KG	50SB06B	Sodium	152	J	MG/KG
59SS06	Antimony	1.2	J	MG/KG	50SB07A	Potassium	654		MG/KG
59SS06	Mercury	0.047	J	MG/KG	50SB07A	Sodium	54.8	J	MG/KG
59SS07	Potassium	735		MG/KG	50SB07B	1,2,3,4,6,7,8-HpCDF	2.87	A	PG/G
59SS07	Sodium	74.5	J	MG/KG	50SB07B	2,3,7,8-TCDF	0.370	A	PG/G
59SS07	Antimony	0.73	J	MG/KG	50SB07B	OCDF	11.8	A	PG/G
59SS07	Mercury	0.027	J	MG/KG	50SB07B	Total PeCDFs	0.207	A, EMPC	PG/G
59SS08	Sodium	56.8	J	MG/KG	50SB07B	Total TCDFs	0.779	A, EMPC	PG/G
59SS08	Antimony	0.98	J	MG/KG	50SB07B	Potassium	307	J	MG/KG
59SS09	Potassium	441	J	MG/KG	50SB07B	Sodium	180	J	MG/KG
59SS09	Antimony	0.39	J	MG/KG	50SB08B	Potassium	590	J	MG/KG
59SS09	Selenium	2.7	J	MG/KG	50SB08B	Sodium	138	J	MG/KG
59SS10	Potassium	431	J	MG/KG	50SB09A	2,3,4,7,8-PeCDF	0.187	A	PG/G
59SS10	Sodium	69.8	J	MG/KG	50SB09A	2,3,7,8-TCDF	0.267	A	PG/G
59SS10	Antimony	0.64	J	MG/KG	50SB09A	Potassium	759		MG/KG
59SS06	2,3,7,8-TCDF	0.424	A	PG/G	50SB09A	Sodium	52.7	J	MG/KG
59SS07	2,3,7,8-TCDF	0.413	A	PG/G	50SB09B	Potassium	372	J	MG/KG
59SS08	2,3,7,8-TCDF	0.566	A	PG/G	50SB09B	Sodium	198	J	MG/KG

J = A = Indicates an estimated value for estimating a concentration <MRL and ≥ MDL.
EMPC = Estimated Maximum Possible Concentration.

Laboratory control samples: The LCSs were analyzed to assess general method performance by the ability of the laboratory to successfully recover the target analytes from a control matrix. The LCS is similar in composition to the method blank. For aqueous analyses, spiked analyte-free reagent water was used. For soil analyses, a purified solid matrix (e.g., sand, sodium sulfate, or other purified solid) was used. The LCSs were spiked with single-component target analytes before it is carried through the preparation, cleanup, and determinative procedures. LCSs were performed at a rate of one per preparation batch per matrix. When samples were not subjected to a separate preparatory procedure (i.e., purge and trap VOC analyses, or aqueous Hg analysis), the CCV may have been used as the LCS, provided the CCV acceptance limits were used for evaluation.

- **Laboratory Control Sample Analysis:** The results of the LCS were evaluated, in conjunction with other QC information during the data validation process to ascertain the acceptability of the data generated for that batch of samples. The LCS samples were evaluated for each SDG and are matrix specific. For LCS samples, USACE DoD QSM and laboratory criteria limits were used for each method in the validation process. The aqueous LCS samples were within specified criteria for all target parameters and/or compounds of concern except for chloromethane, endrin aldehyde, 2,4,5-T, dicamba, 2,4,5-TP, dalapon, HMX, 1,3-dichlorobenzene, and 1,4-dichlorobenzene for select SDGs. The solid LCS samples were within specified criteria for all target parameters and/or compounds of concern except for HMX, endrin aldehyde, delta-BHC, 2,4,5-TP, dalapon, dicamba, dinoseb, 2,4-dinitrophenol, 4,6-dinitro-2-methylphenol, vinyl chloride, chloromethane, 1,3-dichlorobenzene, and 1,4-dichlorobenzene for select SDGs. Data qualifiers were applied as appropriate to associated samples based upon these outliers. Further details may be found in the data validation reports located on a CD at the back of this report. While qualification was applied due to high or low LCS recoveries, the data was still considered useable (except for dalapon – see completeness discussion), the accuracy data quality goal was met, and the qualified data did not impact the data quality for the RFI.

Matrix spikes: The MS was used to assess the performance of the method as applied to a particular project matrix. A MS is an environmental sample to which known concentrations of certain target analytes have been added before sample manipulation from the preparation, cleanup, and determinative procedures have been implemented. The original field sample was mixed or shaken to ensure homogeneous fractions when allowed by the method. MSs were performed at a rate of one per preparation batch or 5% whichever was more frequent per matrix. The results of the MS are evaluated, in conjunction with other QC information during the validation process to assess the effect of the matrix on the bias of the analysis. If a matrix spike duplicate (MSD) was analyzed, it was also evaluated.

- **Matrix Spike and Matrix Spike Duplicate Analysis:** The results of the MS/MSD were evaluated, in conjunction with other QC information during the data validation process to ascertain the acceptability of the data generated for that batch of samples. Only spiked project site SWMU 50 and SWMU59 samples were evaluated. The spiked samples varied among parameter groups, matrices, and SDGs. For MS/MSD samples, USACE DoD QSM and laboratory criteria limits were used for each method in the validation process. For aqueous matrices, MS and MSD samples were within specified criteria for all target parameters and/or compounds of interest except for 4-nitrophenol for spiked

sample 50MW01 for select SDGs. For solid matrices, MS and MSD samples were within specified criteria for all target parameters and/or compounds of interest except for delta-BHC and endrin aldehyde for spiked sample 59SB02A; aluminum, antimony, calcium, chromium, selenium, vanadium, zinc, cobalt, copper, nickel, and thallium for spiked sample 59SB03A; chrysene and 1-methylnaphthalene for spiked sample 59SB04A; antimony, arsenic, cadmium, chromium, cobalt, nickel, selenium, thallium, vanadium, zinc, calcium, magnesium, aluminum, iron, and manganese for spiked sample 50SB06A; 2,4-dimethylphenol and 3,3'-dichlorobenzidine for spiked sample 50SB010A; aluminum, antimony, arsenic, cadmium, calcium, chromium, iron, manganese, nickel, potassium, selenium, silver, sodium, thallium, and vanadium for spiked sample 59SS10; 2,4-D, 2,4,5-TP, 2,4,5-T, dinoseb, and dichloroprop for spiked sample 50SB011A; acetone, cis-1,3-dichloropropene, trans-1,3-dichloropropene, 2-hexanone, 4-methyl-2-pentanone, methyl ethyl ketone, and 1,1,2,2-tetrachloroethane for spiked sample 50SB012A; and aldrin, alpha-BHC, beta-BHC, delta-BHC, gamma-BHC, alpha chlordane, gamma chlordane, dieldrin, 4,4'-DDE, 4,4'-DDT, endosulfan sulfate, endrin aldehyde, endosulfan I, endosulfan II, heptachlor, heptachlor epoxide, methoxychlor, acenaphthene, acenaphthylene, anthracene, chrysene, fluorene, 1-methylnaphthalene, 2-methylnaphthalene, naphthalene, and phenanthrene for spiked sample 50SB014A. All criteria were met for spiked samples 59SB05B, 59SS06, 59SS08, 50SB09A, and 50SB11B for where used as parent sample. The spiked samples were qualified as applicable to USEPA Region III guidance. In some cases, the sample amount was greater than the amount spiked or the associated sample was non-detect for a high recovery; therefore, no qualifiers were required. Further details may be found in the data validation reports located on a CD at the back of this report. While qualification was applied due to high or low MS or MSD recoveries in some cases, the data was still considered useable, the accuracy data quality goal was met, and the qualified data did not impact the data quality for the RFI.

Completeness: Completeness is a measure of the amount of information that must be collected during the field investigation to allow for successful achievement of the objectives. An adequate amount and type of data must be collected for conclusions to be valid. Missing data may reduce the precision of estimates or introduce bias, thus lowering the confidence level of the conclusions. While completeness has been historically presented as a percentage of the data that is considered usable, this does not take into account critical sample locations or critical analytical parameters.

The amount and type of data that may be lost due to sampling or analytical error cannot be predicted or evaluated in advance. The importance of lost or suspect data will be evaluated in terms of the sample location, analytical parameter, nature of the problem, decision to be made, and the consequence of an erroneous decision. Critical locations or parameters for which data is found to be inadequate will either be re-sampled and re-analyzed or the data will be appropriately qualified based on the decision of the project QA manager. The completeness goal percentage of usable data is set at 90%.

Sampling completeness was assessed through evaluation of the total number of samples proposed for collection in the work plan versus the actual number of samples collected and analyzed. Analytical completeness was assessed by comparing the number of useable data points collected to the total number of data points generated. Completeness is calculated using the following equations:

$$\%\,\text{Sampling Completeness} = \frac{\text{No. of actual samples collected}}{\text{No. of proposed samples}}$$

$$\%\,\text{Analytical Completeness} = \frac{\text{No. of usable data}}{\text{No. of requested analyses}}$$

For the purposes of this report, unusable data are defined to include rejected data points ("R" qualifier).

- **Completeness Analysis:** Twenty surface soil samples, twenty subsurface soil samples, three groundwater samples, five field duplicate samples (four soil and one groundwater), two project wide IDM samples (one aqueous and one solid), eight trip blanks, and three rinse blanks were proposed for collection at the SWMU 50 and SWMU 59 as specified in MWP Addendum 019 (Shaw, 2007). The field duplicates, rinse blanks, and IDM samples were collected on a site-wide basis. All samples were collected and analyzed for the parameters as specified in MWP Addendum 019. The resulting sampling completeness quotient is 100% and meets the pre-defined goals of 90% for the sampling program. The overall analytical percent completeness was assessed by parameter group and matrix for the samples collected. Analysis of the all samples resulted in the generation of 10,251 out of 10,253 data points deemed to be useable, generating an overall analytical completeness quotient of 99.9%. Dalapon was rejected for the samples 50MW01 and 50MW02 based upon no recovery found in the LCS resulting in an analytical completeness percentage of 99.6% (495 out of 497 data points) for chlorinated herbicides. All other completeness scenarios for all other parameter groups and/or matrices were 100%. The completeness percentages met the pre-defined goal of 90% for all SWMU 50 and SWMU 59 sampling events and did not impact the overall RFI.

Representativeness: Representativeness is a measure of the degree to which the measured results accurately reflect the medium being sampled. It is a qualitative parameter that is addressed through the proper design of the sampling program in terms of sample location, number of samples, and actual material collected as a "sample" of the whole.

Sampling protocols were developed to assure that samples collected are representative of the media. Field handling protocols (e.g., storage, handling in the field, and shipping) were designed to protect the representativeness of the collected samples. Proper field documentation and QC inspections were used to establish that protocols were followed and that sample identification and integrity was maintained and met pre-defined goals.

Comparability: Comparability is the confidence with which one data set can be compared to another. Comparability was controlled through the use of SOPs that have been developed to standardize the collection of measurements and samples and approved analytical technique with defined QC criteria. USEPA-approved methodologies were used in providing laboratory analytical support for this project. Laboratory SOPs were developed from these methods. Consistent and proper calibration of equipment throughout the field exercises, as described in MWP Addendum 019 and the MWP (URS, 2003), will assist in the comparability of measurements. Field documentation and QA audits were used to establish that protocols for sampling and measurement follow appropriate SOPs and met pre-defined goals.

Levels of Concern

An integral part of the identification of DQOs is the establishment of LOCs. These levels were compared with analytical PQLs and MDLs prior to analytical method selection to ensure the method was capable of addressing project DQOs, preclude occurrence of false negative issues, and assess best available technology limitations. Although LOCs selected as potential concerns may not necessarily reflect RFI-specific objectives, they were developed to ensure that the chosen analytical methods have detection limits sensitive enough to achieve compliance with appropriate site-specific screening levels or other specified criteria for soil. The LOCs for the SWMU 50 and SWMU 59 are based on soil applicable or relevant and appropriate requirements (ARARs) and To-Be-Considered (TBC) guidance and are as follows:

The soil and sediment ARAR/TBC guidance includes:

- RFAAP Facility-Wide Background inorganic soil concentrations (IT, 2001); and
- Oakridge National Laboratory (ORNL) Regional Screening Table – Residential and Industrial Scenarios with a hazard index (HI) = 0.1 for non-carcinogen compounds and a dilution attenuation factor (DAF) = 20 for the SSL Transfer levels (September 12, 2008)

The groundwater and surface water ARAR/TBC guidance includes:

- Oakridge National Laboratory Regional Screening Table – Tap Water Scenario (September 12, 2008) with a hazard index (HI) = 0.1 for non-carcinogen compounds; and
- USEPA Drinking Water Maximum Contaminant Levels (August, 2006)

Sensitivity (quantitation, reporting, and detection limits): The term sensitivity is used broadly to describe the method detection, quantitation, and reporting limits established to meet project-specific data quality objectives; and not limited to the definition which describes the capability of a method or instrument to discriminate between measurement responses. The method detection limits (MDLs) and the practical quantitation limits (PQLs) published within USEPA methods are based upon a reagent water matrix, and are not necessarily reflective of typical sample matrices; therefore, care was taken in establishing limits for laboratory analysis. Methods were selected based upon their sensitivity, technological, and economical considerations while keeping the screening values and available methodology in mind and were sufficient in meeting the given levels of concern (LOCs).

The laboratory generated PQLs and MDLs were compared at the onset of the project. The MDL is the minimum concentration of an analyte that can be measured and reported with a 99% confidence that the analyte is above zero and is identified from the analysis of a sample in a given matrix containing the analyte. The MDLs were derived by the method based upon 40 CFR Chapter 136 Appendix B. The MDL values differ and change periodically because each MDL is laboratory, instrument, analyst, matrix, and method specific. Therefore, the more conservative MDLs were reported where there were multiple instruments and or studies performed. The PQLs are the values at which the laboratory has demonstrated the ability to reliably quantitate the target value of an analyte for the method performed and are based upon the lowest calibration standard used for the initial calibration curve or the lowest verification standard performed. PQLs must be at least 3 times the MDL.

The laboratory used a method reporting limit (MRL) or sample quantitation limit to report non-detects for each sample. The MRL is the threshold value below which the laboratory reports non-detected values as "U," "ND," or "<" and will vary for each sample based upon matrix, dilution, sample volumes, percent moistures (for solids), and the method performed.

Data was calculated over a linear range and the resulting highest concentration within the linear range represents the upper quantitation limit. Each target compound for every sample was reported at a specific level. Any target analytes detected above the MDL, but less than the MRL or 3 times the MDL (whichever was greater), were reported as estimated values "J". Target analytes detected above the upper calibration standard were diluted and analyzed within established calibration windows or qualified. The units used for aqueous samples were ng/L, µg/L, or mg/L and for solid samples were pg/g, µg/kg, or mg/kg.

- **SWMU 50 and SWMU 59 Sensitivity Analysis:** The method sensitivities (i.e., MDLs) were compared to the levels of concern for the samples collected. Comparing the groundwater samples against the ORNL tap water RBCs, 1,1,2,2-tetrachloroethane, 1,1,2-trichloroethane, 1,2-dichloroethane, carbon tetrachloride, chloroform, tetrachloroethene, vinyl chloride, benz(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, dibenz(a,h)anthracene, indeno(1,2,3-cd)pyrene, naphthalene, 1,2,4-trichlorobenzene, 1,4-dichlorobenzene, 2,4,6-trichlorophenol, 2,4-dinitrophenol, 3,3'-dichlorobenzidine, 3-nitroaniline, 4,6-dinitro-2-methylphenol, 4-chloroaniline, bis(2-chloroethyl)ether, bis(chloroisopropyl)ether, hexachlorobenzene, hexachlorobutadiene, hexachloroethane, nitrobenzene, n-nitrosodi-n-propylamine, pentachlorophenol, aldrin, dieldrin, heptachlor epoxide, toxaphene, PCB-1016, PCB-1221, PCB-1232, PCB-1242, PCB-1248, PCB-1254, PCB-1260, nitroglycerin, MCPA, MCPP, aluminum, antimony, arsenic, mercury, selenium, thallium, 2,3,7,8-TCDD, 2,3,4,7,8-PECDF, Total PECDD, Total HXCDD, and Total HXCDF had MDLs greater than the given tap water RBCs for select samples. Comparing the groundwater samples against the Drinking Water MCLs, hexachlorobenzene, pentachlorophenol, aluminum, antimony, selenium, and thallium had MDLs greater than the given MCLs for select samples. The samples had higher sensitivity levels due to the given available USEPA method sensitivity capabilities as well as any required sample dilutions and/or sample volume adjustments due to either high analyte concentration and/or matrix interferences. Though an uncertainty may be present with these sensitivity gaps between the MCLs and tap water RBCs to the MDLs for these compounds, it is unlikely that they present an impact to the decisions regarding the RFI.

- Comparing the surface and subsurface soil samples against the USEPA ORNL residential RBCs, benzo(a)pyrene, dibenz(a,h)anthracene, bis(2-chloroethyl)ether, n-nitrosodi-n-propylamine, toxaphene, PCB-1221, PCB-1232, nitroglycerin, cadmium, and thallium had MDLs greater than the given residential RBCs for select samples. Comparing the surface and subsurface soil samples against the USEPA ORNL industrial RBCs, n-nitrosodi-n-propylamine and thallium had MDLs greater than the given industrial RBCs for select samples. Comparing the surface and subsurface soil samples against the ORNL SSL Transfer concentrations, 1,1,2,2-tetrachloroethane, 1,1,2-trichloroethane, 1,2-dichloroethane, 1,2-dichloropropane, carbon tetrachloride, chloroform, tetrachloroethene, vinyl chloride, 1-methylnaphthalene, benzo(a)pyrene, naphthalene, 1,4-dichlorobenzene, 2,4-dinitrophenol, 3,3'-dichlorobenzidine, 3-nitroaniline, 4,6-dinitro-2-methylphenol, 4-chloroaniline, 4-nitroaniline, bis(2-chloroethyl)ether, bis(chloroisopropyl)ether, hexachlorobenzene, hexachlorobutadiene, hexachloroethane, nitrobenzene, n-nitrosodi-n-propylamine, pentachlorophenol, dieldrin, PCB-1221, PCB-1232, PCB-1242, PCB-1248, 1,3-dinitrobenzene, 2-nitrotoluene, nitrobenzene, RDX, nitroglycerin, MCPA, MCPP, arsenic, cadmium, thallium, 2,3,7,8-TCDD, 2,3,4,7,8-PECDF, Total PECDD, Total HXCDD, and Total HXCDF had MDLs greater than the given SSL Transfer concentrations for select samples. Comparing the surface and subsurface soil samples against site-wide metals background concentrations, cadmium and thallium had MDLs greater than the given site-wide metals background for select samples. The samples had higher sensitivities due to the given available USEPA method sensitivity capabilities as well as percent solid adjustments for dryness, and any required sample dilutions or sample volume adjustments due to either high analyte concentration and/or matrix interferences. Though an uncertainty may be present with these sensitivity gaps between the residential RBCs, industrial RBCs, SSL Transfer concentrations, and background concentrations to the MDLs for these compounds, it is unlikely that they present an impact to the decisions regarding the RFI.

Appendix A-3

Validation Reports and Form 1s

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Shaw® Shaw Environmental, Inc.

MEMORANDUM

TO: Jeff Parks, Shaw E&I Radford Army Ammunition Plant (RFAAP) Project Manager

FROM: Eric Malarek, Shaw E&I Project Chemist

SUBJECT: RFAAP Data Validation – Dioxin Furans
SGS Paradigm Analytical Laboratories, Inc. SDGs G383-583
(Accutest SDG F51154)

DATE: September 26, 2007

The purpose of this memorandum is to present the data validation report for the samples collected at Main Manufacturing Area at RFAAP for a RFI/CMS Nine Sites on July 18, 2007 and July 19, 2007. The samples were analyzed for Dioxin Furan compounds using USEPA SW-846 Method 8290 High Resolution Gas Chromatography/High Resolution Mass Spectroscopy (HRGC/HRMS). A total of five aqueous samples and seventeen solid samples were validated. The sample Ids are:

Field Sample ID	Lab Sample ID	Field Sample ID	Lab Sample ID
41SW08	F51154-6	41SD11	F51154-22
41SW09	F51154-7	49SS02	F51154-23
41SW10	F51154-8	49SS03	F51154-24
41SD08	F51154-9	49SS04	F51154-25
41SD09	F51154-10	49SS05	F51154-26
41SD10	F51154-11	59SS06	F51154-27
LFSD01	F51154-15	59SS07	F51154-28
TMSD01	F51154-16	59SS08	F51154-29
LFSW01	F51154-17	59SS09	F51154-30
APSD01	F51154-18	59SS10	F51154-31
TMSW01	F51154-20	TMSS05	F51154-32

Data were reviewed and validated using a combination of project QAPP, *DOD Quality Systems Manual for Environmental Laboratories, Final Version 3, January, 2006* (DoD, 2006) (DoD QSM), method-specific criteria, and laboratory SOP criteria. The data qualifier scheme was consistent with the *USEPA Region III Dioxin/Furan Data Validation Guidance* (March, 1999). Parameters evaluated are presented in **Table 1**. Data associated with parameters in compliance with quality control specifications have not been qualified. Data associated with parameters that did not comply with quality control specifications and directly impacted project data have been qualified in accordance with USEPA Region III specifications.

Table 1 Laboratory Performance Criteria

Qualified		Parameter
Yes	No	
	X	Holding Times and Preservation
X		Blank Analysis
	X	Instrument Performance Check
	X	Initial Calibration
	X	Continuing Calibration
	X	Internal Standards (IS) Recovery Standard Solutions
	X	Cleanup Standards
	X	Laboratory Control Standard or Ongoing Precision Result (OPR)
X		Matrix Spike and Spike Duplicate
X		Field Duplicate
X		Quantitation Verification

The quality of data collected in support of this sampling activity is considered acceptable with noted qualifications.

Eric Malarek, Chemist

9/26/07
Date

RFAAP VALIDATION REPORT
DIOXIN FURAN REVIEW
SDGs G383-583
(Accutest SDG F51154)

I-Holding Times and Preservation

The objective is to ascertain the validity of results based on the holding time of the sample from time of collection to time of sample extraction and analysis. Holding time criteria: For aqueous samples, dioxin and furans are shipped cooled (@4°C ± 2°C) with a maximum holding time of 30 days from sample collection to preparative extraction and 45 days from preparative extraction to determinative analysis. For solid samples, dioxin and furans are shipped cooled (@4°C ± 2°C) with a maximum holding time of 30 days from sample collection to preparative extraction and 45 days from preparative extraction to determinative analysis.

- Temperature Review: The temperature blank was sent with each cooler and recorded by the laboratory upon receipt. For samples collected on 07/18/07 and 07/19/07, the coolers were received by the primary laboratory (Accutest) on 07/20/07 at 4.0°C, 4.0°C, 4.6°C, 4.6°C, 4.8°C, 5.0°C, 5.0°C, and 5.8°C. The herbicides were subcontracted to Accutest TX and were received the samples at 4.2°C, 4.0°C, and 3.6°C. The perchlorate subcontract laboratory (Datachem Laboratories, Inc.) received the aqueous samples at 3.0°C. The dioxin subcontract laboratory (SGS Paradigm Analytical Laboratories, Inc.) received the samples at 5.5°C and 5.2°C. All criteria were met. No qualifiers were applied.

- Holding Time Review: The aqueous and soil samples were collected on 07/18/07 and 07/19/07. For samples collected 07/18/07, the dioxins and furans were extracted on 07/26/07 and 07/29/07 and analyzed on 07/28/07, 07/30/07, and 07/31/07. For samples collected 07/19/07, the dioxins and furans were extracted on 07/26/07, 07/29/07, 07/30/07, and 07/31/07 and analyzed on 07/31/07 and 08/01/07. Sample collection dates may be found on the attached form 1s. All criteria were met. No qualifiers were applied.

II-Blank Analysis

The purpose of laboratory (or field) blank analyses is to determine the existence and magnitude of contamination problems resulting from field and laboratory activities. No contamination should be found in any of the blanks >EDL (estimated detection limit). The DoD QSM criteria specifies all concentrations should be less than ½ MRL (<MRL for common laboratory contaminants OCDD and OCDF) and <2EDL for the calibration blanks. Positive sample results are reported and qualified "B", if the concentration of the compound in the sample is ≤10 times (10x) the maximum amount in any blank for the common laboratory contaminants OCDD or OCDF, or 5 times (5X) the maximum amount for other target compounds. **Table 2** summarizes the blank contamination analysis. Action levels are based upon dilution factor of one and for solid matrices were converted to soil values (soil conversion factor = 100) if needed. Rinse blank RB083007 (F52208-1) (low-flow pump) applies to the groundwater "GW" samples in this SDG. The surface water "SW" samples were collected directly into the laboratory bottles; therefore, no rinse blank applies for the SW samples. Rinse blanks 072407R (F51275-1) and 072507R (F51300-31) apply to the surface soil "SS" and subsurface soil "SB" samples in this SDG. Rinse blank RB071807 (F51154-12) applies to the sediment "SD" samples in this SDG.

Table 2 Blank Contamination Analysis Summary

Analysis Date	QC Blank ID	Compound	Max Conc. ng/L	Action Level ng/L	B qualified samples
07/28/07	LMB14381	All congeners <EDL	NA	NA	None
09/09/07	RB083007	All congeners <EDL	NA	NA	None
Analysis Date	**QC Blank ID**	**Compound**	**Max Conc. pg/g**	**Action Level pg/g**	**B qualified samples**
07/30/07	LMB14383	OCDD	0.640J	6.40	None
07/30/07	LMB14383	2,3,7,8-TCDF	0.0940J	0.47	None
07/30/07	LMB14383	1,2,3,4,7,8-HxCDF	0.186J	0.93	None
07/30/07	LMB14383	1,2,3,4,6,7,8-HpCDF	0.776J	3.88	None
07/30/07	LMB14383	OCDF	1.57J	15.7	None
07/30/07	LMB14383	Total TCDFs	0.0940J	0.47	None
07/30/07	LMB14383	Total HxCDFs	0.186J	0.93	None
07/30/07	LMB14383	Total HpCDFs	0.776J	3.88	None
07/31/07	LMB14385	1,2,3,4,6,7,8-HpCDD	0.374J	1.87	None
07/31/07	LMB14385	OCDD	1.31J	13.1	None
07/31/07	LMB14385	2,3,7,8-TCDF	0.174J	0.87	41SD11, APSD01
07/31/07	LMB14385	1,2,3,4,7,8-HxCDF	0.256J	1.28	41SD11, APSD01
07/31/07	LMB14385	1,2,3,4,6,7,8-HpCDF	1.79J	8.95	41SD11
07/31/07	LMB14385	OCDF	3.80J	19.0	41SD11
07/31/07	LMB14385	Total HpCDDs	0.374J	1.87	None
07/31/07	LMB14385	Total TCDFs	0.174J	0.87	None
07/31/07	LMB14385	Total HxCDFs	0.444J	2.22	None
07/31/07	LMB14385	Total HpCDFs	1.79J	8.95	None
08/01/07	LMB14389	OCDD	0.702J	7.02	None
08/01/07	LMB14389	2,3,7,8-TCDF	0.122J	0.61	49SS04, 59SS06, 59SS07, 59SS08, 59SS09, 59SS10
08/01/07	LMB14389	2,3,4,7,8-PeCDF	0.0680J, EMPC	0.34	49SS04, 59SS09, 59SS10
08/01/07	LMB14389	1,2,3,4,6,7,8-HpCDF	0.650J	3.25	None
08/01/07	LMB14389	OCDF	1.12J	11.2	None
08/01/07	LMB14389	Total TCDFs	0.122J	0.61	None
08/01/07	LMB14389	Total PeCDFs	0.0680J	0.34	None
08/01/07	LMB14389	Total HxCDFs	0.0940J	0.47	None
08/01/07	LMB14389	Total HpCDFs	0.650J	3.25	None
07/28/07	RB071807	All congeners <EDL	NA	NA	None
08/03/07	072407R	All congeners <EDL	NA	NA	None
08/08/07	072507R	1,2,3,4,6,7,8-HpCDF	0.849J	4.25	None
08/08/07	072507R	OCDF	1.42J	14.2	None
08/08/07	072507R	Total HpCDFs	0.849J	4.25	None

J = Estimated value <MRL and >EDL.
EMPC = Estimated Maximum Possible Concentration.

III-Instrument Performance Check

Instrument must be tuned with perfluorokerosene (PFK) to achieve a static resolving power of at least 10,000 (10% valley) and lock-mass ion between lowest and highest masses for each descriptor and level of reference compound ≤10%. Documentation of the mass spectrometer resolving power is accomplished by recording the peak profile of the high-mass reference signal (typically m/z 330.9792) obtained during a peak examination by using the low-mass PFK ion at m/z 292.9825 or lower in mass as reference. At the beginning of the each 12-hour period, the chromatographic resolution is verified in the same fashion as in the initial calibration through the analysis of HRCC solution on the DB-5 (or equivalent) column or through the analysis of the column performance solution on the SP-2331 or SP-225 (or equivalent) column. A 25% valley must be achieved between the close eluters.

- All PFK forms were verified and found to be in compliance with method specification. No qualifiers were applied.

IV-Initial Calibration
Once the window defining mix has been analyzed and the descriptor switching times have been verified, the five point calibration solutions can be analyzed prior to sample analysis. Per method and DoD QSM, the initial calibration criteria are as follows:

- The percent relative standard deviations for the mean response factors RRF(n) from the 17 unlabeled standards must not exceed ±20%, and those for the labeled reference compounds must not exceed ±30%;
- The signal to noise ratio ≥10% for all target ions;
- Ion abundance ratios must be within the specified control limits in Table 8 (SW846 Method 8290).

- For initial calibration performed on 07/10/07 for all target compounds on instrument HRMS1, all criteria were met. No qualifiers were applied. Samples 41SW08 (F51154-6), 41SW09 (F51154-7), 41SW10 (F51154-8), 41SD08 (F51154-9), 41SD09 (F51154-10), 41SD10 (F51154-11), LFSD01 (F51154-15), TMSD01 (F51154-16), LFSW01 (F51154-17), APSD01 (F51154-18), TMSW01 (F51154-20), 41SD11 (F51154-22), 49SS02 (F51154-23), 49SS03 (F51154-24), 49SS04 (F51154-25), 49SS05 (F51154-26), 59SS06 (F51154-27), 59SS07 (F51154-28), 59SS08 (F51154-29), 59SS09 (F51154-30), 59SS10 (F51154-31), and TMSS05 (F51154-32) apply to this initial calibration.

V-Continuing Calibration
The continuing calibration consists of two parts: evaluation of the mass resolution and retention time check. Per method and DoD QSM, the following stipulates the continuing calibration criteria.

- The signal signal-to-noise ratio (S/N) must be at least 10:1 for each selected ion current profile (SICP) and for each GC signal representing the elution of a target analyte or labeled standard for each analyte.
- The relative response factor of each analyte for the unlabeled standard must be within ±20% of the average RF obtained from the initial calibration, and the RRF of each labeled standard must be within ±30% of the average RRF established during initial calibration. This is expressed in term of percent difference %D.
- Ion abundance ratios must be within the specified control limits in Table 8 (SW846 Method 8290).

- For continuing calibration performed on 07/28/07 @02:22 on instrument HRMS1, all criteria were met. No qualifiers were applied. No samples reported apply to this continuing calibration.

- For continuing calibration performed on 07/28/07 @13:44 on instrument HRMS1, all criteria were met. No qualifiers were applied. Samples 41SW08 (F51154-6), 41SW09 (F51154-7), and 41SW10 (F51154-8) apply to this continuing calibration.

- For continuing calibration performed on 07/28/07 @23:29 on instrument HRMS1, all criteria were met. No qualifiers were applied. No samples reported apply to this continuing calibration.

- For continuing calibration performed on 07/30/07 @17:04 on instrument HRMS1, all criteria were met. No qualifiers were applied. Samples 41SD08 (F51154-9), 41SD09 (F51154-10), 41SD10 (F51154-11), LFSD01 (F51154-15), TMSD01 (F51154-16), APSD01 (F51154-18), and 41SD11 (F51154-22) apply to this continuing calibration.

- For continuing calibration performed on 07/31/07 @04:20 on instrument HRMS1, all criteria were met. No qualifiers were applied. Samples LFSW01 (F51154-17), TMSW01 (F51154-20), 49SS02 (F51154-23), and 49SS03 (F51154-24) apply to this continuing calibration.

- For continuing calibration performed on 07/31/07 @13:17 on instrument HRMS1, all criteria were met. No qualifiers were applied. No samples reported apply to this continuing calibration.

- For continuing calibration performed on 08/01/07 @00:39 on instrument HRMS1, all criteria were met. No qualifiers were applied. Samples 49SS04 (F51154-25), 49SS05 (F51154-26), 59SS06 (F51154-27), 59SS07 (F51154-28), 59SS08 (F51154-29), 59SS09 (F51154-30), and 59SS10 (F51154-31) apply to this continuing calibration.

- For continuing calibration performed on 08/01/07 @10:25 on instrument HRMS1, all criteria were met. No qualifiers were applied. No samples reported apply to this continuing calibration.

- For continuing calibration performed on 08/01/07 @14:32 on instrument HRMS1, all criteria were met. No qualifiers were applied. Sample TMSS05 (F51154-32) applies to this continuing calibration.

- For continuing calibration performed on 08/02/07 @01:54 on instrument HRMS1, all criteria were met. No qualifiers were applied. No samples reported apply to this continuing calibration.

- For continuing calibration performed on 08/02/07 @12:28 on instrument HRMS1, all criteria were met. No qualifiers were applied. No samples reported apply to this continuing calibration.

- For continuing calibration performed on 08/02/07 @16:03 on instrument HRMS1, all criteria were met. No qualifiers were applied. No samples reported apply to this continuing calibration.

- For continuing calibration performed on 08/03/07 @03:24 on instrument HRMS1, all criteria were met. No qualifiers were applied. No samples reported apply to this continuing calibration.

- For continuing calibration performed on 08/03/07 @14:47 on instrument HRMS1, all criteria were met. No qualifiers were applied. No samples reported apply to this continuing calibration.

VI-Internal Standards (IS) Recovery Standard Solutions
Internal standards performance criteria ensure that GC/MS sensitivity and response are stable during every analytical run. Specific criteria include: Recoveries of the isotopically-labeled recovery standards to fall within the 40 to 135 percent range for the tetra- through octachlorinated congeners, or as stated in the data package (DoD QSM limits 40-135%).

- All criteria were met. No qualifiers were applied.

VII-Cleanup Standards
Cleanup standards are added to every sample, blank, quality control sample, and calibration solution. This compound is added to the samples after extraction but prior to cleanup and is used to verify the percent recovery obtained using the isotope dilution technique. The control limits are 40 to 135 percent (DoD QSM limits 40-135%).

- All criteria were met. No qualifiers were applied.

VIII-Laboratory Control Standard (LCS) or Ongoing Precision Result (OPR)
LCSs are used to monitor laboratory accuracy and precision by calculating the percent recoveries of the spiked compounds. Per DOD QSM and method criteria, acceptable performance is determined by:

1. Recoveries of the isotopically-labeled extraction standards to fall within 40-135% control limits for the tetra- through octachlorinated congeners, or as stated in the data package;

2. Recoveries (accuracy) of the unlabeled compounds should be within ±35% when spiked at the method quantitation limit and within ±30% when spiked above 20 times the method quantitation limit, or as stated in the data package;

3. When duplicate OPR are required, the relative percent difference (RPD) of the unlabeled analytes concentrations should be within 30% when spiked at the method quantitation limit and within ±20% when spiked above 20 times the method quantitation limit.

- Sample OPR14381 was used as LCS and LCSD on 07/28/07 analytical run. All criteria were met. No qualifiers were applied. Samples 41SW08 (F51154-6), 41SW09 (F51154-7), and 41SW10 (F51154-8) apply to this LCS.

- Sample OPR14383 was used as LCS and LCSD on 07/30/07 analytical run. All criteria were met. No qualifiers were applied. Samples 41SD08 (F51154-9), 41SD09 (F51154-10), 41SD10 (F51154-11), LFSD01 (F51154-15), TMSD01 (F51154-16), APSD01 (F51154-18), and 41SD11 (F51154-22) apply to this LCS.

- Sample OPR14385 was used as LCS and LCSD on 07/31/07 analytical run. All criteria were met. No qualifiers were applied. Samples LFSW01 (F51154-17), TMSW01 (F51154-20), 49SS02 (F51154-23), and 49SS03 (F51154-24) apply to this LCS.

- Sample OPR14389 was used as LCS and LCSD on 08/01/07 analytical run. All criteria were met. No qualifiers were applied. Samples 49SS04 (F51154-25), 49SS05 (F51154-26), 59SS06 (F51154-27), 59SS07 (F51154-28), 59SS08 (F51154-29), 59SS09 (F51154-30), 59SS10 (F51154-31), and TMSS05 (F51154-32) apply to this LCS.

IX-Matrix Spike/Matrix Spike Duplicate
Data for matrix spike/matrix spike duplicates (MS/MSD) are generated to determine long-term precision and accuracy of the analytical method on various matrices and to demonstrate acceptable compound recovery by the laboratory at the time of sample analysis. The percent recoveries (%Rs) and the relative percent difference (RPD) must be within the specified control limits. Per DoD QSM, MS/MSD recoveries must be within in-house laboratory limits (75-125%) and RPD ≤20%.

- Sample LFSW01 (F51154-17) was used for the aqueous MS/MSD analysis on 07/31/07. OCDD (147%, 167%) and 2,3,4,7,8-PeCDF (RPD=21%) were outside lab criteria. For all other congeners, all criteria were met. OCDD was qualified estimated bias high "K" for detects for the spiked sample based upon the high recoveries. The associated LCS was within criteria limits. Samples 41SW08 (F51154-6), 41SW09 (F51154-7), 41SW10 (F51154-8), LFSW01 (F51154-17), and TMSW01 (F51154-20) apply to this MS/MSD.

- No project specific solid matrix MS/MSD was performed; therefore, it was not evaluated.

X-Field Duplicate Sample Analysis
Field duplicates were collected to identify the cumulative precision of the sampling and analytical process and sent to the laboratory blind. The RPD was calculated only for those analytes which were detected in both samples of the duplicate pair. Analytes that were rejected (R-qualified) in either sample of the duplicate pair were excluded from the duplicate assessment. Precision control criterion was established at 50% RPD for the aqueous and solid samples. Analytical results were qualified as estimated (J) for any RPDs exceeding criteria.

- Field surface water sample duplicate pair LFSW01 (F51154-17) and TMSW01 (F51154-20) was collected for dioxin and furans. All detected dioxin and furans found in the sample and its duplicate pair and associated %RPD are noted in **Table 3**. All other dioxin and furans target compounds were non-detect. Total HpCDDs (71.7%) was above criteria due to low concentration levels detected below the MRL and were reported as estimated maximum possible concentration (EMPC). Total HpCDDs was qualified estimated "J" for the original and duplicate pair samples based upon these outliers. For all other dioxin and furans, all criteria were met.

Table 3 Field Precision Hits Analysis Summary for Dioxin and Furans for Duplicate Pair LFSW01 (F51154-17) and TMSW01 (F51154-20)

Compound	Original Sample (ng/L)	Duplicate Pair (ng/L)	%RPD
1,2,3,4,6,7,8-HpCDD	0.00503J, EMPC	0.00448J	11.6
OCDD	0.0423J	0.0295J	35.7
1,2,3,7,8-PeCDF	0.00593U	0.00178J	NA
1,2,3,4,6,7,8-HpCDF	0.00205J	0.00609U	NA
OCDF	0.00586J	0.0122U	NA
Total HpCDDs	0.00949J, EMPC	0.00448	71.7
Total TCDFs	0.00622J, EMPC	0.00200U	NA
Total HpCDFs	0.00422J, EMPC	0.00609U	NA
Total PeCDFs	0.00202U	0.00373J, EMPC	NA

U = Value non-detect as <EDL.
J = Estimated value <MRL and >EDL. Data point qualified was estimated "J".
NA = Not Applicable.
EMPC = Estimated Maximum Possible Concentration

- Field sediment sample duplicate pair LFSD01 (F51154-15) and TMSD01 (F51154-16) was collected for dioxin and furans. All detected dioxin and furans found in the sample and its duplicate pair and associated %RPD are noted in **Table 4**. All other dioxin and furans target compounds were non-detect. 2,3,7,8-TCDF (59.5%), 1,2,3,7,8-PeCDF (59.9%), 2,3,4,7,8-PeCDF (93.8%), 1,2,3,6,7,8-HxCDF (59.5%), 2,3,4,6,7,8-HxCDF (86.9%), 1,2,3,7,8,9-HxCDF (72.4%), Total TCDFs (84.2%), and Total PeCDFs (90.4%) was above criteria probably due to sample non-homogeneity and/or low sample concentration levels detected below the MRL. 2,3,7,8-TCDF, 1,2,3,7,8-PeCDF, 2,3,4,7,8-PeCDF, 1,2,3,6,7,8-HxCDF, 2,3,4,6,7,8-HxCDF, 1,2,3,7,8,9-HxCDF, Total TCDFs, and Total PeCDFs were qualified estimated "J" for the original and duplicate pair samples based upon these outliers. For all other dioxin and furans, all criteria were met.

Table 4 Field Precision Hits Analysis Summary for Dioxin and Furans for Duplicate Pair LFSD01 (F51154-15) and TMSD01 (F51154-16)

Compound	Original Sample (pg/g)	Duplicate Pair (pg/g)	%RPD
2,3,7,8-TCDD	2.38	1.72	32.2
1,2,3,7,8-PeCDD	7.55J	5.77J	26.7
1,2,3,4,7,8-HxCDD	7.83J	6.23	22.8
1,2,3,6,7,8-HxCDD	19.0	18.8	1.1
1,2,3,7,8,9-HxCDD	17.5	16.2	7.7
1,2,3,4,6,7,8-HpCDD	571	734	25.0
OCDD	5030	6660E	27.9
2,3,7,8-TCDF	5.58	3.02	59.5
1,2,3,7,8-PeCDF	5.73J	3.09J	59.9
2,3,4,7,8-PeCDF	10.6	3.83J	93.8
1,2,3,4,7,8-HxCDF	19.8	15.8	22.5
1,2,3,6,7,8-HxCDF	10.8	5.85J	59.5
2,3,4,6,7,8-HxCDF	11.7	4.61J	86.9
1,2,3,7,8,9-HxCDF	2.39J	1.12J	72.4
1,2,3,4,6,7,8-HpCDF	132	139	5.2
1,2,3,4,7,8,9-HpCDF	5.24J	4.97J	5.3
OCDF	385	416	7.7
Total TCDDs	37.9	27.8	30.8
Total PeCDDs	69.9	57.4	19.6
Total HxCDDs	200	186	7.3
Total HpCDDs	1060	1310	21.1
Total TCDFs	132	53.8	84.2
Total PeCDFs	137	51.7	90.4
Total HxCDFs	158	113	33.2
Total HpCDFs	328	333	1.5

E = Value exceeded calibration range. Data point qualified was estimated "J".
J = Estimated value <MRL and >EDL. Data point qualified was estimated "J".

- Field surface soil sample duplicate pair 49SS05 (F51154-26) and TMSS05 (F51154-32) was collected for dioxin and furans. All detected dioxin and furans found in the sample and its duplicate pair and associated %RPD are noted in **Table 5**. All other dioxin and furans target compounds were non-detect. All criteria were met. No qualifiers were applied.

Table 5 Field Precision Hits Analysis Summary for Dioxin and Furans for Duplicate Pair 49SS05 (F51154-26) and TMSS05 (F51154-32)

Compound	Original Sample (pg/g)	Duplicate Pair (pg/g)	%RPD
2,3,7,8-TCDD	0.333J, EMPC	0.241J, EMPC	32.1
1,2,3,7,8-PeCDD	2.89J	3.04J	5.1
1,2,3,4,7,8-HxCDD	9.00	10.8	18.2
1,2,3,6,7,8-HxCDD	36.5	27.8	27.1
1,2,3,7,8,9-HxCDD	21.0	19.2	9.0
1,2,3,4,6,7,8-HpCDD	946	950	0.4
OCDD	9640E	10300E	6.6
2,3,7,8-TCDF	0.938J	0.917J	2.3
1,2,3,7,8-PeCDF	0.567J	0.593J	4.5
2,3,4,7,8-PeCDF	1.04J	0.996J	4.3
1,2,3,4,7,8-HxCDF	4.61J	6.93J	40.2
1,2,3,6,7,8-HxCDF	3.71J	6.14	49.3
2,3,4,6,7,8-HxCDF	6.00	5.34J	11.6
1,2,3,7,8,9-HxCDF	0.839J	0.635J	27.7
1,2,3,4,6,7,8-HpCDF	138	132	4.4
1,2,3,4,7,8,9-HpCDF	10.2	8.10	23.0
OCDF	367	397	7.9
Total TCDDs	4.08J, EMPC	6.23J, EMPC	41.7
Total PeCDDs	13.2J, EMPC	15.9	18.6
Total HxCDDs	137	134J, EMPC	2.2
Total HpCDDs	1400	1420	1.4
Total TCDFs	8.68J, EMPC	10.4J, EMPC	18.0
Total PeCDFs	25.3J, EMPC	22.0J, EMPC	14.0
Total HxCDFs	138	129	6.7
Total HpCDFs	418	420	0.5

E = Value exceeded calibration range. Data point qualified was estimated "J".
J = Estimated value <MRL and >EDL. Data point qualified was estimated "J".
EMPC = Estimated Maximum Possible Concentration

XI-Quantitation Verification

The accuracy of analytical results was verified through the calculation of at least one the several parameters such as the %D, %RSD, % recovery, and/or compound concentration. Values were found to be within 10%. Any value reported by the laboratory as estimated "A" based on an analyte to internal standard ratio below the calibration curve was qualified as estimated "J". The signal signal-to-noise ratio (S/N) must be greater than 2.5 for each selected ion current profile (SICP) and for each GC signal representing the elution of a target analyte or labeled standard. Any detected value with ether interference (I-lab flag) was qualified as estimated "J". For where the ion ratio failed the 25% criteria (*-lab flag), the estimated maximum possible concentration (EMPC) was reported and flagged estimated "J". For where presence of quantitation interference (Q-lab flag), the date was flagged estimated "J" for detects and "UJ" for non-detects.

- For sample 41SW08 (F51154-6), 1,2,3,7,8-PeCDD, 2,3,4,7,8-PeCDF, Total PeCDDs, and Total PeCDFs were qualified estimated non-detect "UJ" based upon the presence of quantitation interference.

- For sample 59SS09 (F51154-30), Total TCDFs was qualified estimated non-detect "J" based upon the presence of quantitation interference.

- OCDD exceeded upper calibration limit for samples 49SS02 (F51154-23), 49SS03 (F51154-24), 49SS04 (F51154-25), 49SS05 (F51154-26), 59SS06 (F51154-27), 59SS07 (F51154-28), 59SS08 (F51154-29), TMSD01 (F51154-16), and TMSS05 (F51154-32). OCDD was qualified estimated "J" for all associated samples based upon these outliers.

Sample: 41SW08 (F51154-6), OCDD

A(x) = sum of the integrated ion abundances of the quantitation ions for the unlabeled ions;
A(is) = sum of the integrated ion abundances of the quantitation ions for the labeled ions;
Q(is) = quantity, in ng/ul, of the internal standard added to the sample before extraction;
W = weight, in g, of the sample (solid or organic liquid) as dry weight, or volume in mL of an aqueous sample; and
Avg. RRF(n) = calculated mean relative response factor for the unlabeled analyte.

$$\text{Conc. (ng/L)} = \frac{(A(x)) * Q(is) * 1000}{A(is) * W * \text{Avg. RRF}} = \frac{(214000+222000) * 4.0 * 1000}{(36700000+40800000) * 953 * 1.0783} = 0.0219 \text{ ng/L}$$

Reported Value = 0.0219 ng/L
% Difference = 0.0%
Values were within 10% difference

Sample: 41SD09 (F51154-10), OCDD

A(x) = sum of the integrated ion abundances of the quantitation ions for the unlabeled ions;

A(is) = sum of the integrated ion abundances of the quantitation ions for the labeled ions;

Q(is) = quantity, in pg, of the internal standard added to the sample before extraction; Here need to multiply concentration (pg/uL) by final extract volume (uL).

W = weight, in g, of the sample (solid or organic liquid) as dry weight, or volume in mL of an aqueous sample; and

Avg. RRF(n) = calculated mean relative response factor for the unlabeled analyte.

$$\text{Conc. (ng/kg)} = \frac{(A(x)) * Q(is)}{A(is) * W * \text{Avg. RRF}} = \frac{(56400000+63100000) * 4.0 * 1000}{(26300000+29500000) * (12.20 * 0.7270) * 1.0783} =$$
$$= 896 \text{ ng/kg} = 896 \text{ pg/g}$$

Reported Value = 897 pg/g
% Difference = 0.1%
Values were within 10% difference.

USEPA Region III Validation Qualifiers

(No Code) = Confirmed identification.

B = The analyte has been detected in the sample and the associated laboratory or field blank.

J = Indicates an estimated value for (1) estimated value due to QC non-conformance. Reported value may not be accurate or precise, (2) estimating a concentration as a tentatively identified compound as indicated by the mass spectral and retention time data, or (3) estimating a concentration ≥ EDL and <MRL or <3*EDL, whichever is greater.

K = Analyte present. Reported value may be biased high (estimated) due to QC non-conformance.

L = Analyte present. Reported value may be biased low (estimated) due to QC non-conformance.

R = Unreliable result. Analyte may or may not be present in the sample due to QC non-conformance.

UL = Value is estimated bias low and not detected due to QC non-conformance. Reporting limit may be inaccurate or imprecise. Quantitation limit is probably higher.

UJ = Value is estimated and not detected due to QC non-conformance. Reporting limit may be inaccurate or imprecise.

Laboratory Qualifiers

(No Code) = Confirmed identification.

U = Not detected. The associated number indicates the compound reporting limit for the sample.

A (Dioxins) = B (Metals) = The reported value was obtained from a reading <MRL and ≥EDL and is considered estimated.

B (Organics) = The analyte or compound has been detected in the sample and laboratory method blank. It indicates probable blank contamination.

E (Metals) = Reported value is estimated because of the presence of interferences.

E (Organics) = Identifies compounds whose concentrations exceed the upper level of the calibration range.

EMPC (Dioxins) = The ion-abundance ratio between the two characteristic PCDD/PCDF ions was outside accepted ranges. The detected PCDD/PCDF was reported as an estimated maximum possible concentration (EMPC).

D = Indicates sample was analyzed at a dilution.

J = Indicates an estimated value for (1) estimating a concentration as a tentatively identified compound as indicated by the mass spectral and retention time data, or (2) estimating a concentration <MRL and ≥ EDL.

N (Organics) = Indicates presumptive evidence of a compound for tentatively identified compounds using a library search.

N (Metals) = Laboratory spike sample recovery not within control limits.

P (Organics) = Target analyte confirmation >40% difference for detected compound between the primary and secondary columns. The lower of the two values was reported.

* (Metals) = Duplicate analysis not within control limits.

* (Organics) = Surrogate outside of QC limits on both original and re-analysis.

Form I Copy

SGS Environmental Services

Method 8290
F51154-6
Accutest

Analytical Data Summary Sheet

Analyte	Amount (ng/L)	EDL (ng/L)	EMPC (ng/L)	RT (min.)	Ratio	Qualifier
2,3,7,8-TCDD	ND	0.00164				
1,2,3,7,8-PeCDD	ND VJ	0.00525				Q
1,2,3,4,7,8-HxCDD	ND	0.00525				
1,2,3,6,7,8-HxCDD	ND	0.00525				
1,2,3,7,8,9-HxCDD	ND	0.00525				
1,2,3,4,6,7,8-HpCDD	ND	0.00525				
OCDD	0.0219 J			45:10	0.97	A
2,3,7,8-TCDF	ND	0.00105				
1,2,3,7,8-PeCDF	ND	0.00525				
2,3,4,7,8-PeCDF	ND VJ	0.00525				Q
1,2,3,4,7,8-HxCDF	ND	0.00525				
1,2,3,6,7,8-HxCDF	ND	0.00525				
2,3,4,6,7,8-HxCDF	ND	0.00525				
1,2,3,7,8,9-HxCDF	ND	0.00525				
1,2,3,4,6,7,8-HpCDF	ND	0.00525				
1,2,3,4,7,8,9-HpCDF	ND	0.00525				
OCDF	ND	0.0105				
Total TCDDs	ND	0.00164				
Total PeCDDs	ND VJ	0.00525				Q
Total HxCDDs	ND	0.00525				
Total HpCDDs	ND	0.00525				
Total TCDFs	ND	0.00105				
Total PeCDFs	ND VJ	0.00525				Q
Total HxCDFs	ND	0.00525				
Total HpCDFs	ND	0.00525				
WHO-2005 TEQ (ND=0)	0.00000657		0.00000657			
WHO-2005 TEQ (ND=½)	0.00629		0.00629			

Client Information			**Sample Information**	
Project Name:	F51154		Report Basis:	Wet
			Matrix:	Water
Sample ID:	F51154-6		Weight / Volume:	953 mL
			Solids / Lipids:	NA %
			Original pH :	8
Laboratory Information			Batch ID:	WG14381
Project ID:	G383-583		Instrument:	HRMS1
Sample ID:	G383-583-1C		Filename:	a27jul07a_3-8
Collection Date/Time:	07/18/07	10:40	Retchk:	a27jul07a_2-14
Receipt Date/Time:	07/21/07	10:35	Begin ConCal:	a27jul07a_2-14
Extraction Date:	07/26/07		End ConCal:	a27jul07a_3-12
Analysis Date/Time:	07/28/07	20:15	Initial Cal:	m8290-071007a

Form I (OM)

Method 8290
F51154-6
Accutest

Labeled Standard	Expected Amount (ng)	Measured Amount (ng)	Percent Recovery (%)	RT (min.)	Ratio	Qualifier
Extraction Standards						
13C12-2,3,7,8-TCDD	2.0	1.57	78.6	31:40	0.77	
13C12-1,2,3,7,8-PeCDD	2.0	1.10	55.2	34:25	1.60	Q
13C12-1,2,3,6,7,8-HxCDD	2.0	1.64	82.0	37:10	1.26	
13C12-1,2,3,4,6,7,8-HpCDD	2.0	1.73	86.3	40:39	1.06	
13C12-OCDD	4.0	3.79	94.7	45:09	0.90	
13C12-2,3,7,8-TCDF	2.0	1.76	88.0	31:07	0.79	
13C12-1,2,3,7,8-PeCDF	2.0	1.41	70.5	33:37	1.59	
13C12-1,2,3,6,7,8-HxCDF	2.0	1.37	68.5	36:28	0.53	
13C12-1,2,3,4,6,7,8-HpCDF	2.0	1.69	84.7	39:21	0.45	
Cleanup Standards						
37Cl4-2,3,7,8-TCDD	0.4	0.365	91.3	31:40	-	
13C12-2,3,4,7,8-PeCDF	0.4	0.269	67.3	34:13	1.63	Q
13C12-1,2,3,4,7,8-HxCDD	0.4	0.330	82.6	37:06	1.27	
13C12-1,2,3,4,7,8-HxCDF	0.4	0.319	79.7	36:22	0.52	
13C12-1,2,3,4,7,8,9-HpCDF	0.4	0.326	81.5	41:21	0.43	
Injection Standards						
13C12-1,2,3,4-TCDD	2.0	-	-	31:15	0.79	
13C12-1,2,3,7,8,9-HxCDD	2.0	-	-	37:27	1.25	

Client Information			**Sample Information**	
Project Name:	F51154		Report Basis:	Wet
			Matrix:	Water
Sample ID:	F51154-6		Weight / Volume:	953 mL
			Solids / Lipids:	NA %
			Original pH :	8
Laboratory Information			Batch ID:	WG14381
Project ID:	G383-583		Instrument:	HRMS1
Sample ID:	G383-583-1C		Filename:	a27jul07a_3-8
Collection Date/Time:	07/18/07	10:40	Retchk:	a27jul07a_2-14
Receipt Date/Time:	07/21/07	10:35	Begin ConCal:	a27jul07a_2-14
Extraction Date:	07/26/07		End ConCal:	a27jul07a_3-12
Analysis Date/Time:	07/28/07	20:15	Initial Cal:	m8290-071007a

Form Version:[8290_DB_2.14]Report

Analyzed by: JWC
Date: 28/07/07

Reviewed by: [illegible]
Date: 8/9/07

Form I copy

SGS Environmental Services

Method 8290
F51154-7
Accutest

Analytical Data Summary Sheet

Analyte	Amount (ng/L)	EDL (ng/L)	EMPC (ng/L)	RT (min.)	Ratio		Qualifier
2,3,7,8-TCDD	EMPC	~~0.00114~~	0.00257 J	31:40	0.60	*	A
1,2,3,7,8-PeCDD	0.00607 J			34:25	1.36		A
1,2,3,4,7,8-HxCDD	0.00468 J			37:07	1.27		A
1,2,3,6,7,8-HxCDD	0.00475 J			37:12	1.10		A
1,2,3,7,8,9-HxCDD	0.00495 J			37:27	1.23		A
1,2,3,4,6,7,8-HpCDD	0.00564 J			40:39	1.14		A
OCDD	0.0292 J			45:09	0.91		A
2,3,7,8-TCDF	0.00147 J			31:07	0.73		A
1,2,3,7,8-PeCDF	0.00662 J			33:37	1.62		A
2,3,4,7,8-PeCDF	0.00589 J			34:15	1.71		A
1,2,3,4,7,8-HxCDF	0.00532 J			36:22	1.30		A
1,2,3,6,7,8-HxCDF	0.00509 J			36:28	1.18		A
2,3,4,6,7,8-HxCDF	0.00409 J			37:00	1.16		A
1,2,3,7,8,9-HxCDF	0.00501 J			37:46	1.18		A
1,2,3,4,6,7,8-HpCDF	EMPC	~~0.00509~~	0.00536 J	39:21	1.22	*	A
1,2,3,4,7,8,9-HpCDF	0.00420			41:21	1.08		A
OCDF	0.00874			45:27	1.01		A
Total TCDDs	ND	~~0.00114~~	0.00257 J				
Total PeCDDs	0.00607						
Total HxCDDs	0.0144						
Total HpCDDs	0.00564						
Total TCDFs	0.00147						
Total PeCDFs	0.0125						
Total HxCDFs	0.0195						
Total HpCDFs	~~0.00420~~		0.00955 J				
WHO-2005 TEQ (ND=0)	0.0117		0.0143				
WHO-2005 TEQ (ND=½)	0.0123		0.0143				

Client Information			**Sample Information**		
Project Name:	F51154		Report Basis:	Wet	
			Matrix:	Water	
Sample ID:	F51154-7		Weight / Volume:	982 mL	
			Solids / Lipids:	NA	%
			Original pH :	8	
Laboratory Information			Batch ID:	WG14381	
Project ID:	G383-583		Instrument:	HRMS1	
Sample ID:	G383-583-2C		Filename:	a27jul07a_3-9	
Collection Date/Time:	07/18/07	11:05	Retchk:	a27jul07a_2-14	
Receipt Date/Time:	07/21/07	10:35	Begin ConCal:	a27jul07a_2-14	
Extraction Date:	07/26/07		End ConCal:	a27jul07a_3-12	
Analysis Date/Time:	07/28/07	21:04	Initial Cal:	m8290-071007a	

Form I Cm

SGS Environmental Services

Method 8290
F51154-7
Accutest

Labeled Standard	Expected Amount (ng)	Measured Amount (ng)	Percent Recovery (%)	RT (min.)	Ratio	Qualifier
Extraction Standards						
13C12-2,3,7,8-TCDD	2.0	1.51	75.4	31:39	0.78	
13C12-1,2,3,7,8-PeCDD	2.0	1.40	69.8	34:25	1.59	
13C12-1,2,3,6,7,8-HxCDD	2.0	1.58	78.9	37:10	1.26	
13C12-1,2,3,4,6,7,8-HpCDD	2.0	1.69	84.7	40:39	1.05	
13C12-OCDD	4.0	3.70	92.4	45:09	0.89	
13C12-2,3,7,8-TCDF	2.0	1.72	86.0	31:07	0.79	
13C12-1,2,3,7,8-PeCDF	2.0	1.34	67.1	33:37	1.58	
13C12-1,2,3,6,7,8-HxCDF	2.0	1.50	74.8	36:28	0.52	
13C12-1,2,3,4,6,7,8-HpCDF	2.0	1.64	82.1	39:21	0.45	
Cleanup Standards						
37Cl4-2,3,7,8-TCDD	0.4	0.364	90.9	31:40	-	
13C12-2,3,4,7,8-PeCDF	0.4	0.311	77.8	34:13	1.61	
13C12-1,2,3,4,7,8-HxCDD	0.4	0.339	84.7	37:06	1.26	
13C12-1,2,3,4,7,8-HxCDF	0.4	0.350	87.6	36:22	0.51	
13C12-1,2,3,4,7,8,9-HpCDF	0.4	0.337	84.1	41:21	0.42	
Injection Standards						
13C12-1,2,3,4-TCDD	2.0	-	-	31:15	0.79	
13C12-1,2,3,7,8,9-HxCDD	2.0	-	-	37:27	1.26	

Client Information			**Sample Information**		
Project Name:	F51154		Report Basis:	Wet	
			Matrix:	Water	
Sample ID:	F51154-7		Weight / Volume:	982 mL	
			Solids / Lipids:	NA	%
			Original pH :	8	
Laboratory Information			Batch ID:	WG14381	
Project ID:	G383-583		Instrument:	HRMS1	
Sample ID:	G383-583-2C		Filename:	a27jul07a_3-9	
Collection Date/Time:	07/18/07	11:05	Retchk:	a27jul07a_2-14	
Receipt Date/Time:	07/21/07	10:35	Begin ConCal:	a27jul07a_2-14	
Extraction Date:	07/26/07		End ConCal:	a27jul07a_3-12	
Analysis Date/Time:	07/28/07	21:04	Initial Cal:	m8290-071007a	

Form Version:[8290_DB_2.14]Report

Analyzed by: JWP
Date: 08/08/07

Reviewed by: DD
Date: 8/9/07

Form I Corr

SGS Environmental Services

Method 8290
F51154-8
Accutest

Analytical Data Summary Sheet

Analyte	Amount (ng/L)	EDL (ng/L)	EMPC (ng/L)	RT (min.)	Ratio	Qualifier
2,3,7,8-TCDD	ND	0.00179				
1,2,3,7,8-PeCDD	ND	0.00538				
1,2,3,4,7,8-HxCDD	ND	0.00689				
1,2,3,6,7,8-HxCDD	ND	0.00702				
1,2,3,7,8,9-HxCDD	ND	0.00712				
1,2,3,4,6,7,8-HpCDD	ND	0.00538				
OCDD	0.0618 J			45:09	0.95	A
2,3,7,8-TCDF	ND	0.00128				
1,2,3,7,8-PeCDF	ND	0.00538				
2,3,4,7,8-PeCDF	ND	0.00538				
1,2,3,4,7,8-HxCDF	ND	0.00538				
1,2,3,6,7,8-HxCDF	ND	0.00538				
2,3,4,6,7,8-HxCDF	ND	0.00538				
1,2,3,7,8,9-HxCDF	ND	0.00538				
1,2,3,4,6,7,8-HpCDF	ND	0.00538				
1,2,3,4,7,8,9-HpCDF	ND	0.00538				
OCDF	ND	0.0108				
Total TCDDs	ND	0.00179				
Total PeCDDs	ND	0.00538				
Total HxCDDs	ND	0.00712				
Total HpCDDs	ND	0.00538				
Total TCDFs	ND	0.00128				
Total PeCDFs	ND	0.00538				
Total HxCDFs	ND	0.00538				
Total HpCDFs	ND	0.00538				
WHO-2005 TEQ (ND=0)	0.0000185		0.0000185			
WHO-2005 TEQ (ND=½)	0.00677		0.00677			

Client Information			**Sample Information**		
Project Name:	F51154		Report Basis:	Wet	
			Matrix:	Water	
Sample ID:	F51154-8		Weight / Volume:	929 mL	
			Solids / Lipids:	NA	%
			Original pH :	8	
Laboratory Information			Batch ID:	WG14381	
Project ID:	G383-583		Instrument:	HRMS1	
Sample ID:	G383-583-3C		Filename:	a27jul07a_3-10	
Collection Date/Time:	07/18/07	11:45	Retchk:	a27jul07a_2-14	
Receipt Date/Time:	07/21/07	10:35	Begin ConCal:	a27jul07a_2-14	
Extraction Date:	07/26/07		End ConCal:	a27jul07a_3-12	
Analysis Date/Time:	07/28/07	21:52	Initial Cal:	m8290-071007a	

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SGS Environmental Services

Method 8290
F51154-8
Accutest

Labeled Standard	Expected Amount (ng)	Measured Amount (ng)	Percent Recovery (%)	RT (min.)	Ratio	Qualifier
Extraction Standards						
13C12-2,3,7,8-TCDD	2.0	1.34	67.0	31:39	0.77	
13C12-1,2,3,7,8-PeCDD	2.0	1.30	65.1	34:25	1.60	
13C12-1,2,3,6,7,8-HxCDD	2.0	1.37	68.6	37:10	1.26	
13C12-1,2,3,4,6,7,8-HpCDD	2.0	1.49	74.3	40:39	1.06	
13C12-OCDD	4.0	3.16	79.1	45:07	0.90	
13C12-2,3,7,8-TCDF	2.0	1.51	75.7	31:07	0.79	
13C12-1,2,3,7,8-PeCDF	2.0	1.28	63.9	33:37	1.60	
13C12-1,2,3,6,7,8-HxCDF	2.0	1.34	66.8	36:28	0.53	
13C12-1,2,3,4,6,7,8-HpCDF	2.0	1.43	71.4	39:21	0.44	
Cleanup Standards						
37Cl4-2,3,7,8-TCDD	0.4	0.329	82.1	31:40	-	
13C12-2,3,4,7,8-PeCDF	0.4	0.291	72.8	34:13	1.64	
13C12-1,2,3,4,7,8-HxCDD	0.4	0.301	75.1	37:06	1.29	
13C12-1,2,3,4,7,8-HxCDF	0.4	0.319	79.7	36:22	0.51	
13C12-1,2,3,4,7,8,9-HpCDF	0.4	0.297	74.3	41:19	0.42	
Injection Standards						
13C12-1,2,3,4-TCDD	2.0	-	-	31:13	0.79	
13C12-1,2,3,7,8,9-HxCDD	2.0	-	-	37:27	1.27	

Client Information			**Sample Information**		
Project Name:	F51154		Report Basis:	Wet	
			Matrix:	Water	
Sample ID:	F51154-8		Weight / Volume:	929 mL	
			Solids / Lipids:	NA	%
			Original pH :	8	
Laboratory Information			Batch ID:	WG14381	
Project ID:	G383-583		Instrument:	HRMS1	
Sample ID:	G383-583-3C		Filename:	a27jul07a_3-10	
Collection Date/Time:	07/18/07	11:45	Retchk:	a27jul07a_2-14	
Receipt Date/Time:	07/21/07	10:35	Begin ConCal:	a27jul07a_2-14	
Extraction Date:	07/26/07		End ConCal:	a27jul07a_3-12	
Analysis Date/Time:	07/28/07	21:52	Initial Cal:	m8290-071007a	

FormVersion:[8290_DB_2.14]Report

Analyzed by: JWO
Date: 08/09/07

Reviewed by: [illegible]
Date: 8/9/07

Form I Corr

Method 8290
F51154-9
Accutest

Analytical Data Summary Sheet

Analyte	Amount (pg/g)	EDL (pg/g)	EMPC (pg/g)	RT (min.)	Ratio		Qualifier
2,3,7,8-TCDD	EMPC	~~0.438~~	0.748 J	31:40	0.98	*	A
1,2,3,7,8-PeCDD	ND	1.43					
1,2,3,4,7,8-HxCDD	ND	1.43					
1,2,3,6,7,8-HxCDD	ND	1.43					
1,2,3,7,8,9-HxCDD	3.18 J			37:28	1.30		A
1,2,3,4,6,7,8-HpCDD	46.7			40:42	1.05		
OCDD	2080			45:13	0.89		
2,3,7,8-TCDF	EMPC	~~0.637~~	1.55 J	31:09	0.91	*	A
1,2,3,7,8-PeCDF	2.90 J			33:37	1.61		A
2,3,4,7,8-PeCDF	1.40 J			34:16	1.39		A
1,2,3,4,7,8-HxCDF	8.37 J			36:24	1.27		A
1,2,3,6,7,8-HxCDF	4.78 J			36:30	1.34		A
2,3,4,6,7,8-HxCDF	1.49 J			37:01	1.35		A
1,2,3,7,8,9-HxCDF	ND	1.43					
1,2,3,4,6,7,8-HpCDF	62.2			39:22	1.03		
1,2,3,4,7,8,9-HpCDF	1.26 J			41:22	1.07		A
OCDF	53.9			45:31	0.86		
Total TCDDs	~~2.77~~		3.52 J				
Total PeCDDs	4.57						
Total HxCDDs	~~13.0~~		13.5 J				
Total HpCDDs	99.0						
Total TCDFs	~~16.5~~		27.6 J				
Total PeCDFs	~~30.6~~		32.6 J				
Total HxCDFs	~~43.3~~		45.3 J				
Total HpCDFs	75.6						
WHO-2005 TEQ (ND=0)	4.03		4.93				
WHO-2005 TEQ (ND=½)	5.21		5.86				

Client Information			**Sample Information**		
Project Name:	F51154		Report Basis:	Dry	
			Matrix:	Soil	
Sample ID:	F51154-9		Weight / Volume:	10.07 g	
			Solids / Lipids:	34.8	%
			Original pH :	NA	
Laboratory Information			Batch ID:	WG14383	
Project ID:	G383-583		Instrument:	HRMS1	
Sample ID:	G383-583-4B		Filename:	a30jul07a-8	
Collection Date/Time:	07/18/07	10:50	Retchk:	a30jul07a-1	
Receipt Date/Time:	07/21/07	10:35	Begin ConCal:	a30jul07a-1	
Extraction Date:	07/29/07		End ConCal:	a30jul07a-15	
Analysis Date/Time:	07/30/07	22:42	Initial Cal:	m8290-071007a	

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SGS Environmental Services

Method 8290
F51154-9
Accutest

Labeled Standard	Expected Amount (ng)	Measured Amount (ng)	Percent Recovery (%)	RT (min.)	Ratio	Qualifier
Extraction Standards						
13C12-2,3,7,8-TCDD	2.0	1.46	73.0	31:40	0.78	
13C12-1,2,3,7,8-PeCDD	2.0	1.41	70.3	34:25	1.59	
13C12-1,2,3,6,7,8-HxCDD	2.0	1.57	78.3	37:12	1.27	
13C12-1,2,3,4,6,7,8-HpCDD	2.0	1.67	83.3	40:40	1.07	
13C12-OCDD	4.0	3.42	85.5	45:10	0.90	
13C12-2,3,7,8-TCDF	2.0	1.69	84.7	31:07	0.80	
13C12-1,2,3,7,8-PeCDF	2.0	1.37	68.7	33:37	1.59	
13C12-1,2,3,6,7,8-HxCDF	2.0	1.41	70.7	36:30	0.52	
13C12-1,2,3,4,6,7,8-HpCDF	2.0	1.52	76.1	39:22	0.45	
Cleanup Standards						
37Cl4-2,3,7,8-TCDD	0.4	0.341	85.3	31:40	-	
13C12-2,3,4,7,8-PeCDF	0.4	0.253	63.1	34:15	1.62	
13C12-1,2,3,4,7,8-HxCDD	0.4	0.297	74.1	37:07	1.27	
13C12-1,2,3,4,7,8-HxCDF	0.4	0.299	74.6	36:24	0.50	
13C12-1,2,3,4,7,8,9-HpCDF	0.4	0.289	72.3	41:22	0.42	
Injection Standards						
13C12-1,2,3,4-TCDD	2.0	-	-	31:15	0.78	
13C12-1,2,3,7,8,9-HxCDD	2.0	-	-	37:28	1.25	

Client Information			**Sample Information**		
Project Name:	F51154		Report Basis:	Dry	
			Matrix:	Soil	
Sample ID:	F51154-9		Weight / Volume:	10.07 g	
			Solids / Lipids:	34.8	%
			Original pH :	NA	
Laboratory Information			Batch ID:	WG14383	
Project ID:	G383-583		Instrument:	HRMS1	
Sample ID:	G383-583-4B		Filename:	a30jul07a-8	
Collection Date/Time:	07/18/07	10:50	Retchk:	a30jul07a-1	
Receipt Date/Time:	07/21/07	10:35	Begin ConCal:	a30jul07a-1	
Extraction Date:	07/29/07		End ConCal:	a30jul07a-15	
Analysis Date/Time:	07/30/07	22:42	Initial Cal:	m8290-071007a	

Form Version:[8290_DB_2.14]Report

Analyzed by: JWF
Date: 08/09/07

Reviewed by: GM
Date: 8/9/07

Form 1 Copy

SGS Environmental Services

Method 8290
F51154-10
Accutest

Analytical Data Summary Sheet

Analyte	Amount (pg/g)	EDL (pg/g)	EMPC (pg/g)	RT (min.)	Ratio		Qualifier
2,3,7,8-TCDD	EMPC	~~0.177~~	0.280 J	31:40	0.53	*	A
1,2,3,7,8-PeCDD	EMPC	~~0.564~~	0.259 J	34:27	1.80	*	A
1,2,3,4,7,8-HxCDD	0.316 J			37:07	1.08		A
1,2,3,6,7,8-HxCDD	EMPC	~~0.564~~	0.595 J	37:12	0.99	*	A
1,2,3,7,8,9-HxCDD	1.01 J			37:28	1.21		A
1,2,3,4,6,7,8-HpCDD	20.8			40:40	1.05		
OCDD	897			45:13	0.89		
2,3,7,8-TCDF	0.866 J			31:09	0.68		A
1,2,3,7,8-PeCDF	1.15 J			33:37	1.48		A
2,3,4,7,8-PeCDF	0.633 J			34:15	1.65		A
1,2,3,4,7,8-HxCDF	3.07 J			36:24	1.32		A
1,2,3,6,7,8-HxCDF	1.88 J			36:30	1.19		A
2,3,4,6,7,8-HxCDF	0.482 J			37:00	1.21		A
1,2,3,7,8,9-HxCDF	EMPC	~~0.564~~	0.189 J	37:49	1.67	*	A
1,2,3,4,6,7,8-HpCDF	22.2			39:22	1.05		
1,2,3,4,7,8,9-HpCDF	0.498 J			41:22	1.11		A
OCDF	20.8			45:31	0.87		
Total TCDDs	ND	~~0.177~~	0.280 J				
Total PeCDDs	1.59		2.15 J				
Total HxCDDs	6.16		6.76 J				
Total HpCDDs	44.4						
Total TCDFs	8.67		10.3 J				
Total PeCDFs	12.0		13.0 J				
Total HxCDFs	16.3						
Total HpCDFs	27.2						
WHO-2005 TEQ (ND=0)	1.70		2.31				
WHO-2005 TEQ (ND=½)	2.12		2.31				

Client Information			**Sample Information**		
Project Name:	F51154		Report Basis:	Dry	
			Matrix:	Soil	
Sample ID:	F51154-10		Weight / Volume:	12.20 g	
			Solids / Lipids:	72.7	%
			Original pH :	NA	
Laboratory Information			Batch ID:	WG14383	
Project ID:	G383-583		Instrument:	HRMS1	
Sample ID:	G383-583-5B		Filename:	a30jul07a-9	
Collection Date/Time:	07/18/07	11:15	Retchk:	a30jul07a-1	
Receipt Date/Time:	07/21/07	10:35	Begin ConCal:	a30jul07a-1	
Extraction Date:	07/29/07		End ConCal:	a30jul07a-15	
Analysis Date/Time:	07/30/07	23:30	Initial Cal:	m8290-071007a	

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SGS Environmental Services

Method 8290
F51154-10
Accutest

Labeled Standard	Expected Amount (ng)	Measured Amount (ng)	Percent Recovery (%)	RT (min.)	Ratio	Qualifier
Extraction Standards						
13C12-2,3,7,8-TCDD	2.0	1.48	73.9	31:40	0.78	
13C12-1,2,3,7,8-PeCDD	2.0	1.32	65.8	34:25	1.59	
13C12-1,2,3,6,7,8-HxCDD	2.0	1.49	74.6	37:12	1.26	
13C12-1,2,3,4,6,7,8-HpCDD	2.0	1.60	79.8	40:40	1.06	
13C12-OCDD	4.0	3.08	77.0	45:10	0.89	
13C12-2,3,7,8-TCDF	2.0	1.62	80.9	31:07	0.79	
13C12-1,2,3,7,8-PeCDF	2.0	1.34	66.9	33:37	1.59	
13C12-1,2,3,6,7,8-HxCDF	2.0	1.39	69.5	36:28	0.52	
13C12-1,2,3,4,6,7,8-HpCDF	2.0	1.46	73.1	39:22	0.44	
Cleanup Standards						
37Cl4-2,3,7,8-TCDD	0.4	0.342	85.6	31:40	-	
13C12-2,3,4,7,8-PeCDF	0.4	0.264	66.0	34:15	1.62	
13C12-1,2,3,4,7,8-HxCDD	0.4	0.317	79.2	37:07	1.26	
13C12-1,2,3,4,7,8-HxCDF	0.4	0.291	72.7	36:22	0.50	
13C12-1,2,3,4,7,8,9-HpCDF	0.4	0.285	71.4	41:22	0.43	
Injection Standards						
13C12-1,2,3,4-TCDD	2.0	-	-	31:15	0.78	
13C12-1,2,3,7,8,9-HxCDD	2.0	-	-	37:28	1.25	

Client Information			**Sample Information**		
Project Name:	F51154		Report Basis:	Dry	
			Matrix:	Soil	
Sample ID:	F51154-10		Weight / Volume:	12.20 g	
			Solids / Lipids:	72.7	%
			Original pH :	NA	
Laboratory Information			Batch ID:	WG14383	
Project ID:	G383-583		Instrument:	HRMS1	
Sample ID:	G383-583-5B		Filename:	a30jul07a-9	
Collection Date/Time:	07/18/07	11:15	Retchk:	a30jul07a-1	
Receipt Date/Time:	07/21/07	10:35	Begin ConCal:	a30jul07a-1	
Extraction Date:	07/29/07		End ConCal:	a30jul07a-15	
Analysis Date/Time:	07/30/07	23:30	Initial Cal:	m8290-071007a	

Form Version:[8290_DB_2.14]Report

Analyzed by: JW
Date: 080907

Reviewed by: DLD
Date: 8/9/07

for 5 Cm7

SGS Environmental Services

Method 8290
F51154-11
Accutest

Analytical Data Summary Sheet

Analyte	Amount (pg/g)	EDL (pg/g)	EMPC (pg/g)	RT (min.)	Ratio		Qualifier
2,3,7,8-TCDD	EMPC	~~0.303~~	0.573 J	31:40	0.44	*	A
1,2,3,7,8-PeCDD	0.601			34:25	1.67		A
1,2,3,4,7,8-HxCDD	EMPC	~~1.35~~	0.805 J	37:07	1.50	*	A
1,2,3,6,7,8-HxCDD	EMPC	~~1.37~~	1.41 J	37:12	1.61	*	A
1,2,3,7,8,9-HxCDD	1.71 J			37:28	1.32		A
1,2,3,4,6,7,8-HpCDD	44.5			40:40	1.05		
OCDD	1790			45:10	0.89		
2,3,7,8-TCDF	1.58 J			31:09	0.78		A
1,2,3,7,8-PeCDF	2.68 J			33:37	1.60		A
2,3,4,7,8-PeCDF	1.27 J			34:15	1.74		A
1,2,3,4,7,8-HxCDF	7.44 J			36:22	1.22		A
1,2,3,6,7,8-HxCDF	4.60 J			36:28	1.24		A
2,3,4,6,7,8-HxCDF	1.68 J			37:00	1.27		A
1,2,3,7,8,9-HxCDF	0.541 J			37:48	1.15		A
1,2,3,4,6,7,8-HpCDF	58.6			39:22	1.04		
1,2,3,4,7,8,9-HpCDF	1.06 J			41:22	1.10		A
OCDF	48.4			45:28	0.88		
Total TCDDs	~~0.424~~		1.93 J				
Total PeCDDs	~~3.69~~		4.37 J				
Total HxCDDs	~~13.0~~		14.4 J				
Total HpCDDs	96.3						
Total TCDFs	~~17.2~~		19.3 J				
Total PeCDFs	~~27~~.1		28.1 J				
Total HxCDFs	41.0						
Total HpCDFs	69.2						
WHO-2005 TEQ (ND=0)	4.41		5.21				
WHO-2005 TEQ (ND=½)	4.70		5.21				

Client Information			**Sample Information**	
Project Name:	F51154		Report Basis:	Dry
			Matrix:	Soil
Sample ID:	F51154-11		Weight / Volume:	10.42 g
			Solids / Lipids:	47.9 %
			Original pH :	NA
Laboratory Information			Batch ID:	WG14383
Project ID:	G383-583		Instrument:	HRMS1
Sample ID:	G383-583-6B		Filename:	a30jul07a-10
Collection Date/Time:	07/18/07	12:00	Retchk:	a30jul07a-1
Receipt Date/Time:	07/21/07	10:35	Begin ConCal:	a30jul07a-1
Extraction Date:	07/29/07		End ConCal:	a30jul07a-15
Analysis Date/Time:	07/31/07	0:19	Initial Cal:	m8290-071007a

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Method 8290
F51154-11
Accutest

Labeled Standard	Expected Amount (ng)	Measured Amount (ng)	Percent Recovery (%)	RT (min.)	Ratio	Qualifier
Extraction Standards						
13C12-2,3,7,8-TCDD	2.0	1.46	72.8	31:39	0.77	
13C12-1,2,3,7,8-PeCDD	2.0	1.39	69.6	34:25	1.60	
13C12-1,2,3,6,7,8-HxCDD	2.0	1.53	76.3	37:12	1.26	
13C12-1,2,3,4,6,7,8-HpCDD	2.0	1.63	81.6	40:39	1.05	
13C12-OCDD	4.0	3.25	81.4	45:10	0.90	
13C12-2,3,7,8-TCDF	2.0	1.64	82.2	31:07	0.79	
13C12-1,2,3,7,8-PeCDF	2.0	1.35	67.6	33:37	1.59	
13C12-1,2,3,6,7,8-HxCDF	2.0	1.41	70.5	36:28	0.52	
13C12-1,2,3,4,6,7,8-HpCDF	2.0	1.48	73.8	39:22	0.44	
Cleanup Standards						
37Cl4-2,3,7,8-TCDD	0.4	0.400	99.9	31:40	-	
13C12-2,3,4,7,8-PeCDF	0.4	0.308	77.0	34:13	1.61	
13C12-1,2,3,4,7,8-HxCDD	0.4	0.340	85.0	37:07	1.27	
13C12-1,2,3,4,7,8-HxCDF	0.4	0.359	89.8	36:22	0.50	
13C12-1,2,3,4,7,8,9-HpCDF	0.4	0.346	86.4	41:21	0.43	
Injection Standards						
13C12-1,2,3,4-TCDD	2.0	-	-	31:15	0.78	
13C12-1,2,3,7,8,9-HxCDD	2.0	-	-	37:27	1.26	

Client Information			**Sample Information**		
Project Name:	F51154		Report Basis:	Dry	
			Matrix:	Soil	
Sample ID:	F51154-11		Weight / Volume:	10.42 g	
			Solids / Lipids:	47.9	%
			Original pH :	NA	
Laboratory Information			Batch ID:	WG14383	
Project ID:	G383-583		Instrument:	HRMS1	
Sample ID:	G383-583-6B		Filename:	a30jul07a-10	
Collection Date/Time:	07/18/07	12:00	Retchk:	a30jul07a-1	
Receipt Date/Time:	07/21/07	10:35	Begin ConCal:	a30jul07a-1	
Extraction Date:	07/29/07		End ConCal:	a30jul07a-15	
Analysis Date/Time:	07/31/07	0:19	Initial Cal:	m8290-071007a	

Form Version:[8290_DB_2.14]Report

Analyzed by: JW
Date: 08/8/07

Reviewed by: DD
Date: 8/9/07

Form I CORY

SGS Environmental Services

Method 8290
F51154-15
Accutest

Analytical Data Summary Sheet

Analyte	Amount (pg/g)	EDL (pg/g)	EMPC (pg/g)	RT (min.)	Ratio	Qualifier
2,3,7,8-TCDD	2.38			31:40	0.76	
1,2,3,7,8-PeCDD	7.55 J			34:25	1.57	A
1,2,3,4,7,8-HxCDD	7.83 J			37:07	1.31	A
1,2,3,6,7,8-HxCDD	19.0			37:13	1.35	
1,2,3,7,8,9-HxCDD	17.5			37:28	1.28	
1,2,3,4,6,7,8-HpCDD	571			40:40	1.05	
OCDD	5030			45:10	0.89	
2,3,7,8-TCDF	5.58 J			31:09	0.69	
1,2,3,7,8-PeCDF	5.73 J			33:37	1.65	A
2,3,4,7,8-PeCDF	10.6 J			34:15	1.64	
1,2,3,4,7,8-HxCDF	19.8			36:22	1.25	
1,2,3,6,7,8-HxCDF	10.8 J			36:28	1.27	
2,3,4,6,7,8-HxCDF	11.7 J			37:00	1.38	
1,2,3,7,8,9-HxCDF	2.39 J			37:48	1.21	A
1,2,3,4,6,7,8-HpCDF	132			39:22	1.04	
1,2,3,4,7,8,9-HpCDF	5.24 J			41:22	1.17	A
OCDF	385			45:28	0.88	
Total TCDDs	37.9					
Total PeCDDs	69.9					
Total HxCDDs	200					
Total HpCDDs	1060					
Total TCDFs	~~132~~		140 J			
Total PeCDFs	~~137~~		137 J			
Total HxCDFs	~~158~~		163 J			
Total HpCDFs	328					
WHO-2005 TEQ (ND=0)	31.4		31.4			
WHO-2005 TEQ (ND=½)	31.4		31.4			

Client Information			**Sample Information**		
Project Name:	F51154		Report Basis:	Dry	
			Matrix:	Soil	
Sample ID:	F51154-15		Weight / Volume:	10.10 g	
			Solids / Lipids:	60.8	%
			Original pH :	NA	
Laboratory Information			Batch ID:	WG14383	
Project ID:	G383-583		Instrument:	HRMS1	
Sample ID:	G383-583-8B		Filename:	a30jul07a-11	
Collection Date/Time:	07/19/07	11:30	Retchk:	a30jul07a-1	
Receipt Date/Time:	07/21/07	10:35	Begin ConCal:	a30jul07a-1	
Extraction Date:	07/29/07		End ConCal:	a30jul07a-15	
Analysis Date/Time:	07/31/07	1:07	Initial Cal:	m8290-071007a	

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Method 8290
F51154-15
Accutest

Labeled Standard	Expected Amount (ng)	Measured Amount (ng)	Percent Recovery (%)	RT (min.)	Ratio	Qualifier
Extraction Standards						
13C12-2,3,7,8-TCDD	2.0	1.48	73.9	31:39	0.78	
13C12-1,2,3,7,8-PeCDD	2.0	1.41	70.7	34:25	1.59	
13C12-1,2,3,6,7,8-HxCDD	2.0	1.56	78.0	37:12	1.26	
13C12-1,2,3,4,6,7,8-HpCDD	2.0	1.67	83.5	40:39	1.07	
13C12-OCDD	4.0	3.37	84.3	45:10	0.89	
13C12-2,3,7,8-TCDF	2.0	1.63	81.4	31:07	0.78	
13C12-1,2,3,7,8-PeCDF	2.0	1.37	68.6	33:37	1.60	
13C12-1,2,3,6,7,8-HxCDF	2.0	1.42	70.8	36:28	0.52	
13C12-1,2,3,4,6,7,8-HpCDF	2.0	1.50	75.2	39:22	0.44	
Cleanup Standards						
37Cl4-2,3,7,8-TCDD	0.4	0.342	85.5	31:40	-	
13C12-2,3,4,7,8-PeCDF	0.4	0.258	64.5	34:13	1.61	
13C12-1,2,3,4,7,8-HxCDD	0.4	0.301	75.2	37:06	1.28	
13C12-1,2,3,4,7,8-HxCDF	0.4	0.307	76.7	36:22	0.50	
13C12-1,2,3,4,7,8,9-HpCDF	0.4	0.295	73.9	41:21	0.43	
Injection Standards						
13C12-1,2,3,4-TCDD	2.0	-	-	31:15	0.79	
13C12-1,2,3,7,8,9-HxCDD	2.0	-	-	37:27	1.26	

Client Information			**Sample Information**		
Project Name:	F51154		Report Basis:	Dry	
			Matrix:	Soil	
Sample ID:	F51154-15		Weight / Volume:	10.10 g	
			Solids / Lipids:	60.8	%
			Original pH :	NA	
Laboratory Information			Batch ID:	WG14383	
Project ID:	G383-583		Instrument:	HRMS1	
Sample ID:	G383-583-8B		Filename:	a30jul07a-11	
Collection Date/Time:	07/19/07	11:30	Retchk:	a30jul07a-1	
Receipt Date/Time:	07/21/07	10:35	Begin ConCal:	a30jul07a-1	
Extraction Date:	07/29/07		End ConCal:	a30jul07a-15	
Analysis Date/Time:	07/31/07	1:07	Initial Cal:	m8290-071007a	

Form Version:[8290_DB_2.14]Report

Analyzed by: JMC
Date: 080907

Reviewed by: [signature]
Date: 8/4/07

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SGS Environmental Services

Method 8290
F51154-16
Accutest

Analytical Data Summary Sheet

Analyte	Amount (pg/g)	EDL (pg/g)	EMPC (pg/g)	RT (min.)	Ratio	Qualifier
2,3,7,8-TCDD	1.72			31:40	0.67	
1,2,3,7,8-PeCDD	5.77 J			34:25	1.60	A
1,2,3,4,7,8-HxCDD	6.23			37:07	1.35	
1,2,3,6,7,8-HxCDD	18.8			37:13	1.24	
1,2,3,7,8,9-HxCDD	16.2			37:28	1.29	
1,2,3,4,6,7,8-HpCDD	734			40:40	1.04	
OCDD	6660 J			45:10	0.89	E
2,3,7,8-TCDF	3.02 J			31:09	0.77	
1,2,3,7,8-PeCDF	3.09 J			33:37	1.66	A
2,3,4,7,8-PeCDF	3.83 J			34:15	1.60	A
1,2,3,4,7,8-HxCDF	15.8			36:22	1.31	
1,2,3,6,7,8-HxCDF	5.85 J			36:28	1.25	A
2,3,4,6,7,8-HxCDF	4.61 J			37:00	1.27	A
1,2,3,7,8,9-HxCDF	1.12 J			37:49	1.38	A
1,2,3,4,6,7,8-HpCDF	139			39:22	1.03	
1,2,3,4,7,8,9-HpCDF	4.97 J			41:22	1.02	A
OCDF	416			45:28	0.89	
Total TCDDs	~~27.8~~		28.8 J			
Total PeCDDs	57.4					
Total HxCDDs	186					
Total HpCDDs	1310					
Total TCDFs	~~53.8 J~~		54.3 J			
Total PeCDFs	~~51.7 J~~		58.1 J			
Total HxCDFs	113					
Total HpCDFs	333					
WHO-2005 TEQ (ND=0)	26.8		26.8			
WHO-2005 TEQ (ND=½)	26.8		26.8			

Client Information			**Sample Information**		
Project Name:	F51154		Report Basis:	Dry	
			Matrix:	Soil	
Sample ID:	F51154-16		Weight / Volume:	11.67 g	
			Solids / Lipids:	70.5	%
			Original pH :	NA	
Laboratory Information			Batch ID:	WG14383	
Project ID:	G383-583		Instrument:	HRMS1	
Sample ID:	G383-583-9B		Filename:	a30jul07a-12	
Collection Date/Time:	07/19/07	10:30	Retchk:	a30jul07a-1	
Receipt Date/Time:	07/21/07	10:35	Begin ConCal:	a30jul07a-1	
Extraction Date:	07/29/07		End ConCal:	a30jul07a-15	
Analysis Date/Time:	07/31/07	1:55	Initial Cal:	m8290-071007a	

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SGS Environmental Services

Method 8290
F51154-16
Accutest

Labeled Standard	Expected Amount (ng)	Measured Amount (ng)	Percent Recovery (%)	RT (min.)	Ratio	Qualifier
Extraction Standards						
13C12-2,3,7,8-TCDD	2.0	1.50	75.0	31:39	0.78	
13C12-1,2,3,7,8-PeCDD	2.0	1.41	70.7	34:25	1.59	
13C12-1,2,3,6,7,8-HxCDD	2.0	1.58	78.8	37:12	1.26	
13C12-1,2,3,4,6,7,8-HpCDD	2.0	1.68	83.8	40:39	1.06	
13C12-OCDD	4.0	3.62	90.4	45:10	0.90	
13C12-2,3,7,8-TCDF	2.0	1.67	83.5	31:07	0.79	
13C12-1,2,3,7,8-PeCDF	2.0	1.40	70.1	33:37	1.58	
13C12-1,2,3,6,7,8-HxCDF	2.0	1.45	72.5	36:28	0.52	
13C12-1,2,3,4,6,7,8-HpCDF	2.0	1.55	77.4	39:22	0.44	
Cleanup Standards						
37Cl4-2,3,7,8-TCDD	0.4	0.383	95.7	31:40	-	
13C12-2,3,4,7,8-PeCDF	0.4	0.286	71.5	34:13	1.60	
13C12-1,2,3,4,7,8-HxCDD	0.4	0.336	84.0	37:06	1.27	
13C12-1,2,3,4,7,8-HxCDF	0.4	0.346	86.6	36:22	0.50	
13C12-1,2,3,4,7,8,9-HpCDF	0.4	0.330	82.5	41:22	0.43	
Injection Standards						
13C12-1,2,3,4-TCDD	2.0	-	-	31:15	0.78	
13C12-1,2,3,7,8,9-HxCDD	2.0	-	-	37:27	1.26	

Client Information			**Sample Information**		
Project Name:	F51154		Report Basis:	Dry	
			Matrix:	Soil	
Sample ID:	F51154-16		Weight / Volume:	11.67 g	
			Solids / Lipids:	70.5	%
			Original pH :	NA	
Laboratory Information			Batch ID:	WG14383	
Project ID:	G383-583		Instrument:	HRMS1	
Sample ID:	G383-583-9B		Filename:	a30jul07a-12	
Collection Date/Time:	07/19/07	10:30	Retchk:	a30jul07a-1	
Receipt Date/Time:	07/21/07	10:35	Begin ConCal:	a30jul07a-1	
Extraction Date:	07/29/07		End ConCal:	a30jul07a-15	
Analysis Date/Time:	07/31/07	1:55	Initial Cal:	m8290-071007a	

Form Version:[8290_DB_2.14]Report

Analyzed by: JWP
Date: 080907

Reviewed by: [illegible]
Date: 8/9/07

Form I Copy

Method 8290
F51154-17
Accutest

Analytical Data Summary Sheet

Analyte	Amount (ng/L)	EDL (ng/L)	EMPC (ng/L)	RT (min.)	Ratio	Qualifier
2,3,7,8-TCDD	ND	0.00175				
1,2,3,7,8-PeCDD	ND	0.00593				
1,2,3,4,7,8-HxCDD	ND	0.00593				
1,2,3,6,7,8-HxCDD	ND	0.00593				
1,2,3,7,8,9-HxCDD	ND	0.00593				
1,2,3,4,6,7,8-HpCDD	EMPC	~~0.00593~~	0.00503 J	40:39	0.88 *	A
OCDD	0.0423 K			45:10	0.87	A
2,3,7,8-TCDF	ND	0.00153				
1,2,3,7,8-PeCDF	ND	0.00593				
2,3,4,7,8-PeCDF	ND	0.00593				
1,2,3,4,7,8-HxCDF	ND	0.00593				
1,2,3,6,7,8-HxCDF	ND	0.00593				
2,3,4,6,7,8-HxCDF	ND	0.00593				
1,2,3,7,8,9-HxCDF	ND	0.00593				
1,2,3,4,6,7,8-HpCDF	0.00204 J			39:21	1.18	A
1,2,3,4,7,8,9-HpCDF	ND	0.00593				
OCDF	0.00586 J			45:28	0.79	A
Total TCDDs	ND	0.00175				
Total PeCDDs	ND	0.00593				
Total HxCDDs	ND	0.00593				
Total HpCDDs	~~0.00446~~		0.00949 J			
Total TCDFs	~~0.00382~~		0.00622 J			
Total PeCDFs	ND	~~0.00593~~	0.00202 J			
Total HxCDFs	ND	0.00593				
Total HpCDFs	~~0.00204~~		0.00422 J			
WHO-2005 TEQ (ND=0)	0.0000348		0.0000851			
WHO-2005 TEQ (ND=½)	0.00707		0.00709			

Client Information			**Sample Information**	
Project Name:	F51154		Report Basis:	Wet
			Matrix:	Water
Sample ID:	F51154-17		Weight / Volume:	843 mL
			Solids / Lipids:	NA %
			Original pH :	8
Laboratory Information			Batch ID:	WG14381
Project ID:	G383-583		Instrument:	HRMS1
Sample ID:	G383-583-10C		Filename:	a30jul07a_2-4
Collection Date/Time:	07/19/07	11:20	Retchk:	a30jul07a-15
Receipt Date/Time:	07/21/07	10:35	Begin ConCal:	a30jul07a-15
Extraction Date:	07/26/07		End ConCal:	a30jul07a_2-11
Analysis Date/Time:	07/31/07	7:38	Initial Cal:	m8290-071007a

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Method 8290
F51154-17
Accutest

Labeled Standard	Expected Amount (ng)	Measured Amount (ng)	Percent Recovery (%)	RT (min.)	Ratio	Qualifier
Extraction Standards						
13C12-2,3,7,8-TCDD	2.0	1.47	73.6	31:39	0.78	
13C12-1,2,3,7,8-PeCDD	2.0	1.46	73.2	34:25	1.60	
13C12-1,2,3,6,7,8-HxCDD	2.0	1.66	83.1	37:10	1.26	
13C12-1,2,3,4,6,7,8-HpCDD	2.0	1.76	88.1	40:37	1.06	
13C12-OCDD	4.0	3.84	95.9	45:07	0.89	
13C12-2,3,7,8-TCDF	2.0	1.68	84.2	31:06	0.79	
13C12-1,2,3,7,8-PeCDF	2.0	1.41	70.6	33:37	1.58	
13C12-1,2,3,6,7,8-HxCDF	2.0	1.51	75.6	36:28	0.53	
13C12-1,2,3,4,6,7,8-HpCDF	2.0	1.66	83.2	39:21	0.45	
Cleanup Standards						
37Cl4-2,3,7,8-TCDD	0.4	0.360	89.9	31:40	-	
13C12-2,3,4,7,8-PeCDF	0.4	0.276	69.1	34:13	1.63	
13C12-1,2,3,4,7,8-HxCDD	0.4	0.322	80.5	37:06	1.26	
13C12-1,2,3,4,7,8-HxCDF	0.4	0.341	85.3	36:22	0.50	
13C12-1,2,3,4,7,8,9-HpCDF	0.4	0.326	81.5	41:21	0.43	
Injection Standards						
13C12-1,2,3,4-TCDD	2.0	-	-	31:13	0.78	
13C12-1,2,3,7,8,9-HxCDD	2.0	-	-	37:25	1.25	

Client Information			**Sample Information**		
Project Name:	F51154		Report Basis:	Wet	
			Matrix:	Water	
Sample ID:	F51154-17		Weight / Volume:	843 mL	
			Solids / Lipids:	NA	%
			Original pH :	8	
Laboratory Information			Batch ID:	WG14381	
Project ID:	G383-583		Instrument:	HRMS1	
Sample ID:	G383-583-10C		Filename:	a30jul07a_2-4	
Collection Date/Time:	07/19/07	11:20	Retchk:	a30jul07a-15	
Receipt Date/Time:	07/21/07	10:35	Begin ConCal:	a30jul07a-15	
Extraction Date:	07/26/07		End ConCal:	a30jul07a_2-11	
Analysis Date/Time:	07/31/07	7:38	Initial Cal:	m8290-071007a	

Form Version:[8290_DB_2.14]Report

Analyzed by: JWP
Date: 08/2/07

Reviewed by: [illegible]
Date: 8/9/07

For I Corp

SGS Environmental Services

Method 8290
F51154-18
Accutest

Analytical Data Summary Sheet

Analyte	Amount (pg/g)	EDL (pg/g)	EMPC (pg/g)	RT (min.)	Ratio		Qualifier
2,3,7,8-TCDD	EMPC	~~0.168~~	0.191 J	31:39	0.62	*	A
1,2,3,7,8-PeCDD	0.875 J			34:25	1.45		A
1,2,3,4,7,8-HxCDD	1.53 J			37:07	1.18		A
1,2,3,6,7,8-HxCDD	4.08 J			37:12	1.28		A
1,2,3,7,8,9-HxCDD	4.19 J			37:27	1.29		A
1,2,3,4,6,7,8-HpCDD	178			40:40	1.04		
OCDD	2180			45:09	0.90		
2,3,7,8-TCDF	0.509 B			31:07	0.87		A
1,2,3,7,8-PeCDF	0.238 J			33:37	1.56		A
2,3,4,7,8-PeCDF	EMPC	~~0.561~~	0.0965 J	34:19	1.09	*	A
1,2,3,4,7,8-HxCDF	0.938 B			36:22	1.32		A
1,2,3,6,7,8-HxCDF	0.763 J			36:28	1.30		A
2,3,4,6,7,8-HxCDF	0.965 J			36:58	1.29		A
1,2,3,7,8,9-HxCDF	ND	0.561					
1,2,3,4,6,7,8-HpCDF	37.6			39:22	1.06		
1,2,3,4,7,8,9-HpCDF	1.14 J			41:22	1.11		A
OCDF	115			45:28	0.90		
Total TCDDs	ND	~~0.168~~	1.30 J				
Total PeCDDs	3.04		3.27 J				
Total HxCDDs	27.3						
Total HpCDDs	304						
Total TCDFs	3.13		3.48 J				
Total PeCDFs	5.63		5.80 J				
Total HxCDFs	23.2		23.4 J				
Total HpCDFs	95.5		95.9 J				
WHO-2005 TEQ (ND=0)	5.04		5.26				
WHO-2005 TEQ (ND=½)	5.23		5.28				

Client Information			**Sample Information**		
Project Name:	F51154		Report Basis:	Dry	
			Matrix:	Soil	
Sample ID:	F51154-18		Weight / Volume:	10.39 g	
			Solids / Lipids:	85.8	%
			Original pH :	NA	
Laboratory Information			Batch ID:	WG14383	
Project ID:	G383-583		Instrument:	HRMS1	
Sample ID:	G383-583-13B		Filename:	a30jul07a-13	
Collection Date/Time:	07/19/07	14:45	Retchk:	a30jul07a-1	
Receipt Date/Time:	07/21/07	10:35	Begin ConCal:	a30jul07a-1	
Extraction Date:	07/29/07		End ConCal:	a30jul07a-15	
Analysis Date/Time:	07/31/07	2:44	Initial Cal:	m8290-071007a	

Form 1 Con

Method 8290
F51154-18
Accutest

Labeled Standard	Expected Amount (ng)	Measured Amount (ng)	Percent Recovery (%)	RT (min.)	Ratio	Qualifier
Extraction Standards						
13C12-2,3,7,8-TCDD	2.0	1.42	71.2	31:39	0.77	
13C12-1,2,3,7,8-PeCDD	2.0	1.43	71.5	34:25	1.59	
13C12-1,2,3,6,7,8-HxCDD	2.0	1.54	77.1	37:12	1.26	
13C12-1,2,3,4,6,7,8-HpCDD	2.0	1.65	82.6	40:39	1.07	
13C12-OCDD	4.0	3.48	86.9	45:09	0.89	
13C12-2,3,7,8-TCDF	2.0	1.59	79.5	31:07	0.79	
13C12-1,2,3,7,8-PeCDF	2.0	1.36	68.2	33:37	1.59	
13C12-1,2,3,6,7,8-HxCDF	2.0	1.43	71.4	36:28	0.52	
13C12-1,2,3,4,6,7,8-HpCDF	2.0	1.50	74.8	39:21	0.45	
Cleanup Standards						
37Cl4-2,3,7,8-TCDD	0.4	0.331	82.7	31:40	-	
13C12-2,3,4,7,8-PeCDF	0.4	0.255	63.7	34:13	1.63	
13C12-1,2,3,4,7,8-HxCDD	0.4	0.315	78.8	37:06	1.29	
13C12-1,2,3,4,7,8-HxCDF	0.4	0.295	73.7	36:22	0.50	
13C12-1,2,3,4,7,8,9-HpCDF	0.4	0.290	72.5	41:21	0.43	
Injection Standards						
13C12-1,2,3,4-TCDD	2.0	-	-	31:15	0.77	
13C12-1,2,3,7,8,9-HxCDD	2.0	-	-	37:27	1.25	

Client Information			**Sample Information**		
Project Name:	F51154		Report Basis:	Dry	
			Matrix:	Soil	
Sample ID:	F51154-18		Weight / Volume:	10.39 g	
			Solids / Lipids:	85.8	%
			Original pH :	NA	
Laboratory Information			Batch ID:	WG14383	
Project ID:	G383-583		Instrument:	HRMS1	
Sample ID:	G383-583-13B		Filename:	a30jul07a-13	
Collection Date/Time:	07/19/07	14:45	Retchk:	a30jul07a-1	
Receipt Date/Time:	07/21/07	10:35	Begin ConCal:	a30jul07a-1	
Extraction Date:	07/29/07		End ConCal:	a30jul07a-15	
Analysis Date/Time:	07/31/07	2:44	Initial Cal:	m8290-071007a	

Form Version:[8290_DB_2.14]Report

Analyzed by: JMP
Date: 080907

Reviewed by: MM
Date: 8/9/07

Form I Cont

Method 8290
F51154-20
Accutest

Analytical Data Summary Sheet

Analyte	Amount (ng/L)	EDL (ng/L)	EMPC (ng/L)	RT (min.)	Ratio	Qualifier
2,3,7,8-TCDD	ND	0.00236				
1,2,3,7,8-PeCDD	ND	0.00609				
1,2,3,4,7,8-HxCDD	ND	0.00609				
1,2,3,6,7,8-HxCDD	ND	0.00609				
1,2,3,7,8,9-HxCDD	ND	0.00609				
1,2,3,4,6,7,8-HpCDD	0.00448 J			40:39	1.19	A
OCDD	0.0295 J			45:09	0.92	A
2,3,7,8-TCDF	ND	0.00200				
1,2,3,7,8-PeCDF	0.00178 J			33:37	1.58	A
2,3,4,7,8-PeCDF	ND	0.00609				
1,2,3,4,7,8-HxCDF	ND	0.00609				
1,2,3,6,7,8-HxCDF	ND	0.00609				
2,3,4,6,7,8-HxCDF	ND	0.00609				
1,2,3,7,8,9-HxCDF	ND	0.00609				
1,2,3,4,6,7,8-HpCDF	ND	0.00609				
1,2,3,4,7,8,9-HpCDF	ND	0.00609				
OCDF	ND	0.0122				
Total TCDDs	ND	0.00236				
Total PeCDDs	ND	0.00609				
Total HxCDDs	ND	0.00609				
Total HpCDDs	0.00448 J					
Total TCDFs	ND	0.00200				
Total PeCDFs	~~0.00178~~		0.00373 J			
Total HxCDFs	ND	0.00609				
Total HpCDFs	ND	0.00609				
WHO-2005 TEQ (ND=0)	0.000107		0.000107			
WHO-2005 TEQ (ND=½)	0.00754		0.00754			

Client Information			Sample Information	
Project Name:	F51154		Report Basis:	Wet
			Matrix:	Water
Sample ID:	F51154-20		Weight / Volume:	821 mL
			Solids / Lipids:	NA %
			Original pH :	8
Laboratory Information			Batch ID:	WG14381
Project ID:	G383-583		Instrument:	HRMS1
Sample ID:	G383-583-14C		Filename:	a30jul07a_2-7
Collection Date/Time:	07/19/07	11:20	Retchk:	a30jul07a-15
Receipt Date/Time:	07/21/07	10:35	Begin ConCal:	a30jul07a-15
Extraction Date:	07/26/07		End ConCal:	a30jul07a_2-11
Analysis Date/Time:	07/31/07	10:03	Initial Cal:	m8290-071007a

Form I Cont

Method 8290
F51154-20
Accutest

Labeled Standard	Expected Amount (ng)	Measured Amount (ng)	Percent Recovery (%)	RT (min.)	Ratio	Qualifier
Extraction Standards						
13C12-2,3,7,8-TCDD	2.0	1.39	69.3	31:39	0.78	
13C12-1,2,3,7,8-PeCDD	2.0	1.45	72.4	34:25	1.57	
13C12-1,2,3,6,7,8-HxCDD	2.0	1.55	77.7	37:10	1.24	
13C12-1,2,3,4,6,7,8-HpCDD	2.0	1.73	86.4	40:37	1.06	
13C12-OCDD	4.0	3.70	92.5	45:07	0.89	
13C12-2,3,7,8-TCDF	2.0	1.58	78.9	31:06	0.79	
13C12-1,2,3,7,8-PeCDF	2.0	1.37	68.6	33:37	1.60	
13C12-1,2,3,6,7,8-HxCDF	2.0	1.45	72.6	36:28	0.52	
13C12-1,2,3,4,6,7,8-HpCDF	2.0	1.57	78.4	39:21	0.45	
Cleanup Standards						
37Cl4-2,3,7,8-TCDD	0.4	0.341	85.2	31:40	-	
13C12-2,3,4,7,8-PeCDF	0.4	0.303	75.8	34:13	1.60	
13C12-1,2,3,4,7,8-HxCDD	0.4	0.338	84.4	37:04	1.33	
13C12-1,2,3,4,7,8-HxCDF	0.4	0.320	80.1	36:22	0.51	
13C12-1,2,3,4,7,8,9-HpCDF	0.4	0.310	77.6	41:21	0.43	
Injection Standards						
13C12-1,2,3,4-TCDD	2.0	-	-	31:13	0.79	
13C12-1,2,3,7,8,9-HxCDD	2.0	-	-	37:25	1.26	

Client Information			**Sample Information**		
Project Name:	F51154		Report Basis:	Wet	
			Matrix:	Water	
Sample ID:	F51154-20		Weight / Volume:	821 mL	
			Solids / Lipids:	NA	%
			Original pH :	8	
Laboratory Information			Batch ID:	WG14381	
Project ID:	G383-583		Instrument:	HRMS1	
Sample ID:	G383-583-14C		Filename:	a30jul07a_2-7	
Collection Date/Time:	07/19/07	11:20	Retchk:	a30jul07a-15	
Receipt Date/Time:	07/21/07	10:35	Begin ConCal:	a30jul07a-15	
Extraction Date:	07/26/07		End ConCal:	a30jul07a_2-11	
Analysis Date/Time:	07/31/07	10:03	Initial Cal:	m8290-071007a	

Form Version:[8290_DB_2.14]Report

Analyzed by: JLW
Date: 08/8/07

Reviewed by: [illegible]
Date: 8/9/07

form I Cn

Method 8290
F51154-22
Accutest

Analytical Data Summary Sheet

Analyte	Amount (pg/g)	EDL (pg/g)	EMPC (pg/g)	RT (min.)	Ratio		Qualifier
2,3,7,8-TCDD	ND	0.181					
1,2,3,7,8-PeCDD	ND	0.594					
1,2,3,4,7,8-HxCDD	0.214 J			37:07	1.33		A
1,2,3,6,7,8-HxCDD	0.537 J			37:10	1.29		A
1,2,3,7,8,9-HxCDD	1.27 J			37:27	1.30		A
1,2,3,4,6,7,8-HpCDD	27.9			40:40	1.04		
OCDD	1710			45:10	0.89		
2,3,7,8-TCDF	0.492 B			31:07	0.86		A
1,2,3,7,8-PeCDF	0.235 J			33:37	1.52		A
2,3,4,7,8-PeCDF	EMPC	~~0.594~~	0.356 J	34:15	1.86	*	A
1,2,3,4,7,8-HxCDF	0.801 B			36:22	1.21		A
1,2,3,6,7,8-HxCDF	0.297 J			36:28	1.29		A
2,3,4,6,7,8-HxCDF	EMPC	~~0.594~~	0.342 J	36:58	1.50	*	A
1,2,3,7,8,9-HxCDF	ND	0.594					
1,2,3,4,6,7,8-HpCDF	4.20 B			39:21	1.08		A
1,2,3,4,7,8,9-HpCDF	0.361 J			41:21	0.91		A
OCDF	11.2 B			45:28	0.86		A
Total TCDDs	ND	0.181					
Total PeCDDs	0.268						
Total HxCDDs	8.65						
Total HpCDDs	65.9						
Total TCDFs	~~2.38~~		2.55 J				
Total PeCDFs	~~2.56~~		3.10 J				
Total HxCDFs	~~4.74~~		5.08 J				
Total HpCDFs	10.5						
WHO-2005 TEQ (ND=0)	1.21		1.35				
WHO-2005 TEQ (ND=½)	1.75		1.77				

Client Information			**Sample Information**	
Project Name:	F51154		Report Basis:	Dry
			Matrix:	Soil
Sample ID:	F51154-22		Weight / Volume:	10.64 g
			Solids / Lipids:	79.1 %
			Original pH :	NA
Laboratory Information			Batch ID:	WG14383
Project ID:	G383-583		Instrument:	HRMS1
Sample ID:	G383-583-15B		Filename:	a30jul07a-14
Collection Date/Time:	07/19/07	7:00	Retchk:	a30jul07a-1
Receipt Date/Time:	07/21/07	10:35	Begin ConCal:	a30jul07a-1
Extraction Date:	07/29/07		End ConCal:	a30jul07a-15
Analysis Date/Time:	07/31/07	3:32	Initial Cal:	m8290-071007a

Form I Copy

SGS Environmental Services

Method 8290
F51154-22
Accutest

Labeled Standard	Expected Amount (ng)	Measured Amount (ng)	Percent Recovery (%)	RT (min.)	Ratio	Qualifier
Extraction Standards						
13C12-2,3,7,8-TCDD	2.0	1.31	65.7	31:39	0.78	
13C12-1,2,3,7,8-PeCDD	2.0	1.32	66.2	34:25	1.60	
13C12-1,2,3,6,7,8-HxCDD	2.0	1.43	71.7	37:10	1.29	
13C12-1,2,3,4,6,7,8-HpCDD	2.0	1.52	75.9	40:37	1.05	
13C12-OCDD	4.0	3.10	77.5	45:07	0.89	
13C12-2,3,7,8-TCDF	2.0	1.48	73.9	31:07	0.79	
13C12-1,2,3,7,8-PeCDF	2.0	1.27	63.3	33:37	1.61	
13C12-1,2,3,6,7,8-HxCDF	2.0	1.32	66.1	36:28	0.52	
13C12-1,2,3,4,6,7,8-HpCDF	2.0	1.36	68.1	39:21	0.44	
Cleanup Standards						
37Cl4-2,3,7,8-TCDD	0.4	0.310	77.4	31:40	-	
13C12-2,3,4,7,8-PeCDF	0.4	0.249	62.2	34:13	1.66	
13C12-1,2,3,4,7,8-HxCDD	0.4	0.279	69.7	37:06	1.09	
13C12-1,2,3,4,7,8-HxCDF	0.4	0.276	69.0	36:22	0.50	
13C12-1,2,3,4,7,8,9-HpCDF	0.4	0.270	67.5	41:21	0.42	
Injection Standards						
13C12-1,2,3,4-TCDD	2.0	-	-	31:13	0.79	
13C12-1,2,3,7,8,9-HxCDD	2.0	-	-	37:27	1.25	

Client Information			**Sample Information**	
Project Name:	F51154		Report Basis:	Dry
			Matrix:	Soil
Sample ID:	F51154-22		Weight / Volume:	10.64 g
			Solids / Lipids:	79.1 %
			Original pH :	NA
Laboratory Information			Batch ID:	WG14383
Project ID:	G383-583		Instrument:	HRMS1
Sample ID:	G383-583-15B		Filename:	a30jul07a-14
Collection Date/Time:	07/19/07	7:00	Retchk:	a30jul07a-1
Receipt Date/Time:	07/21/07	10:35	Begin ConCal:	a30jul07a-1
Extraction Date:	07/29/07		End ConCal:	a30jul07a-15
Analysis Date/Time:	07/31/07	3:32	Initial Cal:	m8290-071007a

Reviewed by: [signature]
Date: 8/9/07

Analyzed by: [signature]
Date: 08-09-07

Report Version: [8290_DB_2.14] Report

Form I Copy

SGS Environmental Services

Method 8290
F51154-23
Accutest

Analytical Data Summary Sheet

Analyte	Amount (pg/g)	EDL (pg/g)	EMPC (pg/g)	RT (min.)	Ratio	Qualifier
2,3,7,8-TCDD	EMPC	~~0.160~~	0.198 J	31:40	0.64 *	A
1,2,3,7,8-PeCDD	3.72 J			34:27	1.55	A
1,2,3,4,7,8-HxCDD	8.98			37:07	1.26	
1,2,3,6,7,8-HxCDD	29.3			37:12	1.28	
1,2,3,7,8,9-HxCDD	22.2			37:28	1.30	
1,2,3,4,6,7,8-HpCDD	1110			40:40	1.04	
OCDD	10000 J			45:10	0.90	E
2,3,7,8-TCDF	1.19			31:09	0.77	
1,2,3,7,8-PeCDF	1.45 J			33:37	1.52	A
2,3,4,7,8-PeCDF	0.348 J			34:19	1.44	A
1,2,3,4,7,8-HxCDF	8.47			36:24	1.23	
1,2,3,6,7,8-HxCDF	6.38			36:30	1.27	
2,3,4,6,7,8-HxCDF	8.25			37:00	1.28	
1,2,3,7,8,9-HxCDF	1.30 J			37:49	1.15	A
1,2,3,4,6,7,8-HpCDF	214			39:22	1.05	
1,2,3,4,7,8,9-HpCDF	13.7			41:22	1.10	
OCDF	736			45:28	0.89	
Total TCDDs	~~5.11~~		5.67 J			
Total PeCDDs	14.4					
Total HxCDDs	~~147~~		148 J			
Total HpCDDs	1670					
Total TCDFs	~~13.6~~		15.6 J			
Total PeCDFs	~~45.4~~		46.3 J			
Total HxCDFs	221					
Total HpCDFs	719					
WHO-2005 TEQ (ND=0)	29.1		29.3			
WHO-2005 TEQ (ND=½)	29.2		29.3			

Client Information			**Sample Information**	
Project Name:	F51154		Report Basis:	Dry
			Matrix:	Soil
Sample ID:	F51154-23		Weight / Volume:	11.02 g
			Solids / Lipids:	89.6 %
			Original pH :	NA
Laboratory Information			Batch ID:	WG14383
Project ID:	G383-583		Instrument:	HRMS1
Sample ID:	G383-583-16B		Filename:	a30jul07a_2-2
Collection Date/Time:	07/19/07	7:55	Retchk:	a30jul07a-15
Receipt Date/Time:	07/21/07	10:35	Begin ConCal:	a30jul07a-15
Extraction Date:	07/29/07		End ConCal:	a30jul07a_2-11
Analysis Date/Time:	07/31/07	6:01	Initial Cal:	m8290-071007a

Form I Cont

SGS Environmental Services

Method 8290
F51154-23
Accutest

Labeled Standard	Expected Amount (ng)	Measured Amount (ng)	Percent Recovery (%)	RT (min.)	Ratio	Qualifier
Extraction Standards						
13C12-2,3,7,8-TCDD	2.0	1.50	75.2	31:40	0.78	
13C12-1,2,3,7,8-PeCDD	2.0	1.46	72.8	34:25	1.59	
13C12-1,2,3,6,7,8-HxCDD	2.0	1.57	78.3	37:12	1.24	
13C12-1,2,3,4,6,7,8-HpCDD	2.0	1.70	84.8	40:39	1.05	
13C12-OCDD	4.0	3.50	87.4	45:10	0.89	
13C12-2,3,7,8-TCDF	2.0	1.74	87.1	31:07	0.79	
13C12-1,2,3,7,8-PeCDF	2.0	1.41	70.7	33:37	1.60	
13C12-1,2,3,6,7,8-HxCDF	2.0	1.44	72.1	36:28	0.52	
13C12-1,2,3,4,6,7,8-HpCDF	2.0	1.52	76.2	39:22	0.44	
Cleanup Standards						
37Cl4-2,3,7,8-TCDD	0.4	0.348	87.0	31:40	-	
13C12-2,3,4,7,8-PeCDF	0.4	0.294	73.6	34:15	1.62	
13C12-1,2,3,4,7,8-HxCDD	0.4	0.309	77.2	37:07	1.42	
13C12-1,2,3,4,7,8-HxCDF	0.4	0.297	74.4	36:22	0.49	
13C12-1,2,3,4,7,8,9-HpCDF	0.4	0.278	69.5	41:21	0.41	
Injection Standards						
13C12-1,2,3,4-TCDD	2.0	-	-	31:16	0.78	
13C12-1,2,3,7,8,9-HxCDD	2.0	-	-	37:27	1.26	

Client Information			**Sample Information**	
Project Name:	F51154		Report Basis:	Dry
			Matrix:	Soil
Sample ID:	F51154-23		Weight / Volume:	11.02 g
			Solids / Lipids:	89.6 %
			Original pH :	NA
Laboratory Information			Batch ID:	WG14383
Project ID:	G383-583		Instrument:	HRMS1
Sample ID:	G383-583-16B		Filename:	a30jul07a_2-2
Collection Date/Time:	07/19/07	7:55	Retchk:	a30jul07a-15
Receipt Date/Time:	07/21/07	10:35	Begin ConCal:	a30jul07a-15
Extraction Date:	07/29/07		End ConCal:	a30jul07a_2-11
Analysis Date/Time:	07/31/07	6:01	Initial Cal:	m8290-071007a

Form Version:[8290_DB_2.14]Report

Analyzed by: _____
Date: 8/8/07

Reviewed by: _____
Date: 8/9/07

Form I copy

TCDF Confirmation - Method 8290
F51154-23
Accutest

Analytical Data Summary Sheet

Analyte	Amount (pg/g)	EDL (pg/g)	EMPC (pg/g)	RT (min.)	Ratio	Qualifier
2,3,7,8-TCDF	1.71	0.274		20.84	0.79	

Labeled Standard	Spiked Amount (ng)	RT (min.)	Ratio	Qualifier
Extraction Standards				
$^{13}C_{12}$-2,3,7,8-TCDF	2.00	20.83	0.78	

Client Information			**Sample Information**		
Project Name:	F51154		Report Basis:	Dry	
			Matrix:	Soil	
Sample ID:	F51154-23		Weight / Volume:	11.02	g
			Solids / Lipids:	89.63	%
			Original pH :	NA	
Laboratory Information			Batch ID:	WG14383	
Project ID:	G383-583		Instrument:	hrms3	
Sample ID:	G383-583-16B		Filename:	c11aug07a-8	
Collection Date/Time:	07/19/07	7:55	Retchk:	c11aug07a-2	
Receipt Date:	07/21/07	10:35	Begin ConCal:	c11aug07a-1	
Extraction Date:	07/29/07		End ConCal:	c11aug07a-25	
Analysis Date/Time:	08/11/07	13:07	Initial Cal:	mcf-c041807a	

Analyzed by: JWP
Date: 081307

Reviewed by: [signature]
Date: 8/13/07

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SGS Environmental Services

Method 8290
F51154-24
Accutest

Analytical Data Summary Sheet

Analyte	Amount (pg/g)	EDL (pg/g)	EMPC (pg/g)	RT (min.)	Ratio		Qualifier
2,3,7,8-TCDD	0.318 J			31:40	0.69		A
1,2,3,7,8-PeCDD	1.91 J			34:25	1.64		A
1,2,3,4,7,8-HxCDD	4.29 J			37:07	1.41		A
1,2,3,6,7,8-HxCDD	13.6			37:12	1.27		
1,2,3,7,8,9-HxCDD	11.7			37:28	1.26		
1,2,3,4,6,7,8-HpCDD	549			40:40	1.04		
OCDD	6510 J			45:10	0.90		E
2,3,7,8-TCDF	1.44			31:07	0.88		
1,2,3,7,8-PeCDF	1.80 J			33:37	1.74		A
2,3,4,7,8-PeCDF	EMPC	~~0.537~~	0.189 J	34:19	1.17	*	A
1,2,3,4,7,8-HxCDF	5.21 J			36:24	1.24		A
1,2,3,6,7,8-HxCDF	3.66 J			36:30	1.30		A
2,3,4,6,7,8-HxCDF	4.48 J			37:00	1.23		A
1,2,3,7,8,9-HxCDF	0.833 J			37:49	1.09		A
1,2,3,4,6,7,8-HpCDF	101			39:22	1.05		
1,2,3,4,7,8,9-HpCDF	7.64			41:22	1.01		
OCDF	389			45:28	0.89		
Total TCDDs	~~18.3~~		18.6 J				
Total PeCDDs	10.3						
Total HxCDDs	~~76.9~~		77.8 J				
Total HpCDDs	871						
Total TCDFs	~~17.4~~		17.8 J				
Total PeCDFs	~~29.1~~		30.0 J				
Total HxCDFs	101						
Total HpCDFs	325						
WHO-2005 TEQ (ND=0)	15.4		15.5				
WHO-2005 TEQ (ND=½)	15.5		15.5				

Client Information			**Sample Information**		
Project Name:	F51154		Report Basis:	Dry	
			Matrix:	Soil	
Sample ID:	F51154-24		Weight / Volume:	10.22 g	
			Solids / Lipids:	91.2	%
			Original pH :	NA	
Laboratory Information			Batch ID:	WG14383	
Project ID:	G383-583		Instrument:	HRMS1	
Sample ID:	G383-583-17B		Filename:	a30jul07a_2-3	
Collection Date/Time:	07/19/07	8:10	Retchk:	a30jul07a-15	
Receipt Date/Time:	07/21/07	10:35	Begin ConCal:	a30jul07a-15	
Extraction Date:	07/29/07		End ConCal:	a30jul07a_2-11	
Analysis Date/Time:	07/31/07	6:50	Initial Cal:	m8290-071007a	

Form I Corp

SGS Environmental Services

Method 8290
F51154-24
Accutest

Labeled Standard	Expected Amount (ng)	Measured Amount (ng)	Percent Recovery (%)	RT (min.)	Ratio	Qualifier
Extraction Standards						
13C12-2,3,7,8-TCDD	2.0	1.53	76.4	31:40	0.77	
13C12-1,2,3,7,8-PeCDD	2.0	1.52	75.9	34:25	1.59	
13C12-1,2,3,6,7,8-HxCDD	2.0	1.61	80.3	37:12	1.25	
13C12-1,2,3,4,6,7,8-HpCDD	2.0	1.73	86.4	40:39	1.04	
13C12-OCDD	4.0	3.56	88.9	45:09	0.89	
13C12-2,3,7,8-TCDF	2.0	1.78	88.9	31:07	0.79	
13C12-1,2,3,7,8-PeCDF	2.0	1.45	72.3	33:37	1.58	
13C12-1,2,3,6,7,8-HxCDF	2.0	1.46	72.9	36:28	0.52	
13C12-1,2,3,4,6,7,8-HpCDF	2.0	1.56	78.2	39:21	0.45	
Cleanup Standards						
37Cl4-2,3,7,8-TCDD	0.4	0.355	88.8	31:40	-	
13C12-2,3,4,7,8-PeCDF	0.4	0.299	74.9	34:15	1.63	
13C12-1,2,3,4,7,8-HxCDD	0.4	0.300	74.9	37:06	1.27	
13C12-1,2,3,4,7,8-HxCDF	0.4	0.304	76.0	36:22	0.50	
13C12-1,2,3,4,7,8,9-HpCDF	0.4	0.288	72.0	41:21	0.43	
Injection Standards						
13C12-1,2,3,4-TCDD	2.0	-	-	31:15	0.79	
13C12-1,2,3,7,8,9-HxCDD	2.0	-	-	37:27	1.25	

Client Information			**Sample Information**	
Project Name:	F51154		Report Basis:	Dry
			Matrix:	Soil
Sample ID:	F51154-24		Weight / Volume:	10.22 g
			Solids / Lipids:	91.2 %
			Original pH :	NA
Laboratory Information			Batch ID:	WG14383
Project ID:	G383-583		Instrument:	HRMS1
Sample ID:	G383-583-17B		Filename:	a30jul07a_2-3
Collection Date/Time:	07/19/07	8:10	Retchk:	a30jul07a-15
Receipt Date/Time:	07/21/07	10:35	Begin ConCal:	a30jul07a-15
Extraction Date:	07/29/07		End ConCal:	a30jul07a_2-11
Analysis Date/Time:	07/31/07	6:50	Initial Cal:	m8290-071007a

Print Version:[8290_DB_2.14]Report

Analyzed by: _____
Date: 08/01/07

Reviewed by: _____
Date: 8/9/07

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TCDF Confirmation - Method 8290
F51154-24
Accutest

Analytical Data Summary Sheet

Analyte	Amount (pg/g)	EDL (pg/g)	EMPC (pg/g)	RT (min.)	Ratio	Qualifier
2,3,7,8-TCDF	1.95	0.585		20.83	0.77	

Labeled Standard	Spiked Amount (ng)	RT (min.)	Ratio	Qualifier
Extraction Standards				
$^{13}C_{12}$-2,3,7,8-TCDF	2.00	20.80	0.78	

Client Information			**Sample Information**		
Project Name:	F51154		Report Basis:	Dry	
			Matrix:	Soil	
Sample ID:	F51154-24		Weight / Volume:	10.22	g
			Solids / Lipids:	91.19	%
			Original pH :	NA	
Laboratory Information			Batch ID:	WG14383	
Project ID:	G383-583		Instrument:	hrms3	
Sample ID:	G383-583-17B		Filename:	c11aug07a-9	
Collection Date/Time:	07/19/07	8:10	Retchk:	c11aug07a-2	
Receipt Date:	07/21/07	10:35	Begin ConCal:	c11aug07a-1	
Extraction Date:	07/29/07		End ConCal:	c11aug07a-25	
Analysis Date/Time:	08/11/07	13:31	Initial Cal:	mcf-c041807a	

Analyzed by: JWP
Date: 08/13/07

Reviewed by: [signature]
Date: 8/13/07

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SGS Environmental Services

Method 8290
F51154-25
Accutest

Analytical Data Summary Sheet

Analyte	Amount (pg/g)	EDL (pg/g)	EMPC (pg/g)	RT (min.)	Ratio		Qualifier
2,3,7,8-TCDD	ND	0.198					
1,2,3,7,8-PeCDD	ND	0.553					
1,2,3,4,7,8-HxCDD	0.588 J			37:06	1.13		A
1,2,3,6,7,8-HxCDD	1.60 J			37:12	1.25		A
1,2,3,7,8,9-HxCDD	1.32 J			37:27	1.18		A
1,2,3,4,6,7,8-HpCDD	80.0			40:39	1.04		
OCDD	4540 J			45:09	0.90		E
2,3,7,8-TCDF	0.413 B			31:07	0.81		A
1,2,3,7,8-PeCDF	0.168 J			33:37	1.75		A
2,3,4,7,8-PeCDF	EMPC	~~0.553~~	0.252 B	34:15	1.19	*	A
1,2,3,4,7,8-HxCDF	0.791 J			36:22	1.30		A
1,2,3,6,7,8-HxCDF	0.343 J			36:28	1.20		A
2,3,4,6,7,8-HxCDF	0.422 J			36:58	1.34		A
1,2,3,7,8,9-HxCDF	ND	0.553					
1,2,3,4,6,7,8-HpCDF	10.4			39:21	1.02		
1,2,3,4,7,8,9-HpCDF	0.718 J			41:21	1.05		A
OCDF	30.2			45:27	0.90		
Total TCDDs	~~ND~~	~~0.198~~	1.20 J				
Total PeCDDs	1.13						
Total HxCDDs	~~10.8~~		11.1 J				
Total HpCDDs	147						
Total TCDFs	~~1.45~~		1.59 J				
Total PeCDFs	~~2.68~~		2.94 J				
Total HxCDFs	8.87						
Total HpCDFs	28.9						
WHO-2005 TEQ (ND=0)	2.83		2.91				
WHO-2005 TEQ (ND=½)	3.32		3.31				

Client Information			**Sample Information**		
Project Name:	F51154		Report Basis:	Dry	
			Matrix:	Soil	
Sample ID:	F51154-25		Weight / Volume:	10.40 g	
			Solids / Lipids:	87.0	%
			Original pH :	NA	
Laboratory Information			Batch ID:	WG14385	
Project ID:	G383-583		Instrument:	HRMS1	
Sample ID:	G383-583-18B		Filename:	a30jul07a_4-2	
Collection Date/Time:	07/19/07	8:25	Retchk:	a30jul07a_3-14	
Receipt Date/Time:	07/21/07	10:35	Begin ConCal:	a30jul07a_3-14	
Extraction Date:	07/30/07		End ConCal:	a30jul07a_4-12	
Analysis Date/Time:	08/01/07	2:21	Initial Cal:	m8290-071007a	

Form I Cdn

SGS Environmental Services

Method 8290
F51154-25
Accutest

Labeled Standard	Expected Amount (ng)	Measured Amount (ng)	Percent Recovery (%)	RT (min.)	Ratio	Qualifier
Extraction Standards						
13C12-2,3,7,8-TCDD	2.0	1.52	76.2	31:39	0.78	
13C12-1,2,3,7,8-PeCDD	2.0	1.54	77.2	34:25	1.59	
13C12-1,2,3,6,7,8-HxCDD	2.0	1.57	78.5	37:10	1.25	
13C12-1,2,3,4,6,7,8-HpCDD	2.0	1.67	83.7	40:37	1.06	
13C12-OCDD	4.0	3.36	84.0	45:07	0.90	
13C12-2,3,7,8-TCDF	2.0	1.78	89.0	31:06	0.79	
13C12-1,2,3,7,8-PeCDF	2.0	1.46	73.1	33:37	1.59	
13C12-1,2,3,6,7,8-HxCDF	2.0	1.44	71.8	36:28	0.52	
13C12-1,2,3,4,6,7,8-HpCDF	2.0	1.50	75.0	39:19	0.44	
Cleanup Standards						
37Cl4-2,3,7,8-TCDD	0.4	0.354	88.5	31:39	-	
13C12-2,3,4,7,8-PeCDF	0.4	0.303	75.7	34:13	1.62	
13C12-1,2,3,4,7,8-HxCDD	0.4	0.325	81.4	37:04	1.26	
13C12-1,2,3,4,7,8-HxCDF	0.4	0.318	79.5	36:22	0.51	
13C12-1,2,3,4,7,8,9-HpCDF	0.4	0.291	72.8	41:19	0.43	
Injection Standards						
13C12-1,2,3,4-TCDD	2.0	-	-	31:13	0.78	
13C12-1,2,3,7,8,9-HxCDD	2.0	-	-	37:25	1.25	

Client Information			**Sample Information**		
Project Name:	F51154		Report Basis:	Dry	
			Matrix:	Soil	
Sample ID:	F51154-25		Weight / Volume:	10.40 g	
			Solids / Lipids:	87.0	%
			Original pH :	NA	
Laboratory Information			Batch ID:	WG14385	
Project ID:	G383-583		Instrument:	HRMS1	
Sample ID:	G383-583-18B		Filename:	a30jul07a_4-2	
Collection Date/Time:	07/19/07	8:25	Retchk:	a30jul07a_3-14	
Receipt Date/Time:	07/21/07	10:35	Begin ConCal:	a30jul07a_3-14	
Extraction Date:	07/30/07		End ConCal:	a30jul07a_4-12	
Analysis Date/Time:	08/01/07	2:21	Initial Cal:	m8290-071007a	

Form Version:[8290_DB_2.14]Report

Analyzed by: _____
Date: 8/8/07

Reviewed by: _____
Date: 8/9/07

Form I COA

SGS Environmental Services

Method 8290
F51154-26
Accutest

Analytical Data Summary Sheet

Analyte	Amount (pg/g)	EDL (pg/g)	EMPC (pg/g)	RT (min.)	Ratio		Qualifier
2,3,7,8-TCDD	EMPC	~~0.161~~	0.333 J	31:40	0.57	*	A
1,2,3,7,8-PeCDD	2.89 J			34:25	1.49		A
1,2,3,4,7,8-HxCDD	9.00			37:06	1.25		
1,2,3,6,7,8-HxCDD	26.5			37:10	1.27		
1,2,3,7,8,9-HxCDD	21.0			37:27	1.27		
1,2,3,4,6,7,8-HpCDD	946			40:39	1.04		
OCDD	9640 J			45:09	0.89		E
2,3,7,8-TCDF	0.938 J			31:07	0.74		A
1,2,3,7,8-PeCDF	0.567 J			33:37	1.54		A
2,3,4,7,8-PeCDF	1.04 J			34:15	1.55		A
1,2,3,4,7,8-HxCDF	4.61 J			36:22	1.34		A
1,2,3,6,7,8-HxCDF	3.71 J			36:28	1.18		A
2,3,4,6,7,8-HxCDF	6.00			36:58	1.23		
1,2,3,7,8,9-HxCDF	0.839 J			37:48	1.20		A
1,2,3,4,6,7,8-HpCDF	138			39:21	1.05		
1,2,3,4,7,8,9-HpCDF	10.2			41:21	1.01		
OCDF	367			45:27	0.89		
Total TCDDs	~~3.56~~		4.08 J				
Total PeCDDs	~~13.0~~		13.2 J				
Total HxCDDs	137						
Total HpCDDs	1400						
Total TCDFs	~~7.08~~		8.68 J				
Total PeCDFs	~~24.9~~		25.3 J				
Total HxCDFs	138						
Total HpCDFs	418						
WHO-2005 TEQ (ND=0)	24.4		24.8				
WHO-2005 TEQ (ND=½)	24.5		24.8				

Client Information			**Sample Information**		
Project Name:	F51154		Report Basis:	Dry	
			Matrix:	Soil	
Sample ID:	F51154-26		Weight / Volume:	10.48 g	
			Solids / Lipids:	86.5	%
			Original pH :	NA	
Laboratory Information			Batch ID:	WG14385	
Project ID:	G383-583		Instrument:	HRMS1	
Sample ID:	G383-583-19B		Filename:	a30jul07a_4-3	
Collection Date/Time:	07/19/07	8:40	Retchk:	a30jul07a_3-14	
Receipt Date/Time:	07/21/07	10:35	Begin ConCal:	a30jul07a_3-14	
Extraction Date:	07/30/07		End ConCal:	a30jul07a_4-12	
Analysis Date/Time:	08/01/07	3:09	Initial Cal:	m8290-071007a	

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SGS Environmental Services

Method 8290
F51154-26
Accutest

Labeled Standard	Expected Amount (ng)	Measured Amount (ng)	Percent Recovery (%)	RT (min.)	Ratio	Qualifier
Extraction Standards						
13C12-2,3,7,8-TCDD	2.0	1.77	88.3	31:39	0.78	
13C12-1,2,3,7,8-PeCDD	2.0	1.77	88.5	34:25	1.59	
13C12-1,2,3,6,7,8-HxCDD	2.0	1.85	92.3	37:10	1.25	
13C12-1,2,3,4,6,7,8-HpCDD	2.0	2.02	101	40:37	1.05	
13C12-OCDD	4.0	4.23	106	45:07	0.89	
13C12-2,3,7,8-TCDF	2.0	1.99	99.5	31:06	0.78	
13C12-1,2,3,7,8-PeCDF	2.0	1.64	82.0	33:37	1.59	
13C12-1,2,3,6,7,8-HxCDF	2.0	1.66	83.2	36:28	0.52	
13C12-1,2,3,4,6,7,8-HpCDF	2.0	1.76	88.1	39:19	0.44	
Cleanup Standards						
37Cl4-2,3,7,8-TCDD	0.4	0.410	102	31:40	-	
13C12-2,3,4,7,8-PeCDF	0.4	0.351	87.7	34:13	1.58	
13C12-1,2,3,4,7,8-HxCDD	0.4	0.392	98.0	37:06	1.28	
13C12-1,2,3,4,7,8-HxCDF	0.4	0.357	89.3	36:22	0.51	
13C12-1,2,3,4,7,8,9-HpCDF	0.4	0.360	90.0	41:19	0.43	
Injection Standards						
13C12-1,2,3,4-TCDD	2.0	-	-	31:13	0.77	
13C12-1,2,3,7,8,9-HxCDD	2.0	-	-	37:25	1.25	

Client Information			**Sample Information**		
Project Name:	F51154		Report Basis:	Dry	
			Matrix:	Soil	
Sample ID:	F51154-26		Weight / Volume:	10.48 g	
			Solids / Lipids:	86.5	%
			Original pH :	NA	
Laboratory Information			Batch ID:	WG14385	
Project ID:	G383-583		Instrument:	HRMS1	
Sample ID:	G383-583-19B		Filename:	a30jul07a_4-3	
Collection Date/Time:	07/19/07	8:40	Retchk:	a30jul07a_3-14	
Receipt Date/Time:	07/21/07	10:35	Begin ConCal:	a30jul07a_3-14	
Extraction Date:	07/30/07		End ConCal:	a30jul07a_4-12	
Analysis Date/Time:	08/01/07	3:09	Initial Cal:	m8290-071007a	

Form Version:[8290_DB_2.14]Report

Analyzed by: _____
Date: 8/8/07

Reviewed by: _____
Date: 8/9/07

Form I Corr

SGS Environmental Services

Method 8290
F51154-27
Accutest

Analytical Data Summary Sheet

Analyte	Amount (pg/g)	EDL (pg/g)	EMPC (pg/g)	RT (min.)	Ratio		Qualifier
2,3,7,8-TCDD	EMPC	~~0.178~~	0.236 J	31:39	0.52	*	A
1,2,3,7,8-PeCDD	1.09 J			34:25	1.61		A
1,2,3,4,7,8-HxCDD	2.05 J			37:04	1.28		A
1,2,3,6,7,8-HxCDD	5.92			37:10	1.24		
1,2,3,7,8,9-HxCDD	5.30			37:27	1.20		
1,2,3,4,6,7,8-HpCDD	274			40:39	1.04		
OCDD	17400 J			45:09	0.89		E
2,3,7,8-TCDF	0.424 B			31:07	0.77		A
1,2,3,7,8-PeCDF	0.302 J			33:37	1.53		A
2,3,4,7,8-PeCDF	0.473 J			34:15	1.47		A
1,2,3,4,7,8-HxCDF	2.03 J			36:22	1.14		A
1,2,3,6,7,8-HxCDF	0.963 J			36:28	1.31		A
2,3,4,6,7,8-HxCDF	1.40 J			36:58	1.30		A
1,2,3,7,8,9-HxCDF	0.581 J			37:48	1.23		A
1,2,3,4,6,7,8-HpCDF	46.1			39:21	1.03		
1,2,3,4,7,8,9-HpCDF	2.02 J			41:21	1.03		A
OCDF	150			45:27	0.89		
Total TCDDs	~~1.60~~		1.84 J				
Total PeCDDs	~~4.35~~		5.00 J				
Total HxCDDs	41.5						
Total HpCDDs	490						
Total TCDFs	~~2.21~~		2.42 J				
Total PeCDFs	~~6.76~~		7.31 J				
Total HxCDFs	49.4						
Total HpCDFs	154						
WHO-2005 TEQ (ND=0)	11.6		11.8				
WHO-2005 TEQ (ND=½)	11.7		11.8				

Client Information			**Sample Information**		
Project Name:	F51154		Report Basis:	Dry	
			Matrix:	Soil	
Sample ID:	F51154-27		Weight / Volume:	10.67 g	
			Solids / Lipids:	90.7	%
			Original pH :	NA	
Laboratory Information			Batch ID:	WG14385	
Project ID:	G383-583		Instrument:	HRMS1	
Sample ID:	G383-583-20B		Filename:	a30jul07a_4-4	
Collection Date/Time:	07/19/07	9:40	Retchk:	a30jul07a_3-14	
Receipt Date/Time:	07/21/07	10:35	Begin ConCal:	a30jul07a_3-14	
Extraction Date:	07/30/07		End ConCal:	a30jul07a_4-12	
Analysis Date/Time:	08/01/07	3:58	Initial Cal:	m8290-071007a	

Form I Corp

SGS Environmental Services

Method 8290
F51154-27
Accutest

Labeled Standard	Expected Amount (ng)	Measured Amount (ng)	Percent Recovery (%)	RT (min.)	Ratio	Qualifier
Extraction Standards						
13C12-2,3,7,8-TCDD	2.0	1.59	79.6	31:39	0.78	
13C12-1,2,3,7,8-PeCDD	2.0	1.60	79.9	34:25	1.59	
13C12-1,2,3,6,7,8-HxCDD	2.0	1.68	83.8	37:10	1.25	
13C12-1,2,3,4,6,7,8-HpCDD	2.0	1.77	88.5	40:37	1.05	
13C12-OCDD	4.0	3.76	94.1	45:07	0.90	
13C12-2,3,7,8-TCDF	2.0	1.80	90.2	31:06	0.78	
13C12-1,2,3,7,8-PeCDF	2.0	1.51	75.5	33:37	1.57	
13C12-1,2,3,6,7.8-HxCDF	2.0	1.50	75.2	36:28	0.52	
13C12-1,2.3,4,6,7,8-HpCDF	2.0	1.56	78.1	39:19	0.44	
Cleanup Standards						
37Cl4-2,3,7,8-TCDD	0.4	0.371	92.6	31:39	-	
13C12-2,3,4,7,8-PeCDF	0.4	0.286	71.4	34:13	1.59	
13C12-1,2,3,4,7,8-HxCDD	0.4	0.316	78.9	37:04	1.27	
13C12-1,2,3,4,7,8-HxCDF	0.4	0.327	81.7	36:22	0.51	
13C12-1,2,3,4,7,8,9-HpCDF	0.4	0.313	78.3	41:19	0.43	
Injection Standards						
13C12-1,2,3,4-TCDD	2.0	-	-	31:13	0.78	
13C12-1,2,3,7,8,9-HxCDD	2.0	-	-	37:25	1.25	

Client Information			**Sample Information**	
Project Name:	F51154		Report Basis:	Dry
			Matrix:	Soil
Sample ID:	F51154-27		Weight / Volume:	10.67 g
			Solids / Lipids:	90.7 %
			Original pH :	NA
Laboratory Information			Batch ID:	WG14385
Project ID:	G383-583		Instrument:	HRMS1
Sample ID:	G383-583-20B		Filename:	a30jul07a_4-4
Collection Date/Time:	07/19/07	9:40	Retchk:	a30jul07a_3-14
Receipt Date/Time:	07/21/07	10:35	Begin ConCal:	a30jul07a_3-14
Extraction Date:	07/30/07		End ConCal:	a30jul07a_4-12
Analysis Date/Time:	08/01/07	3:58	Initial Cal:	m8290-071007a

Form Version:[8290_DB_2.14]Report

Analyzed by: DWO
Date: 08/9/07

Reviewed by: [signature]
Date: 8/9/07

Form I Cont

Method 8290
F51154-28
Accutest

Analytical Data Summary Sheet

Analyte	Amount (pg/g)	EDL (pg/g)	EMPC (pg/g)	RT (min.)	Ratio		Qualifier
2,3,7,8-TCDD	ND	0.210					
1,2,3,7,8-PeCDD	1.23 J			34:25	1.55		A
1,2,3,4,7,8-HxCDD	1.95 J			37:06	1.24		A
1,2,3,6,7,8-HxCDD	5.26			37:12	1.20		
1,2,3,7,8,9-HxCDD	5.44			37:27	1.24		
1,2,3,4,6,7,8-HpCDD	204			40:39	1.04		
OCDD	7200 J			45:07	0.89		E
2,3,7,8-TCDF	0.413 B			31:07	0.68		A
1,2,3,7,8-PeCDF	EMPC	~~0.496~~	0.254 J	33:37	1.95	*	A
2,3,4,7,8-PeCDF	0.437 J			34:15	1.55		A
1,2,3,4,7,8-HxCDF	2.11 J			36:22	1.27		A
1,2,3,6,7,8-HxCDF	0.840 J			36:28	1.24		A
2,3,4,6,7,8-HxCDF	1.11 J			36:58	1.12		A
1,2,3,7,8,9-HxCDF	0.391 J			37:48	1.21		A
1,2,3,4,6,7,8-HpCDF	33.2			39:21	1.04		
1,2,3,4,7,8,9-HpCDF	1.39 J			41:21	0.96		A
OCDF	79.3			45:25	0.89		
Total TCDDs	1.26						
Total PeCDDs	~~3.87~~		5.17 J				
Total HxCDDs	~~40.0~~		41.3 J				
Total HpCDDs	385						
Total TCDFs	~~2.02~~		2.52 J				
Total PeCDFs	~~5.87~~		6.13 J				
Total HxCDFs	36.2						
Total HpCDFs	~~93.3~~		93.8 J				
WHO-2005 TEQ (ND=0)	7.68		7.69				
WHO-2005 TEQ (ND=½)	7.79		7.79				

Client Information			**Sample Information**	
Project Name:	F51154		Report Basis:	Dry
			Matrix:	Soil
Sample ID:	F51154-28		Weight / Volume:	11.03 g
			Solids / Lipids:	91.4 %
			Original pH :	NA
Laboratory Information			Batch ID:	WG14385
Project ID:	G383-583		Instrument:	HRMS1
Sample ID:	G383-583-21B		Filename:	a30jul07a_4-5
Collection Date/Time:	07/19/07	9:25	Retchk:	a30jul07a_3-14
Receipt Date/Time:	07/21/07	10:35	Begin ConCal:	a30jul07a_3-14
Extraction Date:	07/30/07		End ConCal:	a30jul07a_4-12
Analysis Date/Time:	08/01/07	4:46	Initial Cal:	m8290-071007a

From I Corp

SGS Environmental Services

Method 8290
F51154-28
Accutest

Labeled Standard	Expected Amount (ng)	Measured Amount (ng)	Percent Recovery (%)	RT (min.)	Ratio	Qualifier
Extraction Standards						
13C12-2,3,7,8-TCDD	2.0	1.58	79.2	31:37	0.77	
13C12-1,2,3,7,8-PeCDD	2.0	1.64	81.8	34:25	1.58	
13C12-1,2,3,6,7,8-HxCDD	2.0	1.66	82.9	37:10	1.23	
13C12-1,2,3,4,6,7,8-HpCDD	2.0	1.77	88.4	40:37	1.05	
13C12-OCDD	4.0	3.73	93.3	45:07	0.90	
13C12-2,3,7,8-TCDF	2.0	1.82	91.2	31:06	0.79	
13C12-1,2,3,7,8-PeCDF	2.0	1.52	75.9	33:37	1.59	
13C12-1,2,3,6,7,8-HxCDF	2.0	1.52	76.0	36:28	0.52	
13C12-1,2,3,4,6,7,8-HpCDF	2.0	1.58	78.9	39:19	0.45	
Cleanup Standards						
37Cl4-2,3,7,8-TCDD	0.4	0.366	91.4	31:39	-	
13C12-2,3,4,7,8-PeCDF	0.4	0.283	70.6	34:13	1.60	
13C12-1,2,3,4,7,8-HxCDD	0.4	0.336	84.0	37:04	1.38	
13C12-1,2,3,4,7,8-HxCDF	0.4	0.321	80.3	36:22	0.50	
13C12-1,2,3,4,7,8,9-HpCDF	0.4	0.316	79.1	41:19	0.43	
Injection Standards						
13C12-1,2,3,4-TCDD	2.0	-	-	31:13	0.78	
13C12-1,2,3,7,8,9-HxCDD	2.0	-	-	37:25	1.25	

Client Information			**Sample Information**		
Project Name:	F51154		Report Basis:	Dry	
			Matrix:	Soil	
Sample ID:	F51154-28		Weight / Volume:	11.03 g	
			Solids / Lipids:	91.4	%
			Original pH :	NA	
Laboratory Information			Batch ID:	WG14385	
Project ID:	G383-583		Instrument:	HRMS1	
Sample ID:	G383-583-21B		Filename:	a30jul07a_4-5	
Collection Date/Time:	07/19/07	9:25	Retchk:	a30jul07a_3-14	
Receipt Date/Time:	07/21/07	10:35	Begin ConCal:	a30jul07a_3-14	
Extraction Date:	07/30/07		End ConCal:	a30jul07a_4-12	
Analysis Date/Time:	08/01/07	4:46	Initial Cal:	m8290-071007a	

Form Version:[8290_DB_2 14]Report

Analyzed by: JMP
Date: 080907

Reviewed by: BPA
Date: 8/8/07

Form I Corr

Method 8290
F51154-29
Accutest

Analytical Data Summary Sheet

Analyte	Amount (pg/g)	EDL (pg/g)	EMPC (pg/g)	RT (min.)	Ratio		Qualifier
2,3,7,8-TCDD	0.231 J			31:40	0.77		A
1,2,3,7,8-PeCDD	2.03 J			34:25	1.58		A
1,2,3,4,7,8-HxCDD	3.47 J			37:06	1.41		A
1,2,3,6,7,8-HxCDD	8.25			37:12	1.28		
1,2,3,7,8,9-HxCDD	9.49			37:27	1.25		
1,2,3,4,6,7,8-HpCDD	269			40:39	1.05		
OCDD	9970 J			45:07	0.90		E
2,3,7,8-TCDF	0.566 B			31:07	0.84		A
1,2,3,7,8-PeCDF	EMPC	~~0.560~~	0.275 J	33:37	1.26	*	A
2,3,4,7,8-PeCDF	0.537 J			34:15	1.52		A
1,2,3,4,7,8-HxCDF	2.10 J			36:22	1.20		A
1,2,3,6,7,8-HxCDF	1.38 J			36:28	1.17		A
2,3,4,6,7,8-HxCDF	1.95 J			36:58	1.27		A
1,2,3,7,8,9-HxCDF	ND	0.560					
1,2,3,4,6,7,8-HpCDF	49.2			39:21	1.04		
1,2,3,4,7,8,9-HpCDF	2.09 J			41:21	1.11		A
OCDF	136			45:25	0.89		
Total TCDDs	1.67						
Total PeCDDs	7.45						
Total HxCDDs	55.3						
Total HpCDDs	461						
Total TCDFs	~~3.62~~		3.91 J				
Total PeCDFs	~~8.05~~		8.48 J				
Total HxCDFs	~~48.3~~		48.5 J				
Total HpCDFs	143						
WHO-2005 TEQ (ND=0)	11.4		11.4				
WHO-2005 TEQ (ND=½)	11.4		11.4				

Client Information			**Sample Information**		
Project Name:	F51154		Report Basis:	Dry	
			Matrix:	Soil	
Sample ID:	F51154-29		Weight / Volume:	10.07 g	
			Solids / Lipids:	88.7	%
			Original pH :	NA	
Laboratory Information			Batch ID:	WG14385	
Project ID:	G383-583		Instrument:	HRMS1	
Sample ID:	G383-583-22B		Filename:	a30jul07a_4-6	
Collection Date/Time:	07/19/07	8:55	Retchk:	a30jul07a_3-14	
Receipt Date/Time:	07/21/07	10:35	Begin ConCal:	a30jul07a_3-14	
Extraction Date:	07/30/07		End ConCal:	a30jul07a_4-12	
Analysis Date/Time:	08/01/07	5:35	Initial Cal:	m8290-071007a	

Form I Cont

Method 8290
F51154-29
Accutest

Labeled Standard	Expected Amount (ng)	Measured Amount (ng)	Percent Recovery (%)	RT (min.)	Ratio	Qualifier
Extraction Standards						
13C12-2,3,7,8-TCDD	2.0	1.59	79.4	31:39	0.78	
13C12-1,2,3,7,8-PeCDD	2.0	1.56	78.1	34:25	1.58	
13C12-1,2,3,6,7,8-HxCDD	2.0	1.63	81.7	37:10	1.27	
13C12-1,2,3,4,6,7,8-HpCDD	2.0	1.76	88.1	40:37	1.06	
13C12-OCDD	4.0	3.68	92.1	45:07	0.89	
13C12-2,3,7,8-TCDF	2.0	1.80	89.9	31:06	0.79	
13C12-1,2,3,7,8-PeCDF	2.0	1.47	73.6	33:37	1.58	
13C12-1,2,3,6,7,8-HxCDF	2.0	1.49	74.7	36:28	0.52	
13C12-1,2,3,4,6,7,8-HpCDF	2.0	1.56	78.0	39:19	0.44	
Cleanup Standards						
37Cl4-2,3,7,8-TCDD	0.4	0.355	88.9	31:40	-	
13C12-2,3,4,7,8-PeCDF	0.4	0.271	67.8	34:13	1.59	
13C12-1,2,3,4,7,8-HxCDD	0.4	0.329	82.2	37:04	1.27	
13C12-1,2,3,4,7,8-HxCDF	0.4	0.326	81.5	36:22	0.51	
13C12-1,2,3,4,7,8,9-HpCDF	0.4	0.301	75.2	41:19	0.43	
Injection Standards						
13C12-1,2,3,4-TCDD	2.0	-	-	31:13	0.78	
13C12-1,2,3,7,8,9-HxCDD	2.0	-	-	37:27	1.24	

Client Information			**Sample Information**		
Project Name:	F51154		Report Basis:	Dry	
			Matrix:	Soil	
Sample ID:	F51154-29		Weight / Volume:	10.07 g	
			Solids / Lipids:	88.7	%
			Original pH :	NA	
Laboratory Information			Batch ID:	WG14385	
Project ID:	G383-583		Instrument:	HRMS1	
Sample ID:	G383-583-22B		Filename:	a30jul07a_4-6	
Collection Date/Time:	07/19/07	8:55	Retchk:	a30jul07a_3-14	
Receipt Date/Time:	07/21/07	10:35	Begin ConCal:	a30jul07a_3-14	
Extraction Date:	07/30/07		End ConCal:	a30jul07a_4-12	
Analysis Date/Time:	08/01/07	5:35	Initial Cal:	m8290-071007a	

Form Version:[8290_DB_2.14]Report

Analyzed by: _____
Date: 8/8/07

Reviewed by: _____
Date: 8/9/07

Form I copy

Method 8290
F51154-30
Accutest

Analytical Data Summary Sheet

Analyte	Amount (pg/g)	EDL (pg/g)	EMPC (pg/g)	RT (min.)	Ratio		Qualifier
2,3,7,8-TCDD	EMPC	~~0.184~~	0.248 J	31:42	0.55	*	A
1,2,3,7,8-PeCDD	0.934 J			34:25	1.61		A
1,2,3,4,7,8-HxCDD	1.66 J			37:07	1.13		A
1,2,3,6,7,8-HxCDD	3.73 J			37:13	1.25		A
1,2,3,7,8,9-HxCDD	4.39 J			37:28	1.19		A
1,2,3,4,6,7,8-HpCDD	122			40:40	1.05		
OCDD	1410			45:10	0.89		
2,3,7,8-TCDF	0.424 B			31:10	0.78		A
1,2,3,7,8-PeCDF	EMPC	~~0.484~~	0.286 J	33:39	1.79	*	A
2,3,4,7,8-PeCDF	EMPC	~~0.484~~	0.292 B	34:15	1.83	*	A
1,2,3,4,7,8-HxCDF	1.04 J			36:24	1.20		A
1,2,3,6,7,8-HxCDF	0.619 J			36:30	1.14		A
2,3,4,6,7,8-HxCDF	0.745 J			37:00	1.21		A
1,2,3,7,8,9-HxCDF	ND	0.484					
1,2,3,4,6,7,8-HpCDF	21.5			39:22	1.04		
1,2,3,4,7,8,9-HpCDF	0.830 J			41:22	1.09		A
OCDF	57.6			45:28	0.90		
Total TCDDs	~~3.35~~		3.60 J				
Total PeCDDs	~~5.10~~		5.46 J				
Total HxCDDs	30.9						
Total HpCDDs	222						
Total TCDFs	~~5.14 J~~		5.30 J				Q
Total PeCDFs	~~4.05~~		4.74 J				
Total HxCDFs	~~17.5~~		17.8 J				
Total HpCDFs	57.9						
WHO-2005 TEQ (ND=0)	4.08		4.42				
WHO-2005 TEQ (ND=½)	4.27		4.45				

Client Information			**Sample Information**		
Project Name:	F51154		Report Basis:	Dry	
			Matrix:	Soil	
Sample ID:	F51154-30		Weight / Volume:	11.03 g	
			Solids / Lipids:	93.8	%
			Original pH :	NA	
Laboratory Information			Batch ID:	WG14385	
Project ID:	G383-583		Instrument:	HRMS1	
Sample ID:	G383-583-23B		Filename:	a30jul07a_4-7	
Collection Date/Time:	07/19/07	9:10	Retchk:	a30jul07a_3-14	
Receipt Date/Time:	07/21/07	10:35	Begin ConCal:	a30jul07a_3-14	
Extraction Date:	07/30/07		End ConCal:	a30jul07a_4-12	
Analysis Date/Time:	08/01/07	6:23	Initial Cal:	m8290-071007a	

Form I com

SGS Environmental Services

Method 8290
F51154-30
Accutest

Labeled Standard	Expected Amount (ng)	Measured Amount (ng)	Percent Recovery (%)	RT (min.)	Ratio	Qualifier
Extraction Standards						
13C12-2,3,7,8-TCDD	2.0	1.59	79.6	31:40	0.78	
13C12-1,2,3,7,8-PeCDD	2.0	1.63	81.4	34:25	1.57	
13C12-1,2,3,6,7,8-HxCDD	2.0	1.74	86.8	37:12	1.27	
13C12-1,2,3,4,6,7,8-HpCDD	2.0	1.88	93.9	40:39	1.06	
13C12-OCDD	4.0	3.87	96.8	45:10	0.89	
13C12-2,3,7,8-TCDF	2.0	1.88	93.8	31:09	0.79	
13C12-1,2,3,7,8-PeCDF	2.0	1.50	75.1	33:39	1.58	
13C12-1,2,3,6,7,8-HxCDF	2.0	1.57	78.4	36:28	0.52	
13C12-1,2,3,4,6,7,8-HpCDF	2.0	1.67	83.4	39:21	0.45	
Cleanup Standards						
37Cl4-2,3,7,8-TCDD	0.4	0.375	93.7	31:42	-	
13C12-2,3,4,7,8-PeCDF	0.4	0.306	76.4	34:15	1.60	
13C12-1,2,3,4,7,8-HxCDD	0.4	0.343	85.8	37:07	1.27	
13C12-1,2,3,4,7,8-HxCDF	0.4	0.339	84.9	36:22	0.51	
13C12-1,2,3,4,7,8,9-HpCDF	0.4	0.337	84.4	41:21	0.43	
Injection Standards						
13C12-1,2,3,4-TCDD	2.0	-	-	31:16	0.78	
13C12-1,2,3,7,8,9-HxCDD	2.0	-	-	37:27	1.25	

Client Information			**Sample Information**		
Project Name:	F51154		Report Basis:	Dry	
			Matrix:	Soil	
Sample ID:	F51154-30		Weight / Volume:	11.03 g	
			Solids / Lipids:	93.8	%
			Original pH :	NA	
Laboratory Information			Batch ID:	WG14385	
Project ID:	G383-583		Instrument:	HRMS1	
Sample ID:	G383-583-23B		Filename:	a30jul07a_4-7	
Collection Date/Time:	07/19/07	9:10	Retchk:	a30jul07a_3-14	
Receipt Date/Time:	07/21/07	10:35	Begin ConCal:	a30jul07a_3-14	
Extraction Date:	07/30/07		End ConCal:	a30jul07a_4-12	
Analysis Date/Time:	08/01/07	6:23	Initial Cal:	m8290-071007a	

Form Version:[8290_DD_2.14]Report

Analyzed by: JWC
Date: 080107

Reviewed by: [illegible]
Date: 8/9/07

Form I Corr

SGS Environmental Services

Method 8290
F51154-31
Accutest

Analytical Data Summary Sheet

Analyte	Amount (pg/g)	EDL (pg/g)	EMPC (pg/g)	RT (min.)	Ratio		Qualifier
2,3,7,8-TCDD	ND	0.204					
1,2,3,7,8-PeCDD	0.341 J			34:25	1.56		A
1,2,3,4,7,8-HxCDD	0.657 J			37:07	1.21		A
1,2,3,6,7,8-HxCDD	1.56 J			37:13	1.23		A
1,2,3,7,8,9-HxCDD	1.49 J			37:27	1.37		A
1,2,3,4,6,7,8-HpCDD	54.1			40:40	1.04		
OCDD	1030			45:10	0.89		
2,3,7,8-TCDF	EMPC	~~0.184~~	0.442 B	31:09	0.89	*	A
1,2,3,7,8-PeCDF	0.196 J			33:39	1.47		A
2,3,4,7,8-PeCDF	EMPC	~~0.517~~	0.184 B	34:15	1.93	*	A
1,2,3,4,7,8-HxCDF	0.810 J			36:22	1.18		A
1,2,3,6,7,8-HxCDF	0.358 J			36:28	1.14		A
2,3,4,6,7,8-HxCDF	0.335 J			36:58	1.23		A
1,2,3,7,8,9-HxCDF	ND	0.517					
1,2,3,4,6,7,8-HpCDF	10.6			39:22	1.02		
1,2,3,4,7,8,9-HpCDF	0.451 J			41:21	1.05		A
OCDF	26.0			45:28	0.89		
Total TCDDs	13.3						
Total PeCDDs	~~1.93~~		2.20 J				
Total HxCDDs	11.8						
Total HpCDDs	99.1						
Total TCDFs	~~1.70~~		2.82 J				
Total PeCDFs	~~2.11~~		2.57 J				
Total HxCDFs	~~7.58~~		7.80 J				
Total HpCDFs	26.4						
WHO-2005 TEQ (ND=0)	1.84		1.94				
WHO-2005 TEQ (ND=½)	2.05		2.06				

Client Information			**Sample Information**	
Project Name:	F51154		Report Basis:	Dry
			Matrix:	Soil
Sample ID:	F51154-31		Weight / Volume:	10.26 g
			Solids / Lipids:	94.3 %
			Original pH :	NA
Laboratory Information			Batch ID:	WG14385
Project ID:	G383-583		Instrument:	HRMS1
Sample ID:	G383-583-24B		Filename:	a30jul07a_4-8
Collection Date/Time:	07/19/07	9:55	Retchk:	a30jul07a_3-14
Receipt Date/Time:	07/21/07	10:35	Begin ConCal:	a30jul07a_3-14
Extraction Date:	07/30/07		End ConCal:	a30jul07a_4-12
Analysis Date/Time:	08/01/07	7:11	Initial Cal:	m8290-071007a

Form I cont

Method 8290
F51154-31
Accutest

Labeled Standard	Expected Amount (ng)	Measured Amount (ng)	Percent Recovery (%)	RT (min.)	Ratio	Qualifier
Extraction Standards						
13C12-2,3,7,8-TCDD	2.0	1.63	81.7	31:40	0.77	
13C12-1,2,3,7,8-PeCDD	2.0	1.66	82.8	34:25	1.58	
13C12-1,2,3,6,7,8-HxCDD	2.0	1.68	84.1	37:12	1.26	
13C12-1,2,3,4,6,7,8-HpCDD	2.0	1.83	91.5	40:39	1.06	
13C12-OCDD	4.0	3.73	93.2	45:09	0.90	
13C12-2,3,7,8-TCDF	2.0	1.90	95.0	31:07	0.78	
13C12-1,2,3,7,8-PeCDF	2.0	1.54	77.2	33:37	1.59	
13C12-1,2,3,6,7,8-HxCDF	2.0	1.54	76.8	36:28	0.52	
13C12-1,2,3,4,6,7,8-HpCDF	2.0	1.63	81.7	39:21	0.44	
Cleanup Standards						
37Cl4-2,3,7,8-TCDD	0.4	0.404	101	31:40	-	
13C12-2,3,4,7,8-PeCDF	0.4	0.316	79.0	34:15	1.60	
13C12-1,2,3,4,7,8-HxCDD	0.4	0.377	94.3	37:06	1.26	
13C12-1,2,3,4,7,8-HxCDF	0.4	0.366	91.4	36:22	0.51	
13C12-1,2,3,4,7,8,9-HpCDF	0.4	0.351	87.8	41:21	0.44	
Injection Standards						
13C12-1,2,3,4-TCDD	2.0	-	-	31:15	0.78	
13C12-1,2,3,7,8,9-HxCDD	2.0	-	-	37:27	1.25	

Client Information			**Sample Information**	
Project Name:	F51154		Report Basis:	Dry
			Matrix:	Soil
Sample ID:	F51154-31		Weight / Volume:	10.26 g
			Solids / Lipids:	94.3 %
			Original pH :	NA
Laboratory Information			Batch ID:	WG14385
Project ID:	G383-583		Instrument:	HRMS1
Sample ID:	G383-583-24B		Filename:	a30jul07a_4-8
Collection Date/Time:	07/19/07	9:55	Retchk:	a30jul07a_3-14
Receipt Date/Time:	07/21/07	10:35	Begin ConCal:	a30jul07a_3-14
Extraction Date:	07/30/07		End ConCal:	a30jul07a_4-12
Analysis Date/Time:	08/01/07	7:11	Initial Cal:	m8290-071007a

Form Version:[8290_DB_2.14]Report

Analyzed by: _____
Date: 08-Aug-07

Reviewed by: _____
Date: 8/9/07

Form I Copy

SGS Environmental Services

Method 8290
F51154-32
Accutest

Analytical Data Summary Sheet

Analyte	Amount (pg/g)	EDL (pg/g)	EMPC (pg/g)	RT (min.)	Ratio		Qualifier
2,3,7,8-TCDD	EMPC	~~0.223~~	0.241 J	31:39	0.61	*	A
1,2,3,7,8-PeCDD	3.04 J			34:25	1.58		A
1,2,3,4,7,8-HxCDD	10.8			37:06	1.26		
1,2,3,6,7,8-HxCDD	27.8			37:10	1.30		
1,2,3,7,8,9-HxCDD	19.2			37:25	1.29		
1,2,3,4,6,7,8-HpCDD	950			40:39	1.04		
OCDD	10300 J			45:07	0.89		E
2,3,7,8-TCDF	0.917 J			31:06	0.87		A
1,2,3,7,8-PeCDF	0.593 J			33:37	1.35		A
2,3,4,7,8-PeCDF	0.996 J			34:13	1.71		A
1,2,3,4,7,8-HxCDF	6.93			36:22	1.21		
1,2,3,6,7,8-HxCDF	6.14			36:28	1.35		
2,3,4,6,7,8-HxCDF	5.34 J			36:58	1.30		A
1,2,3,7,8,9-HxCDF	0.635 J			37:46	1.19		A
1,2,3,4,6,7,8-HpCDF	132			39:21	1.05		
1,2,3,4,7,8,9-HpCDF	8.10			41:21	0.90		
OCDF	397			45:25	0.89		
Total TCDDs	~~5.50~~		6.23 J				
Total PeCDDs	15.9						
Total HxCDDs	~~130~~		134 J				
Total HpCDDs	1420						
Total TCDFs	~~7.80~~		10.4 J				
Total PeCDFs	~~21.6~~		22.0 J				
Total HxCDFs	129						
Total HpCDFs	420						
WHO-2005 TEQ (ND=0)	25.2		25.5				
WHO-2005 TEQ (ND=½)	25.4		25.5				

Client Information			**Sample Information**		
Project Name:	F51154		Report Basis:	Dry	
			Matrix:	Soil	
Sample ID:	F51154-32		Weight / Volume:	10.19 g	
			Solids / Lipids:	85.4	%
			Original pH :	NA	
Laboratory Information			Batch ID:	WG14389	
Project ID:	G383-583		Instrument:	HRMS1	
Sample ID:	G383-583-25B		Filename:	a30jul07a_6-5	
Collection Date/Time:	07/19/07	8:40	Retchk:	a30jul07a_4-12	
Receipt Date/Time:	07/21/07	10:35	Begin ConCal:	a30jul07a_4-12	
Extraction Date:	07/31/07		End ConCal:	a30jul07a_6-14	
Analysis Date/Time:	08/01/07	18:39	Initial Cal:	m8290-071007a	

Form I CDF

SGS Environmental Services

Method 8290
F51154-32
Accutest

Labeled Standard	Expected Amount (ng)	Measured Amount (ng)	Percent Recovery (%)	RT (min.)	Ratio	Qualifier
Extraction Standards						
13C12-2,3,7,8-TCDD	2.0	1.54	76.8	31:39	0.78	
13C12-1,2,3,7,8-PeCDD	2.0	1.48	74.0	34:25	1.60	
13C12-1,2,3,6,7,8-HxCDD	2.0	1.64	81.9	37:10	1.26	
13C12-1,2,3,4,6,7,8-HpCDD	2.0	1.78	89.1	40:37	1.06	
13C12-OCDD	4.0	3.83	95.8	45:07	0.89	
13C12-2,3,7,8-TCDF	2.0	1.73	86.6	31:06	0.78	
13C12-1,2,3,7,8-PeCDF	2.0	1.40	70.0	33:37	1.61	
13C12-1,2,3,6,7,8-HxCDF	2.0	1.51	75.3	36:28	0.52	
13C12-1,2,3,4,6,7,8-HpCDF	2.0	1.58	79.2	39:19	0.43	
Cleanup Standards						
37Cl4-2,3,7,8-TCDD	0.4	0.362	90.4	31:39	-	
13C12-2,3,4,7,8-PeCDF	0.4	0.267	66.7	34:13	1.64	
13C12-1,2,3,4,7,8-HxCDD	0.4	0.317	79.3	37:04	1.28	
13C12-1,2,3,4,7,8-HxCDF	0.4	0.324	81.1	36:22	0.50	
13C12-1,2,3,4,7,8,9-HpCDF	0.4	0.293	73.3	41:19	0.41	
Injection Standards						
13C12-1,2,3,4-TCDD	2.0	-	-	31:13	0.79	
13C12-1,2,3,7,8,9-HxCDD	2.0	-	-	37:25	1.26	

Client Information			**Sample Information**	
Project Name:	F51154		Report Basis:	Dry
			Matrix:	Soil
Sample ID:	F51154-32		Weight / Volume:	10.19 g
			Solids / Lipids:	85.4 %
			Original pH :	NA
Laboratory Information			Batch ID:	WG14389
Project ID:	G383-583		Instrument:	HRMS1
Sample ID:	G383-583-25B		Filename:	a30jul07a_6-5
Collection Date/Time:	07/19/07	8:40	Retchk:	a30jul07a_4-12
Receipt Date/Time:	07/21/07	10:35	Begin ConCal:	a30jul07a_4-12
Extraction Date:	07/31/07		End ConCal:	a30jul07a_6-14
Analysis Date/Time:	08/01/07	18:39	Initial Cal:	m8290-071007a

Form Version:[8290_DB_2.14]Report

Analyzed by: JWP
Date: 08/07/07

Reviewed by: DLL
Date: 8/9/07

For I copy

SGS Environmental Services

Method 8290
F51154-12 RB071807
Accutest

Analytical Data Summary Sheet

Analyte	Amount (ng/L)	EDL (ng/L)	EMPC (ng/L)	RT (min.)	Ratio	Qualifier
2,3,7,8-TCDD	ND	0.00179				
1,2,3,7,8-PeCDD	ND	0.00551				
1,2,3,4,7,8-HxCDD	ND	0.00551				
1,2,3,6,7,8-HxCDD	ND	0.00551				
1,2,3,7,8,9-HxCDD	ND	0.00551				
1,2,3,4,6,7,8-HpCDD	ND	0.00551				
OCDD	ND	0.0110				
2,3,7,8-TCDF	ND	0.00126				
1,2,3,7,8-PeCDF	ND	0.00551				
2,3,4,7,8-PeCDF	ND	0.00551				
1,2,3,4,7,8-HxCDF	ND	0.00551				
1,2,3,6,7,8-HxCDF	ND	0.00551				
2,3,4,6,7,8-HxCDF	ND	0.00551				
1,2,3,7,8,9-HxCDF	ND	0.00551				
1,2,3,4,6,7,8-HpCDF	ND	0.00551				
1,2,3,4,7,8,9-HpCDF	ND	0.00551				
OCDF	ND	0.0110				
Total TCDDs	ND	0.00179				
Total PeCDDs	ND	0.00551				
Total HxCDDs	ND	0.00551				
Total HpCDDs	ND	0.00551				
Total TCDFs	ND	0.00126				
Total PeCDFs	ND	0.00551				
Total HxCDFs	ND	0.00551				
Total HpCDFs	ND	0.00551				
WHO-2005 TEQ (ND=0)	ND		ND			
WHO-2005 TEQ (ND=½)	0.00664		0.00664			

Client Information			**Sample Information**		
Project Name:	F51154		Report Basis:	Wet	
			Matrix:	Water	
Sample ID:	F51154-12		Weight / Volume:	907 mL	
			Solids / Lipids:	NA	%
			Original pH :	7	
Laboratory Information			Batch ID:	WG14381	
Project ID:	G383-583		Instrument:	HRMS1	
Sample ID:	G383-583-7C		Filename:	a27jul07a_3-11	
Collection Date/Time:	07/18/07	13:15	Retchk:	a27jul07a_2-14	
Receipt Date/Time:	07/21/07	10:35	Begin ConCal:	a27jul07a_2-14	
Extraction Date:	07/26/07		End ConCal:	a27jul07a_3-12	
Analysis Date/Time:	07/28/07	22:40	Initial Cal:	m8290-071007a	

Form I Corr

Method 8290
F51154-12
Accutest

Labeled Standard	Expected Amount (ng)	Measured Amount (ng)	Percent Recovery (%)	RT (min.)	Ratio	Qualifier
Extraction Standards						
13C12-2,3,7,8-TCDD	2.0	1.59	79.7	31:39	0.79	
13C12-1,2,3,7,8-PeCDD	2.0	1.58	79.0	34:25	1.58	
13C12-1,2,3,6,7,8-HxCDD	2.0	1.66	83.2	37:10	1.26	
13C12-1,2,3,4,6,7,8-HpCDD	2.0	1.81	90.3	40:39	1.06	
13C12-OCDD	4.0	3.96	99.0	45:09	0.89	
13C12-2,3,7,8-TCDF	2.0	1.81	90.4	31:07	0.79	
13C12-1,2,3,7,8-PeCDF	2.0	1.56	77.9	33:37	1.58	
13C12-1,2,3,6,7,8-HxCDF	2.0	1.63	81.6	36:28	0.52	
13C12-1,2,3,4,6,7,8-HpCDF	2.0	1.75	87.3	39:21	0.45	
Cleanup Standards						
37Cl4-2,3,7,8-TCDD	0.4	0.382	95.5	31:40	-	
13C12-2,3,4,7,8-PeCDF	0.4	0.341	85.3	34:13	1.62	
13C12-1,2,3,4,7,8-HxCDD	0.4	0.369	92.3	37:06	1.28	
13C12-1,2,3,4,7,8-HxCDF	0.4	0.367	91.9	36:22	0.54	
13C12-1,2,3,4,7,8,9-HpCDF	0.4	0.362	90.5	41:19	0.42	
Injection Standards						
13C12-1,2,3,4-TCDD	2.0	-	-	31:13	0.79	
13C12-1,2,3,7,8,9-HxCDD	2.0	-	-	37:27	1.26	

Client Information			**Sample Information**	
Project Name:	F51154		Report Basis:	Wet
			Matrix:	Water
Sample ID:	F51154-12		Weight / Volume:	907 mL
			Solids / Lipids:	NA %
			Original pH :	7
Laboratory Information			Batch ID:	WG14381
Project ID:	G383-583		Instrument:	HRMS1
Sample ID:	G383-583-7C		Filename:	a27jul07a_3-11
Collection Date/Time:	07/18/07	13:15	Retchk:	a27jul07a_2-14
Receipt Date/Time:	07/21/07	10:35	Begin ConCal:	a27jul07a_2-14
Extraction Date:	07/26/07		End ConCal:	a27jul07a_3-12
Analysis Date/Time:	07/28/07	22:40	Initial Cal:	m8290-071007a

Report Version:[8290_DB_2.14]Report

Analyzed by: _____
Date: 08/08/07

Reviewed by: _____
Date: 8/9/07

Shaw Environmental, Inc.
2113 Emmorton Park Road
Edgewood, Maryland
410-612-6350
FAX: 410-612-6351

Shaw® Shaw Environmental, Inc.

MEMORANDUM

TO: Jeff Parks, Shaw E&I Radford Army Ammunition Plant (RFAAP) Project Manager

FROM: Eric Malarek, Shaw E&I Project Chemist

SUBJECT: RFAAP Data Validation – Explosives, PETN, & Nitroglycerin
Accutest Laboratories, Inc., SDG F51154

DATE: September 25, 2007

The purpose of this memorandum is to present the data validation report for the samples collected at collected at Main Manufacturing Area at RFAAP for a RFI/CMS Nine Sites on July 18, 2007 and July 19, 2007. Aqueous samples were analyzed for explosives, nitroglycerin, and PETN using USEPA SW-846 3535A/8330A. Solid samples were analyzed for explosives, nitroglycerin, and PETN using USEPA SW-846 8330B/8330A. A total of five aqueous samples and seventeen solid samples were validated. The sample Ids are:

Field Sample ID	Lab Sample ID	Field Sample ID	Lab Sample ID
41SW08	F51154-6	41SD11	F51154-22
41SW09	F51154-7	49SS02	F51154-23
41SW10	F51154-8	49SS03	F51154-24
41SD08	F51154-9	49SS04	F51154-25
41SD09	F51154-10	49SS05	F51154-26
41SD10	F51154-11	59SS06	F51154-27
LFSD01	F51154-15	59SS07	F51154-28
TMSD01	F51154-16	59SS08	F51154-29
LFSW01	F51154-17	59SS09	F51154-30
APSD01	F51154-18	59SS10	F51154-31
TMSW01	F51154-20	TMSS05	F51154-32

Data were reviewed by Eric Malarek and validated using a combination of project QAPP, *Quality Systems Manual for Environmental Laboratories, Final Version 3, January, 2006* (DoD, 2006) (DoD QSM), method-specific criteria, and laboratory SOP criteria. The data qualifier scheme was consistent with the *Region III Modifications to the National Functional Guidelines for Organic Data Review* (September 1994). Parameters evaluated are presented in **Table 1**. Data associated with parameters in compliance with quality control specifications have not been qualified. Data associated with parameters that did not comply with quality control specifications and directly impacted project data have been qualified in accordance with USEPA Region III specifications.

Table 1 Laboratory Performance Criteria

Qualified		Parameter
Yes	No	
	X	Holding Times and Preservation
	X	Blank Analysis
	X	Initial Calibration
	X	Continuing Calibration
	X	System Monitoring Compounds
	X	Laboratory Control Sample
	X	Matrix Spike/Spike Duplicate
	X	Field Duplicate
	X	Quantitation Verification

The quality of data collected in support of this sampling activity is considered acceptable.

Eric Malarek

Eric Malarek, Chemist

9/25/07

Date

RFAAP VALIDATION REPORT
EXPLOSIVES REVIEW
SDG F51154

I-Holding Times and Preservation

The objective is to ascertain the validity of results based on the holding time of the sample from time of collection to time of sample extraction and analysis. Holding time criteria: For aqueous samples, explosive compounds are shipped cooled (@4°C ± 2°C) with a maximum holding time of 7 days from sample collection to preparative extraction and 40 days from preparative extraction to determinative analysis. For solid samples, explosive compounds are shipped cooled (@4°C ± 2°C) with a maximum holding time of 14 days from sample collection to preparative extraction and 40 days from preparative extraction to determinative analysis.

- Temperature Review: The temperature blank was sent with each cooler and recorded by the laboratory upon receipt. For samples collected on 07/18/07 and 07/19/07, the coolers were received by the primary laboratory (Accutest) on 07/20/07 at 4.0°C, 4.0°C, 4.6°C, 4.6°C, 4.8°C, 5.0°C, 5.0°C, and 5.8°C. The herbicides were subcontracted to Accutest TX and were received the samples at 4.2°C, 4.0°C, and 3.6°C. The perchlorate subcontract laboratory (Datachem Laboratories, Inc.) received the aqueous samples at 3.0°C. The dioxin subcontract laboratory (SGS Paradigm Analytical Laboratories, Inc.) received the samples at 5.5°C and 5.2°C. All criteria were met. No qualifiers were applied.

- Holding Time Review: The aqueous and solid samples were collected on 07/18/07 and 07/19/07. For the aqueous samples collected 07/18/07 and 07/19/07, the explosives were extracted on 07/25/07 and analyzed on 07/27/07. For the solid samples collected 07/18/07 and 07/19/07, the explosives were extracted on 08/01/07 and analyzed on 08/03/07. All criteria were met. No qualifiers were applied.

II-Blank Analysis

The purpose of laboratory or field blank analyses is to determine the existence and magnitude of contamination problems resulting from laboratory or field activities. One method blank per analytical batch must be run on each instrument used to analyze samples. No contaminants should be present in the blanks. The DoD QSM criterion specifies all concentrations should be less than one-half MRL. Positive sample results are reported and qualified "B", if the concentration of the compound in the sample is ≤5 times (5x) the maximum amount for explosive target compounds. **Table 2** summarizes the blank contamination analysis. Action levels are based upon dilution factor of one and for solid matrices were converted to soil values (soil conversion factor = 10) if needed. Rinse blank RB083007 (F52208-1) (low-flow pump) applies to the groundwater "GW" samples in this SDG. The surface water "SW" samples were collected directly into the laboratory bottles; therefore, no rinse blank applies for the SW samples. Rinse blanks 072407R (F51275-1) and 072507R (F51300-31) apply to the surface soil "SS" and subsurface soil "SB" samples in this SDG. Rinse blank RB071807 (F51154-12) applies to the sediment "SD" samples in this SDG.

Table 2 Blank Contamination Analysis Summary

Analysis Date	QC Blank ID	Compound	Max Conc. µg/L	Action Level µg/L	B qualified samples
07/27/07	OP21593-MB	All target explosives <½MRL	NA	NA	None
07/27/07	OP21593-MB	All target explosives <½MRL	NA	NA	None
07/27/07	OP21593-MB	PETN & NG <½MRL	NA	NA	None
07/27/07	OP21593-MB	PETN & NG <½MRL	NA	NA	None
09/11/07	RB083007	All target explosives <½MRL	NA	NA	None
09/07/07	RB083007	PETN & NG <½MRL	NA	NA	None
Analysis Date	**QC Blank ID**	**Compound**	**Max Conc. µg/kg**	**Action Level µg/kg**	**B qualified samples**
08/03/07	OP21693-MB	All target explosives <½MRL	NA	NA	None
08/03/07	OP21693-MB	PETN & NG <½MRL	NA	NA	None
07/27/07	RB071807	All target explosives <½MRL	NA	NA	None
07/27/07	RB071807	PETN & NG <½MRL	NA	NA	None
08/01/07	072407R	All target explosives <½MRL	NA	NA	None
08/01/07	072407R	PETN & NG <½MRL	NA	NA	None
08/01/07	072507R	All target explosives <½MRL	NA	NA	None
08/01/07	072507R	PETN & NG <½MRL	NA	NA	None

MRL = Method Reporting Limit
NA = Not Applicable

III-Initial Calibration

Compliance requirements for satisfactory instrument calibration are established to ensure that the instrument is capable of producing acceptable qualitative and quantitative data for the target compounds. The initial 5-point calibration demonstrates that the instrument is capable of acceptable performance in the beginning of the analytical run. The DoD QSM specifies that the correlation coefficient must be ≥0.995 and/or the percent relative standard deviation (%RSD) must be ≤20%. All detects were qualified as estimated "J" for where there were exceeding %RSDs, and all non-detects were qualified as estimated "UJ" for where there were grossly exceeding recoveries. Grossly exceeding is defined as twice the established criteria limits.

- For the explosives initial calibration performed on 10/18/06 on instrument G1315B, all criteria were met for target explosives compounds. All compounds were determined using calibration factors with RSDs ≤20%. No qualifiers were applied. Samples 41SW08 (F51154-6), 41SW09 (F51154-7), 41SW10 (F51154-8), LFSW01 (F51154-17), and TMSW01 (F51154-20) apply to this initial calibration.

- For the explosives initial calibration performed on 10/20/06 on instrument G1315B, all criteria were met for target explosives compounds. All compounds were determined using calibration factors with RSDs ≤20%. No qualifiers were applied. Samples 41SD08 (F51154-9), 41SD09 (F51154-10), 41SD10 (F51154-11), LFSD01 (F51154-15), TMSD01 (F51154-16), APSD01 (F51154-18), 41SD11 (F51154-22), 49SS02 (F51154-23), 49SS03 (F51154-24), 49SS04 (F51154-25), 49SS05 (F51154-26), 59SS06 (F51154-27), 59SS07 (F51154-28), 59SS08 (F51154-29), 59SS09 (F51154-30), 59SS10 (F51154-31), and TMSS05 (F51154-32) apply to this initial calibration.

- For the PETN and nitroglycerine initial calibration performed on 03/15/07 on instrument G1315B, all criteria were met for target compounds. All compounds were determined using calibration factors with RSDs ≤20%. No qualifiers were applied. Samples 41SW08 (F51154-6), 41SW09 (F51154-7), 41SW10 (F51154-8), LFSW01 (F51154-17), TMSW01 (F51154-20), 41SD08 (F51154-9), 41SD09 (F51154-10), 41SD10 (F51154-11), LFSD01 (F51154-15), TMSD01 (F51154-16), APSD01 (F51154-18), 41SD11 (F51154-22), 49SS02 (F51154-23), 49SS03 (F51154-24), 49SS04 (F51154-25), 49SS05 (F51154-26), 59SS06 (F51154-27), 59SS07 (F51154-28), 59SS08 (F51154-29), 59SS09 (F51154-30), 59SS10 (F51154-31), and TMSS05 (F51154-32) apply to this initial calibration.

IV-Continuing Calibration

Compliance requirements for satisfactory instrument calibration are established to ensure that the instrument is capable of producing acceptable qualitative and quantitative data for the target compounds. Continuing calibration standards are analyzed after every 10 injections, and at the end of the analysis sequence. The DoD QSM specifies that the percent difference (%D) from initial calibration should be no greater than ±20%. All detects were qualified as estimated "J" for where there were exceeding %Ds, and all non-detects were qualified as estimated "UJ" for where there were grossly exceeding recoveries. Grossly exceeding is defined as twice the established criteria limits.

- For explosives initial calibration verification performed on 10/18/06 @17:39 on instrument G1315B, all criteria were met for target compounds. No qualifiers were applied. No samples reported apply to this initial verification calibration.

- For explosives initial calibration verification performed on 10/19/06 @13:44 on instrument G1315B, all criteria were met for target compounds. No qualifiers were applied. No samples reported apply to this initial verification calibration.

- For explosives initial calibration verification performed on 10/20/06 @14:03 on instrument G1315B, nitrobenzene (20.5%) was outside criteria. All samples were non-detect for this compound. No qualifiers were applied. No samples reported apply to this initial verification calibration.

- For explosives initial calibration verification performed on 10/20/06 @15:10 on instrument G1315B, all criteria were met for target compounds. No qualifiers were applied. No samples reported apply to this initial verification calibration.

- For explosives continuing calibration performed on 07/27/07 @10:31 on instrument G1315B, all criteria were met for target compounds. No qualifiers were applied. Samples 41SW08 (F51154-6) and 41SW09 (F51154-7) apply to this continuing calibration.

- For explosives continuing calibration performed on 07/27/07 @14:11 on instrument G1315B, all criteria were met for target compounds. No qualifiers were applied. Samples 41SW10 (F51154-8), LFSW01 (F51154-17), and TMSW01 (F51154-20) apply to this continuing calibration.

- For explosives continuing calibration performed on 07/27/07 @16:57 on instrument G1315B, all criteria were met for target compounds. No qualifiers were applied. No samples reported apply to this continuing calibration.

- For explosives continuing calibration performed on 07/27/07 @18:36 on instrument G1315B, all criteria were met for target compounds. No qualifiers were applied. Samples 41SW08 (F51154-6), 41SW09 (F51154-7), and 41SW10 (F51154-8) apply to this continuing calibration.

- For explosives continuing calibration performed on 07/27/07 @20:33 on instrument G1315B, all criteria were met for target compounds. No qualifiers were applied. Samples apply to this continuing calibration.

- For explosives continuing calibration performed on 08/02/07 @22:39 on instrument G1315B, all criteria were met for target compounds. No qualifiers were applied. Samples 41SD08 (F51154-9), 41SD09 (F51154-10), 41SD10 (F51154-11), LFSD01 (F51154-15), TMSD01 (F51154-16), and APSD01 (F51154-18) apply to this continuing calibration.

- For explosives continuing calibration performed on 08/03/07 @04:11 on instrument G1315B, all criteria were met for target compounds. No qualifiers were applied. Samples 41SD11 (F51154-22), 49SS02 (F51154-23), 49SS03 (F51154-24), 49SS04 (F51154-25), 49SS05 (F51154-26), 59SS06 (F51154-27), 59SS07 (F51154-28), 59SS08 (F51154-29), 59SS09 (F51154-30), and 59SS10 (F51154-31) apply to this continuing calibration.

- For explosives continuing calibration performed on 08/03/07 @09:41 on instrument G1315B, all criteria were met for target compounds. No qualifiers were applied. Sample TMSS05 (F51154-32) applies to this continuing calibration.

- For explosives continuing calibration performed on 08/03/07 @15:37 on instrument G1315B, all criteria were met for target compounds. No qualifiers were applied. No samples reported apply to this continuing calibration.

- For PETN and nitroglycerin initial calibration verification performed on 03/15/07 @12:35 on instrument G1315B, all criteria were met for target compounds. No qualifiers were applied. No samples reported apply to this continuing calibration.

- For PETN and nitroglycerin continuing calibration performed on 07/27/07 @13:19 on instrument G1315B, all criteria were met for target compounds. No qualifiers were applied. Samples 41SW08 (F51154-6), 41SW09 (F51154-7), 41SW10 (F51154-8), LFSW01 (F51154-17), and TMSW01 (F51154-20) apply to this continuing calibration.

- For PETN and nitroglycerin continuing calibration performed on 07/27/07 @15:29 on instrument G1315B, all criteria were met for target compounds. No qualifiers were applied. No samples reported apply to this continuing calibration.

- For PETN and nitroglycerin continuing calibration performed on 08/03/07 @09:24 on instrument G1315B, all criteria were met for target compounds. No qualifiers were applied. Samples 41SD08 (F51154-9), 41SD09 (F51154-10), 41SD10 (F51154-11), LFSD01 (F51154-15), TMSD01 (F51154-16), and APSD01 (F51154-18) apply to this continuing calibration.

- For PETN and nitroglycerin continuing calibration performed on 08/03/07 @10:59 on instrument G1315B, all criteria were met for target compounds. No qualifiers were applied. Samples 41SD11 (F51154-22), 49SS02 (F51154-23), 49SS03 (F51154-24), 49SS04 (F51154-25), 49SS05 (F51154-26), 59SS06 (F51154-27), 59SS07 (F51154-28), 59SS08 (F51154-29), 59SS09 (F51154-30), and 59SS10 (F51154-31) apply to this continuing calibration.

- For PETN and nitroglycerin continuing calibration performed on 08/03/07 @12:41 on instrument G1315B, all criteria were met for target compounds. No qualifiers were applied. Sample TMSS05 (F51154-32) applies to this continuing calibration.

- For PETN and nitroglycerin continuing calibration performed on 08/03/07 @13:33 on instrument G1315B, all criteria were met for target compounds. No qualifiers were applied. No samples reported apply to this continuing calibration.

V-System Monitoring Compound (Surrogates)
Laboratory performance on individual samples is established by means of spiking activities. The percent recovery (%R) for all samples and blanks must be within the laboratory control limits. DoD surrogate recovery limits are specified in Table D-3 of the DoD QSM (DoD, 2006). If the surrogate is not listed, then the laboratory criteria shall be used.

Aqueous Criteria: 3,4-dinitrotoluene (70-136%)
Solid Criteria: 3,4-dinitrotoluene (72-145%)

- All criteria were met for explosives, PETN, and nitroglycerin. No qualifiers were applied.

VI-Laboratory Control Sample
Laboratory control samples (LCS) are used to monitor long-term accuracy of the analytical method. The analysis is performed at a frequency of 1 per analytical batch. The percent recoveries (%Rs) must be within the laboratory control limits. DoD QSM aqueous LCS recovery limits are specified in Table D-12 of the DoD QSM (DoD, 2006). DoD QSM solid LCS recovery limits are specified in Table D-2 and Table D-13 of the DoD QSM (DoD, 2006). If the compound is not listed, then the laboratory criteria shall be used.

- Sample OP21593-BS was used as aqueous LCS for explosives analyzed on 07/27/07. All criteria were met. No qualifiers were applied. Samples 41SW08 (F51154-6), 41SW09 (F51154-7), 41SW10 (F51154-8), LFSW01 (F51154-17), and TMSW01 (F51154-20) apply to this LCS.

- Sample OP21593-BS was used as aqueous LCS for explosives analyzed on 07/27/07. HMX (136%) was outside DoD QSM criteria and within laboratory criteria. All samples were non-detect HMX; therefore, no qualifiers were applied based upon this outlier. Samples 41SW08 (F51154-6), 41SW09 (F51154-7), 41SW10 (F51154-8), LFSW01 (F51154-17), and TMSW01 (F51154-20) apply to this LCS.

- Sample OP21693-BS was used as solid LCS for explosives analyzed on 08/02/07. All criteria were met. No qualifiers were applied. Samples 41SD08 (F51154-9), 41SD09 (F51154-10), 41SD10 (F51154-11), LFSD01 (F51154-15), TMSD01 (F51154-16), APSD01 (F51154-18), 41SD11 (F51154-22), 49SS02 (F51154-23), 49SS03 (F51154-24), 49SS04 (F51154-25), 49SS05 (F51154-26), 59SS06 (F51154-27), 59SS07 (F51154-28), 59SS08 (F51154-29), 59SS09 (F51154-30), 59SS10 (F51154-31), and TMSS05 (F51154-32) apply to this LCS.

- Sample OP21593-BS2 was used as aqueous LCS for PETN and nitroglycerin analyzed on 07/27/07. All criteria were met. No qualifiers were applied. Samples 41SW08 (F51154-6), 41SW09 (F51154-7), 41SW10 (F51154-8), LFSW01 (F51154-17), and TMSW01 (F51154-20) apply to this LCS.

- Sample OP21693-BS2 was used as solid LCS for PETN and nitroglycerin analyzed on 08/03/07. All criteria were met. No qualifiers were applied. Samples 41SD08 (F51154-9), 41SD09 (F51154-10), 41SD10 (F51154-11), LFSD01 (F51154-15), TMSD01 (F51154-16), APSD01 (F51154-18), 41SD11 (F51154-22), 49SS02 (F51154-23), 49SS03 (F51154-24), 49SS04 (F51154-25), 49SS05 (F51154-26), 59SS06 (F51154-27), 59SS07 (F51154-28), 59SS08 (F51154-29), 59SS09 (F51154-30), 59SS10 (F51154-31), and TMSS05 (F51154-32) apply to this LCS.

VII-Matrix Spike/Matrix Spike Duplicate
Data for matrix spike/matrix spike duplicates (MS/MSD) are generated to determine long-term precision and accuracy of the analytical method on various matrices and to demonstrate acceptable compound recovery by the laboratory at the time of sample analysis. The percent recoveries (%Rs) and the relative percent difference (RPD) must be within the laboratory control limits. DoD QSM aqueous MS/MSD recovery limits follow the LCS criteria and are specified in Table D-12 of the DoD QSM (DoD, 2006). DoD QSM solid MS/MSD recovery limits follow the LCS criteria and are specified in Table D-2 and Table D-13 of the DoD QSM (DoD, 2006). If the compound is not listed, then the laboratory criteria shall be used.

- Sample 41SW09 (F51154-7) was used as the aqueous MS/MSD for the explosive analysis on 07/27/07. HMX (121%, 118%) was outside DoD QSM criteria and within laboratory criteria. All samples were non-detect HMX; therefore, no qualifiers were applied based upon these outliers. Samples 41SW08 (F51154-6), 41SW09 (F51154-7), 41SW10 (F51154-8), LFSW01 (F51154-17), and TMSW01 (F51154-20) apply to this MS/MSD.

- Sample APSD01 (F51154-18) was used as the solid MS/MSD for the explosive analysis on 08/03/07. 2,6-Dinitrotoluene (RPD=18%), 2,4-dinitrotoluene (131%, RPD=20%), 2-amino-4,6-dinitrotoluene (126%), and 4-amino-2,6-dinitrotoluene (RPD=19%) were outside DoD QSM criteria and/or laboratory criteria. All associated samples were non-detect for these compounds; therefore, no qualifiers were applied based upon these outliers. Samples 41SD08 (F51154-9), 41SD09 (F51154-10), 41SD10 (F51154-11), LFSD01 (F51154-15), TMSD01 (F51154-16), APSD01 (F51154-18), 41SD11 (F51154-22), 49SS02 (F51154-23), 49SS03 (F51154-24), 49SS04 (F51154-25), 49SS05 (F51154-26), 59SS06 (F51154-27), 59SS07 (F51154-28), 59SS08 (F51154-29), 59SS09 (F51154-30), 59SS10 (F51154-31), and TMSS05 (F51154-32) apply to this MS/MSD.

- Sample LFSW01 (F51154-17) was used as the aqueous MS/MSD for the PETN and nitroglycerin analysis on 07/27/07. All criteria were met. No qualifiers were applied. Samples 41SW08 (F51154-6), 41SW09 (F51154-7), 41SW10 (F51154-8), LFSW01 (F51154-17), and TMSW01 (F51154-20) apply to this MS/MSD.

- Sample TMSD01 (F51154-16) was used as the solid MS/MSD for the PETN and nitroglycerin analysis on 07/02-03/07. Nitroglycerin (RPD=27%) was above lab criteria. For PETN, all criteria were met. All associated samples were non-detect for nitroglycerin; therefore, no qualifiers were applied based upon this outlier. Samples 41SD08 (F51154-9), 41SD09 (F51154-10), 41SD10 (F51154-11), LFSD01 (F51154-15), TMSD01 (F51154-16), APSD01 (F51154-18), 41SD11 (F51154-22), 49SS02 (F51154-23), 49SS03 (F51154-24), 49SS04 (F51154-25), 49SS05 (F51154-26), 59SS06 (F51154-27), 59SS07 (F51154-28), 59SS08 (F51154-29), 59SS09 (F51154-30), 59SS10 (F51154-31), and TMSS05 (F51154-32) apply to this MS/MSD.

VIII-Field Duplicate Sample Analysis
Field duplicates were collected to identify the cumulative precision of the sampling and analytical process and sent to the laboratory blind. The RPD was calculated only for those analytes which were detected at levels exceeding the method reporting limits in both samples of the duplicate pair. Analytes that were rejected (R-qualified) in either sample of the duplicate pair were excluded from the duplicate assessment. Precision control criterion was established at 50% RPD for the aqueous and solid samples. Analytical results were qualified as estimated (J) for any RPDs exceeding criteria.

- Field surface water sample duplicate pair LFSW01 (F51154-17) and TMSW01 (F51154-20) was collected for explosives, nitroglycerin, and PETN. All explosives, nitroglycerin, and PETN target compounds were non-detect. All criteria were met. No qualifiers were applied.

- Field surface soil sample duplicate pair 49SS05 (F51154-26) and TMSS05 (F51154-32) was collected for explosives, nitroglycerin, and PETN. All explosives, nitroglycerin, and PETN target compounds were non-detect. All criteria were met. No qualifiers were applied.

- Field sediment sample duplicate pair LFSD01 (F51154-15) and TMSD01 (F51154-16) was collected for explosives, nitroglycerin, and PETN. All explosives, nitroglycerin, and PETN target compounds were non-detect. All criteria were met. No qualifiers were applied.

IX-Quantitation Verification

The accuracy of analytical results was verified through the calculation of several parameters. The calculation was based calibration factors. The absolute percent difference (%D) between the calculated and the reported value must be within 10% difference. All values >MDL and <MRL or <3*MDL (whichever was greater) were qualified as estimated "J".

- The %D between the primary and secondary columns was within criteria for all detected explosives, PETN, and nitroglycerin.

Sample: 41SW08 (F51154-6), 2-amino-4,6-dinitrotoluene

Conc. µg/L = (Ax * Vt * DF) / (CF * Vs)

where: Conc. = Sample concentration in µg/L
Ax = Area of characteristic ion for compound being measured.
Vt = Volume of total extract (mL).
CF = Average relative calibration factor for compound being measured (from ICAL)
Vs = Volume of sample extracted (mL).
DF = Dilution factor

Conc. µg/L = (199179 * 10 * 1) / (7177 * 1010) = 0.27 µg/L (Signal #1)

Reported Value = 0.27 µg/L
% Difference = 0.0%
Values were within 10% difference

Sample: LFSW01MS (F51154-17MS), nitroglycerin

Conc. µg/L = (Ax * Vt * DF) / (CF * Vs)

where: Conc. = Sample concentration in µg/L
Ax = Area of characteristic ion for compound being measured.
Vt = Volume of total extract (mL).
CF = Average relative calibration factor for compound being measured (from ICAL)
Vs = Volume of sample extracted (mL).
DF = Dilution factor

Conc. µg/L = (3198546 * 10 * 1) / (1228 * 430) = 60.6 µg/L (Signal #1)

Reported Value = 60.6 µg/L
% Difference = 0.0%
Values were within 10% difference

Sample: APSD01MS (F51154-18MS), nitrobenzene

Conc. mg/kg = (Ax * Vt * DF) / (CF * Ws * D)

where: Conc. = Sample concentration in mg/kg
Ax = Area of characteristic ion for compound being measured.
Vt = Volume of total extract (mL).
CF = Average relative calibration factor for compound being measured (from ICAL)
W(s) = Weight of sample in kilograms.
D = Percent dry weight (100 - % moisture in sample)/100
DF = Dilution factor

Conc. mg/kg = (4241037 * 20 * 1) / (7223 * 2.45 * 1) = 4970 µg/kg (Signal #1)
Reported Value = 4970 µg/kg
% Difference = 0.0%
Values were within 10% difference

Sample: TMSD01MS (F51154-16MS), nitroglycerin

Conc. mg/kg = (Ax * Vt * DF) / (CF * Ws * D)

where: Conc. = Sample concentration in mg/kg
Ax = Area of characteristic ion for compound being measured.
Vt = Volume of total extract (mL).
CF = Average relative calibration factor for compound being measured (from ICAL)
W(s) = Weight of sample in kilograms.
D = Percent dry weight (100 - % moisture in sample)/100
DF = Dilution factor

Conc. mg/kg = (3248217 * 20 * 1) / (1228 * 2.68 * 1) = 19700 µg/kg (Signal #1)
Reported Value = 19700 µg/kg
% Difference = 0.0%
Values were within 10% difference

USEPA Region III Validation Qualifiers

(No Code) = Confirmed identification.

B = The analyte has been detected in the sample and the associated laboratory or field blank.

J = Indicates an estimated value for (1) estimated value due to QC non-conformance. Reported value may not be accurate or precise, (2) estimating a concentration as a tentatively identified compound as indicated by the mass spectral and retention time data, or (3) estimating a concentration ≥ MDL and <MRL or <3*MDL, whichever is greater.

K = Analyte present. Reported value may be biased high (estimated) due to QC non-conformance.

L = Analyte present. Reported value may be biased low (estimated) due to QC non-conformance.

R = Unreliable result. Analyte may or may not be present in the sample due to QC non-conformance.

UL = Value is estimated bias low and not detected due to QC non-conformance. Reporting limit may be inaccurate or imprecise. Quantitation limit is probably higher.

UJ = Value is estimated and not detected due to QC non-conformance. Reporting limit may be inaccurate or imprecise.

Laboratory Qualifiers

(No Code) = Confirmed identification.

U = Not detected. The associated number indicates the compound reporting limit for the sample.

A (Dioxins) = B (Metals) = The reported value was obtained from a reading <MRL and ≥MDL and is considered estimated.

B (Organics) = The analyte or compound has been detected in the sample and laboratory method blank. It indicates probable blank contamination.

E (Metals) = Reported value is estimated because of the presence of interferences.

E (Organics) = Identifies compounds whose concentrations exceed the upper level of the calibration range.

EMPC (Dioxins) = The ion-abundance ratio between the two characteristic PCDD/PCDF ions was outside accepted ranges. The detected PCDD/PCDF was reported as an estimated maximum possible concentration (EMPC).

D = Indicates sample was analyzed at a dilution.

J = Indicates an estimated value for (1) estimating a concentration as a tentatively identified compound as indicated by the mass spectral and retention time data, or (2) estimating a concentration <MRL and ≥ MDL.

N (Organics) = Indicates presumptive evidence of a compound for tentatively identified compounds using a library search.

N (Metals) = Laboratory spike sample recovery not within control limits.

P (Organics) = Target analyte confirmation >40% difference for detected compound between the primary and secondary columns. The lower of the two values was reported.

* (Metals) = Duplicate analysis not within control limits.

* (Organics) = Surrogate outside of QC limits on both original and re-analysis.

Raw Data: GG022998.D PP021775.D GG023013.D

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Accutest Laboratories

Report of Analysis

Client Sample ID:	41SW08		
Lab Sample ID:	F51154-6	Date Sampled:	07/18/07
Matrix:	AQ - Surface Water	Date Received:	07/19/07
Method:	SW846 8330A SW846 3535A	Percent Solids:	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	GG022998.D	1	07/27/07	MRE	07/25/07	OP21593	GGG987
Run #2	PP021775.D	1	07/27/07	MRE	07/25/07	OP21593	GPP751
Run #3 [b]	GG023013.D	1	07/27/07	MRE	07/25/07	OP21593	GGG988

	Initial Volume	Final Volume
Run #1	1010 ml	10.0 ml
Run #2	1010 ml	10.0 ml
Run #3	1010 ml	10.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q
2691-41-0	HMX	ND	0.20	0.059	ug/l	
121-82-4	RDX	ND	0.20	0.074	ug/l	
99-65-0	1,3-Dinitrobenzene	ND	0.20	0.069	ug/l	
606-20-2	2,6-Dinitrotoluene	ND	0.20	0.064	ug/l	
121-14-2	2,4-Dinitrotoluene	ND	0.20	0.074	ug/l	
35572-78-2	2-amino-4,6-Dinitrotoluene	0.27	0.20	0.069	ug/l	
19406-51-0	4-amino-2,6-Dinitrotoluene	0.87	0.20	0.079	ug/l	
98-95-3	Nitrobenzene	ND	0.20	0.059	ug/l	
88-72-2	o-Nitrotoluene	ND	0.20	0.059	ug/l	
99-08-1	m-Nitrotoluene	ND	0.20	0.074	ug/l	
99-99-0	p-Nitrotoluene	ND	0.20	0.074	ug/l	
479-45-8	Tetryl	ND	0.20	0.074	ug/l	
99-35-4	1,3,5-Trinitrobenzene	ND	0.20	0.094	ug/l	
118-96-7	2,4,6-Trinitrotoluene	ND	0.20	0.079	ug/l	
55-63-0	Nitroglycerine	ND [c]	2.0	0.69	ug/l	
78-11-5	PETN	ND [c]	2.0	0.69	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Run# 3	Limits
610-39-9	3,4-Dinitrotoluene	102%	103%	101%	70-136%

(a) All hits confirmed by reanalysis on a dissimilar column.
(b) Confirmation run.
(c) Result is from Run# 2

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: GG022999.D PP021776.D GG023014.D

Accutest Laboratories

Report of Analysis

Client Sample ID:	41SW09		
Lab Sample ID:	F51154-7	Date Sampled:	07/18/07
Matrix:	AQ - Surface Water	Date Received:	07/19/07
Method:	SW846 8330A SW846 3535A	Percent Solids:	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	GG022999.D	1	07/27/07	MRE	07/25/07	OP21593	GGG987
Run #2	PP021776.D	1	07/27/07	MRE	07/25/07	OP21593	GPP751
Run #3 [b]	GG023014.D	1	07/27/07	MRE	07/25/07	OP21593	GGG988

	Initial Volume	Final Volume
Run #1	1000 ml	10.0 ml
Run #2	1000 ml	10.0 ml
Run #3	1000 ml	10.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q
2691-41-0	HMX	ND	0.20	0.060	ug/l	
121-82-4	RDX	ND	0.20	0.075	ug/l	
99-65-0	1,3-Dinitrobenzene	ND	0.20	0.070	ug/l	
606-20-2	2,6-Dinitrotoluene	ND	0.20	0.065	ug/l	
121-14-2	2,4-Dinitrotoluene	ND	0.20	0.075	ug/l	
35572-78-2	2-amino-4,6-Dinitrotoluene	0.76	0.20	0.070	ug/l	
19406-51-0	4-amino-2,6-Dinitrotoluene	1.7	0.20	0.080	ug/l	
98-95-3	Nitrobenzene	ND	0.20	0.060	ug/l	
88-72-2	o-Nitrotoluene	ND	0.20	0.060	ug/l	
99-08-1	m-Nitrotoluene	ND	0.20	0.075	ug/l	
99-99-0	p-Nitrotoluene	ND	0.20	0.075	ug/l	
479-45-8	Tetryl	ND	0.20	0.075	ug/l	
99-35-4	1,3,5-Trinitrobenzene	ND	0.20	0.095	ug/l	
118-96-7	2,4,6-Trinitrotoluene	ND	0.20	0.080	ug/l	
55-63-0	Nitroglycerine	ND [c]	2.0	0.70	ug/l	
78-11-5	PETN	ND [c]	2.0	0.70	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Run# 3	Limits
610-39-9	3,4-Dinitrotoluene	97%	96%	101%	70-136%

(a) All hits confirmed by reanalysis on a dissimilar column.
(b) Confirmation run.
(c) Result is from Run# 2

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: GG023004.D PP021777.D GG023015.D

Form I Corr

Accutest Laboratories

Report of Analysis

Client Sample ID:	41SW10		
Lab Sample ID:	F51154-8	Date Sampled:	07/18/07
Matrix:	AQ - Surface Water	Date Received:	07/19/07
Method:	SW846 8330A SW846 3535A	Percent Solids:	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	GG023004.D	1	07/27/07	MRE	07/25/07	OP21593	GGG987
Run #2	PP021777.D	1	07/27/07	MRE	07/25/07	OP21593	GPP751
Run #3 [b]	GG023015.D	1	07/27/07	MRE	07/25/07	OP21593	GGG988

	Initial Volume	Final Volume
Run #1	1000 ml	10.0 ml
Run #2	1000 ml	10.0 ml
Run #3	1000 ml	10.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q
2691-41-0	HMX	ND	0.20	0.060	ug/l	
121-82-4	RDX	ND	0.20	0.075	ug/l	
99-65-0	1,3-Dinitrobenzene	ND	0.20	0.070	ug/l	
606-20-2	2,6-Dinitrotoluene	ND	0.20	0.065	ug/l	
121-14-2	2,4-Dinitrotoluene	ND	0.20	0.075	ug/l	
35572-78-2	2-amino-4,6-Dinitrotoluene	1.1	0.20	0.070	ug/l	
19406-51-0	4-amino-2,6-Dinitrotoluene	2.5	0.20	0.080	ug/l	
98-95-3	Nitrobenzene	ND	0.20	0.060	ug/l	
88-72-2	o-Nitrotoluene	ND	0.20	0.060	ug/l	
99-08-1	m-Nitrotoluene	ND	0.20	0.075	ug/l	
99-99-0	p-Nitrotoluene	ND	0.20	0.075	ug/l	
479-45-8	Tetryl	ND	0.20	0.075	ug/l	
99-35-4	1,3,5-Trinitrobenzene	ND	0.20	0.095	ug/l	
118-96-7	2,4,6-Trinitrotoluene	1.3	0.20	0.080	ug/l	
55-63-0	Nitroglycerine	ND [c]	2.0	0.70	ug/l	
78-11-5	PETN	ND [c]	2.0	0.70	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Run# 3	Limits
610-39-9	3,4-Dinitrotoluene	97%	102%	104%	70-136%

(a) All hits confirmed by reanalysis on a dissimilar column.
(b) Confirmation run.
(c) Result is from Run# 2

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: GG023079.D PP021960.D

Form I Copy

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Report of Analysis

Client Sample ID:	41SD08		
Lab Sample ID:	F51154-9	Date Sampled:	07/18/07
Matrix:	SO - Sediment	Date Received:	07/19/07
Method:	SW846 8330A SW846 8330B	Percent Solids:	36.9
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GG023079.D	1	08/03/07	NAF	08/01/07	OP21693	GGG991
Run #2	PP021960.D	1	08/03/07	NAF	08/01/07	OP21693	GPP759

	Initial Weight	Final Volume
Run #1	2.37 g	20.0 ml
Run #2	2.37 g	20.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q
2691-41-0	HMX	ND	210	44	ug/kg	
121-82-4	RDX	ND	210	42	ug/kg	
99-65-0	1,3-Dinitrobenzene	ND	210	42	ug/kg	
606-20-2	2,6-Dinitrotoluene	ND	210	75	ug/kg	
121-14-2	2,4-Dinitrotoluene	ND	210	42	ug/kg	
35572-78-2	2-amino-4,6-Dinitrotoluene	ND	210	42	ug/kg	
19406-51-0	4-amino-2,6-Dinitrotoluene	ND	210	46	ug/kg	
98-95-3	Nitrobenzene	ND	210	60	ug/kg	
88-72-2	o-Nitrotoluene	ND	210	65	ug/kg	
99-08-1	m-Nitrotoluene	ND	210	87	ug/kg	
99-99-0	p-Nitrotoluene	ND	210	58	ug/kg	
479-45-8	Tetryl	ND	420	120	ug/kg	
99-35-4	1,3,5-Trinitrobenzene	ND	210	50	ug/kg	
118-96-7	2,4,6-Trinitrotoluene	ND	210	42	ug/kg	
55-63-0	Nitroglycerine	ND [a]	1700	630	ug/kg	
78-11-5	PETN	ND [a]	1700	630	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
610-39-9	3,4-Dinitrotoluene		107%	72-145%

(a) Result is from Run# 2

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: GG023080.D PP021961.D

Form I OA

Accutest Laboratories

Report of Analysis

Client Sample ID:	41SD09		
Lab Sample ID:	F51154-10	Date Sampled:	07/18/07
Matrix:	SO - Sediment	Date Received:	07/19/07
Method:	SW846 8330A SW846 8330B	Percent Solids:	82.4
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GG023080.D	1	08/03/07	NAF	08/01/07	OP21693	GGG991
Run #2	PP021961.D	1	08/03/07	NAF	08/01/07	OP21693	GPP759

	Initial Weight	Final Volume
Run #1	2.45 g	20.0 ml
Run #2	2.45 g	20.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q
2691-41-0	HMX	ND	200	42	ug/kg	
121-82-4	RDX	ND	200	41	ug/kg	
99-65-0	1,3-Dinitrobenzene	ND	200	41	ug/kg	
606-20-2	2,6-Dinitrotoluene	ND	200	73	ug/kg	
121-14-2	2,4-Dinitrotoluene	ND	200	41	ug/kg	
35572-78-2	2-amino-4,6-Dinitrotoluene	ND	200	41	ug/kg	
19406-51-0	4-amino-2,6-Dinitrotoluene	ND	200	44	ug/kg	
98-95-3	Nitrobenzene	ND	200	58	ug/kg	
88-72-2	o-Nitrotoluene	ND	200	63	ug/kg	
99-08-1	m-Nitrotoluene	ND	200	84	ug/kg	
99-99-0	p-Nitrotoluene	ND	200	56	ug/kg	
479-45-8	Tetryl	ND	410	120	ug/kg	
99-35-4	1,3,5-Trinitrobenzene	ND	200	48	ug/kg	
118-96-7	2,4,6-Trinitrotoluene	ND	200	41	ug/kg	
55-63-0	Nitroglycerine	ND [a]	1600	610	ug/kg	
78-11-5	PETN	ND [a]	1600	610	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
610-39-9	3,4-Dinitrotoluene	106%	102%	72-145%

(a) Result is from Run# 2

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: GG023081.D PP021962.D

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Report of Analysis

Client Sample ID:	41SD10		
Lab Sample ID:	F51154-11	Date Sampled:	07/18/07
Matrix:	SO - Sediment	Date Received:	07/19/07
Method:	SW846 8330A SW846 8330B	Percent Solids:	79.2
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GG023081.D	1	08/03/07	NAF	08/01/07	OP21693	GGG991
Run #2	PP021962.D	1	08/03/07	NAF	08/01/07	OP21693	GPP759

	Initial Weight	Final Volume
Run #1	2.22 g	20.0 ml
Run #2	2.22 g	20.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q
2691-41-0	HMX	ND	230	47	ug/kg	
121-82-4	RDX	ND	230	45	ug/kg	
99-65-0	1,3-Dinitrobenzene	ND	230	45	ug/kg	
606-20-2	2,6-Dinitrotoluene	ND	230	80	ug/kg	
121-14-2	2,4-Dinitrotoluene	ND	230	45	ug/kg	
35572-78-2	2-amino-4,6-Dinitrotoluene	ND	230	45	ug/kg	
19406-51-0	4-amino-2,6-Dinitrotoluene	ND	230	49	ug/kg	
98-95-3	Nitrobenzene	ND	230	64	ug/kg	
88-72-2	o-Nitrotoluene	ND	230	69	ug/kg	
99-08-1	m-Nitrotoluene	ND	230	93	ug/kg	
99-99-0	p-Nitrotoluene	ND	230	62	ug/kg	
479-45-8	Tetryl	ND	450	130	ug/kg	
99-35-4	1,3,5-Trinitrobenzene	ND	230	53	ug/kg	
118-96-7	2,4,6-Trinitrotoluene	ND	230	45	ug/kg	
55-63-0	Nitroglycerine	ND [a]	1800	680	ug/kg	
78-11-5	PETN	ND [a]	1800	680	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
610-39-9	3,4-Dinitrotoluene	107%	104%	72-145%

(a) Result is from Run# 2

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: GG023005.D PP021778.D

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Report of Analysis

Client Sample ID:	RB071807		
Lab Sample ID:	F51154-12	Date Sampled:	07/18/07
Matrix:	AQ - Surface Water	Date Received:	07/19/07
Method:	SW846 8330A SW846 3535A	Percent Solids:	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GG023005.D	1	07/27/07	MRE	07/25/07	OP21593	GGG987
Run #2	PP021778.D	1	07/27/07	MRE	07/25/07	OP21593	GPP751

	Initial Volume	Final Volume
Run #1	1040 ml	10.0 ml
Run #2	1040 ml	10.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q
2691-41-0	HMX	ND	0.19	0.058	ug/l	
121-82-4	RDX	ND	0.19	0.072	ug/l	
99-65-0	1,3-Dinitrobenzene	ND	0.19	0.067	ug/l	
606-20-2	2,6-Dinitrotoluene	ND	0.19	0.062	ug/l	
121-14-2	2,4-Dinitrotoluene	ND	0.19	0.072	ug/l	
35572-78-2	2-amino-4,6-Dinitrotoluene	ND	0.19	0.067	ug/l	
19406-51-0	4-amino-2,6-Dinitrotoluene	ND	0.19	0.077	ug/l	
98-95-3	Nitrobenzene	ND	0.19	0.058	ug/l	
88-72-2	o-Nitrotoluene	ND	0.19	0.058	ug/l	
99-08-1	m-Nitrotoluene	ND	0.19	0.072	ug/l	
99-99-0	p-Nitrotoluene	ND	0.19	0.072	ug/l	
479-45-8	Tetryl	ND	0.19	0.072	ug/l	
99-35-4	1,3,5-Trinitrobenzene	ND	0.19	0.091	ug/l	
118-96-7	2,4,6-Trinitrotoluene	ND	0.19	0.077	ug/l	
55-63-0	Nitroglycerine	ND [a]	1.9	0.67	ug/l	
78-11-5	PETN	ND [a]	1.9	0.67	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
610-39-9	3,4-Dinitrotoluene	103%	113%	70-136%

(a) Result is from Run# 2

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: GG023082.D PP021963.D

Form I Corr

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Report of Analysis

Client Sample ID:	LFSD01		
Lab Sample ID:	F51154-15	Date Sampled:	07/19/07
Matrix:	SO - Sediment	Date Received:	07/19/07
Method:	SW846 8330A SW846 8330B	Percent Solids:	57.9
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GG023082.D	1	08/03/07	NAF	08/01/07	OP21693	GGG991
Run #2	PP021963.D	1	08/03/07	NAF	08/01/07	OP21693	GPP759

	Initial Weight	Final Volume
Run #1	2.46 g	20.0 ml
Run #2	2.46 g	20.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q
2691-41-0	HMX	ND	200	42	ug/kg	
121-82-4	RDX	ND	200	41	ug/kg	
99-65-0	1,3-Dinitrobenzene	ND	200	41	ug/kg	
606-20-2	2,6-Dinitrotoluene	ND	200	72	ug/kg	
121-14-2	2,4-Dinitrotoluene	ND	200	41	ug/kg	
35572-78-2	2-amino-4,6-Dinitrotoluene	ND	200	41	ug/kg	
19406-51-0	4-amino-2,6-Dinitrotoluene	ND	200	44	ug/kg	
98-95-3	Nitrobenzene	ND	200	58	ug/kg	
88-72-2	o-Nitrotoluene	ND	200	63	ug/kg	
99-08-1	m-Nitrotoluene	ND	200	84	ug/kg	
99-99-0	p-Nitrotoluene	ND	200	56	ug/kg	
479-45-8	Tetryl	ND	410	110	ug/kg	
99-35-4	1,3,5-Trinitrobenzene	ND	200	48	ug/kg	
118-96-7	2,4,6-Trinitrotoluene	ND	200	41	ug/kg	
55-63-0	Nitroglycerine	ND [a]	1600	610	ug/kg	
78-11-5	PETN	ND [a]	1600	610	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
610-39-9	3,4-Dinitrotoluene	110%	108%	72-145%

(a) Result is from Run# 2

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: GG023083.D PP021964.D

Accutest Laboratories

Report of Analysis

Client Sample ID:	TMSD01		
Lab Sample ID:	F51154-16	Date Sampled:	07/19/07
Matrix:	SO - Sediment	Date Received:	07/19/07
Method:	SW846 8330A SW846 8330B	Percent Solids:	65.0
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GG023083.D	1	08/03/07	NAF	08/01/07	OP21693	GGG991
Run #2	PP021964.D	1	08/03/07	NAF	08/01/07	OP21693	GPP759

	Initial Weight	Final Volume
Run #1	2.62 g	20.0 ml
Run #2	2.62 g	20.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q
2691-41-0	HMX	ND	190	40	ug/kg	
121-82-4	RDX	ND	190	38	ug/kg	
99-65-0	1,3-Dinitrobenzene	ND	190	38	ug/kg	
606-20-2	2,6-Dinitrotoluene	ND	190	68	ug/kg	
121-14-2	2,4-Dinitrotoluene	ND	190	38	ug/kg	
35572-78-2	2-amino-4,6-Dinitrotoluene	ND	190	38	ug/kg	
19406-51-0	4-amino-2,6-Dinitrotoluene	ND	190	41	ug/kg	
98-95-3	Nitrobenzene	ND	190	54	ug/kg	
88-72-2	o-Nitrotoluene	ND	190	59	ug/kg	
99-08-1	m-Nitrotoluene	ND	190	79	ug/kg	
99-99-0	p-Nitrotoluene	ND	190	53	ug/kg	
479-45-8	Tetryl	ND	380	110	ug/kg	
99-35-4	1,3,5-Trinitrobenzene	ND	190	45	ug/kg	
118-96-7	2,4,6-Trinitrotoluene	ND	190	38	ug/kg	
55-63-0	Nitroglycerine	ND [a]	1500	570	ug/kg	
78-11-5	PETN	ND [a]	1500	570	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
610-39-9	3,4-Dinitrotoluene	107%	105%	72-145%

(a) Result is from Run# 2

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Form I Org

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Report of Analysis

Client Sample ID:	LFSW01		
Lab Sample ID:	F51154-17	Date Sampled:	07/19/07
Matrix:	AQ - Surface Water	Date Received:	07/19/07
Method:	SW846 8330A SW846 3535A	Percent Solids:	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GG023006.D	1	07/27/07	MRE	07/25/07	OP21593	GGG987
Run #2	PP021779.D	1	07/27/07	MRE	07/25/07	OP21593	GPP751

	Initial Volume	Final Volume
Run #1	860 ml	10.0 ml
Run #2	860 ml	10.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q
2691-41-0	HMX	ND	0.23	0.070	ug/l	
121-82-4	RDX	ND	0.23	0.087	ug/l	
99-65-0	1,3-Dinitrobenzene	ND	0.23	0.081	ug/l	
606-20-2	2,6-Dinitrotoluene	ND	0.23	0.076	ug/l	
121-14-2	2,4-Dinitrotoluene	ND	0.23	0.087	ug/l	
35572-78-2	2-amino-4,6-Dinitrotoluene	ND	0.23	0.081	ug/l	
19406-51-0	4-amino-2,6-Dinitrotoluene	ND	0.23	0.093	ug/l	
98-95-3	Nitrobenzene	ND	0.23	0.070	ug/l	
88-72-2	o-Nitrotoluene	ND	0.23	0.070	ug/l	
99-08-1	m-Nitrotoluene	ND	0.23	0.087	ug/l	
99-99-0	p-Nitrotoluene	ND	0.23	0.087	ug/l	
479-45-8	Tetryl	ND	0.23	0.087	ug/l	
99-35-4	1,3,5-Trinitrobenzene	ND	0.23	0.11	ug/l	
118-96-7	2,4,6-Trinitrotoluene	ND	0.23	0.093	ug/l	
55-63-0	Nitroglycerine	ND [a]	2.3	0.81	ug/l	
78-11-5	PETN	ND [a]	2.3	0.81	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
610-39-9	3,4-Dinitrotoluene	100%	106%	70-136%

(a) Result is from Run# 2

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: GG023084.D PP021967.D

Form I COM

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Report of Analysis

Client Sample ID:	APSD01		
Lab Sample ID:	F51154-18	Date Sampled:	07/19/07
Matrix:	SO - Sediment	Date Received:	07/19/07
Method:	SW846 8330A SW846 8330B	Percent Solids:	86.8
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GG023084.D	1	08/03/07	NAF	08/01/07	OP21693	GGG991
Run #2	PP021967.D	1	08/03/07	NAF	08/01/07	OP21693	GPP759

	Initial Weight	Final Volume
Run #1	2.70 g	20.0 ml
Run #2	2.70 g	20.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q
2691-41-0	HMX	ND	190	39	ug/kg	
121-82-4	RDX	ND	190	37	ug/kg	
99-65-0	1,3-Dinitrobenzene	ND	190	37	ug/kg	
606-20-2	2,6-Dinitrotoluene	ND	190	66	ug/kg	
121-14-2	2,4-Dinitrotoluene	ND	190	37	ug/kg	
35572-78-2	2-amino-4,6-Dinitrotoluene	ND	190	37	ug/kg	
19406-51-0	4-amino-2,6-Dinitrotoluene	ND	190	40	ug/kg	
98-95-3	Nitrobenzene	ND	190	53	ug/kg	
88-72-2	o-Nitrotoluene	ND	190	57	ug/kg	
99-08-1	m-Nitrotoluene	ND	190	76	ug/kg	
99-99-0	p-Nitrotoluene	ND	190	51	ug/kg	
479-45-8	Tetryl	ND	370	100	ug/kg	
99-35-4	1,3,5-Trinitrobenzene	ND	190	44	ug/kg	
118-96-7	2,4,6-Trinitrotoluene	ND	190	37	ug/kg	
55-63-0	Nitroglycerine	ND [a]	1500	560	ug/kg	
78-11-5	PETN	ND [a]	1500	560	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
610-39-9	3,4-Dinitrotoluene	107%	104%	72-145%

(a) Result is from Run# 2

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: GG023007.D PP021782.D

Form I Org

Accutest Laboratories

Report of Analysis

Client Sample ID:	TMSW01		
Lab Sample ID:	F51154-20	Date Sampled:	07/19/07
Matrix:	AQ - Surface Water	Date Received:	07/19/07
Method:	SW846 8330A SW846 3535A	Percent Solids:	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GG023007.D	1	07/27/07	MRE	07/25/07	OP21593	GGG987
Run #2	PP021782.D	1	07/27/07	MRE	07/25/07	OP21593	GPP751

	Initial Volume	Final Volume
Run #1	850 ml	10.0 ml
Run #2	850 ml	10.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q
2691-41-0	HMX	ND	0.24	0.071	ug/l	
121-82-4	RDX	ND	0.24	0.088	ug/l	
99-65-0	1,3-Dinitrobenzene	ND	0.24	0.082	ug/l	
606-20-2	2,6-Dinitrotoluene	ND	0.24	0.076	ug/l	
121-14-2	2,4-Dinitrotoluene	ND	0.24	0.088	ug/l	
35572-78-2	2-amino-4,6-Dinitrotoluene	ND	0.24	0.082	ug/l	
19406-51-0	4-amino-2,6-Dinitrotoluene	ND	0.24	0.094	ug/l	
98-95-3	Nitrobenzene	ND	0.24	0.071	ug/l	
88-72-2	o-Nitrotoluene	ND	0.24	0.071	ug/l	
99-08-1	m-Nitrotoluene	ND	0.24	0.088	ug/l	
99-99-0	p-Nitrotoluene	ND	0.24	0.088	ug/l	
479-45-8	Tetryl	ND	0.24	0.088	ug/l	
99-35-4	1,3,5-Trinitrobenzene	ND	0.24	0.11	ug/l	
118-96-7	2,4,6-Trinitrotoluene	ND	0.24	0.094	ug/l	
55-63-0	Nitroglycerine	ND [a]	2.4	0.82	ug/l	
78-11-5	PETN	ND [a]	2.4	0.82	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
610-39-9	3,4-Dinitrotoluene	99%	110%	70-136%

(a) Result is from Run# 2

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Form I OBZ

Accutest Laboratories

Report of Analysis

Client Sample ID:	41SD11		
Lab Sample ID:	F51154-22	Date Sampled:	07/19/07
Matrix:	SO - Soil	Date Received:	07/19/07
Method:	SW846 8330A SW846 8330B	Percent Solids:	86.8
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GG023089.D	1	08/03/07	NAF	08/01/07	OP21693	GGG991
Run #2	PP021970.D	1	08/03/07	NAF	08/01/07	OP21693	GPP759

	Initial Weight	Final Volume
Run #1	2.43 g	20.0 ml
Run #2	2.43 g	20.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q
2691-41-0	HMX	ND	210	43	ug/kg	
121-82-4	RDX	ND	210	41	ug/kg	
99-65-0	1,3-Dinitrobenzene	ND	210	41	ug/kg	
606-20-2	2,6-Dinitrotoluene	ND	210	73	ug/kg	
121-14-2	2,4-Dinitrotoluene	ND	210	41	ug/kg	
35572-78-2	2-amino-4,6-Dinitrotoluene	ND	210	41	ug/kg	
19406-51-0	4-amino-2,6-Dinitrotoluene	ND	210	44	ug/kg	
98-95-3	Nitrobenzene	ND	210	58	ug/kg	
88-72-2	o-Nitrotoluene	ND	210	63	ug/kg	
99-08-1	m-Nitrotoluene	ND	210	85	ug/kg	
99-99-0	p-Nitrotoluene	ND	210	57	ug/kg	
479-45-8	Tetryl	ND	410	120	ug/kg	
99-35-4	1,3,5-Trinitrobenzene	ND	210	49	ug/kg	
118-96-7	2,4,6-Trinitrotoluene	ND	210	41	ug/kg	
55-63-0	Nitroglycerine	ND [a]	1600	620	ug/kg	
78-11-5	PETN	ND [a]	1600	620	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
610-39-9	3,4-Dinitrotoluene	111%	110%	72-145%

(a) Result is from Run# 2

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: GG023090.D PP021971.D

Form I COA

Accutest Laboratories

Report of Analysis

Client Sample ID:	49SS02		
Lab Sample ID:	F51154-23	Date Sampled:	07/19/07
Matrix:	SO - Soil	Date Received:	07/19/07
Method:	SW846 8330A SW846 8330B	Percent Solids:	89.6
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GG023090.D	1	08/03/07	NAF	08/01/07	OP21693	GGG991
Run #2	PP021971.D	1	08/03/07	NAF	08/01/07	OP21693	GPP759

	Initial Weight	Final Volume
Run #1	2.39 g	20.0 ml
Run #2	2.39 g	20.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q
2691-41-0	HMX	ND	210	44	ug/kg	
121-82-4	RDX	ND	210	42	ug/kg	
99-65-0	1,3-Dinitrobenzene	ND	210	42	ug/kg	
606-20-2	2,6-Dinitrotoluene	ND	210	74	ug/kg	
121-14-2	2,4-Dinitrotoluene	ND	210	42	ug/kg	
35572-78-2	2-amino-4,6-Dinitrotoluene	ND	210	42	ug/kg	
19406-51-0	4-amino-2,6-Dinitrotoluene	ND	210	45	ug/kg	
98-95-3	Nitrobenzene	ND	210	59	ug/kg	
88-72-2	o-Nitrotoluene	ND	210	64	ug/kg	
99-08-1	m-Nitrotoluene	ND	210	86	ug/kg	
99-99-0	p-Nitrotoluene	ND	210	58	ug/kg	
479-45-8	Tetryl	ND	420	120	ug/kg	
99-35-4	1,3,5-Trinitrobenzene	ND	210	49	ug/kg	
118-96-7	2,4,6-Trinitrotoluene	ND	210	42	ug/kg	
55-63-0	Nitroglycerine	ND [a]	1700	630	ug/kg	
78-11-5	PETN	ND [a]	1700	630	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
610-39-9	3,4-Dinitrotoluene	109%	109%	72-145%

(a) Result is from Run# 2

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: GG023091.D PP021972.D

Run 1 only

Accutest Laboratories

Report of Analysis

Client Sample ID:	49SS03		
Lab Sample ID:	F51154-24	Date Sampled:	07/19/07
Matrix:	SO - Soil	Date Received:	07/19/07
Method:	SW846 8330A SW846 8330B	Percent Solids:	92.0
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GG023091.D	1	08/03/07	NAF	08/01/07	OP21693	GGG991
Run #2	PP021972.D	1	08/03/07	NAF	08/01/07	OP21693	GPP759

	Initial Weight	Final Volume
Run #1	2.42 g	20.0 ml
Run #2	2.42 g	20.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q
2691-41-0	HMX	ND	210	43	ug/kg	
121-82-4	RDX	ND	210	41	ug/kg	
99-65-0	1,3-Dinitrobenzene	ND	210	41	ug/kg	
606-20-2	2,6-Dinitrotoluene	ND	210	74	ug/kg	
121-14-2	2,4-Dinitrotoluene	ND	210	41	ug/kg	
35572-78-2	2-amino-4,6-Dinitrotoluene	ND	210	41	ug/kg	
19406-51-0	4-amino-2,6-Dinitrotoluene	ND	210	45	ug/kg	
98-95-3	Nitrobenzene	ND	210	59	ug/kg	
88-72-2	o-Nitrotoluene	ND	210	64	ug/kg	
99-08-1	m-Nitrotoluene	ND	210	85	ug/kg	
99-99-0	p-Nitrotoluene	ND	210	57	ug/kg	
479-45-8	Tetryl	ND	410	120	ug/kg	
99-35-4	1,3,5-Trinitrobenzene	ND	210	49	ug/kg	
118-96-7	2,4,6-Trinitrotoluene	ND	210	41	ug/kg	
55-63-0	Nitroglycerine	ND [a]	1700	620	ug/kg	
78-11-5	PETN	ND [a]	1700	620	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
610-39-9	3,4-Dinitrotoluene	111%	111%	72-145%

(a) Result is from Run# 2

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: GG023092.D PP021973.D

Form I Copy

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Report of Analysis

3.2.5

Client Sample ID:	49SS04		
Lab Sample ID:	F51154-25	Date Sampled:	07/19/07
Matrix:	SO - Soil	Date Received:	07/19/07
Method:	SW846 8330A SW846 8330B	Percent Solids:	87.5
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GG023092.D	1	08/03/07	NAF	08/01/07	OP21693	GGG991
Run #2	PP021973.D	1	08/03/07	NAF	08/01/07	OP21693	GPP759

	Initial Weight	Final Volume
Run #1	2.12 g	20.0 ml
Run #2	2.12 g	20.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q
2691-41-0	HMX	ND	240	49	ug/kg	
121-82-4	RDX	ND	240	47	ug/kg	
99-65-0	1,3-Dinitrobenzene	ND	240	47	ug/kg	
606-20-2	2,6-Dinitrotoluene	ND	240	84	ug/kg	
121-14-2	2,4-Dinitrotoluene	ND	240	47	ug/kg	
35572-78-2	2-amino-4,6-Dinitrotoluene	ND	240	47	ug/kg	
19406-51-0	4-amino-2,6-Dinitrotoluene	ND	240	51	ug/kg	
98-95-3	Nitrobenzene	ND	240	67	ug/kg	
88-72-2	o-Nitrotoluene	ND	240	73	ug/kg	
99-08-1	m-Nitrotoluene	ND	240	97	ug/kg	
99-99-0	p-Nitrotoluene	ND	240	65	ug/kg	
479-45-8	Tetryl	ND	470	130	ug/kg	
99-35-4	1,3,5-Trinitrobenzene	ND	240	56	ug/kg	
118-96-7	2,4,6-Trinitrotoluene	ND	240	47	ug/kg	
55-63-0	Nitroglycerine	ND [a]	1900	710	ug/kg	
78-11-5	PETN	ND [a]	1900	710	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
610-39-9	3,4-Dinitrotoluene	112%	112%	72-145%

(a) Result is from Run# 2

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: GG023093.D PP021974.D

Run I OA

Accutest Laboratories

Report of Analysis

Client Sample ID:	49SS05		
Lab Sample ID:	F51154-26	Date Sampled:	07/19/07
Matrix:	SO - Soil	Date Received:	07/19/07
Method:	SW846 8330A SW846 8330B	Percent Solids:	85.9
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GG023093.D	1	08/03/07	NAF	08/01/07	OP21693	GGG991
Run #2	PP021974.D	1	08/03/07	NAF	08/01/07	OP21693	GPP759

	Initial Weight	Final Volume
Run #1	2.27 g	20.0 ml
Run #2	2.27 g	20.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q
2691-41-0	HMX	ND	220	46	ug/kg	
121-82-4	RDX	ND	220	44	ug/kg	
99-65-0	1,3-Dinitrobenzene	ND	220	44	ug/kg	
606-20-2	2,6-Dinitrotoluene	ND	220	78	ug/kg	
121-14-2	2,4-Dinitrotoluene	ND	220	44	ug/kg	
35572-78-2	2-amino-4,6-Dinitrotoluene	ND	220	44	ug/kg	
19406-51-0	4-amino-2,6-Dinitrotoluene	ND	220	48	ug/kg	
98-95-3	Nitrobenzene	ND	220	63	ug/kg	
88-72-2	o-Nitrotoluene	ND	220	68	ug/kg	
99-08-1	m-Nitrotoluene	ND	220	91	ug/kg	
99-99-0	p-Nitrotoluene	ND	220	61	ug/kg	
479-45-8	Tetryl	ND	440	120	ug/kg	
99-35-4	1,3,5-Trinitrobenzene	ND	220	52	ug/kg	
118-96-7	2,4,6-Trinitrotoluene	ND	220	44	ug/kg	
55-63-0	Nitroglycerine	ND [a]	1800	660	ug/kg	
78-11-5	PETN	ND [a]	1800	660	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
610-39-9	3,4-Dinitrotoluene	111%	108%	72-145%

(a) Result is from Run# 2

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: GG023094.D PP021975.D

Form I copy

Accutest Laboratories

Report of Analysis

Client Sample ID:	59SS06		
Lab Sample ID:	F51154-27	Date Sampled:	07/19/07
Matrix:	SO - Soil	Date Received:	07/19/07
Method:	SW846 8330A SW846 8330B	Percent Solids:	92.0
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GG023094.D	1	08/03/07	NAF	08/01/07	OP21693	GGG991
Run #2	PP021975.D	1	08/03/07	NAF	08/01/07	OP21693	GPP759

	Initial Weight	Final Volume
Run #1	2.25 g	20.0 ml
Run #2	2.25 g	20.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q
2691-41-0	HMX	ND	220	46	ug/kg	
121-82-4	RDX	ND	220	44	ug/kg	
99-65-0	1,3-Dinitrobenzene	ND	220	44	ug/kg	
606-20-2	2,6-Dinitrotoluene	ND	220	79	ug/kg	
121-14-2	2,4-Dinitrotoluene	ND	220	44	ug/kg	
35572-78-2	2-amino-4,6-Dinitrotoluene	ND	220	44	ug/kg	
19406-51-0	4-amino-2,6-Dinitrotoluene	ND	220	48	ug/kg	
98-95-3	Nitrobenzene	ND	220	63	ug/kg	
88-72-2	o-Nitrotoluene	ND	220	68	ug/kg	
99-08-1	m-Nitrotoluene	ND	220	92	ug/kg	
99-99-0	p-Nitrotoluene	ND	220	61	ug/kg	
479-45-8	Tetryl	ND	440	130	ug/kg	
99-35-4	1,3,5-Trinitrobenzene	ND	220	52	ug/kg	
118-96-7	2,4,6-Trinitrotoluene	ND	220	44	ug/kg	
55-63-0	Nitroglycerine	ND [a]	1800	670	ug/kg	
78-11-5	PETN	ND [a]	1800	670	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
610-39-9	3,4-Dinitrotoluene	114%	116%	72-145%

(a) Result is from Run# 2

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: GG023095.D PP021976.D

Form I Copy

Accutest Laboratories

Report of Analysis

Client Sample ID:	59SS07		
Lab Sample ID:	F51154-28	Date Sampled:	07/19/07
Matrix:	SO - Soil	Date Received:	07/19/07
Method:	SW846 8330A SW846 8330B	Percent Solids:	91.6
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GG023095.D	1	08/03/07	NAF	08/01/07	OP21693	GGG991
Run #2	PP021976.D	1	08/03/07	NAF	08/01/07	OP21693	GPP759

	Initial Weight	Final Volume
Run #1	2.37 g	20.0 ml
Run #2	2.37 g	20.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q
2691-41-0	HMX	ND	210	44	ug/kg	
121-82-4	RDX	ND	210	42	ug/kg	
99-65-0	1,3-Dinitrobenzene	ND	210	42	ug/kg	
606-20-2	2,6-Dinitrotoluene	ND	210	75	ug/kg	
121-14-2	2,4-Dinitrotoluene	ND	210	42	ug/kg	
35572-78-2	2-amino-4,6-Dinitrotoluene	ND	210	42	ug/kg	
19406-51-0	4-amino-2,6-Dinitrotoluene	ND	210	46	ug/kg	
98-95-3	Nitrobenzene	ND	210	60	ug/kg	
88-72-2	o-Nitrotoluene	ND	210	65	ug/kg	
99-08-1	m-Nitrotoluene	ND	210	87	ug/kg	
99-99-0	p-Nitrotoluene	ND	210	58	ug/kg	
479-45-8	Tetryl	ND	420	120	ug/kg	
99-35-4	1,3,5-Trinitrobenzene	ND	210	50	ug/kg	
118-96-7	2,4,6-Trinitrotoluene	ND	210	42	ug/kg	
55-63-0	Nitroglycerine	ND [a]	1700	630	ug/kg	
78-11-5	PETN	ND [a]	1700	630	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
610-39-9	3,4-Dinitrotoluene	119%	118%	72-145%

(a) Result is from Run# 2

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: GG023096.D PP021977.D

Form I CVR

Accutest Laboratories

Report of Analysis

Client Sample ID:	59SS08		
Lab Sample ID:	F51154-29	Date Sampled:	07/19/07
Matrix:	SO - Soil	Date Received:	07/19/07
Method:	SW846 8330A SW846 8330B	Percent Solids:	89.0
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GG023096.D	1	08/03/07	NAF	08/01/07	OP21693	GGG991
Run #2	PP021977.D	1	08/03/07	NAF	08/01/07	OP21693	GPP759

	Initial Weight	Final Volume
Run #1	2.33 g	20.0 ml
Run #2	2.33 g	20.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q
2691-41-0	HMX	ND	210	45	ug/kg	
121-82-4	RDX	ND	210	43	ug/kg	
99-65-0	1,3-Dinitrobenzene	ND	210	43	ug/kg	
606-20-2	2,6-Dinitrotoluene	ND	210	76	ug/kg	
121-14-2	2,4-Dinitrotoluene	ND	210	43	ug/kg	
35572-78-2	2-amino-4,6-Dinitrotoluene	ND	210	43	ug/kg	
19406-51-0	4-amino-2,6-Dinitrotoluene	ND	210	46	ug/kg	
98-95-3	Nitrobenzene	ND	210	61	ug/kg	
88-72-2	o-Nitrotoluene	ND	210	66	ug/kg	
99-08-1	m-Nitrotoluene	ND	210	88	ug/kg	
99-99-0	p-Nitrotoluene	ND	210	59	ug/kg	
479-45-8	Tetryl	ND	430	120	ug/kg	
99-35-4	1,3,5-Trinitrobenzene	ND	210	51	ug/kg	
118-96-7	2,4,6-Trinitrotoluene	ND	210	43	ug/kg	
55-63-0	Nitroglycerine	ND [a]	1700	640	ug/kg	
78-11-5	PETN	ND [a]	1700	640	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
610-39-9	3,4-Dinitrotoluene	106%	102%	72-145%

(a) Result is from Run# 2

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: GG023097.D PP021978.D

Form I OV

Accutest Laboratories

Report of Analysis

Client Sample ID:	59SS09		
Lab Sample ID:	F51154-30	Date Sampled:	07/19/07
Matrix:	SO - Soil	Date Received:	07/19/07
Method:	SW846 8330A SW846 8330B	Percent Solids:	95.1
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GG023097.D	1	08/03/07	NAF	08/01/07	OP21693	GGG991
Run #2	PP021978.D	1	08/03/07	NAF	08/01/07	OP21693	GPP759

	Initial Weight	Final Volume
Run #1	2.16 g	20.0 ml
Run #2	2.16 g	20.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q
2691-41-0	HMX	ND	230	48	ug/kg	
121-82-4	RDX	ND	230	46	ug/kg	
99-65-0	1,3-Dinitrobenzene	ND	230	46	ug/kg	
606-20-2	2,6-Dinitrotoluene	ND	230	82	ug/kg	
121-14-2	2,4-Dinitrotoluene	ND	230	46	ug/kg	
35572-78-2	2-amino-4,6-Dinitrotoluene	ND	230	46	ug/kg	
19406-51-0	4-amino-2,6-Dinitrotoluene	ND	230	50	ug/kg	
98-95-3	Nitrobenzene	ND	230	66	ug/kg	
88-72-2	o-Nitrotoluene	ND	230	71	ug/kg	
99-08-1	m-Nitrotoluene	ND	230	95	ug/kg	
99-99-0	p-Nitrotoluene	ND	230	64	ug/kg	
479-45-8	Tetryl	ND	460	130	ug/kg	
99-35-4	1,3,5-Trinitrobenzene	ND	230	55	ug/kg	
118-96-7	2,4,6-Trinitrotoluene	ND	230	46	ug/kg	
55-63-0	Nitroglycerine	ND [a]	1900	690	ug/kg	
78-11-5	PETN	ND [a]	1900	690	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
610-39-9	3,4-Dinitrotoluene	104%	111%	72-145%

(a) Result is from Run# 2

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: GG023098.D PP021979.D

Form I OP

Accutest Laboratories

Report of Analysis

Client Sample ID:	59SS10		
Lab Sample ID:	F51154-31	Date Sampled:	07/19/07
Matrix:	SO - Soil	Date Received:	07/19/07
Method:	SW846 8330A SW846 8330B	Percent Solids:	95.7
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GG023098.D	1	08/03/07	NAF	08/01/07	OP21693	GGG991
Run #2	PP021979.D	1	08/03/07	NAF	08/01/07	OP21693	GPP759

	Initial Weight	Final Volume
Run #1	2.30 g	20.0 ml
Run #2	2.30 g	20.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q
2691-41-0	HMX	ND	220	45	ug/kg	
121-82-4	RDX	ND	220	43	ug/kg	
99-65-0	1,3-Dinitrobenzene	ND	220	43	ug/kg	
606-20-2	2,6-Dinitrotoluene	ND	220	77	ug/kg	
121-14-2	2,4-Dinitrotoluene	ND	220	43	ug/kg	
35572-78-2	2-amino-4,6-Dinitrotoluene	ND	220	43	ug/kg	
19406-51-0	4-amino-2,6-Dinitrotoluene	ND	220	47	ug/kg	
98-95-3	Nitrobenzene	ND	220	62	ug/kg	
88-72-2	o-Nitrotoluene	ND	220	67	ug/kg	
99-08-1	m-Nitrotoluene	ND	220	90	ug/kg	
99-99-0	p-Nitrotoluene	ND	220	60	ug/kg	
479-45-8	Tetryl	ND	430	120	ug/kg	
99-35-4	1,3,5-Trinitrobenzene	ND	220	51	ug/kg	
118-96-7	2,4,6-Trinitrotoluene	ND	220	43	ug/kg	
55-63-0	Nitroglycerine	ND [a]	1700	650	ug/kg	
78-11-5	PETN	ND [a]	1700	650	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
610-39-9	3,4-Dinitrotoluene	106%	107%	72-145%

(a) Result is from Run# 2

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: GG023101.D PP021982.D

Form I COC

Accutest Laboratories

Report of Analysis

Client Sample ID:	TMSS05		
Lab Sample ID:	F51154-32	Date Sampled:	07/19/07
Matrix:	SO - Soil	Date Received:	07/19/07
Method:	SW846 8330A SW846 8330B	Percent Solids:	86.6
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GG023101.D	1	08/03/07	NAF	08/01/07	OP21693	GGG991
Run #2	PP021982.D	1	08/03/07	NAF	08/01/07	OP21693	GPP759

	Initial Weight	Final Volume
Run #1	2.38 g	20.0 ml
Run #2	2.38 g	20.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q
2691-41-0	HMX	ND	210	44	ug/kg	
121-82-4	RDX	ND	210	42	ug/kg	
99-65-0	1,3-Dinitrobenzene	ND	210	42	ug/kg	
606-20-2	2,6-Dinitrotoluene	ND	210	75	ug/kg	
121-14-2	2,4-Dinitrotoluene	ND	210	42	ug/kg	
35572-78-2	2-amino-4,6-Dinitrotoluene	ND	210	42	ug/kg	
19406-51-0	4-amino-2,6-Dinitrotoluene	ND	210	45	ug/kg	
98-95-3	Nitrobenzene	ND	210	60	ug/kg	
88-72-2	o-Nitrotoluene	ND	210	65	ug/kg	
99-08-1	m-Nitrotoluene	ND	210	87	ug/kg	
99-99-0	p-Nitrotoluene	ND	210	58	ug/kg	
479-45-8	Tetryl	ND	420	120	ug/kg	
99-35-4	1,3,5-Trinitrobenzene	ND	210	50	ug/kg	
118-96-7	2,4,6-Trinitrotoluene	ND	210	42	ug/kg	
55-63-0	Nitroglycerine	ND [a]	1700	630	ug/kg	
78-11-5	PETN	ND [a]	1700	630	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
610-39-9	3,4-Dinitrotoluene	116%	113%	72-145%

(a) Result is from Run# 2

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Shaw Environmental, Inc.
2113 Emmorton Park Road
Edgewood, Maryland
410-612-6350
FAX: 410-612-6351

Shaw® Shaw Environmental, Inc.

MEMORANDUM

TO: Jeff Parks, Shaw E&I RFAAP Project Manager

FROM: Eric Malarek, Shaw E&I RFAAP Project Chemist

SUBJECT: Radford Army Ammunition Plant (RFAAP) Data Validation – Herbicides
Accutest Laboratories, Inc., SDG F51154

DATE: September 25, 2007

The purpose of this memorandum is to present the data validation report for the samples collected at Main Manufacturing Area at RFAAP for a RFI/CMS Nine Sites on July 18, 2007 and July 19, 2007. Aqueous samples were analyzed for chlorinated herbicides using USEPA SW846 Method 3510C/8151A. Solid samples were analyzed for chlorinated herbicides using USEPA SW846 Method 3550B/8151A. A total of five aqueous samples and seventeen solid samples were validated. The sample Ids are:

Field Sample ID	Lab Sample ID	Field Sample ID	Lab Sample ID
41SW08	F51154-6	41SD11	F51154-22
41SW09	F51154-7	49SS02	F51154-23
41SW10	F51154-8	49SS03	F51154-24
41SD08	F51154-9	49SS04	F51154-25
41SD09	F51154-10	49SS05	F51154-26
41SD10	F51154-11	59SS06	F51154-27
LFSD01	F51154-15	59SS07	F51154-28
TMSD01	F51154-16	59SS08	F51154-29
LFSW01	F51154-17	59SS09	F51154-30
APSD01	F51154-18	59SS10	F51154-31
TMSW01	F51154-20	TMSS05	F51154-32

Data were reviewed by Eric Malarek and validated using a combination of project QAPP, *Quality Systems Manual for Environmental Laboratories, Final Version 3, January, 2006* (DoD, 2006) (DoD QSM), method-specific criteria, and laboratory SOP criteria. The data qualifier scheme was consistent with the *Region III Modifications to the National Functional Guidelines for Organic Data Review* (September 1994). Parameters evaluated are presented in **Table 1**. Data associated with parameters in compliance with quality control specifications have not been qualified. Data associated with parameters that did not comply with quality control specifications and directly impacted project data have been qualified in accordance with USEPA Region III specifications.

Table 1 Laboratory Performance Criteria

Qualified		Parameter
Yes	No	
	X	Holding Times
X		Initial Calibration
X		Continuing Calibration
	X	Blank Analysis
	X	System Monitoring Compounds
X		Laboratory Control Sample
	X	Matrix Spike/Spike Duplicate
	X	Field Duplicate
	X	Quantitation Verification

The quality of data collected in support of this sampling activity is considered acceptable with noted qualifications.

Eric Malarek, Chemist

9/25/07
Date

RFAAP VALIDATION REPORT
CHLORINATED HERBICIDES REVIEW
SDG F51154

I-Holding Times

The objective is to ascertain the validity of results based on the holding time of the sample from time of collection to time of sample extraction and analysis. Holding time criteria: For aqueous samples, chlorinated herbicides compounds are shipped cooled (@4°C ± 2°C) with a maximum holding time of 7 days from sample collection to preparative extraction and 40 days from preparative extraction to determinative analysis. For solid samples, chlorinated herbicides compounds are shipped cooled (@4°C ± 2°C) with a maximum holding time of 14 days from sample collection to preparative extraction and 40 days from preparative extraction to determinative analysis.

- Temperature Review: The temperature blank was sent with each cooler and recorded by the laboratory upon receipt. For samples collected on 07/18/07 and 07/19/07, the coolers were received by the primary laboratory (Accutest) on 07/20/07 at 4.0°C, 4.0°C, 4.6°C, 4.6°C, 4.8°C, 5.0°C, 5.0°C, and 5.8°C. The herbicides were subcontracted to Accutest TX and were received the samples at 4.2°C, 4.0°C, and 3.6°C. The perchlorate subcontract laboratory (Datachem Laboratories, Inc.) received the aqueous samples at 3.0°C. The dioxin subcontract laboratory (SGS Paradigm Analytical Laboratories, Inc.) received the samples at 5.5°C and 5.2°C. All criteria were met. No qualifiers were applied.

- Holding Time Review: The aqueous and solid samples were collected on 07/18/07 and 07/19/07. For aqueous samples collected 07/18/07 and 07/19/07, the herbicides were extracted on 07/24/07 and analyzed on 07/25/07. For solid samples collected 07/18/07 and 07/19/07, the herbicides were extracted on 07/24/07 and analyzed on 07/27/07 and 07/28/07. All criteria were met. No qualifiers were applied.

II-Initial Calibration

Compliance requirements for satisfactory instrument calibration are established to ensure that the instrument used is capable of producing acceptable qualitative and quantitative data for semivolatile target compounds. Initial calibration demonstrates that the instrument is capable of acceptable performance in the beginning of the analytical run and of producing a linear calibration curve. The DoD QSM specifies that the percent relative standard deviation (%RSD) for a 5-point standard calibration should be ≤20% for each target compound.

- No initial calibration was provided for MCPP and MCPA on instrument GC-GG. During discussions with the laboratory, they indicated that they perform a daily single point calibration rather than a five point calibration. All samples were non-detect and qualified estimated "UJ" based upon this outlier. Samples 41SW08 (F51154-6), 41SW09 (F51154-7), 41SW10 (F51154-8), LFSW01 (F51154-17), TMSW01 (F51154-20), 41SD08 (F51154-9), 41SD09 (F51154-10), 41SD10 (F51154-11), LFSD01 (F51154-15), TMSD01 (F51154-16), APSD01 (F51154-18), 41SD11 (F51154-22), 49SS02 (F51154-23), 49SS03 (F51154-24), 49SS04 (F51154-25), 49SS05 (F51154-26), 59SS06 (F51154-27), 59SS07 (F51154-28), 59SS08 (F51154-29), 59SS09 (F51154-30), 59SS10 (F51154-31), and TMSS05 (F51154-32) apply to this single point calibration.

- For initial calibration performed on 07/25/07 on instrument GC-GG, all criteria were met for signal #1 and signal #2 for all target compounds, except MCPP and MCPA. No qualifiers were applied. Samples 41SW08 (F51154-6), 41SW09 (F51154-7), 41SW10 (F51154-8), LFSW01 (F51154-17), TMSW01 (F51154-20), 41SD08 (F51154-9), 41SD09 (F51154-10), 41SD10 (F51154-11), LFSD01 (F51154-15), TMSD01 (F51154-16), APSD01 (F51154-18), 41SD11 (F51154-22), 49SS02 (F51154-23), 49SS03 (F51154-24), 49SS04 (F51154-25), 49SS05 (F51154-26), 59SS06 (F51154-27), 59SS07 (F51154-28), 59SS08 (F51154-29), 59SS09 (F51154-30), 59SS10 (F51154-31), and TMSS05 (F51154-32) apply to this initial calibration.

III-Continuing Calibration

Compliance requirements for satisfactory instrument calibration are established to ensure that the instrument used is capable of producing acceptable qualitative and quantitative data for semivolatile target compounds. Continuing calibration establishes the response factors on which the quantitations are based and checks satisfactory performance of the instrument on a day-to-day basis. The DoD QSM specifies that the percent difference (%D) between the initial calibration CF and the continuing calibration CF must be ≤20%.

- A single point calibration was provided for MCPP and MCPA on instrument GC-GG for 07/25/07 run. The calibration standard indicated adequate response for MCPP and MCPA. However, since a five point calibration was not performed, %D calculation could not be verified. All samples were non-detect and qualified estimated "UJ" based upon this outlier. Samples 41SW08 (F51154-6), 41SW09 (F51154-7), 41SW10 (F51154-8), LFSW01 (F51154-17), TMSW01 (F51154-20), 41SD08 (F51154-9), 41SD09 (F51154-10), 41SD10 (F51154-11), LFSD01 (F51154-15), TMSD01 (F51154-16), APSD01 (F51154-18), 41SD11 (F51154-22), 49SS02 (F51154-23), 49SS03 (F51154-24), 49SS04 (F51154-25), 49SS05 (F51154-26), 59SS06 (F51154-27), 59SS07 (F51154-28), 59SS08 (F51154-29), 59SS09 (F51154-30), 59SS10 (F51154-31), and TMSS05 (F51154-32) apply to this single point calibration.

- For continuing calibration performed on 07/25/07 @11:38 on instrument GC-GG, all criteria were met for signal #1 and signal #2 for all target compounds, except MCPP and MCPA. No qualifiers were applied. Samples 41SW08 (F51154-6), 41SW09 (F51154-7), 41SW10 (F51154-8), LFSW01 (F51154-17), and TMSW01 (F51154-20) apply to this continuing calibration.

- For continuing calibration performed on 07/25/07 @17:37 on instrument GC-GG, all criteria were met for signal #1 and signal #2 for all target compounds, except MCPP and MCPA. No qualifiers were applied. No samples reported apply to this continuing calibration.

- For continuing calibration performed on 07/25/07 @19:25 on instrument GC-GG, all criteria were met for signal #1 and signal #2 for all target compounds. No qualifiers were applied. No samples reported apply to this continuing calibration.

- For continuing calibration performed on 07/27/07 @12:05 on instrument GC-GG, all criteria were met for signal #1 and signal #2 for all target compounds, except MCPP and MCPA. No qualifiers were applied. Samples 41SD08 (F51154-9), 41SD09 (F51154-10), 41SD10 (F51154-11), LFSD01 (F51154-15), TMSD01 (F51154-16), APSD01 (F51154-18), 41SD11 (F51154-22), 49SS02 (F51154-23), 49SS03 (F51154-24), and 49SS04 (F51154-25) apply to this continuing calibration.

- For continuing calibration performed on 07/27/07 @18:56 on instrument GC-GG, all criteria were met for signal #1 and signal #2 for all target compounds, except MCPP and MCPA. No qualifiers were applied. Samples 49SS05 (F51154-26), 59SS06 (F51154-27), 59SS07 (F51154-28), 59SS08 (F51154-29), 59SS09 (F51154-30), 59SS10 (F51154-31), and TMSS05 (F51154-32) apply to this continuing calibration.

- For continuing calibration performed on 07/27/07 @23:27 on instrument GC-GG, all criteria were met for signal #1 and signal #2 for all target compounds, except MCPP and MCPA. No qualifiers were applied. Samples 49SS02 (F51154-23), 49SS03 (F51154-24) apply to this continuing calibration.

- For continuing calibration performed on 07/28/07 @02:08 on instrument GC-GG, all criteria were met for signal #1 and signal #2 for all target compounds, except MCPP and MCPA. No qualifiers were applied. No samples reported apply to this continuing calibration.

IV-Blank Analysis

The purpose of blank analyses is to determine the presence and magnitude of contamination problems resulting from field or laboratory activities. No contaminants should be detected in any of the associated blanks. The DoD QSM criterion specifies all concentrations should be less than one-half MRL. Positive sample results are qualified "B" if the concentration of the analyte is ≤ five times (5x) the absolute maximum blank concentration. **Table 2** summarizes the blank contamination analysis. Action levels are based upon dilution factor of one and for solid matrices were converted to soil values (soil conversion factor = 33) if needed. Rinse blank RB083007 (F52208-1) (low-flow pump) applies to the groundwater "GW" samples in this SDG. The surface water "SW" samples were collected directly into the laboratory bottles; therefore, no rinse blank applies for the SW samples. Rinse blanks 072407R (F51275-1) and 072507R (F51300-31) apply to the surface soil "SS" and subsurface soil "SB" samples in this SDG. Rinse blank RB071807 (F51154-12) applies to the sediment "SD" samples in this SDG.

Table 2 Blank Contamination Analysis Summary

Analysis Date	QC Blank ID	Compound	Max Conc. µg/L	Action Level µg/L	B qualified samples
07/25/07	OP7755-MB	All target compounds <½MRL	NA	NA	None
09/10/07	RB083007	All target compounds <½MRL	NA	NA	None
Analysis Date	**QC Blank ID**	**Compound**	**Max Conc. µg/kg**	**Action Level µg/kg**	**B qualified samples**
07/27/07	OP7756-MB	All target compounds <½MRL	NA	NA	None
07/25/07	RB071807	All target compounds <½MRL	NA	NA	None
08/03/07	072407R	All target compounds <½MRL	NA	NA	None
08/03/07	072507R	All target compounds <½MRL	NA	NA	None

V-System Monitoring Compounds (Surrogates)

Laboratory performance on individual samples is established by means of spiking activities. All samples are spiked with surrogate compounds prior to sample preparation. Spike recoveries must be within the specified control limits. DoD surrogate recovery limits are specified in Table D-3 of the DoD QSM (DoD, 2006). If the surrogate is not listed, then the laboratory criteria shall be used.

Aqueous Control Limit: 2,4-DCAA (34-179%)
Solid Control Limit: 2,4-DCAA (34-179%)

- For sample 49SS02 (F51154-23), surrogate 2,4-DCAA was above criteria limits due to double spiking (lab error). The surrogate adjusted (145%) and within criteria. No qualifiers were applied based upon this outlier.

- For sample 49SS03 (F51154-24), surrogate 2,4-DCAA was above criteria limits due to double spiking (lab error). The surrogate adjusted (137%) and within criteria. No qualifiers were applied based upon this outlier.

- For sample 59SS10 (F51154-31), surrogate 2,4-DCAA (338%) was above criteria limits. The sample was non-detect for all target compounds; therefore, no qualifiers were applied based upon this outlier.

- For all other samples, all criteria were met.

VI-Laboratory Control Samples
Data for laboratory control samples (LCS) are generated to determine long-term precision and accuracy of the analytical method. Percent recoveries must be within the specified control limits. DoD QSM aqueous LCS recovery limits are specified in Table D-8 of the DoD QSM (DoD, 2006). DoD QSM solid LCS recovery limits are specified in Table D-2 and Table D-9 of the DoD QSM (DoD, 2006). If the compound is not listed, then the laboratory criteria shall be used.

- Sample OP7755-BS was used as the aqueous LCS for the 07/25/07 run. Dinoseb (98%) was above DoD QSM criteria and within laboratory criteria. All samples were non-detect for dinoseb; therefore, no qualifiers were applied based upon this outlier. All other herbicides were within criteria. No qualifiers were applied. Samples 41SW08 (F51154-6), 41SW09 (F51154-7), 41SW10 (F51154-8), LFSW01 (F51154-17), and TMSW01 (F51154-20) apply to this LCS.

- Sample OP7756-BS was used as the solid LCS for the 07/27/07 run. Dicamba (150%) and dinoseb (55%) were above DoD QSM criteria and/or laboratory criteria. All samples were non-detect for dinoseb; therefore, no qualifiers were applied based upon this outlier. Dicamba was qualified estimated bias high "K" for detects and no qualifier for non-detects based upon the high recovery. All other herbicides were within criteria. No qualifiers were applied. Samples 41SD08 (F51154-9), 41SD09 (F51154-10), 41SD10 (F51154-11), LFSD01 (F51154-15), TMSD01 (F51154-16), APSD01 (F51154-18), 41SD11 (F51154-22), 49SS02 (F51154-23), 49SS03 (F51154-24), 49SS04 (F51154-25), 49SS05 (F51154-26), 59SS06 (F51154-27), 59SS07 (F51154-28), 59SS08 (F51154-29), 59SS09 (F51154-30), 59SS10 (F51154-31), and TMSS05 (F51154-32) apply to this LCS.

VII-Matrix Spike/Matrix Spike Duplicate
Data for matrix spike/matrix spike duplicates (MS/MSD) are generated to determine long-term precision and accuracy of the analytical method on various matrices and to demonstrate acceptable compound recovery by the laboratory at the time of sample analysis. The percent recoveries (%Rs) and the relative percent difference (RPD) must be within the specified control limits. DoD QSM aqueous MS/MSD recovery limits follow the LCS criteria and are specified in Table D-8 of the DoD QSM (DoD, 2006). DoD QSM solid MS/MSD recovery limits follow the LCS criteria and are specified in Table D-2 and Table D-9 of the DoD QSM (DoD, 2006). If the compound is not listed, then the laboratory criteria shall be used.

- Sample LFSW01 (F51154-17) was used for the aqueous MS/MSD analysis on 07/25/07. All criteria were met. No qualifiers were applied. Samples 41SW08 (F51154-6), 41SW09 (F51154-7), 41SW10 (F51154-8), LFSW01 (F51154-17), and TMSW01 (F51154-20) apply to this MS/MSD.

- Sample TMSS05 (F51154-32) was used as the solid MS/MSD for the 07/27/07 run. 2,4-D (142%), 2,4,5-TP (149%; RPD=30%), dinoseb (RPD=40%), and dalapon (147%) were above DoD QSM criteria and/or laboratory criteria. All samples were non-detect for 2,4-D, 2,4,5-TP, dinoseb, and dalapon; therefore, no qualifiers were applied based upon these outliers. All other herbicides were within criteria. No qualifiers were applied. Samples 41SD08 (F51154-9), 41SD09 (F51154-10), 41SD10 (F51154-11), LFSD01 (F51154-15), TMSD01 (F51154-16), APSD01 (F51154-18), 41SD11 (F51154-22), 49SS02 (F51154-23), 49SS03 (F51154-24), 49SS04 (F51154-25), 49SS05 (F51154-26), 59SS06 (F51154-27), 59SS07 (F51154-28), 59SS08 (F51154-29), 59SS09 (F51154-30), 59SS10 (F51154-31), and TMSS05 (F51154-32) apply to this MS/MSD.

VIII-Field Duplicate Sample Analysis
Field duplicates were collected to identify the cumulative precision of the sampling and analytical process and sent to the laboratory blind. The RPD was calculated only for those analytes which were detected at levels exceeding the method reporting limits in both samples of the duplicate pair. Analytes that were qualified because of blank contamination (B-qualified) or were rejected (R-qualified) in either sample of the duplicate pair were excluded from the duplicate assessment. Precision control criterion was established at 50% RPD for the aqueous and solid samples. Analytical results were qualified as estimated (J) for any RPDs exceeding criteria.

- Field surface water sample duplicate pair LFSW01 (F51154-17) and TMSW01 (F51154-20) was collected for chlorinated herbicides. All chlorinated herbicides target compounds were non-detect. All criteria were met. No qualifiers were applied.

- Field surface soil sample duplicate pair 49SS05 (F51154-26) and TMSS05 (F51154-32) was collected for chlorinated herbicides. All chlorinated herbicides target compounds were non-detect. All criteria were met. No qualifiers were applied.

- Field sediment sample duplicate pair LFSD01 (F51154-15) and TMSD01 (F51154-16) was collected for chlorinated herbicides. All chlorinated herbicides target compounds were non-detect. All criteria were met. No qualifiers were applied.

IX-Quantitation Verification
The accuracy of analytical results is verified through the calculation of several parameters. Percent difference (%D) between the calculated value and the reported value must be within 10%. All positive values must have less than or equal to 40% %D between the primary and secondary columns. Any sample value >MDL and <MRL is qualified as estimated, "J." All criteria were met. No qualifiers were applied.

- The %D between the primary and secondary columns was within criteria for all detected chlorinated herbicides.

Sample: LFSW01MS (F51154-17MS), 2,4-DB

Conc. µg/L = (Amt * DF * Vt) / (CF * Vo)

where: Amt = the response on column (ng/mL) of the sample
CF = Calibration Factor (from initial calibration)
Vt = volume of final extract (mL)
DF = dilution factor
Vo = volume of the sample extracted (mL)

Conc. µg/L = (1734556 ng/mL * 1 * 10 mL) / (4558* 1000 mL)
= 3.8 ng/mL = 3.8 µg/L

Reported Conc. = 3.8 µg/L
%D = 0.0%
Values were within 10% difference

Sample: 49SS03 (F51154-24), 2,4-DB

Conc. µg/kg = (Amt * Ve * DF) / (CF * Ws * D)

where: Amt = the response on column (µg/mL) of the sample
CF = Calibration Factor (from initial calibration)
Ve = Final Volume of extract (mL)
DF = Dilution factor
W(s) = Weight of sample in grams.
D = Percent dry weight (100 - % moisture in sample)/100

Conc. µg/kg = (1158430 * 10 * 1) / (4558* 30.0 * 0.920) = 92.1 µg/kg

Reported value = 92.1 µg/kg
%D = 0.0%
Values were within 10% difference.

USEPA Region III Validation Qualifiers

(No Code) = Confirmed identification.

B = The analyte has been detected in the sample and the associated laboratory or field blank.

J = Indicates an estimated value for (1) estimated value due to QC non-conformance. Reported value may not be accurate or precise, (2) estimating a concentration as a tentatively identified compound as indicated by the mass spectral and retention time data, or (3) estimating a concentration ≥ MDL and <MRL or <3*MDL, whichever is greater.

K = Analyte present. Reported value may be biased high (estimated) due to QC non-conformance.

L = Analyte present. Reported value may be biased low (estimated) due to QC non-conformance.

R = Unreliable result. Analyte may or may not be present in the sample due to QC non-conformance.

UL = Value is estimated bias low and not detected due to QC non-conformance. Reporting limit may be inaccurate or imprecise. Quantitation limit is probably higher.

UJ = Value is estimated and not detected due to QC non-conformance. Reporting limit may be inaccurate or imprecise.

Laboratory Qualifiers

(No Code) = Confirmed identification.

A (Dioxins) = MDL is based upon the signal-to-noise measurement.

B (Metals) = The reported value was obtained from a reading <MRL and ≥MDL and is considered estimated.

B (Organics and Dioxins) = The analyte or compound has been detected in the sample and laboratory method blank. It indicates probable blank contamination.

D (Organics) = Indicates sample was analyzed at a dilution.

E (Metals) = Reported value is estimated because of the presence of interferences.

E (Organics) = Identifies compounds whose concentrations exceed the upper level of the calibration range.

E (Dioxins) = Reported value is estimated because of the presence of ether interferences.

EMPC (Dioxins) = The ion-abundance ratio between the two characteristic PCDD/F ions is outside accepted ranges. The detected PCDD/F is reported as an estimated maximum possible concentration (EMPC).

I (Dioxins) = Reported value is estimated because of the incorrect isotope rations were obtained.

J (All) = Indicates an estimated value for (1) estimating a concentration as a tentatively identified compound as indicated by the mass spectral and retention time data, (2) estimating a concentration <MRL and ≥ MDL, or estimating a concentration below the calibration range.

N (Organics) = Indicates presumptive evidence of a compound for tentatively identified compounds using a library search.

N (Metals) = Laboratory spike sample recovery not within control limits.

P (Organics) = Target analyte confirmation >40% difference for detected compound between the primary and secondary columns. The lower of the two values was reported.

U (All) = ND = BQL = Not detected. The associated number indicates the compound reporting limit for the sample.

* (Metals) = Duplicate analysis not within control limits.

* (Organics) = Surrogate outside of QC limits on both original and re-analysis.

Raw Data: GG36347.D

Form I Copy

Accutest Laboratories

Report of Analysis

Client Sample ID:	41SW08		
Lab Sample ID:	F51154-6	Date Sampled:	07/18/07
Matrix:	AQ - Surface Water	Date Received:	07/19/07
Method:	SW846 8151 SW846 3510C	Percent Solids:	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	GG36347.D	1	07/25/07	ATX	07/24/07	T:OP7755	T:GGG1135
Run #2							

	Initial Volume	Final Volume
Run #1	1000 ml	10.0 ml
Run #2		

Herbicide List

CAS No.	Compound	Result	RL	MDL	Units	Q
94-75-7	2,4-D	ND	1.5	0.80	ug/l	
93-72-1	2,4,5-TP (Silvex)	ND	0.20	0.15	ug/l	
93-76-5	2,4,5-T	ND	0.20	0.12	ug/l	
1918-00-9	Dicamba	ND	0.20	0.080	ug/l	
88-85-7	Dinoseb	ND	0.20	0.090	ug/l	
75-99-0	Dalapon	ND	1.0	1.0	ug/l	
120-36-5	Dichloroprop	ND	1.0	0.51	ug/l	
94-82-6	2,4-DB	ND	2.0	1.9	ug/l	
93-65-2	MCPP	ND UJ	50		ug/l	
94-74-6	MCPA	ND UJ	50		ug/l	
87-86-5	Pentachlorophenol	ND	0.050	0.040	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
19719-28-9	2,4-DCAA	105%		34-179%

(a) Analysis performed at Accutest Laboratories, Houston, TX.

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: GC36348.D

For I Cpy

Accutest Laboratories

Report of Analysis

Client Sample ID:	41SW09		
Lab Sample ID:	F51154-7	Date Sampled:	07/18/07
Matrix:	AQ - Surface Water	Date Received:	07/19/07
Method:	SW846 8151 SW846 3510C	Percent Solids:	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	GG36348.D	1	07/25/07	ATX	07/24/07	T:OP7755	T:GGG1135
Run #2							

	Initial Volume	Final Volume
Run #1	1000 ml	10.0 ml
Run #2		

Herbicide List

CAS No.	Compound	Result	RL	MDL	Units	Q
94-75-7	2,4-D	ND	1.5	0.80	ug/l	
93-72-1	2,4,5-TP (Silvex)	ND	0.20	0.15	ug/l	
93-76-5	2,4,5-T	ND	0.20	0.12	ug/l	
1918-00-9	Dicamba	ND	0.20	0.080	ug/l	
88-85-7	Dinoseb	ND	0.20	0.090	ug/l	
75-99-0	Dalapon	ND	1.0	1.0	ug/l	
120-36-5	Dichloroprop	ND	1.0	0.51	ug/l	
94-82-6	2,4-DB	ND	2.0	1.9	ug/l	
93-65-2	MCPP	ND UJ	50		ug/l	
94-74-6	MCPA	ND UJ	50		ug/l	
87-86-5	Pentachlorophenol	ND	0.050	0.040	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
19719-28-9	2,4-DCAA	109%		34-179%

(a) Analysis performed at Accutest Laboratories, Houston, TX.

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: GG36349.D

Form I Org

Accutest Laboratories

Report of Analysis

Client Sample ID:	41SW10		
Lab Sample ID:	F51154-8	Date Sampled:	07/18/07
Matrix:	AQ - Surface Water	Date Received:	07/19/07
Method:	SW846 8151 SW846 3510C	Percent Solids:	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	GG36349.D	1	07/25/07	ATX	07/24/07	T:OP7755	T:GGG1135
Run #2							

	Initial Volume	Final Volume
Run #1	1000 ml	10.0 ml
Run #2		

Herbicide List

CAS No.	Compound	Result	RL	MDL	Units	Q
94-75-7	2,4-D	ND	1.5	0.80	ug/l	
93-72-1	2,4,5-TP (Silvex)	ND	0.20	0.15	ug/l	
93-76-5	2,4,5-T	ND	0.20	0.12	ug/l	
1918-00-9	Dicamba	ND	0.20	0.080	ug/l	
88-85-7	Dinoseb	ND	0.20	0.090	ug/l	
75-99-0	Dalapon	ND	1.0	1.0	ug/l	
120-36-5	Dichloroprop	ND	1.0	0.51	ug/l	
94-82-6	2,4-DB	ND	2.0	1.9	ug/l	
93-65-2	MCPP	ND VJ	50		ug/l	
94-74-6	MCPA	ND VJ	50		ug/l	
87-86-5	Pentachlorophenol	ND	0.050	0.040	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
19719-28-9	2,4-DCAA	104%		34-179%

(a) Analysis performed at Accutest Laboratories, Houston, TX.

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: GG36366.D

Form I Org

Accutest Laboratories

Report of Analysis

Client Sample ID:	41SD08		
Lab Sample ID:	F51154-9	Date Sampled:	07/18/07
Matrix:	SO - Sediment	Date Received:	07/19/07
Method:	SW846 8151 SW846 3550B	Percent Solids:	36.9
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	GG36366.D	1	07/27/07	ATX	07/24/07	T:OP7756	T:GGG1136
Run #2							

	Initial Weight	Final Volume
Run #1	30.0 g	10.0 ml
Run #2		

Herbicide List

CAS No.	Compound	Result	RL	MDL	Units	Q
94-75-7	2,4-D	ND	90	36	ug/kg	
93-72-1	2,4,5-TP (Silvex)	ND	36	32	ug/kg	
93-76-5	2,4,5-T	ND	18	9.0	ug/kg	
1918-00-9	Dicamba	ND	18	14	ug/kg	
88-85-7	Dinoseb	ND	18	12	ug/kg	
75-99-0	Dalapon	ND	90	63	ug/kg	
120-36-5	Dichloroprop	ND	90	24	ug/kg	
94-82-6	2,4-DB	ND	180	150	ug/kg	
93-65-2	MCPP	ND UJ	450		ug/kg	
94-74-6	MCPA	ND UJ	450		ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
19719-28-9	2,4-DCAA	87%		34-179%

(a) Analysis performed at Accutest Laboratories, Houston, TX.

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: GG36367.D

Form I Org

Accutest Laboratories

Report of Analysis

Client Sample ID:	41SD09		
Lab Sample ID:	F51154-10	Date Sampled:	07/18/07
Matrix:	SO - Sediment	Date Received:	07/19/07
Method:	SW846 8151 SW846 3550B	Percent Solids:	82.4
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	GG36367.D	1	07/27/07	ATX	07/24/07	T:OP7756	T:GGG1136
Run #2							

	Initial Weight	Final Volume
Run #1	30.0 g	10.0 ml
Run #2		

Herbicide List

CAS No.	Compound	Result	RL	MDL	Units	Q
94-75-7	2,4-D	ND	40	16	ug/kg	
93-72-1	2,4,5-TP (Silvex)	ND	16	14	ug/kg	
93-76-5	2,4,5-T	ND	8.1	4.0	ug/kg	
1918-00-9	Dicamba	ND	8.1	6.1	ug/kg	
88-85-7	Dinoseb	ND	8.1	5.3	ug/kg	
75-99-0	Dalapon	ND	40	28	ug/kg	
120-36-5	Dichloroprop	ND	40	11	ug/kg	
94-82-6	2,4-DB	ND	81	66	ug/kg	
93-65-2	MCPP	ND UJ	200		ug/kg	
94-74-6	MCPA	ND UJ	200		ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
19719-28-9	2,4-DCAA	85%		34-179%

(a) Analysis performed at Accutest Laboratories, Houston, TX.

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: GG36368.D

For I 00Pz

Accutest Laboratories

Report of Analysis

Client Sample ID:	41SD10		
Lab Sample ID:	F51154-11	Date Sampled:	07/18/07
Matrix:	SO - Sediment	Date Received:	07/19/07
Method:	SW846 8151 SW846 3550B	Percent Solids:	79.2
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	GG36368.D	1	07/27/07	ATX	07/24/07	T:OP7756	T:GGG1136
Run #2							

	Initial Weight	Final Volume
Run #1	30.0 g	10.0 ml
Run #2		

Herbicide List

CAS No.	Compound	Result	RL	MDL	Units	Q
94-75-7	2,4-D	ND	42	17	ug/kg	
93-72-1	2,4,5-TP (Silvex)	ND	17	15	ug/kg	
93-76-5	2,4,5-T	ND	8.4	4.2	ug/kg	
1918-00-9	Dicamba	ND	8.4	6.3	ug/kg	
88-85-7	Dinoseb	ND	8.4	5.5	ug/kg	
75-99-0	Dalapon	ND	42	29	ug/kg	
120-36-5	Dichloroprop	ND	42	11	ug/kg	
94-82-6	2,4-DB	ND	84	69	ug/kg	
93-65-2	MCPP	ND UJ	210		ug/kg	
94-74-6	MCPA	ND UJ	210		ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
19719-28-9	2,4-DCAA	105%		34-179%

(a) Analysis performed at Accutest Laboratories, Houston, TX.

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: GG36369.D

Accutest Laboratories

Report of Analysis

Client Sample ID:	LFSD01		
Lab Sample ID:	F51154-15	Date Sampled:	07/19/07
Matrix:	SO - Sediment	Date Received:	07/19/07
Method:	SW846 8151 SW846 3550B	Percent Solids:	57.9
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	GG36369.D	1	07/27/07	ATX	07/24/07	T:OP7756	T:GGG1136
Run #2							

	Initial Weight	Final Volume
Run #1	30.0 g	10.0 ml
Run #2		

Herbicide List

CAS No.	Compound	Result	RL	MDL	Units	Q
94-75-7	2,4-D	ND	58	23	ug/kg	
93-72-1	2,4,5-TP (Silvex)	ND	23	20	ug/kg	
93-76-5	2,4,5-T	ND	12	5.8	ug/kg	
1918-00-9	Dicamba	ND	12	8.6	ug/kg	
88-85-7	Dinoseb	ND	12	7.5	ug/kg	
75-99-0	Dalapon	ND	58	40	ug/kg	
120-36-5	Dichloroprop	ND	58	16	ug/kg	
94-82-6	2,4-DB	ND	120	94	ug/kg	
93-65-2	MCPP	ND VJ	290		ug/kg	
94-74-6	MCPA	ND VJ	290		ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
19719-28-9	2,4-DCAA	105%		34-179%

(a) Analysis performed at Accutest Laboratories, Houston, TX.

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Form I Copy

Accutest Laboratories

Report of Analysis

Client Sample ID:	TMSD01		
Lab Sample ID:	F51154-16	Date Sampled:	07/19/07
Matrix:	SO - Sediment	Date Received:	07/19/07
Method:	SW846 8151 SW846 3550B	Percent Solids:	65.0
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	GG36370.D	1	07/27/07	ATX	07/24/07	T:OP7756	T:GGG1136
Run #2							

	Initial Weight	Final Volume
Run #1	30.0 g	10.0 ml
Run #2		

Herbicide List

CAS No.	Compound	Result	RL	MDL	Units	Q
94-75-7	2,4-D	ND	51	21	ug/kg	
93-72-1	2,4,5-TP (Silvex)	ND	21	18	ug/kg	
93-76-5	2,4,5-T	ND	10	5.1	ug/kg	
1918-00-9	Dicamba	ND	10	7.7	ug/kg	
88-85-7	Dinoseb	ND	10	6.7	ug/kg	
75-99-0	Dalapon	ND	51	36	ug/kg	
120-36-5	Dichloroprop	ND	51	14	ug/kg	
94-82-6	2,4-DB	ND	100	84	ug/kg	
93-65-2	MCPP	ND UJ	260		ug/kg	
94-74-6	MCPA	ND UJ	260		ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
19719-28-9	2,4-DCAA	62%		34-179%

(a) Analysis performed at Accutest Laboratories, Houston, TX.

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: GG36351.D

For I Cor

Accutest Laboratories

Report of Analysis

Client Sample ID:	LFSW01		
Lab Sample ID:	F51154-17	Date Sampled:	07/19/07
Matrix:	AQ - Surface Water	Date Received:	07/19/07
Method:	SW846 8151 SW846 3510C	Percent Solids:	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	GG36351.D	1	07/25/07	ATX	07/24/07	T:OP7755	T:GGG1135
Run #2							

	Initial Volume	Final Volume
Run #1	1000 ml	10.0 ml
Run #2		

Herbicide List

CAS No.	Compound	Result	RL	MDL	Units	Q
94-75-7	2,4-D	ND	1.5	0.80	ug/l	
93-72-1	2,4,5-TP (Silvex)	ND	0.20	0.15	ug/l	
93-76-5	2,4,5-T	ND	0.20	0.12	ug/l	
1918-00-9	Dicamba	ND	0.20	0.080	ug/l	
88-85-7	Dinoseb	ND	0.20	0.090	ug/l	
75-99-0	Dalapon	ND	1.0	1.0	ug/l	
120-36-5	Dichloroprop	ND	1.0	0.51	ug/l	
94-82-6	2,4-DB	ND	2.0	1.9	ug/l	
93-65-2	MCPP	ND UJ	50		ug/l	
94-74-6	MCPA	ND UJ	50		ug/l	
87-86-5	Pentachlorophenol	ND	0.050	0.040	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
19719-28-9	2,4-DCAA	108%		34-179%

(a) Analysis performed at Accutest Laboratories, Houston, TX.

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: GG36371.D

Form I OR4

Accutest Laboratories

Report of Analysis

Client Sample ID:	APSD01		
Lab Sample ID:	F51154-18	Date Sampled:	07/19/07
Matrix:	SO - Sediment	Date Received:	07/19/07
Method:	SW846 8151 SW846 3550B	Percent Solids:	86.8
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	GG36371.D	1	07/27/07	ATX	07/24/07	T:OP7756	T:GGG1136
Run #2							

	Initial Weight	Final Volume
Run #1	30.0 g	10.0 ml
Run #2		

Herbicide List

CAS No.	Compound	Result	RL	MDL	Units	Q
94-75-7	2,4-D	ND	38	15	ug/kg	
93-72-1	2,4,5-TP (Silvex)	ND	15	13	ug/kg	
93-76-5	2,4,5-T	ND	7.7	3.8	ug/kg	
1918-00-9	Dicamba	14.5 K	7.7	5.8	ug/kg	
88-85-7	Dinoseb	ND	7.7	5.0	ug/kg	
75-99-0	Dalapon	ND	38	27	ug/kg	
120-36-5	Dichloroprop	ND	38	10	ug/kg	
94-82-6	2,4-DB	ND	77	63	ug/kg	
93-65-2	MCPP	ND UJ	190		ug/kg	
94-74-6	MCPA	ND UJ	190		ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
19719-28-9	2,4-DCAA	113%		34-179%

(a) Analysis performed at Accutest Laboratories, Houston, TX.

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: GG36352.D

Form I GC

Accutest Laboratories

Report of Analysis

3.2D
3

Client Sample ID:	TMSW01		
Lab Sample ID:	F51154-20	Date Sampled:	07/19/07
Matrix:	AQ - Surface Water	Date Received:	07/19/07
Method:	SW846 8151 SW846 3510C	Percent Solids:	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	GG36352.D	1	07/25/07	ATX	07/24/07	T:OP7755	T:GGG1135
Run #2							

	Initial Volume	Final Volume
Run #1	1000 ml	10.0 ml
Run #2		

Herbicide List

CAS No.	Compound	Result	RL	MDL	Units	Q
94-75-7	2,4-D	ND	1.5	0.80	ug/l	
93-72-1	2,4,5-TP (Silvex)	ND	0.20	0.15	ug/l	
93-76-5	2,4,5-T	ND	0.20	0.12	ug/l	
1918-00-9	Dicamba	ND	0.20	0.080	ug/l	
88-85-7	Dinoseb	ND	0.20	0.090	ug/l	
75-99-0	Dalapon	ND	1.0	1.0	ug/l	
120-36-5	Dichloroprop	ND	1.0	0.51	ug/l	
94-82-6	2,4-DB	ND	2.0	1.9	ug/l	
93-65-2	MCPP	ND VJ	50		ug/l	
94-74-6	MCPA	ND VJ	50		ug/l	
87-86-5	Pentachlorophenol	ND	0.050	0.040	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
19719-28-9	2,4-DCAA	146%		34-179%

(a) Analysis performed at Accutest Laboratories, Houston, TX.

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Run I 08

Accutest Laboratories

Report of Analysis

Client Sample ID:	41SD11		
Lab Sample ID:	F51154-22	Date Sampled:	07/19/07
Matrix:	SO - Soil	Date Received:	07/19/07
Method:	SW846 8151 SW846 3550B	Percent Solids:	86.8
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	GG36372.D	1	07/27/07	ATX	07/24/07	T:OP7756	T:GGG1136
Run #2							

	Initial Weight	Final Volume
Run #1	30.0 g	10.0 ml
Run #2		

Herbicide List

CAS No.	Compound	Result	RL	MDL	Units	Q
94-75-7	2,4-D	ND	38	15	ug/kg	
93-72-1	2,4,5-TP (Silvex)	ND	15	13	ug/kg	
93-76-5	2,4,5-T	ND	7.7	3.8	ug/kg	
1918-00-9	Dicamba	ND	7.7	5.8	ug/kg	
88-85-7	Dinoseb	ND	7.7	5.0	ug/kg	
75-99-0	Dalapon	ND	38	27	ug/kg	
120-36-5	Dichloroprop	ND	38	10	ug/kg	
94-82-6	2,4-DB	ND	77	63	ug/kg	
93-65-2	MCPP	ND VJ	190		ug/kg	
94-74-6	MCPA	ND VJ	190		ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
19719-28-9	2,4-DCAA	111%		34-179%

(a) Analysis performed at Accutest Laboratories, Houston, TX.

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: GG36387.D

for I OM

Accutest Laboratories

Report of Analysis

Client Sample ID:	49SS02		
Lab Sample ID:	F51154-23	Date Sampled:	07/19/07
Matrix:	SO - Soil	Date Received:	07/19/07
Method:	SW846 8151 SW846 3550B	Percent Solids:	89.6
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	GG36387.D	1	07/28/07	ATX	07/24/07	T:OP7756	T:GGG1136
Run #2							

	Initial Weight	Final Volume
Run #1	30.0 g	10.0 ml
Run #2		

Herbicide List

CAS No.	Compound	Result	RL	MDL	Units	Q
94-75-7	2,4-D	ND	37	15	ug/kg	
93-72-1	2,4,5-TP (Silvex)	ND	15	13	ug/kg	
93-76-5	2,4,5-T	ND	7.4	3.7	ug/kg	
1918-00-9	Dicamba	ND	7.4	5.6	ug/kg	
88-85-7	Dinoseb	ND	7.4	4.8	ug/kg	
75-99-0	Dalapon	ND	37	26	ug/kg	
120-36-5	Dichloroprop	ND	37	10	ug/kg	
94-82-6	2,4-DB	ND	74	61	ug/kg	
93-65-2	MCPP	ND UJ	190		ug/kg	
94-74-6	MCPA	ND UJ	190		ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
19719-28-9	2,4-DCAA	145% [b]		34-179%

(a) Analysis performed at Accutest Laboratories, Houston, TX.
(b) Surrogate was adjusted due to double spiking

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: GG36388.D

For I Cm

Accutest Laboratories

Report of Analysis

3.24

Client Sample ID:	49SS03		
Lab Sample ID:	F51154-24	Date Sampled:	07/19/07
Matrix:	SO - Soil	Date Received:	07/19/07
Method:	SW846 8151 SW846 3550B	Percent Solids:	92.0
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	GG36388.D	1	07/28/07	ATX	07/24/07	T:OP7756	T:GGG1136
Run #2							

	Initial Weight	Final Volume
Run #1	30.0 g	10.0 ml
Run #2		

Herbicide List

CAS No.	Compound	Result	RL	MDL	Units	Q
94-75-7	2,4-D	ND	36	14	ug/kg	
93-72-1	2,4,5-TP (Silvex)	ND	14	13	ug/kg	
93-76-5	2,4,5-T	ND	7.2	3.6	ug/kg	
1918-00-9	Dicamba	ND	7.2	5.4	ug/kg	
88-85-7	Dinoseb	ND	7.2	4.7	ug/kg	
75-99-0	Dalapon	ND	36	25	ug/kg	
120-36-5	Dichloroprop	ND	36	9.8	ug/kg	
94-82-6	2,4-DB	92.1	72	59	ug/kg	
93-65-2	MCPP	ND UJ	180		ug/kg	
94-74-6	MCPA	ND UJ	180		ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
19719-28-9	2,4-DCAA	137% [b]		34-179%

(a) Analysis performed at Accutest Laboratories, Houston, TX.
(b) Surrogate was adjusted due to double spiking.

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: GG36373.D

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Report of Analysis

3.2.5

3

Client Sample ID:	49SS04		
Lab Sample ID:	F51154-25	Date Sampled:	07/19/07
Matrix:	SO - Soil	Date Received:	07/19/07
Method:	SW846 8151 SW846 3550B	Percent Solids:	87.5
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	GG36373.D	1	07/27/07	ATX	07/24/07	T:OP7756	T:GGG1136
Run #2							

	Initial Weight	Final Volume
Run #1	30.0 g	10.0 ml
Run #2		

Herbicide List

CAS No.	Compound	Result	RL	MDL	Units	Q
94-75-7	2,4-D	ND	38	15	ug/kg	
93-72-1	2,4,5-TP (Silvex)	ND	15	13	ug/kg	
93-76-5	2,4,5-T	ND	7.6	3.8	ug/kg	
1918-00-9	Dicamba	ND	7.6	5.7	ug/kg	
88-85-7	Dinoseb	ND	7.6	5.0	ug/kg	
75-99-0	Dalapon	ND	38	27	ug/kg	
120-36-5	Dichloroprop	ND	38	10	ug/kg	
94-82-6	2,4-DB	ND	76	62	ug/kg	
93-65-2	MCPP	ND UJ	190		ug/kg	
94-74-6	MCPA	ND UJ	190		ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
19719-28-9	2,4-DCAA	109%		34-179%

(a) Analysis performed at Accutest Laboratories, Houston, TX.

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: GG36376.D

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Report of Analysis

3.2.6 3

Client Sample ID:	49SS05		
Lab Sample ID:	F51154-26	Date Sampled:	07/19/07
Matrix:	SO - Soil	Date Received:	07/19/07
Method:	SW846 8151 SW846 3550B	Percent Solids:	85.9
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	GG36376.D	1	07/27/07	ATX	07/24/07	T:OP7756	T:GGG1136
Run #2							

	Initial Weight	Final Volume
Run #1	30.0 g	10.0 ml
Run #2		

Herbicide List

CAS No.	Compound	Result	RL	MDL	Units	Q
94-75-7	2,4-D	ND	39	16	ug/kg	
93-72-1	2,4,5-TP (Silvex)	ND	16	14	ug/kg	
93-76-5	2,4,5-T	ND	7.8	3.9	ug/kg	
1918-00-9	Dicamba	ND	7.8	5.8	ug/kg	
88-85-7	Dinoseb	ND	7.8	5.0	ug/kg	
75-99-0	Dalapon	ND	39	27	ug/kg	
120-36-5	Dichloroprop	ND	39	10	ug/kg	
94-82-6	2,4-DB	ND	78	63	ug/kg	
93-65-2	MCPP	ND UJ	190		ug/kg	
94-74-6	MCPA	ND UJ	190		ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
19719-28-9	2,4-DCAA	91%		34-179%

(a) Analysis performed at Accutest Laboratories, Houston, TX.

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Accutest Laboratories

Report of Analysis

Client Sample ID:	59SS06		
Lab Sample ID:	F51154-27	Date Sampled:	07/19/07
Matrix:	SO - Soil	Date Received:	07/19/07
Method:	SW846 8151 SW846 3550B	Percent Solids:	92.0
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	GG36377.D	1	07/27/07	ATX	07/24/07	T:OP7756	T:GGG1136
Run #2							

	Initial Weight	Final Volume
Run #1	30.0 g	10.0 ml
Run #2		

Herbicide List

CAS No.	Compound	Result	RL	MDL	Units	Q
94-75-7	2,4-D	ND	36	14	ug/kg	
93-72-1	2,4,5-TP (Silvex)	ND	14	13	ug/kg	
93-76-5	2,4,5-T	ND	7.2	3.6	ug/kg	
1918-00-9	Dicamba	ND	7.2	5.4	ug/kg	
88-85-7	Dinoseb	ND	7.2	4.7	ug/kg	
75-99-0	Dalapon	ND	36	25	ug/kg	
120-36-5	Dichloroprop	ND	36	9.8	ug/kg	
94-82-6	2,4-DB	ND	72	59	ug/kg	
93-65-2	MCPP	ND UJ	180		ug/kg	
94-74-6	MCPA	ND UJ	180		ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
19719-28-9	2,4-DCAA	151%		34-179%

(a) Analysis performed at Accutest Laboratories, Houston, TX.

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: GG36378.D

Form I copy

Accutest Laboratories

Report of Analysis

Client Sample ID:	59SS07		
Lab Sample ID:	F51154-28	Date Sampled:	07/19/07
Matrix:	SO - Soil	Date Received:	07/19/07
Method:	SW846 8151 SW846 3550B	Percent Solids:	91.6
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	GG36378.D	1	07/27/07	ATX	07/24/07	T:OP7756	T:GGG1136
Run #2							

	Initial Weight	Final Volume
Run #1	30.0 g	10.0 ml
Run #2		

Herbicide List

CAS No.	Compound	Result	RL	MDL	Units	Q
94-75-7	2,4-D	ND	36	15	ug/kg	
93-72-1	2,4,5-TP (Silvex)	ND	15	13	ug/kg	
93-76-5	2,4,5-T	ND	7.3	3.6	ug/kg	
1918-00-9	Dicamba	ND	7.3	5.5	ug/kg	
88-85-7	Dinoseb	ND	7.3	4.7	ug/kg	
75-99-0	Dalapon	ND	36	25	ug/kg	
120-36-5	Dichloroprop	ND	36	9.8	ug/kg	
94-82-6	2,4-DB	ND	73	59	ug/kg	
93-65-2	MCPP	ND UJ	180		ug/kg	
94-74-6	MCPA	ND UJ	180		ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
19719-28-9	2,4-DCAA	143%		34-179%

(a) Analysis performed at Accutest Laboratories, Houston, TX.

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Accutest Laboratories

Report of Analysis

Client Sample ID:	59SS08		
Lab Sample ID:	F51154-29	Date Sampled:	07/19/07
Matrix:	SO - Soil	Date Received:	07/19/07
Method:	SW846 8151 SW846 3550B	Percent Solids:	89.0
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	GG36379.D	1	07/27/07	ATX	07/24/07	T:OP7756	T:GGG1136
Run #2							

	Initial Weight	Final Volume
Run #1	30.0 g	10.0 ml
Run #2		

Herbicide List

CAS No.	Compound	Result	RL	MDL	Units	Q
94-75-7	2,4-D	ND	37	15	ug/kg	
93-72-1	2,4,5-TP (Silvex)	ND	15	13	ug/kg	
93-76-5	2,4,5-T	ND	7.5	3.7	ug/kg	
1918-00-9	Dicamba	ND	7.5	5.6	ug/kg	
88-85-7	Dinoseb	ND	7.5	4.9	ug/kg	
75-99-0	Dalapon	ND	37	26	ug/kg	
120-36-5	Dichloroprop	ND	37	10	ug/kg	
94-82-6	2,4-DB	ND	75	61	ug/kg	
93-65-2	MCPP	ND UJ	190		ug/kg	
94-74-6	MCPA	ND UJ	190		ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
19719-28-9	2,4-DCAA	79%		34-179%

(a) Analysis performed at Accutest Laboratories, Houston, TX.

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: GG36380.D

For 1 only

Accutest Laboratories

Report of Analysis

Client Sample ID:	59SS09		
Lab Sample ID:	F51154-30	Date Sampled:	07/19/07
Matrix:	SO - Soil	Date Received:	07/19/07
Method:	SW846 8151 SW846 3550B	Percent Solids:	95.1
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	GG36380.D	1	07/27/07	ATX	07/24/07	T:OP7756	T:GGG1136
Run #2							

	Initial Weight	Final Volume
Run #1	30.0 g	10.0 ml
Run #2		

Herbicide List

CAS No.	Compound	Result	RL	MDL	Units	Q
94-75-7	2,4-D	ND	35	14	ug/kg	
93-72-1	2,4,5-TP (Silvex)	ND	14	12	ug/kg	
93-76-5	2,4,5-T	ND	7.0	3.5	ug/kg	
1918-00-9	Dicamba	ND	7.0	5.3	ug/kg	
88-85-7	Dinoseb	ND	7.0	4.6	ug/kg	
75-99-0	Dalapon	ND	35	25	ug/kg	
120-36-5	Dichloroprop	ND	35	9.5	ug/kg	
94-82-6	2,4-DB	ND	70	57	ug/kg	
93-65-2	MCPP	ND VJ	180		ug/kg	
94-74-6	MCPA	ND VJ	180		ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
19719-28-9	2,4-DCAA	134%		34-179%

(a) Analysis performed at Accutest Laboratories, Houston, TX.

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: GG36381.D

Form I OR

Accutest Laboratories

Report of Analysis

Client Sample ID:	59SS10		
Lab Sample ID:	F51154-31	Date Sampled:	07/19/07
Matrix:	SO - Soil	Date Received:	07/19/07
Method:	SW846 8151 SW846 3550B	Percent Solids:	95.7
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	GG36381.D	1	07/27/07	ATX	07/24/07	T:OP7756	T:GGG1136
Run #2							

	Initial Weight	Final Volume
Run #1	30.0 g	10.0 ml
Run #2		

Herbicide List

CAS No.	Compound	Result	RL	MDL	Units	Q
94-75-7	2,4-D	ND	35	14	ug/kg	
93-72-1	2,4,5-TP (Silvex)	ND	14	12	ug/kg	
93-76-5	2,4,5-T	ND	7.0	3.5	ug/kg	
1918-00-9	Dicamba	ND	7.0	5.2	ug/kg	
88-85-7	Dinoseb	ND	7.0	4.5	ug/kg	
75-99-0	Dalapon	ND	35	24	ug/kg	
120-36-5	Dichloroprop	ND	35	9.4	ug/kg	
94-82-6	2,4-DB	ND	70	57	ug/kg	
93-65-2	MCPP	ND UJ	170		ug/kg	
94-74-6	MCPA	ND UJ	170		ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
19719-28-9	2,4-DCAA	338% [b]		34-179%

(a) Analysis performed at Accutest Laboratories, Houston, TX.
(b) Outside control limits due to matrix interference.

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: GG36382.D

Form I Copy

Accutest Laboratories

Report of Analysis

Client Sample ID:	TMSS05		
Lab Sample ID:	F51154-32	Date Sampled:	07/19/07
Matrix:	SO - Soil	Date Received:	07/19/07
Method:	SW846 8151 SW846 3550B	Percent Solids:	86.6
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	GG36382.D	1	07/27/07	ATX	07/24/07	T:OP7756	T:GGG1136
Run #2							

	Initial Weight	Final Volume
Run #1	30.0 g	10.0 ml
Run #2		

Herbicide List

CAS No.	Compound	Result		RL	MDL	Units	Q
94-75-7	2,4-D	ND		38	15	ug/kg	
93-72-1	2,4,5-TP (Silvex)	ND		15	13	ug/kg	
93-76-5	2,4,5-T	ND		7.7	3.8	ug/kg	
1918-00-9	Dicamba	ND		7.7	5.8	ug/kg	
88-85-7	Dinoseb	ND		7.7	5.0	ug/kg	
75-99-0	Dalapon	ND		38	27	ug/kg	
120-36-5	Dichloroprop	ND		38	10	ug/kg	
94-82-6	2,4-DB	ND		77	63	ug/kg	
93-65-2	MCPP	ND	UJ	190		ug/kg	
94-74-6	MCPA	ND	UJ	190		ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
19719-28-9	2,4-DCAA	174%		34-179%

(a) Analysis performed at Accutest Laboratories, Houston, TX.

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: GG36350.D

Form I Copy

Accutest Laboratories

Report of Analysis

Client Sample ID:	RB071807		
Lab Sample ID:	F51154-12	Date Sampled:	07/18/07
Matrix:	AQ - Surface Water	Date Received:	07/19/07
Method:	SW846 8151 SW846 3510C	Percent Solids:	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	GG36350.D	1	07/25/07	ATX	07/24/07	T:OP7755	T:GGG1135
Run #2							

	Initial Volume	Final Volume
Run #1	1000 ml	10.0 ml
Run #2		

Herbicide List

CAS No.	Compound	Result	RL	MDL	Units	Q
94-75-7	2,4-D	ND	1.5	0.80	ug/l	
93-72-1	2,4,5-TP (Silvex)	ND	0.20	0.15	ug/l	
93-76-5	2,4,5-T	ND	0.20	0.12	ug/l	
1918-00-9	Dicamba	ND	0.20	0.080	ug/l	
88-85-7	Dinoseb	ND	0.20	0.090	ug/l	
75-99-0	Dalapon	ND	1.0	1.0	ug/l	
120-36-5	Dichloroprop	ND	1.0	0.51	ug/l	
94-82-6	2,4-DB	ND	2.0	1.9	ug/l	
93-65-2	MCPP	ND	50		ug/l	
94-74-6	MCPA	ND	50		ug/l	
87-86-5	Pentachlorophenol	ND	0.050	0.040	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
19719-28-9	2,4-DCAA	92%		34-179%

(a) Analysis performed at Accutest Laboratories, Houston, TX.

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Shaw Environmental, Inc.
2113 Emmorton Park Road
Edgewood, Maryland
410-612-6350
FAX: 410-612-6351

Shaw® Shaw Environmental, Inc.

MEMORANDUM

TO: Jeff Parks, Shaw E&I Radford Army Ammunition Plant (RFAAP) Project Manager

FROM: Eric Malarek, Shaw E&I Project Chemist

SUBJECT: RFAAP Data Validation – TAL Metals
Accutest Laboratories, Inc., SDG F51154

DATE: September 25, 2007

The purpose of this memorandum is to present the data validation report for the samples collected at Main Manufacturing Area at RFAAP for a RFI/CMS Nine Sites on July 18, 2007 and July 19, 2007. Aqueous samples were analyzed for target analyte list (TAL) metals using USEPA SW-846 3010A/6010B for ICP metals and SW-846 7470A for mercury. Solid samples were analyzed for target analyte list (TAL) metals using USEPA SW-846 3050B/6010B for ICP metals and SW-846 7471A for mercury. A total of five aqueous samples and seventeen solid samples were validated. The sample Ids are:

Field Sample ID	Lab Sample ID	Field Sample ID	Lab Sample ID
41SW08	F51154-6	41SD11	F51154-22
41SW09	F51154-7	49SS02	F51154-23
41SW10	F51154-8	49SS03	F51154-24
41SD08	F51154-9	49SS04	F51154-25
41SD09	F51154-10	49SS05	F51154-26
41SD10	F51154-11	59SS06	F51154-27
LFSD01	F51154-15	59SS07	F51154-28
TMSD01	F51154-16	59SS08	F51154-29
LFSW01	F51154-17	59SS09	F51154-30
APSD01	F51154-18	59SS10	F51154-31
TMSW01	F51154-20	TMSS05	F51154-32

Data were reviewed by Eric Malarek and validated using a combination of project QAPP, *Quality Systems Manual for Environmental Laboratories, Final Version 3, January, 2006* (DoD, 2006) (DoD QSM), method-specific criteria, and laboratory SOP criteria. The data qualifier scheme was consistent with the *Region III Modifications to the National Functional Guidelines for Inorganic Data Review* (April, 1993). Parameters evaluated are presented in **Table 1**. Data associated with parameters in compliance with quality control specifications have not been qualified. Data associated with parameters that did not comply with quality control specifications and directly impacted project data have been qualified in accordance with USEPA Region III specifications.

Table 1 Laboratory Performance Criteria

Qualified		Parameter
Yes	No	
	X	Holding Times
X		Initial and Continuing Calibration
X		Blank Analysis
	X	ICP Interference Check Sample (ICS)
	X	Laboratory Control Sample (LCS)
	X	Laboratory Sample Duplicate
X		Matrix Spike and Spike Duplicate
X		ICP Serial Dilution
X		Field Sample Duplicate
X		Quantitation Verification

The quality of data collected in support of this sampling activity is considered acceptable with noted qualifications.

Eric Malarek, Chemist

9/25/07
Date

RFAAP VALIDATION REPORT
METALS REVIEW
SDG F51154

I-Holding Times

The primary objective is to ascertain the validity of results based on the holding time of the sample from time of collection to time of sample analysis. Holding time criteria: For aqueous matrices, the samples are shipped cool @4°C±2°C and preserved to pH<2 with HNO_3 with a maximum holding time is 180 days for ICP metals and 28 days for mercury. For solid matrices, the samples are shipped cool @4°C±2°C with a maximum holding time is 180 days for ICP metals and 28 days for mercury.

- Temperature Review: The temperature blank was sent with each cooler and recorded by the laboratory upon receipt. For samples collected on 07/18/07 and 07/19/07, the coolers were received by the primary laboratory (Accutest) on 07/20/07 at 4.0°C, 4.0°C, 4.6°C, 4.6°C, 4.8°C, 5.0°C, 5.0°C, and 5.8°C. The herbicides were subcontracted to Accutest TX and were received the samples at 4.2°C, 4.0°C, and 3.6°C. The perchlorate subcontract laboratory (Datachem Laboratories, Inc.) received the aqueous samples at 3.0°C. The dioxin subcontract laboratory (SGS Paradigm Analytical Laboratories, Inc.) received the samples at 5.5°C and 5.2°C. All criteria were met. No qualifiers were applied.

- Holding Time Review: Samples were collected 07/18/07 and 07/19/07 for metals analysis. For aqueous samples collected 07/18/07 and 07/19/07, they were digested on 07/26/07 and analyzed on 07/27/07 for ICP metals. For solid samples collected 07/18/07 and 07/19/07, they were digested on 07/25/07 and 07/26/07 and analyzed on 07/25/07, 07/26/07, and 07/27/07 (Mn & Zn) for ICP metals. For aqueous samples collected 07/18/07 and 07/19/07, they were digested on 07/25/07 and analyzed on 07/25/07 for mercury. For solid samples collected 07/18/07 and 07/19/07, they were digested on 07/26/07 and analyzed on 07/26/07 for mercury (two runs). All criteria were met. No qualifiers were applied.

II-Initial and Continuing Calibration

Requirements for satisfactory instrument calibration are established to ensure that the instrument is capable of producing acceptable quantitative data. Initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of the analysis run, and continuing calibration verification documents that the initial calibration is still valid.

ICP:	1- blank (DoD QSM <½ MRL)	Hg:	1 – blank (DoD QSM <½ MRL)
	3 – standards (r≥0.995)		5 – standards (r≥0.995)
	ICV/CCV (90-110%) (DoD QSM 90-110%)		ICV/CCV (80-120%)(DoD QSM ICV 90-110% & CCV 80-120%)
	MRL (70-130%) (DoD QSM 80-120%)		MRL (80-120%) (DoD QSM 80-120%)
	High Std. (95-105%)		High Std. (95-105%)

- The aqueous samples were analyzed for ICP metals on 07/27/07. The solid samples were analyzed for ICP metals on 07/25/07, 07/26/07, and 07/27/07 (Mn & Zn). Mercury was analyzed for the aqueous samples on 07/25/07 with a correlation coefficient of 0.9998. Mercury was analyzed for the solid samples on 07/26/07 with a correlation coefficient of 0.9998. Mercury was analyzed for the solid samples on 07/26/07 (second run) with a correlation coefficient of 0.9991. For 07/26/07 ICP run, zinc (CCV5=110.5%) was outside criteria; however, no samples were bracketed by this CCV for zinc. No qualifiers were applied based upon this outlier. For 07/27/07 ICP run, zinc (CCV14=88.5% and CCV18=89.5%) were outside criteria; however, no samples were bracketed by these CCVs for zinc. No qualifiers were applied based upon these outliers. All other ICV/CCV/High Standard criteria were met for all other metals and runs. **Table 2** summarizes the MRL standard analysis. Samples with concentrations detected less than two times the MRL with out of criteria MRL recovery were qualified.

Table 2 MRL Analysis Summary

Analysis Date	Analysis	MRL (µg/L)	MRL %Recovery	Qualified samples @ <2xMRL	Validation Qualifiers
07/25/07	Hg	1.0	65.0%	41SW08, 41SW09, 41SW10, LFSW01, TMSW01	L, UL
07/26/07	ICP-Al	200	71.0%	41SW08, 41SW09, 41SW10, TMSW01	L, UL
07/26/07	ICP-As	10	121%	None	K
07/26/07	ICP-Pb	10	126%	TMSW01	K
07/26/07	ICP-Se	10	126%	None	K
Analysis Date	**Analysis**	**MRL (mg/kg)**	**MRL %Recovery**	**Qualified samples @ <2xMRL**	**Validation Qualifiers**
07/25/07	ICP-Sb	3.0	32.0%	41SD08, 41SD09, 41SD10, 41SD11, 49SS02, 49SS03, 49SS04, 49SS05, 59SS06, 59SS07, 59SS08, 59SS09, 59SS10, APSD01, LFSD01, TMSD01, TMSS05	L, UL
07/25/07	ICP-As	0.4	123%	None	K
07/25/07	ICP-Pb	5.0	130%	41SD08, 41SD09, 41SD10, 49SS04, 49SS05, 59SS06, 59SS07, 59SS08, 59SS09, 59SS10, TMSS05	K
07/25/07	ICP-Se	5.0	130%; 122%	41SD08, 41SD09, 41SD10, 41SD11, 49SS02, 49SS03, 49SS04, 49SS05, 59SS06, 59SS07, 59SS08, 59SS09, 59SS10, APSD01, LFSD01, TMSD01, TMSS05	K
07/25/07	ICP-Tl	0.50	79.0%	41SD08, 41SD09, 41SD10, 49SS02, 49SS03, 49SS04, 49SS05, 59SS06, 59SS07, 59SS08, 59SS09, 59SS10, APSD01, LFSD01, TMSD01, TMSS05	L, UL
07/27/07	Mn & Zn	0.74 & 1.0	All within criteria	None	None
07/26/07	Hg	0.083	48.0%	41SD08, 41SD09, 41SD10, 41SD11, 49SS02, 49SS04, 49SS05, 59SS06, 59SS07, APSD01, LFSD01, TMSD01	L, UL
07/26/07	Hg	0.083	All within criteria	None	None

III-Blanks

Blanks (preparation and calibration blanks) are assessed to determine the existence and magnitude of contamination problems. No contaminants should be detected (i.e. <MDL) in any of the associated blanks. DoD QSM limits are <½MRL for the method blank and <2*MDL for the calibration blanks. Samples are qualified "B" when they are less than 5x the absolute value of the maximum blank concentration. **Table 3** summarizes the blank contamination analysis. Action levels are based upon dilution factor of one and for solid matrices were converted to soil values (soil conversion factor = 10 for ICP and Hg = 12) if needed. Rinse blank RB083007 (F52208-1) (low-flow pump) applies to the groundwater "GW" samples in this SDG. The surface water "SW" samples were collected directly into the laboratory bottles; therefore, no rinse blank applies for the SW samples. Rinse blanks 072407R (F51275-1) and 072507R (F51300-31) apply to the surface soil "SS" and subsurface soil "SB" samples in this SDG. Rinse blank RB071807 (F51154-12) applies to the sediment "SD" samples in this SDG.

Table 3 Blank Contamination Analysis Summary

Analysis Date	Analysis	QC Blank ID	Max Conc. µg/L	Action Level µg/L	B qualified samples
07/26/07	Aluminum	ICB/CCBs	39.0J	195	41SW09, TMSW01
07/26/07	Antimony	ICB/CCBs	7.3	36.5	None
07/26/07	Copper	ICB/CCBs	1.9J	9.5	41SW10
07/26/07	Iron	ICB/CCBs	30.7J	154	41SW08, 41SW10
07/26/07	Magnesium	ICB/CCBs	10.5J	52.5	None
07/26/07	Nickel	ICB/CCBs	4.2J	21.0	41SW08, 41SW10
07/26/07	Potassium	ICB/CCBs	1740J	8700	41SW08, 41SW09, 41SW10, LFSW01, TMSW01
07/26/07	Selenium	ICB/CCBs	5.4J	27.0	None
07/26/07	Sodium	ICB/CCBs	2080J	10400	None
07/26/07	Thallium	ICB/CCBs	9.2J	46.0	None
07/25/07	Mercury	ICB/CCBs	0.19J	0.95	None
07/25/07	Mercury	MP12560-MB	<2*MDL	NA	None
07/27/07	Iron	MP12581-MB	25.7J	129	41SW08, 41SW10
07/27/07	Potassium	MP12581-MB	1700J	8500	41SW08, 41SW09, 41SW10, LFSW01, TMSW01
07/27/07	Sodium	MP12581-MB	2020J	10100	None
09/17/07	Potassium	RB083007	1740J	8700	41SW08, 41SW09, 41SW10, LFSW01, TMSW01
09/17/07	Sodium	RB083007	1860J	9300	None
09/05/07	Mercury	RB083007	<2*MDL	NA	None
Analysis Date	**Analysis**	**QC Blank ID**	**Max Conc. mg/kg**	**Action Level mg/kg**	**B qualified samples**
07/25/07	Antimony	ICB/CCBs	0.62	3.1	41SD09, 41SD10, 41SD11, 49SS02, 49SS03, 49SS04, 49SS05, 59SS06, 59SS07, 59SS08, 59SS09, 59SS10, APSD01, LFSD01, TMSD01, TMSS05
07/25/07	Copper	ICB/CCBs	0.22J	1.1	None
07/25/07	Lead	ICB/CCBs	0.43J	2.2	None
07/25/07	Nickel	ICB/CCBs	0.76J	3.8	None
07/25/07	Potassium	ICB/CCBs	171J	855	41SD08, 41SD09, 41SD10, 49SS02, 49SS03, 49SS05, 59SS06, 59SS07, 59SS09, 59SS10, LFSD01, TMSD01, TMSS05
07/25/07	Selenium	ICB/CCBs	0.52J	2.6	41SD08, 41SD10, 59SS09
07/25/07	Sodium	ICB/CCBs	190J	950	41SD08, 41SD09, 41SD10, 49SS02, 49SS03, 59SS06, 59SS07, 59SS08, 59SS10, APSD01, LFSD01, TMSD01
07/25/07	Thallium	ICB/CCBs	0.59J	3.0	41SD11
07/25/07	Zinc	ICB/CCBs	0.27J	1.4	None
07/27/07	Mn & Zn	ICB/CCBs	<2*MDL	NA	None
07/26/07	Mercury	ICB/CCBs	<2*MDL	NA	None
07/26/07	Mercury	ICB/CCBs	0.0208J	0.10	41SD08, 41SD09, 41SD10, 41SD11, 49SS04, 49SS05, 59SS06, 59SS07, APSD01, LFSD01, TMSD01
07/25/07	Lead	MP12567-MB	0.25J	1.3	None
07/25/07	Potassium	MP12567-MB	85.1J	426	59SS09
07/25/07	Sodium	MP12567-MB	112	560	41SD08, 41SD09, 41SD10, 49SS02, 49SS03, 59SS06, 59SS07, 59SS08, APSD01, LFSD01, TMSD01
07/25/07	Thallium	MP12567-MB	0.61J	3.1	41SD11
07/26/07	Mercury	MP12573-MB	0.016	0.080	41SD08, 41SD09, 41SD10, 41SD11, 49SS04, 49SS05, 59SS06, 59SS07, APSD01, LFSD01, TMSD01
07/26/07	Mercury	MP12574-MB	<2*MDL	NA	None
07/26/07	Copper	MP12577-MB	0.14J	0.70	None
07/26/07	Potassium	MP12577-MB	83.8J	419	59SS10
07/26/07	Sodium	MP12577-MB	113J	565	59SS10
07/26/07	Thallium	MP12577-MB	0.51J	2.6	None

Table 3 Blank Contamination Analysis Summary, Continued

Analysis Date	Analysis	QC Blank ID	Max Conc. mg/kg	Action Level mg/kg	B qualified samples
07/27/07	Potassium	RB071807	177J	885	41SD08, 41SD09, 41SD10, 41SD11, LFSD01, TMSD01
07/27/07	Sodium	RB071807	206J	1030	41SD08, 41SD09, 41SD10, APSD01, LFSD01, TMSD01
07/27/07	Zinc	RB071807	0.19J	0.95	None
07/25/07	Mercury	RB071807	<2*MDL	NA	None
07/31/07	Lead	072407R	0.21J	1.1	None
07/31/07	Magnesium	072407R	0.53J	2.7	None
07/31/07	Potassium	072407R	176J	880	49SS02, 49SS03, 49SS05, 59SS06, 59SS07, 59SS09, 59SS10, TMSS05
07/28/07	Sodium	072407R	192J	960	49SS02, 49SS03, 59SS06, 59SS07, 59SS08, 59SS10
07/28/07	Mercury	072407R	<2*MDL	NA	None
07/28/07	Potassium	072507R	177J	885	49SS02, 49SS03, 49SS05, 59SS06, 59SS07, 59SS09, 59SS10, TMSS05
07/28/07	Sodium	072507R	213J	1065	49SS02, 49SS03, 59SS06, 59SS07, 59SS08, 59SS10
07/28/07	Mercury	072507R	<2*MDL	NA	None

J = Estimated value <MRL and >MDL. Data point qualified was estimated "J".

IV-ICP Interference Check Sample (ICS)

The ICP interference check sample (ICS) verifies interelement and background correction factors. ICP Interference Check is performed at the beginning and end of each sample analysis run. Control limits are 80-120% (DoD QSM limits 80-120%).

- All criteria were met. No qualifiers were applied.

V-Laboratory Control Samples (LCS)

The laboratory control sample (LCS) serves as a monitor of the overall performance of each step during the analysis, including the sample preparation. All aqueous LCS results must fall within the control limits. The DoD QSM aqueous LCS recovery limits are specified in Table D-18 of the DoD QSM (DoD, 2006). The DoD QSM solid LCS recovery limits are specified in Table D-19 of the DoD QSM (DoD, 2006). If the compound is not listed, then the laboratory criteria shall be used.

- Sample MP12581-BS was used as aqueous LCS for ICP metals analysis on 07/26/07. All criteria were met. No qualifiers were applied. Samples 41SW08 (F51154-6), 41SW09 (F51154-7), 41SW10 (F51154-8), LFSW01 (F51154-17), and TMSW01 (F51154-20) apply to this LCS.

- Sample MP12567-BS was used as solid LCS for ICP metals analysis on 07/25/07. All criteria were met. No qualifiers were applied. Samples 41SD08 (F51154-9), 41SD09 (F51154-10), 41SD10 (F51154-11), LFSD01 (F51154-15), TMSD01 (F51154-16), APSD01 (F51154-18), 41SD11 (F51154-22), 49SS02 (F51154-23), 49SS03 (F51154-24), 49SS04 (F51154-25), 49SS05 (F51154-26), 59SS06 (F51154-27), 59SS07 (F51154-28), 59SS08 (F51154-29), and 59SS09 (F51154-30) apply to this LCS.

- Sample MP12577-BS was used as solid LCS for ICP metals analysis on 07/26/07. All criteria were met. No qualifiers were applied. Samples 59SS10 (F51154-31) and TMSS05 (F51154-32) apply to this LCS.

- Sample MP12560-BS was used as aqueous LCS for mercury analysis performed on 07/25/07. All criteria were met. No qualifiers were applied. Samples 41SW08 (F51154-6), 41SW09 (F51154-7), 41SW10 (F51154-8), LFSW01 (F51154-17), and TMSW01 (F51154-20) apply to this LCS.

- Sample MP12573-BS was used as solid LCS for mercury analysis on 07/26/07. All criteria were met. No qualifiers were applied. Samples 41SD08 (F51154-9), 41SD09 (F51154-10), 41SD10 (F51154-11), LFSD01 (F51154-15), TMSD01 (F51154-16), APSD01 (F51154-18), 41SD11 (F51154-22), 49SS02 (F51154-23), 49SS03 (F51154-24), 49SS04 (F51154-25), 49SS05 (F51154-26), 59SS06 (F51154-27), and 59SS07 (F51154-28) apply to this LCS.

- Sample MP12574-BS was used as solid LCS for mercury analysis on 07/26/07. All criteria were met. No qualifiers were applied. Samples 59SS08 (F51154-29), 59SS09 (F51154-30), 59SS10 (F51154-31), and TMSS05 (F51154-32) apply to this LCS.

VI-Laboratory Duplicate Sample Analysis

Duplicate sample determinations are used to demonstrate acceptable method precision by the laboratory at the time of analysis. Duplicate analyses are also performed to generate data in order to determine the long-term precision of the analytical method on various matrices. RPDs must be within established control limits. DoD QSM limits for metals are 20% RPD for ICP metals and mercury.

- Sample LFSW01 (F51154-17) was used as aqueous laboratory duplicate for ICP metals analysis on 07/27/07. Chromium (200%), manganese (23.7%), nickel (200%), and vanadium (200%) were above criteria. Chromium, manganese, nickel, and vanadium were outside due to low sample concentrations (i.e. <MRL); therefore, no qualifiers were applied based upon this outlier. All other metals were within criteria. No qualifiers were applied. Samples 41SW08 (F51154-6), 41SW09 (F51154-7), 41SW10 (F51154-8), LFSW01 (F51154-17), and TMSW01 (F51154-20) apply to this laboratory duplicate.

- Sample F51150-6 was used as soil laboratory duplicate for ICP metals analysis on 07/25/07. This sample is not a RFAAP site sample; therefore, it was not evaluated. Samples 41SD08 (F51154-9), 41SD09 (F51154-10), 41SD10 (F51154-11), LFSD01 (F51154-15), TMSD01 (F51154-16), APSD01 (F51154-18), 41SD11 (F51154-22), 49SS02 (F51154-23), 49SS03 (F51154-24), 49SS04 (F51154-25), 49SS05 (F51154-26), 59SS06 (F51154-27), 59SS07 (F51154-28), 59SS08 (F51154-29), and 59SS09 (F51154-30) apply to this laboratory duplicate.

- Sample 59SS10 (F51154-31) was used as solid laboratory duplicate for ICP metals analysis on 07/26/07. Silver (200%) was above criteria. Silver was outside due to low sample concentrations (i.e. <MRL); therefore, no qualifiers were applied based upon this outlier. All other metals were within criteria. No qualifiers were applied. Samples 59SS10 (F51154-31) and TMSS05 (F51154-32) apply to this laboratory duplicate.

- Sample LFSW01 (F51154-17) was used as aqueous laboratory duplicate for mercury analysis on 06/25/07. All criteria were met. No qualifiers were applied. Samples 41SW08 (F51154-6), 41SW09 (F51154-7), 41SW10 (F51154-8), LFSW01 (F51154-17), and TMSW01 (F51154-20) apply to this laboratory duplicate.

- Sample F51240-2 was used as soil laboratory duplicate for mercury analysis on 07/26/07. This sample is not a RFAAP site sample; therefore, it was not evaluated. Samples 41SD08 (F51154-9), 41SD09 (F51154-10), 41SD10 (F51154-11), LFSD01 (F51154-15), TMSD01 (F51154-16), APSD01 (F51154-18), 41SD11 (F51154-22), 49SS02 (F51154-23), 49SS03 (F51154-24), 49SS04 (F51154-25), 49SS05 (F51154-26), 59SS06 (F51154-27), and 59SS07 (F51154-28) apply to this laboratory duplicate.

- Sample 59SS08 (F51154-29) was used as solid laboratory duplicate for mercury analysis on 07/26/07. All criteria were met. No qualifiers were applied. Samples 59SS08 (F51154-29), 59SS09 (F51154-30), 59SS10 (F51154-31), and TMSS05 (F51154-32) apply to this laboratory duplicate.

VII-Matrix Spike/Spike Duplicate

MS/MSD are generated to determine long-term precision and accuracy of the analytical method on various matrices and to demonstrate acceptable compound recovery by the laboratory at the time of sample analysis. Specific criteria include the analyses of matrix spike and matrix spike duplicate samples at a frequency of one MS and MSD per 20 samples of similar matrix. MS and MSD recoveries and relative percent differences between MS and MSD recoveries should be within the specified limits. DoD QSM aqueous MS/MSD recovery limits follow the LCS criteria and are specified in Table D-18 of the DoD QSM (DoD, 2006). DoD QSM solid MS/MSD recovery limits follow the LCS criteria and are specified in Table D-19 of the DoD QSM (DoD, 2006). If the compound is not listed, then the laboratory criteria shall be used. Post digestion spikes limits are 75-125% for ICP metals and mercury.

- Sample LFSW01 (F51154-17) was used as aqueous laboratory MS/MSD for ICP metals analysis on 07/27/07. All criteria were met. No qualifiers were applied. Samples 41SW08 (F51154-6), 41SW09 (F51154-7), 41SW10 (F51154-8), LFSW01 (F51154-17), and TMSW01 (F51154-20) apply to this MS/MSD.

- Sample F51150-6 was used as laboratory solid MS/MSD for ICP metals analysis on 07/25/07. This sample is not a RFAAP site sample; therefore, it was not evaluated. Samples 41SD08 (F51154-9), 41SD09 (F51154-10), 41SD10 (F51154-11), LFSD01 (F51154-15), TMSD01 (F51154-16), APSD01 (F51154-18), 41SD11 (F51154-22), 49SS02 (F51154-23), 49SS03 (F51154-24), 49SS04 (F51154-25), 49SS05 (F51154-26), 59SS06 (F51154-27), 59SS07 (F51154-28), 59SS08 (F51154-29), and 59SS09 (F51154-30) apply to this MS/MSD.

- Sample 59SS10 (F51154-31) was used as solid laboratory MS/MSD for ICP metals analysis on 07/26/07. Aluminum (138%), antimony (17.5%, 12.5%; RPD=31.0%), arsenic (78.4%, 74.5%), cadmium (78.9%), calcium (79.6%), chromium (55.5%, 64.1%), iron (33.9%), manganese (-23%, 1064%; RPD=57.1%), nickel (79.3%), potassium (78.8%, 79.6%), selenium (77.3%, 71.8%), silver (78.9%), sodium (79.7%), thallium (75.9%), and vanadium (75.0%, 75.3%) were outside criteria. The sample concentration was >4 times the spike added for iron and manganese; therefore, no qualifiers were applied based upon these outliers. Antimony, arsenic, cadmium, calcium, chromium, nickel, potassium, selenium, silver, sodium, thallium, and vanadium were qualified bias low "L" for detects and "UL" for non-detects based upon the low recoveries. Aluminum was qualified bias high "K" for detects and no qualifier for non-detects based upon the high recovery. All other metals were within criteria. Samples 59SS10 (F51154-31) and TMSS05 (F51154-32) apply to this MS/MSD.

- Sample LFSW01 (F51154-17) was used as laboratory aqueous MS/MSD for mercury analysis on 06/25/07. All criteria were met. No qualifiers were applied. Samples 41SW08 (F51154-6), 41SW09 (F51154-7), 41SW10 (F51154-8), LFSW01 (F51154-17), and TMSW01 (F51154-20) apply to this MS/MSD.

- Sample F51240-2 was used as solid MS/MSD for mercury analysis on 07/26/07. This sample is not a RFAAP site sample; therefore, it was not evaluated. Samples 41SD08 (F51154-9), 41SD09 (F51154-10), 41SD10 (F51154-11), LFSD01 (F51154-15), TMSD01 (F51154-16), APSD01 (F51154-18), 41SD11 (F51154-22), 49SS02 (F51154-23), 49SS03 (F51154-24), 49SS04 (F51154-25), 49SS05 (F51154-26), 59SS06 (F51154-27), and 59SS07 (F51154-28) apply to this MS/MSD.

- Sample 59SS08 (F51154-29) was used as solid MS/MSD for mercury analysis on 07/26/07. All criteria were met. No qualifiers were applied. Samples 59SS08 (F51154-29), 59SS09 (F51154-30), 59SS10 (F51154-31), and TMSS05 (F51154-32) apply to this MS/MSD.

VIII-ICP Serial Dilution
An ICP serial dilution is performed to determine whether significant physical or chemical interferences exist due to sample matrix at high concentrations. An analysis of a 5-fold dilution should agree within 10% difference of the original result when the concentration in sample is a factor of 50 above MDL.

- The serial dilution for ICP metals was analyzed on 07/27/07 using aqueous sample LFSW01 (F51154-17). Lead (100%), potassium (147%), sodium (29.7%), and zinc (100%) were outside of criteria limits. Sample concentrations were <50 times MDL for lead, sodium, and zinc; therefore, no qualifiers were applied based upon these outliers. For potassium, all detects were qualified estimated "J" and non-detects no qualifier based upon this outlier. Samples 41SW08 (F51154-6), 41SW09 (F51154-7), 41SW10 (F51154-8), LFSW01 (F51154-17), and TMSW01 (F51154-20) apply to this serial dilution.

- The serial dilution for total ICP metals was analyzed using solid sample F51150-6 on 07/25/07. This sample is not a RFAAP site sample; therefore, it was not evaluated. Samples 41SD08 (F51154-9), 41SD09 (F51154-10), 41SD10 (F51154-11), LFSD01 (F51154-15), TMSD01 (F51154-16), APSD01 (F51154-18), 41SD11 (F51154-22), 49SS02 (F51154-23), 49SS03 (F51154-24), 49SS04 (F51154-25), 49SS05 (F51154-26), 59SS06 (F51154-27), 59SS07 (F51154-28), 59SS08 (F51154-29), and 59SS09 (F51154-30) apply to this serial dilution.

- The serial dilution for ICP metals was analyzed on 07/26/07 using solid sample 59SS10 (F51154-31). Antimony (100%), arsenic (15.2%), beryllium (17.9%), calcium (15.4%), chromium (13.5%), cobalt (16.4%), iron (14.5%), lead (19.0%), magnesium (14.3%), manganese (16.5%), nickel (13.5%), potassium (83.6%), selenium (24.4%), sodium (532%), vanadium (11.8%), and zinc (15.6%) were outside of criteria limits. Sample concentrations were <50 times MDL for antimony, beryllium, selenium, and sodium; therefore, no qualifiers were applied based upon these outliers. For arsenic, calcium, chromium, cobalt, iron, lead, magnesium, manganese, nickel, potassium, vanadium, and zinc, all detects were qualified estimated "J" and non-detects no qualifier based upon these outliers. Samples 59SS10 (F51154-31) and TMSS05 (F51154-32) apply to this serial dilution.

- The serial dilution for mercury was analyzed using aqueous sample LFSW01 (F51154-17) on 07/25/07. All criteria were met. No qualifiers were applied. Samples 41SW08 (F51154-6), 41SW09 (F51154-7), 41SW10 (F51154-8), LFSW01 (F51154-17), and TMSW01 (F51154-20) apply to this serial dilution.

- The serial dilution for mercury was analyzed using solid sample F51240-2 on 07/26/07. This sample is not a RFAAP site sample; therefore, it was not evaluated. Samples 41SD08 (F51154-9), 41SD09 (F51154-10), 41SD10 (F51154-11), LFSD01 (F51154-15), TMSD01 (F51154-16), APSD01 (F51154-18), 41SD11 (F51154-22), 49SS02 (F51154-23), 49SS03 (F51154-24), 49SS04 (F51154-25), 49SS05 (F51154-26), 59SS06 (F51154-27), and 59SS07 (F51154-28) apply to this serial dilution.

- The serial dilution for mercury was analyzed using solid sample 59SS08 (F51154-29) on 07/26/07. Mercury (34.5%) was above criteria. Sample concentration was <50 times MDL for mercury; therefore, no qualifiers were applied based upon this outlier. Samples 59SS08 (F51154-29), 59SS09 (F51154-30), 59SS10 (F51154-31), and TMSS05 (F51154-32) apply to this serial dilution.

IX-Field Duplicate Sample Analysis

Field duplicates were collected to identify the cumulative precision of the sampling and analytical process and sent to the laboratory blind. The RPD was calculated only for those analytes which were detected at levels exceeding the method reporting limits in both samples of the duplicate pair. Analytes that were rejected (R-qualified) in either sample of the duplicate pair were excluded from the duplicate assessment. Precision control criterion was established at 35% RPD for the aqueous and solid samples. Analytical results were qualified as estimated (J) for any RPDs exceeding criteria.

- Field surface water sample duplicate pair LFSW01 (F51154-17) and TMSW01 (F51154-20) was collected for TAL metals. All detected TAL metals found in the sample and its duplicate pair and associated %RPD are noted in **Table 4**. All other TAL metals target compounds were non-detect. Manganese (86.2%) and zinc (69.5%) were above criteria due to low concentration levels detected below the MRL. Manganese and zinc were qualified estimated "J" for the original and duplicate pair samples based upon these outliers. For all other metals, all criteria were met.

Table 4 Field Precision Hits Analysis Summary for TAL Metals for Duplicate Pair LFSW01 (F51154-17) and TMSW01 (F51154-20)

Compound	Original Sample (µg/L)	Duplicate Pair (µg/L)	%RPD
Aluminum	18.0U	50.7J	NA
Lead	3.4U	3.4J	NA
Magnesium	30100	30900	2.6
Manganese	3.3J	8.3J	86.2
Potassium	4320J	4450J	3.0
Sodium	24100	24800	2.9
Barium	103J	108J	4.7
Chromium	0.6U	0.99J	NA
Zinc	7.6J	15.7J	69.5
Calcium	79600	81600	2.5

J = Estimated value <MRL and >MDL. Data point qualified was estimated "J".
U = Non-detect as <MDL.
NA = Not Applicable

- Field sediment sample duplicate pair LFSD01 (F51154-15) and TMSD01 (F51154-16) was collected for TAL metals. All detected TAL metals found in the sample and its duplicate pair and associated %RPD are noted in **Table 5**. All other TAL metals target compounds were non-detect. Barium (49.3%) was above criteria probably due to sample non-homogeneity. Mercury (51.2%) was above criteria due to low concentration levels detected below the MRL. Barium and mercury were qualified estimated "J" for the original and duplicate pair samples based upon these outliers. For all other metals, all criteria were met.

Table 5 Field Precision Hits Analysis Summary for TAL Metals for Duplicate Pair LFSD01 (F51154-15) and TMSD01 (F51154-16)

Compound	Original Sample (mg/kg)	Duplicate Pair (mg/kg)	%RPD
Aluminum	10100	8710	14.8
Iron	29000	23200	22.2
Lead	195	143	30.8
Magnesium	2970	2910	2.0
Nickel	11.7	9.7	18.7
Potassium	1180	996	16.9
Silver	0.076U	0.081J	NA
Sodium	222J	200J	10.4
Antimony	1.8J	1.3J	32.3
Arsenic	3.4	2.9	15.9
Barium	167	101	49.3
Beryllium	1.1	0.94	15.7
Chromium	24.9	18.5	29.5
Cobalt	11.8	9.1	25.8
Copper	22.1	19.9	10.5
Vanadium	28	22	24.0
Calcium	2480	3100	22.2
Selenium	9.6	7.5	24.6
Manganese	1600	1190	29.4
Zinc	682	512	28.5
Mercury	0.076J	0.045J	51.2

J = Estimated value <MRL and >MDL. Data point qualified was estimated "J".
U = Non-detect as <MDL.
NA = Not Applicable

- Field surface soil sample duplicate pair 49SS05 (F51154-26) and TMSS05 (F51154-32) was collected for TAL metals. All detected TAL metals found in the sample and its duplicate pair and associated %RPD are noted in **Table 6**. All other TAL metals target compounds were non-detect. All criteria were met. No qualifiers were applied.

Table 6 Field Precision Hits Analysis Summary for TAL Metals for Duplicate Pair 49SS05 (F51154-26) and TMSS05 (F51154-32)

Compound	Original Sample (mg/kg)	Duplicate Pair (mg/kg)	%RPD
Aluminum	15500	15900	2.6
Iron	17900	18300	2.2
Lead	20.5	20.3	1.0
Magnesium	863	872	1.0
Nickel	7.4	7.9	6.5
Potassium	776	791	1.9
Antimony	0.73J	0.89J	19.8
Arsenic	3.2	3.5	9.0
Barium	69.8	67.0	4.1
Beryllium	0.61	0.59	3.3
Chromium	14.9	17.6	16.6
Cobalt	3.7	4.0	7.8
Copper	12.8	13.0	1.6
Vanadium	37.7	37.6	0.3
Zinc	44.5	46.2	3.8
Calcium	1450	1420	2.1
Selenium	6.4	6.6	3.1
Manganese	358	356	0.6
Mercury	0.072J	0.093J	25.5

J = Estimated value <MRL and >MDL. Data point qualified was estimated "J".

X-Quantitation Verification
The accuracy of analytical results is verified through the calculation of several parameters. The percent difference (%D) between the calculated and the reported values should be within 10%. Any sample value >MDL and <MRL or <3*MDL (whichever is greater) was qualified as estimated, "J." The following calculations were performed for verification.

ICP Sample: 41SW08 (F51154-6), Barium

Conc. (µg/L) = (conc. µg/L) *(Final Volume mL) * (DF) / (Volume Sample mL)

Conc. (µg/L) = (64.9 µg/L)*(50 mL)*(1) / (50 mL) = 64.9 µg/L

Reported concentration = 64.9 µg/L
%D = 0.0%
Values were within 10% difference.

CVAA Sample: LFSW01MS (F51154-17MS), Mercury

Conc. (µg/L) = (conc. µg/L) *(Final Volume mL) * (DF) / (Volume Sample mL)

Conc. (µg/L) = (2.95 µg/L)*(50 mL)*(1) / (50 mL) = 3.0 µg/L

Reported concentration = 3.0 µg/L
%D = 0.0%.
Values were within 10% difference.

ICP Sample: 41SD08 (F51154-9), Barium

Conc. (mg/kg) = {(conc. µg/L)*(Final Volume L)*(DF)} / {(Weight Sample g)*(Fraction Solids)}

Conc. (mg/kg) = {(985.6 µg/L)*(0.050 L)*(1)} / {(1.00 g)*(0.3690)} = 134 µg/g = 134 mg/kg

Reported concentration = 134 mg/kg
%D = 0.0%
Values were within 10% difference.

Hg Sample: 41SD08 (F51154-9), Mercury

Conc. (mg/kg) = {(conc. µg/L)*(Final Volume L)*(DF)} / {(Weight Sample g)*(Fraction Solids)}

Conc. (mg/kg) = {(0.471 µg/L)*(0.050 L)*(1)} / {(0.63 g)*(0.3690)} = 0.10 µg/g = 0.10 mg/kg

Reported concentration = 0.10 mg/kg
%D = 0.0%
Values were within 10% difference.

USEPA Region III Validation Qualifiers

(No Code) = Confirmed identification.

B = The analyte has been detected in the sample and the associated laboratory or field blank.

J = Indicates an estimated value for (1) estimated value due to QC non-conformance. Reported value may not be accurate or precise, (2) estimating a concentration as a tentatively identified compound as indicated by the mass spectral and retention time data, or (3) estimating a concentration ≥MDL and <MRL or <3*MDL, whichever is greater.

K = Analyte present. Reported value may be biased high (estimated) due to QC non-conformance.

L = Analyte present. Reported value may be biased low (estimated) due to QC non-conformance.

R = Unreliable result. Analyte may or may not be present in the sample due to QC non-conformance.

UL = Value is estimated bias low and not detected due to QC non-conformance. Reporting limit may be inaccurate or imprecise. Quantitation limit is probably higher.

UJ = Value is estimated and not detected due to QC non-conformance. Reporting limit may be inaccurate or imprecise.

Laboratory Qualifiers

(No Code) = Confirmed identification.

U = Not detected. The associated number indicates the compound reporting limit for the sample.

A (Dioxins) = B (Metals) = The reported value was obtained from a reading <MRL and ≥MDL and is considered estimated.

B (Organics) = The analyte or compound has been detected in the sample and laboratory method blank. It indicates probable blank contamination.

E (Metals) = Reported value is estimated because of the presence of interferences.

E (Organics) = Identifies compounds whose concentrations exceed the upper level of the calibration range.

D = Indicates sample was analyzed at a dilution.

EMPC (Dioxins) = The ion-abundance ratio between the two characteristic PCDD/PCDF ions was outside accepted ranges. The detected PCDD/PCDF was reported as an estimated maximum possible concentration (EMPC).

J = Indicates an estimated value for (1) estimating a concentration as a tentatively identified compound as indicated by the mass spectral and retention time data, or (2) estimating a concentration <MRL and ≥ MDL.

N (Organics) = Indicates presumptive evidence of a compound for tentatively identified compounds using a library search.

P (Organics) = Target analyte confirmation >40% difference for detected compound between the primary and secondary columns. The lower of the two values was reported.

N (Metals) = Laboratory spike sample recovery not within control limits.

* (Metals) = Duplicate analysis not within control limits.

* (Organics) = Surrogate outside of QC limits on both original and re-analysis.

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Report of Analysis

Client Sample ID:	41SW08		
Lab Sample ID:	F51154-6	Date Sampled:	07/18/07
Matrix:	AQ - Surface Water	Date Received:	07/19/07
		Percent Solids:	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

Metals Analysis

Analyte	Result	RL	MDL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Aluminum	208 L	200	18	ug/l	1	07/26/07	07/27/07	RS	SW846 6010B [2]	SW846 3010A [4]
Antimony	3.4 U	6.0	3.4	ug/l	1	07/26/07	07/27/07	RS	SW846 6010B [2]	SW846 3010A [4]
Arsenic	2.8 U	10	2.8	ug/l	1	07/26/07	07/27/07	RS	SW846 6010B [2]	SW846 3010A [4]
Barium	64.9 J J	200	5.0	ug/l	1	07/26/07	07/27/07	RS	SW846 6010B [2]	SW846 3010A [4]
Beryllium	1.0 U	4.0	1.0	ug/l	1	07/26/07	07/27/07	RS	SW846 6010B [2]	SW846 3010A [4]
Cadmium	1.0 U	5.0	1.0	ug/l	1	07/26/07	07/27/07	RS	SW846 6010B [2]	SW846 3010A [4]
Calcium	50100	1000	42	ug/l	1	07/26/07	07/27/07	RS	SW846 6010B [2]	SW846 3010A [4]
Chromium	0.60 U	10	0.60	ug/l	1	07/26/07	07/27/07	RS	SW846 6010B [2]	SW846 3010A [4]
Cobalt	1.0 U	50	1.0	ug/l	1	07/26/07	07/27/07	RS	SW846 6010B [2]	SW846 3010A [4]
Copper	1.0 U	25	1.0	ug/l	1	07/26/07	07/27/07	RS	SW846 6010B [2]	SW846 3010A [4]
Iron	88.1 J B	300	15	ug/l	1	07/26/07	07/27/07	RS	SW846 6010B [2]	SW846 3010A [4]
Lead [a]	3.4 U	10	3.4	ug/l	1	07/26/07	07/27/07	RS	SW846 6010B [2]	SW846 3010A [4]
Magnesium	23800	5000	4.3	ug/l	1	07/26/07	07/27/07	RS	SW846 6010B [2]	SW846 3010A [4]
Manganese	61.9	15	1.5	ug/l	1	07/26/07	07/27/07	RS	SW846 6010B [2]	SW846 3010A [4]
Mercury	0.10 U UL	1.0	0.10	ug/l	1	07/25/07	07/25/07	MS	SW846 7470A [1]	SW846 7470A [3]
Nickel	1.2 J B	40	1.0	ug/l	1	07/26/07	07/27/07	RS	SW846 6010B [2]	SW846 3010A [4]
Potassium	4300 J B	10000	100	ug/l	1	07/26/07	07/27/07	RS	SW846 6010B [2]	SW846 3010A [4]
Selenium	2.8 U	10	2.8	ug/l	1	07/26/07	07/27/07	RS	SW846 6010B [2]	SW846 3010A [4]
Silver	0.90 U	10	0.90	ug/l	1	07/26/07	07/27/07	RS	SW846 6010B [2]	SW846 3010A [4]
Sodium	14300	10000	500	ug/l	1	07/26/07	07/27/07	RS	SW846 6010B [2]	SW846 3010A [4]
Thallium	2.9 U	10	2.9	ug/l	1	07/26/07	07/27/07	RS	SW846 6010B [2]	SW846 3010A [4]
Vanadium	1.1 J J	50	1.1	ug/l	1	07/26/07	07/27/07	RS	SW846 6010B [2]	SW846 3010A [4]
Zinc	5.5 J J	20	1.6	ug/l	1	07/26/07	07/27/07	RS	SW846 6010B [2]	SW846 3010A [4]

(1) Instrument QC Batch: MA5873
(2) Instrument QC Batch: MA5878
(3) Prep QC Batch: MP12560
(4) Prep QC Batch: MP12581

(a) Elevated RL/MDL due to CRIA exceeding acceptance criteria.

RL = Reporting Limit
MDL = Method Detection Limit

U = Indicates a result < MDL
J = Indicates a result >= MDL but < RL

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Accutest Laboratories

Report of Analysis

Client Sample ID:	41SW09		
Lab Sample ID:	F51154-7	Date Sampled:	07/18/07
Matrix:	AQ - Surface Water	Date Received:	07/19/07
		Percent Solids:	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

Metals Analysis

Analyte	Result	RL	MDL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Aluminum	170 J B	200	18	ug/l	1	07/26/07	07/27/07	RS	SW846 6010B [2]	SW846 3010A [4]
Antimony	3.4 U	6.0	3.4	ug/l	1	07/26/07	07/27/07	RS	SW846 6010B [2]	SW846 3010A [4]
Arsenic	2.8 U	10	2.8	ug/l	1	07/26/07	07/27/07	RS	SW846 6010B [2]	SW846 3010A [4]
Barium	62.6 J J	200	5.0	ug/l	1	07/26/07	07/27/07	RS	SW846 6010B [2]	SW846 3010A [4]
Beryllium	1.0 U	4.0	1.0	ug/l	1	07/26/07	07/27/07	RS	SW846 6010B [2]	SW846 3010A [4]
Cadmium	1.0 U	5.0	1.0	ug/l	1	07/26/07	07/27/07	RS	SW846 6010B [2]	SW846 3010A [4]
Calcium	52700	1000	42	ug/l	1	07/26/07	07/27/07	RS	SW846 6010B [2]	SW846 3010A [4]
Chromium	0.60 U	10	0.60	ug/l	1	07/26/07	07/27/07	RS	SW846 6010B [2]	SW846 3010A [4]
Cobalt	1.0 U	50	1.0	ug/l	1	07/26/07	07/27/07	RS	SW846 6010B [2]	SW846 3010A [4]
Copper	1.0 U	25	1.0	ug/l	1	07/26/07	07/27/07	RS	SW846 6010B [2]	SW846 3010A [4]
Iron	15 U	300	15	ug/l	1	07/26/07	07/27/07	RS	SW846 6010B [2]	SW846 3010A [4]
Lead [a]	3.4 U	10	3.4	ug/l	1	07/26/07	07/27/07	RS	SW846 6010B [2]	SW846 3010A [4]
Magnesium	28100	5000	4.3	ug/l	1	07/26/07	07/27/07	RS	SW846 6010B [2]	SW846 3010A [4]
Manganese	21.1	15	1.5	ug/l	1	07/26/07	07/27/07	RS	SW846 6010B [2]	SW846 3010A [4]
Mercury	0.10 U UL	1.0	0.10	ug/l	1	07/25/07	07/25/07	MS	SW846 7470A [1]	SW846 7470A [3]
Nickel	1.0 U	40	1.0	ug/l	1	07/26/07	07/27/07	RS	SW846 6010B [2]	SW846 3010A [4]
Potassium	4020 J B	10000	100	ug/l	1	07/26/07	07/27/07	RS	SW846 6010B [2]	SW846 3010A [4]
Selenium	2.8 U	10	2.8	ug/l	1	07/26/07	07/27/07	RS	SW846 6010B [2]	SW846 3010A [4]
Silver	0.90 U	10	0.90	ug/l	1	07/26/07	07/27/07	RS	SW846 6010B [2]	SW846 3010A [4]
Sodium	15900	10000	500	ug/l	1	07/26/07	07/27/07	RS	SW846 6010B [2]	SW846 3010A [4]
Thallium	2.9 U	10	2.9	ug/l	1	07/26/07	07/27/07	RS	SW846 6010B [2]	SW846 3010A [4]
Vanadium	1.4 J J	50	1.1	ug/l	1	07/26/07	07/27/07	RS	SW846 6010B [2]	SW846 3010A [4]
Zinc	6.7 J J	20	1.6	ug/l	1	07/26/07	07/27/07	RS	SW846 6010B [2]	SW846 3010A [4]

(1) Instrument QC Batch: MA5873
(2) Instrument QC Batch: MA5878
(3) Prep QC Batch: MP12560
(4) Prep QC Batch: MP12581

(a) Elevated RL/MDL due to CRIA exceeding acceptance criteria.

RL = Reporting Limit
MDL = Method Detection Limit

U = Indicates a result < MDL
J = Indicates a result >= MDL but < RL

Form I Only

Accutest Laboratories

Report of Analysis

Client Sample ID:	41SW10		
Lab Sample ID:	F51154-8	Date Sampled:	07/18/07
Matrix:	AQ - Surface Water	Date Received:	07/19/07
		Percent Solids:	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

Metals Analysis

Analyte	Result	RL	MDL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Aluminum	235 L	200	18	ug/l	1	07/26/07	07/27/07	RS	SW846 6010B [2]	SW846 3010A [4]
Antimony	3.4 U	6.0	3.4	ug/l	1	07/26/07	07/27/07	RS	SW846 6010B [2]	SW846 3010A [4]
Arsenic	2.8 U	10	2.8	ug/l	1	07/26/07	07/27/07	RS	SW846 6010B [2]	SW846 3010A [4]
Barium	63.3 J J	200	5.0	ug/l	1	07/26/07	07/27/07	RS	SW846 6010B [2]	SW846 3010A [4]
Beryllium	1.0 U	4.0	1.0	ug/l	1	07/26/07	07/27/07	RS	SW846 6010B [2]	SW846 3010A [4]
Cadmium	1.0 U	5.0	1.0	ug/l	1	07/26/07	07/27/07	RS	SW846 6010B [2]	SW846 3010A [4]
Calcium	53000	1000	42	ug/l	1	07/26/07	07/27/07	RS	SW846 6010B [2]	SW846 3010A [4]
Chromium	0.60 U	10	0.60	ug/l	1	07/26/07	07/27/07	RS	SW846 6010B [2]	SW846 3010A [4]
Cobalt	1.0 U	50	1.0	ug/l	1	07/26/07	07/27/07	RS	SW846 6010B [2]	SW846 3010A [4]
Copper	1.2 J B	25	1.0	ug/l	1	07/26/07	07/27/07	RS	SW846 6010B [2]	SW846 3010A [4]
Iron	52.7 J B	300	15	ug/l	1	07/26/07	07/27/07	RS	SW846 6010B [2]	SW846 3010A [4]
Lead [a]	3.4 U	10	3.4	ug/l	1	07/26/07	07/27/07	RS	SW846 6010B [2]	SW846 3010A [4]
Magnesium	30200	5000	4.3	ug/l	1	07/26/07	07/27/07	RS	SW846 6010B [2]	SW846 3010A [4]
Manganese	39.5	15	1.5	ug/l	1	07/26/07	07/27/07	RS	SW846 6010B [2]	SW846 3010A [4]
Mercury	0.10 U UL	1.0	0.10	ug/l	1	07/25/07	07/25/07	MS	SW846 7470A [1]	SW846 7470A [3]
Nickel	1.1 J B	40	1.0	ug/l	1	07/26/07	07/27/07	RS	SW846 6010B [2]	SW846 3010A [4]
Potassium	4060 J B	10000	100	ug/l	1	07/26/07	07/27/07	RS	SW846 6010B [2]	SW846 3010A [4]
Selenium	2.8 U	10	2.8	ug/l	1	07/26/07	07/27/07	RS	SW846 6010B [2]	SW846 3010A [4]
Silver	0.90 U	10	0.90	ug/l	1	07/26/07	07/27/07	RS	SW846 6010B [2]	SW846 3010A [4]
Sodium	16600	10000	500	ug/l	1	07/26/07	07/27/07	RS	SW846 6010B [2]	SW846 3010A [4]
Thallium	2.9 U	10	2.9	ug/l	1	07/26/07	07/27/07	RS	SW846 6010B [2]	SW846 3010A [4]
Vanadium	1.3 J J	50	1.1	ug/l	1	07/26/07	07/27/07	RS	SW846 6010B [2]	SW846 3010A [4]
Zinc	2.6 J J	20	1.6	ug/l	1	07/26/07	07/27/07	RS	SW846 6010B [2]	SW846 3010A [4]

(1) Instrument QC Batch: MA5873
(2) Instrument QC Batch: MA5878
(3) Prep QC Batch: MP12560
(4) Prep QC Batch: MP12581

(a) Elevated RL/MDL due to CRIA exceeding acceptance criteria.

RL = Reporting Limit
MDL = Method Detection Limit

U = Indicates a result < MDL
J = Indicates a result >= MDL but < RL

Form I Copy

Accutest Laboratories

Report of Analysis

Client Sample ID:	41SD08		
Lab Sample ID:	F51154-9	Date Sampled:	07/18/07
Matrix:	SO - Sediment	Date Received:	07/19/07
		Percent Solids:	36.9
Project:	WPA 019 Field Investigation; Radford AAP, VA		

Metals Analysis

Analyte	Result	RL	MDL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Aluminum	13300	27	3.0	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [3]
Antimony	0.72 U VL	8.1	0.72	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [3]
Arsenic	5.2	1.1	0.53	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [3]
Barium	134	27	0.68	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [3]
Beryllium	0.88	0.68	0.14	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [3]
Cadmium	0.14 U	0.54	0.14	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [3]
Calcium	25600	680	7.7	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [3]
Chromium	15.5	1.4	0.12	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [3]
Cobalt	10.4	6.8	0.14	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [3]
Copper	24.8	3.4	0.12	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [3]
Iron	18200	14	1.6	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [3]
Lead	20.1 K	14	0.27	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [3]
Magnesium	6440	680	1.0	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [3]
Manganese	299	2.0	0.081	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [3]
Mercury	0.10 J B	0.22	0.017	mg/kg	1	07/26/07	07/26/07	MS	SW846 7471A [2]	SW846 7471A [4]
Nickel	17.7	5.4	0.14	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [3]
Potassium	1890 B	1400	14	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [3]
Selenium	3.3 J B	14	0.27	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [3]
Silver	0.12 U	1.4	0.12	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [3]
Sodium	475 J B	1400	110	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [3]
Thallium [a]	1.2 U VL	5.6	1.2	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [3]
Vanadium	23.3	6.8	0.081	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [3]
Zinc	89.5	2.7	0.18	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [3]

(1) Instrument QC Batch: MA5875
(2) Instrument QC Batch: MA5877
(3) Prep QC Batch: MP12567
(4) Prep QC Batch: MP12573

(a) Elevated RL/MDL due to negative bias of Method Blank.

RL = Reporting Limit
MDL = Method Detection Limit

U = Indicates a result < MDL
J = Indicates a result >= MDL but < RL

Form I Copy

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Report of Analysis

Client Sample ID:	41SD09		
Lab Sample ID:	F51154-10	Date Sampled:	07/18/07
Matrix:	SO - Sediment	Date Received:	07/19/07
		Percent Solids:	82.4
Project:	WPA 019 Field Investigation; Radford AAP, VA		

Metals Analysis

Analyte	Result	RL	MDL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Aluminum	10000	12	1.3	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [4]
Antimony	1.4 J B	3.5	0.31	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [4]
Arsenic	5.9	0.46	0.23	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [4]
Barium	102	12	0.29	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [4]
Beryllium	0.76	0.29	0.058	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [4]
Cadmium [a]	0.58 U	1.2	0.58	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [4]
Calcium	5590	290	3.3	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [4]
Chromium	13.6	0.58	0.052	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [4]
Cobalt	13.4	2.9	0.058	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [4]
Copper	20.0	1.4	0.052	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [4]
Iron	24900	5.8	0.69	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [4]
Lead	10.4 K	5.8	0.12	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [4]
Magnesium	4900	290	0.43	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [4]
Manganese	854	4.3	0.17	mg/kg	5	07/25/07	07/26/07	RS	SW846 6010B [3]	SW846 3050B [4]
Mercury	0.030 J B	0.091	0.0072	mg/kg	1	07/26/07	07/26/07	MS	SW846 7471A [2]	SW846 7471A [5]
Nickel	24.0	2.3	0.058	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [4]
Potassium	939 B	580	5.8	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [4]
Selenium	7.7 K	5.8	0.12	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [4]
Silver	0.052 U	0.58	0.052	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [4]
Sodium	173 J B	580	48	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [4]
Thallium [b]	0.52 U VL	2.3	0.52	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [4]
Vanadium	15.4	2.9	0.035	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [4]
Zinc	81.5	1.2	0.075	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [4]

(1) Instrument QC Batch: MA5875
(2) Instrument QC Batch: MA5877
(3) Instrument QC Batch: MA5878
(4) Prep QC Batch: MP12567
(5) Prep QC Batch: MP12573

(a) Elevated reporting limit(s) due to matrix interference.
(b) Elevated RL/MDL due to negative bias of Method Blank.

RL = Reporting Limit
MDL = Method Detection Limit

U = Indicates a result < MDL
J = Indicates a result >= MDL but < RL

Form I OR

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Report of Analysis

3-11

Client Sample ID:	41SD10		
Lab Sample ID:	F51154-11	Date Sampled:	07/18/07
Matrix:	SO - Sediment	Date Received:	07/19/07
		Percent Solids:	79.2
Project:	WPA 019 Field Investigation; Radford AAP, VA		

Metals Analysis

Analyte	Result	RL	MDL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Aluminum	6170	13	1.4	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [4]
Antimony	0.50 J B	3.8	0.33	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [4]
Arsenic	3.7	0.51	0.25	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [4]
Barium	63.0	13	0.32	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [4]
Beryllium	0.54	0.32	0.063	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [4]
Cadmium	0.063 U	0.25	0.063	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [4]
Calcium	10200	320	3.6	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [4]
Chromium	9.6	0.63	0.057	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [4]
Cobalt	6.9	3.2	0.063	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [4]
Copper	12.7	1.6	0.057	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [4]
Iron	12500	6.3	0.76	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [4]
Lead	15.4 K	6.3	0.13	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [4]
Magnesium	3680	320	0.47	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [4]
Manganese	547	4.7	0.19	mg/kg	5	07/25/07	07/26/07	RS	SW846 6010B [3]	SW846 3050B [4]
Mercury	0.027 J B	0.093	0.0074	mg/kg	1	07/26/07	07/26/07	MS	SW846 7471A [2]	SW846 7471A [5]
Nickel	10.0	2.5	0.063	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [4]
Potassium	731 B	630	6.3	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [4]
Selenium	2.9 J B	6.3	0.13	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [4]
Silver	0.072 J J	0.63	0.057	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [4]
Sodium	199 J B	630	52	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [4]
Thallium [a]	0.60 U VL	2.5	0.60	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [4]
Vanadium	12.1	3.2	0.038	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [4]
Zinc	57.9	1.3	0.082	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [4]

(1) Instrument QC Batch: MA5875
(2) Instrument QC Batch: MA5877
(3) Instrument QC Batch: MA5878
(4) Prep QC Batch: MP12567
(5) Prep QC Batch: MP12573

(a) Elevated RL/MDL due to negative bias of Method Blank.

RL = Reporting Limit
MDL = Method Detection Limit

U = Indicates a result < MDL
J = Indicates a result >= MDL but < RL

for I only

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Report of Analysis

Client Sample ID:	LFSD01		
Lab Sample ID:	F51154-15	Date Sampled:	07/19/07
Matrix:	SO - Sediment	Date Received:	07/19/07
		Percent Solids:	57.9
Project:	WPA 019 Field Investigation; Radford AAP, VA		

Metals Analysis

Analyte	Result	RL	MDL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Aluminum	10100	17	1.9	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [5]
Antimony	1.8 J B	5.1	0.45	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [5]
Arsenic	3.4	0.68	0.33	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [5]
Barium	167 J	17	0.42	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [5]
Beryllium	1.1	0.42	0.085	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [5]
Cadmium	0.085 U	0.34	0.085	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [5]
Calcium	2480	420	4.8	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [5]
Chromium	24.9	0.85	0.076	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [5]
Cobalt	11.8	4.2	0.085	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [5]
Copper	22.1	2.1	0.076	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [5]
Iron	29000	8.5	1.0	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [5]
Lead	195	8.5	0.17	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [5]
Magnesium	2970	420	0.63	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [5]
Manganese	1600	6.3	0.25	mg/kg	5	07/25/07	07/26/07	RS	SW846 6010B [3]	SW846 3050B [5]
Mercury	0.076 J B	0.14	0.012	mg/kg	1	07/26/07	07/26/07	MS	SW846 7471A [2]	SW846 7471A [6]
Nickel	11.7	3.4	0.085	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [5]
Potassium	1180 B	850	8.5	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [5]
Selenium	9.6 K	8.5	0.17	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [5]
Silver	0.076 U	0.85	0.076	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [5]
Sodium	222 J B	850	70	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [5]
Thallium [a]	7.6 U VL	17	7.6	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [5]
Vanadium	28.0	4.2	0.051	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [5]
Zinc	682	8.5	0.55	mg/kg	5	07/25/07	07/27/07	RS	SW846 6010B [4]	SW846 3050B [5]

(1) Instrument QC Batch: MA5875
(2) Instrument QC Batch: MA5877
(3) Instrument QC Batch: MA5878
(4) Instrument QC Batch: MA5883
(5) Prep QC Batch: MP12567
(6) Prep QC Batch: MP12573

(a) Elevated reporting limit(s) due to matrix interference.

RL = Reporting Limit
MDL = Method Detection Limit

U = Indicates a result < MDL
J = Indicates a result > = MDL but < RL

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Report of Analysis

Client Sample ID:	TMSD01		
Lab Sample ID:	F51154-16	Date Sampled:	07/19/07
Matrix:	SO - Sediment	Date Received:	07/19/07
		Percent Solids:	65.0
Project:	WPA 019 Field Investigation; Radford AAP, VA		

Metals Analysis

Analyte	Result	RL	MDL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Aluminum	8710	15	1.6	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [5]
Antimony	1.3 J B	4.4	0.39	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [5]
Arsenic	2.9	0.59	0.29	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [5]
Barium	101 J	15	0.37	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [5]
Beryllium	0.94	0.37	0.073	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [5]
Cadmium	0.073 U	0.29	0.073	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [5]
Calcium	3100	370	4.2	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [5]
Chromium	18.5	0.73	0.066	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [5]
Cobalt	9.1	3.7	0.073	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [5]
Copper	19.9	1.8	0.066	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [5]
Iron	23200	7.3	0.88	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [5]
Lead	143	7.3	0.15	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [5]
Magnesium	2910	370	0.54	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [5]
Manganese	1190	5.5	0.22	mg/kg	5	07/25/07	07/26/07	RS	SW846 6010B [3]	SW846 3050B [5]
Mercury	0.045 J B	0.13	0.010	mg/kg	1	07/26/07	07/26/07	MS	SW846 7471A [2]	SW846 7471A [6]
Nickel	9.7	2.9	0.073	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [5]
Potassium	996 B	730	7.3	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [5]
Selenium	7.5 K	7.3	0.15	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [5]
Silver	0.081 J J	0.73	0.066	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [5]
Sodium	200 J B	730	60	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [5]
Thallium [a]	6.8 U VL	15	6.8	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [5]
Vanadium	22.0	3.7	0.044	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [5]
Zinc	512	7.3	0.48	mg/kg	5	07/25/07	07/27/07	RS	SW846 6010B [4]	SW846 3050B [5]

(1) Instrument QC Batch: MA5875
(2) Instrument QC Batch: MA5877
(3) Instrument QC Batch: MA5878
(4) Instrument QC Batch: MA5883
(5) Prep QC Batch: MP12567
(6) Prep QC Batch: MP12573

(a) Elevated reporting limit(s) due to matrix interference.

RL = Reporting Limit
MDL = Method Detection Limit

U = Indicates a result < MDL
J = Indicates a result >= MDL but < RL

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Accutest Laboratories

Report of Analysis

Client Sample ID:	LFSW01		
Lab Sample ID:	F51154-17	Date Sampled:	07/19/07
Matrix:	AQ - Surface Water	Date Received:	07/19/07
		Percent Solids:	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

Metals Analysis

Analyte	Result	RL	MDL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Aluminum	18 U	200	18	ug/l	1	07/26/07	07/27/07	RS	SW846 6010B [2]	SW846 3010A [4]
Antimony	3.4 U	6.0	3.4	ug/l	1	07/26/07	07/27/07	RS	SW846 6010B [2]	SW846 3010A [4]
Arsenic	2.8 U	10	2.8	ug/l	1	07/26/07	07/27/07	RS	SW846 6010B [2]	SW846 3010A [4]
Barium	103 J J	200	5.0	ug/l	1	07/26/07	07/27/07	RS	SW846 6010B [2]	SW846 3010A [4]
Beryllium	1.0 U	4.0	1.0	ug/l	1	07/26/07	07/27/07	RS	SW846 6010B [2]	SW846 3010A [4]
Cadmium	1.0 U	5.0	1.0	ug/l	1	07/26/07	07/27/07	RS	SW846 6010B [2]	SW846 3010A [4]
Calcium	79600	1000	42	ug/l	1	07/26/07	07/27/07	RS	SW846 6010B [2]	SW846 3010A [4]
Chromium	0.60 U	10	0.60	ug/l	1	07/26/07	07/27/07	RS	SW846 6010B [2]	SW846 3010A [4]
Cobalt	1.0 U	50	1.0	ug/l	1	07/26/07	07/27/07	RS	SW846 6010B [2]	SW846 3010A [4]
Copper	1.0 U	25	1.0	ug/l	1	07/26/07	07/27/07	RS	SW846 6010B [2]	SW846 3010A [4]
Iron	15 U	300	15	ug/l	1	07/26/07	07/27/07	RS	SW846 6010B [2]	SW846 3010A [4]
Lead [a]	3.4 U	10	3.4	ug/l	1	07/26/07	07/27/07	RS	SW846 6010B [2]	SW846 3010A [4]
Magnesium	30100	5000	4.3	ug/l	1	07/26/07	07/27/07	RS	SW846 6010B [2]	SW846 3010A [4]
Manganese	3.3 J J	15	1.5	ug/l	1	07/26/07	07/27/07	RS	SW846 6010B [2]	SW846 3010A [4]
Mercury	0.10 U UL	1.0	0.10	ug/l	1	07/25/07	07/25/07	MS	SW846 7470A [1]	SW846 7470A [3]
Nickel	1.0 U	40	1.0	ug/l	1	07/26/07	07/27/07	RS	SW846 6010B [2]	SW846 3010A [4]
Potassium	4320 J B	10000	100	ug/l	1	07/26/07	07/27/07	RS	SW846 6010B [2]	SW846 3010A [4]
Selenium	2.8 U	10	2.8	ug/l	1	07/26/07	07/27/07	RS	SW846 6010B [2]	SW846 3010A [4]
Silver	0.90 U	10	0.90	ug/l	1	07/26/07	07/27/07	RS	SW846 6010B [2]	SW846 3010A [4]
Sodium	24100	10000	500	ug/l	1	07/26/07	07/27/07	RS	SW846 6010B [2]	SW846 3010A [4]
Thallium	2.9 U	10	2.9	ug/l	1	07/26/07	07/27/07	RS	SW846 6010B [2]	SW846 3010A [4]
Vanadium	1.1 U	50	1.1	ug/l	1	07/26/07	07/27/07	RS	SW846 6010B [2]	SW846 3010A [4]
Zinc	7.6 J J	20	1.6	ug/l	1	07/26/07	07/27/07	RS	SW846 6010B [2]	SW846 3010A [4]

(1) Instrument QC Batch: MA5873
(2) Instrument QC Batch: MA5878
(3) Prep QC Batch: MP12560
(4) Prep QC Batch: MP12581

(a) Elevated RL/MDL due to CRIA exceeding acceptance criteria.

RL = Reporting Limit
MDL = Method Detection Limit

U = Indicates a result < MDL
J = Indicates a result >= MDL but < RL

Form I Copy

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Report of Analysis

Client Sample ID:	APSD01		
Lab Sample ID:	F51154-18	Date Sampled:	07/19/07
Matrix:	SO - Sediment	Date Received:	07/19/07
		Percent Solids:	86.8
Project:	WPA 019 Field Investigation; Radford AAP, VA		

Metals Analysis

Analyte	Result	RL	MDL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Aluminum	8300	11	1.2	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [5]
Antimony	0.88 J B	3.3	0.29	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [5]
Arsenic	1.5	0.44	0.22	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [5]
Barium	132	11	0.28	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [5]
Beryllium	0.84	0.28	0.055	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [5]
Cadmium	0.064 J J	0.22	0.055	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [5]
Calcium	1260	280	3.2	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [5]
Chromium	13.4	0.55	0.050	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [5]
Cobalt	10.1	2.8	0.055	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [5]
Copper	9.8	1.4	0.050	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [5]
Iron	19500	5.5	0.66	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [5]
Lead	125	5.5	0.11	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [5]
Magnesium	1810	280	0.41	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [5]
Manganese	1470	8.3	0.33	mg/kg	10	07/25/07	07/26/07	RS	SW846 6010B [3]	SW846 3050B [5]
Mercury	0.038 J B	0.093	0.0074	mg/kg	1	07/26/07	07/26/07	MS	SW846 7471A [2]	SW846 7471A [6]
Nickel	9.0	2.2	0.055	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [5]
Potassium	1060	550	5.5	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [5]
Selenium	6.4 K	5.5	0.11	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [5]
Silver	0.050 U	0.55	0.050	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [5]
Sodium	111 J B	550	46	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [5]
Thallium [a]	6.5 U VL	11	6.5	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [5]
Vanadium	19.1	2.8	0.033	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [5]
Zinc	504	11	0.72	mg/kg	10	07/25/07	07/27/07	RS	SW846 6010B [4]	SW846 3050B [5]

(1) Instrument QC Batch: MA5875
(2) Instrument QC Batch: MA5877
(3) Instrument QC Batch: MA5878
(4) Instrument QC Batch: MA5883
(5) Prep QC Batch: MP12567
(6) Prep QC Batch: MP12573

(a) Elevated reporting limit(s) due to matrix interference.

RL = Reporting Limit
MDL = Method Detection Limit

U = Indicates a result < MDL
J = Indicates a result >= MDL but < RL

Form I Corp

Accutest Laboratories

Report of Analysis

Client Sample ID:	TMSW01		
Lab Sample ID:	F51154-20	Date Sampled:	07/19/07
Matrix:	AQ - Surface Water	Date Received:	07/19/07
		Percent Solids:	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

Metals Analysis

Analyte	Result	RL	MDL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Aluminum	50.7 J B	200	18	ug/l	1	07/26/07	07/27/07	RS	SW846 6010B [2]	SW846 3010A [4]
Antimony	3.4 U	6.0	3.4	ug/l	1	07/26/07	07/27/07	RS	SW846 6010B [2]	SW846 3010A [4]
Arsenic	2.8 U	10	2.8	ug/l	1	07/26/07	07/27/07	RS	SW846 6010B [2]	SW846 3010A [4]
Barium	108 J J	200	5.0	ug/l	1	07/26/07	07/27/07	RS	SW846 6010B [2]	SW846 3010A [4]
Beryllium	1.0 U	4.0	1.0	ug/l	1	07/26/07	07/27/07	RS	SW846 6010B [2]	SW846 3010A [4]
Cadmium	1.0 U	5.0	1.0	ug/l	1	07/26/07	07/27/07	RS	SW846 6010B [2]	SW846 3010A [4]
Calcium	81600	1000	42	ug/l	1	07/26/07	07/27/07	RS	SW846 6010B [2]	SW846 3010A [4]
Chromium	0.99 J J	10	0.60	ug/l	1	07/26/07	07/27/07	RS	SW846 6010B [2]	SW846 3010A [4]
Cobalt	1.0 U	50	1.0	ug/l	1	07/26/07	07/27/07	RS	SW846 6010B [2]	SW846 3010A [4]
Copper	1.0 U	25	1.0	ug/l	1	07/26/07	07/27/07	RS	SW846 6010B [2]	SW846 3010A [4]
Iron	15 U	300	15	ug/l	1	07/26/07	07/27/07	RS	SW846 6010B [2]	SW846 3010A [4]
Lead [a]	3.4 J K	10	3.4	ug/l	1	07/26/07	07/27/07	RS	SW846 6010B [2]	SW846 3010A [4]
Magnesium	30900	5000	4.3	ug/l	1	07/26/07	07/27/07	RS	SW846 6010B [2]	SW846 3010A [4]
Manganese	8.3 J J	15	1.5	ug/l	1	07/26/07	07/27/07	RS	SW846 6010B [2]	SW846 3010A [4]
Mercury	0.10 U VL	1.0	0.10	ug/l	1	07/25/07	07/25/07	MS	SW846 7470A [1]	SW846 7470A [3]
Nickel	1.0 U	40	1.0	ug/l	1	07/26/07	07/27/07	RS	SW846 6010B [2]	SW846 3010A [4]
Potassium	4450 J B	10000	100	ug/l	1	07/26/07	07/27/07	RS	SW846 6010B [2]	SW846 3010A [4]
Selenium	2.8 U	10	2.8	ug/l	1	07/26/07	07/27/07	RS	SW846 6010B [2]	SW846 3010A [4]
Silver	0.90 U	10	0.90	ug/l	1	07/26/07	07/27/07	RS	SW846 6010B [2]	SW846 3010A [4]
Sodium	24800	10000	500	ug/l	1	07/26/07	07/27/07	RS	SW846 6010B [2]	SW846 3010A [4]
Thallium	2.9 U	10	2.9	ug/l	1	07/26/07	07/27/07	RS	SW846 6010B [2]	SW846 3010A [4]
Vanadium	1.1 U	50	1.1	ug/l	1	07/26/07	07/27/07	RS	SW846 6010B [2]	SW846 3010A [4]
Zinc	15.7 J J	20	1.6	ug/l	1	07/26/07	07/27/07	RS	SW846 6010B [2]	SW846 3010A [4]

(1) Instrument QC Batch: MA5873
(2) Instrument QC Batch: MA5878
(3) Prep QC Batch: MP12560
(4) Prep QC Batch: MP12581

(a) Elevated RL/MDL due to CRIA exceeding acceptance criteria.

RL = Reporting Limit
MDL = Method Detection Limit

U = Indicates a result < MDL
J = Indicates a result >= MDL but < RL

Form I Copy

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Report of Analysis

Client Sample ID:	41SD11		
Lab Sample ID:	F51154-22	Date Sampled:	07/19/07
Matrix:	SO - Soil	Date Received:	07/19/07
		Percent Solids:	86.8
Project:	WPA 019 Field Investigation; Radford AAP, VA		

Metals Analysis

Analyte	Result	RL	MDL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Aluminum	14300	11	1.2	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [4]
Antimony	1.1 J B	3.4	0.30	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [4]
Arsenic	16.6	0.45	0.22	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [4]
Barium	219	11	0.28	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [4]
Beryllium	1.0	0.28	0.056	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [4]
Cadmium	0.056 U	0.23	0.056	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [4]
Calcium	20100	280	3.2	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [4]
Chromium	20.4	0.56	0.051	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [4]
Cobalt	13.4	2.8	0.056	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [4]
Copper	38.4	1.4	0.051	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [4]
Iron	25900	5.6	0.68	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [4]
Lead	59.3	5.6	0.11	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [4]
Magnesium	12500	280	0.42	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [4]
Manganese	2800	17	0.68	mg/kg	20	07/25/07	07/26/07	RS	SW846 6010B [3]	SW846 3050B [4]
Mercury	0.056 J B	0.083	0.0067	mg/kg	1	07/26/07	07/26/07	MS	SW846 7471A [2]	SW846 7471A [5]
Nickel	13.4	2.3	0.056	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [4]
Potassium	1010 B	560	5.6	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [4]
Selenium	5.4 J K	5.6	0.11	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [4]
Silver	0.051 U	0.56	0.051	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [4]
Sodium	2150	560	47	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [4]
Thallium [a]	1.1 J B	2.2	0.52	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [4]
Vanadium	33.0	2.8	0.034	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [4]
Zinc	108	1.1	0.073	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [4]

(1) Instrument QC Batch: MA5875
(2) Instrument QC Batch: MA5877
(3) Instrument QC Batch: MA5878
(4) Prep QC Batch: MP12567
(5) Prep QC Batch: MP12573

(a) Elevated RL/MDL due to negative bias of Method Blank.

RL = Reporting Limit
MDL = Method Detection Limit

U = Indicates a result < MDL
J = Indicates a result > = MDL but < RL

Form I Corr

Accutest Laboratories

Report of Analysis

Client Sample ID:	49SS02		
Lab Sample ID:	F51154-23	Date Sampled:	07/19/07
Matrix:	SO - Soil	Date Received:	07/19/07
		Percent Solids:	89.6
Project:	WPA 019 Field Investigation; Radford AAP, VA		

Metals Analysis

Analyte	Result	RL	MDL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Aluminum	10300	11	1.2	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [4]
Antimony	0.86 J B	3.3	0.29	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [4]
Arsenic	6.2	0.44	0.21	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [4]
Barium	80.8	11	0.27	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [4]
Beryllium	0.52	0.27	0.055	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [4]
Cadmium	0.055 U	0.22	0.055	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [4]
Calcium	997	270	3.1	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [4]
Chromium	13.5	0.55	0.049	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [4]
Cobalt	3.2	2.7	0.055	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [4]
Copper	17.6	1.4	0.049	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [4]
Iron	13800	5.5	0.66	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [4]
Lead	71.6	5.5	0.11	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [4]
Magnesium	706	270	0.40	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [4]
Manganese	299	4.1	0.16	mg/kg	5	07/25/07	07/26/07	RS	SW846 6010B [3]	SW846 3050B [4]
Mercury	0.17 L	0.089	0.0071	mg/kg	1	07/26/07	07/26/07	MS	SW846 7471A [2]	SW846 7471A [5]
Nickel	5.8	2.2	0.055	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [4]
Potassium	597 B	550	5.5	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [4]
Selenium	5.2 J K	5.5	0.11	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [4]
Silver	0.049 U	0.55	0.049	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [4]
Sodium	78.4 J B	550	45	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [4]
Thallium [a]	5.2 U VL	11	5.2	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [4]
Vanadium	25.6	2.7	0.033	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [4]
Zinc	56.5	1.1	0.071	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [4]

(1) Instrument QC Batch: MA5875
(2) Instrument QC Batch: MA5877
(3) Instrument QC Batch: MA5878
(4) Prep QC Batch: MP12567
(5) Prep QC Batch: MP12573

(a) Elevated reporting limit(s) due to matrix interference.

RL = Reporting Limit
MDL = Method Detection Limit

U = Indicates a result < MDL
J = Indicates a result >= MDL but < RL

Bmw I Copy

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Report of Analysis

Client Sample ID:	49SS03		
Lab Sample ID:	F51154-24	Date Sampled:	07/19/07
Matrix:	SO - Soil	Date Received:	07/19/07
		Percent Solids:	92.0
Project:	WPA 019 Field Investigation; Radford AAP, VA		

Metals Analysis

Analyte	Result	RL	MDL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Aluminum	9220	10	1.1	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [4]
Antimony	0.63 J B	3.1	0.28	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [4]
Arsenic	8.2	0.42	0.20	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [4]
Barium	67.7	10	0.26	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [4]
Beryllium	0.55	0.26	0.052	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [4]
Cadmium [a]	0.26 U	0.42	0.26	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [4]
Calcium	524	260	3.0	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [4]
Chromium	11.8	0.52	0.047	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [4]
Cobalt	3.1	2.6	0.052	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [4]
Copper	14.4	1.3	0.047	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [4]
Iron	13800	5.2	0.63	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [4]
Lead	50.3	5.2	0.10	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [4]
Magnesium	518	260	0.39	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [4]
Manganese	293	3.9	0.16	mg/kg	5	07/25/07	07/26/07	RS	SW846 6010B [3]	SW846 3050B [4]
Mercury	0.31	0.086	0.0069	mg/kg	1	07/26/07	07/26/07	MS	SW846 7471A [2]	SW846 7471A [5]
Nickel	5.9	2.1	0.052	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [4]
Potassium	538 B	520	5.2	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [4]
Selenium	5.4 K	5.2	0.10	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [4]
Silver	0.047 U	0.52	0.047	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [4]
Sodium	73.4 J B	520	43	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [4]
Thallium [a]	4.8 U VL	10	4.8	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [4]
Vanadium	24.3	2.6	0.031	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [4]
Zinc	45.8	1.0	0.068	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [4]

(1) Instrument QC Batch: MA5875
(2) Instrument QC Batch: MA5877
(3) Instrument QC Batch: MA5878
(4) Prep QC Batch: MP12567
(5) Prep QC Batch: MP12573

(a) Elevated reporting limit(s) due to matrix interference.

RL = Reporting Limit
MDL = Method Detection Limit

U = Indicates a result < MDL
J = Indicates a result >= MDL but < RL

Form I Cpy

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Report of Analysis

3.2.5

Client Sample ID:	49SS04		
Lab Sample ID:	F51154-25	Date Sampled:	07/19/07
Matrix:	SO - Soil	Date Received:	07/19/07
		Percent Solids:	87.5
Project:	WPA 019 Field Investigation; Radford AAP, VA		

Metals Analysis

Analyte	Result	RL	MDL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Aluminum	22700	11	1.2	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [3]
Antimony	1.5 J B	3.3	0.29	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [3]
Arsenic	2.3	0.44	0.21	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [3]
Barium	57.5	11	0.27	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [3]
Beryllium	0.69	0.27	0.054	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [3]
Cadmium [a]	0.54 U	0.88	0.54	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [3]
Calcium	770	270	3.1	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [3]
Chromium	20.7	0.54	0.049	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [3]
Cobalt	4.0	2.7	0.054	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [3]
Copper	15.9	1.4	0.049	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [3]
Iron	26900	5.4	0.65	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [3]
Lead	13.4 K	5.4	0.11	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [3]
Magnesium	1120	270	0.40	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [3]
Manganese	165	0.82	0.033	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [3]
Mercury	0.058 J B	0.092	0.0074	mg/kg	1	07/26/07	07/26/07	MS	SW846 7471A [2]	SW846 7471A [4]
Nickel	9.6	2.2	0.054	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [3]
Potassium	1060	540	5.4	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [3]
Selenium	9.4 K	5.4	0.11	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [3]
Silver	0.049 U	0.54	0.049	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [3]
Sodium	45 U	540	45	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [3]
Thallium [a]	13 U VL	22	13	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [3]
Vanadium	56.3	2.7	0.033	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [3]
Zinc	49.1	1.1	0.071	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [3]

(1) Instrument QC Batch: MA5875
(2) Instrument QC Batch: MA5877
(3) Prep QC Batch: MP12567
(4) Prep QC Batch: MP12573

(a) Elevated reporting limit(s) due to matrix interference.

RL = Reporting Limit
MDL = Method Detection Limit

U = Indicates a result < MDL
J = Indicates a result >= MDL but < RL

Form I 03

Accutest Laboratories

Report of Analysis

Client Sample ID:	49SS05		
Lab Sample ID:	F51154-26	Date Sampled:	07/19/07
Matrix:	SO - Soil	Date Received:	07/19/07
		Percent Solids:	85.9
Project:	WPA 019 Field Investigation; Radford AAP, VA		

Metals Analysis

Analyte	Result	RL	MDL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Aluminum	15500	12	1.3	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [4]
Antimony	0.73 J B	3.5	0.31	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [4]
Arsenic	3.2	0.47	0.23	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [4]
Barium	69.8	12	0.29	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [4]
Beryllium	0.61	0.29	0.058	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [4]
Cadmium [a]	0.29 U	0.46	0.29	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [4]
Calcium	1450	290	3.3	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [4]
Chromium	14.9	0.58	0.052	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [4]
Cobalt	3.7	2.9	0.058	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [4]
Copper	12.8	1.5	0.052	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [4]
Iron	17900	5.8	0.70	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [4]
Lead	20.5 K	5.8	0.12	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [4]
Magnesium	863	290	0.43	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [4]
Manganese	358	4.4	0.17	mg/kg	5	07/25/07	07/26/07	RS	SW846 6010B [3]	SW846 3050B [4]
Mercury	0.072 J B	0.087	0.0070	mg/kg	1	07/26/07	07/26/07	MS	SW846 7471A [2]	SW846 7471A [5]
Nickel	7.4	2.3	0.058	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [4]
Potassium	776 B	580	5.8	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [4]
Selenium	6.4 K	5.8	0.12	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [4]
Silver	0.052 U	0.58	0.052	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [4]
Sodium	48 U	580	48	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [4]
Thallium [a]	5.2 U UL	12	5.2	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [4]
Vanadium	37.7	2.9	0.035	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [4]
Zinc	44.5	1.2	0.076	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [4]

(1) Instrument QC Batch: MA5875
(2) Instrument QC Batch: MA5877
(3) Instrument QC Batch: MA5878
(4) Prep QC Batch: MP12567
(5) Prep QC Batch: MP12573

(a) Elevated reporting limit(s) due to matrix interference.

RL = Reporting Limit
MDL = Method Detection Limit

U = Indicates a result < MDL
J = Indicates a result >= MDL but < RL

Form I rev

Accutest Laboratories

Report of Analysis

Client Sample ID:	59SS06		
Lab Sample ID:	F51154-27	Date Sampled:	07/19/07
Matrix:	SO - Soil	Date Received:	07/19/07
		Percent Solids:	92.0
Project:	WPA 019 Field Investigation; Radford AAP, VA		

Metals Analysis

Analyte	Result	RL	MDL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Aluminum	13100	11	1.2	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [4]
Antimony	1.2 J B	3.2	0.28	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [4]
Arsenic	2.9	0.43	0.21	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [4]
Barium	62.8	11	0.27	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [4]
Beryllium	0.61	0.27	0.053	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [4]
Cadmium [a]	0.53 U	0.84	0.53	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [4]
Calcium	2550	270	3.0	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [4]
Chromium	21.1	0.53	0.048	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [4]
Cobalt	5.1	2.7	0.053	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [4]
Copper	7.5	1.3	0.048	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [4]
Iron	18500	5.3	0.64	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [4]
Lead	17.0 K	5.3	0.11	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [4]
Magnesium	1910	270	0.39	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [4]
Manganese	367	4.0	0.16	mg/kg	5	07/25/07	07/26/07	RS	SW846 6010B [3]	SW846 3050B [4]
Mercury	0.047 J B	0.082	0.0066	mg/kg	1	07/26/07	07/26/07	MS	SW846 7471A [2]	SW846 7471A [5]
Nickel	5.8	2.1	0.053	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [4]
Potassium	693 B	530	5.3	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [4]
Selenium	6.3 K	5.3	0.11	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [4]
Silver	0.048 U	0.53	0.048	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [4]
Sodium	76.5 J B	530	44	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [4]
Thallium [a]	4.8 U VL	11	4.8	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [4]
Vanadium	35.8	2.7	0.032	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [4]
Zinc	34.3	1.1	0.069	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [4]

(1) Instrument QC Batch: MA5875
(2) Instrument QC Batch: MA5877
(3) Instrument QC Batch: MA5878
(4) Prep QC Batch: MP12567
(5) Prep QC Batch: MP12573

(a) Elevated reporting limit(s) due to matrix interference.

RL = Reporting Limit
MDL = Method Detection Limit

U = Indicates a result < MDL
J = Indicates a result >= MDL but < RL

Form I Corr

Accutest Laboratories

Report of Analysis

Client Sample ID:	59SS07		
Lab Sample ID:	F51154-28	Date Sampled:	07/19/07
Matrix:	SO - Soil	Date Received:	07/19/07
		Percent Solids:	91.6
Project:	WPA 019 Field Investigation; Radford AAP, VA		

Metals Analysis

Analyte	Result	RL	MDL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Aluminum	12300	10	1.1	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [4]
Antimony	0.73 J B	3.1	0.28	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [4]
Arsenic	2.8	0.42	0.20	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [4]
Barium	67.5	10	0.26	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [4]
Beryllium	0.63	0.26	0.052	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [4]
Cadmium [a]	0.26 U	0.42	0.26	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [4]
Calcium	2270	260	3.0	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [4]
Chromium	14.3	0.52	0.047	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [4]
Cobalt	5.5	2.6	0.052	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [4]
Copper	7.7	1.3	0.047	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [4]
Iron	15000	5.2	0.62	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [4]
Lead	17.3 K	5.2	0.10	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [4]
Magnesium	1640	260	0.38	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [4]
Manganese	473	3.9	0.16	mg/kg	5	07/25/07	07/26/07	RS	SW846 6010B [3]	SW846 3050B [4]
Mercury	0.027 J B	0.091	0.0073	mg/kg	1	07/26/07	07/26/07	MS	SW846 7471A [2]	SW846 7471A [5]
Nickel	6.2	2.1	0.052	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [4]
Potassium	735 B	520	5.2	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [4]
Selenium	5.0 J K	5.2	0.10	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [4]
Silver	0.047 U	0.52	0.047	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [4]
Sodium	74.5 J B	520	43	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [4]
Thallium [a]	4.8 U VL	10	4.8	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [4]
Vanadium	30.5	2.6	0.031	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [4]
Zinc	33.2	1.0	0.068	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [4]

(1) Instrument QC Batch: MA5875
(2) Instrument QC Batch: MA5877
(3) Instrument QC Batch: MA5878
(4) Prep QC Batch: MP12567
(5) Prep QC Batch: MP12573

(a) Elevated reporting limit(s) due to matrix interference.

RL = Reporting Limit
MDL = Method Detection Limit

U = Indicates a result < MDL
J = Indicates a result >= MDL but < RL

Form I copy

Accutest Laboratories

Report of Analysis

3-28
3

Client Sample ID:	59SS08		
Lab Sample ID:	F51154-29	Date Sampled:	07/19/07
Matrix:	SO - Soil	Date Received:	07/19/07
		Percent Solids:	89.0
Project:	WPA 019 Field Investigation; Radford AAP, VA		

Metals Analysis

Analyte	Result	RL	MDL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Aluminum	16200	11	1.2	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [4]
Antimony	0.98 J B	3.4	0.30	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [4]
Arsenic	4.4	0.45	0.22	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [4]
Barium	71.9	11	0.28	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [4]
Beryllium	0.63	0.28	0.056	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [4]
Cadmium [a]	0.56 U	0.88	0.56	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [4]
Calcium	1100	280	3.2	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [4]
Chromium	18.8	0.56	0.051	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [4]
Cobalt	5.0	2.8	0.056	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [4]
Copper	10.5	1.4	0.051	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [4]
Iron	19700	5.6	0.67	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [4]
Lead	17.1 K	5.6	0.11	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [4]
Magnesium	1230	280	0.42	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [4]
Manganese	276	4.2	0.17	mg/kg	5	07/25/07	07/26/07	RS	SW846 6010B [3]	SW846 3050B [4]
Mercury	0.068 J J	0.081	0.0065	mg/kg	1	07/26/07	07/26/07	MS	SW846 7471A [2]	SW846 7471A [5]
Nickel	7.7	2.2	0.056	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [4]
Potassium	1070	560	5.6	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [4]
Selenium	7.0 K	5.6	0.11	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [4]
Silver	0.051 U	0.56	0.051	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [4]
Sodium	56.8 J B	560	46	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [4]
Thallium [a]	5.2 U VL	11	5.2	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [4]
Vanadium	39.3	2.8	0.034	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [4]
Zinc	44.9	1.1	0.073	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [4]

(1) Instrument QC Batch: MA5875
(2) Instrument QC Batch: MA5876
(3) Instrument QC Batch: MA5878
(4) Prep QC Batch: MP12567
(5) Prep QC Batch: MP12574

(a) Elevated reporting limit(s) due to matrix interference.

RL = Reporting Limit
MDL = Method Detection Limit

U = Indicates a result < MDL
J = Indicates a result >= MDL but < RL

Area I Corp

Accutest Laboratories

Report of Analysis

Client Sample ID:	59SS09		
Lab Sample ID:	F51154-30	Date Sampled:	07/19/07
Matrix:	SO - Soil	Date Received:	07/19/07
		Percent Solids:	95.1
Project:	WPA 019 Field Investigation; Radford AAP, VA		

Metals Analysis

Analyte	Result	RL	MDL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Aluminum	4430	10	1.1	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [3]
Antimony	0.39 J B	3.1	0.27	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [3]
Arsenic	5.6	0.41	0.20	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [3]
Barium	160	10	0.26	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [3]
Beryllium	0.85	0.26	0.051	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [3]
Cadmium	0.051 U	0.20	0.051	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [3]
Calcium	718	260	2.9	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [3]
Chromium	7.5	0.51	0.046	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [3]
Cobalt	4.8	2.6	0.051	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [3]
Copper	15.3	1.3	0.046	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [3]
Iron	6660	5.1	0.61	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [3]
Lead	5.9 K	5.1	0.10	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [3]
Magnesium	410	260	0.38	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [3]
Manganese	104	0.77	0.031	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [3]
Mercury	0.40	0.086	0.0069	mg/kg	1	07/26/07	07/26/07	MS	SW846 7471A [2]	SW846 7471A [4]
Nickel	8.5	2.0	0.051	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [3]
Potassium	441 J B	510	5.1	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [3]
Selenium	2.7 J B	5.1	0.10	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [3]
Silver	0.046 U	0.51	0.046	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [3]
Sodium	42 U	510	42	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [3]
Thallium [a]	12 U VL	20	12	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [3]
Vanadium	17.6	2.6	0.031	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [3]
Zinc	15.9	1.0	0.066	mg/kg	1	07/25/07	07/25/07	RS	SW846 6010B [1]	SW846 3050B [3]

(1) Instrument QC Batch: MA5875
(2) Instrument QC Batch: MA5876
(3) Prep QC Batch: MP12567
(4) Prep QC Batch: MP12574

(a) Elevated reporting limit(s) due to matrix interference.

RL = Reporting Limit
MDL = Method Detection Limit

U = Indicates a result < MDL
J = Indicates a result >= MDL but < RL

Form I OR

Accutest Laboratories

Report of Analysis

Client Sample ID:	59SS10		
Lab Sample ID:	F51154-31	Date Sampled:	07/19/07
Matrix:	SO - Soil	Date Received:	07/19/07
		Percent Solids:	95.7
Project:	WPA 019 Field Investigation; Radford AAP, VA		

Metals Analysis

Analyte	Result	RL	MDL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Aluminum	5020 K	10	1.1	mg/kg	1	07/26/07	07/26/07	RS	SW846 6010B [2]	SW846 3050B [5]
Antimony	0.64 J B	3.1	0.27	mg/kg	1	07/26/07	07/26/07	RS	SW846 6010B [2]	SW846 3050B [5]
Arsenic	24.1 J	0.41	0.20	mg/kg	1	07/26/07	07/26/07	RS	SW846 6010B [2]	SW846 3050B [5]
Barium	99.7	10	0.26	mg/kg	1	07/26/07	07/26/07	RS	SW846 6010B [2]	SW846 3050B [5]
Beryllium	0.85	0.26	0.051	mg/kg	1	07/26/07	07/26/07	RS	SW846 6010B [2]	SW846 3050B [5]
Cadmium	0.051 U VL	0.20	0.051	mg/kg	1	07/26/07	07/26/07	RS	SW846 6010B [2]	SW846 3050B [5]
Calcium	730 J	260	2.9	mg/kg	1	07/26/07	07/26/07	RS	SW846 6010B [2]	SW846 3050B [5]
Chromium	9.5 J	0.51	0.046	mg/kg	1	07/26/07	07/26/07	RS	SW846 6010B [2]	SW846 3050B [5]
Cobalt	3.6 J	2.6	0.051	mg/kg	1	07/26/07	07/26/07	RS	SW846 6010B [2]	SW846 3050B [5]
Copper	10.6	1.3	0.046	mg/kg	1	07/26/07	07/26/07	RS	SW846 6010B [2]	SW846 3050B [5]
Iron	9530 J	5.1	0.61	mg/kg	1	07/26/07	07/26/07	RS	SW846 6010B [2]	SW846 3050B [5]
Lead	9.2 J	5.1	0.10	mg/kg	1	07/26/07	07/26/07	RS	SW846 6010B [2]	SW846 3050B [5]
Magnesium	334 J	260	0.38	mg/kg	1	07/26/07	07/26/07	RS	SW846 6010B [2]	SW846 3050B [5]
Manganese	414 J	3.8	0.15	mg/kg	5	07/26/07	07/27/07	RS	SW846 6010B [3]	SW846 3050B [5]
Mercury	0.34	0.083	0.0066	mg/kg	1	07/26/07	07/26/07	MS	SW846 7471A [1]	SW846 7471A [4]
Nickel	6.6 J	2.0	0.051	mg/kg	1	07/26/07	07/26/07	RS	SW846 6010B [2]	SW846 3050B [5]
Potassium	431 J B	510	5.1	mg/kg	1	07/26/07	07/26/07	RS	SW846 6010B [2]	SW846 3050B [5]
Selenium	4.8 J K	5.1	0.10	mg/kg	1	07/26/07	07/26/07	RS	SW846 6010B [2]	SW846 3050B [5]
Silver	0.046 U VL	0.51	0.046	mg/kg	1	07/26/07	07/26/07	RS	SW846 6010B [2]	SW846 3050B [5]
Sodium	69.8 J B	510	42	mg/kg	1	07/26/07	07/26/07	RS	SW846 6010B [2]	SW846 3050B [5]
Thallium [a]	4.8 U VL	10	4.8	mg/kg	1	07/26/07	07/26/07	RS	SW846 6010B [2]	SW846 3050B [5]
Vanadium	18.3 J	2.6	0.031	mg/kg	1	07/26/07	07/26/07	RS	SW846 6010B [2]	SW846 3050B [5]
Zinc	13.0 J	1.0	0.067	mg/kg	1	07/26/07	07/26/07	RS	SW846 6010B [2]	SW846 3050B [5]

(1) Instrument QC Batch: MA5876
(2) Instrument QC Batch: MA5878
(3) Instrument QC Batch: MA5883
(4) Prep QC Batch: MP12574
(5) Prep QC Batch: MP12577

(a) Elevated reporting limit(s) due to matrix interference.

RL = Reporting Limit
MDL = Method Detection Limit

U = Indicates a result < MDL
J = Indicates a result >= MDL but < RL

Form I copy

Accutest Laboratories

Report of Analysis

Client Sample ID:	TMSS05		
Lab Sample ID:	F51154-32	Date Sampled:	07/19/07
Matrix:	SO - Soil	Date Received:	07/19/07
		Percent Solids:	86.6
Project:	WPA 019 Field Investigation; Radford AAP, VA		

Metals Analysis

Analyte	Result	RL	MDL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Aluminum	15900 K	11	1.2	mg/kg	1	07/26/07	07/26/07	RS	SW846 6010B [2]	SW846 3050B [5]
Antimony	0.89 J B	3.4	0.30	mg/kg	1	07/26/07	07/26/07	RS	SW846 6010B [2]	SW846 3050B [5]
Arsenic	3.5 J	0.45	0.22	mg/kg	1	07/26/07	07/26/07	RS	SW846 6010B [2]	SW846 3050B [5]
Barium	67.0	11	0.28	mg/kg	1	07/26/07	07/26/07	RS	SW846 6010B [2]	SW846 3050B [5]
Beryllium	0.59	0.28	0.057	mg/kg	1	07/26/07	07/26/07	RS	SW846 6010B [2]	SW846 3050B [5]
Cadmium	0.057 U VL	0.23	0.057	mg/kg	1	07/26/07	07/26/07	RS	SW846 6010B [2]	SW846 3050B [5]
Calcium	1420 J	280	3.2	mg/kg	1	07/26/07	07/26/07	RS	SW846 6010B [2]	SW846 3050B [5]
Chromium	17.6 J	0.57	0.051	mg/kg	1	07/26/07	07/26/07	RS	SW846 6010B [2]	SW846 3050B [5]
Cobalt	4.0 J	2.8	0.057	mg/kg	1	07/26/07	07/26/07	RS	SW846 6010B [2]	SW846 3050B [5]
Copper	13.0	1.4	0.051	mg/kg	1	07/26/07	07/26/07	RS	SW846 6010B [2]	SW846 3050B [5]
Iron	18300 J	5.7	0.68	mg/kg	1	07/26/07	07/26/07	RS	SW846 6010B [2]	SW846 3050B [5]
Lead	20.3 J	5.7	0.11	mg/kg	1	07/26/07	07/26/07	RS	SW846 6010B [2]	SW846 3050B [5]
Magnesium	872 J	280	0.42	mg/kg	1	07/26/07	07/26/07	RS	SW846 6010B [2]	SW846 3050B [5]
Manganese	356 J	4.2	0.17	mg/kg	5	07/26/07	07/27/07	RS	SW846 6010B [3]	SW846 3050B [5]
Mercury	0.093 J J	0.095	0.0076	mg/kg	1	07/26/07	07/26/07	MS	SW846 7471A [1]	SW846 7471A [4]
Nickel	7.9 J	2.3	0.057	mg/kg	1	07/26/07	07/26/07	RS	SW846 6010B [2]	SW846 3050B [5]
Potassium	791 B	570	5.7	mg/kg	1	07/26/07	07/26/07	RS	SW846 6010B [2]	SW846 3050B [5]
Selenium	6.6 K	5.7	0.11	mg/kg	1	07/26/07	07/26/07	RS	SW846 6010B [2]	SW846 3050B [5]
Silver	0.051 U VL	0.57	0.051	mg/kg	1	07/26/07	07/26/07	RS	SW846 6010B [2]	SW846 3050B [5]
Sodium	47 U VL	570	47	mg/kg	1	07/26/07	07/26/07	RS	SW846 6010B [2]	SW846 3050B [5]
Thallium [a]	5.2 U VL	11	5.2	mg/kg	1	07/26/07	07/26/07	RS	SW846 6010B [2]	SW846 3050B [5]
Vanadium	37.6 J	2.8	0.034	mg/kg	1	07/26/07	07/26/07	RS	SW846 6010B [2]	SW846 3050B [5]
Zinc	46.2 J	1.1	0.074	mg/kg	1	07/26/07	07/26/07	RS	SW846 6010B [2]	SW846 3050B [5]

(1) Instrument QC Batch: MA5876
(2) Instrument QC Batch: MA5878
(3) Instrument QC Batch: MA5883
(4) Prep QC Batch: MP12574
(5) Prep QC Batch: MP12577

(a) Elevated reporting limit(s) due to matrix interference.

RL = Reporting Limit
MDL = Method Detection Limit

U = Indicates a result < MDL
J = Indicates a result >= MDL but < RL

Form I OM

Accutest Laboratories

Report of Analysis

Client Sample ID:	RB071807		
Lab Sample ID:	F51154-12	Date Sampled:	07/18/07
Matrix:	AQ - Surface Water	Date Received:	07/19/07
		Percent Solids:	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

Metals Analysis

Analyte	Result	RL	MDL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Aluminum	18 U	200	18	ug/l	1	07/26/07	07/27/07	RS	SW846 6010B [2]	SW846 3010A [4]
Antimony	3.4 U	6.0	3.4	ug/l	1	07/26/07	07/27/07	RS	SW846 6010B [2]	SW846 3010A [4]
Arsenic	2.8 U	10	2.8	ug/l	1	07/26/07	07/27/07	RS	SW846 6010B [2]	SW846 3010A [4]
Barium	5.0 U	200	5.0	ug/l	1	07/26/07	07/27/07	RS	SW846 6010B [2]	SW846 3010A [4]
Beryllium	1.0 U	4.0	1.0	ug/l	1	07/26/07	07/27/07	RS	SW846 6010B [2]	SW846 3010A [4]
Cadmium	1.0 U	5.0	1.0	ug/l	1	07/26/07	07/27/07	RS	SW846 6010B [2]	SW846 3010A [4]
Calcium	42 U	1000	42	ug/l	1	07/26/07	07/27/07	RS	SW846 6010B [2]	SW846 3010A [4]
Chromium	0.60 U	10	0.60	ug/l	1	07/26/07	07/27/07	RS	SW846 6010B [2]	SW846 3010A [4]
Cobalt	1.0 U	50	1.0	ug/l	1	07/26/07	07/27/07	RS	SW846 6010B [2]	SW846 3010A [4]
Copper	1.0 U	25	1.0	ug/l	1	07/26/07	07/27/07	RS	SW846 6010B [2]	SW846 3010A [4]
Iron	15 U	300	15	ug/l	1	07/26/07	07/27/07	RS	SW846 6010B [2]	SW846 3010A [4]
Lead [a]	3.4 U	10	3.4	ug/l	1	07/26/07	07/27/07	RS	SW846 6010B [2]	SW846 3010A [4]
Magnesium	4.3 U	5000	4.3	ug/l	1	07/26/07	07/27/07	RS	SW846 6010B [2]	SW846 3010A [4]
Manganese	1.5 U	15	1.5	ug/l	1	07/26/07	07/27/07	RS	SW846 6010B [2]	SW846 3010A [4]
Mercury	0.10 U	1.0	0.10	ug/l	1	07/25/07	07/25/07	MS	SW846 7470A [1]	SW846 7470A [3]
Nickel	1.0 U	40	1.0	ug/l	1	07/26/07	07/27/07	RS	SW846 6010B [2]	SW846 3010A [4]
Potassium	1770 J J	10000	100	ug/l	1	07/26/07	07/27/07	RS	SW846 6010B [2]	SW846 3010A [4]
Selenium	2.8 U	10	2.8	ug/l	1	07/26/07	07/27/07	RS	SW846 6010B [2]	SW846 3010A [4]
Silver	0.90 U	10	0.90	ug/l	1	07/26/07	07/27/07	RS	SW846 6010B [2]	SW846 3010A [4]
Sodium	2060 J J	10000	500	ug/l	1	07/26/07	07/27/07	RS	SW846 6010B [2]	SW846 3010A [4]
Thallium	2.9 U	10	2.9	ug/l	1	07/26/07	07/27/07	RS	SW846 6010B [2]	SW846 3010A [4]
Vanadium	1.1 U	50	1.1	ug/l	1	07/26/07	07/27/07	RS	SW846 6010B [2]	SW846 3010A [4]
Zinc	1.9 J J	20	1.6	ug/l	1	07/26/07	07/27/07	RS	SW846 6010B [2]	SW846 3010A [4]

(1) Instrument QC Batch: MA5873
(2) Instrument QC Batch: MA5878
(3) Prep QC Batch: MP12560
(4) Prep QC Batch: MP12581

(a) Elevated RL/MDL due to CRIA exceeding acceptance criteria.

RL = Reporting Limit
MDL = Method Detection Limit

U = Indicates a result < MDL
J = Indicates a result >= MDL but < RL

Shaw Environmental, Inc.
2113 Emmorton Park Road
Edgewood, Maryland
410-612-6350
FAX: 410-612-6351

Shaw® Shaw Environmental, Inc.

MEMORANDUM

TO: Jeff Parks, Shaw E&I Radford Army Ammunition Plant (RFAAP) Project Manager

FROM: Eric Malarek, Shaw E&I Project Chemist

SUBJECT: RFAAP Data Validation – Pesticides and PCBs
Accutest Laboratories, Inc., SDG F51154

DATE: September 26, 2007

The purpose of this memorandum is to present the data validation report for the samples collected at Main Manufacturing Area at RFAAP for a RFI/CMS Nine Sites on July 18, 2007 and July 19, 2007. Aqueous samples were analyzed for pesticides and PCBs using USEPA Method 3510C/8081A and 3510C/8082, respectively. Solid samples were analyzed for pesticides and PCBs using USEPA Method 3550B/8081A and 3550B/8082, respectively. A total of five aqueous samples and seventeen solid samples were validated. The sample Ids are:

Field Sample ID	Lab Sample ID	Field Sample ID	Lab Sample ID
41SW08	F51154-6	41SD11	F51154-22
41SW09	F51154-7	49SS02	F51154-23
41SW10	F51154-8	49SS03	F51154-24
41SD08	F51154-9	49SS04	F51154-25
41SD09	F51154-10	49SS05	F51154-26
41SD10	F51154-11	59SS06	F51154-27
LFSD01	F51154-15	59SS07	F51154-28
TMSD01	F51154-16	59SS08	F51154-29
LFSW01	F51154-17	59SS09	F51154-30
APSD01	F5 1154-18	59SS10	F51154-31
TMSW01	F51154-20	TMSS05	F51154-32

Data were reviewed by Eric Malarek and validated using a combination of project QAPP, *Quality Systems Manual for Environmental Laboratories, Final Version 3, January, 2006* (DoD, 2006) (DoD QSM), method-specific criteria, and laboratory SOP criteria. The data qualifier scheme was consistent with the *Region III Modifications to the National Functional Guidelines for Organic Data Review* (September 1994). Parameters evaluated are presented in **Table 1**. Data associated with parameters in compliance with quality control specifications have not been qualified. Data associated with parameters that did not comply with quality control specifications and directly impacted project data have been qualified in accordance with USEPA Region III specifications.

Table 1 Laboratory Performance Criteria

Qualified		Parameter
Yes	No	
	X	Holding Times and Preservation
	X	Instrument Performance Check
	X	Initial Calibration
X		Continuing Calibration
	X	Blank Analysis
X		System Monitoring Compounds
X		Laboratory Control Samples
X		Matrix Spike/Spike Duplicate
X		Field Duplicate
X		Quantitation Verification

The quality of data collected in support of this sampling activity is considered acceptable with noted qualifications.

Eric Malarek, Chemist

9/26/07
Date

RFAAP VALIDATION REPORT
PESTICIDE/PCB REVIEW
SDG F51154

I-Holding Times and Preservation
The objective is to ascertain the validity of results based on the holding time of the sample from time of collection to time of sample extraction and analysis. Holding time criteria: For aqueous samples, pesticide and PCB compounds are shipped cooled (@4°C ± 2°C) with a maximum holding time of 7 days from sample collection to preparative extraction and 40 days from preparative extraction to determinative analysis. For solid samples, pesticide and PCB compounds are shipped cooled (@4°C ± 2°C) with a maximum holding time of 14 days from sample collection to preparative extraction and 40 days from preparative extraction to determinative analysis.

- Temperature Review: The temperature blank was sent with each cooler and recorded by the laboratory upon receipt. For samples collected on 07/18/07 and 07/19/07, the coolers were received by the primary laboratory (Accutest) on 07/20/07 at 4.0°C, 4.0°C, 4.6°C, 4.6°C, 4.8°C, 5.0°C, 5.0°C, and 5.8°C. The herbicides were subcontracted to Accutest TX and were received the samples at 4.2°C, 4.0°C, and 3.6°C. The perchlorate subcontract laboratory (Datachem Laboratories, Inc.) received the aqueous samples at 3.0°C. The dioxin subcontract laboratory (SGS Paradigm Analytical Laboratories, Inc.) received the samples at 5.5°C and 5.2°C. All criteria were met. No qualifiers were applied.

- Holding Time Review: The aqueous samples were collected on 07/18/07 and 07/19/07. For aqueous samples collected 07/18/07 and 07/19/07, the pesticides and PCBs were extracted on 07/24/07 and analyzed on 07/26/07. For solid samples collected 07/18/07 and 07/19/07, the pesticides were extracted on 07/27/07 and analyzed on 07/31/07, 08/02/07, 08/06/07, and 08/08/07. All criteria were met. No qualifiers were applied.

II-Instrument Performance Check (Degradation Standard)
Performance checks on the gas chromatograph with electron capture detector (GC/ECD) system are performed to ensure adequate resolution and instrument sensitivity. The performance evaluation mixture (PEM) must be analyzed at the beginning of the analytical sequence. The breakdown of Endrin and 4,4'-DDT must be ≤15% on both signals.

- For analysis performed on 07/24/07 @14:31, endrin and 4,4'-DDT percent breakdowns were 10.3% and 9.0% on signal #1 and 10.8% and 7.8% on signal #2, respectively. All criteria were met. No qualifiers were applied.

- For analysis performed on 07/26/07 @11:10, endrin and 4,4'-DDT percent breakdowns were 12.4% and 4.2% on signal #1 and 13.8% and 3.7% on signal #2, respectively. All criteria were met. No qualifiers were applied.

- For analysis performed on 08/01/07 @12:02, endrin and 4,4'-DDT percent breakdowns were 13.7% and 8.0% on signal #1 and 14.5% and 7.7% on signal #2, respectively. All criteria were met. No qualifiers were applied.

- For analysis performed on 08/02/07 @11:19, endrin and 4,4'-DDT percent breakdowns were 13.3% and 7.7% on signal #1 and 14.5% and 7.2% on signal #2, respectively. All criteria were met. No qualifiers were applied.

- For analysis performed on 08/04/07 @09:09, endrin and 4,4'-DDT percent breakdowns were 14.1% and 5.0% on signal #1 and 13.8% and 4.5% on signal #2, respectively. All criteria were met. No qualifiers were applied.

- For analysis performed on 07/13/07 @13:24, endrin and 4,4'-DDT percent breakdowns were 11.8% and 6.5% on signal #1 and 12.0% and 5.6% on signal #2, respectively. All criteria were met. No qualifiers were applied.

- For analysis performed on 07/31/07 @13:54, endrin and 4,4'-DDT percent breakdowns were 10.9% and 11.4% on signal #1 and 10.1% and 9.2% on signal #2, respectively. All criteria were met. No qualifiers were applied.

- For analysis performed on 08/06/07 @09:25, endrin and 4,4'-DDT percent breakdowns were 11.2% and 7.1% on signal #1 and 10.7% and 5.6% on signal #2, respectively. All criteria were met. No qualifiers were applied.

III-Initial Calibration

Compliance requirements for satisfactory instrument calibration are established to ensure that the instrument is capable of producing acceptable qualitative and quantitative data for the target compounds. The initial 5 point calibration demonstrates that the instrument is capable of acceptable performance in the beginning of the analytical run. Calibration factors are generated for each compound. The DoD QSM specifies that the percent relative standard deviation (%RSD) for all single peak target analytes, and aroclors 1016, 1242, 1254, and 1260 must be <20% or the mean %RSD for all analytes in the standard must be ≤20%. If linear regression is used, the correlation coefficient must be ≥0.995. All detects are qualified as estimated "J" for where there were exceeding %RSDs, and all non-detects are qualified as estimated "UJ" for where there were grossly exceeding recoveries, unless determined to be unusable "R". Grossly exceeding is defined as twice the established criteria limits.

- For the pesticide initial calibration performed on 07/24/07 on instrument ECD5, all criteria were met. No qualifiers were applied. Samples 41SW08 (F51154-6), 41SW09 (F51154-7), 41SW10 (F51154-8), LFSW01 (F51154-17), and TMSW01 (F51154-20) were analyzed using this initial calibration.

- For the pesticide initial calibration performed on 08/01/07 on instrument ECD5, all criteria were met. No qualifiers were applied. Samples LFSD01 (F51154-15), APSD01 (F51154-18), 41SD11 (F51154-22), 49SS02 (F51154-23), 49SS03 (F51154-24), 49SS04 (F51154-25), 49SS05 (F51154-26), and TMSS05 (F51154-32) were analyzed using this initial calibration.

- For the pesticide initial calibration performed on 08/04/07 on instrument ECD5, all criteria were met. No qualifiers were applied. Samples TMSD01 (F51154-16), 59SS06 (F51154-27), 59SS07 (F51154-28), 59SS08 (F51154-29), 59SS09 (F51154-30), and 59SS10 (F51154-31) were analyzed using this initial calibration.

- For the pesticide initial calibration performed on 07/13/07 on instrument ECD6, all criteria were met. No qualifiers were applied. Samples LFSD01 (F51154-15), APSD01 (F51154-18), 41SD11 (F51154-22), 49SS02 (F51154-23), 49SS03 (F51154-24), 49SS05 (F51154-26), and TMSS05 (F51154-32) were analyzed using this initial calibration.

- For the pesticide initial calibration performed on 08/06/07 on instrument ECD6, all criteria were met. No qualifiers were applied. Samples 41SD08 (F51154-9), 41SD09 (F51154-10), 41SD10 (F51154-11), 49SS04 (F51154-25), 59SS06 (F51154-27), 59SS07 (F51154-28), and 59SS08 (F51154-29), 59SS09 (F51154-30), and 59SS10 (F51154-31) were analyzed using this initial calibration.

- For the PCB initial calibration performed on 07/28/07 on instrument ECD3, all criteria were met. No qualifiers were applied. Samples 41SD08 (F51154-9), 41SD09 (F51154-10), 41SD10 (F51154-11), LFSD01 (F51154-15), TMSD01 (F51154-16), APSD01 (F51154-18), 41SD11 (F51154-22), 49SS03 (F51154-24), 49SS04 (F51154-25), 49SS05 (F51154-26), 59SS06 (F51154-27), 59SS07 (F51154-28), 59SS08 (F51154-29), 59SS09 (F51154-30), 59SS10 (F51154-31), and TMSS05 (F51154-32) were analyzed using this initial calibration.

- For the PCB initial calibration performed on 07/26/07 on instrument ECD7, all criteria were met. No qualifiers were applied. Samples 41SW08 (F51154-6), 41SW09 (F51154-7), 41SW10 (F51154-8), LFSW01 (F51154-17), and TMSW01 (F51154-20) were analyzed using this initial calibration.

- For the PCB initial calibration performed on 08/02/07 on instrument ECD7, all criteria were met. No qualifiers were applied. Sample 49SS02 (F51154-23) was analyzed using this initial calibration.

IV-Continuing Calibration

Compliance requirements for satisfactory instrument calibration are established to ensure that the instrument is capable of producing acceptable qualitative and quantitative data for pesticide/PCB target compounds. Continuing calibration standards containing both target compounds and surrogates are analyzed at the beginning of each 12-hour analytical shift and after every 20 samples. The DoD QSM specifies that the percent difference (%D) or the average %Ds for all analytes in the standard from the initial calibration should be no greater than ±20%.

- For pesticide initial calibration verification performed on 07/24/07 @17:08 on instrument ECD5, all criteria were met. No qualifiers were applied. No samples reported were analyzed using this initial calibration verification.

- For pesticide continuing calibration performed on 07/26/07 @15:31 on instrument ECD5, all criteria were met. No qualifiers were applied. Samples 41SW08 (F51154-6), 41SW09 (F51154-7), 41SW10 (F51154-8), LFSW01 (F51154-17), and TMSW01 (F51154-20) were analyzed using this continuing calibration.

- For pesticide continuing calibration performed on 07/26/07 @19:00 on instrument ECD5, endrin (25.4%) was outside criteria for the signal #1. Endrin (24.4%) was outside criteria for the signal #2. Endrin was non-detect for all associated samples; therefore, no qualifiers were applied based upon these outliers. No samples reported were analyzed using this continuing calibration.

- For pesticide initial calibration verification performed on 08/01/07 @15:15 on instrument ECD5, all criteria were met. No qualifiers were applied. No samples reported were analyzed using this initial calibration verification.

- For pesticide continuing calibration performed on 08/02/07 @14:21 on instrument ECD5, all criteria were met for signal #1 and for the signal #2. No qualifiers were applied. Samples LFSD01 (F51154-15), APSD01 (F51154-18), 41SD11 (F51154-22), 49SS02 (F51154-23), 49SS03 (F51154-24), 49SS04 (F51154-25), 49SS05 (F51154-26), and TMSS05 (F51154-32) were analyzed using this continuing calibration.

- For pesticide continuing calibration performed on 08/02/07 @17:22 on instrument ECD5, 4,4'-DDT (23.5%) was outside criteria for the signal #1. 4,4'-DDT (24.1%) was outside criteria for the signal #2. 4,4'-DDT was non-detect for all associated samples; therefore, no qualifiers were applied based upon these outliers. No samples reported were analyzed using this continuing calibration.

- For pesticide initial calibration verification performed on 08/04/07 @12:47 on instrument ECD5, all criteria were met. No qualifiers were applied. No samples reported were analyzed using this initial calibration verification.

- For pesticide continuing calibration performed on 08/08/07 @13:34 on instrument ECD5, all criteria were met for signal #1 and for the signal #2. No qualifiers were applied. Sample TMSD01 (F51154-16) was analyzed using this continuing calibration.

- For pesticide continuing calibration performed on 08/08/07 @14:59 on instrument ECD5, all criteria were met for signal #1 and for the signal #2. No qualifiers were applied. Samples TMSD01 (F51154-16), 59SS06 (F51154-27), 59SS07 (F51154-28), 59SS08 (F51154-29), 59SS09 (F51154-30), and 59SS10 (F51154-31) were analyzed using this continuing calibration.

- For pesticide continuing calibration performed on 08/08/07 @17:30 on instrument ECD5, heptachlor (30.4%), 4,4'-DDD (22.4%), 4,4'-DDT (87.0%; grossly exceeding), methoxychlor (82.0%; grossly exceeding), and endrin ketone (29.8%) were outside criteria for the signal #1. Heptachlor (31.3%), 4,4'-DDD (26.7%), 4,4'-DDT (88.2%; grossly exceeding), methoxychlor (83.0%; grossly exceeding), and endrin ketone (33.5%) were outside criteria for the signal #2. No samples reported was analyzed using this continuing calibration; therefore, no qualifiers were applied based upon these outliers.

- For pesticide initial calibration verification performed on 07/13/07 @15:47 on instrument ECD3, all criteria were met. No qualifiers were applied. No samples reported were analyzed using this initial calibration verification.

- For pesticide continuing calibration performed on 07/31/07 @14:52 on instrument ECD6, all criteria were met for signal #1. 4,4'-DDT (25.4%) was outside criteria for the signal #2. 4,4'-DDT was non-detect for all associated samples; therefore, no qualifiers were applied based upon these outliers. Samples LFSD01 (F51154-15), APSD01 (F51154-18), 41SD11 (F51154-22), and 49SS02 (F51154-23) were analyzed using this continuing calibration.

- For toxaphene pesticide continuing calibration performed on 07/31/07 @15:08 on instrument ECD6, all criteria were met. No qualifiers were applied. No samples reported were analyzed using this continuing calibration.

- For chlordane pesticide continuing calibration performed on 07/31/07 @15:24 on instrument ECD6, all criteria were met. No qualifiers were applied. No samples reported were analyzed using this continuing calibration.

- For pesticide continuing calibration performed on 07/31/07 @18:23 on instrument ECD6, 4,4'-DDT (65.7%; grossly exceeding) and methoxychlor (53.6%; grossly exceeding) were outside criteria for the signal #1. 4,4'-DDT (69.1%; grossly exceeding) and methoxychlor (57.7%; grossly exceeding) were outside criteria for the signal #2. 4,4'-DDT and methoxychlor were qualified estimated "UJ" for non-detects based upon the very high %Ds. Samples 49SS03 (F51154-24), 49SS05 (F51154-26), and TMSS05 (F51154-32) were analyzed using this continuing calibration.

- For pesticide continuing calibration performed on 07/31/07 @19:42 on instrument ECD6, 4,4'-DDT (64.5%; grossly exceeding) and methoxychlor (53.9%; grossly exceeding) were outside criteria for the signal #1. 4,4'-DDT (67.9%; grossly exceeding) and methoxychlor (56.8%; grossly exceeding) were outside criteria for the signal #2. 4,4'-DDT and methoxychlor were qualified estimated "UJ" for non-detects based upon the very high %Ds. No samples reported were analyzed using this continuing calibration.

- For pesticide initial calibration verification performed on 08/06/07 @12:29 on instrument ECD6, all criteria were met. No qualifiers were applied. No samples reported were analyzed using this initial calibration verification.

- For pesticide continuing calibration performed on 08/06/07 @15:35 on instrument ECD6, all criteria were met. No qualifiers were applied. Samples 41SD08 (F51154-9), 41SD09 (F51154-10), 41SD10 (F51154-11), 49SS04 (F51154-25), 59SS06 (F51154-27), 59SS07 (F51154-28), and 59SS08 (F51154-29) were analyzed using this continuing calibration.

- For pesticide continuing calibration performed on 08/06/07 @18:29 on instrument ECD6, 4,4'-DDT (47.6%; grossly exceeding) and methoxychlor (43.5%; grossly exceeding) were outside criteria for the signal #1. 4,4'-DDT (45.2%; grossly exceeding) and methoxychlor (43.0%; grossly exceeding) were outside criteria for the signal #2. 4,4'-DDT and methoxychlor were qualified estimated "UJ" for non-detects based upon the very high %Ds. Samples 59SS09 (F51154-30) and 59SS10 (F51154-31) were analyzed using this continuing calibration.

- For pesticide continuing calibration performed on 08/06/07 @19:32 on instrument ECD6, 4,4'-DDD (20.6%), 4,4'-DDT (51.2%; grossly exceeding), and methoxychlor (43.4%; grossly exceeding) were outside criteria for the signal #1. 4,4'-DDD (21.0%), 4,4'-DDT (67.9%; grossly exceeding), and methoxychlor (56.8%; grossly exceeding) were outside criteria for the signal #2. 4,4'-DDT and methoxychlor were qualified estimated "UJ" for non-detects based upon the very high %Ds. 4,4'-DDD was non-detect for all associated samples; therefore, no qualifiers were applied based upon these outliers. Samples 41SD08 (F51154-9), 41SD09 (F51154-10), 41SD10 (F51154-11), and 49SS04 (F51154-25) were analyzed using this continuing calibration.

- For pesticide continuing calibration performed on 08/06/07 @22:42 on instrument ECD6, heptachlor (37.9%), 4,4'-DDD (30.8%), 4,4'-DDT (95.2%; grossly exceeding), methoxychlor (89.2%; grossly exceeding), and endrin ketone (50.6%; grossly exceeding) were outside criteria for the signal #1. Heptachlor (36.0%), 4,4'-DDE (21.1%), 4,4'-DDD (56.2%; grossly exceeding), 4,4'-DDT (88.8%; grossly exceeding), methoxychlor (80.5%; grossly exceeding), and endrin ketone (47.3%; grossly exceeding) were outside criteria for the signal #2. 4,4'-DDD, 4,4'-DDT, methoxychlor, and endrin ketone were qualified estimated "J" for detects and "UJ" for non-detects based upon the very high %Ds. Heptachlor and 4,4'-DDE were non-detect for all associated samples; therefore, no qualifiers were applied based upon these outliers. No samples reported were analyzed using this continuing calibration.

- For PCB 1016/1260 initial calibration verification performed on 07/28/07 @14:59 on instrument ECD3, all criteria were met. No qualifiers were applied. No samples reported were analyzed using this initial calibration verification.

- For PCB 1016/1260 continuing calibration performed on 07/31/07 @09:51 on instrument ECD3, all criteria were met. No qualifiers were applied. Samples 41SD08 (F51154-9), 41SD09 (F51154-10), 41SD10 (F51154-11), LFSD01 (F51154-15), TMSD01 (F51154-16), APSD01 (F51154-18), and 41SD11 (F51154-22) were analyzed using this continuing calibration.

- For PCB 1248 continuing calibration performed on 07/31/07 @10:13 on instrument ECD3, all criteria were met. No qualifiers were applied. No samples reported were analyzed using this continuing calibration.

- For PCB 1242 continuing calibration performed on 07/31/07 @10:30 on instrument ECD3, all criteria were met. No qualifiers were applied. No samples reported were analyzed using this continuing calibration.

- For PCB 1232/1268 continuing calibration performed on 07/31/07 @10:47 on instrument ECD3, all criteria were met. No qualifiers were applied. No samples reported were analyzed using this continuing calibration.

- For PCB 1221/1254 continuing calibration performed on 07/31/07 @11:04 on instrument ECD3, all criteria were met. No qualifiers were applied. No samples reported were analyzed using this continuing calibration.

- For PCB 1016/1260 continuing calibration performed on 07/31/07 @14:29 on instrument ECD3, all criteria were met. No qualifiers were applied. Samples 49SS04 (F51154-25), 49SS05 (F51154-26), 59SS06 (F51154-27), 59SS07 (F51154-28), 59SS08 (F51154-29), 59SS09 (F51154-30), and 59SS10 (F51154-31) were analyzed using this continuing calibration.

- For PCB 1016/1260 continuing calibration performed on 07/31/07 @17:54 on instrument ECD3, all criteria were met. No qualifiers were applied. Sample TMSS05 (F51154-32) was analyzed using this continuing calibration.

- For PCB 1016/1260 continuing calibration performed on 07/31/07 @18:45 on instrument ECD3, all criteria were met. No qualifiers were applied. No samples reported were analyzed using this continuing calibration.

- For PCB 1016/1260 continuing calibration performed on 08/01/07 @09:49 on instrument ECD3, all criteria were met. No qualifiers were applied. Sample 49SS03 (F51154-24) was analyzed using this continuing calibration.

- For PCB 1248 continuing calibration performed on 08/01/07 @10:06 on instrument ECD3, all criteria were met. No qualifiers were applied. No samples reported were analyzed using this continuing calibration.

- For PCB 1242 continuing calibration performed on 08/01/07 @10:23 on instrument ECD3, all criteria were met. No qualifiers were applied. No samples reported were analyzed using this continuing calibration.

- For PCB 1232/1268 continuing calibration performed on 08/01/07 @10:44 on instrument ECD3, all criteria were met. No qualifiers were applied. No samples reported were analyzed using this continuing calibration.

- For PCB 1221/1254 continuing calibration performed on 08/01/07 @11:01 on instrument ECD3, all criteria were met. No qualifiers were applied. No samples reported were analyzed using this continuing calibration.

- For PCB 1016/1260 continuing calibration performed on 08/01/07 @13:56 on instrument ECD3, all criteria were met. No qualifiers were applied. No samples reported were analyzed using this continuing calibration.

- For PCB 1016/1260 initial calibration verification performed on 07/26/07 @13:51 on instrument ECD7, all criteria were met. No qualifiers were applied. No samples reported were analyzed using this initial calibration verification.

- For PCB 1016/1260 continuing calibration performed on 07/26/07 @18:39 on instrument ECD7, PCB1016-A (28.0%) was outside criteria for signal #1; however, the average %D for PCB1016 was 12.4%. PCB1016-A (40.6%), PCB1016-B (29.9%), and PCB1016-F (22.8%) were outside criteria for signal #2. The average %D for PCB1016 was 20.9% for signal #2. PCB 1016 was non-detect for all associated samples and was qualified estimated "UJ" for non-detects based upon the high %D. Samples 41SW08 (F51154-6), 41SW09 (F51154-7), 41SW10 (F51154-8), LFSW01 (F51154-17), and TMSW01 (F51154-20) were analyzed using this continuing calibration.

- For PCB 1016/1260 continuing calibration performed on 07/26/07 @21:45 on instrument ECD7, all criteria were met. No qualifiers were applied. No samples reported were analyzed using this continuing calibration.

- For PCB 1016/1260 initial calibration verification performed on 08/02/07 @13:41 on instrument ECD7, all criteria were met. No qualifiers were applied. Sample 49SS02 (F51154-23) was analyzed using this initial calibration verification.

- For PCB 1016/1260 continuing calibration performed on 08/02/07 @16:48 on instrument ECD7, all criteria were met. No qualifiers were applied. No samples reported were analyzed using this continuing calibration.

V-Blank Analysis

The purpose of laboratory or field blank analyses is to determine the existence and magnitude of contamination problems resulting from laboratory or field activities. One method blank per analytical batch must be run on each instrument used to analyze samples. The DoD QSM criterion specifies all concentrations should be less than one-half MRL. Positive sample results are reported and qualified "B", if the concentration of the compound in the sample is ≤5 times (5X) the maximum amount for pesticide and PCB target compounds. **Table 2** summarizes the blank contamination analysis. Action levels are based upon dilution factor of one and for solid matrices were converted to soil values (soil conversion factor = 33) if needed. Rinse blank RB083007 (F52208-1) (low-flow pump) applies to the groundwater "GW" samples in this SDG. The surface water "SW" samples were collected directly into the laboratory bottles; therefore, no rinse blank applies for the SW samples. Rinse blanks 072407R (F51275-1) and 072507R (F51300-31) apply to the surface soil "SS" and subsurface soil "SB" samples in this SDG. Rinse blank RB071807 (F51154-12) applies to the sediment "SD" samples in this SDG.

Table 2 Blank Contamination Analysis Summary

Parameter	Analysis Date	QC Blank ID	Compound	Max Conc. µg/L	Action Level µg/L	B qualified samples
Pesticides	07/26/07	OP21578-MB	All target <½MRL	NA	NA	None
Pesticides	09/24/07	RB083007	All target <½MRL	NA	NA	None
PCBs	06/27/07	OP21577-MB	All target <½MRL	NA	NA	None
PCBs	09/14/07	RB083007	All target <½MRL	NA	NA	None
Parameter	**Analysis Date**	**QC Blank ID**	**Compound**	**Max Conc. µg/kg**	**Action Level µg/kg**	**B qualified samples**
Pesticides	07/31/07	OP21640-MB	All target <½MRL	NA	NA	None
Pesticides	08/02/07	OP21640-MB	All target <½MRL	NA	NA	None
Pesticides	08/06/07	OP21640-MB	All target <½MRL	NA	NA	None
Pesticides	08/08/07	OP21640-MB	All target <½MRL	NA	NA	None
Pesticides	07/02/07	RB071807	All target <½MRL	NA	NA	None
Pesticides	07/02/07	072407R	All target <½MRL	NA	NA	None
Pesticides	07/02/07	072507R	All target <½MRL	NA	NA	None
PCBs	07/26/07	OP21641-MB	All target <½MRL	NA	NA	None
PCBs	07/27/07	OP21641-MB	All target <½MRL	NA	NA	None
PCBs	07/27/07	OP21641-MB	All target <½MRL	NA	NA	None
PCBs	06/27/07	RB071807	All target <½MRL	NA	NA	None
PCBs	06/27/07	072407R	All target <½MRL	NA	NA	None
PCBs	06/27/07	072507R	All target <½MRL	NA	NA	None

NA = Not Applicable
MRL = Method Reporting Limit

VI-System Monitoring Compound (Surrogates)
Laboratory performance on individual samples is evaluated through the review of surrogate spike samples. Surrogate spikes are added to all samples and blanks to measure their recovery in sample and blank matrices. The percent recoveries (%Rs) must be within the specified control limits. DoD surrogate recovery limits are specified in Table D-3 of the DoD QSM (DoD, 2006). If the surrogate is not listed, then the laboratory criteria shall be used.

Aqueous Criteria:	Tetrachloro-m-xylene:	Pesticides: 42-127% (DoD QSM 25-140%)
	Decachlorobiphenyl:	Pesticides: 27-127% (DoD QSM 30-135%)
Aqueous Criteria:	Tetrachloro-m-xylene:	PCBs: 38-127% (DoD QSM Not Listed)
	Decachlorobiphenyl:	PCBs: 25-137% (DoD QSM 40-135%)
Solid Criteria:	Tetrachloro-m-xylene:	Pesticides: 46-122% (DoD QSM 70-125%)
	Decachlorobiphenyl:	Pesticides: 50-133% (DoD QSM 55-130%)
Solid Criteria:	Tetrachloro-m-xylene:	PCBs: 44-126% (DoD QSM Not Listed)
	Decachlorobiphenyl:	PCBs: 39-157% (DoD QSM 60-125%)

- For pesticides sample 41SD10 (F51154-11), all criteria were met for the original run. For the confirmation, tetrachloro-m-xylene (69.0%) was below DoD QSM criteria and within laboratory criteria. Decachlorobiphenyl was within criteria. Since only one surrogate was outside criteria, no qualifiers were applied based upon this outlier for run #2.

- For pesticides sample TMSD01 (F51154-16), tetrachloro-m-xylene (50.0%) and decachlorobiphenyl (37.0%) were outside criteria. All detects were qualified "L" and non-detects "UL" based upon the low recoveries. Sample was re-analyzed for confirmation (run #2). For the confirmation, tetrachloro-m-xylene (62.0%) was below DoD QSM criteria and within laboratory criteria. Decachlorobiphenyl was within criteria. Since only one surrogate was outside criteria, no qualifiers were applied based upon this outlier for run #2.

- For pesticides sample 41SD11 (F51154-22), tetrachloro-m-xylene (69.0%) was below DoD QSM criteria and within laboratory criteria. Decachlorobiphenyl was within criteria. Since only one surrogate was outside criteria, no qualifiers were applied based upon this outlier. Sample was re-analyzed for confirmation (run #2). For the confirmation, tetrachloro-m-xylene (65.0%) was below DoD QSM criteria and within laboratory criteria. Decachlorobiphenyl was within criteria. Since only one surrogate was outside criteria, no qualifiers were applied based upon this outlier for run #2.

- For pesticides sample 49SS02 (F51154-23), tetrachloro-m-xylene (53.0%) was below DoD QSM criteria and within laboratory criteria. Decachlorobiphenyl was within criteria. Since only one surrogate was outside criteria, no qualifiers were applied based upon this outlier. Sample was re-analyzed for confirmation (run #2). For the confirmation, tetrachloro-m-xylene (51.0%) and decachlorobiphenyl (48.0%) were outside criteria. All detects were qualified "L" and non-detects "UL" based upon the low recoveries for run #2.

- For pesticides sample 49SS03 (F51154-24), tetrachloro-m-xylene (64.0%) was below DoD QSM criteria and within laboratory criteria. Decachlorobiphenyl was within criteria. Since only one surrogate was outside criteria, no qualifiers were applied based upon this outlier. For the confirmation, tetrachloro-m-xylene (62.0%) was below DoD QSM criteria and within laboratory criteria. Decachlorobiphenyl was within criteria. Since only one surrogate was outside criteria, no qualifiers were applied based upon this outlier for run #2.

- For pesticides sample 59SS07 (F51154-28), all criteria were met for the original run. For the confirmation, tetrachloro-m-xylene (67.0%) was below DoD QSM criteria and within laboratory criteria. Decachlorobiphenyl was within criteria. Since only one surrogate was outside criteria, no qualifiers were applied based upon this outlier for run #2.

- For pesticides sample 59SS09 (F51154-30), tetrachloro-m-xylene (66.0%) was below DoD QSM criteria and within laboratory criteria. Decachlorobiphenyl was within criteria. Since only one surrogate was outside criteria, no qualifiers were applied based upon this outlier. Sample was re-analyzed for confirmation (run #2). For the confirmation, tetrachloro-m-xylene (69.0%) was below DoD QSM criteria and within laboratory criteria. Decachlorobiphenyl was within criteria. Since only one surrogate was outside criteria, no qualifiers were applied based upon this outlier for run #2.

- For pesticides sample 59SS10 (F51154-31), tetrachloro-m-xylene (55.0%) was below DoD QSM criteria and within laboratory criteria. Decachlorobiphenyl was within criteria. Since only one surrogate was outside criteria, no qualifiers were applied based upon this outlier. Sample was re-analyzed for confirmation (run #2). For the confirmation, all criteria were met.

- For pesticides sample TMSS05 (F51154-32), all criteria were met for the original run. For the confirmation, tetrachloro-m-xylene (69.0%) was below DoD QSM criteria and within laboratory criteria. Decachlorobiphenyl was within criteria. Since only one surrogate was outside criteria, no qualifiers were applied based upon this outlier for run #2.

- For PCBs sample 41SD08 (F51154-9), decachlorobiphenyl (57.0%) was below DoD QSM criteria and within laboratory criteria. Tetrachloro-m-xylene was within criteria. Since only one surrogate was outside criteria, no qualifiers were applied based upon this outlier.

- For PCBs sample 41SD10 (F51154-11), decachlorobiphenyl (56.0%) was below DoD QSM criteria and within laboratory criteria. Tetrachloro-m-xylene was within criteria. Since only one surrogate was outside criteria, no qualifiers were applied based upon this outlier.

- For PCBs sample LFSD01 (F51154-15), decachlorobiphenyl (48.0%) was below DoD QSM criteria and within laboratory criteria. Tetrachloro-m-xylene was within criteria. Since only one surrogate was outside criteria, no qualifiers were applied based upon this outlier.

- For PCBs sample TMSD01 (F51154-16), decachlorobiphenyl (59.0%) was below DoD QSM criteria and within laboratory criteria. Tetrachloro-m-xylene was within criteria. Since only one surrogate was outside criteria, no qualifiers were applied based upon this outlier.

- For PCBs sample 59SS06 (F51154-27), decachlorobiphenyl (59.0%) was below DoD QSM criteria and within laboratory criteria. Tetrachloro-m-xylene was within criteria. Since only one surrogate was outside criteria, no qualifiers were applied based upon this outlier.

- For PCBs sample 59SS07 (F51154-28), decachlorobiphenyl (59.0%) was below DoD QSM criteria and within laboratory criteria. Tetrachloro-m-xylene was within criteria. Since only one surrogate was outside criteria, no qualifiers were applied based upon this outlier.

- For all other samples, all criteria were met for pesticides and PCBs analysis.

VII-Laboratory Control Samples
Laboratory control samples (LCS) are used to monitor laboratory accuracy by calculating the percent recoveries of the spiked compounds. All LCS percent recoveries must be within the specified control limits. DoD QSM aqueous LCS recovery limits are specified in Table D-14 and Table D-16 of the DoD QSM (DoD, 2006). DoD QSM solid LCS recovery limits are specified in Table D-15 and Table D-17 of the DoD QSM (DoD, 2006). If the compound is not listed, then the laboratory criteria shall be used.

- Sample OP21578-BS was used as the aqueous LCS for the pesticide analysis on 07/26/07. Compound endrin aldehyde (12%) was outside DoD QSM criteria, however within laboratory criteria. Compound endrin aldehyde was non-detect for all associated samples and was qualified estimated bias "UL" for non-detects based upon very low recovery. Samples 41SW08 (F51154-6), 41SW09 (F51154-7), 41SW10 (F51154-8), LFSW01 (F51154-17), and TMSW01 (F51154-20) apply to this LCS.

- Sample OP21640-BS was used as the solid LCS for the pesticide analysis on 07/31/07. Compound endrin aldehyde (8%) was outside DoD QSM criteria, however within laboratory criteria. Compound endrin aldehyde was non-detect for all associated samples and was qualified estimated bias "UL" for non-detects based upon very low recovery. Samples 41SD08 (F51154-9), 41SD09 (F51154-10), 41SD10 (F51154-11), LFSD01 (F51154-15), TMSD01 (F51154-16), APSD01 (F51154-18), 41SD11 (F51154-22), 49SS02 (F51154-23), 49SS03 (F51154-24), 49SS04 (F51154-25), 49SS05 (F51154-26), 59SS06 (F51154-27), 59SS07 (F51154-28), 59SS08 (F51154-29), 59SS09 (F51154-30), 59SS10 (F51154-31), and TMSS05 (F51154-32) apply to this LCS.

- Sample OP21577-BS was used as the aqueous LCS for the PCB analysis on 07/26/07. All criteria were met. No qualifiers were applied. Samples 41SW08 (F51154-6), 41SW09 (F51154-7), 41SW10 (F51154-8), LFSW01 (F51154-17), and TMSW01 (F51154-20) apply to this LCS.

- Sample OP21641-BS was used as the solid LCS for the PCB analysis on 07/31/07. All criteria were met. No qualifiers were applied. Samples 41SD08 (F51154-9), 41SD09 (F51154-10), 41SD10 (F51154-11), LFSD01 (F51154-15), TMSD01 (F51154-16), APSD01 (F51154-18), 41SD11 (F51154-22), 49SS02 (F51154-23), 49SS03 (F51154-24), 49SS04 (F51154-25), 49SS05 (F51154-26), 59SS06 (F51154-27), 59SS07 (F51154-28), 59SS08 (F51154-29), 59SS09 (F51154-30), 59SS10 (F51154-31), and TMSS05 (F51154-32) apply to this LCS.

VIII-Matrix Spike/Matrix Spike Duplicate
Data for matrix spike/matrix spike duplicates (MS/MSD) are generated to determine long-term precision and accuracy of the analytical method on various matrices and to demonstrate acceptable compound recovery by the laboratory at the time of sample analysis. The percent recoveries (%Rs) and the relative percent difference (RPD) must be within the specified control limits. DoD aqueous MS/MSD recovery limits follow the LCS criteria and are specified in Table D-14 and Table D-16 of the DoD QSM (DoD, 2006). DoD solid MS/MSD recovery limits follow the LCS criteria and are specified in Table D-15 and Table D-17 of the DoD QSM (DoD, 2006). If the compound is not listed, then the laboratory criteria shall be used.

- Sample LFSW01 (F51154-17) was used as the MS/MSD for the pesticide analysis on 07/26/07. Compound endrin aldehyde (21%, 15%) was outside DoD QSM criteria, however within laboratory criteria. The LCS was also low in recovery (See Section VII). Compound endrin aldehyde was non-detect for all samples and qualified estimated bias low "UL" for non-detects for the spiked sample based upon very low recoveries. Samples 41SW08 (F51154-6), 41SW09 (F51154-7), 41SW10 (F51154-8), LFSW01 (F51154-17), and TMSW01 (F51154-20) apply to this MS/MSD.

- Sample LFSW01 (F51154-17) was used as the MS/MSD for the PCB analysis on 07/26/07. All criteria were met. No qualifiers were applied. Samples 41SW08 (F51154-6), 41SW09 (F51154-7), 41SW10 (F51154-8), LFSW01 (F51154-17), and TMSW01 (F51154-20) apply to this MS/MSD.

- Sample 49SS04 (F51154-25) was used as the MS/MSD for the pesticide analysis on 08/06/07. Compounds delta-BHC (RPD=56%), alpha chlordane (72%), gamma chlordane (74%), dieldrin (70%), 4,4'-DDE (72%), 4,4'-DDT (48%, 0%; RPD=200%), endrin (70%), endosulfan sulfate (0%, RPD=200%), endrin aldehyde (0%, 0%), endrin ketone (62%), endosulfan II (70%), and methoxychlor (60%, 44%, RPD=29%) were outside DoD QSM criteria and/or laboratory criteria. The LCS was also low in recovery (See Section VII). Compounds 4,4'-DDT, endosulfan sulfate, and endrin aldehyde were rejected for the spiked sample based upon no recovery found. Compounds alpha chlordane, gamma chlordane, dieldrin, 4,4'-DDE, endrin, endrin ketone, endosulfan II, and methoxychlor were non-detect for the spiked sample and qualified estimated bias low "UL" for non-detects based upon low recoveries. Delta-BHC was qualified "UJ" for the spiked sample based upon the high RPD. Samples 41SD08 (F51154-9), 41SD09 (F51154-10), 41SD10 (F51154-11), LFSD01 (F51154-15), TMSD01 (F51154-16), APSD01 (F51154-18), 41SD11 (F51154-22), 49SS02 (F51154-23), 49SS03 (F51154-24), 49SS04 (F51154-25), 49SS05 (F51154-26), 59SS06 (F51154-27), 59SS07 (F51154-28), 59SS08 (F51154-29), 59SS09 (F51154-30), 59SS10 (F51154-31), and TMSS05 (F51154-32) apply to this MS/MSD.

- Sample 59SS06 (F51154-27) was used as the MS/MSD for the PCB analysis on 07/31/07. All criteria were met. No qualifiers were applied. Samples 41SD08 (F51154-9), 41SD09 (F51154-10), 41SD10 (F51154-11), LFSD01 (F51154-15), TMSD01 (F51154-16), APSD01 (F51154-18), 41SD11 (F51154-22), 49SS02 (F51154-23), 49SS03 (F51154-24), 49SS04 (F51154-25), 49SS05 (F51154-26), 59SS06 (F51154-27), 59SS07 (F51154-28), 59SS08 (F51154-29), 59SS09 (F51154-30), 59SS10 (F51154-31), and TMSS05 (F51154-32) apply to this MS/MSD.

IX-Field Duplicate Sample Analysis

Field duplicates were collected to identify the cumulative precision of the sampling and analytical process and sent to the laboratory blind. The RPD was calculated only for those analytes which were detected at levels exceeding the method reporting limits in both samples of the duplicate pair. Analytes that were rejected (R-qualified) in either sample of the duplicate pair were excluded from the duplicate assessment. Precision control criterion was established at 50% RPD for the aqueous and solid samples. Analytical results were qualified as estimated (J) for any RPDs exceeding criteria.

- Field surface water sample duplicate pair LFSW01 (F51154-17) and TMSW01 (F51154-20) was collected for chlorinated pesticides and PCBs. All chlorinated pesticides and PCBs target compounds were non-detect. All criteria were met. No qualifiers were applied.

- Field surface soil sample duplicate pair 49SS05 (F51154-26) and TMSS05 (F51154-32) was collected for chlorinated pesticides and PCBs. All chlorinated pesticides and PCBs target compounds were non-detect, except for Aroclor 1254. PCB 1254 was detected at 41.1 µg/kg in the original sample and 75.6 µg/kg in the duplicate pair resulting in a RPD of 59.1%. PCB 1254 was qualified estimated "J" for the duplicate pair based upon the high RPD.

- Field sediment sample duplicate pair LFSD01 (F51154-15) and TMSD01 (F51154-16) was collected for chlorinated pesticides and PCBs. All detected chlorinated pesticides and PCBs target compounds found in the sample and its duplicate pair and associated %RPD are noted in **Table 3**. All other chlorinated pesticides and PCBs target compounds were non-detect. alpha-Chlordane (88.4%), gamma-Chlordane (70.7%), and Aroclor 1260 (58.1%) were above criteria due to low concentration levels detected below the MRL and/or matrix effects. alpha-Chlordane, gamma-chlordane, and aroclor 1260 were qualified estimated "J" for the original and duplicate pair samples based upon these outliers. For all other compounds, all criteria were met.

Table 3 Field Precision Hits Analysis Summary for Chlorinated Pesticides and PCBs for Duplicate Pair LFSD01 (F51154-15) and TMSD01 (F51154-16)

Compound	Original Sample (µg/kg)	Duplicate Pair (µg/kg)	%RPD
Heptachlor epoxide	14U	1.7J	NA
alpha-Chlordane	13.7J	5.3	88.4
gamma-Chlordane	13.6J	6.5	70.7
Aroclor 1260	135	74.2	58.1

J = Estimated value <MRL and >MDL.
U = Non-detect as <MRL.
NA = Not Applicable

X-Quantitation Verification

The accuracy of analytical results was verified through the calculation of several parameters. The difference between the calculated value and the reported value must be within 10% difference. All positive values must have less than or equal to 40% %D between the primary and secondary columns. Any sample value >MDL and <MRL or <3*MDL (whichever is greater) was qualified as estimated, "J." All criteria were met.

- For sample 59SS07 (F51154-28), dieldrin (86.8%) and heptachlor epoxide (57.4%) were outside criteria. All other target compounds were within criteria. Dieldrin and heptachlor epoxide were qualified estimated "J" based upon the high %Ds.

- For sample 59SS08 (F51154-29), dieldrin (114%) and 4,4'-DDD (82.4%) were outside criteria. All other target compounds were within criteria. Dieldrin and 4,4'-DDD were qualified estimated "J" based upon the high %Ds.

- For all other samples with detected chlorinated pesticides and PCBs, the %D (average %D for multi-peak compounds) between the primary and secondary columns was within criteria.

Sample: LFSW01MS (F51154-17MS), alpha-chlordane

Conc. µg/L = (Amt * DF * Vt) / (CF * Vo)

where: Amt is the response on column (ng/mL) of the sample
CF = Calibration Factor (from initial calibration)
Vt is the volume of final extract (mL)
DF is the dilution factor
Vo is the volume of the sample extracted (mL)

Conc. µg/L = (9068815 ng/mL * 1 * 10 mL) / (212100 * 430 mL)
= 0.99 ng/mL = 0.99 µg/L

Reported Conc. = 0.99 µg/L
%D = 0.0%
Values were within 10% difference

Sample: **LFSW01MS (F51154-17MS), Aroclor 1260**

Conc. µg/L = (Ax * Vt * DF) / (CF * Vi * Vs)

where: Conc. = Sample concentration in µg/L
Ax = Area/response for compound being measured.
Vt = Volume of total extract, taking into account dilutions (i.e., a 1-to-10 dilution of a 1-mL extract will mean V(t) = 10000 µL.
CF = Ave calibration response factor for compound being measured from ICAL (Area/pg)
Vi = Volume of extract injected (µL).
Vs = Volume of sample extracted (L).
DF = Dilution factor

Signal #1
Conc1 µg/L = (1118429 * 10000* 1) / (3120 *(1000000) * 1 * 0.44) = 8.15 µg/L
Conc2 µg/L = (1273241 * 10000* 1) / (3552 *(1000000) * 1 * 0.44) = 8.15 µg/L
Conc3 µg/L = (1179335 * 10000* 1) / (3200 *(1000000) * 1 * 0.44) = 8.38 µg/L
Conc4 µg/L = (944050 * 10000* 1) / (2782 *(1000000) * 1 * 0.44) = 8.07 µg/L
Conc5 µg/L = (2049224 * 10000* 1) / (5769 *(1000000) * 1 * 0.44) = 7.66 µg/L
Conc6 µg/L = (772955 * 10000* 1) / (2276 *(1000000) * 1 * 0.44) = 7.72 µg/L
Average concentration = 8.0 µg/L

Signal #2
Conc1 µg/L = (689475 * 10000* 1) / (1917 *(1000000) * 1 * 0.44) = 8.17 µg/L
Conc2 µg/L = (800449 * 10000* 1) / (2172 *(1000000) * 1 * 0.44) = 8.38 µg/L
Conc3 µg/L = (772763 * 10000* 1) / (2088 *(1000000) * 1 * 0.44) = 8.41 µg/L
Conc4 µg/L = (589063 * 10000* 1) / (1698 *(1000000) * 1 * 0.44) = 7.88 µg/L
Conc5 µg/L = (1340728 * 10000* 1) / (3820 *(1000000) * 1 * 0.44) = 7.98 µg/L
Conc6 µg/L = (504915 * 10000* 1) / (1482 *(1000000) * 1 * 0.44) = 7.74 µg/L
Average concentration = 8.1 µg/L

Reported Value = 8.0 µg/L (from signal #1)
% Difference = 0.0%
Values were within 10% difference.

Sample: LFSD01 (F51154-15), alpha-chlordane

Conc. µg/kg = (Ax * Vt * DF) / (CF * Vi * Ws * D)

where: Conc. = Sample concentration in µg/kg
Ax = Area/response for compound being measured.
Vt = Volume of total extract, taking into account dilutions (i.e., a 1-to-10 dilution of a 1-mL extract will mean V(t) = 10000 µL.
CF = Ave calibration response factor for compound being measured from ICAL (Area/pg)
Vi = Volume of extract injected (mL).
W(s) = Weight of sample extracted or diluted in grams.
D = Percent dry weight (100 - % moisture in sample)/100 = 1.0 for Wet Weight
DF = Dilution factor

Conc. µg/kg = (166174 Area*10000µL*5) / (34180 Area/pg*(1000 pg/ng)*1 µL*30.7g*0.5790) = 13.7 µg/kg

Reported Value = 13.7 µg/kg
% Difference = 0.0%
Values were within 10% difference

Sample: 49SS03 (F51154-24), Aroclor 1260

Conc. µg/kg = (Ax * Vt * DF) / (CF * Vi * Ws * D)

where: Conc. = Sample concentration in µg/kg
Ax = Area/response for compound being measured.
Vt = Volume of total extract, taking into account dilutions (i.e., a 1-to-10 dilution of a 1-mL extract will mean V(t) = 10000 µL.
CF = Ave calibration response factor for compound being measured from ICAL (Area/pg)
Vi = Volume of extract injected (µL).
W(s) = Weight of sample extracted or diluted in grams.
D = Percent dry weight (100 - % moisture in sample)/100 = 1.0 for Wet Weight
DF = Dilution factor

Signal #1
Conc1 µg/kg = (0*10000*2) / (8040*(1000)*1*29.9*0.9200) = 0.00 µg/kg
Conc2 µg/kg = (0*10000*2) / (9920*(1000)*1*29.9*0.9200) = 0.00 µg/kg
Conc3 µg/kg = (0*10000*2) / (9980*(1000)*1*29.9*0.9200) = 0.00 µg/kg
Conc4 µg/kg = (685577*10000*2) / (7129*(1000)*1*29.9*0.9200) = 69.92 µg/kg
Conc5 µg/kg = (1484623*10000*2) / (16390*(1000)*1*29.9*0.9200) = 65.86 µg/kg
Conc6 µg/kg = (1094850*10000*2) / (9500*(1000)*1*29.9*0.9200) = 83.79 µg/kg
Average concentration = 73.2 µg/kg (Peaks 4 → 6)

Signal #2
Conc1 µg/kg = (0*10000*2) / (1276*(1000)*1*29.9*0.9200) = 0.00 µg/kg
Conc2 µg/kg = (0*10000*2) / (1547*(1000)*1*29.9*0.9200) = 0.00 µg/kg
Conc3 µg/kg = (0*10000*2) / (1420*(1000)*1*29.9*0.9200) = 0.00 µg/kg
Conc4 µg/kg = (171305*10000*2) / (1103*(1000)*1*29.9*0.9200) = 112.92 µg/kg
Conc5 µg/kg = (238470*10000*2) / (2556*(1000)*1*29.9*0.9200) = 67.83 µg/kg
Conc6 µg/kg = (141537*10000*2) / (1028*(1000)*1*29.9*0.9200) = 100.10 µg/kg
Average concentration = 93.6 µg/kg (Peaks 4 → 6)

Reported Value = 73.2 µg/kg (signal #1)
% Difference = 0.0%
Values were within 10% difference.

USEPA Region III Validation Qualifiers

(No Code) = Confirmed identification.

B = The analyte has been detected in the sample and the associated laboratory or field blank.

J = Indicates an estimated value for (1) estimated value due to QC non-conformance. Reported value may not be accurate or precise, (2) estimating a concentration as a tentatively identified compound as indicated by the mass spectral and retention time data, or (3) estimating a concentration ≥ MDL and <MRL or <3*MDL, whichever is greater.

K = Analyte present. Reported value may be biased high (estimated) due to QC non-conformance.

L = Analyte present. Reported value may be biased low (estimated) due to QC non-conformance.

R = Unreliable result. Analyte may or may not be present in the sample due to QC non-conformance.

UL = Value is estimated bias low and not detected due to QC non-conformance. Reporting limit may be inaccurate or imprecise. Quantitation limit is probably higher.

UJ = Value is estimated and not detected due to QC non-conformance. Reporting limit may be inaccurate or imprecise.

Laboratory Qualifiers

(No Code) = Confirmed identification.

U = Not detected. The associated number indicates the compound reporting limit for the sample.

A (Dioxins) = B (Metals) = The reported value was obtained from a reading <MRL and ≥MDL and is considered estimated.

B (Organics) = The analyte or compound has been detected in the sample and laboratory method blank. It indicates probable blank contamination.

E (Metals) = Reported value is estimated because of the presence of interferences.

E (Organics) = Identifies compounds whose concentrations exceed the upper level of the calibration range.

EMPC (Dioxins) = The ion-abundance ratio between the two characteristic PCDD/PCDF ions was outside accepted ranges. The detected PCDD/PCDF was reported as an estimated maximum possible concentration (EMPC).

D = Indicates sample was analyzed at a dilution.

J = Indicates an estimated value for (1) estimating a concentration as a tentatively identified compound as indicated by the mass spectral and retention time data, or (2) estimating a concentration <MRL and ≥ MDL.

N (Organics) = Indicates presumptive evidence of a compound for tentatively identified compounds using a library search.

P (Organics) = Target analyte confirmation >40% difference for detected compound between the primary and secondary columns. The lower of the two values was reported.

N (Metals) = Laboratory spike sample recovery not within control limits.

* (Metals) = Duplicate analysis not within control limits.

* (Organics) = Surrogate outside of QC limits on both original and re-analysis.

Raw Data: KK20472.D

Form I Copy

Accutest Laboratories

Report of Analysis

Client Sample ID:	41SW08		
Lab Sample ID:	F51154-6	Date Sampled:	07/18/07
Matrix:	AQ - Surface Water	Date Received:	07/19/07
Method:	SW846 8081A SW846 3510C	Percent Solids:	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	KK20472.D	1	07/26/07	FS	07/24/07	OP21578	GKK752
Run #2							

	Initial Volume	Final Volume
Run #1	1000 ml	10.0 ml
Run #2		

Pesticide TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
309-00-2	Aldrin	ND	0.050	0.020	ug/l	
319-84-6	alpha-BHC	ND	0.050	0.015	ug/l	
319-85-7	beta-BHC	ND	0.050	0.020	ug/l	
319-86-8	delta-BHC	ND	0.050	0.020	ug/l	
58-89-9	gamma-BHC (Lindane)	ND	0.050	0.015	ug/l	
5103-71-9	alpha-Chlordane	ND	0.050	0.015	ug/l	
5103-74-2	gamma-Chlordane	ND	0.050	0.015	ug/l	
60-57-1	Dieldrin	ND	0.050	0.015	ug/l	
72-54-8	4,4'-DDD	ND	0.10	0.020	ug/l	
72-55-9	4,4'-DDE	ND	0.10	0.020	ug/l	
50-29-3	4,4'-DDT	ND	0.10	0.020	ug/l	
72-20-8	Endrin	ND	0.10	0.040	ug/l	
1031-07-8	Endosulfan sulfate	ND	0.10	0.020	ug/l	
7421-93-4	Endrin aldehyde	ND VL	0.10	0.040	ug/l	
53494-70-5	Endrin ketone	ND	0.10	0.020	ug/l	
959-98-8	Endosulfan-I	ND	0.050	0.015	ug/l	
33213-65-9	Endosulfan-II	ND	0.10	0.020	ug/l	
76-44-8	Heptachlor	ND	0.050	0.020	ug/l	
1024-57-3	Heptachlor epoxide	ND	0.050	0.015	ug/l	
72-43-5	Methoxychlor	ND	0.10	0.040	ug/l	
8001-35-2	Toxaphene	ND	2.5	1.3	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	74%		42-127%
2051-24-3	Decachlorobiphenyl	74%		27-127%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: XX022300.D

Form I Copy

Accutest Laboratories

Report of Analysis

Client Sample ID:	41SW08		
Lab Sample ID:	F51154-6	Date Sampled:	07/18/07
Matrix:	AQ - Surface Water	Date Received:	07/19/07
Method:	SW846 8082 SW846 3510C	Percent Solids:	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	XX022300.D	1	07/26/07	AC	07/24/07	OP21577	GXX184
Run #2							

	Initial Volume	Final Volume
Run #1	1000 ml	10.0 ml
Run #2		

PCB List

CAS No.	Compound	Result	RL	MDL	Units	Q
12674-11-2	Aroclor 1016	ND UJ	0.50	0.25	ug/l	
11104-28-2	Aroclor 1221	ND	0.50	0.40	ug/l	
11141-16-5	Aroclor 1232	ND	0.50	0.40	ug/l	
53469-21-9	Aroclor 1242	ND	0.50	0.25	ug/l	
12672-29-6	Aroclor 1248	ND	0.50	0.25	ug/l	
11097-69-1	Aroclor 1254	ND	0.50	0.25	ug/l	
11096-82-5	Aroclor 1260	ND	0.50	0.25	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	86%		38-127%
2051-24-3	Decachlorobiphenyl	78%		25-137%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: KK20473.D

Form I Copy

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Report of Analysis

Client Sample ID:	41SW09		
Lab Sample ID:	F51154-7	Date Sampled:	07/18/07
Matrix:	AQ - Surface Water	Date Received:	07/19/07
Method:	SW846 8081A SW846 3510C	Percent Solids:	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	KK20473.D	1	07/26/07	FS	07/24/07	OP21578	GKK752
Run #2							

	Initial Volume	Final Volume
Run #1	940 ml	10.0 ml
Run #2		

Pesticide TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
309-00-2	Aldrin	ND	0.053	0.021	ug/l	
319-84-6	alpha-BHC	ND	0.053	0.016	ug/l	
319-85-7	beta-BHC	ND	0.053	0.021	ug/l	
319-86-8	delta-BHC	ND	0.053	0.021	ug/l	
58-89-9	gamma-BHC (Lindane)	ND	0.053	0.016	ug/l	
5103-71-9	alpha-Chlordane	ND	0.053	0.016	ug/l	
5103-74-2	gamma-Chlordane	ND	0.053	0.016	ug/l	
60-57-1	Dieldrin	ND	0.053	0.016	ug/l	
72-54-8	4,4'-DDD	ND	0.11	0.021	ug/l	
72-55-9	4,4'-DDE	ND	0.11	0.021	ug/l	
50-29-3	4,4'-DDT	ND	0.11	0.021	ug/l	
72-20-8	Endrin	ND	0.11	0.043	ug/l	
1031-07-8	Endosulfan sulfate	ND	0.11	0.021	ug/l	
7421-93-4	Endrin aldehyde	ND VL	0.11	0.043	ug/l	
53494-70-5	Endrin ketone	ND	0.11	0.021	ug/l	
959-98-8	Endosulfan-I	ND	0.053	0.016	ug/l	
33213-65-9	Endosulfan-II	ND	0.11	0.021	ug/l	
76-44-8	Heptachlor	ND	0.053	0.021	ug/l	
1024-57-3	Heptachlor epoxide	ND	0.053	0.016	ug/l	
72-43-5	Methoxychlor	ND	0.11	0.043	ug/l	
8001-35-2	Toxaphene	ND	2.7	1.3	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	78%		42-127%
2051-24-3	Decachlorobiphenyl	76%		27-127%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: XX022301.D

Form I Copy

Accutest Laboratories

Report of Analysis

Client Sample ID:	41SW09		
Lab Sample ID:	F51154-7	Date Sampled:	07/18/07
Matrix:	AQ - Surface Water	Date Received:	07/19/07
Method:	SW846 8082 SW846 3510C	Percent Solids:	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	XX022301.D	1	07/26/07	AC	07/24/07	OP21577	GXX184
Run #2							

	Initial Volume	Final Volume
Run #1	940 ml	10.0 ml
Run #2		

PCB List

CAS No.	Compound	Result	RL	MDL	Units	Q
12674-11-2	Aroclor 1016	ND VJ	0.53	0.27	ug/l	
11104-28-2	Aroclor 1221	ND	0.53	0.43	ug/l	
11141-16-5	Aroclor 1232	ND	0.53	0.43	ug/l	
53469-21-9	Aroclor 1242	ND	0.53	0.27	ug/l	
12672-29-6	Aroclor 1248	ND	0.53	0.27	ug/l	
11097-69-1	Aroclor 1254	ND	0.53	0.27	ug/l	
11096-82-5	Aroclor 1260	ND	0.53	0.27	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	87%		38-127%
2051-24-3	Decachlorobiphenyl	81%		25-137%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: KK20474.D

Form I Org

Accutest Laboratories

Report of Analysis

Client Sample ID:	41SW10		
Lab Sample ID:	F51154-8	Date Sampled:	07/18/07
Matrix:	AQ - Surface Water	Date Received:	07/19/07
Method:	SW846 8081A SW846 3510C	Percent Solids:	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	KK20474.D	1	07/26/07	FS	07/24/07	OP21578	GKK752
Run #2							

	Initial Volume	Final Volume
Run #1	1020 ml	10.0 ml
Run #2		

Pesticide TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
309-00-2	Aldrin	ND	0.049	0.020	ug/l	
319-84-6	alpha-BHC	ND	0.049	0.015	ug/l	
319-85-7	beta-BHC	ND	0.049	0.020	ug/l	
319-86-8	delta-BHC	ND	0.049	0.020	ug/l	
58-89-9	gamma-BHC (Lindane)	ND	0.049	0.015	ug/l	
5103-71-9	alpha-Chlordane	ND	0.049	0.015	ug/l	
5103-74-2	gamma-Chlordane	ND	0.049	0.015	ug/l	
60-57-1	Dieldrin	ND	0.049	0.015	ug/l	
72-54-8	4,4'-DDD	ND	0.098	0.020	ug/l	
72-55-9	4,4'-DDE	ND	0.098	0.020	ug/l	
50-29-3	4,4'-DDT	ND	0.098	0.020	ug/l	
72-20-8	Endrin	ND	0.098	0.039	ug/l	
1031-07-8	Endosulfan sulfate	ND	0.098	0.020	ug/l	
7421-93-4	Endrin aldehyde	ND VL	0.098	0.039	ug/l	
53494-70-5	Endrin ketone	ND	0.098	0.020	ug/l	
959-98-8	Endosulfan-I	ND	0.049	0.015	ug/l	
33213-65-9	Endosulfan-II	ND	0.098	0.020	ug/l	
76-44-8	Heptachlor	ND	0.049	0.020	ug/l	
1024-57-3	Heptachlor epoxide	ND	0.049	0.015	ug/l	
72-43-5	Methoxychlor	ND	0.098	0.039	ug/l	
8001-35-2	Toxaphene	ND	2.5	1.2	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	75%		42-127%
2051-24-3	Decachlorobiphenyl	76%		27-127%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: XX022302.D

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Accutest Laboratories

Report of Analysis

Client Sample ID:	41SW10		
Lab Sample ID:	F51154-8	Date Sampled:	07/18/07
Matrix:	AQ - Surface Water	Date Received:	07/19/07
Method:	SW846 8082 SW846 3510C	Percent Solids:	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	XX022302.D	1	07/26/07	AC	07/24/07	OP21577	GXX184
Run #2							

	Initial Volume	Final Volume
Run #1	1020 ml	10.0 ml
Run #2		

PCB List

CAS No.	Compound	Result	RL	MDL	Units	Q
12674-11-2	Aroclor 1016	ND UT	0.49	0.25	ug/l	
11104-28-2	Aroclor 1221	ND	0.49	0.39	ug/l	
11141-16-5	Aroclor 1232	ND	0.49	0.39	ug/l	
53469-21-9	Aroclor 1242	ND	0.49	0.25	ug/l	
12672-29-6	Aroclor 1248	ND	0.49	0.25	ug/l	
11097-69-1	Aroclor 1254	ND	0.49	0.25	ug/l	
11096-82-5	Aroclor 1260	ND	0.49	0.25	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	85%		38-127%
2051-24-3	Decachlorobiphenyl	80%		25-137%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	41SD08		
Lab Sample ID:	F51154-9	Date Sampled:	07/18/07
Matrix:	SO - Sediment	Date Received:	07/19/07
Method:	SW846 8081A SW846 3550B	Percent Solids:	36.9
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	TT08193.D	1	08/06/07	FS	07/27/07	OP21640	GTT278
Run #2	TT08178.D	10	08/06/07	FS	07/27/07	OP21640	GTT278

	Initial Weight	Final Volume
Run #1	30.7 g	10.0 ml
Run #2	30.7 g	10.0 ml

Pesticide TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
309-00-2	Aldrin	ND	4.4	1.1	ug/kg	
319-84-6	alpha-BHC	ND	4.4	1.2	ug/kg	
319-85-7	beta-BHC	ND	4.4	1.1	ug/kg	
319-86-8	delta-BHC	ND	4.4	1.9	ug/kg	
58-89-9	gamma-BHC (Lindane)	ND	4.4	1.5	ug/kg	
5103-71-9	alpha-Chlordane	ND	4.4	0.88	ug/kg	
5103-74-2	gamma-Chlordane	ND	4.4	0.97	ug/kg	
60-57-1	Dieldrin	ND	4.4	0.97	ug/kg	
72-54-8	4,4'-DDD	ND	8.8	1.8	ug/kg	
72-55-9	4,4'-DDE	ND	8.8	1.8	ug/kg	
50-29-3	4,4'-DDT	ND [a] UJ	88	20	ug/kg	
72-20-8	Endrin	ND	8.8	1.8	ug/kg	
1031-07-8	Endosulfan sulfate	ND	8.8	2.9	ug/kg	
7421-93-4	Endrin aldehyde	ND UL	8.8	2.6	ug/kg	
53494-70-5	Endrin ketone	ND	8.8	1.8	ug/kg	
959-98-8	Endosulfan-I	ND	4.4	0.97	ug/kg	
33213-65-9	Endosulfan-II	ND	8.8	1.3	ug/kg	
76-44-8	Heptachlor	ND [a]	44	12	ug/kg	
1024-57-3	Heptachlor epoxide	ND	4.4	0.88	ug/kg	
72-43-5	Methoxychlor	ND [a] UJ	88	18	ug/kg	
8001-35-2	Toxaphene	ND	220	110	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	72%	76%	46-122%
2051-24-3	Decachlorobiphenyl	78%	87%	50-133%

(a) Result is from Run# 2

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: ST64232.D

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Accutest Laboratories

Report of Analysis

Client Sample ID:	41SD08		
Lab Sample ID:	F51154-9	Date Sampled:	07/18/07
Matrix:	SO - Sediment	Date Received:	07/19/07
Method:	SW846 8082 SW846 3550B	Percent Solids:	36.9
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	ST64232.D	1	07/31/07	JB	07/27/07	OP21641	GST1697
Run #2							

	Initial Weight	Final Volume
Run #1	30.7 g	10.0 ml
Run #2		

PCB List

CAS No.	Compound	Result	RL	MDL	Units	Q
12674-11-2	Aroclor 1016	ND	44	22	ug/kg	
11104-28-2	Aroclor 1221	ND	44	35	ug/kg	
11141-16-5	Aroclor 1232	ND	44	35	ug/kg	
53469-21-9	Aroclor 1242	ND	44	22	ug/kg	
12672-29-6	Aroclor 1248	ND	44	22	ug/kg	
11097-69-1	Aroclor 1254	ND	44	22	ug/kg	
11096-82-5	Aroclor 1260	ND	44	22	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	69%		44-126%
2051-24-3	Decachlorobiphenyl	57%		39-157%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: TT08194.D TT08179.D

Form I Org

Accutest Laboratories

Report of Analysis

Client Sample ID:	41SD09		
Lab Sample ID:	F51154-10	Date Sampled:	07/18/07
Matrix:	SO - Sediment	Date Received:	07/19/07
Method:	SW846 8081A SW846 3550B	Percent Solids:	82.4
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	TT08194.D	1	08/06/07	FS	07/27/07	OP21640	GTT278
Run #2	TT08179.D	10	08/06/07	FS	07/27/07	OP21640	GTT278

	Initial Weight	Final Volume
Run #1	30.3 g	10.0 ml
Run #2	30.3 g	10.0 ml

Pesticide TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
309-00-2	Aldrin	ND	2.0	0.48	ug/kg	
319-84-6	alpha-BHC	ND	2.0	0.56	ug/kg	
319-85-7	beta-BHC	ND	2.0	0.52	ug/kg	
319-86-8	delta-BHC	ND	2.0	0.88	ug/kg	
58-89-9	gamma-BHC (Lindane)	ND	2.0	0.68	ug/kg	
5103-71-9	alpha-Chlordane	ND	2.0	0.40	ug/kg	
5103-74-2	gamma-Chlordane	ND	2.0	0.44	ug/kg	
60-57-1	Dieldrin	ND	2.0	0.44	ug/kg	
72-54-8	4,4'-DDD	ND	4.0	0.80	ug/kg	
72-55-9	4,4'-DDE	ND	4.0	0.80	ug/kg	
50-29-3	4,4'-DDT	ND [a] VJ	40	9.2	ug/kg	
72-20-8	Endrin	ND	4.0	0.80	ug/kg	
1031-07-8	Endosulfan sulfate	ND	4.0	1.3	ug/kg	
7421-93-4	Endrin aldehyde	ND VL	4.0	1.2	ug/kg	
53494-70-5	Endrin ketone	ND	4.0	0.80	ug/kg	
959-98-8	Endosulfan-I	ND	2.0	0.44	ug/kg	
33213-65-9	Endosulfan-II	ND	4.0	0.60	ug/kg	
76-44-8	Heptachlor	ND [a]	20	5.6	ug/kg	
1024-57-3	Heptachlor epoxide	ND	2.0	0.40	ug/kg	
72-43-5	Methoxychlor	ND [a] VJ	40	8.0	ug/kg	
8001-35-2	Toxaphene	ND	100	50	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	80%	70%	46-122%
2051-24-3	Decachlorobiphenyl	79%	77%	50-133%

(a) Result is from Run# 2

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: ST64233.D

For I Carey

Accutest Laboratories

Report of Analysis

Client Sample ID:	41SD09		
Lab Sample ID:	F51154-10	Date Sampled:	07/18/07
Matrix:	SO - Sediment	Date Received:	07/19/07
Method:	SW846 8082 SW846 3550B	Percent Solids:	82.4
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	ST64233.D	1	07/31/07	JB	07/27/07	OP21641	GST1697
Run #2							

	Initial Weight	Final Volume
Run #1	30.3 g	10.0 ml
Run #2		

PCB List

CAS No.	Compound	Result	RL	MDL	Units	Q
12674-11-2	Aroclor 1016	ND	20	10	ug/kg	
11104-28-2	Aroclor 1221	ND	20	16	ug/kg	
11141-16-5	Aroclor 1232	ND	20	16	ug/kg	
53469-21-9	Aroclor 1242	ND	20	10	ug/kg	
12672-29-6	Aroclor 1248	ND	20	10	ug/kg	
11097-69-1	Aroclor 1254	ND	20	10	ug/kg	
11096-82-5	Aroclor 1260	ND	20	10	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	68%		44-126%
2051-24-3	Decachlorobiphenyl	66%		39-157%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: TT08195.D TT08180.D

Run I Opy

Accutest Laboratories

Report of Analysis

Client Sample ID:	41SD10		
Lab Sample ID:	F51154-11	Date Sampled:	07/18/07
Matrix:	SO - Sediment	Date Received:	07/19/07
Method:	SW846 8081A SW846 3550B	Percent Solids:	79.2
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	TT08195.D	1	08/06/07	FS	07/27/07	OP21640	GTT278
Run #2	TT08180.D	10	08/06/07	FS	07/27/07	OP21640	GTT278

	Initial Weight	Final Volume
Run #1	30.2 g	10.0 ml
Run #2	30.2 g	10.0 ml

Pesticide TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
309-00-2	Aldrin	ND	2.1	0.50	ug/kg	
319-84-6	alpha-BHC	ND	2.1	0.59	ug/kg	
319-85-7	beta-BHC	ND	2.1	0.54	ug/kg	
319-86-8	delta-BHC	ND	2.1	0.92	ug/kg	
58-89-9	gamma-BHC (Lindane)	ND	2.1	0.71	ug/kg	
5103-71-9	alpha-Chlordane	ND	2.1	0.42	ug/kg	
5103-74-2	gamma-Chlordane	ND	2.1	0.46	ug/kg	
60-57-1	Dieldrin	ND	2.1	0.46	ug/kg	
72-54-8	4,4'-DDD	ND	4.2	0.84	ug/kg	
72-55-9	4,4'-DDE	ND	4.2	0.84	ug/kg	
50-29-3	4,4'-DDT	ND [a] UJ	42	9.6	ug/kg	
72-20-8	Endrin	ND	4.2	0.84	ug/kg	
1031-07-8	Endosulfan sulfate	ND	4.2	1.4	ug/kg	
7421-93-4	Endrin aldehyde	ND VL	4.2	1.3	ug/kg	
53494-70-5	Endrin ketone	ND	4.2	0.84	ug/kg	
959-98-8	Endosulfan-I	ND	2.1	0.46	ug/kg	
33213-65-9	Endosulfan-II	ND	4.2	0.63	ug/kg	
76-44-8	Heptachlor	ND [a]	21	5.9	ug/kg	
1024-57-3	Heptachlor epoxide	ND	2.1	0.42	ug/kg	
72-43-5	Methoxychlor	ND [a] UJ	42	8.4	ug/kg	
8001-35-2	Toxaphene	ND	100	52	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	77%	69%	46-122%
2051-24-3	Decachlorobiphenyl	78%	78%	50-133%

(a) Result is from Run# 2

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: ST64234.D

Form I Org

Accutest Laboratories

Report of Analysis

Client Sample ID:	41SD10		
Lab Sample ID:	F51154-11	Date Sampled:	07/18/07
Matrix:	SO - Sediment	Date Received:	07/19/07
Method:	SW846 8082 SW846 3550B	Percent Solids:	79.2
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	ST64234.D	1	07/31/07	JB	07/27/07	OP21641	GST1697
Run #2							

	Initial Weight	Final Volume
Run #1	30.2 g	10.0 ml
Run #2		

PCB List

CAS No.	Compound	Result	RL	MDL	Units	Q
12674-11-2	Aroclor 1016	ND	21	10	ug/kg	
11104-28-2	Aroclor 1221	ND	21	17	ug/kg	
11141-16-5	Aroclor 1232	ND	21	17	ug/kg	
53469-21-9	Aroclor 1242	ND	21	10	ug/kg	
12672-29-6	Aroclor 1248	ND	21	10	ug/kg	
11097-69-1	Aroclor 1254	ND	21	10	ug/kg	
11096-82-5	Aroclor 1260	ND	21	10	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	74%		44-126%
2051-24-3	Decachlorobiphenyl	56%		39-157%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: TT08068.D KK20593.D

Form I Copy

Accutest Laboratories

Report of Analysis

Client Sample ID:	LFSD01		
Lab Sample ID:	F51154-15	Date Sampled:	07/19/07
Matrix:	SO - Sediment	Date Received:	07/19/07
Method:	SW846 8081A SW846 3550B	Percent Solids:	57.9
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	TT08068.D	5	07/31/07	FS	07/27/07	OP21640	GTT274
Run #2	KK20593.D	10	08/02/07	FS	07/27/07	OP21640	GKK756

	Initial Weight	Final Volume
Run #1	30.7 g	10.0 ml
Run #2	30.7 g	10.0 ml

Pesticide TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
309-00-2	Aldrin	ND	14	3.4	ug/kg	
319-84-6	alpha-BHC	ND	14	3.9	ug/kg	
319-85-7	beta-BHC	ND	14	3.7	ug/kg	
319-86-8	delta-BHC	ND	14	6.2	ug/kg	
58-89-9	gamma-BHC (Lindane)	ND	14	4.8	ug/kg	
5103-71-9	alpha-Chlordane	13.7 J	14	2.8	ug/kg	J
5103-74-2	gamma-Chlordane	13.6 J	14	3.1	ug/kg	J
60-57-1	Dieldrin	ND	14	3.1	ug/kg	
72-54-8	4,4'-DDD	ND	28	5.6	ug/kg	
72-55-9	4,4'-DDE	ND	28	5.6	ug/kg	
50-29-3	4,4'-DDT	ND [b]	56	13	ug/kg	
72-20-8	Endrin	ND	28	5.6	ug/kg	
1031-07-8	Endosulfan sulfate	ND	28	9.3	ug/kg	
7421-93-4	Endrin aldehyde	ND VL	28	8.4	ug/kg	
53494-70-5	Endrin ketone	ND	28	5.6	ug/kg	
959-98-8	Endosulfan-I	ND	14	3.1	ug/kg	
33213-65-9	Endosulfan-II	ND	28	4.2	ug/kg	
76-44-8	Heptachlor	ND	14	3.9	ug/kg	
1024-57-3	Heptachlor epoxide	ND	14	2.8	ug/kg	
72-43-5	Methoxychlor	ND [b]	56	11	ug/kg	
8001-35-2	Toxaphene	ND	700	350	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	78%	70%	46-122%
2051-24-3	Decachlorobiphenyl	76%	57%	50-133%

(a) Dilution required due to matrix interference.
(b) Result is from Run# 2

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: ST64235.D

Accutest Laboratories

Report of Analysis

Client Sample ID:	LFSD01		
Lab Sample ID:	F51154-15	Date Sampled:	07/19/07
Matrix:	SO - Sediment	Date Received:	07/19/07
Method:	SW846 8082 SW846 3550B	Percent Solids:	57.9
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	ST64235.D	1	07/31/07	JB	07/27/07	OP21641	GST1697
Run #2							

	Initial Weight	Final Volume
Run #1	30.7 g	10.0 ml
Run #2		

PCB List

CAS No.	Compound	Result	RL	MDL	Units	Q
12674-11-2	Aroclor 1016	ND	28	14	ug/kg	
11104-28-2	Aroclor 1221	ND	28	23	ug/kg	
11141-16-5	Aroclor 1232	ND	28	23	ug/kg	
53469-21-9	Aroclor 1242	ND	28	14	ug/kg	
12672-29-6	Aroclor 1248	ND	28	14	ug/kg	
11097-69-1	Aroclor 1254	ND	28	14	ug/kg	
11096-82-5	Aroclor 1260	135 J	28	14	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	70%		44-126%
2051-24-3	Decachlorobiphenyl	48%		39-157%

(a) All hits confirmed by dual column analysis.

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: KK20783.D KK20775.D

Form I OCs

Accutest Laboratories

Report of Analysis

Client Sample ID:	TMSD01		
Lab Sample ID:	F51154-16	Date Sampled:	07/19/07
Matrix:	SO - Sediment	Date Received:	07/19/07
Method:	SW846 8081A SW846 3550B	Percent Solids:	65.0
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	KK20783.D	1	08/08/07	FS	07/27/07	OP21640	GKK761
Run #2	KK20775.D	10	08/08/07	FS	07/27/07	OP21640	GKK761

	Initial Weight	Final Volume
Run #1	30.5 g	10.0 ml
Run #2	30.3 g	10.0 ml

Pesticide TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
309-00-2	Aldrin	ND UL	2.5	0.61	ug/kg	
319-84-6	alpha-BHC	ND UL	2.5	0.71	ug/kg	
319-85-7	beta-BHC	ND UL	2.5	0.66	ug/kg	
319-86-8	delta-BHC	ND UL	2.5	1.1	ug/kg	
58-89-9	gamma-BHC (Lindane)	ND UL	2.5	0.86	ug/kg	
5103-71-9	alpha-Chlordane	5.3 J	2.5	0.50	ug/kg	
5103-74-2	gamma-Chlordane	6.5 J	2.5	0.55	ug/kg	
60-57-1	Dieldrin	ND UL	2.5	0.55	ug/kg	
72-54-8	4,4'-DDD	ND UL	5.0	1.0	ug/kg	
72-55-9	4,4'-DDE	ND UL	5.0	1.0	ug/kg	
50-29-3	4,4'-DDT	ND [b]	51	12	ug/kg	
72-20-8	Endrin	ND UL	5.0	1.0	ug/kg	
1031-07-8	Endosulfan sulfate	ND UL	5.0	1.7	ug/kg	
7421-93-4	Endrin aldehyde	ND UL	5.0	1.5	ug/kg	
53494-70-5	Endrin ketone	ND UL	5.0	1.0	ug/kg	
959-98-8	Endosulfan-I	ND UL	2.5	0.55	ug/kg	
33213-65-9	Endosulfan-II	ND UL	5.0	0.76	ug/kg	
76-44-8	Heptachlor	ND [b]	25	7.1	ug/kg	
1024-57-3	Heptachlor epoxide	1.7 L	2.5	0.50	ug/kg	J
72-43-5	Methoxychlor	ND [b]	51	10	ug/kg	
8001-35-2	Toxaphene	ND UL	130	63	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	50%	62%	46-122%
2051-24-3	Decachlorobiphenyl	37% [c]	61%	50-133%

(a) All hits confirmed by dual column analysis.
(b) Result is from Run# 2
(c) Outside control limits due to matrix interference.

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: ST64236.D

Accutest Laboratories

Report of Analysis

Client Sample ID:	TMSD01		
Lab Sample ID:	F51154-16	Date Sampled:	07/19/07
Matrix:	SO - Sediment	Date Received:	07/19/07
Method:	SW846 8082 SW846 3550B	Percent Solids:	65.0
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	ST64236.D	1	07/31/07	JB	07/27/07	OP21641	GST1697
Run #2							

	Initial Weight	Final Volume
Run #1	30.5 g	10.0 ml
Run #2		

PCB List

CAS No.	Compound	Result	RL	MDL	Units	Q
12674-11-2	Aroclor 1016	ND	25	13	ug/kg	
11104-28-2	Aroclor 1221	ND	25	20	ug/kg	
11141-16-5	Aroclor 1232	ND	25	20	ug/kg	
53469-21-9	Aroclor 1242	ND	25	13	ug/kg	
12672-29-6	Aroclor 1248	ND	25	13	ug/kg	
11097-69-1	Aroclor 1254	ND	25	13	ug/kg	
11096-82-5	Aroclor 1260	74.2 J	25	13	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	72%		44-126%
2051-24-3	Decachlorobiphenyl	59%		39-157%

(a) All hits confirmed by dual column analysis.

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: KK20476.D

Form I Copy

Accutest Laboratories

Report of Analysis

Client Sample ID:	LFSW01		
Lab Sample ID:	F51154-17	Date Sampled:	07/19/07
Matrix:	AQ - Surface Water	Date Received:	07/19/07
Method:	SW846 8081A SW846 3510C	Percent Solids:	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	KK20476.D	1	07/26/07	FS	07/24/07	OP21578	GKK752
Run #2							

	Initial Volume	Final Volume
Run #1	1040 ml	10.0 ml
Run #2		

Pesticide TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
309-00-2	Aldrin	ND	0.048	0.019	ug/l	
319-84-6	alpha-BHC	ND	0.048	0.014	ug/l	
319-85-7	beta-BHC	ND	0.048	0.019	ug/l	
319-86-8	delta-BHC	ND	0.048	0.019	ug/l	
58-89-9	gamma-BHC (Lindane)	ND	0.048	0.014	ug/l	
5103-71-9	alpha-Chlordane	ND	0.048	0.014	ug/l	
5103-74-2	gamma-Chlordane	ND	0.048	0.014	ug/l	
60-57-1	Dieldrin	ND	0.048	0.014	ug/l	
72-54-8	4,4'-DDD	ND	0.096	0.019	ug/l	
72-55-9	4,4'-DDE	ND	0.096	0.019	ug/l	
50-29-3	4,4'-DDT	ND	0.096	0.019	ug/l	
72-20-8	Endrin	ND	0.096	0.038	ug/l	
1031-07-8	Endosulfan sulfate	ND	0.096	0.019	ug/l	
7421-93-4	Endrin aldehyde	ND VL	0.096	0.038	ug/l	
53494-70-5	Endrin ketone	ND	0.096	0.019	ug/l	
959-98-8	Endosulfan-I	ND	0.048	0.014	ug/l	
33213-65-9	Endosulfan-II	ND	0.096	0.019	ug/l	
76-44-8	Heptachlor	ND	0.048	0.019	ug/l	
1024-57-3	Heptachlor epoxide	ND	0.048	0.014	ug/l	
72-43-5	Methoxychlor	ND	0.096	0.038	ug/l	
8001-35-2	Toxaphene	ND	2.4	1.2	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	75%		42-127%
2051-24-3	Decachlorobiphenyl	78%		27-127%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: XX022304.D

Form I OR

Accutest Laboratories

Report of Analysis

Client Sample ID:	LFSW01		
Lab Sample ID:	F51154-17	Date Sampled:	07/19/07
Matrix:	AQ - Surface Water	Date Received:	07/19/07
Method:	SW846 8082 SW846 3510C	Percent Solids:	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	XX022304.D	1	07/26/07	AC	07/24/07	OP21577	GXX184
Run #2							

	Initial Volume	Final Volume
Run #1	1040 ml	10.0 ml
Run #2		

PCB List

CAS No.	Compound	Result	RL	MDL	Units	Q
12674-11-2	Aroclor 1016	ND UJ	0.48	0.24	ug/l	
11104-28-2	Aroclor 1221	ND	0.48	0.38	ug/l	
11141-16-5	Aroclor 1232	ND	0.48	0.38	ug/l	
53469-21-9	Aroclor 1242	ND	0.48	0.24	ug/l	
12672-29-6	Aroclor 1248	ND	0.48	0.24	ug/l	
11097-69-1	Aroclor 1254	ND	0.48	0.24	ug/l	
11096-82-5	Aroclor 1260	ND	0.48	0.24	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	80%		38-127%
2051-24-3	Decachlorobiphenyl	82%		25-137%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: TT08066.D KK20586.D

Form I Copy

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Report of Analysis

Client Sample ID:	APSD01		
Lab Sample ID:	F51154-18	Date Sampled:	07/19/07
Matrix:	SO - Sediment	Date Received:	07/19/07
Method:	SW846 8081A SW846 3550B	Percent Solids:	86.8
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	TT08066.D	5	07/31/07	FS	07/27/07	OP21640	GTT274
Run #2	KK20586.D	10	08/02/07	FS	07/27/07	OP21640	GKK756

	Initial Weight	Final Volume
Run #1	30.7 g	10.0 ml
Run #2	30.8 g	10.0 ml

Pesticide TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
309-00-2	Aldrin	ND	9.4	2.3	ug/kg	
319-84-6	alpha-BHC	ND	9.4	2.6	ug/kg	
319-85-7	beta-BHC	ND	9.4	2.4	ug/kg	
319-86-8	delta-BHC	ND	9.4	4.1	ug/kg	
58-89-9	gamma-BHC (Lindane)	ND	9.4	3.2	ug/kg	
5103-71-9	alpha-Chlordane	ND	9.4	1.9	ug/kg	
5103-74-2	gamma-Chlordane	ND	9.4	2.1	ug/kg	
60-57-1	Dieldrin	ND	9.4	2.1	ug/kg	
72-54-8	4,4'-DDD	ND	19	3.8	ug/kg	
72-55-9	4,4'-DDE	ND	19	3.8	ug/kg	
50-29-3	4,4'-DDT	ND [b]	37	8.6	ug/kg	
72-20-8	Endrin	ND	19	3.8	ug/kg	
1031-07-8	Endosulfan sulfate	ND	19	6.2	ug/kg	
7421-93-4	Endrin aldehyde	ND UL	19	5.6	ug/kg	
53494-70-5	Endrin ketone	ND	19	3.8	ug/kg	
959-98-8	Endosulfan-I	ND	9.4	2.1	ug/kg	
33213-65-9	Endosulfan-II	ND	19	2.8	ug/kg	
76-44-8	Heptachlor	ND	9.4	2.6	ug/kg	
1024-57-3	Heptachlor epoxide	ND	9.4	1.9	ug/kg	
72-43-5	Methoxychlor	ND [b]	37	7.5	ug/kg	
8001-35-2	Toxaphene	ND	470	230	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	75%	70%	46-122%
2051-24-3	Decachlorobiphenyl	80%	72%	50-133%

(a) Dilution required due to matrix interference.
(b) Result is from Run# 2

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: ST64237.D

Form I Copy

Accutest Laboratories

Report of Analysis

Client Sample ID:	APSD01		
Lab Sample ID:	F51154-18	Date Sampled:	07/19/07
Matrix:	SO - Sediment	Date Received:	07/19/07
Method:	SW846 8082 SW846 3550B	Percent Solids:	86.8
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	ST64237.D	1	07/31/07	JB	07/27/07	OP21641	GST1697
Run #2							

	Initial Weight	Final Volume
Run #1	30.8 g	10.0 ml
Run #2		

PCB List

CAS No.	Compound	Result	RL	MDL	Units	Q
12674-11-2	Aroclor 1016	ND	19	9.4	ug/kg	
11104-28-2	Aroclor 1221	ND	19	15	ug/kg	
11141-16-5	Aroclor 1232	ND	19	15	ug/kg	
53469-21-9	Aroclor 1242	ND	19	9.4	ug/kg	
12672-29-6	Aroclor 1248	ND	19	9.4	ug/kg	
11097-69-1	Aroclor 1254 [b]	42.0 J	19	9.4	ug/kg	J
11096-82-5	Aroclor 1260 [b]	41.8 J	19	9.4	ug/kg	J

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	77%		44-126%
2051-24-3	Decachlorobiphenyl	79%		39-157%

(a) All hits confirmed by dual column analysis.
(b) Estimated value due to the presence of multiple overlapping Aroclor patterns.

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: KK20479.D

Form I Org

Accutest Laboratories

Report of Analysis

Client Sample ID:	TMSW01		
Lab Sample ID:	F51154-20	Date Sampled:	07/19/07
Matrix:	AQ - Surface Water	Date Received:	07/19/07
Method:	SW846 8081A SW846 3510C	Percent Solids:	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	KK20479.D	1	07/26/07	FS	07/24/07	OP21578	GKK752
Run #2							

	Initial Volume	Final Volume
Run #1	880 ml	10.0 ml
Run #2		

Pesticide TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
309-00-2	Aldrin	ND	0.057	0.023	ug/l	
319-84-6	alpha-BHC	ND	0.057	0.017	ug/l	
319-85-7	beta-BHC	ND	0.057	0.023	ug/l	
319-86-8	delta-BHC	ND	0.057	0.023	ug/l	
58-89-9	gamma-BHC (Lindane)	ND	0.057	0.017	ug/l	
5103-71-9	alpha-Chlordane	ND	0.057	0.017	ug/l	
5103-74-2	gamma-Chlordane	ND	0.057	0.017	ug/l	
60-57-1	Dieldrin	ND	0.057	0.017	ug/l	
72-54-8	4,4'-DDD	ND	0.11	0.023	ug/l	
72-55-9	4,4'-DDE	ND	0.11	0.023	ug/l	
50-29-3	4,4'-DDT	ND	0.11	0.023	ug/l	
72-20-8	Endrin	ND	0.11	0.045	ug/l	
1031-07-8	Endosulfan sulfate	ND	0.11	0.023	ug/l	
7421-93-4	Endrin aldehyde	ND VL	0.11	0.045	ug/l	
53494-70-5	Endrin ketone	ND	0.11	0.023	ug/l	
959-98-8	Endosulfan-I	ND	0.057	0.017	ug/l	
33213-65-9	Endosulfan-II	ND	0.11	0.023	ug/l	
76-44-8	Heptachlor	ND	0.057	0.023	ug/l	
1024-57-3	Heptachlor epoxide	ND	0.057	0.017	ug/l	
72-43-5	Methoxychlor	ND	0.11	0.045	ug/l	
8001-35-2	Toxaphene	ND	2.8	1.4	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	78%		42-127%
2051-24-3	Decachlorobiphenyl	82%		27-127%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: XX022307.D

Run I Cal

Accutest Laboratories

Report of Analysis

Client Sample ID:	TMSW01		
Lab Sample ID:	F51154-20	Date Sampled:	07/19/07
Matrix:	AQ - Surface Water	Date Received:	07/19/07
Method:	SW846 8082 SW846 3510C	Percent Solids:	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	XX022307.D	1	07/26/07	AC	07/24/07	OP21577	GXX184
Run #2							

	Initial Volume	Final Volume
Run #1	880 ml	10.0 ml
Run #2		

PCB List

CAS No.	Compound	Result	RL	MDL	Units	Q
12674-11-2	Aroclor 1016	ND UJ	0.57	0.28	ug/l	
11104-28-2	Aroclor 1221	ND	0.57	0.45	ug/l	
11141-16-5	Aroclor 1232	ND	0.57	0.45	ug/l	
53469-21-9	Aroclor 1242	ND	0.57	0.28	ug/l	
12672-29-6	Aroclor 1248	ND	0.57	0.28	ug/l	
11097-69-1	Aroclor 1254	ND	0.57	0.28	ug/l	
11096-82-5	Aroclor 1260	ND	0.57	0.28	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	80%		38-127%
2051-24-3	Decachlorobiphenyl	87%		25-137%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: TT08070.D KK20587.D

Form I copy

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Report of Analysis

Client Sample ID:	41SD11		
Lab Sample ID:	F51154-22	Date Sampled:	07/19/07
Matrix:	SO - Soil	Date Received:	07/19/07
Method:	SW846 8081A SW846 3550B	Percent Solids:	86.8
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	TT08070.D	5	07/31/07	FS	07/27/07	OP21640	GTT274
Run #2	KK20587.D	10	08/02/07	FS	07/27/07	OP21640	GKK756

	Initial Weight	Final Volume
Run #1	29.9 g	10.0 ml
Run #2	29.9 g	10.0 ml

Pesticide TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
309-00-2	Aldrin	ND	9.6	2.3	ug/kg	
319-84-6	alpha-BHC	ND	9.6	2.7	ug/kg	
319-85-7	beta-BHC	ND	9.6	2.5	ug/kg	
319-86-8	delta-BHC	ND	9.6	4.2	ug/kg	
58-89-9	gamma-BHC (Lindane)	ND	9.6	3.3	ug/kg	
5103-71-9	alpha-Chlordane	ND	9.6	1.9	ug/kg	
5103-74-2	gamma-Chlordane	ND	9.6	2.1	ug/kg	
60-57-1	Dieldrin	ND	9.6	2.1	ug/kg	
72-54-8	4,4'-DDD	ND	19	3.9	ug/kg	
72-55-9	4,4'-DDE	ND	19	3.9	ug/kg	
50-29-3	4,4'-DDT	ND [b]	39	8.9	ug/kg	
72-20-8	Endrin	ND	19	3.9	ug/kg	
1031-07-8	Endosulfan sulfate	ND	19	6.4	ug/kg	
7421-93-4	Endrin aldehyde	ND VL	19	5.8	ug/kg	
53494-70-5	Endrin ketone	ND	19	3.9	ug/kg	
959-98-8	Endosulfan-I	ND	9.6	2.1	ug/kg	
33213-65-9	Endosulfan-II	ND	19	2.9	ug/kg	
76-44-8	Heptachlor	ND	9.6	2.7	ug/kg	
1024-57-3	Heptachlor epoxide	ND	9.6	1.9	ug/kg	
72-43-5	Methoxychlor	ND [b]	39	7.7	ug/kg	
8001-35-2	Toxaphene	ND	480	240	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	69%	65%	46-122%
2051-24-3	Decachlorobiphenyl	80%	72%	50-133%

(a) Dilution required due to matrix interference.
(b) Result is from Run# 2

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: ST64238.D

Run I copy

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Report of Analysis

3122

Client Sample ID:	41SD11		
Lab Sample ID:	F51154-22	Date Sampled:	07/19/07
Matrix:	SO - Soil	Date Received:	07/19/07
Method:	SW846 8082 SW846 3550B	Percent Solids:	86.8
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	ST64238.D	1	07/31/07	JB	07/27/07	OP21641	GST1697
Run #2							

	Initial Weight	Final Volume
Run #1	29.9 g	10.0 ml
Run #2		

PCB List

CAS No.	Compound	Result	RL	MDL	Units	Q
12674-11-2	Aroclor 1016	ND	19	9.6	ug/kg	
11104-28-2	Aroclor 1221	ND	19	15	ug/kg	
11141-16-5	Aroclor 1232	ND	19	15	ug/kg	
53469-21-9	Aroclor 1242	ND	19	9.6	ug/kg	
12672-29-6	Aroclor 1248	ND	19	9.6	ug/kg	
11097-69-1	Aroclor 1254	90.2	19	9.6	ug/kg	
11096-82-5	Aroclor 1260	ND	19	9.6	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	70%		44-126%
2051-24-3	Decachlorobiphenyl	76%		39-157%

(a) All hits confirmed by dual column analysis.

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: TT08071.D KK20588.D

Run I Cas

Accutest Laboratories

Report of Analysis

Client Sample ID:	49SS02		
Lab Sample ID:	F51154-23	Date Sampled:	07/19/07
Matrix:	SO - Soil	Date Received:	07/19/07
Method:	SW846 8081A SW846 3550B	Percent Solids:	89.6
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	TT08071.D	5	07/31/07	FS	07/27/07	OP21640	GTT274
Run #2	KK20588.D	10	08/02/07	FS	07/27/07	OP21640	GKK756

	Initial Weight	Final Volume
Run #1	29.9 g	10.0 ml
Run #2	29.9 g	10.0 ml

Pesticide TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
309-00-2	Aldrin	ND	9.3	2.2	ug/kg	
319-84-6	alpha-BHC	ND	9.3	2.6	ug/kg	
319-85-7	beta-BHC	ND	9.3	2.4	ug/kg	
319-86-8	delta-BHC	ND	9.3	4.1	ug/kg	
58-89-9	gamma-BHC (Lindane)	ND	9.3	3.2	ug/kg	
5103-71-9	alpha-Chlordane	ND	9.3	1.9	ug/kg	
5103-74-2	gamma-Chlordane	ND	9.3	2.1	ug/kg	
60-57-1	Dieldrin	ND	9.3	2.1	ug/kg	
72-54-8	4,4'-DDD	ND	19	3.7	ug/kg	
72-55-9	4,4'-DDE	ND	19	3.7	ug/kg	
50-29-3	4,4'-DDT	ND [b] VL	37	8.6	ug/kg	
72-20-8	Endrin	ND	19	3.7	ug/kg	
1031-07-8	Endosulfan sulfate	ND	19	6.2	ug/kg	
7421-93-4	Endrin aldehyde	ND VL	19	5.6	ug/kg	
53494-70-5	Endrin ketone	ND	19	3.7	ug/kg	
959-98-8	Endosulfan-I	ND	9.3	2.1	ug/kg	
33213-65-9	Endosulfan-II	ND	19	2.8	ug/kg	
76-44-8	Heptachlor	ND	9.3	2.6	ug/kg	
1024-57-3	Heptachlor epoxide	ND	9.3	1.9	ug/kg	
72-43-5	Methoxychlor	ND [b] VL	37	7.5	ug/kg	
8001-35-2	Toxaphene	ND	470	230	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	53%	51%	46-122%
2051-24-3	Decachlorobiphenyl	59%	48% [c]	50-133%

(a) Dilution required due to matrix interference.
(b) Result is from Run# 2
(c) Outside control limits due to dilution.

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: XX022594.D

Form I OR

Accutest Laboratories

Report of Analysis

Client Sample ID:	49SS02		
Lab Sample ID:	F51154-23	Date Sampled:	07/19/07
Matrix:	SO - Soil	Date Received:	07/19/07
Method:	SW846 8082 SW846 3550B	Percent Solids:	89.6
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	XX022594.D	2	08/02/07	AC	07/27/07	OP21641	GXX189
Run #2							

	Initial Weight	Final Volume
Run #1	29.9 g	10.0 ml
Run #2		

PCB List

CAS No.	Compound	Result	RL	MDL	Units	Q
12674-11-2	Aroclor 1016	ND	37	19	ug/kg	
11104-28-2	Aroclor 1221	ND	37	30	ug/kg	
11141-16-5	Aroclor 1232	ND	37	30	ug/kg	
53469-21-9	Aroclor 1242	ND	37	19	ug/kg	
12672-29-6	Aroclor 1248	ND	37	19	ug/kg	
11097-69-1	Aroclor 1254	ND	37	37	ug/kg	
11096-82-5	Aroclor 1260	152	37	19	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	47%		44-126%
2051-24-3	Decachlorobiphenyl	59%		39-157%

(a) All hits confirmed by dual column analysis.

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: TT08076.D KK20589.D

Form I Cpy

Accutest Laboratories

Report of Analysis

Client Sample ID:	49SS03		
Lab Sample ID:	F51154-24	Date Sampled:	07/19/07
Matrix:	SO - Soil	Date Received:	07/19/07
Method:	SW846 8081A SW846 3550B	Percent Solids:	92.0
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	TT08076.D	5	07/31/07	FS	07/27/07	OP21640	GTT274
Run #2	KK20589.D	10	08/02/07	FS	07/27/07	OP21640	GKK756

	Initial Weight	Final Volume
Run #1	29.9 g	10.0 ml
Run #2	29.9 g	10.0 ml

Pesticide TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
309-00-2	Aldrin	ND	9.1	2.2	ug/kg	
319-84-6	alpha-BHC	ND	9.1	2.5	ug/kg	
319-85-7	beta-BHC	ND	9.1	2.4	ug/kg	
319-86-8	delta-BHC	ND	9.1	4.0	ug/kg	
58-89-9	gamma-BHC (Lindane)	ND	9.1	3.1	ug/kg	
5103-71-9	alpha-Chlordane	ND	9.1	1.8	ug/kg	
5103-74-2	gamma-Chlordane	ND	9.1	2.0	ug/kg	
60-57-1	Dieldrin	ND	9.1	2.0	ug/kg	
72-54-8	4,4'-DDD	ND	18	3.6	ug/kg	
72-55-9	4,4'-DDE	ND	18	3.6	ug/kg	
50-29-3	4,4'-DDT	ND [b] UJ	36	8.4	ug/kg	
72-20-8	Endrin	ND	18	3.6	ug/kg	
1031-07-8	Endosulfan sulfate	ND	18	6.0	ug/kg	
7421-93-4	Endrin aldehyde	ND VL	18	5.5	ug/kg	
53494-70-5	Endrin ketone	ND	18	3.6	ug/kg	
959-98-8	Endosulfan-I	ND	9.1	2.0	ug/kg	
33213-65-9	Endosulfan-II	ND	18	2.7	ug/kg	
76-44-8	Heptachlor	ND [b]	18	5.1	ug/kg	
1024-57-3	Heptachlor epoxide	ND	9.1	1.8	ug/kg	
72-43-5	Methoxychlor	ND [b] UJ	36	7.3	ug/kg	
8001-35-2	Toxaphene	ND	450	230	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	64%	62%	46-122%
2051-24-3	Decachlorobiphenyl	67%	55%	50-133%

(a) Dilution required due to matrix interference.
(b) Result is from Run# 2

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: ST64296.D

Accutest Laboratories

Report of Analysis

Client Sample ID:	49SS03		
Lab Sample ID:	F51154-24	Date Sampled:	07/19/07
Matrix:	SO - Soil	Date Received:	07/19/07
Method:	SW846 8082 SW846 3550B	Percent Solids:	92.0
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	ST64296.D	2	08/01/07	JB	07/27/07	OP21641	GST1698
Run #2							

	Initial Weight	Final Volume
Run #1	29.9 g	10.0 ml
Run #2		

PCB List

CAS No.	Compound	Result	RL	MDL	Units	Q
12674-11-2	Aroclor 1016	ND	36	18	ug/kg	
11104-28-2	Aroclor 1221	ND	36	29	ug/kg	
11141-16-5	Aroclor 1232	ND	36	29	ug/kg	
53469-21-9	Aroclor 1242	ND	36	18	ug/kg	
12672-29-6	Aroclor 1248	ND	36	18	ug/kg	
11097-69-1	Aroclor 1254 [b]	124 J	36	18	ug/kg	J
11096-82-5	Aroclor 1260 [b]	73.2 J	36	18	ug/kg	J

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	61%		44-126%
2051-24-3	Decachlorobiphenyl	62%		39-157%

(a) All hits confirmed by dual column analysis.
(b) Estimated value due to the presence of multiple overlapping Aroclor patterns.

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: TT08196.D TT08182.D

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Accutest Laboratories

Report of Analysis

3.2.5

Client Sample ID:	49SS04		
Lab Sample ID:	F51154-25	Date Sampled:	07/19/07
Matrix:	SO - Soil	Date Received:	07/19/07
Method:	SW846 8081A SW846 3550B	Percent Solids:	87.5
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	TT08196.D	1	08/06/07	FS	07/27/07	OP21640	GTT278
Run #2	TT08182.D	10	08/06/07	FS	07/27/07	OP21640	GTT278

	Initial Weight	Final Volume
Run #1	30.6 g	10.0 ml
Run #2	30.6 g	10.0 ml

Pesticide TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
309-00-2	Aldrin	ND	1.9	0.45	ug/kg	
319-84-6	alpha-BHC	ND	1.9	0.52	ug/kg	
319-85-7	beta-BHC	ND	1.9	0.49	ug/kg	
319-86-8	delta-BHC	ND VJ	1.9	0.82	ug/kg	
58-89-9	gamma-BHC (Lindane)	ND	1.9	0.63	ug/kg	
5103-71-9	alpha-Chlordane	ND VL	1.9	0.37	ug/kg	
5103-74-2	gamma-Chlordane	ND VL	1.9	0.41	ug/kg	
60-57-1	Dieldrin	ND VL	1.9	0.41	ug/kg	
72-54-8	4,4'-DDD	ND	3.7	0.75	ug/kg	
72-55-9	4,4'-DDE	ND VL	3.7	0.75	ug/kg	
50-29-3	4,4'-DDT	ND [a] VJ	37	8.6	ug/kg	
72-20-8	Endrin	ND VL	3.7	0.75	ug/kg	
1031-07-8	Endosulfan sulfate	ND	3.7	1.2	ug/kg	
7421-93-4	Endrin aldehyde	ND VL	3.7	1.1	ug/kg	
53494-70-5	Endrin ketone	ND VL	3.7	0.75	ug/kg	
959-98-8	Endosulfan-I	ND	1.9	0.41	ug/kg	
33213-65-9	Endosulfan-II	ND VL	3.7	0.56	ug/kg	
76-44-8	Heptachlor	ND [a]	19	5.2	ug/kg	
1024-57-3	Heptachlor epoxide	ND	1.9	0.37	ug/kg	
72-43-5	Methoxychlor	ND [a] VJ	37	7.5	ug/kg	
8001-35-2	Toxaphene	ND	93	47	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	76%	70%	46-122%
2051-24-3	Decachlorobiphenyl	68%	77%	50-133%

(a) Result is from Run# 2

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: ST64243.D

From I 87

Accutest Laboratories

Report of Analysis

Client Sample ID:	49SS04		
Lab Sample ID:	F51154-25	Date Sampled:	07/19/07
Matrix:	SO - Soil	Date Received:	07/19/07
Method:	SW846 8082 SW846 3550B	Percent Solids:	87.5
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	ST64243.D	1	07/31/07	JB	07/27/07	OP21641	GST1697
Run #2							

	Initial Weight	Final Volume
Run #1	30.6 g	10.0 ml
Run #2		

PCB List

CAS No.	Compound	Result	RL	MDL	Units	Q
12674-11-2	Aroclor 1016	ND	19	9.3	ug/kg	
11104-28-2	Aroclor 1221	ND	19	15	ug/kg	
11141-16-5	Aroclor 1232	ND	19	15	ug/kg	
53469-21-9	Aroclor 1242	ND	19	9.3	ug/kg	
12672-29-6	Aroclor 1248	ND	19	9.3	ug/kg	
11097-69-1	Aroclor 1254	10.9 J	19	9.3	ug/kg	J
11096-82-5	Aroclor 1260	ND	19	9.3	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	67%		44-126%
2051-24-3	Decachlorobiphenyl	65%		39-157%

(a) All hits confirmed by dual column analysis.

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: TT08075.D KK20590.D

For L Coq

Accutest Laboratories

Report of Analysis

Client Sample ID:	49SS05		
Lab Sample ID:	F51154-26	Date Sampled:	07/19/07
Matrix:	SO - Soil	Date Received:	07/19/07
Method:	SW846 8081A SW846 3550B	Percent Solids:	85.9
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	TT08075.D	5	07/31/07	FS	07/27/07	OP21640	GTT274
Run #2	KK20590.D	10	08/02/07	FS	07/27/07	OP21640	GKK756

	Initial Weight	Final Volume
Run #1	30.3 g	10.0 ml
Run #2	30.3 g	10.0 ml

Pesticide TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
309-00-2	Aldrin	ND	9.6	2.3	ug/kg	
319-84-6	alpha-BHC	ND	9.6	2.7	ug/kg	
319-85-7	beta-BHC	ND	9.6	2.5	ug/kg	
319-86-8	delta-BHC	ND	9.6	4.2	ug/kg	
58-89-9	gamma-BHC (Lindane)	ND	9.6	3.3	ug/kg	
5103-71-9	alpha-Chlordane	ND	9.6	1.9	ug/kg	
5103-74-2	gamma-Chlordane	ND	9.6	2.1	ug/kg	
60-57-1	Dieldrin	ND	9.6	2.1	ug/kg	
72-54-8	4,4'-DDD	ND	19	3.8	ug/kg	
72-55-9	4,4'-DDE	ND	19	3.8	ug/kg	
50-29-3	4,4'-DDT	ND [b] VJ	38	8.8	ug/kg	
72-20-8	Endrin	ND	19	3.8	ug/kg	
1031-07-8	Endosulfan sulfate	ND	19	6.3	ug/kg	
7421-93-4	Endrin aldehyde	ND VL	19	5.8	ug/kg	
53494-70-5	Endrin ketone	ND	19	3.8	ug/kg	
959-98-8	Endosulfan-I	ND	9.6	2.1	ug/kg	
33213-65-9	Endosulfan-II	ND	19	2.9	ug/kg	
76-44-8	Heptachlor	ND [b]	19	5.4	ug/kg	
1024-57-3	Heptachlor epoxide	ND	9.6	1.9	ug/kg	
72-43-5	Methoxychlor	ND [b] VJ	38	7.7	ug/kg	
8001-35-2	Toxaphene	ND	480	240	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	78%	72%	46-122%
2051-24-3	Decachlorobiphenyl	87%	72%	50-133%

(a) Dilution required due to matrix interference.
(b) Result is from Run# 2

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: ST64244.D

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Report of Analysis

3.2.6

Client Sample ID:	49SS05		
Lab Sample ID:	F51154-26	Date Sampled:	07/19/07
Matrix:	SO - Soil	Date Received:	07/19/07
Method:	SW846 8082 SW846 3550B	Percent Solids:	85.9
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	ST64244.D	1	07/31/07	JB	07/27/07	OP21641	GST1697
Run #2							

	Initial Weight	Final Volume
Run #1	30.3 g	10.0 ml
Run #2		

PCB List

CAS No.	Compound	Result	RL	MDL	Units	Q
12674-11-2	Aroclor 1016	ND	19	9.6	ug/kg	
11104-28-2	Aroclor 1221	ND	19	15	ug/kg	
11141-16-5	Aroclor 1232	ND	19	15	ug/kg	
53469-21-9	Aroclor 1242	ND	19	9.6	ug/kg	
12672-29-6	Aroclor 1248	ND	19	9.6	ug/kg	
11097-69-1	Aroclor 1254	41.1 J	19	9.6	ug/kg	
11096-82-5	Aroclor 1260	ND	19	9.6	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	68%		44-126%
2051-24-3	Decachlorobiphenyl	68%		39-157%

(a) All hits confirmed by dual column analysis.

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: KK20778.D TT08181.D

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Report of Analysis

Client Sample ID:	59SS06		
Lab Sample ID:	F51154-27	Date Sampled:	07/19/07
Matrix:	SO - Soil	Date Received:	07/19/07
Method:	SW846 8081A SW846 3550B	Percent Solids:	92.0
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	KK20778.D	1	08/08/07	FS	07/27/07	OP21640	GKK761
Run #2	TT08181.D	10	08/06/07	FS	07/27/07	OP21640	GTT278

	Initial Weight	Final Volume
Run #1	30.8 g	10.0 ml
Run #2	30.8 g	10.0 ml

Pesticide TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
309-00-2	Aldrin	ND	1.8	0.42	ug/kg	
319-84-6	alpha-BHC	ND	1.8	0.49	ug/kg	
319-85-7	beta-BHC	ND	1.8	0.46	ug/kg	
319-86-8	delta-BHC	ND	1.8	0.78	ug/kg	
58-89-9	gamma-BHC (Lindane)	ND	1.8	0.60	ug/kg	
5103-71-9	alpha-Chlordane	ND	1.8	0.35	ug/kg	
5103-74-2	gamma-Chlordane	ND	1.8	0.39	ug/kg	
60-57-1	Dieldrin	ND	1.8	0.39	ug/kg	
72-54-8	4,4'-DDD	ND	3.5	0.71	ug/kg	
72-55-9	4,4'-DDE	ND	3.5	0.71	ug/kg	
50-29-3	4,4'-DDT	ND [a]	35	8.1	ug/kg	
72-20-8	Endrin	ND	3.5	0.71	ug/kg	
1031-07-8	Endosulfan sulfate	ND	3.5	1.2	ug/kg	
7421-93-4	Endrin aldehyde	ND vL	3.5	1.1	ug/kg	
53494-70-5	Endrin ketone	ND	3.5	0.71	ug/kg	
959-98-8	Endosulfan-I	ND	1.8	0.39	ug/kg	
33213-65-9	Endosulfan-II	ND	3.5	0.53	ug/kg	
76-44-8	Heptachlor	ND [a]	18	4.9	ug/kg	
1024-57-3	Heptachlor epoxide	0.48 J	1.8	0.35	ug/kg	J
72-43-5	Methoxychlor	ND [a]	35	7.1	ug/kg	
8001-35-2	Toxaphene	ND	88	44	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	110%	70%	46-122%
2051-24-3	Decachlorobiphenyl	88%	78%	50-133%

(a) Result is from Run# 2

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: ST64245.D

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Report of Analysis

Client Sample ID:	59SS06		
Lab Sample ID:	F51154-27	Date Sampled:	07/19/07
Matrix:	SO - Soil	Date Received:	07/19/07
Method:	SW846 8082 SW846 3550B	Percent Solids:	92.0
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	ST64245.D	1	07/31/07	JB	07/27/07	OP21641	GST1697
Run #2							

	Initial Weight	Final Volume
Run #1	30.8 g	10.0 ml
Run #2		

PCB List

CAS No.	Compound	Result	RL	MDL	Units	Q
12674-11-2	Aroclor 1016	ND	18	8.8	ug/kg	
11104-28-2	Aroclor 1221	ND	18	14	ug/kg	
11141-16-5	Aroclor 1232	ND	18	14	ug/kg	
53469-21-9	Aroclor 1242	ND	18	8.8	ug/kg	
12672-29-6	Aroclor 1248	ND	18	8.8	ug/kg	
11097-69-1	Aroclor 1254	11.1 J	18	8.8	ug/kg	J
11096-82-5	Aroclor 1260	ND	18	8.8	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	66%		44-126%
2051-24-3	Decachlorobiphenyl	59%		39-157%

(a) All hits confirmed by dual column analysis.

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: KK20779.D TT08185.D

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Report of Analysis

Client Sample ID:	59SS07		
Lab Sample ID:	F51154-28	Date Sampled:	07/19/07
Matrix:	SO - Soil	Date Received:	07/19/07
Method:	SW846 8081A SW846 3550B	Percent Solids:	91.6
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	KK20779.D	1	08/08/07	FS	07/27/07	OP21640	GKK761
Run #2	TT08185.D	10	08/06/07	FS	07/27/07	OP21640	GTT278

	Initial Weight	Final Volume
Run #1	30.8 g	10.0 ml
Run #2	30.8 g	10.0 ml

Pesticide TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
309-00-2	Aldrin	ND	1.8	0.43	ug/kg	
319-84-6	alpha-BHC	ND	1.8	0.50	ug/kg	
319-85-7	beta-BHC	ND	1.8	0.46	ug/kg	
319-86-8	delta-BHC	ND	1.8	0.78	ug/kg	
58-89-9	gamma-BHC (Lindane)	ND	1.8	0.60	ug/kg	
5103-71-9	alpha-Chlordane	ND	1.8	0.35	ug/kg	
5103-74-2	gamma-Chlordane	ND	1.8	0.39	ug/kg	
60-57-1	Dieldrin	0.75 J	1.8	0.39	ug/kg	J
72-54-8	4,4'-DDD	ND	3.5	0.71	ug/kg	
72-55-9	4,4'-DDE	ND	3.5	0.71	ug/kg	
50-29-3	4,4'-DDT	ND [b]	35	8.2	ug/kg	
72-20-8	Endrin	ND	3.5	0.71	ug/kg	
1031-07-8	Endosulfan sulfate	ND	3.5	1.2	ug/kg	
7421-93-4	Endrin aldehyde	ND VL	3.5	1.1	ug/kg	
53494-70-5	Endrin ketone	ND	3.5	0.71	ug/kg	
959-98-8	Endosulfan-I	ND	1.8	0.39	ug/kg	
33213-65-9	Endosulfan-II	ND	3.5	0.53	ug/kg	
76-44-8	Heptachlor	ND [b]	18	5.0	ug/kg	
1024-57-3	Heptachlor epoxide	0.46 J	1.8	0.35	ug/kg	J
72-43-5	Methoxychlor	ND [b]	35	7.1	ug/kg	
8001-35-2	Toxaphene	ND	89	44	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	75%	67%	46-122%
2051-24-3	Decachlorobiphenyl	62%	70%	50-133%

(a) All hits confirmed by dual column analysis.
(b) Result is from Run# 2

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: ST64248.D

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Report of Analysis

Client Sample ID:	59SS07		
Lab Sample ID:	F51154-28	Date Sampled:	07/19/07
Matrix:	SO - Soil	Date Received:	07/19/07
Method:	SW846 8082 SW846 3550B	Percent Solids:	91.6
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	ST64248.D	1	07/31/07	JB	07/27/07	OP21641	GST1697
Run #2							

	Initial Weight	Final Volume
Run #1	30.8 g	10.0 ml
Run #2		

PCB List

CAS No.	Compound	Result		RL	MDL	Units	Q
12674-11-2	Aroclor 1016	ND		18	8.9	ug/kg	
11104-28-2	Aroclor 1221	ND		18	14	ug/kg	
11141-16-5	Aroclor 1232	ND		18	14	ug/kg	
53469-21-9	Aroclor 1242	ND		18	8.9	ug/kg	
12672-29-6	Aroclor 1248	ND		18	8.9	ug/kg	
11097-69-1	Aroclor 1254 [b]	21.0	J	18	8.9	ug/kg	
11096-82-5	Aroclor 1260	ND		18	8.9	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	74%		44-126%
2051-24-3	Decachlorobiphenyl	59%		39-157%

(a) All hits confirmed by dual column analysis.
(b) Aroclor pattern appears to be weathered.

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: KK20780.D TT08186.D

Form I COR

Accutest Laboratories

Report of Analysis

Client Sample ID:	59SS08		
Lab Sample ID:	F51154-29	Date Sampled:	07/19/07
Matrix:	SO - Soil	Date Received:	07/19/07
Method:	SW846 8081A SW846 3550B	Percent Solids:	89.0
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	KK20780.D	1	08/08/07	FS	07/27/07	OP21640	GKK761
Run #2	TT08186.D	10	08/06/07	FS	07/27/07	OP21640	GTT278

	Initial Weight	Final Volume
Run #1	30.1 g	10.0 ml
Run #2	30.1 g	10.0 ml

Pesticide TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
309-00-2	Aldrin	ND	1.9	0.45	ug/kg	
319-84-6	alpha-BHC	ND	1.9	0.52	ug/kg	
319-85-7	beta-BHC	ND	1.9	0.49	ug/kg	
319-86-8	delta-BHC	ND	1.9	0.82	ug/kg	
58-89-9	gamma-BHC (Lindane)	ND	1.9	0.63	ug/kg	
5103-71-9	alpha-Chlordane	ND	1.9	0.37	ug/kg	
5103-74-2	gamma-Chlordane	ND	1.9	0.41	ug/kg	
60-57-1	Dieldrin	0.44 J	1.9	0.41	ug/kg	J
72-54-8	4,4'-DDD	1.0 J	3.7	0.75	ug/kg	J
72-55-9	4,4'-DDE	ND	3.7	0.75	ug/kg	
50-29-3	4,4'-DDT	ND [b]	37	8.6	ug/kg	
72-20-8	Endrin	ND	3.7	0.75	ug/kg	
1031-07-8	Endosulfan sulfate	ND	3.7	1.2	ug/kg	
7421-93-4	Endrin aldehyde	ND VL	3.7	1.1	ug/kg	
53494-70-5	Endrin ketone	ND	3.7	0.75	ug/kg	
959-98-8	Endosulfan-I	ND	1.9	0.41	ug/kg	
33213-65-9	Endosulfan-II	ND	3.7	0.56	ug/kg	
76-44-8	Heptachlor	ND [b]	19	5.2	ug/kg	
1024-57-3	Heptachlor epoxide	ND	1.9	0.37	ug/kg	
72-43-5	Methoxychlor	ND [b]	37	7.5	ug/kg	
8001-35-2	Toxaphene	ND	93	47	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	120%	77%	46-122%
2051-24-3	Decachlorobiphenyl	100%	78%	50-133%

(a) All hits confirmed by dual column analysis.
(b) Result is from Run# 2

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: ST64249.D

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Report of Analysis

Client Sample ID:	59SS08		
Lab Sample ID:	F51154-29	Date Sampled:	07/19/07
Matrix:	SO - Soil	Date Received:	07/19/07
Method:	SW846 8082 SW846 3550B	Percent Solids:	89.0
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	ST64249.D	1	07/31/07	JB	07/27/07	OP21641	GST1697
Run #2							

	Initial Weight	Final Volume
Run #1	30.1 g	10.0 ml
Run #2		

PCB List

CAS No.	Compound	Result	RL	MDL	Units	Q
12674-11-2	Aroclor 1016	ND	19	9.3	ug/kg	
11104-28-2	Aroclor 1221	ND	19	15	ug/kg	
11141-16-5	Aroclor 1232	ND	19	15	ug/kg	
53469-21-9	Aroclor 1242	ND	19	9.3	ug/kg	
12672-29-6	Aroclor 1248	ND	19	9.3	ug/kg	
11097-69-1	Aroclor 1254 [b]	24.7 J	19	9.3	ug/kg	
11096-82-5	Aroclor 1260	ND	19	9.3	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	73%		44-126%
2051-24-3	Decachlorobiphenyl	66%		39-157%

(a) All hits confirmed by dual column analysis.
(b) Aroclor pattern appears to be weathered.

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: KK20781.D TT08189.D

Form I Copy

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Report of Analysis

Client Sample ID:	59SS09		
Lab Sample ID:	F51154-30	Date Sampled:	07/19/07
Matrix:	SO - Soil	Date Received:	07/19/07
Method:	SW846 8081A SW846 3550B	Percent Solids:	95.1
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	KK20781.D	1	08/08/07	FS	07/27/07	OP21640	GKK761
Run #2	TT08189.D	10	08/06/07	FS	07/27/07	OP21640	GTT278

	Initial Weight	Final Volume
Run #1	30.5 g	10.0 ml
Run #2	30.5 g	10.0 ml

Pesticide TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
309-00-2	Aldrin	ND	1.7	0.41	ug/kg	
319-84-6	alpha-BHC	ND	1.7	0.48	ug/kg	
319-85-7	beta-BHC	ND	1.7	0.45	ug/kg	
319-86-8	delta-BHC	ND	1.7	0.76	ug/kg	
58-89-9	gamma-BHC (Lindane)	ND	1.7	0.59	ug/kg	
5103-71-9	alpha-Chlordane	ND	1.7	0.34	ug/kg	
5103-74-2	gamma-Chlordane	ND	1.7	0.38	ug/kg	
60-57-1	Dieldrin	ND	1.7	0.38	ug/kg	
72-54-8	4,4'-DDD	ND	3.4	0.69	ug/kg	
72-55-9	4,4'-DDE	ND	3.4	0.69	ug/kg	
50-29-3	4,4'-DDT	ND [b] UJ	34	7.9	ug/kg	
72-20-8	Endrin	ND	3.4	0.69	ug/kg	
1031-07-8	Endosulfan sulfate	7.1	3.4	1.1	ug/kg	
7421-93-4	Endrin aldehyde	ND VL	3.4	1.0	ug/kg	
53494-70-5	Endrin ketone	ND	3.4	0.69	ug/kg	
959-98-8	Endosulfan-I	ND	1.7	0.38	ug/kg	
33213-65-9	Endosulfan-II	ND	3.4	0.52	ug/kg	
76-44-8	Heptachlor	ND [b]	17	4.8	ug/kg	
1024-57-3	Heptachlor epoxide	ND	1.7	0.34	ug/kg	
72-43-5	Methoxychlor	ND [b] UJ	34	6.9	ug/kg	
8001-35-2	Toxaphene	ND	86	43	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	66%	69%	46-122%
2051-24-3	Decachlorobiphenyl	73%	80%	50-133%

(a) All hits confirmed by dual column analysis.
(b) Result is from Run# 2

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: ST64250.D

Accutest Laboratories

Report of Analysis

Client Sample ID:	59SS09		
Lab Sample ID:	F51154-30	Date Sampled:	07/19/07
Matrix:	SO - Soil	Date Received:	07/19/07
Method:	SW846 8082 SW846 3550B	Percent Solids:	95.1
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	ST64250.D	1	07/31/07	JB	07/27/07	OP21641	GST1697
Run #2							

	Initial Weight	Final Volume
Run #1	30.5 g	10.0 ml
Run #2		

PCB List

CAS No.	Compound	Result	RL	MDL	Units	Q
12674-11-2	Aroclor 1016	ND	17	8.6	ug/kg	
11104-28-2	Aroclor 1221	ND	17	14	ug/kg	
11141-16-5	Aroclor 1232	ND	17	14	ug/kg	
53469-21-9	Aroclor 1242	ND	17	8.6	ug/kg	
12672-29-6	Aroclor 1248	ND	17	8.6	ug/kg	
11097-69-1	Aroclor 1254	ND	17	8.6	ug/kg	
11096-82-5	Aroclor 1260	ND	17	8.6	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	63%		44-126%
2051-24-3	Decachlorobiphenyl	72%		39-157%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: KK20782.D TT08190.D

Accutest Laboratories

Report of Analysis

Client Sample ID:	59SS10		
Lab Sample ID:	F51154-31	Date Sampled:	07/19/07
Matrix:	SO - Soil	Date Received:	07/19/07
Method:	SW846 8081A SW846 3550B	Percent Solids:	95.7
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	KK20782.D	1	08/08/07	FS	07/27/07	OP21640	GKK761
Run #2	TT08190.D	10	08/06/07	FS	07/27/07	OP21640	GTT278

	Initial Weight	Final Volume
Run #1	30.7 g	10.0 ml
Run #2	31.7 g	10.0 ml

Pesticide TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
309-00-2	Aldrin	ND	1.7	0.41	ug/kg	
319-84-6	alpha-BHC	ND	1.7	0.48	ug/kg	
319-85-7	beta-BHC	ND	1.7	0.44	ug/kg	
319-86-8	delta-BHC	ND	1.7	0.75	ug/kg	
58-89-9	gamma-BHC (Lindane)	ND	1.7	0.58	ug/kg	
5103-71-9	alpha-Chlordane	ND	1.7	0.34	ug/kg	
5103-74-2	gamma-Chlordane	ND	1.7	0.37	ug/kg	
60-57-1	Dieldrin	ND	1.7	0.37	ug/kg	
72-54-8	4,4'-DDD	ND	3.4	0.68	ug/kg	
72-55-9	4,4'-DDE	ND	3.4	0.68	ug/kg	
50-29-3	4,4'-DDT	ND [b] UJ	33	7.6	ug/kg	
72-20-8	Endrin	ND	3.4	0.68	ug/kg	
1031-07-8	Endosulfan sulfate	2.1 J	3.4	1.1	ug/kg	J
7421-93-4	Endrin aldehyde	ND UL	3.4	1.0	ug/kg	
53494-70-5	Endrin ketone	ND	3.4	0.68	ug/kg	
959-98-8	Endosulfan-I	ND	1.7	0.37	ug/kg	
33213-65-9	Endosulfan-II	ND	3.4	0.51	ug/kg	
76-44-8	Heptachlor	ND [b]	16	4.6	ug/kg	
1024-57-3	Heptachlor epoxide	ND	1.7	0.34	ug/kg	
72-43-5	Methoxychlor	ND [b] UJ	33	6.6	ug/kg	
8001-35-2	Toxaphene	ND	85	43	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	55%	80%	46-122%
2051-24-3	Decachlorobiphenyl	57%	81%	50-133%

(a) All hits confirmed by dual column analysis.
(b) Result is from Run# 2

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: ST64251.D

Form I OR

Accutest Laboratories

Report of Analysis

Client Sample ID:	59SS10		
Lab Sample ID:	F51154-31	Date Sampled:	07/19/07
Matrix:	SO - Soil	Date Received:	07/19/07
Method:	SW846 8082 SW846 3550B	Percent Solids:	95.7
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	ST64251.D	1	07/31/07	JB	07/27/07	OP21641	GST1697
Run #2							

	Initial Weight	Final Volume
Run #1	30.7 g	10.0 ml
Run #2		

PCB List

CAS No.	Compound	Result	RL	MDL	Units	Q
12674-11-2	Aroclor 1016	ND	17	8.5	ug/kg	
11104-28-2	Aroclor 1221	ND	17	14	ug/kg	
11141-16-5	Aroclor 1232	ND	17	14	ug/kg	
53469-21-9	Aroclor 1242	ND	17	8.5	ug/kg	
12672-29-6	Aroclor 1248	ND	17	8.5	ug/kg	
11097-69-1	Aroclor 1254	ND	17	8.5	ug/kg	
11096-82-5	Aroclor 1260	ND	17	8.5	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	70%		44-126%
2051-24-3	Decachlorobiphenyl	80%		39-157%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: TT08074.D KK20592.D

Form I Org

Accutest Laboratories

Report of Analysis

Client Sample ID:	TMSS05		
Lab Sample ID:	F51154-32	Date Sampled:	07/19/07
Matrix:	SO - Soil	Date Received:	07/19/07
Method:	SW846 8081A SW846 3550B	Percent Solids:	86.6
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	TT08074.D	5	07/31/07	FS	07/27/07	OP21640	GTT274
Run #2	KK20592.D	10	08/02/07	FS	07/27/07	OP21640	GKK756

	Initial Weight	Final Volume
Run #1	29.9 g	10.0 ml
Run #2	29.9 g	10.0 ml

Pesticide TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
309-00-2	Aldrin	ND	9.7	2.3	ug/kg	
319-84-6	alpha-BHC	ND	9.7	2.7	ug/kg	
319-85-7	beta-BHC	ND	9.7	2.5	ug/kg	
319-86-8	delta-BHC	ND	9.7	4.2	ug/kg	
58-89-9	gamma-BHC (Lindane)	ND	9.7	3.3	ug/kg	
5103-71-9	alpha-Chlordane	ND	9.7	1.9	ug/kg	
5103-74-2	gamma-Chlordane	ND	9.7	2.1	ug/kg	
60-57-1	Dieldrin	ND	9.7	2.1	ug/kg	
72-54-8	4,4'-DDD	ND	19	3.9	ug/kg	
72-55-9	4,4'-DDE	ND	19	3.9	ug/kg	
50-29-3	4,4'-DDT	ND [b] UJ	39	8.9	ug/kg	
72-20-8	Endrin	ND	19	3.9	ug/kg	
1031-07-8	Endosulfan sulfate	ND	19	6.4	ug/kg	
7421-93-4	Endrin aldehyde	ND UL	19	5.8	ug/kg	
53494-70-5	Endrin ketone	ND	19	3.9	ug/kg	
959-98-8	Endosulfan-I	ND	9.7	2.1	ug/kg	
33213-65-9	Endosulfan-II	ND	19	2.9	ug/kg	
76-44-8	Heptachlor	ND [b]	19	5.4	ug/kg	
1024-57-3	Heptachlor epoxide	ND	9.7	1.9	ug/kg	
72-43-5	Methoxychlor	ND [b] UJ	39	7.7	ug/kg	
8001-35-2	Toxaphene	ND	480	240	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	78%	69%	46-122%
2051-24-3	Decachlorobiphenyl	86%	75%	50-133%

(a) Dilution required due to matrix interference.
(b) Result is from Run# 2

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: ST64254.D

Form I OR

Accutest Laboratories

Report of Analysis

Client Sample ID:	TMSS05		
Lab Sample ID:	F51154-32	Date Sampled:	07/19/07
Matrix:	SO - Soil	Date Received:	07/19/07
Method:	SW846 8082 SW846 3550B	Percent Solids:	86.6
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	ST64254.D	1	07/31/07	JB	07/27/07	OP21641	GST1697
Run #2							

	Initial Weight	Final Volume
Run #1	29.9 g	10.0 ml
Run #2		

PCB List

CAS No.	Compound	Result	RL	MDL	Units	Q
12674-11-2	Aroclor 1016	ND	19	9.7	ug/kg	
11104-28-2	Aroclor 1221	ND	19	15	ug/kg	
11141-16-5	Aroclor 1232	ND	19	15	ug/kg	
53469-21-9	Aroclor 1242	ND	19	9.7	ug/kg	
12672-29-6	Aroclor 1248	ND	19	9.7	ug/kg	
11097-69-1	Aroclor 1254	75.6	19	9.7	ug/kg	J
11096-82-5	Aroclor 1260	ND	19	9.7	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	65%		44-126%
2051-24-3	Decachlorobiphenyl	70%		39-157%

(a) All hits confirmed by dual column analysis.

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: KK20475.D

Form I copy

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Report of Analysis

Client Sample ID:	RB071807		
Lab Sample ID:	F51154-12	Date Sampled:	07/18/07
Matrix:	AQ - Surface Water	Date Received:	07/19/07
Method:	SW846 8081A SW846 3510C	Percent Solids:	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	KK20475.D	1	07/26/07	FS	07/24/07	OP21578	GKK752
Run #2							

	Initial Volume	Final Volume
Run #1	920 ml	10.0 ml
Run #2		

Pesticide TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
309-00-2	Aldrin	ND	0.054	0.022	ug/l	
319-84-6	alpha-BHC	ND	0.054	0.016	ug/l	
319-85-7	beta-BHC	ND	0.054	0.022	ug/l	
319-86-8	delta-BHC	ND	0.054	0.022	ug/l	
58-89-9	gamma-BHC (Lindane)	ND	0.054	0.016	ug/l	
5103-71-9	alpha-Chlordane	ND	0.054	0.016	ug/l	
5103-74-2	gamma-Chlordane	ND	0.054	0.016	ug/l	
60-57-1	Dieldrin	ND	0.054	0.016	ug/l	
72-54-8	4,4'-DDD	ND	0.11	0.022	ug/l	
72-55-9	4,4'-DDE	ND	0.11	0.022	ug/l	
50-29-3	4,4'-DDT	ND	0.11	0.022	ug/l	
72-20-8	Endrin	ND	0.11	0.043	ug/l	
1031-07-8	Endosulfan sulfate	ND	0.11	0.022	ug/l	
7421-93-4	Endrin aldehyde	ND	0.11	0.043	ug/l	
53494-70-5	Endrin ketone	ND	0.11	0.022	ug/l	
959-98-8	Endosulfan-I	ND	0.054	0.016	ug/l	
33213-65-9	Endosulfan-II	ND	0.11	0.022	ug/l	
76-44-8	Heptachlor	ND	0.054	0.022	ug/l	
1024-57-3	Heptachlor epoxide	ND	0.054	0.016	ug/l	
72-43-5	Methoxychlor	ND	0.11	0.043	ug/l	
8001-35-2	Toxaphene	ND	2.7	1.4	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	78%		42-127%
2051-24-3	Decachlorobiphenyl	71%		27-127%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: XX022303.D

Form I Copy

Accutest Laboratories

Report of Analysis

Client Sample ID:	RB071807		
Lab Sample ID:	F51154-12	Date Sampled:	07/18/07
Matrix:	AQ - Surface Water	Date Received:	07/19/07
Method:	SW846 8082 SW846 3510C	Percent Solids:	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	XX022303.D	1	07/26/07	AC	07/24/07	OP21577	GXX184
Run #2							

	Initial Volume	Final Volume
Run #1	920 ml	10.0 ml
Run #2		

PCB List

CAS No.	Compound	Result	RL	MDL	Units	Q
12674-11-2	Aroclor 1016	ND	0.54	0.27	ug/l	
11104-28-2	Aroclor 1221	ND	0.54	0.43	ug/l	
11141-16-5	Aroclor 1232	ND	0.54	0.43	ug/l	
53469-21-9	Aroclor 1242	ND	0.54	0.27	ug/l	
12672-29-6	Aroclor 1248	ND	0.54	0.27	ug/l	
11097-69-1	Aroclor 1254	ND	0.54	0.27	ug/l	
11096-82-5	Aroclor 1260	ND	0.54	0.27	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	87%		38-127%
2051-24-3	Decachlorobiphenyl	75%		25-137%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Edgewood, Maryland
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Shaw® Shaw Environmental, Inc.

MEMORANDUM

TO: Jeff Parks, Shaw E&I Radford Army Ammunition Plant (RFAAP) Project Manager

FROM: Eric Malarek, Shaw E&I Project Chemist

SUBJECT: RFAAP Data Validation – Semi-Volatiles & Polynuclear Aromatic Hydrocarbons Accutest Laboratories, Inc., SDG F51154

DATE: September 25, 2007

The purpose of this memorandum is to present the data validation report for the samples collected at Main Manufacturing Area at RFAAP for a RFI/CMS Nine Sites on July 18, 2007 and July 19, 2007. Samples were analyzed for semivolatile organic compounds (SVOCs) using USEPA SW846 Methods 3510C/8270C for aqueous matrices and USEPA SW846 Methods 3550B/8270C for solid matrices. The polynuclear aromatic hydrocarbons (PAHs) were analyzed using selective ion monitoring (SIM) techniques. A total of seven aqueous samples and nineteen solid samples were validated. The sample Ids are:

Field Sample ID	Lab Sample ID	Field Sample ID	Lab Sample ID
AOSW01	F51154-1	LFSW01	F51154-17
AOSW02	F51154-2	APSD01	F51154-18
TMSW01	F51154-3	41SD11	F51154-22
AOSD01	F51154-4	49SS02	F51154-23
AOSD02	F51154-5	49SS03	F51154-24
41SW08	F51154-6	49SS04	F51154-25
41SW09	F51154-7	49SS05	F51154-26
41SW10	F51154-8	59SS06	F51154-27
41SD08	F51154-9	59SS07	F51154-28
41SD09	F51154-10	59SS08	F51154-29
41SD10	F51154-11	59SS09	F51154-30
LFSD01	F51154-15	59SS10	F51154-31
TMSD01	F51154-16	TMSS05	F51154-32

Data were reviewed by Eric Malarek and validated using a combination of project QAPP, *Quality Systems Manual for Environmental Laboratories, Final Version 3, January, 2006* (DoD, 2006) (DoD QSM), method-specific criteria, and laboratory SOP criteria. The data qualifier scheme was consistent with the *Region III Modifications to the National Functional Guidelines for Organic Data Review* (September 1994). Parameters evaluated are presented in **Table 1**. Data associated with parameters in compliance with quality control specifications have not been qualified. Data associated with parameters that did not comply with quality control specifications and directly impacted project data have been qualified in accordance with USEPA Region III specifications.

Table 1 Laboratory Performance Criteria

Qualified		Parameter
Yes	No	
	X	Holding Times and Preservation
	X	Instrument Performance Check
	X	Initial Calibration
	X	Continuing Calibration
	X	Blank Analysis
	X	Surrogate Spikes
	X	Internal Standards
X		Laboratory Control Sample
X		Matrix Spike/Spike Duplicate
X		Field Duplicate
X		Quantitation Verification

The quality of data collected in support of this sampling activity is considered acceptable with noted qualifications, except for the following. Benzoic acid was qualified rejected "R" for samples AOSW01 (F51154-1), AOSW02 (F51154-2), TMSW01 (F51154-3), 41SW08 (F51154-6), 41SW09 (F51154-7), and 41SW10 (F51154-8) based upon the grossly low (i.e. <10% recovery) found in the associated LCS (see Section VIII).

Eric Malarek, Chemist

9/25/07
Date

RFAAP VALIDATION REPORT
SEMIVOLATILES AND PAH REVIEW
SDG F51154

I-Holding Times and Preservation

The objective is to ascertain the validity of results based on the holding time of the sample from time of collection to time of sample extraction and analysis. Holding time criteria: For semivolatile (SVOC) and polynuclear aromatic hydrocarbons (PAH) compounds , the samples are cooled @4°C ± 2°C for aqueous samples with a maximum holding time of 7 days from sample collection to preparative extraction and 40 days from preparative extraction to determinative analysis. For solid matrices, the samples are cooled @4°C ± 2°C with a maximum holding time of 14 days from sample collection to preparative extraction and 40 days from preparative extraction to determinative analysis.

- Temperature Review: The temperature blank was sent with each cooler and recorded by the laboratory upon receipt. For samples collected on 07/18/07 and 07/19/07, the coolers were received by the primary laboratory (Accutest) on 07/20/07 at 4.0°C, 4.0°C, 4.6°C, 4.6°C, 4.8°C, 5.0°C, 5.0°C, and 5.8°C. The herbicides were subcontracted to Accutest TX and were received the samples at 4.2°C, 4.0°C, and 3.6°C. The perchlorate subcontract laboratory (Datachem Laboratories, Inc.) received the aqueous samples at 3.0°C. The dioxin subcontract laboratory (SGS Paradigm Analytical Laboratories, Inc.) received the samples at 5.5°C and 5.2°C. All criteria were met. No qualifiers were applied.

- Holding Time Review: The aqueous samples were collected on 07/18/07 and 07/19/07. For the surface water samples collected 07/18/07 and 07/19/07, the SVOCs were extracted on 07/24/07 and 07/26/07 and analyzed on 07/31/07. For the surface water samples collected 07/18/07 and 07/19/07, the PAHs by SIM were extracted on 07/24/07 and 07/26/07 and analyzed on 07/30/07 and 07/31/07. For the sediment and soil samples collected 07/18/07 and 07/19/07, the SVOCs were extracted on 07/25/07, 07/27/07, and 08/06/07 (49SS03 (F51154-24) confirmation) and analyzed on 07/26/07, 07/30/07, and 08/06/07 (49SS03 (F51154-24) confirmation). Sample 49SS03 (F51154-24) was re-extracted and re-analyzed for confirmation out of holding time for compound di-n-butylphthalate; however, the original sample was reported. No qualifiers were applied based upon this outlier. For the sediment and soil samples collected 07/18/07 and 07/19/07, the PAHs by SIM were extracted on 07/27/07 and analyzed on 07/27/07, 07/31/07, and 08/01/07. Sample collection dates may be found on the attached form 1s. All criteria were met. No qualifiers were applied.

II-Instrument Performance Check

GC/MS instrument performance checks are performed to ensure mass resolution, identification and, to some degree, sensitivity. The analysis of the instrument performance check solution must be performed at the beginning of each 12-hour period during which samples are analyzed.

- The instrument performance check, decafluorotriphenylphosphine (DFTPP), met the ion abundance criteria. No qualification was applied.

III-Initial Calibration

Compliance requirements for satisfactory instrument calibration are established to ensure that the instrument used is capable of producing acceptable qualitative and quantitative data for compounds on the semivolatile target compound list (TCL). Initial calibration demonstrates that the instrument is capable of acceptable performance in the beginning of the analytical run and of producing a linear calibration curve. For compounds analyzed using linear regression or second order, correlation coefficients must be >0.995 and coefficients of determination >0.99. The minimum relative response factor (RRF) criteria must be ≥0.05. The DoD QSM specifies that the initial calibration percent relative standard deviation (%RSD) must be ≤15% on the average for all compounds (<30% for CCCs). All detects are qualified as estimated "J" for where there were exceeding %RSDs, and all non-detects are qualified as estimated "UJ" for where there were grossly exceeding recoveries, unless determined to be unusable "R". Grossly exceeding is defined as twice the established criteria limits. For where there were low RRFs, all detects are qualified as estimated "J" and non-detects are rejected "R".

- Initial calibration for the SVOCs was performed on 07/05/07 on instrument MSBNA02. Target compounds 2,4-dinitrophenol (19.7%) and 4,6-dinitro-2-methylphenol (25.9%) were outside criteria. All other target compounds were within criteria (%RSD≤15% or ≤30%; RRF≥0.05). Compounds 2,4-dinitrophenol (r=0.9950) and 4,6-dinitro-2-methylphenol (r=0.9975) were quantified using linear or second order regression with correlation coefficients >0.995, therefore, no qualifiers were applied based upon the high %RSDs. Sample LFSW01 (F51154-17) was analyzed using this initial calibration.

- Initial calibration for the SVOCs was performed on 07/23/07 on instrument MSBNA03. Target compounds 2,4-dinitrophenol (49.6%; grossly exceeding) and 4,6-dinitro-2-methylphenol (32.7%; grossly exceeding) were outside criteria. All other target compounds were within criteria (%RSD≤15% or ≤30%; RRF≥0.05). Compounds 2,4-dinitrophenol (r=0.9956) and 4,6-dinitro-2-methylphenol (r=0.9972) were quantified using linear or second order regression with correlation coefficients >0.995, therefore, no qualifiers were applied based upon the high %RSDs. Samples AOSD01 (F51154-4), AOSD02 (F51154-5), 41SD08 (F51154-9), 41SD09 (F51154-10), 41SD10 (F51154-11), LFSD01 (F51154-15), TMSD01 (F51154-16), APSD01 (F51154-18), 41SD11 (F51154-22), 49SS02 (F51154-23), 49SS03 (F51154-24), 49SS04 (F51154-25), 49SS05 (F51154-26), 59SS06 (F51154-27), 59SS07 (F51154-28), 59SS08 (F51154-29), 59SS09 (F51154-30), 59SS10 (F51154-31), and TMSS05 (F51154-32) were analyzed using this initial calibration.

- Initial calibration for the SVOCs was performed on 07/31/07 on instrument MSBNA03. Target compounds 2,4-dinitrophenol (43.8%; grossly exceeding) and 4,6-dinitro-2-methylphenol (22.8%) were outside criteria. All other target compounds were within criteria (%RSD≤15% or ≤30%; RRF≥0.05). Compounds 2,4-dinitrophenol (r=0.9962) and 4,6-dinitro-2-methylphenol (r=0.9982) were quantified using linear or second order regression with correlation coefficients >0.995, therefore, no qualifiers were applied based upon the high %RSDs. No samples reported were analyzed using this initial calibration.

- Initial calibration for the SVOCs was performed on 07/13/07 on instrument MSBNA04. Target compounds 2,4-dinitrophenol (42.0%; grossly exceeding) and 4,6-dinitro-2-methylphenol (24.0%) were outside criteria. All other target compounds were within criteria (%RSD≤15% or ≤30%; RRF≥0.05). Compounds 2,4-dinitrophenol (r=0.9988) and 4,6-dinitro-2-methylphenol (r=0.9995) were quantified using linear or second order regression with correlation coefficients >0.995, therefore, no qualifiers were applied based upon the high %RSDs. Samples AOSW01 (F51154-1), AOSW02 (F51154-2), TMSW01 (F51154-3), 41SW08 (F51154-6), 41SW09 (F51154-7), and 41SW10 (F51154-8) as well as the confirmation for sample 49SS03 (F51154-24) were analyzed using this initial calibration.

- Initial calibration for the PAHs by SIM was performed on 07/27/07 on instrument MSBNA01, all target compounds were within criteria (%RSD≤15% or ≤30%; RRF≥0.05). No qualifiers were applied. Samples AOSD01 (F51154-4), AOSD02 (F51154-5), LFSW01 (F51154-17), AOSW01 (F51154-1), AOSW02 (F51154-2), TMSW01 (F51154-3), 41SW08 (F51154-6), 41SW09 (F51154-7), 41SW10 (F51154-8), 41SD08 (F51154-9), 41SD09 (F51154-10), 41SD10 (F51154-11), LFSD01 (F51154-15), TMSD01 (F51154-16), APSD01 (F51154-18), 41SD11 (F51154-22), 49SS02 (F51154-23), 49SS03 (F51154-24), 49SS04 (F51154-25), 49SS05 (F51154-26), 59SS06 (F51154-27), 59SS07 (F51154-28), 59SS08 (F51154-29), 59SS09 (F51154-30), 59SS10 (F51154-31), and TMSS05 (F51154-32) were analyzed using this initial calibration.

IV-Continuing Calibration

Compliance requirements for satisfactory instrument calibration are established to ensure that the instrument used was capable of producing acceptable qualitative and quantitative data for semivolatile target compounds. Continuing calibration standards containing both target and surrogates compounds are analyzed at the beginning of each 12-hour analysis period following the analysis of the instrument performance check and prior to the analysis of blanks and samples. The minimum relative response factors (RRF) for semivolatile target compounds and surrogates must be ≥0.05. The DoD QSM specifies that the percent difference (%D) between the initial calibration RRF and the continuing calibration RRF must be within ±20% for all target compounds. Grossly exceeding is defined where %D>40%. All detects are qualified as estimated "J" for where there were exceeding %Ds, and all non-detects are qualified as estimated "UJ" for where there were grossly exceeding recoveries, unless determined to be unusable "R". Grossly exceeding is defined as twice the established criteria limits. For where there were low RRFs, all detects are qualified as estimated "J" and non-detects are rejected "R".

- For SVOC initial calibration verification performed on 07/05/07 @15:27 on instrument MSBNA02, 3-nitroaniline (26.0%) was outside criteria limits. For all other target compounds, all criteria were met. All samples were non-detect for 3-nitroaniline. No qualifiers were applied. No samples reported apply to this initial calibration verification.

- For SVOC initial calibration verification performed on 07/05/07 @15:55 on instrument MSBNA02, all criteria were met for all target compounds. No qualifiers were applied. No samples reported apply to this initial calibration verification.

- For SVOC continuing calibration performed on 07/31/07 @09:50 on instrument MSBNA02, all criteria were met for all target compounds. No qualifiers were applied. Sample LFSW01 (F51154-17) applies to this continuing calibration.

- For SVOC initial calibration verification performed on 07/23/07 @18:28 on instrument MSBNA03, 4-chloroaniline (44.6%; grossly exceeding) and 3-nitroaniline (27.8%) were outside criteria limits. For all other target compounds, all criteria were met. All samples were non-detect for 4-chloroaniline and 3-nitroaniline. No samples reported apply to this initial calibration verification. No qualifiers were applied.

- For SVOC initial calibration verification performed on 07/23/07 @18:58 on instrument MSBNA03, all criteria were met for all target compounds. No qualifiers were applied. No samples reported apply to this initial calibration verification.

- For SVOC continuing calibration performed on 07/26/07 @09:59 on instrument MSBNA03, all criteria were met for all target compounds. No qualifiers were applied. Samples AOSD01 (F51154-4) and AOSD02 (F51154-5) apply to this continuing calibration.

- For SVOC continuing calibration performed on 07/30/07 @09:46 on instrument MSBNA03, all criteria were met for all target compounds. No qualifiers were applied. Samples 41SD08 (F51154-9), 41SD09 (F51154-10), 41SD10 (F51154-11), LFSD01 (F51154-15), TMSD01 (F51154-16), APSD01 (F51154-18), 41SD11 (F51154-22), 49SS02 (F51154-23), 49SS03 (F51154-24), 49SS04 (F51154-25), 49SS05 (F51154-26), 59SS06 (F51154-27), 59SS07 (F51154-28), 59SS08 (F51154-29), 59SS09 (F51154-30), 59SS10 (F51154-31), and TMSS05 (F51154-32) apply to this continuing calibration.

- For SVOC initial calibration verification performed on 07/31/07 @16:11 on instrument MSBNA03, 4-chloroaniline (43.4%; grossly exceeding) and 3-nitroaniline (35.4%) were outside criteria limits. For all other target compounds, all criteria were met. All samples were non-detect for 4-chloroaniline and 3-nitroaniline. No samples reported apply to this initial calibration verification. No qualifiers were applied.

- For SVOC initial calibration verification performed on 07/31/07 @16:42 on instrument MSBNA03, all criteria were met for all target compounds. No qualifiers were applied. No samples reported apply to this initial calibration verification.

- For SVOC continuing calibration performed on 08/01/07 @12:32 on instrument MSBNA03, all criteria were met for all target compounds. No qualifiers were applied. No samples reported apply to this continuing calibration.

- For SVOC initial calibration verification performed on 07/13/07 @13:48 on instrument MSBNA04, 4-chloroaniline (38.2%) and 3-nitroaniline (39.0%) were outside criteria limits. For all other target compounds, all criteria were met. All samples were non-detect for 4-chloroaniline and 3-nitroaniline. No samples reported apply to this initial calibration verification. No qualifiers were applied.

- For SVOC initial calibration verification performed on 07/13/07 @14:19 on instrument MSBNA04, all criteria were met for all target compounds. No qualifiers were applied. No samples reported apply to this initial calibration verification.

- For SVOC continuing calibration performed on 07/31/07 @11:19 on instrument MSBNA04, all criteria were met for all target compounds. No qualifiers were applied. Samples AOSW01 (F51154-1), AOSW02 (F51154-2), TMSW01 (F51154-3), 41SW08 (F51154-6), 41SW09 (F51154-7), and 41SW10 (F51154-8) apply to this continuing calibration.

- For SVOC continuing calibration performed on 08/06/07 @11:28 on instrument MSBNA04, all criteria were met for all target compounds. No qualifiers were applied. Confirmation for sample 49SS03 (F51154-24) applies to this continuing calibration.

- For PAH by SIM initial calibration verification performed on 07/27/07 @20:02 on instrument MSBNA01, all criteria were met for all target compounds. No qualifiers were applied. Samples AOSD01 (F51154-4) and AOSD02 (F51154-5) apply to this initial calibration verification.

- For PAH by SIM continuing calibration performed on 07/30/07 @11:52 on instrument MSBNA01, all criteria were met for all target compounds. No qualifiers were applied. Samples apply to this continuing calibration.

- For PAH by SIM continuing calibration performed on 07/30/07 @23:02 on instrument MSBNA01, all criteria were met for all target compounds. No qualifiers were applied. Sample LFSW01 (F51154-17) applies to this continuing calibration.

- For PAH by SIM continuing calibration performed on 07/30/07 @11:52 on instrument MSBNA01, all criteria were met for all target compounds. No qualifiers were applied. Samples AOSW01 (F51154-1), AOSW02 (F51154-2), TMSW01 (F51154-3), 41SW08 (F51154-6), 41SW09 (F51154-7), and 41SW10 (F51154-8) apply to this continuing calibration.

- For PAH by SIM continuing calibration performed on 07/31/07 @09:58 on instrument MSBNA01, all criteria were met for all target compounds. No qualifiers were applied. Samples 41SD08 (F51154-9) and 41SD09 (F51154-10) apply to this continuing calibration.

- For PAH by SIM continuing calibration performed on 08/01/07 @13:31 on instrument MSBNA01, all criteria were met for all target compounds. No qualifiers were applied. Samples 41SD10 (F51154-11), LFSD01 (F51154-15), TMSD01 (F51154-16), APSD01 (F51154-18), 41SD11 (F51154-22), 49SS02 (F51154-23), 49SS03 (F51154-24), 49SS04 (F51154-25), 49SS05 (F51154-26), 59SS06 (F51154-27), 59SS07 (F51154-28), 59SS08 (F51154-29), 59SS09 (F51154-30), 59SS10 (F51154-31), and TMSS05 (F51154-32) apply to this continuing calibration.

V-Blank Analysis

The purpose of blank analyses is to determine the presence and magnitude of contamination problems resulting from field and laboratory activities. A method blank analysis must be performed after the calibration standards and once every 12-hour time period beginning with the injection of DFTPP. No contaminants should be detected in any of the associated blanks > the MDL. DoD QSM criteria specifies all concentrations should be less than one-half MRL (<MRL for common laboratory contaminants phthalate esters). Positive sample results are reported and qualified "B", if the concentration of the compound in the sample is ≤10 times (10x) the maximum amount in any blank for the common laboratory contaminants phthalate esters, or 5 times (5X) the maximum amount for other semivolatile target compounds. **Table 2** summarizes the blank contamination analysis. Action levels are based upon dilution factor of one and for solid matrices were converted to soil values (soil conversion factor = 33) if needed. Rinse blank RB083007 (F52208-1) (low-flow pump) applies to the groundwater "GW" samples in this SDG. The surface water "SW" samples were collected directly into the laboratory bottles; therefore, no rinse blank applies for the SW samples. Rinse blanks 072407R (F51275-1) and 072507R (F51300-31) apply to the surface soil "SS" and subsurface soil "SB" samples in this SDG. Rinse blank RB071807 (F51154-12) applies to the sediment "SD" samples in this SDG.

Table 2 Blank Contamination Analysis Summary

Analysis Date	QC Blank ID	Compound	Max Conc. µg/L	Action Level µg/L	B qualified samples
07/31/07	OP21580-MB	All SVOC target <½MRL	NA	NA	None
08/01/07	OP21580-MB	All SVOC target <½MRL	NA	NA	None
07/31/07	OP21610-MB	All SVOC target <½MRL	NA	NA	None
07/30/07	OP21581-MB	All PAH SIM target <½MRL	NA	NA	None
07/30/07	OP21611-MB	All PAH SIM target <½MRL	NA	NA	None
07/05/07	OP21206-MB	All PAH SIM target <½MRL	NA	NA	None
09/15/07	RB083007	All SVOC target <½MRL	NA	NA	None
09/20/07	RB083007	All PAH SIM target <½MRL	NA	NA	None

Table 2 Blank Contamination Analysis Summary, Continued

Analysis Date	QC Blank ID	Compound	Max Conc. µg/kg	Action Level µg/kg	B qualified samples
07/26/07	OP21602-MB	All SVOC target <½MRL	NA	NA	None
07/30/07	OP21634-MB	All SVOC target <½MRL	NA	NA	None
07/27/07	OP21630-MB	All PAH SIM target <½MRL	NA	NA	None
07/31/07	OP21636-MB	All PAH SIM target <½MRL	NA	NA	None
08/01/07	OP21636-MB	All PAH SIM target <½MRL	NA	NA	None
07/31/07	RB071807	All SVOC target <½MRL	NA	NA	None
07/30/07	RB071807	All PAH SIM target <½MRL	NA	NA	None
08/02/07	072407R	All SVOC target <½MRL	NA	NA	None
08/02/07	072407R	All PAH SIM target <½MRL	NA	NA	None
08/02/07	072507R	All SVOC target <½MRL	NA	NA	None
08/02/07	072507R	All PAH SIM target <½MRL	NA	NA	None

NA = Not applicable.
MRL = Method reporting limit.

VI-Surrogate Spikes

Laboratory performance on individual samples is evaluated through the review of surrogate spike samples. Surrogate spikes are added to all samples and blanks to measure their recovery in sample and blank matrices. The percent recoveries (%Rs) must be within the specified control limits. DoD surrogate recovery limits are specified in Table D-2 and Table D-3 of the DoD QSM (DoD, 2006). If the surrogate is not listed, then the laboratory criteria shall be used.

Aqueous Criteria:
2-Fluorophenol (14-62%) – (DoD QSM = 20-110%)
Phenol – d5 (10-40%) – (DoD QSM = 10-115%)
2,4,6-Tribromophenol (33-118%) – (DoD QSM = 40-125%)
Nitrobenzene-d5 (42-108%) – (DoD QSM = 40-110%)
2-Fluorobiphenyl (40-106%) – (DoD QSM = 50-110%)
p-Terphenyl – d14 (39-121%) – (DoD QSM = 50-135%)

Solid Criteria:
2-Fluorophenol (40-102%) – (DoD QSM = 35-105%)
Phenol – d5 (41-100%) – (DoD QSM = 40-100%)
2,4,6-Tribromophenol (42-108%) – (DoD QSM = 35-125%)
Nitrobenzene-d5 (40-105%) – (DoD QSM = 35-100%)
2-Fluorobiphenyl (43-107%) – (DoD QSM = 45-105%)
p-Terphenyl – d14 (45-119%) – (DoD QSM = 30-125%)

- For soil sample 49SS03 (F51154-24), 2,4,6-tribromophenol (41.0%) was outside lab criteria; however within DoD QSM criteria. Since all other surrogates were within criteria, no qualifiers were applied based upon this outlier. The sample was rerun for confirmation with 59.0% recovery.

- For all other field samples, all surrogates were within criteria limits. No qualifiers were applied.

VII-Internal Standards

Internal standards performance criteria ensure that GC/MS sensitivity and response are stable during every analytical run. Internal standard area counts for samples and blanks must not vary by more than a factor of two (-50% to +100%) from the associated calibration standard. The retention time of the internal standards in samples and blanks must not vary by more than ±30 seconds from the retention time of the associated calibration standard.

- All criteria were met. No qualifiers were applied.

VIII-Laboratory Control Sample

Laboratory control samples (LCS) are used to monitor laboratory accuracy by calculating the percent recoveries of the spiked compounds. All LCS percent recoveries must be within the specified control limits. DoD LCS aqueous recovery limits are specified in Table D-2 and Table D-6 of the DoD QSM (DoD, 2006). DoD LCS solid recovery limits are specified in Table D-2 and Table D-7 of the DoD QSM (DoD, 2006). If the compound is not listed, then the laboratory criteria shall be used.

- Sample OP21580-BS was used as the aqueous LCS for the SVOC analysis on 07/31/07. Benzoic acid (8%) was grossly below (i.e. <10%R) the laboratory and/or the DoD QSM criteria. Benzoic acid was qualified rejected "R" based upon the very low recovery. All other compounds were within criteria. Samples AOSW01 (F51154-1), AOSW02 (F51154-2), TMSW01 (F51154-3), 41SW08 (F51154-6), 41SW09 (F51154-7), and 41SW10 (F51154-8) apply to this LCS.

- Sample OP21610-BS was used as the aqueous LCS for the SVOC analysis on 07/31/07. All criteria were met. No qualifiers were applied. Sample LFSW01 (F51154-17) applies to this LCS.

- Sample OP21602-BS was used as the solid LCS for the SVOC analysis on 07/26/07. All criteria were met. No qualifiers were applied. Samples AOSD01 (F51154-4) and AOSD02 (F51154-5) apply to this LCS.

- Sample OP21634-BS was used as the solid LCS for the SVOC analysis on 07/30/07. All criteria were met. No qualifiers were applied. Samples 41SD08 (F51154-9), 41SD09 (F51154-10), 41SD10 (F51154-11), LFSD01 (F51154-15), TMSD01 (F51154-16), APSD01 (F51154-18), 41SD11 (F51154-22), 49SS02 (F51154-23), 49SS03 (F51154-24), 49SS04 (F51154-25), 49SS05 (F51154-26), 59SS06 (F51154-27), 59SS07 (F51154-28), 59SS08 (F51154-29), 59SS09 (F51154-30), 59SS10 (F51154-31), and TMSS05 (F51154-32) apply to this LCS.

- Sample OP21581-BS was used as the aqueous LCS for the PAH SIM analysis on 07/30/07. All criteria were met. No qualifiers were applied. Samples AOSW01 (F51154-1), AOSW02 (F51154-2), TMSW01 (F51154-3), 41SW08 (F51154-6), 41SW09 (F51154-7), and 41SW10 (F51154-8) apply to this LCS.

- Sample OP21611-BS was used as the aqueous LCS for the PAH SIM analysis on 07/30/07. 1-Methylnaphthalene (57%) and 2-methylnaphthalene (55%) were below laboratory criteria. The associated sample was non-detect for these compounds and was qualified bias low "UL" based upon the low recoveries. Sample LFSW01 (F51154-17) applies to this LCS.

- Sample OP21630-BS was used as the solid LCS for the PAH SIM analysis on 07/27/07. All criteria were met. No qualifiers were applied. Samples AOSD01 (F51154-4) and AOSD02 (F51154-5) apply to this LCS.

- Sample OP21636-BS was used as the solid LCS for the PAH SIM analysis on 07/31/07. All criteria were met. No qualifiers were applied. No samples reported were analyzed using this LCS.

- Sample OP21636-BS was used as the solid LCS for the PAH SIM analysis on 08/01/07. All criteria were met. No qualifiers were applied. Samples 41SD08 (F51154-9), 41SD09 (F51154-10), 41SD10 (F51154-11), LFSD01 (F51154-15), TMSD01 (F51154-16), APSD01 (F51154-18), 41SD11 (F51154-22), 49SS02 (F51154-23), 49SS03 (F51154-24), 49SS04 (F51154-25), 49SS05 (F51154-26), 59SS06 (F51154-27), 59SS07 (F51154-28), 59SS08 (F51154-29), 59SS09 (F51154-30), 59SS10 (F51154-31), and TMSS05 (F51154-32) apply to this LCS.

IX-Matrix Spike/Matrix Spike Duplicate

Data for matrix spike/matrix spike duplicates (MS/MSD) are generated to determine long-term precision and accuracy of the analytical method on various matrices and to demonstrate acceptable compound recovery by the laboratory at the time of sample analysis. The percent recoveries (%Rs) and the relative percent difference (RPD) must be within the specified control limits. DoD aqueous MS/MSD recovery limits follow the LCS criteria and are specified in Table D-2 and Table D-6 of the DoD QSM (DoD, 2006). DoD solid MS/MSD recovery limits follow the LCS criteria and are specified in Table D-2 and Table D-7 of the DoD QSM (DoD, 2006). If the compound is not listed, then the laboratory criteria shall be used.

- Sample AOSW02 (F51154-2) was used for the aqueous MS/MSD for SVOC analysis on 07/31/07. All criteria were met. No qualifiers were applied. Samples AOSW01 (F51154-1), AOSW02 (F51154-2), TMSW01 (F51154-3), 41SW08 (F51154-6), 41SW09 (F51154-7), and 41SW10 (F51154-8) apply to this MS/MSD.

- Sample LFSW01 (F51154-17) was used for the aqueous MS/MSD for SVOC analysis on 07/31/07. 4-Nitrophenol (56%) and phenol (56%, 56%) were above laboratory accuracy criteria; however, within DoD QSM criteria. All other target compounds were within criteria. The associated aqueous LCS was within criteria and all surface water samples were non-detect for these compounds. No qualifiers were applied for 4-nitrophenol and phenol based upon these outliers. Sample LFSW01 (F51154-17) applies to this MS/MSD.

- Sample F51123-5 was used for the MS/MSD for the solid SVOC analysis on 07/26/07. The spiked sample was not a RFAAP site sample; therefore, it was not evaluated. Samples AOSD01 (F51154-4) and AOSD02 (F51154-5) apply to this MS/MSD.

- Sample APSD01 (F51154-18) was used for the solid MS/MSD for SVOC analysis on 07/30/07. Benzoic acid (RPD=37%), 1,3-dichlorobenzene (43%), 1,4-dichlorobenzene (44%), 3,3'-dichlorobenzidine (25%, 24%), hexachlorocyclopentadiene (13%, 10%), and hexachloroethane (41%, 33%) were below laboratory and/or DoD QSM accuracy criteria. All other target compounds were within criteria. The associated solid LCS was within criteria and all solid samples were non-detect for these compounds. 1,3-Dichlorobenzene, 1,4-dichlorobenzene, 3,3'-dichlorobenzidine, hexachlorocyclopentadiene, and hexachloroethane were non-detect for the spiked sample and qualified "UL" based upon the low recoveries. No qualifiers were applied for benzoic acid based upon this outlier. Samples 41SD08 (F51154-9), 41SD09 (F51154-10), 41SD10 (F51154-11), LFSD01 (F51154-15), TMSD01 (F51154-16), APSD01 (F51154-18), 41SD11 (F51154-22), 49SS02 (F51154-23), 49SS03 (F51154-24), 49SS04 (F51154-25), 49SS05 (F51154-26), 59SS06 (F51154-27), 59SS07 (F51154-28), 59SS08 (F51154-29), 59SS09 (F51154-30), 59SS10 (F51154-31), and TMSS05 (F51154-32) apply to this MS/MSD.

- Sample AOSW02 (F51154-2) was used for the aqueous MS/MSD for PAH SIM analysis on 07/03/07. All criteria were met. No qualifiers were applied. Samples AOSW01 (F51154-1), AOSW02 (F51154-2), TMSW01 (F51154-3), 41SW08 (F51154-6), 41SW09 (F51154-7), and 41SW10 (F51154-8) apply to this MS/MSD.

- Sample LFSW01 (F51154-17) was used for the aqueous MS/MSD for PAH SIM analysis on 07/03/07. All criteria were met. No qualifiers were applied. Sample LFSW01 (F51154-17) applies to this MS/MSD.

- Sample F51296-22 was used for the MS/MSD for the solid PAH SIM analysis on 07/28/07. The spiked sample was not a RFAAP site sample; therefore, it was not evaluated. Samples AOSD01 (F51154-4) and AOSD02 (F51154-5) apply to this MS/MSD.

- Sample 41SD09 (F51154-10) was used for the solid MS/MSD for PAH SIM analysis on 07/31/07. Benzo(g,h,i)perylene (53%), indeno(1,2,3-cd)pyrene (56%), benzo(b)fluoranthene (67%, 65%), benzo(k)fluoranthene (60%), chrysene (57%), benzo(a)pyrene (68%), and benzo(a)anthracene (61%) were below laboratory; however, within DoD QSM accuracy criteria. All other target compounds were within criteria. The associated solid LCS was within criteria. Benzo(g,h,i)perylene, indeno(1,2,3-cd)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, benzo(a)pyrene, and benzo(a)anthracene were detected for the spiked sample and qualified "L" based upon the low recoveries. Samples 41SD08 (F51154-9), 41SD09 (F51154-10), 41SD10 (F51154-11), LFSD01 (F51154-15), TMSD01 (F51154-16), APSD01 (F51154-18), 41SD11 (F51154-22), 49SS02 (F51154-23), 49SS03 (F51154-24), 49SS04 (F51154-25), 49SS05 (F51154-26), 59SS06 (F51154-27), 59SS07 (F51154-28), 59SS08 (F51154-29), 59SS09 (F51154-30), 59SS10 (F51154-31), and TMSS05 (F51154-32) apply to this MS/MSD.

X-Field Duplicate Sample Analysis

Field duplicates were collected to identify the cumulative precision of the sampling and analytical process and sent to the laboratory blind. The RPD was calculated only for those analytes which were detected at levels exceeding the method reporting limits in both samples of the duplicate pair. Analytes that were rejected (R-qualified) in either sample of the duplicate pair were excluded from the duplicate assessment. Precision control criterion was established at 50% RPD for the aqueous and solid samples. Analytical results were qualified as estimated (J) for any RPDs exceeding criteria.

- Field surface water sample duplicate pair AOSW01 (F51154-1) and TMSW01 (F51154-3) was collected for TCL SVOCs and PAHs. All detected TCL SVOCs and PAHs found in the sample and its duplicate pair and associated %RPD are noted in **Table 3**. All other TCL SVOC and PAH target compounds were non-detect. Phenanthrene (58.5%) was above criteria due to low concentration levels detected below the MRL. Phenanthrene was qualified estimated "J" for the original and duplicate pair samples based upon this outlier. For all other compounds, all criteria were met.

Table 3 Field Precision Hits Analysis Summary for TCL SVOCs and PAHs for Duplicate Pair AOSW01 (F51154-1) and TMSW01 (F51154-3)

Compound	Original Sample (µg/L)	Duplicate Pair (µg/L)	%RPD
Acenaphthene	0.91J	0.75J	19.3
Phenanthrene	0.95J	0.52J	58.5
Fluorene	1.7	1.3	26.7
1-Methylnaphthalene	4.8	3.4	34.2

J = Estimated value <MRL and >MDL.

- Field surface soil sample duplicate pair 49SS05 (F51154-26) and TMSS05 (F51154-32) was collected for TCL SVOCs and PAHs. All TCL SVOC and PAH target compounds were non-detect. All criteria were met. No qualifiers were applied.

- Field sediment sample duplicate pair LFSD01 (F51154-15) and TMSD01 (F51154-16) was collected for TCL SVOCs and PAHs. All detected TCL SVOCs and PAHs found in the sample and its duplicate pair and associated %RPD are noted in **Table 4**. All other TCL SVOC and PAH target compounds were non-detect. All criteria were met. No qualifiers were applied.

Table 4 Field Precision Hits Analysis Summary for TCL SVOCs and PAHs for Duplicate Pair LFSD01 (F51154-15) and TMSD01 (F51154-16)

Compound	Original Sample (µg/kg)	Duplicate Pair (µg/kg)	%RPD
Benzo(g,h,i)perylene	92U	20.8J	NA
Indeno(1,2,3-cd)pyrene	92U	20.2J	NA
Benzo(b)fluoranthene	45.6J	37.5J	19.5
Benzo(k)fluoranthene	31.2J	26.9J	14.8
Chrysene	43.0J	32.8J	26.9
Benzo(a)pyrene	31.9J	27.9J	13.4
Benzo(a)anthracene	29.0J	26.2J	10.1

J = Estimated value <MRL and >MDL.
U = Non-detect as <MRL.
NA = Not Applicable

XI-Quantitation Verification

The accuracy of analytical results was verified through the calculation of several parameters. Percent difference (%D) between the calculated and reported values must be ≤10%. Any sample value >MDL and <MRL or <3*MDL (whichever is greater) was qualified as estimated, "J."

Sample: AOSW02MS (F51154-2MS), bis(2-ethylhexyl)phthalate

Conc. (µg/L) = {(Ax)*(Is)*(Vt)*(DF)}/{(Ais)*(RRF)*(V_o)*(V_i)}

where:

	$Conc_{sample}$	=	Sample concentration in µg/L
	A_x	=	Area of characteristic ion for compound being measured.
	I_s	=	Amount of internal standard injected (ng).
	V_t	=	Volume of total extract, taking into account dilutions (i.e., a 1-to-10 dilution of a 1-mL extract will mean V(t) = 10,000 µL.
	A_{is}	=	Area of characteristic ion for the internal standard.
	RRF_A	=	Average relative response factor for compound being measured
	V_o	=	Volume of water extracted (mL).
	V_i	=	Volume of extract injected (µL).
	DF	=	Dilution Factor

Conc. µg/L = (381474 * 40 * 1000 * 1) / (413841 * 0.892 * 480 * 1) = 86.1 ng/mL
= 86.1 µg/L

Reported Value = 86.2 µg/L
% Difference = 0.1%
Values were within 10% difference.

Sample: AOSW01 (F51154-1), fluorene

Conc. (µg/L) = {(Ax)*(Is)*(Vt)*(DF)}/{(Ais)*(RRF)*(V_o)*(V_i)}

where:	$Conc_{sample}$	=	Sample concentration in µg/L
	A_x	=	Area of characteristic ion for compound being measured.
	I_s	=	Amount of internal standard injected (ng).
	V_t	=	Volume of total extract, taking into account dilutions (i.e., a 1-to-10 dilution of a 1-mL extract will mean V(t) = 10,000 µL.
	A_{is}	=	Area of characteristic ion for the internal standard.
	RRF_A	=	Average relative response factor for compound being measured
	V_o	=	Volume of water extracted (mL).
	V_i	=	Volume of extract injected (µL).
	DF	=	Dilution Factor

Conc. µg/L = (71366 * 4 * 1000 * 1) / (128124 * 1.333 * 980 * 1) = 1.7 ng/mL
= 1.7 µg/L

Reported Value = 1.7 µg/L
% Difference = 0.0%
Values were within 10% difference.

Sample: 49SS02 (F51154-23), di-n-butyl phthalate

Conc. µg/kg = (Ax * Is * Vt * DF) / (Ais * RRF * Vi * Ws * D)

where:	Conc.	= Sample concentration in µg/kg
	Ax	= Area of characteristic ion for compound being measured.
	Is	= Amount of internal standard injected (ng).
	Vt	= Volume of total extract, taking into account dilutions (i.e., a 1-to-10 dilution of a 1-mL extract will mean V(t) = 10,000 uL.
	Ais	= Area of characteristic ion for the internal standard.
	RRF	= Average relative response factor for compound being measured (from ICAL)
	Vi	= Volume of extract injected (uL).
	W(s)	= Weight of sample extracted or diluted in grams.
	D	= Percent dry weight (100 - % moisture in sample)/100
	DF	= Dilution factor

Conc. µg/kg = (47730 * 40 * 1000 * 1) / (452232 * 1.278 * 1 * 30.0 * 0.8960) = 123 µg/kg
Reported Value = 123 µg/kg
% Difference = 0.0%
Values were within 10% difference

Sample: 49SS02 (F51154-23), chrysene

Conc. µg/kg = (Ax * Is * Vt * DF) / (Ais * RRF * Vi * Ws * D)

where: Conc. = Sample concentration in µg/kg
Ax = Area of characteristic ion for compound being measured.
Is = Amount of internal standard injected (ng).
Vt = Volume of total extract, taking into account dilutions (i.e., a 1-to-10 dilution of a 1-mL extract will mean V(t) = 10,000 uL.
Ais = Area of characteristic ion for the internal standard.
RRF = Average relative response factor for compound being measured (from ICAL)
Vi = Volume of extract injected (uL).
W(s) = Weight of sample extracted or diluted in grams.
D = Percent dry weight (100 - % moisture in sample)/100
DF = Dilution factor

Conc. µg/kg = (3895 * 4.0 * 1000 * 4) / (81063 * 1.670 * 1 * 30.0 * 0.8960) = 17.1 µg/kg
Reported Value = 17.1 µg/kg
% Difference = 0.0%
Values were within 10% difference

USEPA Region III Validation Qualifiers

(No Code) = Confirmed identification.

B = The analyte has been detected in the sample and the associated laboratory or field blank.

J = Indicates an estimated value for (1) estimated value due to QC non-conformance. Reported value may not be accurate or precise, (2) estimating a concentration as a tentatively identified compound as indicated by the mass spectral and retention time data, or (3) estimating a concentration ≥MDL and <MRL or <3*MDL, whichever is greater.

K = Analyte present. Reported value may be biased high (estimated) due to QC non-conformance.

L = Analyte present. Reported value may be biased low (estimated) due to QC non-conformance.

R = Unreliable result. Analyte may or may not be present in the sample due to QC non-conformance.

UL = Value is estimated bias low and not detected due to QC non-conformance. Reporting limit may be inaccurate or imprecise. Quantitation limit is probably higher.

UJ = Value is estimated and not detected due to QC non-conformance. Reporting limit may be inaccurate or imprecise.

Laboratory Qualifiers

(No Code) = Confirmed identification.

U = Not detected. The associated number indicates the compound reporting limit for the sample.

A (Dioxins) = B (Metals) = The reported value was obtained from a reading <MRL and ≥MDL and is considered estimated.

B (Organics) = The analyte or compound has been detected in the sample and laboratory method blank. It indicates probable blank contamination.

E (Metals) = Reported value is estimated because of the presence of interferences.

E (Organics) = Identifies compounds whose concentrations exceed the upper level of the calibration range.

EMPC (Dioxins) = The ion-abundance ratio between the two characteristic PCDD/PCDF ions was outside accepted ranges. The detected PCDD/PCDF was reported as an estimated maximum possible concentration (EMPC).

D = Indicates sample was analyzed at a dilution.

J = Indicates an estimated value for (1) estimating a concentration as a tentatively identified compound as indicated by the mass spectral and retention time data, or (2) estimating a concentration <MRL and ≥MDL.

N (Organics) = Indicates presumptive evidence of a compound for tentatively identified compounds using a library search.

N (Metals) = Laboratory spike sample recovery not within control limits.

P (Organics) = Target analyte confirmation >40% difference for detected compound between the primary and secondary columns. The lower of the two values was reported.

* (Metals) = Duplicate analysis not within control limits.

* (Organics) = Surrogate outside of QC limits on both original and re-analysis.

Raw Data: U003663.D

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Report of Analysis

Client Sample ID:	AOSW01		
Lab Sample ID:	F51154-1	Date Sampled:	07/18/07
Matrix:	AQ - Surface Water	Date Received:	07/19/07
Method:	SW846 8270C SW846 3510C	Percent Solids:	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	U003663.D	1	07/31/07	NJ	07/24/07	OP21580	SU180
Run #2							

	Initial Volume	Final Volume
Run #1	980 ml	1.0 ml
Run #2		

ABN TCL List w/o PAHs

CAS No.	Compound	Result	RL	MDL	Units	Q
65-85-0	Benzoic Acid	ND R	26	10	ug/l	
95-57-8	2-Chlorophenol	ND	5.1	1.0	ug/l	
59-50-7	4-Chloro-3-methyl phenol	ND	5.1	2.0	ug/l	
120-83-2	2,4-Dichlorophenol	ND	5.1	1.0	ug/l	
105-67-9	2,4-Dimethylphenol	ND	5.1	2.0	ug/l	
51-28-5	2,4-Dinitrophenol	ND	26	10	ug/l	
534-52-1	4,6-Dinitro-o-cresol	ND	10	2.0	ug/l	
95-48-7	2-Methylphenol	ND	5.1	1.0	ug/l	
	3&4-Methylphenol	ND	5.1	1.3	ug/l	
88-75-5	2-Nitrophenol	ND	5.1	1.0	ug/l	
100-02-7	4-Nitrophenol	ND	26	10	ug/l	
87-86-5	Pentachlorophenol	ND	26	10	ug/l	
108-95-2	Phenol	ND	5.1	2.0	ug/l	
95-95-4	2,4,5-Trichlorophenol	ND	5.1	1.0	ug/l	
88-06-2	2,4,6-Trichlorophenol	ND	5.1	1.0	ug/l	
101-55-3	4-Bromophenyl phenyl ether	ND	5.1	1.2	ug/l	
85-68-7	Butyl benzyl phthalate	ND	5.1	2.0	ug/l	
100-51-6	Benzyl Alcohol	ND	5.1	1.0	ug/l	
91-58-7	2-Chloronaphthalene	ND	5.1	1.3	ug/l	
106-47-8	4-Chloroaniline	ND	5.1	2.0	ug/l	
86-74-8	Carbazole	ND	5.1	1.0	ug/l	
111-91-1	bis(2-Chloroethoxy)methane	ND	5.1	1.0	ug/l	
111-44-4	bis(2-Chloroethyl)ether	ND	5.1	1.0	ug/l	
108-60-1	bis(2-Chloroisopropyl)ether	ND	5.1	1.0	ug/l	
7005-72-3	4-Chlorophenyl phenyl ether	ND	5.1	1.3	ug/l	
95-50-1	1,2-Dichlorobenzene	ND	5.1	1.5	ug/l	
541-73-1	1,3-Dichlorobenzene	ND	5.1	1.6	ug/l	
106-46-7	1,4-Dichlorobenzene	ND	5.1	1.5	ug/l	
121-14-2	2,4-Dinitrotoluene	ND	5.1	1.0	ug/l	
606-20-2	2,6-Dinitrotoluene	ND	5.1	1.0	ug/l	
91-94-1	3,3'-Dichlorobenzidine	ND	10	2.0	ug/l	
132-64-9	Dibenzofuran	ND	5.1	1.0	ug/l	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	AOSW01		
Lab Sample ID:	F51154-1	Date Sampled:	07/18/07
Matrix:	AQ - Surface Water	Date Received:	07/19/07
Method:	SW846 8270C SW846 3510C	Percent Solids:	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

ABN TCL List w/o PAHs

CAS No.	Compound	Result	RL	MDL	Units	Q
84-74-2	Di-n-butyl phthalate	ND	5.1	2.0	ug/l	
117-84-0	Di-n-octyl phthalate	ND	5.1	2.0	ug/l	
84-66-2	Diethyl phthalate	ND	5.1	2.0	ug/l	
131-11-3	Dimethyl phthalate	ND	5.1	2.0	ug/l	
117-81-7	bis(2-Ethylhexyl)phthalate	ND	5.1	2.0	ug/l	
118-74-1	Hexachlorobenzene	ND	5.1	1.2	ug/l	
87-68-3	Hexachlorobutadiene	ND	5.1	1.7	ug/l	
77-47-4	Hexachlorocyclopentadiene	ND	5.1	1.5	ug/l	
67-72-1	Hexachloroethane	ND	5.1	1.9	ug/l	
78-59-1	Isophorone	ND	5.1	1.0	ug/l	
88-74-4	2-Nitroaniline	ND	10	2.0	ug/l	
99-09-2	3-Nitroaniline	ND	10	2.0	ug/l	
100-01-6	4-Nitroaniline	ND	10	2.0	ug/l	
98-95-3	Nitrobenzene	ND	5.1	1.0	ug/l	
621-64-7	N-Nitroso-di-n-propylamine	ND	5.1	1.0	ug/l	
86-30-6	N-Nitrosodiphenylamine	ND	5.1	1.0	ug/l	
120-82-1	1,2,4-Trichlorobenzene	ND	5.1	1.5	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol	41%		14-62%
4165-62-2	Phenol-d5	28%		10-40%
118-79-6	2,4,6-Tribromophenol	84%		33-118%
4165-60-0	Nitrobenzene-d5	69%		42-108%
321-60-8	2-Fluorobiphenyl	73%		40-106%
1718-51-0	Terphenyl-d14	81%		39-121%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: W035898.D

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Report of Analysis

Client Sample ID:	AOSW01		
Lab Sample ID:	F51154-1	Date Sampled:	07/18/07
Matrix:	AQ - Surface Water	Date Received:	07/19/07
Method:	SW846 8270C BY SIM SW846 3510C	Percent Solids:	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	W035898.D	1	07/30/07	RB	07/24/07	OP21581	SW1859
Run #2							

	Initial Volume	Final Volume
Run #1	980 ml	1.0 ml
Run #2		

BN PAH List

CAS No.	Compound	Result	RL	MDL	Units	Q
83-32-9	Acenaphthene	0.91 J	1.0	0.51	ug/l	J
208-96-8	Acenaphthylene	ND	1.0	0.51	ug/l	
120-12-7	Anthracene	ND	1.0	0.51	ug/l	
56-55-3	Benzo(a)anthracene	ND	0.20	0.051	ug/l	
50-32-8	Benzo(a)pyrene	ND	0.20	0.10	ug/l	
205-99-2	Benzo(b)fluoranthene	ND	0.20	0.051	ug/l	
191-24-2	Benzo(g,h,i)perylene	ND	0.20	0.10	ug/l	
207-08-9	Benzo(k)fluoranthene	ND	0.20	0.10	ug/l	
218-01-9	Chrysene	ND	0.20	0.10	ug/l	
53-70-3	Dibenzo(a,h)anthracene	ND	0.20	0.051	ug/l	
206-44-0	Fluoranthene	ND	1.0	0.26	ug/l	
86-73-7	Fluorene	1.7	1.0	0.26	ug/l	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	0.20	0.051	ug/l	
90-12-0	1-Methylnaphthalene	4.8	1.0	0.26	ug/l	
91-57-6	2-Methylnaphthalene	ND	1.0	0.26	ug/l	
91-20-3	Naphthalene	ND	1.0	0.26	ug/l	
85-01-8	Phenanthrene	0.95 J	1.0	0.51	ug/l	J
129-00-0	Pyrene	ND	1.0	0.26	ug/l	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: U003664.D

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Report of Analysis

Client Sample ID:	AOSW02		
Lab Sample ID:	F51154-2	Date Sampled:	07/18/07
Matrix:	AQ - Surface Water	Date Received:	07/19/07
Method:	SW846 8270C SW846 3510C	Percent Solids:	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	U003664.D	1	07/31/07	NJ	07/24/07	OP21580	SU180
Run #2							

	Initial Volume	Final Volume
Run #1	990 ml	1.0 ml
Run #2		

ABN TCL List w/o PAHs

CAS No.	Compound	Result	RL	MDL	Units	Q
65-85-0	Benzoic Acid	ND R	25	10	ug/l	
95-57-8	2-Chlorophenol	ND	5.1	1.0	ug/l	
59-50-7	4-Chloro-3-methyl phenol	ND	5.1	2.0	ug/l	
120-83-2	2,4-Dichlorophenol	ND	5.1	1.0	ug/l	
105-67-9	2,4-Dimethylphenol	ND	5.1	2.0	ug/l	
51-28-5	2,4-Dinitrophenol	ND	25	10	ug/l	
534-52-1	4,6-Dinitro-o-cresol	ND	10	2.0	ug/l	
95-48-7	2-Methylphenol	ND	5.1	1.0	ug/l	
	3&4-Methylphenol	ND	5.1	1.3	ug/l	
88-75-5	2-Nitrophenol	ND	5.1	1.0	ug/l	
100-02-7	4-Nitrophenol	ND	25	10	ug/l	
87-86-5	Pentachlorophenol	ND	25	10	ug/l	
108-95-2	Phenol	ND	5.1	2.0	ug/l	
95-95-4	2,4,5-Trichlorophenol	ND	5.1	1.0	ug/l	
88-06-2	2,4,6-Trichlorophenol	ND	5.1	1.0	ug/l	
101-55-3	4-Bromophenyl phenyl ether	ND	5.1	1.2	ug/l	
85-68-7	Butyl benzyl phthalate	ND	5.1	2.0	ug/l	
100-51-6	Benzyl Alcohol	ND	5.1	1.0	ug/l	
91-58-7	2-Chloronaphthalene	ND	5.1	1.3	ug/l	
106-47-8	4-Chloroaniline	ND	5.1	2.0	ug/l	
86-74-8	Carbazole	ND	5.1	1.0	ug/l	
111-91-1	bis(2-Chloroethoxy)methane	ND	5.1	1.0	ug/l	
111-44-4	bis(2-Chloroethyl)ether	ND	5.1	1.0	ug/l	
108-60-1	bis(2-Chloroisopropyl)ether	ND	5.1	1.0	ug/l	
7005-72-3	4-Chlorophenyl phenyl ether	ND	5.1	1.3	ug/l	
95-50-1	1,2-Dichlorobenzene	ND	5.1	1.5	ug/l	
541-73-1	1,3-Dichlorobenzene	ND	5.1	1.6	ug/l	
106-46-7	1,4-Dichlorobenzene	ND	5.1	1.5	ug/l	
121-14-2	2,4-Dinitrotoluene	ND	5.1	1.0	ug/l	
606-20-2	2,6-Dinitrotoluene	ND	5.1	1.0	ug/l	
91-94-1	3,3'-Dichlorobenzidine	ND	10	2.0	ug/l	
132-64-9	Dibenzofuran	ND	5.1	1.0	ug/l	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	AOSW02		
Lab Sample ID:	F51154-2	Date Sampled:	07/18/07
Matrix:	AQ - Surface Water	Date Received:	07/19/07
Method:	SW846 8270C SW846 3510C	Percent Solids:	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

ABN TCL List w/o PAHs

CAS No.	Compound	Result	RL	MDL	Units	Q
84-74-2	Di-n-butyl phthalate	ND	5.1	2.0	ug/l	
117-84-0	Di-n-octyl phthalate	ND	5.1	2.0	ug/l	
84-66-2	Diethyl phthalate	ND	5.1	2.0	ug/l	
131-11-3	Dimethyl phthalate	ND	5.1	2.0	ug/l	
117-81-7	bis(2-Ethylhexyl)phthalate	ND	5.1	2.0	ug/l	
118-74-1	Hexachlorobenzene	ND	5.1	1.2	ug/l	
87-68-3	Hexachlorobutadiene	ND	5.1	1.7	ug/l	
77-47-4	Hexachlorocyclopentadiene	ND	5.1	1.5	ug/l	
67-72-1	Hexachloroethane	ND	5.1	1.9	ug/l	
78-59-1	Isophorone	ND	5.1	1.0	ug/l	
88-74-4	2-Nitroaniline	ND	10	2.0	ug/l	
99-09-2	3-Nitroaniline	ND	10	2.0	ug/l	
100-01-6	4-Nitroaniline	ND	10	2.0	ug/l	
98-95-3	Nitrobenzene	ND	5.1	1.0	ug/l	
621-64-7	N-Nitroso-di-n-propylamine	ND	5.1	1.0	ug/l	
86-30-6	N-Nitrosodiphenylamine	ND	5.1	1.0	ug/l	
120-82-1	1,2,4-Trichlorobenzene	ND	5.1	1.5	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol	42%		14-62%
4165-62-2	Phenol-d5	30%		10-40%
118-79-6	2,4,6-Tribromophenol	73%		33-118%
4165-60-0	Nitrobenzene-d5	71%		42-108%
321-60-8	2-Fluorobiphenyl	71%		40-106%
1718-51-0	Terphenyl-d14	72%		39-121%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: W035899.D

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Report of Analysis

Client Sample ID:	AOSW02		
Lab Sample ID:	F51154-2	Date Sampled:	07/18/07
Matrix:	AQ - Surface Water	Date Received:	07/19/07
Method:	SW846 8270C BY SIM SW846 3510C	Percent Solids:	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	W035899.D	1	07/30/07	RB	07/24/07	OP21581	SW1859
Run #2							

	Initial Volume	Final Volume
Run #1	940 ml	1.0 ml
Run #2		

BN PAH List

CAS No.	Compound	Result	RL	MDL	Units	Q
83-32-9	Acenaphthene	ND	1.1	0.53	ug/l	
208-96-8	Acenaphthylene	ND	1.1	0.53	ug/l	
120-12-7	Anthracene	ND	1.1	0.53	ug/l	
56-55-3	Benzo(a)anthracene	ND	0.21	0.053	ug/l	
50-32-8	Benzo(a)pyrene	ND	0.21	0.11	ug/l	
205-99-2	Benzo(b)fluoranthene	ND	0.21	0.053	ug/l	
191-24-2	Benzo(g,h,i)perylene	ND	0.21	0.11	ug/l	
207-08-9	Benzo(k)fluoranthene	ND	0.21	0.11	ug/l	
218-01-9	Chrysene	ND	0.21	0.11	ug/l	
53-70-3	Dibenzo(a,h)anthracene	ND	0.21	0.053	ug/l	
206-44-0	Fluoranthene	ND	1.1	0.27	ug/l	
86-73-7	Fluorene	ND	1.1	0.27	ug/l	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	0.21	0.053	ug/l	
90-12-0	1-Methylnaphthalene	ND	1.1	0.27	ug/l	
91-57-6	2-Methylnaphthalene	ND	1.1	0.27	ug/l	
91-20-3	Naphthalene	ND	1.1	0.27	ug/l	
85-01-8	Phenanthrene	ND	1.1	0.53	ug/l	
129-00-0	Pyrene	ND	1.1	0.27	ug/l	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: U003667.D

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Report of Analysis

Client Sample ID:	TMSW01		
Lab Sample ID:	F51154-3	Date Sampled:	07/18/07
Matrix:	AQ - Surface Water	Date Received:	07/19/07
Method:	SW846 8270C SW846 3510C	Percent Solids:	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	U003667.D	1	07/31/07	NJ	07/24/07	OP21580	SU180
Run #2							

	Initial Volume	Final Volume
Run #1	980 ml	1.0 ml
Run #2		

ABN TCL List w/o PAHs

CAS No.	Compound	Result	RL	MDL	Units	Q
65-85-0	Benzoic Acid	ND R	26	10	ug/l	
95-57-8	2-Chlorophenol	ND	5.1	1.0	ug/l	
59-50-7	4-Chloro-3-methyl phenol	ND	5.1	2.0	ug/l	
120-83-2	2,4-Dichlorophenol	ND	5.1	1.0	ug/l	
105-67-9	2,4-Dimethylphenol	ND	5.1	2.0	ug/l	
51-28-5	2,4-Dinitrophenol	ND	26	10	ug/l	
534-52-1	4,6-Dinitro-o-cresol	ND	10	2.0	ug/l	
95-48-7	2-Methylphenol	ND	5.1	1.0	ug/l	
	3&4-Methylphenol	ND	5.1	1.3	ug/l	
88-75-5	2-Nitrophenol	ND	5.1	1.0	ug/l	
100-02-7	4-Nitrophenol	ND	26	10	ug/l	
87-86-5	Pentachlorophenol	ND	26	10	ug/l	
108-95-2	Phenol	ND	5.1	2.0	ug/l	
95-95-4	2,4,5-Trichlorophenol	ND	5.1	1.0	ug/l	
88-06-2	2,4,6-Trichlorophenol	ND	5.1	1.0	ug/l	
101-55-3	4-Bromophenyl phenyl ether	ND	5.1	1.2	ug/l	
85-68-7	Butyl benzyl phthalate	ND	5.1	2.0	ug/l	
100-51-6	Benzyl Alcohol	ND	5.1	1.0	ug/l	
91-58-7	2-Chloronaphthalene	ND	5.1	1.3	ug/l	
106-47-8	4-Chloroaniline	ND	5.1	2.0	ug/l	
86-74-8	Carbazole	ND	5.1	1.0	ug/l	
111-91-1	bis(2-Chloroethoxy)methane	ND	5.1	1.0	ug/l	
111-44-4	bis(2-Chloroethyl)ether	ND	5.1	1.0	ug/l	
108-60-1	bis(2-Chloroisopropyl)ether	ND	5.1	1.0	ug/l	
7005-72-3	4-Chlorophenyl phenyl ether	ND	5.1	1.3	ug/l	
95-50-1	1,2-Dichlorobenzene	ND	5.1	1.5	ug/l	
541-73-1	1,3-Dichlorobenzene	ND	5.1	1.6	ug/l	
106-46-7	1,4-Dichlorobenzene	ND	5.1	1.5	ug/l	
121-14-2	2,4-Dinitrotoluene	ND	5.1	1.0	ug/l	
606-20-2	2,6-Dinitrotoluene	ND	5.1	1.0	ug/l	
91-94-1	3,3'-Dichlorobenzidine	ND	10	2.0	ug/l	
132-64-9	Dibenzofuran	ND	5.1	1.0	ug/l	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	TMSW01		
Lab Sample ID:	F51154-3	Date Sampled:	07/18/07
Matrix:	AQ - Surface Water	Date Received:	07/19/07
Method:	SW846 8270C SW846 3510C	Percent Solids:	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

ABN TCL List w/o PAHs

CAS No.	Compound	Result	RL	MDL	Units	Q
84-74-2	Di-n-butyl phthalate	ND	5.1	2.0	ug/l	
117-84-0	Di-n-octyl phthalate	ND	5.1	2.0	ug/l	
84-66-2	Diethyl phthalate	ND	5.1	2.0	ug/l	
131-11-3	Dimethyl phthalate	ND	5.1	2.0	ug/l	
117-81-7	bis(2-Ethylhexyl)phthalate	ND	5.1	2.0	ug/l	
118-74-1	Hexachlorobenzene	ND	5.1	1.2	ug/l	
87-68-3	Hexachlorobutadiene	ND	5.1	1.7	ug/l	
77-47-4	Hexachlorocyclopentadiene	ND	5.1	1.5	ug/l	
67-72-1	Hexachloroethane	ND	5.1	1.9	ug/l	
78-59-1	Isophorone	ND	5.1	1.0	ug/l	
88-74-4	2-Nitroaniline	ND	10	2.0	ug/l	
99-09-2	3-Nitroaniline	ND	10	2.0	ug/l	
100-01-6	4-Nitroaniline	ND	10	2.0	ug/l	
98-95-3	Nitrobenzene	ND	5.1	1.0	ug/l	
621-64-7	N-Nitroso-di-n-propylamine	ND	5.1	1.0	ug/l	
86-30-6	N-Nitrosodiphenylamine	ND	5.1	1.0	ug/l	
120-82-1	1,2,4-Trichlorobenzene	ND	5.1	1.5	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol	44%		14-62%
4165-62-2	Phenol-d5	31%		10-40%
118-79-6	2,4,6-Tribromophenol	81%		33-118%
4165-60-0	Nitrobenzene-d5	74%		42-108%
321-60-8	2-Fluorobiphenyl	75%		40-106%
1718-51-0	Terphenyl-d14	77%		39-121%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: W035902.D

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Report of Analysis

Client Sample ID:	TMSW01		
Lab Sample ID:	F51154-3	Date Sampled:	07/18/07
Matrix:	AQ - Surface Water	Date Received:	07/19/07
Method:	SW846 8270C BY SIM SW846 3510C	Percent Solids:	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	W035902.D	1	07/30/07	RB	07/24/07	OP21581	SW1859
Run #2							

	Initial Volume	Final Volume
Run #1	980 ml	1.0 ml
Run #2		

BN PAH List

CAS No.	Compound	Result	RL	MDL	Units	Q
83-32-9	Acenaphthene	0.75 J	1.0	0.51	ug/l	J
208-96-8	Acenaphthylene	ND	1.0	0.51	ug/l	
120-12-7	Anthracene	ND	1.0	0.51	ug/l	
56-55-3	Benzo(a)anthracene	ND	0.20	0.051	ug/l	
50-32-8	Benzo(a)pyrene	ND	0.20	0.10	ug/l	
205-99-2	Benzo(b)fluoranthene	ND	0.20	0.051	ug/l	
191-24-2	Benzo(g,h,i)perylene	ND	0.20	0.10	ug/l	
207-08-9	Benzo(k)fluoranthene	ND	0.20	0.10	ug/l	
218-01-9	Chrysene	ND	0.20	0.10	ug/l	
53-70-3	Dibenzo(a,h)anthracene	ND	0.20	0.051	ug/l	
206-44-0	Fluoranthene	ND	1.0	0.26	ug/l	
86-73-7	Fluorene	1.3	1.0	0.26	ug/l	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	0.20	0.051	ug/l	
90-12-0	1-Methylnaphthalene	3.4	1.0	0.26	ug/l	
91-57-6	2-Methylnaphthalene	ND	1.0	0.26	ug/l	
91-20-3	Naphthalene	ND	1.0	0.26	ug/l	
85-01-8	Phenanthrene	0.52 J	1.0	0.51	ug/l	J
129-00-0	Pyrene	ND	1.0	0.26	ug/l	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: R09439.D

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Report of Analysis

Client Sample ID:	AOSD01		
Lab Sample ID:	F51154-4	Date Sampled:	07/18/07
Matrix:	SO - Sediment	Date Received:	07/19/07
Method:	SW846 8270C SW846 3550B	Percent Solids:	66.2
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	R09439.D	1	07/26/07	NJ	07/25/07	OP21602	SR446
Run #2							

	Initial Weight	Final Volume
Run #1	30.2 g	1.0 ml
Run #2		

ABN TCL List w/o PAHs

CAS No.	Compound	Result	RL	MDL	Units	Q
65-85-0	Benzoic acid	ND	1300	500	ug/kg	
95-57-8	2-Chlorophenol	ND	250	50	ug/kg	
59-50-7	4-Chloro-3-methyl phenol	ND	250	50	ug/kg	
120-83-2	2,4-Dichlorophenol	ND	250	50	ug/kg	
105-67-9	2,4-Dimethylphenol	ND	250	50	ug/kg	
51-28-5	2,4-Dinitrophenol	ND	1300	500	ug/kg	
534-52-1	4,6-Dinitro-o-cresol	ND	500	100	ug/kg	
95-48-7	2-Methylphenol	ND	250	50	ug/kg	
	3&4-Methylphenol	ND	250	50	ug/kg	
88-75-5	2-Nitrophenol	ND	250	50	ug/kg	
100-02-7	4-Nitrophenol	ND	1300	500	ug/kg	
87-86-5	Pentachlorophenol	ND	1300	500	ug/kg	
108-95-2	Phenol	ND	250	50	ug/kg	
95-95-4	2,4,5-Trichlorophenol	ND	250	50	ug/kg	
88-06-2	2,4,6-Trichlorophenol	ND	250	50	ug/kg	
101-55-3	4-Bromophenyl phenyl ether	ND	250	50	ug/kg	
85-68-7	Butyl benzyl phthalate	ND	500	130	ug/kg	
100-51-6	Benzyl Alcohol	ND	250	50	ug/kg	
91-58-7	2-Chloronaphthalene	ND	250	50	ug/kg	
106-47-8	4-Chloroaniline	ND	500	200	ug/kg	
86-74-8	Carbazole	ND	250	50	ug/kg	
111-91-1	bis(2-Chloroethoxy)methane	ND	250	50	ug/kg	
111-44-4	bis(2-Chloroethyl)ether	ND	250	100	ug/kg	
108-60-1	bis(2-Chloroisopropyl)ether	ND	250	50	ug/kg	
7005-72-3	4-Chlorophenyl phenyl ether	ND	250	50	ug/kg	
95-50-1	1,2-Dichlorobenzene	ND	250	50	ug/kg	
541-73-1	1,3-Dichlorobenzene	ND	250	50	ug/kg	
106-46-7	1,4-Dichlorobenzene	ND	250	50	ug/kg	
121-14-2	2,4-Dinitrotoluene	ND	250	100	ug/kg	
606-20-2	2,6-Dinitrotoluene	ND	250	100	ug/kg	
91-94-1	3,3'-Dichlorobenzidine	ND	500	250	ug/kg	
132-64-9	Dibenzofuran	ND	250	50	ug/kg	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	AOSD01		
Lab Sample ID:	F51154-4	Date Sampled:	07/18/07
Matrix:	SO - Sediment	Date Received:	07/19/07
Method:	SW846 8270C SW846 3550B	Percent Solids:	66.2
Project:	WPA 019 Field Investigation; Radford AAP, VA		

ABN TCL List w/o PAHs

CAS No.	Compound	Result	RL	MDL	Units	Q
84-74-2	Di-n-butyl phthalate	ND	500	130	ug/kg	
117-84-0	Di-n-octyl phthalate	ND	500	250	ug/kg	
84-66-2	Diethyl phthalate	ND	500	130	ug/kg	
131-11-3	Dimethyl phthalate	ND	500	130	ug/kg	
117-81-7	bis(2-Ethylhexyl)phthalate	ND	500	250	ug/kg	
118-74-1	Hexachlorobenzene	ND	250	50	ug/kg	
87-68-3	Hexachlorobutadiene	ND	250	100	ug/kg	
77-47-4	Hexachlorocyclopentadiene	ND	250	100	ug/kg	
67-72-1	Hexachloroethane	ND	250	100	ug/kg	
78-59-1	Isophorone	ND	250	50	ug/kg	
88-74-4	2-Nitroaniline	ND	500	130	ug/kg	
99-09-2	3-Nitroaniline	ND	500	130	ug/kg	
100-01-6	4-Nitroaniline	ND	500	180	ug/kg	
98-95-3	Nitrobenzene	ND	250	50	ug/kg	
621-64-7	N-Nitroso-di-n-propylamine	ND	250	100	ug/kg	
86-30-6	N-Nitrosodiphenylamine	ND	250	50	ug/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	250	50	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol	68%		40-102%
4165-62-2	Phenol-d5	75%		41-100%
118-79-6	2,4,6-Tribromophenol	85%		42-108%
4165-60-0	Nitrobenzene-d5	65%		40-105%
321-60-8	2-Fluorobiphenyl	68%		43-107%
1718-51-0	Terphenyl-d14	84%		45-119%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: W035879.D

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Accutest Laboratories

Report of Analysis

Client Sample ID:	AOSD01		
Lab Sample ID:	F51154-4	Date Sampled:	07/18/07
Matrix:	SO - Sediment	Date Received:	07/19/07
Method:	SW846 8270C BY SIM SW846 3550B	Percent Solids:	66.2
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	W035879.D	4	07/27/07	RB	07/27/07	OP21630	SW1858
Run #2							

	Initial Weight	Final Volume
Run #1	30.2 g	1.0 ml
Run #2		

BN PAH List

CAS No.	Compound	Result	RL	MDL	Units	Q
83-32-9	Acenaphthene	ND	400	100	ug/kg	
208-96-8	Acenaphthylene	ND	400	100	ug/kg	
120-12-7	Anthracene	ND	400	60	ug/kg	
56-55-3	Benzo(a)anthracene	ND	80	20	ug/kg	
50-32-8	Benzo(a)pyrene	ND	80	20	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	80	20	ug/kg	
191-24-2	Benzo(g,h,i)perylene	ND	80	20	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	80	20	ug/kg	
218-01-9	Chrysene	ND	80	20	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	80	20	ug/kg	
206-44-0	Fluoranthene	ND	400	70	ug/kg	
86-73-7	Fluorene	ND	400	60	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	80	20	ug/kg	
90-12-0	1-Methylnaphthalene	ND	400	60	ug/kg	
91-57-6	2-Methylnaphthalene	ND	400	60	ug/kg	
91-20-3	Naphthalene	ND	400	60	ug/kg	
85-01-8	Phenanthrene	ND	400	60	ug/kg	
129-00-0	Pyrene	ND	400	70	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
4165-60-0	Nitrobenzene-d5	76%		40-105%
321-60-8	2-Fluorobiphenyl	82%		43-107%
1718-51-0	Terphenyl-d14	78%		45-119%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	AOSD02		
Lab Sample ID:	F51154-5	Date Sampled:	07/18/07
Matrix:	SO - Sediment	Date Received:	07/19/07
Method:	SW846 8270C SW846 3550B	Percent Solids:	59.3
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	R09440.D	1	07/26/07	NJ	07/25/07	OP21602	SR446
Run #2							

	Initial Weight	Final Volume
Run #1	30.2 g	1.0 ml
Run #2		

ABN TCL List w/o PAHs

CAS No.	Compound	Result	RL	MDL	Units	Q
65-85-0	Benzoic acid	ND	1400	560	ug/kg	
95-57-8	2-Chlorophenol	ND	280	56	ug/kg	
59-50-7	4-Chloro-3-methyl phenol	ND	280	56	ug/kg	
120-83-2	2,4-Dichlorophenol	ND	280	56	ug/kg	
105-67-9	2,4-Dimethylphenol	ND	280	56	ug/kg	
51-28-5	2,4-Dinitrophenol	ND	1400	560	ug/kg	
534-52-1	4,6-Dinitro-o-cresol	ND	560	110	ug/kg	
95-48-7	2-Methylphenol	ND	280	56	ug/kg	
	3&4-Methylphenol	ND	280	56	ug/kg	
88-75-5	2-Nitrophenol	ND	280	56	ug/kg	
100-02-7	4-Nitrophenol	ND	1400	560	ug/kg	
87-86-5	Pentachlorophenol	ND	1400	560	ug/kg	
108-95-2	Phenol	ND	280	56	ug/kg	
95-95-4	2,4,5-Trichlorophenol	ND	280	56	ug/kg	
88-06-2	2,4,6-Trichlorophenol	ND	280	56	ug/kg	
101-55-3	4-Bromophenyl phenyl ether	ND	280	56	ug/kg	
85-68-7	Butyl benzyl phthalate	ND	560	140	ug/kg	
100-51-6	Benzyl Alcohol	ND	280	56	ug/kg	
91-58-7	2-Chloronaphthalene	ND	280	56	ug/kg	
106-47-8	4-Chloroaniline	ND	560	220	ug/kg	
86-74-8	Carbazole	ND	280	56	ug/kg	
111-91-1	bis(2-Chloroethoxy)methane	ND	280	56	ug/kg	
111-44-4	bis(2-Chloroethyl)ether	ND	280	110	ug/kg	
108-60-1	bis(2-Chloroisopropyl)ether	ND	280	56	ug/kg	
7005-72-3	4-Chlorophenyl phenyl ether	ND	280	56	ug/kg	
95-50-1	1,2-Dichlorobenzene	ND	280	56	ug/kg	
541-73-1	1,3-Dichlorobenzene	ND	280	56	ug/kg	
106-46-7	1,4-Dichlorobenzene	ND	280	56	ug/kg	
121-14-2	2,4-Dinitrotoluene	ND	280	110	ug/kg	
606-20-2	2,6-Dinitrotoluene	ND	280	110	ug/kg	
91-94-1	3,3'-Dichlorobenzidine	ND	560	280	ug/kg	
132-64-9	Dibenzofuran	ND	280	56	ug/kg	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	AOSD02		
Lab Sample ID:	F51154-5	Date Sampled:	07/18/07
Matrix:	SO - Sediment	Date Received:	07/19/07
Method:	SW846 8270C SW846 3550B	Percent Solids:	59.3
Project:	WPA 019 Field Investigation; Radford AAP, VA		

ABN TCL List w/o PAHs

CAS No.	Compound	Result	RL	MDL	Units	Q
84-74-2	Di-n-butyl phthalate	ND	560	140	ug/kg	
117-84-0	Di-n-octyl phthalate	ND	560	280	ug/kg	
84-66-2	Diethyl phthalate	ND	560	140	ug/kg	
131-11-3	Dimethyl phthalate	ND	560	140	ug/kg	
117-81-7	bis(2-Ethylhexyl)phthalate	ND	560	280	ug/kg	
118-74-1	Hexachlorobenzene	ND	280	56	ug/kg	
87-68-3	Hexachlorobutadiene	ND	280	110	ug/kg	
77-47-4	Hexachlorocyclopentadiene	ND	280	110	ug/kg	
67-72-1	Hexachloroethane	ND	280	110	ug/kg	
78-59-1	Isophorone	ND	280	56	ug/kg	
88-74-4	2-Nitroaniline	ND	560	140	ug/kg	
99-09-2	3-Nitroaniline	ND	560	140	ug/kg	
100-01-6	4-Nitroaniline	ND	560	200	ug/kg	
98-95-3	Nitrobenzene	ND	280	56	ug/kg	
621-64-7	N-Nitroso-di-n-propylamine	ND	280	110	ug/kg	
86-30-6	N-Nitrosodiphenylamine	ND	280	56	ug/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	280	56	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol	67%		40-102%
4165-62-2	Phenol-d5	73%		41-100%
118-79-6	2,4,6-Tribromophenol	76%		42-108%
4165-60-0	Nitrobenzene-d5	64%		40-105%
321-60-8	2-Fluorobiphenyl	66%		43-107%
1718-51-0	Terphenyl-d14	72%		45-119%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: W035880.D

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Report of Analysis

Client Sample ID:	AOSD02		
Lab Sample ID:	F51154-5	Date Sampled:	07/18/07
Matrix:	SO - Sediment	Date Received:	07/19/07
Method:	SW846 8270C BY SIM SW846 3550B	Percent Solids:	59.3
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	W035880.D	4	07/27/07	RB	07/27/07	OP21630	SW1858
Run #2							

	Initial Weight	Final Volume
Run #1	30.1 g	1.0 ml
Run #2		

BN PAH List

CAS No.	Compound	Result	RL	MDL	Units	Q
83-32-9	Acenaphthene	ND	450	110	ug/kg	
208-96-8	Acenaphthylene	ND	450	110	ug/kg	
120-12-7	Anthracene	ND	450	67	ug/kg	
56-55-3	Benzo(a)anthracene	ND	90	22	ug/kg	
50-32-8	Benzo(a)pyrene	ND	90	22	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	90	22	ug/kg	
191-24-2	Benzo(g,h,i)perylene	ND	90	22	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	90	22	ug/kg	
218-01-9	Chrysene	ND	90	22	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	90	22	ug/kg	
206-44-0	Fluoranthene	ND	450	78	ug/kg	
86-73-7	Fluorene	ND	450	67	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	90	22	ug/kg	
90-12-0	1-Methylnaphthalene	ND	450	67	ug/kg	
91-57-6	2-Methylnaphthalene	ND	450	67	ug/kg	
91-20-3	Naphthalene	ND	450	67	ug/kg	
85-01-8	Phenanthrene	ND	450	67	ug/kg	
129-00-0	Pyrene	ND	450	78	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
4165-60-0	Nitrobenzene-d5	78%		40-105%
321-60-8	2-Fluorobiphenyl	79%		43-107%
1718-51-0	Terphenyl-d14	81%		45-119%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: U003668.D

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Report of Analysis

Client Sample ID:	41SW08		
Lab Sample ID:	F51154-6	Date Sampled:	07/18/07
Matrix:	AQ - Surface Water	Date Received:	07/19/07
Method:	SW846 8270C SW846 3510C	Percent Solids:	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	U003668.D	1	07/31/07	NJ	07/24/07	OP21580	SU180
Run #2							

	Initial Volume	Final Volume
Run #1	1030 ml	1.0 ml
Run #2		

ABN TCL List w/o PAHs

CAS No.	Compound	Result	RL	MDL	Units	Q
65-85-0	Benzoic Acid	ND R	24	9.7	ug/l	
95-57-8	2-Chlorophenol	ND	4.9	0.97	ug/l	
59-50-7	4-Chloro-3-methyl phenol	ND	4.9	1.9	ug/l	
120-83-2	2,4-Dichlorophenol	ND	4.9	0.97	ug/l	
105-67-9	2,4-Dimethylphenol	ND	4.9	1.9	ug/l	
51-28-5	2,4-Dinitrophenol	ND	24	9.7	ug/l	
534-52-1	4,6-Dinitro-o-cresol	ND	9.7	1.9	ug/l	
95-48-7	2-Methylphenol	ND	4.9	0.97	ug/l	
	3&4-Methylphenol	ND	4.9	1.3	ug/l	
88-75-5	2-Nitrophenol	ND	4.9	0.97	ug/l	
100-02-7	4-Nitrophenol	ND	24	9.7	ug/l	
87-86-5	Pentachlorophenol	ND	24	9.7	ug/l	
108-95-2	Phenol	ND	4.9	1.9	ug/l	
95-95-4	2,4,5-Trichlorophenol	ND	4.9	0.97	ug/l	
88-06-2	2,4,6-Trichlorophenol	ND	4.9	0.97	ug/l	
101-55-3	4-Bromophenyl phenyl ether	ND	4.9	1.2	ug/l	
85-68-7	Butyl benzyl phthalate	ND	4.9	1.9	ug/l	
100-51-6	Benzyl Alcohol	ND	4.9	0.97	ug/l	
91-58-7	2-Chloronaphthalene	ND	4.9	1.3	ug/l	
106-47-8	4-Chloroaniline	ND	4.9	1.9	ug/l	
86-74-8	Carbazole	ND	4.9	0.97	ug/l	
111-91-1	bis(2-Chloroethoxy)methane	ND	4.9	0.97	ug/l	
111-44-4	bis(2-Chloroethyl)ether	ND	4.9	0.97	ug/l	
108-60-1	bis(2-Chloroisopropyl)ether	ND	4.9	0.97	ug/l	
7005-72-3	4-Chlorophenyl phenyl ether	ND	4.9	1.3	ug/l	
95-50-1	1,2-Dichlorobenzene	ND	4.9	1.5	ug/l	
541-73-1	1,3-Dichlorobenzene	ND	4.9	1.6	ug/l	
106-46-7	1,4-Dichlorobenzene	ND	4.9	1.5	ug/l	
121-14-2	2,4-Dinitrotoluene	ND	4.9	0.97	ug/l	
606-20-2	2,6-Dinitrotoluene	ND	4.9	0.97	ug/l	
91-94-1	3,3'-Dichlorobenzidine	ND	9.7	1.9	ug/l	
132-64-9	Dibenzofuran	ND	4.9	0.97	ug/l	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	41SW08		
Lab Sample ID:	F51154-6	Date Sampled:	07/18/07
Matrix:	AQ - Surface Water	Date Received:	07/19/07
Method:	SW846 8270C SW846 3510C	Percent Solids:	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

ABN TCL List w/o PAHs

CAS No.	Compound	Result	RL	MDL	Units	Q
84-74-2	Di-n-butyl phthalate	ND	4.9	1.9	ug/l	
117-84-0	Di-n-octyl phthalate	ND	4.9	1.9	ug/l	
84-66-2	Diethyl phthalate	ND	4.9	1.9	ug/l	
131-11-3	Dimethyl phthalate	ND	4.9	1.9	ug/l	
117-81-7	bis(2-Ethylhexyl)phthalate	ND	4.9	1.9	ug/l	
118-74-1	Hexachlorobenzene	ND	4.9	1.2	ug/l	
87-68-3	Hexachlorobutadiene	ND	4.9	1.7	ug/l	
77-47-4	Hexachlorocyclopentadiene	ND	4.9	1.5	ug/l	
67-72-1	Hexachloroethane	ND	4.9	1.8	ug/l	
78-59-1	Isophorone	ND	4.9	0.97	ug/l	
88-74-4	2-Nitroaniline	ND	9.7	1.9	ug/l	
99-09-2	3-Nitroaniline	ND	9.7	1.9	ug/l	
100-01-6	4-Nitroaniline	ND	9.7	1.9	ug/l	
98-95-3	Nitrobenzene	ND	4.9	0.97	ug/l	
621-64-7	N-Nitroso-di-n-propylamine	ND	4.9	0.97	ug/l	
86-30-6	N-Nitrosodiphenylamine	ND	4.9	0.97	ug/l	
120-82-1	1,2,4-Trichlorobenzene	ND	4.9	1.5	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol	41%		14-62%
4165-62-2	Phenol-d5	28%		10-40%
118-79-6	2,4,6-Tribromophenol	78%		33-118%
4165-60-0	Nitrobenzene-d5	73%		42-108%
321-60-8	2-Fluorobiphenyl	75%		40-106%
1718-51-0	Terphenyl-d14	73%		39-121%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	41SW08		
Lab Sample ID:	F51154-6	Date Sampled:	07/18/07
Matrix:	AQ - Surface Water	Date Received:	07/19/07
Method:	SW846 8270C BY SIM SW846 3510C	Percent Solids:	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	W035903.D	1	07/30/07	RB	07/24/07	OP21581	SW1859
Run #2							

	Initial Volume	Final Volume
Run #1	1030 ml	1.0 ml
Run #2		

BN PAH List

CAS No.	Compound	Result	RL	MDL	Units	Q
83-32-9	Acenaphthene	ND	0.97	0.49	ug/l	
208-96-8	Acenaphthylene	ND	0.97	0.49	ug/l	
120-12-7	Anthracene	ND	0.97	0.49	ug/l	
56-55-3	Benzo(a)anthracene	ND	0.19	0.049	ug/l	
50-32-8	Benzo(a)pyrene	ND	0.19	0.097	ug/l	
205-99-2	Benzo(b)fluoranthene	ND	0.19	0.049	ug/l	
191-24-2	Benzo(g,h,i)perylene	ND	0.19	0.097	ug/l	
207-08-9	Benzo(k)fluoranthene	ND	0.19	0.097	ug/l	
218-01-9	Chrysene	ND	0.19	0.097	ug/l	
53-70-3	Dibenzo(a,h)anthracene	ND	0.19	0.049	ug/l	
206-44-0	Fluoranthene	ND	0.97	0.24	ug/l	
86-73-7	Fluorene	ND	0.97	0.24	ug/l	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	0.19	0.049	ug/l	
90-12-0	1-Methylnaphthalene	ND	0.97	0.24	ug/l	
91-57-6	2-Methylnaphthalene	ND	0.97	0.24	ug/l	
91-20-3	Naphthalene	ND	0.97	0.24	ug/l	
85-01-8	Phenanthrene	ND	0.97	0.49	ug/l	
129-00-0	Pyrene	ND	0.97	0.24	ug/l	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: U003669.D

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Report of Analysis

Client Sample ID:	41SW09		
Lab Sample ID:	F51154-7	Date Sampled:	07/18/07
Matrix:	AQ - Surface Water	Date Received:	07/19/07
Method:	SW846 8270C SW846 3510C	Percent Solids:	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	U003669.D	1	07/31/07	NJ	07/24/07	OP21580	SU180
Run #2							

	Initial Volume	Final Volume
Run #1	880 ml	1.0 ml
Run #2		

ABN TCL List w/o PAHs

CAS No.	Compound	Result	RL	MDL	Units	Q
65-85-0	Benzoic Acid	ND R	28	11	ug/l	
95-57-8	2-Chlorophenol	ND	5.7	1.1	ug/l	
59-50-7	4-Chloro-3-methyl phenol	ND	5.7	2.3	ug/l	
120-83-2	2,4-Dichlorophenol	ND	5.7	1.1	ug/l	
105-67-9	2,4-Dimethylphenol	ND	5.7	2.3	ug/l	
51-28-5	2,4-Dinitrophenol	ND	28	11	ug/l	
534-52-1	4,6-Dinitro-o-cresol	ND	11	2.3	ug/l	
95-48-7	2-Methylphenol	ND	5.7	1.1	ug/l	
	3&4-Methylphenol	ND	5.7	1.5	ug/l	
88-75-5	2-Nitrophenol	ND	5.7	1.1	ug/l	
100-02-7	4-Nitrophenol	ND	28	11	ug/l	
87-86-5	Pentachlorophenol	ND	28	11	ug/l	
108-95-2	Phenol	ND	5.7	2.3	ug/l	
95-95-4	2,4,5-Trichlorophenol	ND	5.7	1.1	ug/l	
88-06-2	2,4,6-Trichlorophenol	ND	5.7	1.1	ug/l	
101-55-3	4-Bromophenyl phenyl ether	ND	5.7	1.4	ug/l	
85-68-7	Butyl benzyl phthalate	ND	5.7	2.3	ug/l	
100-51-6	Benzyl Alcohol	ND	5.7	1.1	ug/l	
91-58-7	2-Chloronaphthalene	ND	5.7	1.5	ug/l	
106-47-8	4-Chloroaniline	ND	5.7	2.3	ug/l	
86-74-8	Carbazole	ND	5.7	1.1	ug/l	
111-91-1	bis(2-Chloroethoxy)methane	ND	5.7	1.1	ug/l	
111-44-4	bis(2-Chloroethyl)ether	ND	5.7	1.1	ug/l	
108-60-1	bis(2-Chloroisopropyl)ether	ND	5.7	1.1	ug/l	
7005-72-3	4-Chlorophenyl phenyl ether	ND	5.7	1.5	ug/l	
95-50-1	1,2-Dichlorobenzene	ND	5.7	1.7	ug/l	
541-73-1	1,3-Dichlorobenzene	ND	5.7	1.8	ug/l	
106-46-7	1,4-Dichlorobenzene	ND	5.7	1.7	ug/l	
121-14-2	2,4-Dinitrotoluene	ND	5.7	1.1	ug/l	
606-20-2	2,6-Dinitrotoluene	ND	5.7	1.1	ug/l	
91-94-1	3,3'-Dichlorobenzidine	ND	11	2.3	ug/l	
132-64-9	Dibenzofuran	ND	5.7	1.1	ug/l	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Form I Org

Accutest Laboratories

Report of Analysis

Client Sample ID:	41SW09		
Lab Sample ID:	F51154-7	Date Sampled:	07/18/07
Matrix:	AQ - Surface Water	Date Received:	07/19/07
Method:	SW846 8270C SW846 3510C	Percent Solids:	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

ABN TCL List w/o PAHs

CAS No.	Compound	Result	RL	MDL	Units	Q
84-74-2	Di-n-butyl phthalate	ND	5.7	2.3	ug/l	
117-84-0	Di-n-octyl phthalate	ND	5.7	2.3	ug/l	
84-66-2	Diethyl phthalate	ND	5.7	2.3	ug/l	
131-11-3	Dimethyl phthalate	ND	5.7	2.3	ug/l	
117-81-7	bis(2-Ethylhexyl)phthalate	ND	5.7	2.3	ug/l	
118-74-1	Hexachlorobenzene	ND	5.7	1.4	ug/l	
87-68-3	Hexachlorobutadiene	ND	5.7	1.9	ug/l	
77-47-4	Hexachlorocyclopentadiene	ND	5.7	1.7	ug/l	
67-72-1	Hexachloroethane	ND	5.7	2.2	ug/l	
78-59-1	Isophorone	ND	5.7	1.1	ug/l	
88-74-4	2-Nitroaniline	ND	11	2.3	ug/l	
99-09-2	3-Nitroaniline	ND	11	2.3	ug/l	
100-01-6	4-Nitroaniline	ND	11	2.3	ug/l	
98-95-3	Nitrobenzene	ND	5.7	1.1	ug/l	
621-64-7	N-Nitroso-di-n-propylamine	ND	5.7	1.1	ug/l	
86-30-6	N-Nitrosodiphenylamine	ND	5.7	1.1	ug/l	
120-82-1	1,2,4-Trichlorobenzene	ND	5.7	1.7	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol	44%		14-62%
4165-62-2	Phenol-d5	32%		10-40%
118-79-6	2,4,6-Tribromophenol	76%		33-118%
4165-60-0	Nitrobenzene-d5	69%		42-108%
321-60-8	2-Fluorobiphenyl	70%		40-106%
1718-51-0	Terphenyl-d14	79%		39-121%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: W035904.D

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Report of Analysis

Client Sample ID:	41SW09		
Lab Sample ID:	F51154-7	Date Sampled:	07/18/07
Matrix:	AQ - Surface Water	Date Received:	07/19/07
Method:	SW846 8270C BY SIM SW846 3510C	Percent Solids:	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	W035904.D	1	07/30/07	RB	07/24/07	OP21581	SW1859
Run #2							

	Initial Volume	Final Volume
Run #1	880 ml	1.0 ml
Run #2		

BN PAH List

CAS No.	Compound	Result	RL	MDL	Units	Q
83-32-9	Acenaphthene	ND	1.1	0.57	ug/l	
208-96-8	Acenaphthylene	ND	1.1	0.57	ug/l	
120-12-7	Anthracene	ND	1.1	0.57	ug/l	
56-55-3	Benzo(a)anthracene	ND	0.23	0.057	ug/l	
50-32-8	Benzo(a)pyrene	ND	0.23	0.11	ug/l	
205-99-2	Benzo(b)fluoranthene	ND	0.23	0.057	ug/l	
191-24-2	Benzo(g,h,i)perylene	ND	0.23	0.11	ug/l	
207-08-9	Benzo(k)fluoranthene	ND	0.23	0.11	ug/l	
218-01-9	Chrysene	ND	0.23	0.11	ug/l	
53-70-3	Dibenzo(a,h)anthracene	ND	0.23	0.057	ug/l	
206-44-0	Fluoranthene	ND	1.1	0.28	ug/l	
86-73-7	Fluorene	ND	1.1	0.28	ug/l	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	0.23	0.057	ug/l	
90-12-0	1-Methylnaphthalene	ND	1.1	0.28	ug/l	
91-57-6	2-Methylnaphthalene	ND	1.1	0.28	ug/l	
91-20-3	Naphthalene	ND	1.1	0.28	ug/l	
85-01-8	Phenanthrene	ND	1.1	0.57	ug/l	
129-00-0	Pyrene	ND	1.1	0.28	ug/l	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: U003670.D

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Report of Analysis

Client Sample ID:	41SW10		
Lab Sample ID:	F51154-8	Date Sampled:	07/18/07
Matrix:	AQ - Surface Water	Date Received:	07/19/07
Method:	SW846 8270C SW846 3510C	Percent Solids:	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	U003670.D	1	07/31/07	NJ	07/24/07	OP21580	SU180
Run #2							

	Initial Volume	Final Volume
Run #1	1000 ml	1.0 ml
Run #2		

ABN TCL List w/o PAHs

CAS No.	Compound	Result	RL	MDL	Units	Q
65-85-0	Benzoic Acid	ND R	25	10	ug/l	
95-57-8	2-Chlorophenol	ND	5.0	1.0	ug/l	
59-50-7	4-Chloro-3-methyl phenol	ND	5.0	2.0	ug/l	
120-83-2	2,4-Dichlorophenol	ND	5.0	1.0	ug/l	
105-67-9	2,4-Dimethylphenol	ND	5.0	2.0	ug/l	
51-28-5	2,4-Dinitrophenol	ND	25	10	ug/l	
534-52-1	4,6-Dinitro-o-cresol	ND	10	2.0	ug/l	
95-48-7	2-Methylphenol	ND	5.0	1.0	ug/l	
	3&4-Methylphenol	ND	5.0	1.3	ug/l	
88-75-5	2-Nitrophenol	ND	5.0	1.0	ug/l	
100-02-7	4-Nitrophenol	ND	25	10	ug/l	
87-86-5	Pentachlorophenol	ND	25	10	ug/l	
108-95-2	Phenol	ND	5.0	2.0	ug/l	
95-95-4	2,4,5-Trichlorophenol	ND	5.0	1.0	ug/l	
88-06-2	2,4,6-Trichlorophenol	ND	5.0	1.0	ug/l	
101-55-3	4-Bromophenyl phenyl ether	ND	5.0	1.2	ug/l	
85-68-7	Butyl benzyl phthalate	ND	5.0	2.0	ug/l	
100-51-6	Benzyl Alcohol	ND	5.0	1.0	ug/l	
91-58-7	2-Chloronaphthalene	ND	5.0	1.3	ug/l	
106-47-8	4-Chloroaniline	ND	5.0	2.0	ug/l	
86-74-8	Carbazole	ND	5.0	1.0	ug/l	
111-91-1	bis(2-Chloroethoxy)methane	ND	5.0	1.0	ug/l	
111-44-4	bis(2-Chloroethyl)ether	ND	5.0	1.0	ug/l	
108-60-1	bis(2-Chloroisopropyl)ether	ND	5.0	1.0	ug/l	
7005-72-3	4-Chlorophenyl phenyl ether	ND	5.0	1.3	ug/l	
95-50-1	1,2-Dichlorobenzene	ND	5.0	1.5	ug/l	
541-73-1	1,3-Dichlorobenzene	ND	5.0	1.6	ug/l	
106-46-7	1,4-Dichlorobenzene	ND	5.0	1.5	ug/l	
121-14-2	2,4-Dinitrotoluene	ND	5.0	1.0	ug/l	
606-20-2	2,6-Dinitrotoluene	ND	5.0	1.0	ug/l	
91-94-1	3,3'-Dichlorobenzidine	ND	10	2.0	ug/l	
132-64-9	Dibenzofuran	ND	5.0	1.0	ug/l	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	41SW10		
Lab Sample ID:	F51154-8	Date Sampled:	07/18/07
Matrix:	AQ - Surface Water	Date Received:	07/19/07
Method:	SW846 8270C SW846 3510C	Percent Solids:	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

ABN TCL List w/o PAHs

CAS No.	Compound	Result	RL	MDL	Units	Q
84-74-2	Di-n-butyl phthalate	ND	5.0	2.0	ug/l	
117-84-0	Di-n-octyl phthalate	ND	5.0	2.0	ug/l	
84-66-2	Diethyl phthalate	ND	5.0	2.0	ug/l	
131-11-3	Dimethyl phthalate	ND	5.0	2.0	ug/l	
117-81-7	bis(2-Ethylhexyl)phthalate	ND	5.0	2.0	ug/l	
118-74-1	Hexachlorobenzene	ND	5.0	1.2	ug/l	
87-68-3	Hexachlorobutadiene	ND	5.0	1.7	ug/l	
77-47-4	Hexachlorocyclopentadiene	ND	5.0	1.5	ug/l	
67-72-1	Hexachloroethane	ND	5.0	1.9	ug/l	
78-59-1	Isophorone	ND	5.0	1.0	ug/l	
88-74-4	2-Nitroaniline	ND	10	2.0	ug/l	
99-09-2	3-Nitroaniline	ND	10	2.0	ug/l	
100-01-6	4-Nitroaniline	ND	10	2.0	ug/l	
98-95-3	Nitrobenzene	ND	5.0	1.0	ug/l	
621-64-7	N-Nitroso-di-n-propylamine	ND	5.0	1.0	ug/l	
86-30-6	N-Nitrosodiphenylamine	ND	5.0	1.0	ug/l	
120-82-1	1,2,4-Trichlorobenzene	ND	5.0	1.5	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol	42%		14-62%
4165-62-2	Phenol-d5	28%		10-40%
118-79-6	2,4,6-Tribromophenol	80%		33-118%
4165-60-0	Nitrobenzene-d5	74%		42-108%
321-60-8	2-Fluorobiphenyl	75%		40-106%
1718-51-0	Terphenyl-d14	80%		39-121%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: W035905.D

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Report of Analysis

Client Sample ID:	41SW10		
Lab Sample ID:	F51154-8	Date Sampled:	07/18/07
Matrix:	AQ - Surface Water	Date Received:	07/19/07
Method:	SW846 8270C BY SIM SW846 3510C	Percent Solids:	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	W035905.D	1	07/30/07	RB	07/24/07	OP21581	SW1859
Run #2							

	Initial Volume	Final Volume
Run #1	1000 ml	1.0 ml
Run #2		

BN PAH List

CAS No.	Compound	Result	RL	MDL	Units	Q
83-32-9	Acenaphthene	ND	1.0	0.50	ug/l	
208-96-8	Acenaphthylene	ND	1.0	0.50	ug/l	
120-12-7	Anthracene	ND	1.0	0.50	ug/l	
56-55-3	Benzo(a)anthracene	ND	0.20	0.050	ug/l	
50-32-8	Benzo(a)pyrene	ND	0.20	0.10	ug/l	
205-99-2	Benzo(b)fluoranthene	ND	0.20	0.050	ug/l	
191-24-2	Benzo(g,h,i)perylene	ND	0.20	0.10	ug/l	
207-08-9	Benzo(k)fluoranthene	ND	0.20	0.10	ug/l	
218-01-9	Chrysene	ND	0.20	0.10	ug/l	
53-70-3	Dibenzo(a,h)anthracene	ND	0.20	0.050	ug/l	
206-44-0	Fluoranthene	ND	1.0	0.25	ug/l	
86-73-7	Fluorene	ND	1.0	0.25	ug/l	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	0.20	0.050	ug/l	
90-12-0	1-Methylnaphthalene	ND	1.0	0.25	ug/l	
91-57-6	2-Methylnaphthalene	ND	1.0	0.25	ug/l	
91-20-3	Naphthalene	ND	1.0	0.25	ug/l	
85-01-8	Phenanthrene	ND	1.0	0.50	ug/l	
129-00-0	Pyrene	ND	1.0	0.25	ug/l	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: R09468.D

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Report of Analysis

Client Sample ID:	41SD08		
Lab Sample ID:	F51154-9	Date Sampled:	07/18/07
Matrix:	SO - Sediment	Date Received:	07/19/07
Method:	SW846 8270C SW846 3550B	Percent Solids:	36.9
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	R09468.D	1	07/30/07	NJ	07/27/07	OP21634	SR448
Run #2							

	Initial Weight	Final Volume
Run #1	30.1 g	1.0 ml
Run #2		

ABN TCL List w/o PAHs

CAS No.	Compound	Result	RL	MDL	Units	Q
65-85-0	Benzoic acid	ND	2300	900	ug/kg	
95-57-8	2-Chlorophenol	ND	450	90	ug/kg	
59-50-7	4-Chloro-3-methyl phenol	ND	450	90	ug/kg	
120-83-2	2,4-Dichlorophenol	ND	450	90	ug/kg	
105-67-9	2,4-Dimethylphenol	ND	450	90	ug/kg	
51-28-5	2,4-Dinitrophenol	ND	2300	900	ug/kg	
534-52-1	4,6-Dinitro-o-cresol	ND	900	180	ug/kg	
95-48-7	2-Methylphenol	ND	450	90	ug/kg	
	3&4-Methylphenol	ND	450	90	ug/kg	
88-75-5	2-Nitrophenol	ND	450	90	ug/kg	
100-02-7	4-Nitrophenol	ND	2300	900	ug/kg	
87-86-5	Pentachlorophenol	ND	2300	900	ug/kg	
108-95-2	Phenol	ND	450	90	ug/kg	
95-95-4	2,4,5-Trichlorophenol	ND	450	90	ug/kg	
88-06-2	2,4,6-Trichlorophenol	ND	450	90	ug/kg	
101-55-3	4-Bromophenyl phenyl ether	ND	450	90	ug/kg	
85-68-7	Butyl benzyl phthalate	ND	900	230	ug/kg	
100-51-6	Benzyl Alcohol	ND	450	90	ug/kg	
91-58-7	2-Chloronaphthalene	ND	450	90	ug/kg	
106-47-8	4-Chloroaniline	ND	900	360	ug/kg	
86-74-8	Carbazole	ND	450	90	ug/kg	
111-91-1	bis(2-Chloroethoxy)methane	ND	450	90	ug/kg	
111-44-4	bis(2-Chloroethyl)ether	ND	450	180	ug/kg	
108-60-1	bis(2-Chloroisopropyl)ether	ND	450	90	ug/kg	
7005-72-3	4-Chlorophenyl phenyl ether	ND	450	90	ug/kg	
95-50-1	1,2-Dichlorobenzene	ND	450	90	ug/kg	
541-73-1	1,3-Dichlorobenzene	ND	450	90	ug/kg	
106-46-7	1,4-Dichlorobenzene	ND	450	90	ug/kg	
121-14-2	2,4-Dinitrotoluene	ND	450	180	ug/kg	
606-20-2	2,6-Dinitrotoluene	ND	450	180	ug/kg	
91-94-1	3,3'-Dichlorobenzidine	ND	900	450	ug/kg	
132-64-9	Dibenzofuran	ND	450	90	ug/kg	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	41SD08		
Lab Sample ID:	F51154-9	Date Sampled:	07/18/07
Matrix:	SO - Sediment	Date Received:	07/19/07
Method:	SW846 8270C SW846 3550B	Percent Solids:	36.9
Project:	WPA 019 Field Investigation; Radford AAP, VA		

ABN TCL List w/o PAHs

CAS No.	Compound	Result	RL	MDL	Units	Q
84-74-2	Di-n-butyl phthalate	ND	900	230	ug/kg	
117-84-0	Di-n-octyl phthalate	ND	900	450	ug/kg	
84-66-2	Diethyl phthalate	ND	900	230	ug/kg	
131-11-3	Dimethyl phthalate	ND	900	230	ug/kg	
117-81-7	bis(2-Ethylhexyl)phthalate	ND	900	450	ug/kg	
118-74-1	Hexachlorobenzene	ND	450	90	ug/kg	
87-68-3	Hexachlorobutadiene	ND	450	180	ug/kg	
77-47-4	Hexachlorocyclopentadiene	ND	450	180	ug/kg	
67-72-1	Hexachloroethane	ND	450	180	ug/kg	
78-59-1	Isophorone	ND	450	90	ug/kg	
88-74-4	2-Nitroaniline	ND	900	230	ug/kg	
99-09-2	3-Nitroaniline	ND	900	230	ug/kg	
100-01-6	4-Nitroaniline	ND	900	320	ug/kg	
98-95-3	Nitrobenzene	ND	450	90	ug/kg	
621-64-7	N-Nitroso-di-n-propylamine	ND	450	180	ug/kg	
86-30-6	N-Nitrosodiphenylamine	ND	450	90	ug/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	450	90	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol	47%		40-102%
4165-62-2	Phenol-d5	53%		41-100%
118-79-6	2,4,6-Tribromophenol	55%		42-108%
4165-60-0	Nitrobenzene-d5	44%		40-105%
321-60-8	2-Fluorobiphenyl	49%		43-107%
1718-51-0	Terphenyl-d14	57%		45-119%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: W035942.D

Form I Org

Accutest Laboratories

Report of Analysis

Client Sample ID:	41SD08		
Lab Sample ID:	F51154-9	Date Sampled:	07/18/07
Matrix:	SO - Sediment	Date Received:	07/19/07
Method:	SW846 8270C BY SIM SW846 3550B	Percent Solids:	36.9
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	W035942.D	4	07/31/07	RB	07/27/07	OP21636	SW1861
Run #2							

	Initial Weight	Final Volume
Run #1	30.1 g	1.0 ml
Run #2		

BN PAH List

CAS No.	Compound	Result	RL	MDL	Units	Q
83-32-9	Acenaphthene	ND	720	180	ug/kg	
208-96-8	Acenaphthylene	ND	720	180	ug/kg	
120-12-7	Anthracene	ND	720	110	ug/kg	
56-55-3	Benzo(a)anthracene	50.9 J	140	36	ug/kg	J
50-32-8	Benzo(a)pyrene	72.0 J	140	36	ug/kg	J
205-99-2	Benzo(b)fluoranthene	120 J	140	36	ug/kg	J
191-24-2	Benzo(g,h,i)perylene	62.2 J	140	36	ug/kg	J
207-08-9	Benzo(k)fluoranthene	66.9 J	140	36	ug/kg	J
218-01-9	Chrysene	98.2 J	140	36	ug/kg	J
53-70-3	Dibenzo(a,h)anthracene	ND	140	36	ug/kg	
206-44-0	Fluoranthene	174 J	720	130	ug/kg	J
86-73-7	Fluorene	ND	720	110	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	67.1 J	140	36	ug/kg	J
90-12-0	1-Methylnaphthalene	ND	720	110	ug/kg	
91-57-6	2-Methylnaphthalene	ND	720	110	ug/kg	
91-20-3	Naphthalene	ND	720	110	ug/kg	
85-01-8	Phenanthrene	ND	720	110	ug/kg	
129-00-0	Pyrene	135 J	720	130	ug/kg	J

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: R09469.D

Form I OR1

Accutest Laboratories

Report of Analysis

Client Sample ID:	41SD09		
Lab Sample ID:	F51154-10	Date Sampled:	07/18/07
Matrix:	SO - Sediment	Date Received:	07/19/07
Method:	SW846 8270C SW846 3550B	Percent Solids:	82.4
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	R09469.D	1	07/30/07	NJ	07/27/07	OP21634	SR448
Run #2							

	Initial Weight	Final Volume
Run #1	30.0 g	1.0 ml
Run #2		

ABN TCL List w/o PAHs

CAS No.	Compound	Result	RL	MDL	Units	Q
65-85-0	Benzoic acid	ND	1000	400	ug/kg	
95-57-8	2-Chlorophenol	ND	200	40	ug/kg	
59-50-7	4-Chloro-3-methyl phenol	ND	200	40	ug/kg	
120-83-2	2,4-Dichlorophenol	ND	200	40	ug/kg	
105-67-9	2,4-Dimethylphenol	ND	200	40	ug/kg	
51-28-5	2,4-Dinitrophenol	ND	1000	400	ug/kg	
534-52-1	4,6-Dinitro-o-cresol	ND	400	81	ug/kg	
95-48-7	2-Methylphenol	ND	200	40	ug/kg	
	3&4-Methylphenol	ND	200	40	ug/kg	
88-75-5	2-Nitrophenol	ND	200	40	ug/kg	
100-02-7	4-Nitrophenol	ND	1000	400	ug/kg	
87-86-5	Pentachlorophenol	ND	1000	400	ug/kg	
108-95-2	Phenol	ND	200	40	ug/kg	
95-95-4	2,4,5-Trichlorophenol	ND	200	40	ug/kg	
88-06-2	2,4,6-Trichlorophenol	ND	200	40	ug/kg	
101-55-3	4-Bromophenyl phenyl ether	ND	200	40	ug/kg	
85-68-7	Butyl benzyl phthalate	ND	400	100	ug/kg	
100-51-6	Benzyl Alcohol	ND	200	40	ug/kg	
91-58-7	2-Chloronaphthalene	ND	200	40	ug/kg	
106-47-8	4-Chloroaniline	ND	400	160	ug/kg	
86-74-8	Carbazole	ND	200	40	ug/kg	
111-91-1	bis(2-Chloroethoxy)methane	ND	200	40	ug/kg	
111-44-4	bis(2-Chloroethyl)ether	ND	200	81	ug/kg	
108-60-1	bis(2-Chloroisopropyl)ether	ND	200	40	ug/kg	
7005-72-3	4-Chlorophenyl phenyl ether	ND	200	40	ug/kg	
95-50-1	1,2-Dichlorobenzene	ND	200	40	ug/kg	
541-73-1	1,3-Dichlorobenzene	ND	200	40	ug/kg	
106-46-7	1,4-Dichlorobenzene	ND	200	40	ug/kg	
121-14-2	2,4-Dinitrotoluene	ND	200	81	ug/kg	
606-20-2	2,6-Dinitrotoluene	ND	200	81	ug/kg	
91-94-1	3,3'-Dichlorobenzidine	ND	400	200	ug/kg	
132-64-9	Dibenzofuran	ND	200	40	ug/kg	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	41SD09		
Lab Sample ID:	F51154-10	Date Sampled:	07/18/07
Matrix:	SO - Sediment	Date Received:	07/19/07
Method:	SW846 8270C SW846 3550B	Percent Solids:	82.4
Project:	WPA 019 Field Investigation; Radford AAP, VA		

ABN TCL List w/o PAHs

CAS No.	Compound	Result	RL	MDL	Units	Q
84-74-2	Di-n-butyl phthalate	ND	400	100	ug/kg	
117-84-0	Di-n-octyl phthalate	ND	400	200	ug/kg	
84-66-2	Diethyl phthalate	ND	400	100	ug/kg	
131-11-3	Dimethyl phthalate	ND	400	100	ug/kg	
117-81-7	bis(2-Ethylhexyl)phthalate	ND	400	200	ug/kg	
118-74-1	Hexachlorobenzene	ND	200	40	ug/kg	
87-68-3	Hexachlorobutadiene	ND	200	81	ug/kg	
77-47-4	Hexachlorocyclopentadiene	ND	200	81	ug/kg	
67-72-1	Hexachloroethane	ND	200	81	ug/kg	
78-59-1	Isophorone	ND	200	40	ug/kg	
88-74-4	2-Nitroaniline	ND	400	100	ug/kg	
99-09-2	3-Nitroaniline	ND	400	100	ug/kg	
100-01-6	4-Nitroaniline	ND	400	140	ug/kg	
98-95-3	Nitrobenzene	ND	200	40	ug/kg	
621-64-7	N-Nitroso-di-n-propylamine	ND	200	81	ug/kg	
86-30-6	N-Nitrosodiphenylamine	ND	200	40	ug/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	200	40	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol	66%		40-102%
4165-62-2	Phenol-d5	73%		41-100%
118-79-6	2,4,6-Tribromophenol	72%		42-108%
4165-60-0	Nitrobenzene-d5	60%		40-105%
321-60-8	2-Fluorobiphenyl	62%		43-107%
1718-51-0	Terphenyl-d14	76%		45-119%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: W035943.D

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Accutest Laboratories

Report of Analysis

Client Sample ID:	41SD09		
Lab Sample ID:	F51154-10	Date Sampled:	07/18/07
Matrix:	SO - Sediment	Date Received:	07/19/07
Method:	SW846 8270C BY SIM SW846 3550B	Percent Solids:	82.4
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	W035943.D	4	07/31/07	RB	07/27/07	OP21636	SW1861
Run #2							

	Initial Weight	Final Volume
Run #1	30.0 g	1.0 ml
Run #2		

BN PAH List

CAS No.	Compound	Result	RL	MDL	Units	Q
83-32-9	Acenaphthene	ND	320	81	ug/kg	
208-96-8	Acenaphthylene	ND	320	81	ug/kg	
120-12-7	Anthracene	ND	320	49	ug/kg	
56-55-3	Benzo(a)anthracene	17.4 L	65	16	ug/kg	J
50-32-8	Benzo(a)pyrene	22.9 L	65	16	ug/kg	J
205-99-2	Benzo(b)fluoranthene	40.2 L	65	16	ug/kg	J
191-24-2	Benzo(g,h,i)perylene	20.0 L	65	16	ug/kg	J
207-08-9	Benzo(k)fluoranthene	24.2 L	65	16	ug/kg	J
218-01-9	Chrysene	34.0 L	65	16	ug/kg	J
53-70-3	Dibenzo(a,h)anthracene	ND	65	16	ug/kg	
206-44-0	Fluoranthene	ND	320	57	ug/kg	
86-73-7	Fluorene	ND	320	49	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	21.0 L	65	16	ug/kg	J
90-12-0	1-Methylnaphthalene	ND	320	49	ug/kg	
91-57-6	2-Methylnaphthalene	ND	320	49	ug/kg	
91-20-3	Naphthalene	ND	320	49	ug/kg	
85-01-8	Phenanthrene	ND	320	49	ug/kg	
129-00-0	Pyrene	ND	320	57	ug/kg	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: R09470.D

Run 1 only

Accutest Laboratories

Report of Analysis

Client Sample ID:	41SD10		
Lab Sample ID:	F51154-11	Date Sampled:	07/18/07
Matrix:	SO - Sediment	Date Received:	07/19/07
Method:	SW846 8270C SW846 3550B	Percent Solids:	79.2
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	R09470.D	1	07/30/07	NJ	07/27/07	OP21634	SR448
Run #2							

	Initial Weight	Final Volume
Run #1	30.4 g	1.0 ml
Run #2		

ABN TCL List w/o PAHs

CAS No.	Compound	Result	RL	MDL	Units	Q
65-85-0	Benzoic acid	ND	1000	420	ug/kg	
95-57-8	2-Chlorophenol	ND	210	42	ug/kg	
59-50-7	4-Chloro-3-methyl phenol	ND	210	42	ug/kg	
120-83-2	2,4-Dichlorophenol	ND	210	42	ug/kg	
105-67-9	2,4-Dimethylphenol	ND	210	42	ug/kg	
51-28-5	2,4-Dinitrophenol	ND	1000	420	ug/kg	
534-52-1	4,6-Dinitro-o-cresol	ND	420	83	ug/kg	
95-48-7	2-Methylphenol	ND	210	42	ug/kg	
	3&4-Methylphenol	ND	210	42	ug/kg	
88-75-5	2-Nitrophenol	ND	210	42	ug/kg	
100-02-7	4-Nitrophenol	ND	1000	420	ug/kg	
87-86-5	Pentachlorophenol	ND	1000	420	ug/kg	
108-95-2	Phenol	ND	210	42	ug/kg	
95-95-4	2,4,5-Trichlorophenol	ND	210	42	ug/kg	
88-06-2	2,4,6-Trichlorophenol	ND	210	42	ug/kg	
101-55-3	4-Bromophenyl phenyl ether	ND	210	42	ug/kg	
85-68-7	Butyl benzyl phthalate	ND	420	100	ug/kg	
100-51-6	Benzyl Alcohol	ND	210	42	ug/kg	
91-58-7	2-Chloronaphthalene	ND	210	42	ug/kg	
106-47-8	4-Chloroaniline	ND	420	170	ug/kg	
86-74-8	Carbazole	ND	210	42	ug/kg	
111-91-1	bis(2-Chloroethoxy)methane	ND	210	42	ug/kg	
111-44-4	bis(2-Chloroethyl)ether	ND	210	83	ug/kg	
108-60-1	bis(2-Chloroisopropyl)ether	ND	210	42	ug/kg	
7005-72-3	4-Chlorophenyl phenyl ether	ND	210	42	ug/kg	
95-50-1	1,2-Dichlorobenzene	ND	210	42	ug/kg	
541-73-1	1,3-Dichlorobenzene	ND	210	42	ug/kg	
106-46-7	1,4-Dichlorobenzene	ND	210	42	ug/kg	
121-14-2	2,4-Dinitrotoluene	ND	210	83	ug/kg	
606-20-2	2,6-Dinitrotoluene	ND	210	83	ug/kg	
91-94-1	3,3'-Dichlorobenzidine	ND	420	210	ug/kg	
132-64-9	Dibenzofuran	ND	210	42	ug/kg	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Accutest Laboratories

Report of Analysis

Client Sample ID:	41SD10		
Lab Sample ID:	F51154-11	Date Sampled:	07/18/07
Matrix:	SO - Sediment	Date Received:	07/19/07
Method:	SW846 8270C SW846 3550B	Percent Solids:	79.2
Project:	WPA 019 Field Investigation; Radford AAP, VA		

ABN TCL List w/o PAHs

CAS No.	Compound	Result	RL	MDL	Units	Q
84-74-2	Di-n-butyl phthalate	ND	420	100	ug/kg	
117-84-0	Di-n-octyl phthalate	ND	420	210	ug/kg	
84-66-2	Diethyl phthalate	ND	420	100	ug/kg	
131-11-3	Dimethyl phthalate	ND	420	100	ug/kg	
117-81-7	bis(2-Ethylhexyl)phthalate	ND	420	210	ug/kg	
118-74-1	Hexachlorobenzene	ND	210	42	ug/kg	
87-68-3	Hexachlorobutadiene	ND	210	83	ug/kg	
77-47-4	Hexachlorocyclopentadiene	ND	210	83	ug/kg	
67-72-1	Hexachloroethane	ND	210	83	ug/kg	
78-59-1	Isophorone	ND	210	42	ug/kg	
88-74-4	2-Nitroaniline	ND	420	100	ug/kg	
99-09-2	3-Nitroaniline	ND	420	100	ug/kg	
100-01-6	4-Nitroaniline	ND	420	150	ug/kg	
98-95-3	Nitrobenzene	ND	210	42	ug/kg	
621-64-7	N-Nitroso-di-n-propylamine	ND	210	83	ug/kg	
86-30-6	N-Nitrosodiphenylamine	ND	210	42	ug/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	210	42	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol	68%		40-102%
4165-62-2	Phenol-d5	77%		41-100%
118-79-6	2,4,6-Tribromophenol	80%		42-108%
4165-60-0	Nitrobenzene-d5	64%		40-105%
321-60-8	2-Fluorobiphenyl	69%		43-107%
1718-51-0	Terphenyl-d14	81%		45-119%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: W035973.D

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Report of Analysis

Client Sample ID:	41SD10		
Lab Sample ID:	F51154-11	Date Sampled:	07/18/07
Matrix:	SO - Sediment	Date Received:	07/19/07
Method:	SW846 8270C BY SIM SW846 3550B	Percent Solids:	79.2
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	W035973.D	4	08/01/07	RB	07/27/07	OP21636	SW1862
Run #2							

	Initial Weight	Final Volume
Run #1	30.4 g	1.0 ml
Run #2		

BN PAH List

CAS No.	Compound	Result	RL	MDL	Units	Q
83-32-9	Acenaphthene	ND	330	83	ug/kg	
208-96-8	Acenaphthylene	ND	330	83	ug/kg	
120-12-7	Anthracene	ND	330	50	ug/kg	
56-55-3	Benzo(a)anthracene	46.3 J	66	17	ug/kg	J
50-32-8	Benzo(a)pyrene	67.3	66	17	ug/kg	
205-99-2	Benzo(b)fluoranthene	113	66	17	ug/kg	
191-24-2	Benzo(g,h,i)perylene	53.9 J	66	17	ug/kg	J
207-08-9	Benzo(k)fluoranthene	64.7 J	66	17	ug/kg	J
218-01-9	Chrysene	90.1	66	17	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	66	17	ug/kg	
206-44-0	Fluoranthene	154 J	330	58	ug/kg	J
86-73-7	Fluorene	ND	330	50	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	57.2 J	66	17	ug/kg	J
90-12-0	1-Methylnaphthalene	ND	330	50	ug/kg	
91-57-6	2-Methylnaphthalene	ND	330	50	ug/kg	
91-20-3	Naphthalene	ND	330	50	ug/kg	
85-01-8	Phenanthrene	60.2 J	330	50	ug/kg	J
129-00-0	Pyrene	141 J	330	58	ug/kg	J

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: R09471.D

Run I Only

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Report of Analysis

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Client Sample ID:	LFSD01		
Lab Sample ID:	F51154-15	Date Sampled:	07/19/07
Matrix:	SO - Sediment	Date Received:	07/19/07
Method:	SW846 8270C SW846 3550B	Percent Solids:	57.9
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	R09471.D	1	07/30/07	NJ	07/27/07	OP21634	SR448
Run #2							

	Initial Weight	Final Volume
Run #1	30.1 g	1.0 ml
Run #2		

ABN TCL List w/o PAHs

CAS No.	Compound	Result	RL	MDL	Units	Q
65-85-0	Benzoic acid	ND	1400	570	ug/kg	
95-57-8	2-Chlorophenol	ND	290	57	ug/kg	
59-50-7	4-Chloro-3-methyl phenol	ND	290	57	ug/kg	
120-83-2	2,4-Dichlorophenol	ND	290	57	ug/kg	
105-67-9	2,4-Dimethylphenol	ND	290	57	ug/kg	
51-28-5	2,4-Dinitrophenol	ND	1400	570	ug/kg	
534-52-1	4,6-Dinitro-o-cresol	ND	570	110	ug/kg	
95-48-7	2-Methylphenol	ND	290	57	ug/kg	
	3&4-Methylphenol	ND	290	57	ug/kg	
88-75-5	2-Nitrophenol	ND	290	57	ug/kg	
100-02-7	4-Nitrophenol	ND	1400	570	ug/kg	
87-86-5	Pentachlorophenol	ND	1400	570	ug/kg	
108-95-2	Phenol	ND	290	57	ug/kg	
95-95-4	2,4,5-Trichlorophenol	ND	290	57	ug/kg	
88-06-2	2,4,6-Trichlorophenol	ND	290	57	ug/kg	
101-55-3	4-Bromophenyl phenyl ether	ND	290	57	ug/kg	
85-68-7	Butyl benzyl phthalate	ND	570	140	ug/kg	
100-51-6	Benzyl Alcohol	ND	290	57	ug/kg	
91-58-7	2-Chloronaphthalene	ND	290	57	ug/kg	
106-47-8	4-Chloroaniline	ND	570	230	ug/kg	
86-74-8	Carbazole	ND	290	57	ug/kg	
111-91-1	bis(2-Chloroethoxy)methane	ND	290	57	ug/kg	
111-44-4	bis(2-Chloroethyl)ether	ND	290	110	ug/kg	
108-60-1	bis(2-Chloroisopropyl)ether	ND	290	57	ug/kg	
7005-72-3	4-Chlorophenyl phenyl ether	ND	290	57	ug/kg	
95-50-1	1,2-Dichlorobenzene	ND	290	57	ug/kg	
541-73-1	1,3-Dichlorobenzene	ND	290	57	ug/kg	
106-46-7	1,4-Dichlorobenzene	ND	290	57	ug/kg	
121-14-2	2,4-Dinitrotoluene	ND	290	110	ug/kg	
606-20-2	2,6-Dinitrotoluene	ND	290	110	ug/kg	
91-94-1	3,3'-Dichlorobenzidine	ND	570	290	ug/kg	
132-64-9	Dibenzofuran	ND	290	57	ug/kg	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	LFSD01		
Lab Sample ID:	F51154-15	Date Sampled:	07/19/07
Matrix:	SO - Sediment	Date Received:	07/19/07
Method:	SW846 8270C SW846 3550B	Percent Solids:	57.9
Project:	WPA 019 Field Investigation; Radford AAP, VA		

ABN TCL List w/o PAHs

CAS No.	Compound	Result	RL	MDL	Units	Q
84-74-2	Di-n-butyl phthalate	ND	570	140	ug/kg	
117-84-0	Di-n-octyl phthalate	ND	570	290	ug/kg	
84-66-2	Diethyl phthalate	ND	570	140	ug/kg	
131-11-3	Dimethyl phthalate	ND	570	140	ug/kg	
117-81-7	bis(2-Ethylhexyl)phthalate	ND	570	290	ug/kg	
118-74-1	Hexachlorobenzene	ND	290	57	ug/kg	
87-68-3	Hexachlorobutadiene	ND	290	110	ug/kg	
77-47-4	Hexachlorocyclopentadiene	ND	290	110	ug/kg	
67-72-1	Hexachloroethane	ND	290	110	ug/kg	
78-59-1	Isophorone	ND	290	57	ug/kg	
88-74-4	2-Nitroaniline	ND	570	140	ug/kg	
99-09-2	3-Nitroaniline	ND	570	140	ug/kg	
100-01-6	4-Nitroaniline	ND	570	200	ug/kg	
98-95-3	Nitrobenzene	ND	290	57	ug/kg	
621-64-7	N-Nitroso-di-n-propylamine	ND	290	110	ug/kg	
86-30-6	N-Nitrosodiphenylamine	ND	290	57	ug/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	290	57	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol	66%		40-102%
4165-62-2	Phenol-d5	74%		41-100%
118-79-6	2,4,6-Tribromophenol	76%		42-108%
4165-60-0	Nitrobenzene-d5	61%		40-105%
321-60-8	2-Fluorobiphenyl	66%		43-107%
1718-51-0	Terphenyl-d14	76%		45-119%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: W035974.D

Form I OR

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Report of Analysis

Client Sample ID:	LFSD01		
Lab Sample ID:	F51154-15	Date Sampled:	07/19/07
Matrix:	SO - Sediment	Date Received:	07/19/07
Method:	SW846 8270C BY SIM SW846 3550B	Percent Solids:	57.9
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	W035974.D	4	08/01/07	RB	07/27/07	OP21636	SW1862
Run #2							

	Initial Weight	Final Volume
Run #1	30.1 g	1.0 ml
Run #2		

BN PAH List

CAS No.	Compound	Result	RL	MDL	Units	Q
83-32-9	Acenaphthene	ND	460	110	ug/kg	
208-96-8	Acenaphthylene	ND	460	110	ug/kg	
120-12-7	Anthracene	ND	460	69	ug/kg	
56-55-3	Benzo(a)anthracene	29.0 J	92	23	ug/kg	J
50-32-8	Benzo(a)pyrene	31.9 J	92	23	ug/kg	J
205-99-2	Benzo(b)fluoranthene	45.6 J	92	23	ug/kg	J
191-24-2	Benzo(g,h,i)perylene	ND	92	23	ug/kg	
207-08-9	Benzo(k)fluoranthene	31.2 J	92	23	ug/kg	J
218-01-9	Chrysene	43.0 J	92	23	ug/kg	J
53-70-3	Dibenzo(a,h)anthracene	ND	92	23	ug/kg	
206-44-0	Fluoranthene	ND	460	80	ug/kg	
86-73-7	Fluorene	ND	460	69	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	92	23	ug/kg	
90-12-0	1-Methylnaphthalene	ND	460	69	ug/kg	
91-57-6	2-Methylnaphthalene	ND	460	69	ug/kg	
91-20-3	Naphthalene	ND	460	69	ug/kg	
85-01-8	Phenanthrene	ND	460	69	ug/kg	
129-00-0	Pyrene	ND	460	80	ug/kg	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: R09472.D

Form I Cor

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Report of Analysis

Client Sample ID:	TMSD01		
Lab Sample ID:	F51154-16	Date Sampled:	07/19/07
Matrix:	SO - Sediment	Date Received:	07/19/07
Method:	SW846 8270C SW846 3550B	Percent Solids:	65.0
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	R09472.D	1	07/30/07	NJ	07/27/07	OP21634	SR448
Run #2							

	Initial Weight	Final Volume
Run #1	30.9 g	1.0 ml
Run #2		

ABN TCL List w/o PAHs

CAS No.	Compound	Result	RL	MDL	Units	Q
65-85-0	Benzoic acid	ND	1200	500	ug/kg	
95-57-8	2-Chlorophenol	ND	250	50	ug/kg	
59-50-7	4-Chloro-3-methyl phenol	ND	250	50	ug/kg	
120-83-2	2,4-Dichlorophenol	ND	250	50	ug/kg	
105-67-9	2,4-Dimethylphenol	ND	250	50	ug/kg	
51-28-5	2,4-Dinitrophenol	ND	1200	500	ug/kg	
534-52-1	4,6-Dinitro-o-cresol	ND	500	100	ug/kg	
95-48-7	2-Methylphenol	ND	250	50	ug/kg	
	3&4-Methylphenol	ND	250	50	ug/kg	
88-75-5	2-Nitrophenol	ND	250	50	ug/kg	
100-02-7	4-Nitrophenol	ND	1200	500	ug/kg	
87-86-5	Pentachlorophenol	ND	1200	500	ug/kg	
108-95-2	Phenol	ND	250	50	ug/kg	
95-95-4	2,4,5-Trichlorophenol	ND	250	50	ug/kg	
88-06-2	2,4,6-Trichlorophenol	ND	250	50	ug/kg	
101-55-3	4-Bromophenyl phenyl ether	ND	250	50	ug/kg	
85-68-7	Butyl benzyl phthalate	ND	500	120	ug/kg	
100-51-6	Benzyl Alcohol	ND	250	50	ug/kg	
91-58-7	2-Chloronaphthalene	ND	250	50	ug/kg	
106-47-8	4-Chloroaniline	ND	500	200	ug/kg	
86-74-8	Carbazole	ND	250	50	ug/kg	
111-91-1	bis(2-Chloroethoxy)methane	ND	250	50	ug/kg	
111-44-4	bis(2-Chloroethyl)ether	ND	250	100	ug/kg	
108-60-1	bis(2-Chloroisopropyl)ether	ND	250	50	ug/kg	
7005-72-3	4-Chlorophenyl phenyl ether	ND	250	50	ug/kg	
95-50-1	1,2-Dichlorobenzene	ND	250	50	ug/kg	
541-73-1	1,3-Dichlorobenzene	ND	250	50	ug/kg	
106-46-7	1,4-Dichlorobenzene	ND	250	50	ug/kg	
121-14-2	2,4-Dinitrotoluene	ND	250	100	ug/kg	
606-20-2	2,6-Dinitrotoluene	ND	250	100	ug/kg	
91-94-1	3,3'-Dichlorobenzidine	ND	500	250	ug/kg	
132-64-9	Dibenzofuran	ND	250	50	ug/kg	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Form I OR1

Accutest Laboratories

Report of Analysis

Client Sample ID:	TMSD01		
Lab Sample ID:	F51154-16	Date Sampled:	07/19/07
Matrix:	SO - Sediment	Date Received:	07/19/07
Method:	SW846 8270C SW846 3550B	Percent Solids:	65.0
Project:	WPA 019 Field Investigation; Radford AAP, VA		

ABN TCL List w/o PAHs

CAS No.	Compound	Result	RL	MDL	Units	Q
84-74-2	Di-n-butyl phthalate	ND	500	120	ug/kg	
117-84-0	Di-n-octyl phthalate	ND	500	250	ug/kg	
84-66-2	Diethyl phthalate	ND	500	120	ug/kg	
131-11-3	Dimethyl phthalate	ND	500	120	ug/kg	
117-81-7	bis(2-Ethylhexyl)phthalate	ND	500	250	ug/kg	
118-74-1	Hexachlorobenzene	ND	250	50	ug/kg	
87-68-3	Hexachlorobutadiene	ND	250	100	ug/kg	
77-47-4	Hexachlorocyclopentadiene	ND	250	100	ug/kg	
67-72-1	Hexachloroethane	ND	250	100	ug/kg	
78-59-1	Isophorone	ND	250	50	ug/kg	
88-74-4	2-Nitroaniline	ND	500	120	ug/kg	
99-09-2	3-Nitroaniline	ND	500	120	ug/kg	
100-01-6	4-Nitroaniline	ND	500	170	ug/kg	
98-95-3	Nitrobenzene	ND	250	50	ug/kg	
621-64-7	N-Nitroso-di-n-propylamine	ND	250	100	ug/kg	
86-30-6	N-Nitrosodiphenylamine	ND	250	50	ug/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	250	50	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol	47%		40-102%
4165-62-2	Phenol-d5	51%		41-100%
118-79-6	2,4,6-Tribromophenol	54%		42-108%
4165-60-0	Nitrobenzene-d5	44%		40-105%
321-60-8	2-Fluorobiphenyl	46%		43-107%
1718-51-0	Terphenyl-d14	54%		45-119%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: W035975.D

Form I OR

Accutest Laboratories

Report of Analysis

Client Sample ID:	TMSD01		
Lab Sample ID:	F51154-16	Date Sampled:	07/19/07
Matrix:	SO - Sediment	Date Received:	07/19/07
Method:	SW846 8270C BY SIM SW846 3550B	Percent Solids:	65.0
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	W035975.D	4	08/01/07	RB	07/27/07	OP21636	SW1862
Run #2							

	Initial Weight	Final Volume
Run #1	30.9 g	1.0 ml
Run #2		

BN PAH List

CAS No.	Compound	Result	RL	MDL	Units	Q
83-32-9	Acenaphthene	ND	400	100	ug/kg	
208-96-8	Acenaphthylene	ND	400	100	ug/kg	
120-12-7	Anthracene	ND	400	60	ug/kg	
56-55-3	Benzo(a)anthracene	26.2 J	80	20	ug/kg	J
50-32-8	Benzo(a)pyrene	27.9 J	80	20	ug/kg	J
205-99-2	Benzo(b)fluoranthene	37.5 J	80	20	ug/kg	J
191-24-2	Benzo(g,h,i)perylene	20.8 J	80	20	ug/kg	J
207-08-9	Benzo(k)fluoranthene	26.9 J	80	20	ug/kg	J
218-01-9	Chrysene	32.8 J	80	20	ug/kg	J
53-70-3	Dibenzo(a,h)anthracene	ND	80	20	ug/kg	
206-44-0	Fluoranthene	ND	400	70	ug/kg	
86-73-7	Fluorene	ND	400	60	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	20.2 J	80	20	ug/kg	J
90-12-0	1-Methylnaphthalene	ND	400	60	ug/kg	
91-57-6	2-Methylnaphthalene	ND	400	60	ug/kg	
91-20-3	Naphthalene	ND	400	60	ug/kg	
85-01-8	Phenanthrene	ND	400	60	ug/kg	
129-00-0	Pyrene	ND	400	70	ug/kg	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: L037535.D

Form I copy

Accutest Laboratories

Report of Analysis

Client Sample ID:	LFSW01		
Lab Sample ID:	F51154-17	Date Sampled:	07/19/07
Matrix:	AQ - Surface Water	Date Received:	07/19/07
Method:	SW846 8270C SW846 3510C	Percent Solids:	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	L037535.D	1	07/31/07	RB	07/26/07	OP21610	SL1920
Run #2							

	Initial Volume	Final Volume
Run #1	1020 ml	1.0 ml
Run #2		

ABN TCL List w/o PAHs

CAS No.	Compound	Result	RL	MDL	Units	Q
65-85-0	Benzoic Acid	ND	25	9.8	ug/l	
95-57-8	2-Chlorophenol	ND	4.9	0.98	ug/l	
59-50-7	4-Chloro-3-methyl phenol	ND	4.9	2.0	ug/l	
120-83-2	2,4-Dichlorophenol	ND	4.9	0.98	ug/l	
105-67-9	2,4-Dimethylphenol	ND	4.9	2.0	ug/l	
51-28-5	2,4-Dinitrophenol	ND	25	9.8	ug/l	
534-52-1	4,6-Dinitro-o-cresol	ND	9.8	2.0	ug/l	
95-48-7	2-Methylphenol	ND	4.9	0.98	ug/l	
	3&4-Methylphenol	ND	4.9	1.3	ug/l	
88-75-5	2-Nitrophenol	ND	4.9	0.98	ug/l	
100-02-7	4-Nitrophenol	ND	25	9.8	ug/l	
87-86-5	Pentachlorophenol	ND	25	9.8	ug/l	
108-95-2	Phenol	ND	4.9	2.0	ug/l	
95-95-4	2,4,5-Trichlorophenol	ND	4.9	0.98	ug/l	
88-06-2	2,4,6-Trichlorophenol	ND	4.9	0.98	ug/l	
101-55-3	4-Bromophenyl phenyl ether	ND	4.9	1.2	ug/l	
85-68-7	Butyl benzyl phthalate	ND	4.9	2.0	ug/l	
100-51-6	Benzyl Alcohol	ND	4.9	0.98	ug/l	
91-58-7	2-Chloronaphthalene	ND	4.9	1.3	ug/l	
106-47-8	4-Chloroaniline	ND	4.9	2.0	ug/l	
86-74-8	Carbazole	ND	4.9	0.98	ug/l	
111-91-1	bis(2-Chloroethoxy)methane	ND	4.9	0.98	ug/l	
111-44-4	bis(2-Chloroethyl)ether	ND	4.9	0.98	ug/l	
108-60-1	bis(2-Chloroisopropyl)ether	ND	4.9	0.98	ug/l	
7005-72-3	4-Chlorophenyl phenyl ether	ND	4.9	1.3	ug/l	
95-50-1	1,2-Dichlorobenzene	ND	4.9	1.5	ug/l	
541-73-1	1,3-Dichlorobenzene	ND	4.9	1.6	ug/l	
106-46-7	1,4-Dichlorobenzene	ND	4.9	1.5	ug/l	
121-14-2	2,4-Dinitrotoluene	ND	4.9	0.98	ug/l	
606-20-2	2,6-Dinitrotoluene	ND	4.9	0.98	ug/l	
91-94-1	3,3'-Dichlorobenzidine	ND	9.8	2.0	ug/l	
132-64-9	Dibenzofuran	ND	4.9	0.98	ug/l	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Form I Only

Accutest Laboratories

Report of Analysis

Client Sample ID:	LFSW01		
Lab Sample ID:	F51154-17	Date Sampled:	07/19/07
Matrix:	AQ - Surface Water	Date Received:	07/19/07
Method:	SW846 8270C SW846 3510C	Percent Solids:	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

ABN TCL List w/o PAHs

CAS No.	Compound	Result	RL	MDL	Units	Q
84-74-2	Di-n-butyl phthalate	ND	4.9	2.0	ug/l	
117-84-0	Di-n-octyl phthalate	ND	4.9	2.0	ug/l	
84-66-2	Diethyl phthalate	ND	4.9	2.0	ug/l	
131-11-3	Dimethyl phthalate	ND	4.9	2.0	ug/l	
117-81-7	bis(2-Ethylhexyl)phthalate	ND	4.9	2.0	ug/l	
118-74-1	Hexachlorobenzene	ND	4.9	1.2	ug/l	
87-68-3	Hexachlorobutadiene	ND	4.9	1.7	ug/l	
77-47-4	Hexachlorocyclopentadiene	ND	4.9	1.5	ug/l	
67-72-1	Hexachloroethane	ND	4.9	1.9	ug/l	
78-59-1	Isophorone	ND	4.9	0.98	ug/l	
88-74-4	2-Nitroaniline	ND	9.8	2.0	ug/l	
99-09-2	3-Nitroaniline	ND	9.8	2.0	ug/l	
100-01-6	4-Nitroaniline	ND	9.8	2.0	ug/l	
98-95-3	Nitrobenzene	ND	4.9	0.98	ug/l	
621-64-7	N-Nitroso-di-n-propylamine	ND	4.9	0.98	ug/l	
86-30-6	N-Nitrosodiphenylamine	ND	4.9	0.98	ug/l	
120-82-1	1,2,4-Trichlorobenzene	ND	4.9	1.5	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol	46%		14-62%
4165-62-2	Phenol-d5	32%		10-40%
118-79-6	2,4,6-Tribromophenol	80%		33-118%
4165-60-0	Nitrobenzene-d5	79%		42-108%
321-60-8	2-Fluorobiphenyl	79%		40-106%
1718-51-0	Terphenyl-d14	76%		39-121%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: W035923.D

Form I GC/MS

Accutest Laboratories

Report of Analysis

Client Sample ID:	LFSW01		
Lab Sample ID:	F51154-17	Date Sampled:	07/19/07
Matrix:	AQ - Surface Water	Date Received:	07/19/07
Method:	SW846 8270C BY SIM SW846 3510C	Percent Solids:	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	W035923.D	1	07/31/07	RB	07/26/07	OP21611	SW1860
Run #2							

	Initial Volume	Final Volume
Run #1	1020 ml	1.0 ml
Run #2		

BN PAH List

CAS No.	Compound	Result		RL	MDL	Units	Q
83-32-9	Acenaphthene	ND		0.98	0.49	ug/l	
208-96-8	Acenaphthylene	ND		0.98	0.49	ug/l	
120-12-7	Anthracene	ND		0.98	0.49	ug/l	
56-55-3	Benzo(a)anthracene	ND		0.20	0.049	ug/l	
50-32-8	Benzo(a)pyrene	ND		0.20	0.098	ug/l	
205-99-2	Benzo(b)fluoranthene	ND		0.20	0.049	ug/l	
191-24-2	Benzo(g,h,i)perylene	ND		0.20	0.098	ug/l	
207-08-9	Benzo(k)fluoranthene	ND		0.20	0.098	ug/l	
218-01-9	Chrysene	ND		0.20	0.098	ug/l	
53-70-3	Dibenzo(a,h)anthracene	ND		0.20	0.049	ug/l	
206-44-0	Fluoranthene	ND		0.98	0.25	ug/l	
86-73-7	Fluorene	ND		0.98	0.25	ug/l	
193-39-5	Indeno(1,2,3-cd)pyrene	ND		0.20	0.049	ug/l	
90-12-0	1-Methylnaphthalene	ND	VL	0.98	0.25	ug/l	
91-57-6	2-Methylnaphthalene	ND	VL	0.98	0.25	ug/l	
91-20-3	Naphthalene	ND		0.98	0.25	ug/l	
85-01-8	Phenanthrene	ND		0.98	0.49	ug/l	
129-00-0	Pyrene	ND		0.98	0.25	ug/l	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: R09473.D

For I COA

Accutest Laboratories

Report of Analysis

Client Sample ID:	APSD01		
Lab Sample ID:	F51154-18	Date Sampled:	07/19/07
Matrix:	SO - Sediment	Date Received:	07/19/07
Method:	SW846 8270C SW846 3550B	Percent Solids:	86.8
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	R09473.D	1	07/30/07	NJ	07/27/07	OP21634	SR448
Run #2							

	Initial Weight	Final Volume
Run #1	30.7 g	1.0 ml
Run #2		

ABN TCL List w/o PAHs

CAS No.	Compound	Result	RL	MDL	Units	Q
65-85-0	Benzoic acid	ND	940	380	ug/kg	
95-57-8	2-Chlorophenol	ND	190	38	ug/kg	
59-50-7	4-Chloro-3-methyl phenol	ND	190	38	ug/kg	
120-83-2	2,4-Dichlorophenol	ND	190	38	ug/kg	
105-67-9	2,4-Dimethylphenol	ND	190	38	ug/kg	
51-28-5	2,4-Dinitrophenol	ND	940	380	ug/kg	
534-52-1	4,6-Dinitro-o-cresol	ND	380	75	ug/kg	
95-48-7	2-Methylphenol	ND	190	38	ug/kg	
	3&4-Methylphenol	ND	190	38	ug/kg	
88-75-5	2-Nitrophenol	ND	190	38	ug/kg	
100-02-7	4-Nitrophenol	ND	940	380	ug/kg	
87-86-5	Pentachlorophenol	ND	940	380	ug/kg	
108-95-2	Phenol	ND	190	38	ug/kg	
95-95-4	2,4,5-Trichlorophenol	ND	190	38	ug/kg	
88-06-2	2,4,6-Trichlorophenol	ND	190	38	ug/kg	
101-55-3	4-Bromophenyl phenyl ether	ND	190	38	ug/kg	
85-68-7	Butyl benzyl phthalate	ND	380	94	ug/kg	
100-51-6	Benzyl Alcohol	ND	190	38	ug/kg	
91-58-7	2-Chloronaphthalene	ND	190	38	ug/kg	
106-47-8	4-Chloroaniline	ND	380	150	ug/kg	
86-74-8	Carbazole	ND	190	38	ug/kg	
111-91-1	bis(2-Chloroethoxy)methane	ND	190	38	ug/kg	
111-44-4	bis(2-Chloroethyl)ether	ND	190	75	ug/kg	
108-60-1	bis(2-Chloroisopropyl)ether	ND	190	38	ug/kg	
7005-72-3	4-Chlorophenyl phenyl ether	ND	190	38	ug/kg	
95-50-1	1,2-Dichlorobenzene	ND	190	38	ug/kg	
541-73-1	1,3-Dichlorobenzene	ND VL	190	38	ug/kg	
106-46-7	1,4-Dichlorobenzene	ND VL	190	38	ug/kg	
121-14-2	2,4-Dinitrotoluene	ND	190	75	ug/kg	
606-20-2	2,6-Dinitrotoluene	ND	190	75	ug/kg	
91-94-1	3,3'-Dichlorobenzidine	ND VL	380	190	ug/kg	
132-64-9	Dibenzofuran	ND	190	38	ug/kg	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Form I OA

Accutest Laboratories

Report of Analysis

Client Sample ID:	APSD01		
Lab Sample ID:	F51154-18	Date Sampled:	07/19/07
Matrix:	SO - Sediment	Date Received:	07/19/07
Method:	SW846 8270C SW846 3550B	Percent Solids:	86.8
Project:	WPA 019 Field Investigation; Radford AAP, VA		

ABN TCL List w/o PAHs

CAS No.	Compound	Result	RL	MDL	Units	Q
84-74-2	Di-n-butyl phthalate	ND	380	94	ug/kg	
117-84-0	Di-n-octyl phthalate	ND	380	190	ug/kg	
84-66-2	Diethyl phthalate	ND	380	94	ug/kg	
131-11-3	Dimethyl phthalate	ND	380	94	ug/kg	
117-81-7	bis(2-Ethylhexyl)phthalate	ND	380	190	ug/kg	
118-74-1	Hexachlorobenzene	ND	190	38	ug/kg	
87-68-3	Hexachlorobutadiene	ND	190	75	ug/kg	
77-47-4	Hexachlorocyclopentadiene	ND VL	190	75	ug/kg	
67-72-1	Hexachloroethane	ND VL	190	75	ug/kg	
78-59-1	Isophorone	ND	190	38	ug/kg	
88-74-4	2-Nitroaniline	ND	380	94	ug/kg	
99-09-2	3-Nitroaniline	ND	380	94	ug/kg	
100-01-6	4-Nitroaniline	ND	380	130	ug/kg	
98-95-3	Nitrobenzene	ND	190	38	ug/kg	
621-64-7	N-Nitroso-di-n-propylamine	ND	190	75	ug/kg	
86-30-6	N-Nitrosodiphenylamine	ND	190	38	ug/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	190	38	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol	66%		40-102%
4165-62-2	Phenol-d5	71%		41-100%
118-79-6	2,4,6-Tribromophenol	66%		42-108%
4165-60-0	Nitrobenzene-d5	59%		40-105%
321-60-8	2-Fluorobiphenyl	60%		43-107%
1718-51-0	Terphenyl-d14	64%		45-119%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: W035976.D

Form I OM

Accutest Laboratories

Report of Analysis

Client Sample ID:	APSD01		
Lab Sample ID:	F51154-18	Date Sampled:	07/19/07
Matrix:	SO - Sediment	Date Received:	07/19/07
Method:	SW846 8270C BY SIM SW846 3550B	Percent Solids:	86.8
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	W035976.D	4	08/01/07	RB	07/27/07	OP21636	SW1862
Run #2							

	Initial Weight	Final Volume
Run #1	30.7 g	1.0 ml
Run #2		

BN PAH List

CAS No.	Compound	Result	RL	MDL	Units	Q
83-32-9	Acenaphthene	ND	300	75	ug/kg	
208-96-8	Acenaphthylene	ND	300	75	ug/kg	
120-12-7	Anthracene	ND	300	45	ug/kg	
56-55-3	Benzo(a)anthracene	16.2 J	60	15	ug/kg	J
50-32-8	Benzo(a)pyrene	18.0 J	60	15	ug/kg	J
205-99-2	Benzo(b)fluoranthene	24.7 J	60	15	ug/kg	J
191-24-2	Benzo(g,h,i)perylene	15.1 J	60	15	ug/kg	J
207-08-9	Benzo(k)fluoranthene	15.2 J	60	15	ug/kg	J
218-01-9	Chrysene	21.1 J	60	15	ug/kg	J
53-70-3	Dibenzo(a,h)anthracene	ND	60	15	ug/kg	
206-44-0	Fluoranthene	ND	300	53	ug/kg	
86-73-7	Fluorene	ND	300	45	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	15.1 J	60	15	ug/kg	J
90-12-0	1-Methylnaphthalene	ND	300	45	ug/kg	
91-57-6	2-Methylnaphthalene	ND	300	45	ug/kg	
91-20-3	Naphthalene	ND	300	45	ug/kg	
85-01-8	Phenanthrene	ND	300	45	ug/kg	
129-00-0	Pyrene	ND	300	53	ug/kg	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: R09476.D

Form I Copy

Accutest Laboratories

Report of Analysis

Client Sample ID:	41SD11		
Lab Sample ID:	F51154-22	Date Sampled:	07/19/07
Matrix:	SO - Soil	Date Received:	07/19/07
Method:	SW846 8270C SW846 3550B	Percent Solids:	86.8
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	R09476.D	1	07/30/07	NJ	07/27/07	OP21634	SR448
Run #2							

	Initial Weight	Final Volume
Run #1	30.2 g	1.0 ml
Run #2		

ABN TCL List w/o PAHs

CAS No.	Compound	Result	RL	MDL	Units	Q
65-85-0	Benzoic acid	ND	950	380	ug/kg	
95-57-8	2-Chlorophenol	ND	190	38	ug/kg	
59-50-7	4-Chloro-3-methyl phenol	ND	190	38	ug/kg	
120-83-2	2,4-Dichlorophenol	ND	190	38	ug/kg	
105-67-9	2,4-Dimethylphenol	ND	190	38	ug/kg	
51-28-5	2,4-Dinitrophenol	ND	950	380	ug/kg	
534-52-1	4,6-Dinitro-o-cresol	ND	380	76	ug/kg	
95-48-7	2-Methylphenol	ND	190	38	ug/kg	
	3&4-Methylphenol	ND	190	38	ug/kg	
88-75-5	2-Nitrophenol	ND	190	38	ug/kg	
100-02-7	4-Nitrophenol	ND	950	380	ug/kg	
87-86-5	Pentachlorophenol	ND	950	380	ug/kg	
108-95-2	Phenol	ND	190	38	ug/kg	
95-95-4	2,4,5-Trichlorophenol	ND	190	38	ug/kg	
88-06-2	2,4,6-Trichlorophenol	ND	190	38	ug/kg	
101-55-3	4-Bromophenyl phenyl ether	ND	190	38	ug/kg	
85-68-7	Butyl benzyl phthalate	ND	380	95	ug/kg	
100-51-6	Benzyl Alcohol	ND	190	38	ug/kg	
91-58-7	2-Chloronaphthalene	ND	190	38	ug/kg	
106-47-8	4-Chloroaniline	ND	380	150	ug/kg	
86-74-8	Carbazole	ND	190	38	ug/kg	
111-91-1	bis(2-Chloroethoxy)methane	ND	190	38	ug/kg	
111-44-4	bis(2-Chloroethyl)ether	ND	190	76	ug/kg	
108-60-1	bis(2-Chloroisopropyl)ether	ND	190	38	ug/kg	
7005-72-3	4-Chlorophenyl phenyl ether	ND	190	38	ug/kg	
95-50-1	1,2-Dichlorobenzene	ND	190	38	ug/kg	
541-73-1	1,3-Dichlorobenzene	ND	190	38	ug/kg	
106-46-7	1,4-Dichlorobenzene	ND	190	38	ug/kg	
121-14-2	2,4-Dinitrotoluene	ND	190	76	ug/kg	
606-20-2	2,6-Dinitrotoluene	ND	190	76	ug/kg	
91-94-1	3,3'-Dichlorobenzidine	ND	380	190	ug/kg	
132-64-9	Dibenzofuran	ND	190	38	ug/kg	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Accutest Laboratories

Report of Analysis

Client Sample ID:	41SD11		
Lab Sample ID:	F51154-22	Date Sampled:	07/19/07
Matrix:	SO - Soil	Date Received:	07/19/07
Method:	SW846 8270C SW846 3550B	Percent Solids:	86.8
Project:	WPA 019 Field Investigation; Radford AAP, VA		

ABN TCL List w/o PAHs

CAS No.	Compound	Result	RL	MDL	Units	Q
84-74-2	Di-n-butyl phthalate	ND	380	95	ug/kg	
117-84-0	Di-n-octyl phthalate	ND	380	190	ug/kg	
84-66-2	Diethyl phthalate	ND	380	95	ug/kg	
131-11-3	Dimethyl phthalate	ND	380	95	ug/kg	
117-81-7	bis(2-Ethylhexyl)phthalate	ND	380	190	ug/kg	
118-74-1	Hexachlorobenzene	ND	190	38	ug/kg	
87-68-3	Hexachlorobutadiene	ND	190	76	ug/kg	
77-47-4	Hexachlorocyclopentadiene	ND	190	76	ug/kg	
67-72-1	Hexachloroethane	ND	190	76	ug/kg	
78-59-1	Isophorone	ND	190	38	ug/kg	
88-74-4	2-Nitroaniline	ND	380	95	ug/kg	
99-09-2	3-Nitroaniline	ND	380	95	ug/kg	
100-01-6	4-Nitroaniline	ND	380	130	ug/kg	
98-95-3	Nitrobenzene	ND	190	38	ug/kg	
621-64-7	N-Nitroso-di-n-propylamine	ND	190	76	ug/kg	
86-30-6	N-Nitrosodiphenylamine	ND	190	38	ug/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	190	38	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol	67%		40-102%
4165-62-2	Phenol-d5	72%		41-100%
118-79-6	2,4,6-Tribromophenol	70%		42-108%
4165-60-0	Nitrobenzene-d5	64%		40-105%
321-60-8	2-Fluorobiphenyl	63%		43-107%
1718-51-0	Terphenyl-d14	82%		45-119%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: W035977.D

Form I Org

Accutest Laboratories

Report of Analysis

Client Sample ID:	41SD11		
Lab Sample ID:	F51154-22	Date Sampled:	07/19/07
Matrix:	SO - Soil	Date Received:	07/19/07
Method:	SW846 8270C BY SIM SW846 3550B	Percent Solids:	86.8
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	W035977.D	4	08/01/07	RB	07/27/07	OP21636	SW1862
Run #2							

	Initial Weight	Final Volume
Run #1	30.2 g	1.0 ml
Run #2		

BN PAH List

CAS No.	Compound	Result	RL	MDL	Units	Q
83-32-9	Acenaphthene	ND	310	76	ug/kg	
208-96-8	Acenaphthylene	ND	310	76	ug/kg	
120-12-7	Anthracene	ND	310	46	ug/kg	
56-55-3	Benzo(a)anthracene	ND	61	15	ug/kg	
50-32-8	Benzo(a)pyrene	ND	61	15	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	61	15	ug/kg	
191-24-2	Benzo(g,h,i)perylene	ND	61	15	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	61	15	ug/kg	
218-01-9	Chrysene	ND	61	15	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	61	15	ug/kg	
206-44-0	Fluoranthene	ND	310	53	ug/kg	
86-73-7	Fluorene	ND	310	46	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	61	15	ug/kg	
90-12-0	1-Methylnaphthalene	ND	310	46	ug/kg	
91-57-6	2-Methylnaphthalene	ND	310	46	ug/kg	
91-20-3	Naphthalene	ND	310	46	ug/kg	
85-01-8	Phenanthrene	ND	310	46	ug/kg	
129-00-0	Pyrene	ND	310	53	ug/kg	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Form I OR

Accutest Laboratories

Report of Analysis

Client Sample ID:	49SS02		
Lab Sample ID:	F51154-23	Date Sampled:	07/19/07
Matrix:	SO - Soil	Date Received:	07/19/07
Method:	SW846 8270C SW846 3550B	Percent Solids:	89.6
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	R09477.D	1	07/30/07	NJ	07/27/07	OP21634	SR448
Run #2							

	Initial Weight	Final Volume
Run #1	30.0 g	1.0 ml
Run #2		

ABN TCL List w/o PAHs

CAS No.	Compound	Result	RL	MDL	Units	Q
65-85-0	Benzoic acid	ND	930	370	ug/kg	
95-57-8	2-Chlorophenol	ND	190	37	ug/kg	
59-50-7	4-Chloro-3-methyl phenol	ND	190	37	ug/kg	
120-83-2	2,4-Dichlorophenol	ND	190	37	ug/kg	
105-67-9	2,4-Dimethylphenol	ND	190	37	ug/kg	
51-28-5	2,4-Dinitrophenol	ND	930	370	ug/kg	
534-52-1	4,6-Dinitro-o-cresol	ND	370	74	ug/kg	
95-48-7	2-Methylphenol	ND	190	37	ug/kg	
	3&4-Methylphenol	ND	190	37	ug/kg	
88-75-5	2-Nitrophenol	ND	190	37	ug/kg	
100-02-7	4-Nitrophenol	ND	930	370	ug/kg	
87-86-5	Pentachlorophenol	ND	930	370	ug/kg	
108-95-2	Phenol	ND	190	37	ug/kg	
95-95-4	2,4,5-Trichlorophenol	ND	190	37	ug/kg	
88-06-2	2,4,6-Trichlorophenol	ND	190	37	ug/kg	
101-55-3	4-Bromophenyl phenyl ether	ND	190	37	ug/kg	
85-68-7	Butyl benzyl phthalate	ND	370	93	ug/kg	
100-51-6	Benzyl Alcohol	ND	190	37	ug/kg	
91-58-7	2-Chloronaphthalene	ND	190	37	ug/kg	
106-47-8	4-Chloroaniline	ND	370	150	ug/kg	
86-74-8	Carbazole	ND	190	37	ug/kg	
111-91-1	bis(2-Chloroethoxy)methane	ND	190	37	ug/kg	
111-44-4	bis(2-Chloroethyl)ether	ND	190	74	ug/kg	
108-60-1	bis(2-Chloroisopropyl)ether	ND	190	37	ug/kg	
7005-72-3	4-Chlorophenyl phenyl ether	ND	190	37	ug/kg	
95-50-1	1,2-Dichlorobenzene	ND	190	37	ug/kg	
541-73-1	1,3-Dichlorobenzene	ND	190	37	ug/kg	
106-46-7	1,4-Dichlorobenzene	ND	190	37	ug/kg	
121-14-2	2,4-Dinitrotoluene	ND	190	74	ug/kg	
606-20-2	2,6-Dinitrotoluene	ND	190	74	ug/kg	
91-94-1	3,3'-Dichlorobenzidine	ND	370	190	ug/kg	
132-64-9	Dibenzofuran	ND	190	37	ug/kg	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Form I copy

Accutest Laboratories

Report of Analysis

Client Sample ID:	49SS02		
Lab Sample ID:	F51154-23	Date Sampled:	07/19/07
Matrix:	SO - Soil	Date Received:	07/19/07
Method:	SW846 8270C SW846 3550B	Percent Solids:	89.6
Project:	WPA 019 Field Investigation; Radford AAP, VA		

ABN TCL List w/o PAHs

CAS No.	Compound	Result	RL	MDL	Units	Q
84-74-2	Di-n-butyl phthalate	123 J	370	93	ug/kg	J
117-84-0	Di-n-octyl phthalate	ND	370	190	ug/kg	
84-66-2	Diethyl phthalate	ND	370	93	ug/kg	
131-11-3	Dimethyl phthalate	ND	370	93	ug/kg	
117-81-7	bis(2-Ethylhexyl)phthalate	ND	370	190	ug/kg	
118-74-1	Hexachlorobenzene	ND	190	37	ug/kg	
87-68-3	Hexachlorobutadiene	ND	190	74	ug/kg	
77-47-4	Hexachlorocyclopentadiene	ND	190	74	ug/kg	
67-72-1	Hexachloroethane	ND	190	74	ug/kg	
78-59-1	Isophorone	ND	190	37	ug/kg	
88-74-4	2-Nitroaniline	ND	370	93	ug/kg	
99-09-2	3-Nitroaniline	ND	370	93	ug/kg	
100-01-6	4-Nitroaniline	ND	370	130	ug/kg	
98-95-3	Nitrobenzene	ND	190	37	ug/kg	
621-64-7	N-Nitroso-di-n-propylamine	ND	190	74	ug/kg	
86-30-6	N-Nitrosodiphenylamine	ND	190	37	ug/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	190	37	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol	69%		40-102%
4165-62-2	Phenol-d5	79%		41-100%
118-79-6	2,4,6-Tribromophenol	79%		42-108%
4165-60-0	Nitrobenzene-d5	66%		40-105%
321-60-8	2-Fluorobiphenyl	74%		43-107%
1718-51-0	Terphenyl-d14	77%		45-119%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: W035978.D

Form I Cpy

Accutest Laboratories

Report of Analysis

Client Sample ID:	49SS02		
Lab Sample ID:	F51154-23	Date Sampled:	07/19/07
Matrix:	SO - Soil	Date Received:	07/19/07
Method:	SW846 8270C BY SIM SW846 3550B	Percent Solids:	89.6
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	W035978.D	4	08/01/07	RB	07/27/07	OP21636	SW1862
Run #2							

	Initial Weight	Final Volume
Run #1	30.0 g	1.0 ml
Run #2		

BN PAH List

CAS No.	Compound	Result	RL	MDL	Units	Q
83-32-9	Acenaphthene	ND	300	74	ug/kg	
208-96-8	Acenaphthylene	ND	300	74	ug/kg	
120-12-7	Anthracene	ND	300	45	ug/kg	
56-55-3	Benzo(a)anthracene	ND	60	15	ug/kg	
50-32-8	Benzo(a)pyrene	ND	60	15	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	60	15	ug/kg	
191-24-2	Benzo(g,h,i)perylene	ND	60	15	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	60	15	ug/kg	
218-01-9	Chrysene	17.1 J	60	15	ug/kg	J
53-70-3	Dibenzo(a,h)anthracene	ND	60	15	ug/kg	
206-44-0	Fluoranthene	ND	300	52	ug/kg	
86-73-7	Fluorene	ND	300	45	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	60	15	ug/kg	
90-12-0	1-Methylnaphthalene	65.4 J	300	45	ug/kg	J
91-57-6	2-Methylnaphthalene	117 J	300	45	ug/kg	J
91-20-3	Naphthalene	ND	300	45	ug/kg	
85-01-8	Phenanthrene	75.1 J	300	45	ug/kg	J
129-00-0	Pyrene	ND	300	52	ug/kg	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: R09478.D U003771.D

Run I OR

Accutest Laboratories

Report of Analysis

Client Sample ID:	49SS03		
Lab Sample ID:	F51154-24	Date Sampled:	07/19/07
Matrix:	SO - Soil	Date Received:	07/19/07
Method:	SW846 8270C SW846 3550B	Percent Solids:	92.0
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	R09478.D	1	07/30/07	NJ	07/27/07	OP21634	SR448
Run #2 [b]	U003771.D	1	08/06/07	NJ	08/03/07	OP21735	SU184

	Initial Weight	Final Volume
Run #1	30.0 g	1.0 ml
Run #2	30.0 g	1.0 ml

ABN TCL List w/o PAHs

CAS No.	Compound	Result	RL	MDL	Units	Q
65-85-0	Benzoic acid	ND	910	360	ug/kg	
95-57-8	2-Chlorophenol	ND	180	36	ug/kg	
59-50-7	4-Chloro-3-methyl phenol	ND	180	36	ug/kg	
120-83-2	2,4-Dichlorophenol	ND	180	36	ug/kg	
105-67-9	2,4-Dimethylphenol	ND	180	36	ug/kg	
51-28-5	2,4-Dinitrophenol	ND	910	360	ug/kg	
534-52-1	4,6-Dinitro-o-cresol	ND	360	72	ug/kg	
95-48-7	2-Methylphenol	ND	180	36	ug/kg	
	3&4-Methylphenol	ND	180	36	ug/kg	
88-75-5	2-Nitrophenol	ND	180	36	ug/kg	
100-02-7	4-Nitrophenol	ND	910	360	ug/kg	
87-86-5	Pentachlorophenol	ND	910	360	ug/kg	
108-95-2	Phenol	ND	180	36	ug/kg	
95-95-4	2,4,5-Trichlorophenol	ND	180	36	ug/kg	
88-06-2	2,4,6-Trichlorophenol	ND	180	36	ug/kg	
101-55-3	4-Bromophenyl phenyl ether	ND	180	36	ug/kg	
85-68-7	Butyl benzyl phthalate	ND	360	91	ug/kg	
100-51-6	Benzyl Alcohol	ND	180	36	ug/kg	
91-58-7	2-Chloronaphthalene	ND	180	36	ug/kg	
106-47-8	4-Chloroaniline	ND	360	140	ug/kg	
86-74-8	Carbazole	ND	180	36	ug/kg	
111-91-1	bis(2-Chloroethoxy)methane	ND	180	36	ug/kg	
111-44-4	bis(2-Chloroethyl)ether	ND	180	72	ug/kg	
108-60-1	bis(2-Chloroisopropyl)ether	ND	180	36	ug/kg	
7005-72-3	4-Chlorophenyl phenyl ether	ND	180	36	ug/kg	
95-50-1	1,2-Dichlorobenzene	ND	180	36	ug/kg	
541-73-1	1,3-Dichlorobenzene	ND	180	36	ug/kg	
106-46-7	1,4-Dichlorobenzene	ND	180	36	ug/kg	
121-14-2	2,4-Dinitrotoluene	ND	180	72	ug/kg	
606-20-2	2,6-Dinitrotoluene	ND	180	72	ug/kg	
91-94-1	3,3'-Dichlorobenzidine	ND	360	180	ug/kg	
132-64-9	Dibenzofuran	ND	180	36	ug/kg	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Form I copy

Accutest Laboratories

Report of Analysis

Client Sample ID:	49SS03		
Lab Sample ID:	F51154-24	Date Sampled:	07/19/07
Matrix:	SO - Soil	Date Received:	07/19/07
Method:	SW846 8270C SW846 3550B	Percent Solids:	92.0
Project:	WPA 019 Field Investigation; Radford AAP, VA		

ABN TCL List w/o PAHs

CAS No.	Compound	Result	RL	MDL	Units	Q
84-74-2	Di-n-butyl phthalate	128 J	360	91	ug/kg	J
117-84-0	Di-n-octyl phthalate	ND	360	180	ug/kg	
84-66-2	Diethyl phthalate	ND	360	91	ug/kg	
131-11-3	Dimethyl phthalate	ND	360	91	ug/kg	
117-81-7	bis(2-Ethylhexyl)phthalate	ND	360	180	ug/kg	
118-74-1	Hexachlorobenzene	ND	180	36	ug/kg	
87-68-3	Hexachlorobutadiene	ND	180	72	ug/kg	
77-47-4	Hexachlorocyclopentadiene	ND	180	72	ug/kg	
67-72-1	Hexachloroethane	ND	180	72	ug/kg	
78-59-1	Isophorone	ND	180	36	ug/kg	
88-74-4	2-Nitroaniline	ND	360	91	ug/kg	
99-09-2	3-Nitroaniline	ND	360	91	ug/kg	
100-01-6	4-Nitroaniline	ND	360	130	ug/kg	
98-95-3	Nitrobenzene	ND	180	36	ug/kg	
621-64-7	N-Nitroso-di-n-propylamine	ND	180	72	ug/kg	
86-30-6	N-Nitrosodiphenylamine	ND	180	36	ug/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	180	36	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol	45%	53%	40-102%
4165-62-2	Phenol-d5	48%	62%	41-100%
118-79-6	2,4,6-Tribromophenol	41%	59%	42-108%
4165-60-0	Nitrobenzene-d5	50%	56%	40-105%
321-60-8	2-Fluorobiphenyl	49%	60%	43-107%
1718-51-0	Terphenyl-d14	51%	64%	45-119%

(a) All hits confirmed by re-extraction and reanalysis beyond holdtime.
(b) Confirmation run.

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Form I OM

Accutest Laboratories

Report of Analysis

Client Sample ID:	49SS03		
Lab Sample ID:	F51154-24	Date Sampled:	07/19/07
Matrix:	SO - Soil	Date Received:	07/19/07
Method:	SW846 8270C BY SIM SW846 3550B	Percent Solids:	92.0
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	W035979.D	4	08/01/07	RB	07/27/07	OP21636	SW1862
Run #2							

	Initial Weight	Final Volume
Run #1	30.0 g	1.0 ml
Run #2		

BN PAH List

CAS No.	Compound	Result	RL	MDL	Units	Q
83-32-9	Acenaphthene	ND	290	72	ug/kg	
208-96-8	Acenaphthylene	ND	290	72	ug/kg	
120-12-7	Anthracene	ND	290	43	ug/kg	
56-55-3	Benzo(a)anthracene	ND	58	14	ug/kg	
50-32-8	Benzo(a)pyrene	ND	58	14	ug/kg	
205-99-2	Benzo(b)fluoranthene	21.1 J	58	14	ug/kg	J
191-24-2	Benzo(g,h,i)perylene	ND	58	14	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	58	14	ug/kg	
218-01-9	Chrysene	22.9 J	58	14	ug/kg	J
53-70-3	Dibenzo(a,h)anthracene	ND	58	14	ug/kg	
206-44-0	Fluoranthene	ND	290	51	ug/kg	
86-73-7	Fluorene	ND	290	43	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	58	14	ug/kg	
90-12-0	1-Methylnaphthalene	49.5 J	290	43	ug/kg	J
91-57-6	2-Methylnaphthalene	60.7 J	290	43	ug/kg	J
91-20-3	Naphthalene	ND	290	43	ug/kg	
85-01-8	Phenanthrene	60.9 J	290	43	ug/kg	J
129-00-0	Pyrene	ND	290	51	ug/kg	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: R09479.D

Form I OM

Accutest Laboratories

Report of Analysis

Client Sample ID:	49SS04		
Lab Sample ID:	F51154-25	Date Sampled:	07/19/07
Matrix:	SO - Soil	Date Received:	07/19/07
Method:	SW846 8270C SW846 3550B	Percent Solids:	87.5
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	R09479.D	1	07/30/07	NJ	07/27/07	OP21634	SR448
Run #2							

	Initial Weight	Final Volume
Run #1	30.1 g	1.0 ml
Run #2		

ABN TCL List w/o PAHs

CAS No.	Compound	Result	RL	MDL	Units	Q
65-85-0	Benzoic acid	ND	950	380	ug/kg	
95-57-8	2-Chlorophenol	ND	190	38	ug/kg	
59-50-7	4-Chloro-3-methyl phenol	ND	190	38	ug/kg	
120-83-2	2,4-Dichlorophenol	ND	190	38	ug/kg	
105-67-9	2,4-Dimethylphenol	ND	190	38	ug/kg	
51-28-5	2,4-Dinitrophenol	ND	950	380	ug/kg	
534-52-1	4,6-Dinitro-o-cresol	ND	380	76	ug/kg	
95-48-7	2-Methylphenol	ND	190	38	ug/kg	
	3&4-Methylphenol	ND	190	38	ug/kg	
88-75-5	2-Nitrophenol	ND	190	38	ug/kg	
100-02-7	4-Nitrophenol	ND	950	380	ug/kg	
87-86-5	Pentachlorophenol	ND	950	380	ug/kg	
108-95-2	Phenol	ND	190	38	ug/kg	
95-95-4	2,4,5-Trichlorophenol	ND	190	38	ug/kg	
88-06-2	2,4,6-Trichlorophenol	ND	190	38	ug/kg	
101-55-3	4-Bromophenyl phenyl ether	ND	190	38	ug/kg	
85-68-7	Butyl benzyl phthalate	ND	380	95	ug/kg	
100-51-6	Benzyl Alcohol	ND	190	38	ug/kg	
91-58-7	2-Chloronaphthalene	ND	190	38	ug/kg	
106-47-8	4-Chloroaniline	ND	380	150	ug/kg	
86-74-8	Carbazole	ND	190	38	ug/kg	
111-91-1	bis(2-Chloroethoxy)methane	ND	190	38	ug/kg	
111-44-4	bis(2-Chloroethyl)ether	ND	190	76	ug/kg	
108-60-1	bis(2-Chloroisopropyl)ether	ND	190	38	ug/kg	
7005-72-3	4-Chlorophenyl phenyl ether	ND	190	38	ug/kg	
95-50-1	1,2-Dichlorobenzene	ND	190	38	ug/kg	
541-73-1	1,3-Dichlorobenzene	ND	190	38	ug/kg	
106-46-7	1,4-Dichlorobenzene	ND	190	38	ug/kg	
121-14-2	2,4-Dinitrotoluene	ND	190	76	ug/kg	
606-20-2	2,6-Dinitrotoluene	ND	190	76	ug/kg	
91-94-1	3,3'-Dichlorobenzidine	ND	380	190	ug/kg	
132-64-9	Dibenzofuran	ND	190	38	ug/kg	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Form I OR

Accutest Laboratories

Report of Analysis

Client Sample ID:	49SS04		
Lab Sample ID:	F51154-25	Date Sampled:	07/19/07
Matrix:	SO - Soil	Date Received:	07/19/07
Method:	SW846 8270C SW846 3550B	Percent Solids:	87.5
Project:	WPA 019 Field Investigation; Radford AAP, VA		

ABN TCL List w/o PAHs

CAS No.	Compound	Result	RL	MDL	Units	Q
84-74-2	Di-n-butyl phthalate	ND	380	95	ug/kg	
117-84-0	Di-n-octyl phthalate	ND	380	190	ug/kg	
84-66-2	Diethyl phthalate	ND	380	95	ug/kg	
131-11-3	Dimethyl phthalate	ND	380	95	ug/kg	
117-81-7	bis(2-Ethylhexyl)phthalate	ND	380	190	ug/kg	
118-74-1	Hexachlorobenzene	ND	190	38	ug/kg	
87-68-3	Hexachlorobutadiene	ND	190	76	ug/kg	
77-47-4	Hexachlorocyclopentadiene	ND	190	76	ug/kg	
67-72-1	Hexachloroethane	ND	190	76	ug/kg	
78-59-1	Isophorone	ND	190	38	ug/kg	
88-74-4	2-Nitroaniline	ND	380	95	ug/kg	
99-09-2	3-Nitroaniline	ND	380	95	ug/kg	
100-01-6	4-Nitroaniline	ND	380	130	ug/kg	
98-95-3	Nitrobenzene	ND	190	38	ug/kg	
621-64-7	N-Nitroso-di-n-propylamine	ND	190	76	ug/kg	
86-30-6	N-Nitrosodiphenylamine	ND	190	38	ug/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	190	38	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol	73%		40-102%
4165-62-2	Phenol-d5	78%		41-100%
118-79-6	2,4,6-Tribromophenol	82%		42-108%
4165-60-0	Nitrobenzene-d5	69%		40-105%
321-60-8	2-Fluorobiphenyl	70%		43-107%
1718-51-0	Terphenyl-d14	83%		45-119%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: W035980.D

Accutest Laboratories

Report of Analysis

Client Sample ID:	49SS04		
Lab Sample ID:	F51154-25	Date Sampled:	07/19/07
Matrix:	SO - Soil	Date Received:	07/19/07
Method:	SW846 8270C BY SIM SW846 3550B	Percent Solids:	87.5
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	W035980.D	4	08/01/07	RB	07/27/07	OP21636	SW1862
Run #2							

	Initial Weight	Final Volume
Run #1	30.1 g	1.0 ml
Run #2		

BN PAH List

CAS No.	Compound	Result	RL	MDL	Units	Q
83-32-9	Acenaphthene	ND	300	76	ug/kg	
208-96-8	Acenaphthylene	ND	300	76	ug/kg	
120-12-7	Anthracene	ND	300	46	ug/kg	
56-55-3	Benzo(a)anthracene	ND	61	15	ug/kg	
50-32-8	Benzo(a)pyrene	ND	61	15	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	61	15	ug/kg	
191-24-2	Benzo(g,h,i)perylene	ND	61	15	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	61	15	ug/kg	
218-01-9	Chrysene	ND	61	15	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	61	15	ug/kg	
206-44-0	Fluoranthene	ND	300	53	ug/kg	
86-73-7	Fluorene	ND	300	46	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	61	15	ug/kg	
90-12-0	1-Methylnaphthalene	ND	300	46	ug/kg	
91-57-6	2-Methylnaphthalene	ND	300	46	ug/kg	
91-20-3	Naphthalene	ND	300	46	ug/kg	
85-01-8	Phenanthrene	ND	300	46	ug/kg	
129-00-0	Pyrene	ND	300	53	ug/kg	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: R09480.D

Form I OR

Accutest Laboratories

Report of Analysis

Client Sample ID:	49SS05		
Lab Sample ID:	F51154-26	Date Sampled:	07/19/07
Matrix:	SO - Soil	Date Received:	07/19/07
Method:	SW846 8270C SW846 3550B	Percent Solids:	85.9
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	R09480.D	1	07/30/07	NJ	07/27/07	OP21634	SR448
Run #2							

	Initial Weight	Final Volume
Run #1	30.6 g	1.0 ml
Run #2		

ABN TCL List w/o PAHs

CAS No.	Compound	Result	RL	MDL	Units	Q
65-85-0	Benzoic acid	ND	950	380	ug/kg	
95-57-8	2-Chlorophenol	ND	190	38	ug/kg	
59-50-7	4-Chloro-3-methyl phenol	ND	190	38	ug/kg	
120-83-2	2,4-Dichlorophenol	ND	190	38	ug/kg	
105-67-9	2,4-Dimethylphenol	ND	190	38	ug/kg	
51-28-5	2,4-Dinitrophenol	ND	950	380	ug/kg	
534-52-1	4,6-Dinitro-o-cresol	ND	380	76	ug/kg	
95-48-7	2-Methylphenol	ND	190	38	ug/kg	
	3&4-Methylphenol	ND	190	38	ug/kg	
88-75-5	2-Nitrophenol	ND	190	38	ug/kg	
100-02-7	4-Nitrophenol	ND	950	380	ug/kg	
87-86-5	Pentachlorophenol	ND	950	380	ug/kg	
108-95-2	Phenol	ND	190	38	ug/kg	
95-95-4	2,4,5-Trichlorophenol	ND	190	38	ug/kg	
88-06-2	2,4,6-Trichlorophenol	ND	190	38	ug/kg	
101-55-3	4-Bromophenyl phenyl ether	ND	190	38	ug/kg	
85-68-7	Butyl benzyl phthalate	ND	380	95	ug/kg	
100-51-6	Benzyl Alcohol	ND	190	38	ug/kg	
91-58-7	2-Chloronaphthalene	ND	190	38	ug/kg	
106-47-8	4-Chloroaniline	ND	380	150	ug/kg	
86-74-8	Carbazole	ND	190	38	ug/kg	
111-91-1	bis(2-Chloroethoxy)methane	ND	190	38	ug/kg	
111-44-4	bis(2-Chloroethyl)ether	ND	190	76	ug/kg	
108-60-1	bis(2-Chloroisopropyl)ether	ND	190	38	ug/kg	
7005-72-3	4-Chlorophenyl phenyl ether	ND	190	38	ug/kg	
95-50-1	1,2-Dichlorobenzene	ND	190	38	ug/kg	
541-73-1	1,3-Dichlorobenzene	ND	190	38	ug/kg	
106-46-7	1,4-Dichlorobenzene	ND	190	38	ug/kg	
121-14-2	2,4-Dinitrotoluene	ND	190	76	ug/kg	
606-20-2	2,6-Dinitrotoluene	ND	190	76	ug/kg	
91-94-1	3,3'-Dichlorobenzidine	ND	380	190	ug/kg	
132-64-9	Dibenzofuran	ND	190	38	ug/kg	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	49SS05		
Lab Sample ID:	F51154-26	Date Sampled:	07/19/07
Matrix:	SO - Soil	Date Received:	07/19/07
Method:	SW846 8270C SW846 3550B	Percent Solids:	85.9
Project:	WPA 019 Field Investigation; Radford AAP, VA		

ABN TCL List w/o PAHs

CAS No.	Compound	Result	RL	MDL	Units	Q
84-74-2	Di-n-butyl phthalate	ND	380	95	ug/kg	
117-84-0	Di-n-octyl phthalate	ND	380	190	ug/kg	
84-66-2	Diethyl phthalate	ND	380	95	ug/kg	
131-11-3	Dimethyl phthalate	ND	380	95	ug/kg	
117-81-7	bis(2-Ethylhexyl)phthalate	ND	380	190	ug/kg	
118-74-1	Hexachlorobenzene	ND	190	38	ug/kg	
87-68-3	Hexachlorobutadiene	ND	190	76	ug/kg	
77-47-4	Hexachlorocyclopentadiene	ND	190	76	ug/kg	
67-72-1	Hexachloroethane	ND	190	76	ug/kg	
78-59-1	Isophorone	ND	190	38	ug/kg	
88-74-4	2-Nitroaniline	ND	380	95	ug/kg	
99-09-2	3-Nitroaniline	ND	380	95	ug/kg	
100-01-6	4-Nitroaniline	ND	380	130	ug/kg	
98-95-3	Nitrobenzene	ND	190	38	ug/kg	
621-64-7	N-Nitroso-di-n-propylamine	ND	190	76	ug/kg	
86-30-6	N-Nitrosodiphenylamine	ND	190	38	ug/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	190	38	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol	64%		40-102%
4165-62-2	Phenol-d5	69%		41-100%
118-79-6	2,4,6-Tribromophenol	66%		42-108%
4165-60-0	Nitrobenzene-d5	59%		40-105%
321-60-8	2-Fluorobiphenyl	60%		43-107%
1718-51-0	Terphenyl-d14	66%		45-119%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: W035981.D

Form I OR

Accutest Laboratories

Report of Analysis

Client Sample ID:	49SS05		
Lab Sample ID:	F51154-26	Date Sampled:	07/19/07
Matrix:	SO - Soil	Date Received:	07/19/07
Method:	SW846 8270C BY SIM SW846 3550B	Percent Solids:	85.9
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	W035981.D	4	08/01/07	RB	07/27/07	OP21636	SW1862
Run #2							

	Initial Weight	Final Volume
Run #1	30.6 g	1.0 ml
Run #2		

BN PAH List

CAS No.	Compound	Result	RL	MDL	Units	Q
83-32-9	Acenaphthene	ND	300	76	ug/kg	
208-96-8	Acenaphthylene	ND	300	76	ug/kg	
120-12-7	Anthracene	ND	300	46	ug/kg	
56-55-3	Benzo(a)anthracene	ND	61	15	ug/kg	
50-32-8	Benzo(a)pyrene	ND	61	15	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	61	15	ug/kg	
191-24-2	Benzo(g,h,i)perylene	ND	61	15	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	61	15	ug/kg	
218-01-9	Chrysene	ND	61	15	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	61	15	ug/kg	
206-44-0	Fluoranthene	ND	300	53	ug/kg	
86-73-7	Fluorene	ND	300	46	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	61	15	ug/kg	
90-12-0	1-Methylnaphthalene	ND	300	46	ug/kg	
91-57-6	2-Methylnaphthalene	ND	300	46	ug/kg	
91-20-3	Naphthalene	ND	300	46	ug/kg	
85-01-8	Phenanthrene	ND	300	46	ug/kg	
129-00-0	Pyrene	ND	300	53	ug/kg	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: R09481.D

Form I copy

Accutest Laboratories

Report of Analysis

Client Sample ID:	59SS06		
Lab Sample ID:	F51154-27	Date Sampled:	07/19/07
Matrix:	SO - Soil	Date Received:	07/19/07
Method:	SW846 8270C SW846 3550B	Percent Solids:	92.0
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	R09481.D	1	07/30/07	NJ	07/27/07	OP21634	SR448
Run #2							

	Initial Weight	Final Volume
Run #1	30.1 g	1.0 ml
Run #2		

ABN TCL List w/o PAHs

CAS No.	Compound	Result	RL	MDL	Units	Q
65-85-0	Benzoic acid	ND	900	360	ug/kg	
95-57-8	2-Chlorophenol	ND	180	36	ug/kg	
59-50-7	4-Chloro-3-methyl phenol	ND	180	36	ug/kg	
120-83-2	2,4-Dichlorophenol	ND	180	36	ug/kg	
105-67-9	2,4-Dimethylphenol	ND	180	36	ug/kg	
51-28-5	2,4-Dinitrophenol	ND	900	360	ug/kg	
534-52-1	4,6-Dinitro-o-cresol	ND	360	72	ug/kg	
95-48-7	2-Methylphenol	ND	180	36	ug/kg	
	3&4-Methylphenol	ND	180	36	ug/kg	
88-75-5	2-Nitrophenol	ND	180	36	ug/kg	
100-02-7	4-Nitrophenol	ND	900	360	ug/kg	
87-86-5	Pentachlorophenol	ND	900	360	ug/kg	
108-95-2	Phenol	ND	180	36	ug/kg	
95-95-4	2,4,5-Trichlorophenol	ND	180	36	ug/kg	
88-06-2	2,4,6-Trichlorophenol	ND	180	36	ug/kg	
101-55-3	4-Bromophenyl phenyl ether	ND	180	36	ug/kg	
85-68-7	Butyl benzyl phthalate	ND	360	90	ug/kg	
100-51-6	Benzyl Alcohol	ND	180	36	ug/kg	
91-58-7	2-Chloronaphthalene	ND	180	36	ug/kg	
106-47-8	4-Chloroaniline	ND	360	140	ug/kg	
86-74-8	Carbazole	ND	180	36	ug/kg	
111-91-1	bis(2-Chloroethoxy)methane	ND	180	36	ug/kg	
111-44-4	bis(2-Chloroethyl)ether	ND	180	72	ug/kg	
108-60-1	bis(2-Chloroisopropyl)ether	ND	180	36	ug/kg	
7005-72-3	4-Chlorophenyl phenyl ether	ND	180	36	ug/kg	
95-50-1	1,2-Dichlorobenzene	ND	180	36	ug/kg	
541-73-1	1,3-Dichlorobenzene	ND	180	36	ug/kg	
106-46-7	1,4-Dichlorobenzene	ND	180	36	ug/kg	
121-14-2	2,4-Dinitrotoluene	ND	180	72	ug/kg	
606-20-2	2,6-Dinitrotoluene	ND	180	72	ug/kg	
91-94-1	3,3'-Dichlorobenzidine	ND	360	180	ug/kg	
132-64-9	Dibenzofuran	ND	180	36	ug/kg	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Form I Corr

Accutest Laboratories

Report of Analysis

Client Sample ID:	59SS06		
Lab Sample ID:	F51154-27	Date Sampled:	07/19/07
Matrix:	SO - Soil	Date Received:	07/19/07
Method:	SW846 8270C SW846 3550B	Percent Solids:	92.0
Project:	WPA 019 Field Investigation; Radford AAP, VA		

ABN TCL List w/o PAHs

CAS No.	Compound	Result	RL	MDL	Units	Q
84-74-2	Di-n-butyl phthalate	ND	360	90	ug/kg	
117-84-0	Di-n-octyl phthalate	ND	360	180	ug/kg	
84-66-2	Diethyl phthalate	ND	360	90	ug/kg	
131-11-3	Dimethyl phthalate	ND	360	90	ug/kg	
117-81-7	bis(2-Ethylhexyl)phthalate	ND	360	180	ug/kg	
118-74-1	Hexachlorobenzene	ND	180	36	ug/kg	
87-68-3	Hexachlorobutadiene	ND	180	72	ug/kg	
77-47-4	Hexachlorocyclopentadiene	ND	180	72	ug/kg	
67-72-1	Hexachloroethane	ND	180	72	ug/kg	
78-59-1	Isophorone	ND	180	36	ug/kg	
88-74-4	2-Nitroaniline	ND	360	90	ug/kg	
99-09-2	3-Nitroaniline	ND	360	90	ug/kg	
100-01-6	4-Nitroaniline	ND	360	130	ug/kg	
98-95-3	Nitrobenzene	ND	180	36	ug/kg	
621-64-7	N-Nitroso-di-n-propylamine	ND	180	72	ug/kg	
86-30-6	N-Nitrosodiphenylamine	ND	180	36	ug/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	180	36	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol	60%		40-102%
4165-62-2	Phenol-d5	67%		41-100%
118-79-6	2,4,6-Tribromophenol	73%		42-108%
4165-60-0	Nitrobenzene-d5	59%		40-105%
321-60-8	2-Fluorobiphenyl	63%		43-107%
1718-51-0	Terphenyl-d14	75%		45-119%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: W035982.D

Accutest Laboratories

Report of Analysis

Client Sample ID:	59SS06		
Lab Sample ID:	F51154-27	Date Sampled:	07/19/07
Matrix:	SO - Soil	Date Received:	07/19/07
Method:	SW846 8270C BY SIM SW846 3550B	Percent Solids:	92.0
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	W035982.D	4	08/01/07	RB	07/27/07	OP21636	SW1862
Run #2							

	Initial Weight	Final Volume
Run #1	30.1 g	1.0 ml
Run #2		

BN PAH List

CAS No.	Compound	Result	RL	MDL	Units	Q
83-32-9	Acenaphthene	ND	290	72	ug/kg	
208-96-8	Acenaphthylene	ND	290	72	ug/kg	
120-12-7	Anthracene	ND	290	43	ug/kg	
56-55-3	Benzo(a)anthracene	38.2 J	58	14	ug/kg	J
50-32-8	Benzo(a)pyrene	35.6 J	58	14	ug/kg	J
205-99-2	Benzo(b)fluoranthene	42.4 J	58	14	ug/kg	J
191-24-2	Benzo(g,h,i)perylene	18.9 J	58	14	ug/kg	J
207-08-9	Benzo(k)fluoranthene	31.1 J	58	14	ug/kg	J
218-01-9	Chrysene	40.1 J	58	14	ug/kg	J
53-70-3	Dibenzo(a,h)anthracene	ND	58	14	ug/kg	
206-44-0	Fluoranthene	90.6 J	290	51	ug/kg	J
86-73-7	Fluorene	ND	290	43	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	21.3 J	58	14	ug/kg	J
90-12-0	1-Methylnaphthalene	ND	290	43	ug/kg	
91-57-6	2-Methylnaphthalene	ND	290	43	ug/kg	
91-20-3	Naphthalene	ND	290	43	ug/kg	
85-01-8	Phenanthrene	67.0 J	290	43	ug/kg	J
129-00-0	Pyrene	83.8 J	290	51	ug/kg	J

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: R09482.D

Form I copy

Accutest Laboratories

Report of Analysis

Client Sample ID:	59SS07		
Lab Sample ID:	F51154-28	Date Sampled:	07/19/07
Matrix:	SO - Soil	Date Received:	07/19/07
Method:	SW846 8270C SW846 3550B	Percent Solids:	91.6
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	R09482.D	1	07/30/07	NJ	07/27/07	OP21634	SR448
Run #2							

	Initial Weight	Final Volume
Run #1	30.7 g	1.0 ml
Run #2		

ABN TCL List w/o PAHs

CAS No.	Compound	Result	RL	MDL	Units	Q
65-85-0	Benzoic acid	ND	890	360	ug/kg	
95-57-8	2-Chlorophenol	ND	180	36	ug/kg	
59-50-7	4-Chloro-3-methyl phenol	ND	180	36	ug/kg	
120-83-2	2,4-Dichlorophenol	ND	180	36	ug/kg	
105-67-9	2,4-Dimethylphenol	ND	180	36	ug/kg	
51-28-5	2,4-Dinitrophenol	ND	890	360	ug/kg	
534-52-1	4,6-Dinitro-o-cresol	ND	360	71	ug/kg	
95-48-7	2-Methylphenol	ND	180	36	ug/kg	
	3&4-Methylphenol	ND	180	36	ug/kg	
88-75-5	2-Nitrophenol	ND	180	36	ug/kg	
100-02-7	4-Nitrophenol	ND	890	360	ug/kg	
87-86-5	Pentachlorophenol	ND	890	360	ug/kg	
108-95-2	Phenol	ND	180	36	ug/kg	
95-95-4	2,4,5-Trichlorophenol	ND	180	36	ug/kg	
88-06-2	2,4,6-Trichlorophenol	ND	180	36	ug/kg	
101-55-3	4-Bromophenyl phenyl ether	ND	180	36	ug/kg	
85-68-7	Butyl benzyl phthalate	ND	360	89	ug/kg	
100-51-6	Benzyl Alcohol	ND	180	36	ug/kg	
91-58-7	2-Chloronaphthalene	ND	180	36	ug/kg	
106-47-8	4-Chloroaniline	ND	360	140	ug/kg	
86-74-8	Carbazole	ND	180	36	ug/kg	
111-91-1	bis(2-Chloroethoxy)methane	ND	180	36	ug/kg	
111-44-4	bis(2-Chloroethyl)ether	ND	180	71	ug/kg	
108-60-1	bis(2-Chloroisopropyl)ether	ND	180	36	ug/kg	
7005-72-3	4-Chlorophenyl phenyl ether	ND	180	36	ug/kg	
95-50-1	1,2-Dichlorobenzene	ND	180	36	ug/kg	
541-73-1	1,3-Dichlorobenzene	ND	180	36	ug/kg	
106-46-7	1,4-Dichlorobenzene	ND	180	36	ug/kg	
121-14-2	2,4-Dinitrotoluene	ND	180	71	ug/kg	
606-20-2	2,6-Dinitrotoluene	ND	180	71	ug/kg	
91-94-1	3,3'-Dichlorobenzidine	ND	360	180	ug/kg	
132-64-9	Dibenzofuran	ND	180	36	ug/kg	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Form I OZ

Accutest Laboratories

Report of Analysis

Client Sample ID:	59SS07		
Lab Sample ID:	F51154-28	Date Sampled:	07/19/07
Matrix:	SO - Soil	Date Received:	07/19/07
Method:	SW846 8270C SW846 3550B	Percent Solids:	91.6
Project:	WPA 019 Field Investigation; Radford AAP, VA		

ABN TCL List w/o PAHs

CAS No.	Compound	Result	RL	MDL	Units	Q
84-74-2	Di-n-butyl phthalate	ND	360	89	ug/kg	
117-84-0	Di-n-octyl phthalate	ND	360	180	ug/kg	
84-66-2	Diethyl phthalate	ND	360	89	ug/kg	
131-11-3	Dimethyl phthalate	ND	360	89	ug/kg	
117-81-7	bis(2-Ethylhexyl)phthalate	ND	360	180	ug/kg	
118-74-1	Hexachlorobenzene	ND	180	36	ug/kg	
87-68-3	Hexachlorobutadiene	ND	180	71	ug/kg	
77-47-4	Hexachlorocyclopentadiene	ND	180	71	ug/kg	
67-72-1	Hexachloroethane	ND	180	71	ug/kg	
78-59-1	Isophorone	ND	180	36	ug/kg	
88-74-4	2-Nitroaniline	ND	360	89	ug/kg	
99-09-2	3-Nitroaniline	ND	360	89	ug/kg	
100-01-6	4-Nitroaniline	ND	360	120	ug/kg	
98-95-3	Nitrobenzene	ND	180	36	ug/kg	
621-64-7	N-Nitroso-di-n-propylamine	ND	180	71	ug/kg	
86-30-6	N-Nitrosodiphenylamine	ND	180	36	ug/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	180	36	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol	71%		40-102%
4165-62-2	Phenol-d5	79%		41-100%
118-79-6	2,4,6-Tribromophenol	77%		42-108%
4165-60-0	Nitrobenzene-d5	66%		40-105%
321-60-8	2-Fluorobiphenyl	65%		43-107%
1718-51-0	Terphenyl-d14	87%		45-119%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: W035983.D

Accutest Laboratories

Report of Analysis

Client Sample ID:	59SS07		
Lab Sample ID:	F51154-28	Date Sampled:	07/19/07
Matrix:	SO - Soil	Date Received:	07/19/07
Method:	SW846 8270C BY SIM SW846 3550B	Percent Solids:	91.6
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	W035983.D	4	08/01/07	RB	07/27/07	OP21636	SW1862
Run #2							

	Initial Weight	Final Volume
Run #1	30.7 g	1.0 ml
Run #2		

BN PAH List

CAS No.	Compound	Result	RL	MDL	Units	Q
83-32-9	Acenaphthene	ND	280	71	ug/kg	
208-96-8	Acenaphthylene	ND	280	71	ug/kg	
120-12-7	Anthracene	ND	280	43	ug/kg	
56-55-3	Benzo(a)anthracene	21.0 J	57	14	ug/kg	J
50-32-8	Benzo(a)pyrene	19.6 J	57	14	ug/kg	J
205-99-2	Benzo(b)fluoranthene	22.6 J	57	14	ug/kg	J
191-24-2	Benzo(g,h,i)perylene	ND	57	14	ug/kg	
207-08-9	Benzo(k)fluoranthene	18.0 J	57	14	ug/kg	J
218-01-9	Chrysene	22.7 J	57	14	ug/kg	J
53-70-3	Dibenzo(a,h)anthracene	ND	57	14	ug/kg	
206-44-0	Fluoranthene	ND	280	50	ug/kg	
86-73-7	Fluorene	ND	280	43	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	57	14	ug/kg	
90-12-0	1-Methylnaphthalene	ND	280	43	ug/kg	
91-57-6	2-Methylnaphthalene	ND	280	43	ug/kg	
91-20-3	Naphthalene	ND	280	43	ug/kg	
85-01-8	Phenanthrene	ND	280	43	ug/kg	
129-00-0	Pyrene	ND	280	50	ug/kg	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: R09483.D

Form I Cap

Accutest Laboratories

Report of Analysis

Client Sample ID:	59SS08		
Lab Sample ID:	F51154-29	Date Sampled:	07/19/07
Matrix:	SO - Soil	Date Received:	07/19/07
Method:	SW846 8270C SW846 3550B	Percent Solids:	89.0
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	R09483.D	1	07/30/07	NJ	07/27/07	OP21634	SR448
Run #2							

	Initial Weight	Final Volume
Run #1	30.3 g	1.0 ml
Run #2		

ABN TCL List w/o PAHs

CAS No.	Compound	Result	RL	MDL	Units	Q
65-85-0	Benzoic acid	ND	930	370	ug/kg	
95-57-8	2-Chlorophenol	ND	190	37	ug/kg	
59-50-7	4-Chloro-3-methyl phenol	ND	190	37	ug/kg	
120-83-2	2,4-Dichlorophenol	ND	190	37	ug/kg	
105-67-9	2,4-Dimethylphenol	ND	190	37	ug/kg	
51-28-5	2,4-Dinitrophenol	ND	930	370	ug/kg	
534-52-1	4,6-Dinitro-o-cresol	ND	370	74	ug/kg	
95-48-7	2-Methylphenol	ND	190	37	ug/kg	
	3&4-Methylphenol	ND	190	37	ug/kg	
88-75-5	2-Nitrophenol	ND	190	37	ug/kg	
100-02-7	4-Nitrophenol	ND	930	370	ug/kg	
87-86-5	Pentachlorophenol	ND	930	370	ug/kg	
108-95-2	Phenol	ND	190	37	ug/kg	
95-95-4	2,4,5-Trichlorophenol	ND	190	37	ug/kg	
88-06-2	2,4,6-Trichlorophenol	ND	190	37	ug/kg	
101-55-3	4-Bromophenyl phenyl ether	ND	190	37	ug/kg	
85-68-7	Butyl benzyl phthalate	ND	370	93	ug/kg	
100-51-6	Benzyl Alcohol	ND	190	37	ug/kg	
91-58-7	2-Chloronaphthalene	ND	190	37	ug/kg	
106-47-8	4-Chloroaniline	ND	370	150	ug/kg	
86-74-8	Carbazole	ND	190	37	ug/kg	
111-91-1	bis(2-Chloroethoxy)methane	ND	190	37	ug/kg	
111-44-4	bis(2-Chloroethyl)ether	ND	190	74	ug/kg	
108-60-1	bis(2-Chloroisopropyl)ether	ND	190	37	ug/kg	
7005-72-3	4-Chlorophenyl phenyl ether	ND	190	37	ug/kg	
95-50-1	1,2-Dichlorobenzene	ND	190	37	ug/kg	
541-73-1	1,3-Dichlorobenzene	ND	190	37	ug/kg	
106-46-7	1,4-Dichlorobenzene	ND	190	37	ug/kg	
121-14-2	2,4-Dinitrotoluene	ND	190	74	ug/kg	
606-20-2	2,6-Dinitrotoluene	ND	190	74	ug/kg	
91-94-1	3,3'-Dichlorobenzidine	ND	370	190	ug/kg	
132-64-9	Dibenzofuran	ND	190	37	ug/kg	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Form I 03

Accutest Laboratories

Report of Analysis

Client Sample ID:	59SS08		
Lab Sample ID:	F51154-29	Date Sampled:	07/19/07
Matrix:	SO - Soil	Date Received:	07/19/07
Method:	SW846 8270C SW846 3550B	Percent Solids:	89.0
Project:	WPA 019 Field Investigation; Radford AAP, VA		

ABN TCL List w/o PAHs

CAS No.	Compound	Result	RL	MDL	Units	Q
84-74-2	Di-n-butyl phthalate	ND	370	93	ug/kg	
117-84-0	Di-n-octyl phthalate	ND	370	190	ug/kg	
84-66-2	Diethyl phthalate	ND	370	93	ug/kg	
131-11-3	Dimethyl phthalate	ND	370	93	ug/kg	
117-81-7	bis(2-Ethylhexyl)phthalate	ND	370	190	ug/kg	
118-74-1	Hexachlorobenzene	ND	190	37	ug/kg	
87-68-3	Hexachlorobutadiene	ND	190	74	ug/kg	
77-47-4	Hexachlorocyclopentadiene	ND	190	74	ug/kg	
67-72-1	Hexachloroethane	ND	190	74	ug/kg	
78-59-1	Isophorone	ND	190	37	ug/kg	
88-74-4	2-Nitroaniline	ND	370	93	ug/kg	
99-09-2	3-Nitroaniline	ND	370	93	ug/kg	
100-01-6	4-Nitroaniline	ND	370	130	ug/kg	
98-95-3	Nitrobenzene	ND	190	37	ug/kg	
621-64-7	N-Nitroso-di-n-propylamine	ND	190	74	ug/kg	
86-30-6	N-Nitrosodiphenylamine	ND	190	37	ug/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	190	37	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol	75%		40-102%
4165-62-2	Phenol-d5	82%		41-100%
118-79-6	2,4,6-Tribromophenol	83%		42-108%
4165-60-0	Nitrobenzene-d5	72%		40-105%
321-60-8	2-Fluorobiphenyl	73%		43-107%
1718-51-0	Terphenyl-d14	90%		45-119%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: W035984.D

Form I OR

Accutest Laboratories

Report of Analysis

Client Sample ID:	59SS08		
Lab Sample ID:	F51154-29	Date Sampled:	07/19/07
Matrix:	SO - Soil	Date Received:	07/19/07
Method:	SW846 8270C BY SIM SW846 3550B	Percent Solids:	89.0
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	W035984.D	4	08/01/07	RB	07/27/07	OP21636	SW1862
Run #2							

	Initial Weight	Final Volume
Run #1	30.3 g	1.0 ml
Run #2		

BN PAH List

CAS No.	Compound	Result	RL	MDL	Units	Q
83-32-9	Acenaphthene	ND	300	74	ug/kg	
208-96-8	Acenaphthylene	ND	300	74	ug/kg	
120-12-7	Anthracene	ND	300	44	ug/kg	
56-55-3	Benzo(a)anthracene	39.2 J	59	15	ug/kg	J
50-32-8	Benzo(a)pyrene	40.0 J	59	15	ug/kg	J
205-99-2	Benzo(b)fluoranthene	45.0 J	59	15	ug/kg	J
191-24-2	Benzo(g,h,i)perylene	23.5 J	59	15	ug/kg	J
207-08-9	Benzo(k)fluoranthene	32.3 J	59	15	ug/kg	J
218-01-9	Chrysene	41.7 J	59	15	ug/kg	J
53-70-3	Dibenzo(a,h)anthracene	ND	59	15	ug/kg	
206-44-0	Fluoranthene	81.7 J	300	52	ug/kg	J
86-73-7	Fluorene	ND	300	44	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	26.3 J	59	15	ug/kg	J
90-12-0	1-Methylnaphthalene	ND	300	44	ug/kg	
91-57-6	2-Methylnaphthalene	ND	300	44	ug/kg	
91-20-3	Naphthalene	ND	300	44	ug/kg	
85-01-8	Phenanthrene	48.8 J	300	44	ug/kg	J
129-00-0	Pyrene	74.7 J	300	52	ug/kg	J

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Form I Copy

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Report of Analysis

Client Sample ID:	59SS09		
Lab Sample ID:	F51154-30	Date Sampled:	07/19/07
Matrix:	SO - Soil	Date Received:	07/19/07
Method:	SW846 8270C SW846 3550B	Percent Solids:	95.1
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	R09484.D	1	07/30/07	NJ	07/27/07	OP21634	SR448
Run #2							

	Initial Weight	Final Volume
Run #1	30.0 g	1.0 ml
Run #2		

ABN TCL List w/o PAHs

CAS No.	Compound	Result	RL	MDL	Units	Q
65-85-0	Benzoic acid	ND	880	350	ug/kg	
95-57-8	2-Chlorophenol	ND	180	35	ug/kg	
59-50-7	4-Chloro-3-methyl phenol	ND	180	35	ug/kg	
120-83-2	2,4-Dichlorophenol	ND	180	35	ug/kg	
105-67-9	2,4-Dimethylphenol	ND	180	35	ug/kg	
51-28-5	2,4-Dinitrophenol	ND	880	350	ug/kg	
534-52-1	4,6-Dinitro-o-cresol	ND	350	70	ug/kg	
95-48-7	2-Methylphenol	ND	180	35	ug/kg	
	3&4-Methylphenol	ND	180	35	ug/kg	
88-75-5	2-Nitrophenol	ND	180	35	ug/kg	
100-02-7	4-Nitrophenol	ND	880	350	ug/kg	
87-86-5	Pentachlorophenol	ND	880	350	ug/kg	
108-95-2	Phenol	ND	180	35	ug/kg	
95-95-4	2,4,5-Trichlorophenol	ND	180	35	ug/kg	
88-06-2	2,4,6-Trichlorophenol	ND	180	35	ug/kg	
101-55-3	4-Bromophenyl phenyl ether	ND	180	35	ug/kg	
85-68-7	Butyl benzyl phthalate	ND	350	88	ug/kg	
100-51-6	Benzyl Alcohol	ND	180	35	ug/kg	
91-58-7	2-Chloronaphthalene	ND	180	35	ug/kg	
106-47-8	4-Chloroaniline	ND	350	140	ug/kg	
86-74-8	Carbazole	ND	180	35	ug/kg	
111-91-1	bis(2-Chloroethoxy)methane	ND	180	35	ug/kg	
111-44-4	bis(2-Chloroethyl)ether	ND	180	70	ug/kg	
108-60-1	bis(2-Chloroisopropyl)ether	ND	180	35	ug/kg	
7005-72-3	4-Chlorophenyl phenyl ether	ND	180	35	ug/kg	
95-50-1	1,2-Dichlorobenzene	ND	180	35	ug/kg	
541-73-1	1,3-Dichlorobenzene	ND	180	35	ug/kg	
106-46-7	1,4-Dichlorobenzene	ND	180	35	ug/kg	
121-14-2	2,4-Dinitrotoluene	ND	180	70	ug/kg	
606-20-2	2,6-Dinitrotoluene	ND	180	70	ug/kg	
91-94-1	3,3'-Dichlorobenzidine	ND	350	180	ug/kg	
132-64-9	Dibenzofuran	ND	180	35	ug/kg	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Form I only

Accutest Laboratories

Report of Analysis

Client Sample ID:	59SS09		
Lab Sample ID:	F51154-30	Date Sampled:	07/19/07
Matrix:	SO - Soil	Date Received:	07/19/07
Method:	SW846 8270C SW846 3550B	Percent Solids:	95.1
Project:	WPA 019 Field Investigation; Radford AAP, VA		

ABN TCL List w/o PAHs

CAS No.	Compound	Result	RL	MDL	Units	Q
84-74-2	Di-n-butyl phthalate	ND	350	88	ug/kg	
117-84-0	Di-n-octyl phthalate	ND	350	180	ug/kg	
84-66-2	Diethyl phthalate	ND	350	88	ug/kg	
131-11-3	Dimethyl phthalate	ND	350	88	ug/kg	
117-81-7	bis(2-Ethylhexyl)phthalate	ND	350	180	ug/kg	
118-74-1	Hexachlorobenzene	ND	180	35	ug/kg	
87-68-3	Hexachlorobutadiene	ND	180	70	ug/kg	
77-47-4	Hexachlorocyclopentadiene	ND	180	70	ug/kg	
67-72-1	Hexachloroethane	ND	180	70	ug/kg	
78-59-1	Isophorone	ND	180	35	ug/kg	
88-74-4	2-Nitroaniline	ND	350	88	ug/kg	
99-09-2	3-Nitroaniline	ND	350	88	ug/kg	
100-01-6	4-Nitroaniline	ND	350	120	ug/kg	
98-95-3	Nitrobenzene	ND	180	35	ug/kg	
621-64-7	N-Nitroso-di-n-propylamine	ND	180	70	ug/kg	
86-30-6	N-Nitrosodiphenylamine	ND	180	35	ug/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	180	35	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol	62%		40-102%
4165-62-2	Phenol-d5	72%		41-100%
118-79-6	2,4,6-Tribromophenol	72%		42-108%
4165-60-0	Nitrobenzene-d5	67%		40-105%
321-60-8	2-Fluorobiphenyl	67%		43-107%
1718-51-0	Terphenyl-d14	82%		45-119%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: W035985.D

Form I COR

Accutest Laboratories

Report of Analysis

Client Sample ID:	59SS09		
Lab Sample ID:	F51154-30	Date Sampled:	07/19/07
Matrix:	SO - Soil	Date Received:	07/19/07
Method:	SW846 8270C BY SIM SW846 3550B	Percent Solids:	95.1
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	W035985.D	4	08/01/07	RB	07/27/07	OP21636	SW1862
Run #2							

	Initial Weight	Final Volume
Run #1	30.0 g	1.0 ml
Run #2		

BN PAH List

CAS No.	Compound	Result		RL	MDL	Units	Q
83-32-9	Acenaphthene	ND		280	70	ug/kg	
208-96-8	Acenaphthylene	ND		280	70	ug/kg	
120-12-7	Anthracene	ND		280	42	ug/kg	
56-55-3	Benzo(a)anthracene	ND		56	14	ug/kg	
50-32-8	Benzo(a)pyrene	ND		56	14	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND		56	14	ug/kg	
191-24-2	Benzo(g,h,i)perylene	ND		56	14	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND		56	14	ug/kg	
218-01-9	Chrysene	ND		56	14	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	ND		56	14	ug/kg	
206-44-0	Fluoranthene	ND		280	49	ug/kg	
86-73-7	Fluorene	ND		280	42	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND		56	14	ug/kg	
90-12-0	1-Methylnaphthalene	92.0	J	280	42	ug/kg	J
91-57-6	2-Methylnaphthalene	115	J	280	42	ug/kg	J
91-20-3	Naphthalene	82.2	J	280	42	ug/kg	J
85-01-8	Phenanthrene	65.4	J	280	42	ug/kg	J
129-00-0	Pyrene	ND		280	49	ug/kg	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: R09485.D

Form I OA

Accutest Laboratories

Report of Analysis

Client Sample ID:	59SS10		
Lab Sample ID:	F51154-31	Date Sampled:	07/19/07
Matrix:	SO - Soil	Date Received:	07/19/07
Method:	SW846 8270C SW846 3550B	Percent Solids:	95.7
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	R09485.D	1	07/30/07	NJ	07/27/07	OP21634	SR448
Run #2							

	Initial Weight	Final Volume
Run #1	30.1 g	1.0 ml
Run #2		

ABN TCL List w/o PAHs

CAS No.	Compound	Result	RL	MDL	Units	Q
65-85-0	Benzoic acid	ND	870	350	ug/kg	
95-57-8	2-Chlorophenol	ND	170	35	ug/kg	
59-50-7	4-Chloro-3-methyl phenol	ND	170	35	ug/kg	
120-83-2	2,4-Dichlorophenol	ND	170	35	ug/kg	
105-67-9	2,4-Dimethylphenol	ND	170	35	ug/kg	
51-28-5	2,4-Dinitrophenol	ND	870	350	ug/kg	
534-52-1	4,6-Dinitro-o-cresol	ND	350	69	ug/kg	
95-48-7	2-Methylphenol	ND	170	35	ug/kg	
	3&4-Methylphenol	ND	170	35	ug/kg	
88-75-5	2-Nitrophenol	ND	170	35	ug/kg	
100-02-7	4-Nitrophenol	ND	870	350	ug/kg	
87-86-5	Pentachlorophenol	ND	870	350	ug/kg	
108-95-2	Phenol	ND	170	35	ug/kg	
95-95-4	2,4,5-Trichlorophenol	ND	170	35	ug/kg	
88-06-2	2,4,6-Trichlorophenol	ND	170	35	ug/kg	
101-55-3	4-Bromophenyl phenyl ether	ND	170	35	ug/kg	
85-68-7	Butyl benzyl phthalate	ND	350	87	ug/kg	
100-51-6	Benzyl Alcohol	ND	170	35	ug/kg	
91-58-7	2-Chloronaphthalene	ND	170	35	ug/kg	
106-47-8	4-Chloroaniline	ND	350	140	ug/kg	
86-74-8	Carbazole	ND	170	35	ug/kg	
111-91-1	bis(2-Chloroethoxy)methane	ND	170	35	ug/kg	
111-44-4	bis(2-Chloroethyl)ether	ND	170	69	ug/kg	
108-60-1	bis(2-Chloroisopropyl)ether	ND	170	35	ug/kg	
7005-72-3	4-Chlorophenyl phenyl ether	ND	170	35	ug/kg	
95-50-1	1,2-Dichlorobenzene	ND	170	35	ug/kg	
541-73-1	1,3-Dichlorobenzene	ND	170	35	ug/kg	
106-46-7	1,4-Dichlorobenzene	ND	170	35	ug/kg	
121-14-2	2,4-Dinitrotoluene	ND	170	69	ug/kg	
606-20-2	2,6-Dinitrotoluene	ND	170	69	ug/kg	
91-94-1	3,3'-Dichlorobenzidine	ND	350	170	ug/kg	
132-64-9	Dibenzofuran	ND	170	35	ug/kg	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Accutest Laboratories

Report of Analysis

Client Sample ID:	59SS10		
Lab Sample ID:	F51154-31	Date Sampled:	07/19/07
Matrix:	SO - Soil	Date Received:	07/19/07
Method:	SW846 8270C SW846 3550B	Percent Solids:	95.7
Project:	WPA 019 Field Investigation; Radford AAP, VA		

ABN TCL List w/o PAHs

CAS No.	Compound	Result	RL	MDL	Units	Q
84-74-2	Di-n-butyl phthalate	ND	350	87	ug/kg	
117-84-0	Di-n-octyl phthalate	ND	350	170	ug/kg	
84-66-2	Diethyl phthalate	ND	350	87	ug/kg	
131-11-3	Dimethyl phthalate	ND	350	87	ug/kg	
117-81-7	bis(2-Ethylhexyl)phthalate	ND	350	170	ug/kg	
118-74-1	Hexachlorobenzene	ND	170	35	ug/kg	
87-68-3	Hexachlorobutadiene	ND	170	69	ug/kg	
77-47-4	Hexachlorocyclopentadiene	ND	170	69	ug/kg	
67-72-1	Hexachloroethane	ND	170	69	ug/kg	
78-59-1	Isophorone	ND	170	35	ug/kg	
88-74-4	2-Nitroaniline	ND	350	87	ug/kg	
99-09-2	3-Nitroaniline	ND	350	87	ug/kg	
100-01-6	4-Nitroaniline	ND	350	120	ug/kg	
98-95-3	Nitrobenzene	ND	170	35	ug/kg	
621-64-7	N-Nitroso-di-n-propylamine	ND	170	69	ug/kg	
86-30-6	N-Nitrosodiphenylamine	ND	170	35	ug/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	170	35	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol	44%		40-102%
4165-62-2	Phenol-d5	49%		41-100%
118-79-6	2,4,6-Tribromophenol	55%		42-108%
4165-60-0	Nitrobenzene-d5	46%		40-105%
321-60-8	2-Fluorobiphenyl	49%		43-107%
1718-51-0	Terphenyl-d14	57%		45-119%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: W035986.D

Form I OR

Accutest Laboratories

Report of Analysis

Client Sample ID:	59SS10		
Lab Sample ID:	F51154-31	Date Sampled:	07/19/07
Matrix:	SO - Soil	Date Received:	07/19/07
Method:	SW846 8270C BY SIM SW846 3550B	Percent Solids:	95.7
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	W035986.D	4	08/01/07	RB	07/27/07	OP21636	SW1862
Run #2							

	Initial Weight	Final Volume
Run #1	30.1 g	1.0 ml
Run #2		

BN PAH List

CAS No.	Compound	Result	RL	MDL	Units	Q
83-32-9	Acenaphthene	ND	280	69	ug/kg	
208-96-8	Acenaphthylene	ND	280	69	ug/kg	
120-12-7	Anthracene	ND	280	42	ug/kg	
56-55-3	Benzo(a)anthracene	ND	56	14	ug/kg	
50-32-8	Benzo(a)pyrene	ND	56	14	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	56	14	ug/kg	
191-24-2	Benzo(g,h,i)perylene	ND	56	14	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	56	14	ug/kg	
218-01-9	Chrysene	ND	56	14	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	56	14	ug/kg	
206-44-0	Fluoranthene	ND	280	49	ug/kg	
86-73-7	Fluorene	ND	280	42	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	56	14	ug/kg	
90-12-0	1-Methylnaphthalene	51.4 J	280	42	ug/kg	J
91-57-6	2-Methylnaphthalene	56.4 J	280	42	ug/kg	J
91-20-3	Naphthalene	ND	280	42	ug/kg	
85-01-8	Phenanthrene	45.3 J	280	42	ug/kg	J
129-00-0	Pyrene	ND	280	49	ug/kg	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: R09486.D

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Report of Analysis

Client Sample ID:	TMSS05		
Lab Sample ID:	F51154-32	Date Sampled:	07/19/07
Matrix:	SO - Soil	Date Received:	07/19/07
Method:	SW846 8270C SW846 3550B	Percent Solids:	86.6
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	R09486.D	1	07/30/07	NJ	07/27/07	OP21634	SR448
Run #2							

	Initial Weight	Final Volume
Run #1	30.2 g	1.0 ml
Run #2		

ABN TCL List w/o PAHs

CAS No.	Compound	Result	RL	MDL	Units	Q
65-85-0	Benzoic acid	ND	960	380	ug/kg	
95-57-8	2-Chlorophenol	ND	190	38	ug/kg	
59-50-7	4-Chloro-3-methyl phenol	ND	190	38	ug/kg	
120-83-2	2,4-Dichlorophenol	ND	190	38	ug/kg	
105-67-9	2,4-Dimethylphenol	ND	190	38	ug/kg	
51-28-5	2,4-Dinitrophenol	ND	960	380	ug/kg	
534-52-1	4,6-Dinitro-o-cresol	ND	380	76	ug/kg	
95-48-7	2-Methylphenol	ND	190	38	ug/kg	
	3&4-Methylphenol	ND	190	38	ug/kg	
88-75-5	2-Nitrophenol	ND	190	38	ug/kg	
100-02-7	4-Nitrophenol	ND	960	380	ug/kg	
87-86-5	Pentachlorophenol	ND	960	380	ug/kg	
108-95-2	Phenol	ND	190	38	ug/kg	
95-95-4	2,4,5-Trichlorophenol	ND	190	38	ug/kg	
88-06-2	2,4,6-Trichlorophenol	ND	190	38	ug/kg	
101-55-3	4-Bromophenyl phenyl ether	ND	190	38	ug/kg	
85-68-7	Butyl benzyl phthalate	ND	380	96	ug/kg	
100-51-6	Benzyl Alcohol	ND	190	38	ug/kg	
91-58-7	2-Chloronaphthalene	ND	190	38	ug/kg	
106-47-8	4-Chloroaniline	ND	380	150	ug/kg	
86-74-8	Carbazole	ND	190	38	ug/kg	
111-91-1	bis(2-Chloroethoxy)methane	ND	190	38	ug/kg	
111-44-4	bis(2-Chloroethyl)ether	ND	190	76	ug/kg	
108-60-1	bis(2-Chloroisopropyl)ether	ND	190	38	ug/kg	
7005-72-3	4-Chlorophenyl phenyl ether	ND	190	38	ug/kg	
95-50-1	1,2-Dichlorobenzene	ND	190	38	ug/kg	
541-73-1	1,3-Dichlorobenzene	ND	190	38	ug/kg	
106-46-7	1,4-Dichlorobenzene	ND	190	38	ug/kg	
121-14-2	2,4-Dinitrotoluene	ND	190	76	ug/kg	
606-20-2	2,6-Dinitrotoluene	ND	190	76	ug/kg	
91-94-1	3,3'-Dichlorobenzidine	ND	380	190	ug/kg	
132-64-9	Dibenzofuran	ND	190	38	ug/kg	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Form I OM

Accutest Laboratories

Report of Analysis

Client Sample ID:	TMSS05		
Lab Sample ID:	F51154-32	Date Sampled:	07/19/07
Matrix:	SO - Soil	Date Received:	07/19/07
Method:	SW846 8270C SW846 3550B	Percent Solids:	86.6
Project:	WPA 019 Field Investigation; Radford AAP, VA		

ABN TCL List w/o PAHs

CAS No.	Compound	Result	RL	MDL	Units	Q
84-74-2	Di-n-butyl phthalate	ND	380	96	ug/kg	
117-84-0	Di-n-octyl phthalate	ND	380	190	ug/kg	
84-66-2	Diethyl phthalate	ND	380	96	ug/kg	
131-11-3	Dimethyl phthalate	ND	380	96	ug/kg	
117-81-7	bis(2-Ethylhexyl)phthalate	ND	380	190	ug/kg	
118-74-1	Hexachlorobenzene	ND	190	38	ug/kg	
87-68-3	Hexachlorobutadiene	ND	190	76	ug/kg	
77-47-4	Hexachlorocyclopentadiene	ND	190	76	ug/kg	
67-72-1	Hexachloroethane	ND	190	76	ug/kg	
78-59-1	Isophorone	ND	190	38	ug/kg	
88-74-4	2-Nitroaniline	ND	380	96	ug/kg	
99-09-2	3-Nitroaniline	ND	380	96	ug/kg	
100-01-6	4-Nitroaniline	ND	380	130	ug/kg	
98-95-3	Nitrobenzene	ND	190	38	ug/kg	
621-64-7	N-Nitroso-di-n-propylamine	ND	190	76	ug/kg	
86-30-6	N-Nitrosodiphenylamine	ND	190	38	ug/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	190	38	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol	74%		40-102%
4165-62-2	Phenol-d5	84%		41-100%
118-79-6	2,4,6-Tribromophenol	84%		42-108%
4165-60-0	Nitrobenzene-d5	71%		40-105%
321-60-8	2-Fluorobiphenyl	75%		43-107%
1718-51-0	Terphenyl-d14	85%		45-119%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: W035987.D

Form I OR

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Report of Analysis

Client Sample ID:	TMSS05		
Lab Sample ID:	F51154-32	Date Sampled:	07/19/07
Matrix:	SO - Soil	Date Received:	07/19/07
Method:	SW846 8270C BY SIM SW846 3550B	Percent Solids:	86.6
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	W035987.D	4	08/01/07	RB	07/27/07	OP21636	SW1862
Run #2							

	Initial Weight	Final Volume
Run #1	30.2 g	1.0 ml
Run #2		

BN PAH List

CAS No.	Compound	Result	RL	MDL	Units	Q
83-32-9	Acenaphthene	ND	310	76	ug/kg	
208-96-8	Acenaphthylene	ND	310	76	ug/kg	
120-12-7	Anthracene	ND	310	46	ug/kg	
56-55-3	Benzo(a)anthracene	ND	61	15	ug/kg	
50-32-8	Benzo(a)pyrene	ND	61	15	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	61	15	ug/kg	
191-24-2	Benzo(g,h,i)perylene	ND	61	15	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	61	15	ug/kg	
218-01-9	Chrysene	ND	61	15	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	61	15	ug/kg	
206-44-0	Fluoranthene	ND	310	54	ug/kg	
86-73-7	Fluorene	ND	310	46	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	61	15	ug/kg	
90-12-0	1-Methylnaphthalene	ND	310	46	ug/kg	
91-57-6	2-Methylnaphthalene	ND	310	46	ug/kg	
91-20-3	Naphthalene	ND	310	46	ug/kg	
85-01-8	Phenanthrene	ND	310	46	ug/kg	
129-00-0	Pyrene	ND	310	54	ug/kg	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: U003671.D

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Report of Analysis

Client Sample ID:	RB071807		
Lab Sample ID:	F51154-12	Date Sampled:	07/18/07
Matrix:	AQ - Surface Water	Date Received:	07/19/07
Method:	SW846 8270C SW846 3510C	Percent Solids:	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	U003671.D	1	07/31/07	NJ	07/24/07	OP21580	SU180
Run #2							

	Initial Volume	Final Volume
Run #1	1000 ml	1.0 ml
Run #2		

ABN TCL List w/o PAHs

CAS No.	Compound	Result	RL	MDL	Units	Q
65-85-0	Benzoic Acid	ND	25	10	ug/l	
95-57-8	2-Chlorophenol	ND	5.0	1.0	ug/l	
59-50-7	4-Chloro-3-methyl phenol	ND	5.0	2.0	ug/l	
120-83-2	2,4-Dichlorophenol	ND	5.0	1.0	ug/l	
105-67-9	2,4-Dimethylphenol	ND	5.0	2.0	ug/l	
51-28-5	2,4-Dinitrophenol	ND	25	10	ug/l	
534-52-1	4,6-Dinitro-o-cresol	ND	10	2.0	ug/l	
95-48-7	2-Methylphenol	ND	5.0	1.0	ug/l	
	3&4-Methylphenol	ND	5.0	1.3	ug/l	
88-75-5	2-Nitrophenol	ND	5.0	1.0	ug/l	
100-02-7	4-Nitrophenol	ND	25	10	ug/l	
87-86-5	Pentachlorophenol	ND	25	10	ug/l	
108-95-2	Phenol	ND	5.0	2.0	ug/l	
95-95-4	2,4,5-Trichlorophenol	ND	5.0	1.0	ug/l	
88-06-2	2,4,6-Trichlorophenol	ND	5.0	1.0	ug/l	
101-55-3	4-Bromophenyl phenyl ether	ND	5.0	1.2	ug/l	
85-68-7	Butyl benzyl phthalate	ND	5.0	2.0	ug/l	
100-51-6	Benzyl Alcohol	ND	5.0	1.0	ug/l	
91-58-7	2-Chloronaphthalene	ND	5.0	1.3	ug/l	
106-47-8	4-Chloroaniline	ND	5.0	2.0	ug/l	
86-74-8	Carbazole	ND	5.0	1.0	ug/l	
111-91-1	bis(2-Chloroethoxy)methane	ND	5.0	1.0	ug/l	
111-44-4	bis(2-Chloroethyl)ether	ND	5.0	1.0	ug/l	
108-60-1	bis(2-Chloroisopropyl)ether	ND	5.0	1.0	ug/l	
7005-72-3	4-Chlorophenyl phenyl ether	ND	5.0	1.3	ug/l	
95-50-1	1,2-Dichlorobenzene	ND	5.0	1.5	ug/l	
541-73-1	1,3-Dichlorobenzene	ND	5.0	1.6	ug/l	
106-46-7	1,4-Dichlorobenzene	ND	5.0	1.5	ug/l	
121-14-2	2,4-Dinitrotoluene	ND	5.0	1.0	ug/l	
606-20-2	2,6-Dinitrotoluene	ND	5.0	1.0	ug/l	
91-94-1	3,3'-Dichlorobenzidine	ND	10	2.0	ug/l	
132-64-9	Dibenzofuran	ND	5.0	1.0	ug/l	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	RB071807		
Lab Sample ID:	F51154-12	Date Sampled:	07/18/07
Matrix:	AQ - Surface Water	Date Received:	07/19/07
Method:	SW846 8270C SW846 3510C	Percent Solids:	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

ABN TCL List w/o PAHs

CAS No.	Compound	Result	RL	MDL	Units	Q
84-74-2	Di-n-butyl phthalate	ND	5.0	2.0	ug/l	
117-84-0	Di-n-octyl phthalate	ND	5.0	2.0	ug/l	
84-66-2	Diethyl phthalate	ND	5.0	2.0	ug/l	
131-11-3	Dimethyl phthalate	ND	5.0	2.0	ug/l	
117-81-7	bis(2-Ethylhexyl)phthalate	ND	5.0	2.0	ug/l	
118-74-1	Hexachlorobenzene	ND	5.0	1.2	ug/l	
87-68-3	Hexachlorobutadiene	ND	5.0	1.7	ug/l	
77-47-4	Hexachlorocyclopentadiene	ND	5.0	1.5	ug/l	
67-72-1	Hexachloroethane	ND	5.0	1.9	ug/l	
78-59-1	Isophorone	ND	5.0	1.0	ug/l	
88-74-4	2-Nitroaniline	ND	10	2.0	ug/l	
99-09-2	3-Nitroaniline	ND	10	2.0	ug/l	
100-01-6	4-Nitroaniline	ND	10	2.0	ug/l	
98-95-3	Nitrobenzene	ND	5.0	1.0	ug/l	
621-64-7	N-Nitroso-di-n-propylamine	ND	5.0	1.0	ug/l	
86-30-6	N-Nitrosodiphenylamine	ND	5.0	1.0	ug/l	
120-82-1	1,2,4-Trichlorobenzene	ND	5.0	1.5	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol	43%		14-62%
4165-62-2	Phenol-d5	27%		10-40%
118-79-6	2,4,6-Tribromophenol	80%		33-118%
4165-60-0	Nitrobenzene-d5	76%		42-108%
321-60-8	2-Fluorobiphenyl	79%		40-106%
1718-51-0	Terphenyl-d14	83%		39-121%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: W035906.D

Form I Copy

Accutest Laboratories

Report of Analysis

Client Sample ID:	RB071807		
Lab Sample ID:	F51154-12	Date Sampled:	07/18/07
Matrix:	AQ - Surface Water	Date Received:	07/19/07
Method:	SW846 8270C BY SIM SW846 3510C	Percent Solids:	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	W035906.D	1	07/30/07	RB	07/24/07	OP21581	SW1859
Run #2							

	Initial Volume	Final Volume
Run #1	1000 ml	1.0 ml
Run #2		

BN PAH List

CAS No.	Compound	Result	RL	MDL	Units	Q
83-32-9	Acenaphthene	ND	1.0	0.50	ug/l	
208-96-8	Acenaphthylene	ND	1.0	0.50	ug/l	
120-12-7	Anthracene	ND	1.0	0.50	ug/l	
56-55-3	Benzo(a)anthracene	ND	0.20	0.050	ug/l	
50-32-8	Benzo(a)pyrene	ND	0.20	0.10	ug/l	
205-99-2	Benzo(b)fluoranthene	ND	0.20	0.050	ug/l	
191-24-2	Benzo(g,h,i)perylene	ND	0.20	0.10	ug/l	
207-08-9	Benzo(k)fluoranthene	ND	0.20	0.10	ug/l	
218-01-9	Chrysene	ND	0.20	0.10	ug/l	
53-70-3	Dibenzo(a,h)anthracene	ND	0.20	0.050	ug/l	
206-44-0	Fluoranthene	ND	1.0	0.25	ug/l	
86-73-7	Fluorene	ND	1.0	0.25	ug/l	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	0.20	0.050	ug/l	
90-12-0	1-Methylnaphthalene	ND	1.0	0.25	ug/l	
91-57-6	2-Methylnaphthalene	ND	1.0	0.25	ug/l	
91-20-3	Naphthalene	ND	1.0	0.25	ug/l	
85-01-8	Phenanthrene	ND	1.0	0.50	ug/l	
129-00-0	Pyrene	ND	1.0	0.25	ug/l	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Shaw Environmental, Inc.
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Shaw® Shaw Environmental, Inc.

MEMORANDUM

TO: Jeff Parks, Shaw E&I Radford Army Ammunition Plant (RFAAP) Project Manager

FROM: Eric Malarek, Shaw E&I Project Chemist

SUBJECT: RFAAP Data Validation - Volatiles
Accutest Laboratories, Inc., SDG F51154

DATE: September 25, 2007

The purpose of this memorandum is to present the data validation report for the samples collected at Main Manufacturing Area at RFAAP for a RFI/CMS Nine Sites on July 18, 2007 and July 19, 2007. The samples were analyzed for target compound list (TCL) volatile organic compounds (VOCs) using USEPA SW846 Method 5030B/8260B for aqueous matrices and USEPA SW846 Method 5035/8260B for solid matrices. A total of seven aqueous samples and eighteen solid samples were validated. The sample IDs are:

Field Sample ID	Lab Sample ID	Field Sample ID	Lab Sample ID
AOSW01	F51154-1	APSD01	F51154-18
AOSW02	F51154-2	41SD11	F51154-22
TMSW01	F51154-3	49SS02	F51154-23
AOSD01	F51154-4	49SS03	F51154-24
AOSD02	F51154-5	49SS04	F51154-25
41SW08	F51154-6	49SS05	F51154-26
41SW09	F51154-7	59SS06	F51154-27
41SW10	F51154-8	59SS07	F51154-28
41SD08	F51154-9	59SS08	F51154-29
41SD09	F51154-10	59SS09	F51154-30
41SD10	F51154-11	59SS10	F51154-31
LFSD01	F51154-15	TMSS05	F51154-32
LFSW01	F51154-17		

Data were reviewed by Eric Malarek and validated using a combination of project QAPP, *Quality Systems Manual for Environmental Laboratories, Final Version 3, January, 2006* (DoD, 2006) (DoD QSM), method-specific criteria, and laboratory SOP criteria. The data qualifier scheme was consistent with the *Region III Modifications to the National Functional Guidelines for Organic Data Review* (September 1994). Parameters evaluated are presented in **Table 1**. Data associated with parameters in compliance with quality control specifications have not been qualified. Data associated with parameters that did not comply with quality control specifications and directly impacted project data have been qualified in accordance with USEPA Region III specifications.

Table 1 Laboratory Performance Criteria

Qualified		Parameter
Yes	No	
	X	Holding Times and Preservation
	X	Instrument Performance Results
	X	Initial Calibration
X		Continuing Calibration
	X	Blank Analysis
X		Laboratory Control Sample
X		Matrix Spike / Spike Duplicate Sample
	X	System Monitoring Compounds
	X	Internal Standards
	X	Field Sample Duplicate
X		Quantitation Verification

The quality of data collected in support of this sampling activity is considered acceptable with noted qualifications.

Eric Malarek, Chemist

9/25/07
Date

RFAAP VALIDATION REPORT
VOLATILES REVIEW
SDG F51154

I-Holding Times and Preservation
The objective is to ascertain the validity of results based on the holding time of the sample from time of collection to time of analysis. Holding time criteria: For aqueous samples cooled @ 4°C±2°C; pH<2 HCl, the maximum holding time is 14 days (7 days if no HCl added) from sample collection to analysis. For soil samples cooled @ 4°C±2°C; the maximum holding time is 14 days from sample collection to analysis.

- Temperature Review: The temperature blank was sent with each cooler and recorded by the laboratory upon receipt. For samples collected on 07/18/07 and 07/19/07, the coolers were received by the primary laboratory (Accutest) on 07/20/07 at 4.0°C, 4.0°C, 4.6°C, 4.6°C, 4.8°C, 5.0°C, 5.0°C, and 5.8°C. The herbicides were subcontracted to Accutest TX and were received the samples at 4.2°C, 4.0°C, and 3.6°C. The perchlorate subcontract laboratory (Datachem Laboratories, Inc.) received the aqueous samples at 3.0°C. The dioxin subcontract laboratory (SGS Paradigm Analytical Laboratories, Inc.) received the samples at 5.5°C and 5.2°C. All criteria were met. No qualifiers were applied.

- Holding Time Review: The aqueous samples were collected for TCL VOCs on 07/18/07 and 07/19/07. For the aqueous samples collected 07/18/07, the VOCs were prepped and analyzed on 07/26/07 and 07/31/07 (LFSW01). For the solid samples collected 07/18/07 and 07/19/07, the VOCs were prepped and analyzed on 07/26/07, 07/27/07, and 07/28/07. All criteria were met. No qualifiers were applied.

II-Instrument Performance Check
The analysis of the instrument performance check solution must be performed at the beginning of each 12-hour period during which samples are analyzed.

- The instrument performance check, bromofluorobenzene (BFB), met the ion abundance criteria. No qualification was applied.

III-Initial Calibration
Compliance requirements for satisfactory instrument calibration are established to ensure that the instrument used is capable of producing acceptable qualitative and quantitative data for volatile target compounds. Initial calibration demonstrates that the instrument is capable of acceptable performance in the beginning of the analytical run and of producing a linear calibration curve. The RRF must be greater than 0.1 for chloromethane, 1,1-dichloroethane, and bromoform and greater than 0.3 for 1,1,2,2-tetrachloroethane and chlorobenzene. The minimum relative response factor (RRF) must be ≥0.05 for all other compounds. The DoD QSM specifies that the percent relative standard deviation (%RSD) must be ≤15% for each target compound and must be ≤30% for each calibration check compound. For compounds analyzed using linear regression or second order, correlation coefficients must be >0.995 and coefficients of determination >0.99. All detects are qualified as estimated "J" for where there were exceeding %RSDs, and all non-detects are qualified as estimated "UJ" for where there were grossly exceeding recoveries, unless determined to be unusable "R". Grossly exceeding is defined as twice the established criteria limits. For where there were low RRFs, all detects are qualified as estimated "J" and non-detects are rejected "R".

- For initial calibration performed on 07/25/07 on instrument MSVOA9, target compounds methylene chloride (49.2%; grossly exceeding) and acetone (21.3%) were outside criteria. All other target compounds were within criteria (%RSD≤15% or ≤30%; RRF≥0.05). Compounds methylene chloride (r=0.9984) and acetone (r=0.9995) were quantified using linear or second order regression with correlation coefficients >0.995; therefore, no qualifiers were applied based upon these outliers. Samples 59SS06 (F51154-27), 59SS07 (F51154-28), 59SS08 (F51154-29), 59SS09 (F51154-30), 59SS10 (F51154-31), and TMSS05 (F51154-32) were analyzed using this initial calibration.

- For initial calibration performed on 07/16/07 on instrument MSVOA3, target compounds acetone (18.5%), methylene chloride (32.0%; grossly exceeding), ethylbenzene (15.1%), m,p-xylene (16.6%), and o-xylene (15.4%) were outside criteria. All other target compounds were within criteria (%RSD≤15% or ≤30%; RRF≥0.05). Compounds acetone (r=0.9962), methylene chloride (r=1.0000), ethylbenzene (r=0.9985), m,p-xylene (r=0.9988), and o-xylene (r=0.9990) were quantified using linear or second order regression with correlation coefficients >0.995; therefore, no qualifiers were applied based upon these outliers. Samples AOSD01 (F51154-4), AOSD02 (F51154-5), 41SD08 (F51154-9), 41SD09 (F51154-10), 41SD10 (F51154-11), LFSD01 (F51154-15), APSD01 (F51154-18), 41SD11 (F51154-22), 49SS02 (F51154-23), 49SS03 (F51154-24), 49SS04 (F51154-25), and 49SS05 (F51154-26) as well as the sample confirmations for samples 41SD08 (F51154-9), 41SD10 (F51154-11), 49SS02 (F51154-23), 49SS03 (F51154-24), and 49SS05 (F51154-26) were analyzed using this initial calibration.

- For initial calibration performed on 07/18/07 on instrument MSVOA6, target compounds bromomethane (24.2%), chloroethane (30.7%; grossly exceeding), carbon disulfide (17.4%), methylene chloride (39.6%; grossly exceeding), acetone (22.6%), trans-1,2-dichloroethene (18.2%), and benzene (16.8%) were outside %RSD/RRF criteria. All RSDs/RRFs (RRF≥0.05) were within criteria for all other target compounds. Compounds bromomethane (r=0.9982), chloroethane (r=0.9974), carbon disulfide (r=0.9994), methylene chloride (r=0.9995), acetone (r=0.9989), trans-1,2-dichloroethene (r=1.0000), and benzene (r=1.0000) were quantified using linear or higher order with correlations >0.995; therefore, no qualifiers were applied based upon these outliers. Samples AOSW01 (F51154-1), AOSW02 (F51154-2), TMSW01 (F51154-3), 41SW08 (F51154-6), 41SW09 (F51154-7), and 41SW10 (F51154-8) were analyzed using this initial calibration.

- For initial calibration performed on 07/31/07 on instrument MSVOA6, target compounds bromomethane (22.0%), chloroethane (21.9%), methylene chloride (123%; grossly exceeding), and trans-1,3-dichloropropene (21.2%) were outside %RSD/RRF criteria. All RSDs/RRFs (RRF≥0.05) were within criteria for all other target compounds. Compounds bromomethane (r=0.9954), chloroethane (r=0.9957), methylene chloride (r=0.9962), and trans-1,3-dichloropropene (r=0.9998) were quantified using linear or higher order with correlations >0.995; therefore, no qualifiers were applied based upon these outliers. Sample LFSW01 (F51154-17) was analyzed using this initial calibration.

IV-Continuing Calibration

Compliance requirements for satisfactory instrument calibration are established to ensure that the instrument used is capable of producing acceptable qualitative and quantitative data for volatile target compounds. Continuing calibration establishes the 12-hour relative response factors on which the quantitations are based and checks satisfactory performance of the instrument on a day-to-day basis. The RRF must be greater than 0.1 for chloromethane, 1,1-dichloroethane, and bromoform and greater than 0.3 for 1,1,2,2-tetrachloroethane and chlorobenzene. The minimum relative response factor (RRF) must be ≥0.05 for all other compounds. The DoD QSM specifies that the percent difference (%D) between the initial calibration RRF and the continuing calibration RRF must be within 20% for all target compounds. All detects are qualified as estimated "J" for where there were exceeding %Ds, and all non-detects are qualified as estimated "UJ" for where there were grossly exceeding recoveries, unless determined to be unusable "R". Grossly exceeding is defined as twice the established criteria limits. For where there were low RRFs, all detects are qualified as estimated "J" and non-detects are rejected "R".

- For initial calibration verification performed on 07/25/07 @15:34 on instrument MSVOA9, bromomethane (28.8%) was outside criteria. All other target compounds were within criteria (%D≤20%; %Drift≤20%; RRF≥0.05). Bromomethane was non-detect for all samples; therefore, no qualifiers were applied based upon the high %D. No samples reported apply to this initial calibration verification. No qualifiers were applied based upon this outlier.

- For continuing calibration performed on 07/27/07 @11:30 on instrument MSVOA9, target compounds bromomethane (20.8%) and acetone (59.9%; grossly exceeding) were outside criteria. All other target compounds were within criteria (%D≤20%; %Drift≤20%; RRF≥0.05). Acetone was qualified estimated "J" for detects and "UJ" for non-detects based upon the very high %Drift. Bromomethane was non-detect for all associated samples; therefore no qualifiers were applied based upon this outlier. Samples 59SS06 (F51154-27), 59SS07 (F51154-28), 59SS08 (F51154-29), 59SS09 (F51154-30), and 59SS10 (F51154-31) apply to this continuing calibration.

- For continuing calibration performed on 07/28/07 @12:33 on instrument MSVOA9, all criteria were met. No qualifiers were applied. Sample TMSS05 (F51154-32) applies to this continuing calibration.

- For initial calibration verification performed on 07/16/07 @18:20 on instrument MSVOA3, bromomethane (36.1%) was outside criteria. All other target compounds were within criteria (%D≤20%; %Drift≤20%; RRF≥0.05). Bromomethane was non-detect for all samples; therefore, no qualifiers were applied based upon the high %D. No samples reported apply to this initial calibration verification. No qualifiers were applied based upon this outlier.

- For continuing calibration performed on 07/26/07 @10:18 on instrument MSVOA3, target compounds acetone (77.6%; grossly exceeding) and 2-butanone (23.6%) were outside criteria. All other target compounds were within criteria (%D≤20%; %Drift≤20%; RRF≥0.05). Acetone was qualified estimated "J" for detects and "UJ" for non-detects based upon the very high %Drift. 2-Butanone (MEK) was qualified estimated "J" for detects and no qualifier for non-detects based upon the high %Drift. Samples AOSD01 (F51154-4), AOSD02 (F51154-5), 41SD08 (F51154-9), 41SD09 (F51154-10), 41SD10 (F51154-11), LFSD01 (F51154-15), APSD01 (F51154-18), 41SD11 (F51154-22), 49SS02 (F51154-23), 49SS03 (F51154-24), 49SS04 (F51154-25), and 49SS05 (F51154-26) apply to this continuing calibration.

- For continuing calibration performed on 07/27/07 @11:02 on instrument MSVOA3, target compounds acetone (55.4%; grossly exceeding), 1,1,1-trichloroethane (25.9%) and carbon tetrachloride (30.4%) were outside criteria. All other target compounds were within criteria (%D≤20%; %Drift≤20%; RRF≥0.05). Acetone was qualified estimated "J" for detects and "UJ" for non-detects based upon the very high %Drift. 1,1,1-Trichloroethane and carbon tetrachloride were non-detect for all associated confirmation samples; therefore, no qualifiers were applied based upon these outliers. Sample confirmations 41SD08 (F51154-9), 41SD10 (F51154-11), 49SS02 (F51154-23), 49SS03 (F51154-24), and 49SS05 (F51154-26) apply to this continuing calibration.

- For initial calibration verification performed on 07/18/07 @12:59 on instrument MSVOA6, target compound bromomethane (31.1%) was outside criteria. All criteria (%D≤20%; %Drift≤20%; RRF≥0.05) were met for all other target compounds. No samples reported apply to this initial calibration verification. No qualifiers were applied based upon this outlier.

- For continuing calibration performed on 07/26/07 @10:10 on instrument MSVOA6, target compound chloroethane (27.8%) was outside criteria. All other target compounds were within criteria (%D≤20%; %Drift≤20%; RRF≥0.05). Chloroethane was non-detect for all associated samples; therefore no qualifiers were applied based upon the high %D. Samples AOSW01 (F51154-1), AOSW02 (F51154-2), TMSW01 (F51154-3), 41SW08 (F51154-6), 41SW09 (F51154-7), and 41SW10 (F51154-8) apply to this continuing calibration.

- For initial calibration verification performed on 07/31/07 @13:39 on instrument MSVOA6, target compound bromomethane (21.8%), acetone (22.5%), and trans-1,3-dichloropropene (20.5%) were outside criteria. All criteria (%D≤20%; %Drift≤20%; RRF≥0.05) were met for all other target compounds. No samples reported apply to this initial calibration verification. No qualifiers were applied based upon these outliers.

- For continuing calibration performed on 07/31/07 @14:27 on instrument MSVOA6, all target compounds were within criteria (%D≤20%; %Drift≤20%; RRF≥0.05). No qualifiers were applied. Sample LFSW01 (F51154-17) applies to this continuing calibration.

V-Blank Analysis

The purpose of blank analyses is to determine the presence and magnitude of contamination problems resulting from field and laboratory activities. A method blank analysis must be performed after the calibration standards and once every 12-hour time period beginning with the injection of BFB. No contaminants should be detected in any of the associated blanks > the MDL. The DoD QSM criteria specifies all concentrations should be less than one-half MRL (<MRL for common laboratory contaminants methylene chloride, acetone, and 2-butanone). Positive sample results are reported and qualified "B", if the concentration of the compound in the sample is ≤10 times (10x) the maximum amount in any blank for the common laboratory contaminants methylene chloride, acetone, and 2-butanone (MEK), or 5 times (5X) the maximum amount for other volatile target compounds. **Table 2** summarizes the blank contamination analysis. Action levels are based upon dilution factor of one and for solid matrices were converted to soil values (soil conversion factor = 1) as needed. Rinse blank RB083007 (F52208-1) (low-flow pump) applies to the groundwater "GW" samples in this SDG. The surface water "SW" samples were collected directly into the laboratory bottles; therefore, no rinse blank applies for the SW samples. Rinse blanks 072407R (F51275-1) and 072507R (F51300-31) apply to the surface soil "SS" and subsurface soil "SB" samples in this SDG. Rinse blank RB071807 (F51154-12) applies to the sediment "SD" samples in this SDG. The trip blanks 071807TW (F51154-13) and TB071907W (F51154-21) apply to the aqueous samples collected 07/18/07 and 07/19/07, respectively. The trip blanks 071807TS (F51154-14) and TB071907S (F51154-19) apply to the solid samples collected 07/18/07 and 07/19/07, respectively.

Table 2 Blank Contamination Analysis Summary

Analysis Date	QC Blank ID	Compound	Max Conc. µg/L	Action Level µg/L	B qualified samples
07/26/07	VJ2187-MB	All target <½MRL	NA	NA	None
07/31/07	VJ2191-MB	All target <½MRL	NA	NA	None
09/13/07	RB083007	All target <½MRL	NA	NA	None
07/26/07	071807TW	All target <½MRL	NA	NA	None
07/26/07	071907TW	Chloroform	1.3	6.5	None
Analysis Date	**QC Blank ID**	**Compound**	**Max Conc. µg/kg**	**Action Level µg/kg**	**B qualified samples**
07/26/07	VH1662-MB	All target <½MRL	NA	NA	None
07/27/07	VF413-MB	All target <½MRL	NA	NA	None
07/28/07	VF414-MB	All target <½MRL	NA	NA	None
07/31/07	072407R	All target <½MRL	NA	NA	None
08/02/07	072507R	All target <½MRL	NA	NA	None
07/26/07	RB071807	Methylene chloride	2.7J	27	None
07/26/07	071807TS	All target <½MRL	NA	NA	None
07/26/07	071907TS	All target <½MRL	NA	NA	None

J = Estimated value <MRL and >MDL. Data point qualified was estimated "J".
NA = Not Applicable
MRL = Method Reporting Limit

VI-Laboratory Control Sample

Data for laboratory control samples (LCS) are evaluated to determine long-term accuracy of the analytical method on various matrices. Percent recoveries (%Rs) should be within the specified control limits. The DoD aqueous LCS recovery limits are specified in Table D-4 of the DoD QSM (DoD, 2006). DoD LCS soil recovery limits are specified in Table D-5 of the DoD QSM (DoD, 2006). If the compound is not listed, then the laboratory criteria shall be used.

- Sample VJ2187-BS was used as the aqueous LCS for the VOC analysis on 07/26/07. Trans-1,3-dichloropropene (83%) was below lab limits and within DoD QSM criteria. Trans-1,3-dichloropropene was non-detect for all associated samples; therefore, the samples were qualified bias low "UL" for these compounds based upon this outlier. All other percent recoveries were within criteria for all target compounds. Samples AOSW01 (F51154-1), AOSW02 (F51154-2), TMSW01 (F51154-3), 41SW08 (F51154-6), 41SW09 (F51154-7), and 41SW10 (F51154-8) apply to this LCS.

- Sample VJ2191-BS was used as the aqueous LCS for the VOC analysis on 07/31/07. All criteria were met. No qualifiers were applied. Sample LFSW01 (F51154-17) applies to this LCS.

- Sample VH1662-BS was used as the solid LCS for the VOC analysis on 07/26/07. Chloromethane (56%) was below the lab limits and within DoD QSM criteria and vinyl chloride (58%) was below both the DoD QSM and lab limits. Chloromethane and vinyl chloride were non-detect for all associated samples; therefore, the samples were qualified bias low "UL" for these compounds based upon these outliers. All other percent recoveries were within criteria for all target compounds. Samples AOSD01 (F51154-4), AOSD02 (F51154-5), 41SD08 (F51154-9), 41SD09 (F51154-10), 41SD10 (F51154-11), LFSD01 (F51154-15), APSD01 (F51154-18), 41SD11 (F51154-22), 49SS02 (F51154-23), 49SS03 (F51154-24), 49SS04 (F51154-25), and 49SS05 (F51154-26) apply to this LCS.

- Sample VF413-BS was used as the solid LCS for the VOC analysis on 07/27/07. All criteria were met. No qualifiers were applied. Samples 59SS06 (F51154-27), 59SS07 (F51154-28), 59SS08 (F51154-29), 59SS09 (F51154-30), and 59SS10 (F51154-31) apply to this LCS.

- Sample VF414-BS was used as the solid LCS for the VOC analysis on 07/28/07. All criteria were met. No qualifiers were applied. Sample TMSS05 (F51154-32) applies to this LCS.

VII-Matrix Spike/Matrix Spike Duplicate

Data for matrix spike/matrix spike duplicates (MS/MSD) are generated to determine long-term precision and accuracy of the analytical method on various matrices and to demonstrate acceptable compound recovery by the laboratory at the time of sample analysis. The percent recoveries (%Rs) and the relative percent difference (RPD) must be within the specified control limits. The DoD MS/MSD aqueous recovery limits follow the LCS criteria and are specified in Table D-4 of the DoD QSM (DoD, 2006). The DoD MS/MSD solid recovery limits follow the LCS criteria and are specified in Table D-5 of the DoD QSM (DoD, 2006). If the compound is not listed, then the laboratory criteria shall be used.

- Sample AOSW02 (F51154-2) was used for the aqueous MS/MSD analysis on 07/26/07. Cis-1,3-dichloropropene (81%) and trans-1,3-dichloropropene (80%, 82%) were outside lab criteria and within DoD QSM criteria for the MS/MSD sample. The associated LCS was within criteria for these compounds (See Section VI). The associated samples were non-detect for these compounds; therefore, the spiked sample was qualified bias low "UL" for these compounds based upon these outliers. All other percent recoveries were within criteria for all target compounds. Samples AOSW01 (F51154-1), AOSW02 (F51154-2), TMSW01 (F51154-3), 41SW08 (F51154-6), 41SW09 (F51154-7), and 41SW10 (F51154-8) apply to this MS/MSD.

- Sample LFSW01 (F51154-17) was used for the aqueous MS/MSD analysis on 07/31/07. Bromomethane (146%, 148%) was outside DoD QSM criteria and within lab criteria for the MS/MSD sample. The associated LCS was within criteria for these compounds (See Section VI). The associated sample was non-detect for this compound; therefore, no qualifiers were applied based upon this outlier. All other percent recoveries were within criteria for all target compounds. Sample LFSW01 (F51154-17) applies to this MS/MSD.

- Sample AOSD02 (F51154-5) was used for the solid MS/MSD analysis on 07/26/07. Acetone (51%, 48%), bromoform (52%, 47%), chloroethane (56%, 60%), carbon tetrachloride (71%, 56%), dibromochloromethane (70%, 66%), trans-1,3-dichloropropene (82%), 2-hexanone (58%), 4-methyl-2-pentanone (65%), methyl bromide (52%, 56%), methyl chloride (39%, 46%), methylene chloride (202%, 171%), methyl ethyl ketone (48%, 55%), toluene (125%), and vinyl chloride (43%, 46%) were outside lab criteria and/or DoD QSM criteria for the MS/MSD sample. The associated LCS was within criteria for these compounds (See Section VI) except for methyl chloride and vinyl chloride. The associated samples were non-detect for all of these compounds. All associated samples were qualified bias low "UL" for methyl chloride and vinyl chloride based upon these outliers. The spiked sample was qualified bias low "L" for detects and "UL" for non-detects for acetone, bromoform, chloroethane, carbon tetrachloride, dibromochloromethane, trans-1,3-dichloropropene, 2-hexanone, 4-methyl-2-pentanone, methyl bromide, and methyl ethyl ketone based upon these outliers. No qualifiers were applied for methylene chloride and toluene based upon the high recoveries (spiked sample was non-detect for these compounds). All other percent recoveries were within criteria for all target compounds. Samples AOSD01 (F51154-4), AOSD02 (F51154-5), 41SD08 (F51154-9), 41SD09 (F51154-10), 41SD10 (F51154-11), LFSD01 (F51154-15), APSD01 (F51154-18), 41SD11 (F51154-22), 49SS02 (F51154-23), 49SS03 (F51154-24), 49SS04 (F51154-25), and 49SS05 (F51154-26) apply to this MS/MSD.

- Sample F51158-1 was used for the solid MS/MSD analysis for analysis on 07/27/07. Since this sample is not a RFAAP site sample, it was not evaluated. No qualifiers were applied. Samples 59SS06 (F51154-27), 59SS07 (F51154-28), 59SS08 (F51154-29), 59SS09 (F51154-30), and 59SS10 (F51154-31) apply to this MS/MSD.

- Sample F51333-1 was used for the solid MS/MSD analysis for analysis on 07/28/07. Since this sample is not a RFAAP site sample, it was not evaluated. No qualifiers were applied. Sample TMSS05 (F51154-32) applies to this MS/MSD.

VIII-System Monitoring Compounds (Surrogates)
Laboratory performance on individual samples is evaluated through the review of surrogate spike samples. Recoveries for system monitoring compounds in volatile samples and blanks must be within the specified control limits. DoD surrogate recovery limits are specified in Table D-3 of the DoD QSM (DoD, 2006). If the surrogate is not listed, then the laboratory criteria shall be used.

Aqueous Criteria:	Dibromofluoromethane (87-116%) (DoD QSM = 85-115%) 1,2-Dichloroethane-d4 (76-127%) (DoD QSM = 70-120%) Toluene-d8 (86-112%) (DoD QSM = 85-120%) 4-Bromofluorobenzene (84-120%) (DoD QSM = 75-120%)
Solid Criteria:	Dibromofluoromethane (80-121%) (DoD QSM = None Listed) 1,2-Dichloroethane-d4 (77-123%) (DoD QSM = None Listed) Toluene-d8 (71-130%) (DoD QSM = 85-115%) 4-Bromofluorobenzene (59-148%) (DoD QSM = 85-120%)

- For sample AOSD02 (F51154-5), 4-bromofluorobenzene (125%) was outside DoD QSM criteria and within lab criteria. Since all other surrogates were within criteria, no qualifiers were applied based upon this outlier.

- For sample AOSD02 (F51154-5), 4-bromofluorobenzene (125%) was outside DoD QSM criteria and within lab criteria. Since all other surrogates were within criteria, no qualifiers were applied based upon this outlier.

- For sample 41SD08 (F51154-9), 4-bromofluorobenzene (134%) was outside DoD QSM criteria and within lab criteria. Since all other surrogates were within criteria, no qualifiers were applied based upon this outlier. The sample was rerun for confirmation with 129% recovery.

- For sample 41SD09 (F51154-10), 4-bromofluorobenzene (131%) was outside DoD QSM criteria and within lab criteria. Since all other surrogates were within criteria, no qualifiers were applied based upon this outlier.

- For sample 41SD10 (F51154-11), 4-bromofluorobenzene (145%) was outside DoD QSM criteria and within lab criteria. Since all other surrogates were within criteria, no qualifiers were applied based upon this outlier. The sample was rerun for confirmation with 134% recovery.

- For sample LFSD01 (F51154-15), 4-bromofluorobenzene (126%) was outside DoD QSM criteria and within lab criteria. Since all other surrogates were within criteria, no qualifiers were applied based upon this outlier.

- For sample 41SD11 (F51154-22), 4-bromofluorobenzene (135%) was outside DoD QSM criteria and within lab criteria. Since all other surrogates were within criteria, no qualifiers were applied based upon this outlier.

- For sample 49SS02 (F51154-23), 4-bromofluorobenzene (146%) was outside DoD QSM criteria and within lab criteria. Since all other surrogates were within criteria, no qualifiers were applied based upon this outlier. The sample was rerun for confirmation with 134% recovery.

- For sample 49SS03 (F51154-24), 4-bromofluorobenzene (162%) was outside DoD QSM criteria and outside lab criteria. Since all other surrogates were within criteria, no qualifiers were applied based upon this outlier. The sample was rerun for confirmation with 133% recovery.

- For sample 49SS04 (F51154-25), 4-bromofluorobenzene (125%) was outside DoD QSM criteria and within lab criteria. Since all other surrogates were within criteria, no qualifiers were applied based upon this outlier.

- For sample 49SS05 (F51154-26), 4-bromofluorobenzene (130%) was outside DoD QSM criteria and within lab criteria. Since all other surrogates were within criteria, no qualifiers were applied based upon this outlier. The sample was rerun for confirmation with 138% recovery.

- For sample 59SS09 (F51154-30), 4-bromofluorobenzene (132%) was outside DoD QSM criteria and within lab criteria. Since all other surrogates were within criteria, no qualifiers were applied based upon this outlier.

- For sample TMSS05 (F51154-32), 4-bromofluorobenzene (121%) was outside DoD QSM criteria and within lab criteria. Since all other surrogates were within criteria, no qualifiers were applied based upon this outlier.

- For all other samples, all criteria were met. No qualifiers were applied.

IX-Internal Standards (IS)
Internal standards performance criteria ensure that GC/MS sensitivity and response are stable during every analytical run. Specific criteria include: area counts (-50% to +100%) of the associated calibration standard, and retention time (± 30 seconds) from that of the associated calibration standard.

- For sample AOSD01 (F51154-4), internal standard 4 tert-butyl-alcohol-d10 was below criteria limits. No target analytes were quantified using this internal standard; therefore, no qualifiers were applied based upon this outlier. All other internal standards were within criteria.

- For sample AOSD02 (F51154-5), internal standard 4 tert-butyl-alcohol-d10 was below criteria limits. No target analytes were quantified using this internal standard; therefore, no qualifiers were applied based upon this outlier. All other internal standards were within criteria.

- For sample 41SD08 (F51154-9), internal standard 3 1,4-dichlorobenzene-d4 and internal standard 4 tert-butyl-alcohol-d10 were below criteria limits. No target analytes were quantified using 1,4-dichlorobenzene-d4 or tert-butyl-alcohol-d10; therefore, no qualifiers were applied based upon this outlier. All other internal standards were within criteria. The sample was rerun for confirmation.

- For sample 41SD10 (F51154-11), internal standard 3 1,4-dichlorobenzene-d4 and internal standard 4 tert-butyl-alcohol-d10 were below criteria limits. No target analytes were quantified using 1,4-dichlorobenzene-d4 or tert-butyl-alcohol-d10; therefore, no qualifiers were applied based upon this outlier. All other internal standards were within criteria. The sample was rerun for confirmation.

- For sample LFSD01 (F51154-15), internal standard 4 tert-butyl-alcohol-d10 was below criteria limits. No target analytes were quantified using this internal standard; therefore, no qualifiers were applied based upon this outlier. All other internal standards were within criteria.

- For sample 41SD11 (F51154-22), internal standard 4 tert-butyl-alcohol-d10 was below criteria limits. No target analytes were quantified using this internal standard; therefore, no qualifiers were applied based upon this outlier. All other internal standards were within criteria.

- For sample 49SS02 (F51154-23), internal standard 3 1,4-dichlorobenzene-d4 and internal standard 4 tert-butyl-alcohol-d10 were below criteria limits. No target analytes were quantified using 1,4-dichlorobenzene-d4 or tert-butyl-alcohol-d10; therefore, no qualifiers were applied based upon this outlier. All other internal standards were within criteria. The sample was rerun for confirmation.

- For sample 49SS03 (F51154-24), internal standard 3 1,4-dichlorobenzene-d4 and internal standard 4 tert-butyl-alcohol-d10 were below criteria limits. No target analytes were quantified using 1,4-dichlorobenzene-d4 or tert-butyl-alcohol-d10; therefore, no qualifiers were applied based upon this outlier. All other internal standards were within criteria. The sample was rerun for confirmation.

- For sample 49SS05 (F51154-26), internal standard 3 1,4-dichlorobenzene-d4 and internal standard 4 tert-butyl-alcohol-d10 were below criteria limits. No target analytes were quantified using 1,4-dichlorobenzene-d4 or tert-butyl-alcohol-d10; therefore, no qualifiers were applied based upon this outlier. All other internal standards were within criteria. The sample was rerun for confirmation.

- For all other samples, all criteria were met. No qualifiers were applied.

X-Field Duplicate Sample Analysis

Field duplicates were collected to identify the cumulative precision of the sampling and analytical process and sent to the laboratory blind. The RPD was calculated only for those analytes which were detected at levels exceeding the method reporting limits in both samples of the duplicate pair. Analytes that were rejected (R-qualified) in either sample of the duplicate pair were excluded from the duplicate assessment. Precision control criterion was established at 50% RPD for the aqueous and solid samples. Analytical results were qualified as estimated (J) for any RPDs exceeding criteria.

- Field surface water sample duplicate pair AOSW01 (F51154-1) and TMSW01 (F51154-3) was collected for TCL VOCs. All TCL VOCs target compounds were non-detect. All criteria were met. No qualifiers were applied.

- Field surface soil sample duplicate pair 49SS05 (F51154-26) and TMSS05 (F51154-32) was collected for TCL VOCs. Acetone was non-detect in the original sample and detected at a concentration below the MRL at 78.2J ug/kg in the duplicate pair. All other TCL VOCs target compounds were non-detect. All criteria were met. No qualifiers were applied.

XI-Quantitation Verification

The accuracy of analytical results is verified through the calculation of several parameters. The percent difference (%D) between the calculated and the reported values should be within 10%. Any sample value >MDL and <MRL or <3*MDL (whichever is greater) was qualified as estimated, "J."

Sample: TB071907W (F51154-21), chloroform

Conc. (µg/L) = (Ax)*(Is) *(DF)/(Ais)*(RRF)

where: Ax is the compound area
Ais is the corresponding internal standard area
Is is the corresponding internal standard concentration (µg/L)
DF is the dilution factor
RRF is the relative response factor.

Conc. µg/L = (27317 * 50 µg/L * 1) / (2460609 * 0.423) = 1.3 µg/L

Reported Conc. = 1.3 µg/L
%D = 0.0%
Values were within 10% difference.

Sample: 41SD08 (F51154-9), methyl ethyl ketone

Conc. (µg/kg) = {(Ax)*(Is)*(DF)*(Vp)} / {(Ais)*(RRF)*(Ws)*Fs)}
where:
Ax is the compound area
Is is the corresponding internal standard concentration (ng/mL)
DF is the dilution factor
Vp is the volume purged (mL)
Ais is the corresponding internal standard area
RRF is the relative response factor
Ws is the weight of the sample (g)
Fs is the fraction solids for the sample

Conc. µg/kg = (73706 * 50 ng/mL * 1 * 5mL) / (919966 * 0.284 * 3.92g * 0.369) =
= 48.8 µg/kg

Reported Conc. = 48.8 µg/kg
%D = 0.0%
Values were within 10% difference.

USEPA Region III Validation Qualifiers

(No Code) = Confirmed identification.

B = The analyte has been detected in the sample and the associated laboratory or field blank.

J = Indicates an estimated value for (1) estimated value due to QC non-conformance. Reported value may not be accurate or precise, (2) estimating a concentration as a tentatively identified compound as indicated by the mass spectral and retention time data, or (3) estimating a concentration ≥MDL and <MRL or <3*MDL, whichever is greater.

K = Analyte present. Reported value may be biased high (estimated) due to QC non-conformance.

L = Analyte present. Reported value may be biased low (estimated) due to QC non-conformance.

R = Unreliable result. Analyte may or may not be present in the sample due to QC non-conformance.

UL = Value is estimated bias low and not detected due to QC non-conformance. Reporting limit may be inaccurate or imprecise. Quantitation limit is probably higher.

UJ = Value is estimated and not detected due to QC non-conformance. Reporting limit may be inaccurate or imprecise.

Laboratory Qualifiers

(No Code) = Confirmed identification.

U = Not detected. The associated number indicates the compound reporting limit for the sample.

A (Dioxins) = B (Metals) = The reported value was obtained from a reading <MRL and ≥MDL and is considered estimated.

B (Organics) = The analyte or compound has been detected in the sample and laboratory method blank. It indicates probable blank contamination.

E (Metals) = Reported value is estimated because of the presence of interferences.

E (Organics) = Identifies compounds whose concentrations exceed the upper level of the calibration range.

EMPC (Dioxins) = The ion-abundance ratio between the two characteristic PCDD/PCDF ions was outside accepted ranges. The detected PCDD/PCDF was reported as an estimated maximum possible concentration (EMPC).

D = Indicates sample was analyzed at a dilution.

J = Indicates an estimated value for (1) estimating a concentration as a tentatively identified compound as indicated by the mass spectral and retention time data, or (2) estimating a concentration <MRL and ≥ MDL.

N (Organics) = Indicates presumptive evidence of a compound for tentatively identified compounds using a library search.

N (Metals) = Laboratory spike sample recovery not within control limits.

P (Organics) = Target analyte confirmation >40% difference for detected compound between the primary and secondary columns. The lower of the two values was reported.

* (Metals) = Duplicate analysis not within control limits.

* (Organics) = Surrogate outside of QC limits on both original and re-analysis.

Raw Data: J031452.D

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Report of Analysis

Client Sample ID:	AOSW01		
Lab Sample ID:	F51154-1	Date Sampled:	07/18/07
Matrix:	AQ - Surface Water	Date Received:	07/19/07
Method:	SW846 8260B	Percent Solids:	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	J031452.D	1	07/26/07	JG	n/a	n/a	VJ2187
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	25	5.0	ug/l	
71-43-2	Benzene	ND	1.0	0.50	ug/l	
75-27-4	Bromodichloromethane	ND	1.0	0.50	ug/l	
75-25-2	Bromoform	ND	1.0	0.50	ug/l	
108-90-7	Chlorobenzene	ND	1.0	0.50	ug/l	
75-00-3	Chloroethane	ND	2.0	1.0	ug/l	
67-66-3	Chloroform	ND	1.0	0.50	ug/l	
75-15-0	Carbon disulfide	ND	2.0	1.0	ug/l	
56-23-5	Carbon tetrachloride	ND	1.0	0.50	ug/l	
75-34-3	1,1-Dichloroethane	ND	1.0	0.50	ug/l	
75-35-4	1,1-Dichloroethylene	ND	1.0	0.50	ug/l	
107-06-2	1,2-Dichloroethane	ND	1.0	0.50	ug/l	
78-87-5	1,2-Dichloropropane	ND	1.0	0.50	ug/l	
124-48-1	Dibromochloromethane	ND	1.0	0.40	ug/l	
156-59-2	cis-1,2-Dichloroethylene	ND	1.0	0.50	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	1.0	0.30	ug/l	
156-60-5	trans-1,2-Dichloroethylene	ND	1.0	0.50	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND VL	1.0	0.30	ug/l	
100-41-4	Ethylbenzene	ND	1.0	0.50	ug/l	
591-78-6	2-Hexanone	ND	5.0	2.5	ug/l	
108-10-1	4-Methyl-2-pentanone	ND	5.0	2.5	ug/l	
74-83-9	Methyl bromide	ND	2.0	1.0	ug/l	
74-87-3	Methyl chloride	ND	2.0	1.0	ug/l	
75-09-2	Methylene chloride	ND	5.0	1.0	ug/l	
78-93-3	Methyl ethyl ketone	ND	5.0	2.5	ug/l	
100-42-5	Styrene	ND	1.0	0.50	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	1.0	0.50	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.0	0.40	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	1.0	0.50	ug/l	
127-18-4	Tetrachloroethylene	ND	1.0	0.50	ug/l	
108-88-3	Toluene	ND	1.0	0.50	ug/l	
79-01-6	Trichloroethylene	ND	1.0	0.50	ug/l	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	AOSW01		
Lab Sample ID:	F51154-1	Date Sampled:	07/18/07
Matrix:	AQ - Surface Water	Date Received:	07/19/07
Method:	SW846 8260B	Percent Solids:	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
75-01-4	Vinyl chloride	ND	1.0	0.50	ug/l	
	m,p-Xylene	ND	2.0	0.50	ug/l	
95-47-6	o-Xylene	ND	1.0	0.50	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	101%		87-116%
17060-07-0	1,2-Dichloroethane-D4	95%		76-127%
2037-26-5	Toluene-D8	100%		86-112%
460-00-4	4-Bromofluorobenzene	109%		84-120%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: J031449.D

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Report of Analysis

Client Sample ID:	AOSW02		
Lab Sample ID:	F51154-2	Date Sampled:	07/18/07
Matrix:	AQ - Surface Water	Date Received:	07/19/07
Method:	SW846 8260B	Percent Solids:	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	J031449.D	1	07/26/07	JG	n/a	n/a	VJ2187
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	7.0 J	25	5.0	ug/l	J
71-43-2	Benzene	ND	1.0	0.50	ug/l	
75-27-4	Bromodichloromethane	ND	1.0	0.50	ug/l	
75-25-2	Bromoform	ND	1.0	0.50	ug/l	
108-90-7	Chlorobenzene	ND	1.0	0.50	ug/l	
75-00-3	Chloroethane	ND	2.0	1.0	ug/l	
67-66-3	Chloroform	ND	1.0	0.50	ug/l	
75-15-0	Carbon disulfide	ND	2.0	1.0	ug/l	
56-23-5	Carbon tetrachloride	ND	1.0	0.50	ug/l	
75-34-3	1,1-Dichloroethane	ND	1.0	0.50	ug/l	
75-35-4	1,1-Dichloroethylene	ND	1.0	0.50	ug/l	
107-06-2	1,2-Dichloroethane	ND	1.0	0.50	ug/l	
78-87-5	1,2-Dichloropropane	ND	1.0	0.50	ug/l	
124-48-1	Dibromochloromethane	ND	1.0	0.40	ug/l	
156-59-2	cis-1,2-Dichloroethylene	ND	1.0	0.50	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND VL	1.0	0.30	ug/l	
156-60-5	trans-1,2-Dichloroethylene	ND	1.0	0.50	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND VL	1.0	0.30	ug/l	
100-41-4	Ethylbenzene	ND	1.0	0.50	ug/l	
591-78-6	2-Hexanone	ND	5.0	2.5	ug/l	
108-10-1	4-Methyl-2-pentanone	ND	5.0	2.5	ug/l	
74-83-9	Methyl bromide	ND	2.0	1.0	ug/l	
74-87-3	Methyl chloride	ND	2.0	1.0	ug/l	
75-09-2	Methylene chloride	ND	5.0	1.0	ug/l	
78-93-3	Methyl ethyl ketone	ND	5.0	2.5	ug/l	
100-42-5	Styrene	ND	1.0	0.50	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	1.0	0.50	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.0	0.40	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	1.0	0.50	ug/l	
127-18-4	Tetrachloroethylene	ND	1.0	0.50	ug/l	
108-88-3	Toluene	ND	1.0	0.50	ug/l	
79-01-6	Trichloroethylene	ND	1.0	0.50	ug/l	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	AOSW02		
Lab Sample ID:	F51154-2	Date Sampled:	07/18/07
Matrix:	AQ - Surface Water	Date Received:	07/19/07
Method:	SW846 8260B	Percent Solids:	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
75-01-4	Vinyl chloride	ND	1.0	0.50	ug/l	
	m,p-Xylene	ND	2.0	0.50	ug/l	
95-47-6	o-Xylene	ND	1.0	0.50	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	99%		87-116%
17060-07-0	1,2-Dichloroethane-D4	93%		76-127%
2037-26-5	Toluene-D8	99%		86-112%
460-00-4	4-Bromofluorobenzene	108%		84-120%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	TMSW01		
Lab Sample ID:	F51154-3	Date Sampled:	07/18/07
Matrix:	AQ - Surface Water	Date Received:	07/19/07
Method:	SW846 8260B	Percent Solids:	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	J031453.D	1	07/26/07	JG	n/a	n/a	VJ2187
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	25	5.0	ug/l	
71-43-2	Benzene	ND	1.0	0.50	ug/l	
75-27-4	Bromodichloromethane	ND	1.0	0.50	ug/l	
75-25-2	Bromoform	ND	1.0	0.50	ug/l	
108-90-7	Chlorobenzene	ND	1.0	0.50	ug/l	
75-00-3	Chloroethane	ND	2.0	1.0	ug/l	
67-66-3	Chloroform	ND	1.0	0.50	ug/l	
75-15-0	Carbon disulfide	ND	2.0	1.0	ug/l	
56-23-5	Carbon tetrachloride	ND	1.0	0.50	ug/l	
75-34-3	1,1-Dichloroethane	ND	1.0	0.50	ug/l	
75-35-4	1,1-Dichloroethylene	ND	1.0	0.50	ug/l	
107-06-2	1,2-Dichloroethane	ND	1.0	0.50	ug/l	
78-87-5	1,2-Dichloropropane	ND	1.0	0.50	ug/l	
124-48-1	Dibromochloromethane	ND	1.0	0.40	ug/l	
156-59-2	cis-1,2-Dichloroethylene	ND	1.0	0.50	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	1.0	0.30	ug/l	
156-60-5	trans-1,2-Dichloroethylene	ND	1.0	0.50	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND VL	1.0	0.30	ug/l	
100-41-4	Ethylbenzene	ND	1.0	0.50	ug/l	
591-78-6	2-Hexanone	ND	5.0	2.5	ug/l	
108-10-1	4-Methyl-2-pentanone	ND	5.0	2.5	ug/l	
74-83-9	Methyl bromide	ND	2.0	1.0	ug/l	
74-87-3	Methyl chloride	ND	2.0	1.0	ug/l	
75-09-2	Methylene chloride	ND	5.0	1.0	ug/l	
78-93-3	Methyl ethyl ketone	ND	5.0	2.5	ug/l	
100-42-5	Styrene	ND	1.0	0.50	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	1.0	0.50	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.0	0.40	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	1.0	0.50	ug/l	
127-18-4	Tetrachloroethylene	ND	1.0	0.50	ug/l	
108-88-3	Toluene	ND	1.0	0.50	ug/l	
79-01-6	Trichloroethylene	ND	1.0	0.50	ug/l	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Form I Copy

Accutest Laboratories

Report of Analysis

Client Sample ID:	TMSW01		
Lab Sample ID:	F51154-3		
Matrix:	AQ - Surface Water	Date Sampled:	07/18/07
Method:	SW846 8260B	Date Received:	07/19/07
Project:	WPA 019 Field Investigation; Radford AAP, VA	Percent Solids:	n/a

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
75-01-4	Vinyl chloride	ND	1.0	0.50	ug/l	
	m,p-Xylene	ND	2.0	0.50	ug/l	
95-47-6	o-Xylene	ND	1.0	0.50	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	101%		87-116%
17060-07-0	1,2-Dichloroethane-D4	97%		76-127%
2037-26-5	Toluene-D8	100%		86-112%
460-00-4	4-Bromofluorobenzene	106%		84-120%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: H044667.D

For I Only

Accutest Laboratories

Report of Analysis

Client Sample ID:	AOSD01		
Lab Sample ID:	F51154-4	Date Sampled:	07/18/07
Matrix:	SO - Sediment	Date Received:	07/19/07
Method:	SW846 8260B	Percent Solids:	66.2
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	H044667.D	1	07/26/07	SH	n/a	n/a	VH1662
Run #2							

	Initial Weight
Run #1	3.53 g
Run #2	

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND UJ	110	53	ug/kg	
71-43-2	Benzene	ND	11	4.3	ug/kg	
75-27-4	Bromodichloromethane	ND	11	4.3	ug/kg	
75-25-2	Bromoform	ND	11	4.3	ug/kg	
108-90-7	Chlorobenzene	ND	11	4.3	ug/kg	
75-00-3	Chloroethane	ND	11	6.4	ug/kg	
67-66-3	Chloroform	ND	11	4.3	ug/kg	
75-15-0	Carbon disulfide	ND	11	4.3	ug/kg	
56-23-5	Carbon tetrachloride	ND	11	4.3	ug/kg	
75-34-3	1,1-Dichloroethane	ND	11	4.3	ug/kg	
75-35-4	1,1-Dichloroethylene	ND	11	4.3	ug/kg	
107-06-2	1,2-Dichloroethane	ND	11	4.3	ug/kg	
78-87-5	1,2-Dichloropropane	ND	11	4.3	ug/kg	
124-48-1	Dibromochloromethane	ND	11	4.3	ug/kg	
156-59-2	cis-1,2-Dichloroethylene	ND	11	4.3	ug/kg	
10061-01-5	cis-1,3-Dichloropropene	ND	11	4.3	ug/kg	
156-60-5	trans-1,2-Dichloroethylene	ND	11	4.3	ug/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	11	4.3	ug/kg	
100-41-4	Ethylbenzene	ND	11	4.3	ug/kg	
591-78-6	2-Hexanone	ND	53	21	ug/kg	
108-10-1	4-Methyl-2-pentanone	ND	53	21	ug/kg	
74-83-9	Methyl bromide	ND	11	4.3	ug/kg	
74-87-3	Methyl chloride	ND UL	11	4.3	ug/kg	
75-09-2	Methylene chloride	ND	21	11	ug/kg	
78-93-3	Methyl ethyl ketone	ND	53	21	ug/kg	
100-42-5	Styrene	ND	11	4.3	ug/kg	
71-55-6	1,1,1-Trichloroethane	ND	11	4.3	ug/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	11	4.3	ug/kg	
79-00-5	1,1,2-Trichloroethane	ND	11	4.3	ug/kg	
127-18-4	Tetrachloroethylene	ND	11	4.3	ug/kg	
108-88-3	Toluene	ND	11	4.3	ug/kg	
79-01-6	Trichloroethylene	ND	11	4.3	ug/kg	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Form I COM

Accutest Laboratories

Report of Analysis

Client Sample ID:	AOSD01		
Lab Sample ID:	F51154-4	Date Sampled:	07/18/07
Matrix:	SO - Sediment	Date Received:	07/19/07
Method:	SW846 8260B	Percent Solids:	66.2
Project:	WPA 019 Field Investigation; Radford AAP, VA		

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
75-01-4	Vinyl chloride	ND VL	11	4.3	ug/kg	
	m,p-Xylene	ND	21	6.4	ug/kg	
95-47-6	o-Xylene	ND	11	4.3	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	105%		80-121%
2037-26-5	Toluene-D8	99%		71-130%
460-00-4	4-Bromofluorobenzene	109%		59-148%
17060-07-0	1,2-Dichloroethane-D4	105%		77-123%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: H044668.D

Form I copy

Accutest Laboratories

Report of Analysis

Client Sample ID:	AOSD02		
Lab Sample ID:	F51154-5	Date Sampled:	07/18/07
Matrix:	SO - Sediment	Date Received:	07/19/07
Method:	SW846 8260B	Percent Solids:	59.3
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	H044668.D	1	07/26/07	SH	n/a	n/a	VH1662
Run #2							

	Initial Weight
Run #1	4.36 g
Run #2	

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone [a]	87.7 J	97	48	ug/kg	J
71-43-2	Benzene	ND	9.7	3.9	ug/kg	
75-27-4	Bromodichloromethane	ND	9.7	3.9	ug/kg	
75-25-2	Bromoform	ND VL	9.7	3.9	ug/kg	
108-90-7	Chlorobenzene	ND	9.7	3.9	ug/kg	
75-00-3	Chloroethane	ND VL	9.7	5.8	ug/kg	
67-66-3	Chloroform	ND	9.7	3.9	ug/kg	
75-15-0	Carbon disulfide	ND	9.7	3.9	ug/kg	
56-23-5	Carbon tetrachloride	ND VL	9.7	3.9	ug/kg	
75-34-3	1,1-Dichloroethane	ND	9.7	3.9	ug/kg	
75-35-4	1,1-Dichloroethylene	ND	9.7	3.9	ug/kg	
107-06-2	1,2-Dichloroethane	ND	9.7	3.9	ug/kg	
78-87-5	1,2-Dichloropropane	ND	9.7	3.9	ug/kg	
124-48-1	Dibromochloromethane	ND VL	9.7	3.9	ug/kg	
156-59-2	cis-1,2-Dichloroethylene	ND	9.7	3.9	ug/kg	
10061-01-5	cis-1,3-Dichloropropene	ND	9.7	3.9	ug/kg	
156-60-5	trans-1,2-Dichloroethylene	ND	9.7	3.9	ug/kg	
10061-02-6	trans-1,3-Dichloropropene	ND VL	9.7	3.9	ug/kg	
100-41-4	Ethylbenzene	ND	9.7	3.9	ug/kg	
591-78-6	2-Hexanone	ND VL	48	19	ug/kg	
108-10-1	4-Methyl-2-pentanone	ND VL	48	19	ug/kg	
74-83-9	Methyl bromide	ND VL	9.7	3.9	ug/kg	
74-87-3	Methyl chloride	ND VL	9.7	3.9	ug/kg	
75-09-2	Methylene chloride	ND	19	9.7	ug/kg	
78-93-3	Methyl ethyl ketone	ND VL	48	19	ug/kg	
100-42-5	Styrene	ND	9.7	3.9	ug/kg	
71-55-6	1,1,1-Trichloroethane	ND	9.7	3.9	ug/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	9.7	3.9	ug/kg	
79-00-5	1,1,2-Trichloroethane	ND	9.7	3.9	ug/kg	
127-18-4	Tetrachloroethylene	ND	9.7	3.9	ug/kg	
108-88-3	Toluene	ND	9.7	3.9	ug/kg	
79-01-6	Trichloroethylene	ND	9.7	3.9	ug/kg	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Form I copy

Accutest Laboratories

Report of Analysis

Client Sample ID:	AOSD02		
Lab Sample ID:	F51154-5	Date Sampled:	07/18/07
Matrix:	SO - Sediment	Date Received:	07/19/07
Method:	SW846 8260B	Percent Solids:	59.3
Project:	WPA 019 Field Investigation; Radford AAP, VA		

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
75-01-4	Vinyl chloride	ND VL	9.7	3.9	ug/kg	
	m,p-Xylene	ND	19	5.8	ug/kg	
95-47-6	o-Xylene	ND	9.7	3.9	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	103%		80-121%
2037-26-5	Toluene-D8	101%		71-130%
460-00-4	4-Bromofluorobenzene	125%		59-148%
17060-07-0	1,2-Dichloroethane-D4	104%		77-123%

(a) CCV outside of control limits; results may be biased high.

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: J031454.D

Form 1 Copy

Accutest Laboratories

Report of Analysis

Client Sample ID:	41SW08		
Lab Sample ID:	F51154-6	Date Sampled:	07/18/07
Matrix:	AQ - Surface Water	Date Received:	07/19/07
Method:	SW846 8260B	Percent Solids:	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	J031454.D	1	07/26/07	JG	n/a	n/a	VJ2187
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	25	5.0	ug/l	
71-43-2	Benzene	ND	1.0	0.50	ug/l	
75-27-4	Bromodichloromethane	ND	1.0	0.50	ug/l	
75-25-2	Bromoform	ND	1.0	0.50	ug/l	
108-90-7	Chlorobenzene	ND	1.0	0.50	ug/l	
75-00-3	Chloroethane	ND	2.0	1.0	ug/l	
67-66-3	Chloroform	ND	1.0	0.50	ug/l	
75-15-0	Carbon disulfide	ND	2.0	1.0	ug/l	
56-23-5	Carbon tetrachloride	ND	1.0	0.50	ug/l	
75-34-3	1,1-Dichloroethane	ND	1.0	0.50	ug/l	
75-35-4	1,1-Dichloroethylene	ND	1.0	0.50	ug/l	
107-06-2	1,2-Dichloroethane	ND	1.0	0.50	ug/l	
78-87-5	1,2-Dichloropropane	ND	1.0	0.50	ug/l	
124-48-1	Dibromochloromethane	ND	1.0	0.40	ug/l	
156-59-2	cis-1,2-Dichloroethylene	ND	1.0	0.50	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	1.0	0.30	ug/l	
156-60-5	trans-1,2-Dichloroethylene	ND	1.0	0.50	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND VL	1.0	0.30	ug/l	
100-41-4	Ethylbenzene	ND	1.0	0.50	ug/l	
591-78-6	2-Hexanone	ND	5.0	2.5	ug/l	
108-10-1	4-Methyl-2-pentanone	ND	5.0	2.5	ug/l	
74-83-9	Methyl bromide	ND	2.0	1.0	ug/l	
74-87-3	Methyl chloride	ND	2.0	1.0	ug/l	
75-09-2	Methylene chloride	ND	5.0	1.0	ug/l	
78-93-3	Methyl ethyl ketone	ND	5.0	2.5	ug/l	
100-42-5	Styrene	ND	1.0	0.50	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	1.0	0.50	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.0	0.40	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	1.0	0.50	ug/l	
127-18-4	Tetrachloroethylene	ND	1.0	0.50	ug/l	
108-88-3	Toluene	ND	1.0	0.50	ug/l	
79-01-6	Trichloroethylene	ND	1.0	0.50	ug/l	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Form I OA1

Accutest Laboratories

Report of Analysis

3.3
3

Client Sample ID:	41SW08		
Lab Sample ID:	F51154-6	Date Sampled:	07/18/07
Matrix:	AQ - Surface Water	Date Received:	07/19/07
Method:	SW846 8260B	Percent Solids:	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
75-01-4	Vinyl chloride	ND	1.0	0.50	ug/l	
	m,p-Xylene	ND	2.0	0.50	ug/l	
95-47-6	o-Xylene	ND	1.0	0.50	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	102%		87-116%
17060-07-0	1,2-Dichloroethane-D4	97%		76-127%
2037-26-5	Toluene-D8	99%		86-112%
460-00-4	4-Bromofluorobenzene	107%		84-120%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: J031455.D

Form I COA

Accutest Laboratories

Report of Analysis

Client Sample ID:	41SW09		
Lab Sample ID:	F51154-7	Date Sampled:	07/18/07
Matrix:	AQ - Surface Water	Date Received:	07/19/07
Method:	SW846 8260B	Percent Solids:	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	J031455.D	1	07/26/07	JG	n/a	n/a	VJ2187
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	25	5.0	ug/l	
71-43-2	Benzene	ND	1.0	0.50	ug/l	
75-27-4	Bromodichloromethane	ND	1.0	0.50	ug/l	
75-25-2	Bromoform	ND	1.0	0.50	ug/l	
108-90-7	Chlorobenzene	ND	1.0	0.50	ug/l	
75-00-3	Chloroethane	ND	2.0	1.0	ug/l	
67-66-3	Chloroform	ND	1.0	0.50	ug/l	
75-15-0	Carbon disulfide	ND	2.0	1.0	ug/l	
56-23-5	Carbon tetrachloride	ND	1.0	0.50	ug/l	
75-34-3	1,1-Dichloroethane	ND	1.0	0.50	ug/l	
75-35-4	1,1-Dichloroethylene	ND	1.0	0.50	ug/l	
107-06-2	1,2-Dichloroethane	ND	1.0	0.50	ug/l	
78-87-5	1,2-Dichloropropane	ND	1.0	0.50	ug/l	
124-48-1	Dibromochloromethane	ND	1.0	0.40	ug/l	
156-59-2	cis-1,2-Dichloroethylene	ND	1.0	0.50	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	1.0	0.30	ug/l	
156-60-5	trans-1,2-Dichloroethylene	ND	1.0	0.50	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND VL	1.0	0.30	ug/l	
100-41-4	Ethylbenzene	ND	1.0	0.50	ug/l	
591-78-6	2-Hexanone	ND	5.0	2.5	ug/l	
108-10-1	4-Methyl-2-pentanone	ND	5.0	2.5	ug/l	
74-83-9	Methyl bromide	ND	2.0	1.0	ug/l	
74-87-3	Methyl chloride	ND	2.0	1.0	ug/l	
75-09-2	Methylene chloride	ND	5.0	1.0	ug/l	
78-93-3	Methyl ethyl ketone	ND	5.0	2.5	ug/l	
100-42-5	Styrene	ND	1.0	0.50	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	1.0	0.50	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.0	0.40	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	1.0	0.50	ug/l	
127-18-4	Tetrachloroethylene	ND	1.0	0.50	ug/l	
108-88-3	Toluene	ND	1.0	0.50	ug/l	
79-01-6	Trichloroethylene	ND	1.0	0.50	ug/l	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

For I Copy

Accutest Laboratories

Report of Analysis

Client Sample ID:	41SW09		
Lab Sample ID:	F51154-7	Date Sampled:	07/18/07
Matrix:	AQ - Surface Water	Date Received:	07/19/07
Method:	SW846 8260B	Percent Solids:	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
75-01-4	Vinyl chloride	ND	1.0	0.50	ug/l	
	m,p-Xylene	ND	2.0	0.50	ug/l	
95-47-6	o-Xylene	ND	1.0	0.50	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	102%		87-116%
17060-07-0	1,2-Dichloroethane-D4	97%		76-127%
2037-26-5	Toluene-D8	100%		86-112%
460-00-4	4-Bromofluorobenzene	109%		84-120%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: J031456.D

Form I Org

Accutest Laboratories

Report of Analysis

Client Sample ID:	41SW10		
Lab Sample ID:	F51154-8	Date Sampled:	07/18/07
Matrix:	AQ - Surface Water	Date Received:	07/19/07
Method:	SW846 8260B	Percent Solids:	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	J031456.D	1	07/26/07	JG	n/a	n/a	VJ2187
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	25	5.0	ug/l	
71-43-2	Benzene	ND	1.0	0.50	ug/l	
75-27-4	Bromodichloromethane	ND	1.0	0.50	ug/l	
75-25-2	Bromoform	ND	1.0	0.50	ug/l	
108-90-7	Chlorobenzene	ND	1.0	0.50	ug/l	
75-00-3	Chloroethane	ND	2.0	1.0	ug/l	
67-66-3	Chloroform	ND	1.0	0.50	ug/l	
75-15-0	Carbon disulfide	ND	2.0	1.0	ug/l	
56-23-5	Carbon tetrachloride	ND	1.0	0.50	ug/l	
75-34-3	1,1-Dichloroethane	ND	1.0	0.50	ug/l	
75-35-4	1,1-Dichloroethylene	ND	1.0	0.50	ug/l	
107-06-2	1,2-Dichloroethane	ND	1.0	0.50	ug/l	
78-87-5	1,2-Dichloropropane	ND	1.0	0.50	ug/l	
124-48-1	Dibromochloromethane	ND	1.0	0.40	ug/l	
156-59-2	cis-1,2-Dichloroethylene	ND	1.0	0.50	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	1.0	0.30	ug/l	
156-60-5	trans-1,2-Dichloroethylene	ND	1.0	0.50	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND VL	1.0	0.30	ug/l	
100-41-4	Ethylbenzene	ND	1.0	0.50	ug/l	
591-78-6	2-Hexanone	ND	5.0	2.5	ug/l	
108-10-1	4-Methyl-2-pentanone	ND	5.0	2.5	ug/l	
74-83-9	Methyl bromide	ND	2.0	1.0	ug/l	
74-87-3	Methyl chloride	ND	2.0	1.0	ug/l	
75-09-2	Methylene chloride	ND	5.0	1.0	ug/l	
78-93-3	Methyl ethyl ketone	ND	5.0	2.5	ug/l	
100-42-5	Styrene	ND	1.0	0.50	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	1.0	0.50	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.0	0.40	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	1.0	0.50	ug/l	
127-18-4	Tetrachloroethylene	ND	1.0	0.50	ug/l	
108-88-3	Toluene	ND	1.0	0.50	ug/l	
79-01-6	Trichloroethylene	ND	1.0	0.50	ug/l	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Form I only

Accutest Laboratories

Report of Analysis

Client Sample ID:	41SW10		
Lab Sample ID:	F51154-8	Date Sampled:	07/18/07
Matrix:	AQ - Surface Water	Date Received:	07/19/07
Method:	SW846 8260B	Percent Solids:	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
75-01-4	Vinyl chloride	ND	1.0	0.50	ug/l	
	m,p-Xylene	ND	2.0	0.50	ug/l	
95-47-6	o-Xylene	ND	1.0	0.50	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	100%		87-116%
17060-07-0	1,2-Dichloroethane-D4	95%		76-127%
2037-26-5	Toluene-D8	101%		86-112%
460-00-4	4-Bromofluorobenzene	109%		84-120%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Form I OR

Accutest Laboratories

Report of Analysis

Client Sample ID:	41SD08		
Lab Sample ID:	F51154-9	Date Sampled:	07/18/07
Matrix:	SO - Sediment	Date Received:	07/19/07
Method:	SW846 8260B	Percent Solids:	36.9
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	H044671.D	1	07/26/07	SH	n/a	n/a	VH1662
Run #2 [a]	H044689.D	1	07/27/07	SH	n/a	n/a	VH1663

	Initial Weight
Run #1	3.92 g
Run #2	4.24 g

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone [b]	253 J	170	86	ug/kg	
71-43-2	Benzene	ND	17	6.9	ug/kg	
75-27-4	Bromodichloromethane	ND	17	6.9	ug/kg	
75-25-2	Bromoform	ND	17	6.9	ug/kg	
108-90-7	Chlorobenzene	ND	17	6.9	ug/kg	
75-00-3	Chloroethane	ND	17	10	ug/kg	
67-66-3	Chloroform	ND	17	6.9	ug/kg	
75-15-0	Carbon disulfide	ND	17	6.9	ug/kg	
56-23-5	Carbon tetrachloride	ND	17	6.9	ug/kg	
75-34-3	1,1-Dichloroethane	ND	17	6.9	ug/kg	
75-35-4	1,1-Dichloroethylene	ND	17	6.9	ug/kg	
107-06-2	1,2-Dichloroethane	ND	17	6.9	ug/kg	
78-87-5	1,2-Dichloropropane	ND	17	6.9	ug/kg	
124-48-1	Dibromochloromethane	ND	17	6.9	ug/kg	
156-59-2	cis-1,2-Dichloroethylene	ND	17	6.9	ug/kg	
10061-01-5	cis-1,3-Dichloropropene	ND	17	6.9	ug/kg	
156-60-5	trans-1,2-Dichloroethylene	ND	17	6.9	ug/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	17	6.9	ug/kg	
100-41-4	Ethylbenzene	ND	17	6.9	ug/kg	
591-78-6	2-Hexanone	ND	86	35	ug/kg	
108-10-1	4-Methyl-2-pentanone	ND	86	35	ug/kg	
74-83-9	Methyl bromide	ND	17	6.9	ug/kg	
74-87-3	Methyl chloride	ND VL	17	6.9	ug/kg	
75-09-2	Methylene chloride	ND	35	17	ug/kg	
78-93-3	Methyl ethyl ketone	48.8 J	86	35	ug/kg	J
100-42-5	Styrene	ND	17	6.9	ug/kg	
71-55-6	1,1,1-Trichloroethane	ND	17	6.9	ug/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	17	6.9	ug/kg	
79-00-5	1,1,2-Trichloroethane	ND	17	6.9	ug/kg	
127-18-4	Tetrachloroethylene	ND	17	6.9	ug/kg	
108-88-3	Toluene	ND	17	6.9	ug/kg	
79-01-6	Trichloroethylene	ND	17	6.9	ug/kg	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

For I Corr

Accutest Laboratories

Report of Analysis

Client Sample ID:	41SD08		
Lab Sample ID:	F51154-9	Date Sampled:	07/18/07
Matrix:	SO - Sediment	Date Received:	07/19/07
Method:	SW846 8260B	Percent Solids:	36.9
Project:	WPA 019 Field Investigation; Radford AAP, VA		

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
75-01-4	Vinyl chloride	ND VL	17	6.9	ug/kg	
	m,p-Xylene	ND	35	10	ug/kg	
95-47-6	o-Xylene	ND	17	6.9	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	102%	101%	80-121%
2037-26-5	Toluene-D8	110%	105%	71-130%
460-00-4	4-Bromofluorobenzene	129%	134%	59-148%
17060-07-0	1,2-Dichloroethane-D4	98%	100%	77-123%

(a) Confirmation run.
(b) CCV outside of control limits; results may be biased high.

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: H044672.D

Form I OV

Accutest Laboratories

Report of Analysis

Client Sample ID:	41SD09		
Lab Sample ID:	F51154-10	Date Sampled:	07/18/07
Matrix:	SO - Sediment	Date Received:	07/19/07
Method:	SW846 8260B	Percent Solids:	82.4
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	H044672.D	1	07/26/07	SH	n/a	n/a	VH1662
Run #2							

	Initial Weight
Run #1	5.48 g
Run #2	

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND UJ	55	28	ug/kg	
71-43-2	Benzene	ND	5.5	2.2	ug/kg	
75-27-4	Bromodichloromethane	ND	5.5	2.2	ug/kg	
75-25-2	Bromoform	ND	5.5	2.2	ug/kg	
108-90-7	Chlorobenzene	ND	5.5	2.2	ug/kg	
75-00-3	Chloroethane	ND	5.5	3.3	ug/kg	
67-66-3	Chloroform	ND	5.5	2.2	ug/kg	
75-15-0	Carbon disulfide	ND	5.5	2.2	ug/kg	
56-23-5	Carbon tetrachloride	ND	5.5	2.2	ug/kg	
75-34-3	1,1-Dichloroethane	ND	5.5	2.2	ug/kg	
75-35-4	1,1-Dichloroethylene	ND	5.5	2.2	ug/kg	
107-06-2	1,2-Dichloroethane	ND	5.5	2.2	ug/kg	
78-87-5	1,2-Dichloropropane	ND	5.5	2.2	ug/kg	
124-48-1	Dibromochloromethane	ND	5.5	2.2	ug/kg	
156-59-2	cis-1,2-Dichloroethylene	ND	5.5	2.2	ug/kg	
10061-01-5	cis-1,3-Dichloropropene	ND	5.5	2.2	ug/kg	
156-60-5	trans-1,2-Dichloroethylene	ND	5.5	2.2	ug/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	5.5	2.2	ug/kg	
100-41-4	Ethylbenzene	ND	5.5	2.2	ug/kg	
591-78-6	2-Hexanone	ND	28	11	ug/kg	
108-10-1	4-Methyl-2-pentanone	ND	28	11	ug/kg	
74-83-9	Methyl bromide	ND	5.5	2.2	ug/kg	
74-87-3	Methyl chloride	ND UL	5.5	2.2	ug/kg	
75-09-2	Methylene chloride	ND	11	5.5	ug/kg	
78-93-3	Methyl ethyl ketone	ND	28	11	ug/kg	
100-42-5	Styrene	ND	5.5	2.2	ug/kg	
71-55-6	1,1,1-Trichloroethane	ND	5.5	2.2	ug/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	5.5	2.2	ug/kg	
79-00-5	1,1,2-Trichloroethane	ND	5.5	2.2	ug/kg	
127-18-4	Tetrachloroethylene	ND	5.5	2.2	ug/kg	
108-88-3	Toluene	ND	5.5	2.2	ug/kg	
79-01-6	Trichloroethylene	ND	5.5	2.2	ug/kg	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

For I Only

Accutest Laboratories

Report of Analysis

Client Sample ID:	41SD09		
Lab Sample ID:	F51154-10	Date Sampled:	07/18/07
Matrix:	SO - Sediment	Date Received:	07/19/07
Method:	SW846 8260B	Percent Solids:	82.4
Project:	WPA 019 Field Investigation; Radford AAP, VA		

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
75-01-4	Vinyl chloride	ND VL	5.5	2.2	ug/kg	
	m,p-Xylene	ND	11	3.3	ug/kg	
95-47-6	o-Xylene	ND	5.5	2.2	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	105%		80-121%
2037-26-5	Toluene-D8	104%		71-130%
460-00-4	4-Bromofluorobenzene	131%		59-148%
17060-07-0	1,2-Dichloroethane-D4	108%		77-123%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: H044673.D H044690.D

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Accutest Laboratories

Report of Analysis

Client Sample ID:	41SD10		
Lab Sample ID:	F51154-11	Date Sampled:	07/18/07
Matrix:	SO - Sediment	Date Received:	07/19/07
Method:	SW846 8260B	Percent Solids:	79.2
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	H044673.D	1	07/26/07	SH	n/a	n/a	VH1662
Run #2 [a]	H044690.D	1	07/27/07	SH	n/a	n/a	VH1663

	Initial Weight
Run #1	4.31 g
Run #2	4.39 g

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND UJ	73	37	ug/kg	
71-43-2	Benzene	ND	7.3	2.9	ug/kg	
75-27-4	Bromodichloromethane	ND	7.3	2.9	ug/kg	
75-25-2	Bromoform	ND	7.3	2.9	ug/kg	
108-90-7	Chlorobenzene	ND	7.3	2.9	ug/kg	
75-00-3	Chloroethane	ND	7.3	4.4	ug/kg	
67-66-3	Chloroform	ND	7.3	2.9	ug/kg	
75-15-0	Carbon disulfide	ND	7.3	2.9	ug/kg	
56-23-5	Carbon tetrachloride	ND	7.3	2.9	ug/kg	
75-34-3	1,1-Dichloroethane	ND	7.3	2.9	ug/kg	
75-35-4	1,1-Dichloroethylene	ND	7.3	2.9	ug/kg	
107-06-2	1,2-Dichloroethane	ND	7.3	2.9	ug/kg	
78-87-5	1,2-Dichloropropane	ND	7.3	2.9	ug/kg	
124-48-1	Dibromochloromethane	ND	7.3	2.9	ug/kg	
156-59-2	cis-1,2-Dichloroethylene	ND	7.3	2.9	ug/kg	
10061-01-5	cis-1,3-Dichloropropene	ND	7.3	2.9	ug/kg	
156-60-5	trans-1,2-Dichloroethylene	ND	7.3	2.9	ug/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	7.3	2.9	ug/kg	
100-41-4	Ethylbenzene	ND	7.3	2.9	ug/kg	
591-78-6	2-Hexanone	ND	37	15	ug/kg	
108-10-1	4-Methyl-2-pentanone	ND	37	15	ug/kg	
74-83-9	Methyl bromide	ND	7.3	2.9	ug/kg	
74-87-3	Methyl chloride	ND VL	7.3	2.9	ug/kg	
75-09-2	Methylene chloride	ND	15	7.3	ug/kg	
78-93-3	Methyl ethyl ketone	ND	37	15	ug/kg	
100-42-5	Styrene	ND	7.3	2.9	ug/kg	
71-55-6	1,1,1-Trichloroethane	ND	7.3	2.9	ug/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	7.3	2.9	ug/kg	
79-00-5	1,1,2-Trichloroethane	ND	7.3	2.9	ug/kg	
127-18-4	Tetrachloroethylene	ND	7.3	2.9	ug/kg	
108-88-3	Toluene	ND	7.3	2.9	ug/kg	
79-01-6	Trichloroethylene	ND	7.3	2.9	ug/kg	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Form I OA7

Accutest Laboratories

Report of Analysis

Client Sample ID:	41SD10		
Lab Sample ID:	F51154-11	Date Sampled:	07/18/07
Matrix:	SO - Sediment	Date Received:	07/19/07
Method:	SW846 8260B	Percent Solids:	79.2
Project:	WPA 019 Field Investigation; Radford AAP, VA		

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
75-01-4	Vinyl chloride	ND VL	7.3	2.9	ug/kg	
	m,p-Xylene	ND	15	4.4	ug/kg	
95-47-6	o-Xylene	ND	7.3	2.9	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	106%	104%	80-121%
2037-26-5	Toluene-D8	106%	110%	71-130%
460-00-4	4-Bromofluorobenzene	134%	145%	59-148%
17060-07-0	1,2-Dichloroethane-D4	108%	102%	77-123%

(a) Confirmation run.

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: H044674.D

Form I Copy

Accutest Laboratories

Report of Analysis

Client Sample ID:	LFSD01		
Lab Sample ID:	F51154-15	Date Sampled:	07/19/07
Matrix:	SO - Sediment	Date Received:	07/19/07
Method:	SW846 8260B	Percent Solids:	57.9
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	H044674.D	1	07/26/07	SH	n/a	n/a	VH1662
Run #2							

	Initial Weight
Run #1	5.78 g
Run #2	

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND UJ	75	37	ug/kg	
71-43-2	Benzene	ND	7.5	3.0	ug/kg	
75-27-4	Bromodichloromethane	ND	7.5	3.0	ug/kg	
75-25-2	Bromoform	ND	7.5	3.0	ug/kg	
108-90-7	Chlorobenzene	ND	7.5	3.0	ug/kg	
75-00-3	Chloroethane	ND	7.5	4.5	ug/kg	
67-66-3	Chloroform	ND	7.5	3.0	ug/kg	
75-15-0	Carbon disulfide	ND	7.5	3.0	ug/kg	
56-23-5	Carbon tetrachloride	ND	7.5	3.0	ug/kg	
75-34-3	1,1-Dichloroethane	ND	7.5	3.0	ug/kg	
75-35-4	1,1-Dichloroethylene	ND	7.5	3.0	ug/kg	
107-06-2	1,2-Dichloroethane	ND	7.5	3.0	ug/kg	
78-87-5	1,2-Dichloropropane	ND	7.5	3.0	ug/kg	
124-48-1	Dibromochloromethane	ND	7.5	3.0	ug/kg	
156-59-2	cis-1,2-Dichloroethylene	ND	7.5	3.0	ug/kg	
10061-01-5	cis-1,3-Dichloropropene	ND	7.5	3.0	ug/kg	
156-60-5	trans-1,2-Dichloroethylene	ND	7.5	3.0	ug/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	7.5	3.0	ug/kg	
100-41-4	Ethylbenzene	ND	7.5	3.0	ug/kg	
591-78-6	2-Hexanone	ND	37	15	ug/kg	
108-10-1	4-Methyl-2-pentanone	ND	37	15	ug/kg	
74-83-9	Methyl bromide	ND	7.5	3.0	ug/kg	
74-87-3	Methyl chloride	ND VL	7.5	3.0	ug/kg	
75-09-2	Methylene chloride	ND	15	7.5	ug/kg	
78-93-3	Methyl ethyl ketone	ND	37	15	ug/kg	
100-42-5	Styrene	ND	7.5	3.0	ug/kg	
71-55-6	1,1,1-Trichloroethane	ND	7.5	3.0	ug/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	7.5	3.0	ug/kg	
79-00-5	1,1,2-Trichloroethane	ND	7.5	3.0	ug/kg	
127-18-4	Tetrachloroethylene	ND	7.5	3.0	ug/kg	
108-88-3	Toluene	ND	7.5	3.0	ug/kg	
79-01-6	Trichloroethylene	ND	7.5	3.0	ug/kg	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

For I Corp

Accutest Laboratories

Report of Analysis

Client Sample ID:	LFSD01		
Lab Sample ID:	F51154-15	Date Sampled:	07/19/07
Matrix:	SO - Sediment	Date Received:	07/19/07
Method:	SW846 8260B	Percent Solids:	57.9
Project:	WPA 019 Field Investigation; Radford AAP, VA		

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
75-01-4	Vinyl chloride	ND VL	7.5	3.0	ug/kg	
	m,p-Xylene	ND	15	4.5	ug/kg	
95-47-6	o-Xylene	ND	7.5	3.0	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	108%		80-121%
2037-26-5	Toluene-D8	102%		71-130%
460-00-4	4-Bromofluorobenzene	126%		59-148%
17060-07-0	1,2-Dichloroethane-D4	112%		77-123%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: J031542.D

Form I COA

Accutest Laboratories

Report of Analysis

Client Sample ID:	LFSW01		
Lab Sample ID:	F51154-17	Date Sampled:	07/19/07
Matrix:	AQ - Surface Water	Date Received:	07/19/07
Method:	SW846 8260B	Percent Solids:	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	J031542.D	1	07/31/07	JG	n/a	n/a	VJ2191
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	25	10	ug/l	
71-43-2	Benzene	ND	1.0	0.20	ug/l	
75-27-4	Bromodichloromethane	ND	1.0	0.29	ug/l	
75-25-2	Bromoform	ND	1.0	0.28	ug/l	
108-90-7	Chlorobenzene	ND	1.0	0.20	ug/l	
75-00-3	Chloroethane	ND	2.0	0.46	ug/l	
67-66-3	Chloroform	ND	1.0	0.21	ug/l	
75-15-0	Carbon disulfide	ND	2.0	0.20	ug/l	
56-23-5	Carbon tetrachloride	ND	1.0	0.29	ug/l	
75-34-3	1,1-Dichloroethane	ND	1.0	0.25	ug/l	
75-35-4	1,1-Dichloroethylene	ND	1.0	0.23	ug/l	
107-06-2	1,2-Dichloroethane	ND	1.0	0.20	ug/l	
78-87-5	1,2-Dichloropropane	ND	1.0	0.25	ug/l	
124-48-1	Dibromochloromethane	ND	1.0	0.20	ug/l	
156-59-2	cis-1,2-Dichloroethylene	ND	1.0	0.28	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	1.0	0.24	ug/l	
156-60-5	trans-1,2-Dichloroethylene	ND	1.0	0.20	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	1.0	0.21	ug/l	
100-41-4	Ethylbenzene	ND	1.0	0.20	ug/l	
591-78-6	2-Hexanone	ND	10	2.9	ug/l	
108-10-1	4-Methyl-2-pentanone	ND	5.0	2.2	ug/l	
74-83-9	Methyl bromide	ND	2.0	0.54	ug/l	
74-87-3	Methyl chloride	ND	2.0	0.38	ug/l	
75-09-2	Methylene chloride	ND	5.0	1.0	ug/l	
78-93-3	Methyl ethyl ketone	ND	5.0	2.0	ug/l	
100-42-5	Styrene	ND	1.0	0.20	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	1.0	0.29	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.0	0.37	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	1.0	0.30	ug/l	
127-18-4	Tetrachloroethylene	ND	1.0	0.25	ug/l	
108-88-3	Toluene	ND	1.0	0.27	ug/l	
79-01-6	Trichloroethylene	ND	1.0	0.38	ug/l	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Form I OR

Accutest Laboratories

Report of Analysis

Client Sample ID:	LFSW01		
Lab Sample ID:	F51154-17	Date Sampled:	07/19/07
Matrix:	AQ - Surface Water	Date Received:	07/19/07
Method:	SW846 8260B	Percent Solids:	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
75-01-4	Vinyl chloride	ND	1.0	0.34	ug/l	
	m,p-Xylene	ND	2.0	0.36	ug/l	
95-47-6	o-Xylene	ND	1.0	0.20	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	104%		87-116%
17060-07-0	1,2-Dichloroethane-D4	104%		76-127%
2037-26-5	Toluene-D8	94%		86-112%
460-00-4	4-Bromofluorobenzene	98%		84-120%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: H044675.D

Form I VOA

Accutest Laboratories

Report of Analysis

Client Sample ID:	APSD01		
Lab Sample ID:	F51154-18	Date Sampled:	07/19/07
Matrix:	SO - Sediment	Date Received:	07/19/07
Method:	SW846 8260B	Percent Solids:	86.8
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	H044675.D	1	07/26/07	SH	n/a	n/a	VH1662
Run #2							

	Initial Weight
Run #1	3.46 g
Run #2	

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND UJ	83	42	ug/kg	
71-43-2	Benzene	ND	8.3	3.3	ug/kg	
75-27-4	Bromodichloromethane	ND	8.3	3.3	ug/kg	
75-25-2	Bromoform	ND	8.3	3.3	ug/kg	
108-90-7	Chlorobenzene	ND	8.3	3.3	ug/kg	
75-00-3	Chloroethane	ND	8.3	5.0	ug/kg	
67-66-3	Chloroform	ND	8.3	3.3	ug/kg	
75-15-0	Carbon disulfide	ND	8.3	3.3	ug/kg	
56-23-5	Carbon tetrachloride	ND	8.3	3.3	ug/kg	
75-34-3	1,1-Dichloroethane	ND	8.3	3.3	ug/kg	
75-35-4	1,1-Dichloroethylene	ND	8.3	3.3	ug/kg	
107-06-2	1,2-Dichloroethane	ND	8.3	3.3	ug/kg	
78-87-5	1,2-Dichloropropane	ND	8.3	3.3	ug/kg	
124-48-1	Dibromochloromethane	ND	8.3	3.3	ug/kg	
156-59-2	cis-1,2-Dichloroethylene	ND	8.3	3.3	ug/kg	
10061-01-5	cis-1,3-Dichloropropene	ND	8.3	3.3	ug/kg	
156-60-5	trans-1,2-Dichloroethylene	ND	8.3	3.3	ug/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	8.3	3.3	ug/kg	
100-41-4	Ethylbenzene	ND	8.3	3.3	ug/kg	
591-78-6	2-Hexanone	ND	42	17	ug/kg	
108-10-1	4-Methyl-2-pentanone	ND	42	17	ug/kg	
74-83-9	Methyl bromide	ND	8.3	3.3	ug/kg	
74-87-3	Methyl chloride	ND UL	8.3	3.3	ug/kg	
75-09-2	Methylene chloride	ND	17	8.3	ug/kg	
78-93-3	Methyl ethyl ketone	ND	42	17	ug/kg	
100-42-5	Styrene	ND	8.3	3.3	ug/kg	
71-55-6	1,1,1-Trichloroethane	ND	8.3	3.3	ug/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	8.3	3.3	ug/kg	
79-00-5	1,1,2-Trichloroethane	ND	8.3	3.3	ug/kg	
127-18-4	Tetrachloroethylene	ND	8.3	3.3	ug/kg	
108-88-3	Toluene	ND	8.3	3.3	ug/kg	
79-01-6	Trichloroethylene	ND	8.3	3.3	ug/kg	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Form I Copy

Accutest Laboratories

Report of Analysis

Client Sample ID:	APSD01		
Lab Sample ID:	F51154-18	Date Sampled:	07/19/07
Matrix:	SO - Sediment	Date Received:	07/19/07
Method:	SW846 8260B	Percent Solids:	86.8
Project:	WPA 019 Field Investigation; Radford AAP, VA		

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
75-01-4	Vinyl chloride	ND VL	8.3	3.3	ug/kg	
	m,p-Xylene	ND	17	5.0	ug/kg	
95-47-6	o-Xylene	ND	8.3	3.3	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	109%		80-121%
2037-26-5	Toluene-D8	100%		71-130%
460-00-4	4-Bromofluorobenzene	118%		59-148%
17060-07-0	1,2-Dichloroethane-D4	116%		77-123%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: H044676.D

Anal Org

Accutest Laboratories

Report of Analysis

Client Sample ID:	41SD11		
Lab Sample ID:	F51154-22	Date Sampled:	07/19/07
Matrix:	SO - Soil	Date Received:	07/19/07
Method:	SW846 8260B	Percent Solids:	86.8
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	H044676.D	1	07/26/07	SH	n/a	n/a	VH1662
Run #2							

	Initial Weight
Run #1	5.17 g
Run #2	

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND VJ	56	28	ug/kg	
71-43-2	Benzene	ND	5.6	2.2	ug/kg	
75-27-4	Bromodichloromethane	ND	5.6	2.2	ug/kg	
75-25-2	Bromoform	ND	5.6	2.2	ug/kg	
108-90-7	Chlorobenzene	ND	5.6	2.2	ug/kg	
75-00-3	Chloroethane	ND	5.6	3.3	ug/kg	
67-66-3	Chloroform	ND	5.6	2.2	ug/kg	
75-15-0	Carbon disulfide	ND	5.6	2.2	ug/kg	
56-23-5	Carbon tetrachloride	ND	5.6	2.2	ug/kg	
75-34-3	1,1-Dichloroethane	ND	5.6	2.2	ug/kg	
75-35-4	1,1-Dichloroethylene	ND	5.6	2.2	ug/kg	
107-06-2	1,2-Dichloroethane	ND	5.6	2.2	ug/kg	
78-87-5	1,2-Dichloropropane	ND	5.6	2.2	ug/kg	
124-48-1	Dibromochloromethane	ND	5.6	2.2	ug/kg	
156-59-2	cis-1,2-Dichloroethylene	ND	5.6	2.2	ug/kg	
10061-01-5	cis-1,3-Dichloropropene	ND	5.6	2.2	ug/kg	
156-60-5	trans-1,2-Dichloroethylene	ND	5.6	2.2	ug/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	5.6	2.2	ug/kg	
100-41-4	Ethylbenzene	ND	5.6	2.2	ug/kg	
591-78-6	2-Hexanone	ND	28	11	ug/kg	
108-10-1	4-Methyl-2-pentanone	ND	28	11	ug/kg	
74-83-9	Methyl bromide	ND	5.6	2.2	ug/kg	
74-87-3	Methyl chloride	ND VL	5.6	2.2	ug/kg	
75-09-2	Methylene chloride	ND	11	5.6	ug/kg	
78-93-3	Methyl ethyl ketone	ND	28	11	ug/kg	
100-42-5	Styrene	ND	5.6	2.2	ug/kg	
71-55-6	1,1,1-Trichloroethane	ND	5.6	2.2	ug/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	5.6	2.2	ug/kg	
79-00-5	1,1,2-Trichloroethane	ND	5.6	2.2	ug/kg	
127-18-4	Tetrachloroethylene	ND	5.6	2.2	ug/kg	
108-88-3	Toluene	ND	5.6	2.2	ug/kg	
79-01-6	Trichloroethylene	ND	5.6	2.2	ug/kg	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Form I OA

Accutest Laboratories

Report of Analysis

Client Sample ID:	41SD11		
Lab Sample ID:	F51154-22	Date Sampled:	07/19/07
Matrix:	SO - Soil	Date Received:	07/19/07
Method:	SW846 8260B	Percent Solids:	86.8
Project:	WPA 019 Field Investigation; Radford AAP, VA		

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
75-01-4	Vinyl chloride	ND VL	5.6	2.2	ug/kg	
	m,p-Xylene	ND	11	3.3	ug/kg	
95-47-6	o-Xylene	ND	5.6	2.2	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	109%		80-121%
2037-26-5	Toluene-D8	106%		71-130%
460-00-4	4-Bromofluorobenzene	135%		59-148%
17060-07-0	1,2-Dichloroethane-D4	115%		77-123%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: H044677.D H044691.D

Form I OA

Accutest Laboratories

Report of Analysis

Client Sample ID:	49SS02		
Lab Sample ID:	F51154-23	Date Sampled:	07/19/07
Matrix:	SO - Soil	Date Received:	07/19/07
Method:	SW846 8260B	Percent Solids:	89.6
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	H044677.D	1	07/26/07	SH	n/a	n/a	VH1662
Run #2 [a]	H044691.D	1	07/27/07	SH	n/a	n/a	VH1663

	Initial Weight
Run #1	3.74 g
Run #2	2.36 g

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone [b]	70.7 J	75	37	ug/kg	J
71-43-2	Benzene	ND	7.5	3.0	ug/kg	
75-27-4	Bromodichloromethane	ND	7.5	3.0	ug/kg	
75-25-2	Bromoform	ND	7.5	3.0	ug/kg	
108-90-7	Chlorobenzene	ND	7.5	3.0	ug/kg	
75-00-3	Chloroethane	ND	7.5	4.5	ug/kg	
67-66-3	Chloroform	ND	7.5	3.0	ug/kg	
75-15-0	Carbon disulfide	ND	7.5	3.0	ug/kg	
56-23-5	Carbon tetrachloride	ND	7.5	3.0	ug/kg	
75-34-3	1,1-Dichloroethane	ND	7.5	3.0	ug/kg	
75-35-4	1,1-Dichloroethylene	ND	7.5	3.0	ug/kg	
107-06-2	1,2-Dichloroethane	ND	7.5	3.0	ug/kg	
78-87-5	1,2-Dichloropropane	ND	7.5	3.0	ug/kg	
124-48-1	Dibromochloromethane	ND	7.5	3.0	ug/kg	
156-59-2	cis-1,2-Dichloroethylene	ND	7.5	3.0	ug/kg	
10061-01-5	cis-1,3-Dichloropropene	ND	7.5	3.0	ug/kg	
156-60-5	trans-1,2-Dichloroethylene	ND	7.5	3.0	ug/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	7.5	3.0	ug/kg	
100-41-4	Ethylbenzene	ND	7.5	3.0	ug/kg	
591-78-6	2-Hexanone	ND	37	15	ug/kg	
108-10-1	4-Methyl-2-pentanone	ND	37	15	ug/kg	
74-83-9	Methyl bromide	ND	7.5	3.0	ug/kg	
74-87-3	Methyl chloride	ND VL	7.5	3.0	ug/kg	
75-09-2	Methylene chloride	ND	15	7.5	ug/kg	
78-93-3	Methyl ethyl ketone	ND	37	15	ug/kg	
100-42-5	Styrene	ND	7.5	3.0	ug/kg	
71-55-6	1,1,1-Trichloroethane	ND	7.5	3.0	ug/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	7.5	3.0	ug/kg	
79-00-5	1,1,2-Trichloroethane	ND	7.5	3.0	ug/kg	
127-18-4	Tetrachloroethylene	ND	7.5	3.0	ug/kg	
108-88-3	Toluene	ND	7.5	3.0	ug/kg	
79-01-6	Trichloroethylene	ND	7.5	3.0	ug/kg	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Form I OA

Accutest Laboratories

Report of Analysis

Client Sample ID:	49SS02		
Lab Sample ID:	F51154-23	Date Sampled:	07/19/07
Matrix:	SO - Soil	Date Received:	07/19/07
Method:	SW846 8260B	Percent Solids:	89.6
Project:	WPA 019 Field Investigation; Radford AAP, VA		

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
75-01-4	Vinyl chloride	ND VL	7.5	3.0	ug/kg	
	m,p-Xylene	ND	15	4.5	ug/kg	
95-47-6	o-Xylene	ND	7.5	3.0	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	110%	108%	80-121%
2037-26-5	Toluene-D8	105%	107%	71-130%
460-00-4	4-Bromofluorobenzene	134%	146%	59-148%
17060-07-0	1,2-Dichloroethane-D4	119%	112%	77-123%

(a) Confirmation run.
(b) CCV outside of control limits; results may be biased high.

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: H044678.D H044692.D

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Accutest Laboratories

Report of Analysis

Client Sample ID:	49SS03		
Lab Sample ID:	F51154-24	Date Sampled:	07/19/07
Matrix:	SO - Soil	Date Received:	07/19/07
Method:	SW846 8260B	Percent Solids:	92.0
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	H044678.D	1	07/26/07	SH	n/a	n/a	VH1662
Run #2 [a]	H044692.D	1	07/27/07	SH	n/a	n/a	VH1663

	Initial Weight
Run #1	2.95 g
Run #2	3.02 g

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND VJ	92	46	ug/kg	
71-43-2	Benzene	ND	9.2	3.7	ug/kg	
75-27-4	Bromodichloromethane	ND	9.2	3.7	ug/kg	
75-25-2	Bromoform	ND	9.2	3.7	ug/kg	
108-90-7	Chlorobenzene	ND	9.2	3.7	ug/kg	
75-00-3	Chloroethane	ND	9.2	5.5	ug/kg	
67-66-3	Chloroform	ND	9.2	3.7	ug/kg	
75-15-0	Carbon disulfide	ND	9.2	3.7	ug/kg	
56-23-5	Carbon tetrachloride	ND	9.2	3.7	ug/kg	
75-34-3	1,1-Dichloroethane	ND	9.2	3.7	ug/kg	
75-35-4	1,1-Dichloroethylene	ND	9.2	3.7	ug/kg	
107-06-2	1,2-Dichloroethane	ND	9.2	3.7	ug/kg	
78-87-5	1,2-Dichloropropane	ND	9.2	3.7	ug/kg	
124-48-1	Dibromochloromethane	ND	9.2	3.7	ug/kg	
156-59-2	cis-1,2-Dichloroethylene	ND	9.2	3.7	ug/kg	
10061-01-5	cis-1,3-Dichloropropene	ND	9.2	3.7	ug/kg	
156-60-5	trans-1,2-Dichloroethylene	ND	9.2	3.7	ug/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	9.2	3.7	ug/kg	
100-41-4	Ethylbenzene	ND	9.2	3.7	ug/kg	
591-78-6	2-Hexanone	ND	46	18	ug/kg	
108-10-1	4-Methyl-2-pentanone	ND	46	18	ug/kg	
74-83-9	Methyl bromide	ND	9.2	3.7	ug/kg	
74-87-3	Methyl chloride	ND VL	9.2	3.7	ug/kg	
75-09-2	Methylene chloride	ND	18	9.2	ug/kg	
78-93-3	Methyl ethyl ketone	ND	46	18	ug/kg	
100-42-5	Styrene	ND	9.2	3.7	ug/kg	
71-55-6	1,1,1-Trichloroethane	ND	9.2	3.7	ug/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	9.2	3.7	ug/kg	
79-00-5	1,1,2-Trichloroethane	ND	9.2	3.7	ug/kg	
127-18-4	Tetrachloroethylene	ND	9.2	3.7	ug/kg	
108-88-3	Toluene	ND	9.2	3.7	ug/kg	
79-01-6	Trichloroethylene	ND	9.2	3.7	ug/kg	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Form I OA7

Accutest Laboratories

Report of Analysis

Client Sample ID:	49SS03		
Lab Sample ID:	F51154-24	Date Sampled:	07/19/07
Matrix:	SO - Soil	Date Received:	07/19/07
Method:	SW846 8260B	Percent Solids:	92.0
Project:	WPA 019 Field Investigation; Radford AAP, VA		

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
75-01-4	Vinyl chloride	ND VL	9.2	3.7	ug/kg	
	m,p-Xylene	ND	18	5.5	ug/kg	
95-47-6	o-Xylene	ND	9.2	3.7	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	109%	110%	80-121%
2037-26-5	Toluene-D8	108%	110%	71-130%
460-00-4	4-Bromofluorobenzene	133%	162%	59-148%
17060-07-0	1,2-Dichloroethane-D4	116%	117%	77-123%

(a) Confirmation run.

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: H044680.D

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Accutest Laboratories

Report of Analysis

3-25
3

Client Sample ID:	49SS04		
Lab Sample ID:	F51154-25	Date Sampled:	07/19/07
Matrix:	SO - Soil	Date Received:	07/19/07
Method:	SW846 8260B	Percent Solids:	87.5
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	H044680.D	1	07/26/07	SH	n/a	n/a	VH1662
Run #2							

	Initial Weight
Run #1	4.08 g
Run #2	

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND VJ	70	35	ug/kg	
71-43-2	Benzene	ND	7.0	2.8	ug/kg	
75-27-4	Bromodichloromethane	ND	7.0	2.8	ug/kg	
75-25-2	Bromoform	ND	7.0	2.8	ug/kg	
108-90-7	Chlorobenzene	ND	7.0	2.8	ug/kg	
75-00-3	Chloroethane	ND	7.0	4.2	ug/kg	
67-66-3	Chloroform	ND	7.0	2.8	ug/kg	
75-15-0	Carbon disulfide	ND	7.0	2.8	ug/kg	
56-23-5	Carbon tetrachloride	ND	7.0	2.8	ug/kg	
75-34-3	1,1-Dichloroethane	ND	7.0	2.8	ug/kg	
75-35-4	1,1-Dichloroethylene	ND	7.0	2.8	ug/kg	
107-06-2	1,2-Dichloroethane	ND	7.0	2.8	ug/kg	
78-87-5	1,2-Dichloropropane	ND	7.0	2.8	ug/kg	
124-48-1	Dibromochloromethane	ND	7.0	2.8	ug/kg	
156-59-2	cis-1,2-Dichloroethylene	ND	7.0	2.8	ug/kg	
10061-01-5	cis-1,3-Dichloropropene	ND	7.0	2.8	ug/kg	
156-60-5	trans-1,2-Dichloroethylene	ND	7.0	2.8	ug/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	7.0	2.8	ug/kg	
100-41-4	Ethylbenzene	ND	7.0	2.8	ug/kg	
591-78-6	2-Hexanone	ND	35	14	ug/kg	
108-10-1	4-Methyl-2-pentanone	ND	35	14	ug/kg	
74-83-9	Methyl bromide	ND	7.0	2.8	ug/kg	
74-87-3	Methyl chloride	ND VL	7.0	2.8	ug/kg	
75-09-2	Methylene chloride	ND	14	7.0	ug/kg	
78-93-3	Methyl ethyl ketone	ND	35	14	ug/kg	
100-42-5	Styrene	ND	7.0	2.8	ug/kg	
71-55-6	1,1,1-Trichloroethane	ND	7.0	2.8	ug/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	7.0	2.8	ug/kg	
79-00-5	1,1,2-Trichloroethane	ND	7.0	2.8	ug/kg	
127-18-4	Tetrachloroethylene	ND	7.0	2.8	ug/kg	
108-88-3	Toluene	ND	7.0	2.8	ug/kg	
79-01-6	Trichloroethylene	ND	7.0	2.8	ug/kg	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Form I OA

Accutest Laboratories

Report of Analysis

Client Sample ID:	49SS04		
Lab Sample ID:	F51154-25	Date Sampled:	07/19/07
Matrix:	SO - Soil	Date Received:	07/19/07
Method:	SW846 8260B	Percent Solids:	87.5
Project:	WPA 019 Field Investigation; Radford AAP, VA		

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
75-01-4	Vinyl chloride	ND VL	7.0	2.8	ug/kg	
	m,p-Xylene	ND	14	4.2	ug/kg	
95-47-6	o-Xylene	ND	7.0	2.8	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	111%		80-121%
2037-26-5	Toluene-D8	102%		71-130%
460-00-4	4-Bromofluorobenzene	125%		59-148%
17060-07-0	1,2-Dichloroethane-D4	117%		77-123%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: H044681.D H044693.D

Form I com

Accutest Laboratories

Report of Analysis

Client Sample ID:	49SS05		
Lab Sample ID:	F51154-26	Date Sampled:	07/19/07
Matrix:	SO - Soil	Date Received:	07/19/07
Method:	SW846 8260B	Percent Solids:	85.9
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	H044681.D	1	07/26/07	SH	n/a	n/a	VH1662
Run #2 [a]	H044693.D	1	07/27/07	SH	n/a	n/a	VH1663

	Initial Weight
Run #1	3.67 g
Run #2	2.93 g

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND VJ	79	40	ug/kg	
71-43-2	Benzene	ND	7.9	3.2	ug/kg	
75-27-4	Bromodichloromethane	ND	7.9	3.2	ug/kg	
75-25-2	Bromoform	ND	7.9	3.2	ug/kg	
108-90-7	Chlorobenzene	ND	7.9	3.2	ug/kg	
75-00-3	Chloroethane	ND	7.9	4.8	ug/kg	
67-66-3	Chloroform	ND	7.9	3.2	ug/kg	
75-15-0	Carbon disulfide	ND	7.9	3.2	ug/kg	
56-23-5	Carbon tetrachloride	ND	7.9	3.2	ug/kg	
75-34-3	1,1-Dichloroethane	ND	7.9	3.2	ug/kg	
75-35-4	1,1-Dichloroethylene	ND	7.9	3.2	ug/kg	
107-06-2	1,2-Dichloroethane	ND	7.9	3.2	ug/kg	
78-87-5	1,2-Dichloropropane	ND	7.9	3.2	ug/kg	
124-48-1	Dibromochloromethane	ND	7.9	3.2	ug/kg	
156-59-2	cis-1,2-Dichloroethylene	ND	7.9	3.2	ug/kg	
10061-01-5	cis-1,3-Dichloropropene	ND	7.9	3.2	ug/kg	
156-60-5	trans-1,2-Dichloroethylene	ND	7.9	3.2	ug/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	7.9	3.2	ug/kg	
100-41-4	Ethylbenzene	ND	7.9	3.2	ug/kg	
591-78-6	2-Hexanone	ND	40	16	ug/kg	
108-10-1	4-Methyl-2-pentanone	ND	40	16	ug/kg	
74-83-9	Methyl bromide	ND	7.9	3.2	ug/kg	
74-87-3	Methyl chloride	ND VL	7.9	3.2	ug/kg	
75-09-2	Methylene chloride	ND	16	7.9	ug/kg	
78-93-3	Methyl ethyl ketone	ND	40	16	ug/kg	
100-42-5	Styrene	ND	7.9	3.2	ug/kg	
71-55-6	1,1,1-Trichloroethane	ND	7.9	3.2	ug/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	7.9	3.2	ug/kg	
79-00-5	1,1,2-Trichloroethane	ND	7.9	3.2	ug/kg	
127-18-4	Tetrachloroethylene	ND	7.9	3.2	ug/kg	
108-88-3	Toluene	ND	7.9	3.2	ug/kg	
79-01-6	Trichloroethylene	ND	7.9	3.2	ug/kg	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Form I Corg

Accutest Laboratories

Report of Analysis

Client Sample ID:	49SS05		
Lab Sample ID:	F51154-26	Date Sampled:	07/19/07
Matrix:	SO - Soil	Date Received:	07/19/07
Method:	SW846 8260B	Percent Solids:	85.9
Project:	WPA 019 Field Investigation; Radford AAP, VA		

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
75-01-4	Vinyl chloride	ND VL	7.9	3.2	ug/kg	
	m,p-Xylene	ND	16	4.8	ug/kg	
95-47-6	o-Xylene	ND	7.9	3.2	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	110%	107%	80-121%
2037-26-5	Toluene-D8	107%	113%	71-130%
460-00-4	4-Bromofluorobenzene	138%	130%	59-148%
17060-07-0	1,2-Dichloroethane-D4	115%	115%	77-123%

(a) Confirmation run.

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: F022458.D

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Accutest Laboratories

Report of Analysis

Client Sample ID:	59SS06		
Lab Sample ID:	F51154-27	Date Sampled:	07/19/07
Matrix:	SO - Soil	Date Received:	07/19/07
Method:	SW846 8260B	Percent Solids:	92.0
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	F022458.D	1	07/27/07	WJ	n/a	n/a	VF413
Run #2							

	Initial Weight
Run #1	4.45 g
Run #2	

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND VT	61	31	ug/kg	
71-43-2	Benzene	ND	6.1	2.4	ug/kg	
75-27-4	Bromodichloromethane	ND	6.1	2.4	ug/kg	
75-25-2	Bromoform	ND	6.1	2.4	ug/kg	
108-90-7	Chlorobenzene	ND	6.1	2.4	ug/kg	
75-00-3	Chloroethane	ND	6.1	3.7	ug/kg	
67-66-3	Chloroform	ND	6.1	2.4	ug/kg	
75-15-0	Carbon disulfide	ND	6.1	2.4	ug/kg	
56-23-5	Carbon tetrachloride	ND	6.1	2.4	ug/kg	
75-34-3	1,1-Dichloroethane	ND	6.1	2.4	ug/kg	
75-35-4	1,1-Dichloroethylene	ND	6.1	2.4	ug/kg	
107-06-2	1,2-Dichloroethane	ND	6.1	2.4	ug/kg	
78-87-5	1,2-Dichloropropane	ND	6.1	2.4	ug/kg	
124-48-1	Dibromochloromethane	ND	6.1	2.4	ug/kg	
156-59-2	cis-1,2-Dichloroethylene	ND	6.1	2.4	ug/kg	
10061-01-5	cis-1,3-Dichloropropene	ND	6.1	2.4	ug/kg	
156-60-5	trans-1,2-Dichloroethylene	ND	6.1	2.4	ug/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	6.1	2.4	ug/kg	
100-41-4	Ethylbenzene	ND	6.1	2.4	ug/kg	
591-78-6	2-Hexanone	ND	31	12	ug/kg	
108-10-1	4-Methyl-2-pentanone	ND	31	12	ug/kg	
74-83-9	Methyl bromide	ND	6.1	2.4	ug/kg	
74-87-3	Methyl chloride	ND	6.1	2.4	ug/kg	
75-09-2	Methylene chloride	ND	12	6.1	ug/kg	
78-93-3	Methyl ethyl ketone	ND	31	12	ug/kg	
100-42-5	Styrene	ND	6.1	2.4	ug/kg	
71-55-6	1,1,1-Trichloroethane	ND	6.1	2.4	ug/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	6.1	2.4	ug/kg	
79-00-5	1,1,2-Trichloroethane	ND	6.1	2.4	ug/kg	
127-18-4	Tetrachloroethylene	ND	6.1	2.4	ug/kg	
108-88-3	Toluene	ND	6.1	2.4	ug/kg	
79-01-6	Trichloroethylene	ND	6.1	2.4	ug/kg	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Form I OA

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Report of Analysis

Client Sample ID:	59SS06		
Lab Sample ID:	F51154-27	Date Sampled:	07/19/07
Matrix:	SO - Soil	Date Received:	07/19/07
Method:	SW846 8260B	Percent Solids:	92.0
Project:	WPA 019 Field Investigation; Radford AAP, VA		

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
75-01-4	Vinyl chloride	ND	6.1	2.4	ug/kg	
	m,p-Xylene	ND	12	3.7	ug/kg	
95-47-6	o-Xylene	ND	6.1	2.4	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	108%		80-121%
2037-26-5	Toluene-D8	100%		71-130%
460-00-4	4-Bromofluorobenzene	106%		59-148%
17060-07-0	1,2-Dichloroethane-D4	110%		77-123%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: F022459.D

Form I COA

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Report of Analysis

3.2.8

Client Sample ID:	59SS07		
Lab Sample ID:	F51154-28	Date Sampled:	07/19/07
Matrix:	SO - Soil	Date Received:	07/19/07
Method:	SW846 8260B	Percent Solids:	91.6
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	F022459.D	1	07/27/07	WJ	n/a	n/a	VF413
Run #2							

	Initial Weight
Run #1	4.16 g
Run #2	

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND VJ	66	33	ug/kg	
71-43-2	Benzene	ND	6.6	2.6	ug/kg	
75-27-4	Bromodichloromethane	ND	6.6	2.6	ug/kg	
75-25-2	Bromoform	ND	6.6	2.6	ug/kg	
108-90-7	Chlorobenzene	ND	6.6	2.6	ug/kg	
75-00-3	Chloroethane	ND	6.6	3.9	ug/kg	
67-66-3	Chloroform	ND	6.6	2.6	ug/kg	
75-15-0	Carbon disulfide	ND	6.6	2.6	ug/kg	
56-23-5	Carbon tetrachloride	ND	6.6	2.6	ug/kg	
75-34-3	1,1-Dichloroethane	ND	6.6	2.6	ug/kg	
75-35-4	1,1-Dichloroethylene	ND	6.6	2.6	ug/kg	
107-06-2	1,2-Dichloroethane	ND	6.6	2.6	ug/kg	
78-87-5	1,2-Dichloropropane	ND	6.6	2.6	ug/kg	
124-48-1	Dibromochloromethane	ND	6.6	2.6	ug/kg	
156-59-2	cis-1,2-Dichloroethylene	ND	6.6	2.6	ug/kg	
10061-01-5	cis-1,3-Dichloropropene	ND	6.6	2.6	ug/kg	
156-60-5	trans-1,2-Dichloroethylene	ND	6.6	2.6	ug/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	6.6	2.6	ug/kg	
100-41-4	Ethylbenzene	ND	6.6	2.6	ug/kg	
591-78-6	2-Hexanone	ND	33	13	ug/kg	
108-10-1	4-Methyl-2-pentanone	ND	33	13	ug/kg	
74-83-9	Methyl bromide	ND	6.6	2.6	ug/kg	
74-87-3	Methyl chloride	ND	6.6	2.6	ug/kg	
75-09-2	Methylene chloride	ND	13	6.6	ug/kg	
78-93-3	Methyl ethyl ketone	ND	33	13	ug/kg	
100-42-5	Styrene	ND	6.6	2.6	ug/kg	
71-55-6	1,1,1-Trichloroethane	ND	6.6	2.6	ug/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	6.6	2.6	ug/kg	
79-00-5	1,1,2-Trichloroethane	ND	6.6	2.6	ug/kg	
127-18-4	Tetrachloroethylene	ND	6.6	2.6	ug/kg	
108-88-3	Toluene	ND	6.6	2.6	ug/kg	
79-01-6	Trichloroethylene	ND	6.6	2.6	ug/kg	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	59SS07		
Lab Sample ID:	F51154-28	Date Sampled:	07/19/07
Matrix:	SO - Soil	Date Received:	07/19/07
Method:	SW846 8260B	Percent Solids:	91.6
Project:	WPA 019 Field Investigation; Radford AAP, VA		

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
75-01-4	Vinyl chloride	ND	6.6	2.6	ug/kg	
	m,p-Xylene	ND	13	3.9	ug/kg	
95-47-6	o-Xylene	ND	6.6	2.6	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	108%		80-121%
2037-26-5	Toluene-D8	103%		71-130%
460-00-4	4-Bromofluorobenzene	116%		59-148%
17060-07-0	1,2-Dichloroethane-D4	110%		77-123%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: F022460.D

Form I Cog

Accutest Laboratories

Report of Analysis

3129

3

Client Sample ID:	59SS08		
Lab Sample ID:	F51154-29	Date Sampled:	07/19/07
Matrix:	SO - Soil	Date Received:	07/19/07
Method:	SW846 8260B	Percent Solids:	89.0
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	F022460.D	1	07/27/07	WJ	n/a	n/a	VF413
Run #2							

	Initial Weight
Run #1	2.74 g
Run #2	

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND VJ	100	51	ug/kg	
71-43-2	Benzene	ND	10	4.1	ug/kg	
75-27-4	Bromodichloromethane	ND	10	4.1	ug/kg	
75-25-2	Bromoform	ND	10	4.1	ug/kg	
108-90-7	Chlorobenzene	ND	10	4.1	ug/kg	
75-00-3	Chloroethane	ND	10	6.2	ug/kg	
67-66-3	Chloroform	ND	10	4.1	ug/kg	
75-15-0	Carbon disulfide	ND	10	4.1	ug/kg	
56-23-5	Carbon tetrachloride	ND	10	4.1	ug/kg	
75-34-3	1,1-Dichloroethane	ND	10	4.1	ug/kg	
75-35-4	1,1-Dichloroethylene	ND	10	4.1	ug/kg	
107-06-2	1,2-Dichloroethane	ND	10	4.1	ug/kg	
78-87-5	1,2-Dichloropropane	ND	10	4.1	ug/kg	
124-48-1	Dibromochloromethane	ND	10	4.1	ug/kg	
156-59-2	cis-1,2-Dichloroethylene	ND	10	4.1	ug/kg	
10061-01-5	cis-1,3-Dichloropropene	ND	10	4.1	ug/kg	
156-60-5	trans-1,2-Dichloroethylene	ND	10	4.1	ug/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	10	4.1	ug/kg	
100-41-4	Ethylbenzene	ND	10	4.1	ug/kg	
591-78-6	2-Hexanone	ND	51	21	ug/kg	
108-10-1	4-Methyl-2-pentanone	ND	51	21	ug/kg	
74-83-9	Methyl bromide	ND	10	4.1	ug/kg	
74-87-3	Methyl chloride	ND	10	4.1	ug/kg	
75-09-2	Methylene chloride	ND	21	10	ug/kg	
78-93-3	Methyl ethyl ketone	ND	51	21	ug/kg	
100-42-5	Styrene	ND	10	4.1	ug/kg	
71-55-6	1,1,1-Trichloroethane	ND	10	4.1	ug/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	10	4.1	ug/kg	
79-00-5	1,1,2-Trichloroethane	ND	10	4.1	ug/kg	
127-18-4	Tetrachloroethylene	ND	10	4.1	ug/kg	
108-88-3	Toluene	ND	10	4.1	ug/kg	
79-01-6	Trichloroethylene	ND	10	4.1	ug/kg	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

form I OM

Accutest Laboratories

Report of Analysis

Client Sample ID:	59SS08		
Lab Sample ID:	F51154-29	Date Sampled:	07/19/07
Matrix:	SO - Soil	Date Received:	07/19/07
Method:	SW846 8260B	Percent Solids:	89.0
Project:	WPA 019 Field Investigation; Radford AAP, VA		

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
75-01-4	Vinyl chloride	ND	10	4.1	ug/kg	
	m,p-Xylene	ND	21	6.2	ug/kg	
95-47-6	o-Xylene	ND	10	4.1	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	109%		80-121%
2037-26-5	Toluene-D8	101%		71-130%
460-00-4	4-Bromofluorobenzene	114%		59-148%
17060-07-0	1,2-Dichloroethane-D4	110%		77-123%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: F022461.D

Form I Org

Accutest Laboratories

Report of Analysis

Client Sample ID:	59SS09		
Lab Sample ID:	F51154-30	Date Sampled:	07/19/07
Matrix:	SO - Soil	Date Received:	07/19/07
Method:	SW846 8260B	Percent Solids:	95.1
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	F022461.D	1	07/27/07	WJ	n/a	n/a	VF413
Run #2							

	Initial Weight
Run #1	2.18 g
Run #2	

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND UJ	120	60	ug/kg	
71-43-2	Benzene	ND	12	4.8	ug/kg	
75-27-4	Bromodichloromethane	ND	12	4.8	ug/kg	
75-25-2	Bromoform	ND	12	4.8	ug/kg	
108-90-7	Chlorobenzene	ND	12	4.8	ug/kg	
75-00-3	Chloroethane	ND	12	7.2	ug/kg	
67-66-3	Chloroform	ND	12	4.8	ug/kg	
75-15-0	Carbon disulfide	ND	12	4.8	ug/kg	
56-23-5	Carbon tetrachloride	ND	12	4.8	ug/kg	
75-34-3	1,1-Dichloroethane	ND	12	4.8	ug/kg	
75-35-4	1,1-Dichloroethylene	ND	12	4.8	ug/kg	
107-06-2	1,2-Dichloroethane	ND	12	4.8	ug/kg	
78-87-5	1,2-Dichloropropane	ND	12	4.8	ug/kg	
124-48-1	Dibromochloromethane	ND	12	4.8	ug/kg	
156-59-2	cis-1,2-Dichloroethylene	ND	12	4.8	ug/kg	
10061-01-5	cis-1,3-Dichloropropene	ND	12	4.8	ug/kg	
156-60-5	trans-1,2-Dichloroethylene	ND	12	4.8	ug/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	12	4.8	ug/kg	
100-41-4	Ethylbenzene	ND	12	4.8	ug/kg	
591-78-6	2-Hexanone	ND	60	24	ug/kg	
108-10-1	4-Methyl-2-pentanone	ND	60	24	ug/kg	
74-83-9	Methyl bromide	ND	12	4.8	ug/kg	
74-87-3	Methyl chloride	ND	12	4.8	ug/kg	
75-09-2	Methylene chloride	ND	24	12	ug/kg	
78-93-3	Methyl ethyl ketone	ND	60	24	ug/kg	
100-42-5	Styrene	ND	12	4.8	ug/kg	
71-55-6	1,1,1-Trichloroethane	ND	12	4.8	ug/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	12	4.8	ug/kg	
79-00-5	1,1,2-Trichloroethane	ND	12	4.8	ug/kg	
127-18-4	Tetrachloroethylene	ND	12	4.8	ug/kg	
108-88-3	Toluene	ND	12	4.8	ug/kg	
79-01-6	Trichloroethylene	ND	12	4.8	ug/kg	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Form I OA

Accutest Laboratories

Report of Analysis

Client Sample ID:	59SS09		
Lab Sample ID:	F51154-30	Date Sampled:	07/19/07
Matrix:	SO - Soil	Date Received:	07/19/07
Method:	SW846 8260B	Percent Solids:	95.1
Project:	WPA 019 Field Investigation; Radford AAP, VA		

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
75-01-4	Vinyl chloride	ND	12	4.8	ug/kg	
	m,p-Xylene	ND	24	7.2	ug/kg	
95-47-6	o-Xylene	ND	12	4.8	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	114%		80-121%
2037-26-5	Toluene-D8	108%		71-130%
460-00-4	4-Bromofluorobenzene	122%		59-148%
17060-07-0	1,2-Dichloroethane-D4	116%		77-123%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: F022462.D

Form I Org

Accutest Laboratories

Report of Analysis

Client Sample ID:	59SS10		
Lab Sample ID:	F51154-31	Date Sampled:	07/19/07
Matrix:	SO - Soil	Date Received:	07/19/07
Method:	SW846 8260B	Percent Solids:	95.7
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	F022462.D	1	07/27/07	WJ	n/a	n/a	VF413
Run #2							

	Initial Weight
Run #1	2.06 g
Run #2	

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone [a]	65.8 J	130	63	ug/kg	J
71-43-2	Benzene	ND	13	5.1	ug/kg	
75-27-4	Bromodichloromethane	ND	13	5.1	ug/kg	
75-25-2	Bromoform	ND	13	5.1	ug/kg	
108-90-7	Chlorobenzene	ND	13	5.1	ug/kg	
75-00-3	Chloroethane	ND	13	7.6	ug/kg	
67-66-3	Chloroform	ND	13	5.1	ug/kg	
75-15-0	Carbon disulfide	ND	13	5.1	ug/kg	
56-23-5	Carbon tetrachloride	ND	13	5.1	ug/kg	
75-34-3	1,1-Dichloroethane	ND	13	5.1	ug/kg	
75-35-4	1,1-Dichloroethylene	ND	13	5.1	ug/kg	
107-06-2	1,2-Dichloroethane	ND	13	5.1	ug/kg	
78-87-5	1,2-Dichloropropane	ND	13	5.1	ug/kg	
124-48-1	Dibromochloromethane	ND	13	5.1	ug/kg	
156-59-2	cis-1,2-Dichloroethylene	ND	13	5.1	ug/kg	
10061-01-5	cis-1,3-Dichloropropene	ND	13	5.1	ug/kg	
156-60-5	trans-1,2-Dichloroethylene	ND	13	5.1	ug/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	13	5.1	ug/kg	
100-41-4	Ethylbenzene	ND	13	5.1	ug/kg	
591-78-6	2-Hexanone	ND	63	25	ug/kg	
108-10-1	4-Methyl-2-pentanone	ND	63	25	ug/kg	
74-83-9	Methyl bromide	ND	13	5.1	ug/kg	
74-87-3	Methyl chloride	ND	13	5.1	ug/kg	
75-09-2	Methylene chloride	ND	25	13	ug/kg	
78-93-3	Methyl ethyl ketone	ND	63	25	ug/kg	
100-42-5	Styrene	ND	13	5.1	ug/kg	
71-55-6	1,1,1-Trichloroethane	ND	13	5.1	ug/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	13	5.1	ug/kg	
79-00-5	1,1,2-Trichloroethane	ND	13	5.1	ug/kg	
127-18-4	Tetrachloroethylene	ND	13	5.1	ug/kg	
108-88-3	Toluene	ND	13	5.1	ug/kg	
79-01-6	Trichloroethylene	ND	13	5.1	ug/kg	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

For I Only

Accutest Laboratories

Report of Analysis

3.31

Client Sample ID:	59SS10		
Lab Sample ID:	F51154-31	Date Sampled:	07/19/07
Matrix:	SO - Soil	Date Received:	07/19/07
Method:	SW846 8260B	Percent Solids:	95.7
Project:	WPA 019 Field Investigation; Radford AAP, VA		

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
75-01-4	Vinyl chloride	ND	13	5.1	ug/kg	
	m,p-Xylene	ND	25	7.6	ug/kg	
95-47-6	o-Xylene	ND	13	5.1	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	112%		80-121%
2037-26-5	Toluene-D8	105%		71-130%
460-00-4	4-Bromofluorobenzene	118%		59-148%
17060-07-0	1,2-Dichloroethane-D4	116%		77-123%

(a) CCV outside of control limits; results may be biased high.

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: F022479.D

Form I OM

Accutest Laboratories

Report of Analysis

Client Sample ID:	TMSS05		
Lab Sample ID:	F51154-32	Date Sampled:	07/19/07
Matrix:	SO - Soil	Date Received:	07/19/07
Method:	SW846 8260B	Percent Solids:	86.6
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	F022479.D	1	07/28/07	WJ	n/a	n/a	VF414
Run #2							

	Initial Weight
Run #1	3.53 g
Run #2	

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	78.2 J	82	41	ug/kg	J
71-43-2	Benzene	ND	8.2	3.3	ug/kg	
75-27-4	Bromodichloromethane	ND	8.2	3.3	ug/kg	
75-25-2	Bromoform	ND	8.2	3.3	ug/kg	
108-90-7	Chlorobenzene	ND	8.2	3.3	ug/kg	
75-00-3	Chloroethane	ND	8.2	4.9	ug/kg	
67-66-3	Chloroform	ND	8.2	3.3	ug/kg	
75-15-0	Carbon disulfide	ND	8.2	3.3	ug/kg	
56-23-5	Carbon tetrachloride	ND	8.2	3.3	ug/kg	
75-34-3	1,1-Dichloroethane	ND	8.2	3.3	ug/kg	
75-35-4	1,1-Dichloroethylene	ND	8.2	3.3	ug/kg	
107-06-2	1,2-Dichloroethane	ND	8.2	3.3	ug/kg	
78-87-5	1,2-Dichloropropane	ND	8.2	3.3	ug/kg	
124-48-1	Dibromochloromethane	ND	8.2	3.3	ug/kg	
156-59-2	cis-1,2-Dichloroethylene	ND	8.2	3.3	ug/kg	
10061-01-5	cis-1,3-Dichloropropene	ND	8.2	3.3	ug/kg	
156-60-5	trans-1,2-Dichloroethylene	ND	8.2	3.3	ug/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	8.2	3.3	ug/kg	
100-41-4	Ethylbenzene	ND	8.2	3.3	ug/kg	
591-78-6	2-Hexanone	ND	41	16	ug/kg	
108-10-1	4-Methyl-2-pentanone	ND	41	16	ug/kg	
74-83-9	Methyl bromide	ND	8.2	3.3	ug/kg	
74-87-3	Methyl chloride	ND	8.2	3.3	ug/kg	
75-09-2	Methylene chloride	ND	16	8.2	ug/kg	
78-93-3	Methyl ethyl ketone	ND	41	16	ug/kg	
100-42-5	Styrene	ND	8.2	3.3	ug/kg	
71-55-6	1,1,1-Trichloroethane	ND	8.2	3.3	ug/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	8.2	3.3	ug/kg	
79-00-5	1,1,2-Trichloroethane	ND	8.2	3.3	ug/kg	
127-18-4	Tetrachloroethylene	ND	8.2	3.3	ug/kg	
108-88-3	Toluene	ND	8.2	3.3	ug/kg	
79-01-6	Trichloroethylene	ND	8.2	3.3	ug/kg	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Form I Org

Accutest Laboratories

Report of Analysis

Client Sample ID:	TMSS05		
Lab Sample ID:	F51154-32	Date Sampled:	07/19/07
Matrix:	SO - Soil	Date Received:	07/19/07
Method:	SW846 8260B	Percent Solids:	86.6
Project:	WPA 019 Field Investigation; Radford AAP, VA		

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
75-01-4	Vinyl chloride	ND	8.2	3.3	ug/kg	
	m,p-Xylene	ND	16	4.9	ug/kg	
95-47-6	o-Xylene	ND	8.2	3.3	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	109%		80-121%
2037-26-5	Toluene-D8	106%		71-130%
460-00-4	4-Bromofluorobenzene	121%		59-148%
17060-07-0	1,2-Dichloroethane-D4	108%		77-123%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: J031457.D

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Report of Analysis

Client Sample ID:	RB071807		
Lab Sample ID:	F51154-12	Date Sampled:	07/18/07
Matrix:	AQ - Surface Water	Date Received:	07/19/07
Method:	SW846 8260B	Percent Solids:	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	J031457.D	1	07/26/07	JG	n/a	n/a	VJ2187
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	25	5.0	ug/l	
71-43-2	Benzene	ND	1.0	0.50	ug/l	
75-27-4	Bromodichloromethane	ND	1.0	0.50	ug/l	
75-25-2	Bromoform	ND	1.0	0.50	ug/l	
108-90-7	Chlorobenzene	ND	1.0	0.50	ug/l	
75-00-3	Chloroethane	ND	2.0	1.0	ug/l	
67-66-3	Chloroform	ND	1.0	0.50	ug/l	
75-15-0	Carbon disulfide	ND	2.0	1.0	ug/l	
56-23-5	Carbon tetrachloride	ND	1.0	0.50	ug/l	
75-34-3	1,1-Dichloroethane	ND	1.0	0.50	ug/l	
75-35-4	1,1-Dichloroethylene	ND	1.0	0.50	ug/l	
107-06-2	1,2-Dichloroethane	ND	1.0	0.50	ug/l	
78-87-5	1,2-Dichloropropane	ND	1.0	0.50	ug/l	
124-48-1	Dibromochloromethane	ND	1.0	0.40	ug/l	
156-59-2	cis-1,2-Dichloroethylene	ND	1.0	0.50	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	1.0	0.30	ug/l	
156-60-5	trans-1,2-Dichloroethylene	ND	1.0	0.50	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	1.0	0.30	ug/l	
100-41-4	Ethylbenzene	ND	1.0	0.50	ug/l	
591-78-6	2-Hexanone	ND	5.0	2.5	ug/l	
108-10-1	4-Methyl-2-pentanone	ND	5.0	2.5	ug/l	
74-83-9	Methyl bromide	ND	2.0	1.0	ug/l	
74-87-3	Methyl chloride	ND	2.0	1.0	ug/l	
75-09-2	Methylene chloride	2.7 J	5.0	1.0	ug/l	J
78-93-3	Methyl ethyl ketone	ND	5.0	2.5	ug/l	
100-42-5	Styrene	ND	1.0	0.50	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	1.0	0.50	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.0	0.40	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	1.0	0.50	ug/l	
127-18-4	Tetrachloroethylene	ND	1.0	0.50	ug/l	
108-88-3	Toluene	ND	1.0	0.50	ug/l	
79-01-6	Trichloroethylene	ND	1.0	0.50	ug/l	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Accutest Laboratories

Report of Analysis

Client Sample ID:	RB071807		
Lab Sample ID:	F51154-12	Date Sampled:	07/18/07
Matrix:	AQ - Surface Water	Date Received:	07/19/07
Method:	SW846 8260B	Percent Solids:	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
75-01-4	Vinyl chloride	ND	1.0	0.50	ug/l	
	m,p-Xylene	ND	2.0	0.50	ug/l	
95-47-6	o-Xylene	ND	1.0	0.50	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	101%		87-116%
17060-07-0	1,2-Dichloroethane-D4	94%		76-127%
2037-26-5	Toluene-D8	101%		86-112%
460-00-4	4-Bromofluorobenzene	108%		84-120%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: J031458.D

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Report of Analysis

Client Sample ID:	071807TW		
Lab Sample ID:	F51154-13	Date Sampled:	07/18/07
Matrix:	AQ - Trip Blank Water	Date Received:	07/19/07
Method:	SW846 8260B	Percent Solids:	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	J031458.D	1	07/26/07	JG	n/a	n/a	VJ2187
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	25	5.0	ug/l	
71-43-2	Benzene	ND	1.0	0.50	ug/l	
75-27-4	Bromodichloromethane	ND	1.0	0.50	ug/l	
75-25-2	Bromoform	ND	1.0	0.50	ug/l	
108-90-7	Chlorobenzene	ND	1.0	0.50	ug/l	
75-00-3	Chloroethane	ND	2.0	1.0	ug/l	
67-66-3	Chloroform	ND	1.0	0.50	ug/l	
75-15-0	Carbon disulfide	ND	2.0	1.0	ug/l	
56-23-5	Carbon tetrachloride	ND	1.0	0.50	ug/l	
75-34-3	1,1-Dichloroethane	ND	1.0	0.50	ug/l	
75-35-4	1,1-Dichloroethylene	ND	1.0	0.50	ug/l	
107-06-2	1,2-Dichloroethane	ND	1.0	0.50	ug/l	
78-87-5	1,2-Dichloropropane	ND	1.0	0.50	ug/l	
124-48-1	Dibromochloromethane	ND	1.0	0.40	ug/l	
156-59-2	cis-1,2-Dichloroethylene	ND	1.0	0.50	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	1.0	0.30	ug/l	
156-60-5	trans-1,2-Dichloroethylene	ND	1.0	0.50	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	1.0	0.30	ug/l	
100-41-4	Ethylbenzene	ND	1.0	0.50	ug/l	
591-78-6	2-Hexanone	ND	5.0	2.5	ug/l	
108-10-1	4-Methyl-2-pentanone	ND	5.0	2.5	ug/l	
74-83-9	Methyl bromide	ND	2.0	1.0	ug/l	
74-87-3	Methyl chloride	ND	2.0	1.0	ug/l	
75-09-2	Methylene chloride	ND	5.0	1.0	ug/l	
78-93-3	Methyl ethyl ketone	ND	5.0	2.5	ug/l	
100-42-5	Styrene	ND	1.0	0.50	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	1.0	0.50	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.0	0.40	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	1.0	0.50	ug/l	
127-18-4	Tetrachloroethylene	ND	1.0	0.50	ug/l	
108-88-3	Toluene	ND	1.0	0.50	ug/l	
79-01-6	Trichloroethylene	ND	1.0	0.50	ug/l	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Form I rev

Accutest Laboratories

Report of Analysis

Client Sample ID:	071807TW		
Lab Sample ID:	F51154-13	Date Sampled:	07/18/07
Matrix:	AQ - Trip Blank Water	Date Received:	07/19/07
Method:	SW846 8260B	Percent Solids:	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
75-01-4	Vinyl chloride	ND	1.0	0.50	ug/l	
	m,p-Xylene	ND	2.0	0.50	ug/l	
95-47-6	o-Xylene	ND	1.0	0.50	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	99%		87-116%
17060-07-0	1,2-Dichloroethane-D4	93%		76-127%
2037-26-5	Toluene-D8	99%		86-112%
460-00-4	4-Bromofluorobenzene	109%		84-120%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: H044658.D

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Accutest Laboratories

Report of Analysis

Client Sample ID:	071807TS		
Lab Sample ID:	F51154-14	Date Sampled:	07/18/07
Matrix:	SO - Trip Blank Soil	Date Received:	07/19/07
Method:	SW846 8260B	Percent Solids:	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	H044658.D	1	07/26/07	SH	n/a	n/a	VH1662
Run #2							

	Initial Weight
Run #1	5.00 g
Run #2	

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	50	25	ug/kg	
71-43-2	Benzene	ND	5.0	2.0	ug/kg	
75-27-4	Bromodichloromethane	ND	5.0	2.0	ug/kg	
75-25-2	Bromoform	ND	5.0	2.0	ug/kg	
108-90-7	Chlorobenzene	ND	5.0	2.0	ug/kg	
75-00-3	Chloroethane	ND	5.0	3.0	ug/kg	
67-66-3	Chloroform	ND	5.0	2.0	ug/kg	
75-15-0	Carbon disulfide	ND	5.0	2.0	ug/kg	
56-23-5	Carbon tetrachloride	ND	5.0	2.0	ug/kg	
75-34-3	1,1-Dichloroethane	ND	5.0	2.0	ug/kg	
75-35-4	1,1-Dichloroethylene	ND	5.0	2.0	ug/kg	
107-06-2	1,2-Dichloroethane	ND	5.0	2.0	ug/kg	
78-87-5	1,2-Dichloropropane	ND	5.0	2.0	ug/kg	
124-48-1	Dibromochloromethane	ND	5.0	2.0	ug/kg	
156-59-2	cis-1,2-Dichloroethylene	ND	5.0	2.0	ug/kg	
10061-01-5	cis-1,3-Dichloropropene	ND	5.0	2.0	ug/kg	
156-60-5	trans-1,2-Dichloroethylene	ND	5.0	2.0	ug/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	5.0	2.0	ug/kg	
100-41-4	Ethylbenzene	ND	5.0	2.0	ug/kg	
591-78-6	2-Hexanone	ND	25	10	ug/kg	
108-10-1	4-Methyl-2-pentanone	ND	25	10	ug/kg	
74-83-9	Methyl bromide	ND	5.0	2.0	ug/kg	
74-87-3	Methyl chloride	ND	5.0	2.0	ug/kg	
75-09-2	Methylene chloride	ND	10	5.0	ug/kg	
78-93-3	Methyl ethyl ketone	ND	25	10	ug/kg	
100-42-5	Styrene	ND	5.0	2.0	ug/kg	
71-55-6	1,1,1-Trichloroethane	ND	5.0	2.0	ug/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	5.0	2.0	ug/kg	
79-00-5	1,1,2-Trichloroethane	ND	5.0	2.0	ug/kg	
127-18-4	Tetrachloroethylene	ND	5.0	2.0	ug/kg	
108-88-3	Toluene	ND	5.0	2.0	ug/kg	
79-01-6	Trichloroethylene	ND	5.0	2.0	ug/kg	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Final Copy

Accutest Laboratories

Report of Analysis

Client Sample ID:	071807TS		
Lab Sample ID:	F51154-14	Date Sampled:	07/18/07
Matrix:	SO - Trip Blank Soil	Date Received:	07/19/07
Method:	SW846 8260B	Percent Solids:	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
75-01-4	Vinyl chloride	ND	5.0	2.0	ug/kg	
	m,p-Xylene	ND	10	3.0	ug/kg	
95-47-6	o-Xylene	ND	5.0	2.0	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	97%		80-121%
2037-26-5	Toluene-D8	98%		71-130%
460-00-4	4-Bromofluorobenzene	113%		59-148%
17060-07-0	1,2-Dichloroethane-D4	102%		77-123%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: H044659.D

Form I OV7

Accutest Laboratories

Report of Analysis

Client Sample ID:	TB071907S		
Lab Sample ID:	F51154-19	Date Sampled:	07/19/07
Matrix:	SO - Trip Blank Soil	Date Received:	07/19/07
Method:	SW846 8260B	Percent Solids:	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	H044659.D	1	07/26/07	SH	n/a	n/a	VH1662
Run #2							

	Initial Weight
Run #1	5.00 g
Run #2	

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	50	25	ug/kg	
71-43-2	Benzene	ND	5.0	2.0	ug/kg	
75-27-4	Bromodichloromethane	ND	5.0	2.0	ug/kg	
75-25-2	Bromoform	ND	5.0	2.0	ug/kg	
108-90-7	Chlorobenzene	ND	5.0	2.0	ug/kg	
75-00-3	Chloroethane	ND	5.0	3.0	ug/kg	
67-66-3	Chloroform	ND	5.0	2.0	ug/kg	
75-15-0	Carbon disulfide	ND	5.0	2.0	ug/kg	
56-23-5	Carbon tetrachloride	ND	5.0	2.0	ug/kg	
75-34-3	1,1-Dichloroethane	ND	5.0	2.0	ug/kg	
75-35-4	1,1-Dichloroethylene	ND	5.0	2.0	ug/kg	
107-06-2	1,2-Dichloroethane	ND	5.0	2.0	ug/kg	
78-87-5	1,2-Dichloropropane	ND	5.0	2.0	ug/kg	
124-48-1	Dibromochloromethane	ND	5.0	2.0	ug/kg	
156-59-2	cis-1,2-Dichloroethylene	ND	5.0	2.0	ug/kg	
10061-01-5	cis-1,3-Dichloropropene	ND	5.0	2.0	ug/kg	
156-60-5	trans-1,2-Dichloroethylene	ND	5.0	2.0	ug/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	5.0	2.0	ug/kg	
100-41-4	Ethylbenzene	ND	5.0	2.0	ug/kg	
591-78-6	2-Hexanone	ND	25	10	ug/kg	
108-10-1	4-Methyl-2-pentanone	ND	25	10	ug/kg	
74-83-9	Methyl bromide	ND	5.0	2.0	ug/kg	
74-87-3	Methyl chloride	ND	5.0	2.0	ug/kg	
75-09-2	Methylene chloride	ND	10	5.0	ug/kg	
78-93-3	Methyl ethyl ketone	ND	25	10	ug/kg	
100-42-5	Styrene	ND	5.0	2.0	ug/kg	
71-55-6	1,1,1-Trichloroethane	ND	5.0	2.0	ug/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	5.0	2.0	ug/kg	
79-00-5	1,1,2-Trichloroethane	ND	5.0	2.0	ug/kg	
127-18-4	Tetrachloroethylene	ND	5.0	2.0	ug/kg	
108-88-3	Toluene	ND	5.0	2.0	ug/kg	
79-01-6	Trichloroethylene	ND	5.0	2.0	ug/kg	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Form I OA

Accutest Laboratories

Report of Analysis

Client Sample ID:	TB071907S		
Lab Sample ID:	F51154-19	Date Sampled:	07/19/07
Matrix:	SO - Trip Blank Soil	Date Received:	07/19/07
Method:	SW846 8260B	Percent Solids:	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
75-01-4	Vinyl chloride	ND	5.0	2.0	ug/kg	
	m,p-Xylene	ND	10	3.0	ug/kg	
95-47-6	o-Xylene	ND	5.0	2.0	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	100%		80-121%
2037-26-5	Toluene-D8	97%		71-130%
460-00-4	4-Bromofluorobenzene	113%		59-148%
17060-07-0	1,2-Dichloroethane-D4	101%		77-123%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: J031459.D

Form I GC

Accutest Laboratories

Report of Analysis

Client Sample ID:	TB071907W		
Lab Sample ID:	F51154-21	Date Sampled:	07/19/07
Matrix:	AQ - Trip Blank Water	Date Received:	07/19/07
Method:	SW846 8260B	Percent Solids:	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	J031459.D	1	07/26/07	JG	n/a	n/a	VJ2187
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

VOA TCL List

CAS No.	Compound	Result		RL	MDL	Units	Q
67-64-1	Acetone	ND		25	5.0	ug/l	
71-43-2	Benzene	ND		1.0	0.50	ug/l	
75-27-4	Bromodichloromethane	ND		1.0	0.50	ug/l	
75-25-2	Bromoform	ND		1.0	0.50	ug/l	
108-90-7	Chlorobenzene	ND		1.0	0.50	ug/l	
75-00-3	Chloroethane	ND		2.0	1.0	ug/l	
67-66-3	Chloroform	1.3	J	1.0	0.50	ug/l	
75-15-0	Carbon disulfide	ND		2.0	1.0	ug/l	
56-23-5	Carbon tetrachloride	ND		1.0	0.50	ug/l	
75-34-3	1,1-Dichloroethane	ND		1.0	0.50	ug/l	
75-35-4	1,1-Dichloroethylene	ND		1.0	0.50	ug/l	
107-06-2	1,2-Dichloroethane	ND		1.0	0.50	ug/l	
78-87-5	1,2-Dichloropropane	ND		1.0	0.50	ug/l	
124-48-1	Dibromochloromethane	ND		1.0	0.40	ug/l	
156-59-2	cis-1,2-Dichloroethylene	ND		1.0	0.50	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND		1.0	0.30	ug/l	
156-60-5	trans-1,2-Dichloroethylene	ND		1.0	0.50	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND		1.0	0.30	ug/l	
100-41-4	Ethylbenzene	ND		1.0	0.50	ug/l	
591-78-6	2-Hexanone	ND		5.0	2.5	ug/l	
108-10-1	4-Methyl-2-pentanone	ND		5.0	2.5	ug/l	
74-83-9	Methyl bromide	ND		2.0	1.0	ug/l	
74-87-3	Methyl chloride	ND		2.0	1.0	ug/l	
75-09-2	Methylene chloride	ND		5.0	1.0	ug/l	
78-93-3	Methyl ethyl ketone	ND		5.0	2.5	ug/l	
100-42-5	Styrene	ND		1.0	0.50	ug/l	
71-55-6	1,1,1-Trichloroethane	ND		1.0	0.50	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND		1.0	0.40	ug/l	
79-00-5	1,1,2-Trichloroethane	ND		1.0	0.50	ug/l	
127-18-4	Tetrachloroethylene	ND		1.0	0.50	ug/l	
108-88-3	Toluene	ND		1.0	0.50	ug/l	
79-01-6	Trichloroethylene	ND		1.0	0.50	ug/l	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Form I - OA

Accutest Laboratories

Report of Analysis

Client Sample ID:	TB071907W		
Lab Sample ID:	F51154-21	Date Sampled:	07/19/07
Matrix:	AQ - Trip Blank Water	Date Received:	07/19/07
Method:	SW846 8260B	Percent Solids:	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
75-01-4	Vinyl chloride	ND	1.0	0.50	ug/l	
	m,p-Xylene	ND	2.0	0.50	ug/l	
95-47-6	o-Xylene	ND	1.0	0.50	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	99%		87-116%
17060-07-0	1,2-Dichloroethane-D4	93%		76-127%
2037-26-5	Toluene-D8	99%		86-112%
460-00-4	4-Bromofluorobenzene	110%		84-120%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Shaw Environmental, Inc.
2113 Emmorton Park Road
Edgewood, Maryland
410-612-6350
FAX: 410-612-6351

Shaw® Shaw Environmental, Inc.

MEMORANDUM

TO: Jeff Parks, Shaw E&I Radford Army Ammunition Plant (RFAAP) Project Manager

FROM: Eric Malarek, Shaw E&I Project Chemist

SUBJECT: RFAAP Data Validation – Dioxin Furans
SGS Paradigm Analytical Laboratories, Inc. SDGs G383-584
(Accutest SDG F51247)

DATE: November 30, 2007

The purpose of this memorandum is to present the data validation report for the samples collected at Main Manufacturing Area at RFAAP for a RFI/CMS Nine Sites on July 23, 2007. The samples were analyzed for Dioxin Furan compounds using USEPA SW-846 Method 8290 High Resolution Gas Chromatography/High Resolution Mass Spectroscopy (HRGC/HRMS). A total of twenty solid samples were validated. The sample Ids are:

Field Sample ID	Lab Sample ID	Field Sample ID	Lab Sample ID
50SB06A	F51247-1	50SB011A	F51247-11
50SB06B	F51247-2	50SB011B	F51247-12
50SB07A	F51247-3	50SB012A	F51247-13
50SB07B	F51247-4	50SB012B	F51247-14
50SB08A	F51247-5	50SB013A	F51247-15
50SB08B	F51247-6	50SB013B	F51247-16
50SB09A	F51247-7	50SB014A	F51247-17
50SB09B	F51247-8	50SB014B	F51247-18
50SB010A	F51247-9	50SB015A	F51247-19
50SB010B	F51247-10	50SB015B	F51247-20

Data were reviewed and validated using a combination of project QAPP, *DOD Quality Systems Manual for Environmental Laboratories, Final Version 3, January, 2006* (DoD, 2006) (DoD QSM), method-specific criteria, and laboratory SOP criteria. The data qualifier scheme was consistent with the *USEPA Region III Dioxin/Furan Data Validation Guidance* (March, 1999). Parameters evaluated are presented in **Table 1**. Data associated with parameters in compliance with quality control specifications have not been qualified. Data associated with parameters that did not comply with quality control specifications and directly impacted project data have been qualified in accordance with USEPA Region III specifications.

Table 1 Laboratory Performance Criteria

Qualified		Parameter
Yes	No	
	X	Holding Times and Preservation
X		Blank Analysis
	X	Instrument Performance Check
	X	Initial Calibration
	X	Continuing Calibration
	X	Internal Standards (IS) Recovery Standard Solutions
	X	Cleanup Standards
	X	Laboratory Control Standard or Ongoing Precision Result (OPR)
	X	Matrix Spike and Spike Duplicate
	X	Field Duplicate
X		Quantitation Verification

The quality of data collected in support of this sampling activity is considered acceptable with noted qualifications.

Eric Malarek, Chemist

11/30/07
Date

RFAAP VALIDATION REPORT
DIOXIN FURAN REVIEW
SDGs G383-584
(Accutest SDG F51247)

I-Holding Times and Preservation

The objective is to ascertain the validity of results based on the holding time of the sample from time of collection to time of sample extraction and analysis. Holding time criteria: For solid samples, dioxin and furans are shipped cooled (@4°C ± 2°C) with a maximum holding time of 30 days from sample collection to preparative extraction and 45 days from preparative extraction to determinative analysis.

- Temperature Review: The temperature blank was sent with each cooler and recorded by the laboratory upon receipt. For samples collected on 07/23/07, the coolers were received by the primary laboratory (Accutest) on 07/20/07 at 2.8°C, and 3.2°C. The herbicides were subcontracted to Accutest TX and were received the samples at 3.4°C. The dioxin subcontract laboratory (SGS Paradigm Analytical Laboratories, Inc.) received the samples at 1.2°C. Even though the receipt temperature was below criteria for some coolers, there were no impacts to the data quality. No qualifiers were applied based upon this outlier.

- Holding Time Review: The soil samples were collected on 07/23/07. The dioxins and furans were extracted on 07/31/07, 08/01/07, and 08/05/07 and analyzed on 08/01/07, 08/02/07, 08/03/07, and 08/08/07. Sample collection dates may be found on the attached form 1s. All criteria were met. No qualifiers were applied.

II-Blank Analysis

The purpose of laboratory (or field) blank analyses is to determine the existence and magnitude of contamination problems resulting from field and laboratory activities. No contamination should be found in any of the blanks >EDL (estimated detection limit). The DoD QSM criteria specifies all concentrations should be less than ½ MRL (<MRL for common laboratory contaminants OCDD and OCDF) and <2EDL for the calibration blanks. Positive sample results are reported and qualified "B", if the concentration of the compound in the sample is ≤10 times (10x) the maximum amount in any blank for the common laboratory contaminants OCDD or OCDF, or 5 times (5X) the maximum amount for other target compounds. **Table 2** summarizes the blank contamination analysis. Action levels are based upon dilution factor of one and for solid matrices were converted to soil values (soil conversion factor = 100) if needed. Rinse blanks 072407R (F51275-1) and 072507R (F51300-31) apply to the surface soil "SS" and subsurface soil "SB" samples in this SDG.

Table 2 Blank Contamination Analysis Summary

Analysis Date	QC Blank ID	Compound	Max Conc. pg/g	Action Level pg/g	B qualified samples
08/01/07	LMB14389	OCDD	0.702J	7.02	None
08/01/07	LMB14389	2,3,7,8-TCDF	0.122J	0.61	50SB010A, 50SB010B, 50SB011A, 50SB011B, 50SB012A, 50SB013A, 50SB013B, 50SB06A, 50SB07B, 50SB09A
08/01/07	LMB14389	2,3,4,7,8-PeCDF	0.0680J, EMPC	0.34	50SB010A, 50SB010B, 50SB011A, 50SB013A, 50SB09A
08/01/07	LMB14389	1,2,3,4,6,7,8-HpCDF	0.650J	3.25	50SB010A, 50SB010B, 50SB011A, 50SB011B, 50SB07B
08/01/07	LMB14389	OCDF	1.12J	11.2	50SB010A, 50SB010B, 50SB011A, 50SB011B, 50SB07B
08/01/07	LMB14389	Total TCDFs	0.122J	0.61	50SB010B, 50SB011A, 50SB011B, 50SB07B
08/01/07	LMB14389	Total PeCDFs	0.0680J	0.34	50SB011B, 50SB07B
08/01/07	LMB14389	Total HxCDFs	0.0940J	0.47	None
08/01/07	LMB14389	Total HpCDFs	0.650J	3.25	50SB011A
08/04/07	LMB14391	OCDD	3.26J	32.6	None
08/04/07	LMB14391	1,2,3,4,6,7,8-HpCDF	1.05J	5.25	50SB014B, 50SB015A, 50SB015B
08/04/07	LMB14391	OCDF	1.83J	18.3	50SB014B, 50SB015A, 50SB015B
08/04/07	LMB14391	Total HpCDFs	1.05J	5.25	50SB014B, 50SB015A, 50SB015B
08/08/07	LMB14398	OCDD	3.63J	18.2	None
08/08/07	LMB14398	1,2,3,4,6,7,8-HpCDF	0.966J	4.83	None
08/08/07	LMB14398	OCDF	1.78J	8.90	None
08/08/07	LMB14398	Total HpCDFs	0.966J	4.83	None
07/28/07	RB071807	All congeners <EDL	NA	NA	None
08/03/07	072407R	All congeners <EDL	NA	NA	None
08/08/07	072507R	1,2,3,4,6,7,8-HpCDF	0.849J	4.25	50SB010A, 50SB010B, 50SB011A, 50SB011B, 50SB014B, 50SB015A, 50SB015B, 50SB07B
08/08/07	072507R	OCDF	1.42J	14.2	50SB010A, 50SB010B, 50SB011A, 50SB011B, 50SB014B, 50SB015A, 50SB015B, 50SB07B
08/08/07	072507R	Total HpCDFs	0.849J	4.25	50SB011A, 50SB011B, 50SB014B, 50SB015A, 50SB015B

J = Estimated value <MRL and >EDL.
EMPC = Estimated Maximum Possible Concentration.

III-Instrument Performance Check

Instrument must be tuned with perfluorokerosene (PFK) to achieve a static resolving power of at least 10,000 (10% valley) and lock-mass ion between lowest and highest masses for each descriptor and level of reference compound ≤10%. Documentation of the mass spectrometer resolving power is accomplished by recording the peak profile of the high-mass reference signal (typically m/z 330.9792) obtained during a peak examination by using the low-mass PFK ion at m/z 292.9825 or lower in mass as reference. At the beginning of the each 12-hour period, the chromatographic resolution is verified in the same fashion as in the initial calibration through the analysis of HRCC solution on the DB-5 (or equivalent) column or through the analysis of the column performance solution on the SP-2331 or SP-225 (or equivalent) column. A 25% valley must be achieved between the close eluters.

- All PFK forms were verified and found to be in compliance with method specification. No qualifiers were applied.

IV-Initial Calibration
Once the window defining mix has been analyzed and the descriptor switching times have been verified, the five point calibration solutions can be analyzed prior to sample analysis. Per method and DoD QSM, the initial calibration criteria are as follows:

- The percent relative standard deviations for the mean response factors RRF(n) from the 17 unlabeled standards must not exceed ±20%, and those for the labeled reference compounds must not exceed ±30%;
- The signal to noise ratio ≥10% for all target ions;
- Ion abundance ratios must be within the specified control limits in Table 8 (SW846 Method 8290).

- For initial calibration performed on 11/02/07 for all target compounds on instrument HRMS3, all criteria were met. No qualifiers were applied. Sample 50SB08A (F51247-5) applies to this initial calibration.

- For 2,3,7,8-TCDF initial calibration performed on 04/18/07 for all target compounds on instrument HRMS3, all criteria were met. No qualifiers were applied. 2,3,7,8-TCDF confirmations for samples 50SB06B (F51247-2), 50SB07A (F51247-3), 50SB09B (F51247-8), and 50SB012B (F51247-14) apply to this initial calibration.

- For initial calibration performed on 07/10/07 for all target compounds on instrument HRMS1, all criteria were met. No qualifiers were applied. Samples 50SB06A (F51247-1), 50SB06B (F51247-2), 50SB07A (F51247-3), 50SB07B (F51247-4), 50SB08B (F51247-6), 50SB09A (F51247-7), 50SB09B (F51247-8), 50SB010A (F51247-9), 50SB010B (F51247-10), 50SB011A (F51247-11), 50SB011B (F51247-12), 50SB012A (F51247-13), 50SB012B (F51247-14), 50SB013A (F51247-15), 50SB013B (F51247-16), 50SB014A (F51247-17), 50SB014B (F51247-18), 50SB015A (F51247-19), and 50SB015B (F51247-20) apply to this initial calibration.

V-Continuing Calibration
The continuing calibration consists of two parts: evaluation of the mass resolution and retention time check. Per method and DoD QSM, the following stipulates the continuing calibration criteria.

- The signal signal-to-noise ratio (S/N) must be at least 10:1 for each selected ion current profile (SICP) and for each GC signal representing the elution of a target analyte or labeled standard for each analyte.
- The relative response factor of each analyte for the unlabeled standard must be within ±20% of the average RF obtained from the initial calibration, and the RRF of each labeled standard must be within ±30% of the average RRF established during initial calibration. This is expressed in term of percent difference %D.
- Ion abundance ratios must be within the specified control limits in Table 8 (SW846 Method 8290).

- For continuing calibration performed on 07/30/07 @17:04 on instrument HRMS1, all criteria were met. No qualifiers were applied. No samples reported apply to this continuing calibration.

- For continuing calibration performed on 07/31/07 @04:20 on instrument HRMS1, all criteria were met. No qualifiers were applied. No samples reported apply to this continuing calibration.

- For continuing calibration performed on 07/31/07 @13:17 on instrument HRMS1, all criteria were met. No qualifiers were applied. No samples reported apply to this continuing calibration.

- For continuing calibration performed on 08/01/07 @00:39 on instrument HRMS1, all criteria were met. No qualifiers were applied. No samples reported apply to this continuing calibration.

- For continuing calibration performed on 08/01/07 @10:25 on instrument HRMS1, all criteria were met. No qualifiers were applied. No samples reported apply to this continuing calibration.

- For continuing calibration performed on 08/01/07 @14:32 on instrument HRMS1, all criteria were met. No qualifiers were applied. Samples 50SB06B (F51247-2), 50SB07A (F51247-3), 50SB07B (F51247-4), 50SB08B (F51247-6), 50SB09A (F51247-7), and 50SB09B (F51247-8) apply to this continuing calibration.

- For continuing calibration performed on 08/02/07 @01:54 on instrument HRMS1, all criteria were met. No qualifiers were applied. Samples 50SB06A (F51247-1), 50SB010A (F51247-9), 50SB010B (F51247-10), 50SB011A (F51247-11), 50SB011B (F51247-12), 50SB012A (F51247-13), 50SB012B (F51247-14), 50SB013A (F51247-15), and 50SB013B (F51247-16) apply to this continuing calibration.

- For continuing calibration performed on 08/02/07 @12:28 on instrument HRMS1, all criteria were met. No qualifiers were applied. No samples reported apply to this continuing calibration.

- For continuing calibration performed on 08/02/07 @16:03 on instrument HRMS1, all criteria were met. No qualifiers were applied. Samples 50SB014A (F51247-17), 50SB014B and (F51247-18) apply to this continuing calibration.

- For continuing calibration performed on 08/03/07 @03:24 on instrument HRMS1, all criteria were met. No qualifiers were applied. No samples reported apply to this continuing calibration.

- For continuing calibration performed on 08/03/07 @14:47 on instrument HRMS1, all criteria were met. No qualifiers were applied. No samples reported apply to this continuing calibration.

- For continuing calibration performed on 08/04/07 @13:46 on instrument HRMS1, all criteria were met. No qualifiers were applied. Samples 50SB015A (F51247-19) and 50SB015B (F51247-20) apply to this continuing calibration.

- For continuing calibration performed on 08/05/07 @01:03 on instrument HRMS1, all criteria were met. No qualifiers were applied. No samples reported apply to this continuing calibration.

- For continuing calibration performed on 08/08/07 @15:10 on instrument HRMS3, all criteria were met. No qualifiers were applied. No samples reported apply to this continuing calibration.

- For continuing calibration performed on 08/08/07 @14:36 on instrument HRMS3, all criteria were met. No qualifiers were applied. No samples reported apply to this continuing calibration.

- For continuing calibration performed on 08/09/07 @01:59 on instrument HRMS3, all criteria were met. No qualifiers were applied. No samples reported apply to this continuing calibration.

- For continuing calibration performed on 08/09/07 @13:23 on instrument HRMS3, all criteria were met. No qualifiers were applied. Sample 50SB08A (F51247-5) applies to this continuing calibration.

- For continuing calibration performed on 08/09/07 @22:34 on instrument HRMS3, all criteria were met. No qualifiers were applied. No samples reported apply to this continuing calibration.

- For continuing calibration performed on 08/10/07 @05:55 on instrument HRMS3, all criteria were met. No qualifiers were applied. No samples reported apply to this continuing calibration.

- For 2,3,7,8-TCDF continuing calibration performed on 08/11/07 @10:20 on instrument HRMS3, all criteria were met. No qualifiers were applied. 2,3,7,8-TCDF confirmations for samples 50SB06B (F51247-2), 50SB07A (F51247-3), 50SB09B (F51247-8), and 50SB012B (F51247-14) apply to this continuing calibration.

- For 2,3,7,8-TCDF continuing calibration performed on 08/11/07 @19:53 on instrument HRMS3, all criteria were met. No qualifiers were applied. No samples reported apply to this continuing calibration.

VI-Internal Standards (IS) Recovery Standard Solutions
Internal standards performance criteria ensure that GC/MS sensitivity and response are stable during every analytical run. Specific criteria include: Recoveries of the isotopically-labeled recovery standards to fall within the 40 to 135 percent range for the tetra- through octachlorinated congeners, or as stated in the data package (DoD QSM limits 40-135%).

- All criteria were met. No qualifiers were applied.

VII-Cleanup Standards
Cleanup standards are added to every sample, blank, quality control sample, and calibration solution. This compound is added to the samples after extraction but prior to cleanup and is used to verify the percent recovery obtained using the isotope dilution technique. The control limits are 40 to 135 percent (DoD QSM limits 40-135%).

- All criteria were met. No qualifiers were applied.

VIII-Laboratory Control Standard (LCS) or Ongoing Precision Result (OPR)
LCSs are used to monitor laboratory accuracy and precision by calculating the percent recoveries of the spiked compounds. Per DOD QSM and method criteria, acceptable performance is determined by:

1. Recoveries of the isotopically-labeled extraction standards to fall within 40-135% control limits for the tetra- through octachlorinated congeners, or as stated in the data package;

2. Recoveries (accuracy) of the unlabeled compounds should be within ±35% when spiked at the method quantitation limit and within ±30% when spiked above 20 times the method quantitation limit, or as stated in the data package;

3. When duplicate OPR are required, the relative percent difference (RPD) of the unlabeled analytes concentrations should be within 30% when spiked at the method quantitation limit and within ±20% when spiked above 20 times the method quantitation limit.

- Sample OPR14389 was used as LCS and LCSD on 08/01/07 analytical run. All criteria were met. No qualifiers were applied. Samples 50SB06A (F51247-1), 50SB06B (F51247-2), 50SB07A (F51247-3), 50SB07B (F51247-4), 50SB08B (F51247-6), 50SB09A (F51247-7), 50SB09B (F51247-8), 50SB010A (F51247-9), 50SB010B (F51247-10), 50SB011A (F51247-11), 50SB011B (F51247-12), 50SB012A (F51247-13), 50SB012B (F51247-14), 50SB013A (F51247-15), and 50SB013B (F51247-16) apply to this LCS. The 2,3,7,8-TCDF confirmations for samples 50SB06B (F51247-2), 50SB07A (F51247-3), 50SB09B (F51247-8), and 50SB012B (F51247-14) also apply to this LCS.

- Sample OPR14391 was used as LCS and LCSD on 08/04/07 analytical run. All criteria were met. No qualifiers were applied. Samples 50SB014A (F51247-17), 50SB014B (F51247-18), 50SB015A (F51247-19), and 50SB015B (F51247-20) apply to this LCS.

- Sample OPR14398 was used as LCS and LCSD on 08/09/07 analytical run. All criteria were met. No qualifiers were applied. Sample 50SB08A (F51247-5) applies to this LCS.

IX-Matrix Spike/Matrix Spike Duplicate
Data for matrix spike/matrix spike duplicates (MS/MSD) are generated to determine long-term precision and accuracy of the analytical method on various matrices and to demonstrate acceptable compound recovery by the laboratory at the time of sample analysis. The percent recoveries (%Rs) and the relative percent difference (RPD) must be within the specified control limits. Per DoD QSM, MS/MSD recoveries must be within in-house laboratory limits (75-125%) and RPD ≤20%.

- No project specific solid matrix MS/MSD was performed; therefore, it was not evaluated.

X-Field Duplicate Sample Analysis
Field duplicates were collected to identify the cumulative precision of the sampling and analytical process and sent to the laboratory blind. The RPD was calculated only for those analytes which were detected in both samples of the duplicate pair. Analytes that were rejected (R-qualified) in either sample of the duplicate pair were excluded from the duplicate assessment. Precision control criterion was established at 50% RPD for the solid samples. Analytical results were qualified as estimated (J) for any RPDs exceeding criteria.

- No project specific solid field duplicate was analyzed with this SDG; therefore, it was not evaluated.

XI-Quantitation Verification

The accuracy of analytical results was verified through the calculation of at least one the several parameters such as the %D, %RSD, % recovery, and/or compound concentration. Values were found to be within 10%. Any value reported by the laboratory as estimated "A" based on an analyte to internal standard ratio below the calibration curve was qualified as estimated "J". The signal signal-to-noise ratio (S/N) must be greater than 2.5 for each selected ion current profile (SICP) and for each GC signal representing the elution of a target analyte or labeled standard. Any detected value with ether interference (I-lab flag) was qualified as estimated "J". For where the ion ratio failed the 25% criteria (*-lab flag), the estimated maximum possible concentration (EMPC) was reported and flagged estimated "J". For where presence of quantitation interference (Q-lab flag), the date was flagged estimated "J" for detects and "UJ" for non-detects.

- For sample 50SB06A (F51247-1), Total PeCDDs was qualified estimated "J" based upon the presence of quantitation interference.

- For sample 50SB06B (F51247-2), Total PeCDDs was qualified estimated "J" based upon the presence of quantitation interference.

- For sample 50SB07A (F51247-3), Total PeCDDs and Total PeCDFs were qualified estimated "J" based upon the presence of quantitation interference.

- For sample 50SB09B (F51247-8), 2,3,4,7,8-PeCDF, Total PeCDDs, and Total PeCDFs were qualified estimated "J" based upon the presence of quantitation interference.

- OCDD exceeded upper calibration limit for samples 50SB06A (F51247-1), 50SB06B (F51247-2), 50SB07A (F51247-3), 50SB08A (F51247-5), 50SB09A (F51247-7), 50SB010B (F51247-10), 50SB011A (F51247-11), 50SB011B (F51247-12), 50SB012A (F51247-13), 50SB012B (F51247-14), 50SB013A (F51247-15), 50SB014A (F51247-17), 50SB015A (F51247-19), and 50SB015B (F51247-20). OCDD was qualified estimated "J" for all associated samples based upon these outliers.

- 1,2,3,4,6,7,8-HpCDD exceeded upper calibration limit for samples 50SB06A (F51247-1) and 50SB012A (F51247-13). 1,2,3,4,6,7,8-HpCDD was qualified estimated "J" for all associated samples based upon these outliers.

Sample: 41SD09 (F51154-10), OCDD

A(x) = sum of the integrated ion abundances of the quantitation ions for the unlabeled ions;

A(is) = sum of the integrated ion abundances of the quantitation ions for the labeled ions;

Q(is) = quantity, in pg, of the internal standard added to the sample before extraction; Here need to multiply concentration (pg/uL) by final extract volume (uL).

W = weight, in g, of the sample (solid or organic liquid) as dry weight, or volume in mL of an aqueous sample; and

Avg. RRF(n) = calculated mean relative response factor for the unlabeled analyte.

$$\text{Conc. (ng/kg)} = \frac{(A(x))\ *Q(is)}{A(is) * W * \text{Avg. RRF}} = \frac{(3490000000+3900000000)*4.0*1000}{(26000000+28900000) * (11.35 * 0.8770) * 1.0783} =$$

= 50200 ng/kg = 50200 pg/g

Reported Value = 50200 pg/g
% Difference = 0.0%
Values were within 10% difference.

USEPA Region III Validation Qualifiers

(No Code) = Confirmed identification.

B = The analyte has been detected in the sample and the associated laboratory or field blank.

J = Indicates an estimated value for (1) estimated value due to QC non-conformance. Reported value may not be accurate or precise, (2) estimating a concentration as a tentatively identified compound as indicated by the mass spectral and retention time data, or (3) estimating a concentration ≥ EDL and <MRL or <3*EDL, whichever is greater.

K = Analyte present. Reported value may be biased high (estimated) due to QC non-conformance.

L = Analyte present. Reported value may be biased low (estimated) due to QC non-conformance.

R = Unreliable result. Analyte may or may not be present in the sample due to QC non-conformance.

UL = Value is estimated bias low and not detected due to QC non-conformance. Reporting limit may be inaccurate or imprecise. Quantitation limit is probably higher.

UJ = Value is estimated and not detected due to QC non-conformance. Reporting limit may be inaccurate or imprecise.

Laboratory Qualifiers

(No Code) = Confirmed identification.

U = Not detected. The associated number indicates the compound reporting limit for the sample.

A (Dioxins) = B (Metals) = The reported value was obtained from a reading <MRL and ≥EDL and is considered estimated.

B (Organics) = The analyte or compound has been detected in the sample and laboratory method blank. It indicates probable blank contamination.

E (Metals) = Reported value is estimated because of the presence of interferences.

E (Organics) = Identifies compounds whose concentrations exceed the upper level of the calibration range.

EMPC (Dioxins) = The ion-abundance ratio between the two characteristic PCDD/PCDF ions was outside accepted ranges. The detected PCDD/PCDF was reported as an estimated maximum possible concentration (EMPC).

D = Indicates sample was analyzed at a dilution.

J = Indicates an estimated value for (1) estimating a concentration as a tentatively identified compound as indicated by the mass spectral and retention time data, or (2) estimating a concentration <MRL and ≥ EDL.

N (Organics) = Indicates presumptive evidence of a compound for tentatively identified compounds using a library search.

N (Metals) = Laboratory spike sample recovery not within control limits.

P (Organics) = Target analyte confirmation >40% difference for detected compound between the primary and secondary columns. The lower of the two values was reported.

* (Metals) = Duplicate analysis not within control limits.

* (Organics) = Surrogate outside of QC limits on both original and re-analysis.

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Method 8290
F51247-1
Accutest

Analytical Data Summary Sheet

Analyte	Amount (pg/g)	EDL (pg/g)	EMPC (pg/g)	RT (min.)	Ratio	Qualifier
2,3,7,8-TCDD	0.454 J			31:39	0.78	A
1,2,3,7,8-PeCDD	5.88			34:25	1.59	
1,2,3,4,7,8-HxCDD	13.8			37:04	1.19	
1,2,3,6,7,8-HxCDD	122			37:10	1.26	
1,2,3,7,8,9-HxCDD	41.2			37:25	1.25	
1,2,3,4,6,7,8-HpCDD	4610 J			40:37	1.04	E
OCDD	50200 J			45:09	0.90	E
2,3,7,8-TCDF	0.599 B			31:06	0.81	A
1,2,3,7,8-PeCDF	1.76 J			33:36	1.52	A
2,3,4,7,8-PeCDF	2.73 J			34:13	1.49	A
1,2,3,4,7,8-HxCDF	15.3			36:22	1.30	
1,2,3,6,7,8-HxCDF	7.40			36:28	1.22	
2,3,4,6,7,8-HxCDF	12.8			36:58	1.28	
1,2,3,7,8,9-HxCDF	2.79 J			37:46	1.26	A
1,2,3,4,6,7,8-HpCDF	519			39:19	1.05	
1,2,3,4,7,8,9-HpCDF	29.7			41:19	0.99	
OCDF	2090			45:25	0.89	
Total TCDDs	0.454					
Total PeCDDs	~~16.3~~		16.9 J			Q
Total HxCDDs	404					
Total HpCDDs	7350					
Total TCDFs	2.42					
Total PeCDFs	48.2					
Total HxCDFs	518					
Total HpCDFs	~~2030~~		2040 J			
WHO-2005 TEQ (ND=0)	96.1		96.1			
WHO-2005 TEQ (ND=½)	96.1		96.1			

Client Information			**Sample Information**	
Project Name:	F51247		Report Basis:	Dry
			Matrix:	Soil
Sample ID:	F51247-1		Weight / Volume:	11.35 g
			Solids / Lipids:	87.7 %
			Original pH :	NA
Laboratory Information			Batch ID:	WG14389
Project ID:	G383-584		Instrument:	HRMS1
Sample ID:	G383-584-1B		Filename:	a30jul07a_7-12
Collection Date/Time:	07/23/07	14:45	Retchk:	a30jul07a_6-14
Receipt Date/Time:	07/25/07	10:15	Begin ConCal:	a30jul07a_6-14
Extraction Date:	07/31/07		End ConCal:	a30jul07a_7-13
Analysis Date/Time:	08/02/07	11:39	Initial Cal:	m8290-071007a

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SGS Environmental Services

Method 8290
F51247-1
Accutest

Labeled Standard	Expected Amount (ng)	Measured Amount (ng)	Percent Recovery (%)	RT (min.)	Ratio	Qualifier
Extraction Standards						
13C12-2,3,7,8-TCDD	2.0	1.55	77.6	31:37	0.77	
13C12-1,2,3,7,8-PeCDD	2.0	1.53	76.6	34:25	1.58	
13C12-1,2,3,6,7,8-HxCDD	2.0	1.70	85.0	37:10	1.26	
13C12-1,2,3,4,6,7,8-HpCDD	2.0	1.85	92.7	40:37	1.06	
13C12-OCDD	4.0	4.08	102	45:07	0.90	
13C12-2,3,7,8-TCDF	2.0	1.72	86.0	31:04	0.79	
13C12-1,2,3,7,8-PeCDF	2.0	1.48	74.0	33:36	1.60	
13C12-1,2,3,6,7,8-HxCDF	2.0	1.56	78.2	36:27	0.52	
13C12-1,2,3,4,6,7,8-HpCDF	2.0	1.62	80.8	39:19	0.45	
Cleanup Standards						
37Cl4-2,3,7,8-TCDD	0.4	0.350	87.5	31:39	-	
13C12-2,3,4,7,8-PeCDF	0.4	0.266	66.6	34:13	1.62	
13C12-1,2,3,4,7,8-HxCDD	0.4	0.295	73.9	37:04	1.27	
13C12-1,2,3,4,7,8-HxCDF	0.4	0.315	78.8	36:21	0.51	
13C12-1,2,3,4,7,8,9-HpCDF	0.4	0.296	74.1	41:19	0.42	
Injection Standards						
13C12-1,2,3,4-TCDD	2.0	-	-	31:13	0.79	
13C12-1,2,3,7,8,9-HxCDD	2.0	-	-	37:25	1.25	

Client Information			**Sample Information**		
Project Name:	F51247		Report Basis:	Dry	
			Matrix:	Soil	
Sample ID:	F51247-1		Weight / Volume:	11.35 g	
			Solids / Lipids:	87.7	%
			Original pH :	NA	
Laboratory Information			Batch ID:	WG14389	
Project ID:	G383-584		Instrument:	HRMS1	
Sample ID:	G383-584-1B		Filename:	a30jul07a_7-12	
Collection Date/Time:	07/23/07	14:45	Retchk:	a30jul07a_6-14	
Receipt Date/Time:	07/25/07	10:15	Begin ConCal:	a30jul07a_6-14	
Extraction Date:	07/31/07		End ConCal:	a30jul07a_7-13	
Analysis Date/Time:	08/02/07	11:39	Initial Cal:	m8290-071007a	

Form Version:[8290_DB_2.14]Report

Analyzed by: JWP
Date: 080907

Reviewed by: [signature]
Date: 8/9/07

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SGS Environmental Services

Method 8290
F51247-2
Accutest

Analytical Data Summary Sheet

Analyte	Amount (pg/g)	EDL (pg/g)	EMPC (pg/g)	RT (min.)	Ratio	Qualifier
2,3,7,8-TCDD	EMPC	~~0.220~~	0.314 J	31:37	0.57 *	A
1,2,3,7,8-PeCDD	2.10 J			34:25	1.54	A
1,2,3,4,7,8-HxCDD	5.35 J			37:06	1.33	A
1,2,3,6,7,8-HxCDD	24.0			37:10	1.25	
1,2,3,7,8,9-HxCDD	15.1			37:25	1.26	
1,2,3,4,6,7,8-HpCDD	889			40:37	1.04	
OCDD	7920 J			45:07	0.90	E
2,3,7,8-TCDF	3.81			31:06	0.74	
1,2,3,7,8-PeCDF	1.53 J			33:37	1.56	A
2,3,4,7,8-PeCDF	3.48 J			34:13	1.73	A
1,2,3,4,7,8-HxCDF	14.7			36:22	1.31	
1,2,3,6,7,8-HxCDF	5.43 J			36:28	1.23	A
2,3,4,6,7,8-HxCDF	6.97			36:58	1.19	
1,2,3,7,8,9-HxCDF	1.73 J			37:48	1.06	A
1,2,3,4,6,7,8-HpCDF	212			39:21	1.05	
1,2,3,4,7,8,9-HpCDF	10.3			41:19	1.06	
OCDF	716			45:25	0.89	
Total TCDDs	~~0.347~~		0.971 J			
Total PeCDDs	~~5.88~~		6.35 J			Q
Total HxCDDs	110					
Total HpCDDs	1420					
Total TCDFs	~~23.7~~		25.2 J			
Total PeCDFs	~~41.2~~		42.0 J			
Total HxCDFs	224					
Total HpCDFs	731					
WHO-2005 TEQ (ND=0)	24.6		24.9			
WHO-2005 TEQ (ND=½)	24.7		24.9			

Client Information			**Sample Information**	
Project Name:	F51247		Report Basis:	Dry
			Matrix:	Soil
Sample ID:	F51247-2		Weight / Volume:	10.18 g
			Solids / Lipids:	71.8 %
			Original pH :	NA
Laboratory Information			Batch ID:	WG14389
Project ID:	G383-584		Instrument:	HRMS1
Sample ID:	G383-584-2B		Filename:	a30jul07a_6-7
Collection Date/Time:	07/23/07	14:55	Retchk:	a30jul07a_4-12
Receipt Date/Time:	07/25/07	10:15	Begin ConCal:	a30jul07a_4-12
Extraction Date:	07/31/07		End ConCal:	a30jul07a_6-14
Analysis Date/Time:	08/01/07	20:15	Initial Cal:	m8290-071007a

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SGS Environmental Services

Method 8290
F51247-2
Accutest

Labeled Standard	Expected Amount (ng)	Measured Amount (ng)	Percent Recovery (%)	RT (min.)	Ratio	Qualifier
Extraction Standards						
13C12-2,3,7,8-TCDD	2.0	1.56	78.1	31:37	0.77	
13C12-1,2,3,7,8-PeCDD	2.0	1.54	76.9	34:25	1.59	
13C12-1,2,3,6,7,8-HxCDD	2.0	1.62	81.2	37:10	1.25	
13C12-1,2,3,4,6,7,8-HpCDD	2.0	1.75	87.5	40:37	1.06	
13C12-OCDD	4.0	3.74	93.6	45:07	0.90	
13C12-2,3,7,8-TCDF	2.0	1.76	88.2	31:06	0.79	
13C12-1,2,3,7,8-PeCDF	2.0	1.45	72.3	33:37	1.59	
13C12-1,2,3,6,7,8-HxCDF	2.0	1.51	75.4	36:28	0.52	
13C12-1,2,3,4,6,7,8-HpCDF	2.0	1.56	77.9	39:19	0.44	
Cleanup Standards						
37Cl4-2,3,7,8-TCDD	0.4	0.342	85.6	31:39	-	
13C12-2,3,4,7,8-PeCDF	0.4	0.266	66.4	34:13	1.65	
13C12-1,2,3,4,7,8-HxCDD	0.4	0.322	80.4	37:04	1.29	
13C12-1,2,3,4,7,8-HxCDF	0.4	0.318	79.6	36:21	0.49	
13C12-1,2,3,4,7,8,9-HpCDF	0.4	0.279	69.8	41:19	0.41	
Injection Standards						
13C12-1,2,3,4-TCDD	2.0	-	-	31:13	0.79	
13C12-1,2,3,7,8,9-HxCDD	2.0	-	-	37:25	1.25	

Client Information			**Sample Information**	
Project Name:	F51247		Report Basis:	Dry
			Matrix:	Soil
Sample ID:	F51247-2		Weight / Volume:	10.18 g
			Solids / Lipids:	71.8 %
			Original pH :	NA
Laboratory Information			Batch ID:	WG14389
Project ID:	G383-584		Instrument:	HRMS1
Sample ID:	G383-584-2B		Filename:	a30jul07a_6-7
Collection Date/Time:	07/23/07	14:55	Retchk:	a30jul07a_4-12
Receipt Date/Time:	07/25/07	10:15	Begin ConCal:	a30jul07a_4-12
Extraction Date:	07/31/07		End ConCal:	a30jul07a_6-14
Analysis Date/Time:	08/01/07	20:15	Initial Cal:	m8290-071007a

Form Version:[8290_DB_2.14]Report

Analyzed by: _____
Date: 08/01/07

Reviewed by: _____
Date: 8/10/07

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TCDF Confirmation - Method 8290
F51247-2
Accutest

Analytical Data Summary Sheet

Analyte	Amount (pg/g)	EDL (pg/g)	EMPC (pg/g)	RT (min.)	Ratio	Qualifier
2,3,7,8-TCDF	5.62	0.284		20.82	0.81	

Labeled Standard	Spiked Amount (ng)	RT (min.)	Ratio	Qualifier
Extraction Standards				
$^{13}C_{12}$-2,3,7,8-TCDF	2.00	20.80	0.78	

Client Information			**Sample Information**		
Project Name:	F51247		Report Basis:	Dry	
			Matrix:	Soil	
Sample ID:	F51247-2		Weight / Volume:	10.18	g
			Solids / Lipids:	71.84	%
			Original pH :	NA	
Laboratory Information			Batch ID:	WG14389	
Project ID:	G383-584		Instrument:	hrms3	
Sample ID:	G383-584-2B		Filename:	c11aug07a-10	
Collection Date/Time:	07/23/07	14:55	Retchk:	c11aug07a-2	
Receipt Date:	07/25/07	10:15	Begin ConCal:	c11aug07a-1	
Extraction Date:	07/31/07		End ConCal:	c11aug07a-25	
Analysis Date/Time:	08/11/07	13:55	Initial Cal:	mcf-c041807a	

Analyzed by: JW
Date: 8/13/07

Reviewed by: [illegible]
Date: 8/13/07

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SGS Environmental Services

Method 8290
F51247-3
Accutest

Analytical Data Summary Sheet

Analyte	Amount (pg/g)	EDL (pg/g)	EMPC (pg/g)	RT (min.)	Ratio	Qualifier
2,3,7,8-TCDD	0.563 J			31:40	0.76	A
1,2,3,7,8-PeCDD	6.68			34:27	1.60	
1,2,3,4,7,8-HxCDD	14.6			37:07	1.27	
1,2,3,6,7,8-HxCDD	48.7			37:13	1.29	
1,2,3,7,8,9-HxCDD	38.7			37:28	1.28	
1,2,3,4,6,7,8-HpCDD	1580			40:40	1.04	
OCDD	16200 J			45:10	0.90	E
2,3,7,8-TCDF	7.79			31:07	0.81	
1,2,3,7,8-PeCDF	4.08 J			33:37	1.57	A
2,3,4,7,8-PeCDF	9.63			34:15	1.64	
1,2,3,4,7,8-HxCDF	37.0			36:24	1.28	
1,2,3,6,7,8-HxCDF	16.6			36:30	1.28	
2,3,4,6,7,8-HxCDF	15.3			37:00	1.29	
1,2,3,7,8,9-HxCDF	4.27 J			37:49	1.34	A
1,2,3,4,6,7,8-HpCDF	385			39:22	1.04	
1,2,3,4,7,8,9-HpCDF	21.9			41:21	1.06	
OCDF	1160			45:28	0.89	
Total TCDDs	~~3.04~~		3.41 J			
Total PeCDDs	~~17.4~~		17.8 J			Q
Total HxCDDs	256					
Total HpCDDs	2540					
Total TCDFs	~~55.4~~		56.2 J			
Total PeCDFs	~~109~~		109 J			Q
Total HxCDFs	415					
Total HpCDFs	1140					
WHO-2005 TEQ (ND=0)	53.6		53.6			
WHO-2005 TEQ (ND=½)	53.6		53.6			

Client Information			**Sample Information**	
Project Name:	F51247		Report Basis:	Dry
			Matrix:	Soil
Sample ID:	F51247-3		Weight / Volume:	10.73 g
			Solids / Lipids:	91.4 %
			Original pH :	NA
Laboratory Information			Batch ID:	WG14389
Project ID:	G383-584		Instrument:	HRMS1
Sample ID:	G383-584-3B		Filename:	a30jul07a_6-8
Collection Date/Time:	07/23/07	16:15	Retchk:	a30jul07a_4-12
Receipt Date/Time:	07/25/07	10:15	Begin ConCal:	a30jul07a_4-12
Extraction Date:	07/31/07		End ConCal:	a30jul07a_6-14
Analysis Date/Time:	08/01/07	21:04	Initial Cal:	m8290-071007a

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SGS Environmental Services

Method 8290
F51247-3
Accutest

Labeled Standard	Expected Amount (ng)	Measured Amount (ng)	Percent Recovery (%)	RT (min.)	Ratio	Qualifier
Extraction Standards						
13C12-2,3,7,8-TCDD	2.0	1.66	83.0	31:40	0.77	
13C12-1,2,3,7,8-PeCDD	2.0	1.59	79.7	34:25	1.59	
13C12-1,2,3,6,7,8-HxCDD	2.0	1.70	85.0	37:13	1.26	
13C12-1,2,3,4,6,7,8-HpCDD	2.0	1.90	94.8	40:39	1.06	
13C12-OCDD	4.0	4.10	103	45:10	0.90	
13C12-2,3,7,8-TCDF	2.0	1.89	94.6	31:07	0.78	
13C12-1,2,3,7,8-PeCDF	2.0	1.49	74.3	33:37	1.59	
13C12-1,2,3,6,7,8-HxCDF	2.0	1.65	82.6	36:28	0.52	
13C12-1,2,3,4,6,7,8-HpCDF	2.0	1.68	84.1	39:21	0.44	
Cleanup Standards						
37Cl4-2,3,7,8-TCDD	0.4	0.365	91.2	31:40	-	
13C12-2,3,4,7,8-PeCDF	0.4	0.296	73.9	34:13	1.62	
13C12-1,2,3,4,7,8-HxCDD	0.4	0.375	93.8	37:07	1.28	
13C12-1,2,3,4,7,8-HxCDF	0.4	0.305	76.3	36:22	0.49	
13C12-1,2,3,4,7,8,9-HpCDF	0.4	0.301	75.2	41:21	0.40	
Injection Standards						
13C12-1,2,3,4-TCDD	2.0	-	-	31:13	0.79	
13C12-1,2,3,7,8,9-HxCDD	2.0	-	-	37:28	1.26	

Client Information			**Sample Information**	
Project Name:	F51247		Report Basis:	Dry
			Matrix:	Soil
Sample ID:	F51247-3		Weight / Volume:	10.73 g
			Solids / Lipids:	91.4 %
			Original pH :	NA
Laboratory Information			Batch ID:	WG14389
Project ID:	G383-584		Instrument:	HRMS1
Sample ID:	G383-584-3B		Filename:	a30jul07a_6-8
Collection Date/Time:	07/23/07	16:15	Retchk:	a30jul07a_4-12
Receipt Date/Time:	07/25/07	10:15	Begin ConCal:	a30jul07a_4-12
Extraction Date:	07/31/07		End ConCal:	a30jul07a_6-14
Analysis Date/Time:	08/01/07	21:04	Initial Cal:	m8290-071007a

Form Version:[8290_DB_2.14]Report

Analyzed by: JW
Date: 8/10/07

Reviewed by: [signature]
Date: 8/10/07

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TCDF Confirmation - Method 8290
F51247-3
Accutest

Analytical Data Summary Sheet

Analyte	Amount (pg/g)	EDL (pg/g)	EMPC (pg/g)	RT (min.)	Ratio	Qualifier
2,3,7,8-TCDF	10.0	0.392		20.81	0.78	

Labeled Standard	Spiked Amount (ng)	RT (min.)	Ratio	Qualifier
Extraction Standards				
$^{13}C_{12}$-2,3,7,8-TCDF	2.00	20.80	0.78	

Client Information			**Sample Information**		
Project Name:	F51247		Report Basis:	Dry	
			Matrix:	Soil	
Sample ID:	F51247-3		Weight / Volume:	10.73	g
			Solids / Lipids:	91.41	%
			Original pH :	NA	
Laboratory Information			Batch ID:	WG14389	
Project ID:	G383-584		Instrument:	hrms3	
Sample ID:	G383-584-3B		Filename:	c11aug07a-11	
Collection Date/Time:	07/23/07	16:15	Retchk:	c11aug07a-2	
Receipt Date:	07/25/07	10:15	Begin ConCal:	c11aug07a-1	
Extraction Date:	07/31/07		End ConCal:	c11aug07a-25	
Analysis Date/Time:	08/11/07	14:19	Initial Cal:	mcf-c041807a	

Analyzed by: _____
Date: 081307

Reviewed by: _____
Date: 8/13/07

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SGS Environmental Services

Method 8290
F51247-4
Accutest

Analytical Data Summary Sheet

Analyte	Amount (pg/g)	EDL (pg/g)	EMPC (pg/g)	RT (min.)	Ratio	Qualifier
2,3,7,8-TCDD	ND	0.265				
1,2,3,7,8-PeCDD	ND	0.798				
1,2,3,4,7,8-HxCDD	ND	0.798				
1,2,3,6,7,8-HxCDD	ND	0.798				
1,2,3,7,8,9-HxCDD	ND	0.798				
1,2,3,4,6,7,8-HpCDD	14.5			40:39	1.07	
OCDD	472			45:07	0.89	
2,3,7,8-TCDF	0.370 B			31:06	0.79	A
1,2,3,7,8-PeCDF	ND	0.798				
2,3,4,7,8-PeCDF	ND	0.798				
1,2,3,4,7,8-HxCDF	0.399 J			36:22	1.38	A
1,2,3,6,7,8-HxCDF	ND	0.798				
2,3,4,6,7,8-HxCDF	ND	0.798				
1,2,3,7,8,9-HxCDF	ND	0.798				
1,2,3,4,6,7,8-HpCDF	2.87 B			39:19	1.10	A
1,2,3,4,7,8,9-HpCDF	ND	0.798				
OCDF	11.8 B			45:25	0.88	A
Total TCDDs	0.182					
Total PeCDDs	ND	0.798				
Total HxCDDs	1.19					
Total HpCDDs	28.7					
Total TCDFs	~~0.370~~		0.779 B			
Total PeCDFs	~~ND~~	~~0.798~~	0.207 B			
Total HxCDFs	~~1.34~~		2.11 J			
Total HpCDFs	7.80					
WHO-2005 TEQ (ND=0)	0.396		0.396			
WHO-2005 TEQ (ND=½)	1.30		1.30			

Client Information			**Sample Information**	
Project Name:	F51247		Report Basis:	Dry
			Matrix:	Soil
Sample ID:	F51247-4		Weight / Volume:	10.80 g
			Solids / Lipids:	58.0 %
			Original pH :	NA
Laboratory Information			Batch ID:	WG14389
Project ID:	G383-584		Instrument:	HRMS1
Sample ID:	G383-584-4B		Filename:	a30jul07a_6-9
Collection Date/Time:	07/23/07	16:25	Retchk:	a30jul07a_4-12
Receipt Date/Time:	07/25/07	10:15	Begin ConCal:	a30jul07a_4-12
Extraction Date:	07/31/07		End ConCal:	a30jul07a_5-5
Analysis Date/Time:	08/01/07	21:52	Initial Cal:	m8290-071007a

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SGS Environmental Services

Method 8290
F51247-4
Accutest

Labeled Standard	Expected Amount (ng)	Measured Amount (ng)	Percent Recovery (%)	RT (min.)	Ratio	Qualifier
Extraction Standards						
13C12-2,3,7,8-TCDD	2.0	1.44	72.0	31:37	0.78	
13C12-1,2,3,7,8-PeCDD	2.0	1.42	71.0	34:25	1.60	
13C12-1,2,3,6,7,8-HxCDD	2.0	1.49	74.5	37:10	1.26	
13C12-1,2,3,4,6,7,8-HpCDD	2.0	1.56	78.1	40:37	1.06	
13C12-OCDD	4.0	3.19	79.8	45:07	0.89	
13C12-2,3,7,8-TCDF	2.0	1.59	79.5	31:06	0.79	
13C12-1,2,3,7,8-PeCDF	2.0	1.32	65.8	33:37	1.60	
13C12-1,2,3,6,7,8-HxCDF	2.0	1.37	68.5	36:28	0.52	
13C12-1,2,3,4,6,7,8-HpCDF	2.0	1.42	71.0	39:19	0.43	
Cleanup Standards						
37Cl4-2,3,7,8-TCDD	0.4	0.312	78.0	31:39	-	
13C12-2,3,4,7,8-PeCDF	0.4	0.240	60.0	34:13	1.62	
13C12-1,2,3,4,7,8-HxCDD	0.4	0.280	70.0	37:04	1.31	
13C12-1,2,3,4,7,8-HxCDF	0.4	0.279	69.8	36:22	0.51	
13C12-1,2,3,4,7,8,9-HpCDF	0.4	0.246	61.6	41:19	0.40	
Injection Standards						
13C12-1,2,3,4-TCDD	10.0	-	-	31:13	0.79	
13C12-1,2,3,7,8,9-HxCDD	10.0	-	-	37:25	1.26	

Client Information			**Sample Information**	
Project Name:	F51247		Report Basis:	Dry
			Matrix:	Soil
Sample ID:	F51247-4		Weight / Volume:	10.80 g
			Solids / Lipids:	58.0 %
			Original pH :	NA
Laboratory Information			Batch ID:	WG14389
Project ID:	G383-584		Instrument:	HRMS1
Sample ID:	G383-584-4B		Filename:	a30jul07a_6-9
Collection Date/Time:	07/23/07	16:25	Retchk:	a30jul07a_4-12
Receipt Date/Time:	07/25/07	10:15	Begin ConCal:	a30jul07a_4-12
Extraction Date:	07/31/07		End ConCal:	a30jul07a_5-5
Analysis Date/Time:	08/01/07	21:52	Initial Cal:	m8290-071007a

Form Version:[8290_DB_2.14]Report

Analyzed by: JMP
Date: 080307

Reviewed by: [signature]
Date: 8/13/07

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SGS Environmental Services

Method 8290
F51247-5
Accutest

Analytical Data Summary Sheet

Analyte	Amount (pg/g)	EDL (pg/g)	EMPC (pg/g)	RT (min.)	Ratio		Qualifier
2,3,7,8-TCDD	ND	0.321					
1,2,3,7,8-PeCDD	2.22 J			34.03	1.54		A
1,2,3,4,7,8-HxCDD	6.02			36.58	1.26		
1,2,3,6,7,8-HxCDD	55.6			36.67	1.26		
1,2,3,7,8,9-HxCDD	21.4			36.91	1.27		
1,2,3,4,6,7,8-HpCDD	1850			39.90	1.07		
OCDD	19500 J			44.04	0.90		E
2,3,7,8-TCDF	EMPC	~~0.401~~	0.302 J	30.21	1.09	*	A
1,2,3,7,8-PeCDF	EMPC	~~0.532~~	0.615 J	33.22	1.29	*	A
2,3,4,7,8-PeCDF	1.35 J			33.84	1.52		A
1,2,3,4,7,8-HxCDF	12.1			35.88	1.29		
1,2,3,6,7,8-HxCDF	6.12			35.98	1.10		
2,3,4,6,7,8-HxCDF	9.24			36.46	1.28		
1,2,3,7,8,9-HxCDF	2.71 J			37.24	1.39		A
1,2,3,4,6,7,8-HpCDF	280			38.68	1.04		
1,2,3,4,7,8,9-HpCDF	23.2			40.55	1.04		
OCDF	1150			44.32	0.88		
Total TCDDs	~~0.649~~		0.970 J				
Total PeCDDs	10.6						
Total HxCDDs	200						
Total HpCDDs	3580						
Total TCDFs	~~1.24~~		1.93 J				
Total PeCDFs	~~5.90~~		15.2 J				
Total HxCDFs	206						
Total HpCDFs	~~1150~~		1160 J				
WHO-2005 TEQ (ND=0)	41.7		41.7				
WHO-2005 TEQ (ND=½)	41.9		41.9				

Client Information			**Sample Information**	
Project Name:	F51247		Report Basis:	Dry
			Matrix:	Soil
Sample ID:	F51247-5		Weight / Volume:	10.96 g
			Solids / Lipids:	85.8 %
			Original pH :	NA
Laboratory Information			Batch ID:	WG14398
Project ID:	G383-584		Instrument:	HRMS3
Sample ID:	G383-584-5C		Filename:	c08aug07a_2-5
Collection Date/Time:	07/23/07	14:20	Retchk:	c08aug07a-7
Receipt Date/Time:	07/25/07	10:15	Begin ConCal:	c08aug07a-7
Extraction Date:	08/05/07		End ConCal:	c08aug07a_2-14
Analysis Date/Time:	08/08/07	18:44	Initial Cal:	m8290-c110206a

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SGS Environmental Services

Method 8290
F51247-5
Accutest

Labeled Standard	Expected Amount (ng)	Measured Amount (ng)	Percent Recovery (%)	RT (min.)	Ratio	Qualifier
Extraction Standards						
13C12-2,3,7,8-TCDD	2.0	1.07	53.6	31.03	0.81	
13C12-1,2,3,7,8-PeCDD	2.0	1.08	54.2	34.01	1.63	
13C12-1,2,3,6,7,8-HxCDD	2.0	1.06	53.2	36.66	1.22	
13C12-1,2,3,4,6,7,8-HpCDD	2.0	1.18	59.0	39.89	1.03	
13C12-OCDD	4.0	2.13	53.3	44.02	0.92	
13C12-2,3,7,8-TCDF	2.0	1.47	73.3	30.19	0.79	
13C12-1,2,3,7,8-PeCDF	2.0	1.16	57.9	33.20	1.55	
13C12-1,2,3,6,7,8-HxCDF	2.0	1.11	55.3	35.97	0.55	
13C12-1,2,3,4,6,7,8-HpCDF	2.0	1.20	60.2	38.67	0.44	
Cleanup Standards						
37Cl4-2,3,7,8-TCDD	0.4	0.234	58.5	31.05	-	
13C12-2,3,4,7,8-PeCDF	0.4	0.221	55.3	33.81	1.60	
13C12-1,2,3,4,7,8-HxCDD	0.4	0.189	47.3	36.57	1.26	
13C12-1,2,3,4,7,8-HxCDF	0.4	0.208	51.9	35.86	0.54	
13C12-1,2,3,4,7,8,9-HpCDF	0.4	0.203	50.9	40.53	0.46	
Injection Standards						
13C12-1,2,3,4-TCDD	2.0	-	-	30.42	0.79	
13C12-1,2,3,7,8,9-HxCDD	2.0	-	-	36.90	1.29	

Client Information			**Sample Information**	
Project Name:	F51247		Report Basis:	Dry
			Matrix:	Soil
Sample ID:	F51247-5		Weight / Volume:	10.96 g
			Solids / Lipids:	85.8 %
			Original pH :	NA
Laboratory Information			Batch ID:	WG14398
Project ID:	G383-584		Instrument:	HRMS3
Sample ID:	G383-584-5C		Filename:	c08aug07a_2-5
Collection Date/Time:	07/23/07	14:20	Retchk:	c08aug07a-7
Receipt Date/Time:	07/25/07	10:15	Begin ConCal:	c08aug07a-7
Extraction Date:	08/05/07		End ConCal:	c08aug07a_2-14
Analysis Date/Time:	08/08/07	18:44	Initial Cal:	m8290-c110206a

Form Version:[8290_DB_2.14]Report

Analyzed by: HMP
Date: 09Aug07

Reviewed by: KC
Date: 8/9/07

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SGS Environmental Services

Method 8290
F51247-6
Accutest

Analytical Data Summary Sheet

Analyte	Amount (pg/g)	EDL (pg/g)	EMPC (pg/g)	RT (min.)	Ratio	Qualifier
2,3,7,8-TCDD	EMPC	~~0.238~~	0.351 J	31:39	0.52 *	A
1,2,3,7,8-PeCDD	0.794 J			34:25	1.50	A
1,2,3,4,7,8-HxCDD	1.37 J			37:04	1.31	A
1,2,3,6,7,8-HxCDD	4.95 J			37:10	1.32	A
1,2,3,7,8,9-HxCDD	3.90 J			37:25	1.23	A
1,2,3,4,6,7,8-HpCDD	205			40:37	1.05	
OCDD	2150			45:07	0.90	
2,3,7,8-TCDF	1.10 J			31:06	0.79	A
1,2,3,7,8-PeCDF	0.487 J			33:37	1.47	A
2,3,4,7,8-PeCDF	1.36 J			34:13	1.62	A
1,2,3,4,7,8-HxCDF	4.55 J			36:22	1.23	A
1,2,3,6,7,8-HxCDF	1.97 J			36:28	1.38	A
2,3,4,6,7,8-HxCDF	1.63 J			36:58	1.23	A
1,2,3,7,8,9-HxCDF	0.819 J			37:46	1.27	A
1,2,3,4,6,7,8-HpCDF	43.3			39:19	1.07	
1,2,3,4,7,8,9-HpCDF	2.68 J			41:19	0.97	A
OCDF	155			45:25	0.88	
Total TCDDs	~~0.438~~		1.58 J			
Total PeCDDs	2.71					
Total HxCDDs	~~25.0~~		26.3 J			
Total HpCDDs	329					
Total TCDFs	~~6.81~~		7.55 J			
Total PeCDFs	11.7					
Total HxCDFs	46.7					
Total HpCDFs	~~147~~		148 J			
WHO-2005 TEQ (ND=0)	6.45		6.80			
WHO-2005 TEQ (ND=½)	6.57		6.80			

Client Information			**Sample Information**	
Project Name:	F51247		Report Basis:	Dry
			Matrix:	Soil
Sample ID:	F51247-6		Weight / Volume:	10.34 g
			Solids / Lipids:	62.3 %
			Original pH :	NA
Laboratory Information			Batch ID:	WG14389
Project ID:	G383-584		Instrument:	HRMS1
Sample ID:	G383-584-6B		Filename:	a30jul07a_6-11
Collection Date/Time:	07/23/07	14:30	Retchk:	a30jul07a_4-12
Receipt Date/Time:	07/25/07	10:15	Begin ConCal:	a30jul07a_4-12
Extraction Date:	07/31/07		End ConCal:	a30jul07a_5-5
Analysis Date/Time:	08/01/07	23:29	Initial Cal:	m8290-071007a

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SGS Environmental Services

Method 8290
F51247-6
Accutest

Labeled Standard	Expected Amount (ng)	Measured Amount (ng)	Percent Recovery (%)	RT (min.)	Ratio	Qualifier
Extraction Standards						
13C12-2,3,7,8-TCDD	2.0	1.44	72.1	31:37	0.77	
13C12-1,2,3,7,8-PeCDD	2.0	1.45	72.6	34:25	1.60	
13C12-1,2,3,6,7,8-HxCDD	2.0	1.59	79.7	37:10	1.27	
13C12-1,2,3,4,6,7,8-HpCDD	2.0	1.65	82.6	40:37	1.05	
13C12-OCDD	4.0	3.43	85.7	45:06	0.89	
13C12-2,3,7,8-TCDF	2.0	1.62	80.9	31:06	0.78	
13C12-1,2,3,7,8-PeCDF	2.0	1.33	66.3	33:37	1.58	
13C12-1,2,3,6,7,8-HxCDF	2.0	1.44	72.2	36:28	0.51	
13C12-1,2,3,4,6,7,8-HpCDF	2.0	1.49	74.3	39:19	0.43	
Cleanup Standards						
37Cl4-2,3,7,8-TCDD	0.4	0.317	79.2	31:39	-	
13C12-2,3,4,7,8-PeCDF	0.4	0.253	63.2	34:13	1.63	
13C12-1,2,3,4,7,8-HxCDD	0.4	0.263	65.8	37:04	1.31	
13C12-1,2,3,4,7,8-HxCDF	0.4	0.283	70.8	36:21	0.52	
13C12-1,2,3,4,7,8,9-HpCDF	0.4	0.262	65.5	41:19	0.41	
Injection Standards						
13C12-1,2,3,4-TCDD	10.0	-	-	31:13	0.79	
13C12-1,2,3,7,8,9-HxCDD	10.0	-	-	37:25	1.25	

Client Information			**Sample Information**	
Project Name:	F51247		Report Basis:	Dry
			Matrix:	Soil
Sample ID:	F51247-6		Weight / Volume:	10.34 g
			Solids / Lipids:	62.3 %
			Original pH :	NA
Laboratory Information			Batch ID:	WG14389
Project ID:	G383-584		Instrument:	HRMS1
Sample ID:	G383-584-6B		Filename:	a30jul07a_6-11
Collection Date/Time:	07/23/07	14:30	Retchk:	a30jul07a_4-12
Receipt Date/Time:	07/25/07	10:15	Begin ConCal:	a30jul07a_4-12
Extraction Date:	07/31/07		End ConCal:	a30jul07a_5-5
Analysis Date/Time:	08/01/07	23:29	Initial Cal:	m8290-071007a

Form Version:[8290_DB_2.14]Report

Analyzed by: JWP
Date: 08/3/07

Reviewed by: [signature]
Date: 8/13/07

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SGS Environmental Services

Method 8290
F51247-7
Accutest

Analytical Data Summary Sheet

Analyte	Amount (pg/g)	EDL (pg/g)	EMPC (pg/g)	RT (min.)	Ratio		Qualifier
2,3,7,8-TCDD	0.130 J			31:37	0.77		A
1,2,3,7,8-PeCDD	0.411 J			34:25	1.52		A
1,2,3,4,7,8-HxCDD	0.712 J			37:06	1.31		A
1,2,3,6,7,8-HxCDD	1.87 J			37:10	1.18		A
1,2,3,7,8,9-HxCDD	1.76 J			37:25	1.24		A
1,2,3,4,6,7,8-HpCDD	84.9			40:37	1.04		
OCDD	4740 J			45:07	0.89		E
2,3,7,8-TCDF	0.267 B			31:06	0.83		A
1,2,3,7,8-PeCDF	0.0999 J			33:37	1.45		A
2,3,4,7,8-PeCDF	0.187 B			34:13	1.55		A
1,2,3,4,7,8-HxCDF	0.658 J			36:22	1.34		A
1,2,3,6,7,8-HxCDF	EMPC	~~0.543~~	0.365 J	36:28	1.45	*	A
2,3,4,6,7,8-HxCDF	0.463 J			36:58	1.19		A
1,2,3,7,8,9-HxCDF	ND	0.543					
1,2,3,4,6,7,8-HpCDF	14.1			39:19	1.04		
1,2,3,4,7,8,9-HpCDF	0.615 J			41:19	0.89		A
OCDF	40.4			45:25	0.89		
Total TCDDs	0.413						
Total PeCDDs	1.68						
Total HxCDDs	~~12.3~~		12.5 J				
Total HpCDDs	152						
Total TCDFs	~~0.788~~		0.901 J				
Total PeCDFs	~~2.05~~		2.44 J				
Total HxCDFs	~~10.5~~		10.8 J				
Total HpCDFs	35.1						
WHO-2005 TEQ (ND=0)	3.60		3.64				
WHO-2005 TEQ (ND=½)	3.66		3.67				

Client Information			**Sample Information**	
Project Name:	F51247		Report Basis:	Dry
			Matrix:	Soil
Sample ID:	F51247-7		Weight / Volume:	10.59 g
			Solids / Lipids:	86.9 %
			Original pH :	NA
Laboratory Information			Batch ID:	WG14389
Project ID:	G383-584		Instrument:	HRMS1
Sample ID:	G383-584-7B		Filename:	a30jul07a_6-12
Collection Date/Time:	07/23/07	15:10	Retchk:	a30jul07a_4-12
Receipt Date/Time:	07/25/07	10:15	Begin ConCal:	a30jul07a_4-12
Extraction Date:	07/31/07		End ConCal:	a30jul07a_5-5
Analysis Date/Time:	08/02/07	0:17	Initial Cal:	m8290-071007a

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SGS Environmental Services

Method 8290
F51247-7
Accutest

Labeled Standard	Expected Amount (ng)	Measured Amount (ng)	Percent Recovery (%)	RT (min.)	Ratio	Qualifier
Extraction Standards						
13C12-2,3,7,8-TCDD	2.0	1.45	72.6	31:37	0.77	
13C12-1,2,3,7,8-PeCDD	2.0	1.47	73.5	34:25	1.59	
13C12-1,2,3,6,7,8-HxCDD	2.0	1.59	79.5	37:10	1.27	
13C12-1,2,3,4,6,7,8-HpCDD	2.0	1.64	81.8	40:37	1.05	
13C12-OCDD	4.0	3.49	87.3	45:06	0.89	
13C12-2,3,7,8-TCDF	2.0	1.63	81.6	31:06	0.78	
13C12-1,2,3,7,8-PeCDF	2.0	1.36	68.1	33:37	1.59	
13C12-1,2,3,6,7,8-HxCDF	2.0	1.45	72.4	36:28	0.52	
13C12-1,2,3,4,6,7,8-HpCDF	2.0	1.46	73.0	39:19	0.43	
Cleanup Standards						
37Cl4-2,3,7,8-TCDD	0.4	0.322	80.6	31:39	-	
13C12-2,3,4,7,8-PeCDF	0.4	0.252	63.1	34:13	1.64	
13C12-1,2,3,4,7,8-HxCDD	0.4	0.264	65.9	37:04	1.26	
13C12-1,2,3,4,7,8-HxCDF	0.4	0.278	69.5	36:21	0.49	
13C12-1,2,3,4,7,8,9-HpCDF	0.4	0.255	63.7	41:19	0.41	
Injection Standards						
13C12-1,2,3,4-TCDD	10.0	-	-	31:13	0.79	
13C12-1,2,3,7,8,9-HxCDD	10.0	-	-	37:25	1.25	

Client Information			**Sample Information**	
Project Name:	F51247		Report Basis:	Dry
			Matrix:	Soil
Sample ID:	F51247-7		Weight / Volume:	10.59 g
			Solids / Lipids:	86.9 %
			Original pH :	NA
Laboratory Information			Batch ID:	WG14389
Project ID:	G383-584		Instrument:	HRMS1
Sample ID:	G383-584-7B		Filename:	a30jul07a_6-12
Collection Date/Time:	07/23/07	15:10	Retchk:	a30jul07a_4-12
Receipt Date/Time:	07/25/07	10:15	Begin ConCal:	a30jul07a_4-12
Extraction Date:	07/31/07		End ConCal:	a30jul07a_5-5
Analysis Date/Time:	08/02/07	0:17	Initial Cal:	m8290-071007a

Form Version:[8290_DB_2.14|Report

Analyzed by: JWP
Date: 08-13-07

Reviewed by: [illegible]
Date: 8/13/07

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SGS Environmental Services

Method 8290
F51247-8
Accutest

Analytical Data Summary Sheet

Analyte	Amount (pg/g)	EDL (pg/g)	EMPC (pg/g)	RT (min.)	Ratio	Qualifier
2,3,7,8-TCDD	EMPC	~~0.256~~	0.248 J	31:39	0.45 *	A
1,2,3,7,8-PeCDD	1.22 J			34:25	1.56	A
1,2,3,4,7,8-HxCDD	2.79 J			37:04	1.42	A
1,2,3,6,7,8-HxCDD	11.2			37:10	1.30	
1,2,3,7,8,9-HxCDD	7.89 J			37:25	1.27	A
1,2,3,4,6,7,8-HpCDD	541			40:37	1.04	
OCDD	5540			45:07	0.90	
2,3,7,8-TCDF	5.49			31:06	0.81	
1,2,3,7,8-PeCDF	2.00 J			33:37	1.65	A
2,3,4,7,8-PeCDF	4.76 J			34:13	1.67	Q A
1,2,3,4,7,8-HxCDF	12.9			36:22	1.24	
1,2,3,6,7,8-HxCDF	5.72 J			36:28	1.21	A
2,3,4,6,7,8-HxCDF	5.25 J			36:58	1.29	A
1,2,3,7,8,9-HxCDF	1.48 J			37:48	1.17	A
1,2,3,4,6,7,8-HpCDF	124			39:19	1.04	
1,2,3,4,7,8,9-HpCDF	7.15 J			41:19	1.06	A
OCDF	416			45:25	0.89	
Total TCDDs	0.626					
Total PeCDDs	4.52 J					Q
Total HxCDDs	~~58.1~~		58.8 J			
Total HpCDDs	864					
Total TCDFs	~~26.3~~		27.5 J			
Total PeCDFs	~~38.3~~		40.2 J			Q
Total HxCDFs	129					
Total HpCDFs	376					
WHO-2005 TEQ (ND=0)	16.5		16.7			
WHO-2005 TEQ (ND=½)	16.6		16.7			

Client Information			**Sample Information**	
Project Name:	F51247		Report Basis:	Dry
			Matrix:	Soil
Sample ID:	F51247-8		Weight / Volume:	10.75 g
			Solids / Lipids:	57.0 %
			Original pH :	NA
Laboratory Information			Batch ID:	WG14389
Project ID:	G383-584		Instrument:	HRMS1
Sample ID:	G383-584-8B		Filename:	a30jul07a_6-13
Collection Date/Time:	07/23/07	15:20	Retchk:	a30jul07a_4-12
Receipt Date/Time:	07/25/07	10:15	Begin ConCal:	a30jul07a_4-12
Extraction Date:	07/31/07		End ConCal:	a30jul07a_6-14
Analysis Date/Time:	08/02/07	1:06	Initial Cal:	m8290-071007a

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SGS Environmental Services

Method 8290
F51247-8
Accutest

Labeled Standard	Expected Amount (ng)	Measured Amount (ng)	Percent Recovery (%)	RT (min.)	Ratio	Qualifier
Extraction Standards						
13C12-2,3,7,8-TCDD	2.0	1.49	74.4	31:37	0.78	
13C12-1,2,3,7,8-PeCDD	2.0	1.49	74.7	34:25	1.58	
13C12-1,2,3,6,7,8-HxCDD	2.0	1.64	82.2	37:10	1.26	
13C12-1,2,3,4,6,7,8-HpCDD	2.0	1.69	84.3	40:37	1.06	
13C12-OCDD	4.0	3.58	89.4	45:06	0.88	
13C12-2,3,7,8-TCDF	2.0	1.69	84.3	31:04	0.79	
13C12-1,2,3,7,8-PeCDF	2.0	1.40	70.0	33:37	1.58	
13C12-1,2,3,6,7,8-HxCDF	2.0	1.50	75.1	36:28	0.52	
13C12-1,2,3,4,6,7,8-HpCDF	2.0	1.53	76.3	39:19	0.44	
Cleanup Standards						
37Cl4-2,3,7,8-TCDD	0.4	0.328	82.0	31:39	-	
13C12-2,3,4,7,8-PeCDF	0.4	0.255	63.6	34:13	1.64	Q
13C12-1,2,3,4,7,8-HxCDD	0.4	0.272	68.0	37:04	1.29	
13C12-1,2,3,4,7,8-HxCDF	0.4	0.281	70.1	36:21	0.49	
13C12-1,2,3,4,7,8,9-HpCDF	0.4	0.269	67.3	41:19	0.40	
Injection Standards						
13C12-1,2,3,4-TCDD	10.0	-	-	31:13	0.78	
13C12-1,2,3,7,8,9-HxCDD	10.0	-	-	37:25	1.25	

Client Information			**Sample Information**	
Project Name:	F51247		Report Basis:	Dry
			Matrix:	Soil
Sample ID:	F51247-8		Weight / Volume:	10.75 g
			Solids / Lipids:	57.0 %
			Original pH :	NA
Laboratory Information			Batch ID:	WG14389
Project ID:	G383-584		Instrument:	HRMS1
Sample ID:	G383-584-8B		Filename:	a30jul07a_6-13
Collection Date/Time:	07/23/07	15:20	Retchk:	a30jul07a_4-12
Receipt Date/Time:	07/25/07	10:15	Begin ConCal:	a30jul07a_4-12
Extraction Date:	07/31/07		End ConCal:	a30jul07a_6-14
Analysis Date/Time:	08/02/07	1:06	Initial Cal:	m8290-071007a

Form Version:[8290_DB_2.14]Report

Analyzed by: DWP
Date: 08-14-07

Reviewed by: [signature]
Date: 8/14/07

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TCDF Confirmation - Method 8290
F51247-8
Accutest

Analytical Data Summary Sheet

Analyte	Amount (pg/g)	EDL (pg/g)	EMPC (pg/g)	RT (min.)	Ratio	Qualifier
2,3,7,8-TCDF	7.11	0.371		20.82	0.72	

Labeled Standard	Spiked Amount (ng)	RT (min.)	Ratio	Qualifier
Extraction Standards				
$^{13}C_{12}$-2,3,7,8-TCDF	2.00	20.80	0.79	

Client Information			**Sample Information**		
Project Name:	F51247		Report Basis:	Dry	
			Matrix:	Soil	
Sample ID:	F51247-8		Weight / Volume:	10.75	g
			Solids / Lipids:	57.05	%
			Original pH :	NA	
Laboratory Information			Batch ID:	WG14389	
Projec: ID:	G383-584		Instrument:	hrms3	
Sample ID:	G383-584-8B		Filename:	c11aug07a-12	
Collection Date/Time:	07/23/07	15:20	Retchk:	c11aug07a-2	
Receipt Date:	07/25/07	10:15	Begin ConCal:	c11aug07a-1	
Extraction Date:	07/31/07		End ConCal:	c11aug07a-25	
Analysis Date/Time:	08/11/07	14:43	Initial Cal:	mcf-c041807a	

Analyzed by: JWC
Date: 8/13/07

Reviewed by: DEJ
Date: 8/13/07

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SGS Environmental Services

Method 8290
F51247-9
Accutest

Analytical Data Summary Sheet

Analyte	Amount (pg/g)	EDL (pg/g)	EMPC (pg/g)	RT (min.)	Ratio		Qualifier
2,3,7,8-TCDD	ND	0.166					
1,2,3,7,8-PeCDD	0.353 J			34:25	1.64		A
1,2,3,4,7,8-HxCDD	EMPC	~~0.510~~	0.512 J	37:06	0.98	*	A
1,2,3,6,7,8-HxCDD	1.02 J			37:10	1.40		A
1,2,3,7,8,9-HxCDD	1.09 J			37:25	1.14		A
1,2,3,4,6,7,8-HpCDD	52.7			40:37	1.05		
OCDD	3810			45:07	0.89		
2,3,7,8-TCDF	EMPC	~~0.148~~	0.483 B	31:06	0.92	*	A
1,2,3,7,8-PeCDF	0.173 J			33:36	1.50		A
2,3,4,7,8-PeCDF	0.232 B			34:13	1.45		A
1,2,3,4,7,8-HxCDF	0.324 J			36:22	1.20		A
1,2,3,6,7,8-HxCDF	0.120 J			36:28	1.31		A
2,3,4,6,7,8-HxCDF	0.183 J			36:58	1.11		A
1,2,3,7,8,9-HxCDF	ND	0.510					
1,2,3,4,6,7,8-HpCDF	2.44 B			39:19	1.02		A
1,2,3,4,7,8,9-HpCDF	ND	0.510					
OCDF	6.53 B			45:25	0.87		A
Total TCDDs	0.838						
Total PeCDDs	2.04						
Total HxCDDs	~~9.07~~		9.86 J				
Total HpCDDs	~~109~~		110 J				
Total TCDFs	~~1.47~~		2.49 J				
Total PeCDFs	2.05						
Total HxCDFs	2.64						
Total HpCDFs	6.17						
WHO-2005 TEQ (ND=0)	2.40		2.50				
WHO-2005 TEQ (ND=½)	2.54		2.61				

Client Information			**Sample Information**	
Project Name:	F51247		Report Basis:	Dry
			Matrix:	Soil
Sample ID:	F51247-9		Weight / Volume:	10.70 g
			Solids / Lipids:	91.7 %
			Original pH :	NA
Laboratory Information			Batch ID:	WG14389
Project ID:	G383-584		Instrument:	HRMS1
Sample ID:	G383-584-9B		Filename:	a30jul07a_7-2
Collection Date/Time:	07/23/07	15:40	Retchk:	a30jul07a_6-14
Receipt Date/Time:	07/25/07	10:15	Begin ConCal:	a30jul07a_6-14
Extraction Date:	07/31/07		End ConCal:	a30jul07a_7-13
Analysis Date/Time:	08/02/07	3:35	Initial Cal:	m8290-071007a

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SGS Environmental Services

Method 8290
F51247-9
Accutest

Labeled Standard	Expected Amount (ng)	Measured Amount (ng)	Percent Recovery (%)	RT (min.)	Ratio	Qualifier
Extraction Standards						
13C12-2,3,7,8-TCDD	2.0	1.35	67.5	31:37	0.79	
13C12-1,2,3,7,8-PeCDD	2.0	1.27	63.6	34:25	1.59	
13C12-1,2,3,6,7,8-HxCDD	2.0	1.44	72.0	37:10	1.26	
13C12-1,2,3,4,6,7,8-HpCDD	2.0	1.45	72.5	40:37	1.06	
13C12-OCDD	4.0	3.16	79.1	45:06	0.90	
13C12-2,3,7,8-TCDF	2.0	1.46	73.1	31:04	0.79	
13C12-1,2,3,7,8-PeCDF	2.0	1.23	61.4	33:36	1.58	
13C12-1,2,3,6,7,8-HxCDF	2.0	1.31	65.4	36:27	0.51	
13C12-1,2,3,4,6,7,8-HpCDF	2.0	1.35	67.3	39:19	0.44	
Cleanup Standards						
37Cl4-2,3,7,8-TCDD	0.4	0.297	74.3	31:39	-	
13C12-2,3,4,7,8-PeCDF	0.4	0.242	60.4	34:13	1.61	
13C12-1,2,3,4,7,8-HxCDD	0.4	0.237	59.3	37:04	1.28	
13C12-1,2,3,4,7,8-HxCDF	0.4	0.250	62.5	36:21	0.50	
13C12-1,2,3,4,7,8,9-HpCDF	0.4	0.225	56.3	41:19	0.41	
Injection Standards						
13C12-1,2,3,4-TCDD	2.0	-	-	31:13	0.79	
13C12-1,2,3,7,8,9-HxCDD	2.0	-	-	37:25	1.25	

Client Information			**Sample Information**	
Project Name:	F51247		Report Basis:	Dry
			Matrix:	Soil
Sample ID:	F51247-9		Weight / Volume:	10.70 g
			Solids / Lipids:	91.7 %
			Original pH :	NA
Laboratory Information			Batch ID:	WG14389
Project ID:	G383-584		Instrument:	HRMS1
Sample ID:	G383-584-9B		Filename:	a30jul07a_7-2
Collection Date/Time:	07/23/07	15:40	Retchk:	a30jul07a_6-14
Receipt Date/Time:	07/25/07	10:15	Begin ConCal:	a30jul07a_6-14
Extraction Date:	07/31/07		End ConCal:	a30jul07a_7-13
Analysis Date/Time:	08/02/07	3:35	Initial Cal:	m8290-071007a

Form Version:[8290_DB_2.14]Report

Analyzed by: _____
Date: 080907

Reviewed by: _____
Date: 8/9/07

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SGS Environmental Services

Method 8290
F51247-10
Accutest

Analytical Data Summary Sheet

Analyte	Amount (pg/g)	EDL (pg/g)	EMPC (pg/g)	RT (min.)	Ratio		Qualifier
2,3,7,8-TCDD	ND	0.187					
1,2,3,7,8-PeCDD	ND	0.609					
1,2,3,4,7,8-HxCDD	ND	0.609					
1,2,3,6,7,8-HxCDD	EMPC	~~0.609~~	0.300 J	37:10	1.67	*	A
1,2,3,7,8,9-HxCDD	EMPC	~~0.609~~	0.293 J	37:25	0.95	*	A
1,2,3,4,6,7,8-HpCDD	64.4			40:37	1.04		
OCDD	10900 J			45:07	0.90		E
2,3,7,8-TCDF	0.244 B			31:06	0.73		A
1,2,3,7,8-PeCDF	ND	0.609					
2,3,4,7,8-PeCDF	EMPC	~~0.609~~	0.107 B	34:13	2.14	*	A
1,2,3,4,7,8-HxCDF	1.20 J			36:22	1.16		A
1,2,3,6,7,8-HxCDF	0.210 J			36:28	1.22		A
2,3,4,6,7,8-HxCDF	ND	0.609					
1,2,3,7,8,9-HxCDF	ND	0.609					
1,2,3,4,6,7,8-HpCDF	4.48 B			39:19	1.08		A
1,2,3,4,7,8,9-HpCDF	ND	0.609					
OCDF	4.89 B			45:25	0.93		A
Total TCDDs	ND	0.187					
Total PeCDDs	ND	0.609					
Total HxCDDs	~~1.76~~		2.35 J				
Total HpCDDs	140						
Total TCDFs	0.244						
Total PeCDFs	~~0.107~~		0.478 J				
Total HxCDFs	~~2.30~~		2.53 J				
Total HpCDFs	5.45						
WHO-2005 TEQ (ND=0)	4.13		4.22				
WHO-2005 TEQ (ND=½)	4.78		4.72				

Client Information			**Sample Information**		
Project Name:	F51247		Report Basis:	Dry	
			Matrix:	Soil	
Sample ID:	F51247-10		Weight / Volume:	10.74 g	
			Solids / Lipids:	76.4	%
			Original pH :	NA	
Laboratory Information			Batch ID:	WG14389	
Project ID:	G383-584		Instrument:	HRMS1	
Sample ID:	G383-584-10B		Filename:	a30jul07a_7-3	
Collection Date/Time:	07/23/07	15:40	Retchk:	a30jul07a_6-14	
Receipt Date/Time:	07/25/07	10:15	Begin ConCal:	a30jul07a_6-14	
Extraction Date:	07/31/07		End ConCal:	a30jul07a_7-13	
Analysis Date/Time:	08/02/07	4:24	Initial Cal:	m8290-071007a	

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Method 8290
F51247-10
Accutest

Labeled Standard	Expected Amount (ng)	Measured Amount (ng)	Percent Recovery (%)	RT (min.)	Ratio	Qualifier
Extraction Standards						
13C12-2,3,7,8-TCDD	2.0	1.45	72.4	31:37	0.78	
13C12-1,2,3,7,8-PeCDD	2.0	1.40	69.8	34:25	1.59	
13C12-1,2,3,6,7,8-HxCDD	2.0	1.52	75.8	37:10	1.26	
13C12-1,2,3,4,6,7,8-HpCDD	2.0	1.55	77.4	40:37	1.06	
13C12-OCDD	4.0	3.31	82.8	45:06	0.90	
13C12-2,3,7,8-TCDF	2.0	1.61	80.4	31:06	0.79	
13C12-1,2,3,7,8-PeCDF	2.0	1.32	66.2	33:37	1.58	
13C12-1,2,3,6,7,8-HxCDF	2.0	1.43	71.3	36:27	0.52	
13C12-1,2,3,4,6,7,8-HpCDF	2.0	1.43	71.4	39:19	0.43	
Cleanup Standards						
37Cl4-2,3,7,8-TCDD	0.4	0.328	81.9	31:39	-	
13C12-2,3,4,7,8-PeCDF	0.4	0.264	66.0	34:13	1.65	
13C12-1,2,3,4,7,8-HxCDD	0.4	0.295	73.8	37:04	1.26	
13C12-1,2,3,4,7,8-HxCDF	0.4	0.271	67.7	36:21	0.48	
13C12-1,2,3,4,7,8,9-HpCDF	0.4	0.251	62.7	41:19	0.42	
Injection Standards						
13C12-1,2,3,4-TCDD	2.0	-	-	31:13	0.79	
13C12-1,2,3,7,8,9-HxCDD	2.0	-	-	37:25	1.25	

Client Information			**Sample Information**	
Project Name:	F51247		Report Basis:	Dry
			Matrix:	Soil
Sample ID:	F51247-10		Weight / Volume:	10.74 g
			Solids / Lipids:	76.4 %
			Original pH :	NA
Laboratory Information			Batch ID:	WG14389
Project ID:	G383-584		Instrument:	HRMS1
Sample ID:	G383-584-10B		Filename:	a30jul07a_7-3
Collection Date/Time:	07/23/07	15:40	Retchk:	a30jul07a_6-14
Receipt Date/Time:	07/25/07	10:15	Begin ConCal:	a30jul07a_6-14
Extraction Date:	07/31/07		End ConCal:	a30jul07a_7-13
Analysis Date/Time:	08/02/07	4:24	Initial Cal:	m8290-071007a

Form Version:[8290_DB_2.14|Report

Analyzed by: _____
Date: 08/10/07

Reviewed by: _____
Date: 8/10/07

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SGS Environmental Services

Method 8290
F51247-11
Accutest

Analytical Data Summary Sheet

Analyte	Amount (pg/g)	EDL (pg/g)	EMPC (pg/g)	RT (min.)	Ratio		Qualifier
2,3,7,8-TCDD	ND	0.139					
1,2,3,7,8-PeCDD	0.346 J			34:25	1.43		A
1,2,3,4,7,8-HxCDD	0.478 J			37:04	1.40		A
1,2,3,6,7,8-HxCDD	0.659 J			37:10	1.29		A
1,2,3,7,8,9-HxCDD	0.760 J			37:25	1.11		A
1,2,3,4,6,7,8-HpCDD	162			40:37	1.04		
OCDD	23800 J			45:07	0.90		E
2,3,7,8-TCDF	0.216 B			31:06	0.84		A
1,2,3,7,8-PeCDF	EMPC	~~0.486~~	0.122 J	33:36	1.05	*	A
2,3,4,7,8-PeCDF	EMPC	~~0.486~~	0.146 B	34:13	1.89	*	A
1,2,3,4,7,8-HxCDF	0.435 J			36:22	1.38		A
1,2,3,6,7,8-HxCDF	0.167 J			36:28	1.32		A
2,3,4,6,7,8-HxCDF	EMPC	~~0.486~~	0.181 J	36:58	0.84	*	A
1,2,3,7,8,9-HxCDF	ND	0.486					
1,2,3,4,6,7,8-HpCDF	1.86 B			39:19	1.02		A
1,2,3,4,7,8,9-HpCDF	ND	0.486					
OCDF	3.06 B			45:25	0.82		A
Total TCDDs	~~ND~~	~~0.139~~	0.371 J				
Total PeCDDs	~~0.684~~		0.870 J				
Total HxCDDs	~~6.67~~		7.23 J				
Total HpCDDs	~~362~~		363 J				
Total TCDFs	~~0.313~~		0.604 B				
Total PeCDFs	~~0.544~~		0.882 J				
Total HxCDFs	1.77						
Total HpCDFs	3.06 B						
WHO-2005 TEQ (ND=0)	9.40		9.46				
WHO-2005 TEQ (ND=½)	9.60		9.56				

Client Information			**Sample Information**	
Project Name:	F51247		Report Basis:	Dry
			Matrix:	Soil
Sample ID:	F51247-11		Weight / Volume:	11.58 g
			Solids / Lipids:	88.9 %
			Original pH :	NA
Laboratory Information			Batch ID:	WG14389
Project ID:	G383-584		Instrument:	HRMS1
Sample ID:	G383-584-11B		Filename:	a30jul07a_7-4
Collection Date/Time:	07/23/07	16:30	Retchk:	a30jul07a_6-14
Receipt Date/Time:	07/25/07	10:15	Begin ConCal:	a30jul07a_6-14
Extraction Date:	07/31/07		End ConCal:	a30jul07a_7-13
Analysis Date/Time:	08/02/07	5:12	Initial Cal:	m8290-071007a

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SGS Environmental Services

Method 8290
F51247-11
Accutest

Labeled Standard	Expected Amount (ng)	Measured Amount (ng)	Percent Recovery (%)	RT (min.)	Ratio	Qualifier
Extraction Standards						
13C12-2,3,7,8-TCDD	2.0	1.51	75.5	31:37	0.78	
13C12-1,2,3,7,8-PeCDD	2.0	1.44	71.8	34:25	1.60	
13C12-1,2,3,6,7,8-HxCDD	2.0	1.60	79.9	37:10	1.25	
13C12-1,2,3,4,6,7,8-HpCDD	2.0	1.61	80.7	40:37	1.06	
13C12-OCDD	4.0	3.71	92.8	45:07	0.89	
13C12-2,3,7,8-TCDF	2.0	1.68	84.0	31:04	0.79	
13C12-1,2,3,7,8-PeCDF	2.0	1.34	67.2	33:36	1.59	
13C12-1,2,3,6,7,8-HxCDF	2.0	1.44	71.9	36:27	0.52	
13C12-1,2,3,4,6,7,8-HpCDF	2.0	1.44	72.0	39:19	0.44	
Cleanup Standards						
37Cl4-2,3,7,8-TCDD	0.4	0.333	83.2	31:39	-	
13C12-2,3,4,7,8-PeCDF	0.4	0.251	62.7	34:13	1.63	
13C12-1,2,3,4,7,8-HxCDD	0.4	0.263	65.7	37:04	1.30	
13C12-1,2,3,4,7,8-HxCDF	0.4	0.286	71.5	36:21	0.53	
13C12-1,2,3,4,7,8,9-HpCDF	0.4	0.256	64.0	41:19	0.42	
Injection Standards						
13C12-1,2,3,4-TCDD	2.0	-	-	31:13	0.78	
13C12-1,2,3,7,8,9-HxCDD	2.0	-	-	37:25	1.25	

Client Information			**Sample Information**	
Project Name:	F51247		Report Basis:	Dry
			Matrix:	Soil
Sample ID:	F51247-11		Weight / Volume:	11.58 g
			Solids / Lipids:	88.9 %
			Original pH :	NA
Laboratory Information			Batch ID:	WG14389
Project ID:	G383-584		Instrument:	HRMS1
Sample ID:	G383-584-11B		Filename:	a30jul07a_7-4
Collection Date/Time:	07/23/07	16:30	Retchk:	a30jul07a_6-14
Receipt Date/Time:	07/25/07	10:15	Begin ConCal:	a30jul07a_6-14
Extraction Date:	07/31/07		End ConCal:	a30jul07a_7-13
Analysis Date/Time:	08/02/07	5:12	Initial Cal:	m8290-071007a

Form Version:[8290_DB_2.14]Report

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Date: _____

Reviewed by: _____
Date: 8/10/07

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SGS Environmental Services

Method 8290
F51247-12
Accutest

Analytical Data Summary Sheet

Analyte	Amount (pg/g)	EDL (pg/g)	EMPC (pg/g)	RT (min.)	Ratio		Qualifier
2,3,7,8-TCDD	ND	0.148					
1,2,3,7,8-PeCDD	ND	0.502					
1,2,3,4,7,8-HxCDD	ND	0.693					
1,2,3,6,7,8-HxCDD	ND	0.705					
1,2,3,7,8,9-HxCDD	ND	0.715					
1,2,3,4,6,7,8-HpCDD	35.4			40:37	1.02		
OCDD	6300 J			45:07	0.90		E
2,3,7,8-TCDF	0.141 B			31:06	0.69		A
1,2,3,7,8-PeCDF	ND	0.502					
2,3,4,7,8-PeCDF	ND	0.502					
1,2,3,4,7,8-HxCDF	0.914 J			36:22	1.34		A
1,2,3,6,7,8-HxCDF	EMPC	~~0.502~~	0.183 J	36:28	1.66	*	A
2,3,4,6,7,8-HxCDF	ND	0.502					
1,2,3,7,8,9-HxCDF	ND	0.502					
1,2,3,4,6,7,8-HpCDF	4.01 B			39:19	1.15		A
1,2,3,4,7,8,9-HpCDF	ND	0.502					
OCDF	3.35 B			45:25	0.82		A
Total TCDDs	ND	0.148					
Total PeCDDs	ND	0.502					
Total HxCDDs	1.56						
Total HpCDDs	82.0						
Total TCDFs	0.141 B						
Total PeCDFs	~~ND~~	~~0.502~~	0.147 B				
Total HxCDFs	~~1.25~~		1.73 J				
Total HpCDFs	~~4.01~~		4.35 B				
WHO-2005 TEQ (ND=0)	2.39		2.41				
WHO-2005 TEQ (ND=½)	2.98		2.98				

Client Information			**Sample Information**	
Project Name:	F51247		Report Basis:	Dry
			Matrix:	Soil
Sample ID:	F51247-12		Weight / Volume:	11.57 g
			Solids / Lipids:	86.1 %
			Original pH :	NA
Laboratory Information			Batch ID:	WG14389
Project ID:	G383-584		Instrument:	HRMS1
Sample ID:	G383-584-12B		Filename:	a30jul07a_7-5
Collection Date/Time:	07/23/07	16:40	Retchk:	a30jul07a_6-14
Receipt Date/Time:	07/25/07	10:15	Begin ConCal:	a30jul07a_6-14
Extraction Date:	07/31/07		End ConCal:	a30jul07a_7-13
Analysis Date/Time:	08/02/07	6:01	Initial Cal:	m8290-071007a

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SGS Environmental Services

Method 8290
F51247-12
Accutest

Labeled Standard	Expected Amount (ng)	Measured Amount (ng)	Percent Recovery (%)	RT (min.)	Ratio	Qualifier
Extraction Standards						
13C12-2,3,7,8-TCDD	2.0	1.42	71.0	31:37	0.78	
13C12-1,2,3,7,8-PeCDD	2.0	1.39	69.6	34:25	1.60	
13C12-1,2,3,6,7,8-HxCDD	2.0	1.53	76.7	37:10	1.26	
13C12-1,2,3,4,6,7,8-HpCDD	2.0	1.53	76.3	40:37	1.05	
13C12-OCDD	4.0	3.22	80.6	45:06	0.90	
13C12-2,3,7,8-TCDF	2.0	1.58	79.1	31:06	0.78	
13C12-1,2,3,7,8-PeCDF	2.0	1.28	64.2	33:36	1.59	
13C12-1,2,3,6,7,8-HxCDF	2.0	1.39	69.6	36:27	0.52	
13C12-1,2,3,4,6,7,8-HpCDF	2.0	1.37	68.6	39:19	0.44	
Cleanup Standards						
37Cl4-2,3,7,8-TCDD	0.4	0.312	78.0	31:39	-	
13C12-2,3,4,7,8-PeCDF	0.4	0.240	59.9	34:13	1.63	
13C12-1,2,3,4,7,8-HxCDD	0.4	0.252	62.9	37:04	1.27	
13C12-1,2,3,4,7,8-HxCDF	0.4	0.266	66.5	36:21	0.48	
13C12-1,2,3,4,7,8,9-HpCDF	0.4	0.237	59.2	41:19	0.41	
Injection Standards						
13C12-1,2,3,4-TCDD	2.0	-	-	31:13	0.79	
13C12-1,2,3,7,8,9-HxCDD	2.0	-	-	37:25	1.25	

Client Information			**Sample Information**	
Project Name:	F51247		Report Basis:	Dry
			Matrix:	Soil
Sample ID:	F51247-12		Weight / Volume:	11.57 g
			Solids / Lipids:	86.1 %
			Original pH :	NA
Laboratory Information			Batch ID:	WG14389
Project ID:	G383-584		Instrument:	HRMS1
Sample ID:	G383-584-12B		Filename:	a30jul07a_7-5
Collection Date/Time:	07/23/07	16:40	Retchk:	a30jul07a_6-14
Receipt Date/Time:	07/25/07	10:15	Begin ConCal:	a30jul07a_6-14
Extraction Date:	07/31/07		End ConCal:	a30jul07a_7-13
Analysis Date/Time:	08/02/07	6:01	Initial Cal:	m8290-071007a

Form Version:[8290_DB_2.14]Report

Analyzed by: [signature]
Date: 08/07/07

Reviewed by: [signature]
Date: 8/10/07

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SGS Environmental Services

Method 8290
F51247-13
Accutest

Analytical Data Summary Sheet

Analyte	Amount (pg/g)	EDL (pg/g)	EMPC (pg/g)	RT (min.)	Ratio	Qualifier
2,3,7,8-TCDD	ND	0.159				
1,2,3,7,8-PeCDD	1.85 J			34:25	1.68	A
1,2,3,4,7,8-HxCDD	5.48 J			37:04	1.22	A
1,2,3,6,7,8-HxCDD	54.9			37:10	1.28	
1,2,3,7,8,9-HxCDD	18.2			37:25	1.34	
1,2,3,4,6,7,8-HpCDD	2350 J			40:37	1.04	E
OCDD	28300 J			45:07	0.90	E
2,3,7,8-TCDF	0.291 B			31:06	0.82	A
1,2,3,7,8-PeCDF	0.428 J			33:37	1.63	A
2,3,4,7,8-PeCDF	0.721 J			34:13	1.40	A
1,2,3,4,7,8-HxCDF	6.87			36:22	1.34	
1,2,3,6,7,8-HxCDF	4.41 J			36:28	1.22	A
2,3,4,6,7,8-HxCDF	6.16			36:58	1.25	
1,2,3,7,8,9-HxCDF	0.777 J			37:48	1.42	A
1,2,3,4,6,7,8-HpCDF	317			39:19	1.05	
1,2,3,4,7,8,9-HpCDF	18.2			41:19	1.14	
OCDF	1220			45:25	0.89	
Total TCDDs	ND	0.159				
Total PeCDDs	~~5.34~~		6.43 J			
Total HxCDDs	190					
Total HpCDDs	3670					
Total TCDFs	~~1.57~~		1.82 J			
Total PeCDFs	~~22.0~~		22.1 J			
Total HxCDFs	238					
Total HpCDFs	~~1140~~		1140 J			
WHO-2005 TEQ (ND=0)	47.5		47.5			
WHO-2005 TEQ (ND=½)	47.6		47.6			

Client Information			**Sample Information**	
Project Name:	F51247		Report Basis:	Dry
			Matrix:	Soil
Sample ID:	F51247-13		Weight / Volume:	10.63 g
			Solids / Lipids:	84.0 %
			Original pH :	NA
Laboratory Information			Batch ID:	WG14389
Project ID:	G383-584		Instrument:	HRMS1
Sample ID:	G383-584-13B		Filename:	a30jul07a_7-6
Collection Date/Time:	07/23/07	12:25	Retchk:	a30jul07a_6-14
Receipt Date/Time:	07/25/07	10:15	Begin ConCal:	a30jul07a_6-14
Extraction Date:	07/31/07		End ConCal:	a30jul07a_7-13
Analysis Date/Time:	08/02/07	6:49	Initial Cal:	m8290-071007a

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Method 8290
F51247-13
Accutest

Labeled Standard	Expected Amount (ng)	Measured Amount (ng)	Percent Recovery (%)	RT (min.)	Ratio	Qualifier
Extraction Standards						
13C12-2,3,7,8-TCDD	2.0	1.42	70.8	31:37	0.78	
13C12-1,2,3,7,8-PeCDD	2.0	1.40	69.8	34:25	1.59	
13C12-1,2,3,6,7,8-HxCDD	2.0	1.52	76.2	37:10	1.25	
13C12-1,2,3,4,6,7,8-HpCDD	2.0	1.65	82.5	40:37	1.07	
13C12-OCDD	4.0	3.67	91.8	45:07	0.90	
13C12-2,3,7,8-TCDF	2.0	1.60	80.0	31:06	0.78	
13C12-1,2,3,7,8-PeCDF	2.0	1.32	65.8	33:36	1.60	
13C12-1,2,3,6,7,8-HxCDF	2.0	1.43	71.6	36:27	0.52	
13C12-1,2,3,4,6,7,8-HpCDF	2.0	1.45	72.3	39:19	0.44	
Cleanup Standards						
37Cl4-2,3,7,8-TCDD	0.4	0.314	78.5	31:39	-	
13C12-2,3,4,7,8-PeCDF	0.4	0.242	60.4	34:13	1.63	
13C12-1,2,3,4,7,8-HxCDD	0.4	0.288	72.0	37:04	1.31	
13C12-1,2,3,4,7,8-HxCDF	0.4	0.271	67.7	36:21	0.49	
13C12-1,2,3,4,7,8,9-HpCDF	0.4	0.248	61.9	41:19	0.41	
Injection Standards						
13C12-1,2,3,4-TCDD	2.0	-	-	31:13	0.78	
13C12-1,2,3,7,8,9-HxCDD	2.0	-	-	37:25	1.25	

Client Information			**Sample Information**	
Project Name:	F51247		Report Basis:	Dry
			Matrix:	Soil
Sample ID:	F51247-13		Weight / Volume:	10.63 g
			Solids / Lipids:	84.0 %
			Original pH :	NA
Laboratory Information			Batch ID:	WG14389
Project ID:	G383-584		Instrument:	HRMS1
Sample ID:	G383-584-13B		Filename:	a30jul07a_7-6
Collection Date/Time:	07/23/07	12:25	Retchk:	a30jul07a_6-14
Receipt Date/Time:	07/25/07	10:15	Begin ConCal:	a30jul07a_6-14
Extraction Date:	07/31/07		End ConCal:	a30jul07a_7-13
Analysis Date/Time:	08/02/07	6:49	Initial Cal:	m8290-071007a

Form Version:[8290_DB_2.14]Report

Analyzed by: JW
Date: 08/10/07

Reviewed by: [illegible]
Date: 8/10/07

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SGS Environmental Services

Method 8290
F51247-14
Accutest

Analytical Data Summary Sheet

Analyte	Amount (pg/g)	EDL (pg/g)	EMPC (pg/g)	RT (min.)	Ratio	Qualifier
2,3,7,8-TCDD	0.505 J			31:39	0.77	A
1,2,3,7,8-PeCDD	2.56 J			34:25	1.41	A
1,2,3,4,7,8-HxCDD	5.34 J			37:04	1.13	A
1,2,3,6,7,8-HxCDD	24.9			37:10	1.28	
1,2,3,7,8,9-HxCDD	15.4			37:25	1.25	
1,2,3,4,6,7,8-HpCDD	957			40:37	1.04	
OCDD	8430 J			45:07	0.89	E
2,3,7,8-TCDF	2.00			31:06	0.78	
1,2,3,7,8-PeCDF	1.35 J			33:36	1.52	A
2,3,4,7,8-PeCDF	8.49			34:13	1.60	
1,2,3,4,7,8-HxCDF	46.0			36:22	1.28	
1,2,3,6,7,8-HxCDF	18.7			36:28	1.32	
2,3,4,6,7,8-HxCDF	10.6			36:58	1.28	
1,2,3,7,8,9-HxCDF	5.74 J			37:48	1.42	A
1,2,3,4,6,7,8-HpCDF	196			39:19	1.03	
1,2,3,4,7,8,9-HpCDF	18.5			41:19	1.03	
OCDF	628			45:25	0.89	
Total TCDDs	~~9.71~~		10.0 J			
Total PeCDDs	~~8.53~~		8.86 J			
Total HxCDDs	113					
Total HpCDDs	1520					
Total TCDFs	~~15.9~~		20.2 J			
Total PeCDFs	~~66.2~~		68.0 J			
Total HxCDFs	261					
Total HpCDFs	~~625~~		630 J			
WHO-2005 TEQ (ND=0)	33.0		33.0			
WHO-2005 TEQ (ND=½)	33.0		33.0			

Client Information			**Sample Information**	
Project Name:	F51247		Report Basis:	Dry
			Matrix:	Soil
Sample ID:	F51247-14		Weight / Volume:	10.41 g
			Solids / Lipids:	69.2 %
			Original pH :	NA
Laboratory Information			Batch ID:	WG14389
Project ID:	G383-584		Instrument:	HRMS1
Sample ID:	G383-584-14B		Filename:	a30jul07a_7-7
Collection Date/Time:	07/23/07	12:35	Retchk:	a30jul07a_6-14
Receipt Date/Time:	07/25/07	10:15	Begin ConCal:	a30jul07a_6-14
Extraction Date:	07/31/07		End ConCal:	a30jul07a_7-13
Analysis Date/Time:	08/02/07	7:37	Initial Cal:	m8290-071007a

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SGS Environmental Services

Method 8290
F51247-14
Accutest

Labeled Standard	Expected Amount (ng)	Measured Amount (ng)	Percent Recovery (%)	RT (min.)	Ratio	Qualifier
Extraction Standards						
13C12-2,3,7,8-TCDD	2.0	1.43	71.7	31:37	0.78	
13C12-1,2,3,7,8-PeCDD	2.0	1.40	70.1	34:25	1.60	
13C12-1,2,3,6,7,8-HxCDD	2.0	1.56	78.2	37:10	1.27	
13C12-1,2,3,4,6,7,8-HpCDD	2.0	1.60	79.8	40:37	1.07	
13C12-OCDD	4.0	3.32	82.9	45:06	0.89	
13C12-2,3,7,8-TCDF	2.0	1.62	80.8	31:04	0.78	
13C12-1,2,3,7,8-PeCDF	2.0	1.32	66.1	33:36	1.59	
13C12-1,2,3,6,7,8-HxCDF	2.0	1.42	70.8	36:27	0.52	
13C12-1,2,3,4,6,7,8-HpCDF	2.0	1.43	71.6	39:19	0.44	
Cleanup Standards						
37Cl4-2,3,7,8-TCDD	0.4	0.319	79.9	31:39	-	
13C12-2,3,4,7,8-PeCDF	0.4	0.243	60.8	34:13	1.62	
13C12-1,2,3,4,7,8-HxCDD	0.4	0.258	64.4	37:04	1.28	
13C12-1,2,3,4,7,8-HxCDF	0.4	0.273	68.2	36:21	0.50	
13C12-1,2,3,4,7,8,9-HpCDF	0.4	0.247	61.7	41:19	0.42	
Injection Standards						
13C12-1,2,3,4-TCDD	2.0	-	-	31:13	0.78	
13C12-1,2,3,7,8,9-HxCDD	2.0	-	-	37:25	1.25	

Client Information			**Sample Information**	
Project Name:	F51247		Report Basis:	Dry
			Matrix:	Soil
Sample ID:	F51247-14		Weight / Volume:	10.41 g
			Solids / Lipids:	69.2 %
			Original pH :	NA
Laboratory Information			Batch ID:	WG14389
Project ID:	G383-584		Instrument:	HRMS1
Sample ID:	G383-584-14B		Filename:	a30jul07a_7-7
Collection Date/Time:	07/23/07	12:35	Retchk:	a30jul07a_6-14
Receipt Date/Time:	07/25/07	10:15	Begin ConCal:	a30jul07a_6-14
Extraction Date:	07/31/07		End ConCal:	a30jul07a_7-13
Analysis Date/Time:	08/02/07	7:37	Initial Cal:	m8290-071007a

Form Version:[8290_DB_2.14]Report

Analyzed by: _____
Date: 8/10/07

Reviewed by: _____
Date: 8/10/07

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TCDF Confirmation - Method 8290
F51247-14
Accutest

Analytical Data Summary Sheet

Analyte	Amount (pg/g)	EDL (pg/g)	EMPC (pg/g)	RT (min.)	Ratio	Qualifier
2,3,7,8-TCDF	3.19	0.280		20.82	0.77	

Labeled Standard	Spiked Amount (ng)	RT (min.)	Ratio	Qualifier
Extraction Standards				
$^{13}C_{12}$-2,3,7,8-TCDF	2.00	20.80	0.79	

Client Information			**Sample Information**		
Project Name:	F51247		Report Basis:	Dry	
			Matrix:	Soil	
Sample ID:	F51247-14		Weight / Volume:	10.41	g
			Solids / Lipids:	69.22	%
			Original pH :	NA	
Laboratory Information			Batch ID:	WG14389	
Project ID:	G383-584		Instrument:	hrms3	
Sample ID:	G383-584-14B		Filename:	c11aug07a-13	
Collection Date/Time:	07/23/07	12:35	Retchk:	c11aug07a-2	
Receipt Date:	07/25/07	10:15	Begin ConCal:	c11aug07a-1	
Extraction Date:	07/31/07		End ConCal:	c11aug07a-25	
Analysis Date/Time:	08/11/07	15:06	Initial Cal:	mcf-c041807a	

Analyzed by: _____
Date: 081307

Reviewed by: _____
Date: 8/13/07

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SGS Environmental Services

Method 8290
F51247-15
Accutest

Analytical Data Summary Sheet

Analyte	Amount (pg/g)	EDL (pg/g)	EMPC (pg/g)	RT (min.)	Ratio		Qualifier
2,3,7,8-TCDD	ND	0.175					
1,2,3,7,8-PeCDD	EMPC	~~0.586~~	0.279 J	34:25	2.18	*	A
1,2,3,4,7,8-HxCDD	0.457 J			37:06	1.31		A
1,2,3,6,7,8-HxCDD	1.40 J			37:10	1.07		A
1,2,3,7,8,9-HxCDD	1.55 J			37:25	1.16		A
1,2,3,4,6,7,8-HpCDD	97.4			40:37	1.06		
OCDD	5960 J			45:07	0.89		E
2,3,7,8-TCDF	0.394 B			31:06	0.84		A
1,2,3,7,8-PeCDF	ND	0.586					
2,3,4,7,8-PeCDF	0.199 B			34:13	1.46		A
1,2,3,4,7,8-HxCDF	0.570 J			36:22	1.19		A
1,2,3,6,7,8-HxCDF	0.368 J			36:28	1.07		A
2,3,4,6,7,8-HxCDF	0.443 J			36:58	1.31		A
1,2,3,7,8,9-HxCDF	ND	0.586					
1,2,3,4,6,7,8-HpCDF	9.77			39:19	1.05		
1,2,3,4,7,8,9-HpCDF	0.588 J			41:19	1.01		A
OCDF	23.2			45:25	0.89		
Total TCDDs	ND	0.175					
Total PeCDDs	~~0.279~~		0.788 J				
Total HxCDDs	13.1						
Total HpCDDs	201						
Total TCDFs	~~1.42~~		1.57 J				
Total PeCDFs	~~2.77~~		2.98 J				
Total HxCDFs	8.92						
Total HpCDFs	25.5						
WHO-2005 TEQ (ND=0)	3.45		3.73				
WHO-2005 TEQ (ND=½)	3.87		3.86				

Client Information			**Sample Information**	
Project Name:	F51247		Report Basis:	Dry
			Matrix:	Soil
Sample ID:	F51247-15		Weight / Volume:	10.16 g
			Solids / Lipids:	84.0 %
			Original pH :	NA
Laboratory Information			Batch ID:	WG14389
Project ID:	G383-584		Instrument:	HRMS1
Sample ID:	G383-584-15B		Filename:	a30jul07a_7-8
Collection Date/Time:	07/23/07	11:55	Retchk:	a30jul07a_6-14
Receipt Date/Time:	07/25/07	10:15	Begin ConCal:	a30jul07a_6-14
Extraction Date:	07/31/07		End ConCal:	a30jul07a_7-13
Analysis Date/Time:	08/02/07	8:26	Initial Cal:	m8290-071007a

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SGS Environmental Services

Method 8290
F51247-15
Accutest

Labeled Standard	Expected Amount (ng)	Measured Amount (ng)	Percent Recovery (%)	RT (min.)	Ratio	Qualifier
Extraction Standards						
13C12-2,3,7,8-TCDD	2.0	1.40	69.9	31:37	0.78	
13C12-1,2,3,7,8-PeCDD	2.0	1.33	66.7	34:25	1.60	
13C12-1,2,3,6,7,8-HxCDD	2.0	1.42	71.2	37:10	1.25	
13C12-1,2,3,4,6,7,8-HpCDD	2.0	1.42	70.8	40:37	1.04	
13C12-OCDD	4.0	2.92	73.1	45:06	0.89	
13C12-2,3,7,8-TCDF	2.0	1.53	76.5	31:04	0.79	
13C12-1,2,3,7,8-PeCDF	2.0	1.25	62.5	33:36	1.60	
13C12-1,2,3,6,7,8-HxCDF	2.0	1.31	65.6	36:27	0.52	
13C12-1,2,3,4,6,7,8-HpCDF	2.0	1.27	63.6	39:19	0.44	
Cleanup Standards						
37Cl4-2,3,7,8-TCDD	0.4	0.310	77.5	31:39	-	
13C12-2,3,4,7,8-PeCDF	0.4	0.230	57.5	34:13	1.65	
13C12-1,2,3,4,7,8-HxCDD	0.4	0.239	59.8	37:04	1.30	
13C12-1,2,3,4,7,8-HxCDF	0.4	0.254	63.5	36:21	0.49	
13C12-1,2,3,4,7,8,9-HpCDF	0.4	0.227	56.8	41:19	0.42	
Injection Standards						
13C12-1,2,3,4-TCDD	2.0	-	-	31:13	0.79	
13C12-1,2,3,7,8,9-HxCDD	2.0	-	-	37:25	1.25	

Client Information			**Sample Information**	
Project Name:	F51247		Report Basis:	Dry
			Matrix:	Soil
Sample ID:	F51247-15		Weight / Volume:	10.16 g
			Solids / Lipids:	84.0 %
			Original pH :	NA
Laboratory Information			Batch ID:	WG14389
Project ID:	G383-584		Instrument:	HRMS1
Sample ID:	G383-584-15B		Filename:	a30jul07a_7-8
Collection Date/Time:	07/23/07	11:55	Retchk:	a30jul07a_6-14
Receipt Date/Time:	07/25/07	10:15	Begin ConCal:	a30jul07a_6-14
Extraction Date:	07/31/07		End ConCal:	a30jul07a_7-13
Analysis Date/Time:	08/02/07	8:26	Initial Cal:	m8290-071007a

Form Version:[8290_DB_2.14]Report

Analyzed by: _____
Date: 8/10/07

Reviewed by: _____
Date: 8/10/07

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SGS Environmental Services

Method 8290
F51247-16
Accutest

Analytical Data Summary Sheet

Analyte	Amount (pg/g)	EDL (pg/g)	EMPC (pg/g)	RT (min.)	Ratio		Qualifier
2,3,7,8-TCDD	ND	0.435					
1,2,3,7,8-PeCDD	EMPC	~~0.695~~	1.08 J	34:25	1.81	*	A
1,2,3,4,7,8-HxCDD	EMPC	~~0.695~~	1.07 J	37:07	1.02	*	A
1,2,3,6,7,8-HxCDD	2.65 J			37:10	1.20		A
1,2,3,7,8,9-HxCDD	1.81 J			37:27	1.35		A
1,2,3,4,6,7,8-HpCDD	66.8			40:39	1.05		
OCDD	999			45:07	0.89		
2,3,7,8-TCDF	0.762 B			31:07	0.87		A
1,2,3,7,8-PeCDF	EMPC	~~0.695~~	1.99 J	33:37	1.84	*	A
2,3,4,7,8-PeCDF	8.02			34:13	1.55		
1,2,3,4,7,8-HxCDF	120			36:22	1.23		
1,2,3,6,7,8-HxCDF	18.7			36:28	1.26		
2,3,4,6,7,8-HxCDF	6.61 J			36:58	1.15		A
1,2,3,7,8,9-HxCDF	2.09 J			37:48	1.13		A
1,2,3,4,6,7,8-HpCDF	559			39:21	1.02		
1,2,3,4,7,8,9-HpCDF	11.1			41:19	1.03		
OCDF	1110			45:25	0.87		
Total TCDDs	~~3.65~~		4.22 J				
Total PeCDDs	~~8.09~~		10.2 J				
Total HxCDDs	~~25.9~~		27.6 J				
Total HpCDDs	125						
Total TCDFs	~~10.2~~		15.1 J				
Total PeCDFs	~~60.7~~		62.7 J				
Total HxCDFs	~~249~~		250 J				
Total HpCDFs	621						
WHO-2005 TEQ (ND=0)	24.7		25.9				
WHO-2005 TEQ (ND=½)	25.3		26.1				

Client Information			**Sample Information**		
Project Name:	F51247		Report Basis:	Dry	
			Matrix:	Soil	
Sample ID:	F51247-16		Weight / Volume:	10.10 g	
			Solids / Lipids:	71.2	%
			Original pH :	NA	
Laboratory Information			Batch ID:	WG14389	
Project ID:	G383-584		Instrument:	HRMS1	
Sample ID:	G383-584-16B		Filename:	a30jul07a_7-9	
Collection Date/Time:	07/23/07	12:05	Retchk:	a30jul07a_6-14	
Receipt Date/Time:	07/25/07	10:15	Begin ConCal:	a30jul07a_6-14	
Extraction Date:	07/31/07		End ConCal:	a30jul07a_7-13	
Analysis Date/Time:	08/02/07	9:14	Initial Cal:	m8290-071007a	

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SGS Environmental Services

Method 8290
F51247-16
Accutest

Labeled Standard	Expected Amount (ng)	Measured Amount (ng)	Percent Recovery (%)	RT (min.)	Ratio	Qualifier
Extraction Standards						
13C12-2,3,7,8-TCDD	2.0	1.50	74.9	31:39	0.79	
13C12-1,2,3,7,8-PeCDD	2.0	1.39	69.7	34:25	1.59	
13C12-1,2,3,6,7,8-HxCDD	2.0	1.53	76.6	37:10	1.25	
13C12-1,2,3,4,6,7,8-HpCDD	2.0	1.60	80.1	40:37	1.06	
13C12-OCDD	4.0	3.19	79.8	45:07	0.89	
13C12-2,3,7,8-TCDF	2.0	1.63	81.6	31:06	0.78	
13C12-1,2,3,7,8-PeCDF	2.0	1.33	66.4	33:36	1.59	
13C12-1,2,3,6,7,8-HxCDF	2.0	1.43	71.3	36:28	0.53	
13C12-1,2,3,4,6,7,8-HpCDF	2.0	1.49	74.3	39:19	0.44	
Cleanup Standards						
37Cl4-2,3,7,8-TCDD	0.4	0.337	84.3	31:39	-	
13C12-2,3,4,7,8-PeCDF	0.4	0.253	63.3	34:13	1.59	
13C12-1,2,3,4,7,8-HxCDD	0.4	0.278	69.6	37:04	1.27	
13C12-1,2,3,4,7,8-HxCDF	0.4	0.293	73.3	36:22	0.49	
13C12-1,2,3,4,7,8,9-HpCDF	0.4	0.261	65.2	41:19	0.41	
Injection Standards						
13C12-1,2,3,4-TCDD	2.0	-	-	31:13	0.79	
13C12-1,2,3,7,8,9-HxCDD	2.0	-	-	37:27	1.25	

Client Information			**Sample Information**	
Project Name:	F51247		Report Basis:	Dry
			Matrix:	Soil
Sample ID:	F51247-16		Weight / Volume:	10.10 g
			Solids / Lipids:	71.2 %
			Original pH :	NA
Laboratory Information			Batch ID:	WG14389
Project ID:	G383-584		Instrument:	HRMS1
Sample ID:	G383-584-16B		Filename:	a30jul07a_7-9
Collection Date/Time:	07/23/07	12:05	Retchk:	a30jul07a_6-14
Receipt Date/Time:	07/25/07	10:15	Begin ConCal:	a30jul07a_6-14
Extraction Date:	07/31/07		End ConCal:	a30jul07a_7-13
Analysis Date/Time:	08/02/07	9:14	Initial Cal:	m8290-071007a

Form Version:[8290_DB_2.14]Report

Analyzed by: _____
Date: 8/2/07

Reviewed by: _____
Date: 8/10/07

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SGS Environmental Services

Method 8290
F51247-17
Accutest

Analytical Data Summary Sheet

Analyte	Amount (pg/g)	EDL (pg/g)	EMPC (pg/g)	RT (min.)	Ratio		Qualifier
2,3,7,8-TCDD	ND	0.497					
1,2,3,7,8-PeCDD	ND	0.575					
1,2,3,4,7,8-HxCDD	EMPC	~~0.842~~	0.890 J	37:04	1.05	*	A
1,2,3,6,7,8-HxCDD	3.38 J			37:10	1.25		A
1,2,3,7,8,9-HxCDD	1.72 J			37:25	1.26		A
1,2,3,4,6,7,8-HpCDD	159			40:37	1.04		
OCDD	9060 J			45:07	0.89		E
2,3,7,8-TCDF	ND	0.393					
1,2,3,7,8-PeCDF	0.387 J			33:37	1.40		A
2,3,4,7,8-PeCDF	0.357 J			34:13	1.76		A
1,2,3,4,7,8-HxCDF	1.16 J			36:22	1.24		A
1,2,3,6,7,8-HxCDF	0.743 J			36:28	1.27		A
2,3,4,6,7,8-HxCDF	0.865 J			36:58	1.28		A
1,2,3,7,8,9-HxCDF	ND	0.682					
1,2,3,4,6,7,8-HpCDF	20.6			39:19	1.07		
1,2,3,4,7,8,9-HpCDF	1.11 J			41:19	1.00		A
OCDF	55.0			45:25	0.88		
Total TCDDs	ND	0.497					
Total PeCDDs	ND	0.575					
Total HxCDDs	~~15.8~~		16.7 J				
Total HpCDDs	294						
Total TCDFs	ND	0.393					
Total PeCDFs	4.56						
Total HxCDFs	17.4						
Total HpCDFs	55.3						
WHO-2005 TEQ (ND=0)	5.45		5.54				
WHO-2005 TEQ (ND=½)	6.08		6.13				

Client Information			**Sample Information**		
Project Name:	F51247		Report Basis:	Dry	
			Matrix:	Soil	
Sample ID:	F51247-17		Weight / Volume:	10.27 g	
			Solids / Lipids:	84.6	%
			Original pH :	NA	
Laboratory Information			Batch ID:	WG14391	
Project ID:	G383-584		Instrument:	HRMS1	
Sample ID:	G383-584-17B		Filename:	a30jul07a_9-13	
Collection Date/Time:	07/23/07	11:30	Retchk:	a30jul07a_7-13	
Receipt Date/Time:	07/25/07	10:15	Begin ConCal:	a30jul07a_7-13	
Extraction Date:	08/01/07		End ConCal:	a30jul07a_9-14	
Analysis Date/Time:	08/03/07	2:36	Initial Cal:	m8290-071007a	

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SGS Environmental Services

Method 8290
F51247-17
Accutest

Labeled Standard	Expected Amount (ng)	Measured Amount (ng)	Percent Recovery (%)	RT (min.)	Ratio	Qualifier
Extraction Standards						
13C12-2,3,7,8-TCDD	2.0	1.61	80.5	31:37	0.78	
13C12-1,2,3,7,8-PeCDD	2.0	1.51	75.5	34:25	1.59	
13C12-1,2,3,6,7,8-HxCDD	2.0	1.69	84.7	37:10	1.25	
13C12-1,2,3,4,6,7,8-HpCDD	2.0	1.74	86.9	40:37	1.07	
13C12-OCDD	4.0	3.76	93.9	45:06	0.90	
13C12-2,3,7,8-TCDF	2.0	1.76	88.2	31:04	0.79	
13C12-1,2,3,7,8-PeCDF	2.0	1.44	72.1	33:37	1.59	
13C12-1,2,3,6,7,8-HxCDF	2.0	1.56	77.9	36:28	0.52	
13C12-1,2,3,4,6,7,8-HpCDF	2.0	1.56	78.2	39:19	0.44	
Cleanup Standards						
37Cl4-2,3,7,8-TCDD	0.4	0.357	89.3	31:39	-	
13C12-2,3,4,7,8-PeCDF	0.4	0.280	70.1	34:13	1.63	
13C12-1,2,3,4,7,8-HxCDD	0.4	0.292	73.1	37:04	1.30	
13C12-1,2,3,4,7,8-HxCDF	0.4	0.300	75.1	36:21	0.50	
13C12-1,2,3,4,7,8,9-HpCDF	0.4	0.278	69.4	41:19	0.43	
Injection Standards						
13C12-1,2,3,4-TCDD	2.0	-	-	31:13	0.79	
13C12-1,2,3,7,8,9-HxCDD	2.0	-	-	37:25	1.27	

Client Information			**Sample Information**	
Project Name:	F51247		Report Basis:	Dry
			Matrix:	Soil
Sample ID:	F51247-17		Weight / Volume:	10.27 g
			Solids / Lipids:	84.6 %
			Original pH :	NA
Laboratory Information			Batch ID:	WG14391
Project ID:	G383-584		Instrument:	HRMS1
Sample ID:	G383-584-17B		Filename:	a30jul07a_9-13
Collection Date/Time:	07/23/07	11:30	Retchk:	a30jul07a_7-13
Receipt Date/Time:	07/25/07	10:15	Begin ConCal:	a30jul07a_7-13
Extraction Date:	08/01/07		End ConCal:	a30jul07a_9-14
Analysis Date/Time:	08/03/07	2:36	Initial Cal:	m8290-071007a

Form Version:[8290_DB_2.14]Report

Analyzed by: _____
Date: 08.14.07

Reviewed by: _____
Date: 8/14/07

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SGS Environmental Services

Method 8290
F51247-18
Accutest

Analytical Data Summary Sheet

Analyte	Amount (pg/g)	EDL (pg/g)	EMPC (pg/g)	RT (min.)	Ratio		Qualifier
2,3,7,8-TCDD	ND	0.679					
1,2,3,7,8-PeCDD	ND	0.834					
1,2,3,4,7,8-HxCDD	ND	0.816					
1,2,3,6,7,8-HxCDD	ND	0.830					
1,2,3,7,8,9-HxCDD	ND	0.842					
1,2,3,4,6,7,8-HpCDD	12.5			40:39	0.96		
OCDD	2660			45:07	0.89		
2,3,7,8-TCDF	EMPC	~~0.430~~	0.410 J	31:07	0.96	*	A
1,2,3,7,8-PeCDF	ND	0.599					
2,3,4,7,8-PeCDF	ND	0.599					
1,2,3,4,7,8-HxCDF	ND	0.669					
1,2,3,6,7,8-HxCDF	ND	0.630					
2,3,4,6,7,8-HxCDF	ND	0.665					
1,2,3,7,8,9-HxCDF	ND	0.774					
1,2,3,4,6,7,8-HpCDF	1.56 B			39:19	1.19		A
1,2,3,4,7,8,9-HpCDF	ND	1.02					
OCDF	2.80 B			45:25	0.94		A
Total TCDDs	1.24						
Total PeCDDs	ND	0.834					
Total HxCDDs	5.32						
Total HpCDDs	35.1						
Total TCDFs	~~ND~~	~~0.430~~	0.410 J				
Total PeCDFs	ND	0.599					
Total HxCDFs	ND	0.774					
Total HpCDFs	1.56 B						
WHO-2005 TEQ (ND=0)	0.939		0.980				
WHO-2005 TEQ (ND=½)	2.08		2.10				

Client Information			**Sample Information**	
Project Name:	F51247		Report Basis:	Dry
			Matrix:	Soil
Sample ID:	F51247-18		Weight / Volume:	10.46 g
			Solids / Lipids:	79.7 %
			Original pH :	NA
Laboratory Information			Batch ID:	WG14391
Project ID:	G383-584		Instrument:	HRMS1
Sample ID:	G383-584-18B		Filename:	a30jul07a_10-13
Collection Date/Time:	07/23/07	11:35	Retchk:	a30jul07a_9-14
Receipt Date/Time:	07/25/07	10:15	Begin ConCal:	a30jul07a_9-14
Extraction Date:	08/01/07		End ConCal:	a30jul07a_10-14
Analysis Date/Time:	08/03/07	13:58	Initial Cal:	m8290-071007a

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SGS Environmental Services

Method 8290
F51247-18
Accutest

Labeled Standard	Expected Amount (ng)	Measured Amount (ng)	Percent Recovery (%)	RT (min.)	Ratio	Qualifier
Extraction Standards						
13C12-2,3,7,8-TCDD	2.0	1.54	77.2	31:39	0.78	
13C12-1,2,3,7,8-PeCDD	2.0	1.42	70.8	34:25	1.58	
13C12-1,2,3,6,7,8-HxCDD	2.0	1.67	83.7	37:10	1.25	
13C12-1,2,3,4,6,7,8-HpCDD	2.0	1.78	88.9	40:37	1.07	
13C12-OCDD	4.0	3.58	89.5	45:07	0.89	
13C12-2,3,7,8-TCDF	2.0	1.74	86.9	31:06	0.80	
13C12-1,2,3,7,8-PeCDF	2.0	1.37	68.4	33:37	1.59	
13C12-1,2,3,6,7,8-HxCDF	2.0	1.50	75.0	36:28	0.52	
13C12-1,2,3,4,6,7,8-HpCDF	2.0	1.55	77.7	39:19	0.44	
Cleanup Standards						
37Cl4-2,3,7,8-TCDD	0.4	0.332	83.1	31:39	-	
13C12-2,3,4,7,8-PeCDF	0.4	0.250	62.5	34:13	1.62	
13C12-1,2,3,4,7,8-HxCDD	0.4	0.300	75.1	37:04	1.27	
13C12-1,2,3,4,7,8-HxCDF	0.4	0.304	76.1	36:22	0.49	
13C12-1,2,3,4,7,8,9-HpCDF	0.4	0.283	70.7	41:19	0.41	
Injection Standards						
13C12-1,2,3,4-TCDD	2.0	-	-	31:13	0.78	
13C12-1,2,3,7,8,9-HxCDD	2.0	-	-	37:25	1.24	

Client Information			**Sample Information**	
Project Name:	F51247		Report Basis:	Dry
			Matrix:	Soil
Sample ID:	F51247-18		Weight / Volume:	10.46 g
			Solids / Lipids:	79.7 %
			Original pH :	NA
Laboratory Information			Batch ID:	WG14391
Project ID:	G383-584		Instrument:	HRMS1
Sample ID:	G383-584-18B		Filename:	a30jul07a_10-13
Collection Date/Time:	07/23/07	11:35	Retchk:	a30jul07a_9-14
Receipt Date/Time:	07/25/07	10:15	Begin ConCal:	a30jul07a_9-14
Extraction Date:	08/01/07		End ConCal:	a30jul07a_10-14
Analysis Date/Time:	08/03/07	13:58	Initial Cal:	m8290-071007a

Form Version:[8290_DB_2.14]Report

Analyzed by: _____
Date: 08-Aug-07

Reviewed by: _____
Date: 8/14/07

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SGS Environmental Services

Method 8290
F51247-19
Accutest

Analytical Data Summary Sheet

Analyte	Amount (pg/g)	EDL (pg/g)	EMPC (pg/g)	RT (min.)	Ratio		Qualifier
2,3,7,8-TCDD	ND	0.192					
1,2,3,7,8-PeCDD	ND	0.554					
1,2,3,4,7,8-HxCDD	EMPC	~~0.554~~	0.202 J	37:06	1.57	*	A
1,2,3,6,7,8-HxCDD	EMPC	~~0.554~~	0.334 J	37:10	0.94	*	A
1,2,3,7,8,9-HxCDD	EMPC	~~0.554~~	0.357 J	37:25	0.93	*	A
1,2,3,4,6,7,8-HpCDD	58.1			40:37	1.03		
OCDD	11400 J			45:07	0.90		E
2,3,7,8-TCDF	0.239 J			31:06	0.79		A
1,2,3,7,8-PeCDF	ND	0.554					
2,3,4,7,8-PeCDF	ND	0.554					
1,2,3,4,7,8-HxCDF	ND	0.554					
1,2,3,6,7,8-HxCDF	ND	0.554					
2,3,4,6,7,8-HxCDF	ND	0.554					
1,2,3,7,8,9-HxCDF	ND	0.554					
1,2,3,4,6,7,8-HpCDF	1.01 B			39:19	1.00		A
1,2,3,4,7,8,9-HpCDF	ND	0.554					
OCDF	1.70 B			45:24	0.88		A
Total TCDDs	ND	0.192					
Total PeCDDs	ND	0.554					
Total HxCDDs	~~2.15~~		3.11 J				
Total HpCDDs	134						
Total TCDFs	0.516						
Total PeCDFs	ND	0.554					
Total HxCDFs	ND	0.554					
Total HpCDFs	1.55 B						
WHO-2005 TEQ (ND=0)	4.04		4.12				
WHO-2005 TEQ (ND=½)	4.70		4.70				

Client Information			**Sample Information**	
Project Name:	F51247		Report Basis:	Dry
			Matrix:	Soil
Sample ID:	F51247-19		Weight / Volume:	11.38 g
			Solids / Lipids:	79.3 %
			Original pH :	NA
Laboratory Information			Batch ID:	WG14391
Project ID:	G383-584		Instrument:	HRMS1
Sample ID:	G383-584-19B		Filename:	a04aug07a-5
Collection Date/Time:	07/23/07	15:50	Retchk:	a04aug07a-1
Receipt Date/Time:	07/25/07	10:15	Begin ConCal:	a04aug07a-1
Extraction Date:	08/01/07		End ConCal:	a04aug07a-15
Analysis Date/Time:	08/04/07	17:00	Initial Cal:	m8290-071007a

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SGS Environmental Services

Method 8290
F51247-19
Accutest

Labeled Standard	Expected Amount (ng)	Measured Amount (ng)	Percent Recovery (%)	RT (min.)	Ratio	Qualifier
Extraction Standards						
13C12-2,3,7,8-TCDD	2.0	1.64	82.2	31:37	0.78	
13C12-1,2,3,7,8-PeCDD	2.0	1.60	79.8	34:25	1.58	
13C12-1,2,3,6,7,8-HxCDD	2.0	1.79	89.3	37:10	1.26	
13C12-1,2,3,4,6,7,8-HpCDD	2.0	1.75	87.6	40:37	1.05	
13C12-OCDD	4.0	3.83	95.7	45:06	0.90	
13C12-2,3,7,8-TCDF	2.0	1.83	91.7	31:04	0.79	
13C12-1,2,3,7,8-PeCDF	2.0	1.47	73.7	33:37	1.57	
13C12-1,2,3,6,7,8-HxCDF	2.0	1.63	81.6	36:27	0.53	
13C12-1,2,3,4,6,7,8-HpCDF	2.0	1.59	79.5	39:19	0.44	
Cleanup Standards						
37Cl4-2,3,7,8-TCDD	0.4	0.360	89.9	31:39	-	
13C12-2,3,4,7,8-PeCDF	0.4	0.297	74.2	34:13	1.60	
13C12-1,2,3,4,7,8-HxCDD	0.4	0.292	72.9	37:04	1.24	
13C12-1,2,3,4,7,8-HxCDF	0.4	0.309	77.3	36:21	0.52	
13C12-1,2,3,4,7,8,9-HpCDF	0.4	0.277	69.3	41:19	0.42	
Injection Standards						
13C12-1,2,3,4-TCDD	2.0	-	-	31:13	0.77	
13C12-1,2,3,7,8,9-HxCDD	2.0	-	-	37:25	1.25	

Client Information			**Sample Information**	
Project Name:	F51247		Report Basis:	Dry
			Matrix:	Soil
Sample ID:	F51247-19		Weight / Volume:	11.38 g
			Solids / Lipids:	79.3 %
			Original pH :	NA
Laboratory Information			Batch ID:	WG14391
Project ID:	G383-584		Instrument:	HRMS1
Sample ID:	G383-584-19B		Filename:	a04aug07a-5
Collection Date/Time:	07/23/07	15:50	Retchk:	a04aug07a-1
Receipt Date/Time:	07/25/07	10:15	Begin ConCal:	a04aug07a-1
Extraction Date:	08/01/07		End ConCal:	a04aug07a-15
Analysis Date/Time:	08/04/07	17:00	Initial Cal:	m8290-071007a

Form Version:[8290_DB_2.14]Report

Analyzed by: _____
Date: 080807

Reviewed by: _____
Date: 8/10/07

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SGS Environmental Services

Method 8290
F51247-20
Accutest

Analytical Data Summary Sheet

Analyte	Amount (pg/g)	EDL (pg/g)	EMPC (pg/g)	RT (min.)	Ratio	Qualifier
2,3,7,8-TCDD	ND	0.203				
1,2,3,7,8-PeCDD	ND	0.539				
1,2,3,4,7,8-HxCDD	ND	0.539				
1,2,3,6,7,8-HxCDD	ND	0.539				
1,2,3,7,8,9-HxCDD	ND	0.539				
1,2,3,4,6,7,8-HpCDD	33.6			40:37	1.05	
OCDD	4630 J			45:07	0.90	E
2,3,7,8-TCDF	0.274 J			31:04	0.74	A
1,2,3,7,8-PeCDF	ND	0.539				
2,3,4,7,8-PeCDF	ND	0.539				
1,2,3,4,7,8-HxCDF	ND	0.539				
1,2,3,6,7,8-HxCDF	ND	0.539				
2,3,4,6,7,8-HxCDF	ND	0.539				
1,2,3,7,8,9-HxCDF	ND	0.539				
1,2,3,4,6,7,8-HpCDF	0.891 B			39:21	1.03	A
1,2,3,4,7,8,9-HpCDF	ND	0.539				
OCDF	1.28 B			45:25	0.94	A
Total TCDDs	ND	0.203				
Total PeCDDs	ND	0.539				
Total HxCDDs	0.630					
Total HpCDDs	71.7					
Total TCDFs	0.403					
Total PeCDFs	ND	0.539				
Total HxCDFs	0.345					
Total HpCDFs	0.891 B					
WHO-2005 TEQ (ND=0)	1.76		1.76			
WHO-2005 TEQ (ND=½)	2.41		2.41			

Client Information			**Sample Information**		
Project Name:	F51247		Report Basis:	Dry	
			Matrix:	Soil	
Sample ID:	F51247-20		Weight / Volume:	10.66 g	
			Solids / Lipids:	87.0	%
			Original pH :	NA	
Laboratory Information			Batch ID:	WG14391	
Project ID:	G383-584		Instrument:	HRMS1	
Sample ID:	G383-584-20B		Filename:	a04aug07a-6	
Collection Date/Time:	07/23/07	16:00	Retchk:	a04aug07a-1	
Receipt Date/Time:	07/25/07	10:15	Begin ConCal:	a04aug07a-1	
Extraction Date:	08/01/07		End ConCal:	a04aug07a-15	
Analysis Date/Time:	08/04/07	17:48	Initial Cal:	m8290-071007a	

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SGS Environmental Services

Method 8290
F51247-20
Accutest

Labeled Standard	Expected Amount (ng)	Measured Amount (ng)	Percent Recovery (%)	RT (min.)	Ratio	Qualifier
Extraction Standards						
13C12-2,3,7,8-TCDD	2.0	1.55	77.3	31:37	0.78	
13C12-1,2,3,7,8-PeCDD	2.0	1.49	74.6	34:25	1.59	
13C12-1,2,3,6,7,8-HxCDD	2.0	1.64	81.9	37:10	1.26	
13C12-1,2,3,4,6,7,8-HpCDD	2.0	1.60	80.1	40:37	1.06	
13C12-OCDD	4.0	3.24	81.0	45:06	0.89	
13C12-2,3,7,8-TCDF	2.0	1.72	85.9	31:04	0.79	
13C12-1,2,3,7,8-PeCDF	2.0	1.36	68.1	33:36	1.58	
13C12-1,2,3,6,7,8-HxCDF	2.0	1.50	74.8	36:27	0.52	
13C12-1,2,3,4,6,7,8-HpCDF	2.0	1.43	71.6	39:19	0.44	
Cleanup Standards						
37Cl4-2,3,7,8-TCDD	0.4	0.334	83.5	31:39	-	
13C12-2,3,4,7,8-PeCDF	0.4	0.282	70.5	34:13	1.59	
13C12-1,2,3,4,7,8-HxCDD	0.4	0.266	66.4	37:04	1.26	
13C12-1,2,3,4,7,8-HxCDF	0.4	0.290	72.6	36:21	0.51	
13C12-1,2,3,4,7,8,9-HpCDF	0.4	0.250	62.6	41:19	0.42	
Injection Standards						
13C12-1,2,3,4-TCDD	2.0	-	-	31:13	0.78	
13C12-1,2,3,7,8,9-HxCDD	2.0	-	-	37:25	1.26	

Client Information			**Sample Information**	
Project Name:	F51247		Report Basis:	Dry
			Matrix:	Soil
Sample ID:	F51247-20		Weight / Volume:	10.66 g
			Solids / Lipids:	87.0 %
			Original pH :	NA
Laboratory Information			Batch ID:	WG14391
Project ID:	G383-584		Instrument:	HRMS1
Sample ID:	G383-584-20B		Filename:	a04aug07a-6
Collection Date/Time:	07/23/07	16:00	Retchk:	a04aug07a-1
Receipt Date/Time:	07/25/07	10:15	Begin ConCal:	a04aug07a-1
Extraction Date:	08/01/07		End ConCal:	a04aug07a-15
Analysis Date/Time:	08/04/07	17:48	Initial Cal:	m8290-071007a

Form Version:[8290_DB_2.14]Report

Analyzed by: _____
Date: 080807

Reviewed by: _____
Date: 8/10/07

Shaw Environmental, Inc.
2113 Emmorton Park Road
Edgewood, Maryland
410-612-6350
FAX: 410-612-6351

Shaw® Shaw Environmental, Inc.

MEMORANDUM

TO: Jeff Parks, Shaw E&I Radford Army Ammunition Plant (RFAAP) Project Manager

FROM: Eric Malarek, Shaw E&I Project Chemist

SUBJECT: RFAAP Data Validation – Explosives, PETN, & Nitroglycerin
Accutest Laboratories, Inc., SDG F51247

DATE: December 10, 2007

The purpose of this memorandum is to present the data validation report for the samples collected at collected at Main Manufacturing Area at RFAAP for a RFI/CMS Nine Sites on July 23, 2007. Solid samples were analyzed for explosives, nitroglycerin, and PETN using USEPA SW-846 8330A. A total of twenty solid samples were validated. The sample Ids are:

Field Sample ID	Lab Sample ID	Field Sample ID	Lab Sample ID
50SB06A	F51247-1	50SB011A	F51247-11
50SB06B	F51247-2	50SB011B	F51247-12
50SB07A	F51247-3	50SB012A	F51247-13
50SB07B	F51247-4	50SB012B	F51247-14
50SB08A	F51247-5	50SB013A	F51247-15
50SB08B	F51247-6	50SB013B	F51247-16
50SB09A	F51247-7	50SB014A	F51247-17
50SB09B	F51247-8	50SB014B	F51247-18
50SB010A	F51247-9	50SB015A	F51247-19
50SB010B	F51247-10	50SB015B	F51247-20

Data were reviewed by Eric Malarek and validated using a combination of project QAPP, *Quality Systems Manual for Environmental Laboratories, Final Version 3, January, 2006* (DoD, 2006) (DoD QSM), method-specific criteria, and laboratory SOP criteria. The data qualifier scheme was consistent with the *Region III Modifications to the National Functional Guidelines for Organic Data Review* (September 1994). Parameters evaluated are presented in **Table 1**. Data associated with parameters in compliance with quality control specifications have not been qualified. Data associated with parameters that did not comply with quality control specifications and directly impacted project data have been qualified in accordance with USEPA Region III specifications.

Table 1 Laboratory Performance Criteria

Qualified		Parameter
Yes	No	
	X	Holding Times and Preservation
	X	Blank Analysis
	X	Initial Calibration
	X	Continuing Calibration
	X	System Monitoring Compounds
	X	Laboratory Control Sample
	X	Matrix Spike/Spike Duplicate
	X	Field Duplicate
X		Quantitation Verification

The quality of data collected in support of this sampling activity is considered acceptable with noted qualifications.

Eric Malarek, Chemist

12/10/07
Date

RFAAP VALIDATION REPORT
EXPLOSIVES REVIEW
SDG F51247

I-Holding Times and Preservation

The objective is to ascertain the validity of results based on the holding time of the sample from time of collection to time of sample extraction and analysis. Holding time criteria: For solid samples, explosive compounds are shipped cooled (@4°C ± 2°C) with a maximum holding time of 14 days from sample collection to preparative extraction and 40 days from preparative extraction to determinative analysis.

- Temperature Review: The temperature blank was sent with each cooler and recorded by the laboratory upon receipt. For samples collected on 07/23/07, the coolers were received by the primary laboratory (Accutest) on 07/20/07 at 2.8°C, and 3.2°C. The herbicides were subcontracted to Accutest TX and were received the samples at 3.4°C. The dioxin subcontract laboratory (SGS Paradigm Analytical Laboratories, Inc.) received the samples at 1.2°C. Even though the receipt temperature was below criteria for some coolers, there were no impacts to the data quality. No qualifiers were applied based upon this outlier.

- Holding Time Review: The solid samples were collected on 07/23/07. For the solid samples, the explosives were extracted on 08/06/07 and analyzed on 08/07/07 and 08/08/07. All criteria were met. No qualifiers were applied.

II-Blank Analysis

The purpose of laboratory or field blank analyses is to determine the existence and magnitude of contamination problems resulting from laboratory or field activities. One method blank per analytical batch must be run on each instrument used to analyze samples. No contaminants should be present in the blanks. The DoD QSM criterion specifies all concentrations should be less than one-half MRL. Positive sample results are reported and qualified "B", if the concentration of the compound in the sample is ≤5 times (5x) the maximum amount for explosive target compounds. **Table 2** summarizes the blank contamination analysis. Action levels are based upon dilution factor of one and for solid matrices were converted to soil values (soil conversion factor = 10) if needed. Rinse blanks 072407R (F51275-1) and 072507R (F51300-31) apply to the surface soil "SS" and subsurface soil "SB" samples in this SDG.

Table 2 Blank Contamination Analysis Summary

Analysis Date	QC Blank ID	Compound	Max Conc. µg/kg	Action Level µg/kg	B qualified samples
08/07/07	OP21756-MB	All target explosives <½MRL	NA	NA	None
08/08/07	OP21756-MB	All target explosives <½MRL	NA	NA	None
08/08/07	OP21756-MB	All target explosives <½MRL	NA	NA	None
08/07/07	OP21756-MB	PETN & NG <½MRL	NA	NA	None
08/01/07	072407R	All target explosives <½MRL	NA	NA	None
08/01/07	072407R	PETN & NG <½MRL	NA	NA	None
08/01/07	072507R	All target explosives <½MRL	NA	NA	None
08/01/07	072507R	PETN & NG <½MRL	NA	NA	None

MRL = Method Reporting Limit
NA = Not Applicable

III-Initial Calibration

Compliance requirements for satisfactory instrument calibration are established to ensure that the instrument is capable of producing acceptable qualitative and quantitative data for the target compounds. The initial 5-point calibration demonstrates that the instrument is capable of acceptable performance in the beginning of the analytical run. The DoD QSM specifies that the correlation coefficient must be ≥0.995 and/or the percent relative standard deviation (%RSD) must be ≤20%. All detects were qualified as estimated "J" for where there were exceeding %RSDs, and all non-detects were qualified as estimated "UJ" for where there were grossly exceeding recoveries. Grossly exceeding is defined as twice the established criteria limits.

- For the explosives initial calibration performed on 10/18/06 on instrument G1315B, all criteria were met for target explosives compounds. All compounds were determined using calibration factors with RSDs ≤20%. No qualifiers were applied. Samples 50SB06A (F51247-1), 50SB06B (F51247-2), 50SB07A (F51247-3), 50SB07B (F51247-4), 50SB08A (F51247-5), 50SB08B (F51247-6), 50SB09A (F51247-7), 50SB09B (F51247-8), 50SB010A (F51247-9), 50SB010B (F51247-10), 50SB011A (F51247-11), 50SB011B (F51247-12), 50SB012A (F51247-13), 50SB012B (F51247-14), 50SB013A (F51247-15), 50SB013B (F51247-16), 50SB014A (F51247-17), 50SB014B (F51247-18), 50SB015A (F51247-19), and 50SB015B (F51247-20) apply to this initial calibration.

- For the explosives initial calibration performed on 01/19/07 on instrument G1315B, all criteria were met for target explosives compounds. All compounds were determined using calibration factors with RSDs ≤20%. No qualifiers were applied. Confirmations for samples 50SB06B (F51247-2), 50SB07A (F51247-3), 50SB08A (F51247-5), 50SB08B (F51247-6), 50SB012B (F51247-14), and 50SB014A (F51247-17) apply to this initial calibration.

- For the PETN and nitroglycerine initial calibration performed on 03/15/07 on instrument G1315B, all criteria were met for target compounds. All compounds were determined using calibration factors with RSDs ≤20%. No qualifiers were applied. Samples 50SB06A (F51247-1), 50SB06B (F51247-2), 50SB07A (F51247-3), 50SB07B (F51247-4), 50SB08A (F51247-5), 50SB08B (F51247-6), 50SB09A (F51247-7), 50SB09B (F51247-8), 50SB010A (F51247-9), 50SB010B (F51247-10), 50SB011A (F51247-11), 50SB011B (F51247-12), 50SB012A (F51247-13), 50SB012B (F51247-14), 50SB013A (F51247-15), 50SB013B (F51247-16), 50SB014A (F51247-17), 50SB014B (F51247-18), 50SB015A (F51247-19), and 50SB015B (F51247-20) apply to this initial calibration.

IV-Continuing Calibration
Compliance requirements for satisfactory instrument calibration are established to ensure that the instrument is capable of producing acceptable qualitative and quantitative data for the target compounds. Continuing calibration standards are analyzed after every 10 injections, and at the end of the analysis sequence. The DoD QSM specifies that the percent difference (%D) from initial calibration should be no greater than ±20%. All detects were qualified as estimated "J" for where there were exceeding %Ds, and all non-detects were qualified as estimated "UJ" for where there were grossly exceeding recoveries. Grossly exceeding is defined as twice the established criteria limits.

- For explosives initial calibration verification performed on 10/18/06 @17:39 on instrument G1315B, all criteria were met for target compounds. No qualifiers were applied. No samples reported apply to this initial verification calibration.

- For explosives initial calibration verification performed on 10/19/06 @13:44 on instrument G1315B, all criteria were met for target compounds. No qualifiers were applied. No samples reported apply to this initial verification calibration.

- For explosives continuing calibration performed on 08/07/07 @19:18 on instrument G1315B, all criteria were met for target compounds. No qualifiers were applied. Samples 50SB06A (F51247-1), 50SB06B (F51247-2), 50SB07A (F51247-3), 50SB07B (F51247-4), 50SB08A (F51247-5), 50SB08B (F51247-6), and 50SB09A (F51247-7) apply to this continuing calibration.

- For explosives continuing calibration performed on 08/08/07 @00:22 on instrument G1315B, all criteria were met for target compounds. No qualifiers were applied. Samples 50SB09B (F51247-8), 50SB010A (F51247-9), 50SB010B (F51247-10), 50SB011A (F51247-11), 50SB011B (F51247-12), 50SB012A (F51247-13), and 50SB012B (F51247-14) apply to this continuing calibration.

- For explosives continuing calibration performed on 08/08/07 @05:25 on instrument G1315B, all criteria were met for target compounds. No qualifiers were applied. No samples reported apply to this continuing calibration.

- For explosives continuing calibration performed on 08/08/07 @13:48 on instrument G1315B, all criteria were met for target compounds. No qualifiers were applied. Samples 50SB013A (F51247-15), 50SB013B (F51247-16), 50SB014A (F51247-17), 50SB014B (F51247-18), 50SB015A (F51247-19), and 50SB015B (F51247-20) apply to this continuing calibration.

- For explosives continuing calibration performed on 08/08/07 @18:51 on instrument G1315B, all criteria were met for target compounds. No qualifiers were applied. No samples reported apply to this continuing calibration.

- For explosives initial calibration verification performed on 01/19/07 @14:58 on instrument G1315B, all criteria were met for target compounds. No qualifiers were applied. No samples reported apply to this initial verification calibration.

- For explosives continuing calibration performed on 08/08/07 @11:46 on instrument G1315B, all criteria were met for target compounds. No qualifiers were applied. Confirmations for samples 50SB06B (F51247-2), 50SB07A (F51247-3), 50SB08A (F51247-5), 50SB08B (F51247-6), 50SB012B (F51247-14), and 50SB014A (F51247-17) apply to this continuing calibration.

- For explosives continuing calibration performed on 08/08/07 @15:08 on instrument G1315B, all criteria were met for target compounds. No qualifiers were applied. No samples reported apply to this continuing calibration.

- For PETN and nitroglycerin initial calibration verification performed on 03/15/07 @12:35 on instrument G1315B, all criteria were met for target compounds. No qualifiers were applied. No samples reported apply to this continuing calibration.

- For PETN and nitroglycerin continuing calibration performed on 08/07/07 @15:38 on instrument G1315B, all criteria were met for target compounds. No qualifiers were applied. Samples 50SB06A (F51247-1), 50SB06B (F51247-2), 50SB07A (F51247-3), 50SB07B (F51247-4), 50SB08A (F51247-5), and 50SB08B (F51247-6) apply to this continuing calibration.

- For PETN and nitroglycerin continuing calibration performed on 08/07/07 @17:03 on instrument G1315B, all criteria were met for target compounds. No qualifiers were applied. Samples 50SB09A (F51247-7), 50SB09B (F51247-8), 50SB010A (F51247-9), 50SB010B (F51247-10), 50SB011A (F51247-11), 50SB011B (F51247-12), 50SB012A (F51247-13), and 50SB012B (F51247-14) apply to this continuing calibration.

- For PETN and nitroglycerin continuing calibration performed on 08/07/07 @18:31 on instrument G1315B, all criteria were met for target compounds. No qualifiers were applied. Samples 50SB013A (F51247-15), 50SB013B (F51247-16), 50SB014A (F51247-17), 50SB014B (F51247-18), 50SB015A (F51247-19), and 50SB015B (F51247-20) apply to this continuing calibration.

- For PETN and nitroglycerin continuing calibration performed on 08/07/07 @19:39 on instrument G1315B, all criteria were met for target compounds. No qualifiers were applied. No samples reported apply to this continuing calibration.

V-System Monitoring Compound (Surrogates)
Laboratory performance on individual samples is established by means of spiking activities. The percent recovery (%R) for all samples and blanks must be within the laboratory control limits. DoD surrogate recovery limits are specified in Table D-3 of the DoD QSM (DoD, 2006). If the surrogate is not listed, then the laboratory criteria shall be used.

Aqueous Criteria:	3,4-dinitrotoluene (70-136%)
Solid Criteria:	3,4-dinitrotoluene (72-145%)

- All criteria were met for explosives, PETN, and nitroglycerin. No qualifiers were applied.

VI-Laboratory Control Sample
Laboratory control samples (LCS) are used to monitor long-term accuracy of the analytical method. The analysis is performed at a frequency of 1 per analytical batch. The percent recoveries (%Rs) must be within the laboratory control limits. DoD QSM solid LCS recovery limits are specified in Table D-2 and Table D-13 of the DoD QSM (DoD, 2006). If the compound is not listed, then the laboratory criteria shall be used.

- Sample OP21756-BS was used as solid LCS for explosives analyzed on 08/07/07. All criteria were met. No qualifiers were applied. Samples 50SB06A (F51247-1), 50SB06B (F51247-2), 50SB07A (F51247-3), 50SB07B (F51247-4), 50SB08A (F51247-5), 50SB08B (F51247-6), 50SB09A (F51247-7), 50SB09B (F51247-8), 50SB010A (F51247-9), 50SB010B (F51247-10), 50SB011A (F51247-11), 50SB011B (F51247-12), 50SB012A (F51247-13), 50SB012B (F51247-14), 50SB013A (F51247-15), 50SB013B (F51247-16), 50SB014A (F51247-17), 50SB014B (F51247-18), 50SB015A (F51247-19), and 50SB015B (F51247-20) apply to this LCS.

- Sample OP22176-BS was used as solid LCS for explosives analyzed on 08/08/07. HMX (138%) was outside DoD QSM criteria and within laboratory criteria. HMX was non-detect for all associated samples; therefore, no qualifiers were applied based upon this outlier. Confirmations for samples 50SB06B (F51247-2), 50SB07A (F51247-3), 50SB08A (F51247-5), 50SB08B (F51247-6), 50SB012B (F51247-14), and 50SB014A (F51247-17) apply to this LCS.

- Sample OP21756-BS2 was used as solid LCS for PETN and nitroglycerin analyzed on 08/07/07. All criteria were met. No qualifiers were applied. Samples 50SB06A (F51247-1), 50SB06B (F51247-2), 50SB07A (F51247-3), 50SB07B (F51247-4), 50SB08A (F51247-5), 50SB08B (F51247-6), 50SB09A (F51247-7), 50SB09B (F51247-8), 50SB010A (F51247-9), 50SB010B (F51247-10), 50SB011A (F51247-11), 50SB011B (F51247-12), 50SB012A (F51247-13), 50SB012B (F51247-14), 50SB013A (F51247-15), 50SB013B (F51247-16), 50SB014A (F51247-17), 50SB014B (F51247-18), 50SB015A (F51247-19), and 50SB015B (F51247-20) apply to this LCS.

VII-Matrix Spike/Matrix Spike Duplicate

Data for matrix spike/matrix spike duplicates (MS/MSD) are generated to determine long-term precision and accuracy of the analytical method on various matrices and to demonstrate acceptable compound recovery by the laboratory at the time of sample analysis. The percent recoveries (%Rs) and the relative percent difference (RPD) must be within the laboratory control limits. DoD QSM solid MS/MSD recovery limits follow the LCS criteria and are specified in Table D-2 and Table D-13 of the DoD QSM (DoD, 2006). If the compound is not listed, then the laboratory criteria shall be used.

- Sample APSD01 (F51154-18) was used as the solid MS/MSD for the explosive analysis on 08/08/07. 2,6-Dinitrotoluene (RPD=18%) was outside DoD QSM criteria and/or laboratory criteria. The spiked sample was non-detect for this compound; therefore, no qualifiers were applied based upon this outlier. The associated LCS (Section VI) was within criteria. Samples 50SB06A (F51247-1), 50SB06B (F51247-2), 50SB07A (F51247-3), 50SB07B (F51247-4), 50SB08A (F51247-5), 50SB08B (F51247-6), 50SB09A (F51247-7), 50SB09B (F51247-8), 50SB010A (F51247-9), 50SB010B (F51247-10), 50SB011A (F51247-11), 50SB011B (F51247-12), 50SB012A (F51247-13), 50SB012B (F51247-14), 50SB013A (F51247-15), 50SB013B (F51247-16), 50SB014A (F51247-17), 50SB014B (F51247-18), 50SB015A (F51247-19), and 50SB015B (F51247-20) apply to this MS/MSD.

- Sample 50SB09A (F51247-7) was used as the solid MS/MSD for the PETN and nitroglycerin analysis on 08/07/07. All criteria were met. No qualifiers were applied. Samples 50SB06A (F51247-1), 50SB06B (F51247-2), 50SB07A (F51247-3), 50SB07B (F51247-4), 50SB08A (F51247-5), 50SB08B (F51247-6), 50SB09A (F51247-7), 50SB09B (F51247-8), 50SB010A (F51247-9), 50SB010B (F51247-10), 50SB011A (F51247-11), 50SB011B (F51247-12), 50SB012A (F51247-13), 50SB012B (F51247-14), 50SB013A (F51247-15), 50SB013B (F51247-16), 50SB014A (F51247-17), 50SB014B (F51247-18), 50SB015A (F51247-19), and 50SB015B (F51247-20) apply to this MS/MSD.

VIII-Field Duplicate Sample Analysis

Field duplicates were collected to identify the cumulative precision of the sampling and analytical process and sent to the laboratory blind. The RPD was calculated only for those analytes which were detected at levels exceeding the method reporting limits in both samples of the duplicate pair. Analytes that were rejected (R-qualified) in either sample of the duplicate pair were excluded from the duplicate assessment. Precision control criterion was established at 50% RPD for the solid samples. Analytical results were qualified as estimated (J) for any RPDs exceeding criteria.

- No project specific solid field duplicate was analyzed with this SDG; therefore, it was not evaluated.

IX-Quantitation Verification
The accuracy of analytical results was verified through the calculation of several parameters. The calculation was based calibration factors. The absolute percent difference (%D) between the calculated and the reported value must be within 10% difference. All values >MDL and <MRL or <3*MDL (whichever was greater) were qualified as estimated "J".

- The %D between the primary and secondary columns was within criteria for all detected explosives, PETN, and nitroglycerin.

Sample: 50SB06B (F51247-2), 2,4,6-trinitrotoluene

Conc. µg/kg = (Ax * Vt * DF) / (CF * Ws * D)

where: Conc. = Sample concentration in µg/kg
Ax = Area of characteristic ion for compound being measured.
Vt = Volume of total extract (mL).
CF = Average relative calibration factor for compound being measured (from ICAL)
W(s) = Weight of sample in kilograms.
D = Percent dry weight (100 - % moisture in sample)/100 (Air dried =1)
DF = Dilution factor

Conc. µg/kg = (72962 * 20 * 1) / (7320 * 2.16 * 1) = 92.3 µg/kg (Signal #1)
Reported Value = 92.3 µg/kg
% Difference = 0.0%
Values were within 10% difference

Sample: 50SB09AMS (F51247-7MS), nitroglycerin

Conc. µg/kg = (Ax * Vt * DF) / (CF * Ws * D)

where: Conc. = Sample concentration in µg/kg
Ax = Area of characteristic ion for compound being measured.
Vt = Volume of total extract (mL).
CF = Average relative calibration factor for compound being measured (from ICAL)
W(s) = Weight of sample in kilograms.
D = Percent dry weight (100 - % moisture in sample)/100
DF = Dilution factor

Conc. µg/kg = (3335480 * 20 * 1) / (1228 * 2.12 * 1) = 25600 µg/kg (Signal #1)
Reported Value = 25600 µg/kg
% Difference = 0.0%
Values were within 10% difference

USEPA Region III Validation Qualifiers

(No Code) = Confirmed identification.

B = The analyte has been detected in the sample and the associated laboratory or field blank.

J = Indicates an estimated value for (1) estimated value due to QC non-conformance. Reported value may not be accurate or precise, (2) estimating a concentration as a tentatively identified compound as indicated by the mass spectral and retention time data, or (3) estimating a concentration ≥ MDL and <MRL or <3*MDL, whichever is greater.

K = Analyte present. Reported value may be biased high (estimated) due to QC non-conformance.

L = Analyte present. Reported value may be biased low (estimated) due to QC non-conformance.

R = Unreliable result. Analyte may or may not be present in the sample due to QC non-conformance.

UL = Value is estimated bias low and not detected due to QC non-conformance. Reporting limit may be inaccurate or imprecise. Quantitation limit is probably higher.

UJ = Value is estimated and not detected due to QC non-conformance. Reporting limit may be inaccurate or imprecise.

Laboratory Qualifiers

(No Code) = Confirmed identification.

U = Not detected. The associated number indicates the compound reporting limit for the sample.

A (Dioxins) = B (Metals) = The reported value was obtained from a reading <MRL and ≥MDL and is considered estimated.

B (Organics) = The analyte or compound has been detected in the sample and laboratory method blank. It indicates probable blank contamination.

E (Metals) = Reported value is estimated because of the presence of interferences.

E (Organics) = Identifies compounds whose concentrations exceed the upper level of the calibration range.

EMPC (Dioxins) = The ion-abundance ratio between the two characteristic PCDD/PCDF ions was outside accepted ranges. The detected PCDD/PCDF was reported as an estimated maximum possible concentration (EMPC).

D = Indicates sample was analyzed at a dilution.

J = Indicates an estimated value for (1) estimating a concentration as a tentatively identified compound as indicated by the mass spectral and retention time data, or (2) estimating a concentration <MRL and ≥ MDL.

N (Organics) = Indicates presumptive evidence of a compound for tentatively identified compounds using a library search.

N (Metals) = Laboratory spike sample recovery not within control limits.

P (Organics) = Target analyte confirmation >40% difference for detected compound between the primary and secondary columns. The lower of the two values was reported.

* (Metals) = Duplicate analysis not within control limits.

* (Organics) = Surrogate outside of QC limits on both original and re-analysis.

Raw Data: GG023178.D PP022074.D

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Report of Analysis

Client Sample ID:	50SB06A		
Lab Sample ID:	F51247-1	**Date Sampled:**	07/23/07
Matrix:	SO - Soil	**Date Received:**	07/24/07
Method:	SW846 8330A SW846 8330A	**Percent Solids:**	88.8
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GG023178.D	1	08/07/07	NAF	08/06/07	OP21756	GGG994
Run #2	PP022074.D	1	08/07/07	NAF	08/06/07	OP21756	GPP764

	Initial Weight	Final Volume
Run #1	2.09 g	20.0 ml
Run #2	2.09 g	20.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q
2691-41-0	HMX	ND	240	50	ug/kg	
121-82-4	RDX	ND	240	48	ug/kg	
99-65-0	1,3-Dinitrobenzene	ND	240	48	ug/kg	
606-20-2	2,6-Dinitrotoluene	ND	240	85	ug/kg	
121-14-2	2,4-Dinitrotoluene	ND	240	48	ug/kg	
35572-78-2	2-amino-4,6-Dinitrotoluene	ND	240	48	ug/kg	
19406-51-0	4-amino-2,6-Dinitrotoluene	ND	240	52	ug/kg	
98-95-3	Nitrobenzene	ND	240	68	ug/kg	
88-72-2	o-Nitrotoluene	ND	240	74	ug/kg	
99-08-1	m-Nitrotoluene	ND	240	99	ug/kg	
99-99-0	p-Nitrotoluene	ND	240	66	ug/kg	
479-45-8	Tetryl	ND	480	130	ug/kg	
99-35-4	1,3,5-Trinitrobenzene	ND	240	56	ug/kg	
118-96-7	2,4,6-Trinitrotoluene	ND	240	48	ug/kg	
55-63-0	Nitroglycerine	ND [a]	1900	720	ug/kg	
78-11-5	PETN	ND [a]	1900	720	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
610-39-9	3,4-Dinitrotoluene	106%	104%	72-145%

(a) Result is from Run# 2

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	50SB06B		
Lab Sample ID:	F51247-2	Date Sampled:	07/23/07
Matrix:	SO - Soil	Date Received:	07/24/07
Method:	SW846 8330A SW846 8330A	Percent Solids:	59.6
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	GG023179.D	1	08/07/07	NAF	08/06/07	OP21756	GGG994
Run #2	PP022075.D	1	08/07/07	NAF	08/06/07	OP21756	GPP764
Run #3 [b]	PP022105.D	1	08/08/07	NAF	08/06/07	OP21756	GPP765

	Initial Weight	Final Volume
Run #1	2.16 g	20.0 ml
Run #2	2.16 g	20.0 ml
Run #3	2.16 g	20.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q
2691-41-0	HMX	ND	230	48	ug/kg	
121-82-4	RDX	ND	230	46	ug/kg	
99-65-0	1,3-Dinitrobenzene	ND	230	46	ug/kg	
606-20-2	2,6-Dinitrotoluene	ND	230	82	ug/kg	
121-14-2	2,4-Dinitrotoluene	ND	230	46	ug/kg	
35572-78-2	2-amino-4,6-Dinitrotoluene	ND	230	46	ug/kg	
19406-51-0	4-amino-2,6-Dinitrotoluene	ND	230	50	ug/kg	
98-95-3	Nitrobenzene	ND	230	66	ug/kg	
88-72-2	o-Nitrotoluene	ND	230	71	ug/kg	
99-08-1	m-Nitrotoluene	ND	230	95	ug/kg	
99-99-0	p-Nitrotoluene	ND	230	64	ug/kg	
479-45-8	Tetryl	ND	460	130	ug/kg	
99-35-4	1,3,5-Trinitrobenzene	ND	230	55	ug/kg	
118-96-7	2,4,6-Trinitrotoluene	92.3 J	230	46	ug/kg	J
55-63-0	Nitroglycerine	ND [c]	1900	690	ug/kg	
78-11-5	PETN	ND [c]	1900	690	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Run# 3	Limits
610-39-9	3,4-Dinitrotoluene	93%	91%	98%	72-145%

(a) All hits confirmed by reanalysis on a dissimilar column.
(b) Confirmation run.
(c) Result is from Run# 2

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: GG023180.D PP022076.D PP022106.D

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Report of Analysis

Client Sample ID:	50SB07A		
Lab Sample ID:	F51247-3	**Date Sampled:**	07/23/07
Matrix:	SO - Soil	**Date Received:**	07/24/07
Method:	SW846 8330A SW846 8330A	**Percent Solids:**	88.4
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	GG023180.D	1	08/07/07	NAF	08/06/07	OP21756	GGG994
Run #2	PP022076.D	1	08/07/07	NAF	08/06/07	OP21756	GPP764
Run #3 [b]	PP022106.D	1	08/08/07	NAF	08/06/07	OP21756	GPP765

	Initial Weight	Final Volume
Run #1	2.32 g	20.0 ml
Run #2	2.32 g	20.0 ml
Run #3	2.32 g	20.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q
2691-41-0	HMX	ND	220	45	ug/kg	
121-82-4	RDX	ND	220	43	ug/kg	
99-65-0	1,3-Dinitrobenzene	ND	220	43	ug/kg	
606-20-2	2,6-Dinitrotoluene	ND	220	77	ug/kg	
121-14-2	2,4-Dinitrotoluene	888	220	43	ug/kg	
35572-78-2	2-amino-4,6-Dinitrotoluene	ND	220	43	ug/kg	
19406-51-0	4-amino-2,6-Dinitrotoluene	ND	220	47	ug/kg	
98-95-3	Nitrobenzene	ND	220	61	ug/kg	
88-72-2	o-Nitrotoluene	ND	220	66	ug/kg	
99-08-1	m-Nitrotoluene	ND	220	89	ug/kg	
99-99-0	p-Nitrotoluene	ND	220	59	ug/kg	
479-45-8	Tetryl	ND	430	120	ug/kg	
99-35-4	1,3,5-Trinitrobenzene	ND	220	51	ug/kg	
118-96-7	2,4,6-Trinitrotoluene	ND	220	43	ug/kg	
55-63-0	Nitroglycerine	ND [c]	1700	650	ug/kg	
78-11-5	PETN	ND [c]	1700	650	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Run# 3	Limits
610-39-9	3,4-Dinitrotoluene	106%	98%	108%	72-145%

(a) All hits confirmed by reanalysis on a dissimilar column.
(b) Confirmation run.
(c) Result is from Run# 2

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	50SB07B		
Lab Sample ID:	F51247-4	**Date Sampled:**	07/23/07
Matrix:	SO - Soil	**Date Received:**	07/24/07
Method:	SW846 8330A SW846 8330A	**Percent Solids:**	59.3
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GG023181.D	1	08/07/07	NAF	08/06/07	OP21756	GGG994
Run #2	PP022077.D	1	08/07/07	NAF	08/06/07	OP21756	GPP764

	Initial Weight	Final Volume
Run #1	2.03 g	20.0 ml
Run #2	2.03 g	20.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q
2691-41-0	HMX	ND	250	51	ug/kg	
121-82-4	RDX	ND	250	49	ug/kg	
99-65-0	1,3-Dinitrobenzene	ND	250	49	ug/kg	
606-20-2	2,6-Dinitrotoluene	ND	250	88	ug/kg	
121-14-2	2,4-Dinitrotoluene	ND	250	49	ug/kg	
35572-78-2	2-amino-4,6-Dinitrotoluene	ND	250	49	ug/kg	
19406-51-0	4-amino-2,6-Dinitrotoluene	ND	250	53	ug/kg	
98-95-3	Nitrobenzene	ND	250	70	ug/kg	
88-72-2	o-Nitrotoluene	ND	250	76	ug/kg	
99-08-1	m-Nitrotoluene	ND	250	100	ug/kg	
99-99-0	p-Nitrotoluene	ND	250	68	ug/kg	
479-45-8	Tetryl	ND	490	140	ug/kg	
99-35-4	1,3,5-Trinitrobenzene	ND	250	58	ug/kg	
118-96-7	2,4,6-Trinitrotoluene	ND	250	49	ug/kg	
55-63-0	Nitroglycerine	ND [a]	2000	740	ug/kg	
78-11-5	PETN	ND [a]	2000	740	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
610-39-9	3,4-Dinitrotoluene	100%	105%	72-145%

(a) Result is from Run# 2

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	50SB08A		
Lab Sample ID:	F51247-5	**Date Sampled:**	07/23/07
Matrix:	SO - Soil	**Date Received:**	07/24/07
Method:	SW846 8330A SW846 8330A	**Percent Solids:**	86.6
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	GG023182.D	1	08/07/07	NAF	08/06/07	OP21756	GGG994
Run #2	PP022078.D	1	08/07/07	NAF	08/06/07	OP21756	GPP764
Run #3 [b]	PP022107.D	1	08/08/07	NAF	08/06/07	OP21756	GPP765

	Initial Weight	Final Volume
Run #1	2.05 g	20.0 ml
Run #2	2.05 g	20.0 ml
Run #3	2.05 g	20.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q
2691-41-0	HMX	ND	240	51	ug/kg	
121-82-4	RDX	ND	240	49	ug/kg	
99-65-0	1,3-Dinitrobenzene	ND	240	49	ug/kg	
606-20-2	2,6-Dinitrotoluene	ND	240	87	ug/kg	
121-14-2	2,4-Dinitrotoluene	101 J	240	49	ug/kg	J
35572-78-2	2-amino-4,6-Dinitrotoluene	ND	240	49	ug/kg	
19406-51-0	4-amino-2,6-Dinitrotoluene	ND	240	53	ug/kg	
98-95-3	Nitrobenzene	ND	240	69	ug/kg	
88-72-2	o-Nitrotoluene	ND	240	75	ug/kg	
99-08-1	m-Nitrotoluene	ND	240	100	ug/kg	
99-99-0	p-Nitrotoluene	ND	240	67	ug/kg	
479-45-8	Tetryl	ND	490	140	ug/kg	
99-35-4	1,3,5-Trinitrobenzene	ND	240	58	ug/kg	
118-96-7	2,4,6-Trinitrotoluene	ND	240	49	ug/kg	
55-63-0	Nitroglycerine	ND [c]	2000	730	ug/kg	
78-11-5	PETN	ND [c]	2000	730	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Run# 3	Limits
610-39-9	3,4-Dinitrotoluene	117%	113%	121%	72-145%

(a) All hits confirmed by reanalysis on a dissimilar column.
(b) Confirmation run.
(c) Result is from Run# 2

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: GG023183.D PP022079.D PP022108.D

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Report of Analysis

Client Sample ID:	50SB08B		
Lab Sample ID:	F51247-6	**Date Sampled:**	07/23/07
Matrix:	SO - Soil	**Date Received:**	07/24/07
Method:	SW846 8330A SW846 8330A	**Percent Solids:**	63.6
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	GG023183.D	1	08/07/07	NAF	08/06/07	OP21756	GGG994
Run #2	PP022079.D	1	08/07/07	NAF	08/06/07	OP21756	GPP764
Run #3 [b]	PP022108.D	1	08/08/07	NAF	08/06/07	OP21756	GPP765

	Initial Weight	Final Volume
Run #1	2.30 g	20.0 ml
Run #2	2.30 g	20.0 ml
Run #3	2.30 g	20.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q
2691-41-0	HMX	ND	220	45	ug/kg	
121-82-4	RDX	ND	220	43	ug/kg	
99-65-0	1,3-Dinitrobenzene	ND	220	43	ug/kg	
606-20-2	2,6-Dinitrotoluene	ND	220	77	ug/kg	
121-14-2	2,4-Dinitrotoluene	77.9 J	220	43	ug/kg	J
35572-78-2	2-amino-4,6-Dinitrotoluene	ND	220	43	ug/kg	
19406-51-0	4-amino-2,6-Dinitrotoluene	ND	220	47	ug/kg	
98-95-3	Nitrobenzene	ND	220	62	ug/kg	
88-72-2	o-Nitrotoluene	ND	220	67	ug/kg	
99-08-1	m-Nitrotoluene	ND	220	90	ug/kg	
99-99-0	p-Nitrotoluene	ND	220	60	ug/kg	
479-45-8	Tetryl	ND	430	120	ug/kg	
99-35-4	1,3,5-Trinitrobenzene	ND	220	51	ug/kg	
118-96-7	2,4,6-Trinitrotoluene	ND	220	43	ug/kg	
55-63-0	Nitroglycerine	ND [c]	1700	650	ug/kg	
78-11-5	PETN	ND [c]	1700	650	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Run# 3	Limits
610-39-9	3,4-Dinitrotoluene	102%	100%	104%	72-145%

(a) All hits confirmed by reanalysis on a dissimilar column.
(b) Confirmation run.
(c) Result is from Run# 2

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	50SB09A		
Lab Sample ID:	F51247-7	**Date Sampled:**	07/23/07
Matrix:	SO - Soil	**Date Received:**	07/24/07
Method:	SW846 8330A SW846 8330A	**Percent Solids:**	83.8
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GG023184.D	1	08/07/07	NAF	08/06/07	OP21756	GGG994
Run #2	PP022082.D	1	08/07/07	NAF	08/06/07	OP21756	GPP764

	Initial Weight	Final Volume
Run #1	2.15 g	20.0 ml
Run #2	2.15 g	20.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q
2691-41-0	HMX	ND	230	48	ug/kg	
121-82-4	RDX	ND	230	47	ug/kg	
99-65-0	1,3-Dinitrobenzene	ND	230	47	ug/kg	
606-20-2	2,6-Dinitrotoluene	ND	230	83	ug/kg	
121-14-2	2,4-Dinitrotoluene	ND	230	47	ug/kg	
35572-78-2	2-amino-4,6-Dinitrotoluene	ND	230	47	ug/kg	
19406-51-0	4-amino-2,6-Dinitrotoluene	ND	230	50	ug/kg	
98-95-3	Nitrobenzene	ND	230	66	ug/kg	
88-72-2	o-Nitrotoluene	ND	230	72	ug/kg	
99-08-1	m-Nitrotoluene	ND	230	96	ug/kg	
99-99-0	p-Nitrotoluene	ND	230	64	ug/kg	
479-45-8	Tetryl	ND	470	130	ug/kg	
99-35-4	1,3,5-Trinitrobenzene	ND	230	55	ug/kg	
118-96-7	2,4,6-Trinitrotoluene	ND	230	47	ug/kg	
55-63-0	Nitroglycerine	ND [a]	1900	700	ug/kg	
78-11-5	PETN	ND [a]	1900	700	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
610-39-9	3,4-Dinitrotoluene	119%	119%	72-145%

(a) Result is from Run# 2

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	50SB09B		
Lab Sample ID:	F51247-8	**Date Sampled:**	07/23/07
Matrix:	SO - Soil	**Date Received:**	07/24/07
Method:	SW846 8330A SW846 8330A	**Percent Solids:**	62.0
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GG023187.D	1	08/08/07	NAF	08/06/07	OP21756	GGG994
Run #2	PP022085.D	1	08/07/07	NAF	08/06/07	OP21756	GPP764

	Initial Weight	Final Volume
Run #1	2.11 g	20.0 ml
Run #2	2.11 g	20.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q
2691-41-0	HMX	ND	240	49	ug/kg	
121-82-4	RDX	ND	240	47	ug/kg	
99-65-0	1,3-Dinitrobenzene	ND	240	47	ug/kg	
606-20-2	2,6-Dinitrotoluene	ND	240	84	ug/kg	
121-14-2	2,4-Dinitrotoluene	ND	240	47	ug/kg	
35572-78-2	2-amino-4,6-Dinitrotoluene	ND	240	47	ug/kg	
19406-51-0	4-amino-2,6-Dinitrotoluene	ND	240	51	ug/kg	
98-95-3	Nitrobenzene	ND	240	67	ug/kg	
88-72-2	o-Nitrotoluene	ND	240	73	ug/kg	
99-08-1	m-Nitrotoluene	ND	240	98	ug/kg	
99-99-0	p-Nitrotoluene	ND	240	65	ug/kg	
479-45-8	Tetryl	ND	470	130	ug/kg	
99-35-4	1,3,5-Trinitrobenzene	ND	240	56	ug/kg	
118-96-7	2,4,6-Trinitrotoluene	ND	240	47	ug/kg	
55-63-0	Nitroglycerine	ND [a]	1900	710	ug/kg	
78-11-5	PETN	ND [a]	1900	710	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
610-39-9	3,4-Dinitrotoluene	105%	100%	72-145%

(a) Result is from Run# 2

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	50SB010A		
Lab Sample ID:	F51247-9	**Date Sampled:**	07/23/07
Matrix:	SO - Soil	**Date Received:**	07/24/07
Method:	SW846 8330A SW846 8330A	**Percent Solids:**	92.6
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GG023188.D	1	08/08/07	NAF	08/06/07	OP21756	GGG994
Run #2	PP022086.D	1	08/07/07	NAF	08/06/07	OP21756	GPP764

	Initial Weight	Final Volume
Run #1	2.02 g	20.0 ml
Run #2	2.02 g	20.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q
2691-41-0	HMX	ND	250	51	ug/kg	
121-82-4	RDX	ND	250	50	ug/kg	
99-65-0	1,3-Dinitrobenzene	ND	250	50	ug/kg	
606-20-2	2,6-Dinitrotoluene	ND	250	88	ug/kg	
121-14-2	2,4-Dinitrotoluene	ND	250	50	ug/kg	
35572-78-2	2-amino-4,6-Dinitrotoluene	ND	250	50	ug/kg	
19406-51-0	4-amino-2,6-Dinitrotoluene	ND	250	53	ug/kg	
98-95-3	Nitrobenzene	ND	250	70	ug/kg	
88-72-2	o-Nitrotoluene	ND	250	76	ug/kg	
99-08-1	m-Nitrotoluene	ND	250	100	ug/kg	
99-99-0	p-Nitrotoluene	ND	250	68	ug/kg	
479-45-8	Tetryl	ND	500	140	ug/kg	
99-35-4	1,3,5-Trinitrobenzene	ND	250	58	ug/kg	
118-96-7	2,4,6-Trinitrotoluene	ND	250	50	ug/kg	
55-63-0	Nitroglycerine	ND [a]	2000	740	ug/kg	
78-11-5	PETN	ND [a]	2000	740	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
610-39-9	3,4-Dinitrotoluene	113%	116%	72-145%

(a) Result is from Run# 2

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	50SB010B		
Lab Sample ID:	F51247-10	**Date Sampled:**	07/23/07
Matrix:	SO - Soil	**Date Received:**	07/24/07
Method:	SW846 8330A SW846 8330A	**Percent Solids:**	76.6
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GG023189.D	1	08/08/07	NAF	08/06/07	OP21756	GGG994
Run #2	PP022087.D	1	08/07/07	NAF	08/06/07	OP21756	GPP764

	Initial Weight	Final Volume
Run #1	2.14 g	20.0 ml
Run #2	2.14 g	20.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q
2691-41-0	HMX	ND	230	49	ug/kg	
121-82-4	RDX	ND	230	47	ug/kg	
99-65-0	1,3-Dinitrobenzene	ND	230	47	ug/kg	
606-20-2	2,6-Dinitrotoluene	ND	230	83	ug/kg	
121-14-2	2,4-Dinitrotoluene	ND	230	47	ug/kg	
35572-78-2	2-amino-4,6-Dinitrotoluene	ND	230	47	ug/kg	
19406-51-0	4-amino-2,6-Dinitrotoluene	ND	230	50	ug/kg	
98-95-3	Nitrobenzene	ND	230	66	ug/kg	
88-72-2	o-Nitrotoluene	ND	230	72	ug/kg	
99-08-1	m-Nitrotoluene	ND	230	96	ug/kg	
99-99-0	p-Nitrotoluene	ND	230	64	ug/kg	
479-45-8	Tetryl	ND	470	130	ug/kg	
99-35-4	1,3,5-Trinitrobenzene	ND	230	55	ug/kg	
118-96-7	2,4,6-Trinitrotoluene	ND	230	47	ug/kg	
55-63-0	Nitroglycerine	ND [a]	1900	700	ug/kg	
78-11-5	PETN	ND [a]	1900	700	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
610-39-9	3,4-Dinitrotoluene	102%	105%	72-145%

(a) Result is from Run# 2

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	50SB011A		
Lab Sample ID:	F51247-11	**Date Sampled:**	07/23/07
Matrix:	SO - Soil	**Date Received:**	07/24/07
Method:	SW846 8330A SW846 8330A	**Percent Solids:**	92.1
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GG023192.D	1	08/08/07	NAF	08/06/07	OP21756	GGG994
Run #2	PP022088.D	1	08/07/07	NAF	08/06/07	OP21756	GPP764

	Initial Weight	Final Volume
Run #1	2.14 g	20.0 ml
Run #2	2.14 g	20.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q
2691-41-0	HMX	ND	230	49	ug/kg	
121-82-4	RDX	ND	230	47	ug/kg	
99-65-0	1,3-Dinitrobenzene	ND	230	47	ug/kg	
606-20-2	2,6-Dinitrotoluene	ND	230	83	ug/kg	
121-14-2	2,4-Dinitrotoluene	ND	230	47	ug/kg	
35572-78-2	2-amino-4,6-Dinitrotoluene	ND	230	47	ug/kg	
19406-51-0	4-amino-2,6-Dinitrotoluene	ND	230	50	ug/kg	
98-95-3	Nitrobenzene	ND	230	66	ug/kg	
88-72-2	o-Nitrotoluene	ND	230	72	ug/kg	
99-08-1	m-Nitrotoluene	ND	230	96	ug/kg	
99-99-0	p-Nitrotoluene	ND	230	64	ug/kg	
479-45-8	Tetryl	ND	470	130	ug/kg	
99-35-4	1,3,5-Trinitrobenzene	ND	230	55	ug/kg	
118-96-7	2,4,6-Trinitrotoluene	ND	230	47	ug/kg	
55-63-0	Nitroglycerine	ND [a]	1900	700	ug/kg	
78-11-5	PETN	ND [a]	1900	700	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
610-39-9	3,4-Dinitrotoluene	109%	111%	72-145%

(a) Result is from Run# 2

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	50SB011B		
Lab Sample ID:	F51247-12	**Date Sampled:**	07/23/07
Matrix:	SO - Soil	**Date Received:**	07/24/07
Method:	SW846 8330A SW846 8330A	**Percent Solids:**	85.6
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GG023193.D	1	08/08/07	NAF	08/06/07	OP21756	GGG994
Run #2	PP022089.D	1	08/07/07	NAF	08/06/07	OP21756	GPP764

	Initial Weight	Final Volume
Run #1	2.12 g	20.0 ml
Run #2	2.12 g	20.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q
2691-41-0	HMX	ND	240	49	ug/kg	
121-82-4	RDX	ND	240	47	ug/kg	
99-65-0	1,3-Dinitrobenzene	ND	240	47	ug/kg	
606-20-2	2,6-Dinitrotoluene	ND	240	84	ug/kg	
121-14-2	2,4-Dinitrotoluene	ND	240	47	ug/kg	
35572-78-2	2-amino-4,6-Dinitrotoluene	ND	240	47	ug/kg	
19406-51-0	4-amino-2,6-Dinitrotoluene	ND	240	51	ug/kg	
98-95-3	Nitrobenzene	ND	240	67	ug/kg	
88-72-2	o-Nitrotoluene	ND	240	73	ug/kg	
99-08-1	m-Nitrotoluene	ND	240	97	ug/kg	
99-99-0	p-Nitrotoluene	ND	240	65	ug/kg	
479-45-8	Tetryl	ND	470	130	ug/kg	
99-35-4	1,3,5-Trinitrobenzene	ND	240	56	ug/kg	
118-96-7	2,4,6-Trinitrotoluene	ND	240	47	ug/kg	
55-63-0	Nitroglycerine	ND [a]	1900	710	ug/kg	
78-11-5	PETN	ND [a]	1900	710	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
610-39-9	3,4-Dinitrotoluene	103%	108%	72-145%

(a) Result is from Run# 2

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	50SB012A		
Lab Sample ID:	F51247-13	**Date Sampled:**	07/23/07
Matrix:	SO - Soil	**Date Received:**	07/24/07
Method:	SW846 8330A SW846 8330A	**Percent Solids:**	85.4
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GG023194.D	1	08/08/07	NAF	08/06/07	OP21756	GGG994
Run #2	PP022090.D	1	08/07/07	NAF	08/06/07	OP21756	GPP764

	Initial Weight	Final Volume
Run #1	2.15 g	20.0 ml
Run #2	2.15 g	20.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q
2691-41-0	HMX	ND	230	48	ug/kg	
121-82-4	RDX	ND	230	47	ug/kg	
99-65-0	1,3-Dinitrobenzene	ND	230	47	ug/kg	
606-20-2	2,6-Dinitrotoluene	ND	230	83	ug/kg	
121-14-2	2,4-Dinitrotoluene	ND	230	47	ug/kg	
35572-78-2	2-amino-4,6-Dinitrotoluene	ND	230	47	ug/kg	
19406-51-0	4-amino-2,6-Dinitrotoluene	ND	230	50	ug/kg	
98-95-3	Nitrobenzene	ND	230	66	ug/kg	
88-72-2	o-Nitrotoluene	ND	230	72	ug/kg	
99-08-1	m-Nitrotoluene	ND	230	96	ug/kg	
99-99-0	p-Nitrotoluene	ND	230	64	ug/kg	
479-45-8	Tetryl	ND	470	130	ug/kg	
99-35-4	1,3,5-Trinitrobenzene	ND	230	55	ug/kg	
118-96-7	2,4,6-Trinitrotoluene	ND	230	47	ug/kg	
55-63-0	Nitroglycerine	ND [a]	1900	700	ug/kg	
78-11-5	PETN	ND [a]	1900	700	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
610-39-9	3,4-Dinitrotoluene	86%	94%	72-145%

(a) Result is from Run# 2

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	50SB012B		
Lab Sample ID:	F51247-14	Date Sampled:	07/23/07
Matrix:	SO - Soil	Date Received:	07/24/07
Method:	SW846 8330A SW846 8330A	Percent Solids:	67.7
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	GG023195.D	1	08/08/07	NAF	08/06/07	OP21756	GGG994
Run #2	PP022091.D	1	08/07/07	NAF	08/06/07	OP21756	GPP764
Run #3 [b]	PP022110.D	1	08/08/07	NAF	08/06/07	OP21756	GPP765

	Initial Weight	Final Volume
Run #1	2.09 g	20.0 ml
Run #2	2.09 g	20.0 ml
Run #3	2.09 g	20.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q
2691-41-0	HMX	ND	240	50	ug/kg	
121-82-4	RDX	ND	240	48	ug/kg	
99-65-0	1,3-Dinitrobenzene	ND	240	48	ug/kg	
606-20-2	2,6-Dinitrotoluene	179 J	240	85	ug/kg	J
121-14-2	2,4-Dinitrotoluene	645	240	48	ug/kg	
35572-78-2	2-amino-4,6-Dinitrotoluene	ND	240	48	ug/kg	
19406-51-0	4-amino-2,6-Dinitrotoluene	ND	240	52	ug/kg	
98-95-3	Nitrobenzene	ND	240	68	ug/kg	
88-72-2	o-Nitrotoluene	ND	240	74	ug/kg	
99-08-1	m-Nitrotoluene	ND	240	99	ug/kg	
99-99-0	p-Nitrotoluene	ND	240	66	ug/kg	
479-45-8	Tetryl	ND	480	130	ug/kg	
99-35-4	1,3,5-Trinitrobenzene	ND	240	56	ug/kg	
118-96-7	2,4,6-Trinitrotoluene	ND	240	48	ug/kg	
55-63-0	Nitroglycerine	ND [c]	1900	720	ug/kg	
78-11-5	PETN	ND [c]	1900	720	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Run# 3	Limits
610-39-9	3,4-Dinitrotoluene	98%	95%	101%	72-145%

(a) All hits confirmed by spectral match using a diode array detector.
(b) Confirmation run.
(c) Result is from Run# 2

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Accutest Laboratories

Report of Analysis

Client Sample ID:	50SB013A		
Lab Sample ID:	F51247-15	**Date Sampled:**	07/23/07
Matrix:	SO - Soil	**Date Received:**	07/24/07
Method:	SW846 8330A SW846 8330A	**Percent Solids:**	87.5
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GG023210.D	1	08/08/07	NAF	08/06/07	OP21756	GGG995
Run #2	PP022094.D	1	08/07/07	NAF	08/06/07	OP21756	GPP764

	Initial Weight	Final Volume
Run #1	2.19 g	20.0 ml
Run #2	2.19 g	20.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q
2691-41-0	HMX	ND	230	47	ug/kg	
121-82-4	RDX	ND	230	46	ug/kg	
99-65-0	1,3-Dinitrobenzene	ND	230	46	ug/kg	
606-20-2	2,6-Dinitrotoluene	ND	230	81	ug/kg	
121-14-2	2,4-Dinitrotoluene	ND	230	46	ug/kg	
35572-78-2	2-amino-4,6-Dinitrotoluene	ND	230	46	ug/kg	
19406-51-0	4-amino-2,6-Dinitrotoluene	ND	230	49	ug/kg	
98-95-3	Nitrobenzene	ND	230	65	ug/kg	
88-72-2	o-Nitrotoluene	ND	230	70	ug/kg	
99-08-1	m-Nitrotoluene	ND	230	94	ug/kg	
99-99-0	p-Nitrotoluene	ND	230	63	ug/kg	
479-45-8	Tetryl	ND	460	130	ug/kg	
99-35-4	1,3,5-Trinitrobenzene	ND	230	54	ug/kg	
118-96-7	2,4,6-Trinitrotoluene	ND	230	46	ug/kg	
55-63-0	Nitroglycerine	ND [a]	1800	680	ug/kg	
78-11-5	PETN	ND [a]	1800	680	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
610-39-9	3,4-Dinitrotoluene	109%	109%	72-145%

(a) Result is from Run# 2

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	50SB013B		
Lab Sample ID:	F51247-16	**Date Sampled:**	07/23/07
Matrix:	SO - Soil	**Date Received:**	07/24/07
Method:	SW846 8330A SW846 8330A	**Percent Solids:**	64.7
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GG023211.D	1	08/08/07	NAF	08/06/07	OP21756	GGG995
Run #2	PP022095.D	1	08/07/07	NAF	08/06/07	OP21756	GPP764

	Initial Weight	Final Volume
Run #1	2.09 g	20.0 ml
Run #2	2.09 g	20.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q
2691-41-0	HMX	ND	240	50	ug/kg	
121-82-4	RDX	ND	240	48	ug/kg	
99-65-0	1,3-Dinitrobenzene	ND	240	48	ug/kg	
606-20-2	2,6-Dinitrotoluene	ND	240	85	ug/kg	
121-14-2	2,4-Dinitrotoluene	ND	240	48	ug/kg	
35572-78-2	2-amino-4,6-Dinitrotoluene	ND	240	48	ug/kg	
19406-51-0	4-amino-2,6-Dinitrotoluene	ND	240	52	ug/kg	
98-95-3	Nitrobenzene	ND	240	68	ug/kg	
88-72-2	o-Nitrotoluene	ND	240	74	ug/kg	
99-08-1	m-Nitrotoluene	ND	240	99	ug/kg	
99-99-0	p-Nitrotoluene	ND	240	66	ug/kg	
479-45-8	Tetryl	ND	480	130	ug/kg	
99-35-4	1,3,5-Trinitrobenzene	ND	240	56	ug/kg	
118-96-7	2,4,6-Trinitrotoluene	ND	240	48	ug/kg	
55-63-0	Nitroglycerine	ND [a]	1900	720	ug/kg	
78-11-5	PETN	ND [a]	1900	720	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
610-39-9	3,4-Dinitrotoluene	107%	102%	72-145%

(a) Result is from Run# 2

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	50SB014A		
Lab Sample ID:	F51247-17	**Date Sampled:**	07/23/07
Matrix:	SO - Soil	**Date Received:**	07/24/07
Method:	SW846 8330A SW846 8330A	**Percent Solids:**	90.3
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	GG023212.D	1	08/08/07	NAF	08/06/07	OP21756	GGG995
Run #2	PP022096.D	1	08/07/07	NAF	08/06/07	OP21756	GPP764
Run #3 [b]	PP022111.D	1	08/08/07	NAF	08/06/07	OP21756	GPP765

	Initial Weight	Final Volume
Run #1	2.01 g	20.0 ml
Run #2	2.01 g	20.0 ml
Run #3	2.01 g	20.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q
2691-41-0	HMX	ND	250	52	ug/kg	
121-82-4	RDX	ND	250	50	ug/kg	
99-65-0	1,3-Dinitrobenzene	ND	250	50	ug/kg	
606-20-2	2,6-Dinitrotoluene	ND	250	89	ug/kg	
121-14-2	2,4-Dinitrotoluene	134 J	250	50	ug/kg	J
35572-78-2	2-amino-4,6-Dinitrotoluene	ND	250	50	ug/kg	
19406-51-0	4-amino-2,6-Dinitrotoluene	ND	250	54	ug/kg	
98-95-3	Nitrobenzene	ND	250	71	ug/kg	
88-72-2	o-Nitrotoluene	ND	250	77	ug/kg	
99-08-1	m-Nitrotoluene	ND	250	100	ug/kg	
99-99-0	p-Nitrotoluene	ND	250	69	ug/kg	
479-45-8	Tetryl	ND	500	140	ug/kg	
99-35-4	1,3,5-Trinitrobenzene	ND	250	59	ug/kg	
118-96-7	2,4,6-Trinitrotoluene	ND	250	50	ug/kg	
55-63-0	Nitroglycerine	ND [c]	2000	750	ug/kg	
78-11-5	PETN	ND [c]	2000	750	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Run# 3	Limits
610-39-9	3,4-Dinitrotoluene	112%	104%	111%	72-145%

(a) All hits confirmed by reanalysis on a dissimilar column.
(b) Confirmation run.
(c) Result is from Run# 2

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	50SB014B		
Lab Sample ID:	F51247-18	**Date Sampled:**	07/23/07
Matrix:	SO - Soil	**Date Received:**	07/24/07
Method:	SW846 8330A SW846 8330A	**Percent Solids:**	82.8
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GG023213.D	1	08/08/07	NAF	08/06/07	OP21756	GGG995
Run #2	PP022097.D	1	08/07/07	NAF	08/06/07	OP21756	GPP764

	Initial Weight	Final Volume
Run #1	2.09 g	20.0 ml
Run #2	2.09 g	20.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q
2691-41-0	HMX	ND	240	50	ug/kg	
121-82-4	RDX	ND	240	48	ug/kg	
99-65-0	1,3-Dinitrobenzene	ND	240	48	ug/kg	
606-20-2	2,6-Dinitrotoluene	ND	240	85	ug/kg	
121-14-2	2,4-Dinitrotoluene	ND	240	48	ug/kg	
35572-78-2	2-amino-4,6-Dinitrotoluene	ND	240	48	ug/kg	
19406-51-0	4-amino-2,6-Dinitrotoluene	ND	240	52	ug/kg	
98-95-3	Nitrobenzene	ND	240	68	ug/kg	
88-72-2	o-Nitrotoluene	ND	240	74	ug/kg	
99-08-1	m-Nitrotoluene	ND	240	99	ug/kg	
99-99-0	p-Nitrotoluene	ND	240	66	ug/kg	
479-45-8	Tetryl	ND	480	130	ug/kg	
99-35-4	1,3,5-Trinitrobenzene	ND	240	56	ug/kg	
118-96-7	2,4,6-Trinitrotoluene	ND	240	48	ug/kg	
55-63-0	Nitroglycerine	ND [a]	1900	720	ug/kg	
78-11-5	PETN	ND [a]	1900	720	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
610-39-9	3,4-Dinitrotoluene	109%	109%	72-145%

(a) Result is from Run# 2

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: GG023214.D PP022098.D

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Accutest Laboratories

Report of Analysis

Client Sample ID:	50SB015A		
Lab Sample ID:	F51247-19	**Date Sampled:**	07/23/07
Matrix:	SO - Soil	**Date Received:**	07/24/07
Method:	SW846 8330A SW846 8330A	**Percent Solids:**	87.1
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GG023214.D	1	08/08/07	NAF	08/06/07	OP21756	GGG995
Run #2	PP022098.D	1	08/07/07	NAF	08/06/07	OP21756	GPP764

	Initial Weight	Final Volume
Run #1	2.03 g	20.0 ml
Run #2	2.03 g	20.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q
2691-41-0	HMX	ND	250	51	ug/kg	
121-82-4	RDX	ND	250	49	ug/kg	
99-65-0	1,3-Dinitrobenzene	ND	250	49	ug/kg	
606-20-2	2,6-Dinitrotoluene	ND	250	88	ug/kg	
121-14-2	2,4-Dinitrotoluene	ND	250	49	ug/kg	
35572-78-2	2-amino-4,6-Dinitrotoluene	ND	250	49	ug/kg	
19406-51-0	4-amino-2,6-Dinitrotoluene	ND	250	53	ug/kg	
98-95-3	Nitrobenzene	ND	250	70	ug/kg	
88-72-2	o-Nitrotoluene	ND	250	76	ug/kg	
99-08-1	m-Nitrotoluene	ND	250	100	ug/kg	
99-99-0	p-Nitrotoluene	ND	250	68	ug/kg	
479-45-8	Tetryl	ND	490	140	ug/kg	
99-35-4	1,3,5-Trinitrobenzene	ND	250	58	ug/kg	
118-96-7	2,4,6-Trinitrotoluene	ND	250	49	ug/kg	
55-63-0	Nitroglycerine	ND [a]	2000	740	ug/kg	
78-11-5	PETN	ND [a]	2000	740	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
610-39-9	3,4-Dinitrotoluene	108%	108%	72-145%

(a) Result is from Run# 2

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Accutest Laboratories

Report of Analysis

Client Sample ID:	50SB015B		
Lab Sample ID:	F51247-20	**Date Sampled:**	07/23/07
Matrix:	SO - Soil	**Date Received:**	07/24/07
Method:	SW846 8330A SW846 8330A	**Percent Solids:**	85.3
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GG023215.D	1	08/08/07	NAF	08/06/07	OP21756	GGG995
Run #2	PP022099.D	1	08/07/07	NAF	08/06/07	OP21756	GPP764

	Initial Weight	Final Volume
Run #1	2.05 g	20.0 ml
Run #2	2.05 g	20.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q
2691-41-0	HMX	ND	240	51	ug/kg	
121-82-4	RDX	ND	240	49	ug/kg	
99-65-0	1,3-Dinitrobenzene	ND	240	49	ug/kg	
606-20-2	2,6-Dinitrotoluene	ND	240	87	ug/kg	
121-14-2	2,4-Dinitrotoluene	ND	240	49	ug/kg	
35572-78-2	2-amino-4,6-Dinitrotoluene	ND	240	49	ug/kg	
19406-51-0	4-amino-2,6-Dinitrotoluene	ND	240	53	ug/kg	
98-95-3	Nitrobenzene	ND	240	69	ug/kg	
88-72-2	o-Nitrotoluene	ND	240	75	ug/kg	
99-08-1	m-Nitrotoluene	ND	240	100	ug/kg	
99-99-0	p-Nitrotoluene	ND	240	67	ug/kg	
479-45-8	Tetryl	ND	490	140	ug/kg	
99-35-4	1,3,5-Trinitrobenzene	ND	240	58	ug/kg	
118-96-7	2,4,6-Trinitrotoluene	ND	240	49	ug/kg	
55-63-0	Nitroglycerine	ND [a]	2000	730	ug/kg	
78-11-5	PETN	ND [a]	2000	730	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
610-39-9	3,4-Dinitrotoluene	107%	108%	72-145%

(a) Result is from Run# 2

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Shaw Environmental, Inc.
2113 Emmorton Park Road
Edgewood, Maryland
410-612-6350
FAX: 410-612-6351

Shaw® Shaw Environmental, Inc.

MEMORANDUM

TO: Jeff Parks, Shaw E&I RFAAP Project Manager

FROM: Eric Malarek, Shaw E&I RFAAP Project Chemist

SUBJECT: Radford Army Ammunition Plant (RFAAP) Data Validation – Herbicides
Accutest Laboratories, Inc., SDG F51247

DATE: December 11, 2007

The purpose of this memorandum is to present the data validation report for the samples collected at Main Manufacturing Area at RFAAP for a RFI/CMS Nine Sites on July 23, 2007. Solid samples were analyzed for chlorinated herbicides using USEPA SW846 Method 3550B/8151A. A total of twenty solid samples were validated. The sample Ids are:

Field Sample ID	Lab Sample ID	Field Sample ID	Lab Sample ID
50SB06A	F51247-1	50SB011A	F51247-11
50SB06B	F51247-2	50SB011B	F51247-12
50SB07A	F51247-3	50SB012A	F51247-13
50SB07B	F51247-4	50SB012B	F51247-14
50SB08A	F51247-5	50SB013A	F51247-15
50SB08B	F51247-6	50SB013B	F51247-16
50SB09A	F51247-7	50SB014A	F51247-17
50SB09B	F51247-8	50SB014B	F51247-18
50SB010A	F51247-9	50SB015A	F51247-19
50SB010B	F51247-10	50SB015B	F51247-20

Data were reviewed by Eric Malarek and validated using a combination of project QAPP, *Quality Systems Manual for Environmental Laboratories, Final Version 3, January, 2006* (DoD, 2006) (DoD QSM), method-specific criteria, and laboratory SOP criteria. The data qualifier scheme was consistent with the *Region III Modifications to the National Functional Guidelines for Organic Data Review* (September 1994). Parameters evaluated are presented in **Table 1**. Data associated with parameters in compliance with quality control specifications have not been qualified. Data associated with parameters that did not comply with quality control specifications and directly impacted project data have been qualified in accordance with USEPA Region III specifications.

Table 1 Laboratory Performance Criteria

Qualified		Parameter
Yes	No	
	X	Holding Times
X		Initial Calibration
X		Continuing Calibration
	X	Blank Analysis
	X	System Monitoring Compounds
	X	Laboratory Control Sample
	X	Matrix Spike/Spike Duplicate
	X	Field Duplicate
X		Quantitation Verification

The quality of data collected in support of this sampling activity is considered acceptable with noted qualifications.

Eric Malarek, Chemist

12/11/07
Date

RFAAP VALIDATION REPORT
CHLORINATED HERBICIDES REVIEW
SDG F51247

I-Holding Times

The objective is to ascertain the validity of results based on the holding time of the sample from time of collection to time of sample extraction and analysis. Holding time criteria: For solid samples, chlorinated herbicides compounds are shipped cooled (@4°C ± 2°C) with a maximum holding time of 14 days from sample collection to preparative extraction and 40 days from preparative extraction to determinative analysis.

- Temperature Review: The temperature blank was sent with each cooler and recorded by the laboratory upon receipt. For samples collected on 07/23/07, the coolers were received by the primary laboratory (Accutest) on 07/20/07 at 2.8°C, and 3.2°C. The herbicides were subcontracted to Accutest TX and were received the samples at 3.4°C. The dioxin subcontract laboratory (SGS Paradigm Analytical Laboratories, Inc.) received the samples at 1.2°C. Even though the receipt temperature was below criteria for some coolers, there were no impacts to the data quality. No qualifiers were applied based upon this outlier.

- Holding Time Review: The solid samples were collected on 07/23/07. For solid samples, the herbicides were extracted on 07/26/07 and analyzed on 07/29/07 and 07/30/07. All criteria were met. No qualifiers were applied.

II-Initial Calibration

Compliance requirements for satisfactory instrument calibration are established to ensure that the instrument used is capable of producing acceptable qualitative and quantitative data for semivolatile target compounds. Initial calibration demonstrates that the instrument is capable of acceptable performance in the beginning of the analytical run and of producing a linear calibration curve. The DoD QSM specifies that the percent relative standard deviation (%RSD) for a 5-point standard calibration should be ≤20% for each target compound.

- No initial calibration was provided for MCPP and MCPA on instrument GC-GG. During discussions with the laboratory, they indicated that they perform a daily single point calibration rather than a five point calibration. All samples were non-detect and qualified estimated "UJ" based upon this outlier. Samples 50SB06A (F51247-1), 50SB06B (F51247-2), 50SB07A (F51247-3), 50SB07B (F51247-4), 50SB08A (F51247-5), 50SB08B (F51247-6), 50SB09A (F51247-7), 50SB09B (F51247-8), 50SB010A (F51247-9), 50SB010B (F51247-10), 50SB011A (F51247-11), 50SB011B (F51247-12), 50SB012A (F51247-13), 50SB012B (F51247-14), 50SB013A (F51247-15), 50SB013B (F51247-16), 50SB014A (F51247-17), 50SB014B (F51247-18), 50SB015A (F51247-19), and 50SB015B (F51247-20) apply to this single point calibration.

- For initial calibration performed on 07/29/07 on instrument GC-GG, all criteria were met for signal #1 and signal #2 for all target compounds, except MCPP and MCPA. No qualifiers were applied. Samples 50SB06A (F51247-1), 50SB06B (F51247-2), 50SB07A (F51247-3), 50SB07B (F51247-4), 50SB08A (F51247-5), 50SB08B (F51247-6), 50SB09A (F51247-7), 50SB09B (F51247-8), 50SB010A (F51247-9), 50SB010B (F51247-10), 50SB011A (F51247-11), 50SB011B (F51247-12), 50SB012A (F51247-13), 50SB012B (F51247-14), 50SB013A (F51247-15), 50SB013B (F51247-16), 50SB014A (F51247-17), 50SB014B (F51247-18), 50SB015A (F51247-19), and 50SB015B (F51247-20) apply to this initial calibration.

III-Continuing Calibration
Compliance requirements for satisfactory instrument calibration are established to ensure that the instrument used is capable of producing acceptable qualitative and quantitative data for semivolatile target compounds. Continuing calibration establishes the response factors on which the quantitations are based and checks satisfactory performance of the instrument on a day-to-day basis. The DoD QSM specifies that the percent difference (%D) between the initial calibration CF and the continuing calibration CF must be ≤20%.

- A single point calibration was provided for MCPP and MCPA on instrument GC-GG for 07/29/07 run. The calibration standard indicated adequate response for MCPP and MCPA. However, since a five point calibration was not performed, %D calculation could not be verified. All samples were non-detect and qualified estimated "UJ" based upon this outlier. Samples 50SB06A (F51247-1), 50SB06B (F51247-2), 50SB07A (F51247-3), 50SB07B (F51247-4), 50SB08A (F51247-5), 50SB08B (F51247-6), 50SB09A (F51247-7), 50SB09B (F51247-8), 50SB010A (F51247-9), 50SB010B (F51247-10), 50SB011A (F51247-11), 50SB011B (F51247-12), 50SB012A (F51247-13), 50SB012B (F51247-14), 50SB013A (F51247-15), 50SB013B (F51247-16), 50SB014A (F51247-17), 50SB014B (F51247-18), 50SB015A (F51247-19), and 50SB015B (F51247-20) apply to this single point calibration.

- For initial calibration standard performed on 07/29/07 @15:00 on instrument GC-GG, all criteria were met for signal #1 and signal #2 for all target compounds, except MCPP and MCPA. See Section II for initial calibration discussion. No qualifiers were applied. Samples 50SB06A (F51247-1), 50SB06B (F51247-2), 50SB07A (F51247-3), 50SB07B (F51247-4), 50SB08A (F51247-5), and 50SB08B (F51247-6) apply to this continuing calibration.

- For continuing calibration performed on 07/29/07 @22:40 on instrument GC-GG, all criteria were met for signal #1 and signal #2 for all target compounds, except MCPP and MCPA. No qualifiers were applied. Samples 50SB09A (F51247-7), 50SB09B (F51247-8), 50SB010A (F51247-9), 50SB010B (F51247-10), 50SB011A (F51247-11), 50SB011B (F51247-12), 50SB012A (F51247-13), 50SB012B (F51247-14), 50SB013A (F51247-15), and 50SB013B (F51247-16) apply to this continuing calibration.

- For continuing calibration performed on 07/30/07 @04:04 on instrument GC-GG, all criteria were met for signal #1 and signal #2 for all target compounds, except MCPP and MCPA. No qualifiers were applied. Samples 50SB014A (F51247-17), 50SB014B (F51247-18), 50SB015A (F51247-19), and 50SB015B (F51247-20) apply to this continuing calibration.

- For continuing calibration performed on 07/30/07 @06:46 on instrument GC-GG, all criteria were met for signal #1 and signal #2 for all target compounds, except MCPP and MCPA. . No qualifiers were applied. No samples reported apply to this continuing calibration.

IV-Blank Analysis
The purpose of blank analyses is to determine the presence and magnitude of contamination problems resulting from field or laboratory activities. No contaminants should be detected in any of the associated blanks. The DoD QSM criterion specifies all concentrations should be less than one-half MRL. Positive sample results are qualified "B" if the concentration of the analyte is ≤ five times (5x) the absolute maximum blank concentration. **Table 2** summarizes the blank contamination analysis. Action levels are based upon dilution factor of one and for solid matrices were converted to soil values (soil conversion factor = 33) if needed. Rinse blanks 072407R (F51275-1) and 072507R (F51300-31) apply to the surface soil "SS" and subsurface soil "SB" samples in this SDG.

Table 2 Blank Contamination Analysis Summary

Analysis Date	QC Blank ID	Compound	Max Conc. µg/kg	Action Level µg/kg	B qualified samples
07/29/07	OP7763-MB	All target compounds <½MRL	NA	NA	None
08/03/07	072407R	All target compounds <½MRL	NA	NA	None
08/03/07	072507R	All target compounds <½MRL	NA	NA	None

MRL = Method Reporting Limit.
NA = Not Applicable.

V-System Monitoring Compounds (Surrogates)
Laboratory performance on individual samples is established by means of spiking activities. All samples are spiked with surrogate compounds prior to sample preparation. Spike recoveries must be within the specified control limits. DoD surrogate recovery limits are specified in Table D-3 of the DoD QSM (DoD, 2006). If the surrogate is not listed, then the laboratory criteria shall be used.

Solid Control Limit: 2,4-DCAA (34-179%)

- All criteria were met. No qualifiers were applied.

VI-Laboratory Control Samples
Data for laboratory control samples (LCS) are generated to determine long-term precision and accuracy of the analytical method. Percent recoveries must be within the specified control limits. DoD QSM solid LCS recovery limits are specified in Table D-2 and Table D-9 of the DoD QSM (DoD, 2006). If the compound is not listed, then the laboratory criteria shall be used.

- Sample OP7763-BS was used as the solid LCS for the 07/29/07 run. All criteria were met. No qualifiers were applied. Samples 50SB06A (F51247-1), 50SB06B (F51247-2), 50SB07A (F51247-3), 50SB07B (F51247-4), 50SB08A (F51247-5), 50SB08B (F51247-6), 50SB09A (F51247-7), 50SB09B (F51247-8), 50SB010A (F51247-9), 50SB010B (F51247-10), 50SB011A (F51247-11), 50SB011B (F51247-12), 50SB012A (F51247-13), 50SB012B (F51247-14), 50SB013A (F51247-15), 50SB013B (F51247-16), 50SB014A (F51247-17), 50SB014B (F51247-18), 50SB015A (F51247-19), and 50SB015B (F51247-20) apply to this LCS.

VII-Matrix Spike/Matrix Spike Duplicate
Data for matrix spike/matrix spike duplicates (MS/MSD) are generated to determine long-term precision and accuracy of the analytical method on various matrices and to demonstrate acceptable compound recovery by the laboratory at the time of sample analysis. The percent recoveries (%Rs) and the relative percent difference (RPD) must be within the specified control limits. DoD QSM solid MS/MSD recovery limits follow the LCS criteria and are specified in Table D-2 and Table D-9 of the DoD QSM (DoD, 2006). If the compound is not listed, then the laboratory criteria shall be used.

- Sample 50SB011A (F51247-11) was used as the solid MS/MSD for the 07/30/07 run. 2,4-D (RPD=36%), 2,4,5-TP (RPD=51%), 2,4,5-T (RPD=42%), dinoseb (61%, RPD=200%), and dichloroprop (RPD=27%) were above DoD QSM criteria and/or laboratory criteria. The LCS was within criteria (Section VI) for all herbicides. All samples were non-detect for 2,4-D, 2,4,5-TP, 2,4,5-T, dinoseb, and dichloroprop; therefore, no qualifiers were applied based upon these outliers. All other herbicides were within criteria. No qualifiers were applied. Samples 50SB06A (F51247-1), 50SB06B (F51247-2), 50SB07A (F51247-3), 50SB07B (F51247-4), 50SB08A (F51247-5), 50SB08B (F51247-6), 50SB09A (F51247-7), 50SB09B (F51247-8), 50SB010A (F51247-9), 50SB010B (F51247-10), 50SB011A (F51247-11), 50SB011B (F51247-12), 50SB012A (F51247-13), 50SB012B (F51247-14), 50SB013A (F51247-15), 50SB013B (F51247-16), 50SB014A (F51247-17), 50SB014B (F51247-18), 50SB015A (F51247-19), and 50SB015B (F51247-20) apply to this MS/MSD.

VIII-Field Duplicate Sample Analysis

Field duplicates were collected to identify the cumulative precision of the sampling and analytical process and sent to the laboratory blind. The RPD was calculated only for those analytes which were detected at levels exceeding the method reporting limits in both samples of the duplicate pair. Analytes that were qualified because of blank contamination (B-qualified) or were rejected (R-qualified) in either sample of the duplicate pair were excluded from the duplicate assessment. Precision control criterion was established at 50% RPD for the solid samples. Analytical results were qualified as estimated (J) for any RPDs exceeding criteria.

- No project specific solid field duplicate was analyzed with this SDG; therefore, it was not evaluated.

IX-Quantitation Verification

The accuracy of analytical results is verified through the calculation of several parameters. Percent difference (%D) between the calculated value and the reported value must be within 10%. All positive values must have less than or equal to 40% %D between the primary and secondary columns. Any sample value >MDL and <MRL or <3*MDL (whichever is greater) was qualified as estimated, "J."

- The %D between the primary and secondary columns was within criteria for all detected chlorinated herbicides.

Sample: 50SB010B (F51247-10), dicamba

Conc. µg/kg = (Amt * Ve * DF) / (CF * Ws * D)

where: Amt = the response on column (µg/mL) of the sample
CF = Calibration Factor (from initial calibration)
Ve = Final Volume of extract (mL)
DF = Dilution factor
W(s) = Weight of sample in grams.
D = Percent dry weight (100 - % moisture in sample)/100

Conc. µg/kg = (1398115 * 10 * 1) / (43400* 30.3 * 0.7660) = 13.9 µg/kg

Reported value = 13.9 µg/kg
%D = 0.0%
Values were within 10% difference.

USEPA Region III Validation Qualifiers

(No Code) = Confirmed identification.

B = The analyte has been detected in the sample and the associated laboratory or field blank.

J = Indicates an estimated value for (1) estimated value due to QC non-conformance. Reported value may not be accurate or precise, (2) estimating a concentration as a tentatively identified compound as indicated by the mass spectral and retention time data, or (3) estimating a concentration ≥ MDL and <MRL or <3*MDL, whichever is greater.

K = Analyte present. Reported value may be biased high (estimated) due to QC non-conformance.

L = Analyte present. Reported value may be biased low (estimated) due to QC non-conformance.

R = Unreliable result. Analyte may or may not be present in the sample due to QC non-conformance.

UL = Value is estimated bias low and not detected due to QC non-conformance. Reporting limit may be inaccurate or imprecise. Quantitation limit is probably higher.

UJ = Value is estimated and not detected due to QC non-conformance. Reporting limit may be inaccurate or imprecise.

Laboratory Qualifiers

(No Code) = Confirmed identification.

A (Dioxins) = MDL is based upon the signal-to-noise measurement.

B (Metals) = The reported value was obtained from a reading <MRL and ≥MDL and is considered estimated.

B (Organics and Dioxins) = The analyte or compound has been detected in the sample and laboratory method blank. It indicates probable blank contamination.

D (Organics) = Indicates sample was analyzed at a dilution.

E (Metals) = Reported value is estimated because of the presence of interferences.

E (Organics) = Identifies compounds whose concentrations exceed the upper level of the calibration range.

E (Dioxins) = Reported value is estimated because of the presence of ether interferences.

EMPC (Dioxins) = The ion-abundance ratio between the two characteristic PCDD/F ions is outside accepted ranges. The detected PCDD/F is reported as an estimated maximum possible concentration (EMPC).

I (Dioxins) = Reported value is estimated because of the incorrect isotope rations were obtained.

J (All) = Indicates an estimated value for (1) estimating a concentration as a tentatively identified compound as indicated by the mass spectral and retention time data, (2) estimating a concentration <MRL and ≥ MDL, or estimating a concentration below the calibration range.

N (Organics) = Indicates presumptive evidence of a compound for tentatively identified compounds using a library search.

N (Metals) = Laboratory spike sample recovery not within control limits.

P (Organics) = Target analyte confirmation >40% difference for detected compound between the primary and secondary columns. The lower of the two values was reported.

U (All) = ND = BQL = Not detected. The associated number indicates the compound reporting limit for the sample.

* (Metals) = Duplicate analysis not within control limits.

* (Organics) = Surrogate outside of QC limits on both original and re-analysis.

Raw Data: GG36408.D

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Report of Analysis

Client Sample ID:	50SB06A		
Lab Sample ID:	F51247-1	**Date Sampled:**	07/23/07
Matrix:	SO - Soil	**Date Received:**	07/24/07
Method:	SW846 8151 SW846 3550B	**Percent Solids:**	88.8
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	GG36408.D	1	07/29/07	ATX	07/26/07	T:OP7763	T:GGG1137
Run #2							

	Initial Weight	Final Volume
Run #1	30.4 g	10.0 ml
Run #2		

Herbicide List

CAS No.	Compound	Result	RL	MDL	Units	Q
94-75-7	2,4-D	ND	37	15	ug/kg	
93-72-1	2,4,5-TP (Silvex)	ND	15	13	ug/kg	
93-76-5	2,4,5-T	ND	7.4	3.7	ug/kg	
1918-00-9	Dicamba	ND	7.4	5.6	ug/kg	
88-85-7	Dinoseb	ND	7.4	4.8	ug/kg	
75-99-0	Dalapon	ND	37	26	ug/kg	
120-36-5	Dichloroprop	ND	37	10	ug/kg	
94-82-6	2,4-DB	ND	74	60	ug/kg	
93-65-2	MCPP	ND UJ	190		ug/kg	
94-74-6	MCPA	ND UJ	190		ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
19719-28-9	2,4-DCAA	124%		34-179%

(a) Analysis performed at Accutest Laboratories, Houston, TX.

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: GG36409.D

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Accutest Laboratories

Report of Analysis

Client Sample ID:	50SB06B		
Lab Sample ID:	F51247-2	**Date Sampled:**	07/23/07
Matrix:	SO - Soil	**Date Received:**	07/24/07
Method:	SW846 8151 SW846 3550B	**Percent Solids:**	59.6
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	GG36409.D	1	07/29/07	ATX	07/26/07	T:OP7763	T:GGG1137
Run #2							

	Initial Weight	Final Volume
Run #1	30.0 g	10.0 ml
Run #2		

Herbicide List

CAS No.	Compound	Result	RL	MDL	Units	Q
94-75-7	2,4-D	ND	56	22	ug/kg	
93-72-1	2,4,5-TP (Silvex)	ND	22	20	ug/kg	
93-76-5	2,4,5-T	ND	11	5.6	ug/kg	
1918-00-9	Dicamba	ND	11	8.4	ug/kg	
88-85-7	Dinoseb	ND	11	7.3	ug/kg	
75-99-0	Dalapon	ND	56	39	ug/kg	
120-36-5	Dichloroprop	ND	56	15	ug/kg	
94-82-6	2,4-DB	ND	110	91	ug/kg	
93-65-2	MCPP	ND UJ	280		ug/kg	
94-74-6	MCPA	ND UJ	280		ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
19719-28-9	2,4-DCAA	109%		34-179%

(a) Analysis performed at Accutest Laboratories, Houston, TX.

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	50SB07A		
Lab Sample ID:	F51247-3	**Date Sampled:**	07/23/07
Matrix:	SO - Soil	**Date Received:**	07/24/07
Method:	SW846 8151 SW846 3550B	**Percent Solids:**	88.4
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	GG36410.D	1	07/29/07	ATX	07/26/07	T:OP7763	T:GGG1137
Run #2							

	Initial Weight	Final Volume
Run #1	30.3 g	10.0 ml
Run #2		

Herbicide List

CAS No.	Compound	Result	RL	MDL	Units	Q
94-75-7	2,4-D	ND	37	15	ug/kg	
93-72-1	2,4,5-TP (Silvex)	ND	15	13	ug/kg	
93-76-5	2,4,5-T	ND	7.5	3.7	ug/kg	
1918-00-9	Dicamba	ND	7.5	5.6	ug/kg	
88-85-7	Dinoseb	ND	7.5	4.9	ug/kg	
75-99-0	Dalapon	ND	37	26	ug/kg	
120-36-5	Dichloroprop	ND	37	10	ug/kg	
94-82-6	2,4-DB	ND	75	61	ug/kg	
93-65-2	MCPP	ND UJ	190		ug/kg	
94-74-6	MCPA	ND UJ	190		ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
19719-28-9	2,4-DCAA	91%		34-179%

(a) Analysis performed at Accutest Laboratories, Houston, TX.

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: GG36411.D

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Report of Analysis

Client Sample ID:	50SB07B		
Lab Sample ID:	F51247-4	Date Sampled:	07/23/07
Matrix:	SO - Soil	Date Received:	07/24/07
Method:	SW846 8151 SW846 3550B	Percent Solids:	59.3
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	GG36411.D	1	07/29/07	ATX	07/26/07	T:OP7763	T:GGG1137
Run #2							

	Initial Weight	Final Volume
Run #1	30.7 g	10.0 ml
Run #2		

Herbicide List

CAS No.	Compound	Result	RL	MDL	Units	Q
94-75-7	2,4-D	ND	55	22	ug/kg	
93-72-1	2,4,5-TP (Silvex)	ND	22	19	ug/kg	
93-76-5	2,4,5-T	ND	11	5.5	ug/kg	
1918-00-9	Dicamba	ND	11	8.2	ug/kg	
88-85-7	Dinoseb	ND	11	7.1	ug/kg	
75-99-0	Dalapon	ND	55	38	ug/kg	
120-36-5	Dichloroprop	ND	55	15	ug/kg	
94-82-6	2,4-DB	ND	110	90	ug/kg	
93-65-2	MCPP	ND UJ	270		ug/kg	
94-74-6	MCPA	ND UJ	270		ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
19719-28-9	2,4-DCAA	111%		34-179%

(a) Analysis performed at Accutest Laboratories, Houston, TX.

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: GG36412.D

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Report of Analysis

Client Sample ID:	50SB08A		
Lab Sample ID:	F51247-5	**Date Sampled:**	07/23/07
Matrix:	SO - Soil	**Date Received:**	07/24/07
Method:	SW846 8151 SW846 3550B	**Percent Solids:**	86.6
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	GG36412.D	1	07/29/07	ATX	07/26/07	T:OP7763	T:GGG1137
Run #2							

	Initial Weight	Final Volume
Run #1	30.2 g	10.0 ml
Run #2		

Herbicide List

CAS No.	Compound	Result	RL	MDL	Units	Q
94-75-7	2,4-D	ND	38	15	ug/kg	
93-72-1	2,4,5-TP (Silvex)	ND	15	13	ug/kg	
93-76-5	2,4,5-T	ND	7.7	3.8	ug/kg	
1918-00-9	Dicamba	ND	7.7	5.7	ug/kg	
88-85-7	Dinoseb	ND	7.7	5.0	ug/kg	
75-99-0	Dalapon	ND	38	27	ug/kg	
120-36-5	Dichloroprop	ND	38	10	ug/kg	
94-82-6	2,4-DB	ND	77	62	ug/kg	
93-65-2	MCPP	ND UJ	190		ug/kg	
94-74-6	MCPA	ND UJ	190		ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
19719-28-9	2,4-DCAA	135%		34-179%

(a) Analysis performed at Accutest Laboratories, Houston, TX.

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	50SB08B		
Lab Sample ID:	F51247-6	**Date Sampled:**	07/23/07
Matrix:	SO - Soil	**Date Received:**	07/24/07
Method:	SW846 8151 SW846 3550B	**Percent Solids:**	63.6
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	GG36413.D	1	07/29/07	ATX	07/26/07	T:OP7763	T:GGG1137
Run #2							

	Initial Weight	Final Volume
Run #1	30.1 g	10.0 ml
Run #2		

Herbicide List

CAS No.	Compound	Result	RL	MDL	Units	Q
94-75-7	2,4-D	ND	52	21	ug/kg	
93-72-1	2,4,5-TP (Silvex)	ND	21	18	ug/kg	
93-76-5	2,4,5-T	ND	10	5.2	ug/kg	
1918-00-9	Dicamba	ND	10	7.8	ug/kg	
88-85-7	Dinoseb	ND	10	6.8	ug/kg	
75-99-0	Dalapon	ND	52	37	ug/kg	
120-36-5	Dichloroprop	ND	52	14	ug/kg	
94-82-6	2,4-DB	ND	100	85	ug/kg	
93-65-2	MCPP	ND VJ	260		ug/kg	
94-74-6	MCPA	ND VJ	260		ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
19719-28-9	2,4-DCAA	116%		34-179%

(a) Analysis performed at Accutest Laboratories, Houston, TX.

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: GG36416.D

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Accutest Laboratories

Report of Analysis

Client Sample ID:	50SB09A		
Lab Sample ID:	F51247-7	Date Sampled:	07/23/07
Matrix:	SO - Soil	Date Received:	07/24/07
Method:	SW846 8151 SW846 3550B	Percent Solids:	83.8
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	GG36416.D	1	07/29/07	ATX	07/26/07	T:OP7763	T:GGG1137
Run #2							

	Initial Weight	Final Volume
Run #1	30.3 g	10.0 ml
Run #2		

Herbicide List

CAS No.	Compound	Result	RL	MDL	Units	Q
94-75-7	2,4-D	ND	39	16	ug/kg	
93-72-1	2,4,5-TP (Silvex)	ND	16	14	ug/kg	
93-76-5	2,4,5-T	ND	7.9	3.9	ug/kg	
1918-00-9	Dicamba	ND	7.9	5.9	ug/kg	
88-85-7	Dinoseb	ND	7.9	5.1	ug/kg	
75-99-0	Dalapon	ND	39	28	ug/kg	
120-36-5	Dichloroprop	ND	39	11	ug/kg	
94-82-6	2,4-DB	ND	79	64	ug/kg	
93-65-2	MCPP	ND UJ	200		ug/kg	
94-74-6	MCPA	ND UJ	200		ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
19719-28-9	2,4-DCAA	94%		34-179%

(a) Analysis performed at Accutest Laboratories, Houston, TX.

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: GG36417.D

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Accutest Laboratories

Report of Analysis

Client Sample ID:	50SB09B		
Lab Sample ID:	F51247-8	**Date Sampled:**	07/23/07
Matrix:	SO - Soil	**Date Received:**	07/24/07
Method:	SW846 8151 SW846 3550B	**Percent Solids:**	62.0
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	GG36417.D	1	07/29/07	ATX	07/26/07	T:OP7763	T:GGG1137
Run #2							

	Initial Weight	Final Volume
Run #1	30.2 g	10.0 ml
Run #2		

Herbicide List

CAS No.	Compound	Result	RL	MDL	Units	Q
94-75-7	2,4-D	ND	53	21	ug/kg	
93-72-1	2,4,5-TP (Silvex)	ND	21	19	ug/kg	
93-76-5	2,4,5-T	ND	11	5.3	ug/kg	
1918-00-9	Dicamba	ND	11	8.0	ug/kg	
88-85-7	Dinoseb	ND	11	7.0	ug/kg	
75-99-0	Dalapon	ND	53	37	ug/kg	
120-36-5	Dichloroprop	ND	53	14	ug/kg	
94-82-6	2,4-DB	ND	110	87	ug/kg	
93-65-2	MCPP	ND UJ	270		ug/kg	
94-74-6	MCPA	ND UJ	270		ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
19719-28-9	2,4-DCAA	84%		34-179%

(a) Analysis performed at Accutest Laboratories, Houston, TX.

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: GG36418.D

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Accutest Laboratories

Report of Analysis

Client Sample ID:	50SB010A		
Lab Sample ID:	F51247-9	**Date Sampled:**	07/23/07
Matrix:	SO - Soil	**Date Received:**	07/24/07
Method:	SW846 8151 SW846 3550B	**Percent Solids:**	92.6
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	GG36418.D	1	07/30/07	ATX	07/26/07	T:OP7763	T:GGG1137
Run #2							

	Initial Weight	Final Volume
Run #1	30.3 g	10.0 ml
Run #2		

Herbicide List

CAS No.	Compound	Result	RL	MDL	Units	Q
94-75-7	2,4-D	ND	36	14	ug/kg	
93-72-1	2,4,5-TP (Silvex)	ND	14	12	ug/kg	
93-76-5	2,4,5-T	ND	7.1	3.6	ug/kg	
1918-00-9	Dicamba	ND	7.1	5.3	ug/kg	
88-85-7	Dinoseb	ND	7.1	4.6	ug/kg	
75-99-0	Dalapon	ND	36	25	ug/kg	
120-36-5	Dichloroprop	ND	36	9.6	ug/kg	
94-82-6	2,4-DB	ND	71	58	ug/kg	
93-65-2	MCPP	ND UJ	180		ug/kg	
94-74-6	MCPA	ND UJ	180		ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
19719-28-9	2,4-DCAA	128%		34-179%

(a) Analysis performed at Accutest Laboratories, Houston, TX.

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	50SB010B		
Lab Sample ID:	F51247-10	**Date Sampled:**	07/23/07
Matrix:	SO - Soil	**Date Received:**	07/24/07
Method:	SW846 8151 SW846 3550B	**Percent Solids:**	76.6
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	GG36419.D	1	07/30/07	ATX	07/26/07	T:OP7763	T:GGG1137
Run #2							

	Initial Weight	Final Volume
Run #1	30.3 g	10.0 ml
Run #2		

Herbicide List

CAS No.	Compound	Result	RL	MDL	Units	Q
94-75-7	2,4-D	ND	43	17	ug/kg	
93-72-1	2,4,5-TP (Silvex)	ND	17	15	ug/kg	
93-76-5	2,4,5-T	ND	8.6	4.3	ug/kg	
1918-00-9	Dicamba	13.9 J	8.6	6.5	ug/kg	
88-85-7	Dinoseb	ND	8.6	5.6	ug/kg	
75-99-0	Dalapon	ND	43	30	ug/kg	
120-36-5	Dichloroprop	ND	43	12	ug/kg	
94-82-6	2,4-DB	ND	86	70	ug/kg	
93-65-2	MCPP	ND UT	220		ug/kg	
94-74-6	MCPA	ND UT	220		ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
19719-28-9	2,4-DCAA	60%		34-179%

(a) Analysis performed at Accutest Laboratories, Houston, TX.

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Accutest Laboratories

Report of Analysis

Client Sample ID:	50SB011A		
Lab Sample ID:	F51247-11	**Date Sampled:**	07/23/07
Matrix:	SO - Soil	**Date Received:**	07/24/07
Method:	SW846 8151 SW846 3550B	**Percent Solids:**	92.1
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	GG36420.D	1	07/30/07	ATX	07/26/07	T:OP7763	T:GGG1137
Run #2							

	Initial Weight	Final Volume
Run #1	30.1 g	10.0 ml
Run #2		

Herbicide List

CAS No.	Compound	Result	RL	MDL	Units	Q
94-75-7	2,4-D	ND	36	14	ug/kg	
93-72-1	2,4,5-TP (Silvex)	ND	14	13	ug/kg	
93-76-5	2,4,5-T	ND	7.2	3.6	ug/kg	
1918-00-9	Dicamba	ND	7.2	5.4	ug/kg	
88-85-7	Dinoseb	ND	7.2	4.7	ug/kg	
75-99-0	Dalapon	ND	36	25	ug/kg	
120-36-5	Dichloroprop	ND	36	9.8	ug/kg	
94-82-6	2,4-DB	ND	72	59	ug/kg	
93-65-2	MCPP	ND UJ	180		ug/kg	
94-74-6	MCPA	ND UJ	180		ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
19719-28-9	2,4-DCAA	87%		34-179%

(a) Analysis performed at Accutest Laboratories, Houston, TX.

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	50SB011B		
Lab Sample ID:	F51247-12	**Date Sampled:**	07/23/07
Matrix:	SO - Soil	**Date Received:**	07/24/07
Method:	SW846 8151 SW846 3550B	**Percent Solids:**	85.6
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	GG36421.D	1	07/30/07	ATX	07/26/07	T:OP7763	T:GGG1137
Run #2							

	Initial Weight	Final Volume
Run #1	30.3 g	10.0 ml
Run #2		

Herbicide List

CAS No.	Compound	Result	RL	MDL	Units	Q
94-75-7	2,4-D	ND	39	15	ug/kg	
93-72-1	2,4,5-TP (Silvex)	ND	15	14	ug/kg	
93-76-5	2,4,5-T	ND	7.7	3.9	ug/kg	
1918-00-9	Dicamba	ND	7.7	5.8	ug/kg	
88-85-7	Dinoseb	ND	7.7	5.0	ug/kg	
75-99-0	Dalapon	ND	39	27	ug/kg	
120-36-5	Dichloroprop	ND	39	10	ug/kg	
94-82-6	2,4-DB	ND	77	63	ug/kg	
93-65-2	MCPP	ND VJ	190		ug/kg	
94-74-6	MCPA	ND VJ	190		ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
19719-28-9	2,4-DCAA	76%		34-179%

(a) Analysis performed at Accutest Laboratories, Houston, TX.

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	50SB012A		
Lab Sample ID:	F51247-13	**Date Sampled:**	07/23/07
Matrix:	SO - Soil	**Date Received:**	07/24/07
Method:	SW846 8151 SW846 3550B	**Percent Solids:**	85.4
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	GG36422.D	1	07/30/07	ATX	07/26/07	T:OP7763	T:GGG1137
Run #2							

	Initial Weight	Final Volume
Run #1	30.4 g	10.0 ml
Run #2		

Herbicide List

CAS No.	Compound	Result	RL	MDL	Units	Q
94-75-7	2,4-D	ND	38	15	ug/kg	
93-72-1	2,4,5-TP (Silvex)	ND	15	13	ug/kg	
93-76-5	2,4,5-T	ND	7.7	3.8	ug/kg	
1918-00-9	Dicamba	ND	7.7	5.8	ug/kg	
88-85-7	Dinoseb	ND	7.7	5.0	ug/kg	
75-99-0	Dalapon	ND	38	27	ug/kg	
120-36-5	Dichloroprop	ND	38	10	ug/kg	
94-82-6	2,4-DB	ND	77	63	ug/kg	
93-65-2	MCPP	ND UJ	190		ug/kg	
94-74-6	MCPA	ND UJ	190		ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
19719-28-9	2,4-DCAA	81%		34-179%

(a) Analysis performed at Accutest Laboratories, Houston, TX.

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	50SB012B		
Lab Sample ID:	F51247-14	**Date Sampled:**	07/23/07
Matrix:	SO - Soil	**Date Received:**	07/24/07
Method:	SW846 8151 SW846 3550B	**Percent Solids:**	67.7
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	GG36423.D	1	07/30/07	ATX	07/26/07	T:OP7763	T:GGG1137
Run #2							

	Initial Weight	Final Volume
Run #1	30.1 g	10.0 ml
Run #2		

Herbicide List

CAS No.	Compound	Result	RL	MDL	Units	Q
94-75-7	2,4-D	ND	49	20	ug/kg	
93-72-1	2,4,5-TP (Silvex)	ND	20	17	ug/kg	
93-76-5	2,4,5-T	ND	9.8	4.9	ug/kg	
1918-00-9	Dicamba	ND	9.8	7.4	ug/kg	
88-85-7	Dinoseb	ND	9.8	6.4	ug/kg	
75-99-0	Dalapon	ND	49	34	ug/kg	
120-36-5	Dichloroprop	ND	49	13	ug/kg	
94-82-6	2,4-DB	ND	98	80	ug/kg	
93-65-2	MCPP	ND VT	250		ug/kg	
94-74-6	MCPA	ND VT	250		ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
19719-28-9	2,4-DCAA	86%		34-179%

(a) Analysis performed at Accutest Laboratories, Houston, TX.

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	50SB013A		
Lab Sample ID:	F51247-15	**Date Sampled:**	07/23/07
Matrix:	SO - Soil	**Date Received:**	07/24/07
Method:	SW846 8151 SW846 3550B	**Percent Solids:**	87.5
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	GG36424.D	1	07/30/07	ATX	07/26/07	T:OP7763	T:GGG1137
Run #2							

	Initial Weight	Final Volume
Run #1	30.1 g	10.0 ml
Run #2		

Herbicide List

CAS No.	Compound	Result	RL	MDL	Units	Q
94-75-7	2,4-D	ND	38	15	ug/kg	
93-72-1	2,4,5-TP (Silvex)	ND	15	13	ug/kg	
93-76-5	2,4,5-T	ND	7.6	3.8	ug/kg	
1918-00-9	Dicamba	ND	7.6	5.7	ug/kg	
88-85-7	Dinoseb	ND	7.6	4.9	ug/kg	
75-99-0	Dalapon	ND	38	27	ug/kg	
120-36-5	Dichloroprop	ND	38	10	ug/kg	
94-82-6	2,4-DB	ND	76	62	ug/kg	
93-65-2	MCPP	ND UJ	190		ug/kg	
94-74-6	MCPA	ND UJ	190		ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
19719-28-9	2,4-DCAA	65%		34-179%

(a) Analysis performed at Accutest Laboratories, Houston, TX.

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	50SB013B		
Lab Sample ID:	F51247-16	**Date Sampled:**	07/23/07
Matrix:	SO - Soil	**Date Received:**	07/24/07
Method:	SW846 8151 SW846 3550B	**Percent Solids:**	64.7
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	GG36425.D	1	07/30/07	ATX	07/26/07	T:OP7763	T:GGG1137
Run #2							

	Initial Weight	Final Volume
Run #1	30.1 g	10.0 ml
Run #2		

Herbicide List

CAS No.	Compound	Result	RL	MDL	Units	Q
94-75-7	2,4-D	ND	51	21	ug/kg	
93-72-1	2,4,5-TP (Silvex)	ND	21	18	ug/kg	
93-76-5	2,4,5-T	ND	10	5.1	ug/kg	
1918-00-9	Dicamba	ND	10	7.7	ug/kg	
88-85-7	Dinoseb	ND	10	6.7	ug/kg	
75-99-0	Dalapon	ND	51	36	ug/kg	
120-36-5	Dichloroprop	ND	51	14	ug/kg	
94-82-6	2,4-DB	ND	100	84	ug/kg	
93-65-2	MCPP	ND VT	260		ug/kg	
94-74-6	MCPA	ND VT	260		ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
19719-28-9	2,4-DCAA	64%		34-179%

(a) Analysis performed at Accutest Laboratories, Houston, TX.

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	50SB014A		
Lab Sample ID:	F51247-17	**Date Sampled:**	07/23/07
Matrix:	SO - Soil	**Date Received:**	07/24/07
Method:	SW846 8151 SW846 3550B	**Percent Solids:**	90.3
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	GG36428.D	1	07/30/07	ATX	07/26/07	T:OP7763	T:GGG1137
Run #2							

	Initial Weight	Final Volume
Run #1	30.3 g	10.0 ml
Run #2		

Herbicide List

CAS No.	Compound	Result	RL	MDL	Units	Q
94-75-7	2,4-D	ND	37	15	ug/kg	
93-72-1	2,4,5-TP (Silvex)	ND	15	13	ug/kg	
93-76-5	2,4,5-T	ND	7.3	3.7	ug/kg	
1918-00-9	Dicamba	ND	7.3	5.5	ug/kg	
88-85-7	Dinoseb	ND	7.3	4.8	ug/kg	
75-99-0	Dalapon	ND	37	26	ug/kg	
120-36-5	Dichloroprop	ND	37	9.9	ug/kg	
94-82-6	2,4-DB	ND	73	60	ug/kg	
93-65-2	MCPP	ND UJ	180		ug/kg	
94-74-6	MCPA	ND UJ	180		ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
19719-28-9	2,4-DCAA	91%		34-179%

(a) Analysis performed at Accutest Laboratories, Houston, TX.

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	50SB014B		
Lab Sample ID:	F51247-18	**Date Sampled:**	07/23/07
Matrix:	SO - Soil	**Date Received:**	07/24/07
Method:	SW846 8151 SW846 3550B	**Percent Solids:**	82.8
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	GG36429.D	1	07/30/07	ATX	07/26/07	T:OP7763	T:GGG1137
Run #2							

	Initial Weight	Final Volume
Run #1	30.3 g	10.0 ml
Run #2		

Herbicide List

CAS No.	Compound	Result	RL	MDL	Units	Q
94-75-7	2,4-D	ND	40	16	ug/kg	
93-72-1	2,4,5-TP (Silvex)	ND	16	14	ug/kg	
93-76-5	2,4,5-T	ND	8.0	4.0	ug/kg	
1918-00-9	Dicamba	ND	8.0	6.0	ug/kg	
88-85-7	Dinoseb	ND	8.0	5.2	ug/kg	
75-99-0	Dalapon	ND	40	28	ug/kg	
120-36-5	Dichloroprop	ND	40	11	ug/kg	
94-82-6	2,4-DB	ND	80	65	ug/kg	
93-65-2	MCPP	ND UJ	200		ug/kg	
94-74-6	MCPA	ND UJ	200		ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
19719-28-9	2,4-DCAA	72%		34-179%

(a) Analysis performed at Accutest Laboratories, Houston, TX.

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	50SB015A		
Lab Sample ID:	F51247-19	**Date Sampled:**	07/23/07
Matrix:	SO - Soil	**Date Received:**	07/24/07
Method:	SW846 8151 SW846 3550B	**Percent Solids:**	87.1
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	GG36430.D	1	07/30/07	ATX	07/26/07	T:OP7763	T:GGG1137
Run #2							

	Initial Weight	Final Volume
Run #1	30.0 g	10.0 ml
Run #2		

Herbicide List

CAS No.	Compound	Result	RL	MDL	Units	Q
94-75-7	2,4-D	ND	38	15	ug/kg	
93-72-1	2,4,5-TP (Silvex)	ND	15	13	ug/kg	
93-76-5	2,4,5-T	ND	7.6	3.8	ug/kg	
1918-00-9	Dicamba	ND	7.6	5.7	ug/kg	
88-85-7	Dinoseb	ND	7.6	5.0	ug/kg	
75-99-0	Dalapon	ND	38	27	ug/kg	
120-36-5	Dichloroprop	ND	38	10	ug/kg	
94-82-6	2,4-DB	ND	76	62	ug/kg	
93-65-2	MCPP	ND VJ	190		ug/kg	
94-74-6	MCPA	ND VJ	190		ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
19719-28-9	2,4-DCAA	51%		34-179%

(a) Analysis performed at Accutest Laboratories, Houston, TX.

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	50SB015B		
Lab Sample ID:	F51247-20	**Date Sampled:**	07/23/07
Matrix:	SO - Soil	**Date Received:**	07/24/07
Method:	SW846 8151 SW846 3550B	**Percent Solids:**	85.3
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	GG36431.D	1	07/30/07	ATX	07/26/07	T:OP7763	T:GGG1137
Run #2							

	Initial Weight	Final Volume
Run #1	30.2 g	10.0 ml
Run #2		

Herbicide List

CAS No.	Compound	Result	RL	MDL	Units	Q
94-75-7	2,4-D	ND	39	16	ug/kg	
93-72-1	2,4,5-TP (Silvex)	ND	16	14	ug/kg	
93-76-5	2,4,5-T	ND	7.8	3.9	ug/kg	
1918-00-9	Dicamba	ND	7.8	5.8	ug/kg	
88-85-7	Dinoseb	ND	7.8	5.0	ug/kg	
75-99-0	Dalapon	ND	39	27	ug/kg	
120-36-5	Dichloroprop	ND	39	10	ug/kg	
94-82-6	2,4-DB	ND	78	63	ug/kg	
93-65-2	MCPP	ND UJ	190		ug/kg	
94-74-6	MCPA	ND UJ	190		ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
19719-28-9	2,4-DCAA	90%		34-179%

(a) Analysis performed at Accutest Laboratories, Houston, TX.

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Shaw Environmental, Inc.
2113 Emmorton Park Road
Edgewood, Maryland
410-612-6350
FAX: 410-612-6351

Shaw® Shaw Environmental, Inc.

MEMORANDUM

TO: Jeff Parks, Shaw E&I Radford Army Ammunition Plant (RFAAP) Project Manager

FROM: Eric Malarek, Shaw E&I Project Chemist

SUBJECT: RFAAP Data Validation – TAL Metals
Accutest Laboratories, Inc., SDG F51247

DATE: December 10, 2007

The purpose of this memorandum is to present the data validation report for the samples collected at Main Manufacturing Area at RFAAP for a RFI/CMS Nine Sites on July 23, 2007. Solid samples were analyzed for target analyte list (TAL) metals using USEPA SW-846 3050B/6010B for ICP metals and SW-846 7471A for mercury. A total of twenty solid samples were validated. The sample Ids are:

Field Sample ID	Lab Sample ID	Field Sample ID	Lab Sample ID
50SB06A	F51247-1	50SB011A	F51247-11
50SB06B	F51247-2	50SB011B	F51247-12
50SB07A	F51247-3	50SB012A	F51247-13
50SB07B	F51247-4	50SB012B	F51247-14
50SB08A	F51247-5	50SB013A	F51247-15
50SB08B	F51247-6	50SB013B	F51247-16
50SB09A	F51247-7	50SB014A	F51247-17
50SB09B	F51247-8	50SB014B	F51247-18
50SB010A	F51247-9	50SB015A	F51247-19
50SB010B	F51247-10	50SB015B	F51247-20

Data were reviewed by Eric Malarek and validated using a combination of project QAPP, *Quality Systems Manual for Environmental Laboratories, Final Version 3, January, 2006* (DoD, 2006) (DoD QSM), method-specific criteria, and laboratory SOP criteria. The data qualifier scheme was consistent with the *Region III Modifications to the National Functional Guidelines for Inorganic Data Review* (April, 1993). Parameters evaluated are presented in **Table 1**. Data associated with parameters in compliance with quality control specifications have not been qualified. Data associated with parameters that did not comply with quality control specifications and directly impacted project data have been qualified in accordance with USEPA Region III specifications.

Table 1 Laboratory Performance Criteria

Qualified		Parameter
Yes	No	
	X	Holding Times
X		Initial and Continuing Calibration
X		Blank Analysis
	X	ICP Interference Check Sample (ICS)
	X	Laboratory Control Sample (LCS)
X		Laboratory Sample Duplicate
X		Matrix Spike and Spike Duplicate
X		ICP Serial Dilution
	X	Field Sample Duplicate
X		Quantitation Verification

The quality of data collected in support of this sampling activity is considered acceptable with noted qualifications.

Eric Malarek, Chemist

12/10/07
Date

RFAAP VALIDATION REPORT
METALS REVIEW
SDG F51247

I-Holding Times

The primary objective is to ascertain the validity of results based on the holding time of the sample from time of collection to time of sample analysis. Holding time criteria: For solid matrices, the samples are shipped cool @4°C±2°C with a maximum holding time is 180 days for ICP metals and 28 days for mercury.

- Temperature Review: The temperature blank was sent with each cooler and recorded by the laboratory upon receipt. For samples collected on 07/23/07, the coolers were received by the primary laboratory (Accutest) on 07/20/07 at 2.8°C, and 3.2°C. The herbicides were subcontracted to Accutest TX and were received the samples at 3.4°C. The dioxin subcontract laboratory (SGS Paradigm Analytical Laboratories, Inc.) received the samples at 1.2°C. Even though the receipt temperature was below criteria for some coolers, there were no impacts to the data quality. No qualifiers were applied based upon this outlier.

- Holding Time Review: Samples were collected 07/23/07 for metals analysis. For solid samples, they were digested on 07/30/07 and analyzed on 07/30/07 and 07/31/07 (Fe, Mn, Ca, Cr, and Cu) for ICP metals. Mercury was digested on 07/26/07 and analyzed on 07/26/07. All criteria were met. No qualifiers were applied.

II-Initial and Continuing Calibration

Requirements for satisfactory instrument calibration are established to ensure that the instrument is capable of producing acceptable quantitative data. Initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of the analysis run, and continuing calibration verification documents that the initial calibration is still valid.

ICP:	1- blank (DoD QSM <½ MRL) 3 – standards (r≥0.995) ICV/CCV (90-110%) (DoD QSM 90-110%) MRL (70-130%) (DoD QSM 80-120%) High Std. (95-105%)	Hg:	1 – blank (DoD QSM <½ MRL) 5 – standards (r≥0.995) ICV/CCV (80-120%)(DoD QSM ICV 90-110% & CCV 80-120%) MRL (80-120%) (DoD QSM 80-120%) High Std. (95-105%)

- The solid samples were analyzed for ICP metals on 07/30/07 and 07/31/07 (Fe, Mn, Ca, Cr, and Cu) for ICP metals. Mercury was analyzed for the solid samples on 07/26/07 with a correlation coefficient of 0.9998. All ICV/CCV/High Standard criteria were met for all metals and runs. **Table 2** summarizes the MRL standard analysis. Samples with concentrations detected less than two times the MRL with out of criteria MRL recovery were qualified.

Table 2 MRL Analysis Summary

Analysis Date	Analysis	MRL (mg/kg)	MRL %Recovery	Qualified samples @ <2xMRL	Validation Qualifiers
07/30/07	ICP-Sb	3.0	34.0%	50SB010A, 50SB010B, 50SB011A, 50SB011B, 50SB012A, 50SB012B, 50SB013A, 50SB013B, 50SB014A, 50SB014B, 50SB015A, 50SB015B, 50SB06A, 50SB06B, 50SB07A, 50SB07B, 50SB08A, 50SB08B, 50SB09A, 50SB09B	L, UL
07/30/07	ICP-Pb	5.0	128%; 138%	50SB010B, 50SB011A, 50SB014B, 50SB015A, 50SB015B	K
07/30/07	ICP-Se	5.0	130%; 122%	50SB010A, 50SB011A, 50SB011B, 50SB012A, 50SB013A, 50SB014A, 50SB014B, 50SB015A, 50SB015B, 50SB06A, 50SB07A, 50SB08A, 50SB09A	K
07/30/07	ICP-Zn	1.0	121%	None	K
07/31/07	Fe, Mn, Ca, Cr, & Cu	Various	All within criteria	None	None
07/26/07	Hg	0.083	All within criteria	None	None

III-Blanks

Blanks (preparation and calibration blanks) are assessed to determine the existence and magnitude of contamination problems. No contaminants should be detected (i.e. <MDL) in any of the associated blanks. DoD QSM limits are <½MRL for the method blank and <2*MDL for the calibration blanks. Samples are qualified "B" when they are less than 5x the absolute value of the maximum blank concentration. **Table 3** summarizes the blank contamination analysis. Action levels are based upon dilution factor of one and for solid matrices were converted to soil values (soil conversion factor = 10 for ICP and Hg = 12) if needed. Rinse blanks 072407R (F51275-1) and 072507R (F51300-31) apply to the surface soil "SS" and subsurface soil "SB" samples in this SDG.

Table 3 Blank Contamination Analysis Summary

Analysis Date	Analysis	QC Blank ID	Max Conc. mg/kg	Action Level mg/kg	B qualified samples
07/30/07	Copper	ICB/CCBs	0.24J	1.2	None
07/30/07	Lead	ICB/CCBs	0.63J	3.2	None
07/30/07	Magnesium	ICB/CCBs	1.04J	5.2	None
07/30/07	Potassium	ICB/CCBs	174J	870	50SB010A, 50SB010B, 50SB011A, 50SB011B, 50SB014A, 50SB014B, 50SB015A, 50SB015B, 50SB06B, 50SB07A, 50SB07B, 50SB08B, 50SB09A, 50SB09B
07/30/07	Selenium	ICB/CCBs	0.50J	2.5	50SB010A
07/30/07	Sodium	ICB/CCBs	194J	970	50SB010A, 50SB011A, 50SB011B, 50SB012B, 50SB013A, 50SB013B, 50SB014A, 50SB014B, 50SB015B, 50SB06B, 50SB07A, 50SB07B, 50SB08B, 50SB09A, 50SB09B
07/30/07	Thallium	ICB/CCBs	0.56J	2.8	None
07/31/07	Fe, Mn, Ca, Cr, & Cu	ICB/CCBs	<2*MDL	NA	None
07/26/07	Mercury	ICB/CCBs	<2*MDL	NA	None
07/30/07	Potassium	MP12604-MB	86.3J	432	50SB010A, 50SB06B, 50SB07B, 50SB09B
07/30/07	Sodium	MP12604-MB	103J	515	50SB010A, 50SB011A, 50SB011B, 50SB012B, 50SB013A, 50SB013B, 50SB014A, 50SB014B, 50SB015B, 50SB06B, 50SB07A, 50SB07B, 50SB08B, 50SB09A, 50SB09B
07/30/07	Thallium	MP12604-MB	0.37J	1.9	None
07/30/07	Zinc	MP12604-MB	0.18J	0.9	None
07/26/07	Mercury	MP12574-MB	<2*MDL	NA	None
07/26/07	Mercury	MP12575-MB	<2*MDL	NA	None
07/31/07	Lead	072407R	0.21J	1.1	None
07/31/07	Magnesium	072407R	0.53J	2.7	None
07/31/07	Potassium	072407R	176J	880	50SB010A, 50SB010B, 50SB011A, 50SB011B, 50SB014A, 50SB014B, 50SB015A, 50SB015B, 50SB06B, 50SB07A, 50SB07B, 50SB08B, 50SB09A, 50SB09B
07/28/07	Sodium	072407R	192J	960	50SB010A, 50SB011A, 50SB011B, 50SB012B, 50SB013A, 50SB013B, 50SB014A, 50SB014B, 50SB015B, 50SB06B, 50SB07A, 50SB07B, 50SB08B, 50SB09A, 50SB09B
07/28/07	Mercury	072407R	<2*MDL	NA	None

Table 3 Blank Contamination Analysis Summary, Continued

Analysis Date	Analysis	QC Blank ID	Max Conc. mg/kg	Action Level mg/kg	B qualified samples
07/28/07	Potassium	072507R	177J	885	50SB010A, 50SB010B, 50SB011A, 50SB011B, 50SB014A, 50SB014B, 50SB015A, 50SB015B, 50SB06B, 50SB07A, 50SB07B, 50SB08B, 50SB09A, 50SB09B
07/28/07	Sodium	072507R	213J	1065	50SB010A, 50SB011A, 50SB011B, 50SB012B, 50SB013A, 50SB013B, 50SB014A, 50SB014B, 50SB015B, 50SB06B, 50SB07A, 50SB07B, 50SB08B, 50SB09A, 50SB09B
07/28/07	Mercury	072507R	<2*MDL	NA	None

J = Estimated value <MRL and >MDL. Data point qualified was estimated "J".
NA = Not Applicable
MDL = Method Detection Limit.

IV-ICP Interference Check Sample (ICS)
The ICP interference check sample (ICS) verifies interelement and background correction factors. ICP Interference Check is performed at the beginning and end of each sample analysis run. Control limits are 80-120% (DoD QSM limits 80-120%).

- All criteria were met. No qualifiers were applied.

V-Laboratory Control Samples (LCS)
The laboratory control sample (LCS) serves as a monitor of the overall performance of each step during the analysis, including the sample preparation. All aqueous LCS results must fall within the control limits. The DoD QSM solid LCS recovery limits are specified in Table D-19 of the DoD QSM (DoD, 2006). If the compound is not listed, then the laboratory criteria shall be used.

- Sample MP12604-BS was used as solid LCS for ICP metals analysis on 07/30/07. All criteria were met. No qualifiers were applied. Samples 50SB06A (F51247-1), 50SB06B (F51247-2), 50SB07A (F51247-3), 50SB07B (F51247-4), 50SB08A (F51247-5), 50SB08B (F51247-6), 50SB09A (F51247-7), 50SB09B (F51247-8), 50SB010A (F51247-9), 50SB010B (F51247-10), 50SB011A (F51247-11), 50SB011B (F51247-12), 50SB012A (F51247-13), 50SB012B (F51247-14), 50SB013A (F51247-15), 50SB013B (F51247-16), 50SB014A (F51247-17), 50SB014B (F51247-18), 50SB015A (F51247-19), and 50SB015B (F51247-20) apply to this LCS.

- Sample MP12574-BS was used as solid LCS for mercury analysis on 07/26/07. All criteria were met. No qualifiers were applied. Samples 50SB06A (F51247-1), 50SB06B (F51247-2), 50SB07A (F51247-3), 50SB07B (F51247-4), 50SB08A (F51247-5), 50SB08B (F51247-6), 50SB09A (F51247-7), 50SB09B (F51247-8), 50SB010A (F51247-9), 50SB010B (F51247-10), 50SB011A (F51247-11), 50SB011B (F51247-12), 50SB012A (F51247-13), 50SB012B (F51247-14), 50SB013A (F51247-15), and 50SB013B (F51247-16) apply to this LCS.

- Sample MP12575-BS was used as solid LCS for mercury analysis on 07/26/07. All criteria were met. No qualifiers were applied. Samples 50SB014A (F51247-17), 50SB014B (F51247-18), 50SB015A (F51247-19), and 50SB015B (F51247-20) apply to this LCS.

VI-Laboratory Duplicate Sample Analysis
Duplicate sample determinations are used to demonstrate acceptable method precision by the laboratory at the time of analysis. Duplicate analyses are also performed to generate data in order to determine the long-term precision of the analytical method on various matrices. RPDs must be within established control limits. DoD QSM limits for metals are 20% RPD for ICP metals and mercury.

- Sample 50SB06A (F51247-1) was used as solid laboratory duplicate for ICP metals analysis on 07/30/07. Arsenic (26.2%) and chromium (32.7%) were above criteria. All other metals were within criteria. Arsenic and chromium were qualified estimated "J" based upon the high RPDs. Samples 50SB06A (F51247-1), 50SB06B (F51247-2), 50SB07A (F51247-3), 50SB07B (F51247-4), 50SB08A (F51247-5), 50SB08B (F51247-6), 50SB09A (F51247-7), 50SB09B (F51247-8), 50SB010A (F51247-9), 50SB010B (F51247-10), 50SB011A (F51247-11), 50SB011B (F51247-12), 50SB012A (F51247-13), 50SB012B (F51247-14), 50SB013A (F51247-15), 50SB013B (F51247-16), 50SB014A (F51247-17), 50SB014B (F51247-18), 50SB015A (F51247-19), and 50SB015B (F51247-20) apply to this laboratory duplicate.

- Sample 59SS08 (F51154-29) was used as solid laboratory duplicate for mercury analysis on 07/26/07. All criteria were met. No qualifiers were applied. Samples 50SB06A (F51247-1), 50SB06B (F51247-2), 50SB07A (F51247-3), 50SB07B (F51247-4), 50SB08A (F51247-5), 50SB08B (F51247-6), 50SB09A (F51247-7), 50SB09B (F51247-8), 50SB010A (F51247-9), 50SB010B (F51247-10), 50SB011A (F51247-11), 50SB011B (F51247-12), 50SB012A (F51247-13), 50SB012B (F51247-14), 50SB013A (F51247-15), and 50SB013B (F51247-16) apply to this laboratory duplicate.

- Sample 50SB014A (F51247-17) was used as soil laboratory duplicate for mercury analysis on 07/26/07. All criteria were met. No qualifiers were applied. Samples 50SB014A (F51247-17), 50SB014B (F51247-18), 50SB015A (F51247-19), and 50SB015B (F51247-20) apply to this laboratory duplicate.

VII-Matrix Spike/Spike Duplicate
MS/MSD are generated to determine long-term precision and accuracy of the analytical method on various matrices and to demonstrate acceptable compound recovery by the laboratory at the time of sample analysis. Specific criteria include the analyses of matrix spike and matrix spike duplicate samples at a frequency of one MS and MSD per 20 samples of similar matrix. MS and MSD recoveries and relative percent differences between MS and MSD recoveries should be within the specified limits. DoD QSM solid MS/MSD recovery limits follow the LCS criteria and are specified in Table D-19 of the DoD QSM (DoD, 2006). If the compound is not listed, then the laboratory criteria shall be used. Post digestion spikes limits are 75-125% for ICP metals and mercury.

- Sample 50SB06A (F51247-1) was used as solid laboratory MS/MSD for ICP metals analysis on 07/30/07. Aluminum (73.1%, 153%), antimony (16.5%, 14.4%), arsenic (68.3%, 75.9%), cadmium (68.2%, 71.8%), calcium (412%, 362%), chromium (-31.4%, -0.09%), cobalt (76.1%), iron (-96.6%), magnesium (259%, 178%), manganese (-197%, 266%; RPD=21.6%), nickel (78.6%), selenium (62.4%, 69.5%), thallium (76.9%, 78.7%), vanadium (70.3%), and zinc (70.7%) were outside criteria. The sample concentration was >4 times the spike added for aluminum, iron, and manganese; therefore, no qualifiers were applied based upon these outliers. Antimony, arsenic, cadmium, chromium, cobalt, nickel, selenium, thallium, vanadium, and zinc were qualified bias low "L" for detects and "UL" for non-detects based upon the low recoveries. Calcium and magnesium were qualified bias high "K" for detects and no qualifier for non-detects based upon the high recoveries. All other metals were within criteria. Samples 50SB06A (F51247-1), 50SB06B (F51247-2), 50SB07A (F51247-3), 50SB07B (F51247-4), 50SB08A (F51247-5), 50SB08B (F51247-6), 50SB09A (F51247-7), 50SB09B (F51247-8), 50SB010A (F51247-9), 50SB010B (F51247-10), 50SB011A (F51247-11), 50SB011B (F51247-12), 50SB012A (F51247-13), 50SB012B (F51247-14), 50SB013A (F51247-15), 50SB013B (F51247-16), 50SB014A (F51247-17), 50SB014B (F51247-18), 50SB015A (F51247-19), and 50SB015B (F51247-20) apply to this MS/MSD.

- Sample 59SS08 (F51154-29) was used as solid MS/MSD for mercury analysis on 07/26/07. All criteria were met. No qualifiers were applied. Samples 50SB06A (F51247-1), 50SB06B (F51247-2), 50SB07A (F51247-3), 50SB07B (F51247-4), 50SB08A (F51247-5), 50SB08B (F51247-6), 50SB09A (F51247-7), 50SB09B (F51247-8), 50SB010A (F51247-9), 50SB010B (F51247-10), 50SB011A (F51247-11), 50SB011B (F51247-12), 50SB012A (F51247-13), 50SB012B (F51247-14), 50SB013A (F51247-15), and 50SB013B (F51247-16) apply to this MS/MSD.

- Sample 50SB014A (F51247-17) was used as solid MS/MSD for mercury analysis on 07/26/07. All criteria were met. No qualifiers were applied. Samples 50SB014A (F51247-17), 50SB014B (F51247-18), 50SB015A (F51247-19), and 50SB015B (F51247-20) apply to this MS/MSD.

VIII-ICP Serial Dilution

An ICP serial dilution is performed to determine whether significant physical or chemical interferences exist due to sample matrix at high concentrations. An analysis of a 5-fold dilution should agree within 10% difference of the original result when the concentration in sample is a factor of 50 above MDL.

- The serial dilution for ICP metals was analyzed on 07/30/07 using solid sample 50SB06A (F51247-1). Aluminum (13.0%), antimony (11.8%), arsenic (29.1%), barium (10.8%), beryllium (22.5%), calcium (22.3%), chromium (19.4%), cobalt (21.6%), iron (20.6%), lead (21.8%), magnesium (19.4%), manganese (24.4%), nickel (23.2%), potassium (32.5%), selenium (39.5%), vanadium (17.4%), and zinc (29.0%) were outside of criteria limits. Sample concentrations were <50 times MDL for antimony, arsenic, and beryllium; therefore, no qualifiers were applied based upon these outliers. For aluminum, barium, calcium, chromium, cobalt, iron, lead, magnesium, manganese, nickel, potassium, selenium, vanadium, and zinc, all detects were qualified estimated "J" and non-detects no qualifier based upon these outliers. Samples 50SB06A (F51247-1), 50SB06B (F51247-2), 50SB07A (F51247-3), 50SB07B (F51247-4), 50SB08A (F51247-5), 50SB08B (F51247-6), 50SB09A (F51247-7), 50SB09B (F51247-8), 50SB010A (F51247-9), 50SB010B (F51247-10), 50SB011A (F51247-11), 50SB011B (F51247-12), 50SB012A (F51247-13), 50SB012B (F51247-14), 50SB013A (F51247-15), 50SB013B (F51247-16), 50SB014A (F51247-17), 50SB014B (F51247-18), 50SB015A (F51247-19), and 50SB015B (F51247-20) apply to this serial dilution.

- The serial dilution for mercury was analyzed using solid sample 59SS08 (F51154-29) on 07/26/07. Mercury (34.5%) was above criteria. Sample concentration was <50 times MDL for mercury; therefore, no qualifiers were applied based upon this outlier. Samples 50SB06A (F51247-1), 50SB06B (F51247-2), 50SB07A (F51247-3), 50SB07B (F51247-4), 50SB08A (F51247-5), 50SB08B (F51247-6), 50SB09A (F51247-7), 50SB09B (F51247-8), 50SB010A (F51247-9), 50SB010B (F51247-10), 50SB011A (F51247-11), 50SB011B (F51247-12), 50SB012A (F51247-13), 50SB012B (F51247-14), 50SB013A (F51247-15), and 50SB013B (F51247-16) apply to this serial dilution.

- The serial dilution for mercury was analyzed using solid sample 50SB014A (F51247-17) on 07/26/07. All criteria were met. No qualifiers were applied. Samples 50SB014A (F51247-17), 50SB014B (F51247-18), 50SB015A (F51247-19), and 50SB015B (F51247-20) apply to this serial dilution.

IX-Field Duplicate Sample Analysis

Field duplicates were collected to identify the cumulative precision of the sampling and analytical process and sent to the laboratory blind. The RPD was calculated only for those analytes which were detected at levels exceeding the method reporting limits in both samples of the duplicate pair. Analytes that were rejected (R-qualified) in either sample of the duplicate pair were excluded from the duplicate assessment. Precision control criterion was established at 35% RPD for the solid samples. Analytical results were qualified as estimated (J) for any RPDs exceeding criteria.

- No project specific solid field duplicate was analyzed with this SDG; therefore, it was not evaluated.

X-Quantitation Verification

The accuracy of analytical results is verified through the calculation of several parameters. The percent difference (%D) between the calculated and the reported values should be within 10%. Any sample value >MDL and <MRL or <3*MDL (whichever is greater) was qualified as estimated, "J." The following calculations were performed for verification.

ICP Sample: 50SB06A (F51247-1), Barium

Conc. (mg/kg) = {(conc. μg/L)*(Final Volume L)*(DF)} / {(Weight Sample g)*(Fraction Solids)}

Conc. (mg/kg) = {(1772 μg/L)*(0.050 L)*(1)} / {(1.05 g)*(0.8880)} = 95.0 μg/g = 95.0 mg/kg

Reported concentration = 95.0 mg/kg
%D = 0.0%
Values were within 10% difference.

Hg Sample: 50SB06A (F51247-1), Mercury

Conc. (mg/kg) = {(conc. μg/L)*(Final Volume L)*(DF)} / {(Weight Sample g)*(Fraction Solids)}

Conc. (mg/kg) = {(0.677 μg/L)*(0.050 L)*(1)} / {(0.67 g)*(0.8880)} = 0.057 μg/g = 0.057 mg/kg

Reported concentration = 0.057 mg/kg
%D = 0.0%
Values were within 10% difference.

USEPA Region III Validation Qualifiers

(No Code) = Confirmed identification.

B = The analyte has been detected in the sample and the associated laboratory or field blank.

J = Indicates an estimated value for (1) estimated value due to QC non-conformance. Reported value may not be accurate or precise, (2) estimating a concentration as a tentatively identified compound as indicated by the mass spectral and retention time data, or (3) estimating a concentration ≥MDL and <MRL or <3*MDL, whichever is greater.

K = Analyte present. Reported value may be biased high (estimated) due to QC non-conformance.

L = Analyte present. Reported value may be biased low (estimated) due to QC non-conformance.

R = Unreliable result. Analyte may or may not be present in the sample due to QC non-conformance.

UL = Value is estimated bias low and not detected due to QC non-conformance. Reporting limit may be inaccurate or imprecise. Quantitation limit is probably higher.

UJ = Value is estimated and not detected due to QC non-conformance. Reporting limit may be inaccurate or imprecise.

Laboratory Qualifiers

(No Code) = Confirmed identification.

U = Not detected. The associated number indicates the compound reporting limit for the sample.

A (Dioxins) = B (Metals) = The reported value was obtained from a reading <MRL and ≥MDL and is considered estimated.

B (Organics) = The analyte or compound has been detected in the sample and laboratory method blank. It indicates probable blank contamination.

E (Metals) = Reported value is estimated because of the presence of interferences.

E (Organics) = Identifies compounds whose concentrations exceed the upper level of the calibration range.

D = Indicates sample was analyzed at a dilution.

EMPC (Dioxins) = The ion-abundance ratio between the two characteristic PCDD/PCDF ions was outside accepted ranges. The detected PCDD/PCDF was reported as an estimated maximum possible concentration (EMPC).

J = Indicates an estimated value for (1) estimating a concentration as a tentatively identified compound as indicated by the mass spectral and retention time data, or (2) estimating a concentration <MRL and ≥ MDL.

N (Organics) = Indicates presumptive evidence of a compound for tentatively identified compounds using a library search.

P (Organics) = Target analyte confirmation >40% difference for detected compound between the primary and secondary columns. The lower of the two values was reported.

N (Metals) = Laboratory spike sample recovery not within control limits.

* (Metals) = Duplicate analysis not within control limits.

* (Organics) = Surrogate outside of QC limits on both original and re-analysis.

Form I Copy

Accutest Laboratories

Report of Analysis

Client Sample ID:	50SB06A		
Lab Sample ID:	F51247-1	**Date Sampled:**	07/23/07
Matrix:	SO - Soil	**Date Received:**	07/24/07
		Percent Solids:	88.8
Project:	WPA 019 Field Investigation; Radford AAP, VA		

Metals Analysis

Analyte	Result	RL	MDL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Aluminum	15300 J	11	1.2	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Antimony	1.1 J	3.2	0.28	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Arsenic	6.9 J	0.43	0.21	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Barium	95.0 J	11	0.27	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Beryllium	0.72	0.27	0.054	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Cadmium [a]	0.54 U UL	1.0	0.54	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Calcium	4050 J	270	3.1	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Chromium	37.0 J	0.54	0.048	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Cobalt	10.9 J	2.7	0.054	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Copper	12.2	1.3	0.048	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Iron	20300 J	5.4	0.64	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Lead	19.9 J	5.4	0.11	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Magnesium	2990 J	270	0.40	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Manganese	776 J	8.0	0.54	mg/kg	10	07/30/07	07/31/07	NS	SW846 6010B [3]	SW846 3050B [5]
Mercury	0.057 J J	0.084	0.0067	mg/kg	1	07/26/07	07/26/07	MS	SW846 7471A [1]	SW846 7471A [4]
Nickel	9.7 J	2.1	0.054	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Potassium	1170 J	540	5.4	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Selenium	5.8 J	5.4	0.11	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Silver	0.048 U	0.54	0.048	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Sodium	44 U	540	44	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Thallium [a]	6.0 U UL	11	6.0	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Vanadium	40.6 J	2.7	0.032	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Zinc	62.0 J	1.1	0.070	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]

(1) Instrument QC Batch: MA5876
(2) Instrument QC Batch: MA5885
(3) Instrument QC Batch: MA5886
(4) Prep QC Batch: MP12574
(5) Prep QC Batch: MP12604

(a) Elevated reporting limit(s) due to matrix interference.

RL = Reporting Limit
MDL = Method Detection Limit

U = Indicates a result < MDL
J = Indicates a result > = MDL but < RL

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Report of Analysis

Client Sample ID:	50SB06B		
Lab Sample ID:	F51247-2	**Date Sampled:**	07/23/07
Matrix:	SO - Soil	**Date Received:**	07/24/07
		Percent Solids:	59.6
Project:	WPA 019 Field Investigation; Radford AAP, VA		

Metals Analysis

Analyte	Result	RL	MDL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Aluminum	11400 J	16	1.8	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Antimony	0.43 U UL	4.8	0.43	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Arsenic	3.7 J	0.65	0.31	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Barium	39.8 J	16	0.40	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Beryllium	0.45	0.40	0.081	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Cadmium	0.081 U UL	0.32	0.081	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Calcium	187000 J	4000	81	mg/kg	10	07/30/07	07/31/07	NS	SW846 6010B [3]	SW846 3050B [5]
Chromium	165 J	0.81	0.073	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Cobalt	3.4 J J	4.0	0.081	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Copper	85.6	2.0	0.073	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Iron	9930 J	8.1	0.97	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Lead	234 J	8.1	0.16	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Magnesium	2150 J	400	0.60	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Manganese	179 J	1.2	0.048	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Mercury	0.11 J J	0.14	0.011	mg/kg	1	07/26/07	07/26/07	MS	SW846 7471A [1]	SW846 7471A [4]
Nickel	30.4 J	3.2	0.081	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Potassium	523 J B	810	8.1	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Selenium [a]	16 U UL	32	16	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Silver	0.076 J J	0.81	0.073	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Sodium	152 J B	810	67	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Thallium [a]	4.8 U UL	8.1	4.8	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Vanadium	16.7 J	4.0	0.048	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Zinc	44.1 J	1.6	0.10	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]

(1) Instrument QC Batch: MA5876
(2) Instrument QC Batch: MA5885
(3) Instrument QC Batch: MA5886
(4) Prep QC Batch: MP12574
(5) Prep QC Batch: MP12604

(a) Elevated reporting limit(s) due to matrix interference.

RL = Reporting Limit
MDL = Method Detection Limit

U = Indicates a result < MDL
J = Indicates a result > = MDL but < RL

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Report of Analysis

Client Sample ID:	50SB07A		
Lab Sample ID:	F51247-3	**Date Sampled:**	07/23/07
Matrix:	SO - Soil	**Date Received:**	07/24/07
		Percent Solids:	88.4
Project:	WPA 019 Field Investigation; Radford AAP, VA		

Metals Analysis

Analyte	Result	RL	MDL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Aluminum	11800 J	11	1.2	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Antimony	1.4 J	3.4	0.30	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Arsenic	3.5 J	0.45	0.22	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Barium	92.7 J	11	0.28	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Beryllium	0.60	0.28	0.057	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Cadmium	0.057 U UL	0.23	0.057	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Calcium	13400 J	280	3.2	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Chromium	116 J	0.57	0.051	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Cobalt	7.6 J	2.8	0.057	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Copper	56.4	1.4	0.051	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Iron	20700 J	5.7	0.68	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Lead	178 J	5.7	0.11	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Magnesium	2420 J	280	0.42	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Manganese	518 J	8.5	0.57	mg/kg	10	07/30/07	07/31/07	NS	SW846 6010B [3]	SW846 3050B [5]
Mercury	0.15	0.086	0.0069	mg/kg	1	07/26/07	07/26/07	MS	SW846 7471A [1]	SW846 7471A [4]
Nickel	50.1 J	2.3	0.057	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Potassium	654 B	570	5.7	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Selenium	4.8 J	5.7	0.11	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Silver	0.17 J	0.57	0.051	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Sodium	54.8 J B	570	47	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Thallium [a]	5.2 U UL	11	5.2	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Vanadium	29.0 J	2.8	0.034	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Zinc	78.8 J	1.1	0.074	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]

(1) Instrument QC Batch: MA5876
(2) Instrument QC Batch: MA5885
(3) Instrument QC Batch: MA5886
(4) Prep QC Batch: MP12574
(5) Prep QC Batch: MP12604

(a) Elevated reporting limit(s) due to matrix interference.

RL = Reporting Limit
MDL = Method Detection Limit

U = Indicates a result < MDL
J = Indicates a result > = MDL but < RL

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Report of Analysis

Client Sample ID:	50SB07B		
Lab Sample ID:	F51247-4	**Date Sampled:**	07/23/07
Matrix:	SO - Soil	**Date Received:**	07/24/07
		Percent Solids:	59.3
Project:	WPA 019 Field Investigation; Radford AAP, VA		

Metals Analysis

Analyte	Result	RL	MDL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Aluminum	3100 J	16	1.8	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Antimony	0.43 U J-	4.8	0.43	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Arsenic	1.5 J	0.64	0.31	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Barium	12.0 J J	16	0.40	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Beryllium	0.13 J J	0.40	0.080	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Cadmium	0.080 U J-	0.32	0.080	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Calcium	230000 J	4000	80	mg/kg	10	07/30/07	07/31/07	NS	SW846 6010B [3]	SW846 3050B [5]
Chromium	42.5 J	0.80	0.072	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Cobalt	1.3 J J	4.0	0.080	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Copper	8.6	2.0	0.072	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Iron	3060 J	8.0	0.96	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Lead	16.6 J	8.0	0.16	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Magnesium	966 J	400	0.59	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Manganese	25.1 J	1.2	0.048	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Mercury	0.012 J J	0.14	0.011	mg/kg	1	07/26/07	07/26/07	MS	SW846 7471A [1]	SW846 7471A [4]
Nickel	15.9 J	3.2	0.080	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Potassium	307 J B	800	8.0	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Selenium [a]	32 U J-	40	32	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Silver	0.072 U	0.80	0.072	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Sodium	180 J B	800	66	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Thallium [a]	3.6 U J-	8.0	3.6	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Vanadium	6.4 J	4.0	0.048	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Zinc	5.0 J	1.6	0.10	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]

(1) Instrument QC Batch: MA5876
(2) Instrument QC Batch: MA5885
(3) Instrument QC Batch: MA5886
(4) Prep QC Batch: MP12574
(5) Prep QC Batch: MP12604

(a) Elevated reporting limit(s) due to matrix interference.

RL = Reporting Limit
MDL = Method Detection Limit

U = Indicates a result < MDL
J = Indicates a result > = MDL but < RL

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Report of Analysis

Client Sample ID:	50SB08A		
Lab Sample ID:	F51247-5	**Date Sampled:**	07/23/07
Matrix:	SO - Soil	**Date Received:**	07/24/07
		Percent Solids:	86.6
Project:	WPA 019 Field Investigation; Radford AAP, VA		

Metals Analysis

Analyte	Result	RL	MDL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Aluminum	18400 J	11	1.2	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Antimony	1.4 J	3.4	0.30	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Arsenic	5.7 J	0.45	0.22	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Barium	123 J	11	0.28	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Beryllium	0.90	0.28	0.056	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Cadmium [a]	0.56 U VL	1.1	0.56	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Calcium	1290 J	280	3.2	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Chromium	33.4 J	0.56	0.050	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Cobalt	17.1 J	2.8	0.056	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Copper	12.9	1.4	0.050	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Iron	22700 J	5.6	0.67	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Lead	18.9 J	5.6	0.11	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Magnesium	2030 J	280	0.41	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Manganese	1130 J	8.4	0.56	mg/kg	10	07/30/07	07/31/07	NS	SW846 6010B [3]	SW846 3050B [5]
Mercury	0.052 J J	0.089	0.0071	mg/kg	1	07/26/07	07/26/07	MS	SW846 7471A [1]	SW846 7471A [4]
Nickel	12.0 J	2.2	0.056	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Potassium	1620 J	560	5.6	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Selenium	6.5 J	5.6	0.11	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Silver	0.050 U	0.56	0.050	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Sodium	46 U	560	46	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Thallium [a]	13 U VL	22	13	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Vanadium	48.9 J	2.8	0.034	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Zinc	77.1 J	1.1	0.073	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]

(1) Instrument QC Batch: MA5876
(2) Instrument QC Batch: MA5885
(3) Instrument QC Batch: MA5886
(4) Prep QC Batch: MP12574
(5) Prep QC Batch: MP12604

(a) Elevated reporting limit(s) due to matrix interference.

RL = Reporting Limit
MDL = Method Detection Limit

U = Indicates a result < MDL
J = Indicates a result > = MDL but < RL

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Report of Analysis

Client Sample ID:	50SB08B		
Lab Sample ID:	F51247-6	**Date Sampled:**	07/23/07
Matrix:	SO - Soil	**Date Received:**	07/24/07
		Percent Solids:	63.6
Project:	WPA 019 Field Investigation; Radford AAP, VA		

Metals Analysis

Analyte	Result	RL	MDL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Aluminum	11900 J	15	1.7	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Antimony	1.1 J	4.5	0.40	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Arsenic	11.2 J	0.60	0.29	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Barium	61.6 J	15	0.38	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Beryllium	0.61	0.38	0.076	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Cadmium	0.076 U UL	0.30	0.076	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Calcium	193000 J	3800	76	mg/kg	10	07/30/07	07/31/07	NS	SW846 6010B [3]	SW846 3050B [5]
Chromium	29.8 J	0.76	0.068	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Cobalt	4.4 J	3.8	0.076	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Copper	216	1.9	0.068	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Iron	23900 J	7.6	0.91	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Lead	69.2 J	7.6	0.15	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Magnesium	1820 J	380	0.56	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Manganese	172 J	1.1	0.045	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Mercury	0.12	0.12	0.0092	mg/kg	1	07/26/07	07/26/07	MS	SW846 7471A [1]	SW846 7471A [4]
Nickel	22.8 J	3.0	0.076	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Potassium	590 JB	760	7.6	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Selenium [a]	15 U UL	30	15	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Silver	0.069 J J	0.76	0.068	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Sodium	138 J B	760	62	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Thallium [a]	4.2 U UL	7.6	4.2	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Vanadium	13.8 J	3.8	0.045	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Zinc	33.4 J	1.5	0.098	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]

(1) Instrument QC Batch: MA5876
(2) Instrument QC Batch: MA5885
(3) Instrument QC Batch: MA5886
(4) Prep QC Batch: MP12574
(5) Prep QC Batch: MP12604

(a) Elevated reporting limit(s) due to matrix interference.

RL = Reporting Limit
MDL = Method Detection Limit

U = Indicates a result < MDL
J = Indicates a result > = MDL but < RL

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Report of Analysis

Client Sample ID:	50SB09A		
Lab Sample ID:	F51247-7	**Date Sampled:**	07/23/07
Matrix:	SO - Soil	**Date Received:**	07/24/07
		Percent Solids:	83.8
Project:	WPA 019 Field Investigation; Radford AAP, VA		

Metals Analysis

Analyte	Result	RL	MDL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Aluminum	17900 J	12	1.3	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Antimony	1.1 J L	3.5	0.31	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Arsenic	7.4 J	0.47	0.23	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Barium	79.9 J	12	0.29	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Beryllium	0.58	0.29	0.058	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Cadmium [a]	1.2 U VL	2.2	1.2	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Calcium	1340 J	290	3.3	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Chromium	29.9 J	0.58	0.053	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Cobalt	10.3 J	2.9	0.058	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Copper	8.9	1.5	0.053	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Iron	21900 J	5.8	0.70	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Lead	17.7 J	5.8	0.12	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Magnesium	1160 J	290	0.43	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Manganese	1180 J	8.8	0.58	mg/kg	10	07/30/07	07/31/07	NS	SW846 6010B [3]	SW846 3050B [5]
Mercury	0.10	0.092	0.0073	mg/kg	1	07/26/07	07/26/07	MS	SW846 7471A [1]	SW846 7471A [4]
Nickel	8.9 J	2.3	0.058	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Potassium	759 B	580	5.8	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Selenium	6.8 J	5.8	0.12	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Silver	0.053 U	0.58	0.053	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Sodium	52.7 J B	580	48	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Thallium [a]	5.2 U VL	12	5.2	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Vanadium	46.1 J	2.9	0.035	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Zinc	33.6 J	1.2	0.076	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]

(1) Instrument QC Batch: MA5876
(2) Instrument QC Batch: MA5885
(3) Instrument QC Batch: MA5886
(4) Prep QC Batch: MP12574
(5) Prep QC Batch: MP12604

(a) Elevated reporting limit(s) due to matrix interference.

RL = Reporting Limit
MDL = Method Detection Limit

U = Indicates a result < MDL
J = Indicates a result > = MDL but < RL

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Report of Analysis

Client Sample ID:	50SB09B		
Lab Sample ID:	F51247-8	**Date Sampled:**	07/23/07
Matrix:	SO - Soil	**Date Received:**	07/24/07
		Percent Solids:	62.0
Project:	WPA 019 Field Investigation; Radford AAP, VA		

Metals Analysis

Analyte	Result	RL	MDL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Aluminum	6700 J	15	1.7	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Antimony	0.41 U J	4.6	0.41	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Arsenic	2.3 J	0.61	0.30	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Barium	28.0 J	15	0.38	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Beryllium	0.20 J J	0.38	0.077	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Cadmium	0.077 U J	0.31	0.077	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Calcium	237000 J	3800	77	mg/kg	10	07/30/07	07/31/07	NS	SW846 6010B [3]	SW846 3050B [5]
Chromium	27.7 J	0.77	0.069	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Cobalt	1.4 J J	3.8	0.077	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Copper	28.8	1.9	0.069	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Iron	3060 J	7.7	0.92	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Lead	56.5 J	7.7	0.15	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Magnesium	1820 J	380	0.57	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Manganese	83.9 J	1.2	0.046	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Mercury	0.031 J J	0.12	0.0096	mg/kg	1	07/26/07	07/26/07	MS	SW846 7471A [1]	SW846 7471A [4]
Nickel	10.4 J	3.1	0.077	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Potassium	372 J B J	770	7.7	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Selenium [a]	30 U J	38	30	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Silver	0.069 U	0.77	0.069	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Sodium	198 J B	770	63	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Thallium [a]	3.6 U J	7.7	3.6	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Vanadium	6.8 J	3.8	0.046	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Zinc	18.2 J	1.5	0.10	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]

(1) Instrument QC Batch: MA5876
(2) Instrument QC Batch: MA5885
(3) Instrument QC Batch: MA5886
(4) Prep QC Batch: MP12574
(5) Prep QC Batch: MP12604

(a) Elevated reporting limit(s) due to matrix interference.

RL = Reporting Limit
MDL = Method Detection Limit

U = Indicates a result < MDL
J = Indicates a result > = MDL but < RL

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Report of Analysis

Client Sample ID:	50SB010A		
Lab Sample ID:	F51247-9	**Date Sampled:**	07/23/07
Matrix:	SO - Soil	**Date Received:**	07/24/07
		Percent Solids:	92.6
Project:	WPA 019 Field Investigation; Radford AAP, VA		

Metals Analysis

Analyte	Result	RL	MDL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Aluminum	6590 J	10	1.2	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Antimony	0.33 J L	3.1	0.28	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Arsenic	2.3 J	0.42	0.20	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Barium	94.4 J	10	0.26	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Beryllium	0.57	0.26	0.052	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Cadmium [a]	0.26 U VL	0.42	0.26	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Calcium	563 J	260	3.0	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Chromium	12.2 J	0.52	0.047	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Cobalt	4.8 J	2.6	0.052	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Copper	4.0	1.3	0.047	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Iron	7510 J	5.2	0.63	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Lead	13.2 J	5.2	0.10	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Magnesium	312 J	260	0.39	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Manganese	933 J	7.9	0.52	mg/kg	10	07/30/07	07/31/07	NS	SW846 6010B [3]	SW846 3050B [5]
Mercury	0.048 J J	0.081	0.0064	mg/kg	1	07/26/07	07/26/07	MS	SW846 7471A [1]	SW846 7471A [4]
Nickel	4.1 J	2.1	0.052	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Potassium	292 J B	520	5.2	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Selenium	2.5 J B	5.2	0.10	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Silver	0.047 U	0.52	0.047	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Sodium	84.4 J B	520	43	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Thallium [a]	2.4 U VL	5.2	2.4	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Vanadium	17.2 J	2.6	0.031	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Zinc	17.0 J	1.0	0.068	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]

(1) Instrument QC Batch: MA5876
(2) Instrument QC Batch: MA5885
(3) Instrument QC Batch: MA5886
(4) Prep QC Batch: MP12574
(5) Prep QC Batch: MP12604

(a) Elevated reporting limit(s) due to matrix interference.

RL = Reporting Limit
MDL = Method Detection Limit

U = Indicates a result < MDL
J = Indicates a result > = MDL but < RL

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Report of Analysis

Client Sample ID:	50SB010B		
Lab Sample ID:	F51247-10	**Date Sampled:**	07/23/07
Matrix:	SO - Soil	**Date Received:**	07/24/07
		Percent Solids:	76.6
Project:	WPA 019 Field Investigation; Radford AAP, VA		

Metals Analysis

Analyte	Result	RL	MDL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Aluminum	31000 J	13	1.4	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Antimony	2.5 J	3.8	0.34	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Arsenic	1.6 J	0.51	0.25	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Barium	43.4 J	13	0.32	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Beryllium	0.61	0.32	0.064	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Cadmium [a]	1.6 U UL	2.6	1.6	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Calcium	332 J	320	3.6	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Chromium	25.0 J	0.64	0.058	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Cobalt	3.7 J	3.2	0.064	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Copper	13.8	1.6	0.058	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Iron	47200 J	64	9.0	mg/kg	10	07/30/07	07/31/07	NS	SW846 6010B [3]	SW846 3050B [5]
Lead	11.7 J	6.4	0.13	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Magnesium	778 J	320	0.47	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Manganese	107 J	0.96	0.038	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Mercury	0.15	0.099	0.0079	mg/kg	1	07/26/07	07/26/07	MS	SW846 7471A [1]	SW846 7471A [4]
Nickel	10.8 J	2.6	0.064	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Potassium	924 B J	640	6.4	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Selenium	13.5 J	6.4	0.13	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Silver	0.058 U	0.64	0.058	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Sodium	53 U	640	53	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Thallium [a]	7.5 U UL	13	7.5	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Vanadium	84.2 J	3.2	0.038	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Zinc	33.5 J	1.3	0.083	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]

(1) Instrument QC Batch: MA5876
(2) Instrument QC Batch: MA5885
(3) Instrument QC Batch: MA5886
(4) Prep QC Batch: MP12574
(5) Prep QC Batch: MP12604

(a) Elevated reporting limit(s) due to matrix interference.

RL = Reporting Limit
MDL = Method Detection Limit

U = Indicates a result < MDL
J = Indicates a result > = MDL but < RL

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Report of Analysis

Client Sample ID:	50SB011A		
Lab Sample ID:	F51247-11	**Date Sampled:**	07/23/07
Matrix:	SO - Soil	**Date Received:**	07/24/07
		Percent Solids:	92.1
Project:	WPA 019 Field Investigation; Radford AAP, VA		

Metals Analysis

Analyte	Result	RL	MDL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Aluminum	13300 J	11	1.2	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [4]
Antimony	1.0 J	3.2	0.28	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [4]
Arsenic	1.9 J	0.42	0.21	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [4]
Barium	68.7 J	11	0.26	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [4]
Beryllium	0.47	0.26	0.053	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [4]
Cadmium [a]	1.1 U UL	2.1	1.1	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [4]
Calcium	706 J	260	3.0	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [4]
Chromium	16.0 J	0.53	0.047	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [4]
Cobalt	3.4 J	2.6	0.053	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [4]
Copper	7.5	1.3	0.047	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [4]
Iron	17500 J	5.3	0.63	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [4]
Lead	9.3 J	5.3	0.11	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [4]
Magnesium	651 J	260	0.39	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [4]
Manganese	175 J	0.79	0.032	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [4]
Mercury	0.057 J J	0.080	0.0064	mg/kg	1	07/26/07	07/26/07	MS	SW846 7471A [1]	SW846 7471A [3]
Nickel	6.1 J	2.1	0.053	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [4]
Potassium	587 B	530	5.3	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [4]
Selenium	5.6 J	5.3	0.11	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [4]
Silver	0.047 U	0.53	0.047	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [4]
Sodium	58.0 J B	530	43	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [4]
Thallium [a]	4.8 U UL	11	4.8	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [4]
Vanadium	37.5 J	2.6	0.032	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [4]
Zinc	26.0 J	1.1	0.069	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [4]

(1) Instrument QC Batch: MA5876
(2) Instrument QC Batch: MA5885
(3) Prep QC Batch: MP12574
(4) Prep QC Batch: MP12604

(a) Elevated reporting limit(s) due to matrix interference.

RL = Reporting Limit
MDL = Method Detection Limit

U = Indicates a result < MDL
J = Indicates a result > = MDL but < RL

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Report of Analysis

Client Sample ID:	50SB011B		
Lab Sample ID:	F51247-12	**Date Sampled:**	07/23/07
Matrix:	SO - Soil	**Date Received:**	07/24/07
		Percent Solids:	85.6
Project:	WPA 019 Field Investigation; Radford AAP, VA		

Metals Analysis

Analyte	Result	RL	MDL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Aluminum	15000 J	11	1.3	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Antimony	0.75 J	3.4	0.30	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Arsenic	3.3 J	0.46	0.22	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Barium	42.5 J	11	0.29	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Beryllium	0.22 J J	0.29	0.057	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Cadmium [a]	1.1 U UL	2.3	1.1	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Calcium	523 J	290	3.3	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Chromium	22.4 J	0.57	0.052	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Cobalt	9.8 J	2.9	0.057	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Copper	6.7	1.4	0.052	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Iron	16200 J	5.7	0.69	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Lead	22.6 J	5.7	0.11	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Magnesium	514 J	290	0.42	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Manganese	697 J	8.6	0.57	mg/kg	10	07/30/07	07/31/07	NS	SW846 6010B [3]	SW846 3050B [5]
Mercury	0.12	0.090	0.0072	mg/kg	1	07/26/07	07/26/07	MS	SW846 7471A [1]	SW846 7471A [4]
Nickel	5.6 J	2.3	0.057	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Potassium	564 JB	570	5.7	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Selenium	5.3 J J	5.7	0.11	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Silver	0.052 U	0.57	0.052	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Sodium	71.8 J B	570	47	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Thallium [a]	3.2 U UL	5.7	3.2	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Vanadium	36.4 J	2.9	0.034	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Zinc	20.1 J	1.1	0.074	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]

(1) Instrument QC Batch: MA5876
(2) Instrument QC Batch: MA5885
(3) Instrument QC Batch: MA5886
(4) Prep QC Batch: MP12574
(5) Prep QC Batch: MP12604

(a) Elevated reporting limit(s) due to matrix interference.

RL = Reporting Limit
MDL = Method Detection Limit

U = Indicates a result < MDL
J = Indicates a result >= MDL but < RL

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Report of Analysis

Client Sample ID:	50SB012A		
Lab Sample ID:	F51247-13	**Date Sampled:**	07/23/07
Matrix:	SO - Soil	**Date Received:**	07/24/07
		Percent Solids:	85.4
Project:	WPA 019 Field Investigation; Radford AAP, VA		

Metals Analysis

Analyte	Result	RL	MDL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Aluminum	18100 J	11	1.2	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Antimony	1.3 J	3.3	0.30	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Arsenic	6.2 J	0.45	0.22	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Barium	109 J	11	0.28	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Beryllium	0.85	0.28	0.056	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Cadmium [a]	1.1 U VL	2.2	1.1	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Calcium	855 J	280	3.2	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Chromium	34.6 J	0.56	0.050	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Cobalt	14.5 J	2.8	0.056	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Copper	11.4	1.4	0.050	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Iron	23400 J	5.6	0.67	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Lead	14.9 J	5.6	0.11	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Magnesium	1710 J	280	0.41	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Manganese	785 J	8.4	0.56	mg/kg	10	07/30/07	07/31/07	NS	SW846 6010B [3]	SW846 3050B [5]
Mercury	0.070 J J	0.089	0.0071	mg/kg	1	07/26/07	07/26/07	MS	SW846 7471A [1]	SW846 7471A [4]
Nickel	11.2 J	2.2	0.056	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Potassium	1280 J	560	5.6	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Selenium	7.4 J	5.6	0.11	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Silver	0.050 U	0.56	0.050	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Sodium	46 U	560	46	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Thallium [a]	13 U VL	22	13	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Vanadium	49.1 J	2.8	0.033	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Zinc	80.7 J	1.1	0.072	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]

(1) Instrument QC Batch: MA5876
(2) Instrument QC Batch: MA5885
(3) Instrument QC Batch: MA5886
(4) Prep QC Batch: MP12574
(5) Prep QC Batch: MP12604

(a) Elevated reporting limit(s) due to matrix interference.

RL = Reporting Limit
MDL = Method Detection Limit

U = Indicates a result < MDL
J = Indicates a result > = MDL but < RL

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Report of Analysis

Client Sample ID:	50SB012B		
Lab Sample ID:	F51247-14	**Date Sampled:**	07/23/07
Matrix:	SO - Soil	**Date Received:**	07/24/07
		Percent Solids:	67.7
Project:	WPA 019 Field Investigation; Radford AAP, VA		

Metals Analysis

Analyte	Result	RL	MDL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Aluminum	8010 J	14	1.6	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Antimony	0.38 U UL	4.3	0.38	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Arsenic	6.0 J	0.58	0.28	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Barium	53.0 J	14	0.36	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Beryllium	0.44	0.36	0.072	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Cadmium	0.072 U UL	0.29	0.072	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Calcium	188000 J	3600	72	mg/kg	10	07/30/07	07/31/07	NS	SW846 6010B [3]	SW846 3050B [5]
Chromium	33.3 J	0.72	0.065	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Cobalt	3.3 J J	3.6	0.072	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Copper	41.5	1.8	0.065	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Iron	7500 J	7.2	0.87	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Lead	115 J	7.2	0.14	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Magnesium	2680 J	360	0.54	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Manganese	107 J	1.1	0.043	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Mercury	0.22	0.12	0.0094	mg/kg	1	07/26/07	07/26/07	MS	SW846 7471A [1]	SW846 7471A [4]
Nickel	16.9 J	2.9	0.072	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Potassium	1820 J	720	7.2	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Selenium [a]	14 U UL	36	14	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Silver	0.065 U	0.72	0.065	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Sodium	92.8 J B	720	60	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Thallium [a]	8.5 U UL	14	8.5	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Vanadium	12.2 J	3.6	0.043	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Zinc	26.9 J	1.4	0.094	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]

(1) Instrument QC Batch: MA5876
(2) Instrument QC Batch: MA5885
(3) Instrument QC Batch: MA5886
(4) Prep QC Batch: MP12574
(5) Prep QC Batch: MP12604

(a) Elevated reporting limit(s) due to matrix interference.

RL = Reporting Limit
MDL = Method Detection Limit

U = Indicates a result < MDL
J = Indicates a result > = MDL but < RL

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Report of Analysis

Client Sample ID:	50SB013A		
Lab Sample ID:	F51247-15	**Date Sampled:**	07/23/07
Matrix:	SO - Soil	**Date Received:**	07/24/07
		Percent Solids:	87.5
Project:	WPA 019 Field Investigation; Radford AAP, VA		

Metals Analysis

Analyte	Result	RL	MDL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Aluminum	18800 J	11	1.2	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Antimony	1.3 J	3.3	0.29	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Arsenic	2.5 J	0.44	0.21	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Barium	75.9 J	11	0.27	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Beryllium	0.75	0.27	0.055	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Cadmium [a]	1.1 U UL	2.2	1.1	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Calcium	12900 J	270	3.1	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Chromium	23.5 J	0.55	0.049	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Cobalt	8.3 J	2.7	0.055	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Copper	21.2	1.4	0.049	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Iron	25000 J	5.5	0.66	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Lead	17.4 J	5.5	0.11	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Magnesium	8820 J	270	0.41	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Manganese	496 J	8.2	0.55	mg/kg	10	07/30/07	07/31/07	NS	SW846 6010B [3]	SW846 3050B [5]
Mercury	0.18	0.087	0.0069	mg/kg	1	07/26/07	07/26/07	MS	SW846 7471A [1]	SW846 7471A [4]
Nickel	13.6 J	2.2	0.055	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Potassium	1140 J	550	5.5	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Selenium	5.6 J	5.5	0.11	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Silver	0.049 U	0.55	0.049	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Sodium	100 J B	550	45	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Thallium [a]	2.6 U UL	5.5	2.6	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Vanadium	37.3 J	2.7	0.033	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Zinc	40.0 J	1.1	0.071	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]

(1) Instrument QC Batch: MA5876
(2) Instrument QC Batch: MA5885
(3) Instrument QC Batch: MA5886
(4) Prep QC Batch: MP12574
(5) Prep QC Batch: MP12604

(a) Elevated reporting limit(s) due to matrix interference.

RL = Reporting Limit
MDL = Method Detection Limit

U = Indicates a result < MDL
J = Indicates a result > = MDL but < RL

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Report of Analysis

Client Sample ID:	50SB013B		
Lab Sample ID:	F51247-16	**Date Sampled:**	07/23/07
Matrix:	SO - Soil	**Date Received:**	07/24/07
		Percent Solids:	64.7
Project:	WPA 019 Field Investigation; Radford AAP, VA		

Metals Analysis

Analyte	Result	RL	MDL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Aluminum	10500 J	15	1.7	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Antimony	1.8 J L	4.5	0.40	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Arsenic	13.1 J	0.60	0.29	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Barium	68.4 J	15	0.38	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Beryllium	0.74	0.38	0.075	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Cadmium	0.075 U VL	0.30	0.075	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Calcium	129000 J	3800	75	mg/kg	10	07/30/07	07/31/07	NS	SW846 6010B [3]	SW846 3050B [5]
Chromium	513 J	7.5	1.1	mg/kg	10	07/30/07	07/31/07	NS	SW846 6010B [3]	SW846 3050B [5]
Cobalt	6.1 J	3.8	0.075	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Copper	438	19	1.4	mg/kg	10	07/30/07	07/31/07	NS	SW846 6010B [3]	SW846 3050B [5]
Iron	16300 J	7.5	0.90	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Lead	128 J	7.5	0.15	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Magnesium	1550 J	380	0.56	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Manganese	199 J	1.1	0.045	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Mercury	0.15	0.12	0.0094	mg/kg	1	07/26/07	07/26/07	MS	SW846 7471A [1]	SW846 7471A [4]
Nickel	160 J	3.0	0.075	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Potassium	1360 J	750	7.5	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Selenium	0.15 U VL	7.5	0.15	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Silver	0.068 U	0.75	0.068	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Sodium	594 J B	750	62	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Thallium [a]	6.8 U VL	15	6.8	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Vanadium	21.7 J	3.8	0.045	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Zinc	33.1 J	1.5	0.098	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]

(1) Instrument QC Batch: MA5876
(2) Instrument QC Batch: MA5885
(3) Instrument QC Batch: MA5886
(4) Prep QC Batch: MP12574
(5) Prep QC Batch: MP12604

(a) Elevated reporting limit(s) due to matrix interference.

RL = Reporting Limit
MDL = Method Detection Limit

U = Indicates a result < MDL
J = Indicates a result > = MDL but < RL

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Report of Analysis

Client Sample ID:	50SB014A		
Lab Sample ID:	F51247-17	**Date Sampled:**	07/23/07
Matrix:	SO - Soil	**Date Received:**	07/24/07
		Percent Solids:	90.3
Project:	WPA 019 Field Investigation; Radford AAP, VA		

Metals Analysis

Analyte	Result	RL	MDL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Aluminum	11300 J	11	1.2	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Antimony	1.0 J L	3.3	0.29	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Arsenic	4.1 J	0.44	0.22	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Barium	74.1 J	11	0.28	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Beryllium	0.35	0.28	0.055	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Cadmium [a]	1.1 U UL	2.2	1.1	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Calcium	1390 J	280	3.2	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Chromium	26.6 J	0.55	0.050	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Cobalt	8.2 J	2.8	0.055	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Copper	6.2	1.4	0.050	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Iron	18300 J	5.5	0.66	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Lead	17.8 J	5.5	0.11	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Magnesium	933 J	280	0.41	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Manganese	888 J	8.3	0.55	mg/kg	10	07/30/07	07/31/07	NS	SW846 6010B [3]	SW846 3050B [5]
Mercury	0.22	0.081	0.0065	mg/kg	1	07/26/07	07/26/07	MS	SW846 7471A [1]	SW846 7471A [4]
Nickel	4.7 J	2.2	0.055	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Potassium	511 J B	550	5.5	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Selenium	5.7 J	5.5	0.11	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Silver	0.050 U	0.55	0.050	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Sodium	75.1 J B	550	46	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Thallium [a]	2.6 U UL	5.5	2.6	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Vanadium	38.9 J	2.8	0.033	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Zinc	17.7 J	1.1	0.072	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]

(1) Instrument QC Batch: MA5876
(2) Instrument QC Batch: MA5885
(3) Instrument QC Batch: MA5886
(4) Prep QC Batch: MP12575
(5) Prep QC Batch: MP12604

(a) Elevated reporting limit(s) due to matrix interference.

RL = Reporting Limit
MDL = Method Detection Limit

U = Indicates a result < MDL
J = Indicates a result > = MDL but < RL

Form I Copy

Accutest Laboratories

Report of Analysis

Client Sample ID:	50SB014B		
Lab Sample ID:	F51247-18	**Date Sampled:**	07/23/07
Matrix:	SO - Soil	**Date Received:**	07/24/07
		Percent Solids:	82.8
Project:	WPA 019 Field Investigation; Radford AAP, VA		

Metals Analysis

Analyte	Result	RL	MDL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Aluminum	26800 J	12	1.3	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [4]
Antimony	1.5 J L	3.6	0.32	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [4]
Arsenic	1.8 J	0.48	0.24	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [4]
Barium	47.5 J	12	0.30	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [4]
Beryllium	0.50	0.30	0.060	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [4]
Cadmium [a]	1.2 U UL	2.4	1.2	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [4]
Calcium	844 J	300	3.4	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [4]
Chromium	32.3 J	0.60	0.054	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [4]
Cobalt	3.3 J	3.0	0.060	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [4]
Copper	12.2	1.5	0.054	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [4]
Iron	30500 J	6.0	0.72	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [4]
Lead	11.1 J	6.0	0.12	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [4]
Magnesium	863 J	300	0.45	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [4]
Manganese	46.8 J	0.91	0.036	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [4]
Mercury	0.22	0.088	0.0070	mg/kg	1	07/26/07	07/26/07	MS	SW846 7471A [1]	SW846 7471A [3]
Nickel	8.4 J	2.4	0.060	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [4]
Potassium	935 B J	600	6.0	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [4]
Selenium	10.1 J	6.0	0.12	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [4]
Silver	0.054 U	0.60	0.054	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [4]
Sodium	50.6 J B	600	50	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [4]
Thallium [a]	7.0 U UL	12	7.0	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [4]
Vanadium	77.8 J	3.0	0.036	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [4]
Zinc	23.4 J	1.2	0.079	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [4]

(1) Instrument QC Batch: MA5876
(2) Instrument QC Batch: MA5885
(3) Prep QC Batch: MP12575
(4) Prep QC Batch: MP12604

(a) Elevated reporting limit(s) due to matrix interference.

RL = Reporting Limit
MDL = Method Detection Limit

U = Indicates a result < MDL
J = Indicates a result > = MDL but < RL

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Accutest Laboratories

Report of Analysis

Client Sample ID:	50SB015A		
Lab Sample ID:	F51247-19	**Date Sampled:**	07/23/07
Matrix:	SO - Soil	**Date Received:**	07/24/07
		Percent Solids:	87.1
Project:	WPA 019 Field Investigation; Radford AAP, VA		

Metals Analysis

Analyte	Result	RL	MDL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Aluminum	14600 J	11	1.3	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [4]
Antimony	1.2 J L	3.4	0.30	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [4]
Arsenic	1.8 J	0.46	0.22	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [4]
Barium	33.9 J	11	0.29	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [4]
Beryllium	0.70	0.29	0.057	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [4]
Cadmium [a]	1.1 U UL	2.3	1.1	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [4]
Calcium	512 J	290	3.3	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [4]
Chromium	14.4 J	0.57	0.052	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [4]
Cobalt	4.1 J	2.9	0.057	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [4]
Copper	11.5	1.4	0.052	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [4]
Iron	19500 J	5.7	0.69	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [4]
Lead	6.6 J	5.7	0.11	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [4]
Magnesium	607 J	290	0.42	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [4]
Manganese	62.8 J	0.86	0.034	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [4]
Mercury	0.051 J J	0.088	0.0071	mg/kg	1	07/26/07	07/26/07	MS	SW846 7471A [1]	SW846 7471A [3]
Nickel	9.3 J	2.3	0.057	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [4]
Potassium	649 B	570	5.7	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [4]
Selenium	6.6 J	5.7	0.11	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [4]
Silver	0.052 U	0.57	0.052	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [4]
Sodium	47 U	570	47	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [4]
Thallium [a]	6.5 U UL	11	6.5	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [4]
Vanadium	42.2 J	2.9	0.034	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [4]
Zinc	19.4 J	1.1	0.075	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [4]

(1) Instrument QC Batch: MA5876
(2) Instrument QC Batch: MA5885
(3) Prep QC Batch: MP12575
(4) Prep QC Batch: MP12604

(a) Elevated reporting limit(s) due to matrix interference.

RL = Reporting Limit
MDL = Method Detection Limit

U = Indicates a result < MDL
J = Indicates a result >= MDL but < RL

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Accutest Laboratories

Report of Analysis

Client Sample ID:	50SB015B		
Lab Sample ID:	F51247-20	**Date Sampled:**	07/23/07
Matrix:	SO - Soil	**Date Received:**	07/24/07
		Percent Solids:	85.3
Project:	WPA 019 Field Investigation; Radford AAP, VA		

Metals Analysis

Analyte	Result	RL	MDL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Aluminum	23500 J	12	1.3	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Antimony	1.0 J	3.5	0.31	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Arsenic	1.9 J	0.47	0.23	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Barium	101 J	12	0.29	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Beryllium	0.59	0.29	0.059	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Cadmium [a]	1.2 U UL	2.3	1.2	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Calcium	25.4 J J	290	3.3	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Chromium	27.5 J	0.59	0.053	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Cobalt	4.9 J	2.9	0.059	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Copper	10.0	1.5	0.053	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Iron	22400 J	5.9	0.70	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Lead	7.3 J	5.9	0.12	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Magnesium	820 J	290	0.43	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Manganese	1440 J	8.8	0.59	mg/kg	10	07/30/07	07/31/07	NS	SW846 6010B [3]	SW846 3050B [5]
Mercury	0.059 J J	0.092	0.0073	mg/kg	1	07/26/07	07/26/07	MS	SW846 7471A [1]	SW846 7471A [4]
Nickel	10.6 J	2.3	0.059	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Potassium	814 B	590	5.9	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Selenium	7.0 J	5.9	0.12	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Silver	0.053 U	0.59	0.053	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Sodium	48.8 J B	590	48	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Thallium [a]	2.6 U UL	5.9	2.6	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Vanadium	31.1 J	2.9	0.035	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Zinc	26.1 J	1.2	0.076	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]

(1) Instrument QC Batch: MA5876
(2) Instrument QC Batch: MA5885
(3) Instrument QC Batch: MA5886
(4) Prep QC Batch: MP12575
(5) Prep QC Batch: MP12604

(a) Elevated reporting limit(s) due to matrix interference.

RL = Reporting Limit
MDL = Method Detection Limit

U = Indicates a result < MDL
J = Indicates a result > = MDL but < RL

Shaw Environmental, Inc.
2113 Emmorton Park Road
Edgewood, Maryland
410-612-6350
FAX: 410-612-6351

Shaw® Shaw Environmental, Inc.

MEMORANDUM

TO: Jeff Parks, Shaw E&I Radford Army Ammunition Plant (RFAAP) Project Manager

FROM: Eric Malarek, Shaw E&I Project Chemist

SUBJECT: RFAAP Data Validation – Pesticides and PCBs
Accutest Laboratories, Inc., SDG F51247

DATE: December 7, 2007

The purpose of this memorandum is to present the data validation report for the samples collected at Main Manufacturing Area at RFAAP for a RFI/CMS Nine Sites on July 23, 2007. Solid samples were analyzed for pesticides and PCBs using USEPA Method 3550B/8081A and 3550B/8082, respectively. A total of twenty solid samples were validated. The sample Ids are:

Field Sample ID	Lab Sample ID	Field Sample ID	Lab Sample ID
50SB06A	F51247-1	50SB011A	F51247-11
50SB06B	F51247-2	50SB011B	F51247-12
50SB07A	F51247-3	50SB012A	F51247-13
50SB07B	F51247-4	50SB012B	F51247-14
50SB08A	F51247-5	50SB013A	F51247-15
50SB08B	F51247-6	50SB013B	F51247-16
50SB09A	F51247-7	50SB014A	F51247-17
50SB09B	F51247-8	50SB014B	F51247-18
50SB010A	F51247-9	50SB015A	F51247-19
50SB010B	F51247-10	50SB015B	F51247-20
50SB06A	F51247-1	50SB011A	F51247-11

Data were reviewed by Eric Malarek and validated using a combination of project QAPP, *Quality Systems Manual for Environmental Laboratories, Final Version 3, January, 2006* (DoD, 2006) (DoD QSM), method-specific criteria, and laboratory SOP criteria. The data qualifier scheme was consistent with the *Region III Modifications to the National Functional Guidelines for Organic Data Review* (September 1994). Parameters evaluated are presented in **Table 1**. Data associated with parameters in compliance with quality control specifications have not been qualified. Data associated with parameters that did not comply with quality control specifications and directly impacted project data have been qualified in accordance with USEPA Region III specifications.

Table 1 Laboratory Performance Criteria

Qualified		Parameter
Yes	No	
	X	Holding Times and Preservation
	X	Instrument Performance Check
	X	Initial Calibration
	X	Continuing Calibration
	X	Blank Analysis
X		System Monitoring Compounds
X		Laboratory Control Samples
X		Matrix Spike/Spike Duplicate
	X	Field Duplicate
X		Quantitation Verification

The quality of data collected in support of this sampling activity is considered acceptable with noted qualifications.

Eric Malarek, Chemist

12/07/07
Date

RFAAP VALIDATION REPORT
PESTICIDE/PCB REVIEW
SDG F51247

I-Holding Times and Preservation
The objective is to ascertain the validity of results based on the holding time of the sample from time of collection to time of sample extraction and analysis. Holding time criteria: For aqueous samples, pesticide and PCB compounds are shipped cooled (@4°C ± 2°C) with a maximum holding time of 7 days from sample collection to preparative extraction and 40 days from preparative extraction to determinative analysis. For solid samples, pesticide and PCB compounds are shipped cooled (@4°C ± 2°C) with a maximum holding time of 14 days from sample collection to preparative extraction and 40 days from preparative extraction to determinative analysis.

- Temperature Review: The temperature blank was sent with each cooler and recorded by the laboratory upon receipt. For samples collected on 07/23/07, the coolers were received by the primary laboratory (Accutest) on 07/20/07 at 2.8°C, and 3.2°C. The herbicides were subcontracted to Accutest TX and were received the samples at 3.4°C. The dioxin subcontract laboratory (SGS Paradigm Analytical Laboratories, Inc.) received the samples at 1.2°C. Even though the receipt temperature was below criteria for some coolers, there were no impacts to the data quality. No qualifiers were applied based upon this outlier.

- Holding Time Review: The solid samples were collected on 07/23/07. The pesticides were extracted on 07/31/07 and analyzed on 08/07/07, 08/08/07, and 08/10/07. The PCBs were extracted on 07/31/07 and analyzed on 08/02/07, 08/03/07, 08/04/07, and 08/06/07. All criteria were met. No qualifiers were applied.

II-Instrument Performance Check (Degradation Standard)
Performance checks on the gas chromatograph with electron capture detector (GC/ECD) system are performed to ensure adequate resolution and instrument sensitivity. The performance evaluation mixture (PEM) must be analyzed at the beginning of the analytical sequence. The breakdown of Endrin and 4,4'-DDT must be ≤15% on both signals.

- For analysis performed on 08/04/07 @09:09, endrin and 4,4'-DDT percent breakdowns were 14.1% and 5.0% on signal #1 and 13.8% and 4.5% on signal #2, respectively. All criteria were met. No qualifiers were applied.

- For analysis performed on 08/06/07 @14:48, endrin and 4,4'-DDT percent breakdowns were 8.0% and 3.0% on signal #1 and 9.2% and 2.4% on signal #2, respectively. All criteria were met. No qualifiers were applied.

III-Initial Calibration
Compliance requirements for satisfactory instrument calibration are established to ensure that the instrument is capable of producing acceptable qualitative and quantitative data for the target compounds. The initial 5 point calibration demonstrates that the instrument is capable of acceptable performance in the beginning of the analytical run. Calibration factors are generated for each compound. The DoD QSM specifies that the percent relative standard deviation (%RSD) for all single peak target analytes, and aroclors 1016, 1242, 1254, and 1260 must be <20% or the mean %RSD for all analytes in the standard must be ≤20%. If linear regression is used, the correlation coefficient must be ≥0.995. All detects are qualified as estimated "J" for where there were exceeding %RSDs, and all non-detects are qualified as estimated "UJ" for where there were grossly exceeding recoveries, unless determined to be unusable "R". Grossly exceeding is defined as twice the established criteria limits.

- For the pesticide initial calibration performed on 08/04/07 on instrument ECD5, all criteria were met. No qualifiers were applied. Samples 50SB06A (F51247-1), 50SB06B (F51247-2), 50SB07A (F51247-3), 50SB08A (F51247-5), 50SB08B (F51247-6), 50SB09A (F51247-7), 50SB09B (F51247-8), 50SB010A (F51247-9), 50SB010B (F51247-10), 50SB011A (F51247-11), 50SB011B (F51247-12), 50SB012B (F51247-14), 50SB013A (F51247-15), 50SB013B (F51247-16), 50SB014A (F51247-17), 50SB014B (F51247-18), 50SB015A (F51247-19), and 50SB015B (F51247-20) were analyzed using this initial calibration.

- For the pesticide initial calibration performed on 08/10/07 on instrument ECD6, all criteria were met. No qualifiers were applied. Sample 50SB012A (F51247-13) was analyzed using this initial calibration.

- For the PCB initial calibration performed on 07/28/07 on instrument ECD3, all criteria were met. No qualifiers were applied. Samples were analyzed using this initial calibration.

- For the PCB initial calibration performed on 08/02/07 on instrument ECD3, PCB1221-A (24.1%) and PCB1221-B (37.3%) were outside criteria for signal #1. For signal #2, PCB1221-A (33.7%) was outside criteria. For signal #1, compounds PCB1221-A (r=0.9974), PCB1221-B (r=0.9938), PCB1221-C (r=0.9992), PCB1221-D (r=0.9995), and PCB1221-E (r=0.9992) were quantified using linear or second order regression with correlation coefficients >0.995. For signal #2, compounds PCB1221-A (r=0.9941), PCB1221-B (r=0.9985), PCB1221-C (r=0.9996), PCB1221-D (r=0.9997), and PCB1221-E (r=0.9996) were quantified using linear or second order regression with correlation coefficients >0.995. Therefore, no qualifiers were applied based upon these outliers. Samples 50SB06A (F51247-1), 50SB07B (F51247-4), 50SB08A (F51247-5), 50SB08B (F51247-6), 50SB09A (F51247-7), 50SB09B (F51247-8), 50SB010A (F51247-9), 50SB010B (F51247-10), 50SB011A (F51247-11), 50SB011B (F51247-12), 50SB012A (F51247-13), 50SB013A (F51247-15), 50SB013B (F51247-16), 50SB014A (F51247-17), 50SB014B (F51247-18), 50SB015A (F51247-19), and 50SB015B (F51247-20) were analyzed using this initial calibration.

- For the PCB initial calibration performed on 08/06/07 on instrument ECD3, all criteria were met. No qualifiers were applied. Samples 50SB06B (F51247-2), 50SB07A (F51247-3), and 50SB012B (F51247-14) were analyzed using this initial calibration.

IV-Continuing Calibration

Compliance requirements for satisfactory instrument calibration are established to ensure that the instrument is capable of producing acceptable qualitative and quantitative data for pesticide/PCB target compounds. Continuing calibration standards containing both target compounds and surrogates are analyzed at the beginning of each 12-hour analytical shift and after every 20 samples. The DoD QSM specifies that the percent difference (%D) or the average %Ds for all analytes in the standard from the initial calibration should be no greater than ±20%.

- For pesticide initial calibration verification performed on 08/04/07 @12:47 on instrument ECD5, all criteria were met. No qualifiers were applied. No samples reported were analyzed using this initial calibration verification.

- For pesticide continuing calibration performed on 08/06/07 @16:34 on instrument ECD5, all criteria were met for signal #1 and for the signal #2. No qualifiers were applied. Sample 50SB09A (F51247-7) was analyzed using this continuing calibration.

- For pesticide continuing calibration performed on 08/06/07 @19:50 on instrument ECD5, all criteria were met for signal #1 and for the signal #2. No qualifiers were applied. No samples reported were analyzed using this continuing calibration.

- For pesticide continuing calibration performed on 08/06/07 @22:45 on instrument ECD5, all criteria were met for signal #1 and for the signal #2. No qualifiers were applied. Sample 50SB08A (F51247-5) was analyzed using this continuing calibration.

- For pesticide continuing calibration performed on 08/07/07 @12:53 on instrument ECD5, all criteria were met for signal #1 and for the signal #2. No qualifiers were applied. No samples reported were analyzed using this continuing calibration.

- For pesticide continuing calibration performed on 08/07/07 @11:26 on instrument ECD5, all criteria were met for signal #1 and for the signal #2. No qualifiers were applied. Samples 50SB08B (F51247-6), 50SB09B (F51247-8), 50SB010A (F51247-9), 50SB010B (F51247-10), 50SB011A (F51247-11), 50SB011B (F51247-12), 50SB013A (F51247-15), and 50SB013B (F51247-16) were analyzed using this continuing calibration.

- For pesticide chlordane continuing calibration performed on 08/07/07 @11:57 on instrument ECD5, all criteria were met for signal #1 and for the signal #2. No qualifiers were applied. No samples reported were analyzed using this continuing calibration.

- For pesticide toxaphene continuing calibration performed on 08/07/07 @12:13 on instrument ECD5, all criteria were met for signal #1 and for the signal #2. No qualifiers were applied. No samples reported were analyzed using this continuing calibration.

- For pesticide continuing calibration performed on 08/07/07 @15:32 on instrument ECD5, all criteria were met for signal #1 and for the signal #2. No qualifiers were applied. Samples 50SB06A (F51247-1), 50SB06B (F51247-2), 50SB014A (F51247-17), 50SB014B (F51247-18), 50SB015A (F51247-19), and 50SB015B (F51247-20) were analyzed using this continuing calibration.

- For pesticide continuing calibration performed on 08/07/07 @18:12 on instrument ECD5, 4,4'-DDD (21.5%), 4,4'-DDT (36.6%), and methoxychlor (31.0%) were outside criteria for the signal #1. 4,4'-DDT (40.6%) and methoxychlor (35.0%) were outside criteria for the signal #2. No samples reported was analyzed using this continuing calibration; therefore, no qualifiers were applied based upon these outliers.

- For pesticide continuing calibration performed on 08/08/07 @11:16 on instrument ECD5, all criteria were met for signal #1 and for the signal #2. No qualifiers were applied. Samples 50SB07B (F51247-4), 50SB08A (F51247-5), and 50SB09A (F51247-7) were analyzed using this continuing calibration.

- For pesticide chlordane continuing calibration performed on 08/08/07 @11:32 on instrument ECD5, all criteria were met for signal #1 and for the signal #2. No qualifiers were applied. No samples reported were analyzed using this continuing calibration.

- For pesticide toxaphene continuing calibration performed on 08/08/07 @11:48 on instrument ECD5, all criteria were met for signal #1 and for the signal #2. No qualifiers were applied. No samples reported were analyzed using this continuing calibration.

- For pesticide continuing calibration performed on 08/08/07 @13:34 on instrument ECD5, all criteria were met for signal #1 and for the signal #2. No qualifiers were applied. Samples 50SB07A (F51247-3) and 50SB012B (F51247-14) were analyzed using this continuing calibration.

- For pesticide continuing calibration performed on 08/10/07 @18:40 on instrument ECD6, all criteria were met for signal #1 and for the signal #2. No qualifiers were applied. No samples reported were analyzed using this continuing calibration.

- For pesticide initial calibration verification performed on 08/10/07 @22:05 on instrument ECD6, all criteria were met. No qualifiers were applied. Sample 50SB012A (F51247-13) were analyzed using this initial calibration verification.

- For pesticide continuing calibration performed on 08/10/07 @23:09 on instrument ECD6, all criteria were met for signal #1 and for the signal #2. No qualifiers were applied. No samples reported were analyzed using this continuing calibration.

- For PCB 1016/1260 initial calibration verification performed on 08/02/07 @12:49 on instrument ECD3, PCB1254-F (22.0%) was outside criteria for signal #1; however, the average %D for PCB1254 was 14.2%. PCB1254-E (21.0%) was outside criteria for signal #2. The average %D for PCB1254 was 13.4% for signal #2. PCB1221-E (98.6%) was outside criteria for signal %1. PCB1221-A (95.9%) and PCB-1221-E (98.7%) were outside criteria for signal #2. No samples were analyzed using this initial calibration verification.

- For PCB 1016/1260 continuing calibration performed on 08/02/07 @14:54 on instrument ECD3, all criteria were met. No qualifiers were applied. Samples 50SB06A (F51247-1), 50SB07B (F51247-4), 50SB08A (F51247-5), and 50SB09A (F51247-7) were analyzed using this continuing calibration.

- For PCB 1016/1260 continuing calibration performed on 08/02/07 @15:28 on instrument ECD3, PCB1016-C (21.6%) was outside criteria for signal #1; however, the average %D for PCB1016 was 10.2%. No qualifiers were applied based upon this outlier. All criteria were met for signal #2. No samples reported were analyzed using this continuing calibration.

- For PCB 1248 continuing calibration performed on 08/02/07 @15:45 on instrument ECD3, all criteria were met. No qualifiers were applied. No samples reported were analyzed using this continuing calibration.

- For PCB 1242 continuing calibration performed on 08/02/07 @16:02 on instrument ECD3, all criteria were met. No qualifiers were applied. No samples reported were analyzed using this continuing calibration.

- For PCB 1232/1268 continuing calibration performed on 08/02/07 @16:19 on instrument ECD3, all criteria were met. No qualifiers were applied. No samples reported were analyzed using this continuing calibration.

- For PCB 1221/1254 continuing calibration performed on 08/02/07 @16:36 on instrument ECD3, PCB1221-B (24.8%) was outside criteria for signal #1; however, the average %D for PCB1221 was 6.9%. No qualifiers were applied based upon this outlier. All criteria were met for signal #2. No samples reported were analyzed using this continuing calibration.

- For PCB 1016/1260 continuing calibration performed on 08/02/07 @19:43 on instrument ECD3, all criteria were met. No qualifiers were applied. Samples 50SB010A (F51247-9), 50SB010B (F51247-10), 50SB011A (F51247-11), 50SB011B (F51247-12), 50SB012A (F51247-13), 50SB013A (F51247-15), and 50SB013B (F51247-16) were analyzed using this continuing calibration.

- For PCB 1016/1260 continuing calibration performed on 08/02/07 @23:08 on instrument ECD3, all criteria were met. No qualifiers were applied. Samples 50SB014A (F51247-17), 50SB014B (F51247-18), 50SB015A (F51247-19), and 50SB015B (F51247-20) were analyzed using this continuing calibration.

- For PCB 1016/1260 continuing calibration performed on 08/03/07 @00:50 on instrument ECD3, all criteria were met. No qualifiers were applied. No samples reported were analyzed using this continuing calibration.

- For PCB 1016/1260 continuing calibration performed on 08/04/07 @06:08 on instrument ECD3, all criteria were met. No qualifiers were applied. Samples 50SB08B (F51247-6) and 50SB09B (F51247-8) were analyzed using this continuing calibration.

- For PCB 1016/1260 continuing calibration performed on 08/04/07 @08:24 on instrument ECD3, all criteria were met. No qualifiers were applied. No samples reported were analyzed using this continuing calibration.

- For PCB 1016/1260 initial calibration verification performed on 08/06/07 @15:56 on instrument ECD3, all criteria were met. No qualifiers were applied. No samples 50SB06B (F51247-2), 50SB07A (F51247-3), and 50SB012B (F51247-14) were analyzed using this initial calibration verification.

- For PCB 1016/1260 continuing calibration performed on 08/06/07 @19:06 on instrument ECD3, all criteria were met. No qualifiers were applied. No samples reported were analyzed using this continuing calibration.

V-Blank Analysis

The purpose of laboratory or field blank analyses is to determine the existence and magnitude of contamination problems resulting from laboratory or field activities. One method blank per analytical batch must be run on each instrument used to analyze samples. The DoD QSM criterion specifies all concentrations should be less than one-half MRL. Positive sample results are reported and qualified "B", if the concentration of the compound in the sample is ≤5 times (5X) the maximum amount for pesticide and PCB target compounds. **Table 2** summarizes the blank contamination analysis. Action levels are based upon dilution factor of one and for solid matrices were converted to soil values (soil conversion factor = 33) if needed. Rinse blanks 072407R (F51275-1) and 072507R (F51300-31) apply to the surface soil "SS" and subsurface soil "SB" samples in this SDG.

Table 2 Blank Contamination Analysis Summary

Parameter	Analysis Date	QC Blank ID	Compound	Max Conc. µg/kg	Action Level µg/kg	B qualified samples
Pesticides	08/06/07	OP21686-MB	All target <½MRL	NA	NA	None
Pesticides	08/08/07	OP21686-MB	All target <½MRL	NA	NA	None
Pesticides	08/10/07	OP21686-MB	All target <½MRL	NA	NA	None
Pesticides	07/02/07	072407R	All target <½MRL	NA	NA	None
Pesticides	07/02/07	072507R	All target <½MRL	NA	NA	None
PCBs	08/02/07	OP21687-MB	All target <½MRL	NA	NA	None
PCBs	08/04/07	OP21687-MB	All target <½MRL	NA	NA	None
PCBs	08/06/07	OP21687-MB	All target <½MRL	NA	NA	None
PCBs	06/27/07	072407R	All target <½MRL	NA	NA	None
PCBs	06/27/07	072507R	All target <½MRL	NA	NA	None

NA = Not Applicable
MRL = Method Reporting Limit

VI-System Monitoring Compound (Surrogates)
Laboratory performance on individual samples is evaluated through the review of surrogate spike samples. Surrogate spikes are added to all samples and blanks to measure their recovery in sample and blank matrices. The percent recoveries (%Rs) must be within the specified control limits. DoD surrogate recovery limits are specified in Table D-3 of the DoD QSM (DoD, 2006). If the surrogate is not listed, then the laboratory criteria shall be used.

Solid Criteria:	Tetrachloro-m-xylene:	Pesticides: 46-122% (DoD QSM 70-125%)
	Decachlorobiphenyl:	Pesticides: 50-133% (DoD QSM 55-130%)
Solid Criteria:	Tetrachloro-m-xylene:	PCBs: 44-126% (DoD QSM Not Listed)
	Decachlorobiphenyl:	PCBs: 39-157% (DoD QSM 60-125%)

- For pesticides sample 50SB06A (F51247-1), tetrachloro-m-xylene (65.0%) was below DoD QSM criteria and within laboratory criteria. Decachlorobiphenyl was within criteria. Since only one surrogate was outside criteria, no qualifiers were applied based upon this outlier.

- For pesticides sample 50SB06B (F51247-2), tetrachloro-m-xylene (66.0%) was below DoD QSM criteria and within laboratory criteria. Decachlorobiphenyl was within criteria. Since only one surrogate was outside criteria, no qualifiers were applied based upon this outlier.

- For pesticides sample 50SB07A (F51247-3), tetrachloro-m-xylene (64.0%) was below DoD QSM criteria and within laboratory criteria. Decachlorobiphenyl was within criteria. The sample was diluted 10x and since only one surrogate was outside criteria, no qualifiers were applied based upon this outlier.

- For pesticides sample 50SB07B (F51247-4), tetrachloro-m-xylene (49.0%) and decachlorobiphenyl (50.0%) were below DoD QSM criteria and within laboratory criteria. All detects were qualified "L" and non-detects "UL" based upon the low recoveries.

- For pesticides sample 50SB08A (F51247-5), tetrachloro-m-xylene (46.0%) and decachlorobiphenyl (44.0%) were below DoD QSM criteria and/or laboratory criteria. All detects were qualified "L" and non-detects "UL" based upon the low recoveries. Sample was re-analyzed at a 10x dilution for confirmation (run #2). For the confirmation, tetrachloro-m-xylene (60.0%) was below DoD QSM criteria and within laboratory criteria. Decachlorobiphenyl was within criteria. Since the confirmation run was run at a 10x dilution and only one surrogate was outside criteria, no qualifiers were applied based upon this outlier for run #2.

- For pesticides sample 50SB08B (F51247-6), tetrachloro-m-xylene (54.0%) was below DoD QSM criteria and within laboratory criteria. Decachlorobiphenyl was within criteria. Since only one surrogate was outside criteria, no qualifiers were applied based upon this outlier.

- For pesticides sample 50SB09A (F51247-7), tetrachloro-m-xylene (52.0%) and decachlorobiphenyl (48.0%) were below DoD QSM criteria and/or laboratory criteria. All detects were qualified "L" and non-detects "UL" based upon the low recoveries. Sample was re-analyzed at a 10x dilution for confirmation (run #2) and all criteria were met.

- For pesticides sample 50SB09B (F51247-8), tetrachloro-m-xylene (51.0%) and decachlorobiphenyl (52.0%) were below DoD QSM criteria and/or laboratory criteria. All detects were qualified "L" and non-detects "UL" based upon the low recoveries.

- For pesticides sample 50SB010A (F51247-9), tetrachloro-m-xylene (59.0%) was below DoD QSM criteria and within laboratory criteria. Decachlorobiphenyl was within criteria. Since only one surrogate was outside criteria, no qualifiers were applied based upon this outlier.

- For pesticides sample 50SB010B (F51247-10), tetrachloro-m-xylene (63.0%) was below DoD QSM criteria and within laboratory criteria. Decachlorobiphenyl was within criteria. Since only one surrogate was outside criteria, no qualifiers were applied based upon this outlier.

- For pesticides sample 50SB011A (F51247-11), tetrachloro-m-xylene (55.0%) was below DoD QSM criteria and within laboratory criteria. Decachlorobiphenyl was within criteria. Since only one surrogate was outside criteria, no qualifiers were applied based upon this outlier.

- For pesticides sample 50SB011B (F51247-12), tetrachloro-m-xylene (60.0%) was below DoD QSM criteria and within laboratory criteria. Decachlorobiphenyl was within criteria. Since only one surrogate was outside criteria, no qualifiers were applied based upon this outlier.

- For pesticides sample 50SB012B (F51247-14), tetrachloro-m-xylene (69.0%) was below DoD QSM criteria and within laboratory criteria. Decachlorobiphenyl was within criteria. The sample was analyzed at a 10x dilution and since only one surrogate was outside criteria, no qualifiers were applied based upon this outlier.

- For pesticides sample 50SB013A (F51247-15), tetrachloro-m-xylene (57.0%) and decachlorobiphenyl (52.0%) were below DoD QSM criteria and/or laboratory criteria. All detects were qualified "L" and non-detects "UL" based upon the low recoveries.

- For pesticides sample 50SB013B (F51247-16), tetrachloro-m-xylene (56.0%) and decachlorobiphenyl (53.0%) were below DoD QSM criteria and/or laboratory criteria. All detects were qualified "L" and non-detects "UL" based upon the low recoveries.

- For pesticides sample 50SB014A (F51247-17), tetrachloro-m-xylene (59.0%) was below DoD QSM criteria and within laboratory criteria. Decachlorobiphenyl was within criteria. Since only one surrogate was outside criteria, no qualifiers were applied based upon this outlier.

- For pesticides sample 50SB014B (F51247-18), tetrachloro-m-xylene (63.0%) was below DoD QSM criteria and within laboratory criteria. Decachlorobiphenyl was within criteria. Since only one surrogate was outside criteria, no qualifiers were applied based upon this outlier.

- For pesticides sample 50SB015A (F51247-19), tetrachloro-m-xylene (56.0%) was below DoD QSM criteria and within laboratory criteria. Decachlorobiphenyl was within criteria. Since only one surrogate was outside criteria, no qualifiers were applied based upon this outlier.

- For pesticides sample 50SB015B (F51247-20), tetrachloro-m-xylene (68.0%) was below DoD QSM criteria and within laboratory criteria. Decachlorobiphenyl was within criteria. Since only one surrogate was outside criteria, no qualifiers were applied based upon this outlier.

- For PCBs sample 50SB07A (F51247-3), tetrachloro-m-xylene (0.0%) and decachlorobiphenyl (0.0%) surrogates were diluted out. The sample was analyzed at a 20x dilution. No qualifiers were applied based upon these outliers.

- For all other samples, all criteria were met for pesticides and PCBs analysis.

VII-Laboratory Control Samples

Laboratory control samples (LCS) are used to monitor laboratory accuracy by calculating the percent recoveries of the spiked compounds. All LCS percent recoveries must be within the specified control limits. DoD QSM solid LCS recovery limits are specified in Table D-15 and Table D-17 of the DoD QSM (DoD, 2006). If the compound is not listed, then the laboratory criteria shall be used.

- Sample OP21686-BS was used as the solid LCS for the pesticide analysis on 08/06/07. Compound endrin aldehyde (12%) was outside DoD QSM criteria, however within laboratory criteria. Compound endrin aldehyde was non-detect for all associated samples and was qualified estimated bias "UL" for non-detects based upon very low recovery. Samples 50SB06A (F51247-1), 50SB06B (F51247-2), 50SB07A (F51247-3), 50SB07B (F51247-4), 50SB08A (F51247-5), 50SB08B (F51247-6), 50SB09A (F51247-7), 50SB09B (F51247-8), 50SB010A (F51247-9), 50SB010B (F51247-10), 50SB011A (F51247-11), 50SB011B (F51247-12), 50SB012A (F51247-13), 50SB012B (F51247-14), 50SB013A (F51247-15), 50SB013B (F51247-16), 50SB014A (F51247-17), 50SB014B (F51247-18), 50SB015A (F51247-19), and 50SB015B (F51247-20) apply to this LCS.

- Sample OP21687-BS was used as the solid LCS for the PCB analysis on 08/02/07. All criteria were met. No qualifiers were applied. Samples 50SB06A (F51247-1), 50SB06B (F51247-2), 50SB07A (F51247-3), 50SB07B (F51247-4), 50SB08A (F51247-5), 50SB08B (F51247-6), 50SB09A (F51247-7), 50SB09B (F51247-8), 50SB010A (F51247-9), 50SB010B (F51247-10), 50SB011A (F51247-11), 50SB011B (F51247-12), 50SB012A (F51247-13), 50SB012B (F51247-14), 50SB013A (F51247-15), 50SB013B (F51247-16), 50SB014A (F51247-17), 50SB014B (F51247-18), 50SB015A (F51247-19), and 50SB015B (F51247-20) apply to this LCS.

- Sample OP21687-BS was used as the solid LCS for the PCB analysis on 08/06/07. All criteria were met. No qualifiers were applied. Samples 50SB06A (F51247-1), 50SB06B (F51247-2), 50SB07A (F51247-3), 50SB07B (F51247-4), 50SB08A (F51247-5), 50SB08B (F51247-6), 50SB09A (F51247-7), 50SB09B (F51247-8), 50SB010A (F51247-9), 50SB010B (F51247-10), 50SB011A (F51247-11), 50SB011B (F51247-12), 50SB012A (F51247-13), 50SB012B (F51247-14), 50SB013A (F51247-15), 50SB013B (F51247-16), 50SB014A (F51247-17), 50SB014B (F51247-18), 50SB015A (F51247-19), and 50SB015B (F51247-20) apply to this LCS.

VIII-Matrix Spike/Matrix Spike Duplicate
Data for matrix spike/matrix spike duplicates (MS/MSD) are generated to determine long-term precision and accuracy of the analytical method on various matrices and to demonstrate acceptable compound recovery by the laboratory at the time of sample analysis. The percent recoveries (%Rs) and the relative percent difference (RPD) must be within the specified control limits. DoD solid MS/MSD recovery limits follow the LCS criteria and are specified in Table D-15 and Table D-17 of the DoD QSM (DoD, 2006). If the compound is not listed, then the laboratory criteria shall be used.

- Sample 50SB014A (F51247-17) was used as the MS/MSD for the pesticide analysis on 08/07/07. Compounds aldrin (54%; RPD=37%), alpha-BHC (49%; RPD=39%), beta-BHC (65%, 51%; RPD=26%), delta-BHC (35%, 28%), gamma-BHC (52%; RPD=40%), alpha chlordane (58%), gamma chlordane (61%), dieldrin (61%), 4,4'-DDE (66%), 4,4'-DDT (61%), endosulfan sulfate (58%, 50%), endrin aldehyde (7%; RPD=109%), endosulfan I (63%; RPD=26), endosulfan II (69%), heptachlor (57%; RPD=42%), heptachlor epoxide (59%; RPD=26%), and methoxychlor (67%) were outside DoD QSM criteria and/or laboratory criteria. The LCS was also low in recovery (See Section VII), except for endrin aldehyde. Compound endrin aldehyde was qualified "UL" for all samples based upon the low recovery. Compounds aldrin, alpha-BHC, beta-BHC, delta-BHC, gamma-BHC, alpha chlordane, gamma chlordane, dieldrin, 4,4'-DDE, 4,4'-DDT, endosulfan sulfate, endosulfan I, endosulfan II, heptachlor, heptachlor epoxide, and methoxychlor were non-detect for the spiked sample and qualified estimated bias low "UL" for non-detects based upon low recoveries. Samples 50SB06A (F51247-1), 50SB06B (F51247-2), 50SB07A (F51247-3), 50SB07B (F51247-4), 50SB08A (F51247-5), 50SB08B (F51247-6), 50SB09A (F51247-7), 50SB09B (F51247-8), 50SB010A (F51247-9), 50SB010B (F51247-10), 50SB011A (F51247-11), 50SB011B (F51247-12), 50SB012A (F51247-13), 50SB012B (F51247-14), 50SB013A (F51247-15), 50SB013B (F51247-16), 50SB014A (F51247-17), 50SB014B (F51247-18), 50SB015A (F51247-19), and 50SB015B (F51247-20) apply to this MS/MSD.

- Sample 50SB011B (F51247-12) was used as the MS/MSD for the PCB analysis on 08/02/07. All criteria were met. No qualifiers were applied. Samples 50SB06A (F51247-1), 50SB06B (F51247-2), 50SB07A (F51247-3), 50SB07B (F51247-4), 50SB08A (F51247-5), 50SB08B (F51247-6), 50SB09A (F51247-7), 50SB09B (F51247-8), 50SB010A (F51247-9), 50SB010B (F51247-10), 50SB011A (F51247-11), 50SB011B (F51247-12), 50SB012A (F51247-13), 50SB012B (F51247-14), 50SB013A (F51247-15), 50SB013B (F51247-16), 50SB014A (F51247-17), 50SB014B (F51247-18), 50SB015A (F51247-19), and 50SB015B (F51247-20) apply to this MS/MSD.

IX-Field Duplicate Sample Analysis
Field duplicates were collected to identify the cumulative precision of the sampling and analytical process and sent to the laboratory blind. The RPD was calculated only for those analytes which were detected at levels exceeding the method reporting limits in both samples of the duplicate pair. Analytes that were rejected (R-qualified) in either sample of the duplicate pair were excluded from the duplicate assessment. Precision control criterion was established at 50% RPD for the solid samples. Analytical results were qualified as estimated (J) for any RPDs exceeding criteria.

- No project specific solid field duplicate was analyzed with this SDG; therefore, it was not evaluated.

X-Quantitation Verification
The accuracy of analytical results was verified through the calculation of several parameters. The difference between the calculated value and the reported value must be within 10% difference. All positive values must have less than or equal to 40% %D between the primary and secondary columns. Any sample value >MDL and <MRL or <3*MDL (whichever is greater) was qualified as estimated, "J." All criteria were met.

- All chlorinated pesticides were non-detect. No confirmations were required.

- For all detected PCBs, the %Ds (average %D for multi-peak compounds) between the primary and secondary columns were within criteria. No qualifiers were applied.

Sample: 50SB014AMS (F51247-17MS), alpha-chlordane

Conc. µg/kg = (Ax * Vt * DF) / (CF * Vi * Ws * D)

where: Conc. = Sample concentration in µg/kg
Ax = Area/response for compound being measured.
Vt = Volume of total extract, taking into account dilutions (i.e., a 1-to-10 dilution of a 1-mL extract will mean V(t) = 10000 µL.
CF = Ave calibration response factor for compound being measured from ICAL (Area/pg)
Vi = Volume of extract injected (mL).
W(s) = Weight of sample extracted or diluted in grams.
D = Percent dry weight (100 - % moisture in sample)/100 = 1.0 for Wet Weight
DF = Dilution factor

Conc. µg/kg = (7431266Area*10000µL*1) / (200100Area/pg*(1000pg/ng)*1 µL*30.3g*0.9030) = 13.6 µg/kg

Reported Value = 13.6 µg/kg
% Difference = 0.0%
Values were within 10% difference

Sample: 50SB06B (F51247-2), Aroclor 1254

Conc. µg/kg = (Ax * Vt * DF) / (CF * Vi * Ws * D)

where: Conc. = Sample concentration in µg/kg
Ax = Area/response for compound being measured.
Vt = Volume of total extract, taking into account dilutions (i.e., a 1-to-10 dilution of a 1-mL extract will mean V(t) = 10000 µL.
CF = Ave calibration response factor for compound being measured from ICAL (Area/pg)
Vi = Volume of extract injected (µL).
W(s) = Weight of sample extracted or diluted in grams.
D = Percent dry weight (100 - % moisture in sample)/100 = 1.0 for Wet Weight
DF = Dilution factor

Signal #1
Conc1 µg/kg = (727512*10000*5) / (7463*(1000)*1*30.1*0.5960) = 271.70 µg/kg
Conc2 µg/kg = (864110*10000*5) / (8365*(1000)*1*30.1*0.5960) = 287.91 µg/kg
Conc3 µg/kg = (1237642*10000*5) / (10960*(1000)*1*30.1*0.5960) = 314.73 µg/kg
Conc4 µg/kg = (958149*10000*5) / (7838*(1000)*1*30.1*0.5960) = 340.71 µg/kg
Conc5 µg/kg = (781847*10000*5) / (6256*(1000)*1*30.1*0.5960) = 348.32 µg/kg
Conc6 µg/kg = (1366880*10000*5) / (10230*(1000)*1*30.1*0.5960) = 372.40 µg/kg
Average concentration = 323 µg/kg

Signal #2
Conc1 µg/kg = (140364*10000*5) / (1538*(1000)*1*30.1*0.5960) = 254.36 µg/kg
Conc2 µg/kg = (130770*10000*5) / (1319*(1000)*1*30.1*0.5960) = 276.33 µg/kg
Conc3 µg/kg = (174760*10000*5) / (1677*(1000)*1*30.1*0.5960) = 290.45 µg/kg
Conc4 µg/kg = (138739*10000*5) / (1243*(1000)*1*30.1*0.5960) = 311.09 µg/kg
Conc5 µg/kg = (119963*10000*5) / (891.6*(1000)*1*30.1*0.5960) = 375.00 µg/kg
Conc6 µg/kg = (202338*10000*5) / (1579*(1000)*1*30.1*0.5960) = 357.15 µg/kg
Average concentration = 311 µg/kg

Reported Value = 323 µg/kg (signal #1)
% Difference = 0.0%
Values were within 10% difference.

USEPA Region III Validation Qualifiers

(No Code) = Confirmed identification.

B = The analyte has been detected in the sample and the associated laboratory or field blank.

J = Indicates an estimated value for (1) estimated value due to QC non-conformance. Reported value may not be accurate or precise, (2) estimating a concentration as a tentatively identified compound as indicated by the mass spectral and retention time data, or (3) estimating a concentration ≥ MDL and <MRL or <3*MDL, whichever is greater.

K = Analyte present. Reported value may be biased high (estimated) due to QC non-conformance.

L = Analyte present. Reported value may be biased low (estimated) due to QC non-conformance.

R = Unreliable result. Analyte may or may not be present in the sample due to QC non-conformance.

UL = Value is estimated bias low and not detected due to QC non-conformance. Reporting limit may be inaccurate or imprecise. Quantitation limit is probably higher.

UJ = Value is estimated and not detected due to QC non-conformance. Reporting limit may be inaccurate or imprecise.

Laboratory Qualifiers

(No Code) = Confirmed identification.

U = Not detected. The associated number indicates the compound reporting limit for the sample.

A (Dioxins) = B (Metals) = The reported value was obtained from a reading <MRL and ≥MDL and is considered estimated.

B (Organics) = The analyte or compound has been detected in the sample and laboratory method blank. It indicates probable blank contamination.

E (Metals) = Reported value is estimated because of the presence of interferences.

E (Organics) = Identifies compounds whose concentrations exceed the upper level of the calibration range.

EMPC (Dioxins) = The ion-abundance ratio between the two characteristic PCDD/PCDF ions was outside accepted ranges. The detected PCDD/PCDF was reported as an estimated maximum possible concentration (EMPC).

D = Indicates sample was analyzed at a dilution.

J = Indicates an estimated value for (1) estimating a concentration as a tentatively identified compound as indicated by the mass spectral and retention time data, or (2) estimating a concentration <MRL and ≥ MDL.

N (Organics) = Indicates presumptive evidence of a compound for tentatively identified compounds using a library search.

P (Organics) = Target analyte confirmation >40% difference for detected compound between the primary and secondary columns. The lower of the two values was reported.

N (Metals) = Laboratory spike sample recovery not within control limits.

* (Metals) = Duplicate analysis not within control limits.

* (Organics) = Surrogate outside of QC limits on both original and re-analysis.

Raw Data: KK20742.D

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Accutest Laboratories

Report of Analysis

Client Sample ID:	50SB06A		
Lab Sample ID:	F51247-1	**Date Sampled:**	07/23/07
Matrix:	SO - Soil	**Date Received:**	07/24/07
Method:	SW846 8081A SW846 3550B	**Percent Solids:**	88.8
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	KK20742.D	1	08/07/07	FS	07/31/07	OP21686	GKK760
Run #2							

	Initial Weight	Final Volume
Run #1	30.6 g	10.0 ml
Run #2		

Pesticide TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
309-00-2	Aldrin	ND	1.8	0.44	ug/kg	
319-84-6	alpha-BHC	ND	1.8	0.52	ug/kg	
319-85-7	beta-BHC	ND	1.8	0.48	ug/kg	
319-86-8	delta-BHC	ND	1.8	0.81	ug/kg	
58-89-9	gamma-BHC (Lindane)	ND	1.8	0.63	ug/kg	
5103-71-9	alpha-Chlordane	ND	1.8	0.37	ug/kg	
5103-74-2	gamma-Chlordane	ND	1.8	0.40	ug/kg	
60-57-1	Dieldrin	ND	1.8	0.40	ug/kg	
72-54-8	4,4'-DDD	ND	3.7	0.74	ug/kg	
72-55-9	4,4'-DDE	ND	3.7	0.74	ug/kg	
50-29-3	4,4'-DDT	ND	3.7	0.85	ug/kg	
72-20-8	Endrin	ND	3.7	0.74	ug/kg	
1031-07-8	Endosulfan sulfate	ND	3.7	1.2	ug/kg	
7421-93-4	Endrin aldehyde	ND	3.7	1.1	ug/kg	
53494-70-5	Endrin ketone	ND	3.7	0.74	ug/kg	
959-98-8	Endosulfan-I	ND	1.8	0.40	ug/kg	
33213-65-9	Endosulfan-II	ND	3.7	0.55	ug/kg	
76-44-8	Heptachlor	ND	1.8	0.52	ug/kg	
1024-57-3	Heptachlor epoxide	ND	1.8	0.37	ug/kg	
72-43-5	Methoxychlor	ND	3.7	0.74	ug/kg	
8001-35-2	Toxaphene	ND	92	46	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	65%		46-122%
2051-24-3	Decachlorobiphenyl	64%		50-133%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: ST64379.D

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Report of Analysis

Client Sample ID:	50SB06A		
Lab Sample ID:	F51247-1	**Date Sampled:**	07/23/07
Matrix:	SO - Soil	**Date Received:**	07/24/07
Method:	SW846 8082 SW846 3550B	**Percent Solids:**	88.8
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	ST64379.D	1	08/02/07	JB	07/31/07	OP21687	GST1699
Run #2							

	Initial Weight	Final Volume
Run #1	30.6 g	10.0 ml
Run #2		

PCB List

CAS No.	Compound	Result	RL	MDL	Units	Q
12674-11-2	Aroclor 1016	ND	18	9.2	ug/kg	
11104-28-2	Aroclor 1221	ND	18	15	ug/kg	
11141-16-5	Aroclor 1232	ND	18	15	ug/kg	
53469-21-9	Aroclor 1242	ND	18	9.2	ug/kg	
12672-29-6	Aroclor 1248	ND	18	9.2	ug/kg	
11097-69-1	Aroclor 1254	ND	18	9.2	ug/kg	
11096-82-5	Aroclor 1260	ND	18	9.2	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	81%		44-126%
2051-24-3	Decachlorobiphenyl	85%		39-157%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: KK20743.D

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Report of Analysis

Client Sample ID:	50SB06B		
Lab Sample ID:	F51247-2	**Date Sampled:**	07/23/07
Matrix:	SO - Soil	**Date Received:**	07/24/07
Method:	SW846 8081A SW846 3550B	**Percent Solids:**	59.6
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	KK20743.D	1	08/07/07	FS	07/31/07	OP21686	GKK760
Run #2							

	Initial Weight	Final Volume
Run #1	30.1 g	10.0 ml
Run #2		

Pesticide TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
309-00-2	Aldrin	ND	2.8	0.67	ug/kg	
319-84-6	alpha-BHC	ND	2.8	0.78	ug/kg	
319-85-7	beta-BHC	ND	2.8	0.72	ug/kg	
319-86-8	delta-BHC	ND	2.8	1.2	ug/kg	
58-89-9	gamma-BHC (Lindane)	ND	2.8	0.95	ug/kg	
5103-71-9	alpha-Chlordane	ND	2.8	0.56	ug/kg	
5103-74-2	gamma-Chlordane	ND	2.8	0.61	ug/kg	
60-57-1	Dieldrin	ND	2.8	0.61	ug/kg	
72-54-8	4,4'-DDD	ND	5.6	1.1	ug/kg	
72-55-9	4,4'-DDE	ND	5.6	1.1	ug/kg	
50-29-3	4,4'-DDT	ND	5.6	1.3	ug/kg	
72-20-8	Endrin	ND	5.6	1.1	ug/kg	
1031-07-8	Endosulfan sulfate	ND	5.6	1.8	ug/kg	
7421-93-4	Endrin aldehyde	ND VL	5.6	1.7	ug/kg	
53494-70-5	Endrin ketone	ND	5.6	1.1	ug/kg	
959-98-8	Endosulfan-I	ND	2.8	0.61	ug/kg	
33213-65-9	Endosulfan-II	ND	5.6	0.84	ug/kg	
76-44-8	Heptachlor	ND	2.8	0.78	ug/kg	
1024-57-3	Heptachlor epoxide	ND	2.8	0.56	ug/kg	
72-43-5	Methoxychlor	ND	5.6	1.1	ug/kg	
8001-35-2	Toxaphene	ND	140	70	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	66%		46-122%
2051-24-3	Decachlorobiphenyl	60%		50-133%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	50SB06B		
Lab Sample ID:	F51247-2	**Date Sampled:**	07/23/07
Matrix:	SO - Soil	**Date Received:**	07/24/07
Method:	SW846 8082 SW846 3550B	**Percent Solids:**	59.6
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	ST64536.D	5	08/06/07	JB	07/31/07	OP21687	GST1701
Run #2							

	Initial Weight	Final Volume
Run #1	30.1 g	10.0 ml
Run #2		

PCB List

CAS No.	Compound	Result	RL	MDL	Units	Q
12674-11-2	Aroclor 1016	ND	140	70	ug/kg	
11104-28-2	Aroclor 1221	ND	140	110	ug/kg	
11141-16-5	Aroclor 1232	ND	140	110	ug/kg	
53469-21-9	Aroclor 1242	ND	140	70	ug/kg	
12672-29-6	Aroclor 1248	ND	140	70	ug/kg	
11097-69-1	Aroclor 1254 [b]	323	140	70	ug/kg	
11096-82-5	Aroclor 1260	ND	140	70	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	79%		44-126%
2051-24-3	Decachlorobiphenyl	84%		39-157%

(a) All hits confirmed by dual column analysis.
(b) Aroclor pattern appears to be weathered.

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	50SB07A		
Lab Sample ID:	F51247-3	**Date Sampled:**	07/23/07
Matrix:	SO - Soil	**Date Received:**	07/24/07
Method:	SW846 8081A SW846 3550B	**Percent Solids:**	88.4
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	KK20774.D	10	08/08/07	FS	07/31/07	OP21686	GKK761
Run #2							

	Initial Weight	Final Volume
Run #1	30.0 g	10.0 ml
Run #2		

Pesticide TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
309-00-2	Aldrin	ND	19	4.5	ug/kg	
319-84-6	alpha-BHC	ND	19	5.3	ug/kg	
319-85-7	beta-BHC	ND	19	4.9	ug/kg	
319-86-8	delta-BHC	ND	19	8.3	ug/kg	
58-89-9	gamma-BHC (Lindane)	ND	19	6.4	ug/kg	
5103-71-9	alpha-Chlordane	ND	19	3.8	ug/kg	
5103-74-2	gamma-Chlordane	ND	19	4.1	ug/kg	
60-57-1	Dieldrin	ND	19	4.1	ug/kg	
72-54-8	4,4'-DDD	ND	38	7.5	ug/kg	
72-55-9	4,4'-DDE	ND	38	7.5	ug/kg	
50-29-3	4,4'-DDT	ND	38	8.7	ug/kg	
72-20-8	Endrin	ND	38	7.5	ug/kg	
1031-07-8	Endosulfan sulfate	ND	38	12	ug/kg	
7421-93-4	Endrin aldehyde	ND VL	38	11	ug/kg	
53494-70-5	Endrin ketone	ND	38	7.5	ug/kg	
959-98-8	Endosulfan-I	ND	19	4.1	ug/kg	
33213-65-9	Endosulfan-II	ND	38	5.7	ug/kg	
76-44-8	Heptachlor	ND	19	5.3	ug/kg	
1024-57-3	Heptachlor epoxide	ND	19	3.8	ug/kg	
72-43-5	Methoxychlor	ND	38	7.5	ug/kg	
8001-35-2	Toxaphene	ND	940	470	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	64%		46-122%
2051-24-3	Decachlorobiphenyl	57%		50-133%

(a) Dilution required due to matrix interference.

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: ST64537.D

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Report of Analysis

Client Sample ID:	50SB07A		
Lab Sample ID:	F51247-3	Date Sampled:	07/23/07
Matrix:	SO - Soil	Date Received:	07/24/07
Method:	SW846 8082 SW846 3550B	Percent Solids:	88.4
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	ST64537.D	20	08/06/07	JB	07/31/07	OP21687	GST1701
Run #2							

	Initial Weight	Final Volume
Run #1	30.0 g	10.0 ml
Run #2		

PCB List

CAS No.	Compound	Result	RL	MDL	Units	Q
12674-11-2	Aroclor 1016	ND	380	190	ug/kg	
11104-28-2	Aroclor 1221	ND	380	300	ug/kg	
11141-16-5	Aroclor 1232	ND	380	300	ug/kg	
53469-21-9	Aroclor 1242	ND	380	190	ug/kg	
12672-29-6	Aroclor 1248	ND	380	190	ug/kg	
11097-69-1	Aroclor 1254	1480	380	190	ug/kg	
11096-82-5	Aroclor 1260	ND	380	190	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	0% [b]		44-126%
2051-24-3	Decachlorobiphenyl	0% [b]		39-157%

(a) All hits confirmed by dual column analysis.
(b) Outside control limits due to dilution.

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	50SB07B		
Lab Sample ID:	F51247-4	**Date Sampled:**	07/23/07
Matrix:	SO - Soil	**Date Received:**	07/24/07
Method:	SW846 8081A SW846 3550B	**Percent Solids:**	59.3
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	KK20767.D	1	08/08/07	FS	07/31/07	OP21686	GKK761
Run #2							

	Initial Weight	Final Volume
Run #1	30.9 g	10.0 ml
Run #2		

Pesticide TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
309-00-2	Aldrin	ND UL	2.7	0.65	ug/kg	
319-84-6	alpha-BHC	ND UL	2.7	0.76	ug/kg	
319-85-7	beta-BHC	ND UL	2.7	0.71	ug/kg	
319-86-8	delta-BHC	ND UL	2.7	1.2	ug/kg	
58-89-9	gamma-BHC (Lindane)	ND UL	2.7	0.93	ug/kg	
5103-71-9	alpha-Chlordane	ND UL	2.7	0.55	ug/kg	
5103-74-2	gamma-Chlordane	ND UL	2.7	0.60	ug/kg	
60-57-1	Dieldrin	ND UL	2.7	0.60	ug/kg	
72-54-8	4,4'-DDD	ND UL	5.5	1.1	ug/kg	
72-55-9	4,4'-DDE	ND UL	5.5	1.1	ug/kg	
50-29-3	4,4'-DDT	ND UL	5.5	1.3	ug/kg	
72-20-8	Endrin	ND UL	5.5	1.1	ug/kg	
1031-07-8	Endosulfan sulfate	ND UL	5.5	1.8	ug/kg	
7421-93-4	Endrin aldehyde	ND UL	5.5	1.6	ug/kg	
53494-70-5	Endrin ketone	ND UL	5.5	1.1	ug/kg	
959-98-8	Endosulfan-I	ND UL	2.7	0.60	ug/kg	
33213-65-9	Endosulfan-II	ND UL	5.5	0.82	ug/kg	
76-44-8	Heptachlor	ND UL	2.7	0.76	ug/kg	
1024-57-3	Heptachlor epoxide	ND UL	2.7	0.55	ug/kg	
72-43-5	Methoxychlor	ND UL	5.5	1.1	ug/kg	
8001-35-2	Toxaphene	ND UL	140	68	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	49%		46-122%
2051-24-3	Decachlorobiphenyl	50%		50-133%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	50SB07B		
Lab Sample ID:	F51247-4	**Date Sampled:**	07/23/07
Matrix:	SO - Soil	**Date Received:**	07/24/07
Method:	SW846 8082 SW846 3550B	**Percent Solids:**	59.3
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	ST64382.D	1	08/02/07	JB	07/31/07	OP21687	GST1699
Run #2							

	Initial Weight	Final Volume
Run #1	30.9 g	10.0 ml
Run #2		

PCB List

CAS No.	Compound	Result	RL	MDL	Units	Q
12674-11-2	Aroclor 1016	ND	27	14	ug/kg	
11104-28-2	Aroclor 1221	ND	27	22	ug/kg	
11141-16-5	Aroclor 1232	ND	27	22	ug/kg	
53469-21-9	Aroclor 1242	ND	27	14	ug/kg	
12672-29-6	Aroclor 1248	ND	27	14	ug/kg	
11097-69-1	Aroclor 1254	ND	27	14	ug/kg	
11096-82-5	Aroclor 1260	ND	27	14	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	65%		44-126%
2051-24-3	Decachlorobiphenyl	76%		39-157%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	50SB08A		
Lab Sample ID:	F51247-5	**Date Sampled:**	07/23/07
Matrix:	SO - Soil	**Date Received:**	07/24/07
Method:	SW846 8081A SW846 3550B	**Percent Solids:**	86.6
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	KK20768.D	1	08/08/07	FS	07/31/07	OP21686	GKK761
Run #2	KK20717.D	10	08/07/07	FS	07/31/07	OP21686	GKK759

	Initial Weight	Final Volume
Run #1	30.1 g	10.0 ml
Run #2	30.1 g	10.0 ml

Pesticide TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
309-00-2	Aldrin	ND UL	1.9	0.46	ug/kg	
319-84-6	alpha-BHC	ND UL	1.9	0.54	ug/kg	
319-85-7	beta-BHC	ND UL	1.9	0.50	ug/kg	
319-86-8	delta-BHC	ND UL	1.9	0.84	ug/kg	
58-89-9	gamma-BHC (Lindane)	ND UL	1.9	0.65	ug/kg	
5103-71-9	alpha-Chlordane	ND UL	1.9	0.38	ug/kg	
5103-74-2	gamma-Chlordane	ND UL	1.9	0.42	ug/kg	
60-57-1	Dieldrin	ND UL	1.9	0.42	ug/kg	
72-54-8	4,4'-DDD	ND UL	3.8	0.77	ug/kg	
72-55-9	4,4'-DDE	ND UL	3.8	0.77	ug/kg	
50-29-3	4,4'-DDT	ND UL	3.8	0.88	ug/kg	
72-20-8	Endrin	ND UL	3.8	0.77	ug/kg	
1031-07-8	Endosulfan sulfate	ND UL	3.8	1.3	ug/kg	
7421-93-4	Endrin aldehyde	ND UL	3.8	1.2	ug/kg	
53494-70-5	Endrin ketone	ND UL	3.8	0.77	ug/kg	
959-98-8	Endosulfan-I	ND UL	1.9	0.42	ug/kg	
33213-65-9	Endosulfan-II	ND UL	3.8	0.58	ug/kg	
76-44-8	Heptachlor	ND UL	1.9	0.54	ug/kg	
1024-57-3	Heptachlor epoxide	ND UL	1.9	0.38	ug/kg	
72-43-5	Methoxychlor	ND UL	3.8	0.77	ug/kg	
8001-35-2	Toxaphene	ND UL	96	48	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	46%	60%	46-122%
2051-24-3	Decachlorobiphenyl	44% [a]	65%	50-133%

(a) Outside control limits due to matrix interference.

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	50SB08A		
Lab Sample ID:	F51247-5	**Date Sampled:**	07/23/07
Matrix:	SO - Soil	**Date Received:**	07/24/07
Method:	SW846 8082 SW846 3550B	**Percent Solids:**	86.6
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	ST64383.D	1	08/02/07	JB	07/31/07	OP21687	GST1699
Run #2							

	Initial Weight	Final Volume
Run #1	30.1 g	10.0 ml
Run #2		

PCB List

CAS No.	Compound	Result	RL	MDL	Units	Q
12674-11-2	Aroclor 1016	ND	19	9.6	ug/kg	
11104-28-2	Aroclor 1221	ND	19	15	ug/kg	
11141-16-5	Aroclor 1232	ND	19	15	ug/kg	
53469-21-9	Aroclor 1242	ND	19	9.6	ug/kg	
12672-29-6	Aroclor 1248	ND	19	9.6	ug/kg	
11097-69-1	Aroclor 1254	ND	19	9.6	ug/kg	
11096-82-5	Aroclor 1260	ND	19	9.6	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	63%		44-126%
2051-24-3	Decachlorobiphenyl	67%		39-157%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: KK20725.D

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Report of Analysis

Client Sample ID:	50SB08B		
Lab Sample ID:	F51247-6	**Date Sampled:**	07/23/07
Matrix:	SO - Soil	**Date Received:**	07/24/07
Method:	SW846 8081A SW846 3550B	**Percent Solids:**	63.6
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	KK20725.D	1	08/07/07	FS	07/31/07	OP21686	GKK760
Run #2							

	Initial Weight	Final Volume
Run #1	30.1 g	10.0 ml
Run #2		

Pesticide TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
309-00-2	Aldrin	ND	2.6	0.63	ug/kg	
319-84-6	alpha-BHC	ND	2.6	0.73	ug/kg	
319-85-7	beta-BHC	ND	2.6	0.68	ug/kg	
319-86-8	delta-BHC	ND	2.6	1.1	ug/kg	
58-89-9	gamma-BHC (Lindane)	ND	2.6	0.89	ug/kg	
5103-71-9	alpha-Chlordane	ND	2.6	0.52	ug/kg	
5103-74-2	gamma-Chlordane	ND	2.6	0.57	ug/kg	
60-57-1	Dieldrin	ND	2.6	2.6	ug/kg	
72-54-8	4,4'-DDD	ND	5.2	1.0	ug/kg	
72-55-9	4,4'-DDE	ND	5.2	1.0	ug/kg	
50-29-3	4,4'-DDT	ND	5.2	1.2	ug/kg	
72-20-8	Endrin	ND	5.2	1.0	ug/kg	
1031-07-8	Endosulfan sulfate	ND	5.2	1.7	ug/kg	
7421-93-4	Endrin aldehyde	ND VL	5.2	1.6	ug/kg	
53494-70-5	Endrin ketone	ND	5.2	1.0	ug/kg	
959-98-8	Endosulfan-I	ND	2.6	0.57	ug/kg	
33213-65-9	Endosulfan-II	ND	5.2	0.78	ug/kg	
76-44-8	Heptachlor	ND	2.6	0.73	ug/kg	
1024-57-3	Heptachlor epoxide	ND	2.6	0.52	ug/kg	
72-43-5	Methoxychlor	ND	5.2	1.0	ug/kg	
8001-35-2	Toxaphene	ND	130	65	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	54%		46-122%
2051-24-3	Decachlorobiphenyl	55%		50-133%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	50SB08B		
Lab Sample ID:	F51247-6	**Date Sampled:**	07/23/07
Matrix:	SO - Soil	**Date Received:**	07/24/07
Method:	SW846 8082 SW846 3550B	**Percent Solids:**	63.6
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	ST64508.D	5	08/04/07	JB	07/31/07	OP21687	GST1700
Run #2							

	Initial Weight	Final Volume
Run #1	30.1 g	10.0 ml
Run #2		

PCB List

CAS No.	Compound	Result	RL	MDL	Units	Q
12674-11-2	Aroclor 1016	ND	130	65	ug/kg	
11104-28-2	Aroclor 1221	ND	130	100	ug/kg	
11141-16-5	Aroclor 1232	ND	130	100	ug/kg	
53469-21-9	Aroclor 1242	ND	130	65	ug/kg	
12672-29-6	Aroclor 1248	ND	130	65	ug/kg	
11097-69-1	Aroclor 1254	343	130	65	ug/kg	
11096-82-5	Aroclor 1260	ND	130	65	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	75%		44-126%
2051-24-3	Decachlorobiphenyl	78%		39-157%

(a) All hits confirmed by dual column analysis.

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: KK20769.D KK20694.D

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Report of Analysis

Client Sample ID:	50SB09A		
Lab Sample ID:	F51247-7	**Date Sampled:**	07/23/07
Matrix:	SO - Soil	**Date Received:**	07/24/07
Method:	SW846 8081A SW846 3550B	**Percent Solids:**	83.8
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	KK20769.D	1	08/08/07	FS	07/31/07	OP21686	GKK761
Run #2	KK20694.D	10	08/06/07	FS	07/31/07	OP21686	GKK759

	Initial Weight	Final Volume
Run #1	30.5 g	10.0 ml
Run #2	30.5 g	10.0 ml

Pesticide TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
309-00-2	Aldrin	ND UL	2.0	0.47	ug/kg	
319-84-6	alpha-BHC	ND UL	2.0	0.55	ug/kg	
319-85-7	beta-BHC	ND UL	2.0	0.51	ug/kg	
319-86-8	delta-BHC	ND UL	2.0	0.86	ug/kg	
58-89-9	gamma-BHC (Lindane)	ND UL	2.0	0.67	ug/kg	
5103-71-9	alpha-Chlordane	ND UL	2.0	0.39	ug/kg	
5103-74-2	gamma-Chlordane	ND UL	2.0	0.43	ug/kg	
60-57-1	Dieldrin	ND UL	2.0	0.43	ug/kg	
72-54-8	4,4'-DDD	ND UL	3.9	0.78	ug/kg	
72-55-9	4,4'-DDE	ND UL	3.9	0.78	ug/kg	
50-29-3	4,4'-DDT	ND UL	3.9	0.90	ug/kg	
72-20-8	Endrin	ND UL	3.9	0.78	ug/kg	
1031-07-8	Endosulfan sulfate	ND UL	3.9	1.3	ug/kg	
7421-93-4	Endrin aldehyde	ND UL	3.9	1.2	ug/kg	
53494-70-5	Endrin ketone	ND UL	3.9	0.78	ug/kg	
959-98-8	Endosulfan-I	ND UL	2.0	0.43	ug/kg	
33213-65-9	Endosulfan-II	ND UL	3.9	0.59	ug/kg	
76-44-8	Heptachlor	ND UL	2.0	0.55	ug/kg	
1024-57-3	Heptachlor epoxide	ND UL	2.0	0.39	ug/kg	
72-43-5	Methoxychlor	ND UL	3.9	0.78	ug/kg	
8001-35-2	Toxaphene	ND UL	98	49	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	52%	70%	46-122%
2051-24-3	Decachlorobiphenyl	48% [a]	74%	50-133%

(a) Outside control limits due to matrix interference.

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: ST64385.D

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Report of Analysis

Client Sample ID:	50SB09A		
Lab Sample ID:	F51247-7	**Date Sampled:**	07/23/07
Matrix:	SO - Soil	**Date Received:**	07/24/07
Method:	SW846 8082 SW846 3550B	**Percent Solids:**	83.8
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	ST64385.D	1	08/02/07	JB	07/31/07	OP21687	GST1699
Run #2							

	Initial Weight	Final Volume
Run #1	30.5 g	10.0 ml
Run #2		

PCB List

CAS No.	Compound	Result	RL	MDL	Units	Q
12674-11-2	Aroclor 1016	ND	20	9.8	ug/kg	
11104-28-2	Aroclor 1221	ND	20	16	ug/kg	
11141-16-5	Aroclor 1232	ND	20	16	ug/kg	
53469-21-9	Aroclor 1242	ND	20	9.8	ug/kg	
12672-29-6	Aroclor 1248	ND	20	9.8	ug/kg	
11097-69-1	Aroclor 1254	ND	20	9.8	ug/kg	
11096-82-5	Aroclor 1260	ND	20	9.8	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	75%		44-126%
2051-24-3	Decachlorobiphenyl	84%		39-157%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: KK20726.D

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Report of Analysis

Client Sample ID:	50SB09B		
Lab Sample ID:	F51247-8	**Date Sampled:**	07/23/07
Matrix:	SO - Soil	**Date Received:**	07/24/07
Method:	SW846 8081A SW846 3550B	**Percent Solids:**	62.0
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	KK20726.D	1	08/07/07	FS	07/31/07	OP21686	GKK760
Run #2							

	Initial Weight	Final Volume
Run #1	30.3 g	10.0 ml
Run #2		

Pesticide TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
309-00-2	Aldrin	ND VL	2.7	0.64	ug/kg	
319-84-6	alpha-BHC	ND VL	2.7	0.75	ug/kg	
319-85-7	beta-BHC	ND VL	2.7	0.69	ug/kg	
319-86-8	delta-BHC	ND VL	2.7	1.2	ug/kg	
58-89-9	gamma-BHC (Lindane)	ND VL	2.7	0.90	ug/kg	
5103-71-9	alpha-Chlordane	ND VL	2.7	0.53	ug/kg	
5103-74-2	gamma-Chlordane	ND VL	2.7	0.59	ug/kg	
60-57-1	Dieldrin	ND VL	2.7	0.59	ug/kg	
72-54-8	4,4'-DDD	ND VL	5.3	1.1	ug/kg	
72-55-9	4,4'-DDE	ND VL	5.3	1.1	ug/kg	
50-29-3	4,4'-DDT	ND VL	5.3	1.2	ug/kg	
72-20-8	Endrin	ND VL	5.3	1.1	ug/kg	
1031-07-8	Endosulfan sulfate	ND VL	5.3	1.8	ug/kg	
7421-93-4	Endrin aldehyde	ND VL	5.3	1.6	ug/kg	
53494-70-5	Endrin ketone	ND VL	5.3	1.1	ug/kg	
959-98-8	Endosulfan-I	ND VL	2.7	0.59	ug/kg	
33213-65-9	Endosulfan-II	ND VL	5.3	0.80	ug/kg	
76-44-8	Heptachlor	ND VL	2.7	0.75	ug/kg	
1024-57-3	Heptachlor epoxide	ND VL	2.7	0.53	ug/kg	
72-43-5	Methoxychlor	ND VL	5.3	1.1	ug/kg	
8001-35-2	Toxaphene	ND VL	130	67	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	51%		46-122%
2051-24-3	Decachlorobiphenyl	52%		50-133%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: ST64509.D

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Report of Analysis

Client Sample ID:	50SB09B		
Lab Sample ID:	F51247-8	**Date Sampled:**	07/23/07
Matrix:	SO - Soil	**Date Received:**	07/24/07
Method:	SW846 8082 SW846 3550B	**Percent Solids:**	62.0
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	ST64509.D	10	08/04/07	JB	07/31/07	OP21687	GST1700
Run #2							

	Initial Weight	Final Volume
Run #1	30.3 g	10.0 ml
Run #2		

PCB List

CAS No.	Compound	Result	RL	MDL	Units	Q
12674-11-2	Aroclor 1016	ND	270	130	ug/kg	
11104-28-2	Aroclor 1221	ND	270	210	ug/kg	
11141-16-5	Aroclor 1232	ND	270	210	ug/kg	
53469-21-9	Aroclor 1242	ND	270	130	ug/kg	
12672-29-6	Aroclor 1248	ND	270	130	ug/kg	
11097-69-1	Aroclor 1254	706	270	130	ug/kg	
11096-82-5	Aroclor 1260	ND	270	130	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	75%		44-126%
2051-24-3	Decachlorobiphenyl	79%		39-157%

(a) All hits confirmed by dual column analysis.

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: KK20727.D

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Report of Analysis

Client Sample ID:	50SB010A		
Lab Sample ID:	F51247-9	**Date Sampled:**	07/23/07
Matrix:	SO - Soil	**Date Received:**	07/24/07
Method:	SW846 8081A SW846 3550B	**Percent Solids:**	92.6
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	KK20727.D	1	08/07/07	FS	07/31/07	OP21686	GKK760
Run #2							

	Initial Weight	Final Volume
Run #1	30.1 g	10.0 ml
Run #2		

Pesticide TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
309-00-2	Aldrin	ND	1.8	0.43	ug/kg	
319-84-6	alpha-BHC	ND	1.8	0.50	ug/kg	
319-85-7	beta-BHC	ND	1.8	0.47	ug/kg	
319-86-8	delta-BHC	ND	1.8	0.79	ug/kg	
58-89-9	gamma-BHC (Lindane)	ND	1.8	0.61	ug/kg	
5103-71-9	alpha-Chlordane	ND	1.8	0.36	ug/kg	
5103-74-2	gamma-Chlordane	ND	1.8	0.39	ug/kg	
60-57-1	Dieldrin	ND	1.8	0.39	ug/kg	
72-54-8	4,4'-DDD	ND	3.6	0.72	ug/kg	
72-55-9	4,4'-DDE	ND	3.6	0.72	ug/kg	
50-29-3	4,4'-DDT	ND	3.6	0.83	ug/kg	
72-20-8	Endrin	ND	3.6	0.72	ug/kg	
1031-07-8	Endosulfan sulfate	ND	3.6	1.2	ug/kg	
7421-93-4	Endrin aldehyde	ND VL	3.6	1.1	ug/kg	
53494-70-5	Endrin ketone	ND	3.6	0.72	ug/kg	
959-98-8	Endosulfan-I	ND	1.8	0.39	ug/kg	
33213-65-9	Endosulfan-II	ND	3.6	0.54	ug/kg	
76-44-8	Heptachlor	ND	1.8	0.50	ug/kg	
1024-57-3	Heptachlor epoxide	ND	1.8	0.36	ug/kg	
72-43-5	Methoxychlor	ND	3.6	0.72	ug/kg	
8001-35-2	Toxaphene	ND	90	45	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	59%		46-122%
2051-24-3	Decachlorobiphenyl	60%		50-133%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	50SB010A		
Lab Sample ID:	F51247-9	**Date Sampled:**	07/23/07
Matrix:	SO - Soil	**Date Received:**	07/24/07
Method:	SW846 8082 SW846 3550B	**Percent Solids:**	92.6
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	ST64389.D	1	08/02/07	JB	07/31/07	OP21687	GST1699
Run #2							

	Initial Weight	Final Volume
Run #1	30.1 g	10.0 ml
Run #2		

PCB List

CAS No.	Compound	Result	RL	MDL	Units	Q
12674-11-2	Aroclor 1016	ND	18	9.0	ug/kg	
11104-28-2	Aroclor 1221	ND	18	14	ug/kg	
11141-16-5	Aroclor 1232	ND	18	14	ug/kg	
53469-21-9	Aroclor 1242	ND	18	9.0	ug/kg	
12672-29-6	Aroclor 1248	ND	18	9.0	ug/kg	
11097-69-1	Aroclor 1254	10.4 J	18	9.0	ug/kg	J
11096-82-5	Aroclor 1260	ND	18	9.0	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	80%		44-126%
2051-24-3	Decachlorobiphenyl	84%		39-157%

(a) All hits confirmed by dual column analysis.

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: KK20728.D

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Report of Analysis

Client Sample ID:	50SB010B		
Lab Sample ID:	F51247-10	**Date Sampled:**	07/23/07
Matrix:	SO - Soil	**Date Received:**	07/24/07
Method:	SW846 8081A SW846 3550B	**Percent Solids:**	76.6
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	KK20728.D	1	08/07/07	FS	07/31/07	OP21686	GKK760
Run #2							

	Initial Weight	Final Volume
Run #1	30.2 g	10.0 ml
Run #2		

Pesticide TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
309-00-2	Aldrin	ND	2.2	0.52	ug/kg	
319-84-6	alpha-BHC	ND	2.2	0.61	ug/kg	
319-85-7	beta-BHC	ND	2.2	0.56	ug/kg	
319-86-8	delta-BHC	ND	2.2	0.95	ug/kg	
58-89-9	gamma-BHC (Lindane)	ND	2.2	0.73	ug/kg	
5103-71-9	alpha-Chlordane	ND	2.2	0.43	ug/kg	
5103-74-2	gamma-Chlordane	ND	2.2	0.48	ug/kg	
60-57-1	Dieldrin	ND	2.2	0.48	ug/kg	
72-54-8	4,4'-DDD	ND	4.3	0.86	ug/kg	
72-55-9	4,4'-DDE	ND	4.3	0.86	ug/kg	
50-29-3	4,4'-DDT	ND	4.3	0.99	ug/kg	
72-20-8	Endrin	ND	4.3	0.86	ug/kg	
1031-07-8	Endosulfan sulfate	ND	4.3	1.4	ug/kg	
7421-93-4	Endrin aldehyde	ND VL	4.3	1.3	ug/kg	
53494-70-5	Endrin ketone	ND	4.3	0.86	ug/kg	
959-98-8	Endosulfan-I	ND	2.2	0.48	ug/kg	
33213-65-9	Endosulfan-II	ND	4.3	0.65	ug/kg	
76-44-8	Heptachlor	ND	2.2	0.61	ug/kg	
1024-57-3	Heptachlor epoxide	ND	2.2	0.43	ug/kg	
72-43-5	Methoxychlor	ND	4.3	0.86	ug/kg	
8001-35-2	Toxaphene	ND	110	54	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	63%		46-122%
2051-24-3	Decachlorobiphenyl	66%		50-133%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	50SB010B		
Lab Sample ID:	F51247-10	**Date Sampled:**	07/23/07
Matrix:	SO - Soil	**Date Received:**	07/24/07
Method:	SW846 8082 SW846 3550B	**Percent Solids:**	76.6
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	ST64390.D	1	08/02/07	JB	07/31/07	OP21687	GST1699
Run #2							

	Initial Weight	Final Volume
Run #1	30.2 g	10.0 ml
Run #2		

PCB List

CAS No.	Compound	Result	RL	MDL	Units	Q
12674-11-2	Aroclor 1016	ND	22	11	ug/kg	
11104-28-2	Aroclor 1221	ND	22	17	ug/kg	
11141-16-5	Aroclor 1232	ND	22	17	ug/kg	
53469-21-9	Aroclor 1242	ND	22	11	ug/kg	
12672-29-6	Aroclor 1248	ND	22	11	ug/kg	
11097-69-1	Aroclor 1254	ND	22	11	ug/kg	
11096-82-5	Aroclor 1260	ND	22	11	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	82%		44-126%
2051-24-3	Decachlorobiphenyl	88%		39-157%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	50SB011A		
Lab Sample ID:	F51247-11	**Date Sampled:**	07/23/07
Matrix:	SO - Soil	**Date Received:**	07/24/07
Method:	SW846 8081A SW846 3550B	**Percent Solids:**	92.1
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	KK20729.D	1	08/07/07	FS	07/31/07	OP21686	GKK760
Run #2							

	Initial Weight	Final Volume
Run #1	30.5 g	10.0 ml
Run #2		

Pesticide TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
309-00-2	Aldrin	ND	1.8	0.43	ug/kg	
319-84-6	alpha-BHC	ND	1.8	0.50	ug/kg	
319-85-7	beta-BHC	ND	1.8	0.46	ug/kg	
319-86-8	delta-BHC	ND	1.8	0.78	ug/kg	
58-89-9	gamma-BHC (Lindane)	ND	1.8	0.61	ug/kg	
5103-71-9	alpha-Chlordane	ND	1.8	0.36	ug/kg	
5103-74-2	gamma-Chlordane	ND	1.8	0.39	ug/kg	
60-57-1	Dieldrin	ND	1.8	0.39	ug/kg	
72-54-8	4,4'-DDD	ND	3.6	0.71	ug/kg	
72-55-9	4,4'-DDE	ND	3.6	0.71	ug/kg	
50-29-3	4,4'-DDT	ND	3.6	0.82	ug/kg	
72-20-8	Endrin	ND	3.6	0.71	ug/kg	
1031-07-8	Endosulfan sulfate	ND	3.6	1.2	ug/kg	
7421-93-4	Endrin aldehyde	ND vL	3.6	1.1	ug/kg	
53494-70-5	Endrin ketone	ND	3.6	0.71	ug/kg	
959-98-8	Endosulfan-I	ND	1.8	0.39	ug/kg	
33213-65-9	Endosulfan-II	ND	3.6	0.53	ug/kg	
76-44-8	Heptachlor	ND	1.8	0.50	ug/kg	
1024-57-3	Heptachlor epoxide	ND	1.8	0.36	ug/kg	
72-43-5	Methoxychlor	ND	3.6	0.71	ug/kg	
8001-35-2	Toxaphene	ND	89	44	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	55%		46-122%
2051-24-3	Decachlorobiphenyl	64%		50-133%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	50SB011A		
Lab Sample ID:	F51247-11	**Date Sampled:**	07/23/07
Matrix:	SO - Soil	**Date Received:**	07/24/07
Method:	SW846 8082 SW846 3550B	**Percent Solids:**	92.1
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	ST64391.D	1	08/02/07	JB	07/31/07	OP21687	GST1699
Run #2							

	Initial Weight	Final Volume
Run #1	30.5 g	10.0 ml
Run #2		

PCB List

CAS No.	Compound	Result	RL	MDL	Units	Q
12674-11-2	Aroclor 1016	ND	18	8.9	ug/kg	
11104-28-2	Aroclor 1221	ND	18	14	ug/kg	
11141-16-5	Aroclor 1232	ND	18	14	ug/kg	
53469-21-9	Aroclor 1242	ND	18	8.9	ug/kg	
12672-29-6	Aroclor 1248	ND	18	8.9	ug/kg	
11097-69-1	Aroclor 1254	ND	18	8.9	ug/kg	
11096-82-5	Aroclor 1260	ND	18	8.9	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	73%		44-126%
2051-24-3	Decachlorobiphenyl	82%		39-157%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	50SB011B		
Lab Sample ID:	F51247-12	**Date Sampled:**	07/23/07
Matrix:	SO - Soil	**Date Received:**	07/24/07
Method:	SW846 8081A SW846 3550B	**Percent Solids:**	85.6
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	KK20730.D	1	08/07/07	FS	07/31/07	OP21686	GKK760
Run #2							

	Initial Weight	Final Volume
Run #1	30.4 g	10.0 ml
Run #2		

Pesticide TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
309-00-2	Aldrin	ND	1.9	0.46	ug/kg	
319-84-6	alpha-BHC	ND	1.9	0.54	ug/kg	
319-85-7	beta-BHC	ND	1.9	0.50	ug/kg	
319-86-8	delta-BHC	ND	1.9	0.85	ug/kg	
58-89-9	gamma-BHC (Lindane)	ND	1.9	0.65	ug/kg	
5103-71-9	alpha-Chlordane	ND	1.9	0.38	ug/kg	
5103-74-2	gamma-Chlordane	ND	1.9	0.42	ug/kg	
60-57-1	Dieldrin	ND	1.9	0.42	ug/kg	
72-54-8	4,4'-DDD	ND	3.8	0.77	ug/kg	
72-55-9	4,4'-DDE	ND	3.8	0.77	ug/kg	
50-29-3	4,4'-DDT	ND	3.8	0.88	ug/kg	
72-20-8	Endrin	ND	3.8	0.77	ug/kg	
1031-07-8	Endosulfan sulfate	ND	3.8	1.3	ug/kg	
7421-93-4	Endrin aldehyde	ND VL	3.8	1.2	ug/kg	
53494-70-5	Endrin ketone	ND	3.8	0.77	ug/kg	
959-98-8	Endosulfan-I	ND	1.9	0.42	ug/kg	
33213-65-9	Endosulfan-II	ND	3.8	0.58	ug/kg	
76-44-8	Heptachlor	ND	1.9	0.54	ug/kg	
1024-57-3	Heptachlor epoxide	ND	1.9	0.38	ug/kg	
72-43-5	Methoxychlor	ND	3.8	0.77	ug/kg	
8001-35-2	Toxaphene	ND	96	48	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	60%		46-122%
2051-24-3	Decachlorobiphenyl	68%		50-133%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	50SB011B		
Lab Sample ID:	F51247-12	**Date Sampled:**	07/23/07
Matrix:	SO - Soil	**Date Received:**	07/24/07
Method:	SW846 8082 SW846 3550B	**Percent Solids:**	85.6
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	ST64392.D	1	08/02/07	JB	07/31/07	OP21687	GST1699
Run #2							

	Initial Weight	Final Volume
Run #1	30.4 g	10.0 ml
Run #2		

PCB List

CAS No.	Compound	Result	RL	MDL	Units	Q
12674-11-2	Aroclor 1016	ND	19	9.6	ug/kg	
11104-28-2	Aroclor 1221	ND	19	15	ug/kg	
11141-16-5	Aroclor 1232	ND	19	15	ug/kg	
53469-21-9	Aroclor 1242	ND	19	9.6	ug/kg	
12672-29-6	Aroclor 1248	ND	19	9.6	ug/kg	
11097-69-1	Aroclor 1254	ND	19	9.6	ug/kg	
11096-82-5	Aroclor 1260	ND	19	9.6	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	82%		44-126%
2051-24-3	Decachlorobiphenyl	86%		39-157%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	50SB012A		
Lab Sample ID:	F51247-13	Date Sampled:	07/23/07
Matrix:	SO - Soil	Date Received:	07/24/07
Method:	SW846 8081A SW846 3550B	Percent Solids:	85.4
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	TT08314.D	1	08/10/07	FS	07/31/07	OP21686	GTT281
Run #2							

	Initial Weight	Final Volume
Run #1	30.0 g	10.0 ml
Run #2		

Pesticide TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
309-00-2	Aldrin	ND	2.0	0.47	ug/kg	
319-84-6	alpha-BHC	ND	2.0	0.55	ug/kg	
319-85-7	beta-BHC	ND	2.0	0.51	ug/kg	
319-86-8	delta-BHC	ND	2.0	0.86	ug/kg	
58-89-9	gamma-BHC (Lindane)	ND	2.0	0.66	ug/kg	
5103-71-9	alpha-Chlordane	ND	2.0	0.39	ug/kg	
5103-74-2	gamma-Chlordane	ND	2.0	0.43	ug/kg	
60-57-1	Dieldrin	ND	2.0	0.43	ug/kg	
72-54-8	4,4'-DDD	ND	3.9	0.78	ug/kg	
72-55-9	4,4'-DDE	ND	3.9	0.78	ug/kg	
50-29-3	4,4'-DDT	ND	3.9	0.90	ug/kg	
72-20-8	Endrin	ND	3.9	0.78	ug/kg	
1031-07-8	Endosulfan sulfate	ND	3.9	1.3	ug/kg	
7421-93-4	Endrin aldehyde	ND VL	3.9	1.2	ug/kg	
53494-70-5	Endrin ketone	ND	3.9	0.78	ug/kg	
959-98-8	Endosulfan-I	ND	2.0	0.43	ug/kg	
33213-65-9	Endosulfan-II	ND	3.9	0.59	ug/kg	
76-44-8	Heptachlor	ND	2.0	0.55	ug/kg	
1024-57-3	Heptachlor epoxide	ND	2.0	0.39	ug/kg	
72-43-5	Methoxychlor	ND	3.9	0.78	ug/kg	
8001-35-2	Toxaphene	ND	98	49	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	76%		46-122%
2051-24-3	Decachlorobiphenyl	79%		50-133%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	50SB012A		
Lab Sample ID:	F51247-13	**Date Sampled:**	07/23/07
Matrix:	SO - Soil	**Date Received:**	07/24/07
Method:	SW846 8082 SW846 3550B	**Percent Solids:**	85.4
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	ST64395.D	1	08/02/07	JB	07/31/07	OP21687	GST1699
Run #2							

	Initial Weight	Final Volume
Run #1	30.1 g	10.0 ml
Run #2		

PCB List

CAS No.	Compound	Result	RL	MDL	Units	Q
12674-11-2	Aroclor 1016	ND	19	9.7	ug/kg	
11104-28-2	Aroclor 1221	ND	19	16	ug/kg	
11141-16-5	Aroclor 1232	ND	19	16	ug/kg	
53469-21-9	Aroclor 1242	ND	19	9.7	ug/kg	
12672-29-6	Aroclor 1248	ND	19	9.7	ug/kg	
11097-69-1	Aroclor 1254	ND	19	9.7	ug/kg	
11096-82-5	Aroclor 1260	ND	19	9.7	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	82%		44-126%
2051-24-3	Decachlorobiphenyl	85%		39-157%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	50SB012B		
Lab Sample ID:	F51247-14	**Date Sampled:**	07/23/07
Matrix:	SO - Soil	**Date Received:**	07/24/07
Method:	SW846 8081A SW846 3550B	**Percent Solids:**	67.7
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	KK20773.D	10	08/08/07	FS	07/31/07	OP21686	GKK761
Run #2							

	Initial Weight	Final Volume
Run #1	30.7 g	10.0 ml
Run #2		

Pesticide TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
309-00-2	Aldrin	ND	24	5.8	ug/kg	
319-84-6	alpha-BHC	ND	24	6.7	ug/kg	
319-85-7	beta-BHC	ND	24	6.3	ug/kg	
319-86-8	delta-BHC	ND	24	11	ug/kg	
58-89-9	gamma-BHC (Lindane)	ND	24	8.2	ug/kg	
5103-71-9	alpha-Chlordane	ND	24	4.8	ug/kg	
5103-74-2	gamma-Chlordane	ND	24	5.3	ug/kg	
60-57-1	Dieldrin	ND	24	5.3	ug/kg	
72-54-8	4,4'-DDD	ND	48	9.6	ug/kg	
72-55-9	4,4'-DDE	ND	48	9.6	ug/kg	
50-29-3	4,4'-DDT	ND	48	11	ug/kg	
72-20-8	Endrin	ND	48	9.6	ug/kg	
1031-07-8	Endosulfan sulfate	ND	48	16	ug/kg	
7421-93-4	Endrin aldehyde	ND VL	48	14	ug/kg	
53494-70-5	Endrin ketone	ND	48	9.6	ug/kg	
959-98-8	Endosulfan-I	ND	24	5.3	ug/kg	
33213-65-9	Endosulfan-II	ND	48	7.2	ug/kg	
76-44-8	Heptachlor	ND	24	6.7	ug/kg	
1024-57-3	Heptachlor epoxide	ND	24	4.8	ug/kg	
72-43-5	Methoxychlor	ND	48	9.6	ug/kg	
8001-35-2	Toxaphene	ND	1200	600	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	69%		46-122%
2051-24-3	Decachlorobiphenyl	69%		50-133%

(a) Dilution required due to matrix interference.

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	50SB012B		
Lab Sample ID:	F51247-14	**Date Sampled:**	07/23/07
Matrix:	SO - Soil	**Date Received:**	07/24/07
Method:	SW846 8082 SW846 3550B	**Percent Solids:**	67.7
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	ST64538.D	10	08/06/07	JB	07/31/07	OP21687	GST1701
Run #2							

	Initial Weight	Final Volume
Run #1	30.7 g	10.0 ml
Run #2		

PCB List

CAS No.	Compound	Result	RL	MDL	Units	Q
12674-11-2	Aroclor 1016	ND	240	120	ug/kg	
11104-28-2	Aroclor 1221	ND	240	190	ug/kg	
11141-16-5	Aroclor 1232	ND	240	190	ug/kg	
53469-21-9	Aroclor 1242	ND	240	120	ug/kg	
12672-29-6	Aroclor 1248	ND	240	120	ug/kg	
11097-69-1	Aroclor 1254	939	240	120	ug/kg	
11096-82-5	Aroclor 1260	ND	240	120	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	97%		44-126%
2051-24-3	Decachlorobiphenyl	91%		39-157%

(a) All hits confirmed by dual column analysis.

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	50SB013A		
Lab Sample ID:	F51247-15	**Date Sampled:**	07/23/07
Matrix:	SO - Soil	**Date Received:**	07/24/07
Method:	SW846 8081A SW846 3550B	**Percent Solids:**	87.5
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	KK20732.D	1	08/07/07	FS	07/31/07	OP21686	GKK760
Run #2							

	Initial Weight	Final Volume
Run #1	30.1 g	10.0 ml
Run #2		

Pesticide TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
309-00-2	Aldrin	ND UL	1.9	0.46	ug/kg	
319-84-6	alpha-BHC	ND UL	1.9	0.53	ug/kg	
319-85-7	beta-BHC	ND UL	1.9	0.49	ug/kg	
319-86-8	delta-BHC	ND UL	1.9	0.84	ug/kg	
58-89-9	gamma-BHC (Lindane)	ND UL	1.9	0.65	ug/kg	
5103-71-9	alpha-Chlordane	ND UL	1.9	0.38	ug/kg	
5103-74-2	gamma-Chlordane	ND UL	1.9	0.42	ug/kg	
60-57-1	Dieldrin	ND UL	1.9	0.42	ug/kg	
72-54-8	4,4'-DDD	ND UL	3.8	0.76	ug/kg	
72-55-9	4,4'-DDE	ND UL	3.8	0.76	ug/kg	
50-29-3	4,4'-DDT	ND UL	3.8	0.87	ug/kg	
72-20-8	Endrin	ND UL	3.8	0.76	ug/kg	
1031-07-8	Endosulfan sulfate	ND UL	3.8	1.3	ug/kg	
7421-93-4	Endrin aldehyde	ND UL	3.8	1.1	ug/kg	
53494-70-5	Endrin ketone	ND UL	3.8	0.76	ug/kg	
959-98-8	Endosulfan-I	ND UL	1.9	0.42	ug/kg	
33213-65-9	Endosulfan-II	ND UL	3.8	0.57	ug/kg	
76-44-8	Heptachlor	ND UL	1.9	0.53	ug/kg	
1024-57-3	Heptachlor epoxide	ND UL	1.9	0.38	ug/kg	
72-43-5	Methoxychlor	ND UL	3.8	0.76	ug/kg	
8001-35-2	Toxaphene	ND UL	95	47	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	57%		46-122%
2051-24-3	Decachlorobiphenyl	52%		50-133%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	50SB013A		
Lab Sample ID:	F51247-15	**Date Sampled:**	07/23/07
Matrix:	SO - Soil	**Date Received:**	07/24/07
Method:	SW846 8082 SW846 3550B	**Percent Solids:**	87.5
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	ST64397.D	1	08/02/07	JB	07/31/07	OP21687	GST1699
Run #2							

	Initial Weight	Final Volume
Run #1	30.1 g	10.0 ml
Run #2		

PCB List

CAS No.	Compound	Result	RL	MDL	Units	Q
12674-11-2	Aroclor 1016	ND	19	9.5	ug/kg	
11104-28-2	Aroclor 1221	ND	19	15	ug/kg	
11141-16-5	Aroclor 1232	ND	19	15	ug/kg	
53469-21-9	Aroclor 1242	ND	19	9.5	ug/kg	
12672-29-6	Aroclor 1248	ND	19	9.5	ug/kg	
11097-69-1	Aroclor 1254	12.6 J	19	9.5	ug/kg	J
11096-82-5	Aroclor 1260	ND	19	9.5	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	76%		44-126%
2051-24-3	Decachlorobiphenyl	70%		39-157%

(a) All hits confirmed by dual column analysis.

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: KK20733.D

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Report of Analysis

Client Sample ID:	50SB013B		
Lab Sample ID:	F51247-16	**Date Sampled:**	07/23/07
Matrix:	SO - Soil	**Date Received:**	07/24/07
Method:	SW846 8081A SW846 3550B	**Percent Solids:**	64.7
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	KK20733.D	1	08/07/07	FS	07/31/07	OP21686	GKK760
Run #2							

	Initial Weight	Final Volume
Run #1	30.4 g	10.0 ml
Run #2		

Pesticide TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
309-00-2	Aldrin	ND VL	2.5	0.61	ug/kg	
319-84-6	alpha-BHC	ND VL	2.5	0.71	ug/kg	
319-85-7	beta-BHC	ND VL	2.5	0.66	ug/kg	
319-86-8	delta-BHC	ND VL	2.5	1.1	ug/kg	
58-89-9	gamma-BHC (Lindane)	ND VL	2.5	0.86	ug/kg	
5103-71-9	alpha-Chlordane	ND VL	2.5	0.51	ug/kg	
5103-74-2	gamma-Chlordane	ND VL	2.5	0.56	ug/kg	
60-57-1	Dieldrin	ND VL	2.5	0.56	ug/kg	
72-54-8	4,4'-DDD	ND VL	5.1	1.0	ug/kg	
72-55-9	4,4'-DDE	ND VL	5.1	1.0	ug/kg	
50-29-3	4,4'-DDT	ND VL	5.1	1.2	ug/kg	
72-20-8	Endrin	ND VL	5.1	1.0	ug/kg	
1031-07-8	Endosulfan sulfate	ND VL	5.1	1.7	ug/kg	
7421-93-4	Endrin aldehyde	ND VL	5.1	1.5	ug/kg	
53494-70-5	Endrin ketone	ND VL	5.1	1.0	ug/kg	
959-98-8	Endosulfan-I	ND VL	2.5	0.56	ug/kg	
33213-65-9	Endosulfan-II	ND VL	5.1	0.76	ug/kg	
76-44-8	Heptachlor	ND VL	2.5	0.71	ug/kg	
1024-57-3	Heptachlor epoxide	ND VL	2.5	0.51	ug/kg	
72-43-5	Methoxychlor	ND VL	5.1	1.0	ug/kg	
8001-35-2	Toxaphene	ND VL	130	64	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	56%		46-122%
2051-24-3	Decachlorobiphenyl	53%		50-133%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	50SB013B		
Lab Sample ID:	F51247-16	**Date Sampled:**	07/23/07
Matrix:	SO - Soil	**Date Received:**	07/24/07
Method:	SW846 8082 SW846 3550B	**Percent Solids:**	64.7
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	ST64398.D	1	08/02/07	JB	07/31/07	OP21687	GST1699
Run #2							

	Initial Weight	Final Volume
Run #1	30.4 g	10.0 ml
Run #2		

PCB List

CAS No.	Compound	Result	RL	MDL	Units	Q
12674-11-2	Aroclor 1016	ND	25	13	ug/kg	
11104-28-2	Aroclor 1221	ND	25	20	ug/kg	
11141-16-5	Aroclor 1232	ND	25	20	ug/kg	
53469-21-9	Aroclor 1242	ND	25	13	ug/kg	
12672-29-6	Aroclor 1248	ND	25	13	ug/kg	
11097-69-1	Aroclor 1254	28.3 J	25	13	ug/kg	
11096-82-5	Aroclor 1260	ND	25	13	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	75%		44-126%
2051-24-3	Decachlorobiphenyl	75%		39-157%

(a) All hits confirmed by dual column analysis.

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	50SB014A		
Lab Sample ID:	F51247-17	**Date Sampled:**	07/23/07
Matrix:	SO - Soil	**Date Received:**	07/24/07
Method:	SW846 8081A SW846 3550B	**Percent Solids:**	90.3
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	KK20736.D	1	08/07/07	FS	07/31/07	OP21686	GKK760
Run #2							

	Initial Weight	Final Volume
Run #1	30.7 g	10.0 ml
Run #2		

Pesticide TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
309-00-2	Aldrin	ND VL	1.8	0.43	ug/kg	
319-84-6	alpha-BHC	ND VL	1.8	0.51	ug/kg	
319-85-7	beta-BHC	ND VL	1.8	0.47	ug/kg	
319-86-8	delta-BHC	ND VL	1.8	0.79	ug/kg	
58-89-9	gamma-BHC (Lindane)	ND VL	1.8	0.61	ug/kg	
5103-71-9	alpha-Chlordane	ND VL	1.8	0.36	ug/kg	
5103-74-2	gamma-Chlordane	ND VL	1.8	0.40	ug/kg	
60-57-1	Dieldrin	ND VL	1.8	0.40	ug/kg	
72-54-8	4,4'-DDD	ND	3.6	0.72	ug/kg	
72-55-9	4,4'-DDE	ND VL	3.6	0.72	ug/kg	
50-29-3	4,4'-DDT	ND VL	3.6	0.83	ug/kg	
72-20-8	Endrin	ND	3.6	0.72	ug/kg	
1031-07-8	Endosulfan sulfate	ND VL	3.6	1.2	ug/kg	
7421-93-4	Endrin aldehyde	ND VL	3.6	1.1	ug/kg	
53494-70-5	Endrin ketone	ND	3.6	0.72	ug/kg	
959-98-8	Endosulfan-I	ND VL	1.8	0.40	ug/kg	
33213-65-9	Endosulfan-II	ND VL	3.6	0.54	ug/kg	
76-44-8	Heptachlor	ND VL	1.8	0.51	ug/kg	
1024-57-3	Heptachlor epoxide	ND VL	1.8	0.36	ug/kg	
72-43-5	Methoxychlor	ND VL	3.6	0.72	ug/kg	
8001-35-2	Toxaphene	ND	90	45	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	59%		46-122%
2051-24-3	Decachlorobiphenyl	62%		50-133%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	50SB014A		
Lab Sample ID:	F51247-17	**Date Sampled:**	07/23/07
Matrix:	SO - Soil	**Date Received:**	07/24/07
Method:	SW846 8082 SW846 3550B	**Percent Solids:**	90.3
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	ST64401.D	1	08/02/07	JB	07/31/07	OP21687	GST1699
Run #2							

	Initial Weight	Final Volume
Run #1	30.7 g	10.0 ml
Run #2		

PCB List

CAS No.	Compound	Result	RL	MDL	Units	Q
12674-11-2	Aroclor 1016	ND	18	9.0	ug/kg	
11104-28-2	Aroclor 1221	ND	18	14	ug/kg	
11141-16-5	Aroclor 1232	ND	18	14	ug/kg	
53469-21-9	Aroclor 1242	ND	18	9.0	ug/kg	
12672-29-6	Aroclor 1248	ND	18	9.0	ug/kg	
11097-69-1	Aroclor 1254	ND	18	9.0	ug/kg	
11096-82-5	Aroclor 1260	ND	18	9.0	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	78%		44-126%
2051-24-3	Decachlorobiphenyl	84%		39-157%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	50SB014B		
Lab Sample ID:	F51247-18	**Date Sampled:**	07/23/07
Matrix:	SO - Soil	**Date Received:**	07/24/07
Method:	SW846 8081A SW846 3550B	**Percent Solids:**	82.8
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	KK20739.D	1	08/07/07	FS	07/31/07	OP21686	GKK760
Run #2							

	Initial Weight	Final Volume
Run #1	30.2 g	10.0 ml
Run #2		

Pesticide TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
309-00-2	Aldrin	ND	2.0	0.48	ug/kg	
319-84-6	alpha-BHC	ND	2.0	0.56	ug/kg	
319-85-7	beta-BHC	ND	2.0	0.52	ug/kg	
319-86-8	delta-BHC	ND	2.0	0.88	ug/kg	
58-89-9	gamma-BHC (Lindane)	ND	2.0	0.68	ug/kg	
5103-71-9	alpha-Chlordane	ND	2.0	0.40	ug/kg	
5103-74-2	gamma-Chlordane	ND	2.0	0.44	ug/kg	
60-57-1	Dieldrin	ND	2.0	0.44	ug/kg	
72-54-8	4,4'-DDD	ND	4.0	0.80	ug/kg	
72-55-9	4,4'-DDE	ND	4.0	0.80	ug/kg	
50-29-3	4,4'-DDT	ND	4.0	0.92	ug/kg	
72-20-8	Endrin	ND	4.0	0.80	ug/kg	
1031-07-8	Endosulfan sulfate	ND	4.0	1.3	ug/kg	
7421-93-4	Endrin aldehyde	ND VL	4.0	1.2	ug/kg	
53494-70-5	Endrin ketone	ND	4.0	0.80	ug/kg	
959-98-8	Endosulfan-I	ND	2.0	0.44	ug/kg	
33213-65-9	Endosulfan-II	ND	4.0	0.60	ug/kg	
76-44-8	Heptachlor	ND	2.0	0.56	ug/kg	
1024-57-3	Heptachlor epoxide	ND	2.0	0.40	ug/kg	
72-43-5	Methoxychlor	ND	4.0	0.80	ug/kg	
8001-35-2	Toxaphene	ND	100	50	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	63%		46-122%
2051-24-3	Decachlorobiphenyl	67%		50-133%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Accutest Laboratories

Report of Analysis

Client Sample ID:	50SB014B		
Lab Sample ID:	F51247-18	**Date Sampled:**	07/23/07
Matrix:	SO - Soil	**Date Received:**	07/24/07
Method:	SW846 8082 SW846 3550B	**Percent Solids:**	82.8
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	ST64402.D	1	08/02/07	JB	07/31/07	OP21687	GST1699
Run #2							

	Initial Weight	Final Volume
Run #1	30.2 g	10.0 ml
Run #2		

PCB List

CAS No.	Compound	Result	RL	MDL	Units	Q
12674-11-2	Aroclor 1016	ND	20	10	ug/kg	
11104-28-2	Aroclor 1221	ND	20	16	ug/kg	
11141-16-5	Aroclor 1232	ND	20	16	ug/kg	
53469-21-9	Aroclor 1242	ND	20	10	ug/kg	
12672-29-6	Aroclor 1248	ND	20	10	ug/kg	
11097-69-1	Aroclor 1254	ND	20	10	ug/kg	
11096-82-5	Aroclor 1260	ND	20	10	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	76%		44-126%
2051-24-3	Decachlorobiphenyl	87%		39-157%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	50SB015A		
Lab Sample ID:	F51247-19	**Date Sampled:**	07/23/07
Matrix:	SO - Soil	**Date Received:**	07/24/07
Method:	SW846 8081A SW846 3550B	**Percent Solids:**	87.1
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	KK20740.D	1	08/07/07	FS	07/31/07	OP21686	GKK760
Run #2							

	Initial Weight	Final Volume
Run #1	30.1 g	10.0 ml
Run #2		

Pesticide TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
309-00-2	Aldrin	ND	1.9	0.46	ug/kg	
319-84-6	alpha-BHC	ND	1.9	0.53	ug/kg	
319-85-7	beta-BHC	ND	1.9	0.50	ug/kg	
319-86-8	delta-BHC	ND	1.9	0.84	ug/kg	
58-89-9	gamma-BHC (Lindane)	ND	1.9	0.65	ug/kg	
5103-71-9	alpha-Chlordane	ND	1.9	0.38	ug/kg	
5103-74-2	gamma-Chlordane	ND	1.9	0.42	ug/kg	
60-57-1	Dieldrin	ND	1.9	0.42	ug/kg	
72-54-8	4,4'-DDD	ND	3.8	0.76	ug/kg	
72-55-9	4,4'-DDE	ND	3.8	0.76	ug/kg	
50-29-3	4,4'-DDT	ND	3.8	0.88	ug/kg	
72-20-8	Endrin	ND	3.8	0.76	ug/kg	
1031-07-8	Endosulfan sulfate	ND	3.8	1.3	ug/kg	
7421-93-4	Endrin aldehyde	ND VL	3.8	1.1	ug/kg	
53494-70-5	Endrin ketone	ND	3.8	0.76	ug/kg	
959-98-8	Endosulfan-I	ND	1.9	0.42	ug/kg	
33213-65-9	Endosulfan-II	ND	3.8	0.57	ug/kg	
76-44-8	Heptachlor	ND	1.9	0.53	ug/kg	
1024-57-3	Heptachlor epoxide	ND	1.9	0.38	ug/kg	
72-43-5	Methoxychlor	ND	3.8	0.76	ug/kg	
8001-35-2	Toxaphene	ND	95	48	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	56%		46-122%
2051-24-3	Decachlorobiphenyl	66%		50-133%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Accutest Laboratories

Report of Analysis

Client Sample ID:	50SB015A		
Lab Sample ID:	F51247-19	**Date Sampled:**	07/23/07
Matrix:	SO - Soil	**Date Received:**	07/24/07
Method:	SW846 8082 SW846 3550B	**Percent Solids:**	87.1
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	ST64403.D	1	08/03/07	JB	07/31/07	OP21687	GST1699
Run #2							

	Initial Weight	Final Volume
Run #1	30.1 g	10.0 ml
Run #2		

PCB List

CAS No.	Compound	Result	RL	MDL	Units	Q
12674-11-2	Aroclor 1016	ND	19	9.5	ug/kg	
11104-28-2	Aroclor 1221	ND	19	15	ug/kg	
11141-16-5	Aroclor 1232	ND	19	15	ug/kg	
53469-21-9	Aroclor 1242	ND	19	9.5	ug/kg	
12672-29-6	Aroclor 1248	ND	19	9.5	ug/kg	
11097-69-1	Aroclor 1254	ND	19	9.5	ug/kg	
11096-82-5	Aroclor 1260	ND	19	9.5	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	66%		44-126%
2051-24-3	Decachlorobiphenyl	82%		39-157%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Accutest Laboratories

Report of Analysis

Client Sample ID:	50SB015B		
Lab Sample ID:	F51247-20	**Date Sampled:**	07/23/07
Matrix:	SO - Soil	**Date Received:**	07/24/07
Method:	SW846 8081A SW846 3550B	**Percent Solids:**	85.3
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	KK20741.D	1	08/07/07	FS	07/31/07	OP21686	GKK760
Run #2							

	Initial Weight	Final Volume
Run #1	30.5 g	10.0 ml
Run #2		

Pesticide TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
309-00-2	Aldrin	ND	1.9	0.46	ug/kg	
319-84-6	alpha-BHC	ND	1.9	0.54	ug/kg	
319-85-7	beta-BHC	ND	1.9	0.50	ug/kg	
319-86-8	delta-BHC	ND	1.9	0.85	ug/kg	
58-89-9	gamma-BHC (Lindane)	ND	1.9	0.65	ug/kg	
5103-71-9	alpha-Chlordane	ND	1.9	0.38	ug/kg	
5103-74-2	gamma-Chlordane	ND	1.9	0.42	ug/kg	
60-57-1	Dieldrin	ND	1.9	0.42	ug/kg	
72-54-8	4,4'-DDD	ND	3.8	0.77	ug/kg	
72-55-9	4,4'-DDE	ND	3.8	0.77	ug/kg	
50-29-3	4,4'-DDT	ND	3.8	0.88	ug/kg	
72-20-8	Endrin	ND	3.8	0.77	ug/kg	
1031-07-8	Endosulfan sulfate	ND	3.8	1.3	ug/kg	
7421-93-4	Endrin aldehyde	ND VL	3.8	1.2	ug/kg	
53494-70-5	Endrin ketone	ND	3.8	0.77	ug/kg	
959-98-8	Endosulfan-I	ND	1.9	0.42	ug/kg	
33213-65-9	Endosulfan-II	ND	3.8	0.58	ug/kg	
76-44-8	Heptachlor	ND	1.9	0.54	ug/kg	
1024-57-3	Heptachlor epoxide	ND	1.9	0.38	ug/kg	
72-43-5	Methoxychlor	ND	3.8	0.77	ug/kg	
8001-35-2	Toxaphene	ND	96	48	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	68%		46-122%
2051-24-3	Decachlorobiphenyl	74%		50-133%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	50SB015B		
Lab Sample ID:	F51247-20	**Date Sampled:**	07/23/07
Matrix:	SO - Soil	**Date Received:**	07/24/07
Method:	SW846 8082 SW846 3550B	**Percent Solids:**	85.3
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	ST64404.D	1	08/03/07	JB	07/31/07	OP21687	GST1699
Run #2							

	Initial Weight	Final Volume
Run #1	30.5 g	10.0 ml
Run #2		

PCB List

CAS No.	Compound	Result	RL	MDL	Units	Q
12674-11-2	Aroclor 1016	ND	19	9.6	ug/kg	
11104-28-2	Aroclor 1221	ND	19	15	ug/kg	
11141-16-5	Aroclor 1232	ND	19	15	ug/kg	
53469-21-9	Aroclor 1242	ND	19	9.6	ug/kg	
12672-29-6	Aroclor 1248	ND	19	9.6	ug/kg	
11097-69-1	Aroclor 1254	ND	19	9.6	ug/kg	
11096-82-5	Aroclor 1260	ND	19	9.6	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	75%		44-126%
2051-24-3	Decachlorobiphenyl	86%		39-157%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Shaw Environmental, Inc.
2113 Emmorton Park Road
Edgewood, Maryland
410-612-6350
FAX: 410-612-6351

Shaw® Shaw Environmental, Inc.

MEMORANDUM

TO: Jeff Parks, Shaw E&I Radford Army Ammunition Plant (RFAAP) Project Manager

FROM: Eric Malarek, Shaw E&I Project Chemist

SUBJECT: RFAAP Data Validation – Semi-Volatiles & Polynuclear Aromatic Hydrocarbons Accutest Laboratories, Inc., SDG F51247

DATE: December 3, 2007

The purpose of this memorandum is to present the data validation report for the samples collected at Main Manufacturing Area at RFAAP for a RFI/CMS Nine Sites on July 23, 2007. Samples were analyzed for semivolatile organic compounds (SVOCs) using USEPA SW846 Methods 3550B/8270C for solid matrices. The polynuclear aromatic hydrocarbons (PAHs) were analyzed using selective ion monitoring (SIM) techniques. A total of twenty solid samples were validated. The sample Ids are:

Field Sample ID	Lab Sample ID	Field Sample ID	Lab Sample ID
50SB06A	F51247-1	50SB011A	F51247-11
50SB06B	F51247-2	50SB011B	F51247-12
50SB07A	F51247-3	50SB012A	F51247-13
50SB07B	F51247-4	50SB012B	F51247-14
50SB08A	F51247-5	50SB013A	F51247-15
50SB08B	F51247-6	50SB013B	F51247-16
50SB09A	F51247-7	50SB014A	F51247-17
50SB09B	F51247-8	50SB014B	F51247-18
50SB010A	F51247-9	50SB015A	F51247-19
50SB010B	F51247-10	50SB015B	F51247-20

Data were reviewed by Eric Malarek and validated using a combination of project QAPP, *Quality Systems Manual for Environmental Laboratories, Final Version 3, January, 2006* (DoD, 2006) (DoD QSM), method-specific criteria, and laboratory SOP criteria. The data qualifier scheme was consistent with the *Region III Modifications to the National Functional Guidelines for Organic Data Review* (September 1994). Parameters evaluated are presented in **Table 1**. Data associated with parameters in compliance with quality control specifications have not been qualified. Data associated with parameters that did not comply with quality control specifications and directly impacted project data have been qualified in accordance with USEPA Region III specifications.

Table 1 Laboratory Performance Criteria

Qualified		Parameter
Yes	No	
	X	Holding Times and Preservation
	X	Instrument Performance Check
	X	Initial Calibration
	X	Continuing Calibration
	X	Blank Analysis
X		Surrogate Spikes
	X	Internal Standards
X		Laboratory Control Sample
X		Matrix Spike/Spike Duplicate
	X	Field Duplicate
X		Quantitation Verification

The quality of data collected in support of this sampling activity is considered acceptable with noted qualifications.

Eric Malarek, Chemist

12/3/07
Date

RFAAP VALIDATION REPORT
SEMIVOLATILES AND PAH REVIEW
SDG F51247

I-Holding Times and Preservation
The objective is to ascertain the validity of results based on the holding time of the sample from time of collection to time of sample extraction and analysis. Holding time criteria: For semivolatile (SVOC) and polynuclear aromatic hydrocarbons (PAH) compounds in solid matrices, the samples are cooled @4°C ± 2°C with a maximum holding time of 14 days from sample collection to preparative extraction and 40 days from preparative extraction to determinative analysis.

- Temperature Review: The temperature blank was sent with each cooler and recorded by the laboratory upon receipt. For samples collected on 07/23/07, the coolers were received by the primary laboratory (Accutest) on 07/20/07 at 2.8°C, and 3.2°C. The herbicides were subcontracted to Accutest TX and were received the samples at 3.4°C. The dioxin subcontract laboratory (SGS Paradigm Analytical Laboratories, Inc.) received the samples at 1.2°C. Even though the receipt temperature was below criteria for some coolers, there were no impacts to the data quality. No qualifiers were applied based upon this outlier.

- Holding Time Review: The soil samples were collected 07/23/07. For samples 50SB07A (F51247-3) and 50SB08B (F51247-6), the SVOCs were extracted on 08/07/07 and analyzed on 08/08/07 and 08/10/07. Samples 50SB07A (F51247-3) and 50SB08B (F51247-6) were extracted one day out of holding time for SVOCs. No qualifiers were applied based upon these outliers. For the remaining samples, the SVOCs were extracted on 07/31/07 and analyzed on 08/01/07 and 08/02/07. For samples 50SB06B (F51247-2), 50SB07A (F51247-3), 50SB08B (F51247-6), 50SB010B (F51247-10), 50SB012B (F51247-14), the PAHs by SIM were extracted on 08/07/07 and analyzed on 08/11/07, 08/15/07, and 08/17/07. Samples 50SB06B (F51247-2), 50SB07A (F51247-3), 50SB08B (F51247-6), 50SB010B (F51247-10), 50SB012B (F51247-14) were extracted one day out of holding time for PAHs by SIM. No qualifiers were applied based upon these outliers. For the remaining samples, the PAHs by SIM were extracted on 07/31/07 and analyzed on 08/03/07 and 08/04/07. No qualifiers were applied based upon this outlier. Sample collection dates may be found on the attached form 1s. All criteria were met. No qualifiers were applied.

II-Instrument Performance Check
GC/MS instrument performance checks are performed to ensure mass resolution, identification and, to some degree, sensitivity. The analysis of the instrument performance check solution must be performed at the beginning of each 12-hour period during which samples are analyzed.

- The instrument performance check, decafluorotriphenylphosphine (DFTPP), met the ion abundance criteria. No qualification was applied.

III-Initial Calibration

Compliance requirements for satisfactory instrument calibration are established to ensure that the instrument used is capable of producing acceptable qualitative and quantitative data for compounds on the semivolatile target compound list (TCL). Initial calibration demonstrates that the instrument is capable of acceptable performance in the beginning of the analytical run and of producing a linear calibration curve. For compounds analyzed using linear regression or second order, correlation coefficients must be >0.995 and coefficients of determination >0.99. The minimum relative response factor (RRF) criteria must be ≥0.05. The DoD QSM specifies that the initial calibration percent relative standard deviation (%RSD) must be ≤15% on the average for all compounds (<30% for CCCs). All detects are qualified as estimated "J" for where there were exceeding %RSDs, and all non-detects are qualified as estimated "UJ" for where there were grossly exceeding recoveries, unless determined to be unusable "R". Grossly exceeding is defined as twice the established criteria limits. For where there were low RRFs, all detects are qualified as estimated "J" and non-detects are rejected "R".

- Initial calibration for the SVOCs was performed on 07/05/07 on instrument MSBNA02. Target compounds 2,4-dinitrophenol (19.7%) and 4,6-dinitro-2-methylphenol (25.9%) were outside criteria. All other target compounds were within criteria (%RSD≤15% or ≤30%; RRF≥0.05). Compounds 2,4-dinitrophenol (r=0.9950) and 4,6-dinitro-2-methylphenol (r=0.9975) were quantified using linear or second order regression with correlation coefficients >0.995, therefore, no qualifiers were applied based upon the high %RSDs. Samples 50SB012A (F51247-13 confirmation), 50SB012B (F51247-14 confirmation), 50SB010B (F51247-10 confirmation), 50SB012B (F51247-14 confirmation), and 50SB06B (F51247-2 confirmation) were analyzed using this initial calibration.

- Initial calibration for the SVOCs was performed on 07/13/07 on instrument MSBNA04. Target compounds 2,4-dinitrophenol (42.0%; grossly exceeding) and 4,6-dinitro-2-methylphenol (24.0%) were outside criteria. All other target compounds were within criteria (%RSD≤15% or ≤30%; RRF≥0.05). Compounds 2,4-dinitrophenol (r=0.9988) and 4,6-dinitro-2-methylphenol (r=0.9995) were quantified using linear or second order regression with correlation coefficients >0.995, therefore, no qualifiers were applied based upon the high %RSDs. Samples 50SB06A (F51247-1), 50SB06B (F51247-2), 50SB07A (F51247-3), 50SB07B (F51247-4), 50SB08A (F51247-5), 50SB08B (F51247-6), 50SB09A (F51247-7), 50SB09B (F51247-8), 50SB010A (F51247-9), 50SB010B (F51247-10), 50SB011A (F51247-11), 50SB011B (F51247-12), 50SB012A (F51247-13), 50SB012B (F51247-14), 50SB013A (F51247-15), 50SB013B (F51247-16), 50SB014A (F51247-17), 50SB014B (F51247-18), 50SB015A (F51247-19), and 50SB015B (F51247-20) were analyzed using this initial calibration.

- Initial calibration for the PAHs by SIM was performed on 07/18/07 on instrument MSBNA03, all target compounds were within criteria (%RSD≤15% or ≤30%; RRF≥0.05). No qualifiers were applied. Samples 50SB06A (F51247-1), 50SB07B (F51247-4), 50SB08A (F51247-5), 50SB09A (F51247-7), 50SB09B (F51247-8), 50SB010A (F51247-9), 50SB011A (F51247-11), 50SB011B (F51247-12), 50SB012A (F51247-13), 50SB013A (F51247-15), 50SB013B (F51247-16), 50SB014A (F51247-17), 50SB014B (F51247-18), 50SB015A (F51247-19), and 50SB015B (F51247-20) were analyzed using this initial calibration.

- Initial calibration for the PAHs by SIM was performed on 08/07/07 on instrument MSBNA01, all target compounds were within criteria (%RSD≤15% or ≤30%; RRF≥0.05). No qualifiers were applied. Samples 50SB010B (F51247-10) and 50SB012B (F51247-14) were analyzed using this initial calibration.

- Initial calibration for the PAHs by SIM was performed on 08/15/07 on instrument MSBNA01, all target compounds were within criteria (%RSD≤15% or ≤30%; RRF≥0.05). No qualifiers were applied. Samples 50SB06B (F51247-2), 50SB07A (F51247-3), and 50SB08B (F51247-6) were analyzed using this initial calibration.

IV-Continuing Calibration

Compliance requirements for satisfactory instrument calibration are established to ensure that the instrument used was capable of producing acceptable qualitative and quantitative data for semivolatile target compounds. Continuing calibration standards containing both target and surrogates compounds are analyzed at the beginning of each 12-hour analysis period following the analysis of the instrument performance check and prior to the analysis of blanks and samples. The minimum relative response factors (RRF) for semivolatile target compounds and surrogates must be ≥0.05. The DoD QSM specifies that the percent difference (%D) between the initial calibration RRF and the continuing calibration RRF must be within ±20% for all target compounds. Grossly exceeding is defined where %D>40%. All detects are qualified as estimated "J" for where there were exceeding %Ds, and all non-detects are qualified as estimated "UJ" for where there were grossly exceeding recoveries, unless determined to be unusable "R". Grossly exceeding is defined as twice the established criteria limits. For where there were low RRFs, all detects are qualified as estimated "J" and non-detects are rejected "R".

- For SVOC initial calibration verification performed on 07/05/07 @15:27 on instrument MSBNA02, 3-nitroaniline (26.0%) was outside criteria limits. For all other target compounds, all criteria were met. All samples were non-detect for 3-nitroaniline. No qualifiers were applied. No samples reported apply to this initial calibration verification.

- For SVOC initial calibration verification performed on 07/05/07 @15:55 on instrument MSBNA02, all criteria were met for all target compounds. No qualifiers were applied. No samples reported apply to this initial calibration verification.

- For SVOC continuing calibration performed on 08/02/07 @13:24 on instrument MSBNA02, all criteria were met for all target compounds. No qualifiers were applied. Samples 50SB012A (F51247-13 confirmation) and 50SB012B (F51247-14 confirmation) apply to this continuing calibration.

- For SVOC continuing calibration performed on 08/08/07 @10:46 on instrument MSBNA02, all criteria were met for all target compounds. No qualifiers were applied. Samples 50SB08B (F51247-6), 50SB010B (F51247-10 confirmation), and 50SB012B (F51247-14 confirmation) apply to this continuing calibration.

- For SVOC continuing calibration performed on 08/13/07 @12:13 on instrument MSBNA02, all criteria were met for all target compounds. No qualifiers were applied. No samples reported apply to this continuing calibration.

- For SVOC continuing calibration performed on 08/13/07 @19:50 on instrument MSBNA02, all criteria were met for all target compounds. No qualifiers were applied. Sample 50SB06B (F51247-2 confirmation) applies to this continuing calibration.

- For SVOC initial calibration verification performed on 07/13/07 @13:48 on instrument MSBNA04, 4-chloroaniline (38.2%) and 3-nitroaniline (39.0%) were outside criteria limits. For all other target compounds, all criteria were met. All samples were non-detect for 4-chloroaniline and 3-nitroaniline. No samples reported apply to this initial calibration verification. No qualifiers were applied.

- For SVOC initial calibration verification performed on 07/13/07 @14:19 on instrument MSBNA04, all criteria were met for all target compounds. No qualifiers were applied. No samples reported apply to this initial calibration verification.

- For SVOC continuing calibration performed on 08/01/07 @13:41 on instrument MSBNA04, all criteria were met for all target compounds. No qualifiers were applied. Samples 50SB06A (F51247-1), 50SB06B (F51247-2), 50SB07B (F51247-4), 50SB08A (F51247-5), 50SB09A (F51247-7), 50SB09B (F51247-8), 50SB010A (F51247-9), 50SB010B (F51247-10), 50SB011A (F51247-11), 50SB011B (F51247-12), 50SB012A (F51247-13), 50SB012B (F51247-14), 50SB013A (F51247-15), 50SB013B (F51247-16), 50SB014A (F51247-17), 50SB014B (F51247-18), 50SB015A (F51247-19), and 50SB015B (F51247-20) apply to this continuing calibration.

- For SVOC continuing calibration performed on 08/10/07 @10:24 on instrument MSBNA04, 2,4-dinitrophenol (20.8%) was outside criteria limits. For all other target compounds, all criteria were met. All samples were non-detect for 2,4-dinitrophenol. Sample 50SB07A (F51247-3) applies to this continuing calibration.

- For PAH by SIM initial calibration verification performed on 07/18/07 @06:34 on instrument MSBNA03, all criteria were met for all target compounds. No qualifiers were applied. No samples reported apply to this initial calibration verification.

- For PAH by SIM continuing calibration performed on 08/03/07 @20:42 on instrument MSBNA03, all criteria were met for all target compounds. No qualifiers were applied. Samples 50SB06A (F51247-1), 50SB07B (F51247-4), 50SB08A (F51247-5), 50SB09A (F51247-7), 50SB09B (F51247-8), 50SB010A (F51247-9), 50SB011A (F51247-11), 50SB011B (F51247-12), 50SB012A (F51247-13), 50SB013A (F51247-15), 50SB013B (F51247-16), 50SB014A (F51247-17), 50SB014B (F51247-18), 50SB015A (F51247-19), and 50SB015B (F51247-20) apply to this continuing calibration.

- For PAH by SIM initial calibration verification performed on 08/07/07 @18:49 on instrument MSBNA01, all criteria were met for all target compounds. No qualifiers were applied. No samples reported apply to this initial calibration verification.

- For PAH by SIM initial calibration verification performed on 08/07/07 @19:17 on instrument MSBNA01, all criteria were met for all target compounds. No qualifiers were applied. No samples reported apply to this initial calibration verification.

- For PAH by SIM continuing calibration performed on 07/30/07 @11:52 on instrument MSBNA01, all criteria were met for all target compounds. No qualifiers were applied. No samples reported apply to this continuing calibration.

- For PAH by SIM continuing calibration performed on 08/10/07 @15:52 on instrument MSBNA01, all criteria were met for all target compounds. No qualifiers were applied. Samples 50SB010B (F51247-10) and 50SB012B (F51247-14) apply to this continuing calibration.

- For PAH by SIM continuing calibration performed on 08/13/07 @10:12 on instrument MSBNA01, all criteria were met for all target compounds. No qualifiers were applied. No samples reported apply to this continuing calibration.

- For PAH by SIM initial calibration verification performed on 08/15/07 @13:54 on instrument MSBNA01, all criteria were met for all target compounds. No qualifiers were applied. No samples reported apply to this initial calibration verification.

- For PAH by SIM initial calibration verification performed on 08/15/07 @14:21 on instrument MSBNA01, all criteria were met for all target compounds. No qualifiers were applied. No samples reported apply to this initial calibration verification.

- For PAH by SIM continuing calibration performed on 08/15/07 @16:26 on instrument MSBNA01, all criteria were met for all target compounds. No qualifiers were applied. Sample 50SB06B (F51247-2) applies to this continuing calibration.

- For PAH by SIM continuing calibration performed on 08/17/07 @00:39 on instrument MSBNA01, all criteria were met for all target compounds. No qualifiers were applied. Samples 50SB07A (F51247-3) and 50SB08B (F51247-6) apply to this continuing calibration.

V-Blank Analysis

The purpose of blank analyses is to determine the presence and magnitude of contamination problems resulting from field and laboratory activities. A method blank analysis must be performed after the calibration standards and once every 12-hour time period beginning with the injection of DFTPP. No contaminants should be detected in any of the associated blanks > the MDL. DoD QSM criteria specifies all concentrations should be less than one-half MRL (<MRL for common laboratory contaminants phthalate esters). Positive sample results are reported and qualified "B", if the concentration of the compound in the sample is ≤10 times (10x) the maximum amount in any blank for the common laboratory contaminants phthalate esters, or 5 times (5X) the maximum amount for other semivolatile target compounds. **Table 2** summarizes the blank contamination analysis. Action levels are based upon dilution factor of one and for solid matrices were converted to soil values (soil conversion factor = 33) if needed. Rinse blanks 072407R (F51275-1) and 072507R (F51300-31) apply to the surface soil "SS" and subsurface soil "SB" samples in this SDG.

Table 2 Blank Contamination Analysis Summary

Analysis Date	QC Blank ID	Compound	Max Conc. µg/kg	Action Level µg/kg	B qualified samples
08/01/07	OP21689-MB	All SVOC target <½MRL	NA	NA	None
08/02/07	OP21689-MB	All SVOC target <½MRL	NA	NA	None
08/08/07	OP21773-MB	All SVOC target <½MRL	NA	NA	None
08/10/07	OP21773-MB	All SVOC target <½MRL	NA	NA	None
08/13/07	OP21773-MB	All SVOC target <½MRL	NA	NA	None
08/13/07	OP21773-MB	All SVOC target <½MRL	NA	NA	None
08/03/07	OP21688-MB	All PAH SIM target <½MRL	NA	NA	None
08/10/07	OP21772-MB	All PAH SIM target <½MRL	NA	NA	None
08/13/07	OP21772-MB	All PAH SIM target <½MRL	NA	NA	None
08/15/07	OP21772-MB	All PAH SIM target <½MRL	NA	NA	None
08/17/07	OP21772-MB	All PAH SIM target <½MRL	NA	NA	None
08/02/07	072407R	All SVOC target <½MRL	NA	NA	None
08/02/07	072407R	All PAH SIM target <½MRL	NA	NA	None
08/02/07	072507R	All SVOC target <½MRL	NA	NA	None
08/02/07	072507R	All PAH SIM target <½MRL	NA	NA	None

NA = Not applicable.
MRL = Method reporting limit.

VI-Surrogate Spikes
Laboratory performance on individual samples is evaluated through the review of surrogate spike samples. Surrogate spikes are added to all samples and blanks to measure their recovery in sample and blank matrices. The percent recoveries (%Rs) must be within the specified control limits. DoD surrogate recovery limits are specified in Table D-2 and Table D-3 of the DoD QSM (DoD, 2006). If the surrogate is not listed, then the laboratory criteria shall be used.

Solid Criteria:
2-Fluorophenol (40-102%) – (DoD QSM = 35-105%)
Phenol – d5 (41-100%) – (DoD QSM = 40-100%)
2,4,6-Tribromophenol (42-108%) – (DoD QSM = 35-125%)
Nitrobenzene-d5 (40-105%) – (DoD QSM = 35-100%)
2-Fluorobiphenyl (43-107%) – (DoD QSM = 45-105%)
p-Terphenyl – d14 (45-119%) – (DoD QSM = 30-125%)

- For soil sample 50SB06B (F51247-2), 2-fluorophenol (36.0%), phenol – d5 (37.0%), 2,4,6-tribromophenol (34.0%), nitrobenzene-d5 (35.0%), 2-fluorobiphenyl (37.0%), and p-terphenyl – d14 (37.0%) were outside lab criteria and/or DoD QSM criteria. The sample was diluted due to matrix effects. The sample was re-extracted and rerun beyond holding times at a further dilution for confirmation with the following recoveries: 2-fluorophenol (9.0%), phenol – d5 (11.0%), 2,4,6-tribromophenol (0.0%), nitrobenzene-d5 (10.0%), 2-fluorobiphenyl (11.0%), and p-terphenyl – d14 (9.0%). Sample 50SB06B (F51247-2) was qualified bias low "UL" based upon the noted matrix effects and the low surrogate recoveries.

- For soil sample 50SB07A (F51247-3), 2-fluorophenol (28.0%), phenol – d5 (34.0%), 2,4,6-tribromophenol (24.0%), nitrobenzene-d5 (28.0%), 2-fluorobiphenyl (32.0%), and p-terphenyl – d14 (29.0%) were outside lab criteria and/or DoD QSM criteria. The sample was diluted due to matrix effects. Sample 50SB07A (F51247-3) was qualified bias low "L" for detects and "UL" for non-detects based upon the noted matrix effects and the low surrogate recoveries.

- For soil sample 50SB010B (F51247-10), 2-fluorophenol (11.0%), phenol – d5 (16.0%), nitrobenzene-d5 (9.0%), and 2-fluorobiphenyl (14.0%) were outside lab criteria and/or DoD QSM criteria. The sample was re-extracted and rerun beyond holding times for confirmation with all recoveries within criteria. Sample 50SB010B (F51247-10) was qualified bias low "UL" based upon the low surrogate recoveries.

- For soil sample 50SB012B (F51247-14), 2-fluorophenol (19.0%), phenol – d5 (20.0%), 2,4,6-tribromophenol (22.0%), nitrobenzene-d5 (20.0%), 2-fluorobiphenyl (24.0%), and p-terphenyl – d14 (25.0%) were outside lab criteria and/or DoD QSM criteria. The sample was diluted due to matrix effects. The sample was re-extracted and rerun beyond holding times for confirmation with the following recoveries: 2-fluorophenol (16.0%), phenol – d5 (16.0%), 2,4,6-tribromophenol (0.0%), nitrobenzene-d5 (23.0%), 2-fluorobiphenyl (29.0%), and p-terphenyl – d14 (27.0%). Sample 50SB012B (F51247-14) was qualified bias low "L" for detects and "UL" for non-detects based upon the noted matrix effects and the low surrogate recoveries.

- For all other field samples, all surrogates were within criteria limits.

VII-Internal Standards
Internal standards performance criteria ensure that GC/MS sensitivity and response are stable during every analytical run. Internal standard area counts for samples and blanks must not vary by more than a factor of two (-50% to +100%) from the associated calibration standard. The retention time of the internal standards in samples and blanks must not vary by more than ±30 seconds from the retention time of the associated calibration standard.

- All criteria were met. No qualifiers were applied.

VIII-Laboratory Control Sample

Laboratory control samples (LCS) are used to monitor laboratory accuracy by calculating the percent recoveries of the spiked compounds. All LCS percent recoveries must be within the specified control limits. DoD LCS solid recovery limits are specified in Table D-2 and Table D-7 of the DoD QSM (DoD, 2006). If the compound is not listed, then the laboratory criteria shall be used.

- Sample OP21689-BS was used as the solid LCS for the SVOC analysis on 08/01/07. All criteria were met. No qualifiers were applied. Samples 50SB06A (F51247-1), 50SB06B (F51247-2), 50SB07B (F51247-4), 50SB08A (F51247-5), 50SB09A (F51247-7), 50SB09B (F51247-8), 50SB010A (F51247-9), 50SB010B (F51247-10), 50SB011A (F51247-11), 50SB011B (F51247-12), 50SB012A (F51247-13), 50SB012B (F51247-14), 50SB013A (F51247-15), 50SB013B (F51247-16), 50SB014A (F51247-17), 50SB014B (F51247-18), 50SB015A (F51247-19), and 50SB015B (F51247-20) apply to this LCS.

- Sample OP21773-BS was used as the solid LCS for the SVOC analysis on 08/08/07. All criteria were met. No qualifiers were applied. Samples 50SB07A (F51247-3) and 50SB08B (F51247-6) apply to this LCS.

- Sample OP21773-BS was used as the solid LCS for the SVOC analysis on 08/10/07. All criteria were met. No qualifiers were applied. Samples 50SB07A (F51247-3) and 50SB08B (F51247-6) apply to this LCS.

- Sample OP21773-BS was used as the solid LCS for the SVOC analysis on 08/13/07. 2,4-Dinitrophenol (35%) and 4,6-dinitro-2-methylphenol (52%) were below laboratory criteria. The associated samples were non-detect for these compounds and was qualified bias low "UL" based upon the low recoveries. Samples 50SB07A (F51247-3) and 50SB08B (F51247-6) apply to this LCS.

- Sample OP21688-BS was used as the solid LCS for the PAH SIM analysis on 08/03/07. All criteria were met. No qualifiers were applied. Samples 50SB06A (F51247-1), 50SB07B (F51247-4), 50SB08A (F51247-5), 50SB09A (F51247-7), 50SB09B (F51247-8), 50SB010A (F51247-9), 50SB011A (F51247-11), 50SB011B (F51247-12), 50SB012A (F51247-13), 50SB013A (F51247-15), 50SB013B (F51247-16), 50SB014A (F51247-17), 50SB014B (F51247-18), 50SB015A (F51247-19), and 50SB015B (F51247-20) apply to this LCS.

- Sample OP21772-BS was used as the solid LCS for the PAH SIM analysis on 08/10/07. All criteria were met. No qualifiers were applied. Samples 50SB06B (F51247-2), 50SB07A (F51247-3), 50SB08B (F51247-6), 50SB010B (F51247-10), and 50SB012B (F51247-14) apply to this LCS.

- Sample OP21772-BS was used as the solid LCS for the PAH SIM analysis on 08/13/07. All criteria were met. No qualifiers were applied. Samples 50SB06B (F51247-2), 50SB07A (F51247-3), 50SB08B (F51247-6), 50SB010B (F51247-10), and 50SB012B (F51247-14) apply to this LCS.

IX-Matrix Spike/Matrix Spike Duplicate

Data for matrix spike/matrix spike duplicates (MS/MSD) are generated to determine long-term precision and accuracy of the analytical method on various matrices and to demonstrate acceptable compound recovery by the laboratory at the time of sample analysis. The percent recoveries (%Rs) and the relative percent difference (RPD) must be within the specified control limits. DoD solid MS/MSD recovery limits follow the LCS criteria and are specified in Table D-2 and Table D-7 of the DoD QSM (DoD, 2006). If the compound is not listed, then the laboratory criteria shall be used.

- Sample 50SB010A (F51247-9) was used for the solid MS/MSD for SVOC analysis on 08/01/07. 2,4-Dimethylphenol (46%, 42%) and 3,3'-dichlorobenzidine (16%, 12%) were below laboratory and/or DoD QSM accuracy criteria. All other target compounds were within criteria. The associated solid LCS was within criteria and all solid samples were non-detect for these compounds. 2,4-Dimethylphenol and 3,3'-dichlorobenzidine were non-detect for the spiked sample and qualified "UL" based upon the low recoveries. Samples 50SB06A (F51247-1), 50SB06B (F51247-2), 50SB07B (F51247-4), 50SB08A (F51247-5), 50SB09A (F51247-7), 50SB09B (F51247-8), 50SB010A (F51247-9), 50SB010B (F51247-10), 50SB011A (F51247-11), 50SB011B (F51247-12), 50SB012A (F51247-13), 50SB012B (F51247-14), 50SB013A (F51247-15), 50SB013B (F51247-16), 50SB014A (F51247-17), 50SB014B (F51247-18), 50SB015A (F51247-19), and 50SB015B (F51247-20) apply to this MS/MSD.

- Sample APSB08B (F51353-27) was used for the solid MS/MSD for SVOC analysis on 07/30/07. 2,4-Dimethylphenol (36%, 30%), 4,6-dinitro-2-methylphenol (52%, 49%), 1,2-dichlorobenzene (44%), 1,3-dichlorobenzene (39%), 1,4-dichlorobenzene (40%), and hexachloroethane (39%) were below laboratory and/or DoD QSM accuracy criteria. All other target compounds were within criteria. The associated solid LCS was within criteria and all solid samples were non-detect for these compounds. 2,4-Dimethylphenol, 4,6-dinitro-2-methylphenol, 1,2-dichlorobenzene, 1,3-dichlorobenzene, 1,4-dichlorobenzene, and hexachloroethane were non-detect for the spiked sample and qualified "UL" based upon the low recoveries. Samples 50SB07A (F51247-3) and 50SB08B (F51247-6) apply to this MS/MSD.

- Sample 50SB014A (F51247-17) was used for the solid MS/MSD for PAH SIM analysis on 08/04/07. Acenaphthene (43%; RPD=37%), acenaphthylene (43%; RPD=40%), anthracene (62%), chrysene (63%), fluorene (51%; RPD=29%), 1-methylnaphthalene (38%; RPD=50%), 2-methylnaphthalene (36%; RPD=51%), naphthalene (34%; RPD=59%), and phenanthrene (61%) were below laboratory and/or DoD QSM accuracy criteria. All other target compounds were within criteria. The associated solid LCS was within criteria. Acenaphthene, acenaphthylene, anthracene, chrysene, fluorene, 1-methylnaphthalene, 2-methylnaphthalene, naphthalene, and phenanthrene were non-detect for the spiked sample and qualified "UL" based upon the low recoveries. Samples 50SB06A (F51247-1), 50SB07B (F51247-4), 50SB08A (F51247-5), 50SB09A (F51247-7), 50SB09B (F51247-8), 50SB010A (F51247-9), 50SB011A (F51247-11), 50SB011B (F51247-12), 50SB012A (F51247-13), 50SB013A (F51247-15), 50SB013B (F51247-16), 50SB014A (F51247-17), 50SB014B (F51247-18), 50SB015A (F51247-19), and 50SB015B (F51247-20) apply to this MS/MSD.

- Sample APSB08B (F51353-27) was used for the aqueous MS/MSD for PAH SIM analysis on 08/13/07. All criteria were met. No qualifiers were applied. Samples 50SB06B (F51247-2), 50SB07A (F51247-3), 50SB08B (F51247-6), 50SB010B (F51247-10), and 50SB012B (F51247-14) apply to this MS/MSD.

X-Field Duplicate Sample Analysis
Field duplicates were collected to identify the cumulative precision of the sampling and analytical process and sent to the laboratory blind. The RPD was calculated only for those analytes which were detected at levels exceeding the method reporting limits in both samples of the duplicate pair. Analytes that were rejected (R-qualified) in either sample of the duplicate pair were excluded from the duplicate assessment. Precision control criterion was established at 50% RPD for the solid samples. Analytical results were qualified as estimated (J) for any RPDs exceeding criteria.

- No project specific solid field duplicate was analyzed with this SDG; therefore, it was not evaluated.

XI-Quantitation Verification
The accuracy of analytical results was verified through the calculation of several parameters. Percent difference (%D) between the calculated and reported values must be ≤10%. Any sample value >MDL and <MRL or <3*MDL (whichever is greater) was qualified as estimated, "J."

Sample: 50SB06A (F51247-1), di-n-butyl phthalate

Conc. µg/kg = (Ax * Is * Vt * DF) / (Ais * RRF * Vi * Ws * D)

where: Conc. = Sample concentration in µg/kg
Ax = Area of characteristic ion for compound being measured.
Is = Amount of internal standard injected (ng).
Vt = Volume of total extract, taking into account dilutions (i.e., a 1-to-10 dilution of a 1-mL extract will mean V(t) = 10,000 uL.
Ais = Area of characteristic ion for the internal standard.
RRF = Average relative response factor for compound being measured (from ICAL)
Vi = Volume of extract injected (uL).
W(s) = Weight of sample extracted or diluted in grams.
D = Percent dry weight (100 - % moisture in sample)/100
DF = Dilution factor

Conc. µg/kg = (101016 * 40 * 1000 * 1) / (799753 * 1.457 * 1 * 30.3 * 0.8880) = 130 µg/kg
Reported Value = 129 µg/kg
% Difference = 0.8%
Values were within 10% difference

Sample: 50SB07A (F51247-3), chrysene

Conc. µg/kg = (Ax * Is * Vt * DF) / (Ais * RRF * Vi * Ws * D)

where: Conc. = Sample concentration in µg/kg
Ax = Area of characteristic ion for compound being measured.
Is = Amount of internal standard injected (ng).
Vt = Volume of total extract, taking into account dilutions (i.e., a 1-to-10 dilution of a 1-mL extract will mean V(t) = 10,000 uL.
Ais = Area of characteristic ion for the internal standard.
RRF = Average relative response factor for compound being measured (from ICAL)
Vi = Volume of extract injected (uL).
W(s) = Weight of sample extracted or diluted in grams.
D = Percent dry weight (100 - % moisture in sample)/100
DF = Dilution factor

Conc. µg/kg = (7702 * 4.0 * 1000 * 20) / (124514 * 1.560 * 1 * 30.2 * 0.8840) = 119 µg/kg
Reported Value = 119 µg/kg
% Difference = 0.0%
Values were within 10% difference

USEPA Region III Validation Qualifiers

(No Code) = Confirmed identification.

B = The analyte has been detected in the sample and the associated laboratory or field blank.

J = Indicates an estimated value for (1) estimated value due to QC non-conformance. Reported value may not be accurate or precise, (2) estimating a concentration as a tentatively identified compound as indicated by the mass spectral and retention time data, or (3) estimating a concentration ≥MDL and <MRL or <3*MDL, whichever is greater.

K = Analyte present. Reported value may be biased high (estimated) due to QC non-conformance.

L = Analyte present. Reported value may be biased low (estimated) due to QC non-conformance.

R = Unreliable result. Analyte may or may not be present in the sample due to QC non-conformance.

UL = Value is estimated bias low and not detected due to QC non-conformance. Reporting limit may be inaccurate or imprecise. Quantitation limit is probably higher.

UJ = Value is estimated and not detected due to QC non-conformance. Reporting limit may be inaccurate or imprecise.

Laboratory Qualifiers

(No Code) = Confirmed identification.

U = Not detected. The associated number indicates the compound reporting limit for the sample.

A (Dioxins) = B (Metals) = The reported value was obtained from a reading <MRL and ≥MDL and is considered estimated.

B (Organics) = The analyte or compound has been detected in the sample and laboratory method blank. It indicates probable blank contamination.

E (Metals) = Reported value is estimated because of the presence of interferences.

E (Organics) = Identifies compounds whose concentrations exceed the upper level of the calibration range.

EMPC (Dioxins) = The ion-abundance ratio between the two characteristic PCDD/PCDF ions was outside accepted ranges. The detected PCDD/PCDF was reported as an estimated maximum possible concentration (EMPC).

D = Indicates sample was analyzed at a dilution.

J = Indicates an estimated value for (1) estimating a concentration as a tentatively identified compound as indicated by the mass spectral and retention time data, or (2) estimating a concentration <MRL and ≥MDL.

N (Organics) = Indicates presumptive evidence of a compound for tentatively identified compounds using a library search.

N (Metals) = Laboratory spike sample recovery not within control limits.

P (Organics) = Target analyte confirmation >40% difference for detected compound between the primary and secondary columns. The lower of the two values was reported.

* (Metals) = Duplicate analysis not within control limits.

* (Organics) = Surrogate outside of QC limits on both original and re-analysis.

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Report of Analysis

Client Sample ID:	50SB06A		
Lab Sample ID:	F51247-1	**Date Sampled:**	07/23/07
Matrix:	SO - Soil	**Date Received:**	07/24/07
Method:	SW846 8270C SW846 3550B	**Percent Solids:**	88.8
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	U003688.D	1	08/01/07	NJ	07/31/07	OP21689	SU181
Run #2							

	Initial Weight	Final Volume
Run #1	30.3 g	1.0 ml
Run #2		

ABN TCL List w/o PAHs

CAS No.	Compound	Result	RL	MDL	Units	Q
65-85-0	Benzoic acid	ND	930	370	ug/kg	
95-57-8	2-Chlorophenol	ND	190	37	ug/kg	
59-50-7	4-Chloro-3-methyl phenol	ND	190	37	ug/kg	
120-83-2	2,4-Dichlorophenol	ND	190	37	ug/kg	
105-67-9	2,4-Dimethylphenol	ND	190	37	ug/kg	
51-28-5	2,4-Dinitrophenol	ND	930	370	ug/kg	
534-52-1	4,6-Dinitro-o-cresol	ND	370	74	ug/kg	
95-48-7	2-Methylphenol	ND	190	37	ug/kg	
	3&4-Methylphenol	ND	190	37	ug/kg	
88-75-5	2-Nitrophenol	ND	190	37	ug/kg	
100-02-7	4-Nitrophenol	ND	930	370	ug/kg	
87-86-5	Pentachlorophenol	ND	930	370	ug/kg	
108-95-2	Phenol	ND	190	37	ug/kg	
95-95-4	2,4,5-Trichlorophenol	ND	190	37	ug/kg	
88-06-2	2,4,6-Trichlorophenol	ND	190	37	ug/kg	
101-55-3	4-Bromophenyl phenyl ether	ND	190	37	ug/kg	
85-68-7	Butyl benzyl phthalate	ND	370	93	ug/kg	
100-51-6	Benzyl Alcohol	ND	190	37	ug/kg	
91-58-7	2-Chloronaphthalene	ND	190	37	ug/kg	
106-47-8	4-Chloroaniline	ND	190	74	ug/kg	
86-74-8	Carbazole	ND	190	37	ug/kg	
111-91-1	bis(2-Chloroethoxy)methane	ND	190	37	ug/kg	
111-44-4	bis(2-Chloroethyl)ether	ND	190	37	ug/kg	
108-60-1	bis(2-Chloroisopropyl)ether	ND	190	37	ug/kg	
7005-72-3	4-Chlorophenyl phenyl ether	ND	190	37	ug/kg	
95-50-1	1,2-Dichlorobenzene	ND	190	37	ug/kg	
541-73-1	1,3-Dichlorobenzene	ND	190	37	ug/kg	
106-46-7	1,4-Dichlorobenzene	ND	190	37	ug/kg	
121-14-2	2,4-Dinitrotoluene	ND	190	37	ug/kg	
606-20-2	2,6-Dinitrotoluene	ND	190	37	ug/kg	
91-94-1	3,3'-Dichlorobenzidine	ND	370	74	ug/kg	
132-64-9	Dibenzofuran	ND	190	37	ug/kg	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	50SB06A		
Lab Sample ID:	F51247-1	**Date Sampled:**	07/23/07
Matrix:	SO - Soil	**Date Received:**	07/24/07
Method:	SW846 8270C SW846 3550B	**Percent Solids:**	88.8
Project:	WPA 019 Field Investigation; Radford AAP, VA		

ABN TCL List w/o PAHs

CAS No.	Compound	Result	RL	MDL	Units	Q
84-74-2	Di-n-butyl phthalate	129 J	370	93	ug/kg	J
117-84-0	Di-n-octyl phthalate	ND	370	93	ug/kg	
84-66-2	Diethyl phthalate	ND	370	190	ug/kg	
131-11-3	Dimethyl phthalate	ND	370	93	ug/kg	
117-81-7	bis(2-Ethylhexyl)phthalate	ND	370	190	ug/kg	
118-74-1	Hexachlorobenzene	ND	190	37	ug/kg	
87-68-3	Hexachlorobutadiene	ND	190	37	ug/kg	
77-47-4	Hexachlorocyclopentadiene	ND	190	37	ug/kg	
67-72-1	Hexachloroethane	ND	190	37	ug/kg	
78-59-1	Isophorone	ND	190	37	ug/kg	
88-74-4	2-Nitroaniline	ND	370	74	ug/kg	
99-09-2	3-Nitroaniline	ND	370	74	ug/kg	
100-01-6	4-Nitroaniline	ND	370	74	ug/kg	
98-95-3	Nitrobenzene	ND	190	37	ug/kg	
621-64-7	N-Nitroso-di-n-propylamine	ND	190	37	ug/kg	
86-30-6	N-Nitrosodiphenylamine	ND	190	37	ug/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	190	37	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol	71%		40-102%
4165-62-2	Phenol-d5	76%		41-100%
118-79-6	2,4,6-Tribromophenol	74%		42-108%
4165-60-0	Nitrobenzene-d5	65%		40-105%
321-60-8	2-Fluorobiphenyl	69%		43-107%
1718-51-0	Terphenyl-d14	77%		45-119%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: R09577.D

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Report of Analysis

Client Sample ID:	50SB06A		
Lab Sample ID:	F51247-1	**Date Sampled:**	07/23/07
Matrix:	SO - Soil	**Date Received:**	07/24/07
Method:	SW846 8270C BY SIM SW846 3550B	**Percent Solids:**	88.8
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	R09577.D	4	08/03/07	NJ	07/31/07	OP21688	SR453
Run #2							

	Initial Weight	Final Volume
Run #1	30.3 g	1.0 ml
Run #2		

BN PAH List

CAS No.	Compound	Result	RL	MDL	Units	Q
83-32-9	Acenaphthene	ND	300	74	ug/kg	
208-96-8	Acenaphthylene	ND	300	74	ug/kg	
120-12-7	Anthracene	ND	300	45	ug/kg	
56-55-3	Benzo(a)anthracene	ND	59	15	ug/kg	
50-32-8	Benzo(a)pyrene	ND	59	15	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	59	15	ug/kg	
191-24-2	Benzo(g,h,i)perylene	ND	59	15	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	59	15	ug/kg	
218-01-9	Chrysene	ND	59	15	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	59	15	ug/kg	
206-44-0	Fluoranthene	ND	300	52	ug/kg	
86-73-7	Fluorene	ND	300	45	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	59	15	ug/kg	
90-12-0	1-Methylnaphthalene	ND	300	45	ug/kg	
91-57-6	2-Methylnaphthalene	ND	300	45	ug/kg	
91-20-3	Naphthalene	ND	300	45	ug/kg	
85-01-8	Phenanthrene	ND	300	45	ug/kg	
129-00-0	Pyrene	ND	300	52	ug/kg	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	50SB06B		
Lab Sample ID:	F51247-2	Date Sampled:	07/23/07
Matrix:	SO - Soil	Date Received:	07/24/07
Method:	SW846 8270C SW846 3550B	Percent Solids:	59.6
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	U003708.D	5	08/02/07	NJ	07/31/07	OP21689	SU181
Run #2 [b]	L037790.D	8	08/13/07	RB	08/07/07	OP21773	SL1931

	Initial Weight	Final Volume
Run #1	30.1 g	1.0 ml
Run #2	30.1 g	1.0 ml

ABN TCL List w/o PAHs

CAS No.	Compound	Result	RL	MDL	Units	Q
65-85-0	Benzoic acid	ND UL	7000	2800	ug/kg	
95-57-8	2-Chlorophenol	ND UL	1400	280	ug/kg	
59-50-7	4-Chloro-3-methyl phenol	ND UL	1400	280	ug/kg	
120-83-2	2,4-Dichlorophenol	ND UL	1400	280	ug/kg	
105-67-9	2,4-Dimethylphenol	ND UL	1400	280	ug/kg	
51-28-5	2,4-Dinitrophenol	ND UL	7000	2800	ug/kg	
534-52-1	4,6-Dinitro-o-cresol	ND UL	2800	560	ug/kg	
95-48-7	2-Methylphenol	ND UL	1400	280	ug/kg	
	3&4-Methylphenol	ND UL	1400	280	ug/kg	
88-75-5	2-Nitrophenol	ND UL	1400	280	ug/kg	
100-02-7	4-Nitrophenol	ND UL	7000	2800	ug/kg	
87-86-5	Pentachlorophenol	ND UL	7000	2800	ug/kg	
108-95-2	Phenol	ND UL	1400	280	ug/kg	
95-95-4	2,4,5-Trichlorophenol	ND UL	1400	280	ug/kg	
88-06-2	2,4,6-Trichlorophenol	ND UL	1400	280	ug/kg	
101-55-3	4-Bromophenyl phenyl ether	ND UL	1400	280	ug/kg	
85-68-7	Butyl benzyl phthalate	ND UL	2800	700	ug/kg	
100-51-6	Benzyl Alcohol	ND UL	1400	280	ug/kg	
91-58-7	2-Chloronaphthalene	ND UL	1400	280	ug/kg	
106-47-8	4-Chloroaniline	ND UL	1400	560	ug/kg	
86-74-8	Carbazole	ND UL	1400	280	ug/kg	
111-91-1	bis(2-Chloroethoxy)methane	ND UL	1400	280	ug/kg	
111-44-4	bis(2-Chloroethyl)ether	ND UL	1400	280	ug/kg	
108-60-1	bis(2-Chloroisopropyl)ether	ND UL	1400	280	ug/kg	
7005-72-3	4-Chlorophenyl phenyl ether	ND UL	1400	280	ug/kg	
95-50-1	1,2-Dichlorobenzene	ND UL	1400	280	ug/kg	
541-73-1	1,3-Dichlorobenzene	ND UL	1400	280	ug/kg	
106-46-7	1,4-Dichlorobenzene	ND UL	1400	280	ug/kg	
121-14-2	2,4-Dinitrotoluene	ND UL	1400	280	ug/kg	
606-20-2	2,6-Dinitrotoluene	ND UL	1400	280	ug/kg	
91-94-1	3,3'-Dichlorobenzidine	ND UL	2800	560	ug/kg	
132-64-9	Dibenzofuran	ND UL	1400	280	ug/kg	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	50SB06B		
Lab Sample ID:	F51247-2	**Date Sampled:**	07/23/07
Matrix:	SO - Soil	**Date Received:**	07/24/07
Method:	SW846 8270C SW846 3550B	**Percent Solids:**	59.6
Project:	WPA 019 Field Investigation; Radford AAP, VA		

ABN TCL List w/o PAHs

CAS No.	Compound	Result	RL	MDL	Units	Q
84-74-2	Di-n-butyl phthalate	ND UL	2800	700	ug/kg	
117-84-0	Di-n-octyl phthalate	ND UL	2800	700	ug/kg	
84-66-2	Diethyl phthalate	ND UL	2800	1400	ug/kg	
131-11-3	Dimethyl phthalate	ND UL	2800	700	ug/kg	
117-81-7	bis(2-Ethylhexyl)phthalate	ND UL	2800	1400	ug/kg	
118-74-1	Hexachlorobenzene	ND UL	1400	280	ug/kg	
87-68-3	Hexachlorobutadiene	ND UL	1400	280	ug/kg	
77-47-4	Hexachlorocyclopentadiene	ND UL	1400	280	ug/kg	
67-72-1	Hexachloroethane	ND UL	1400	280	ug/kg	
78-59-1	Isophorone	ND UL	1400	280	ug/kg	
88-74-4	2-Nitroaniline	ND UL	2800	560	ug/kg	
99-09-2	3-Nitroaniline	ND UL	2800	560	ug/kg	
100-01-6	4-Nitroaniline	ND UL	2800	560	ug/kg	
98-95-3	Nitrobenzene	ND UL	1400	280	ug/kg	
621-64-7	N-Nitroso-di-n-propylamine	ND UL	1400	280	ug/kg	
86-30-6	N-Nitrosodiphenylamine	ND UL	1400	280	ug/kg	
120-82-1	1,2,4-Trichlorobenzene	ND UL	1400	280	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol	36%	9%	40-102%
4165-62-2	Phenol-d5	37%	11%	41-100%
118-79-6	2,4,6-Tribromophenol	34%	0%	42-108%
4165-60-0	Nitrobenzene-d5	35%	10%	40-105%
321-60-8	2-Fluorobiphenyl	37%	11%	43-107%
1718-51-0	Terphenyl-d14	37%	9%	45-119%

(a) Confirmed ND by re-extraction and reanalysis beyond holdtime. Dilution due to matrix interference.
(b) Confirmation run.

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: W036270.D

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Report of Analysis

Client Sample ID:	50SB06B		
Lab Sample ID:	F51247-2	**Date Sampled:**	07/23/07
Matrix:	SO - Soil	**Date Received:**	07/24/07
Method:	SW846 8270C BY SIM SW846 3550B	**Percent Solids:**	59.6
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	W036270.D	8	08/15/07	RB	08/07/07	OP21772	SW1875
Run #2							

	Initial Weight	Final Volume
Run #1	30.1 g	1.0 ml
Run #2		

BN PAH List

CAS No.	Compound	Result	RL	MDL	Units	Q
83-32-9	Acenaphthene	ND VL	890	220	ug/kg	
208-96-8	Acenaphthylene	ND VL	890	220	ug/kg	
120-12-7	Anthracene	ND VL	890	130	ug/kg	
56-55-3	Benzo(a)anthracene	ND VL	180	45	ug/kg	
50-32-8	Benzo(a)pyrene	ND VL	180	45	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND VL	180	45	ug/kg	
191-24-2	Benzo(g,h,i)perylene	ND VL	180	45	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND VL	180	45	ug/kg	
218-01-9	Chrysene	ND VL	180	45	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	ND VL	180	45	ug/kg	
206-44-0	Fluoranthene	ND VL	890	160	ug/kg	
86-73-7	Fluorene	ND VL	890	130	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND VL	180	45	ug/kg	
90-12-0	1-Methylnaphthalene	ND VL	890	130	ug/kg	
91-57-6	2-Methylnaphthalene	ND VL	890	130	ug/kg	
91-20-3	Naphthalene	ND VL	890	130	ug/kg	
85-01-8	Phenanthrene	ND VL	890	130	ug/kg	
129-00-0	Pyrene	ND VL	890	160	ug/kg	

(a) Sample reextracted beyond hold time. Dilution required due to matrix interference.

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	50SB07A		
Lab Sample ID:	F51247-3	**Date Sampled:**	07/23/07
Matrix:	SO - Soil	**Date Received:**	07/24/07
Method:	SW846 8270C SW846 3550B	**Percent Solids:**	88.4
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	U003878.D	4	08/10/07	RB	08/07/07	OP21773	SU187
Run #2							

	Initial Weight	Final Volume
Run #1	30.2 g	1.0 ml
Run #2		

ABN TCL List w/o PAHs

CAS No.	Compound	Result	RL	MDL	Units	Q
65-85-0	Benzoic acid	ND VL	3700	1500	ug/kg	
95-57-8	2-Chlorophenol	ND VL	750	150	ug/kg	
59-50-7	4-Chloro-3-methyl phenol	ND VL	750	150	ug/kg	
120-83-2	2,4-Dichlorophenol	ND VL	750	150	ug/kg	
105-67-9	2,4-Dimethylphenol	ND VL	750	150	ug/kg	
51-28-5	2,4-Dinitrophenol	ND VL	3700	1500	ug/kg	
534-52-1	4,6-Dinitro-o-cresol	ND VL	1500	300	ug/kg	
95-48-7	2-Methylphenol	ND VL	750	150	ug/kg	
	3&4-Methylphenol	ND VL	750	150	ug/kg	
88-75-5	2-Nitrophenol	ND VL	750	150	ug/kg	
100-02-7	4-Nitrophenol	ND VL	3700	1500	ug/kg	
87-86-5	Pentachlorophenol	ND VL	3700	1500	ug/kg	
108-95-2	Phenol	ND VL	750	150	ug/kg	
95-95-4	2,4,5-Trichlorophenol	ND VL	750	150	ug/kg	
88-06-2	2,4,6-Trichlorophenol	ND VL	750	150	ug/kg	
101-55-3	4-Bromophenyl phenyl ether	ND VL	750	150	ug/kg	
85-68-7	Butyl benzyl phthalate	ND VL	1500	370	ug/kg	
100-51-6	Benzyl Alcohol	ND VL	750	150	ug/kg	
91-58-7	2-Chloronaphthalene	ND VL	750	150	ug/kg	
106-47-8	4-Chloroaniline	ND VL	750	300	ug/kg	
86-74-8	Carbazole	ND VL	750	150	ug/kg	
111-91-1	bis(2-Chloroethoxy)methane	ND VL	750	150	ug/kg	
111-44-4	bis(2-Chloroethyl)ether	ND VL	750	150	ug/kg	
108-60-1	bis(2-Chloroisopropyl)ether	ND VL	750	150	ug/kg	
7005-72-3	4-Chlorophenyl phenyl ether	ND VL	750	150	ug/kg	
95-50-1	1,2-Dichlorobenzene	ND VL	750	150	ug/kg	
541-73-1	1,3-Dichlorobenzene	ND VL	750	150	ug/kg	
106-46-7	1,4-Dichlorobenzene	ND VL	750	150	ug/kg	
121-14-2	2,4-Dinitrotoluene	331 L	750	150	ug/kg	J
606-20-2	2,6-Dinitrotoluene	ND VL	750	150	ug/kg	
91-94-1	3,3'-Dichlorobenzidine	ND VL	1500	300	ug/kg	
132-64-9	Dibenzofuran	ND VL	750	150	ug/kg	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	50SB07A		
Lab Sample ID:	F51247-3	**Date Sampled:**	07/23/07
Matrix:	SO - Soil	**Date Received:**	07/24/07
Method:	SW846 8270C SW846 3550B	**Percent Solids:**	88.4
Project:	WPA 019 Field Investigation; Radford AAP, VA		

ABN TCL List w/o PAHs

CAS No.	Compound	Result	RL	MDL	Units	Q
84-74-2	Di-n-butyl phthalate	ND VL	1500	370	ug/kg	
117-84-0	Di-n-octyl phthalate	ND VL	1500	370	ug/kg	
84-66-2	Diethyl phthalate	ND VL	1500	750	ug/kg	
131-11-3	Dimethyl phthalate	ND VL	1500	370	ug/kg	
117-81-7	bis(2-Ethylhexyl)phthalate	ND VL	1500	750	ug/kg	
118-74-1	Hexachlorobenzene	ND VL	750	150	ug/kg	
87-68-3	Hexachlorobutadiene	ND VL	750	150	ug/kg	
77-47-4	Hexachlorocyclopentadiene	ND VL	750	150	ug/kg	
67-72-1	Hexachloroethane	ND VL	750	150	ug/kg	
78-59-1	Isophorone	ND VL	750	150	ug/kg	
88-74-4	2-Nitroaniline	ND VL	1500	300	ug/kg	
99-09-2	3-Nitroaniline	ND VL	1500	300	ug/kg	
100-01-6	4-Nitroaniline	ND VL	1500	300	ug/kg	
98-95-3	Nitrobenzene	ND VL	750	150	ug/kg	
621-64-7	N-Nitroso-di-n-propylamine	ND VL	750	150	ug/kg	
86-30-6	N-Nitrosodiphenylamine	ND VL	750	150	ug/kg	
120-82-1	1,2,4-Trichlorobenzene	ND VL	750	150	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol	28%		40-102%
4165-62-2	Phenol-d5	34%		41-100%
118-79-6	2,4,6-Tribromophenol	24%		42-108%
4165-60-0	Nitrobenzene-d5	28%		40-105%
321-60-8	2-Fluorobiphenyl	32%		43-107%
1718-51-0	Terphenyl-d14	29%		45-119%

(a) Dilution required due to matrix interference. Sample reextracted beyond hold time.

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	50SB07A		
Lab Sample ID:	F51247-3	**Date Sampled:**	07/23/07
Matrix:	SO - Soil	**Date Received:**	07/24/07
Method:	SW846 8270C BY SIM SW846 3550B	**Percent Solids:**	88.4
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	W036285.D	20	08/17/07	RB	08/07/07	OP21772	SW1876
Run #2							

	Initial Weight	Final Volume
Run #1	30.2 g	1.0 ml
Run #2		

BN PAH List

CAS No.	Compound	Result	RL	MDL	Units	Q
83-32-9	Acenaphthene	ND VL	1500	370	ug/kg	
208-96-8	Acenaphthylene	ND VL	1500	370	ug/kg	
120-12-7	Anthracene	ND VL	1500	220	ug/kg	
56-55-3	Benzo(a)anthracene	137 L	300	75	ug/kg	J
50-32-8	Benzo(a)pyrene	150 L	300	75	ug/kg	J
205-99-2	Benzo(b)fluoranthene	152 L	300	75	ug/kg	J
191-24-2	Benzo(g,h,i)perylene	ND VL	300	75	ug/kg	
207-08-9	Benzo(k)fluoranthene	98.9 L	300	75	ug/kg	J
218-01-9	Chrysene	119 L	300	75	ug/kg	J
53-70-3	Dibenzo(a,h)anthracene	ND VL	300	75	ug/kg	
206-44-0	Fluoranthene	ND VL	1500	260	ug/kg	
86-73-7	Fluorene	ND VL	1500	220	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	84.1 L	300	75	ug/kg	J
90-12-0	1-Methylnaphthalene	ND VL	1500	220	ug/kg	
91-57-6	2-Methylnaphthalene	ND VL	1500	220	ug/kg	
91-20-3	Naphthalene	ND VL	1500	220	ug/kg	
85-01-8	Phenanthrene	ND VL	1500	220	ug/kg	
129-00-0	Pyrene	ND VL	1500	260	ug/kg	

(a) Sample reextracted beyond hold time. Dilution required due to matrix interference.

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	50SB07B		
Lab Sample ID:	F51247-4	**Date Sampled:**	07/23/07
Matrix:	SO - Soil	**Date Received:**	07/24/07
Method:	SW846 8270C SW846 3550B	**Percent Solids:**	59.3
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	U003690.D	1	08/01/07	NJ	07/31/07	OP21689	SU181
Run #2							

	Initial Weight	Final Volume
Run #1	30.0 g	1.0 ml
Run #2		

ABN TCL List w/o PAHs

CAS No.	Compound	Result	RL	MDL	Units	Q
65-85-0	Benzoic acid	ND	1400	560	ug/kg	
95-57-8	2-Chlorophenol	ND	280	56	ug/kg	
59-50-7	4-Chloro-3-methyl phenol	ND	280	56	ug/kg	
120-83-2	2,4-Dichlorophenol	ND	280	56	ug/kg	
105-67-9	2,4-Dimethylphenol	ND	280	56	ug/kg	
51-28-5	2,4-Dinitrophenol	ND	1400	560	ug/kg	
534-52-1	4,6-Dinitro-o-cresol	ND	560	110	ug/kg	
95-48-7	2-Methylphenol	ND	280	56	ug/kg	
	3&4-Methylphenol	ND	280	56	ug/kg	
88-75-5	2-Nitrophenol	ND	280	56	ug/kg	
100-02-7	4-Nitrophenol	ND	1400	560	ug/kg	
87-86-5	Pentachlorophenol	ND	1400	560	ug/kg	
108-95-2	Phenol	ND	280	56	ug/kg	
95-95-4	2,4,5-Trichlorophenol	ND	280	56	ug/kg	
88-06-2	2,4,6-Trichlorophenol	ND	280	56	ug/kg	
101-55-3	4-Bromophenyl phenyl ether	ND	280	56	ug/kg	
85-68-7	Butyl benzyl phthalate	ND	560	140	ug/kg	
100-51-6	Benzyl Alcohol	ND	280	56	ug/kg	
91-58-7	2-Chloronaphthalene	ND	280	56	ug/kg	
106-47-8	4-Chloroaniline	ND	280	110	ug/kg	
86-74-8	Carbazole	ND	280	56	ug/kg	
111-91-1	bis(2-Chloroethoxy)methane	ND	280	56	ug/kg	
111-44-4	bis(2-Chloroethyl)ether	ND	280	56	ug/kg	
108-60-1	bis(2-Chloroisopropyl)ether	ND	280	56	ug/kg	
7005-72-3	4-Chlorophenyl phenyl ether	ND	280	56	ug/kg	
95-50-1	1,2-Dichlorobenzene	ND	280	56	ug/kg	
541-73-1	1,3-Dichlorobenzene	ND	280	56	ug/kg	
106-46-7	1,4-Dichlorobenzene	ND	280	56	ug/kg	
121-14-2	2,4-Dinitrotoluene	ND	280	56	ug/kg	
606-20-2	2,6-Dinitrotoluene	ND	280	56	ug/kg	
91-94-1	3,3'-Dichlorobenzidine	ND	560	110	ug/kg	
132-64-9	Dibenzofuran	ND	280	56	ug/kg	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	50SB07B		
Lab Sample ID:	F51247-4	**Date Sampled:**	07/23/07
Matrix:	SO - Soil	**Date Received:**	07/24/07
Method:	SW846 8270C SW846 3550B	**Percent Solids:**	59.3
Project:	WPA 019 Field Investigation; Radford AAP, VA		

ABN TCL List w/o PAHs

CAS No.	Compound	Result	RL	MDL	Units	Q
84-74-2	Di-n-butyl phthalate	ND	560	140	ug/kg	
117-84-0	Di-n-octyl phthalate	ND	560	140	ug/kg	
84-66-2	Diethyl phthalate	ND	560	280	ug/kg	
131-11-3	Dimethyl phthalate	ND	560	140	ug/kg	
117-81-7	bis(2-Ethylhexyl)phthalate	ND	560	280	ug/kg	
118-74-1	Hexachlorobenzene	ND	280	56	ug/kg	
87-68-3	Hexachlorobutadiene	ND	280	56	ug/kg	
77-47-4	Hexachlorocyclopentadiene	ND	280	56	ug/kg	
67-72-1	Hexachloroethane	ND	280	56	ug/kg	
78-59-1	Isophorone	ND	280	56	ug/kg	
88-74-4	2-Nitroaniline	ND	560	110	ug/kg	
99-09-2	3-Nitroaniline	ND	560	110	ug/kg	
100-01-6	4-Nitroaniline	ND	560	110	ug/kg	
98-95-3	Nitrobenzene	ND	280	56	ug/kg	
621-64-7	N-Nitroso-di-n-propylamine	ND	280	56	ug/kg	
86-30-6	N-Nitrosodiphenylamine	ND	280	56	ug/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	280	56	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol	78%		40-102%
4165-62-2	Phenol-d5	82%		41-100%
118-79-6	2,4,6-Tribromophenol	73%		42-108%
4165-60-0	Nitrobenzene-d5	72%		40-105%
321-60-8	2-Fluorobiphenyl	71%		43-107%
1718-51-0	Terphenyl-d14	78%		45-119%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	50SB07B		
Lab Sample ID:	F51247-4	**Date Sampled:**	07/23/07
Matrix:	SO - Soil	**Date Received:**	07/24/07
Method:	SW846 8270C BY SIM SW846 3550B	**Percent Solids:**	59.3
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	R09578.D	4	08/03/07	NJ	07/31/07	OP21688	SR453
Run #2							

	Initial Weight	Final Volume
Run #1	30.0 g	1.0 ml
Run #2		

BN PAH List

CAS No.	Compound	Result	RL	MDL	Units	Q
83-32-9	Acenaphthene	ND	450	110	ug/kg	
208-96-8	Acenaphthylene	ND	450	110	ug/kg	
120-12-7	Anthracene	ND	450	67	ug/kg	
56-55-3	Benzo(a)anthracene	ND	90	22	ug/kg	
50-32-8	Benzo(a)pyrene	ND	90	22	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	90	22	ug/kg	
191-24-2	Benzo(g,h,i)perylene	ND	90	22	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	90	22	ug/kg	
218-01-9	Chrysene	ND	90	22	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	90	22	ug/kg	
206-44-0	Fluoranthene	ND	450	79	ug/kg	
86-73-7	Fluorene	ND	450	67	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	90	22	ug/kg	
90-12-0	1-Methylnaphthalene	ND	450	67	ug/kg	
91-57-6	2-Methylnaphthalene	ND	450	67	ug/kg	
91-20-3	Naphthalene	ND	450	67	ug/kg	
85-01-8	Phenanthrene	ND	450	67	ug/kg	
129-00-0	Pyrene	ND	450	79	ug/kg	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	50SB08A		
Lab Sample ID:	F51247-5	Date Sampled:	07/23/07
Matrix:	SO - Soil	Date Received:	07/24/07
Method:	SW846 8270C SW846 3550B	Percent Solids:	86.6
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	U003691.D	1	08/01/07	NJ	07/31/07	OP21689	SU181
Run #2							

	Initial Weight	Final Volume
Run #1	30.9 g	1.0 ml
Run #2		

ABN TCL List w/o PAHs

CAS No.	Compound	Result	RL	MDL	Units	Q
65-85-0	Benzoic acid	ND	930	370	ug/kg	
95-57-8	2-Chlorophenol	ND	190	37	ug/kg	
59-50-7	4-Chloro-3-methyl phenol	ND	190	37	ug/kg	
120-83-2	2,4-Dichlorophenol	ND	190	37	ug/kg	
105-67-9	2,4-Dimethylphenol	ND	190	37	ug/kg	
51-28-5	2,4-Dinitrophenol	ND	930	370	ug/kg	
534-52-1	4,6-Dinitro-o-cresol	ND	370	75	ug/kg	
95-48-7	2-Methylphenol	ND	190	37	ug/kg	
	3&4-Methylphenol	ND	190	37	ug/kg	
88-75-5	2-Nitrophenol	ND	190	37	ug/kg	
100-02-7	4-Nitrophenol	ND	930	370	ug/kg	
87-86-5	Pentachlorophenol	ND	930	370	ug/kg	
108-95-2	Phenol	ND	190	37	ug/kg	
95-95-4	2,4,5-Trichlorophenol	ND	190	37	ug/kg	
88-06-2	2,4,6-Trichlorophenol	ND	190	37	ug/kg	
101-55-3	4-Bromophenyl phenyl ether	ND	190	37	ug/kg	
85-68-7	Butyl benzyl phthalate	ND	370	93	ug/kg	
100-51-6	Benzyl Alcohol	ND	190	37	ug/kg	
91-58-7	2-Chloronaphthalene	ND	190	37	ug/kg	
106-47-8	4-Chloroaniline	ND	190	75	ug/kg	
86-74-8	Carbazole	ND	190	37	ug/kg	
111-91-1	bis(2-Chloroethoxy)methane	ND	190	37	ug/kg	
111-44-4	bis(2-Chloroethyl)ether	ND	190	37	ug/kg	
108-60-1	bis(2-Chloroisopropyl)ether	ND	190	37	ug/kg	
7005-72-3	4-Chlorophenyl phenyl ether	ND	190	37	ug/kg	
95-50-1	1,2-Dichlorobenzene	ND	190	37	ug/kg	
541-73-1	1,3-Dichlorobenzene	ND	190	37	ug/kg	
106-46-7	1,4-Dichlorobenzene	ND	190	37	ug/kg	
121-14-2	2,4-Dinitrotoluene	63.0 J	190	37	ug/kg	J
606-20-2	2,6-Dinitrotoluene	ND	190	37	ug/kg	
91-94-1	3,3'-Dichlorobenzidine	ND	370	75	ug/kg	
132-64-9	Dibenzofuran	ND	190	37	ug/kg	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	50SB08A		
Lab Sample ID:	F51247-5	**Date Sampled:**	07/23/07
Matrix:	SO - Soil	**Date Received:**	07/24/07
Method:	SW846 8270C SW846 3550B	**Percent Solids:**	86.6
Project:	WPA 019 Field Investigation; Radford AAP, VA		

ABN TCL List w/o PAHs

CAS No.	Compound	Result	RL	MDL	Units	Q
84-74-2	Di-n-butyl phthalate	777	370	93	ug/kg	
117-84-0	Di-n-octyl phthalate	ND	370	93	ug/kg	
84-66-2	Diethyl phthalate	ND	370	190	ug/kg	
131-11-3	Dimethyl phthalate	716	370	93	ug/kg	
117-81-7	bis(2-Ethylhexyl)phthalate	ND	370	190	ug/kg	
118-74-1	Hexachlorobenzene	ND	190	37	ug/kg	
87-68-3	Hexachlorobutadiene	ND	190	37	ug/kg	
77-47-4	Hexachlorocyclopentadiene	ND	190	37	ug/kg	
67-72-1	Hexachloroethane	ND	190	37	ug/kg	
78-59-1	Isophorone	ND	190	37	ug/kg	
88-74-4	2-Nitroaniline	ND	370	75	ug/kg	
99-09-2	3-Nitroaniline	ND	370	75	ug/kg	
100-01-6	4-Nitroaniline	ND	370	75	ug/kg	
98-95-3	Nitrobenzene	ND	190	37	ug/kg	
621-64-7	N-Nitroso-di-n-propylamine	ND	190	37	ug/kg	
86-30-6	N-Nitrosodiphenylamine	ND	190	37	ug/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	190	37	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol	65%		40-102%
4165-62-2	Phenol-d5	69%		41-100%
118-79-6	2,4,6-Tribromophenol	64%		42-108%
4165-60-0	Nitrobenzene-d5	59%		40-105%
321-60-8	2-Fluorobiphenyl	62%		43-107%
1718-51-0	Terphenyl-d14	66%		45-119%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: R09579.D

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Report of Analysis

Client Sample ID:	50SB08A		
Lab Sample ID:	F51247-5	Date Sampled:	07/23/07
Matrix:	SO - Soil	Date Received:	07/24/07
Method:	SW846 8270C BY SIM SW846 3550B	Percent Solids:	86.6
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	R09579.D	4	08/03/07	NJ	07/31/07	OP21688	SR453
Run #2							

	Initial Weight	Final Volume
Run #1	30.9 g	1.0 ml
Run #2		

BN PAH List

CAS No.	Compound	Result	RL	MDL	Units	Q
83-32-9	Acenaphthene	ND	300	75	ug/kg	
208-96-8	Acenaphthylene	ND	300	75	ug/kg	
120-12-7	Anthracene	ND	300	45	ug/kg	
56-55-3	Benzo(a)anthracene	ND	60	15	ug/kg	
50-32-8	Benzo(a)pyrene	ND	60	15	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	60	15	ug/kg	
191-24-2	Benzo(g,h,i)perylene	ND	60	15	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	60	15	ug/kg	
218-01-9	Chrysene	ND	60	15	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	60	15	ug/kg	
206-44-0	Fluoranthene	ND	300	52	ug/kg	
86-73-7	Fluorene	ND	300	45	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	60	15	ug/kg	
90-12-0	1-Methylnaphthalene	ND	300	45	ug/kg	
91-57-6	2-Methylnaphthalene	ND	300	45	ug/kg	
91-20-3	Naphthalene	ND	300	45	ug/kg	
85-01-8	Phenanthrene	ND	300	45	ug/kg	
129-00-0	Pyrene	ND	300	52	ug/kg	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	50SB08B		
Lab Sample ID:	F51247-6	**Date Sampled:**	07/23/07
Matrix:	SO - Soil	**Date Received:**	07/24/07
Method:	SW846 8270C SW846 3550B	**Percent Solids:**	63.6
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	L037698.D	4	08/08/07	RB	08/07/07	OP21773	SL1927
Run #2							

	Initial Weight	Final Volume
Run #1	30.4 g	1.0 ml
Run #2		

ABN TCL List w/o PAHs

CAS No.	Compound	Result	RL	MDL	Units	Q
65-85-0	Benzoic acid	ND	5200	2100	ug/kg	
95-57-8	2-Chlorophenol	ND	1000	210	ug/kg	
59-50-7	4-Chloro-3-methyl phenol	ND	1000	210	ug/kg	
120-83-2	2,4-Dichlorophenol	ND	1000	210	ug/kg	
105-67-9	2,4-Dimethylphenol	ND	1000	210	ug/kg	
51-28-5	2,4-Dinitrophenol	ND VL	5200	2100	ug/kg	
534-52-1	4,6-Dinitro-o-cresol	ND VL	2100	410	ug/kg	
95-48-7	2-Methylphenol	ND	1000	210	ug/kg	
	3&4-Methylphenol	ND	1000	210	ug/kg	
88-75-5	2-Nitrophenol	ND	1000	210	ug/kg	
100-02-7	4-Nitrophenol	ND	5200	2100	ug/kg	
87-86-5	Pentachlorophenol	ND	5200	2100	ug/kg	
108-95-2	Phenol	ND	1000	210	ug/kg	
95-95-4	2,4,5-Trichlorophenol	ND	1000	210	ug/kg	
88-06-2	2,4,6-Trichlorophenol	ND	1000	210	ug/kg	
101-55-3	4-Bromophenyl phenyl ether	ND	1000	210	ug/kg	
85-68-7	Butyl benzyl phthalate	ND	2100	520	ug/kg	
100-51-6	Benzyl Alcohol	ND	1000	210	ug/kg	
91-58-7	2-Chloronaphthalene	ND	1000	210	ug/kg	
106-47-8	4-Chloroaniline	ND	1000	410	ug/kg	
86-74-8	Carbazole	ND	1000	210	ug/kg	
111-91-1	bis(2-Chloroethoxy)methane	ND	1000	210	ug/kg	
111-44-4	bis(2-Chloroethyl)ether	ND	1000	210	ug/kg	
108-60-1	bis(2-Chloroisopropyl)ether	ND	1000	210	ug/kg	
7005-72-3	4-Chlorophenyl phenyl ether	ND	1000	210	ug/kg	
95-50-1	1,2-Dichlorobenzene	ND	1000	210	ug/kg	
541-73-1	1,3-Dichlorobenzene	ND	1000	210	ug/kg	
106-46-7	1,4-Dichlorobenzene	ND	1000	210	ug/kg	
121-14-2	2,4-Dinitrotoluene	ND	1000	210	ug/kg	
606-20-2	2,6-Dinitrotoluene	ND	1000	210	ug/kg	
91-94-1	3,3'-Dichlorobenzidine	ND	2100	410	ug/kg	
132-64-9	Dibenzofuran	ND	1000	210	ug/kg	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	50SB08B		
Lab Sample ID:	F51247-6	**Date Sampled:**	07/23/07
Matrix:	SO - Soil	**Date Received:**	07/24/07
Method:	SW846 8270C SW846 3550B	**Percent Solids:**	63.6
Project:	WPA 019 Field Investigation; Radford AAP, VA		

ABN TCL List w/o PAHs

CAS No.	Compound	Result	RL	MDL	Units	Q
84-74-2	Di-n-butyl phthalate	1270 J	2100	520	ug/kg	J
117-84-0	Di-n-octyl phthalate	ND	2100	520	ug/kg	
84-66-2	Diethyl phthalate	ND	2100	1000	ug/kg	
131-11-3	Dimethyl phthalate	ND	2100	520	ug/kg	
117-81-7	bis(2-Ethylhexyl)phthalate	ND	2100	1000	ug/kg	
118-74-1	Hexachlorobenzene	ND	1000	210	ug/kg	
87-68-3	Hexachlorobutadiene	ND	1000	210	ug/kg	
77-47-4	Hexachlorocyclopentadiene	ND	1000	210	ug/kg	
67-72-1	Hexachloroethane	ND	1000	210	ug/kg	
78-59-1	Isophorone	ND	1000	210	ug/kg	
88-74-4	2-Nitroaniline	ND	2100	410	ug/kg	
99-09-2	3-Nitroaniline	ND	2100	410	ug/kg	
100-01-6	4-Nitroaniline	ND	2100	410	ug/kg	
98-95-3	Nitrobenzene	ND	1000	210	ug/kg	
621-64-7	N-Nitroso-di-n-propylamine	ND	1000	210	ug/kg	
86-30-6	N-Nitrosodiphenylamine	ND	1000	210	ug/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	1000	210	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol	68%		40-102%
4165-62-2	Phenol-d5	60%		41-100%
118-79-6	2,4,6-Tribromophenol	66%		42-108%
4165-60-0	Nitrobenzene-d5	66%		40-105%
321-60-8	2-Fluorobiphenyl	67%		43-107%
1718-51-0	Terphenyl-d14	66%		45-119%

(a) Sample reextracted beyond hold time. Dilution required due to matrix interference.

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: W036286.D

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Report of Analysis

Client Sample ID:	50SB08B		
Lab Sample ID:	F51247-6	**Date Sampled:**	07/23/07
Matrix:	SO - Soil	**Date Received:**	07/24/07
Method:	SW846 8270C BY SIM SW846 3550B	**Percent Solids:**	63.6
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	W036286.D	20	08/17/07	RB	08/07/07	OP21772	SW1876
Run #2							

	Initial Weight	Final Volume
Run #1	30.4 g	1.0 ml
Run #2		

BN PAH List

CAS No.	Compound	Result	RL	MDL	Units	Q
83-32-9	Acenaphthene	ND	2100	520	ug/kg	
208-96-8	Acenaphthylene	ND	2100	520	ug/kg	
120-12-7	Anthracene	ND	2100	310	ug/kg	
56-55-3	Benzo(a)anthracene	ND	410	100	ug/kg	
50-32-8	Benzo(a)pyrene	ND	410	100	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	410	100	ug/kg	
191-24-2	Benzo(g,h,i)perylene	ND	410	100	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	410	100	ug/kg	
218-01-9	Chrysene	ND	410	100	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	410	100	ug/kg	
206-44-0	Fluoranthene	ND	2100	360	ug/kg	
86-73-7	Fluorene	ND	2100	310	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	410	100	ug/kg	
90-12-0	1-Methylnaphthalene	ND	2100	310	ug/kg	
91-57-6	2-Methylnaphthalene	ND	2100	310	ug/kg	
91-20-3	Naphthalene	ND	2100	310	ug/kg	
85-01-8	Phenanthrene	ND	2100	310	ug/kg	
129-00-0	Pyrene	ND	2100	360	ug/kg	

(a) Sample reextracted beyond hold time. Dilution required due to matrix interference.

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	50SB09A		
Lab Sample ID:	F51247-7	**Date Sampled:**	07/23/07
Matrix:	SO - Soil	**Date Received:**	07/24/07
Method:	SW846 8270C SW846 3550B	**Percent Solids:**	83.8
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	U003692.D	1	08/01/07	NJ	07/31/07	OP21689	SU181
Run #2							

	Initial Weight	Final Volume
Run #1	30.4 g	1.0 ml
Run #2		

ABN TCL List w/o PAHs

CAS No.	Compound	Result	RL	MDL	Units	Q
65-85-0	Benzoic acid	ND	980	390	ug/kg	
95-57-8	2-Chlorophenol	ND	200	39	ug/kg	
59-50-7	4-Chloro-3-methyl phenol	ND	200	39	ug/kg	
120-83-2	2,4-Dichlorophenol	ND	200	39	ug/kg	
105-67-9	2,4-Dimethylphenol	ND	200	39	ug/kg	
51-28-5	2,4-Dinitrophenol	ND	980	390	ug/kg	
534-52-1	4,6-Dinitro-o-cresol	ND	390	79	ug/kg	
95-48-7	2-Methylphenol	ND	200	39	ug/kg	
	3&4-Methylphenol	ND	200	39	ug/kg	
88-75-5	2-Nitrophenol	ND	200	39	ug/kg	
100-02-7	4-Nitrophenol	ND	980	390	ug/kg	
87-86-5	Pentachlorophenol	ND	980	390	ug/kg	
108-95-2	Phenol	ND	200	39	ug/kg	
95-95-4	2,4,5-Trichlorophenol	ND	200	39	ug/kg	
88-06-2	2,4,6-Trichlorophenol	ND	200	39	ug/kg	
101-55-3	4-Bromophenyl phenyl ether	ND	200	39	ug/kg	
85-68-7	Butyl benzyl phthalate	ND	390	98	ug/kg	
100-51-6	Benzyl Alcohol	ND	200	39	ug/kg	
91-58-7	2-Chloronaphthalene	ND	200	39	ug/kg	
106-47-8	4-Chloroaniline	ND	200	79	ug/kg	
86-74-8	Carbazole	ND	200	39	ug/kg	
111-91-1	bis(2-Chloroethoxy)methane	ND	200	39	ug/kg	
111-44-4	bis(2-Chloroethyl)ether	ND	200	39	ug/kg	
108-60-1	bis(2-Chloroisopropyl)ether	ND	200	39	ug/kg	
7005-72-3	4-Chlorophenyl phenyl ether	ND	200	39	ug/kg	
95-50-1	1,2-Dichlorobenzene	ND	200	39	ug/kg	
541-73-1	1,3-Dichlorobenzene	ND	200	39	ug/kg	
106-46-7	1,4-Dichlorobenzene	ND	200	39	ug/kg	
121-14-2	2,4-Dinitrotoluene	ND	200	39	ug/kg	
606-20-2	2,6-Dinitrotoluene	ND	200	39	ug/kg	
91-94-1	3,3'-Dichlorobenzidine	ND	390	79	ug/kg	
132-64-9	Dibenzofuran	ND	200	39	ug/kg	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	50SB09A		
Lab Sample ID:	F51247-7	**Date Sampled:**	07/23/07
Matrix:	SO - Soil	**Date Received:**	07/24/07
Method:	SW846 8270C SW846 3550B	**Percent Solids:**	83.8
Project:	WPA 019 Field Investigation; Radford AAP, VA		

ABN TCL List w/o PAHs

CAS No.	Compound	Result	RL	MDL	Units	Q
84-74-2	Di-n-butyl phthalate	ND	390	98	ug/kg	
117-84-0	Di-n-octyl phthalate	ND	390	98	ug/kg	
84-66-2	Diethyl phthalate	ND	390	200	ug/kg	
131-11-3	Dimethyl phthalate	ND	390	98	ug/kg	
117-81-7	bis(2-Ethylhexyl)phthalate	ND	390	200	ug/kg	
118-74-1	Hexachlorobenzene	ND	200	39	ug/kg	
87-68-3	Hexachlorobutadiene	ND	200	39	ug/kg	
77-47-4	Hexachlorocyclopentadiene	ND	200	39	ug/kg	
67-72-1	Hexachloroethane	ND	200	39	ug/kg	
78-59-1	Isophorone	ND	200	39	ug/kg	
88-74-4	2-Nitroaniline	ND	390	79	ug/kg	
99-09-2	3-Nitroaniline	ND	390	79	ug/kg	
100-01-6	4-Nitroaniline	ND	390	79	ug/kg	
98-95-3	Nitrobenzene	ND	200	39	ug/kg	
621-64-7	N-Nitroso-di-n-propylamine	ND	200	39	ug/kg	
86-30-6	N-Nitrosodiphenylamine	ND	200	39	ug/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	200	39	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol	70%		40-102%
4165-62-2	Phenol-d5	75%		41-100%
118-79-6	2,4,6-Tribromophenol	71%		42-108%
4165-60-0	Nitrobenzene-d5	66%		40-105%
321-60-8	2-Fluorobiphenyl	66%		43-107%
1718-51-0	Terphenyl-d14	74%		45-119%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	50SB09A		
Lab Sample ID:	F51247-7	**Date Sampled:**	07/23/07
Matrix:	SO - Soil	**Date Received:**	07/24/07
Method:	SW846 8270C BY SIM SW846 3550B	**Percent Solids:**	83.8
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	R09580.D	4	08/03/07	NJ	07/31/07	OP21688	SR453
Run #2							

	Initial Weight	Final Volume
Run #1	30.4 g	1.0 ml
Run #2		

BN PAH List

CAS No.	Compound	Result	RL	MDL	Units	Q
83-32-9	Acenaphthene	ND	310	79	ug/kg	
208-96-8	Acenaphthylene	ND	310	79	ug/kg	
120-12-7	Anthracene	ND	310	47	ug/kg	
56-55-3	Benzo(a)anthracene	ND	63	16	ug/kg	
50-32-8	Benzo(a)pyrene	ND	63	16	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	63	16	ug/kg	
191-24-2	Benzo(g,h,i)perylene	ND	63	16	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	63	16	ug/kg	
218-01-9	Chrysene	ND	63	16	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	63	16	ug/kg	
206-44-0	Fluoranthene	ND	310	55	ug/kg	
86-73-7	Fluorene	ND	310	47	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	63	16	ug/kg	
90-12-0	1-Methylnaphthalene	ND	310	47	ug/kg	
91-57-6	2-Methylnaphthalene	ND	310	47	ug/kg	
91-20-3	Naphthalene	ND	310	47	ug/kg	
85-01-8	Phenanthrene	ND	310	47	ug/kg	
129-00-0	Pyrene	ND	310	55	ug/kg	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: U003693.D

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Report of Analysis

Client Sample ID:	50SB09B		
Lab Sample ID:	F51247-8	**Date Sampled:**	07/23/07
Matrix:	SO - Soil	**Date Received:**	07/24/07
Method:	SW846 8270C SW846 3550B	**Percent Solids:**	62.0
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	U003693.D	1	08/01/07	NJ	07/31/07	OP21689	SU181
Run #2							

	Initial Weight	Final Volume
Run #1	30.2 g	1.0 ml
Run #2		

ABN TCL List w/o PAHs

CAS No.	Compound	Result	RL	MDL	Units	Q
65-85-0	Benzoic acid	ND	1300	530	ug/kg	
95-57-8	2-Chlorophenol	ND	270	53	ug/kg	
59-50-7	4-Chloro-3-methyl phenol	ND	270	53	ug/kg	
120-83-2	2,4-Dichlorophenol	ND	270	53	ug/kg	
105-67-9	2,4-Dimethylphenol	ND	270	53	ug/kg	
51-28-5	2,4-Dinitrophenol	ND	1300	530	ug/kg	
534-52-1	4,6-Dinitro-o-cresol	ND	530	110	ug/kg	
95-48-7	2-Methylphenol	ND	270	53	ug/kg	
	3&4-Methylphenol	ND	270	53	ug/kg	
88-75-5	2-Nitrophenol	ND	270	53	ug/kg	
100-02-7	4-Nitrophenol	ND	1300	530	ug/kg	
87-86-5	Pentachlorophenol	ND	1300	530	ug/kg	
108-95-2	Phenol	ND	270	53	ug/kg	
95-95-4	2,4,5-Trichlorophenol	ND	270	53	ug/kg	
88-06-2	2,4,6-Trichlorophenol	ND	270	53	ug/kg	
101-55-3	4-Bromophenyl phenyl ether	ND	270	53	ug/kg	
85-68-7	Butyl benzyl phthalate	ND	530	130	ug/kg	
100-51-6	Benzyl Alcohol	ND	270	53	ug/kg	
91-58-7	2-Chloronaphthalene	ND	270	53	ug/kg	
106-47-8	4-Chloroaniline	ND	270	110	ug/kg	
86-74-8	Carbazole	ND	270	53	ug/kg	
111-91-1	bis(2-Chloroethoxy)methane	ND	270	53	ug/kg	
111-44-4	bis(2-Chloroethyl)ether	ND	270	53	ug/kg	
108-60-1	bis(2-Chloroisopropyl)ether	ND	270	53	ug/kg	
7005-72-3	4-Chlorophenyl phenyl ether	ND	270	53	ug/kg	
95-50-1	1,2-Dichlorobenzene	ND	270	53	ug/kg	
541-73-1	1,3-Dichlorobenzene	ND	270	53	ug/kg	
106-46-7	1,4-Dichlorobenzene	ND	270	53	ug/kg	
121-14-2	2,4-Dinitrotoluene	54.0 J	270	53	ug/kg	J
606-20-2	2,6-Dinitrotoluene	ND	270	53	ug/kg	
91-94-1	3,3'-Dichlorobenzidine	ND	530	110	ug/kg	
132-64-9	Dibenzofuran	ND	270	53	ug/kg	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	50SB09B		
Lab Sample ID:	F51247-8	**Date Sampled:**	07/23/07
Matrix:	SO - Soil	**Date Received:**	07/24/07
Method:	SW846 8270C SW846 3550B	**Percent Solids:**	62.0
Project:	WPA 019 Field Investigation; Radford AAP, VA		

ABN TCL List w/o PAHs

CAS No.	Compound	Result	RL	MDL	Units	Q
84-74-2	Di-n-butyl phthalate	355 J	530	130	ug/kg	J
117-84-0	Di-n-octyl phthalate	ND	530	130	ug/kg	
84-66-2	Diethyl phthalate	ND	530	270	ug/kg	
131-11-3	Dimethyl phthalate	ND	530	130	ug/kg	
117-81-7	bis(2-Ethylhexyl)phthalate	ND	530	270	ug/kg	
118-74-1	Hexachlorobenzene	ND	270	53	ug/kg	
87-68-3	Hexachlorobutadiene	ND	270	53	ug/kg	
77-47-4	Hexachlorocyclopentadiene	ND	270	53	ug/kg	
67-72-1	Hexachloroethane	ND	270	53	ug/kg	
78-59-1	Isophorone	ND	270	53	ug/kg	
88-74-4	2-Nitroaniline	ND	530	110	ug/kg	
99-09-2	3-Nitroaniline	ND	530	110	ug/kg	
100-01-6	4-Nitroaniline	ND	530	110	ug/kg	
98-95-3	Nitrobenzene	ND	270	53	ug/kg	
621-64-7	N-Nitroso-di-n-propylamine	ND	270	53	ug/kg	
86-30-6	N-Nitrosodiphenylamine	ND	270	53	ug/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	270	53	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol	46%		40-102%
4165-62-2	Phenol-d5	54%		41-100%
118-79-6	2,4,6-Tribromophenol	50%		42-108%
4165-60-0	Nitrobenzene-d5	55%		40-105%
321-60-8	2-Fluorobiphenyl	55%		43-107%
1718-51-0	Terphenyl-d14	63%		45-119%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: R09581.D

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Report of Analysis

Client Sample ID:	50SB09B		
Lab Sample ID:	F51247-8	**Date Sampled:**	07/23/07
Matrix:	SO - Soil	**Date Received:**	07/24/07
Method:	SW846 8270C BY SIM SW846 3550B	**Percent Solids:**	62.0
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	R09581.D	4	08/04/07	NJ	07/31/07	OP21688	SR453
Run #2							

	Initial Weight	Final Volume
Run #1	30.2 g	1.0 ml
Run #2		

BN PAH List

CAS No.	Compound	Result	RL	MDL	Units	Q
83-32-9	Acenaphthene	ND	430	110	ug/kg	
208-96-8	Acenaphthylene	ND	430	110	ug/kg	
120-12-7	Anthracene	ND	430	64	ug/kg	
56-55-3	Benzo(a)anthracene	ND	85	21	ug/kg	
50-32-8	Benzo(a)pyrene	ND	85	21	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	85	21	ug/kg	
191-24-2	Benzo(g,h,i)perylene	ND	85	21	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	85	21	ug/kg	
218-01-9	Chrysene	ND	85	21	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	85	21	ug/kg	
206-44-0	Fluoranthene	ND	430	75	ug/kg	
86-73-7	Fluorene	ND	430	64	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	85	21	ug/kg	
90-12-0	1-Methylnaphthalene	ND	430	64	ug/kg	
91-57-6	2-Methylnaphthalene	ND	430	64	ug/kg	
91-20-3	Naphthalene	ND	430	64	ug/kg	
85-01-8	Phenanthrene	ND	430	64	ug/kg	
129-00-0	Pyrene	ND	430	75	ug/kg	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	50SB010A		
Lab Sample ID:	F51247-9	**Date Sampled:**	07/23/07
Matrix:	SO - Soil	**Date Received:**	07/24/07
Method:	SW846 8270C SW846 3550B	**Percent Solids:**	92.6
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	U003694.D	1	08/01/07	NJ	07/31/07	OP21689	SU181
Run #2							

	Initial Weight	Final Volume
Run #1	30.9 g	1.0 ml
Run #2		

ABN TCL List w/o PAHs

CAS No.	Compound	Result	RL	MDL	Units	Q
65-85-0	Benzoic acid	ND	870	350	ug/kg	
95-57-8	2-Chlorophenol	ND	170	35	ug/kg	
59-50-7	4-Chloro-3-methyl phenol	ND	170	35	ug/kg	
120-83-2	2,4-Dichlorophenol	ND	170	35	ug/kg	
105-67-9	2,4-Dimethylphenol	ND VL	170	35	ug/kg	
51-28-5	2,4-Dinitrophenol	ND	870	350	ug/kg	
534-52-1	4,6-Dinitro-o-cresol	ND	350	70	ug/kg	
95-48-7	2-Methylphenol	ND	170	35	ug/kg	
	3&4-Methylphenol	ND	170	35	ug/kg	
88-75-5	2-Nitrophenol	ND	170	35	ug/kg	
100-02-7	4-Nitrophenol	ND	870	350	ug/kg	
87-86-5	Pentachlorophenol	ND	870	350	ug/kg	
108-95-2	Phenol	ND	170	35	ug/kg	
95-95-4	2,4,5-Trichlorophenol	ND	170	35	ug/kg	
88-06-2	2,4,6-Trichlorophenol	ND	170	35	ug/kg	
101-55-3	4-Bromophenyl phenyl ether	ND	170	35	ug/kg	
85-68-7	Butyl benzyl phthalate	ND	350	87	ug/kg	
100-51-6	Benzyl Alcohol	ND	170	35	ug/kg	
91-58-7	2-Chloronaphthalene	ND	170	35	ug/kg	
106-47-8	4-Chloroaniline	ND	170	70	ug/kg	
86-74-8	Carbazole	ND	170	35	ug/kg	
111-91-1	bis(2-Chloroethoxy)methane	ND	170	35	ug/kg	
111-44-4	bis(2-Chloroethyl)ether	ND	170	35	ug/kg	
108-60-1	bis(2-Chloroisopropyl)ether	ND	170	35	ug/kg	
7005-72-3	4-Chlorophenyl phenyl ether	ND	170	35	ug/kg	
95-50-1	1,2-Dichlorobenzene	ND	170	35	ug/kg	
541-73-1	1,3-Dichlorobenzene	ND	170	35	ug/kg	
106-46-7	1,4-Dichlorobenzene	ND	170	35	ug/kg	
121-14-2	2,4-Dinitrotoluene	ND	170	35	ug/kg	
606-20-2	2,6-Dinitrotoluene	ND	170	35	ug/kg	
91-94-1	3,3'-Dichlorobenzidine	ND VL	350	70	ug/kg	
132-64-9	Dibenzofuran	ND	170	35	ug/kg	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	50SB010A		
Lab Sample ID:	F51247-9	**Date Sampled:**	07/23/07
Matrix:	SO - Soil	**Date Received:**	07/24/07
Method:	SW846 8270C SW846 3550B	**Percent Solids:**	92.6
Project:	WPA 019 Field Investigation; Radford AAP, VA		

ABN TCL List w/o PAHs

CAS No.	Compound	Result	RL	MDL	Units	Q
84-74-2	Di-n-butyl phthalate	ND	350	87	ug/kg	
117-84-0	Di-n-octyl phthalate	ND	350	87	ug/kg	
84-66-2	Diethyl phthalate	ND	350	170	ug/kg	
131-11-3	Dimethyl phthalate	ND	350	87	ug/kg	
117-81-7	bis(2-Ethylhexyl)phthalate	ND	350	170	ug/kg	
118-74-1	Hexachlorobenzene	ND	170	35	ug/kg	
87-68-3	Hexachlorobutadiene	ND	170	35	ug/kg	
77-47-4	Hexachlorocyclopentadiene	ND	170	35	ug/kg	
67-72-1	Hexachloroethane	ND	170	35	ug/kg	
78-59-1	Isophorone	ND	170	35	ug/kg	
88-74-4	2-Nitroaniline	ND	350	70	ug/kg	
99-09-2	3-Nitroaniline	ND	350	70	ug/kg	
100-01-6	4-Nitroaniline	ND	350	70	ug/kg	
98-95-3	Nitrobenzene	ND	170	35	ug/kg	
621-64-7	N-Nitroso-di-n-propylamine	ND	170	35	ug/kg	
86-30-6	N-Nitrosodiphenylamine	ND	170	35	ug/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	170	35	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol	71%		40-102%
4165-62-2	Phenol-d5	75%		41-100%
118-79-6	2,4,6-Tribromophenol	72%		42-108%
4165-60-0	Nitrobenzene-d5	67%		40-105%
321-60-8	2-Fluorobiphenyl	69%		43-107%
1718-51-0	Terphenyl-d14	76%		45-119%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: R09582.D

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Report of Analysis

Client Sample ID:	50SB010A		
Lab Sample ID:	F51247-9	**Date Sampled:**	07/23/07
Matrix:	SO - Soil	**Date Received:**	07/24/07
Method:	SW846 8270C BY SIM SW846 3550B	**Percent Solids:**	92.6
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	R09582.D	4	08/04/07	NJ	07/31/07	OP21688	SR453
Run #2							

	Initial Weight	Final Volume
Run #1	30.9 g	1.0 ml
Run #2		

BN PAH List

CAS No.	Compound	Result	RL	MDL	Units	Q
83-32-9	Acenaphthene	ND	280	70	ug/kg	
208-96-8	Acenaphthylene	ND	280	70	ug/kg	
120-12-7	Anthracene	ND	280	42	ug/kg	
56-55-3	Benzo(a)anthracene	ND	56	14	ug/kg	
50-32-8	Benzo(a)pyrene	ND	56	14	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	56	14	ug/kg	
191-24-2	Benzo(g,h,i)perylene	ND	56	14	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	56	14	ug/kg	
218-01-9	Chrysene	ND	56	14	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	56	14	ug/kg	
206-44-0	Fluoranthene	ND	280	49	ug/kg	
86-73-7	Fluorene	ND	280	42	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	56	14	ug/kg	
90-12-0	1-Methylnaphthalene	ND	280	42	ug/kg	
91-57-6	2-Methylnaphthalene	ND	280	42	ug/kg	
91-20-3	Naphthalene	ND	280	42	ug/kg	
85-01-8	Phenanthrene	ND	280	42	ug/kg	
129-00-0	Pyrene	ND	280	49	ug/kg	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	50SB010B		
Lab Sample ID:	F51247-10	**Date Sampled:**	07/23/07
Matrix:	SO - Soil	**Date Received:**	07/24/07
Method:	SW846 8270C SW846 3550B	**Percent Solids:**	76.6
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	U003697.D	1	08/01/07	NJ	07/31/07	OP21689	SU181
Run #2 [b]	L037699.D	1	08/08/07	RB	08/07/07	OP21773	SL1927

	Initial Weight	Final Volume
Run #1	30.1 g	1.0 ml
Run #2	30.6 g	1.0 ml

ABN TCL List w/o PAHs

CAS No.	Compound	Result	RL	MDL	Units	Q
65-85-0	Benzoic acid	ND VL	1100	430	ug/kg	
95-57-8	2-Chlorophenol	ND VL	220	43	ug/kg	
59-50-7	4-Chloro-3-methyl phenol	ND VL	220	43	ug/kg	
120-83-2	2,4-Dichlorophenol	ND VL	220	43	ug/kg	
105-67-9	2,4-Dimethylphenol	ND VL	220	43	ug/kg	
51-28-5	2,4-Dinitrophenol	ND VL	1100	430	ug/kg	
534-52-1	4,6-Dinitro-o-cresol	ND VL	430	87	ug/kg	
95-48-7	2-Methylphenol	ND VL	220	43	ug/kg	
	3&4-Methylphenol	ND VL	220	43	ug/kg	
88-75-5	2-Nitrophenol	ND VL	220	43	ug/kg	
100-02-7	4-Nitrophenol	ND VL	1100	430	ug/kg	
87-86-5	Pentachlorophenol	ND VL	1100	430	ug/kg	
108-95-2	Phenol	ND VL	220	43	ug/kg	
95-95-4	2,4,5-Trichlorophenol	ND VL	220	43	ug/kg	
88-06-2	2,4,6-Trichlorophenol	ND VL	220	43	ug/kg	
101-55-3	4-Bromophenyl phenyl ether	ND VL	220	43	ug/kg	
85-68-7	Butyl benzyl phthalate	ND VL	430	110	ug/kg	
100-51-6	Benzyl Alcohol	ND VL	220	43	ug/kg	
91-58-7	2-Chloronaphthalene	ND VL	220	43	ug/kg	
106-47-8	4-Chloroaniline	ND VL	220	87	ug/kg	
86-74-8	Carbazole	ND VL	220	43	ug/kg	
111-91-1	bis(2-Chloroethoxy)methane	ND VL	220	43	ug/kg	
111-44-4	bis(2-Chloroethyl)ether	ND VL	220	43	ug/kg	
108-60-1	bis(2-Chloroisopropyl)ether	ND VL	220	43	ug/kg	
7005-72-3	4-Chlorophenyl phenyl ether	ND VL	220	43	ug/kg	
95-50-1	1,2-Dichlorobenzene	ND VL	220	43	ug/kg	
541-73-1	1,3-Dichlorobenzene	ND VL	220	43	ug/kg	
106-46-7	1,4-Dichlorobenzene	ND VL	220	43	ug/kg	
121-14-2	2,4-Dinitrotoluene	ND VL	220	43	ug/kg	
606-20-2	2,6-Dinitrotoluene	ND VL	220	43	ug/kg	
91-94-1	3,3'-Dichlorobenzidine	ND VL	430	87	ug/kg	
132-64-9	Dibenzofuran	ND VL	220	43	ug/kg	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	50SB010B		
Lab Sample ID:	F51247-10	**Date Sampled:**	07/23/07
Matrix:	SO - Soil	**Date Received:**	07/24/07
Method:	SW846 8270C SW846 3550B	**Percent Solids:**	76.6
Project:	WPA 019 Field Investigation; Radford AAP, VA		

ABN TCL List w/o PAHs

CAS No.	Compound	Result	RL	MDL	Units	Q
84-74-2	Di-n-butyl phthalate	ND UL	430	110	ug/kg	
117-84-0	Di-n-octyl phthalate	ND UL	430	110	ug/kg	
84-66-2	Diethyl phthalate	ND UL	430	220	ug/kg	
131-11-3	Dimethyl phthalate	ND UL	430	110	ug/kg	
117-81-7	bis(2-Ethylhexyl)phthalate	ND UL	430	220	ug/kg	
118-74-1	Hexachlorobenzene	ND UL	220	43	ug/kg	
87-68-3	Hexachlorobutadiene	ND UL	220	43	ug/kg	
77-47-4	Hexachlorocyclopentadiene	ND UL	220	43	ug/kg	
67-72-1	Hexachloroethane	ND UL	220	43	ug/kg	
78-59-1	Isophorone	ND UL	220	43	ug/kg	
88-74-4	2-Nitroaniline	ND UL	430	87	ug/kg	
99-09-2	3-Nitroaniline	ND UL	430	87	ug/kg	
100-01-6	4-Nitroaniline	ND UL	430	87	ug/kg	
98-95-3	Nitrobenzene	ND UL	220	43	ug/kg	
621-64-7	N-Nitroso-di-n-propylamine	ND UL	220	43	ug/kg	
86-30-6	N-Nitrosodiphenylamine	ND UL	220	43	ug/kg	
120-82-1	1,2,4-Trichlorobenzene	ND UL	220	43	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol	11%	66%	40-102%
4165-62-2	Phenol-d5	16%	67%	41-100%
118-79-6	2,4,6-Tribromophenol	52%	74%	42-108%
4165-60-0	Nitrobenzene-d5	9%	59%	40-105%
321-60-8	2-Fluorobiphenyl	14%	63%	43-107%
1718-51-0	Terphenyl-d14	59%	70%	45-119%

(a) Confirmed ND by re-extraction and reanalysis beyond holdtime.
(b) Confirmation run.

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	50SB010B		
Lab Sample ID:	F51247-10	**Date Sampled:**	07/23/07
Matrix:	SO - Soil	**Date Received:**	07/24/07
Method:	SW846 8270C BY SIM SW846 3550B	**Percent Solids:**	76.6
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	W036190.D	4	08/11/07	RB	08/07/07	OP21772	SW1872
Run #2							

	Initial Weight	Final Volume
Run #1	30.6 g	1.0 ml
Run #2		

BN PAH List

CAS No.	Compound	Result	RL	MDL	Units	Q
83-32-9	Acenaphthene	ND VL	340	85	ug/kg	
208-96-8	Acenaphthylene	ND VL	340	85	ug/kg	
120-12-7	Anthracene	ND VL	340	51	ug/kg	
56-55-3	Benzo(a)anthracene	ND VL	68	17	ug/kg	
50-32-8	Benzo(a)pyrene	ND VL	68	17	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND VL	68	17	ug/kg	
191-24-2	Benzo(g,h,i)perylene	ND VL	68	17	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND VL	68	17	ug/kg	
218-01-9	Chrysene	ND VL	68	17	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	ND VL	68	17	ug/kg	
206-44-0	Fluoranthene	ND VL	340	60	ug/kg	
86-73-7	Fluorene	ND VL	340	51	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND VL	68	17	ug/kg	
90-12-0	1-Methylnaphthalene	ND VL	340	51	ug/kg	
91-57-6	2-Methylnaphthalene	ND VL	340	51	ug/kg	
91-20-3	Naphthalene	ND VL	340	51	ug/kg	
85-01-8	Phenanthrene	ND VL	340	51	ug/kg	
129-00-0	Pyrene	ND VL	340	60	ug/kg	

(a) Sample reextracted beyond hold time. Dilution required due to matrix interference.

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	50SB011A		
Lab Sample ID:	F51247-11	**Date Sampled:**	07/23/07
Matrix:	SO - Soil	**Date Received:**	07/24/07
Method:	SW846 8270C SW846 3550B	**Percent Solids:**	92.1
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	U003698.D	1	08/01/07	NJ	07/31/07	OP21689	SU181
Run #2							

	Initial Weight	Final Volume
Run #1	30.7 g	1.0 ml
Run #2		

ABN TCL List w/o PAHs

CAS No.	Compound	Result	RL	MDL	Units	Q
65-85-0	Benzoic acid	ND	880	350	ug/kg	
95-57-8	2-Chlorophenol	ND	180	35	ug/kg	
59-50-7	4-Chloro-3-methyl phenol	ND	180	35	ug/kg	
120-83-2	2,4-Dichlorophenol	ND	180	35	ug/kg	
105-67-9	2,4-Dimethylphenol	ND	180	35	ug/kg	
51-28-5	2,4-Dinitrophenol	ND	880	350	ug/kg	
534-52-1	4,6-Dinitro-o-cresol	ND	350	71	ug/kg	
95-48-7	2-Methylphenol	ND	180	35	ug/kg	
	3&4-Methylphenol	ND	180	35	ug/kg	
88-75-5	2-Nitrophenol	ND	180	35	ug/kg	
100-02-7	4-Nitrophenol	ND	880	350	ug/kg	
87-86-5	Pentachlorophenol	ND	880	350	ug/kg	
108-95-2	Phenol	ND	180	35	ug/kg	
95-95-4	2,4,5-Trichlorophenol	ND	180	35	ug/kg	
88-06-2	2,4,6-Trichlorophenol	ND	180	35	ug/kg	
101-55-3	4-Bromophenyl phenyl ether	ND	180	35	ug/kg	
85-68-7	Butyl benzyl phthalate	ND	350	88	ug/kg	
100-51-6	Benzyl Alcohol	ND	180	35	ug/kg	
91-58-7	2-Chloronaphthalene	ND	180	35	ug/kg	
106-47-8	4-Chloroaniline	ND	180	71	ug/kg	
86-74-8	Carbazole	ND	180	35	ug/kg	
111-91-1	bis(2-Chloroethoxy)methane	ND	180	35	ug/kg	
111-44-4	bis(2-Chloroethyl)ether	ND	180	35	ug/kg	
108-60-1	bis(2-Chloroisopropyl)ether	ND	180	35	ug/kg	
7005-72-3	4-Chlorophenyl phenyl ether	ND	180	35	ug/kg	
95-50-1	1,2-Dichlorobenzene	ND	180	35	ug/kg	
541-73-1	1,3-Dichlorobenzene	ND	180	35	ug/kg	
106-46-7	1,4-Dichlorobenzene	ND	180	35	ug/kg	
121-14-2	2,4-Dinitrotoluene	ND	180	35	ug/kg	
606-20-2	2,6-Dinitrotoluene	ND	180	35	ug/kg	
91-94-1	3,3'-Dichlorobenzidine	ND	350	71	ug/kg	
132-64-9	Dibenzofuran	ND	180	35	ug/kg	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	50SB011A		
Lab Sample ID:	F51247-11	**Date Sampled:**	07/23/07
Matrix:	SO - Soil	**Date Received:**	07/24/07
Method:	SW846 8270C SW846 3550B	**Percent Solids:**	92.1
Project:	WPA 019 Field Investigation; Radford AAP, VA		

ABN TCL List w/o PAHs

CAS No.	Compound	Result	RL	MDL	Units	Q
84-74-2	Di-n-butyl phthalate	ND	350	88	ug/kg	
117-84-0	Di-n-octyl phthalate	ND	350	88	ug/kg	
84-66-2	Diethyl phthalate	ND	350	180	ug/kg	
131-11-3	Dimethyl phthalate	ND	350	88	ug/kg	
117-81-7	bis(2-Ethylhexyl)phthalate	ND	350	180	ug/kg	
118-74-1	Hexachlorobenzene	ND	180	35	ug/kg	
87-68-3	Hexachlorobutadiene	ND	180	35	ug/kg	
77-47-4	Hexachlorocyclopentadiene	ND	180	35	ug/kg	
67-72-1	Hexachloroethane	ND	180	35	ug/kg	
78-59-1	Isophorone	ND	180	35	ug/kg	
88-74-4	2-Nitroaniline	ND	350	71	ug/kg	
99-09-2	3-Nitroaniline	ND	350	71	ug/kg	
100-01-6	4-Nitroaniline	ND	350	71	ug/kg	
98-95-3	Nitrobenzene	ND	180	35	ug/kg	
621-64-7	N-Nitroso-di-n-propylamine	ND	180	35	ug/kg	
86-30-6	N-Nitrosodiphenylamine	ND	180	35	ug/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	180	35	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol	73%		40-102%
4165-62-2	Phenol-d5	75%		41-100%
118-79-6	2,4,6-Tribromophenol	76%		42-108%
4165-60-0	Nitrobenzene-d5	66%		40-105%
321-60-8	2-Fluorobiphenyl	68%		43-107%
1718-51-0	Terphenyl-d14	75%		45-119%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	50SB011A		
Lab Sample ID:	F51247-11	**Date Sampled:**	07/23/07
Matrix:	SO - Soil	**Date Received:**	07/24/07
Method:	SW846 8270C BY SIM SW846 3550B	**Percent Solids:**	92.1
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	R09583.D	4	08/04/07	NJ	07/31/07	OP21688	SR453
Run #2							

	Initial Weight	Final Volume
Run #1	30.7 g	1.0 ml
Run #2		

BN PAH List

CAS No.	Compound	Result	RL	MDL	Units	Q
83-32-9	Acenaphthene	ND	280	71	ug/kg	
208-96-8	Acenaphthylene	ND	280	71	ug/kg	
120-12-7	Anthracene	ND	280	42	ug/kg	
56-55-3	Benzo(a)anthracene	ND	57	14	ug/kg	
50-32-8	Benzo(a)pyrene	ND	57	14	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	57	14	ug/kg	
191-24-2	Benzo(g,h,i)perylene	ND	57	14	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	57	14	ug/kg	
218-01-9	Chrysene	ND	57	14	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	57	14	ug/kg	
206-44-0	Fluoranthene	ND	280	50	ug/kg	
86-73-7	Fluorene	ND	280	42	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	57	14	ug/kg	
90-12-0	1-Methylnaphthalene	ND	280	42	ug/kg	
91-57-6	2-Methylnaphthalene	ND	280	42	ug/kg	
91-20-3	Naphthalene	ND	280	42	ug/kg	
85-01-8	Phenanthrene	ND	280	42	ug/kg	
129-00-0	Pyrene	ND	280	50	ug/kg	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	50SB011B		
Lab Sample ID:	F51247-12	Date Sampled:	07/23/07
Matrix:	SO - Soil	Date Received:	07/24/07
Method:	SW846 8270C SW846 3550B	Percent Solids:	85.6
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	U003699.D	1	08/01/07	NJ	07/31/07	OP21689	SU181
Run #2							

	Initial Weight	Final Volume
Run #1	30.8 g	1.0 ml
Run #2		

ABN TCL List w/o PAHs

CAS No.	Compound	Result	RL	MDL	Units	Q
65-85-0	Benzoic acid	ND	950	380	ug/kg	
95-57-8	2-Chlorophenol	ND	190	38	ug/kg	
59-50-7	4-Chloro-3-methyl phenol	ND	190	38	ug/kg	
120-83-2	2,4-Dichlorophenol	ND	190	38	ug/kg	
105-67-9	2,4-Dimethylphenol	ND	190	38	ug/kg	
51-28-5	2,4-Dinitrophenol	ND	950	380	ug/kg	
534-52-1	4,6-Dinitro-o-cresol	ND	380	76	ug/kg	
95-48-7	2-Methylphenol	ND	190	38	ug/kg	
	3&4-Methylphenol	ND	190	38	ug/kg	
88-75-5	2-Nitrophenol	ND	190	38	ug/kg	
100-02-7	4-Nitrophenol	ND	950	380	ug/kg	
87-86-5	Pentachlorophenol	ND	950	380	ug/kg	
108-95-2	Phenol	ND	190	38	ug/kg	
95-95-4	2,4,5-Trichlorophenol	ND	190	38	ug/kg	
88-06-2	2,4,6-Trichlorophenol	ND	190	38	ug/kg	
101-55-3	4-Bromophenyl phenyl ether	ND	190	38	ug/kg	
85-68-7	Butyl benzyl phthalate	ND	380	95	ug/kg	
100-51-6	Benzyl Alcohol	ND	190	38	ug/kg	
91-58-7	2-Chloronaphthalene	ND	190	38	ug/kg	
106-47-8	4-Chloroaniline	ND	190	76	ug/kg	
86-74-8	Carbazole	ND	190	38	ug/kg	
111-91-1	bis(2-Chloroethoxy)methane	ND	190	38	ug/kg	
111-44-4	bis(2-Chloroethyl)ether	ND	190	38	ug/kg	
108-60-1	bis(2-Chloroisopropyl)ether	ND	190	38	ug/kg	
7005-72-3	4-Chlorophenyl phenyl ether	ND	190	38	ug/kg	
95-50-1	1,2-Dichlorobenzene	ND	190	38	ug/kg	
541-73-1	1,3-Dichlorobenzene	ND	190	38	ug/kg	
106-46-7	1,4-Dichlorobenzene	ND	190	38	ug/kg	
121-14-2	2,4-Dinitrotoluene	ND	190	38	ug/kg	
606-20-2	2,6-Dinitrotoluene	ND	190	38	ug/kg	
91-94-1	3,3'-Dichlorobenzidine	ND	380	76	ug/kg	
132-64-9	Dibenzofuran	ND	190	38	ug/kg	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	50SB011B		
Lab Sample ID:	F51247-12	**Date Sampled:**	07/23/07
Matrix:	SO - Soil	**Date Received:**	07/24/07
Method:	SW846 8270C SW846 3550B	**Percent Solids:**	85.6
Project:	WPA 019 Field Investigation; Radford AAP, VA		

ABN TCL List w/o PAHs

CAS No.	Compound	Result	RL	MDL	Units	Q
84-74-2	Di-n-butyl phthalate	ND	380	95	ug/kg	
117-84-0	Di-n-octyl phthalate	ND	380	95	ug/kg	
84-66-2	Diethyl phthalate	ND	380	190	ug/kg	
131-11-3	Dimethyl phthalate	ND	380	95	ug/kg	
117-81-7	bis(2-Ethylhexyl)phthalate	ND	380	190	ug/kg	
118-74-1	Hexachlorobenzene	ND	190	38	ug/kg	
87-68-3	Hexachlorobutadiene	ND	190	38	ug/kg	
77-47-4	Hexachlorocyclopentadiene	ND	190	38	ug/kg	
67-72-1	Hexachloroethane	ND	190	38	ug/kg	
78-59-1	Isophorone	ND	190	38	ug/kg	
88-74-4	2-Nitroaniline	ND	380	76	ug/kg	
99-09-2	3-Nitroaniline	ND	380	76	ug/kg	
100-01-6	4-Nitroaniline	ND	380	76	ug/kg	
98-95-3	Nitrobenzene	ND	190	38	ug/kg	
621-64-7	N-Nitroso-di-n-propylamine	ND	190	38	ug/kg	
86-30-6	N-Nitrosodiphenylamine	ND	190	38	ug/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	190	38	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol	75%		40-102%
4165-62-2	Phenol-d5	79%		41-100%
118-79-6	2,4,6-Tribromophenol	78%		42-108%
4165-60-0	Nitrobenzene-d5	69%		40-105%
321-60-8	2-Fluorobiphenyl	70%		43-107%
1718-51-0	Terphenyl-d14	82%		45-119%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	50SB011B		
Lab Sample ID:	F51247-12	**Date Sampled:**	07/23/07
Matrix:	SO - Soil	**Date Received:**	07/24/07
Method:	SW846 8270C BY SIM SW846 3550B	**Percent Solids:**	85.6
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	R09584.D	4	08/04/07	NJ	07/31/07	OP21688	SR453
Run #2							

	Initial Weight	Final Volume
Run #1	30.8 g	1.0 ml
Run #2		

BN PAH List

CAS No.	Compound	Result	RL	MDL	Units	Q
83-32-9	Acenaphthene	ND	300	76	ug/kg	
208-96-8	Acenaphthylene	ND	300	76	ug/kg	
120-12-7	Anthracene	ND	300	46	ug/kg	
56-55-3	Benzo(a)anthracene	ND	61	15	ug/kg	
50-32-8	Benzo(a)pyrene	ND	61	15	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	61	15	ug/kg	
191-24-2	Benzo(g,h,i)perylene	ND	61	15	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	61	15	ug/kg	
218-01-9	Chrysene	ND	61	15	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	61	15	ug/kg	
206-44-0	Fluoranthene	ND	300	53	ug/kg	
86-73-7	Fluorene	ND	300	46	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	61	15	ug/kg	
90-12-0	1-Methylnaphthalene	ND	300	46	ug/kg	
91-57-6	2-Methylnaphthalene	ND	300	46	ug/kg	
91-20-3	Naphthalene	ND	300	46	ug/kg	
85-01-8	Phenanthrene	ND	300	46	ug/kg	
129-00-0	Pyrene	ND	300	53	ug/kg	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	50SB012A		
Lab Sample ID:	F51247-13	**Date Sampled:**	07/23/07
Matrix:	SO - Soil	**Date Received:**	07/24/07
Method:	SW846 8270C SW846 3550B	**Percent Solids:**	85.4
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	L037581.D	4	08/02/07	RB	07/31/07	OP21689	SL1922
Run #2							

	Initial Weight	Final Volume
Run #1	30.5 g	1.0 ml
Run #2		

ABN TCL List w/o PAHs

CAS No.	Compound	Result	RL	MDL	Units	Q
65-85-0	Benzoic acid	ND	3800	1500	ug/kg	
95-57-8	2-Chlorophenol	ND	770	150	ug/kg	
59-50-7	4-Chloro-3-methyl phenol	ND	770	150	ug/kg	
120-83-2	2,4-Dichlorophenol	ND	770	150	ug/kg	
105-67-9	2,4-Dimethylphenol	ND	770	150	ug/kg	
51-28-5	2,4-Dinitrophenol	ND	3800	1500	ug/kg	
534-52-1	4,6-Dinitro-o-cresol	ND	1500	310	ug/kg	
95-48-7	2-Methylphenol	ND	770	150	ug/kg	
	3&4-Methylphenol	ND	770	150	ug/kg	
88-75-5	2-Nitrophenol	ND	770	150	ug/kg	
100-02-7	4-Nitrophenol	ND	3800	1500	ug/kg	
87-86-5	Pentachlorophenol	ND	3800	1500	ug/kg	
108-95-2	Phenol	ND	770	150	ug/kg	
95-95-4	2,4,5-Trichlorophenol	ND	770	150	ug/kg	
88-06-2	2,4,6-Trichlorophenol	ND	770	150	ug/kg	
101-55-3	4-Bromophenyl phenyl ether	ND	770	150	ug/kg	
85-68-7	Butyl benzyl phthalate	ND	1500	380	ug/kg	
100-51-6	Benzyl Alcohol	ND	770	150	ug/kg	
91-58-7	2-Chloronaphthalene	ND	770	150	ug/kg	
106-47-8	4-Chloroaniline	ND	770	310	ug/kg	
86-74-8	Carbazole	ND	770	150	ug/kg	
111-91-1	bis(2-Chloroethoxy)methane	ND	770	150	ug/kg	
111-44-4	bis(2-Chloroethyl)ether	ND	770	150	ug/kg	
108-60-1	bis(2-Chloroisopropyl)ether	ND	770	150	ug/kg	
7005-72-3	4-Chlorophenyl phenyl ether	ND	770	150	ug/kg	
95-50-1	1,2-Dichlorobenzene	ND	770	150	ug/kg	
541-73-1	1,3-Dichlorobenzene	ND	770	150	ug/kg	
106-46-7	1,4-Dichlorobenzene	ND	770	150	ug/kg	
121-14-2	2,4-Dinitrotoluene	ND	770	150	ug/kg	
606-20-2	2,6-Dinitrotoluene	ND	770	150	ug/kg	
91-94-1	3,3'-Dichlorobenzidine	ND	1500	310	ug/kg	
132-64-9	Dibenzofuran	ND	770	150	ug/kg	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	50SB012A		
Lab Sample ID:	F51247-13	**Date Sampled:**	07/23/07
Matrix:	SO - Soil	**Date Received:**	07/24/07
Method:	SW846 8270C SW846 3550B	**Percent Solids:**	85.4
Project:	WPA 019 Field Investigation; Radford AAP, VA		

ABN TCL List w/o PAHs

CAS No.	Compound	Result	RL	MDL	Units	Q
84-74-2	Di-n-butyl phthalate	ND	1500	380	ug/kg	
117-84-0	Di-n-octyl phthalate	ND	1500	380	ug/kg	
84-66-2	Diethyl phthalate	ND	1500	770	ug/kg	
131-11-3	Dimethyl phthalate	ND	1500	380	ug/kg	
117-81-7	bis(2-Ethylhexyl)phthalate	ND	1500	770	ug/kg	
118-74-1	Hexachlorobenzene	ND	770	150	ug/kg	
87-68-3	Hexachlorobutadiene	ND	770	150	ug/kg	
77-47-4	Hexachlorocyclopentadiene	ND	770	150	ug/kg	
67-72-1	Hexachloroethane	ND	770	150	ug/kg	
78-59-1	Isophorone	ND	770	150	ug/kg	
88-74-4	2-Nitroaniline	ND	1500	310	ug/kg	
99-09-2	3-Nitroaniline	ND	1500	310	ug/kg	
100-01-6	4-Nitroaniline	ND	1500	310	ug/kg	
98-95-3	Nitrobenzene	ND	770	150	ug/kg	
621-64-7	N-Nitroso-di-n-propylamine	ND	770	150	ug/kg	
86-30-6	N-Nitrosodiphenylamine	ND	770	150	ug/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	770	150	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol	66%		40-102%
4165-62-2	Phenol-d5	67%		41-100%
118-79-6	2,4,6-Tribromophenol	76%		42-108%
4165-60-0	Nitrobenzene-d5	61%		40-105%
321-60-8	2-Fluorobiphenyl	73%		43-107%
1718-51-0	Terphenyl-d14	76%		45-119%

(a) Dilution required due to matrix interference.

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	50SB012A		
Lab Sample ID:	F51247-13	**Date Sampled:**	07/23/07
Matrix:	SO - Soil	**Date Received:**	07/24/07
Method:	SW846 8270C BY SIM SW846 3550B	**Percent Solids:**	85.4
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	R09585.D	4	08/04/07	NJ	07/31/07	OP21688	SR453
Run #2							

	Initial Weight	Final Volume
Run #1	30.5 g	1.0 ml
Run #2		

BN PAH List

CAS No.	Compound	Result	RL	MDL	Units	Q
83-32-9	Acenaphthene	ND	310	77	ug/kg	
208-96-8	Acenaphthylene	ND	310	77	ug/kg	
120-12-7	Anthracene	ND	310	46	ug/kg	
56-55-3	Benzo(a)anthracene	ND	61	15	ug/kg	
50-32-8	Benzo(a)pyrene	ND	61	15	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	61	15	ug/kg	
191-24-2	Benzo(g,h,i)perylene	ND	61	15	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	61	15	ug/kg	
218-01-9	Chrysene	ND	61	15	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	61	15	ug/kg	
206-44-0	Fluoranthene	ND	310	54	ug/kg	
86-73-7	Fluorene	ND	310	46	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	61	15	ug/kg	
90-12-0	1-Methylnaphthalene	ND	310	46	ug/kg	
91-57-6	2-Methylnaphthalene	ND	310	46	ug/kg	
91-20-3	Naphthalene	ND	310	46	ug/kg	
85-01-8	Phenanthrene	ND	310	46	ug/kg	
129-00-0	Pyrene	ND	310	54	ug/kg	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	50SB012B		
Lab Sample ID:	F51247-14	**Date Sampled:**	07/23/07
Matrix:	SO - Soil	**Date Received:**	07/24/07
Method:	SW846 8270C SW846 3550B	**Percent Solids:**	67.7
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	L037582.D	5	08/02/07	RB	07/31/07	OP21689	SL1922
Run #2 [b]	L037700.D	1	08/08/07	RB	08/07/07	OP21773	SL1927

	Initial Weight	Final Volume
Run #1	30.7 g	1.0 ml
Run #2	30.2 g	10.0 ml

ABN TCL List w/o PAHs

CAS No.	Compound	Result	RL	MDL	Units	Q
65-85-0	Benzoic acid	ND VL	6000	2400	ug/kg	
95-57-8	2-Chlorophenol	ND VL	1200	240	ug/kg	
59-50-7	4-Chloro-3-methyl phenol	ND VL	1200	240	ug/kg	
120-83-2	2,4-Dichlorophenol	ND VL	1200	240	ug/kg	
105-67-9	2,4-Dimethylphenol	ND VL	1200	240	ug/kg	
51-28-5	2,4-Dinitrophenol	ND VL	6000	2400	ug/kg	
534-52-1	4,6-Dinitro-o-cresol	ND VL	2400	480	ug/kg	
95-48-7	2-Methylphenol	ND VL	1200	240	ug/kg	
	3&4-Methylphenol	ND VL	1200	240	ug/kg	
88-75-5	2-Nitrophenol	ND VL	1200	240	ug/kg	
100-02-7	4-Nitrophenol	ND VL	6000	2400	ug/kg	
87-86-5	Pentachlorophenol	ND VL	6000	2400	ug/kg	
108-95-2	Phenol	ND VL	1200	240	ug/kg	
95-95-4	2,4,5-Trichlorophenol	ND VL	1200	240	ug/kg	
88-06-2	2,4,6-Trichlorophenol	ND VL	1200	240	ug/kg	
101-55-3	4-Bromophenyl phenyl ether	ND VL	1200	240	ug/kg	
85-68-7	Butyl benzyl phthalate	ND VL	2400	600	ug/kg	
100-51-6	Benzyl Alcohol	ND VL	1200	240	ug/kg	
91-58-7	2-Chloronaphthalene	ND VL	1200	240	ug/kg	
106-47-8	4-Chloroaniline	ND VL	1200	480	ug/kg	
86-74-8	Carbazole	ND VL	1200	240	ug/kg	
111-91-1	bis(2-Chloroethoxy)methane	ND VL	1200	240	ug/kg	
111-44-4	bis(2-Chloroethyl)ether	ND VL	1200	240	ug/kg	
108-60-1	bis(2-Chloroisopropyl)ether	ND VL	1200	240	ug/kg	
7005-72-3	4-Chlorophenyl phenyl ether	ND VL	1200	240	ug/kg	
95-50-1	1,2-Dichlorobenzene	ND VL	1200	240	ug/kg	
541-73-1	1,3-Dichlorobenzene	ND VL	1200	240	ug/kg	
106-46-7	1,4-Dichlorobenzene	ND VL	1200	240	ug/kg	
121-14-2	2,4-Dinitrotoluene	ND VL	1200	240	ug/kg	
606-20-2	2,6-Dinitrotoluene	ND VL	1200	240	ug/kg	
91-94-1	3,3'-Dichlorobenzidine	ND VL	2400	480	ug/kg	
132-64-9	Dibenzofuran	ND VL	1200	240	ug/kg	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	50SB012B		
Lab Sample ID:	F51247-14	**Date Sampled:**	07/23/07
Matrix:	SO - Soil	**Date Received:**	07/24/07
Method:	SW846 8270C SW846 3550B	**Percent Solids:**	67.7
Project:	WPA 019 Field Investigation; Radford AAP, VA		

ABN TCL List w/o PAHs

CAS No.	Compound	Result	RL	MDL	Units	Q
84-74-2	Di-n-butyl phthalate	3540 L	2400	600	ug/kg	
117-84-0	Di-n-octyl phthalate	ND VL	2400	600	ug/kg	
84-66-2	Diethyl phthalate	ND VL	2400	1200	ug/kg	
131-11-3	Dimethyl phthalate	ND VL	2400	600	ug/kg	
117-81-7	bis(2-Ethylhexyl)phthalate	ND VL	2400	1200	ug/kg	
118-74-1	Hexachlorobenzene	ND VL	1200	240	ug/kg	
87-68-3	Hexachlorobutadiene	ND VL	1200	240	ug/kg	
77-47-4	Hexachlorocyclopentadiene	ND VL	1200	240	ug/kg	
67-72-1	Hexachloroethane	ND VL	1200	240	ug/kg	
78-59-1	Isophorone	ND VL	1200	240	ug/kg	
88-74-4	2-Nitroaniline	ND VL	2400	480	ug/kg	
99-09-2	3-Nitroaniline	ND VL	2400	480	ug/kg	
100-01-6	4-Nitroaniline	ND VL	2400	480	ug/kg	
98-95-3	Nitrobenzene	ND VL	1200	240	ug/kg	
621-64-7	N-Nitroso-di-n-propylamine	ND VL	1200	240	ug/kg	
86-30-6	N-Nitrosodiphenylamine	ND VL	1200	240	ug/kg	
120-82-1	1,2,4-Trichlorobenzene	ND VL	1200	240	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol	19%	16%	40-102%
4165-62-2	Phenol-d5	20%	16%	41-100%
118-79-6	2,4,6-Tribromophenol	22%	0%	42-108%
4165-60-0	Nitrobenzene-d5	20%	23%	40-105%
321-60-8	2-Fluorobiphenyl	24%	29%	43-107%
1718-51-0	Terphenyl-d14	25%	27%	45-119%

(a) Confirmed by re-extraction and reanalysis beyond holdtime. Dilution required due to matrix interference.
(b) Confirmation run.

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	50SB012B		
Lab Sample ID:	F51247-14	**Date Sampled:**	07/23/07
Matrix:	SO - Soil	**Date Received:**	07/24/07
Method:	SW846 8270C BY SIM SW846 3550B	**Percent Solids:**	67.7
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	W036191.D	4	08/11/07	RB	08/07/07	OP21772	SW1872
Run #2							

	Initial Weight	Final Volume
Run #1	30.2 g	1.0 ml
Run #2		

BN PAH List

CAS No.	Compound	Result	RL	MDL	Units	Q
83-32-9	Acenaphthene	ND VL	390	98	ug/kg	
208-96-8	Acenaphthylene	ND VL	390	98	ug/kg	
120-12-7	Anthracene	ND VL	390	59	ug/kg	
56-55-3	Benzo(a)anthracene	ND VL	78	20	ug/kg	
50-32-8	Benzo(a)pyrene	ND VL	78	20	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND VL	78	20	ug/kg	
191-24-2	Benzo(g,h,i)perylene	ND VL	78	20	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND VL	78	20	ug/kg	
218-01-9	Chrysene	ND VL	78	20	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	ND VL	78	20	ug/kg	
206-44-0	Fluoranthene	ND VL	390	68	ug/kg	
86-73-7	Fluorene	ND VL	390	59	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND VL	78	20	ug/kg	
90-12-0	1-Methylnaphthalene	ND VL	390	59	ug/kg	
91-57-6	2-Methylnaphthalene	ND VL	390	59	ug/kg	
91-20-3	Naphthalene	ND VL	390	59	ug/kg	
85-01-8	Phenanthrene	ND VL	390	59	ug/kg	
129-00-0	Pyrene	ND VL	390	68	ug/kg	

(a) Sample reextracted beyond hold time. Dilution required due to matrix interference.

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	50SB013A		
Lab Sample ID:	F51247-15	**Date Sampled:**	07/23/07
Matrix:	SO - Soil	**Date Received:**	07/24/07
Method:	SW846 8270C SW846 3550B	**Percent Solids:**	87.5
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	U003702.D	1	08/01/07	NJ	07/31/07	OP21689	SU181
Run #2							

	Initial Weight	Final Volume
Run #1	30.5 g	1.0 ml
Run #2		

ABN TCL List w/o PAHs

CAS No.	Compound	Result	RL	MDL	Units	Q
65-85-0	Benzoic acid	ND	940	370	ug/kg	
95-57-8	2-Chlorophenol	ND	190	37	ug/kg	
59-50-7	4-Chloro-3-methyl phenol	ND	190	37	ug/kg	
120-83-2	2,4-Dichlorophenol	ND	190	37	ug/kg	
105-67-9	2,4-Dimethylphenol	ND	190	37	ug/kg	
51-28-5	2,4-Dinitrophenol	ND	940	370	ug/kg	
534-52-1	4,6-Dinitro-o-cresol	ND	370	75	ug/kg	
95-48-7	2-Methylphenol	ND	190	37	ug/kg	
	3&4-Methylphenol	ND	190	37	ug/kg	
88-75-5	2-Nitrophenol	ND	190	37	ug/kg	
100-02-7	4-Nitrophenol	ND	940	370	ug/kg	
87-86-5	Pentachlorophenol	ND	940	370	ug/kg	
108-95-2	Phenol	ND	190	37	ug/kg	
95-95-4	2,4,5-Trichlorophenol	ND	190	37	ug/kg	
88-06-2	2,4,6-Trichlorophenol	ND	190	37	ug/kg	
101-55-3	4-Bromophenyl phenyl ether	ND	190	37	ug/kg	
85-68-7	Butyl benzyl phthalate	ND	370	94	ug/kg	
100-51-6	Benzyl Alcohol	ND	190	37	ug/kg	
91-58-7	2-Chloronaphthalene	ND	190	37	ug/kg	
106-47-8	4-Chloroaniline	ND	190	75	ug/kg	
86-74-8	Carbazole	ND	190	37	ug/kg	
111-91-1	bis(2-Chloroethoxy)methane	ND	190	37	ug/kg	
111-44-4	bis(2-Chloroethyl)ether	ND	190	37	ug/kg	
108-60-1	bis(2-Chloroisopropyl)ether	ND	190	37	ug/kg	
7005-72-3	4-Chlorophenyl phenyl ether	ND	190	37	ug/kg	
95-50-1	1,2-Dichlorobenzene	ND	190	37	ug/kg	
541-73-1	1,3-Dichlorobenzene	ND	190	37	ug/kg	
106-46-7	1,4-Dichlorobenzene	ND	190	37	ug/kg	
121-14-2	2,4-Dinitrotoluene	ND	190	37	ug/kg	
606-20-2	2,6-Dinitrotoluene	ND	190	37	ug/kg	
91-94-1	3,3'-Dichlorobenzidine	ND	370	75	ug/kg	
132-64-9	Dibenzofuran	ND	190	37	ug/kg	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	50SB013A		
Lab Sample ID:	F51247-15	**Date Sampled:**	07/23/07
Matrix:	SO - Soil	**Date Received:**	07/24/07
Method:	SW846 8270C SW846 3550B	**Percent Solids:**	87.5
Project:	WPA 019 Field Investigation; Radford AAP, VA		

ABN TCL List w/o PAHs

CAS No.	Compound	Result	RL	MDL	Units	Q
84-74-2	Di-n-butyl phthalate	ND	370	94	ug/kg	
117-84-0	Di-n-octyl phthalate	ND	370	94	ug/kg	
84-66-2	Diethyl phthalate	ND	370	190	ug/kg	
131-11-3	Dimethyl phthalate	ND	370	94	ug/kg	
117-81-7	bis(2-Ethylhexyl)phthalate	ND	370	190	ug/kg	
118-74-1	Hexachlorobenzene	ND	190	37	ug/kg	
87-68-3	Hexachlorobutadiene	ND	190	37	ug/kg	
77-47-4	Hexachlorocyclopentadiene	ND	190	37	ug/kg	
67-72-1	Hexachloroethane	ND	190	37	ug/kg	
78-59-1	Isophorone	ND	190	37	ug/kg	
88-74-4	2-Nitroaniline	ND	370	75	ug/kg	
99-09-2	3-Nitroaniline	ND	370	75	ug/kg	
100-01-6	4-Nitroaniline	ND	370	75	ug/kg	
98-95-3	Nitrobenzene	ND	190	37	ug/kg	
621-64-7	N-Nitroso-di-n-propylamine	ND	190	37	ug/kg	
86-30-6	N-Nitrosodiphenylamine	ND	190	37	ug/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	190	37	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol	67%		40-102%
4165-62-2	Phenol-d5	71%		41-100%
118-79-6	2,4,6-Tribromophenol	75%		42-108%
4165-60-0	Nitrobenzene-d5	62%		40-105%
321-60-8	2-Fluorobiphenyl	65%		43-107%
1718-51-0	Terphenyl-d14	80%		45-119%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	50SB013A		
Lab Sample ID:	F51247-15	**Date Sampled:**	07/23/07
Matrix:	SO - Soil	**Date Received:**	07/24/07
Method:	SW846 8270C BY SIM SW846 3550B	**Percent Solids:**	87.5
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	R09586.D	4	08/04/07	NJ	07/31/07	OP21688	SR453
Run #2							

	Initial Weight	Final Volume
Run #1	30.5 g	1.0 ml
Run #2		

BN PAH List

CAS No.	Compound	Result	RL	MDL	Units	Q
83-32-9	Acenaphthene	ND	300	75	ug/kg	
208-96-8	Acenaphthylene	ND	300	75	ug/kg	
120-12-7	Anthracene	ND	300	45	ug/kg	
56-55-3	Benzo(a)anthracene	ND	60	15	ug/kg	
50-32-8	Benzo(a)pyrene	18.7 J	60	15	ug/kg	J
205-99-2	Benzo(b)fluoranthene	20.2 J	60	15	ug/kg	J
191-24-2	Benzo(g,h,i)perylene	16.9 J	60	15	ug/kg	J
207-08-9	Benzo(k)fluoranthene	16.0 J	60	15	ug/kg	J
218-01-9	Chrysene	15.8 J	60	15	ug/kg	J
53-70-3	Dibenzo(a,h)anthracene	ND	60	15	ug/kg	
206-44-0	Fluoranthene	ND	300	52	ug/kg	
86-73-7	Fluorene	ND	300	45	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	19.1 J	60	15	ug/kg	J
90-12-0	1-Methylnaphthalene	ND	300	45	ug/kg	
91-57-6	2-Methylnaphthalene	ND	300	45	ug/kg	
91-20-3	Naphthalene	ND	300	45	ug/kg	
85-01-8	Phenanthrene	ND	300	45	ug/kg	
129-00-0	Pyrene	ND	300	52	ug/kg	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	50SB013B		
Lab Sample ID:	F51247-16	**Date Sampled:**	07/23/07
Matrix:	SO - Soil	**Date Received:**	07/24/07
Method:	SW846 8270C SW846 3550B	**Percent Solids:**	64.7
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	U003703.D	1	08/01/07	NJ	07/31/07	OP21689	SU181
Run #2							

	Initial Weight	Final Volume
Run #1	30.6 g	1.0 ml
Run #2		

ABN TCL List w/o PAHs

CAS No.	Compound	Result	RL	MDL	Units	Q
65-85-0	Benzoic acid	ND	1300	510	ug/kg	
95-57-8	2-Chlorophenol	ND	250	51	ug/kg	
59-50-7	4-Chloro-3-methyl phenol	ND	250	51	ug/kg	
120-83-2	2,4-Dichlorophenol	ND	250	51	ug/kg	
105-67-9	2,4-Dimethylphenol	ND	250	51	ug/kg	
51-28-5	2,4-Dinitrophenol	ND	1300	510	ug/kg	
534-52-1	4,6-Dinitro-o-cresol	ND	510	100	ug/kg	
95-48-7	2-Methylphenol	ND	250	51	ug/kg	
	3&4-Methylphenol	ND	250	51	ug/kg	
88-75-5	2-Nitrophenol	ND	250	51	ug/kg	
100-02-7	4-Nitrophenol	ND	1300	510	ug/kg	
87-86-5	Pentachlorophenol	ND	1300	510	ug/kg	
108-95-2	Phenol	ND	250	51	ug/kg	
95-95-4	2,4,5-Trichlorophenol	ND	250	51	ug/kg	
88-06-2	2,4,6-Trichlorophenol	ND	250	51	ug/kg	
101-55-3	4-Bromophenyl phenyl ether	ND	250	51	ug/kg	
85-68-7	Butyl benzyl phthalate	ND	510	130	ug/kg	
100-51-6	Benzyl Alcohol	ND	250	51	ug/kg	
91-58-7	2-Chloronaphthalene	ND	250	51	ug/kg	
106-47-8	4-Chloroaniline	ND	250	100	ug/kg	
86-74-8	Carbazole	ND	250	51	ug/kg	
111-91-1	bis(2-Chloroethoxy)methane	ND	250	51	ug/kg	
111-44-4	bis(2-Chloroethyl)ether	ND	250	51	ug/kg	
108-60-1	bis(2-Chloroisopropyl)ether	ND	250	51	ug/kg	
7005-72-3	4-Chlorophenyl phenyl ether	ND	250	51	ug/kg	
95-50-1	1,2-Dichlorobenzene	ND	250	51	ug/kg	
541-73-1	1,3-Dichlorobenzene	ND	250	51	ug/kg	
106-46-7	1,4-Dichlorobenzene	ND	250	51	ug/kg	
121-14-2	2,4-Dinitrotoluene	ND	250	51	ug/kg	
606-20-2	2,6-Dinitrotoluene	ND	250	51	ug/kg	
91-94-1	3,3'-Dichlorobenzidine	ND	510	100	ug/kg	
132-64-9	Dibenzofuran	ND	250	51	ug/kg	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	50SB013B		
Lab Sample ID:	F51247-16	**Date Sampled:**	07/23/07
Matrix:	SO - Soil	**Date Received:**	07/24/07
Method:	SW846 8270C SW846 3550B	**Percent Solids:**	64.7
Project:	WPA 019 Field Investigation; Radford AAP, VA		

ABN TCL List w/o PAHs

CAS No.	Compound	Result	RL	MDL	Units	Q
84-74-2	Di-n-butyl phthalate	366 J	510	130	ug/kg	J
117-84-0	Di-n-octyl phthalate	ND	510	130	ug/kg	
84-66-2	Diethyl phthalate	ND	510	250	ug/kg	
131-11-3	Dimethyl phthalate	ND	510	130	ug/kg	
117-81-7	bis(2-Ethylhexyl)phthalate	ND	510	250	ug/kg	
118-74-1	Hexachlorobenzene	ND	250	51	ug/kg	
87-68-3	Hexachlorobutadiene	ND	250	51	ug/kg	
77-47-4	Hexachlorocyclopentadiene	ND	250	51	ug/kg	
67-72-1	Hexachloroethane	ND	250	51	ug/kg	
78-59-1	Isophorone	ND	250	51	ug/kg	
88-74-4	2-Nitroaniline	ND	510	100	ug/kg	
99-09-2	3-Nitroaniline	ND	510	100	ug/kg	
100-01-6	4-Nitroaniline	ND	510	100	ug/kg	
98-95-3	Nitrobenzene	ND	250	51	ug/kg	
621-64-7	N-Nitroso-di-n-propylamine	ND	250	51	ug/kg	
86-30-6	N-Nitrosodiphenylamine	ND	250	51	ug/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	250	51	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol	73%		40-102%
4165-62-2	Phenol-d5	77%		41-100%
118-79-6	2,4,6-Tribromophenol	73%		42-108%
4165-60-0	Nitrobenzene-d5	68%		40-105%
321-60-8	2-Fluorobiphenyl	69%		43-107%
1718-51-0	Terphenyl-d14	81%		45-119%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	50SB013B		
Lab Sample ID:	F51247-16	**Date Sampled:**	07/23/07
Matrix:	SO - Soil	**Date Received:**	07/24/07
Method:	SW846 8270C BY SIM SW846 3550B	**Percent Solids:**	64.7
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	R09587.D	4	08/04/07	NJ	07/31/07	OP21688	SR453
Run #2							

	Initial Weight	Final Volume
Run #1	30.6 g	1.0 ml
Run #2		

BN PAH List

CAS No.	Compound	Result	RL	MDL	Units	Q
83-32-9	Acenaphthene	ND	400	100	ug/kg	
208-96-8	Acenaphthylene	ND	400	100	ug/kg	
120-12-7	Anthracene	ND	400	61	ug/kg	
56-55-3	Benzo(a)anthracene	ND	81	20	ug/kg	
50-32-8	Benzo(a)pyrene	ND	81	20	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	81	20	ug/kg	
191-24-2	Benzo(g,h,i)perylene	24.5 J	81	20	ug/kg	J
207-08-9	Benzo(k)fluoranthene	ND	81	20	ug/kg	
218-01-9	Chrysene	ND	81	20	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	81	20	ug/kg	
206-44-0	Fluoranthene	ND	400	71	ug/kg	
86-73-7	Fluorene	ND	400	61	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	21.0 J	81	20	ug/kg	J
90-12-0	1-Methylnaphthalene	ND	400	61	ug/kg	
91-57-6	2-Methylnaphthalene	ND	400	61	ug/kg	
91-20-3	Naphthalene	ND	400	61	ug/kg	
85-01-8	Phenanthrene	ND	400	61	ug/kg	
129-00-0	Pyrene	ND	400	71	ug/kg	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	50SB014A		
Lab Sample ID:	F51247-17	Date Sampled:	07/23/07
Matrix:	SO - Soil	Date Received:	07/24/07
Method:	SW846 8270C SW846 3550B	Percent Solids:	90.3
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	U003704.D	1	08/01/07	NJ	07/31/07	OP21689	SU181
Run #2							

	Initial Weight	Final Volume
Run #1	30.8 g	1.0 ml
Run #2		

ABN TCL List w/o PAHs

CAS No.	Compound	Result	RL	MDL	Units	Q
65-85-0	Benzoic acid	ND	900	360	ug/kg	
95-57-8	2-Chlorophenol	ND	180	36	ug/kg	
59-50-7	4-Chloro-3-methyl phenol	ND	180	36	ug/kg	
120-83-2	2,4-Dichlorophenol	ND	180	36	ug/kg	
105-67-9	2,4-Dimethylphenol	ND	180	36	ug/kg	
51-28-5	2,4-Dinitrophenol	ND	900	360	ug/kg	
534-52-1	4,6-Dinitro-o-cresol	ND	360	72	ug/kg	
95-48-7	2-Methylphenol	ND	180	36	ug/kg	
	3&4-Methylphenol	ND	180	36	ug/kg	
88-75-5	2-Nitrophenol	ND	180	36	ug/kg	
100-02-7	4-Nitrophenol	ND	900	360	ug/kg	
87-86-5	Pentachlorophenol	ND	900	360	ug/kg	
108-95-2	Phenol	ND	180	36	ug/kg	
95-95-4	2,4,5-Trichlorophenol	ND	180	36	ug/kg	
88-06-2	2,4,6-Trichlorophenol	ND	180	36	ug/kg	
101-55-3	4-Bromophenyl phenyl ether	ND	180	36	ug/kg	
85-68-7	Butyl benzyl phthalate	ND	360	90	ug/kg	
100-51-6	Benzyl Alcohol	ND	180	36	ug/kg	
91-58-7	2-Chloronaphthalene	ND	180	36	ug/kg	
106-47-8	4-Chloroaniline	ND	180	72	ug/kg	
86-74-8	Carbazole	ND	180	36	ug/kg	
111-91-1	bis(2-Chloroethoxy)methane	ND	180	36	ug/kg	
111-44-4	bis(2-Chloroethyl)ether	ND	180	36	ug/kg	
108-60-1	bis(2-Chloroisopropyl)ether	ND	180	36	ug/kg	
7005-72-3	4-Chlorophenyl phenyl ether	ND	180	36	ug/kg	
95-50-1	1,2-Dichlorobenzene	ND	180	36	ug/kg	
541-73-1	1,3-Dichlorobenzene	ND	180	36	ug/kg	
106-46-7	1,4-Dichlorobenzene	ND	180	36	ug/kg	
121-14-2	2,4-Dinitrotoluene	ND	180	36	ug/kg	
606-20-2	2,6-Dinitrotoluene	ND	180	36	ug/kg	
91-94-1	3,3'-Dichlorobenzidine	ND	360	72	ug/kg	
132-64-9	Dibenzofuran	ND	180	36	ug/kg	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	50SB014A		
Lab Sample ID:	F51247-17	**Date Sampled:**	07/23/07
Matrix:	SO - Soil	**Date Received:**	07/24/07
Method:	SW846 8270C SW846 3550B	**Percent Solids:**	90.3
Project:	WPA 019 Field Investigation; Radford AAP, VA		

ABN TCL List w/o PAHs

CAS No.	Compound	Result	RL	MDL	Units	Q
84-74-2	Di-n-butyl phthalate	229 J	360	90	ug/kg	J
117-84-0	Di-n-octyl phthalate	ND	360	90	ug/kg	
84-66-2	Diethyl phthalate	ND	360	180	ug/kg	
131-11-3	Dimethyl phthalate	ND	360	90	ug/kg	
117-81-7	bis(2-Ethylhexyl)phthalate	ND	360	180	ug/kg	
118-74-1	Hexachlorobenzene	ND	180	36	ug/kg	
87-68-3	Hexachlorobutadiene	ND	180	36	ug/kg	
77-47-4	Hexachlorocyclopentadiene	ND	180	36	ug/kg	
67-72-1	Hexachloroethane	ND	180	36	ug/kg	
78-59-1	Isophorone	ND	180	36	ug/kg	
88-74-4	2-Nitroaniline	ND	360	72	ug/kg	
99-09-2	3-Nitroaniline	ND	360	72	ug/kg	
100-01-6	4-Nitroaniline	ND	360	72	ug/kg	
98-95-3	Nitrobenzene	ND	180	36	ug/kg	
621-64-7	N-Nitroso-di-n-propylamine	ND	180	36	ug/kg	
86-30-6	N-Nitrosodiphenylamine	ND	180	36	ug/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	180	36	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol	72%		40-102%
4165-62-2	Phenol-d5	75%		41-100%
118-79-6	2,4,6-Tribromophenol	72%		42-108%
4165-60-0	Nitrobenzene-d5	68%		40-105%
321-60-8	2-Fluorobiphenyl	68%		43-107%
1718-51-0	Terphenyl-d14	76%		45-119%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: R09588.D

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Report of Analysis

Client Sample ID:	50SB014A		
Lab Sample ID:	F51247-17	**Date Sampled:**	07/23/07
Matrix:	SO - Soil	**Date Received:**	07/24/07
Method:	SW846 8270C BY SIM SW846 3550B	**Percent Solids:**	90.3
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	R09588.D	4	08/04/07	NJ	07/31/07	OP21688	SR453
Run #2							

	Initial Weight	Final Volume
Run #1	30.8 g	1.0 ml
Run #2		

BN PAH List

CAS No.	Compound	Result	RL	MDL	Units	Q
83-32-9	Acenaphthene	ND VL	290	72	ug/kg	
208-96-8	Acenaphthylene	ND VL	290	72	ug/kg	
120-12-7	Anthracene	ND VL	290	43	ug/kg	
56-55-3	Benzo(a)anthracene	ND	58	14	ug/kg	
50-32-8	Benzo(a)pyrene	ND	58	14	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	58	14	ug/kg	
191-24-2	Benzo(g,h,i)perylene	ND	58	14	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	58	14	ug/kg	
218-01-9	Chrysene	ND VL	58	14	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	58	14	ug/kg	
206-44-0	Fluoranthene	ND	290	50	ug/kg	
86-73-7	Fluorene	ND VL	290	43	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	58	14	ug/kg	
90-12-0	1-Methylnaphthalene	ND VL	290	43	ug/kg	
91-57-6	2-Methylnaphthalene	ND VL	290	43	ug/kg	
91-20-3	Naphthalene	ND VL	290	43	ug/kg	
85-01-8	Phenanthrene	ND VL	290	43	ug/kg	
129-00-0	Pyrene	ND	290	50	ug/kg	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	50SB014B		
Lab Sample ID:	F51247-18	**Date Sampled:**	07/23/07
Matrix:	SO - Soil	**Date Received:**	07/24/07
Method:	SW846 8270C SW846 3550B	**Percent Solids:**	82.8
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	U003705.D	1	08/01/07	NJ	07/31/07	OP21689	SU181
Run #2							

	Initial Weight	Final Volume
Run #1	30.3 g	1.0 ml
Run #2		

ABN TCL List w/o PAHs

CAS No.	Compound	Result	RL	MDL	Units	Q
65-85-0	Benzoic acid	ND	1000	400	ug/kg	
95-57-8	2-Chlorophenol	ND	200	40	ug/kg	
59-50-7	4-Chloro-3-methyl phenol	ND	200	40	ug/kg	
120-83-2	2,4-Dichlorophenol	ND	200	40	ug/kg	
105-67-9	2,4-Dimethylphenol	ND	200	40	ug/kg	
51-28-5	2,4-Dinitrophenol	ND	1000	400	ug/kg	
534-52-1	4,6-Dinitro-o-cresol	ND	400	80	ug/kg	
95-48-7	2-Methylphenol	ND	200	40	ug/kg	
	3&4-Methylphenol	ND	200	40	ug/kg	
88-75-5	2-Nitrophenol	ND	200	40	ug/kg	
100-02-7	4-Nitrophenol	ND	1000	400	ug/kg	
87-86-5	Pentachlorophenol	ND	1000	400	ug/kg	
108-95-2	Phenol	ND	200	40	ug/kg	
95-95-4	2,4,5-Trichlorophenol	ND	200	40	ug/kg	
88-06-2	2,4,6-Trichlorophenol	ND	200	40	ug/kg	
101-55-3	4-Bromophenyl phenyl ether	ND	200	40	ug/kg	
85-68-7	Butyl benzyl phthalate	ND	400	100	ug/kg	
100-51-6	Benzyl Alcohol	ND	200	40	ug/kg	
91-58-7	2-Chloronaphthalene	ND	200	40	ug/kg	
106-47-8	4-Chloroaniline	ND	200	80	ug/kg	
86-74-8	Carbazole	ND	200	40	ug/kg	
111-91-1	bis(2-Chloroethoxy)methane	ND	200	40	ug/kg	
111-44-4	bis(2-Chloroethyl)ether	ND	200	40	ug/kg	
108-60-1	bis(2-Chloroisopropyl)ether	ND	200	40	ug/kg	
7005-72-3	4-Chlorophenyl phenyl ether	ND	200	40	ug/kg	
95-50-1	1,2-Dichlorobenzene	ND	200	40	ug/kg	
541-73-1	1,3-Dichlorobenzene	ND	200	40	ug/kg	
106-46-7	1,4-Dichlorobenzene	ND	200	40	ug/kg	
121-14-2	2,4-Dinitrotoluene	ND	200	40	ug/kg	
606-20-2	2,6-Dinitrotoluene	ND	200	40	ug/kg	
91-94-1	3,3'-Dichlorobenzidine	ND	400	80	ug/kg	
132-64-9	Dibenzofuran	ND	200	40	ug/kg	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	50SB014B		
Lab Sample ID:	F51247-18	**Date Sampled:**	07/23/07
Matrix:	SO - Soil	**Date Received:**	07/24/07
Method:	SW846 8270C SW846 3550B	**Percent Solids:**	82.8
Project:	WPA 019 Field Investigation; Radford AAP, VA		

ABN TCL List w/o PAHs

CAS No.	Compound	Result	RL	MDL	Units	Q
84-74-2	Di-n-butyl phthalate	ND	400	100	ug/kg	
117-84-0	Di-n-octyl phthalate	ND	400	100	ug/kg	
84-66-2	Diethyl phthalate	ND	400	200	ug/kg	
131-11-3	Dimethyl phthalate	ND	400	100	ug/kg	
117-81-7	bis(2-Ethylhexyl)phthalate	ND	400	200	ug/kg	
118-74-1	Hexachlorobenzene	ND	200	40	ug/kg	
87-68-3	Hexachlorobutadiene	ND	200	40	ug/kg	
77-47-4	Hexachlorocyclopentadiene	ND	200	40	ug/kg	
67-72-1	Hexachloroethane	ND	200	40	ug/kg	
78-59-1	Isophorone	ND	200	40	ug/kg	
88-74-4	2-Nitroaniline	ND	400	80	ug/kg	
99-09-2	3-Nitroaniline	ND	400	80	ug/kg	
100-01-6	4-Nitroaniline	ND	400	80	ug/kg	
98-95-3	Nitrobenzene	ND	200	40	ug/kg	
621-64-7	N-Nitroso-di-n-propylamine	ND	200	40	ug/kg	
86-30-6	N-Nitrosodiphenylamine	ND	200	40	ug/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	200	40	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol	74%		40-102%
4165-62-2	Phenol-d5	78%		41-100%
118-79-6	2,4,6-Tribromophenol	75%		42-108%
4165-60-0	Nitrobenzene-d5	66%		40-105%
321-60-8	2-Fluorobiphenyl	67%		43-107%
1718-51-0	Terphenyl-d14	80%		45-119%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: R09591.D

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Report of Analysis

Client Sample ID:	50SB014B		
Lab Sample ID:	F51247-18	**Date Sampled:**	07/23/07
Matrix:	SO - Soil	**Date Received:**	07/24/07
Method:	SW846 8270C BY SIM SW846 3550B	**Percent Solids:**	82.8
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	R09591.D	4	08/04/07	NJ	07/31/07	OP21688	SR453
Run #2							

	Initial Weight	Final Volume
Run #1	30.3 g	1.0 ml
Run #2		

BN PAH List

CAS No.	Compound	Result	RL	MDL	Units	Q
83-32-9	Acenaphthene	ND	320	80	ug/kg	
208-96-8	Acenaphthylene	ND	320	80	ug/kg	
120-12-7	Anthracene	ND	320	48	ug/kg	
56-55-3	Benzo(a)anthracene	ND	64	16	ug/kg	
50-32-8	Benzo(a)pyrene	ND	64	16	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	64	16	ug/kg	
191-24-2	Benzo(g,h,i)perylene	ND	64	16	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	64	16	ug/kg	
218-01-9	Chrysene	ND	64	16	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	64	16	ug/kg	
206-44-0	Fluoranthene	ND	320	56	ug/kg	
86-73-7	Fluorene	ND	320	48	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	64	16	ug/kg	
90-12-0	1-Methylnaphthalene	ND	320	48	ug/kg	
91-57-6	2-Methylnaphthalene	ND	320	48	ug/kg	
91-20-3	Naphthalene	ND	320	48	ug/kg	
85-01-8	Phenanthrene	ND	320	48	ug/kg	
129-00-0	Pyrene	ND	320	56	ug/kg	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	50SB015A		
Lab Sample ID:	F51247-19	**Date Sampled:**	07/23/07
Matrix:	SO - Soil	**Date Received:**	07/24/07
Method:	SW846 8270C SW846 3550B	**Percent Solids:**	87.1
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	U003706.D	1	08/02/07	NJ	07/31/07	OP21689	SU181
Run #2							

	Initial Weight	Final Volume
Run #1	30.0 g	1.0 ml
Run #2		

ABN TCL List w/o PAHs

CAS No.	Compound	Result	RL	MDL	Units	Q
65-85-0	Benzoic acid	ND	960	380	ug/kg	
95-57-8	2-Chlorophenol	ND	190	38	ug/kg	
59-50-7	4-Chloro-3-methyl phenol	ND	190	38	ug/kg	
120-83-2	2,4-Dichlorophenol	ND	190	38	ug/kg	
105-67-9	2,4-Dimethylphenol	ND	190	38	ug/kg	
51-28-5	2,4-Dinitrophenol	ND	960	380	ug/kg	
534-52-1	4,6-Dinitro-o-cresol	ND	380	77	ug/kg	
95-48-7	2-Methylphenol	ND	190	38	ug/kg	
	3&4-Methylphenol	ND	190	38	ug/kg	
88-75-5	2-Nitrophenol	ND	190	38	ug/kg	
100-02-7	4-Nitrophenol	ND	960	380	ug/kg	
87-86-5	Pentachlorophenol	ND	960	380	ug/kg	
108-95-2	Phenol	ND	190	38	ug/kg	
95-95-4	2,4,5-Trichlorophenol	ND	190	38	ug/kg	
88-06-2	2,4,6-Trichlorophenol	ND	190	38	ug/kg	
101-55-3	4-Bromophenyl phenyl ether	ND	190	38	ug/kg	
85-68-7	Butyl benzyl phthalate	ND	380	96	ug/kg	
100-51-6	Benzyl Alcohol	ND	190	38	ug/kg	
91-58-7	2-Chloronaphthalene	ND	190	38	ug/kg	
106-47-8	4-Chloroaniline	ND	190	77	ug/kg	
86-74-8	Carbazole	ND	190	38	ug/kg	
111-91-1	bis(2-Chloroethoxy)methane	ND	190	38	ug/kg	
111-44-4	bis(2-Chloroethyl)ether	ND	190	38	ug/kg	
108-60-1	bis(2-Chloroisopropyl)ether	ND	190	38	ug/kg	
7005-72-3	4-Chlorophenyl phenyl ether	ND	190	38	ug/kg	
95-50-1	1,2-Dichlorobenzene	ND	190	38	ug/kg	
541-73-1	1,3-Dichlorobenzene	ND	190	38	ug/kg	
106-46-7	1,4-Dichlorobenzene	ND	190	38	ug/kg	
121-14-2	2,4-Dinitrotoluene	ND	190	38	ug/kg	
606-20-2	2,6-Dinitrotoluene	ND	190	38	ug/kg	
91-94-1	3,3'-Dichlorobenzidine	ND	380	77	ug/kg	
132-64-9	Dibenzofuran	ND	190	38	ug/kg	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	50SB015A		
Lab Sample ID:	F51247-19	**Date Sampled:**	07/23/07
Matrix:	SO - Soil	**Date Received:**	07/24/07
Method:	SW846 8270C SW846 3550B	**Percent Solids:**	87.1
Project:	WPA 019 Field Investigation; Radford AAP, VA		

ABN TCL List w/o PAHs

CAS No.	Compound	Result	RL	MDL	Units	Q
84-74-2	Di-n-butyl phthalate	ND	380	96	ug/kg	
117-84-0	Di-n-octyl phthalate	ND	380	96	ug/kg	
84-66-2	Diethyl phthalate	ND	380	190	ug/kg	
131-11-3	Dimethyl phthalate	ND	380	96	ug/kg	
117-81-7	bis(2-Ethylhexyl)phthalate	ND	380	190	ug/kg	
118-74-1	Hexachlorobenzene	ND	190	38	ug/kg	
87-68-3	Hexachlorobutadiene	ND	190	38	ug/kg	
77-47-4	Hexachlorocyclopentadiene	ND	190	38	ug/kg	
67-72-1	Hexachloroethane	ND	190	38	ug/kg	
78-59-1	Isophorone	ND	190	38	ug/kg	
88-74-4	2-Nitroaniline	ND	380	77	ug/kg	
99-09-2	3-Nitroaniline	ND	380	77	ug/kg	
100-01-6	4-Nitroaniline	ND	380	77	ug/kg	
98-95-3	Nitrobenzene	ND	190	38	ug/kg	
621-64-7	N-Nitroso-di-n-propylamine	ND	190	38	ug/kg	
86-30-6	N-Nitrosodiphenylamine	ND	190	38	ug/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	190	38	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol	64%		40-102%
4165-62-2	Phenol-d5	68%		41-100%
118-79-6	2,4,6-Tribromophenol	63%		42-108%
4165-60-0	Nitrobenzene-d5	64%		40-105%
321-60-8	2-Fluorobiphenyl	66%		43-107%
1718-51-0	Terphenyl-d14	74%		45-119%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	50SB015A		
Lab Sample ID:	F51247-19	**Date Sampled:**	07/23/07
Matrix:	SO - Soil	**Date Received:**	07/24/07
Method:	SW846 8270C BY SIM SW846 3550B	**Percent Solids:**	87.1
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	R09592.D	4	08/04/07	NJ	07/31/07	OP21688	SR453
Run #2							

	Initial Weight	Final Volume
Run #1	30.0 g	1.0 ml
Run #2		

BN PAH List

CAS No.	Compound	Result	RL	MDL	Units	Q
83-32-9	Acenaphthene	ND	310	77	ug/kg	
208-96-8	Acenaphthylene	ND	310	77	ug/kg	
120-12-7	Anthracene	ND	310	46	ug/kg	
56-55-3	Benzo(a)anthracene	ND	61	15	ug/kg	
50-32-8	Benzo(a)pyrene	ND	61	15	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	61	15	ug/kg	
191-24-2	Benzo(g,h,i)perylene	ND	61	15	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	61	15	ug/kg	
218-01-9	Chrysene	ND	61	15	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	61	15	ug/kg	
206-44-0	Fluoranthene	ND	310	54	ug/kg	
86-73-7	Fluorene	ND	310	46	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	61	15	ug/kg	
90-12-0	1-Methylnaphthalene	ND	310	46	ug/kg	
91-57-6	2-Methylnaphthalene	ND	310	46	ug/kg	
91-20-3	Naphthalene	ND	310	46	ug/kg	
85-01-8	Phenanthrene	ND	310	46	ug/kg	
129-00-0	Pyrene	ND	310	54	ug/kg	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	50SB015B		
Lab Sample ID:	F51247-20	**Date Sampled:**	07/23/07
Matrix:	SO - Soil	**Date Received:**	07/24/07
Method:	SW846 8270C SW846 3550B	**Percent Solids:**	85.3
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	U003707.D	1	08/02/07	NJ	07/31/07	OP21689	SU181
Run #2							

	Initial Weight	Final Volume
Run #1	30.1 g	1.0 ml
Run #2		

ABN TCL List w/o PAHs

CAS No.	Compound	Result	RL	MDL	Units	Q
65-85-0	Benzoic acid	ND	970	390	ug/kg	
95-57-8	2-Chlorophenol	ND	190	39	ug/kg	
59-50-7	4-Chloro-3-methyl phenol	ND	190	39	ug/kg	
120-83-2	2,4-Dichlorophenol	ND	190	39	ug/kg	
105-67-9	2,4-Dimethylphenol	ND	190	39	ug/kg	
51-28-5	2,4-Dinitrophenol	ND	970	390	ug/kg	
534-52-1	4,6-Dinitro-o-cresol	ND	390	78	ug/kg	
95-48-7	2-Methylphenol	ND	190	39	ug/kg	
	3&4-Methylphenol	ND	190	39	ug/kg	
88-75-5	2-Nitrophenol	ND	190	39	ug/kg	
100-02-7	4-Nitrophenol	ND	970	390	ug/kg	
87-86-5	Pentachlorophenol	ND	970	390	ug/kg	
108-95-2	Phenol	ND	190	39	ug/kg	
95-95-4	2,4,5-Trichlorophenol	ND	190	39	ug/kg	
88-06-2	2,4,6-Trichlorophenol	ND	190	39	ug/kg	
101-55-3	4-Bromophenyl phenyl ether	ND	190	39	ug/kg	
85-68-7	Butyl benzyl phthalate	ND	390	97	ug/kg	
100-51-6	Benzyl Alcohol	ND	190	39	ug/kg	
91-58-7	2-Chloronaphthalene	ND	190	39	ug/kg	
106-47-8	4-Chloroaniline	ND	190	78	ug/kg	
86-74-8	Carbazole	ND	190	39	ug/kg	
111-91-1	bis(2-Chloroethoxy)methane	ND	190	39	ug/kg	
111-44-4	bis(2-Chloroethyl)ether	ND	190	39	ug/kg	
108-60-1	bis(2-Chloroisopropyl)ether	ND	190	39	ug/kg	
7005-72-3	4-Chlorophenyl phenyl ether	ND	190	39	ug/kg	
95-50-1	1,2-Dichlorobenzene	ND	190	39	ug/kg	
541-73-1	1,3-Dichlorobenzene	ND	190	39	ug/kg	
106-46-7	1,4-Dichlorobenzene	ND	190	39	ug/kg	
121-14-2	2,4-Dinitrotoluene	ND	190	39	ug/kg	
606-20-2	2,6-Dinitrotoluene	ND	190	39	ug/kg	
91-94-1	3,3'-Dichlorobenzidine	ND	390	78	ug/kg	
132-64-9	Dibenzofuran	ND	190	39	ug/kg	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	50SB015B		
Lab Sample ID:	F51247-20	**Date Sampled:**	07/23/07
Matrix:	SO - Soil	**Date Received:**	07/24/07
Method:	SW846 8270C SW846 3550B	**Percent Solids:**	85.3
Project:	WPA 019 Field Investigation; Radford AAP, VA		

ABN TCL List w/o PAHs

CAS No.	Compound	Result	RL	MDL	Units	Q
84-74-2	Di-n-butyl phthalate	ND	390	97	ug/kg	
117-84-0	Di-n-octyl phthalate	ND	390	97	ug/kg	
84-66-2	Diethyl phthalate	ND	390	190	ug/kg	
131-11-3	Dimethyl phthalate	ND	390	97	ug/kg	
117-81-7	bis(2-Ethylhexyl)phthalate	ND	390	190	ug/kg	
118-74-1	Hexachlorobenzene	ND	190	39	ug/kg	
87-68-3	Hexachlorobutadiene	ND	190	39	ug/kg	
77-47-4	Hexachlorocyclopentadiene	ND	190	39	ug/kg	
67-72-1	Hexachloroethane	ND	190	39	ug/kg	
78-59-1	Isophorone	ND	190	39	ug/kg	
88-74-4	2-Nitroaniline	ND	390	78	ug/kg	
99-09-2	3-Nitroaniline	ND	390	78	ug/kg	
100-01-6	4-Nitroaniline	ND	390	78	ug/kg	
98-95-3	Nitrobenzene	ND	190	39	ug/kg	
621-64-7	N-Nitroso-di-n-propylamine	ND	190	39	ug/kg	
86-30-6	N-Nitrosodiphenylamine	ND	190	39	ug/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	190	39	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol	62%		40-102%
4165-62-2	Phenol-d5	65%		41-100%
118-79-6	2,4,6-Tribromophenol	67%		42-108%
4165-60-0	Nitrobenzene-d5	56%		40-105%
321-60-8	2-Fluorobiphenyl	59%		43-107%
1718-51-0	Terphenyl-d14	72%		45-119%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	50SB015B		
Lab Sample ID:	F51247-20	**Date Sampled:**	07/23/07
Matrix:	SO - Soil	**Date Received:**	07/24/07
Method:	SW846 8270C BY SIM SW846 3550B	**Percent Solids:**	85.3
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	R09593.D	4	08/04/07	NJ	07/31/07	OP21688	SR453
Run #2							

	Initial Weight	Final Volume
Run #1	30.1 g	1.0 ml
Run #2		

BN PAH List

CAS No.	Compound	Result	RL	MDL	Units	Q
83-32-9	Acenaphthene	ND	310	78	ug/kg	
208-96-8	Acenaphthylene	ND	310	78	ug/kg	
120-12-7	Anthracene	ND	310	47	ug/kg	
56-55-3	Benzo(a)anthracene	ND	62	16	ug/kg	
50-32-8	Benzo(a)pyrene	ND	62	16	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	62	16	ug/kg	
191-24-2	Benzo(g,h,i)perylene	ND	62	16	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	62	16	ug/kg	
218-01-9	Chrysene	ND	62	16	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	62	16	ug/kg	
206-44-0	Fluoranthene	ND	310	55	ug/kg	
86-73-7	Fluorene	ND	310	47	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	62	16	ug/kg	
90-12-0	1-Methylnaphthalene	ND	310	47	ug/kg	
91-57-6	2-Methylnaphthalene	ND	310	47	ug/kg	
91-20-3	Naphthalene	ND	310	47	ug/kg	
85-01-8	Phenanthrene	ND	310	47	ug/kg	
129-00-0	Pyrene	ND	310	55	ug/kg	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Shaw Environmental, Inc.
2113 Emmorton Park Road
Edgewood, Maryland
410-612-6350
FAX: 410-612-6351

Shaw® Shaw Environmental, Inc.

MEMORANDUM

TO: Jeff Parks, Shaw E&I Radford Army Ammunition Plant (RFAAP) Project Manager

FROM: Eric Malarek, Shaw E&I Project Chemist

SUBJECT: RFAAP Data Validation - Volatiles
Accutest Laboratories, Inc., SDG F51247

DATE: November 30, 2007

The purpose of this memorandum is to present the data validation report for the samples collected at Main Manufacturing Area at RFAAP for a RFI/CMS Nine Sites on July 23, 2007. The samples were analyzed for target compound list (TCL) volatile organic compounds (VOCs) using USEPA SW846 Method 5035/8260B for solid matrices. A total of twenty solid samples were validated. The sample IDs are:

Field Sample ID	Lab Sample ID	Field Sample ID	Lab Sample ID
50SB06A	F51247-1	50SB011A	F51247-11
50SB06B	F51247-2	50SB011B	F51247-12
50SB07A	F51247-3	50SB012A	F51247-13
50SB07B	F51247-4	50SB012B	F51247-14
50SB08A	F51247-5	50SB013A	F51247-15
50SB08B	F51247-6	50SB013B	F51247-16
50SB09A	F51247-7	50SB014A	F51247-17
50SB09B	F51247-8	50SB014B	F51247-18
50SB010A	F51247-9	50SB015A	F51247-19
50SB010B	F51247-10	50SB015B	F51247-20

Data were reviewed by Eric Malarek and validated using a combination of project QAPP, *Quality Systems Manual for Environmental Laboratories, Final Version 3, January, 2006* (DoD, 2006) (DoD QSM), method-specific criteria, and laboratory SOP criteria. The data qualifier scheme was consistent with the *Region III Modifications to the National Functional Guidelines for Organic Data Review* (September 1994). Parameters evaluated are presented in **Table 1**. Data associated with parameters in compliance with quality control specifications have not been qualified. Data associated with parameters that did not comply with quality control specifications and directly impacted project data have been qualified in accordance with USEPA Region III specifications.

Table 1 Laboratory Performance Criteria

Qualified		Parameter
Yes	No	
	X	Holding Times and Preservation
	X	Instrument Performance Results
	X	Initial Calibration
X		Continuing Calibration
	X	Blank Analysis
	X	Laboratory Control Sample
X		Matrix Spike / Spike Duplicate Sample
X		System Monitoring Compounds
	X	Internal Standards
	X	Field Sample Duplicate
X		Quantitation Verification

The quality of data collected in support of this sampling activity is considered acceptable with noted qualifications.

Eric Malarek, Chemist

11/30/07
Date

RFAAP VALIDATION REPORT
VOLATILES REVIEW
SDG F51247

I-Holding Times and Preservation
The objective is to ascertain the validity of results based on the holding time of the sample from time of collection to time of analysis. Holding time criteria: For soil samples cooled @ 4°C±2°C; the maximum holding time is 14 days from sample collection to analysis.

- Temperature Review: The temperature blank was sent with each cooler and recorded by the laboratory upon receipt. For samples collected on 07/23/07, the coolers were received by the primary laboratory (Accutest) on 07/20/07 at 2.8°C, and 3.2°C. The herbicides were subcontracted to Accutest TX and were received the samples at 3.4°C. The dioxin subcontract laboratory (SGS Paradigm Analytical Laboratories, Inc.) received the samples at 1.2°C. Even though the receipt temperature was below criteria for some coolers, there were no impacts to the data quality. No qualifiers were applied based upon this outlier.

- Holding Time Review: For the solid samples collected 07/23/07, the VOCs were prepped and analyzed on 07/27/07, 07/30/07, and 07/31/07. All criteria were met. No qualifiers were applied.

II-Instrument Performance Check
The analysis of the instrument performance check solution must be performed at the beginning of each 12-hour period during which samples are analyzed.

- The instrument performance check, bromofluorobenzene (BFB), met the ion abundance criteria. No qualification was applied.

III-Initial Calibration
Compliance requirements for satisfactory instrument calibration are established to ensure that the instrument used is capable of producing acceptable qualitative and quantitative data for volatile target compounds. Initial calibration demonstrates that the instrument is capable of acceptable performance in the beginning of the analytical run and of producing a linear calibration curve. The RRF must be greater than 0.1 for chloromethane, 1,1-dichloroethane, and bromoform and greater than 0.3 for 1,1,2,2-tetrachloroethane and chlorobenzene. The minimum relative response factor (RRF) must be ≥0.05 for all other compounds. The DoD QSM specifies that the percent relative standard deviation (%RSD) must be ≤15% for each target compound and must be ≤30% for each calibration check compound. For compounds analyzed using linear regression or second order, correlation coefficients must be >0.995 and coefficients of determination >0.99. All detects are qualified as estimated "J" for where there were exceeding %RSDs, and all non-detects are qualified as estimated "UJ" for where there were grossly exceeding recoveries, unless determined to be unusable "R". Grossly exceeding is defined as twice the established criteria limits. For where there were low RRFs, all detects are qualified as estimated "J" and non-detects are rejected "R".

- For initial calibration performed on 07/16/07 on instrument MSVOA3, target compounds acetone (18.5%), methylene chloride (32.0%; grossly exceeding), ethylbenzene (15.1%), m,p-xylene (16.6%), and o-xylene (15.4%) were outside criteria. All other target compounds were within criteria (%RSD≤15% or ≤30%; RRF≥0.05). Compounds acetone (r=0.9962), methylene chloride (r=1.0000), ethylbenzene (r=0.9985), m,p-xylene (r=0.9988), and o-xylene (r=0.9990) were quantified using linear or second order regression with correlation coefficients >0.995; therefore, no qualifiers were applied based upon these outliers. Samples 50SB06A (F51247-1), 50SB06B (F51247-2), 50SB07A (F51247-3), 50SB07B (F51247-4), 50SB08A (F51247-5), 50SB08B (F51247-6), 50SB09A (F51247-7), 50SB09B (F51247-8), 50SB010A (F51247-9), 50SB010B (F51247-10), 50SB011A (F51247-11), 50SB011B (F51247-12), 50SB012A (F51247-13), 50SB012B (F51247-14), 50SB013A (F51247-15), 50SB013B (F51247-16), 50SB014A (F51247-17), 50SB014B (F51247-18), 50SB015A (F51247-19), and 50SB015B (F51247-20) were analyzed using this initial calibration. Confirmations for samples 50SB012B (F51247-14), 50SB013B (F51247-16), and 50SB015B (F51247-20) also apply to this initial calibration.

IV-Continuing Calibration

Compliance requirements for satisfactory instrument calibration are established to ensure that the instrument used is capable of producing acceptable qualitative and quantitative data for volatile target compounds. Continuing calibration establishes the 12-hour relative response factors on which the quantitations are based and checks satisfactory performance of the instrument on a day-to-day basis. The RRF must be greater than 0.1 for chloromethane, 1,1-dichloroethane, and bromoform and greater than 0.3 for 1,1,2,2-tetrachloroethane and chlorobenzene. The minimum relative response factor (RRF) must be ≥0.05 for all other compounds. The DoD QSM specifies that the percent difference (%D) between the initial calibration RRF and the continuing calibration RRF must be within 20% for all target compounds. All detects are qualified as estimated "J" for where there were exceeding %Ds, and all non-detects are qualified as estimated "UJ" for where there were grossly exceeding recoveries, unless determined to be unusable "R". Grossly exceeding is defined as twice the established criteria limits. For where there were low RRFs, all detects are qualified as estimated "J" and non-detects are rejected "R".

- For initial calibration verification performed on 07/16/07 @18:20 on instrument MSVOA3, bromomethane (36.1%) was outside criteria. All other target compounds were within criteria (%D≤20%; %Drift≤20%; RRF≥0.05). Bromomethane was non-detect for all samples; therefore, no qualifiers were applied based upon the high %D. No samples reported apply to this initial calibration verification. No qualifiers were applied based upon this outlier.

- For continuing calibration performed on 07/27/07 @11:02 on instrument MSVOA3, target compounds acetone (55.4%; grossly exceeding), 1,1,1-trichloroethane (25.9%) and carbon tetrachloride (30.4%) were outside criteria. All other target compounds were within criteria (%D≤20%; %Drift≤20%; RRF≥0.05). Acetone was qualified estimated "J" for detects and "UJ" for non-detects based upon the very high %Drift. 1,1,1-Trichloroethane and carbon tetrachloride were non-detect for all associated samples; therefore, no qualifiers were applied based upon these outliers. Samples 50SB06A (F51247-1), 50SB06B (F51247-2), 50SB07B (F51247-4), 50SB08A (F51247-5), 50SB08B (F51247-6), 50SB09A (F51247-7), and 50SB09B (F51247-8) apply to this continuing calibration.

- For continuing calibration performed on 07/30/07 @12:07 on instrument MSVOA3, target compounds acetone (43.7%; grossly exceeding), 2-butanone (35.6%), trichloroethene (21.1%), and 2-hexanone (27.0%) were outside criteria. All other target compounds were within criteria (%D≤20%; %Drift≤20%; RRF≥0.05). Acetone was qualified estimated "J" for detects and "UJ" for non-detects based upon the very high %Drift. 2-Butanone, trichloroethene, and 2-hexanone were non-detect for all associated samples; therefore, no qualifiers were applied based upon these outliers. Samples 50SB07A (F51247-3), 50SB010A (F51247-9), 50SB010B (F51247-10), 50SB011A (F51247-11), 50SB011B (F51247-12), 50SB012A (F51247-13), 50SB012B (F51247-14), 50SB013A (F51247-15), 50SB013B (F51247-16), 50SB014A (F51247-17), 50SB014B (F51247-18), 50SB015A (F51247-19), and 50SB015B (F51247-20) apply to this continuing calibration.

- For continuing calibration performed on 07/31/07 @11:12 on instrument MSVOA3, target compounds bromomethane (27.9%), chloroethane (25.4%), acetone (75.0%; grossly exceeding), and 2-butanone (22.9%) were outside criteria. All other target compounds were within criteria (%D≤20%; %Drift≤20%; RRF≥0.05). Acetone was qualified estimated "J" for detects and "UJ" for non-detects based upon the very high %Drift. Bromomethane, chloroethane, and 2-butanone were non-detect for all associated samples; therefore no qualifiers were applied based upon this outlier. Confirmations for samples 50SB012B (F51247-14), 50SB013B (F51247-16), and 50SB015B (F51247-20) apply to this continuing calibration.

V-Blank Analysis

The purpose of blank analyses is to determine the presence and magnitude of contamination problems resulting from field and laboratory activities. A method blank analysis must be performed after the calibration standards and once every 12-hour time period beginning with the injection of BFB. No contaminants should be detected in any of the associated blanks > the MDL. The DoD QSM criteria specifies all concentrations should be less than one-half MRL (<MRL for common laboratory contaminants methylene chloride, acetone, and 2-butanone). Positive sample results are reported and qualified "B", if the concentration of the compound in the sample is ≤10 times (10x) the maximum amount in any blank for the common laboratory contaminants methylene chloride, acetone, and 2-butanone (MEK), or 5 times (5X) the maximum amount for other volatile target compounds. **Table 2** summarizes the blank contamination analysis. Action levels are based upon dilution factor of one and for solid matrices were converted to soil values (soil conversion factor = 1) as needed. Rinse blanks 072407R (F51275-1) and 072507R (F51300-31) apply to the surface soil "SS" and subsurface soil "SB" samples in this SDG. The trip blank TB072307 (F51247-21) applies to the solid samples collected 07/23/07.

Table 2 Blank Contamination Analysis Summary

Analysis Date	QC Blank ID	Compound	Max Conc. µg/kg	Action Level µg/kg	B qualified samples
07/27/07	VH1663-MB	All target <½MRL	NA	NA	None
07/30/07	VH1664-MB	All target <½MRL	NA	NA	None
07/31/07	VH1665-MB	All target <½MRL	NA	NA	None
07/31/07	072407R	All target <½MRL	NA	NA	None
08/02/07	072507R	All target <½MRL	NA	NA	None
07/30/07	TB072307	All target <½MRL	NA	NA	None

NA = Not Applicable
MRL = Method Reporting Limit

VI-Laboratory Control Sample
Data for laboratory control samples (LCS) are evaluated to determine long-term accuracy of the analytical method on various matrices. Percent recoveries (%Rs) should be within the specified control limits. DoD LCS soil recovery limits are specified in Table D-5 of the DoD QSM (DoD, 2006). If the compound is not listed, then the laboratory criteria shall be used.

- Sample VH1663-BS was used as the solid LCS for the VOC analysis on 07/27/07. All criteria were met. No qualifiers were applied. Samples 50SB06A (F51247-1), 50SB06B (F51247-2), 50SB07B (F51247-4), 50SB08A (F51247-5), 50SB08B (F51247-6), 50SB09A (F51247-7), and 50SB09B (F51247-8) apply to this LCS.

- Sample VH1664-BS was used as the solid LCS for the VOC analysis on 07/30/07. All criteria were met. No qualifiers were applied. Samples 50SB07A (F51247-3), 50SB010A (F51247-9), 50SB010B (F51247-10), 50SB011A (F51247-11), 50SB011B (F51247-12), 50SB012A (F51247-13), 50SB012B (F51247-14), 50SB013A (F51247-15), 50SB013B (F51247-16), 50SB014A (F51247-17), 50SB014B (F51247-18), 50SB015A (F51247-19), and 50SB015B (F51247-20) apply to this LCS.

- Sample VH1665-BS was used as the solid LCS for the VOC analysis on 07/31/07. All criteria were met. No qualifiers were applied. Confirmations for samples 50SB012B (F51247-14), 50SB013B (F51247-16), and 50SB015B (F51247-20) apply to this LCS.

VII-Matrix Spike/Matrix Spike Duplicate
Data for matrix spike/matrix spike duplicates (MS/MSD) are generated to determine long-term precision and accuracy of the analytical method on various matrices and to demonstrate acceptable compound recovery by the laboratory at the time of sample analysis. The percent recoveries (%Rs) and the relative percent difference (RPD) must be within the specified control limits. The DoD MS/MSD solid recovery limits follow the LCS criteria and are specified in Table D-5 of the DoD QSM (DoD, 2006). If the compound is not listed, then the laboratory criteria shall be used.

- Sample F51244-2 was used for the solid MS/MSD analysis for analysis on 07/27/07. Since this sample is not a RFAAP site sample, it was not evaluated. No qualifiers were applied. Samples 50SB06A (F51247-1), 50SB06B (F51247-2), 50SB07B (F51247-4), 50SB08A (F51247-5), 50SB08B (F51247-6), 50SB09A (F51247-7), and 50SB09B (F51247-8) apply to this MS/MSD.

- Sample 50SB012A (F51247-13) was used for the solid MS/MSD analysis on 07/30/07. Acetone (48%, 47%), cis-1,3-dichloropropene (74%, 73%), trans-1,3-dichloropropene (83%), 2-hexanone (50%, 53%), 4-methyl-2-pentanone (54%, 56%), methyl ethyl ketone (47%, 48%), 1,1,2,2-tetrachloroethane (67%) were outside lab criteria and/or DoD QSM criteria for the MS/MSD sample. The associated LCS was within criteria for these compounds (See Section VI). The spiked sample was qualified bias low "UL" for non-detects for acetone, cis-1,3-dichloropropene, trans-1,3-dichloropropene, 2-hexanone, 4-methyl-2-pentanone, methyl ethyl ketone, and 1,1,2,2-tetrachloroethane based upon these outliers. All other percent recoveries were within criteria for all target compounds. Samples 50SB07A (F51247-3), 50SB010A (F51247-9), 50SB010B (F51247-10), 50SB011A (F51247-11), 50SB011B (F51247-12), 50SB012A (F51247-13), 50SB012B (F51247-14), 50SB013A (F51247-15), 50SB013B (F51247-16), 50SB014A (F51247-17), 50SB014B (F51247-18), 50SB015A (F51247-19), and 50SB015B (F51247-20) apply to this MS/MSD.

- Sample 43SB10C (F51300-29) was used for the solid MS/MSD analysis on 07/31/07. Acetone (53%, 55%), carbon tetrachloride (139%, 141%), 2-hexanone (62%), 4-methyl-2-pentanone (61%), methyl bromide (156%, 155%), methyl ethyl ketone (54%, 57%), 1,1,1-trichloroethane (135%), and toluene (133%) were outside lab criteria and/or DoD QSM criteria for the MS/MSD sample. The associated LCS was within criteria for these compounds (See Section VI). The spiked sample was qualified bias low "UL" for non-detects for acetone, 2-hexanone, 4-methyl-2-pentanone, and methyl ethyl ketone based upon these outliers. No qualifiers were applied for carbon tetrachloride, methyl bromide, 1,1,1-trichloroethane, and toluene based upon the high recoveries (spiked sample was non-detect for these compounds). All other percent recoveries were within criteria for all target compounds. Confirmations for samples 50SB012B (F51247-14), 50SB013B (F51247-16), and 50SB015B (F51247-20) apply to this MS/MSD.

VIII-System Monitoring Compounds (Surrogates)

Laboratory performance on individual samples is evaluated through the review of surrogate spike samples. Recoveries for system monitoring compounds in volatile samples and blanks must be within the specified control limits. DoD surrogate recovery limits are specified in Table D-3 of the DoD QSM (DoD, 2006). If the surrogate is not listed, then the laboratory criteria shall be used.

Solid Criteria:
Dibromofluoromethane (80-121%) (DoD QSM = None Listed)
Toluene-d8 (71-130%) (DoD QSM = 85-115%)
4-Bromofluorobenzene (59-148%) (DoD QSM = 85-120%)
1,2-Dichloroethane-d4 (77-123%) (DoD QSM = None Listed)

- For sample 50SB06A (F51247-1), 4-bromofluorobenzene (122%) was outside DoD QSM criteria and within lab criteria. Since all other surrogates were within criteria, no qualifiers were applied based upon this outlier.

- For sample 50SB07A (F51247-3), 4-bromofluorobenzene (123%) was outside DoD QSM criteria and within lab criteria. Since all other surrogates were within criteria, no qualifiers were applied based upon this outlier.

- For sample 50SB010A (F51247-9), 4-bromofluorobenzene (121%) was outside DoD QSM criteria and within lab criteria. Since all other surrogates were within criteria, no qualifiers were applied based upon this outlier.

- For sample 50SB012B (F51247-14), dibromofluoromethane (124%) and 4-bromofluorobenzene (144%) were outside DoD QSM criteria and within lab criteria. All detects were qualified estimated high "K" and non-detects no qualifier based upon these outliers. The sample was rerun for confirmation with 107% (within criteria) recovery.

- For sample 50SB013B (F51247-16), 4-bromofluorobenzene (146%) was outside DoD QSM criteria and within lab criteria. Since all other surrogates were within criteria, no qualifiers were applied based upon this outlier. The sample was rerun for confirmation with 130% recovery.

- For sample 50SB015B (F51247-20), dibromofluoromethane (130%) was outside DoD QSM criteria and within lab criteria. Since all other surrogates were within criteria, no qualifiers were applied based upon this outlier. The sample was rerun for confirmation with 123% recovery.

- For all other samples, all criteria were met. No qualifiers were applied.

IX-Internal Standards (IS)
Internal standards performance criteria ensure that GC/MS sensitivity and response are stable during every analytical run. Specific criteria include: area counts (-50% to +100%) of the associated calibration standard, and retention time (± 30 seconds) from that of the associated calibration standard.

- For sample 50SB08A (F51247-5), internal standard 4 tert-butyl-alcohol-d10 was below criteria limits. No target analytes were quantified using this internal standard; therefore, no qualifiers were applied based upon this outlier. All other internal standards were within criteria.

- For sample 50SB08B (F51247-6), internal standard 4 tert-butyl-alcohol-d10 was below criteria limits. No target analytes were quantified using this internal standard; therefore, no qualifiers were applied based upon this outlier. All other internal standards were within criteria.

- For sample 50SB09B (F51247-8), internal standard 4 tert-butyl-alcohol-d10 was below criteria limits. No target analytes were quantified using this internal standard; therefore, no qualifiers were applied based upon this outlier. All other internal standards were within criteria.

- For sample 50SB010A (F51247-9), internal standard 4 tert-butyl-alcohol-d10 was below criteria limits. No target analytes were quantified using this internal standard; therefore, no qualifiers were applied based upon this outlier. All other internal standards were within criteria.

- For sample 50SB012B (F51247-14), internal standard 3 1,4-dichlorobenzene-d4 was below criteria limits. No target analytes were quantified using 1,4-dichlorobenzene-d4; therefore, no qualifiers were applied based upon this outlier. All other internal standards were within criteria. The sample was rerun for confirmation.

- For confirmation run of sample 50SB012B (F51247-14), internal standard 3 1,4-dichlorobenzene-d4 and internal standard 4 tert-butyl-alcohol-d10 were below criteria limits. No target analytes were quantified using 1,4-dichlorobenzene-d4 or tert-butyl-alcohol-d10; therefore, no qualifiers were applied based upon these outliers. All other internal standards were within criteria. The sample was rerun for confirmation.

- For sample 50SB013B (F51247-16), internal standard 3 1,4-dichlorobenzene-d4 was below criteria limits. No target analytes were quantified using 1,4-dichlorobenzene-d4; therefore, no qualifiers were applied based upon this outlier. All other internal standards were within criteria. The sample was rerun for confirmation.

- For confirmation run of sample 50SB013B (F51247-16), internal standard 3 1,4-dichlorobenzene-d4 was below criteria limits. No target analytes were quantified using 1,4-dichlorobenzene-d4; therefore, no qualifiers were applied based upon this outlier. All other internal standards were within criteria. The sample was rerun for confirmation.

- For all other samples, all criteria were met. No qualifiers were applied.

X-Field Duplicate Sample Analysis
Field duplicates were collected to identify the cumulative precision of the sampling and analytical process and sent to the laboratory blind. The RPD was calculated only for those analytes which were detected at levels exceeding the method reporting limits in both samples of the duplicate pair. Analytes that were rejected (R-qualified) in either sample of the duplicate pair were excluded from the duplicate assessment. Precision control criterion was established at 50% RPD for the solid samples. Analytical results were qualified as estimated (J) for any RPDs exceeding criteria.

- No project specific solid field duplicate was analyzed with this SDG; therefore, it was not evaluated.

XI-Quantitation Verification
The accuracy of analytical results is verified through the calculation of several parameters. The percent difference (%D) between the calculated and the reported values should be within 10%. Any sample value >MDL and <MRL or <3*MDL (whichever is greater) was qualified as estimated, "J."

Sample: 50SB012AMS (F51247-13MS), methyl ethyl ketone

Conc. (µg/kg) = {(Ax)*(Is)*(DF)*(Vp)} / {(Ais)*(RRF)*(Ws)*Fs)}
where:
Ax is the compound area
Is is the corresponding internal standard concentration (ng/mL)
DF is the dilution factor
Vp is the volume purged (mL)
Ais is the corresponding internal standard area
RRF is the relative response factor
Ws is the weight of the sample (g)
Fs is the fraction solids for the sample

Conc. µg/kg = (583457 * 50 ng/mL * 1 * 5mL) / (880802 * 0.284 * 5.06g * 0.854) =
= 135 µg/kg

Reported Conc. = 135 µg/kg
%D = 0.0%
Values were within 10% difference.

USEPA Region III Validation Qualifiers

(No Code) = Confirmed identification.

B = The analyte has been detected in the sample and the associated laboratory or field blank.

J = Indicates an estimated value for (1) estimated value due to QC non-conformance. Reported value may not be accurate or precise, (2) estimating a concentration as a tentatively identified compound as indicated by the mass spectral and retention time data, or (3) estimating a concentration ≥MDL and <MRL or <3*MDL, whichever is greater.

K = Analyte present. Reported value may be biased high (estimated) due to QC non-conformance.

L = Analyte present. Reported value may be biased low (estimated) due to QC non-conformance.

R = Unreliable result. Analyte may or may not be present in the sample due to QC non-conformance.

UL = Value is estimated bias low and not detected due to QC non-conformance. Reporting limit may be inaccurate or imprecise. Quantitation limit is probably higher.

UJ = Value is estimated and not detected due to QC non-conformance. Reporting limit may be inaccurate or imprecise.

Laboratory Qualifiers

(No Code) = Confirmed identification.

U = Not detected. The associated number indicates the compound reporting limit for the sample.

A (Dioxins) = B (Metals) = The reported value was obtained from a reading <MRL and ≥MDL and is considered estimated.

B (Organics) = The analyte or compound has been detected in the sample and laboratory method blank. It indicates probable blank contamination.

E (Metals) = Reported value is estimated because of the presence of interferences.

E (Organics) = Identifies compounds whose concentrations exceed the upper level of the calibration range.

EMPC (Dioxins) = The ion-abundance ratio between the two characteristic PCDD/PCDF ions was outside accepted ranges. The detected PCDD/PCDF was reported as an estimated maximum possible concentration (EMPC).

D = Indicates sample was analyzed at a dilution.

J = Indicates an estimated value for (1) estimating a concentration as a tentatively identified compound as indicated by the mass spectral and retention time data, or (2) estimating a concentration <MRL and ≥ MDL.

N (Organics) = Indicates presumptive evidence of a compound for tentatively identified compounds using a library search.

N (Metals) = Laboratory spike sample recovery not within control limits.

P (Organics) = Target analyte confirmation >40% difference for detected compound between the primary and secondary columns. The lower of the two values was reported.

* (Metals) = Duplicate analysis not within control limits.

* (Organics) = Surrogate outside of QC limits on both original and re-analysis.

Raw Data: H044704.D

Form I Copy

Accutest Laboratories

Report of Analysis

Client Sample ID:	50SB06A		
Lab Sample ID:	F51247-1	**Date Sampled:**	07/23/07
Matrix:	SO - Soil	**Date Received:**	07/24/07
Method:	SW846 8260B	**Percent Solids:**	88.8
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	H044704.D	1	07/27/07	SH	n/a	n/a	VH1663
Run #2							

	Initial Weight
Run #1	5.73 g
Run #2	

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND UJ	49	25	ug/kg	
71-43-2	Benzene	ND	4.9	2.0	ug/kg	
75-27-4	Bromodichloromethane	ND	4.9	2.0	ug/kg	
75-25-2	Bromoform	ND	4.9	2.0	ug/kg	
108-90-7	Chlorobenzene	ND	4.9	2.0	ug/kg	
75-00-3	Chloroethane	ND	4.9	2.9	ug/kg	
67-66-3	Chloroform	ND	4.9	2.0	ug/kg	
75-15-0	Carbon disulfide	ND	4.9	2.0	ug/kg	
56-23-5	Carbon tetrachloride	ND	4.9	2.0	ug/kg	
75-34-3	1,1-Dichloroethane	ND	4.9	2.0	ug/kg	
75-35-4	1,1-Dichloroethylene	ND	4.9	2.0	ug/kg	
107-06-2	1,2-Dichloroethane	ND	4.9	2.0	ug/kg	
78-87-5	1,2-Dichloropropane	ND	4.9	2.0	ug/kg	
124-48-1	Dibromochloromethane	ND	4.9	2.0	ug/kg	
156-59-2	cis-1,2-Dichloroethylene	ND	4.9	2.0	ug/kg	
10061-01-5	cis-1,3-Dichloropropene	ND	4.9	2.0	ug/kg	
156-60-5	trans-1,2-Dichloroethylene	ND	4.9	2.0	ug/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	4.9	2.0	ug/kg	
100-41-4	Ethylbenzene	ND	4.9	2.0	ug/kg	
591-78-6	2-Hexanone	ND	25	9.8	ug/kg	
108-10-1	4-Methyl-2-pentanone	ND	25	9.8	ug/kg	
74-83-9	Methyl bromide	ND	4.9	2.0	ug/kg	
74-87-3	Methyl chloride	ND	4.9	2.0	ug/kg	
75-09-2	Methylene chloride	ND	9.8	4.9	ug/kg	
78-93-3	Methyl ethyl ketone	ND	25	9.8	ug/kg	
100-42-5	Styrene	ND	4.9	2.0	ug/kg	
71-55-6	1,1,1-Trichloroethane	ND	4.9	2.0	ug/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	4.9	2.0	ug/kg	
79-00-5	1,1,2-Trichloroethane	ND	4.9	2.0	ug/kg	
127-18-4	Tetrachloroethylene	ND	4.9	2.0	ug/kg	
108-88-3	Toluene	ND	4.9	2.0	ug/kg	
79-01-6	Trichloroethylene	ND	4.9	2.0	ug/kg	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	50SB06A		
Lab Sample ID:	F51247-1	**Date Sampled:**	07/23/07
Matrix:	SO - Soil	**Date Received:**	07/24/07
Method:	SW846 8260B	**Percent Solids:**	88.8
Project:	WPA 019 Field Investigation; Radford AAP, VA		

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
75-01-4	Vinyl chloride	ND	4.9	2.0	ug/kg	
	m,p-Xylene	ND	9.8	2.9	ug/kg	
95-47-6	o-Xylene	ND	4.9	2.0	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	99%		80-121%
2037-26-5	Toluene-D8	99%		71-130%
460-00-4	4-Bromofluorobenzene	122%		59-148%
17060-07-0	1,2-Dichloroethane-D4	105%		77-123%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: H044705.D

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Report of Analysis

Client Sample ID:	50SB06B		
Lab Sample ID:	F51247-2	**Date Sampled:**	07/23/07
Matrix:	SO - Soil	**Date Received:**	07/24/07
Method:	SW846 8260B	**Percent Solids:**	59.6
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	H044705.D	1	07/27/07	SH	n/a	n/a	VH1663
Run #2							

	Initial Weight
Run #1	3.79 g
Run #2	

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND UJ	110	55	ug/kg	
71-43-2	Benzene	ND	11	4.4	ug/kg	
75-27-4	Bromodichloromethane	ND	11	4.4	ug/kg	
75-25-2	Bromoform	ND	11	4.4	ug/kg	
108-90-7	Chlorobenzene	ND	11	4.4	ug/kg	
75-00-3	Chloroethane	ND	11	6.6	ug/kg	
67-66-3	Chloroform	ND	11	4.4	ug/kg	
75-15-0	Carbon disulfide	ND	11	4.4	ug/kg	
56-23-5	Carbon tetrachloride	ND	11	4.4	ug/kg	
75-34-3	1,1-Dichloroethane	ND	11	4.4	ug/kg	
75-35-4	1,1-Dichloroethylene	ND	11	4.4	ug/kg	
107-06-2	1,2-Dichloroethane	ND	11	4.4	ug/kg	
78-87-5	1,2-Dichloropropane	ND	11	4.4	ug/kg	
124-48-1	Dibromochloromethane	ND	11	4.4	ug/kg	
156-59-2	cis-1,2-Dichloroethylene	ND	11	4.4	ug/kg	
10061-01-5	cis-1,3-Dichloropropene	ND	11	4.4	ug/kg	
156-60-5	trans-1,2-Dichloroethylene	ND	11	4.4	ug/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	11	4.4	ug/kg	
100-41-4	Ethylbenzene	ND	11	4.4	ug/kg	
591-78-6	2-Hexanone	ND	55	22	ug/kg	
108-10-1	4-Methyl-2-pentanone	ND	55	22	ug/kg	
74-83-9	Methyl bromide	ND	11	4.4	ug/kg	
74-87-3	Methyl chloride	ND	11	4.4	ug/kg	
75-09-2	Methylene chloride	ND	22	11	ug/kg	
78-93-3	Methyl ethyl ketone	ND	55	22	ug/kg	
100-42-5	Styrene	ND	11	4.4	ug/kg	
71-55-6	1,1,1-Trichloroethane	ND	11	4.4	ug/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	11	4.4	ug/kg	
79-00-5	1,1,2-Trichloroethane	ND	11	4.4	ug/kg	
127-18-4	Tetrachloroethylene	ND	11	4.4	ug/kg	
108-88-3	Toluene	ND	11	4.4	ug/kg	
79-01-6	Trichloroethylene	ND	11	4.4	ug/kg	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	50SB06B		
Lab Sample ID:	F51247-2	**Date Sampled:**	07/23/07
Matrix:	SO - Soil	**Date Received:**	07/24/07
Method:	SW846 8260B	**Percent Solids:**	59.6
Project:	WPA 019 Field Investigation; Radford AAP, VA		

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
75-01-4	Vinyl chloride	ND	11	4.4	ug/kg	
	m,p-Xylene	ND	22	6.6	ug/kg	
95-47-6	o-Xylene	ND	11	4.4	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	100%		80-121%
2037-26-5	Toluene-D8	99%		71-130%
460-00-4	4-Bromofluorobenzene	112%		59-148%
17060-07-0	1,2-Dichloroethane-D4	101%		77-123%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	50SB07A		
Lab Sample ID:	F51247-3	**Date Sampled:**	07/23/07
Matrix:	SO - Soil	**Date Received:**	07/24/07
Method:	SW846 8260B	**Percent Solids:**	88.4
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	H044741.D	1	07/30/07	SH	n/a	n/a	VH1664
Run #2							

	Initial Weight
Run #1	3.13 g
Run #2	

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND VT	90	45	ug/kg	
71-43-2	Benzene	ND	9.0	3.6	ug/kg	
75-27-4	Bromodichloromethane	ND	9.0	3.6	ug/kg	
75-25-2	Bromoform	ND	9.0	3.6	ug/kg	
108-90-7	Chlorobenzene	ND	9.0	3.6	ug/kg	
75-00-3	Chloroethane	ND	9.0	5.4	ug/kg	
67-66-3	Chloroform	ND	9.0	3.6	ug/kg	
75-15-0	Carbon disulfide	ND	9.0	3.6	ug/kg	
56-23-5	Carbon tetrachloride	ND	9.0	3.6	ug/kg	
75-34-3	1,1-Dichloroethane	ND	9.0	3.6	ug/kg	
75-35-4	1,1-Dichloroethylene	ND	9.0	3.6	ug/kg	
107-06-2	1,2-Dichloroethane	ND	9.0	3.6	ug/kg	
78-87-5	1,2-Dichloropropane	ND	9.0	3.6	ug/kg	
124-48-1	Dibromochloromethane	ND	9.0	3.6	ug/kg	
156-59-2	cis-1,2-Dichloroethylene	ND	9.0	3.6	ug/kg	
10061-01-5	cis-1,3-Dichloropropene	ND	9.0	3.6	ug/kg	
156-60-5	trans-1,2-Dichloroethylene	ND	9.0	3.6	ug/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	9.0	3.6	ug/kg	
100-41-4	Ethylbenzene	ND	9.0	3.6	ug/kg	
591-78-6	2-Hexanone	ND	45	18	ug/kg	
108-10-1	4-Methyl-2-pentanone	ND	45	18	ug/kg	
74-83-9	Methyl bromide	ND	9.0	3.6	ug/kg	
74-87-3	Methyl chloride	ND	9.0	3.6	ug/kg	
75-09-2	Methylene chloride	ND	18	9.0	ug/kg	
78-93-3	Methyl ethyl ketone	ND	45	18	ug/kg	
100-42-5	Styrene	ND	9.0	3.6	ug/kg	
71-55-6	1,1,1-Trichloroethane	ND	9.0	3.6	ug/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	9.0	3.6	ug/kg	
79-00-5	1,1,2-Trichloroethane	ND	9.0	3.6	ug/kg	
127-18-4	Tetrachloroethylene	ND	9.0	3.6	ug/kg	
108-88-3	Toluene	ND	9.0	3.6	ug/kg	
79-01-6	Trichloroethylene	ND	9.0	3.6	ug/kg	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	50SB07A		
Lab Sample ID:	F51247-3	**Date Sampled:**	07/23/07
Matrix:	SO - Soil	**Date Received:**	07/24/07
Method:	SW846 8260B	**Percent Solids:**	88.4
Project:	WPA 019 Field Investigation; Radford AAP, VA		

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
75-01-4	Vinyl chloride	ND	9.0	3.6	ug/kg	
	m,p-Xylene	ND	18	5.4	ug/kg	
95-47-6	o-Xylene	ND	9.0	3.6	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	110%		80-121%
2037-26-5	Toluene-D8	101%		71-130%
460-00-4	4-Bromofluorobenzene	123%		59-148%
17060-07-0	1,2-Dichloroethane-D4	118%		77-123%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	50SB07B		
Lab Sample ID:	F51247-4	**Date Sampled:**	07/23/07
Matrix:	SO - Soil	**Date Received:**	07/24/07
Method:	SW846 8260B	**Percent Solids:**	59.3
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	H044707.D	1	07/27/07	SH	n/a	n/a	VH1663
Run #2							

	Initial Weight
Run #1	4.36 g
Run #2	

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND UJ	97	48	ug/kg	
71-43-2	Benzene	ND	9.7	3.9	ug/kg	
75-27-4	Bromodichloromethane	ND	9.7	3.9	ug/kg	
75-25-2	Bromoform	ND	9.7	3.9	ug/kg	
108-90-7	Chlorobenzene	ND	9.7	3.9	ug/kg	
75-00-3	Chloroethane	ND	9.7	5.8	ug/kg	
67-66-3	Chloroform	ND	9.7	3.9	ug/kg	
75-15-0	Carbon disulfide	ND	9.7	3.9	ug/kg	
56-23-5	Carbon tetrachloride	ND	9.7	3.9	ug/kg	
75-34-3	1,1-Dichloroethane	ND	9.7	3.9	ug/kg	
75-35-4	1,1-Dichloroethylene	ND	9.7	3.9	ug/kg	
107-06-2	1,2-Dichloroethane	ND	9.7	3.9	ug/kg	
78-87-5	1,2-Dichloropropane	ND	9.7	3.9	ug/kg	
124-48-1	Dibromochloromethane	ND	9.7	3.9	ug/kg	
156-59-2	cis-1,2-Dichloroethylene	ND	9.7	3.9	ug/kg	
10061-01-5	cis-1,3-Dichloropropene	ND	9.7	3.9	ug/kg	
156-60-5	trans-1,2-Dichloroethylene	ND	9.7	3.9	ug/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	9.7	3.9	ug/kg	
100-41-4	Ethylbenzene	ND	9.7	3.9	ug/kg	
591-78-6	2-Hexanone	ND	48	19	ug/kg	
108-10-1	4-Methyl-2-pentanone	ND	48	19	ug/kg	
74-83-9	Methyl bromide	ND	9.7	3.9	ug/kg	
74-87-3	Methyl chloride	ND	9.7	3.9	ug/kg	
75-09-2	Methylene chloride	ND	19	9.7	ug/kg	
78-93-3	Methyl ethyl ketone	ND	48	19	ug/kg	
100-42-5	Styrene	ND	9.7	3.9	ug/kg	
71-55-6	1,1,1-Trichloroethane	ND	9.7	3.9	ug/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	9.7	3.9	ug/kg	
79-00-5	1,1,2-Trichloroethane	ND	9.7	3.9	ug/kg	
127-18-4	Tetrachloroethylene	ND	9.7	3.9	ug/kg	
108-88-3	Toluene	ND	9.7	3.9	ug/kg	
79-01-6	Trichloroethylene	ND	9.7	3.9	ug/kg	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	50SB07B		
Lab Sample ID:	F51247-4	**Date Sampled:**	07/23/07
Matrix:	SO - Soil	**Date Received:**	07/24/07
Method:	SW846 8260B	**Percent Solids:**	59.3
Project:	WPA 019 Field Investigation; Radford AAP, VA		

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
75-01-4	Vinyl chloride	ND	9.7	3.9	ug/kg	
	m,p-Xylene	ND	19	5.8	ug/kg	
95-47-6	o-Xylene	ND	9.7	3.9	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	104%		80-121%
2037-26-5	Toluene-D8	100%		71-130%
460-00-4	4-Bromofluorobenzene	118%		59-148%
17060-07-0	1,2-Dichloroethane-D4	105%		77-123%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: H044708.D

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Report of Analysis

Client Sample ID:	50SB08A		
Lab Sample ID:	F51247-5	**Date Sampled:**	07/23/07
Matrix:	SO - Soil	**Date Received:**	07/24/07
Method:	SW846 8260B	**Percent Solids:**	86.6
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	H044708.D	1	07/27/07	SH	n/a	n/a	VH1663
Run #2							

	Initial Weight
Run #1	4.70 g
Run #2	

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone [a]	74.5 J	61	31	ug/kg	
71-43-2	Benzene	ND	6.1	2.5	ug/kg	
75-27-4	Bromodichloromethane	ND	6.1	2.5	ug/kg	
75-25-2	Bromoform	ND	6.1	2.5	ug/kg	
108-90-7	Chlorobenzene	ND	6.1	2.5	ug/kg	
75-00-3	Chloroethane	ND	6.1	3.7	ug/kg	
67-66-3	Chloroform	ND	6.1	2.5	ug/kg	
75-15-0	Carbon disulfide	ND	6.1	2.5	ug/kg	
56-23-5	Carbon tetrachloride	ND	6.1	2.5	ug/kg	
75-34-3	1,1-Dichloroethane	ND	6.1	2.5	ug/kg	
75-35-4	1,1-Dichloroethylene	ND	6.1	2.5	ug/kg	
107-06-2	1,2-Dichloroethane	ND	6.1	2.5	ug/kg	
78-87-5	1,2-Dichloropropane	ND	6.1	2.5	ug/kg	
124-48-1	Dibromochloromethane	ND	6.1	2.5	ug/kg	
156-59-2	cis-1,2-Dichloroethylene	ND	6.1	2.5	ug/kg	
10061-01-5	cis-1,3-Dichloropropene	ND	6.1	2.5	ug/kg	
156-60-5	trans-1,2-Dichloroethylene	ND	6.1	2.5	ug/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	6.1	2.5	ug/kg	
100-41-4	Ethylbenzene	ND	6.1	2.5	ug/kg	
591-78-6	2-Hexanone	ND	31	12	ug/kg	
108-10-1	4-Methyl-2-pentanone	ND	31	12	ug/kg	
74-83-9	Methyl bromide	ND	6.1	2.5	ug/kg	
74-87-3	Methyl chloride	ND	6.1	2.5	ug/kg	
75-09-2	Methylene chloride	ND	12	6.1	ug/kg	
78-93-3	Methyl ethyl ketone	ND	31	12	ug/kg	
100-42-5	Styrene	ND	6.1	2.5	ug/kg	
71-55-6	1,1,1-Trichloroethane	ND	6.1	2.5	ug/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	6.1	2.5	ug/kg	
79-00-5	1,1,2-Trichloroethane	ND	6.1	2.5	ug/kg	
127-18-4	Tetrachloroethylene	ND	6.1	2.5	ug/kg	
108-88-3	Toluene	ND	6.1	2.5	ug/kg	
79-01-6	Trichloroethylene	ND	6.1	2.5	ug/kg	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	50SB08A		
Lab Sample ID:	F51247-5	**Date Sampled:**	07/23/07
Matrix:	SO - Soil	**Date Received:**	07/24/07
Method:	SW846 8260B	**Percent Solids:**	86.6
Project:	WPA 019 Field Investigation; Radford AAP, VA		

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
75-01-4	Vinyl chloride	ND	6.1	2.5	ug/kg	
	m,p-Xylene	ND	12	3.7	ug/kg	
95-47-6	o-Xylene	ND	6.1	2.5	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	103%		80-121%
2037-26-5	Toluene-D8	102%		71-130%
460-00-4	4-Bromofluorobenzene	115%		59-148%
17060-07-0	1,2-Dichloroethane-D4	105%		77-123%

(a) CCV outside of control limits; results may be biased high.

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: H044709.D

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Report of Analysis

Client Sample ID:	50SB08B		
Lab Sample ID:	F51247-6	**Date Sampled:**	07/23/07
Matrix:	SO - Soil	**Date Received:**	07/24/07
Method:	SW846 8260B	**Percent Solids:**	63.6
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	H044709.D	1	07/27/07	SH	n/a	n/a	VH1663
Run #2							

	Initial Weight
Run #1	4.12 g
Run #2	

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND UJ	95	48	ug/kg	
71-43-2	Benzene	ND	9.5	3.8	ug/kg	
75-27-4	Bromodichloromethane	ND	9.5	3.8	ug/kg	
75-25-2	Bromoform	ND	9.5	3.8	ug/kg	
108-90-7	Chlorobenzene	ND	9.5	3.8	ug/kg	
75-00-3	Chloroethane	ND	9.5	5.7	ug/kg	
67-66-3	Chloroform	ND	9.5	3.8	ug/kg	
75-15-0	Carbon disulfide	ND	9.5	3.8	ug/kg	
56-23-5	Carbon tetrachloride	ND	9.5	3.8	ug/kg	
75-34-3	1,1-Dichloroethane	ND	9.5	3.8	ug/kg	
75-35-4	1,1-Dichloroethylene	ND	9.5	3.8	ug/kg	
107-06-2	1,2-Dichloroethane	ND	9.5	3.8	ug/kg	
78-87-5	1,2-Dichloropropane	ND	9.5	3.8	ug/kg	
124-48-1	Dibromochloromethane	ND	9.5	3.8	ug/kg	
156-59-2	cis-1,2-Dichloroethylene	ND	9.5	3.8	ug/kg	
10061-01-5	cis-1,3-Dichloropropene	ND	9.5	3.8	ug/kg	
156-60-5	trans-1,2-Dichloroethylene	ND	9.5	3.8	ug/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	9.5	3.8	ug/kg	
100-41-4	Ethylbenzene	ND	9.5	3.8	ug/kg	
591-78-6	2-Hexanone	ND	48	19	ug/kg	
108-10-1	4-Methyl-2-pentanone	ND	48	19	ug/kg	
74-83-9	Methyl bromide	ND	9.5	3.8	ug/kg	
74-87-3	Methyl chloride	ND	9.5	3.8	ug/kg	
75-09-2	Methylene chloride	ND	19	9.5	ug/kg	
78-93-3	Methyl ethyl ketone	ND	48	19	ug/kg	
100-42-5	Styrene	ND	9.5	3.8	ug/kg	
71-55-6	1,1,1-Trichloroethane	ND	9.5	3.8	ug/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	9.5	3.8	ug/kg	
79-00-5	1,1,2-Trichloroethane	ND	9.5	3.8	ug/kg	
127-18-4	Tetrachloroethylene	ND	9.5	3.8	ug/kg	
108-88-3	Toluene	ND	9.5	3.8	ug/kg	
79-01-6	Trichloroethylene	ND	9.5	3.8	ug/kg	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	50SB08B		
Lab Sample ID:	F51247-6	**Date Sampled:**	07/23/07
Matrix:	SO - Soil	**Date Received:**	07/24/07
Method:	SW846 8260B	**Percent Solids:**	63.6
Project:	WPA 019 Field Investigation; Radford AAP, VA		

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
75-01-4	Vinyl chloride	ND	9.5	3.8	ug/kg	
	m,p-Xylene	ND	19	5.7	ug/kg	
95-47-6	o-Xylene	ND	9.5	3.8	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	104%		80-121%
2037-26-5	Toluene-D8	102%		71-130%
460-00-4	4-Bromofluorobenzene	116%		59-148%
17060-07-0	1,2-Dichloroethane-D4	107%		77-123%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: H044710.D

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Report of Analysis

Client Sample ID:	50SB09A		
Lab Sample ID:	F51247-7	**Date Sampled:**	07/23/07
Matrix:	SO - Soil	**Date Received:**	07/24/07
Method:	SW846 8260B	**Percent Solids:**	83.8
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	H044710.D	1	07/27/07	SH	n/a	n/a	VH1663
Run #2							

	Initial Weight
Run #1	4.08 g
Run #2	

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND UJ	73	37	ug/kg	
71-43-2	Benzene	ND	7.3	2.9	ug/kg	
75-27-4	Bromodichloromethane	ND	7.3	2.9	ug/kg	
75-25-2	Bromoform	ND	7.3	2.9	ug/kg	
108-90-7	Chlorobenzene	ND	7.3	2.9	ug/kg	
75-00-3	Chloroethane	ND	7.3	4.4	ug/kg	
67-66-3	Chloroform	ND	7.3	2.9	ug/kg	
75-15-0	Carbon disulfide	ND	7.3	2.9	ug/kg	
56-23-5	Carbon tetrachloride	ND	7.3	2.9	ug/kg	
75-34-3	1,1-Dichloroethane	ND	7.3	2.9	ug/kg	
75-35-4	1,1-Dichloroethylene	ND	7.3	2.9	ug/kg	
107-06-2	1,2-Dichloroethane	ND	7.3	2.9	ug/kg	
78-87-5	1,2-Dichloropropane	ND	7.3	2.9	ug/kg	
124-48-1	Dibromochloromethane	ND	7.3	2.9	ug/kg	
156-59-2	cis-1,2-Dichloroethylene	ND	7.3	2.9	ug/kg	
10061-01-5	cis-1,3-Dichloropropene	ND	7.3	2.9	ug/kg	
156-60-5	trans-1,2-Dichloroethylene	ND	7.3	2.9	ug/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	7.3	2.9	ug/kg	
100-41-4	Ethylbenzene	ND	7.3	2.9	ug/kg	
591-78-6	2-Hexanone	ND	37	15	ug/kg	
108-10-1	4-Methyl-2-pentanone	ND	37	15	ug/kg	
74-83-9	Methyl bromide	ND	7.3	2.9	ug/kg	
74-87-3	Methyl chloride	ND	7.3	2.9	ug/kg	
75-09-2	Methylene chloride	ND	15	7.3	ug/kg	
78-93-3	Methyl ethyl ketone	ND	37	15	ug/kg	
100-42-5	Styrene	ND	7.3	2.9	ug/kg	
71-55-6	1,1,1-Trichloroethane	ND	7.3	2.9	ug/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	7.3	2.9	ug/kg	
79-00-5	1,1,2-Trichloroethane	ND	7.3	2.9	ug/kg	
127-18-4	Tetrachloroethylene	ND	7.3	2.9	ug/kg	
108-88-3	Toluene	ND	7.3	2.9	ug/kg	
79-01-6	Trichloroethylene	ND	7.3	2.9	ug/kg	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	50SB09A		
Lab Sample ID:	F51247-7	**Date Sampled:**	07/23/07
Matrix:	SO - Soil	**Date Received:**	07/24/07
Method:	SW846 8260B	**Percent Solids:**	83.8
Project:	WPA 019 Field Investigation; Radford AAP, VA		

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
75-01-4	Vinyl chloride	ND	7.3	2.9	ug/kg	
	m,p-Xylene	ND	15	4.4	ug/kg	
95-47-6	o-Xylene	ND	7.3	2.9	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	104%		80-121%
2037-26-5	Toluene-D8	99%		71-130%
460-00-4	4-Bromofluorobenzene	114%		59-148%
17060-07-0	1,2-Dichloroethane-D4	108%		77-123%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: H044711.D

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Report of Analysis

Client Sample ID:	50SB09B		
Lab Sample ID:	F51247-8	**Date Sampled:**	07/23/07
Matrix:	SO - Soil	**Date Received:**	07/24/07
Method:	SW846 8260B	**Percent Solids:**	62.0
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	H044711.D	1	07/27/07	SH	n/a	n/a	VH1663
Run #2							

	Initial Weight
Run #1	4.07 g
Run #2	

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND UJ	99	50	ug/kg	
71-43-2	Benzene	ND	9.9	4.0	ug/kg	
75-27-4	Bromodichloromethane	ND	9.9	4.0	ug/kg	
75-25-2	Bromoform	ND	9.9	4.0	ug/kg	
108-90-7	Chlorobenzene	ND	9.9	4.0	ug/kg	
75-00-3	Chloroethane	ND	9.9	5.9	ug/kg	
67-66-3	Chloroform	ND	9.9	4.0	ug/kg	
75-15-0	Carbon disulfide	ND	9.9	4.0	ug/kg	
56-23-5	Carbon tetrachloride	ND	9.9	4.0	ug/kg	
75-34-3	1,1-Dichloroethane	ND	9.9	4.0	ug/kg	
75-35-4	1,1-Dichloroethylene	ND	9.9	4.0	ug/kg	
107-06-2	1,2-Dichloroethane	ND	9.9	4.0	ug/kg	
78-87-5	1,2-Dichloropropane	ND	9.9	4.0	ug/kg	
124-48-1	Dibromochloromethane	ND	9.9	4.0	ug/kg	
156-59-2	cis-1,2-Dichloroethylene	ND	9.9	4.0	ug/kg	
10061-01-5	cis-1,3-Dichloropropene	ND	9.9	4.0	ug/kg	
156-60-5	trans-1,2-Dichloroethylene	ND	9.9	4.0	ug/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	9.9	4.0	ug/kg	
100-41-4	Ethylbenzene	ND	9.9	4.0	ug/kg	
591-78-6	2-Hexanone	ND	50	20	ug/kg	
108-10-1	4-Methyl-2-pentanone	ND	50	20	ug/kg	
74-83-9	Methyl bromide	ND	9.9	4.0	ug/kg	
74-87-3	Methyl chloride	ND	9.9	4.0	ug/kg	
75-09-2	Methylene chloride	ND	20	9.9	ug/kg	
78-93-3	Methyl ethyl ketone	ND	50	20	ug/kg	
100-42-5	Styrene	ND	9.9	4.0	ug/kg	
71-55-6	1,1,1-Trichloroethane	ND	9.9	4.0	ug/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	9.9	4.0	ug/kg	
79-00-5	1,1,2-Trichloroethane	ND	9.9	4.0	ug/kg	
127-18-4	Tetrachloroethylene	ND	9.9	4.0	ug/kg	
108-88-3	Toluene	ND	9.9	4.0	ug/kg	
79-01-6	Trichloroethylene	ND	9.9	4.0	ug/kg	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	50SB09B		
Lab Sample ID:	F51247-8	**Date Sampled:**	07/23/07
Matrix:	SO - Soil	**Date Received:**	07/24/07
Method:	SW846 8260B	**Percent Solids:**	62.0
Project:	WPA 019 Field Investigation; Radford AAP, VA		

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
75-01-4	Vinyl chloride	ND	9.9	4.0	ug/kg	
	m,p-Xylene	ND	20	5.9	ug/kg	
95-47-6	o-Xylene	ND	9.9	4.0	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	112%		80-121%
2037-26-5	Toluene-D8	97%		71-130%
460-00-4	4-Bromofluorobenzene	110%		59-148%
17060-07-0	1,2-Dichloroethane-D4	121%		77-123%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	50SB010A		
Lab Sample ID:	F51247-9	**Date Sampled:**	07/23/07
Matrix:	SO - Soil	**Date Received:**	07/24/07
Method:	SW846 8260B	**Percent Solids:**	92.6
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	H044725.D	1	07/30/07	SH	n/a	n/a	VH1664
Run #2							

	Initial Weight
Run #1	4.94 g
Run #2	

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND UJ	55	27	ug/kg	
71-43-2	Benzene	ND	5.5	2.2	ug/kg	
75-27-4	Bromodichloromethane	ND	5.5	2.2	ug/kg	
75-25-2	Bromoform	ND	5.5	2.2	ug/kg	
108-90-7	Chlorobenzene	ND	5.5	2.2	ug/kg	
75-00-3	Chloroethane	ND	5.5	3.3	ug/kg	
67-66-3	Chloroform	ND	5.5	2.2	ug/kg	
75-15-0	Carbon disulfide	ND	5.5	2.2	ug/kg	
56-23-5	Carbon tetrachloride	ND	5.5	2.2	ug/kg	
75-34-3	1,1-Dichloroethane	ND	5.5	2.2	ug/kg	
75-35-4	1,1-Dichloroethylene	ND	5.5	2.2	ug/kg	
107-06-2	1,2-Dichloroethane	ND	5.5	2.2	ug/kg	
78-87-5	1,2-Dichloropropane	ND	5.5	2.2	ug/kg	
124-48-1	Dibromochloromethane	ND	5.5	2.2	ug/kg	
156-59-2	cis-1,2-Dichloroethylene	ND	5.5	2.2	ug/kg	
10061-01-5	cis-1,3-Dichloropropene	ND	5.5	2.2	ug/kg	
156-60-5	trans-1,2-Dichloroethylene	ND	5.5	2.2	ug/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	5.5	2.2	ug/kg	
100-41-4	Ethylbenzene	ND	5.5	2.2	ug/kg	
591-78-6	2-Hexanone	ND	27	11	ug/kg	
108-10-1	4-Methyl-2-pentanone	ND	27	11	ug/kg	
74-83-9	Methyl bromide	ND	5.5	2.2	ug/kg	
74-87-3	Methyl chloride	ND	5.5	2.2	ug/kg	
75-09-2	Methylene chloride	ND	11	5.5	ug/kg	
78-93-3	Methyl ethyl ketone	ND	27	11	ug/kg	
100-42-5	Styrene	ND	5.5	2.2	ug/kg	
71-55-6	1,1,1-Trichloroethane	ND	5.5	2.2	ug/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	5.5	2.2	ug/kg	
79-00-5	1,1,2-Trichloroethane	ND	5.5	2.2	ug/kg	
127-18-4	Tetrachloroethylene	ND	5.5	2.2	ug/kg	
108-88-3	Toluene	ND	5.5	2.2	ug/kg	
79-01-6	Trichloroethylene	ND	5.5	2.2	ug/kg	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	50SB010A		
Lab Sample ID:	F51247-9	**Date Sampled:**	07/23/07
Matrix:	SO - Soil	**Date Received:**	07/24/07
Method:	SW846 8260B	**Percent Solids:**	92.6
Project:	WPA 019 Field Investigation; Radford AAP, VA		

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
75-01-4	Vinyl chloride	ND	5.5	2.2	ug/kg	
	m,p-Xylene	ND	11	3.3	ug/kg	
95-47-6	o-Xylene	ND	5.5	2.2	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	108%		80-121%
2037-26-5	Toluene-D8	102%		71-130%
460-00-4	4-Bromofluorobenzene	121%		59-148%
17060-07-0	1,2-Dichloroethane-D4	107%		77-123%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	50SB010B		
Lab Sample ID:	F51247-10	Date Sampled:	07/23/07
Matrix:	SO - Soil	Date Received:	07/24/07
Method:	SW846 8260B	Percent Solids:	76.6
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	H044726.D	1	07/30/07	SH	n/a	n/a	VH1664
Run #2							

	Initial Weight
Run #1	5.40 g
Run #2	

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND UJ	60	30	ug/kg	
71-43-2	Benzene	ND	6.0	2.4	ug/kg	
75-27-4	Bromodichloromethane	ND	6.0	2.4	ug/kg	
75-25-2	Bromoform	ND	6.0	2.4	ug/kg	
108-90-7	Chlorobenzene	ND	6.0	2.4	ug/kg	
75-00-3	Chloroethane	ND	6.0	3.6	ug/kg	
67-66-3	Chloroform	ND	6.0	2.4	ug/kg	
75-15-0	Carbon disulfide	ND	6.0	2.4	ug/kg	
56-23-5	Carbon tetrachloride	ND	6.0	2.4	ug/kg	
75-34-3	1,1-Dichloroethane	ND	6.0	2.4	ug/kg	
75-35-4	1,1-Dichloroethylene	ND	6.0	2.4	ug/kg	
107-06-2	1,2-Dichloroethane	ND	6.0	2.4	ug/kg	
78-87-5	1,2-Dichloropropane	ND	6.0	2.4	ug/kg	
124-48-1	Dibromochloromethane	ND	6.0	2.4	ug/kg	
156-59-2	cis-1,2-Dichloroethylene	ND	6.0	2.4	ug/kg	
10061-01-5	cis-1,3-Dichloropropene	ND	6.0	2.4	ug/kg	
156-60-5	trans-1,2-Dichloroethylene	ND	6.0	2.4	ug/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	6.0	2.4	ug/kg	
100-41-4	Ethylbenzene	ND	6.0	2.4	ug/kg	
591-78-6	2-Hexanone	ND	30	12	ug/kg	
108-10-1	4-Methyl-2-pentanone	ND	30	12	ug/kg	
74-83-9	Methyl bromide	ND	6.0	2.4	ug/kg	
74-87-3	Methyl chloride	ND	6.0	2.4	ug/kg	
75-09-2	Methylene chloride	ND	12	6.0	ug/kg	
78-93-3	Methyl ethyl ketone	ND	30	12	ug/kg	
100-42-5	Styrene	ND	6.0	2.4	ug/kg	
71-55-6	1,1,1-Trichloroethane	ND	6.0	2.4	ug/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	6.0	2.4	ug/kg	
79-00-5	1,1,2-Trichloroethane	ND	6.0	2.4	ug/kg	
127-18-4	Tetrachloroethylene	ND	6.0	2.4	ug/kg	
108-88-3	Toluene	ND	6.0	2.4	ug/kg	
79-01-6	Trichloroethylene	ND	6.0	2.4	ug/kg	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	50SB010B		
Lab Sample ID:	F51247-10	**Date Sampled:**	07/23/07
Matrix:	SO - Soil	**Date Received:**	07/24/07
Method:	SW846 8260B	**Percent Solids:**	76.6
Project:	WPA 019 Field Investigation; Radford AAP, VA		

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
75-01-4	Vinyl chloride	ND	6.0	2.4	ug/kg	
	m,p-Xylene	ND	12	3.6	ug/kg	
95-47-6	o-Xylene	ND	6.0	2.4	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	102%		80-121%
2037-26-5	Toluene-D8	99%		71-130%
460-00-4	4-Bromofluorobenzene	110%		59-148%
17060-07-0	1,2-Dichloroethane-D4	106%		77-123%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	50SB011A		
Lab Sample ID:	F51247-11	**Date Sampled:**	07/23/07
Matrix:	SO - Soil	**Date Received:**	07/24/07
Method:	SW846 8260B	**Percent Solids:**	92.1
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	H044727.D	1	07/30/07	SH	n/a	n/a	VH1664
Run #2							

	Initial Weight
Run #1	4.90 g
Run #2	

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND UJ	55	28	ug/kg	
71-43-2	Benzene	ND	5.5	2.2	ug/kg	
75-27-4	Bromodichloromethane	ND	5.5	2.2	ug/kg	
75-25-2	Bromoform	ND	5.5	2.2	ug/kg	
108-90-7	Chlorobenzene	ND	5.5	2.2	ug/kg	
75-00-3	Chloroethane	ND	5.5	3.3	ug/kg	
67-66-3	Chloroform	ND	5.5	2.2	ug/kg	
75-15-0	Carbon disulfide	ND	5.5	2.2	ug/kg	
56-23-5	Carbon tetrachloride	ND	5.5	2.2	ug/kg	
75-34-3	1,1-Dichloroethane	ND	5.5	2.2	ug/kg	
75-35-4	1,1-Dichloroethylene	ND	5.5	2.2	ug/kg	
107-06-2	1,2-Dichloroethane	ND	5.5	2.2	ug/kg	
78-87-5	1,2-Dichloropropane	ND	5.5	2.2	ug/kg	
124-48-1	Dibromochloromethane	ND	5.5	2.2	ug/kg	
156-59-2	cis-1,2-Dichloroethylene	ND	5.5	2.2	ug/kg	
10061-01-5	cis-1,3-Dichloropropene	ND	5.5	2.2	ug/kg	
156-60-5	trans-1,2-Dichloroethylene	ND	5.5	2.2	ug/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	5.5	2.2	ug/kg	
100-41-4	Ethylbenzene	ND	5.5	2.2	ug/kg	
591-78-6	2-Hexanone	ND	28	11	ug/kg	
108-10-1	4-Methyl-2-pentanone	ND	28	11	ug/kg	
74-83-9	Methyl bromide	ND	5.5	2.2	ug/kg	
74-87-3	Methyl chloride	ND	5.5	2.2	ug/kg	
75-09-2	Methylene chloride	ND	11	5.5	ug/kg	
78-93-3	Methyl ethyl ketone	ND	28	11	ug/kg	
100-42-5	Styrene	ND	5.5	2.2	ug/kg	
71-55-6	1,1,1-Trichloroethane	ND	5.5	2.2	ug/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	5.5	2.2	ug/kg	
79-00-5	1,1,2-Trichloroethane	ND	5.5	2.2	ug/kg	
127-18-4	Tetrachloroethylene	ND	5.5	2.2	ug/kg	
108-88-3	Toluene	ND	5.5	2.2	ug/kg	
79-01-6	Trichloroethylene	ND	5.5	2.2	ug/kg	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	50SB011A		
Lab Sample ID:	F51247-11	**Date Sampled:**	07/23/07
Matrix:	SO - Soil	**Date Received:**	07/24/07
Method:	SW846 8260B	**Percent Solids:**	92.1
Project:	WPA 019 Field Investigation; Radford AAP, VA		

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
75-01-4	Vinyl chloride	ND	5.5	2.2	ug/kg	
	m,p-Xylene	ND	11	3.3	ug/kg	
95-47-6	o-Xylene	ND	5.5	2.2	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	106%		80-121%
2037-26-5	Toluene-D8	98%		71-130%
460-00-4	4-Bromofluorobenzene	109%		59-148%
17060-07-0	1,2-Dichloroethane-D4	113%		77-123%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	50SB011B		
Lab Sample ID:	F51247-12	**Date Sampled:**	07/23/07
Matrix:	SO - Soil	**Date Received:**	07/24/07
Method:	SW846 8260B	**Percent Solids:**	85.6
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	H044728.D	1	07/30/07	SH	n/a	n/a	VH1664
Run #2							

	Initial Weight
Run #1	5.92 g
Run #2	

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND UJ	49	25	ug/kg	
71-43-2	Benzene	ND	4.9	2.0	ug/kg	
75-27-4	Bromodichloromethane	ND	4.9	2.0	ug/kg	
75-25-2	Bromoform	ND	4.9	2.0	ug/kg	
108-90-7	Chlorobenzene	ND	4.9	2.0	ug/kg	
75-00-3	Chloroethane	ND	4.9	3.0	ug/kg	
67-66-3	Chloroform	ND	4.9	2.0	ug/kg	
75-15-0	Carbon disulfide	ND	4.9	2.0	ug/kg	
56-23-5	Carbon tetrachloride	ND	4.9	2.0	ug/kg	
75-34-3	1,1-Dichloroethane	ND	4.9	2.0	ug/kg	
75-35-4	1,1-Dichloroethylene	ND	4.9	2.0	ug/kg	
107-06-2	1,2-Dichloroethane	ND	4.9	2.0	ug/kg	
78-87-5	1,2-Dichloropropane	ND	4.9	2.0	ug/kg	
124-48-1	Dibromochloromethane	ND	4.9	2.0	ug/kg	
156-59-2	cis-1,2-Dichloroethylene	ND	4.9	2.0	ug/kg	
10061-01-5	cis-1,3-Dichloropropene	ND	4.9	2.0	ug/kg	
156-60-5	trans-1,2-Dichloroethylene	ND	4.9	2.0	ug/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	4.9	2.0	ug/kg	
100-41-4	Ethylbenzene	ND	4.9	2.0	ug/kg	
591-78-6	2-Hexanone	ND	25	9.9	ug/kg	
108-10-1	4-Methyl-2-pentanone	ND	25	9.9	ug/kg	
74-83-9	Methyl bromide	ND	4.9	2.0	ug/kg	
74-87-3	Methyl chloride	ND	4.9	2.0	ug/kg	
75-09-2	Methylene chloride	ND	9.9	4.9	ug/kg	
78-93-3	Methyl ethyl ketone	ND	25	9.9	ug/kg	
100-42-5	Styrene	ND	4.9	2.0	ug/kg	
71-55-6	1,1,1-Trichloroethane	ND	4.9	2.0	ug/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	4.9	2.0	ug/kg	
79-00-5	1,1,2-Trichloroethane	ND	4.9	2.0	ug/kg	
127-18-4	Tetrachloroethylene	ND	4.9	2.0	ug/kg	
108-88-3	Toluene	ND	4.9	2.0	ug/kg	
79-01-6	Trichloroethylene	ND	4.9	2.0	ug/kg	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	50SB011B		
Lab Sample ID:	F51247-12	**Date Sampled:**	07/23/07
Matrix:	SO - Soil	**Date Received:**	07/24/07
Method:	SW846 8260B	**Percent Solids:**	85.6
Project:	WPA 019 Field Investigation; Radford AAP, VA		

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
75-01-4	Vinyl chloride	ND	4.9	2.0	ug/kg	
	m,p-Xylene	ND	9.9	3.0	ug/kg	
95-47-6	o-Xylene	ND	4.9	2.0	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	105%		80-121%
2037-26-5	Toluene-D8	95%		71-130%
460-00-4	4-Bromofluorobenzene	107%		59-148%
17060-07-0	1,2-Dichloroethane-D4	111%		77-123%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	50SB012A		
Lab Sample ID:	F51247-13	**Date Sampled:**	07/23/07
Matrix:	SO - Soil	**Date Received:**	07/24/07
Method:	SW846 8260B	**Percent Solids:**	85.4
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	H044729.D	1	07/30/07	SH	n/a	n/a	VH1664
Run #2							

	Initial Weight
Run #1	4.65 g
Run #2	

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND UJ	63	31	ug/kg	
71-43-2	Benzene	ND	6.3	2.5	ug/kg	
75-27-4	Bromodichloromethane	ND	6.3	2.5	ug/kg	
75-25-2	Bromoform	ND	6.3	2.5	ug/kg	
108-90-7	Chlorobenzene	ND	6.3	2.5	ug/kg	
75-00-3	Chloroethane	ND	6.3	3.8	ug/kg	
67-66-3	Chloroform	ND	6.3	2.5	ug/kg	
75-15-0	Carbon disulfide	ND	6.3	2.5	ug/kg	
56-23-5	Carbon tetrachloride	ND	6.3	2.5	ug/kg	
75-34-3	1,1-Dichloroethane	ND	6.3	2.5	ug/kg	
75-35-4	1,1-Dichloroethylene	ND	6.3	2.5	ug/kg	
107-06-2	1,2-Dichloroethane	ND	6.3	2.5	ug/kg	
78-87-5	1,2-Dichloropropane	ND	6.3	2.5	ug/kg	
124-48-1	Dibromochloromethane	ND	6.3	2.5	ug/kg	
156-59-2	cis-1,2-Dichloroethylene	ND	6.3	2.5	ug/kg	
10061-01-5	cis-1,3-Dichloropropene	ND UL	6.3	2.5	ug/kg	
156-60-5	trans-1,2-Dichloroethylene	ND	6.3	2.5	ug/kg	
10061-02-6	trans-1,3-Dichloropropene	ND UL	6.3	2.5	ug/kg	
100-41-4	Ethylbenzene	ND	6.3	2.5	ug/kg	
591-78-6	2-Hexanone	ND UL	31	13	ug/kg	
108-10-1	4-Methyl-2-pentanone	ND UL	31	13	ug/kg	
74-83-9	Methyl bromide	ND	6.3	2.5	ug/kg	
74-87-3	Methyl chloride	ND	6.3	2.5	ug/kg	
75-09-2	Methylene chloride	ND	13	6.3	ug/kg	
78-93-3	Methyl ethyl ketone	ND UL	31	13	ug/kg	
100-42-5	Styrene	ND	6.3	2.5	ug/kg	
71-55-6	1,1,1-Trichloroethane	ND	6.3	2.5	ug/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND UL	6.3	2.5	ug/kg	
79-00-5	1,1,2-Trichloroethane	ND	6.3	2.5	ug/kg	
127-18-4	Tetrachloroethylene	ND	6.3	2.5	ug/kg	
108-88-3	Toluene	ND	6.3	2.5	ug/kg	
79-01-6	Trichloroethylene	ND	6.3	2.5	ug/kg	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	50SB012A		
Lab Sample ID:	F51247-13	**Date Sampled:**	07/23/07
Matrix:	SO - Soil	**Date Received:**	07/24/07
Method:	SW846 8260B	**Percent Solids:**	85.4
Project:	WPA 019 Field Investigation; Radford AAP, VA		

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
75-01-4	Vinyl chloride	ND	6.3	2.5	ug/kg	
	m,p-Xylene	ND	13	3.8	ug/kg	
95-47-6	o-Xylene	ND	6.3	2.5	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	107%		80-121%
2037-26-5	Toluene-D8	99%		71-130%
460-00-4	4-Bromofluorobenzene	109%		59-148%
17060-07-0	1,2-Dichloroethane-D4	110%		77-123%

ND = Not detected MDL - Method Detection Limit
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J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	50SB012B		
Lab Sample ID:	F51247-14	**Date Sampled:**	07/23/07
Matrix:	SO - Soil	**Date Received:**	07/24/07
Method:	SW846 8260B	**Percent Solids:**	67.7
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	H044758.D	1	07/31/07	SH	n/a	n/a	VH1665
Run #2 [a]	H044730.D	1	07/30/07	SH	n/a	n/a	VH1664

	Initial Weight
Run #1	4.85 g
Run #2	3.89 g

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone [b]	101 J	76	38	ug/kg	
71-43-2	Benzene	ND	7.6	1.5	ug/kg	
75-27-4	Bromodichloromethane	ND	7.6	1.5	ug/kg	
75-25-2	Bromoform	ND	7.6	1.5	ug/kg	
108-90-7	Chlorobenzene	ND	7.6	1.5	ug/kg	
75-00-3	Chloroethane	ND	7.6	4.0	ug/kg	
67-66-3	Chloroform	ND	7.6	1.5	ug/kg	
75-15-0	Carbon disulfide	ND	7.6	1.5	ug/kg	
56-23-5	Carbon tetrachloride	ND	7.6	2.0	ug/kg	
75-34-3	1,1-Dichloroethane	ND	7.6	1.7	ug/kg	
75-35-4	1,1-Dichloroethylene	ND	7.6	1.5	ug/kg	
107-06-2	1,2-Dichloroethane	ND	7.6	1.5	ug/kg	
78-87-5	1,2-Dichloropropane	ND	7.6	2.0	ug/kg	
124-48-1	Dibromochloromethane	ND	7.6	1.5	ug/kg	
156-59-2	cis-1,2-Dichloroethylene	ND	7.6	1.5	ug/kg	
10061-01-5	cis-1,3-Dichloropropene	ND	7.6	1.5	ug/kg	
156-60-5	trans-1,2-Dichloroethylene	ND	7.6	1.5	ug/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	7.6	1.5	ug/kg	
100-41-4	Ethylbenzene	ND	7.6	1.5	ug/kg	
591-78-6	2-Hexanone	ND	38	15	ug/kg	
108-10-1	4-Methyl-2-pentanone	ND	38	15	ug/kg	
74-83-9	Methyl bromide	ND	7.6	2.7	ug/kg	
74-87-3	Methyl chloride	ND	7.6	3.0	ug/kg	
75-09-2	Methylene chloride	ND	15	7.6	ug/kg	
78-93-3	Methyl ethyl ketone	ND	38	15	ug/kg	
100-42-5	Styrene	ND	7.6	1.5	ug/kg	
71-55-6	1,1,1-Trichloroethane	ND	7.6	1.5	ug/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	7.6	2.0	ug/kg	
79-00-5	1,1,2-Trichloroethane	ND	7.6	1.5	ug/kg	
127-18-4	Tetrachloroethylene	ND	7.6	1.5	ug/kg	
108-88-3	Toluene	ND	7.6	1.5	ug/kg	
79-01-6	Trichloroethylene	ND	7.6	1.5	ug/kg	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	50SB012B		
Lab Sample ID:	F51247-14	**Date Sampled:**	07/23/07
Matrix:	SO - Soil	**Date Received:**	07/24/07
Method:	SW846 8260B	**Percent Solids:**	67.7
Project:	WPA 019 Field Investigation; Radford AAP, VA		

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
75-01-4	Vinyl chloride	ND	7.6	2.1	ug/kg	
	m,p-Xylene	5.8	15	1.7	ug/kg	J
95-47-6	o-Xylene	ND	7.6	1.5	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	107%	124%	80-121%
2037-26-5	Toluene-D8	105%	113%	71-130%
460-00-4	4-Bromofluorobenzene	120%	144%	59-148%
17060-07-0	1,2-Dichloroethane-D4	108%	122%	77-123%

(a) Confirmation run.
(b) CCV outside of control limits; results may be biased high.
(c) Outside control limits due to matrix interference.

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	50SB013A		
Lab Sample ID:	F51247-15	**Date Sampled:**	07/23/07
Matrix:	SO - Soil	**Date Received:**	07/24/07
Method:	SW846 8260B	**Percent Solids:**	87.5
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	H044731.D	1	07/30/07	SH	n/a	n/a	VH1664
Run #2							

	Initial Weight
Run #1	4.93 g
Run #2	

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND UJ	58	29	ug/kg	
71-43-2	Benzene	ND	5.8	2.3	ug/kg	
75-27-4	Bromodichloromethane	ND	5.8	2.3	ug/kg	
75-25-2	Bromoform	ND	5.8	2.3	ug/kg	
108-90-7	Chlorobenzene	ND	5.8	2.3	ug/kg	
75-00-3	Chloroethane	ND	5.8	3.5	ug/kg	
67-66-3	Chloroform	ND	5.8	2.3	ug/kg	
75-15-0	Carbon disulfide	ND	5.8	2.3	ug/kg	
56-23-5	Carbon tetrachloride	ND	5.8	2.3	ug/kg	
75-34-3	1,1-Dichloroethane	ND	5.8	2.3	ug/kg	
75-35-4	1,1-Dichloroethylene	ND	5.8	2.3	ug/kg	
107-06-2	1,2-Dichloroethane	ND	5.8	2.3	ug/kg	
78-87-5	1,2-Dichloropropane	ND	5.8	2.3	ug/kg	
124-48-1	Dibromochloromethane	ND	5.8	2.3	ug/kg	
156-59-2	cis-1,2-Dichloroethylene	ND	5.8	2.3	ug/kg	
10061-01-5	cis-1,3-Dichloropropene	ND	5.8	2.3	ug/kg	
156-60-5	trans-1,2-Dichloroethylene	ND	5.8	2.3	ug/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	5.8	2.3	ug/kg	
100-41-4	Ethylbenzene	ND	5.8	2.3	ug/kg	
591-78-6	2-Hexanone	ND	29	12	ug/kg	
108-10-1	4-Methyl-2-pentanone	ND	29	12	ug/kg	
74-83-9	Methyl bromide	ND	5.8	2.3	ug/kg	
74-87-3	Methyl chloride	ND	5.8	2.3	ug/kg	
75-09-2	Methylene chloride	ND	12	5.8	ug/kg	
78-93-3	Methyl ethyl ketone	ND	29	12	ug/kg	
100-42-5	Styrene	ND	5.8	2.3	ug/kg	
71-55-6	1,1,1-Trichloroethane	ND	5.8	2.3	ug/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	5.8	2.3	ug/kg	
79-00-5	1,1,2-Trichloroethane	ND	5.8	2.3	ug/kg	
127-18-4	Tetrachloroethylene	ND	5.8	2.3	ug/kg	
108-88-3	Toluene	ND	5.8	2.3	ug/kg	
79-01-6	Trichloroethylene	ND	5.8	2.3	ug/kg	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	50SB013A		
Lab Sample ID:	F51247-15	**Date Sampled:**	07/23/07
Matrix:	SO - Soil	**Date Received:**	07/24/07
Method:	SW846 8260B	**Percent Solids:**	87.5
Project:	WPA 019 Field Investigation; Radford AAP, VA		

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
75-01-4	Vinyl chloride	ND	5.8	2.3	ug/kg	
	m,p-Xylene	ND	12	3.5	ug/kg	
95-47-6	o-Xylene	ND	5.8	2.3	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	110%		80-121%
2037-26-5	Toluene-D8	97%		71-130%
460-00-4	4-Bromofluorobenzene	113%		59-148%
17060-07-0	1,2-Dichloroethane-D4	116%		77-123%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	50SB013B		
Lab Sample ID:	F51247-16	**Date Sampled:**	07/23/07
Matrix:	SO - Soil	**Date Received:**	07/24/07
Method:	SW846 8260B	**Percent Solids:**	64.7
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	H044759.D	1	07/31/07	SH	n/a	n/a	VH1665
Run #2 [a]	H044732.D	1	07/30/07	SH	n/a	n/a	VH1664

	Initial Weight
Run #1	4.86 g
Run #2	3.32 g

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND VJ	80	40	ug/kg	
71-43-2	Benzene	ND	8.0	1.6	ug/kg	
75-27-4	Bromodichloromethane	ND	8.0	1.6	ug/kg	
75-25-2	Bromoform	ND	8.0	1.6	ug/kg	
108-90-7	Chlorobenzene	ND	8.0	1.6	ug/kg	
75-00-3	Chloroethane	ND	8.0	4.1	ug/kg	
67-66-3	Chloroform	ND	8.0	1.6	ug/kg	
75-15-0	Carbon disulfide	ND	8.0	1.6	ug/kg	
56-23-5	Carbon tetrachloride	ND	8.0	2.1	ug/kg	
75-34-3	1,1-Dichloroethane	ND	8.0	1.7	ug/kg	
75-35-4	1,1-Dichloroethylene	ND	8.0	1.6	ug/kg	
107-06-2	1,2-Dichloroethane	ND	8.0	1.6	ug/kg	
78-87-5	1,2-Dichloropropane	ND	8.0	2.1	ug/kg	
124-48-1	Dibromochloromethane	ND	8.0	1.6	ug/kg	
156-59-2	cis-1,2-Dichloroethylene	ND	8.0	1.6	ug/kg	
10061-01-5	cis-1,3-Dichloropropene	ND	8.0	1.6	ug/kg	
156-60-5	trans-1,2-Dichloroethylene	ND	8.0	1.6	ug/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	8.0	1.6	ug/kg	
100-41-4	Ethylbenzene	ND	8.0	1.6	ug/kg	
591-78-6	2-Hexanone	ND	40	16	ug/kg	
108-10-1	4-Methyl-2-pentanone	ND	40	16	ug/kg	
74-83-9	Methyl bromide	ND	8.0	2.9	ug/kg	
74-87-3	Methyl chloride	ND	8.0	3.2	ug/kg	
75-09-2	Methylene chloride	ND	16	8.0	ug/kg	
78-93-3	Methyl ethyl ketone	ND	40	16	ug/kg	
100-42-5	Styrene	ND	8.0	1.6	ug/kg	
71-55-6	1,1,1-Trichloroethane	ND	8.0	1.6	ug/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	8.0	2.1	ug/kg	
79-00-5	1,1,2-Trichloroethane	ND	8.0	1.6	ug/kg	
127-18-4	Tetrachloroethylene	ND	8.0	1.6	ug/kg	
108-88-3	Toluene	ND	8.0	1.6	ug/kg	
79-01-6	Trichloroethylene	ND	8.0	1.6	ug/kg	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	50SB013B		
Lab Sample ID:	F51247-16	**Date Sampled:**	07/23/07
Matrix:	SO - Soil	**Date Received:**	07/24/07
Method:	SW846 8260B	**Percent Solids:**	64.7
Project:	WPA 019 Field Investigation; Radford AAP, VA		

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
75-01-4	Vinyl chloride	ND	8.0	2.2	ug/kg	
	m,p-Xylene	ND	16	1.7	ug/kg	
95-47-6	o-Xylene	ND	8.0	1.6	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	111%	115%	80-121%
2037-26-5	Toluene-D8	107%	115%	71-130%
460-00-4	4-Bromofluorobenzene	130%	146%	59-148%
17060-07-0	1,2-Dichloroethane-D4	116%	121%	77-123%

(a) Confirmation run.

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: H044733.D

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Report of Analysis

Client Sample ID:	50SB014A		
Lab Sample ID:	F51247-17	**Date Sampled:**	07/23/07
Matrix:	SO - Soil	**Date Received:**	07/24/07
Method:	SW846 8260B	**Percent Solids:**	90.3
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	H044733.D	1	07/30/07	SH	n/a	n/a	VH1664
Run #2							

	Initial Weight
Run #1	4.10 g
Run #2	

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND UJ	68	34	ug/kg	
71-43-2	Benzene	ND	6.8	2.7	ug/kg	
75-27-4	Bromodichloromethane	ND	6.8	2.7	ug/kg	
75-25-2	Bromoform	ND	6.8	2.7	ug/kg	
108-90-7	Chlorobenzene	ND	6.8	2.7	ug/kg	
75-00-3	Chloroethane	ND	6.8	4.1	ug/kg	
67-66-3	Chloroform	ND	6.8	2.7	ug/kg	
75-15-0	Carbon disulfide	ND	6.8	2.7	ug/kg	
56-23-5	Carbon tetrachloride	ND	6.8	2.7	ug/kg	
75-34-3	1,1-Dichloroethane	ND	6.8	2.7	ug/kg	
75-35-4	1,1-Dichloroethylene	ND	6.8	2.7	ug/kg	
107-06-2	1,2-Dichloroethane	ND	6.8	2.7	ug/kg	
78-87-5	1,2-Dichloropropane	ND	6.8	2.7	ug/kg	
124-48-1	Dibromochloromethane	ND	6.8	2.7	ug/kg	
156-59-2	cis-1,2-Dichloroethylene	ND	6.8	2.7	ug/kg	
10061-01-5	cis-1,3-Dichloropropene	ND	6.8	2.7	ug/kg	
156-60-5	trans-1,2-Dichloroethylene	ND	6.8	2.7	ug/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	6.8	2.7	ug/kg	
100-41-4	Ethylbenzene	ND	6.8	2.7	ug/kg	
591-78-6	2-Hexanone	ND	34	14	ug/kg	
108-10-1	4-Methyl-2-pentanone	ND	34	14	ug/kg	
74-83-9	Methyl bromide	ND	6.8	2.7	ug/kg	
74-87-3	Methyl chloride	ND	6.8	2.7	ug/kg	
75-09-2	Methylene chloride	ND	14	6.8	ug/kg	
78-93-3	Methyl ethyl ketone	ND	34	14	ug/kg	
100-42-5	Styrene	ND	6.8	2.7	ug/kg	
71-55-6	1,1,1-Trichloroethane	ND	6.8	2.7	ug/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	6.8	2.7	ug/kg	
79-00-5	1,1,2-Trichloroethane	ND	6.8	2.7	ug/kg	
127-18-4	Tetrachloroethylene	ND	6.8	2.7	ug/kg	
108-88-3	Toluene	ND	6.8	2.7	ug/kg	
79-01-6	Trichloroethylene	ND	6.8	2.7	ug/kg	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	50SB014A		
Lab Sample ID:	F51247-17	**Date Sampled:**	07/23/07
Matrix:	SO - Soil	**Date Received:**	07/24/07
Method:	SW846 8260B	**Percent Solids:**	90.3
Project:	WPA 019 Field Investigation; Radford AAP, VA		

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
75-01-4	Vinyl chloride	ND	6.8	2.7	ug/kg	
	m,p-Xylene	ND	14	4.1	ug/kg	
95-47-6	o-Xylene	ND	6.8	2.7	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	110%		80-121%
2037-26-5	Toluene-D8	97%		71-130%
460-00-4	4-Bromofluorobenzene	109%		59-148%
17060-07-0	1,2-Dichloroethane-D4	117%		77-123%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	50SB014B		
Lab Sample ID:	F51247-18	**Date Sampled:**	07/23/07
Matrix:	SO - Soil	**Date Received:**	07/24/07
Method:	SW846 8260B	**Percent Solids:**	82.8
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	H044734.D	1	07/30/07	SH	n/a	n/a	VH1664
Run #2							

	Initial Weight
Run #1	4.79 g
Run #2	

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND UJ	63	32	ug/kg	
71-43-2	Benzene	ND	6.3	2.5	ug/kg	
75-27-4	Bromodichloromethane	ND	6.3	2.5	ug/kg	
75-25-2	Bromoform	ND	6.3	2.5	ug/kg	
108-90-7	Chlorobenzene	ND	6.3	2.5	ug/kg	
75-00-3	Chloroethane	ND	6.3	3.8	ug/kg	
67-66-3	Chloroform	ND	6.3	2.5	ug/kg	
75-15-0	Carbon disulfide	ND	6.3	2.5	ug/kg	
56-23-5	Carbon tetrachloride	ND	6.3	2.5	ug/kg	
75-34-3	1,1-Dichloroethane	ND	6.3	2.5	ug/kg	
75-35-4	1,1-Dichloroethylene	ND	6.3	2.5	ug/kg	
107-06-2	1,2-Dichloroethane	ND	6.3	2.5	ug/kg	
78-87-5	1,2-Dichloropropane	ND	6.3	2.5	ug/kg	
124-48-1	Dibromochloromethane	ND	6.3	2.5	ug/kg	
156-59-2	cis-1,2-Dichloroethylene	ND	6.3	2.5	ug/kg	
10061-01-5	cis-1,3-Dichloropropene	ND	6.3	2.5	ug/kg	
156-60-5	trans-1,2-Dichloroethylene	ND	6.3	2.5	ug/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	6.3	2.5	ug/kg	
100-41-4	Ethylbenzene	ND	6.3	2.5	ug/kg	
591-78-6	2-Hexanone	ND	32	13	ug/kg	
108-10-1	4-Methyl-2-pentanone	ND	32	13	ug/kg	
74-83-9	Methyl bromide	ND	6.3	2.5	ug/kg	
74-87-3	Methyl chloride	ND	6.3	2.5	ug/kg	
75-09-2	Methylene chloride	ND	13	6.3	ug/kg	
78-93-3	Methyl ethyl ketone	ND	32	13	ug/kg	
100-42-5	Styrene	ND	6.3	2.5	ug/kg	
71-55-6	1,1,1-Trichloroethane	ND	6.3	2.5	ug/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	6.3	2.5	ug/kg	
79-00-5	1,1,2-Trichloroethane	ND	6.3	2.5	ug/kg	
127-18-4	Tetrachloroethylene	ND	6.3	2.5	ug/kg	
108-88-3	Toluene	ND	6.3	2.5	ug/kg	
79-01-6	Trichloroethylene	ND	6.3	2.5	ug/kg	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	50SB014B		
Lab Sample ID:	F51247-18	**Date Sampled:**	07/23/07
Matrix:	SO - Soil	**Date Received:**	07/24/07
Method:	SW846 8260B	**Percent Solids:**	82.8
Project:	WPA 019 Field Investigation; Radford AAP, VA		

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
75-01-4	Vinyl chloride	ND	6.3	2.5	ug/kg	
	m,p-Xylene	ND	13	3.8	ug/kg	
95-47-6	o-Xylene	ND	6.3	2.5	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	107%		80-121%
2037-26-5	Toluene-D8	99%		71-130%
460-00-4	4-Bromofluorobenzene	106%		59-148%
17060-07-0	1,2-Dichloroethane-D4	112%		77-123%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	50SB015A		
Lab Sample ID:	F51247-19	**Date Sampled:**	07/23/07
Matrix:	SO - Soil	**Date Received:**	07/24/07
Method:	SW846 8260B	**Percent Solids:**	87.1
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	H044735.D	1	07/30/07	SH	n/a	n/a	VH1664
Run #2							

	Initial Weight
Run #1	5.51 g
Run #2	

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND UJ	52	26	ug/kg	
71-43-2	Benzene	ND	5.2	2.1	ug/kg	
75-27-4	Bromodichloromethane	ND	5.2	2.1	ug/kg	
75-25-2	Bromoform	ND	5.2	2.1	ug/kg	
108-90-7	Chlorobenzene	ND	5.2	2.1	ug/kg	
75-00-3	Chloroethane	ND	5.2	3.1	ug/kg	
67-66-3	Chloroform	ND	5.2	2.1	ug/kg	
75-15-0	Carbon disulfide	ND	5.2	2.1	ug/kg	
56-23-5	Carbon tetrachloride	ND	5.2	2.1	ug/kg	
75-34-3	1,1-Dichloroethane	ND	5.2	2.1	ug/kg	
75-35-4	1,1-Dichloroethylene	ND	5.2	2.1	ug/kg	
107-06-2	1,2-Dichloroethane	ND	5.2	2.1	ug/kg	
78-87-5	1,2-Dichloropropane	ND	5.2	2.1	ug/kg	
124-48-1	Dibromochloromethane	ND	5.2	2.1	ug/kg	
156-59-2	cis-1,2-Dichloroethylene	ND	5.2	2.1	ug/kg	
10061-01-5	cis-1,3-Dichloropropene	ND	5.2	2.1	ug/kg	
156-60-5	trans-1,2-Dichloroethylene	ND	5.2	2.1	ug/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	5.2	2.1	ug/kg	
100-41-4	Ethylbenzene	ND	5.2	2.1	ug/kg	
591-78-6	2-Hexanone	ND	26	10	ug/kg	
108-10-1	4-Methyl-2-pentanone	ND	26	10	ug/kg	
74-83-9	Methyl bromide	ND	5.2	2.1	ug/kg	
74-87-3	Methyl chloride	ND	5.2	2.1	ug/kg	
75-09-2	Methylene chloride	ND	10	5.2	ug/kg	
78-93-3	Methyl ethyl ketone	ND	26	10	ug/kg	
100-42-5	Styrene	ND	5.2	2.1	ug/kg	
71-55-6	1,1,1-Trichloroethane	ND	5.2	2.1	ug/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	5.2	2.1	ug/kg	
79-00-5	1,1,2-Trichloroethane	ND	5.2	2.1	ug/kg	
127-18-4	Tetrachloroethylene	ND	5.2	2.1	ug/kg	
108-88-3	Toluene	ND	5.2	2.1	ug/kg	
79-01-6	Trichloroethylene	ND	5.2	2.1	ug/kg	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	50SB015A		
Lab Sample ID:	F51247-19	**Date Sampled:**	07/23/07
Matrix:	SO - Soil	**Date Received:**	07/24/07
Method:	SW846 8260B	**Percent Solids:**	87.1
Project:	WPA 019 Field Investigation; Radford AAP, VA		

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
75-01-4	Vinyl chloride	ND	5.2	2.1	ug/kg	
	m,p-Xylene	ND	10	3.1	ug/kg	
95-47-6	o-Xylene	ND	5.2	2.1	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	111%		80-121%
2037-26-5	Toluene-D8	95%		71-130%
460-00-4	4-Bromofluorobenzene	108%		59-148%
17060-07-0	1,2-Dichloroethane-D4	117%		77-123%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	50SB015B		
Lab Sample ID:	F51247-20	**Date Sampled:**	07/23/07
Matrix:	SO - Soil	**Date Received:**	07/24/07
Method:	SW846 8260B	**Percent Solids:**	85.3
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	H044760.D	1	07/31/07	SH	n/a	n/a	VH1665
Run #2 [a]	H044736.D	1	07/30/07	SH	n/a	n/a	VH1664

	Initial Weight
Run #1	3.73 g
Run #2	4.93 g

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND UJ	79	39	ug/kg	
71-43-2	Benzene	ND	7.9	1.6	ug/kg	
75-27-4	Bromodichloromethane	ND	7.9	1.6	ug/kg	
75-25-2	Bromoform	ND	7.9	1.6	ug/kg	
108-90-7	Chlorobenzene	ND	7.9	1.6	ug/kg	
75-00-3	Chloroethane	ND	7.9	4.1	ug/kg	
67-66-3	Chloroform	ND	7.9	1.6	ug/kg	
75-15-0	Carbon disulfide	ND	7.9	1.6	ug/kg	
56-23-5	Carbon tetrachloride	ND	7.9	2.0	ug/kg	
75-34-3	1,1-Dichloroethane	ND	7.9	1.7	ug/kg	
75-35-4	1,1-Dichloroethylene	ND	7.9	1.6	ug/kg	
107-06-2	1,2-Dichloroethane	ND	7.9	1.6	ug/kg	
78-87-5	1,2-Dichloropropane	ND	7.9	2.0	ug/kg	
124-48-1	Dibromochloromethane	ND	7.9	1.6	ug/kg	
156-59-2	cis-1,2-Dichloroethylene	ND	7.9	1.6	ug/kg	
10061-01-5	cis-1,3-Dichloropropene	ND	7.9	1.6	ug/kg	
156-60-5	trans-1,2-Dichloroethylene	ND	7.9	1.6	ug/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	7.9	1.6	ug/kg	
100-41-4	Ethylbenzene	ND	7.9	1.6	ug/kg	
591-78-6	2-Hexanone	ND	39	16	ug/kg	
108-10-1	4-Methyl-2-pentanone	ND	39	16	ug/kg	
74-83-9	Methyl bromide	ND	7.9	2.8	ug/kg	
74-87-3	Methyl chloride	ND	7.9	3.1	ug/kg	
75-09-2	Methylene chloride	ND	16	7.9	ug/kg	
78-93-3	Methyl ethyl ketone	ND	39	16	ug/kg	
100-42-5	Styrene	ND	7.9	1.6	ug/kg	
71-55-6	1,1,1-Trichloroethane	ND	7.9	1.6	ug/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	7.9	2.0	ug/kg	
79-00-5	1,1,2-Trichloroethane	ND	7.9	1.6	ug/kg	
127-18-4	Tetrachloroethylene	ND	7.9	1.6	ug/kg	
108-88-3	Toluene	ND	7.9	1.6	ug/kg	
79-01-6	Trichloroethylene	ND	7.9	1.6	ug/kg	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	50SB015B		
Lab Sample ID:	F51247-20	**Date Sampled:**	07/23/07
Matrix:	SO - Soil	**Date Received:**	07/24/07
Method:	SW846 8260B	**Percent Solids:**	85.3
Project:	WPA 019 Field Investigation; Radford AAP, VA		

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
75-01-4	Vinyl chloride	ND	7.9	2.2	ug/kg	
	m,p-Xylene	ND	16	1.7	ug/kg	
95-47-6	o-Xylene	ND	7.9	1.6	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	123% [b]	130% [b]	80-121%
2037-26-5	Toluene-D8	98%	97%	71-130%
460-00-4	4-Bromofluorobenzene	110%	106%	59-148%
17060-07-0	1,2-Dichloroethane-D4	114%	120%	77-123%

(a) Confirmation run.
(b) Outside control limits due to matrix interference. Confirmed by reanalysis.

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	TB072307		
Lab Sample ID:	F51247-21	**Date Sampled:**	07/23/07
Matrix:	SO - Trip Blank Soil	**Date Received:**	07/24/07
Method:	SW846 8260B	**Percent Solids:**	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	H044724.D	1	07/30/07	SH	n/a	n/a	VH1664
Run #2							

	Initial Weight
Run #1	5.00 g
Run #2	

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	50	25	ug/kg	
71-43-2	Benzene	ND	5.0	2.0	ug/kg	
75-27-4	Bromodichloromethane	ND	5.0	2.0	ug/kg	
75-25-2	Bromoform	ND	5.0	2.0	ug/kg	
108-90-7	Chlorobenzene	ND	5.0	2.0	ug/kg	
75-00-3	Chloroethane	ND	5.0	3.0	ug/kg	
67-66-3	Chloroform	ND	5.0	2.0	ug/kg	
75-15-0	Carbon disulfide	ND	5.0	2.0	ug/kg	
56-23-5	Carbon tetrachloride	ND	5.0	2.0	ug/kg	
75-34-3	1,1-Dichloroethane	ND	5.0	2.0	ug/kg	
75-35-4	1,1-Dichloroethylene	ND	5.0	2.0	ug/kg	
107-06-2	1,2-Dichloroethane	ND	5.0	2.0	ug/kg	
78-87-5	1,2-Dichloropropane	ND	5.0	2.0	ug/kg	
124-48-1	Dibromochloromethane	ND	5.0	2.0	ug/kg	
156-59-2	cis-1,2-Dichloroethylene	ND	5.0	2.0	ug/kg	
10061-01-5	cis-1,3-Dichloropropene	ND	5.0	2.0	ug/kg	
156-60-5	trans-1,2-Dichloroethylene	ND	5.0	2.0	ug/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	5.0	2.0	ug/kg	
100-41-4	Ethylbenzene	ND	5.0	2.0	ug/kg	
591-78-6	2-Hexanone	ND	25	10	ug/kg	
108-10-1	4-Methyl-2-pentanone	ND	25	10	ug/kg	
74-83-9	Methyl bromide	ND	5.0	2.0	ug/kg	
74-87-3	Methyl chloride	ND	5.0	2.0	ug/kg	
75-09-2	Methylene chloride	ND	10	5.0	ug/kg	
78-93-3	Methyl ethyl ketone	ND	25	10	ug/kg	
100-42-5	Styrene	ND	5.0	2.0	ug/kg	
71-55-6	1,1,1-Trichloroethane	ND	5.0	2.0	ug/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	5.0	2.0	ug/kg	
79-00-5	1,1,2-Trichloroethane	ND	5.0	2.0	ug/kg	
127-18-4	Tetrachloroethylene	ND	5.0	2.0	ug/kg	
108-88-3	Toluene	ND	5.0	2.0	ug/kg	
79-01-6	Trichloroethylene	ND	5.0	2.0	ug/kg	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	TB072307		
Lab Sample ID:	F51247-21	**Date Sampled:**	07/23/07
Matrix:	SO - Trip Blank Soil	**Date Received:**	07/24/07
Method:	SW846 8260B	**Percent Solids:**	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
75-01-4	Vinyl chloride	ND	5.0	2.0	ug/kg	
	m,p-Xylene	ND	10	3.0	ug/kg	
95-47-6	o-Xylene	ND	5.0	2.0	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	101%		80-121%
2037-26-5	Toluene-D8	97%		71-130%
460-00-4	4-Bromofluorobenzene	105%		59-148%
17060-07-0	1,2-Dichloroethane-D4	106%		77-123%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Shaw® Shaw Environmental, Inc.

MEMORANDUM

TO: Jeff Parks, Shaw E&I Radford Army Ammunition Plant (RFAAP) Project Manager

FROM: Richard McCracken, Shaw E&I Project Chemist

SUBJECT: RFAAP Data Validation – Explosives, PETN, & Nitroglycerin
Accutest Laboratories, Inc., SDG F51275

DATE: December 12, 2007

The purpose of this memorandum is to present the data validation report for the samples collected at RFAAP on July 24, 2007. The samples were analyzed for explosives using USEPA SW846 Method 8330A, and nitroglycerin & PETN using USEPA SW-846 Method 8332A. A total of one aqueous and three soil samples were validated. The sample IDs are:

Field Sample ID	Lab Sample ID	Field Sample ID	Lab Sample ID
072407R	F51275-1	59SB03B	F51275-3
59SB03A	F51275-2	59SB03C	F51275-4

Data were reviewed by Richard McCracken and validated using a combination of project QAPP, *Quality Systems Manual for Environmental Laboratories, Final Version 3, January, 2006* (DoD, 2006) (DoD QSM), method-specific criteria, and laboratory SOP criteria. The data qualifier scheme was consistent with the *Region III Modifications to the National Functional Guidelines for Organic Data Review* (September 1994). Parameters evaluated are presented in **Table 1**. Data associated with parameters in compliance with quality control specifications have not been qualified. Data associated with parameters that did not comply with quality control specifications and directly impacted project data have been qualified in accordance with USEPA Region III specifications.

Table 1 Laboratory Performance Criteria

Qualified		Parameter
Yes	No	
	X	Holding Times and Preservation
	X	Blank Analysis
	X	Initial Calibration
	X	Continuing Calibration
	X	System Monitoring Compounds
	X	Laboratory Control Sample
	X	Matrix Spike/Spike Duplicate
	X	Field Duplicate
	X	Quantitation Verification

The quality of data collected in support of this sampling activity is considered acceptable.

Richard M. Cracken

Richard McCracken, Chemist

12/12/07

Date

RFAAP VALIDATION REPORT
EXPLOSIVES REVIEW
SDG F51275

I-Holding Times and Preservation

The objective is to ascertain the validity of results based on the holding time of the sample from time of collection to time of sample extraction and analysis. Solid samples must be cooled @4°C ± 2°C, with a maximum holding time of 14 days from sample collection to preparative extraction and 40 days from preparative extraction to determinative analysis. Aqueous samples must be cooled @4°C ± 2°C, with a maximum holding time of 7 days from sample collection to preparative extraction and 40 days from preparative extraction to determinative analysis.

- Temperature Review: A temperature blank was sent with each cooler and recorded by the laboratory upon receipt. The samples collected on 7/24/07 were sent in two coolers, and were received by the laboratory on 7/25/07 at 2.6 °C & 3.4 °C. No qualifiers were applied.

- Holding Time Review: The samples were collected on 7/24/07, extracted on 7/31/07 & 8/1/07, analyzed for PETN and nitroglycerine on 8/1/07 & 8/3/07, and analyzed for all other explosives on 8/1/07 & 8/3/07. All criteria were met. No qualifiers were applied.

II-Blank Analysis

The purpose of laboratory or field blank analyses is to determine the existence and magnitude of contamination problems resulting from laboratory or field activities. One method blank per analytical batch must be run on each instrument used to analyze samples. No contaminants should be present in the blanks. The DoD QSM criterion specifies all concentrations should be less than one-half MRL. Positive sample results are reported and qualified "B", if the concentration of the compound in the sample is ≤5 times (5x) the maximum amount for explosive target compounds. **Table 2** summarizes the blank contamination analysis.

Table 2 Blank Contamination Analysis Summary

Analysis Date	QC Blank ID	Compound	Max Conc. µg/L	Action Level µg/L	B qualified samples
8/1/07	OP21682-MB	All target explosives <½MRL	NA	NA	None
8/1/07	OP21682-MB	PETN & NG <½MRL	NA	NA	None
8/3/07	OP21693-MB	All target explosives <½MRL	NA	NA	None
8/3/07	OP21693-MB	PETN & NG <½MRL	NA	NA	None
8/1/07	072407R	All target explosives <½MRL	NA	NA	None
8/1/07	072407R	PETN & NG <½MRL	NA	NA	None

072407R is a rinsate blank
MRL = Method Reporting Limit
NA = Not Applicable

III-Initial Calibration

Compliance requirements for satisfactory instrument calibration are established to ensure that the instrument is capable of producing acceptable qualitative and quantitative data for the target compounds. The initial 5-point calibration demonstrates that the instrument is capable of acceptable performance in the beginning of the analytical run. The DoD QSM specifies that the correlation coefficient (r^2) must be ≥0.990 and/or the percent relative standard deviation (%RSD) must be ≤20%. All detects were qualified as estimated "J" for where there were exceeding %RSDs, and all non-detects were qualified as estimated "UJ" for where there were grossly exceeding recoveries. Grossly exceeding is defined as twice the established criteria limits.

- During the explosives initial calibration performed on 10/18/06 on instrument G1315B, all criteria were met for target compounds. No qualifiers were applied. All samples were analyzed in conjunction with this initial calibration.

- During the PETN and nitroglycerine initial calibration performed on 03/15/07 on instrument G1315B, all criteria were met for target compounds. No qualifiers were applied. All samples were analyzed in conjunction with this initial calibration.

IV-Continuing Calibration

Compliance requirements for satisfactory instrument calibration are established to ensure that the instrument is capable of producing acceptable qualitative and quantitative data for the target compounds. Continuing calibration standards are analyzed after every 10 injections, and at the end of the analysis sequence. The DoD QSM specifies that the percent difference (%D) from initial calibration should be no greater than ±20%. All detects were qualified as estimated "J" for where there were exceeding %Ds, and all non-detects were qualified as estimated "UJ" for where there were grossly exceeding recoveries. Grossly exceeding is defined as twice the established criteria limits.

- During the explosives initial calibration verification performed on 10/18/06 @1739 on instrument G1315B, all criteria were met for target compounds. No qualifiers were applied. No samples were analyzed after this initial calibration verification.

- During the explosives initial calibration verification performed on 10/19/06 @1344 on instrument G1315B, all criteria were met for target compounds. No qualifiers were applied. No samples were analyzed after this initial calibration verification.

- During the explosives continuing calibration verification performed on 8/1/07 @1220 on instrument G1315B, all criteria were met for target compounds. No qualifiers were applied. Sample 072407R was analyzed following this continuing calibration.

- During the explosives continuing calibration verification performed on 8/1/07 @1705 on instrument G1315B, all criteria were met for target compounds. No qualifiers were applied. Sample 072407R was analyzed before this continuing calibration.

- During the explosives continuing calibration verification performed on 8/2/07 @2239 on instrument G1315B, all criteria were met for target compounds. No qualifiers were applied. The solid matrix method blank, LCS, MS, & MSD were analyzed after this continuing calibration.

- During the explosives continuing calibration verification performed on 8/3/07 @0411 on instrument G1315B, all criteria were met for target compounds. No qualifiers were applied. The solid matrix method blank, LCS, MS, & MSD were analyzed before this continuing calibration.

- During the explosives continuing calibration verification performed on 8/3/07 @0941 on instrument G1315B, all criteria were met for target compounds. No qualifiers were applied. Samples 59SB03A, 59SB03B, and 59SB03C were analyzed after this continuing calibration.

- During the explosives continuing calibration verification performed on 8/3/07 @1537 on instrument G1315B, all criteria were met for target compounds. No qualifiers were applied. Samples 59SB03A, 59SB03B, and 59SB03C were analyzed before this continuing calibration.

- During the PETN and nitroglycerin initial calibration verification performed on 3/15/07 @1235 on instrument G1315B, all criteria were met for target compounds. No qualifiers were applied. No samples were analyzed in conjunction with this initial calibration verification.

- During the PETN and nitroglycerin continuing calibration performed on 8/1/07 @1027 on instrument G1315B, all criteria were met for target compounds. No qualifiers were applied. Sample 072407R was analyzed after this continuing calibration.

- During the PETN and nitroglycerin continuing calibration performed on 8/1/07 @1136 on instrument G1315B, all criteria were met for target compounds. No qualifiers were applied. Sample 072407R was analyzed before this continuing calibration.

- During the PETN and nitroglycerin continuing calibration performed on 8/3/07 @0924 on instrument G1315B, all criteria were met for target compounds. No qualifiers were applied. The solid matrix method blank and LCS were analyzed after this continuing calibration.

- During the PETN and nitroglycerin continuing calibration performed on 8/3/07 @1059 on instrument G1315B, all criteria were met for target compounds. No qualifiers were applied. The solid matrix method blank and LCS were analyzed before this continuing calibration.

- During the PETN and nitroglycerin continuing calibration performed on 8/3/07 @1241 on instrument G1315B, all criteria were met for target compounds. No qualifiers were applied. Samples 59SB03A, 59SB03B, and 59SB03C were analyzed after this continuing calibration.

- During the PETN and nitroglycerin continuing calibration performed on 8/3/07 @1333 on instrument G1315B, all criteria were met for target compounds. No qualifiers were applied. Samples 59SB03A, 59SB03B, and 59SB03C were analyzed before this continuing calibration.

V-System Monitoring Compound (Surrogates)
Laboratory performance on individual samples is established by means of spiking activities. The percent recovery (%R) for all samples and blanks must be within the laboratory control limits. DoD surrogate recovery limits are specified in Table D-3 of the DoD QSM (DoD, 2006). If the surrogate is not listed, then the laboratory criteria shall be used.

Solid Criteria: 3,4-dinitrotoluene (72-145%)

Aqueous Criteria: 3,4-dinitrotoluene (70-136%)

- All criteria were met for explosives, PETN, and nitroglycerin. No qualifiers were applied.

VI-Laboratory Control Sample
Laboratory control samples (LCS) are used to monitor long-term accuracy of the analytical method. The analysis is performed at a frequency of 1 per analytical batch. The percent recoveries (%Rs) must be within the laboratory control limits. DoD QSM solid matrix LCS recovery limits are specified in Table D-13 of the DoD QSM (DoD, 2006), while the aqueous LCS recovery limits are specified in Table D-12 of the DoD QSM. If the compound is not listed, then the laboratory criteria shall be used.

- Sample OP21682-BS was used as the aqueous LCS for explosives, PETN, and nitroglycerin analysis. All compounds met recovery criteria. Sample 072407R was analyzed in conjunction with this LCS.

- Sample OP21693-BS was used as the solid LCS for explosives, PETN, and nitroglycerin analysis. All compounds met recovery criteria. Samples 59SB03A, 59SB03B, and 59SB03C were analyzed in conjunction with this LCS.

VII-Matrix Spike/Matrix Spike Duplicate
Data for matrix spike/matrix spike duplicates (MS/MSD) are generated to determine long-term precision and accuracy of the analytical method on various matrices and to demonstrate acceptable compound recovery by the laboratory at the time of sample analysis. The percent recoveries (%Rs) and the relative percent difference (RPD) must be within the laboratory control limits. DoD MS/MSD recovery limits follow the LCS criteria specified in Table D-12 (aqueous) and D-13 (solid matrix) of the DoD QSM (DoD, 2006). If the compound is not listed, then the laboratory criteria shall be used.

- Sample 072407R was used for the aqueous MS/MSD analysis. All compounds met criteria. Sample 072407R was analyzed in conjunction with this MS/MSD.

- Sample F51154-18 was used for the solid MS/MSD analysis. The spiked sample was not a RFAAP site sample; therefore, it was not evaluated. Samples 59SB03A, 59SB03B, and 59SB03C were analyzed in conjunction with this MS/MSD.

VIII-Field Duplicate Sample Analysis
Field duplicates were collected to identify the cumulative precision of the sampling and analytical process and sent to the laboratory blind. The RPD was calculated only for those analytes which were detected at levels exceeding the method reporting limits in both samples of the duplicate pair. Analytes that were rejected (R-qualified) in either sample of the duplicate pair were excluded from the duplicate assessment. Precision control criterion was established at 50% RPD for the aqueous and solid samples. Analytical results were qualified as estimated (J) for any RPDs exceeding criteria.

- No field duplicates were included in this data package.

IX-Quantitation Verification
The accuracy of analytical results was verified through the calculation of several parameters. The calculation was based calibration factors. The absolute percent difference (%D) between the calculated and the reported value must be within 10% difference. All values >MDL and <MRL or <3*MDL (whichever was greater) were qualified as estimated "J".

- The %D between the primary and secondary columns was within criteria for all detected compounds.

Sample: OP21693-BS, HMX

Conc. µg/kg = (Ax * Vt * DF) / (CF * Vi * Ws * Ps * 1000)

where: Ax = Area response for the compound being measured
Vt = Total volume of extract, taking into account dilutions (uL)
DF = Dilution factor
CF = Calibration Factor from initial calibration (area/pg)
Vi = Volume of extract injected (uL)
Ws = weight of sample (g)
Ps = percent solids/100

Conc. µg/kg = (1654265 * 20000 * 1) / (2764 * 1 * 2 * 1 * 1000)
= 5980 ug/kg

Reported Value = 5980 µg/kg
% Difference = 0.0%
Values were within 10% difference

Sample: OP21693-BS2, nitroglycerin

Conc. µg/kg = (Ax * Vt * DF) / (CF * Vi * Ws * Ps * 1000)

where:
- Ax = Area response for the compound being measured
- Vt = Total volume of extract, taking into account dilutions (uL)
- DF = Dilution factor
- CF = Calibration Factor from initial calibration (area/pg)
- Vi = Volume of extract injected (uL)
- Ws = weight of sample (g)
- Ps = percent solids/100

Conc. µg/kg = (3475817 * 20000 * 1) / (1228 * 1 * 2.0 * 1 * 1000)
= 28300 ug/kg

Reported Value = 28300 µg/kg
% Difference = 0.0%
Values were within 10% difference

USEPA Region III Validation Qualifiers

(No Code) = Confirmed identification.

B = The analyte has been detected in the sample and the associated laboratory or field blank.

J = Indicates an estimated value for (1) estimated value due to QC non-conformance. Reported value may not be accurate or precise, (2) estimating a concentration as a tentatively identified compound as indicated by the mass spectral and retention time data, or (3) estimating a concentration ≥ MDL and <MRL or <3*MDL, whichever is greater.

K = Analyte present. Reported value may be biased high (estimated) due to QC non-conformance.

L = Analyte present. Reported value may be biased low (estimated) due to QC non-conformance.

R = Unreliable result. Analyte may or may not be present in the sample due to QC non-conformance.

UL = Value is estimated bias low and not detected due to QC non-conformance. Reporting limit may be inaccurate or imprecise. Quantitation limit is probably higher.

UJ = Value is estimated and not detected due to QC non-conformance. Reporting limit may be inaccurate or imprecise.

Laboratory Qualifiers

(No Code) = Confirmed identification.

U = Not detected. The associated number indicates the compound reporting limit for the sample.

A (Dioxins) = B (Metals) = The reported value was obtained from a reading <MRL and ≥MDL and is considered estimated.

B (Organics) = The analyte or compound has been detected in the sample and laboratory method blank. It indicates probable blank contamination.

E (Metals) = Reported value is estimated because of the presence of interferences.

E (Organics) = Identifies compounds whose concentrations exceed the upper level of the calibration range.

EMPC (Dioxins) = The ion-abundance ratio between the two characteristic PCDD/PCDF ions was outside accepted ranges. The detected PCDD/PCDF was reported as an estimated maximum possible concentration (EMPC).

D = Indicates sample was analyzed at a dilution.

J = Indicates an estimated value for (1) estimating a concentration as a tentatively identified compound as indicated by the mass spectral and retention time data, or (2) estimating a concentration <MRL and ≥ MDL.

N (Organics) = Indicates presumptive evidence of a compound for tentatively identified compounds using a library search.

N (Metals) = Laboratory spike sample recovery not within control limits.

P (Organics) = Target analyte confirmation >40% difference for detected compound between the primary and secondary columns. The lower of the two values was reported.

* (Metals) = Duplicate analysis not within control limits.

* (Organics) = Surrogate outside of QC limits on both original and re-analysis.

Accutest Laboratories

Report of Analysis

Client Sample ID:	072407R		
Lab Sample ID:	F51275-1	**Date Sampled:**	07/24/07
Matrix:	AQ - Water	**Date Received:**	07/25/07
Method:	SW846 8330A SW846 3535A	**Percent Solids:**	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GG023032.D	1	08/01/07	NAF	07/31/07	OP21682	GGG990
Run #2	PP021890.D	1	08/01/07	NAF	07/31/07	OP21682	GPP756

	Initial Volume	Final Volume
Run #1	950 ml	10.0 ml
Run #2	950 ml	10.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q
2691-41-0	HMX	ND	0.21	0.054	ug/l	
121-82-4	RDX	ND	0.21	0.063	ug/l	
99-65-0	1,3-Dinitrobenzene	ND	0.21	0.059	ug/l	
606-20-2	2,6-Dinitrotoluene	ND	0.21	0.075	ug/l	
121-14-2	2,4-Dinitrotoluene	ND	0.21	0.10	ug/l	
35572-78-2	2-amino-4,6-Dinitrotoluene	ND	0.21	0.068	ug/l	
19406-51-0	4-amino-2,6-Dinitrotoluene	ND	0.21	0.059	ug/l	
98-95-3	Nitrobenzene	ND	0.21	0.077	ug/l	
88-72-2	o-Nitrotoluene	ND	0.21	0.12	ug/l	
99-08-1	m-Nitrotoluene	ND	0.21	0.082	ug/l	
99-99-0	p-Nitrotoluene	ND	0.21	0.11	ug/l	
479-45-8	Tetryl	ND	0.21	0.072	ug/l	
99-35-4	1,3,5-Trinitrobenzene	ND	0.21	0.068	ug/l	
118-96-7	2,4,6-Trinitrotoluene	ND	0.21	0.053	ug/l	
55-63-0	Nitroglycerine	ND [a]	2.1	0.53	ug/l	
78-11-5	PETN	ND [a]	2.1	0.53	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
610-39-9	3,4-Dinitrotoluene	105%	97%	70-136%

(a) Result is from Run# 2

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	59SB03A		
Lab Sample ID:	F51275-2	**Date Sampled:**	07/24/07
Matrix:	SO - Soil	**Date Received:**	07/25/07
Method:	SW846 8330A SW846 8330B	**Percent Solids:**	93.1
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GG023102.D	1	08/03/07	NAF	08/01/07	OP21693	GGG991
Run #2	PP021983.D	1	08/03/07	NAF	08/01/07	OP21693	GPP759

	Initial Weight	Final Volume
Run #1	2.42 g	20.0 ml
Run #2	2.42 g	20.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q
2691-41-0	HMX	ND	210	43	ug/kg	
121-82-4	RDX	ND	210	41	ug/kg	
99-65-0	1,3-Dinitrobenzene	ND	210	41	ug/kg	
606-20-2	2,6-Dinitrotoluene	ND	210	74	ug/kg	
121-14-2	2,4-Dinitrotoluene	ND	210	41	ug/kg	
35572-78-2	2-amino-4,6-Dinitrotoluene	ND	210	41	ug/kg	
19406-51-0	4-amino-2,6-Dinitrotoluene	ND	210	45	ug/kg	
98-95-3	Nitrobenzene	ND	210	59	ug/kg	
88-72-2	o-Nitrotoluene	ND	210	64	ug/kg	
99-08-1	m-Nitrotoluene	ND	210	85	ug/kg	
99-99-0	p-Nitrotoluene	ND	210	57	ug/kg	
479-45-8	Tetryl	ND	410	120	ug/kg	
99-35-4	1,3,5-Trinitrobenzene	ND	210	49	ug/kg	
118-96-7	2,4,6-Trinitrotoluene	ND	210	41	ug/kg	
55-63-0	Nitroglycerine	ND [a]	1700	620	ug/kg	
78-11-5	PETN	ND [a]	1700	620	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
610-39-9	3,4-Dinitrotoluene	107%	103%	72-145%

(a) Result is from Run# 2

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	59SB03B		
Lab Sample ID:	F51275-3	**Date Sampled:**	07/24/07
Matrix:	SO - Soil	**Date Received:**	07/25/07
Method:	SW846 8330A SW846 8330B	**Percent Solids:**	79.5
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GG023103.D	1	08/03/07	NAF	08/01/07	OP21693	GGG991
Run #2	PP021984.D	1	08/03/07	NAF	08/01/07	OP21693	GPP759

	Initial Weight	Final Volume
Run #1	2.37 g	20.0 ml
Run #2	2.37 g	20.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q
2691-41-0	HMX	ND	210	44	ug/kg	
121-82-4	RDX	ND	210	42	ug/kg	
99-65-0	1,3-Dinitrobenzene	ND	210	42	ug/kg	
606-20-2	2,6-Dinitrotoluene	ND	210	75	ug/kg	
121-14-2	2,4-Dinitrotoluene	ND	210	42	ug/kg	
35572-78-2	2-amino-4,6-Dinitrotoluene	ND	210	42	ug/kg	
19406-51-0	4-amino-2,6-Dinitrotoluene	ND	210	46	ug/kg	
98-95-3	Nitrobenzene	ND	210	60	ug/kg	
88-72-2	o-Nitrotoluene	ND	210	65	ug/kg	
99-08-1	m-Nitrotoluene	ND	210	87	ug/kg	
99-99-0	p-Nitrotoluene	ND	210	58	ug/kg	
479-45-8	Tetryl	ND	420	120	ug/kg	
99-35-4	1,3,5-Trinitrobenzene	ND	210	50	ug/kg	
118-96-7	2,4,6-Trinitrotoluene	ND	210	42	ug/kg	
55-63-0	Nitroglycerine	ND [a]	1700	630	ug/kg	
78-11-5	PETN	ND [a]	1700	630	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
610-39-9	3,4-Dinitrotoluene	105%	107%	72-145%

(a) Result is from Run# 2

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	59SB03C		
Lab Sample ID:	F51275-4	**Date Sampled:**	07/24/07
Matrix:	SO - Soil	**Date Received:**	07/25/07
Method:	SW846 8330A SW846 8330B	**Percent Solids:**	82.2
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GG023104.D	1	08/03/07	NAF	08/01/07	OP21693	GGG991
Run #2	PP021985.D	1	08/03/07	NAF	08/01/07	OP21693	GPP759

	Initial Weight	Final Volume
Run #1	2.39 g	20.0 ml
Run #2	2.39 g	20.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q
2691-41-0	HMX	ND	210	44	ug/kg	
121-82-4	RDX	ND	210	42	ug/kg	
99-65-0	1,3-Dinitrobenzene	ND	210	42	ug/kg	
606-20-2	2,6-Dinitrotoluene	ND	210	74	ug/kg	
121-14-2	2,4-Dinitrotoluene	ND	210	42	ug/kg	
35572-78-2	2-amino-4,6-Dinitrotoluene	ND	210	42	ug/kg	
19406-51-0	4-amino-2,6-Dinitrotoluene	ND	210	45	ug/kg	
98-95-3	Nitrobenzene	ND	210	59	ug/kg	
88-72-2	o-Nitrotoluene	ND	210	64	ug/kg	
99-08-1	m-Nitrotoluene	ND	210	86	ug/kg	
99-99-0	p-Nitrotoluene	ND	210	58	ug/kg	
479-45-8	Tetryl	ND	420	120	ug/kg	
99-35-4	1,3,5-Trinitrobenzene	ND	210	49	ug/kg	
118-96-7	2,4,6-Trinitrotoluene	ND	210	42	ug/kg	
55-63-0	Nitroglycerine	ND [a]	1700	630	ug/kg	
78-11-5	PETN	ND [a]	1700	630	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
610-39-9	3,4-Dinitrotoluene	112%	110%	72-145%

(a) Result is from Run# 2

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Shaw® Shaw Environmental, Inc.

MEMORANDUM

TO: Jeff Parks, Shaw E&I Radford Army Ammunition Plant (RFAAP) Project Manager

FROM: Richard McCracken, Shaw E&I Project Chemist

SUBJECT: RFAAP Data Validation – Dioxin Furans
SGS Paradigm Analytical Laboratories, Inc. Project G383-587
(Accutest SDG F51275)

DATE: December 18, 2007

The purpose of this memorandum is to present the data validation report for the samples collected at RFAAP on July 24, 2007. The samples were analyzed for Dioxin and Furan compounds using USEPA SW-846 Method 8290 High Resolution Gas Chromatography/High Resolution Mass Spectroscopy (HRGC/HRMS). A total of one aqueous and three soil samples were validated. The sample IDs are:

Field Sample ID	Lab Sample ID	**Field Sample ID**	Lab Sample ID
072407R	F51275-1	59SB03B	F51275-3
59SB03A	F51275-2	59SB03C	F51275-4

Data were reviewed and validated using a combination of project QAPP, *DOD Quality Systems Manual for Environmental Laboratories, Final Version 3, January, 2006* (DoD, 2006) (DoD QSM), method-specific criteria, and laboratory SOP criteria. The data qualifier scheme was consistent with the *USEPA Region III Dioxin/Furan Data Validation Guidance* (March, 1999). Parameters evaluated are presented in **Table 1**. Data associated with parameters in compliance with quality control specifications have not been qualified. Data associated with parameters that did not comply with quality control specifications and directly impacted project data have been qualified in accordance with USEPA Region III specifications.

Table 1 Laboratory Performance Criteria

Qualified		Parameter
Yes	No	
	X	Holding Times and Preservation
X		Blank Analysis
	X	Instrument Performance Check
	X	Initial Calibration
	X	Continuing Calibration
	X	Internal Standards (IS) Recovery Standard Solutions
	X	Cleanup Standards
	X	Laboratory Control Standard or Ongoing Precision Result (OPR)
	X	Matrix Spike and Spike Duplicate
	X	Field Duplicate
X		Quantitation Verification

The quality of data collected in support of this sampling activity is considered acceptable with noted qualifications.

Richard M. Cracken

Richard McCracken, Chemist

12/18/07

Date

RFAAP VALIDATION REPORT
DIOXIN FURAN REVIEW
SDG G383-587
(Accutest SDG F51275)

I-Holding Times and Preservation

The objective is to ascertain the validity of results based on the holding time of the sample from time of collection to time of sample extraction and analysis. Dioxin and furan samples must be shipped @4°C ± 2°C, with a maximum holding time of 30 days from sample collection to preparative extraction and 45 days from preparative extraction to determinative analysis.

- Temperature Review: A temperature blank was sent with each cooler and recorded by the laboratory upon receipt. The samples collected on 7/24/07 were sent in two coolers, and were received by the laboratory on 7/25/07 at 2.6 °C & 3.4 °C. No qualifiers were applied. Accutest shipped the dioxin aliquots to SGS Paradigm Analytical Laboratories on 7/27/07, and they were received by SGS Paradigm on 7/31/07 at 4.6°C. No qualifiers were applied.

- Holding Time Review: The samples were collected on 7/24/07, extracted on 8/1/07 & 8/7/07, and analyzed on 8/3/07 & 8/9/07. All criteria were met. No qualifiers were applied.

II-Blank Analysis

The purpose of laboratory (or field) blank analyses is to determine the existence and magnitude of contamination problems resulting from field and laboratory activities. No contamination should be found in any of the blanks >EDL (estimated detection limit). The DoD QSM criteria specifies all concentrations should be less than ½ MRL (<MRL for common laboratory contaminants OCDD and OCDF) and <2EDL for the calibration blanks. Positive sample results are reported and qualified "B", if the concentration of the compound in the sample is ≤10 times (10x) the maximum amount in any blank for the common laboratory contaminants OCDD or OCDF, or 5 times (5X) the maximum amount for other target compounds. **Table 2** summarizes the blank contamination.

Table 2 Blank Contamination Analysis Summary

Analysis Date	QC Blank ID	Compound	Max Conc. pg/g	Action Level pg/g	B qualified samples
8/2/07	LMB14393	All	ND	NA	None
8/9/07	LMB14402	1,2,3,4,6,7,8-HpCDD	0.446	2.23	None
8/9/07	LMB14402	OCDD	2.84	28.4	None
8/9/07	LMB14402	1,2,3,4,7,8-HxCDF	0.258	1.29	F51275-2, -4
8/9/07	LMB14402	1,2,3,6,7,8-HxCDF	0.126	0.63	None
8/9/07	LMB14402	1,2,3,4,6,7,8-HpCDF	1.23	6.15	F51275-4
8/9/07	LMB14402	OCDF	1.95	19.5	F51275-4
8/3/07	072407R	All	ND	NA	None

LMB14393 is an aqueous method blank, for sample F51275-1.
LMB14402 is a solid matrix method blank, for samples F51275-2, -3, & -4.
072407R is a rinsate blank.
J = Estimated value <MRL and >EDL.

III-Instrument Performance Check

Instrument must be tuned with perfluorokerosene (PFK) to achieve a static resolving power of at least 10,000 (10% valley) and lock-mass ion between lowest and highest masses for each descriptor and level of reference compound ≤10%. Documentation of the mass spectrometer resolving power is accomplished by recording the peak profile of the high-mass reference signal (typically m/z 330.9792) obtained during a peak examination by using the low-mass PFK ion at m/z 292.9825 or lower in mass as reference. At the beginning of the each 12-hour period, the chromatographic resolution is verified in the same fashion as in the initial calibration through the analysis of HRCC solution on the DB-5 (or equivalent) column or through the analysis of the column performance solution on the SP-2331 or SP-225 (or equivalent) column. A 25% valley must be achieved between the close eluters.

- All PFK forms were verified and found to be in compliance with method specification. No qualifiers were applied.

IV-Initial Calibration
Once the window defining mix has been analyzed and the descriptor switching times have been verified, the five point calibration solutions can be analyzed prior to sample analysis. Per method and DoD QSM, the initial calibration criteria are as follows:

  - The percent relative standard deviations for the mean response factors RRF(n) from the 17 unlabeled standards must not exceed ±20%, and those for the labeled reference compounds must not exceed ±30%;
  - The signal to noise ratio ≥10% for all target ions;
  - Ion abundance ratios must be within the specified control limits in Table 8 (SW846 Method 8290).

- During initial calibration performed on 07/10/07 using instrument HRMS1, all compounds met criteria. No qualifiers were applied. Sample F51275-1 was analyzed in conjunction with this initial calibration.

- During initial calibration performed on 11/2/06 using instrument HRMS3, all compounds met criteria. No qualifiers were applied. Samples F51275-2, F51275-3, and F51275-4 were analyzed in conjunction with this initial calibration.

V-Continuing Calibration
The continuing calibration consists of two parts: evaluation of the mass resolution and retention time check. Per method and DoD QSM, the following stipulates the continuing calibration criteria.

  - The signal signal-to-noise ratio (S/N) must be at least 10:1 for each selected ion current profile (SICP) and for each GC signal representing the elution of a target analyte or labeled standard for each analyte.
  - The relative response factor of each analyte for the unlabeled standard must be within ±20% of the average RF obtained from the initial calibration, and the RRF of each labeled standard must be within ±30% of the average RRF established during initial calibration. This is expressed in term of percent difference %D.
  - Ion abundance ratios must be within the specified control limits in Table 8 (SW846 Method 8290).

- During the continuing calibration performed on 8/2/07 @1603 on instrument HRMS1, all criteria were met. No qualifiers were applied. Sample F51275-1 was analyzed following this continuing calibration.

- During the continuing calibration performed on 8/3/07 @0324 on instrument HRMS1, all criteria were met. No qualifiers were applied. Sample F51275-1 was analyzed before this continuing calibration.

- During the continuing calibration performed on 8/9/07 @1323 on instrument HRMS3, all criteria were met. No qualifiers were applied. Samples F51275-2, F51275-3, and F51275-4 were analyzed after this continuing calibration.

- During the continuing calibration performed on 8/9/07 @2234 on instrument HRMS3, 13C-1,2,3,4-TCDD (37.2%) and 13C-1,2,3,7,8,9-HxCDD (36.4%) had high %D. These labeled standards are injection standards only, the standards used for quantitation met criteria, so no data qualifiers were applied. All other standards met criteria. Samples F51275-2, F51275-3, and F51275-4 were analyzed after this continuing calibration.

VI-Internal Standards (IS) Recovery Standard Solutions
Internal standards performance criteria ensure that GC/MS sensitivity and response are stable during every analytical run. Specific criteria include: Recoveries of the isotopically-labeled recovery standards to fall within the 40 to 135 percent range for the tetra- through octachlorinated congeners, or as stated in the data package (DoD QSM limits 40-135%).

- All field samples met criteria. No qualifiers were applied.

VII-Cleanup Standards
Cleanup standards are added to every sample, blank, quality control sample, and calibration solution. This compound is added to the samples after extraction but prior to cleanup and is used to verify the percent recovery obtained using the isotope dilution technique. The control limits are 40 to 135 percent (DoD QSM limits 40-135%).

- All field samples met criteria. No qualifiers were applied.

VIII-Laboratory Control Standard (LCS) or Ongoing Precision Result (OPR)
LCSs are used to monitor laboratory accuracy and precision by calculating the percent recoveries of the spiked compounds. Per DOD QSM and method criteria, acceptable performance is determined by:

1. Recoveries of the isotopically-labeled extraction standards to fall within 40-135% control limits for the tetra- through octachlorinated congeners, or as stated in the data package;

2. Recoveries (accuracy) of the unlabeled compounds should be within $\pm$35% when spiked at the method quantitation limit and within $\pm$30% when spiked above 20 times the method quantitation limit, or as stated in the data package;

3. When duplicate OPR are required, the relative percent difference (RPD) of the unlabeled analytes concentrations should be within 30% when spiked at the method quantitation limit and within $\pm$20% when spiked above 20 times the method quantitation limit.

- Sample OPR14402 was used as the solid LCS/LCSD during the 8/9/07 analytical run. All criteria were met. No qualifiers were applied. Samples F51275-2, F51275-3, and F51275-4 were analyzed in conjunction with this LCS.

- Sample OPR14393 was used as the aqueous LCS/LCSD during the 8/2/07 analytical run. All criteria were met. No qualifiers were applied. Sample F51275-1 was were analyzed in conjunction with this LCS.

IX-Matrix Spike/Matrix Spike Duplicate
Data for matrix spike/matrix spike duplicates (MS/MSD) are generated to determine long-term precision and accuracy of the analytical method on various matrices and to demonstrate acceptable compound recovery by the laboratory at the time of sample analysis. The percent recoveries (%Rs) and the relative percent difference (RPD) must be within the specified control limits. Per DoD QSM, MS/MSD recoveries must be within in-house laboratory limits (75-125%) and RPD $\leq$20%.

- MS/MSD analysis was not performed on an RFAAP sample. No data qualification was required.

X-Field Duplicate Sample Analysis
Field duplicates were collected to identify the cumulative precision of the sampling and analytical process and sent to the laboratory blind. The RPD was calculated only for those analytes which were detected in both samples of the duplicate pair. Analytes that were rejected (R-qualified) in either sample of the duplicate pair were excluded from the duplicate assessment. Precision control criterion was established at 50% RPD for the aqueous and solid samples. Analytical results were qualified as estimated (J) for any RPDs exceeding criteria.

- No field duplicates were included in this data package.

XI-Quantitation Verification
The accuracy of analytical results was verified through the calculation of at least one the several parameters such as the %D, %RSD, % recovery, and/or compound concentration. Values were found to be within 10%. Any value reported by the laboratory as estimated "A" based on an analyte to internal standard ratio below the calibration curve was qualified as estimated "J". The signal signal-to-noise ratio (S/N) must be greater than 2.5 for each selected ion current profile (SICP) and for each GC signal representing the elution of a target analyte or labeled standard. Any detected value with ether interference (I-lab flag) was qualified as estimated "J". When the ion ratio failed the 25% criteria (*-lab flag), the estimated maximum possible concentration (EMPC) was reported and flagged estimated "J". If of quantitation interference was present (Q-lab flag), the date was flagged estimated "J" for detects and "UJ" for non-detects.

- The 1,2,3,7,8-PeCDD, 1,2,3,4,7,8-HxCDD, 1,2,3,6,7,8-HxCDD, 1,2,3,7,8,9-HxCDD, 2,3,7,8-TCDF, 1,2,3,7,8-PeCDF, 2,3,4,7,8-PeCDF, 1,2,3,4,7,8-HxCDF, 1,2,3,6,7,8-HxCDF, 2,3,4,6,7,8-HxCDF, and 1,2,3,4,7,8,9-HpCDF results in F51275-2 have been qualified "J" as estimated since the amount detected was less than the Lower Method Calibration Limit. The ion abundance ratios for 1,2,3,7,8-PeCDF and 1,2,3,6,7,8-HxCDF did not meet criteria and have been reported as an Estimated Maximum Possible Concentration (EPMC). Since the results have already been qualified "J", no further qualification is required.

- The 2,3,7,8-TCDF and 1,2,3,4,6,7,8-HpCDF results in F51275-3 have been qualified "J" as estimated since the amount detected was less than the Lower Method Calibration Limit. The ion abundance ratio for 1,2,3,4,6,7,8-HpCDF did not meet criteria and has been reported as an Estimated Maximum Possible Concentration (EPMC). Since the result has already been qualified "J", no further qualification is required.

- The 1,2,3,7,8-PeCDD, 1,2,3,4,7,8-HxCDD, 1,2,3,6,7,8-HxCDD, 1,2,3,7,8,9-HxCDD, 2,3,4,7,8-PeCDF, 1,2,3,4,7,8-HxCDF, 1,2,3,6,7,8-HxCDF, 2,3,4,6,7,8-HxCDF, 1,2,3,4,6,7,8-HpCDF, and OCDF results in F51275-4 have been qualified "J" as estimated since the amount detected was less than the Lower Method Calibration Limit. The ion abundance ratios for 1,2,3,7,8-PeCDD, 1,2,3,4,7,8-HxCDD, 2,3,4,7,8-PeCDF, 1,2,3,6,7,8-HxCDF, and 2,3,4,6,7,8-HxCDF did not meet criteria and have been reported as an Estimated Maximum Possible Concentration (EPMC). Since the results have already been qualified "J", no further qualification is required.

Sample: 49MW01 (F51275-1), OCDD

A(x) = sum of the integrated ion abundances of the quantitation ions for the unlabeled ions;
A(is) = sum of the integrated ion abundances of the quantitation ions for the labeled ions;
Q(is) = quantity, in ng/ul, of the internal standard added to the sample before extraction;
Avg. RRF = calculated mean relative response factor for the unlabeled analyte.
Ws = weight of sample (g)
Ps = percent solids/100

$$\text{Conc. (ng/L)} = \frac{(A(x)) * Q(is) * 1000}{A(is) * \text{Avg. RRF} * Ws * Ps} = \frac{(2910000) * 4.0 * 1000}{(704000) * 1.12564 * 10.56 * 0.797} = 1750 \text{ pg/g}$$

Reported Value = 1750 pg/g
% Difference = 0.0%
Values were within 10% difference

USEPA Region III Validation Qualifiers

(No Code) = Confirmed identification.

B = The analyte has been detected in the sample and the associated laboratory or field blank.

J = Indicates an estimated value for (1) estimated value due to QC non-conformance. Reported value may not be accurate or precise, (2) estimating a concentration as a tentatively identified compound as indicated by the mass spectral and retention time data, or (3) estimating a concentration ≥ EDL and <MRL or <3*EDL, whichever is greater.

K = Analyte present. Reported value may be biased high (estimated) due to QC non-conformance.

L = Analyte present. Reported value may be biased low (estimated) due to QC non-conformance.

R = Unreliable result. Analyte may or may not be present in the sample due to QC non-conformance.

UL = Value is estimated bias low and not detected due to QC non-conformance. Reporting limit may be inaccurate or imprecise. Quantitation limit is probably higher.

UJ = Value is estimated and not detected due to QC non-conformance. Reporting limit may be inaccurate or imprecise.

Laboratory Qualifiers

(No Code) = Confirmed identification.

U = Not detected. The associated number indicates the compound reporting limit for the sample.

A (Dioxins) = B (Metals) = The reported value was obtained from a reading <MRL and ≥EDL and is considered estimated.

B (Organics) = The analyte or compound has been detected in the sample and laboratory method blank. It indicates probable blank contamination.

E (Metals) = Reported value is estimated because of the presence of interferences.

E (Organics) = Identifies compounds whose concentrations exceed the upper level of the calibration range.

EMPC (Dioxins) = The ion-abundance ratio between the two characteristic PCDD/PCDF ions was outside accepted ranges. The detected PCDD/PCDF was reported as an estimated maximum possible concentration (EMPC).

D = Indicates sample was analyzed at a dilution.

J = Indicates an estimated value for (1) estimating a concentration as a tentatively identified compound as indicated by the mass spectral and retention time data, or (2) estimating a concentration <MRL and ≥ EDL.

N (Organics) = Indicates presumptive evidence of a compound for tentatively identified compounds using a library search.

N (Metals) = Laboratory spike sample recovery not within control limits.

P (Organics) = Target analyte confirmation >40% difference for detected compound between the primary and secondary columns. The lower of the two values was reported.

* (Metals) = Duplicate analysis not within control limits.

* (Organics) = Surrogate outside of QC limits on both original and re-analysis.

Method 8290
F51275-1
Accutest

Analytical Data Summary Sheet

Analyte	Amount ng/L	EDL ng/L	EMPC ng/L	RT (min.)	Ratio	Qualifier
2,3,7,8-TCDD	ND	0.00436				
1,2,3,7,8-PeCDD	ND	0.00533				
1,2,3,4,7,8-HxCDD	ND	0.00697				
1,2,3,6,7,8-HxCDD	ND	0.00709				
1,2,3,7,8,9-HxCDD	ND	0.00720				
1,2,3,4,6,7,8-HpCDD	ND	0.0112				
OCDD	ND	0.0173				
2,3,7,8-TCDF	ND	0.00345				
1,2,3,7,8-PeCDF	ND	0.00533				
2,3,4,7,8-PeCDF	ND	0.00533				
1,2,3,4,7,8-HxCDF	ND	0.00533				
1,2,3,6,7,8-HxCDF	ND	0.00533				
2,3,4,6,7,8-HxCDF	ND	0.00533				
1,2,3,7,8,9-HxCDF	ND	0.00545				
1,2,3,4,6,7,8-HpCDF	ND	0.00533				
1,2,3,4,7,8,9-HpCDF	ND	0.00619				
OCDF	ND	0.0141				
Total TCDDs	ND	0.00436				
Total PeCDDs	ND	0.00533				
Total HxCDDs	ND	0.00720				
Total HpCDDs	ND	0.0112				
Total TCDFs	ND	0.00345				
Total PeCDFs	ND	0.00533				
Total HxCDFs	ND	0.00545				
Total HpCDFs	ND	0.00619				
WHO-2005 TEQ (ND=0)	ND		ND			
WHO-2005 TEQ (ND=½)	0.00815		0.00815			

Client Information			**Sample Information**	
Project Name:	F51275		Report Basis:	Wet
			Matrix:	Water
Sample ID:	F51275-1		Weight / Volume:	938 mL
			Solids / Lipids:	NA %
			Original pH :	7
Laboratory Information			Batch ID:	WG14393
Project ID:	G383-587		Instrument:	HRMS1
Sample ID:	G383-587-1C		Filename:	a30jul07a_9-12
Collection Date/Time:	07/24/07	8:00	Retchk:	a30jul07a_8-4
Receipt Date/Time:	07/31/07	10:20	Begin ConCal:	a30jul07a_8-4
Extraction Date:	08/01/07		End ConCal:	a30jul07a_9-14
Analysis Date/Time:	08/03/07	1:48	Initial Cal:	m8290-071007a

Method 8290
F51275-2
Accutest

Analytical Data Summary Sheet

DATA VAL QUALIFIER

Analyte	Amount (pg/g)	EDL (pg/g)	EMPC (pg/g)	RT (min.)	Ratio		Qualifier	
2,3,7,8-TCDD	ND	0.217						
1,2,3,7,8-PeCDD	0.675			34.01	1.54		A	J
1,2,3,4,7,8-HxCDD	1.07			36.57	1.35		A	J
1,2,3,6,7,8-HxCDD	3.07			36.66	1.35		A	J
1,2,3,7,8,9-HxCDD	2.89			36.90	1.20		A	J
1,2,3,4,6,7,8-HpCDD	91.9			39.90	1.05			
OCDD	1750			44.03	0.90			
2,3,7,8-TCDF	0.502			30.18	0.73		A	J
1,2,3,7,8-PeCDF	EMPC	0.594	0.152	33.18	0.81	*	A	J
2,3,4,7,8-PeCDF	0.376			33.81	1.57		A	J
1,2,3,4,7,8-HxCDF	1.11			35.88	1.23		A	BJ
1,2,3,6,7,8-HxCDF	EMPC	0.594	0.616	35.96	1.46	*	A	J
2,3,4,6,7,8-HxCDF	0.899			36.46	1.16		A	J
1,2,3,7,8,9-HxCDF	ND	0.594						
1,2,3,4,6,7,8-HpCDF	18.9			38.67	1.03			
1,2,3,4,7,8,9-HpCDF	0.982			40.55	1.17		A	J
OCDF	50.7			44.31	0.88			
Total TCDDs	0.418		0.535					
Total PeCDDs	2.19		4.50				Q	
Total HxCDDs	19.4							
Total HpCDDs	194							
Total TCDFs	1.50		2.47					
Total PeCDFs	1.67		3.69					
Total HxCDFs	16.3		17.1					
Total HpCDFs	62.0							
WHO-2005 TEQ (ND=0)	3.40		3.47					
WHO-2005 TEQ (ND=½)	3.58		3.60					

Client Information			**Sample Information**	
Project Name:	F51275		Report Basis:	Dry
			Matrix:	Soil
Sample ID:	F51275-2		Weight / Volume:	10.56 g
			Solids / Lipids:	79.7 %
			Original pH :	NA
Laboratory Information			Batch ID:	WG14402
Project ID:	G383-587		Instrument:	HRMS3
Sample ID:	G383-587-2B		Filename:	c08aug07a_4-7
Collection Date/Time:	07/24/07	10:45	Retchk:	c08aug07a_3-14
Receipt Date/Time:	07/31/07	10:20	Begin ConCal:	c08aug07a_3-14
Extraction Date:	08/07/07		End ConCal:	c08aug07a_4-10
Analysis Date/Time:	08/09/07	20:08	Initial Cal:	m8290-c110206a

Method 8290
F51275-3
Accutest

DATA VAL QUALIFIER

Analytical Data Summary Sheet

Analyte	Amount (pg/g)	EDL (pg/g)	EMPC (pg/g)	RT (min.)	Ratio		Qualifier	
2,3,7,8-TCDD	ND	0.261						
1,2,3,7,8-PeCDD	ND	0.615						
1,2,3,4,7,8-HxCDD	ND	0.615						
1,2,3,6,7,8-HxCDD	ND	0.615						
1,2,3,7,8,9-HxCDD	ND	0.615						
1,2,3,4,6,7,8-HpCDD	20.7			39.91	1.10			
OCDD	3260			44.03	0.90			
2,3,7,8-TCDF	0.290			30.21	0.72		A	J
1,2,3,7,8-PeCDF	ND	0.615						
2,3,4,7,8-PeCDF	ND	0.615						
1,2,3,4,7,8-HxCDF	ND	0.615						
1,2,3,6,7,8-HxCDF	ND	0.615						
2,3,4,6,7,8-HxCDF	ND	0.615						
1,2,3,7,8,9-HxCDF	ND	0.615						
1,2,3,4,6,7,8-HpCDF	EMPC	0.615	0.963	38.65	1.24	*	A	J
1,2,3,4,7,8,9-HpCDF	ND	0.615						
OCDF	ND	1.23						
Total TCDDs	ND	0.261						
Total PeCDDs	ND	0.615	0.214					
Total HxCDDs	0.394		0.977					
Total HpCDDs	52.9							
Total TCDFs	0.290							
Total PeCDFs	ND	0.615						
Total HxCDFs	ND	0.615	0.460					
Total HpCDFs	0.896		1.86					
WHO-2005 TEQ (ND=0)	1.21		1.22					
WHO-2005 TEQ (ND=½)	1.98		1.98					

Client Information			**Sample Information**	
Project Name:	F51275		Report Basis:	Dry
			Matrix:	Soil
Sample ID:	F51275-3		Weight / Volume:	10.54 g
			Solids / Lipids:	77.1 %
			Original pH :	NA
Laboratory Information			Batch ID:	WG14402
Project ID:	G383-587		Instrument:	HRMS3
Sample ID:	G383-587-3B		Filename:	c08aug07a_4-8
Collection Date/Time:	07/24/07	10:55	Retchk:	c08aug07a_3-14
Receipt Date/Time:	07/31/07	10:20	Begin ConCal:	c08aug07a_3-14
Extraction Date:	08/07/07		End ConCal:	c08aug07a_4-10
Analysis Date/Time:	08/09/07	20:57	Initial Cal:	m8290-c110206a

Method 8290
F51275-4
Accutest

DATA VAL
QUALIFIER

Analytical Data Summary Sheet

Analyte	Amount (pg/g)	EDL (pg/g)	EMPC (pg/g)	RT (min.)	Ratio		Qualifier	
2,3,7,8-TCDD	ND	0.191						
1,2,3,7,8-PeCDD	EMPC	0.617	0.234	34.02	1.19	*	A	J
1,2,3,4,7,8-HxCDD	EMPC	0.617	0.269	36.60	2.07	*	A	J
1,2,3,6,7,8-HxCDD	0.383			36.67	1.28		A	J
1,2,3,7,8,9-HxCDD	0.496			36.91	1.24		A	J
1,2,3,4,6,7,8-HpCDD	14.7			39.90	1.09			
OCDD	1170			44.03	0.90			
2,3,7,8-TCDF	ND	0.188						
1,2,3,7,8-PeCDF	ND	0.617						
2,3,4,7,8-PeCDF	EMPC	0.617	0.101	33.81	1.30	*	A	J
1,2,3,4,7,8-HxCDF	0.239			35.90	1.20		A	BJ
1,2,3,6,7,8-HxCDF	EMPC	0.617	0.153	35.98	1.96	*	A	J
2,3,4,6,7,8-HxCDF	EMPC	0.617	0.0913	36.46	3.17	*	A	J
1,2,3,7,8,9-HxCDF	ND	0.617						
1,2,3,4,6,7,8-HpCDF	2.75			38.68	1.01		A	BJ
1,2,3,4,7,8,9-HpCDF	ND	0.617						
OCDF	5.74			44.33	0.94		A	BJ
Total TCDDs	0.0740		0.195					
Total PeCDDs	ND	0.617	0.550					
Total HxCDDs	1.34		2.60					
Total HpCDDs	32.3							
Total TCDFs	0.170		0.271					
Total PeCDFs	0.104		0.205					
Total HxCDFs	1.51		1.75					
Total HpCDFs	6.06							
WHO-2005 TEQ (ND=0)	0.639		0.955					
WHO-2005 TEQ (ND=½)	1.28		1.10					

Client Information			**Sample Information**		
Project Name:	F51275		Report Basis:	Dry	
			Matrix:	Soil	
Sample ID:	F51275-4		Weight / Volume:	10.22 g	
			Solids / Lipids:	79.3	%
			Original pH :	NA	
Laboratory Information			Batch ID:	WG14402	
Project ID:	G383-587		Instrument:	HRMS3	
Sample ID:	G383-587-4B		Filename:	c08aug07a_4-9	
Collection Date/Time:	07/24/07	11:05	Retchk:	c08aug07a_3-14	
Receipt Date/Time:	07/31/07	10:20	Begin ConCal:	c08aug07a_3-14	
Extraction Date:	08/07/07		End ConCal:	c08aug07a_4-10	
Analysis Date/Time:	08/09/07	21:45	Initial Cal:	m8290-c110206a	

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Shaw® Shaw Environmental, Inc.

MEMORANDUM

TO: Jeff Parks, Shaw E&I RFAAP Project Manager

FROM: Richard McCracken, Shaw E&I RFAAP Project Chemist

SUBJECT: Radford Army Ammunition Plant (RFAAP) Data Validation – Herbicides
Accutest Laboratories, Inc., SDG F51275

DATE: December 17, 2007

The purpose of this memorandum is to present the data validation report for the samples collected at RFAAP on July 24, 2007. The samples were analyzed for chlorinated herbicides using USEPA SW846 Method 8151A. A total of one aqueous and three soil samples were validated. The sample IDs are:

Field Sample ID	Lab Sample ID	Field Sample ID	Lab Sample ID
072407R	F51275-1	59SB03B	F51275-3
59SB03A	F51275-2	59SB03C	F51275-4

Data were reviewed by Richard McCracken and validated using a combination of project QAPP, *Quality Systems Manual for Environmental Laboratories, Final Version 3, January, 2006* (DoD, 2006) (DoD QSM), method-specific criteria, and laboratory SOP criteria. The data qualifier scheme was consistent with the *Region III Modifications to the National Functional Guidelines for Organic Data Review* (September 1994). Parameters evaluated are presented in **Table 1**. Data associated with parameters in compliance with quality control specifications have not been qualified. Data associated with parameters that did not comply with quality control specifications and directly impacted project data have been qualified in accordance with USEPA Region III specifications.

Table 1 Laboratory Performance Criteria

Qualified		Parameter
Yes	No	
	X	Holding Times
X		Initial Calibration
	X	Continuing Calibration
	X	Blank Analysis
	X	System Monitoring Compounds
	X	Laboratory Control Sample
X		Matrix Spike/Spike Duplicate
	X	Field Duplicate
	X	Quantitation Verification

The quality of data collected in support of this sampling activity is considered acceptable with noted qualifications.

Richard McCracken, Chemist

12/17/07
Date

RFAAP VALIDATION REPORT
CHLORINATED HERBICIDES REVIEW
SDG F51275

I-Holding Times

The objective is to ascertain the validity of results based on the holding time of the sample from time of collection to time of sample extraction and analysis. Solid samples must be cooled @4°C ± 2°C, with a maximum holding time of 14 days from sample collection to preparative extraction and 40 days from preparative extraction to determinative analysis. Aqueous samples must be cooled @4°C ± 2°C, with a maximum holding time of 7 days from sample collection to preparative extraction and 40 days from preparative extraction to determinative analysis.

- Temperature Review: A temperature blank was sent with each cooler and recorded by the laboratory upon receipt. The samples collected on 7/24/07 were sent in two coolers, and were received by the laboratory on 7/25/07 at 2.6 °C & 3.4 °C. No qualifiers were applied.

- Holding Time Review: The samples were collected on 7/24/07, extracted on 7/31/07, and analyzed on 8/2/07 & 8/3/07. All criteria were met. No qualifiers were applied.

II-Initial Calibration

Compliance requirements for satisfactory instrument calibration are established to ensure that the instrument used is capable of producing acceptable qualitative and quantitative data for semivolatile target compounds. Initial calibration demonstrates that the instrument is capable of acceptable performance in the beginning of the analytical run and of producing a linear calibration curve. The DoD QSM specifies that the percent relative standard deviation (%RSD) for a 5-point standard calibration should be ≤20% for each target compound.

- No initial calibration data was provided for MCPP or MCPA. During discussions with the laboratory, they indicated that they perform a one-point calibration each day that analysis for MCPP or MCPA is conducted. A five-point initial calibration was not performed, therefore all data for these two compounds has been qualified "J/UJ".

- During the initial calibration performed on 8/1/07 on instrument GC-GG, pentachlorophenol (20.65%) and 2,4,5-TP (Silvex) (20.32%) had %RSD > 20% on signal #1 - the results for these two compounds have been qualified "J/UJ". The other target compounds (except MCPP and MCPA – see above) met criteria for signal #1 and signal #2. All samples were analyzed following this initial calibration.

III-Continuing Calibration

Compliance requirements for satisfactory instrument calibration are established to ensure that the instrument used is capable of producing acceptable qualitative and quantitative data for semivolatile target compounds. Continuing calibration establishes the response factors on which the quantitations are based and checks satisfactory performance of the instrument on a day-to-day basis. The DoD QSM specifies that the percent difference (%D) between the initial calibration CF and the continuing calibration CF must be ≤20%.

- A one-point daily calibration from 8/2/07 @1149 and 8/3/07 @1729 was provided for MCPP and MCPA, indicating that the lab is able to detect and quantitate both compounds. %D data was not supplied since a five-point initial calibration was not performed. All MCPP and MCPA data has already been qualified (see initial calibration), no additional qualification is required.

- During continuing calibration performed on 8/2/07 @1244 on instrument GC-GG, all target compounds (except MCPP and MCPA – see above) met criteria for signal #1 and signal #2. No qualifiers were applied. Samples 59SB03A, 59SB03B, and 59SB03C were analyzed after this continuing calibration.

- During continuing calibration performed on 8/2/07 @2009 on instrument GC-GG, all target compounds (except MCPP and MCPA – see above) met criteria for signal #1 and signal #2. No qualifiers were applied. Samples 59SB03A, 59SB03B, and 59SB03C were analyzed before this continuing calibration.

- During continuing calibration performed on 8/3/07 @0134 on instrument GC-GG, all target compounds (except MCPP and MCPA – see above) met criteria for signal #1 and signal #2. No qualifiers were applied. The MS & MSD were analyzed after this continuing calibration.

- During continuing calibration performed on 8/3/07 @0350 on instrument GC-GG, all target compounds (except MCPP and MCPA – see above) met criteria for signal #1 and signal #2. No qualifiers were applied. The MS & MSD were analyzed before this continuing calibration.

- During continuing calibration performed on 8/3/07 @1756 on instrument GC-GG, all target compounds (except MCPP and MCPA – see above) met criteria for signal #1 and signal #2. No qualifiers were applied. Sample 072407R plus the aqueous MS & MSD were analyzed after this continuing calibration.

- During continuing calibration performed on 8/3/07 @2322 on instrument GC-GG, all target compounds (except MCPP and MCPA – see above) met criteria for signal #1 and signal #2. No qualifiers were applied. Sample 072407R plus the aqueous MS & MSD were analyzed before this continuing calibration.

IV-Blank Analysis

The purpose of blank analyses is to determine the presence and magnitude of contamination problems resulting from field or laboratory activities. No contaminants should be detected in any of the associated blanks. The DoD QSM criterion specifies all concentrations should be less than one-half MRL. Positive sample results are qualified "B" if the concentration of the analyte is ≤ five times (5x) the absolute maximum blank concentration. **Table 2** summarizes the blank contamination analysis.

Table 2 Blank Contamination Analysis Summary

Analysis Date	QC Blank ID	Compound	Max Conc. µg/L or ug/kg	Action Level µg/L	B qualified samples
8/2/07	OP7785-MB	All target compounds <½MRL	NA	NA	None
8/3/07	OP7790-MB	All target compounds <½MRL	NA	NA	None
8/3/07	072407R	All target compounds <½MRL	NA	NA	None

072407R is a rinsate blank.
NA = Not applicable. MRL = Method reporting limit.

V-System Monitoring Compounds (Surrogates)

Laboratory performance on individual samples is established by means of spiking activities. All samples are spiked with surrogate compounds prior to sample preparation. Spike recoveries must be within the specified control limits. DoD surrogate recovery limits are specified in Table D-3 of the DoD QSM (DoD, 2006). If the surrogate is not listed, then the laboratory criteria shall be used.

Control Limit: 2,4-DCAA (34-179%)

- All samples met recovery criteria.

VI-Laboratory Control Samples
Data for laboratory control samples (LCS) are generated to determine long-term precision and accuracy of the analytical method. Percent recoveries must be within the specified control limits. DoD LCS recovery limits are specified in Tables D-8 (aqueous) and D-9 (solid matrix) of the DoD QSM (DoD, 2006). If the compound is not listed, then the laboratory criteria shall be used.

- Sample OP7785-BS was used as the solid matrix LCS during the 8/2/07 run. All herbicides were within criteria, no data qualifiers were applied. Samples 59SB03A, 59SB03B, and 59SB03C were analyzed in conjunction with this LCS.

- Sample OP7790-BS was used as the aqueous LCS during the 8/3/07 run. All herbicides were within criteria, no data qualifiers were applied. Sample 072407R was analyzed in conjunction with this LCS.

VII-Matrix Spike/Matrix Spike Duplicate
Data for matrix spike/matrix spike duplicates (MS/MSD) are generated to determine long-term precision and accuracy of the analytical method on various matrices and to demonstrate acceptable compound recovery by the laboratory at the time of sample analysis. The percent recoveries (%Rs) and the relative percent difference (RPD) must be within the specified control limits. DoD MS/MSD recovery limits follow the LCS criteria specified in Tables D-8 (aqueous) and D-9 (solid matrix) of the DoD QSM (DoD, 2006). If the compound is not listed, then the laboratory criteria shall be used.

- Solid matrix MS/MSD analysis was performed on F51300-25 (an RFAAP sample analyzed as part of Accutest job number 51300) . Dichloroprop (65%) had a low recovery in the MS – the dichloroprop results in associated samples have been qualified "J/UJ". 2,4,5-TP (Silvex), 2,4,5-T, and dalapon had high RPDs – no data qualification is performed on RPD data alone. All other herbicides met recovery and RPD criteria. Samples 59SB03A, 59SB03B, and 59SB03C were analyzed in conjunction with this MS/MSD.

- Aqueous MS/MSD analysis was performed on 072407R. Dinoseb (13%, 14%) had a low recovery in the MS & MSD, the dinoseb results in associated samples have been qualified "J/UJ". All other herbicides met recovery and RPD criteria. Sample 072407R was analyzed in conjunction with this MS/MSD.

VIII-Field Duplicate Sample Analysis
Field duplicates were collected to identify the cumulative precision of the sampling and analytical process and sent to the laboratory blind. The RPD was calculated only for those analytes which were detected at levels exceeding the method reporting limits in both samples of the duplicate pair. Analytes that were qualified because of blank contamination (B-qualified) or were rejected (R-qualified) in either sample of the duplicate pair were excluded from the duplicate assessment. Precision control criterion was established at 50% RPD for the aqueous and solid samples. Analytical results were qualified as estimated (J) for any RPDs exceeding criteria.

- No field duplicates were included in this data package.

IX-Quantitation Verification

The accuracy of analytical results is verified through the calculation of several parameters. Percent difference (%D) between the calculated value and the reported value must be within 10%. All positive values must have less than or equal to 40% %D between the primary and secondary columns. Any sample value >MDL and <MRL is qualified as estimated, "J." All criteria were met. No qualifiers were applied.

- The %D between the primary and secondary columns was within criteria for all detected chlorinated herbicides.

Sample: OP7785-BS, 2,4,5-TP (Silvex)

Conc. µg/kg = (Ax * Vt * DF) / (CF * Vi * Ws * Ps * 1000)

where:
- Ax = Area response for the compound being measured
- Vt = Total volume of extract, taking into account dilutions (uL)
- DF = Dilution factor
- CF = Calibration Factor from initial calibration (area/pg)
- Vi = Volume of extract injected (uL)
- Ws = weight of sample (g)
- Ps = percent solids/100

Conc. µg/kg = (1639054 * 10000 * 1) / (48130 * 1 * 30.11 * 1 * 1000)
= 11.3 ug/kg

Reported Conc. = 11.3 µg/kg
%D = 0.0%
Values were within 10% difference

USEPA Region III Validation Qualifiers

(No Code) = Confirmed identification.

B = The analyte has been detected in the sample and the associated laboratory or field blank.

J = Indicates an estimated value for (1) estimated value due to QC non-conformance. Reported value may not be accurate or precise, (2) estimating a concentration as a tentatively identified compound as indicated by the mass spectral and retention time data, or (3) estimating a concentration ≥ MDL and <MRL or <3*MDL, whichever is greater.

K = Analyte present. Reported value may be biased high (estimated) due to QC non-conformance.

L = Analyte present. Reported value may be biased low (estimated) due to QC non-conformance.

R = Unreliable result. Analyte may or may not be present in the sample due to QC non-conformance.

UL = Value is estimated bias low and not detected due to QC non-conformance. Reporting limit may be inaccurate or imprecise. Quantitation limit is probably higher.

UJ = Value is estimated and not detected due to QC non-conformance. Reporting limit may be inaccurate or imprecise.

Laboratory Qualifiers

(No Code) = Confirmed identification.

A (Dioxins) = MDL is based upon the signal-to-noise measurement.

B (Metals) = The reported value was obtained from a reading <MRL and ≥MDL and is considered estimated.

B (Organics and Dioxins) = The analyte or compound has been detected in the sample and laboratory method blank. It indicates probable blank contamination.

D (Organics) = Indicates sample was analyzed at a dilution.

E (Metals) = Reported value is estimated because of the presence of interferences.

E (Organics) = Identifies compounds whose concentrations exceed the upper level of the calibration range.

E (Dioxins) = Reported value is estimated because of the presence of ether interferences.

EMPC (Dioxins) = The ion-abundance ratio between the two characteristic PCDD/F ions is outside accepted ranges. The detected PCDD/F is reported as an estimated maximum possible concentration (EMPC).

I (Dioxins) = Reported value is estimated because of the incorrect isotope rations were obtained.

J (All) = Indicates an estimated value for (1) estimating a concentration as a tentatively identified compound as indicated by the mass spectral and retention time data, (2) estimating a concentration <MRL and ≥ MDL, or estimating a concentration below the calibration range.

N (Organics) = Indicates presumptive evidence of a compound for tentatively identified compounds using a library search.

N (Metals) = Laboratory spike sample recovery not within control limits.

P (Organics) = Target analyte confirmation >40% difference for detected compound between the primary and secondary columns. The lower of the two values was reported.

U (All) = ND = BQL = Not detected. The associated number indicates the compound reporting limit for the sample.

* (Metals) = Duplicate analysis not within control limits.

* (Organics) = Surrogate outside of QC limits on both original and re-analysis.

Accutest Laboratories

Report of Analysis

Client Sample ID:	072407R		
Lab Sample ID:	F51275-1	**Date Sampled:**	07/24/07
Matrix:	AQ - Water	**Date Received:**	07/25/07
Method:	SW846 8151 SW846 3510C	**Percent Solids:**	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	GG36536.D	1	08/03/07	ATX	07/31/07	T:OP7790	T:GGG1141
Run #2							

	Initial Volume	Final Volume
Run #1	1000 ml	10.0 ml
Run #2		

Herbicide List

DATA VAL QUALIFIER

CAS No.	Compound	Result	RL	MDL	Units	Q
94-75-7	2,4-D	ND	1.5	0.80	ug/l	
93-72-1	2,4,5-TP (Silvex)	ND	0.20	0.15	ug/l	UJ
93-76-5	2,4,5-T	ND	0.20	0.12	ug/l	
1918-00-9	Dicamba	ND	0.20	0.080	ug/l	
88-85-7	Dinoseb	ND	0.20	0.090	ug/l	UJ
75-99-0	Dalapon	ND	1.0	1.0	ug/l	
120-36-5	Dichloroprop	ND	1.0	0.51	ug/l	
94-82-6	2,4-DB	ND	2.0	1.9	ug/l	
93-65-2	MCPP	ND	50		ug/l	UJ
94-74-6	MCPA	ND	50		ug/l	UJ
87-86-5	Pentachlorophenol	ND	0.050	0.040	ug/l	UJ

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
19719-28-9	2,4-DCAA	85%		34-179%

(a) Analysis performed at Accutest Laboratories, Houston, TX.

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	59SB03A		
Lab Sample ID:	F51275-2	**Date Sampled:**	07/24/07
Matrix:	SO - Soil	**Date Received:**	07/25/07
Method:	SW846 8151 SW846 3550B	**Percent Solids:**	93.1
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	GG36492.D	1	08/02/07	ATX	07/31/07	T:OP7785	T:GGG1140
Run #2							

	Initial Weight	Final Volume
Run #1	30.0 g	10.0 ml
Run #2		

Herbicide List

DATA VAL QUALIFIER

CAS No.	Compound	Result	RL	MDL	Units	Q
94-75-7	2,4-D	ND	36	14	ug/kg	
93-72-1	2,4,5-TP (Silvex)	ND	14	13	ug/kg	UJ
93-76-5	2,4,5-T	ND	7.2	3.6	ug/kg	
1918-00-9	Dicamba	ND	7.2	5.4	ug/kg	
88-85-7	Dinoseb	ND	7.2	4.7	ug/kg	
75-99-0	Dalapon	ND	36	25	ug/kg	
120-36-5	Dichloroprop	ND	36	9.7	ug/kg	UJ
94-82-6	2,4-DB	ND	72	58	ug/kg	
93-65-2	MCPP	ND	180		ug/kg	UJ
94-74-6	MCPA	ND	180		ug/kg	UJ

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
19719-28-9	2,4-DCAA	67%		34-179%

(a) Analysis performed at Accutest Laboratories, Houston, TX.

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	59SB03B		
Lab Sample ID:	F51275-3	**Date Sampled:**	07/24/07
Matrix:	SO - Soil	**Date Received:**	07/25/07
Method:	SW846 8151 SW846 3550B	**Percent Solids:**	79.5
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	GG36493.D	1	08/02/07	ATX	07/31/07	T:OP7785	T:GGG1140
Run #2							

	Initial Weight	Final Volume
Run #1	30.2 g	10.0 ml
Run #2		

Herbicide List

DATA VAL QUALIFIER

CAS No.	Compound	Result	RL	MDL	Units	Q	
94-75-7	2,4-D	ND	42	17	ug/kg		
93-72-1	2,4,5-TP (Silvex)	ND	17	15	ug/kg	UJ	
93-76-5	2,4,5-T	ND	8.3	4.2	ug/kg		
1918-00-9	Dicamba	ND	8.3	6.3	ug/kg		
88-85-7	Dinoseb	ND	8.3	5.4	ug/kg		
75-99-0	Dalapon	ND	42	29	ug/kg		
120-36-5	Dichloroprop	ND	42	11	ug/kg	UJ	
94-82-6	2,4-DB	ND	83	68	ug/kg		
93-65-2	MCPP	ND	210		ug/kg	UJ	
94-74-6	MCPA	ND	210		ug/kg	UJ	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
19719-28-9	2,4-DCAA	86%		34-179%

(a) Analysis performed at Accutest Laboratories, Houston, TX.

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	59SB03C		
Lab Sample ID:	F51275-4	**Date Sampled:**	07/24/07
Matrix:	SO - Soil	**Date Received:**	07/25/07
Method:	SW846 8151 SW846 3550B	**Percent Solids:**	82.2
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	GG36494.D	1	08/02/07	ATX	07/31/07	T:OP7785	T:GGG1140
Run #2							

	Initial Weight	Final Volume
Run #1	30.0 g	10.0 ml
Run #2		

Herbicide List

DATA VAL QUALIFIER

CAS No.	Compound	Result	RL	MDL	Units	Q
94-75-7	2,4-D	ND	41	16	ug/kg	
93-72-1	2,4,5-TP (Silvex)	ND	16	14	ug/kg	UJ
93-76-5	2,4,5-T	ND	8.1	4.1	ug/kg	
1918-00-9	Dicamba	ND	8.1	6.1	ug/kg	
88-85-7	Dinoseb	ND	8.1	5.3	ug/kg	
75-99-0	Dalapon	ND	41	28	ug/kg	
120-36-5	Dichloroprop	ND	41	11	ug/kg	UJ
94-82-6	2,4-DB	ND	81	66	ug/kg	
93-65-2	MCPP	ND	200		ug/kg	UJ
94-74-6	MCPA	ND	200		ug/kg	UJ

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
19719-28-9	2,4-DCAA	84%		34-179%

(a) Analysis performed at Accutest Laboratories, Houston, TX.

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Shaw® Shaw Environmental, Inc.

MEMORANDUM

TO: Jeff Parks, Shaw E&I Radford Army Ammunition Plant (RFAAP) Project Manager

FROM: Richard McCracken, Shaw E&I Project Chemist

SUBJECT: RFAAP Data Validation – TAL Metals
Accutest Laboratories, Inc., SDG F51275

DATE: December 17, 2007

The purpose of this memorandum is to present the data validation report for the samples collected at RFAAP on July 24, 2007. The samples were analyzed for target analyte list (TAL) metals using USEPA SW-846 3010A/6010B (aqueous) and 3050B/6010B (solid matrix) for ICP metals; and SW-846 7470A (aqueous) and 7471A (solid matrix) for mercury. A total of one aqueous and three soil samples were validated. The sample IDs are:

Field Sample ID	Lab Sample ID	Field Sample ID	Lab Sample ID
072407R	F51275-1	59SB03B	F51275-3
59SB03A	F51275-2	59SB03C	F51275-4

Data were reviewed by Richard McCracken and validated using a combination of project QAPP, *Quality Systems Manual for Environmental Laboratories, Final Version 3, January, 2006* (DoD, 2006) (DoD QSM), method-specific criteria, and laboratory SOP criteria. The data qualifier scheme was consistent with the *Region III Modifications to the National Functional Guidelines for Inorganic Data Review* (April, 1993). Parameters evaluated are presented in **Table 1**. Data associated with parameters in compliance with quality control specifications have not been qualified. Data associated with parameters that did not comply with quality control specifications and directly impacted project data have been qualified in accordance with USEPA Region III specifications.

Table 1 Laboratory Performance Criteria

Qualified		Parameter
Yes	No	
	X	Holding Times
X		Initial and Continuing Calibration
	X	Blank Analysis
	X	ICP Interference Check Sample (ICS)
	X	Laboratory Control Sample (LCS)
X		Laboratory Sample Duplicate
X		Matrix Spike and Spike Duplicate
X		ICP Serial Dilution
	X	Field Sample Duplicate
X		Quantitation Verification

The quality of data collected in support of this sampling activity is considered acceptable with noted qualifications.

Richard McCracken, Chemist

12/17/07
Date

RFAAP VALIDATION REPORT
METALS REVIEW
SDG F51275

I-Holding Times

The primary objective is to ascertain the validity of results based on the holding time of the sample from time of collection to time of sample analysis. Holding time criteria: Solid samples must be cooled @4°C±2°C with a maximum holding time of 180 days for ICP metals and 28 days for mercury. Aqueous samples must be preserved to pH<2 with HNO_3 and cooled @4°C±2°C, with a maximum holding time of 180 days for ICP metals and 28 days for mercury.

- Temperature Review: A temperature blank was sent with each cooler and recorded by the laboratory upon receipt. The samples collected on 7/24/07 were sent in two coolers, and were received by the laboratory on 7/25/07 at 2.6 °C & 3.4 °C. No qualifiers were applied.

- Holding Time Review: The samples were collected 7/24/07 for metals analysis, digested for mercury on 7/26/07 and 7/28/07, analyzed for mercury on 7/26/07 and 7/28/07, digested for ICP metals on 7/30/07, and analyzed for ICP metals on 7/30/07 & 7/31/07. All criteria were met. No qualifiers were applied.

II-Initial and Continuing Calibration

Requirements for satisfactory instrument calibration are established to ensure that the instrument is capable of producing acceptable quantitative data. Initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of the analysis run, and continuing calibration verification documents that the initial calibration is still valid.

ICP:	1- blank (DoD QSM <½ MRL)	Hg:	1 – blank (DoD QSM <½ MRL)
	3 – standards (r≥0.995)		5 – standards (r≥0.995)
	ICV/CCV (90-110%) (DoD QSM 90-110%)		ICV/CCV (80-120%)(DoD QSM ICV 90-110% & CCV 80-120%)
	MRL (70-130%) (DoD QSM 80-120%)		MRL (80-120%) (DoD QSM 80-120%)
	High Std. (95-105%)		High Std. (95-105%)

- Mercury analysis was performed on 7/26/07, with a correlation coefficient of 0.999.

- Mercury analysis was performed on 7/28/07, with a correlation coefficient of 0.999.

- The mercury ICVs and CCVs met recovery criteria.

- The four samples in this data package were analyzed between CCV16 and CCV22 during the 7/30/07 metals run. All CCVs in this interval met recovery criteria.

- Samples 59SB03B and 59SB03C were analyzed for iron only between CCV8 and CCV10 during the 7/31/07 metals run. All CCVs in this interval met recovery criteria.

- All metals met recovery criteria during the High Standard analysis.

- **Table 2** summarizes the MRL standard analysis. Samples with concentrations detected less than two times the MRL with out of criteria MRL recovery were qualified.

Table 2 MRL Analysis Summary

Analysis Date	Analysis	MRL	MRL %Recovery	Qualified samples @ <2xMRL	Validation Qualifiers
7/26/07	Hg	0.2 ug/l	Met criteria	None	None
7/28/07	Hg	0.2 ug/l	Met criteria	None	None
7/31/07	ICP-Sb	5 ug/l	34.0	072407R	UL
7/31/07	ICP-Pb	5 ug/l	138.0	072407R	K
7/30/07	ICP-Se	10 ug/l	130.0	None	None
7/30/07	ICP-Zn	20 ug/l	121.5	None	None

III-Blanks

Blanks (preparation and calibration blanks) are assessed to determine the existence and magnitude of contamination problems. No contaminants should be detected (i.e. <MDL) in any of the associated blanks. DoD QSM limits are <½MRL for the method blank and <2*MDL for the calibration blanks. Samples are qualified "B" when they are less than 5x the absolute value of the maximum blank concentration. **Table 3** summarizes the blank contamination analysis.

Table 3 Blank Contamination Analysis Summary

Analysis Date	Analysis	QC Blank ID	Max Conc. µg/kg	Action Level µg/kg	B qualified samples
7/30/07	Copper	ICB/CCBs	0.12	0.60	None
7/30/07	Lead	ICB/CCBs	0.315	1.575	None
7/30/07	Magnesium	ICB/CCBs	0.52	2.6	None
7/30/07	Potassium	ICB/CCBs	87	435	None
7/30/07	Selenium	ICB/CCBs	0.25	1.25	None
7/30/07	Sodium	ICB/CCBs	97	485	None
7/30/07	Thallium	ICB/CCBs	0.28	1.4	None
7/26/07	Mercury	ICB/CCBs	<2*MDL	NA	None
7/28/07	Mercury	ICB/CCBs	<2*MDL	NA	None
7/30/07	ICP Metals	MP12607-MB	<½MRL	NA	None
7/30/07	ICP Metals	MP12611-MB*	<½MRL	NA	None
7/26/07	Mercury	MP12575-MB	<½MRL	NA	None
7/28/07	Mercury	MP12598-MB	<½MRL	NA	None
7/31/07	Lead	072407R	0.105 J	0.525	None
7/31/07	Magnesium	072407R	0.265 J	1.325	None
7/31/07	Potassium	072407R	88 J	440	None
7/31/07	Sodium	072407R	96 J	480	None
7/28/07	Mercury	072407R	<½MRL	NA	None

*: MP12611-MB is an aqueous blank.
072407R is a rinsate blank.
J = Estimated value <MRL and >MDL.

IV-ICP Interference Check Sample (ICS)

The ICP interference check sample (ICS) verifies interelement and background correction factors. ICP Interference Check is performed at the beginning and end of each sample analysis run. Control limits are 80-120% (DoD QSM limits 80-120%).

- All criteria were met. No qualifiers were applied.

V-Laboratory Control Samples (LCS)

The laboratory control sample (LCS) serves as a monitor of the overall performance of each step during the analysis, including the sample preparation. The DoD LCS recovery limits are specified in Tables D-18 (aqueous) and D-19 (solid matrix) of the DoD QSM (DoD, 2006). If the compound is not listed, then the laboratory criteria shall be used.

- Sample MP12607-BS was used as the LCS during solid matrix ICP metals analysis. All criteria were met. No qualifiers were applied. Samples 59SB03A, 59SB03B, and 59SB03C were analyzed in conjunction with this LCS.

- Sample MP12611-BS was used as the LCS during aqueous ICP metals analysis. All criteria were met. No qualifiers were applied. Sample 072407R was analyzed in conjunction with this LCS.

- Sample MP12575-BS was used as the LCS during solid matrix mercury analysis. All criteria were met. No qualifiers were applied. Samples 59SB03A, 59SB03B, and 59SB03C were analyzed in conjunction with this LCS.

- Sample MP12598-BS was used as the LCS during aqueous mercury analysis. All criteria were met. No qualifiers were applied. Sample 072407R was analyzed in conjunction with this LCS.

VI-Laboratory Duplicate Sample Analysis
Duplicate sample determinations are used to demonstrate acceptable method precision by the laboratory at the time of analysis. Duplicate analyses are also performed to generate data in order to determine the long-term precision of the analytical method on various matrices. RPDs must be within established control limits. DoD QSM limits for metals are 20% RPD for ICP metals and mercury.

- Sample 59SB03A was analyzed in duplicate during solid matrix ICP metals analysis. Arsenic (22.3%) and calcium (21.0%) had RPDs above criteria – all results for these two metals have been qualified "J". The other metals met RPD criteria. Samples 59SB03A, 59SB03B, and 59SB03C were analyzed in conjunction with this laboratory duplicate.

- Sample 072407R was analyzed in duplicate during aqueous ICP metals analysis. Copper (53.7%), iron (200%), magnesium (24.8%), and zinc (200%) had RPDs above criteria; the high RPDs were due to low sample concentrations (<RL) Therefore, no qualifiers were applied. All other metals met RPD criteria. Sample 072407R was analyzed in conjunction with this laboratory duplicate.

- Sample F51247-17 was analyzed in duplicate during solid matrix mercury analysis. The sample was not a RFAAP site sample; therefore, it was not evaluated. Samples 59SB03A, 59SB03B, and 59SB03C were analyzed in conjunction with this laboratory duplicate.

- Sample F51314-1 was analyzed in duplicate during aqueous mercury analysis. The sample was not a RFAAP site sample; therefore, it was not evaluated. Sample 072407R was analyzed in conjunction with this laboratory duplicate.

VII-Matrix Spike/Spike Duplicate
MS/MSD are generated to determine long-term precision and accuracy of the analytical method on various matrices and to demonstrate acceptable compound recovery by the laboratory at the time of sample analysis. Specific criteria include the analyses of matrix spike and matrix spike duplicate samples at a frequency of one MS and MSD per 20 samples of similar matrix. MS and MSD recoveries and relative percent differences between MS and MSD recoveries should be within the specified limits. DoD MS/MSD recovery limits follow the LCS criteria specified in Tables D-18 (aqueous) and D-19 (sold matrix) of the DoD QSM (DoD, 2006). If the compound is not listed, then the laboratory criteria shall be used. Post digestion spikes limits are 75-125% for ICP metals and mercury.

- Sample 59SB03A was used as the MS/MSD during solid matrix ICP metals analysis. Aluminum (28.1%, 36.2%), antimony (10.5%, 9.2%), calcium (65.3%, 62.6%), chromium (74.1%, 73.3%), iron (14.6%, 37.6%), magnesium (69.9%, 69.6%), magnesium (0%, 19.6%), selenium (78.6%, 76.2%), vanadium (79.0%, 77.8%), and zinc (62,7%, 69.6%) had low recoveries in the MS & MSD, while cobalt (79.4%), copper (79.8%), nickel (76.6%), and thallium (78.8%) had low recoveries in the MSD. The results for these metals have been qualified "L/UL". The other metals met recovery criteria, and all metals met RPD criteria. Samples 59SB03A, 59SB03B, and 59SB03C were analyzed in conjunction with this MS/MSD.

- Sample 072407R was used as the MS/MSD during aqueous ICP metals analysis. All metals met recovery and RPD criteria. Sample 072407R was analyzed in conjunction with this MS/MSD.

- Sample F51247-17 was used as the MS/MSD during solid matrix mercury analysis. The spiked sample was not a RFAAP site sample; therefore, it was not evaluated. Samples 59SB03A, 59SB03B, and 59SB03C were analyzed in conjunction with this MS/MSD.

- Sample F51314-1 was used as the MS/MSD during aqueous mercury analysis. The spiked sample was not a RFAAP site sample; therefore, it was not evaluated. Sample 072407R was analyzed in conjunction with this MS/MSD.

VIII-ICP Serial Dilution

An ICP serial dilution is performed to determine whether significant physical or chemical interferences exist due to sample matrix at high concentrations. An analysis of a 5-fold dilution should agree within 10% difference of the original result when the concentration in sample is a factor of 50 above MDL.

- Sample 59SB03A was used as the serial dilution during solid matrix ICP metals analysis. Aluminum (13.4%), arsenic (18.3%), barium (13.2%), calcium (18.1%), chromium (17.4%), cobalt (20.4%), copper (11.5%), iron (18.1%), lead (18.9%), magnesium (18.6%), manganese (19.0%), nickel (19.6%), potassium (52.0%), selenium (16.5%), vanadium (16.3%), and zinc (21.0%) had %D > 10%. All detections for these metals have been qualified "J/UJ". The other metals met criteria. Samples 59SB03A, 59SB03B, and 59SB03C were analyzed in conjunction with this serial dilution.

- Sample 072407R was used as the serial dilution during aqueous ICP metals analysis. Potassium (389.3%) had a %D > 10%. The potassium detections have been qualified "J". All other metals met criteria. Sample 072407R was analyzed in conjunction with this serial dilution.

- Sample F51247-17 was used as the serial dilution during solid matrix mercury analysis. The spiked sample was not a RFAAP site sample; therefore, it was not evaluated. Samples 59SB03A, 59SB03B, and 59SB03C were analyzed in conjunction with this serial dilution.

- Sample F51314-1 was used as the serial dilution during aqueous mercury analysis. The spiked sample was not a RFAAP site sample; therefore, it was not evaluated. Sample 072407R was analyzed in conjunction with this serial dilution.

IX-Field Duplicate Sample Analysis
Field duplicates were collected to identify the cumulative precision of the sampling and analytical process and sent to the laboratory blind. The RPD was calculated only for those analytes which were detected at levels exceeding the method reporting limits in both samples of the duplicate pair. Analytes that were rejected (R-qualified) in either sample of the duplicate pair were excluded from the duplicate assessment. Precision control criterion was established at 35% RPD for the aqueous and solid samples. Analytical results were qualified as estimated (J) for any RPDs exceeding criteria.

- No field duplicates were included in this data package.

X-Quantitation Verification
The accuracy of analytical results is verified through the calculation of several parameters. The percent difference (%D) between the calculated and the reported values should be within 10%. Any sample value >MDL and <MRL or <3*MDL (whichever is greater) was qualified as estimated, "J." The following calculations were performed for verification.

ICP Sample: 59SB03A, Chromium

Conc. (mg/kg) = (conc. μg/L) *(Final Volume L) * (DF) / (Sample weight g) * (Percent solids/100)

Conc. (mg/kg) = (296.2 μg/L)*(0.05 L)*(1) / (1.02)*(0.931) = 15.6 mg/kg

Reported concentration = 15.6 mg/kg
%D = 0.0%
Values were within 10% difference.

CVAA Sample: 59SB03A, Mercury

Conc. (mg/kg) = (conc. μg/L) *(Final Volume L) * (DF) / (Sample weight g) * (Percent solids/100)

Conc. (mg/kg) = (2.70 μg/L)*(0.05 L)*(1) / (0.66)*(0.931) = 0.22 mg/kg

Reported concentration = 0.22 mg/kg
%D = 0.0%.
Values were within 10% difference.

USEPA Region III Validation Qualifiers

(No Code) = Confirmed identification.

B = The analyte has been detected in the sample and the associated laboratory or field blank.

J = Indicates an estimated value for (1) estimated value due to QC non-conformance. Reported value may not be accurate or precise, (2) estimating a concentration as a tentatively identified compound as indicated by the mass spectral and retention time data, or (3) estimating a concentration ≥MDL and <MRL or <3*MDL, whichever is greater.

K = Analyte present. Reported value may be biased high (estimated) due to QC non-conformance.

L = Analyte present. Reported value may be biased low (estimated) due to QC non-conformance.

R = Unreliable result. Analyte may or may not be present in the sample due to QC non-conformance.

UL = Value is estimated bias low and not detected due to QC non-conformance. Reporting limit may be inaccurate or imprecise. Quantitation limit is probably higher.

UJ = Value is estimated and not detected due to QC non-conformance. Reporting limit may be inaccurate or imprecise.

Laboratory Qualifiers

(No Code) = Confirmed identification.

U = Not detected. The associated number indicates the compound reporting limit for the sample.

A (Dioxins) = B (Metals) = The reported value was obtained from a reading <MRL and ≥MDL and is considered estimated.

B (Organics) = The analyte or compound has been detected in the sample and laboratory method blank. It indicates probable blank contamination.

E (Metals) = Reported value is estimated because of the presence of interferences.

E (Organics) = Identifies compounds whose concentrations exceed the upper level of the calibration range.

D = Indicates sample was analyzed at a dilution.

EMPC (Dioxins) = The ion-abundance ratio between the two characteristic PCDD/PCDF ions was outside accepted ranges. The detected PCDD/PCDF was reported as an estimated maximum possible concentration (EMPC).

J = Indicates an estimated value for (1) estimating a concentration as a tentatively identified compound as indicated by the mass spectral and retention time data, or (2) estimating a concentration <MRL and ≥ MDL.

N (Organics) = Indicates presumptive evidence of a compound for tentatively identified compounds using a library search.

P (Organics) = Target analyte confirmation >40% difference for detected compound between the primary and secondary columns. The lower of the two values was reported.

N (Metals) = Laboratory spike sample recovery not within control limits.

* (Metals) = Duplicate analysis not within control limits.

* (Organics) = Surrogate outside of QC limits on both original and re-analysis.

Report of Analysis

Client Sample ID:	072407R		
Lab Sample ID:	F51275-1	**Date Sampled:**	07/24/07
Matrix:	AQ - Water	**Date Received:**	07/25/07
		Percent Solids:	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

Metals Analysis DATA VAL QUALIFIER

Analyte	Result		RL	MDL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Aluminum	18 U		200	18	ug/l	1	07/30/07	07/31/07	RS	SW846 6010B [2]	SW846 3010A [4]
Antimony	3.4 U	UL	6.0	3.4	ug/l	1	07/30/07	07/31/07	RS	SW846 6010B [2]	SW846 3010A [4]
Arsenic	2.8 U		10	2.8	ug/l	1	07/30/07	07/31/07	RS	SW846 6010B [2]	SW846 3010A [4]
Barium	5.0 U		200	5.0	ug/l	1	07/30/07	07/31/07	RS	SW846 6010B [2]	SW846 3010A [4]
Beryllium	1.0 U		4.0	1.0	ug/l	1	07/30/07	07/31/07	RS	SW846 6010B [2]	SW846 3010A [4]
Cadmium	1.0 U		5.0	1.0	ug/l	1	07/30/07	07/31/07	RS	SW846 6010B [2]	SW846 3010A [4]
Calcium	42 U		1000	42	ug/l	1	07/30/07	07/31/07	RS	SW846 6010B [2]	SW846 3010A [4]
Chromium	0.60 U		10	0.60	ug/l	1	07/30/07	07/31/07	RS	SW846 6010B [2]	SW846 3010A [4]
Cobalt	1.0 U		50	1.0	ug/l	1	07/30/07	07/31/07	RS	SW846 6010B [2]	SW846 3010A [4]
Copper	1.0 U		25	1.0	ug/l	1	07/30/07	07/31/07	RS	SW846 6010B [2]	SW846 3010A [4]
Iron	15 U		300	15	ug/l	1	07/30/07	07/31/07	RS	SW846 6010B [2]	SW846 3010A [4]
Lead	2.1 J	K	5.0	1.7	ug/l	1	07/30/07	07/31/07	RS	SW846 6010B [2]	SW846 3010A [4]
Magnesium	5.3 J	J	5000	4.3	ug/l	1	07/30/07	07/31/07	RS	SW846 6010B [2]	SW846 3010A [4]
Manganese	1.5 U		15	1.5	ug/l	1	07/30/07	07/31/07	RS	SW846 6010B [2]	SW846 3010A [4]
Mercury	0.10 U		1.0	0.10	ug/l	1	07/28/07	07/28/07	MS	SW846 7470A [1]	SW846 7470A [3]
Nickel	1.0 U		40	1.0	ug/l	1	07/30/07	07/31/07	RS	SW846 6010B [2]	SW846 3010A [4]
Potassium	1760 J	J	10000	100	ug/l	1	07/30/07	07/31/07	RS	SW846 6010B [2]	SW846 3010A [4]
Selenium	2.8 U		10	2.8	ug/l	1	07/30/07	07/31/07	RS	SW846 6010B [2]	SW846 3010A [4]
Silver	0.90 U		10	0.90	ug/l	1	07/30/07	07/31/07	RS	SW846 6010B [2]	SW846 3010A [4]
Sodium	1920 J	J	10000	500	ug/l	1	07/30/07	07/31/07	RS	SW846 6010B [2]	SW846 3010A [4]
Thallium	2.9 U		10	2.9	ug/l	1	07/30/07	07/31/07	RS	SW846 6010B [2]	SW846 3010A [4]
Vanadium	1.1 U		50	1.1	ug/l	1	07/30/07	07/31/07	RS	SW846 6010B [2]	SW846 3010A [4]
Zinc	1.6 U		20	1.6	ug/l	1	07/30/07	07/31/07	RS	SW846 6010B [2]	SW846 3010A [4]

(1) Instrument QC Batch: MA5882
(2) Instrument QC Batch: MA5885
(3) Prep QC Batch: MP12598
(4) Prep QC Batch: MP12611

RL = Reporting Limit
MDL = Method Detection Limit

U = Indicates a result < MDL
J = Indicates a result > = MDL but < RL

Report of Analysis

Client Sample ID:	59SB03A		
Lab Sample ID:	F51275-2	Date Sampled:	07/24/07
Matrix:	SO - Soil	Date Received:	07/25/07
		Percent Solids:	93.1
Project:	WPA 019 Field Investigation; Radford AAP, VA		

Metals Analysis DATA VAL QUALIFIER

Analyte	Result	RL	MDL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Aluminum	10400 J	11	1.2	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [4]
Antimony	0.74 J L	3.2	0.28	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [4]
Arsenic	30.3 J	0.42	0.21	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [4]
Barium	181 J	11	0.26	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [4]
Beryllium	0.59	0.26	0.053	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [4]
Cadmium	0.053 U	0.21	0.053	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [4]
Calcium	1420 J	260	3.0	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [4]
Chromium	15.6	0.53	0.047	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [4]
Cobalt	5.4	2.6	0.053	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [4]
Copper	13.2	1.3	0.047	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [4]
Iron	15600	5.3	0.63	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [4]
Lead	20.3	5.3	0.11	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [4]
Magnesium	1520	260	0.39	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [4]
Manganese	175	0.79	0.032	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [4]
Mercury	0.22	0.081	0.0065	mg/kg	1	07/26/07	07/26/07	MS	SW846 7471A [1]	SW846 7471A [3]
Nickel	8.9 J	2.1	0.053	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [4]
Potassium	757 J	530	5.3	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [4]
Selenium	6.4 J	5.3	0.11	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [4]
Silver	0.047 U	0.53	0.047	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [4]
Sodium	43 U	530	43	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [4]
Thallium [a]	4.8 U	11	4.8	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [4]
Vanadium	25.0 J	2.6	0.032	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [4]
Zinc	45.7 J	1.1	0.068	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [4]

(1) Instrument QC Batch: MA5876
(2) Instrument QC Batch: MA5885
(3) Prep QC Batch: MP12575
(4) Prep QC Batch: MP12607

(a) Elevated reporting limit(s) due to matrix interference.

RL = Reporting Limit
MDL = Method Detection Limit

U = Indicates a result < MDL
J = Indicates a result >= MDL but < RL

Report of Analysis

Client Sample ID:	59SB03B		
Lab Sample ID:	F51275-3	**Date Sampled:**	07/24/07
Matrix:	SO - Soil	**Date Received:**	07/25/07
		Percent Solids:	79.5
Project:	WPA 019 Field Investigation; Radford AAP, VA		

Metals Analysis DATA VAL QUALIFIER

Analyte	Result	RL	MDL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Aluminum	27300 J	12	1.4	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Antimony	1.5 J L	3.7	0.33	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Arsenic	4.3 J	0.49	0.24	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Barium	39.7 J	12	0.31	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Beryllium	0.54	0.31	0.062	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Cadmium	0.062 U	0.25	0.062	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Calcium	138 J J	310	3.5	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Chromium	17.3	0.62	0.055	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Cobalt	3.2	3.1	0.062	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Copper	19.1	1.5	0.055	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Iron	36400	62	8.6	mg/kg	10	07/30/07	07/31/07	NS	SW846 6010B [3]	SW846 3050B [5]
Lead	9.7	6.2	0.12	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Magnesium	972	310	0.46	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Manganese	82.2	0.92	0.037	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Mercury	0.093 J	0.10	0.0080	mg/kg	1	07/26/07	07/26/07	MS	SW846 7471A [1]	SW846 7471A [4]
Nickel	10.6	2.5	0.062	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Potassium	1130	620	6.2	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Selenium	10.7	6.2	0.12	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Silver	0.055 U	0.62	0.055	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Sodium	51 U	620	51	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Thallium [a]	7.0 U	12	7.0	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Vanadium	56.9 J	3.1	0.037	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]
Zinc	31.9 J	1.2	0.080	mg/kg	1	07/30/07	07/30/07	RS	SW846 6010B [2]	SW846 3050B [5]

(1) Instrument QC Batch: MA5876
(2) Instrument QC Batch: MA5885
(3) Instrument QC Batch: MA5886
(4) Prep QC Batch: MP12575
(5) Prep QC Batch: MP12607

(a) Elevated reporting limit(s) due to matrix interference.

RL = Reporting Limit
MDL = Method Detection Limit

U = Indicates a result < MDL
J = Indicates a result >= MDL but < RL

Accutest Laboratories

Report of Analysis

Client Sample ID:	59SB03C		
Lab Sample ID:	F51275-4	**Date Sampled:**	07/24/07
Matrix:	SO - Soil	**Date Received:**	07/25/07
		Percent Solids:	82.2
Project:	WPA 019 Field Investigation; Radford AAP, VA		

Metals Analysis DATA VAL QUALIFIER

Analyte	Result	RL	MDL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Aluminum	24200 J	12	1.3	mg/kg	1	07/30/07	07/31/07	RS	SW846 6010B [2]	SW846 3050B [5]
Antimony	1.8 J L	3.6	0.32	mg/kg	1	07/30/07	07/31/07	RS	SW846 6010B [2]	SW846 3050B [5]
Arsenic	11.0 J	0.49	0.24	mg/kg	1	07/30/07	07/31/07	RS	SW846 6010B [2]	SW846 3050B [5]
Barium	41.6 J	12	0.30	mg/kg	1	07/30/07	07/31/07	RS	SW846 6010B [2]	SW846 3050B [5]
Beryllium	0.48	0.30	0.061	mg/kg	1	07/30/07	07/31/07	RS	SW846 6010B [2]	SW846 3050B [5]
Cadmium [a]	0.61 U	1.2	0.61	mg/kg	1	07/30/07	07/31/07	RS	SW846 6010B [2]	SW846 3050B [5]
Calcium	152 J J	300	3.5	mg/kg	1	07/30/07	07/31/07	RS	SW846 6010B [2]	SW846 3050B [5]
Chromium	19.6	0.61	0.055	mg/kg	1	07/30/07	07/31/07	RS	SW846 6010B [2]	SW846 3050B [5]
Cobalt	2.9 J	3.0	0.061	mg/kg	1	07/30/07	07/31/07	RS	SW846 6010B [2]	SW846 3050B [5]
Copper	17.3	1.5	0.055	mg/kg	1	07/30/07	07/31/07	RS	SW846 6010B [2]	SW846 3050B [5]
Iron	36500	61	8.5	mg/kg	10	07/30/07	07/31/07	NS	SW846 6010B [3]	SW846 3050B [5]
Lead	9.3	6.1	0.12	mg/kg	1	07/30/07	07/31/07	RS	SW846 6010B [2]	SW846 3050B [5]
Magnesium	949	300	0.45	mg/kg	1	07/30/07	07/31/07	RS	SW846 6010B [2]	SW846 3050B [5]
Manganese	76.6	0.91	0.036	mg/kg	1	07/30/07	07/31/07	RS	SW846 6010B [2]	SW846 3050B [5]
Mercury	0.029 J	0.098	0.0078	mg/kg	1	07/26/07	07/26/07	MS	SW846 7471A [1]	SW846 7471A [4]
Nickel	9.6	2.4	0.061	mg/kg	1	07/30/07	07/31/07	RS	SW846 6010B [2]	SW846 3050B [5]
Potassium	1020	610	6.1	mg/kg	1	07/30/07	07/31/07	RS	SW846 6010B [2]	SW846 3050B [5]
Selenium	11.7	6.1	0.12	mg/kg	1	07/30/07	07/31/07	RS	SW846 6010B [2]	SW846 3050B [5]
Silver	0.055 U	0.61	0.055	mg/kg	1	07/30/07	07/31/07	RS	SW846 6010B [2]	SW846 3050B [5]
Sodium	50 U	610	50	mg/kg	1	07/30/07	07/31/07	RS	SW846 6010B [2]	SW846 3050B [5]
Thallium [a]	7.0 U	12	7.0	mg/kg	1	07/30/07	07/31/07	RS	SW846 6010B [2]	SW846 3050B [5]
Vanadium	49.5 J	3.0	0.036	mg/kg	1	07/30/07	07/31/07	RS	SW846 6010B [2]	SW846 3050B [5]
Zinc	29.5 J	1.2	0.079	mg/kg	1	07/30/07	07/31/07	RS	SW846 6010B [2]	SW846 3050B [5]

(1) Instrument QC Batch: MA5876
(2) Instrument QC Batch: MA5885
(3) Instrument QC Batch: MA5886
(4) Prep QC Batch: MP12575
(5) Prep QC Batch: MP12607

(a) Elevated reporting limit(s) due to matrix interference.

RL = Reporting Limit
MDL = Method Detection Limit

U = Indicates a result < MDL
J = Indicates a result > = MDL but < RL

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Shaw® Shaw Environmental, Inc.

MEMORANDUM

TO: Jeff Parks, Shaw E&I Radford Army Ammunition Plant (RFAAP) Project Manager

FROM: Richard McCracken, Shaw E&I Project Chemist

SUBJECT: RFAAP Data Validation – Pesticides and PCBs
Accutest Laboratories, Inc., SDG F51275

DATE: December 11, 2007

The purpose of this memorandum is to present the data validation report for the samples collected at RFAAP on July 24, 2007. Samples were analyzed for pesticides using USEPA Methods 3550B/8081A (soils) and 3510C/8081A (waters); and for PCBs using USEPA Methods 3550B/8082 (soils) and 3510C/8082 (waters), respectively. A total of one aqueous and three soil samples were validated. The sample IDs are:

Field Sample ID	Lab Sample ID	Field Sample ID	Lab Sample ID
072407R	F51275-1	59SB03B	F51275-3
59SB03A	F51275-2	59SB03C	F51275-4

Data were reviewed by Richard McCracken and validated using a combination of project QAPP, *Quality Systems Manual for Environmental Laboratories, Final Version 3, January, 2006* (DoD, 2006) (DoD QSM), method-specific criteria, and laboratory SOP criteria. The data qualifier scheme was consistent with the *Region III Modifications to the National Functional Guidelines for Organic Data Review* (September 1994). Parameters evaluated are presented in **Table 1**. Data associated with parameters in compliance with quality control specifications have not been qualified. Data associated with parameters that did not comply with quality control specifications and directly impacted project data have been qualified in accordance with USEPA Region III specifications.

Table 1 Laboratory Performance Criteria

Qualified		Parameter
Yes	No	
	X	Holding Times and Preservation
	X	Instrument Performance Check
	X	Initial Calibration
X		Continuing Calibration
	X	Blank Analysis
	X	System Monitoring Compounds
X		Laboratory Control Samples
X		Matrix Spike/Spike Duplicate
	X	Field Duplicate
X		Quantitation Verification

The quality of data collected in support of this sampling activity is considered acceptable with noted qualifications.

Richard McCracken, Chemist

12/11/07
Date

RFAAP VALIDATION REPORT
PESTICIDE/PCB REVIEW
SDG F51275

I-Holding Times and Preservation
The objective is to ascertain the validity of results based on the holding time of the sample from time of collection to time of sample extraction and analysis. Holding time criteria: Solid samples must be stored @4°C ± 2°C with a maximum holding time of 14 days from sample collection to preparative extraction and 40 days from preparative extraction to determinative analysis. Aqueous samples must be cooled @4°C ± 2°C with a maximum holding time of 7 days from sample collection to preparative extraction and 40 days from preparative extraction to determinative analysis.

- Temperature Review: A temperature blank was sent with each cooler and recorded by the laboratory upon receipt. The samples collected on 7/24/07 were sent in two coolers, and were received by the laboratory on 7/25/07 at 2.6 °C & 3.4 °C. No qualifiers were applied.

- Holding Time Review: The samples were collected on 7/24/07. The aqueous sample was extracted for pesticides and PCBs on 7/30/07, analyzed for pesticides on 8/10/07, and analyzed for PCBs on 8/1/07. The solid samples were extracted for pesticides and PCBs on 8/2/07, analyzed for pesticides on 8/8/07 & 8/11/07, and analyzed for PCBs on 8/6/07 and 8/13/07. All criteria were met. No qualifiers were applied.

II-Instrument Performance Check (Degradation Standard)
Performance checks on the gas chromatograph with electron capture detector (GC/ECD) system are performed to ensure adequate resolution and instrument sensitivity. The performance evaluation mixture (PEM) must be analyzed at the beginning of the analytical sequence. The breakdown of Endrin and 4,4'-DDT must be ≤15% on both signals.

- During the analysis beginning 8/6/07 @0925, endrin and 4,4'-DDT percent breakdowns were 11.2% and 7.1% on signal #1, and 10.7% and 5.6% on signal #2, respectively. All criteria were met. No qualifiers were applied.

- During the analysis beginning 8/8/07 @1046, endrin and 4,4'-DDT percent breakdowns were 4.6% and 4.2% on signal #1, and 4.6% and 3.1% on signal #2, respectively. All criteria were met. No qualifiers were applied.

- During the analysis beginning 8/10/07 @1538, endrin and 4,4'-DDT percent breakdowns were 3.7% and 2.5% on signal #1, and 3.9% and 2.0% on signal #2, respectively. All criteria were met. No qualifiers were applied.

- During the analysis beginning 8/11/07 @1054, endrin and 4,4'-DDT percent breakdowns were 3.4% and 2.3% on signal #1, and 3.5% and 2.1% on signal #2, respectively. All criteria were met. No qualifiers were applied.

- During the analysis beginning 8/13/07 @1116, endrin and 4,4'-DDT percent breakdowns were 2.7% and 1.4% on signal #1, and 2.6% and 1.1% on signal #2, respectively. All criteria were met. No qualifiers were applied.

III-Initial Calibration
Compliance requirements for satisfactory instrument calibration are established to ensure that the instrument is capable of producing acceptable qualitative and quantitative data for the target compounds. The initial 5 point calibration demonstrates that the instrument is capable of acceptable performance in the beginning of the analytical run. Calibration factors are generated for each compound. The DoD QSM specifies that the percent relative standard deviation (%RSD) for all single peak target analytes, and aroclors 1016, 1242, 1254, and 1260 must be <20% or the mean %RSD for all analytes in the standard must be ≤20%. If linear regression is used, the correlation coefficient must be ≥0.990. All detects are qualified as estimated "J" for where there were exceeding %RSDs, and all non-detects are qualified as estimated "UJ" for where there were grossly exceeding recoveries, unless determined to be unusable "R". Grossly exceeding is defined as twice the established criteria limits.

- During the pesticide initial calibration performed on 8/6/07 on instrument ECD6, all criteria were met. No qualifiers were applied. Samples 59SB03A, 59SB03B, and 59SB03C were analyzed following this initial calibration.

- During the pesticide initial calibration performed on 8/10/07 on instrument ECD6, all criteria were met. No qualifiers were applied. Sample 072407R plus the 1:5 dilutions of 59SB03A, 59SB03B, and 59SB03C were analyzed following this initial calibration.

- During the PCB initial calibration performed on 7/28/07 on instrument ECD3, all criteria were met. No qualifiers were applied. Sample 072407R was analyzed following this initial calibration.

- During the PCB initial calibration performed on 8/6/07 on instrument ECD3, all criteria were met. No qualifiers were applied. Samples 59SB03B and 59SB03C were analyzed following this initial calibration.

- During the PCB initial calibration performed on 8/13/07 on instrument ECD3, all criteria were met. No qualifiers were applied. Samples 59SB03A was analyzed following this initial calibration.

IV-Continuing Calibration
Compliance requirements for satisfactory instrument calibration are established to ensure that the instrument is capable of producing acceptable qualitative and quantitative data for pesticide/PCB target compounds. Continuing calibration standards containing both target compounds and surrogates are analyzed at the beginning of each 12-hour analytical shift and after every 20 samples. The DoD QSM specifies that the percent difference (%D) or the average %Ds for all analytes in the standard from the calibration should be no greater than ±20%.

- During the pesticide initial calibration verification performed on 8/6/07 @1229 on instrument ECD6, all criteria were met. No qualifiers were applied. No samples were analyzed in conjunction with this ICV.

- During the pesticide continuing calibration performed on 8/8/07 @1131 on instrument ECD6, all criteria were met. No qualifiers were applied. A method blank and LCS were analyzed in conjunction with this continuing calibration.

- During the pesticide continuing calibration performed on 8/8/07 @1153 on instrument ECD6, the 4th chlordane peak (20.4%) from signal #2 had a %D outside criteria, but the average %D of all six chlordane peaks was 7.9% which met criteria. No qualifiers were applied. A method blank and LCS were analyzed in conjunction with this continuing calibration.

- During the pesticide continuing calibration performed on 8/8/07 @1209 on instrument ECD6, all criteria were met. No qualifiers were applied. A method blank and LCS were analyzed in conjunction with this continuing calibration.

- During the pesticide continuing calibration performed on 8/8/07 @1528 on instrument ECD6, all criteria were met. No qualifiers were applied. The only sample associated with this continuing calibration was the unspiked MS/MSD (an RFAAP sample but not from this data package).

- During the pesticide continuing calibration performed on 8/8/07 @1838 on instrument ECD6, endrin aldehyde (21.3%) had a high %D on signal #1, while 4,4'-DDT(28.3%, 25.2%) and methoxychlor (25.6%, 24.4%) had a high %D on both signals. All other compounds met criteria. The only sample associated with this continuing calibration was the unspiked MS/MSD (an RFAAP sample but not from this data package). No qualifiers were applied.

- During the pesticide continuing calibration performed on 8/8/07 @1926 on instrument ECD6, heptachlor (24.0%, 23.1%), endrin aldehyde (21.9%, 22.4%), 4,4'-DDT(31.8%, 31.8%), and methoxychlor (31.3%, 32.5%) had a high %D on both signals. The results for these compounds have been qualified "J/UJ" in associated samples. All other compounds met criteria. Samples 59SB03A, 59SB03B, and 59SB03C were analyzed following this continuing calibration.

- During the pesticide continuing calibration performed on 8/8/07 @2116 on instrument ECD6, endrin (20.4%) had a high %D on signal #1, while endrin aldehyde (22.1%, 21.3%), 4,4'-DDT(46.6%, 42.1%), and methoxychlor (40.3%, 35.3%) had a high %D on both signals. The results for these compounds have been qualified "J/UJ" in associated samples. All other compounds met criteria. Samples 59SB03A, 59SB03B, and 59SB03C were analyzed before this continuing calibration.

- During the pesticide initial calibration verification performed on 8/10/07 @1840 on instrument ECD6, all criteria were met. No qualifiers were applied. A method blank and LCS were analyzed following this ICV.

- During the pesticide continuing calibration performed on 8/10/07 @2015 on instrument ECD6, all criteria were met. No qualifiers were applied. A method blank and LCS were analyzed before this continuing calibration, while sample 072407R plus the aqueous MS & MSD were analyzed following with this continuing calibration.

- During the pesticide continuing calibration performed on 8/10/07 @2205 on instrument ECD6, all criteria were met. No qualifiers were applied. Sample 072407R plus the aqueous MS & MSD were analyzed before with this continuing calibration.

- During the pesticide continuing calibration performed on 8/10/07 @2309 on instrument ECD6, all criteria were met. No qualifiers were applied. The solid MS & MSD were analyzed after this continuing calibration.

- During the pesticide continuing calibration performed on 8/11/07 @1110 on instrument ECD6, all criteria were met. No qualifiers were applied. The 1:5 dilution of samples 59SB03A, 59SB03B, and 59SB03C were analyzed after this continuing calibration.

- During the pesticide continuing calibration performed on 8/11/07 @1132 on instrument ECD6, all criteria were met. No qualifiers were applied. The 1:5 dilution of samples 59SB03A, 59SB03B, and 59SB03C were analyzed after this continuing calibration.

- During the pesticide continuing calibration performed on 8/11/07 @1148 on instrument ECD6, all criteria were met. No qualifiers were applied. The 1:5 dilution of samples 59SB03A, 59SB03B, and 59SB03C were analyzed after this continuing calibration.

- During the pesticide continuing calibration performed on 8/11/07 @1400 on instrument ECD6, all criteria were met. No qualifiers were applied. The 1:5 dilution of samples 59SB03A, 59SB03B, and 59SB03C were analyzed before this continuing calibration.

- During the PCB 1016/1260 initial calibration verification performed on 7/28/07 @1459 on instrument ECD3, all criteria were met. No qualifiers were applied. No samples were analyzed following this initial calibration verification.

- During the PCB 1016/1260 continuing calibration performed on 8/1/07 @1521 on instrument ECD3, all criteria were met. No qualifiers were applied. Sample 072407R, the aqueous method blank, the aqueous LCS, and the aqueous MS/MSD were analyzed following this continuing calibration.

- During the PCB 1016/1260 continuing calibration performed on 8/1/07 @1833 on instrument ECD3, all criteria were met. No qualifiers were applied. Sample 072407R, the aqueous method blank, the aqueous LCS, and the aqueous MS/MSD were analyzed before this continuing calibration.

- During the PCB 1016/1260 initial calibration verification performed on 8/6/07 @1556 on instrument ECD3, all criteria were met. No qualifiers were applied. No samples were analyzed following this initial calibration verification.

- During the PCB 1016/1260 continuing calibration performed on 8/6/07 @1906 on instrument ECD3, all criteria were met. No qualifiers were applied. Samples 59SB03B and 59SB03C plus the solid method blank, the solid LCS, and the solid MS/MSD were analyzed after this continuing calibration.

- During the PCB 1016/1260 continuing calibration performed on 8/6/07 @2214 on instrument ECD3, all criteria were met. No qualifiers were applied. Samples 59SB03B and 59SB03C plus the solid method blank, the solid LCS, and the solid MS/MSD were analyzed before this continuing calibration.

- During the PCB 1016/1260 initial calibration verification performed on 8/13/07 @1416 on instrument ECD3, all criteria were met. No qualifiers were applied. Sample 59SB03A was analyzed following this initial calibration verification.

- During the PCB 1016/1260 continuing calibration performed on 8/13/07 @1719 on instrument ECD3, all criteria were met. No qualifiers were applied. Sample 59SB03A was analyzed before this continuing calibration.

V-Blank Analysis

The purpose of laboratory or field blank analyses is to determine the existence and magnitude of contamination problems resulting from laboratory or field activities. One method blank per analytical batch must be run on each instrument used to analyze samples. The DoD QSM criterion specifies all concentrations should be less than one-half MRL. Positive sample results are reported and qualified "B", if the concentration of the compound in the sample is ≤5 times (5X) the maximum amount for pesticide and PCB target compounds. **Table 2** summarizes the blank contamination analysis.

Table 2 Blank Contamination Analysis Summary

Parameter	Analysis Date	QC Blank ID	Compound	Max Conc. µg/L	Action Level µg/L	B qualified samples
Pesticides	8/10/07	OP21657-MB	All target <½MRL	NA	NA	None
Pesticides	8/8/07	OP21716-MB	All target <½MRL	NA	NA	None
Pesticides	8/11/07	OP21716-MB	All target <½MRL	NA	NA	None
Pesticides	8/10/07	072407R	All target <½MRL	NA	NA	None
PCBs	8/1/07	OP21658-MB	All target <½MRL	NA	NA	None
PCBs	8/6/07	OP21715-MB	All target <½MRL	NA	NA	None
PCBs	8/1/07	072407R	All target <½MRL	NA	NA	None

072407R is a rinsate blank.
NA = Not Applicable
MRL = Method Reporting Limit

VI-System Monitoring Compound (Surrogates)
Laboratory performance on individual samples is evaluated through the review of surrogate spike samples. Surrogate spikes are added to all samples and blanks to measure their recovery in sample and blank matrices. The percent recoveries (%Rs) must be within the specified control limits. DoD surrogate recovery limits are specified in Table D-3 of the DoD QSM (DoD, 2006). If the surrogate is not listed, then the laboratory criteria shall be used.

Aqueous Criteria:	Pesticides:	Tetrachloro-m-xylene: 42-127% (DoD QSM 25-140%) Decachlorobiphenyl: 27-127% (DoD QSM 30-135%)
	PCBs:	Tetrachloro-m-xylene: 38-127% (DoD QSM Not Listed) Decachlorobiphenyl: 25-137% (DoD QSM 40-135%)
Solid Criteria:	Pesticides:	Tetrachloro-m-xylene: 46-122% (DoD QSM 70-125%) Decachlorobiphenyl: 50-133% (DoD QSM 55-130%)
	PCBs:	Tetrachloro-m-xylene: 44-126% (DoD QSM Not Listed) Decachlorobiphenyl: 39-157% (DoD QSM 60-125%)

- Sample 59SB03A had a low tetrachloro-m-xylene recovery (61.3%) from signal #1 during pesticide analysis. No data qualification is required unless two surrogates are outside criteria.

- All other samples met surrogate recovery criteria during pesticide analysis.

- All samples met surrogate recovery criteria during PCB analysis.

VII-Laboratory Control Samples
Laboratory control samples (LCS) are used to monitor laboratory accuracy by calculating the percent recoveries of the spiked compounds. All LCS percent recoveries must be within the specified control limits. DoD QSM solid matrix LCS recovery limits are specified in Tables D-15 and D-17 of the DoD QSM (DoD, 2006), while aqueous LCS recovery limits are specified in Tables D-14 and D-16 of the DoD QSM. If the compound is not listed, then the laboratory criteria shall be used.

- Sample OP21657-BS was used as the aqueous LCS during the 8/10/07 pesticide analysis. Endrin aldehyde (15%) had a low recovery, and was not detected in any field samples – the results have been qualified "UL" as estimated in associated samples. All other pesticides met recovery criteria. Sample 072407R was analyzed in conjunction with this LCS.

- Sample OP21716-BS was used as the solid LCS during the 8/8/07 pesticide analysis. Delta-BHC (53%) and endrin aldehyde (12%) had low recoveries, and were not detected in any field samples. The results for both compounds have been qualified "UL" as estimated in associated samples. All other pesticides met recovery criteria. Samples 59SB03A, 59SB03B, and 59SB03C were analyzed in conjunction with this LCS.

- Sample OP21658-BS was used as the aqueous LCS during the 8/1/07 PCB analysis. All criteria were met. No qualifiers were applied.

- Sample OP21715-BS was used as the solid LCS during the 8/6/07 PCB analysis. All criteria were met. No qualifiers were applied.

VIII-Matrix Spike/Matrix Spike Duplicate
Data for matrix spike/matrix spike duplicates (MS/MSD) are generated to determine long-term precision and accuracy of the analytical method on various matrices and to demonstrate acceptable compound recovery by the laboratory at the time of sample analysis. The percent recoveries (%Rs) and the relative percent difference (RPD) must be within the specified control limits. DoD solid matrix MS/MSD recovery limits follow the LCS criteria specified in Tables D-15 and D-17 of the DoD QSM (DoD, 2006), while aqueous MS/MSD recovery limits follow the LCS criteria specified in Tables D-14 and D-16 of the DoD QSM. If the compound is not listed, then the laboratory criteria shall be used.

- Sample F51353-8 was used for the aqueous pesticide MS/MSD analysis. The spiked sample was not a RFAAP site sample; therefore, it was not evaluated. Sample 072407R was analyzed in conjunction with this MS/MSD.

- Sample F51300-11 was used for the solid matrix pesticide MS/MSD analysis. Delta-BHC (51%) and endrin aldehyde (0%, 0%) had low recoveries in the MS and MSD, as well as having low recoveries in the associated LCS. All sample results have already been qualified "UL", no further qualification is required. All other pesticides met criteria. Samples 59SB03A, 59SB03B, and 59SB03C were analyzed in conjunction with this MS/MSD.

- Sample F51314-1 was used for the aqueous PCB MS/MSD analysis. The spiked sample was not a RFAAP site sample; therefore, it was not evaluated. Sample 072407R was analyzed in conjunction with this MS/MSD.

- Sample F51300-1 was used for the solid matrix PCB MS/MSD analysis. All PCBs met criteria. No data qualifiers were applied. Samples 59SB03A, 59SB03B, and 59SB03C were analyzed in conjunction with this MS/MSD.

IX-Field Duplicate Sample Analysis
Field duplicates were collected to identify the cumulative precision of the sampling and analytical process and sent to the laboratory blind. The RPD was calculated only for those analytes which were detected at levels exceeding the method reporting limits in both samples of the duplicate pair. Analytes that were rejected (R-qualified) in either sample of the duplicate pair were excluded from the duplicate assessment. Precision control criterion was established at 50% RPD for the aqueous and solid samples. Analytical results were qualified as estimated (J) for any RPDs exceeding criteria.

- No field duplicates were included in this data package.

X-Quantitation Verification
The accuracy of analytical results was verified through the calculation of several parameters. The difference between the calculated value and the reported value must be within 10% difference. All positive values must have less than or equal to 40% %D between the primary and secondary columns. Any sample value >MDL and <MRL or <3*MDL (whichever is greater) was qualified as estimated, "J." All criteria were met.

Sample: OP21716-BS, beta-BHC

Conc. µg/kg = (Ax * Vt * DF) / (CF * Vi * Ws * Ps * 1000)

where: Ax = Area response for the compound being measured
Vt = Total volume of extract, taking into account dilutions (uL)
DF = Dilution factor
CF = Calibration Factor from initial calibration (area/pg)
Vi = Volume of extract injected (uL)
Ws = weight of sample (g)
Ps = percent solids/100

Conc. µg/kg = (705390 * 10000 * 1) / (19750 * 1 * 30 * 1 * 1000)
= 11.9 ug/kg

Reported Conc. = 11.9 µg/kg
%D = 0.0%
Values were within 10% difference

Sample: OP21715-BS, Aroclor 1260

Conc. µg/kg = (Ax * Vt * DF) / (CF * Vi * Ws * Ps * 1000)

where: Ax = Area response for the compound being measured
Vt = Total volume of extract, taking into account dilutions (uL)
DF = Dilution factor
CF = Calibration Factor from initial calibration (area/pg)
Vi = Volume of extract injected (uL)
Ws = weight of sample (g)
Ps = percent solids/100

Signal #1
Conc1 µg/L = (3211932 * 10000* 1) / (8380 * 1 * 30 * 1000) = 127.76 µg/kg
Conc2 µg/L = (4273339 * 10000* 1) / (10410 * 1 * 30 * 1000) = 136.83 µg/kg
Conc3 µg/L = (4293784 * 10000* 1) / (10450 * 1 * 30 * 1000) = 136.96 µg/kg
Conc4 µg/L = (2923739 * 10000* 1) / (7516 * 1 * 30 * 1000) = 129.67 µg/kg
Conc5 µg/L = (6792273 * 10000* 1) / (17360 * 1 * 30 * 1000) = 130.42 µg/kg
Conc6 µg/L = (3912029 * 10000* 1) / (9980 * 1 * 30 * 1000) = 130.66 µg/kg
Average concentration = 132 µg/kg

Reported Value = 132 µg/kg (from signal #1)
% Difference = 0.0%
Values were within 10% difference.

USEPA Region III Validation Qualifiers

(No Code) = Confirmed identification.

B = The analyte has been detected in the sample and the associated laboratory or field blank.

J = Indicates an estimated value for (1) estimated value due to QC non-conformance. Reported value may not be accurate or precise, (2) estimating a concentration as a tentatively identified compound as indicated by the mass spectral and retention time data, or (3) estimating a concentration ≥ MDL and <MRL or <3*MDL, whichever is greater.

K = Analyte present. Reported value may be biased high (estimated) due to QC non-conformance.

L = Analyte present. Reported value may be biased low (estimated) due to QC non-conformance.

R = Unreliable result. Analyte may or may not be present in the sample due to QC non-conformance.

UL = Value is estimated bias low and not detected due to QC non-conformance. Reporting limit may be inaccurate or imprecise. Quantitation limit is probably higher.

UJ = Value is estimated and not detected due to QC non-conformance. Reporting limit may be inaccurate or imprecise.

Laboratory Qualifiers

(No Code) = Confirmed identification.

U = Not detected. The associated number indicates the compound reporting limit for the sample.

A (Dioxins) = B (Metals) = The reported value was obtained from a reading <MRL and ≥MDL and is considered estimated.

B (Organics) = The analyte or compound has been detected in the sample and laboratory method blank. It indicates probable blank contamination.

E (Metals) = Reported value is estimated because of the presence of interferences.

E (Organics) = Identifies compounds whose concentrations exceed the upper level of the calibration range.

EMPC (Dioxins) = The ion-abundance ratio between the two characteristic PCDD/PCDF ions was outside accepted ranges. The detected PCDD/PCDF was reported as an estimated maximum possible concentration (EMPC).

D = Indicates sample was analyzed at a dilution.

J = Indicates an estimated value for (1) estimating a concentration as a tentatively identified compound as indicated by the mass spectral and retention time data, or (2) estimating a concentration <MRL and ≥ MDL.

N (Organics) = Indicates presumptive evidence of a compound for tentatively identified compounds using a library search.

P (Organics) = Target analyte confirmation >40% difference for detected compound between the primary and secondary columns. The lower of the two values was reported.

N (Metals) = Laboratory spike sample recovery not within control limits.

* (Metals) = Duplicate analysis not within control limits.

* (Organics) = Surrogate outside of QC limits on both original and re-analysis.

Raw Data: TT08307.D

Accutest Laboratories

Report of Analysis

3.1

3

Client Sample ID:	072407R		
Lab Sample ID:	F51275-1	**Date Sampled:**	07/24/07
Matrix:	AQ - Water	**Date Received:**	07/25/07
Method:	SW846 8081A SW846 3510C	**Percent Solids:**	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	TT08307.D	1	08/10/07	FS	07/30/07	OP21657	GTT281
Run #2							

	Initial Volume	Final Volume
Run #1	1000 ml	10.0 ml
Run #2		

Pesticide TCL List

DATA VAL QUALIFIER

CAS No.	Compound	Result	RL	MDL	Units	Q
309-00-2	Aldrin	ND	0.050	0.010	ug/l	
319-84-6	alpha-BHC	ND	0.050	0.010	ug/l	
319-85-7	beta-BHC	ND	0.050	0.011	ug/l	
319-86-8	delta-BHC	ND	0.050	0.010	ug/l	
58-89-9	gamma-BHC (Lindane)	ND	0.050	0.010	ug/l	
5103-71-9	alpha-Chlordane	ND	0.050	0.010	ug/l	
5103-74-2	gamma-Chlordane	ND	0.050	0.010	ug/l	
60-57-1	Dieldrin	ND	0.050	0.010	ug/l	
72-54-8	4,4'-DDD	ND	0.10	0.020	ug/l	
72-55-9	4,4'-DDE	ND	0.10	0.020	ug/l	
50-29-3	4,4'-DDT	ND	0.10	0.020	ug/l	
72-20-8	Endrin	ND	0.10	0.020	ug/l	
1031-07-8	Endosulfan sulfate	ND	0.10	0.020	ug/l	
7421-93-4	Endrin aldehyde	ND	0.10	0.030	ug/l	UL
53494-70-5	Endrin ketone	ND	0.10	0.020	ug/l	
959-98-8	Endosulfan-I	ND	0.050	0.010	ug/l	
33213-65-9	Endosulfan-II	ND	0.10	0.010	ug/l	
76-44-8	Heptachlor	ND	0.050	0.010	ug/l	
1024-57-3	Heptachlor epoxide	ND	0.050	0.010	ug/l	
72-43-5	Methoxychlor	ND	0.10	0.020	ug/l	
8001-35-2	Toxaphene	ND	2.5	1.3	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	78%		42-127%
2051-24-3	Decachlorobiphenyl	82%		27-127%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	072407R		
Lab Sample ID:	F51275-1	**Date Sampled:**	07/24/07
Matrix:	AQ - Water	**Date Received:**	07/25/07
Method:	SW846 8082 SW846 3510C	**Percent Solids:**	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	ST64312.D	1	08/01/07	JB	07/30/07	OP21658	GST1698
Run #2							

	Initial Volume	Final Volume
Run #1	1000 ml	10.0 ml
Run #2		

PCB List

CAS No.	Compound	Result	RL	MDL	Units	Q
12674-11-2	Aroclor 1016	ND	0.50	0.25	ug/l	
11104-28-2	Aroclor 1221	ND	0.50	0.40	ug/l	
11141-16-5	Aroclor 1232	ND	0.50	0.40	ug/l	
53469-21-9	Aroclor 1242	ND	0.50	0.25	ug/l	
12672-29-6	Aroclor 1248	ND	0.50	0.25	ug/l	
11097-69-1	Aroclor 1254	ND	0.50	0.25	ug/l	
11096-82-5	Aroclor 1260	ND	0.50	0.25	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	82%		38-127%
2051-24-3	Decachlorobiphenyl	95%		25-137%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: TT08240.D TT08335.D

Accutest Laboratories

Report of Analysis

Client Sample ID:	59SB03A		
Lab Sample ID:	F51275-2	**Date Sampled:**	07/24/07
Matrix:	SO - Soil	**Date Received:**	07/25/07
Method:	SW846 8081A SW846 3550B	**Percent Solids:**	93.1
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	TT08240.D	1	08/08/07	FS	08/02/07	OP21716	GTT279
Run #2	TT08335.D	5	08/11/07	FS	08/02/07	OP21716	GTT282

	Initial Weight	Final Volume
Run #1	30.6 g	10.0 ml
Run #2	30.6 g	10.0 ml

Pesticide TCL List

DATA VAL QUALIFIER

CAS No.	Compound	Result	RL	MDL	Units	Q
309-00-2	Aldrin	ND	1.8	0.42	ug/kg	
319-84-6	alpha-BHC	ND	1.8	0.49	ug/kg	
319-85-7	beta-BHC	ND	1.8	0.46	ug/kg	
319-86-8	delta-BHC	ND	1.8	0.77	ug/kg	UL
58-89-9	gamma-BHC (Lindane)	ND	1.8	0.60	ug/kg	
5103-71-9	alpha-Chlordane	ND	1.8	0.35	ug/kg	
5103-74-2	gamma-Chlordane	ND	1.8	0.39	ug/kg	
60-57-1	Dieldrin	ND	1.8	0.39	ug/kg	
72-54-8	4,4'-DDD	ND	3.5	0.70	ug/kg	
72-55-9	4,4'-DDE	ND	3.5	0.70	ug/kg	
50-29-3	4,4'-DDT	ND [a]	18	4.0	ug/kg	UJ
72-20-8	Endrin	ND	3.5	0.70	ug/kg	UJ
1031-07-8	Endosulfan sulfate	ND	3.5	1.2	ug/kg	
7421-93-4	Endrin aldehyde	ND	3.5	1.1	ug/kg	UJ
53494-70-5	Endrin ketone	ND	3.5	0.70	ug/kg	
959-98-8	Endosulfan-I	ND	1.8	0.39	ug/kg	
33213-65-9	Endosulfan-II	ND	3.5	0.53	ug/kg	
76-44-8	Heptachlor	ND [a]	8.8	2.5	ug/kg	UJ
1024-57-3	Heptachlor epoxide	ND	1.8	0.35	ug/kg	
72-43-5	Methoxychlor	ND [a]	18	3.5	ug/kg	UJ
8001-35-2	Toxaphene	ND	88	44	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	61%	77%	46-122%
2051-24-3	Decachlorobiphenyl	68%	88%	50-133%

(a) Result is from Run# 2

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	59SB03A		
Lab Sample ID:	F51275-2	**Date Sampled:**	07/24/07
Matrix:	SO - Soil	**Date Received:**	07/25/07
Method:	SW846 8082 SW846 3550B	**Percent Solids:**	93.1
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	ST64788.D	1	08/13/07	JB	08/02/07	OP21715	GST1707
Run #2							

	Initial Weight	Final Volume
Run #1	30.6 g	10.0 ml
Run #2		

PCB List

CAS No.	Compound	Result	RL	MDL	Units	Q
12674-11-2	Aroclor 1016	ND	18	8.8	ug/kg	
11104-28-2	Aroclor 1221	ND	18	14	ug/kg	
11141-16-5	Aroclor 1232	ND	18	14	ug/kg	
53469-21-9	Aroclor 1242	ND	18	8.8	ug/kg	
12672-29-6	Aroclor 1248	ND	18	8.8	ug/kg	
11097-69-1	Aroclor 1254	16.1	18	8.8	ug/kg	J
11096-82-5	Aroclor 1260	ND	18	8.8	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	88%		44-126%
2051-24-3	Decachlorobiphenyl	79%		39-157%

(a) All hits confirmed by dual column analysis.

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	59SB03B		
Lab Sample ID:	F51275-3	**Date Sampled:**	07/24/07
Matrix:	SO - Soil	**Date Received:**	07/25/07
Method:	SW846 8081A SW846 3550B	**Percent Solids:**	79.5
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	TT08241.D	1	08/08/07	FS	08/02/07	OP21716	GTT279
Run #2	TT08336.D	5	08/11/07	FS	08/02/07	OP21716	GTT282

	Initial Weight	Final Volume
Run #1	30.2 g	10.0 ml
Run #2	30.2 g	10.0 ml

Pesticide TCL List

DATA VAL QUALIFIER

CAS No.	Compound	Result	RL	MDL	Units	Q
309-00-2	Aldrin	ND	2.1	0.50	ug/kg	
319-84-6	alpha-BHC	ND	2.1	0.58	ug/kg	
319-85-7	beta-BHC	ND	2.1	0.54	ug/kg	
319-86-8	delta-BHC	ND	2.1	0.92	ug/kg	UL
58-89-9	gamma-BHC (Lindane)	ND	2.1	0.71	ug/kg	
5103-71-9	alpha-Chlordane	ND	2.1	0.42	ug/kg	
5103-74-2	gamma-Chlordane	ND	2.1	0.46	ug/kg	
60-57-1	Dieldrin	ND	2.1	0.46	ug/kg	
72-54-8	4,4'-DDD	ND	4.2	0.83	ug/kg	
72-55-9	4,4'-DDE	ND	4.2	0.83	ug/kg	
50-29-3	4,4'-DDT	ND [a]	21	4.8	ug/kg	UJ
72-20-8	Endrin	ND	4.2	0.83	ug/kg	UJ
1031-07-8	Endosulfan sulfate	ND	4.2	1.4	ug/kg	
7421-93-4	Endrin aldehyde	ND	4.2	1.2	ug/kg	UJ
53494-70-5	Endrin ketone	ND	4.2	0.83	ug/kg	
959-98-8	Endosulfan-I	ND	2.1	0.46	ug/kg	
33213-65-9	Endosulfan-II	ND	4.2	0.62	ug/kg	
76-44-8	Heptachlor	ND [a]	10	2.9	ug/kg	UJ
1024-57-3	Heptachlor epoxide	ND	2.1	0.42	ug/kg	
72-43-5	Methoxychlor	ND [a]	21	4.2	ug/kg	UJ
8001-35-2	Toxaphene	ND	100	52	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	76%	91%	46-122%
2051-24-3	Decachlorobiphenyl	73%	94%	50-133%

(a) Result is from Run# 2

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	59SB03B		
Lab Sample ID:	F51275-3	**Date Sampled:**	07/24/07
Matrix:	SO - Soil	**Date Received:**	07/25/07
Method:	SW846 8082 SW846 3550B	**Percent Solids:**	79.5
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	ST64546.D	1	08/06/07	JB	08/02/07	OP21715	GST1701
Run #2							

	Initial Weight	Final Volume
Run #1	30.2 g	10.0 ml
Run #2		

PCB List

CAS No.	Compound	Result	RL	MDL	Units	Q
12674-11-2	Aroclor 1016	ND	21	10	ug/kg	
11104-28-2	Aroclor 1221	ND	21	17	ug/kg	
11141-16-5	Aroclor 1232	ND	21	17	ug/kg	
53469-21-9	Aroclor 1242	ND	21	10	ug/kg	
12672-29-6	Aroclor 1248	ND	21	10	ug/kg	
11097-69-1	Aroclor 1254	ND	21	10	ug/kg	
11096-82-5	Aroclor 1260	ND	21	10	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	89%		44-126%
2051-24-3	Decachlorobiphenyl	90%		39-157%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	59SB03C		
Lab Sample ID:	F51275-4	**Date Sampled:**	07/24/07
Matrix:	SO - Soil	**Date Received:**	07/25/07
Method:	SW846 8081A SW846 3550B	**Percent Solids:**	82.2
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	TT08242.D	1	08/08/07	FS	08/02/07	OP21716	GTT279
Run #2	TT08337.D	5	08/11/07	FS	08/02/07	OP21716	GTT282

	Initial Weight	Final Volume
Run #1	30.4 g	10.0 ml
Run #2	30.4 g	10.0 ml

Pesticide TCL List

DATA VAL QUALIFIER

CAS No.	Compound	Result	RL	MDL	Units	Q
309-00-2	Aldrin	ND	2.0	0.48	ug/kg	
319-84-6	alpha-BHC	ND	2.0	0.56	ug/kg	
319-85-7	beta-BHC	ND	2.0	0.52	ug/kg	
319-86-8	delta-BHC	ND	2.0	0.88	ug/kg	VL
58-89-9	gamma-BHC (Lindane)	ND	2.0	0.68	ug/kg	
5103-71-9	alpha-Chlordane	ND	2.0	0.40	ug/kg	
5103-74-2	gamma-Chlordane	ND	2.0	0.44	ug/kg	
60-57-1	Dieldrin	ND	2.0	0.44	ug/kg	
72-54-8	4,4'-DDD	ND	4.0	0.80	ug/kg	
72-55-9	4,4'-DDE	ND	4.0	0.80	ug/kg	
50-29-3	4,4'-DDT	ND [a]	20	4.6	ug/kg	UJ
72-20-8	Endrin	ND	4.0	0.80	ug/kg	UJ
1031-07-8	Endosulfan sulfate	ND	4.0	1.3	ug/kg	
7421-93-4	Endrin aldehyde	ND	4.0	1.2	ug/kg	UJ
53494-70-5	Endrin ketone	ND	4.0	0.80	ug/kg	
959-98-8	Endosulfan-I	ND	2.0	0.44	ug/kg	
33213-65-9	Endosulfan-II	ND	4.0	0.60	ug/kg	
76-44-8	Heptachlor	ND [a]	10	2.8	ug/kg	UJ
1024-57-3	Heptachlor epoxide	ND	2.0	0.40	ug/kg	
72-43-5	Methoxychlor	ND [a]	20	4.0	ug/kg	UJ
8001-35-2	Toxaphene	ND	100	50	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	72%	81%	46-122%
2051-24-3	Decachlorobiphenyl	71%	89%	50-133%

(a) Result is from Run# 2

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	59SB03C		
Lab Sample ID:	F51275-4	**Date Sampled:**	07/24/07
Matrix:	SO - Soil	**Date Received:**	07/25/07
Method:	SW846 8082 SW846 3550B	**Percent Solids:**	82.2
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	ST64547.D	1	08/06/07	JB	08/02/07	OP21715	GST1701
Run #2							

	Initial Weight	Final Volume
Run #1	30.4 g	10.0 ml
Run #2		

PCB List

CAS No.	Compound	Result	RL	MDL	Units	Q
12674-11-2	Aroclor 1016	ND	20	10	ug/kg	
11104-28-2	Aroclor 1221	ND	20	16	ug/kg	
11141-16-5	Aroclor 1232	ND	20	16	ug/kg	
53469-21-9	Aroclor 1242	ND	20	10	ug/kg	
12672-29-6	Aroclor 1248	ND	20	10	ug/kg	
11097-69-1	Aroclor 1254	ND	20	10	ug/kg	
11096-82-5	Aroclor 1260	ND	20	10	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	80%		44-126%
2051-24-3	Decachlorobiphenyl	86%		39-157%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Shaw Environmental, Inc.
2790 Mosside Blvd
Monroeville, PA
412-858-3335
FAX: 412-372-8968

Shaw® Shaw Environmental, Inc.

MEMORANDUM

TO: Jeff Parks, Shaw E&I Radford Army Ammunition Plant (RFAAP) Project Manager

FROM: Richard McCracken, Shaw E&I Project Chemist

SUBJECT: RFAAP Data Validation – Semi-Volatiles & Polynuclear Aromatic Hydrocarbons Accutest Laboratories, Inc., SDG F51275

DATE: December 10, 2007

The purpose of this memorandum is to present the data validation report for the samples collected at RFAAP on July 24, 2007. Samples were analyzed for semivolatile organic compounds (SVOCs) using USEPA SW846 Methods 3550B/8270C (solids) and 3510C/8270C (aqueous). The polynuclear aromatic hydrocarbons (PAHs) were analyzed using selective ion monitoring (SIM) techniques. A total of one aqueous and three soil samples were validated. The sample IDs are:

Field Sample ID	Lab Sample ID	Field Sample ID	Lab Sample ID
072407R	F51275-1	59SB03B	F51275-3
59SB03A	F51275-2	59SB03C	F51275-4

Data were reviewed by Richard McCracken and validated using a combination of project QAPP, *Quality Systems Manual for Environmental Laboratories, Final Version 3, January, 2006* (DoD, 2006) (DoD QSM), method-specific criteria, and laboratory SOP criteria. The data qualifier scheme was consistent with the *Region III Modifications to the National Functional Guidelines for Organic Data Review* (September 1994). Parameters evaluated are presented in **Table 1**. Data associated with parameters in compliance with quality control specifications have not been qualified. Data associated with parameters that did not comply with quality control specifications and directly impacted project data have been qualified in accordance with USEPA Region III specifications.

Table 1 Laboratory Performance Criteria

Qualified		Parameter
Yes	No	
	X	Holding Times and Preservation
	X	Instrument Performance Check
	X	Initial Calibration
	X	Continuing Calibration
	X	Blank Analysis
	X	Surrogate Spikes
	X	Internal Standards
	X	Laboratory Control Sample
X		Matrix Spike/Spike Duplicate
	X	Field Duplicate
	X	Quantitation Verification

The quality of data collected in support of this sampling activity is considered acceptable with noted qualifications.

Richard McCracken, Chemist

12/10/07
Date

RFAAP VALIDATION REPORT
SEMIVOLATILES AND PAH REVIEW
SDG F51275

I-Holding Times and Preservation
The objective is to ascertain the validity of results based on the holding time of the sample from time of collection to time of sample extraction and analysis. Holding time criteria: Solid samples must be stored @4°C ± 2°C with a maximum holding time of 14 days from sample collection to preparative extraction and 40 days from preparative extraction to determinative analysis. Aqueous samples must be cooled @4°C ± 2°C with a maximum holding time of 7 days from sample collection to preparative extraction and 40 days from preparative extraction to determinative analysis.

- Temperature Review: A temperature blank was sent with each cooler and recorded by the laboratory upon receipt. The samples collected on 7/24/07 were sent in two coolers, and were received by the laboratory on 7/25/07 at 2.6 °C & 3.4 °C. No qualifiers were applied.

- Holding Time Review: The samples were collected on 7/24/07, extracted for SVOCs on 7/31/07 (aqueous) & 8/2/07 (solids), extracted for PAHs by SIM on 7/31/07 (aqueous) & 8/2/07 (solids), analyzed for SVOCs on 8/2/07 (aqueous) & 8/3/07 (solids), and analyzed for PAHs by SIM on 8/2/07 (aqueous) & 8/6/07 (solids). All criteria were met. No qualifiers were applied.

II-Instrument Performance Check
GC/MS instrument performance checks are performed to ensure mass resolution, identification and, to some degree, sensitivity. The analysis of the instrument performance check solution must be performed at the beginning of each 12-hour period during which samples are analyzed.

- The instrument performance check, decafluorotriphenylphosphine (DFTPP), met the ion abundance criteria. No qualification was applied.

III-Initial Calibration
Compliance requirements for satisfactory instrument calibration are established to ensure that the instrument used is capable of producing acceptable qualitative and quantitative data for compounds on the semivolatile target compound list (TCL). Initial calibration demonstrates that the instrument is capable of acceptable performance in the beginning of the analytical run and of producing a linear calibration curve. For compounds analyzed using linear regression or second order, correlation coefficients must be >0.995 and coefficients of determination >0.99. The minimum relative response factor (RRF) criteria must be ≥0.05. The DoD QSM specifies that the initial calibration percent relative standard deviation (%RSD) must be ≤15% on the average for all compounds (<30% for CCCs). All detects are qualified as estimated "J" for where there were exceeding %RSDs, and all non-detects are qualified as estimated "UJ" for where there were grossly exceeding recoveries, unless determined to be unusable "R". Grossly exceeding is defined as twice the established criteria limits. For where there were low RRFs, all detects are qualified as estimated "J" and non-detects are rejected "R".

- Initial calibration for the SVOCs was performed on 7/5/07 using instrument MSBNA02 (GCMSL). Target compounds 2,4-dinitrophenol (19.68%) and 4,6-dinitro-2-methylphenol (25.87%) had %RSDs outside criteria. All other target compounds were within criteria (%RSD≤15% or ≤30%; RRF≥0.05). The compounds with high %RSD were quantified using linear or second order regression, and had correlation coefficients ≥0.995; therefore no qualifiers were applied. Sample 072407R were analyzed in conjunction with this initial calibration.

- Initial calibration for the SVOCs was performed on 7/13/07 using instrument MSBNA04 (GCMSU). Target compounds 2,4-dinitrophenol (42.04%) and 4,6-dinitro-2-methylphenol (24.04%) had %RSDs outside criteria. All other target compounds were within criteria (%RSD≤15% or ≤30%; RRF≥0.05). The compounds with high %RSD were quantified using linear or second order regression, and had correlation coefficients ≥0.995; therefore no qualifiers were applied. Samples 59SB03A, 59SB03B, and 59SB03C were analyzed in conjunction with this initial calibration.

- Initial calibration for the PAHs-SIM was performed on 7/18/07 using instrument MSBNA3 (GCMSR). All target compounds were within criteria (%RSD≤15% or ≤30%; RRF≥0.05); no qualifiers were applied. All samples were analyzed in conjunction with this initial calibration.

IV-Continuing Calibration

Compliance requirements for satisfactory instrument calibration are established to ensure that the instrument used was capable of producing acceptable qualitative and quantitative data for semivolatile target compounds. Continuing calibration standards containing both target and surrogates compounds are analyzed at the beginning of each 12-hour analysis period following the analysis of the instrument performance check and prior to the analysis of blanks and samples. The minimum relative response factors (RRF) for semivolatile target compounds and surrogates must be ≥0.05. The DoD QSM specifies that the percent difference (%D) between the initial calibration RRF and the continuing calibration RRF must be within ±20% for all target compounds. Grossly exceeding is defined where %D>40%. All detects are qualified as estimated "J" for where there were exceeding %Ds, and all non-detects are qualified as estimated "UJ" for where there were grossly exceeding recoveries, unless determined to be unusable "R". Grossly exceeding is defined as twice the established criteria limits. For where there were low RRFs, all detects are qualified as estimated "J" and non-detects are rejected "R".

- During the SVOC initial calibration verification performed on 7/5/07 @1527 using instrument MSBNA02 (GCMSL), 3-nitroaniline (26.0%) had %D outside criteria. All other target compounds met criteria. No samples were analyzed following this initial calibration verification, no qualifiers were applied.

- During the SVOC initial calibration verification performed on 7/5/07 @1555 using instrument MSBNA02 (GCMSL), all target compounds met criteria. No samples were analyzed following this initial calibration verification, no qualifiers were applied.

- During the SVOC continuing calibration performed on 8/1/07 @1616 using instrument MSBNA02 (GCMSL), 2,4-dinitrophenol (33.0%) and 4,6-dinitro-2-methylphenol (22.1%) had %D outside criteria. All other target compounds met criteria. The MS and MSD were the only samples analyzed following this continuing calibration. Therefore, no qualifiers were applied.

- During the SVOC continuing calibration performed on 8/2/07 @1324 using instrument MSBNA02 (GCMSL), all target compounds met criteria. No qualifiers were applied. Sample 072407R was analyzed following this continuing calibration.

- During the SVOC initial calibration verification performed on 7/13/07 @1348 using instrument MSBNA04 (GCMSU), 4-chloroaniline (38.2%) and 3-nitroaniline (39.0%) had %D outside criteria. All other target compounds met criteria. No samples were analyzed following this initial calibration verification, no qualifiers were applied.

- During the SVOC initial calibration verification performed on 7/13/07 @1419 using instrument MSBNA04 (GCMSU), all target compounds met criteria. No samples were analyzed following this initial calibration verification, no qualifiers were applied.

- During the SVOC continuing calibration performed on 8/3/07 @0952 using instrument MSBNA04 (GCMSU), all target compounds met criteria. No qualifiers were applied. Samples 59SB03A, 59SB03B, and 59SB03C were analyzed following this continuing calibration.

- During the PAH-SIM initial calibration verification performed on 7/18/07 @0634 using instrument MSBNA3 (GCMSR), all criteria were met for all target compounds. No qualifiers were applied. No samples were analyzed following this initial calibration verification.

- During the PAH-SIM continuing calibration performed on 8/2/07 @1000 using instrument MSBNA3 (GCMSR), all criteria were met for all target compounds. No qualifiers were applied. Sample 072407R was analyzed following this continuing calibration.

- During the PAH-SIM continuing calibration performed on 8/6/07 @2107 using instrument MSBNA3 (GCMSR), all criteria were met for all target compounds. No qualifiers were applied. Samples 59SB03A, 59SB03B, and 59SB03C were analyzed following this continuing calibration.

V-Blank Analysis

The purpose of blank analyses is to determine the presence and magnitude of contamination problems resulting from field and laboratory activities. A method blank analysis must be performed after the calibration standards and once every 12-hour time period beginning with the injection of DFTPP. No contaminants should be detected in any of the associated blanks > the MDL. DoD QSM criteria specifies all concentrations should be less than one-half MRL (<MRL for common laboratory contaminants phthalate esters). Positive sample results are reported and qualified "B", if the concentration of the compound in the sample is ≤10 times (10x) the maximum amount in any blank for the common laboratory contaminants phthalate esters, or 5 times (5X) the maximum amount for other semivolatile target compounds. **Table 2** summarizes the blank contamination analysis.

Table 2 Blank Contamination Analysis Summary

Analysis Date	QC Blank ID	Compound	Max Conc. µg/kg	Action Level µg/kg	B qualified samples
8/2/07	OP21675-MB	All SVOC target <½MRL	NA	NA	None
8/3/07	OP21718-MB	All SVOC target <½MRL	NA	NA	None
8/2/07	OP21676-MB	All PAH SIM target <½MRL	NA	NA	None
8/6/07	OP21719-MB	All PAH SIM target <½MRL	NA	NA	None
8/2/07	072407R	All SVOC target <½MRL	NA	NA	None
8/2/07	072407R	All PAH SIM target <½MRL	NA	NA	None

072407R is a rinsate blank.
NA = Not applicable.
MRL = Method reporting limit.

VI-Surrogate Spikes

Laboratory performance on individual samples is evaluated through the review of surrogate spike samples. Surrogate spikes are added to all samples and blanks to measure their recovery in sample and blank matrices. The percent recoveries (%Rs) must be within the specified control limits. DoD surrogate recovery limits are specified in Tables D-2 & D-3 of the DoD QSM (DoD, 2006). If the surrogate is not listed, then the laboratory criteria shall be used.

Aqueous Criteria:
2-Fluorophenol (14-62%) – (DoD QSM = 20-110%)
Phenol-d5 (10-40%) – (DoD QSM = 10-115%)
2,4,6-Tribromophenol (33-118%) – (DoD QSM = 40-125%)
Nitrobenzene-d5 (42-108%) – (DoD QSM = 40-110%)
2-Fluorobiphenyl (40-106%) – (DoD QSM = 50-110%)
p-Terphenyl-d14 (39-121%) – (DoD QSM = 50-135%)

Solid Criteria:

2-Fluorophenol (40-102%) – (DoD QSM = 35-105%)
Phenol-d5 (41-100%) – (DoD QSM = 40-100%)
2,4,6-Tribromophenol (42-108%) – (DoD QSM = 35-125%)
Nitrobenzene-d5 (40-105%) – (DoD QSM = 35-100%)
2-Fluorobiphenyl (43-107%) – (DoD QSM = 45-105%)
p-Terphenyl-d14 (45-119%) – (DoD QSM = 30-125%)

- Sample 072407R had all three base/neutral surrogates with high recoveries during PAH analysis. No PAHs were detected in 072407R, no data qualification was required.

- All other samples met surrogate recovery criteria. No qualifiers were applied.

VII-Internal Standards

Internal standards performance criteria ensure that GC/MS sensitivity and response are stable during every analytical run. Internal standard area counts for samples and blanks must not vary by more than a factor of two (-50% to +100%) from the associated calibration standard. The retention time of the internal standards in samples and blanks must not vary by more than ±30 seconds from the retention time of the associated calibration standard.

- All criteria were met. No qualifiers were applied.

VIII-Laboratory Control Sample

Laboratory control samples (LCS) are used to monitor laboratory accuracy by calculating the percent recoveries of the spiked compounds. All LCS percent recoveries must be within the specified control limits. DoD solid matrix LCS recovery limits are specified in Table D-7 of the DoD QSM (DoD, 2006), while aqueous recovery limits are specified in Table D-6 of the DoD QSM. If the compound is not listed, then the laboratory criteria shall be used.

- Sample OP21675-BS was used as the aqueous LCS during SVOC analysis on 8/2/07. All compounds met recovery criteria. No qualifiers were applied. Sample 072407R was analyzed in conjunction with this LCS.

- Sample OP21718-BS was used as the solid LCS during SVOC analysis on 8/3/07. All compounds met recovery criteria. No qualifiers were applied. Samples 59SB03A, 59SB03B, and 59SB03C were analyzed in conjunction with this LCS.

- Sample OP21676-BS was used as the aqueous LCS for the PAH-SIM analysis on 8/2/07. All compounds met recovery criteria. No qualifiers were applied. Sample 072407R was analyzed in conjunction with this LCS.

- Sample OP21719-BS was used as the solid LCS for the PAH-SIM analysis on 8/6/07. All compounds met recovery criteria. No qualifiers were applied. Samples 59SB03A, 59SB03B, and 59SB03C were analyzed in conjunction with this LCS.

IX-Matrix Spike/Matrix Spike Duplicate
Data for matrix spike/matrix spike duplicates (MS/MSD) are generated to determine long-term precision and accuracy of the analytical method on various matrices and to demonstrate acceptable compound recovery by the laboratory at the time of sample analysis. The percent recoveries (%Rs) and the relative percent difference (RPD) must be within the specified control limits. DoD solid matrix MS/MSD recovery limits follow the LCS criteria specified in Table D-7 of the DoD QSM (DoD, 2006), while aqueous recovery limits follow the LCS criteria in Table D-6 of the DoD QSM. If the compound is not listed, then the laboratory criteria shall be used.

- Sample F51272-6 was used as the aqueous MS/MSD during SVOC analysis on 8/1/07. The spiked sample was not a RFAAP site sample; therefore, it was not evaluated. Sample 072407R was analyzed in conjunction with this MS/MSD.

- Sample F51300-5 (an RFAAP sample in data package F51300) was used as the solid MS/MSD during SVOC analysis on 8/3/07. All target compounds met recovery criteria. No qualifiers were applied. Samples 59SB03A, 59SB03B, and 59SB03C were analyzed in conjunction with this MS/MSD.

- Sample F53100-31 (an RFAAP sample in data package F51300) was used as the aqueous MS/MSD during PAH SIM analysis on 8/2/07. All compounds met recovery criteria. No qualifiers were applied. Sample 072407R was analyzed in conjunction with this MS/MSD.

- Sample F53100-7 (an RFAAP sample in data package F51300) was used as the solid MS/MSD during PAH SIM analysis on 8/7/07. Chrysene (52%, 53%) and 1-methylnaphthalene (56%, 57%) had low recoveries in the MS & MSD; all chrysene and 1-methylnaphthalene results in associated samples have been qualified "J/UJ". All other target compounds met recovery criteria. Samples 59SB03A, 59SB03B, and 59SB03C were analyzed in conjunction with this MS/MSD.

X-Field Duplicate Sample Analysis
Field duplicates were collected to identify the cumulative precision of the sampling and analytical process and sent to the laboratory blind. The RPD was calculated only for those analytes which were detected at levels exceeding the method reporting limits in both samples of the duplicate pair. Analytes that were rejected (R-qualified) in either sample of the duplicate pair were excluded from the duplicate assessment. Precision control criterion was established at 50% RPD for the aqueous and solid samples. Analytical results were qualified as estimated (J) for any RPDs exceeding criteria.

- No field duplicates were included in this data package.

XI-Quantitation Verification

The accuracy of analytical results was verified through the calculation of several parameters. Percent difference (%D) between the calculated and reported values must be ≤10%. Any sample value >MDL and <MRL or <3*MDL (whichever is greater) was qualified as estimated, "J."

Sample: F51300-7 MSD, pyrene

Conc. (µg/kg) = {(Ax)*(Is)*(Vt)*(DF)}/{(Ais)*(RRF)*(V_i)*(Ws)*(Ps)}

where:	Conc	=	Sample concentration in µg/kg
	A_x	=	Area of characteristic ion for compound being measured.
	I_s	=	Amount of internal standard injected (ng).
	V_t	=	Volume of total extract, taking into account dilutions (i.e., a 1-to-10 dilution of a 1-mL extract will mean V(t) = 10,000 µL.
	DF	=	Dilution Factor
	A_{is}	=	Area of characteristic ion for the internal standard.
	RRF_A	=	Average relative response factor for compound being measured
	V_i	=	Volume of extract injected (µL).
	Ws	=	weight of sample (g)
	Ps	=	percent solids/100

Conc. µg/L = (213250 * 4 * 1000 * 4) / (115975 * 2.134 * 1 * 30.1 * 0.866) = 529 ug/kg

Reported Value = 529 µg/kg
% Difference = 0.0%
Values were within 10% difference.

Sample: F51300-5 MSD, 1,2-dichlorobenzene

Conc. (µg/kg) = {(Ax)*(Is)*(Vt)*(DF)}/{(Ais)*(RRF)*(V_i)*(Ws)*(Ps)}

where:	Conc	=	Sample concentration in µg/kg
	A_x	=	Area of characteristic ion for compound being measured.
	I_s	=	Amount of internal standard injected (ng).
	V_t	=	Volume of total extract, taking into account dilutions (i.e., a 1-to-10 dilution of a 1-mL extract will mean V(t) = 10,000 µL.
	DF	=	Dilution Factor
	A_{is}	=	Area of characteristic ion for the internal standard.
	RRF_A	=	Average relative response factor for compound being measured
	V_i	=	Volume of extract injected (µL).
	Ws	=	weight of sample (g)
	Ps	=	percent solids/100

Conc. µg/L = (192226 * 40 * 1000 * 1) / (220274 * 1.477 * 1 * 30.5 * 0.842) = 920 ug/kg

Reported Value = 921 µg/kg
% Difference = 0.1%
Values were within 10% difference.

USEPA Region III Validation Qualifiers

(No Code) = Confirmed identification.

B = The analyte has been detected in the sample and the associated laboratory or field blank.

J = Indicates an estimated value for (1) estimated value due to QC non-conformance. Reported value may not be accurate or precise, (2) estimating a concentration as a tentatively identified compound as indicated by the mass spectral and retention time data, or (3) estimating a concentration ≥MDL and <MRL or <3*MDL, whichever is greater.

K = Analyte present. Reported value may be biased high (estimated) due to QC non-conformance.

L = Analyte present. Reported value may be biased low (estimated) due to QC non-conformance.

R = Unreliable result. Analyte may or may not be present in the sample due to QC non-conformance.

UL = Value is estimated bias low and not detected due to QC non-conformance. Reporting limit may be inaccurate or imprecise. Quantitation limit is probably higher.

UJ = Value is estimated and not detected due to QC non-conformance. Reporting limit may be inaccurate or imprecise.

Laboratory Qualifiers

(No Code) = Confirmed identification.

U = Not detected. The associated number indicates the compound reporting limit for the sample.

A (Dioxins) = B (Metals) = The reported value was obtained from a reading <MRL and ≥MDL and is considered estimated.

B (Organics) = The analyte or compound has been detected in the sample and laboratory method blank. It indicates probable blank contamination.

E (Metals) = Reported value is estimated because of the presence of interferences.

E (Organics) = Identifies compounds whose concentrations exceed the upper level of the calibration range.

EMPC (Dioxins) = The ion-abundance ratio between the two characteristic PCDD/PCDF ions was outside accepted ranges. The detected PCDD/PCDF was reported as an estimated maximum possible concentration (EMPC).

D = Indicates sample was analyzed at a dilution.

J = Indicates an estimated value for (1) estimating a concentration as a tentatively identified compound as indicated by the mass spectral and retention time data, or (2) estimating a concentration <MRL and ≥MDL.

N (Organics) = Indicates presumptive evidence of a compound for tentatively identified compounds using a library search.

N (Metals) = Laboratory spike sample recovery not within control limits.

P (Organics) = Target analyte confirmation >40% difference for detected compound between the primary and secondary columns. The lower of the two values was reported.

* (Metals) = Duplicate analysis not within control limits.

* (Organics) = Surrogate outside of QC limits on both original and re-analysis.

Accutest Laboratories

Report of Analysis

Client Sample ID:	072407R		
Lab Sample ID:	F51275-1	**Date Sampled:**	07/24/07
Matrix:	AQ - Water	**Date Received:**	07/25/07
Method:	SW846 8270C SW846 3510C	**Percent Solids:**	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	L037577.D	1	08/02/07	RB	07/31/07	OP21675	SL1922
Run #2							

	Initial Volume	Final Volume
Run #1	1000 ml	1.0 ml
Run #2		

ABN TCL List w/o PAHs

CAS No.	Compound	Result	RL	MDL	Units	Q
65-85-0	Benzoic Acid	ND	25	10	ug/l	
95-57-8	2-Chlorophenol	ND	5.0	1.0	ug/l	
59-50-7	4-Chloro-3-methyl phenol	ND	5.0	2.0	ug/l	
120-83-2	2,4-Dichlorophenol	ND	5.0	1.0	ug/l	
105-67-9	2,4-Dimethylphenol	ND	5.0	2.0	ug/l	
51-28-5	2,4-Dinitrophenol	ND	25	10	ug/l	
534-52-1	4,6-Dinitro-o-cresol	ND	10	2.0	ug/l	
95-48-7	2-Methylphenol	ND	5.0	1.0	ug/l	
	3&4-Methylphenol	ND	5.0	1.3	ug/l	
88-75-5	2-Nitrophenol	ND	5.0	1.0	ug/l	
100-02-7	4-Nitrophenol	ND	25	10	ug/l	
87-86-5	Pentachlorophenol	ND	25	10	ug/l	
108-95-2	Phenol	ND	5.0	2.0	ug/l	
95-95-4	2,4,5-Trichlorophenol	ND	5.0	1.0	ug/l	
88-06-2	2,4,6-Trichlorophenol	ND	5.0	1.0	ug/l	
101-55-3	4-Bromophenyl phenyl ether	ND	5.0	1.2	ug/l	
85-68-7	Butyl benzyl phthalate	ND	5.0	2.0	ug/l	
100-51-6	Benzyl Alcohol	ND	5.0	1.0	ug/l	
91-58-7	2-Chloronaphthalene	ND	5.0	1.3	ug/l	
106-47-8	4-Chloroaniline	ND	5.0	2.0	ug/l	
86-74-8	Carbazole	ND	5.0	1.0	ug/l	
111-91-1	bis(2-Chloroethoxy)methane	ND	5.0	1.0	ug/l	
111-44-4	bis(2-Chloroethyl)ether	ND	5.0	1.0	ug/l	
108-60-1	bis(2-Chloroisopropyl)ether	ND	5.0	1.0	ug/l	
7005-72-3	4-Chlorophenyl phenyl ether	ND	5.0	1.3	ug/l	
95-50-1	1,2-Dichlorobenzene	ND	5.0	1.5	ug/l	
541-73-1	1,3-Dichlorobenzene	ND	5.0	1.6	ug/l	
106-46-7	1,4-Dichlorobenzene	ND	5.0	1.5	ug/l	
121-14-2	2,4-Dinitrotoluene	ND	5.0	1.0	ug/l	
606-20-2	2,6-Dinitrotoluene	ND	5.0	1.0	ug/l	
91-94-1	3,3'-Dichlorobenzidine	ND	10	2.0	ug/l	
132-64-9	Dibenzofuran	ND	5.0	1.0	ug/l	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	072407R		
Lab Sample ID:	F51275-1	**Date Sampled:**	07/24/07
Matrix:	AQ - Water	**Date Received:**	07/25/07
Method:	SW846 8270C SW846 3510C	**Percent Solids:**	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

ABN TCL List w/o PAHs

CAS No.	Compound	Result	RL	MDL	Units	Q
84-74-2	Di-n-butyl phthalate	ND	5.0	2.0	ug/l	
117-84-0	Di-n-octyl phthalate	ND	5.0	2.0	ug/l	
84-66-2	Diethyl phthalate	ND	5.0	2.0	ug/l	
131-11-3	Dimethyl phthalate	ND	5.0	2.0	ug/l	
117-81-7	bis(2-Ethylhexyl)phthalate	ND	5.0	2.0	ug/l	
118-74-1	Hexachlorobenzene	ND	5.0	1.2	ug/l	
87-68-3	Hexachlorobutadiene	ND	5.0	1.7	ug/l	
77-47-4	Hexachlorocyclopentadiene	ND	5.0	1.5	ug/l	
67-72-1	Hexachloroethane	ND	5.0	1.9	ug/l	
78-59-1	Isophorone	ND	5.0	1.0	ug/l	
88-74-4	2-Nitroaniline	ND	10	2.0	ug/l	
99-09-2	3-Nitroaniline	ND	10	2.0	ug/l	
100-01-6	4-Nitroaniline	ND	10	2.0	ug/l	
98-95-3	Nitrobenzene	ND	5.0	1.0	ug/l	
621-64-7	N-Nitroso-di-n-propylamine	ND	5.0	1.0	ug/l	
86-30-6	N-Nitrosodiphenylamine	ND	5.0	1.0	ug/l	
120-82-1	1,2,4-Trichlorobenzene	ND	5.0	1.5	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol	40%		14-62%
4165-62-2	Phenol-d5	26%		10-40%
118-79-6	2,4,6-Tribromophenol	86%		33-118%
4165-60-0	Nitrobenzene-d5	80%		42-108%
321-60-8	2-Fluorobiphenyl	78%		40-106%
1718-51-0	Terphenyl-d14	80%		39-121%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest LabLink@72036 11:14 19-Dec-2007

Report of Analysis

Client Sample ID:	072407R		
Lab Sample ID:	F51275-1	Date Sampled:	07/24/07
Matrix:	AQ - Water	Date Received:	07/25/07
Method:	SW846 8270C BY SIM SW846 3510C	Percent Solids:	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	R09530.D	1	08/02/07	NJ	07/31/07	OP21676	SR451
Run #2							

	Initial Volume	Final Volume
Run #1	1000 ml	1.0 ml
Run #2		

BN PAH List

CAS No.	Compound	Result	RL	MDL	Units	Q
83-32-9	Acenaphthene	ND	1.0	0.50	ug/l	
208-96-8	Acenaphthylene	ND	1.0	0.50	ug/l	
120-12-7	Anthracene	ND	1.0	0.50	ug/l	
56-55-3	Benzo(a)anthracene	ND	0.20	0.050	ug/l	
50-32-8	Benzo(a)pyrene	ND	0.20	0.10	ug/l	
205-99-2	Benzo(b)fluoranthene	ND	0.20	0.050	ug/l	
191-24-2	Benzo(g,h,i)perylene	ND	0.20	0.10	ug/l	
207-08-9	Benzo(k)fluoranthene	ND	0.20	0.10	ug/l	
218-01-9	Chrysene	ND	0.20	0.10	ug/l	
53-70-3	Dibenzo(a,h)anthracene	ND	0.20	0.050	ug/l	
206-44-0	Fluoranthene	ND	1.0	0.25	ug/l	
86-73-7	Fluorene	ND	1.0	0.25	ug/l	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	0.20	0.050	ug/l	
90-12-0	1-Methylnaphthalene	ND	1.0	0.25	ug/l	
91-57-6	2-Methylnaphthalene	ND	1.0	0.25	ug/l	
91-20-3	Naphthalene	ND	1.0	0.25	ug/l	
85-01-8	Phenanthrene	ND	1.0	0.50	ug/l	
129-00-0	Pyrene	ND	1.0	0.25	ug/l	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	59SB03A		
Lab Sample ID:	F51275-2	**Date Sampled:**	07/24/07
Matrix:	SO - Soil	**Date Received:**	07/25/07
Method:	SW846 8270C SW846 3550B	**Percent Solids:**	93.1
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	U003739.D	1	08/03/07	NJ	08/02/07	OP21718	SU183
Run #2							

	Initial Weight	Final Volume
Run #1	30.0 g	1.0 ml
Run #2		

ABN TCL List w/o PAHs

CAS No.	Compound	Result	RL	MDL	Units	Q
65-85-0	Benzoic acid	ND	900	360	ug/kg	
95-57-8	2-Chlorophenol	ND	180	36	ug/kg	
59-50-7	4-Chloro-3-methyl phenol	ND	180	36	ug/kg	
120-83-2	2,4-Dichlorophenol	ND	180	36	ug/kg	
105-67-9	2,4-Dimethylphenol	ND	180	36	ug/kg	
51-28-5	2,4-Dinitrophenol	ND	900	360	ug/kg	
534-52-1	4,6-Dinitro-o-cresol	ND	360	72	ug/kg	
95-48-7	2-Methylphenol	ND	180	36	ug/kg	
	3&4-Methylphenol	ND	180	36	ug/kg	
88-75-5	2-Nitrophenol	ND	180	36	ug/kg	
100-02-7	4-Nitrophenol	ND	900	360	ug/kg	
87-86-5	Pentachlorophenol	ND	900	360	ug/kg	
108-95-2	Phenol	ND	180	36	ug/kg	
95-95-4	2,4,5-Trichlorophenol	ND	180	36	ug/kg	
88-06-2	2,4,6-Trichlorophenol	ND	180	36	ug/kg	
101-55-3	4-Bromophenyl phenyl ether	ND	180	36	ug/kg	
85-68-7	Butyl benzyl phthalate	ND	360	90	ug/kg	
100-51-6	Benzyl Alcohol	ND	180	36	ug/kg	
91-58-7	2-Chloronaphthalene	ND	180	36	ug/kg	
106-47-8	4-Chloroaniline	ND	180	72	ug/kg	
86-74-8	Carbazole	ND	180	36	ug/kg	
111-91-1	bis(2-Chloroethoxy)methane	ND	180	36	ug/kg	
111-44-4	bis(2-Chloroethyl)ether	ND	180	36	ug/kg	
108-60-1	bis(2-Chloroisopropyl)ether	ND	180	36	ug/kg	
7005-72-3	4-Chlorophenyl phenyl ether	ND	180	36	ug/kg	
95-50-1	1,2-Dichlorobenzene	ND	180	36	ug/kg	
541-73-1	1,3-Dichlorobenzene	ND	180	36	ug/kg	
106-46-7	1,4-Dichlorobenzene	ND	180	36	ug/kg	
121-14-2	2,4-Dinitrotoluene	ND	180	36	ug/kg	
606-20-2	2,6-Dinitrotoluene	ND	180	36	ug/kg	
91-94-1	3,3'-Dichlorobenzidine	ND	360	72	ug/kg	
132-64-9	Dibenzofuran	ND	180	36	ug/kg	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	59SB03A		
Lab Sample ID:	F51275-2	**Date Sampled:**	07/24/07
Matrix:	SO - Soil	**Date Received:**	07/25/07
Method:	SW846 8270C SW846 3550B	**Percent Solids:**	93.1
Project:	WPA 019 Field Investigation; Radford AAP, VA		

ABN TCL List w/o PAHs

CAS No.	Compound	Result	RL	MDL	Units	Q
84-74-2	Di-n-butyl phthalate	ND	360	90	ug/kg	
117-84-0	Di-n-octyl phthalate	ND	360	90	ug/kg	
84-66-2	Diethyl phthalate	ND	360	180	ug/kg	
131-11-3	Dimethyl phthalate	ND	360	90	ug/kg	
117-81-7	bis(2-Ethylhexyl)phthalate	ND	360	180	ug/kg	
118-74-1	Hexachlorobenzene	ND	180	36	ug/kg	
87-68-3	Hexachlorobutadiene	ND	180	36	ug/kg	
77-47-4	Hexachlorocyclopentadiene	ND	180	36	ug/kg	
67-72-1	Hexachloroethane	ND	180	36	ug/kg	
78-59-1	Isophorone	ND	180	36	ug/kg	
88-74-4	2-Nitroaniline	ND	360	72	ug/kg	
99-09-2	3-Nitroaniline	ND	360	72	ug/kg	
100-01-6	4-Nitroaniline	ND	360	72	ug/kg	
98-95-3	Nitrobenzene	ND	180	36	ug/kg	
621-64-7	N-Nitroso-di-n-propylamine	ND	180	36	ug/kg	
86-30-6	N-Nitrosodiphenylamine	ND	180	36	ug/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	180	36	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol	67%		40-102%
4165-62-2	Phenol-d5	72%		41-100%
118-79-6	2,4,6-Tribromophenol	76%		42-108%
4165-60-0	Nitrobenzene-d5	61%		40-105%
321-60-8	2-Fluorobiphenyl	64%		43-107%
1718-51-0	Terphenyl-d14	77%		45-119%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: R09623.D

Accutest Laboratories

Report of Analysis

Client Sample ID:	59SB03A		
Lab Sample ID:	F51275-2	**Date Sampled:**	07/24/07
Matrix:	SO - Soil	**Date Received:**	07/25/07
Method:	SW846 8270C BY SIM SW846 3550B	**Percent Solids:**	93.1
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	R09623.D	4	08/06/07	NJ	08/02/07	OP21719	SR455
Run #2							

	Initial Weight	Final Volume
Run #1	30.0 g	1.0 ml
Run #2		

BN PAH List

DATA VAL QUALIFIER

CAS No.	Compound	Result	RL	MDL	Units	Q
83-32-9	Acenaphthene	ND	290	72	ug/kg	
208-96-8	Acenaphthylene	ND	290	72	ug/kg	
120-12-7	Anthracene	ND	290	43	ug/kg	
56-55-3	Benzo(a)anthracene	25.5	57	14	ug/kg	J
50-32-8	Benzo(a)pyrene	23.9	57	14	ug/kg	J
205-99-2	Benzo(b)fluoranthene	30.9	57	14	ug/kg	J
191-24-2	Benzo(g,h,i)perylene	15.1	57	14	ug/kg	J
207-08-9	Benzo(k)fluoranthene	21.8	57	14	ug/kg	J
218-01-9	Chrysene	37.0	57	14	ug/kg	J
53-70-3	Dibenzo(a,h)anthracene	ND	57	14	ug/kg	
206-44-0	Fluoranthene	51.1	290	50	ug/kg	J
86-73-7	Fluorene	ND	290	43	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	15.9	57	14	ug/kg	J
90-12-0	1-Methylnaphthalene	ND	290	43	ug/kg	UJ
91-57-6	2-Methylnaphthalene	ND	290	43	ug/kg	
91-20-3	Naphthalene	ND	290	43	ug/kg	
85-01-8	Phenanthrene	53.0	290	43	ug/kg	J
129-00-0	Pyrene	ND	290	50	ug/kg	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	59SB03B		
Lab Sample ID:	F51275-3	**Date Sampled:**	07/24/07
Matrix:	SO - Soil	**Date Received:**	07/25/07
Method:	SW846 8270C SW846 3550B	**Percent Solids:**	79.5
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	U003742.D	1	08/03/07	NJ	08/02/07	OP21718	SU183
Run #2							

	Initial Weight	Final Volume
Run #1	30.5 g	1.0 ml
Run #2		

ABN TCL List w/o PAHs

CAS No.	Compound	Result	RL	MDL	Units	Q
65-85-0	Benzoic acid	ND	1000	410	ug/kg	
95-57-8	2-Chlorophenol	ND	210	41	ug/kg	
59-50-7	4-Chloro-3-methyl phenol	ND	210	41	ug/kg	
120-83-2	2,4-Dichlorophenol	ND	210	41	ug/kg	
105-67-9	2,4-Dimethylphenol	ND	210	41	ug/kg	
51-28-5	2,4-Dinitrophenol	ND	1000	410	ug/kg	
534-52-1	4,6-Dinitro-o-cresol	ND	410	82	ug/kg	
95-48-7	2-Methylphenol	ND	210	41	ug/kg	
	3&4-Methylphenol	ND	210	41	ug/kg	
88-75-5	2-Nitrophenol	ND	210	41	ug/kg	
100-02-7	4-Nitrophenol	ND	1000	410	ug/kg	
87-86-5	Pentachlorophenol	ND	1000	410	ug/kg	
108-95-2	Phenol	ND	210	41	ug/kg	
95-95-4	2,4,5-Trichlorophenol	ND	210	41	ug/kg	
88-06-2	2,4,6-Trichlorophenol	ND	210	41	ug/kg	
101-55-3	4-Bromophenyl phenyl ether	ND	210	41	ug/kg	
85-68-7	Butyl benzyl phthalate	ND	410	100	ug/kg	
100-51-6	Benzyl Alcohol	ND	210	41	ug/kg	
91-58-7	2-Chloronaphthalene	ND	210	41	ug/kg	
106-47-8	4-Chloroaniline	ND	210	82	ug/kg	
86-74-8	Carbazole	ND	210	41	ug/kg	
111-91-1	bis(2-Chloroethoxy)methane	ND	210	41	ug/kg	
111-44-4	bis(2-Chloroethyl)ether	ND	210	41	ug/kg	
108-60-1	bis(2-Chloroisopropyl)ether	ND	210	41	ug/kg	
7005-72-3	4-Chlorophenyl phenyl ether	ND	210	41	ug/kg	
95-50-1	1,2-Dichlorobenzene	ND	210	41	ug/kg	
541-73-1	1,3-Dichlorobenzene	ND	210	41	ug/kg	
106-46-7	1,4-Dichlorobenzene	ND	210	41	ug/kg	
121-14-2	2,4-Dinitrotoluene	ND	210	41	ug/kg	
606-20-2	2,6-Dinitrotoluene	ND	210	41	ug/kg	
91-94-1	3,3'-Dichlorobenzidine	ND	410	82	ug/kg	
132-64-9	Dibenzofuran	ND	210	41	ug/kg	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	59SB03B		
Lab Sample ID:	F51275-3	**Date Sampled:**	07/24/07
Matrix:	SO - Soil	**Date Received:**	07/25/07
Method:	SW846 8270C SW846 3550B	**Percent Solids:**	79.5
Project:	WPA 019 Field Investigation; Radford AAP, VA		

ABN TCL List w/o PAHs

CAS No.	Compound	Result	RL	MDL	Units	Q
84-74-2	Di-n-butyl phthalate	ND	410	100	ug/kg	
117-84-0	Di-n-octyl phthalate	ND	410	100	ug/kg	
84-66-2	Diethyl phthalate	ND	410	210	ug/kg	
131-11-3	Dimethyl phthalate	ND	410	100	ug/kg	
117-81-7	bis(2-Ethylhexyl)phthalate	ND	410	210	ug/kg	
118-74-1	Hexachlorobenzene	ND	210	41	ug/kg	
87-68-3	Hexachlorobutadiene	ND	210	41	ug/kg	
77-47-4	Hexachlorocyclopentadiene	ND	210	41	ug/kg	
67-72-1	Hexachloroethane	ND	210	41	ug/kg	
78-59-1	Isophorone	ND	210	41	ug/kg	
88-74-4	2-Nitroaniline	ND	410	82	ug/kg	
99-09-2	3-Nitroaniline	ND	410	82	ug/kg	
100-01-6	4-Nitroaniline	ND	410	82	ug/kg	
98-95-3	Nitrobenzene	ND	210	41	ug/kg	
621-64-7	N-Nitroso-di-n-propylamine	ND	210	41	ug/kg	
86-30-6	N-Nitrosodiphenylamine	ND	210	41	ug/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	210	41	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol	72%		40-102%
4165-62-2	Phenol-d5	76%		41-100%
118-79-6	2,4,6-Tribromophenol	80%		42-108%
4165-60-0	Nitrobenzene-d5	64%		40-105%
321-60-8	2-Fluorobiphenyl	67%		43-107%
1718-51-0	Terphenyl-d14	81%		45-119%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	59SB03B		
Lab Sample ID:	F51275-3	**Date Sampled:**	07/24/07
Matrix:	SO - Soil	**Date Received:**	07/25/07
Method:	SW846 8270C BY SIM SW846 3550B	**Percent Solids:**	79.5
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	R09624.D	4	08/06/07	NJ	08/02/07	OP21719	SR455
Run #2							

	Initial Weight	Final Volume
Run #1	30.5 g	1.0 ml
Run #2		

BN PAH List

DATA VAL QUALIFIER

CAS No.	Compound	Result	RL	MDL	Units	Q
83-32-9	Acenaphthene	ND	330	82	ug/kg	
208-96-8	Acenaphthylene	ND	330	82	ug/kg	
120-12-7	Anthracene	ND	330	49	ug/kg	
56-55-3	Benzo(a)anthracene	ND	66	16	ug/kg	
50-32-8	Benzo(a)pyrene	ND	66	16	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	66	16	ug/kg	
191-24-2	Benzo(g,h,i)perylene	ND	66	16	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	66	16	ug/kg	
218-01-9	Chrysene	ND	66	16	ug/kg	UJ
53-70-3	Dibenzo(a,h)anthracene	ND	66	16	ug/kg	
206-44-0	Fluoranthene	ND	330	58	ug/kg	
86-73-7	Fluorene	ND	330	49	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	66	16	ug/kg	
90-12-0	1-Methylnaphthalene	ND	330	49	ug/kg	UJ
91-57-6	2-Methylnaphthalene	ND	330	49	ug/kg	
91-20-3	Naphthalene	ND	330	49	ug/kg	
85-01-8	Phenanthrene	ND	330	49	ug/kg	
129-00-0	Pyrene	ND	330	58	ug/kg	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	59SB03C		
Lab Sample ID:	F51275-4	**Date Sampled:**	07/24/07
Matrix:	SO - Soil	**Date Received:**	07/25/07
Method:	SW846 8270C SW846 3550B	**Percent Solids:**	82.2
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	U003743.D	1	08/03/07	NJ	08/02/07	OP21718	SU183
Run #2							

	Initial Weight	Final Volume
Run #1	30.8 g	1.0 ml
Run #2		

ABN TCL List w/o PAHs

CAS No.	Compound	Result	RL	MDL	Units	Q
65-85-0	Benzoic acid	ND	990	390	ug/kg	
95-57-8	2-Chlorophenol	ND	200	39	ug/kg	
59-50-7	4-Chloro-3-methyl phenol	ND	200	39	ug/kg	
120-83-2	2,4-Dichlorophenol	ND	200	39	ug/kg	
105-67-9	2,4-Dimethylphenol	ND	200	39	ug/kg	
51-28-5	2,4-Dinitrophenol	ND	990	390	ug/kg	
534-52-1	4,6-Dinitro-o-cresol	ND	390	79	ug/kg	
95-48-7	2-Methylphenol	ND	200	39	ug/kg	
	3&4-Methylphenol	ND	200	39	ug/kg	
88-75-5	2-Nitrophenol	ND	200	39	ug/kg	
100-02-7	4-Nitrophenol	ND	990	390	ug/kg	
87-86-5	Pentachlorophenol	ND	990	390	ug/kg	
108-95-2	Phenol	ND	200	39	ug/kg	
95-95-4	2,4,5-Trichlorophenol	ND	200	39	ug/kg	
88-06-2	2,4,6-Trichlorophenol	ND	200	39	ug/kg	
101-55-3	4-Bromophenyl phenyl ether	ND	200	39	ug/kg	
85-68-7	Butyl benzyl phthalate	ND	390	99	ug/kg	
100-51-6	Benzyl Alcohol	ND	200	39	ug/kg	
91-58-7	2-Chloronaphthalene	ND	200	39	ug/kg	
106-47-8	4-Chloroaniline	ND	200	79	ug/kg	
86-74-8	Carbazole	ND	200	39	ug/kg	
111-91-1	bis(2-Chloroethoxy)methane	ND	200	39	ug/kg	
111-44-4	bis(2-Chloroethyl)ether	ND	200	39	ug/kg	
108-60-1	bis(2-Chloroisopropyl)ether	ND	200	39	ug/kg	
7005-72-3	4-Chlorophenyl phenyl ether	ND	200	39	ug/kg	
95-50-1	1,2-Dichlorobenzene	ND	200	39	ug/kg	
541-73-1	1,3-Dichlorobenzene	ND	200	39	ug/kg	
106-46-7	1,4-Dichlorobenzene	ND	200	39	ug/kg	
121-14-2	2,4-Dinitrotoluene	ND	200	39	ug/kg	
606-20-2	2,6-Dinitrotoluene	ND	200	39	ug/kg	
91-94-1	3,3'-Dichlorobenzidine	ND	390	79	ug/kg	
132-64-9	Dibenzofuran	ND	200	39	ug/kg	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	59SB03C		
Lab Sample ID:	F51275-4	**Date Sampled:**	07/24/07
Matrix:	SO - Soil	**Date Received:**	07/25/07
Method:	SW846 8270C SW846 3550B	**Percent Solids:**	82.2
Project:	WPA 019 Field Investigation; Radford AAP, VA		

ABN TCL List w/o PAHs

CAS No.	Compound	Result	RL	MDL	Units	Q
84-74-2	Di-n-butyl phthalate	ND	390	99	ug/kg	
117-84-0	Di-n-octyl phthalate	ND	390	99	ug/kg	
84-66-2	Diethyl phthalate	ND	390	200	ug/kg	
131-11-3	Dimethyl phthalate	ND	390	99	ug/kg	
117-81-7	bis(2-Ethylhexyl)phthalate	ND	390	200	ug/kg	
118-74-1	Hexachlorobenzene	ND	200	39	ug/kg	
87-68-3	Hexachlorobutadiene	ND	200	39	ug/kg	
77-47-4	Hexachlorocyclopentadiene	ND	200	39	ug/kg	
67-72-1	Hexachloroethane	ND	200	39	ug/kg	
78-59-1	Isophorone	ND	200	39	ug/kg	
88-74-4	2-Nitroaniline	ND	390	79	ug/kg	
99-09-2	3-Nitroaniline	ND	390	79	ug/kg	
100-01-6	4-Nitroaniline	ND	390	79	ug/kg	
98-95-3	Nitrobenzene	ND	200	39	ug/kg	
621-64-7	N-Nitroso-di-n-propylamine	ND	200	39	ug/kg	
86-30-6	N-Nitrosodiphenylamine	ND	200	39	ug/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	200	39	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol	58%		40-102%
4165-62-2	Phenol-d5	64%		41-100%
118-79-6	2,4,6-Tribromophenol	76%		42-108%
4165-60-0	Nitrobenzene-d5	51%		40-105%
321-60-8	2-Fluorobiphenyl	55%		43-107%
1718-51-0	Terphenyl-d14	78%		45-119%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	59SB03C		
Lab Sample ID:	F51275-4	**Date Sampled:**	07/24/07
Matrix:	SO - Soil	**Date Received:**	07/25/07
Method:	SW846 8270C BY SIM SW846 3550B	**Percent Solids:**	82.2
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	R09625.D	4	08/06/07	NJ	08/02/07	OP21719	SR455
Run #2							

	Initial Weight	Final Volume
Run #1	30.8 g	1.0 ml
Run #2		

BN PAH List

DATA VAL QUALIFIER

CAS No.	Compound	Result	RL	MDL	Units	Q
83-32-9	Acenaphthene	ND	320	79	ug/kg	
208-96-8	Acenaphthylene	ND	320	79	ug/kg	
120-12-7	Anthracene	ND	320	47	ug/kg	
56-55-3	Benzo(a)anthracene	ND	63	16	ug/kg	
50-32-8	Benzo(a)pyrene	ND	63	16	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	63	16	ug/kg	
191-24-2	Benzo(g,h,i)perylene	ND	63	16	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	63	16	ug/kg	
218-01-9	Chrysene	ND	63	16	ug/kg	UJ
53-70-3	Dibenzo(a,h)anthracene	ND	63	16	ug/kg	
206-44-0	Fluoranthene	ND	320	55	ug/kg	
86-73-7	Fluorene	ND	320	47	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	63	16	ug/kg	
90-12-0	1-Methylnaphthalene	ND	320	47	ug/kg	UJ
91-57-6	2-Methylnaphthalene	ND	320	47	ug/kg	
91-20-3	Naphthalene	ND	320	47	ug/kg	
85-01-8	Phenanthrene	ND	320	47	ug/kg	
129-00-0	Pyrene	ND	320	55	ug/kg	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Shaw® Shaw Environmental, Inc.

MEMORANDUM

TO: Jeff Parks, Shaw E&I Radford Army Ammunition Plant (RFAAP) Project Manager

FROM: Richard McCracken, Shaw E&I Project Chemist

SUBJECT: RFAAP Data Validation - Volatiles
Accutest Laboratories, Inc., SDG F51275

DATE: December 10, 2007

The purpose of this memorandum is to present the data validation report for the samples collected at RFAAP on July 24, 2007. The samples were analyzed for target compound list (TCL) volatile organic compounds (VOCs) using USEPA SW846 Method 5030B/8260B for aqueous samples and 5035A/8260B for soil samples. A total of three aqueous and three soil samples were validated. The sample IDs are:

Field Sample ID	Lab Sample ID	Field Sample ID	Lab Sample ID
072407R	F51275-1	59SB03C	F51275-4
59SB03A	F51275-2	TB072407S	F51275-5
59SB03B	F51275-3	TB072407W	F51275-6

Data were reviewed by Richard McCracken and validated using a combination of project QAPP, *Quality Systems Manual for Environmental Laboratories, Final Version 3, January, 2006* (DoD, 2006) (DoD QSM), method-specific criteria, and laboratory SOP criteria. The data qualifier scheme was consistent with the *Region III Modifications to the National Functional Guidelines for Organic Data Review* (September 1994). Parameters evaluated are presented in **Table 1**. Data associated with parameters in compliance with quality control specifications have not been qualified. Data associated with parameters that did not comply with quality control specifications and directly impacted project data have been qualified in accordance with USEPA Region III specifications.

Table 1 Laboratory Performance Criteria

Qualified		Parameter
Yes	No	
	X	Holding Times and Preservation
	X	Instrument Performance Results
	X	Initial Calibration
X		Continuing Calibration
	X	Blank Analysis
	X	Laboratory Control Sample
	X	Matrix Spike / Spike Duplicate Sample
X		System Monitoring Compounds
	X	Internal Standards
	X	Field Sample Duplicate
	X	Quantitation Verification

The quality of data collected in support of this sampling activity is considered acceptable with noted qualifications.

Richard M. Cracken

Richard McCracken, Chemist

12/10/07

Date

RFAAP VALIDATION REPORT
VOLATILES REVIEW
SDG F51275

I-Holding Times and Preservation
The objective is to ascertain the validity of results based on the holding time of the sample from time of collection to time of analysis. Holding time criteria: Aqueous samples must be cooled @ 4°C±2°C and acidified to pH<2 with HCl, with a maximum holding time of 14 days (7 days if no HCl added) from sample collection to analysis. Soil samples must be cooled @ 4°C±2°C, with a maximum holding time of 14 days from sample collection to analysis.

- Temperature Review: A temperature blank was sent with each cooler and recorded by the laboratory upon receipt. The samples collected on 7/24/07 were sent in two coolers, and were received by the laboratory on 7/25/07 at 2.6 °C & 3.4 °C. No qualifiers were applied.

- Holding Time Review: All samples were collected for VOCs on 7/24/07. The rinsate blank (072407R) and associated trip blank (TB072407W) were analyzed on 7/31/07, all other samples were analyzed on 7/30/07. All criteria were met. No qualifiers were applied.

II-Instrument Performance Check
The analysis of the instrument performance check solution must be performed at the beginning of each 12-hour period during which samples are analyzed.

- The instrument performance check, bromofluorobenzene (BFB), met the ion abundance criteria. No qualification was applied.

III-Initial Calibration
Compliance requirements for satisfactory instrument calibration are established to ensure that the instrument used is capable of producing acceptable qualitative and quantitative data for volatile target compounds. Initial calibration demonstrates that the instrument is capable of acceptable performance in the beginning of the analytical run and of producing a linear calibration curve. The RRF must be greater than 0.1 for chloromethane, 1,1-dichloroethane, and bromoform and greater than 0.3 for 1,1,2,2-tetrachloroethane and chlorobenzene. The minimum relative response factor (RRF) must be ≥0.05 for all other compounds. The DoD QSM specifies that the percent relative standard deviation (%RSD) must be ≤15% for each target compound and must be ≤30% for each calibration check compound. For compounds analyzed using linear regression or second order, correlation coefficients must be >0.995 and coefficients of determination >0.99. All detects are qualified as estimated "J" for exceeding %RSDs, and all non-detects are qualified as estimated "UJ" for grossly exceeding recoveries, unless determined to be unusable "R". Grossly exceeding is defined as twice the established criteria limits. For compounds with low RRFs, all detects are qualified as estimated "J" and non-detects are rejected "R".

- During the initial calibration performed on 07/16/07 on instrument MSVOA3 (GCMSH), target compounds acetone (18.53%), methylene chloride (32.02%), trichloroethene (24.48%), ethylbenzene (15.12%), m,p-xylene (16.56%), and o-xylene (15.44%) were outside %RSD criteria. All other target compounds met %RSD criteria, and all compounds met RRF criteria. The compounds with high %RSD were quantified using linear or second order regression, and had correlation coefficients >0.995; therefore, no qualifiers were applied. Samples 59SB03A, 59SB03B, 59SB03C, and TB072407S were analyzed in conjunction with this initial calibration.

- During the initial calibration performed on 07/31/07 on instrument MSVOA6 (GCMSJ), target compounds bromomethane (22.0%), chloroethane (21.95%), methylene chloride (123.02%), and trans-1,3-dichloropropene (21.19%) were outside %RSD criteria. All other target compounds met %RSD criteria, and all compounds met RRF criteria. The compounds with high %RSD were quantified using linear or second order regression, and had correlation coefficients >0.995; therefore, no qualifiers were applied. Samples 072407R and TB072407W were analyzed in conjunction with this initial calibration.

IV-Continuing Calibration

Compliance requirements for satisfactory instrument calibration are established to ensure that the instrument used is capable of producing acceptable qualitative and quantitative data for volatile target compounds. Continuing calibration establishes the 12-hour relative response factors on which the quantitations are based and checks satisfactory performance of the instrument on a day-to-day basis. The RRF must be greater than 0.1 for chloromethane, 1,1-dichloroethane, and bromoform and greater than 0.3 for 1,1,2,2-tetrachloroethane and chlorobenzene. The minimum relative response factor (RRF) must be ≥0.05 for all other compounds. The DoD QSM specifies that the percent difference (%D) between the initial calibration RRF and the continuing calibration RRF must be within 20% for all target compounds. All detects are qualified as estimated "J" for exceeding %Ds, and all non-detects are qualified as estimated "UJ" for grossly exceeding recoveries, unless determined to be unusable "R". Grossly exceeding is defined as twice the established criteria limits. For low RRFs, all detects are qualified as estimated "J" and non-detects are rejected "R".

- During the initial calibration verification performed on 7/16/07 @1820 on instrument MSVOA3 (GCMSH), bromomethane (36.1%) had a %D outside criteria. No bromomethane (reported on Form I as methyl bromide) was detected in any samples so no data qualification was required. All other target compounds were within criteria (%D≤20%; %Drift≤20%; RRF≥0.05). No samples were analyzed following this initial calibration verification.

- During the continuing calibration performed on 7/30/07 @1207 on instrument MSVOA3 (GCMSH), acetone (43.7%), trichloroethene (21.1%), and 2-hexanone (27.0%) had %D/%drift outside criteria. All other target compounds were within criteria (%D≤20%; %Drift≤20%; RRF≥0.05). None of these volatiles were detected in any of the associated samples, the acetone results have been qualified "UJ", no other data qualification was required. Samples 59SB03A, 59SB03B, 59SB03C, and TB072407S were analyzed following this continuing calibration.

- During the initial calibration verification performed on 7/31/07 @1339 on instrument MSVOA6 (GCMSJ), bromomethane (21.8%), acetone (22.5%), trans-1,3-dichloropropene (20.5%), had a %D outside criteria. None of these compounds were detected in any samples so no data qualification was required. All other target compounds were within criteria (%D≤20%; %Drift≤20%; RRF≥0.05). Samples 072407R and TB072407W were analyzed following this initial calibration verification.

- During the continuing calibration performed on 7/31/07 @1427 on instrument MSVOA6 (GCMSJ), all target compounds were within criteria (%D≤20%; %Drift≤20%; RRF≥0.05). Samples 072407R and TB072407W were analyzed following this initial calibration verification.

V-Blank Analysis

The purpose of blank analyses is to determine the presence and magnitude of contamination problems resulting from field and laboratory activities. A method blank analysis must be performed after the calibration standards and once every 12-hour time period beginning with the injection of BFB. No contaminants should be detected in any of the associated blanks > the MDL. The DoD QSM criteria specifies all concentrations should be less than one-half MRL (<MRL for common laboratory contaminants methylene chloride, acetone, and 2-butanone). Positive sample results are reported and qualified "B", if the concentration of the compound in the sample is ≤10 times (10x) the maximum amount in any blank for the common laboratory contaminants methylene chloride, acetone, and 2-butanone (MEK), or 5 times (5X) the maximum amount for other volatile target compounds. **Table 2** summarizes the blank contamination analysis.

Table 2 Blank Contamination Analysis Summary

Analysis Date	QC Blank ID	Compound	Max Conc. µg/L	Action Level µg/L	B qualified samples
7/30/07	VH1664-MB	All target <½MRL	NA	NA	None
7/31/07	VJ2191-MB	All target <½MRL	NA	NA	None
7/31/07	072407R	All target <½MRL	NA	NA	None
7/30/07	TB072407S	All target <½MRL	NA	NA	None
7/31/07	TB072407W	All target <½MRL	NA	NA	None

072407R is a rinsate blank.
NA = Not Applicable
MRL = Method Reporting Limit

VI-Laboratory Control Sample

Data for laboratory control samples (LCS) are evaluated to determine long-term accuracy of the analytical method on various matrices. Percent recoveries (%Rs) should be within the specified control limits. The aqueous LCS recovery limits are specified in Table D-4 of the DoD QSM (DoD, 2006), while the solid matrix LCS recovery limits are specified in Table D-5 of the DoD QSM. If the compound is not listed, then the laboratory criteria shall be used.

- Sample VH1664-BS was used as the solid LCS for the VOC analysis on 7/30/07. All target compound recoveries were within criteria. Samples 59SB03A, 59SB03B, 59SB03C, and TB072407S were analyzed in conjunction with this LCS.

- Sample VJ2191-BS was used as the aqueous LCS for the VOC analysis on 7/31/07. All target compound recoveries were within criteria. Samples 072407R and TB072407W were analyzed in conjunction with this LCS.

VII-Matrix Spike/Matrix Spike Duplicate

Data for matrix spike/matrix spike duplicates (MS/MSD) are generated to determine long-term precision and accuracy of the analytical method on various matrices and to demonstrate acceptable compound recovery by the laboratory at the time of sample analysis. The percent recoveries (%Rs) and the relative percent difference (RPD) must be within the specified control limits. The MS/MSD aqueous recovery limits follow the LCS criteria specified in Table D-4 of the DoD QSM (DoD, 2006), while the solid matrix recovery limits follow the LCS criteria specified in Table D-5 of the DoD QSM. If the compound is not listed, then the laboratory criteria shall be used.

- Sample F51247-13 was used for the solid MS/MSD analysis on 7/30/07. The spiked sample was not a RFAAP site sample; therefore, it was not evaluated. Samples 59SB03A, 59SB03B, 59SB03C, and TB072407S were analyzed in conjunction with this MS/MSD.

- Sample F51154-17 (LFSW01, an RFAAP sample in data package F51154) was used for the aqueous MS/MSD analysis on 07/31/07. Bromomethane (146%, 148%) was outside DoD QSM criteria. The associated LCS was met recovery for bromomethane, and no bromomethane was detected in any associated samples; therefore, no qualifiers were applied. All other target compounds met recovery criteria. Samples 072407R and TB072407W were analyzed in conjunction with this MS/MSD.

VIII-System Monitoring Compounds (Surrogates)
Laboratory performance on individual samples is evaluated through the review of surrogate spike samples. Recoveries for system monitoring compounds in volatile samples and blanks must be within the specified control limits. DoD surrogate recovery limits are specified in Table D-3 of the DoD QSM (DoD, 2006). If the surrogate is not listed, then the laboratory criteria shall be used.

Aqueous criteria:	Dibromofluoromethane (87-116%) (DoD QSM = 85-115%) 1,2-Dichloroethane-d4 (76-127%) (DoD QSM = 70-120%) Toluene-d8 (86-112%) (DoD QSM = 85-120%) 4-Bromofluorobenzene (84-120%) (DoD QSM = 75-120%)
Solid matrix criteria:	Dibromofluoromethane (80-121%) (DoD QSM = none) 1,2-Dichloroethane-d4 (77-123%) (DoD QSM = none) Toluene-d8 (71-130%) (DoD QSM = 85-115%) 4-Bromofluorobenzene (59-148%) (DoD QSM = 85-120%)

- Sample 59SB03A had a high 4-bromofluorobenzene (130.0%) recovery. All results in 59SB03A have been qualified "J/UJ".

- All other solid matrix samples and all aqueous samples met surrogate recovery criteria. No qualifiers were applied.

IX-Internal Standards (IS)
Internal standards performance criteria ensure that GC/MS sensitivity and response are stable during every analytical run. Specific criteria include: area counts (-50% to +100%) of the associated calibration standard, and retention time (± 30 seconds) from that of the associated calibration standard.

- The solid matrix MS (F51247-13MS) had a low tert-butyl alcohol-d10 recovery, but no target compounds are quantitated from this internal standard. All other solid matrix samples and all aqueous samples met criteria. No qualifiers were applied.

X-Field Duplicate Sample Analysis
Field duplicates were collected to identify the cumulative precision of the sampling and analytical process and sent to the laboratory blind. The RPD was calculated only for those analytes which were detected at levels exceeding the method reporting limits in both samples of the duplicate pair. Analytes that were rejected (R-qualified) in either sample of the duplicate pair were excluded from the duplicate assessment. Precision control criterion was established at 50% RPD for the aqueous and solid samples. Analytical results were qualified as estimated (J) for any RPDs exceeding criteria.

- No field duplicates were included in this data package.

XI-Quantitation Verification
The accuracy of analytical results is verified through the calculation of several parameters. The percent difference (%D) between the calculated and the reported values should be within 10%. Any sample value >MDL and <MRL or <3*MDL (whichever is greater) was qualified as estimated, "J."

Sample: VH1664-BS, 1,1-dichloroethylene

Conc. (µg/kg) = (Ax * Is * DF)/(Ais * RRF * Ws * Ps)

where:	Conc	=	sample concentration in µg/kg
	Ax	=	area of characteristic ion for compound being measured
	Is	=	amount of internal standard added (ng)
	DF	=	dilution factor
	Ais	=	Area of characteristic ion for the internal standard
	RRF	=	average relative response factor
	Ws	=	weight of sample (g)
	Ps	=	percent solids/100

Conc. µg/L = (578404 * 250 ng * 1) / (1058832 * 0.634 * 5 * 1) = 43.1 µg/kg

Reported Conc. = 43.1 µg/kg
%D = 0.0%
Values were within 10% difference.

USEPA Region III Validation Qualifiers

(No Code) = Confirmed identification.

B = The analyte has been detected in the sample and the associated laboratory or field blank.

J = Indicates an estimated value for (1) estimated value due to QC non-conformance. Reported value may not be accurate or precise, (2) estimating a concentration as a tentatively identified compound as indicated by the mass spectral and retention time data, or (3) estimating a concentration ≥MDL and <MRL or <3*MDL, whichever is greater.

K = Analyte present. Reported value may be biased high (estimated) due to QC non-conformance.

L = Analyte present. Reported value may be biased low (estimated) due to QC non-conformance.

R = Unreliable result. Analyte may or may not be present in the sample due to QC non-conformance.

UL = Value is estimated bias low and not detected due to QC non-conformance. Reporting limit may be inaccurate or imprecise. Quantitation limit is probably higher.

UJ = Value is estimated and not detected due to QC non-conformance. Reporting limit may be inaccurate or imprecise.

Laboratory Qualifiers

(No Code) = Confirmed identification.

U = Not detected. The associated number indicates the compound reporting limit for the sample.

A (Dioxins) = B (Metals) = The reported value was obtained from a reading <MRL and ≥MDL and is considered estimated.

B (Organics) = The analyte or compound has been detected in the sample and laboratory method blank. It indicates probable blank contamination.

E (Metals) = Reported value is estimated because of the presence of interferences.

E (Organics) = Identifies compounds whose concentrations exceed the upper level of the calibration range.

EMPC (Dioxins) = The ion-abundance ratio between the two characteristic PCDD/PCDF ions was outside accepted ranges. The detected PCDD/PCDF was reported as an estimated maximum possible concentration (EMPC).

D = Indicates sample was analyzed at a dilution.

J = Indicates an estimated value for (1) estimating a concentration as a tentatively identified compound as indicated by the mass spectral and retention time data, or (2) estimating a concentration <MRL and ≥ MDL.

N (Organics) = Indicates presumptive evidence of a compound for tentatively identified compounds using a library search.

N (Metals) = Laboratory spike sample recovery not within control limits.

P (Organics) = Target analyte confirmation >40% difference for detected compound between the primary and secondary columns. The lower of the two values was reported.

* (Metals) = Duplicate analysis not within control limits.

* (Organics) = Surrogate outside of QC limits on both original and re-analysis.

Accutest Laboratories

Report of Analysis

Client Sample ID:	072407R		
Lab Sample ID:	F51275-1	**Date Sampled:**	07/24/07
Matrix:	AQ - Water	**Date Received:**	07/25/07
Method:	SW846 8260B	**Percent Solids:**	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	J031550.D	1	07/31/07	JG	n/a	n/a	VJ2191
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	25	10	ug/l	
71-43-2	Benzene	ND	1.0	0.20	ug/l	
75-27-4	Bromodichloromethane	ND	1.0	0.29	ug/l	
75-25-2	Bromoform	ND	1.0	0.28	ug/l	
108-90-7	Chlorobenzene	ND	1.0	0.20	ug/l	
75-00-3	Chloroethane	ND	2.0	0.46	ug/l	
67-66-3	Chloroform	ND	1.0	0.21	ug/l	
75-15-0	Carbon disulfide	ND	2.0	0.20	ug/l	
56-23-5	Carbon tetrachloride	ND	1.0	0.29	ug/l	
75-34-3	1,1-Dichloroethane	ND	1.0	0.25	ug/l	
75-35-4	1,1-Dichloroethylene	ND	1.0	0.23	ug/l	
107-06-2	1,2-Dichloroethane	ND	1.0	0.20	ug/l	
78-87-5	1,2-Dichloropropane	ND	1.0	0.25	ug/l	
124-48-1	Dibromochloromethane	ND	1.0	0.20	ug/l	
156-59-2	cis-1,2-Dichloroethylene	ND	1.0	0.28	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	1.0	0.24	ug/l	
156-60-5	trans-1,2-Dichloroethylene	ND	1.0	0.20	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	1.0	0.21	ug/l	
100-41-4	Ethylbenzene	ND	1.0	0.20	ug/l	
591-78-6	2-Hexanone	ND	10	2.9	ug/l	
108-10-1	4-Methyl-2-pentanone	ND	5.0	2.2	ug/l	
74-83-9	Methyl bromide	ND	2.0	0.54	ug/l	
74-87-3	Methyl chloride	ND	2.0	0.38	ug/l	
75-09-2	Methylene chloride	ND	5.0	1.0	ug/l	
78-93-3	Methyl ethyl ketone	ND	5.0	2.0	ug/l	
100-42-5	Styrene	ND	1.0	0.20	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	1.0	0.29	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.0	0.37	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	1.0	0.30	ug/l	
127-18-4	Tetrachloroethylene	ND	1.0	0.25	ug/l	
108-88-3	Toluene	ND	1.0	0.27	ug/l	
79-01-6	Trichloroethylene	ND	1.0	0.38	ug/l	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	072407R		
Lab Sample ID:	F51275-1	**Date Sampled:**	07/24/07
Matrix:	AQ - Water	**Date Received:**	07/25/07
Method:	SW846 8260B	**Percent Solids:**	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
75-01-4	Vinyl chloride	ND	1.0	0.34	ug/l	
	m,p-Xylene	ND	2.0	0.36	ug/l	
95-47-6	o-Xylene	ND	1.0	0.20	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	105%		87-116%
17060-07-0	1,2-Dichloroethane-D4	103%		76-127%
2037-26-5	Toluene-D8	96%		86-112%
460-00-4	4-Bromofluorobenzene	103%		84-120%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	59SB03A		
Lab Sample ID:	F51275-2	**Date Sampled:**	07/24/07
Matrix:	SO - Soil	**Date Received:**	07/25/07
Method:	SW846 8260B	**Percent Solids:**	93.1
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	H044742.D	1	07/30/07	SH	n/a	n/a	VH1664
Run #2							

	Initial Weight
Run #1	4.11 g
Run #2	

VOA TCL List

DATA VAL QUALIFIER

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	65	33	ug/kg	UJ
71-43-2	Benzene	ND	6.5	2.6	ug/kg	
75-27-4	Bromodichloromethane	ND	6.5	2.6	ug/kg	
75-25-2	Bromoform	ND	6.5	2.6	ug/kg	
108-90-7	Chlorobenzene	ND	6.5	2.6	ug/kg	
75-00-3	Chloroethane	ND	6.5	3.9	ug/kg	
67-66-3	Chloroform	ND	6.5	2.6	ug/kg	
75-15-0	Carbon disulfide	ND	6.5	2.6	ug/kg	
56-23-5	Carbon tetrachloride	ND	6.5	2.6	ug/kg	
75-34-3	1,1-Dichloroethane	ND	6.5	2.6	ug/kg	
75-35-4	1,1-Dichloroethylene	ND	6.5	2.6	ug/kg	
107-06-2	1,2-Dichloroethane	ND	6.5	2.6	ug/kg	
78-87-5	1,2-Dichloropropane	ND	6.5	2.6	ug/kg	
124-48-1	Dibromochloromethane	ND	6.5	2.6	ug/kg	
156-59-2	cis-1,2-Dichloroethylene	ND	6.5	2.6	ug/kg	
10061-01-5	cis-1,3-Dichloropropene	ND	6.5	2.6	ug/kg	
156-60-5	trans-1,2-Dichloroethylene	ND	6.5	2.6	ug/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	6.5	2.6	ug/kg	
100-41-4	Ethylbenzene	ND	6.5	2.6	ug/kg	
591-78-6	2-Hexanone	ND	33	13	ug/kg	
108-10-1	4-Methyl-2-pentanone	ND	33	13	ug/kg	
74-83-9	Methyl bromide	ND	6.5	2.6	ug/kg	
74-87-3	Methyl chloride	ND	6.5	2.6	ug/kg	
75-09-2	Methylene chloride	ND	13	6.5	ug/kg	
78-93-3	Methyl ethyl ketone	ND	33	13	ug/kg	
100-42-5	Styrene	ND	6.5	2.6	ug/kg	
71-55-6	1,1,1-Trichloroethane	ND	6.5	2.6	ug/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	6.5	2.6	ug/kg	
79-00-5	1,1,2-Trichloroethane	ND	6.5	2.6	ug/kg	
127-18-4	Tetrachloroethylene	ND	6.5	2.6	ug/kg	
108-88-3	Toluene	ND	6.5	2.6	ug/kg	
79-01-6	Trichloroethylene	ND	6.5	2.6	ug/kg	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	59SB03A		
Lab Sample ID:	F51275-2	**Date Sampled:**	07/24/07
Matrix:	SO - Soil	**Date Received:**	07/25/07
Method:	SW846 8260B	**Percent Solids:**	93.1
Project:	WPA 019 Field Investigation; Radford AAP, VA		

VOA TCL List

DATA VAL QUALIFIER

CAS No.	Compound	Result	RL	MDL	Units	Q	
75-01-4	Vinyl chloride	ND	6.5	2.6	ug/kg		UJ
	m,p-Xylene	ND	13	3.9	ug/kg		
95-47-6	o-Xylene	ND	6.5	2.6	ug/kg		

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	110%		80-121%
2037-26-5	Toluene-D8	103%		71-130%
460-00-4	4-Bromofluorobenzene	130%		59-148%
17060-07-0	1,2-Dichloroethane-D4	118%		77-123%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	59SB03B		
Lab Sample ID:	F51275-3	**Date Sampled:**	07/24/07
Matrix:	SO - Soil	**Date Received:**	07/25/07
Method:	SW846 8260B	**Percent Solids:**	79.5
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	H044743.D	1	07/30/07	SH	n/a	n/a	VH1664
Run #2							

	Initial Weight
Run #1	5.35 g
Run #2	

VOA TCL List

DATA VAL QUALIFIER

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	59	29	ug/kg	UJ
71-43-2	Benzene	ND	5.9	2.4	ug/kg	
75-27-4	Bromodichloromethane	ND	5.9	2.4	ug/kg	
75-25-2	Bromoform	ND	5.9	2.4	ug/kg	
108-90-7	Chlorobenzene	ND	5.9	2.4	ug/kg	
75-00-3	Chloroethane	ND	5.9	3.5	ug/kg	
67-66-3	Chloroform	ND	5.9	2.4	ug/kg	
75-15-0	Carbon disulfide	ND	5.9	2.4	ug/kg	
56-23-5	Carbon tetrachloride	ND	5.9	2.4	ug/kg	
75-34-3	1,1-Dichloroethane	ND	5.9	2.4	ug/kg	
75-35-4	1,1-Dichloroethylene	ND	5.9	2.4	ug/kg	
107-06-2	1,2-Dichloroethane	ND	5.9	2.4	ug/kg	
78-87-5	1,2-Dichloropropane	ND	5.9	2.4	ug/kg	
124-48-1	Dibromochloromethane	ND	5.9	2.4	ug/kg	
156-59-2	cis-1,2-Dichloroethylene	ND	5.9	2.4	ug/kg	
10061-01-5	cis-1,3-Dichloropropene	ND	5.9	2.4	ug/kg	
156-60-5	trans-1,2-Dichloroethylene	ND	5.9	2.4	ug/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	5.9	2.4	ug/kg	
100-41-4	Ethylbenzene	ND	5.9	2.4	ug/kg	
591-78-6	2-Hexanone	ND	29	12	ug/kg	
108-10-1	4-Methyl-2-pentanone	ND	29	12	ug/kg	
74-83-9	Methyl bromide	ND	5.9	2.4	ug/kg	
74-87-3	Methyl chloride	ND	5.9	2.4	ug/kg	
75-09-2	Methylene chloride	ND	12	5.9	ug/kg	
78-93-3	Methyl ethyl ketone	ND	29	12	ug/kg	
100-42-5	Styrene	ND	5.9	2.4	ug/kg	
71-55-6	1,1,1-Trichloroethane	ND	5.9	2.4	ug/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	5.9	2.4	ug/kg	
79-00-5	1,1,2-Trichloroethane	ND	5.9	2.4	ug/kg	
127-18-4	Tetrachloroethylene	ND	5.9	2.4	ug/kg	
108-88-3	Toluene	ND	5.9	2.4	ug/kg	
79-01-6	Trichloroethylene	ND	5.9	2.4	ug/kg	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	59SB03B		
Lab Sample ID:	F51275-3	**Date Sampled:**	07/24/07
Matrix:	SO - Soil	**Date Received:**	07/25/07
Method:	SW846 8260B	**Percent Solids:**	79.5
Project:	WPA 019 Field Investigation; Radford AAP, VA		

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
75-01-4	Vinyl chloride	ND	5.9	2.4	ug/kg	
	m,p-Xylene	ND	12	3.5	ug/kg	
95-47-6	o-Xylene	ND	5.9	2.4	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	108%		80-121%
2037-26-5	Toluene-D8	95%		71-130%
460-00-4	4-Bromofluorobenzene	109%		59-148%
17060-07-0	1,2-Dichloroethane-D4	119%		77-123%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: H044744.D

Accutest Laboratories

Report of Analysis

Client Sample ID:	59SB03C		
Lab Sample ID:	F51275-4	**Date Sampled:**	07/24/07
Matrix:	SO - Soil	**Date Received:**	07/25/07
Method:	SW846 8260B	**Percent Solids:**	82.2
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	H044744.D	1	07/30/07	SH	n/a	n/a	VH1664
Run #2							

	Initial Weight
Run #1	5.29 g
Run #2	

VOA TCL List

DATA VAL QUALIFIER

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	57	29	ug/kg	UJ
71-43-2	Benzene	ND	5.7	2.3	ug/kg	
75-27-4	Bromodichloromethane	ND	5.7	2.3	ug/kg	
75-25-2	Bromoform	ND	5.7	2.3	ug/kg	
108-90-7	Chlorobenzene	ND	5.7	2.3	ug/kg	
75-00-3	Chloroethane	ND	5.7	3.4	ug/kg	
67-66-3	Chloroform	ND	5.7	2.3	ug/kg	
75-15-0	Carbon disulfide	ND	5.7	2.3	ug/kg	
56-23-5	Carbon tetrachloride	ND	5.7	2.3	ug/kg	
75-34-3	1,1-Dichloroethane	ND	5.7	2.3	ug/kg	
75-35-4	1,1-Dichloroethylene	ND	5.7	2.3	ug/kg	
107-06-2	1,2-Dichloroethane	ND	5.7	2.3	ug/kg	
78-87-5	1,2-Dichloropropane	ND	5.7	2.3	ug/kg	
124-48-1	Dibromochloromethane	ND	5.7	2.3	ug/kg	
156-59-2	cis-1,2-Dichloroethylene	ND	5.7	2.3	ug/kg	
10061-01-5	cis-1,3-Dichloropropene	ND	5.7	2.3	ug/kg	
156-60-5	trans-1,2-Dichloroethylene	ND	5.7	2.3	ug/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	5.7	2.3	ug/kg	
100-41-4	Ethylbenzene	ND	5.7	2.3	ug/kg	
591-78-6	2-Hexanone	ND	29	11	ug/kg	
108-10-1	4-Methyl-2-pentanone	ND	29	11	ug/kg	
74-83-9	Methyl bromide	ND	5.7	2.3	ug/kg	
74-87-3	Methyl chloride	ND	5.7	2.3	ug/kg	
75-09-2	Methylene chloride	ND	11	5.7	ug/kg	
78-93-3	Methyl ethyl ketone	ND	29	11	ug/kg	
100-42-5	Styrene	ND	5.7	2.3	ug/kg	
71-55-6	1,1,1-Trichloroethane	ND	5.7	2.3	ug/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	5.7	2.3	ug/kg	
79-00-5	1,1,2-Trichloroethane	ND	5.7	2.3	ug/kg	
127-18-4	Tetrachloroethylene	ND	5.7	2.3	ug/kg	
108-88-3	Toluene	ND	5.7	2.3	ug/kg	
79-01-6	Trichloroethylene	ND	5.7	2.3	ug/kg	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	59SB03C		
Lab Sample ID:	F51275-4	**Date Sampled:**	07/24/07
Matrix:	SO - Soil	**Date Received:**	07/25/07
Method:	SW846 8260B	**Percent Solids:**	82.2
Project:	WPA 019 Field Investigation; Radford AAP, VA		

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
75-01-4	Vinyl chloride	ND	5.7	2.3	ug/kg	
	m,p-Xylene	ND	11	3.4	ug/kg	
95-47-6	o-Xylene	ND	5.7	2.3	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	108%		80-121%
2037-26-5	Toluene-D8	96%		71-130%
460-00-4	4-Bromofluorobenzene	109%		59-148%
17060-07-0	1,2-Dichloroethane-D4	119%		77-123%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: H044745.D

Accutest Laboratories

Report of Analysis

Client Sample ID:	TB072407S		
Lab Sample ID:	F51275-5	**Date Sampled:**	07/24/07
Matrix:	SO - Trip Blank Soil	**Date Received:**	07/25/07
Method:	SW846 8260B	**Percent Solids:**	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	H044745.D	1	07/30/07	SH	n/a	n/a	VH1664
Run #2							

	Initial Weight
Run #1	5.00 g
Run #2	

VOA TCL List

DATA VAL QUALIFIER

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	50	25	ug/kg	UJ
71-43-2	Benzene	ND	5.0	2.0	ug/kg	
75-27-4	Bromodichloromethane	ND	5.0	2.0	ug/kg	
75-25-2	Bromoform	ND	5.0	2.0	ug/kg	
108-90-7	Chlorobenzene	ND	5.0	2.0	ug/kg	
75-00-3	Chloroethane	ND	5.0	3.0	ug/kg	
67-66-3	Chloroform	ND	5.0	2.0	ug/kg	
75-15-0	Carbon disulfide	ND	5.0	2.0	ug/kg	
56-23-5	Carbon tetrachloride	ND	5.0	2.0	ug/kg	
75-34-3	1,1-Dichloroethane	ND	5.0	2.0	ug/kg	
75-35-4	1,1-Dichloroethylene	ND	5.0	2.0	ug/kg	
107-06-2	1,2-Dichloroethane	ND	5.0	2.0	ug/kg	
78-87-5	1,2-Dichloropropane	ND	5.0	2.0	ug/kg	
124-48-1	Dibromochloromethane	ND	5.0	2.0	ug/kg	
156-59-2	cis-1,2-Dichloroethylene	ND	5.0	2.0	ug/kg	
10061-01-5	cis-1,3-Dichloropropene	ND	5.0	2.0	ug/kg	
156-60-5	trans-1,2-Dichloroethylene	ND	5.0	2.0	ug/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	5.0	2.0	ug/kg	
100-41-4	Ethylbenzene	ND	5.0	2.0	ug/kg	
591-78-6	2-Hexanone	ND	25	10	ug/kg	
108-10-1	4-Methyl-2-pentanone	ND	25	10	ug/kg	
74-83-9	Methyl bromide	ND	5.0	2.0	ug/kg	
74-87-3	Methyl chloride	ND	5.0	2.0	ug/kg	
75-09-2	Methylene chloride	ND	10	5.0	ug/kg	
78-93-3	Methyl ethyl ketone	ND	25	10	ug/kg	
100-42-5	Styrene	ND	5.0	2.0	ug/kg	
71-55-6	1,1,1-Trichloroethane	ND	5.0	2.0	ug/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	5.0	2.0	ug/kg	
79-00-5	1,1,2-Trichloroethane	ND	5.0	2.0	ug/kg	
127-18-4	Tetrachloroethylene	ND	5.0	2.0	ug/kg	
108-88-3	Toluene	ND	5.0	2.0	ug/kg	
79-01-6	Trichloroethylene	ND	5.0	2.0	ug/kg	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	TB072407S		
Lab Sample ID:	F51275-5	**Date Sampled:**	07/24/07
Matrix:	SO - Trip Blank Soil	**Date Received:**	07/25/07
Method:	SW846 8260B	**Percent Solids:**	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
75-01-4	Vinyl chloride	ND	5.0	2.0	ug/kg	
	m,p-Xylene	ND	10	3.0	ug/kg	
95-47-6	o-Xylene	ND	5.0	2.0	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	110%		80-121%
2037-26-5	Toluene-D8	96%		71-130%
460-00-4	4-Bromofluorobenzene	111%		59-148%
17060-07-0	1,2-Dichloroethane-D4	120%		77-123%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	TB072407W		
Lab Sample ID:	F51275-6	**Date Sampled:**	07/24/07
Matrix:	AQ - Trip Blank Water	**Date Received:**	07/25/07
Method:	SW846 8260B	**Percent Solids:**	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	J031551.D	1	07/31/07	JG	n/a	n/a	VJ2191
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	25	10	ug/l	
71-43-2	Benzene	ND	1.0	0.20	ug/l	
75-27-4	Bromodichloromethane	ND	1.0	0.29	ug/l	
75-25-2	Bromoform	ND	1.0	0.28	ug/l	
108-90-7	Chlorobenzene	ND	1.0	0.20	ug/l	
75-00-3	Chloroethane	ND	2.0	0.46	ug/l	
67-66-3	Chloroform	ND	1.0	0.21	ug/l	
75-15-0	Carbon disulfide	ND	2.0	0.20	ug/l	
56-23-5	Carbon tetrachloride	ND	1.0	0.29	ug/l	
75-34-3	1,1-Dichloroethane	ND	1.0	0.25	ug/l	
75-35-4	1,1-Dichloroethylene	ND	1.0	0.23	ug/l	
107-06-2	1,2-Dichloroethane	ND	1.0	0.20	ug/l	
78-87-5	1,2-Dichloropropane	ND	1.0	0.25	ug/l	
124-48-1	Dibromochloromethane	ND	1.0	0.20	ug/l	
156-59-2	cis-1,2-Dichloroethylene	ND	1.0	0.28	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	1.0	0.24	ug/l	
156-60-5	trans-1,2-Dichloroethylene	ND	1.0	0.20	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	1.0	0.21	ug/l	
100-41-4	Ethylbenzene	ND	1.0	0.20	ug/l	
591-78-6	2-Hexanone	ND	10	2.9	ug/l	
108-10-1	4-Methyl-2-pentanone	ND	5.0	2.2	ug/l	
74-83-9	Methyl bromide	ND	2.0	0.54	ug/l	
74-87-3	Methyl chloride	ND	2.0	0.38	ug/l	
75-09-2	Methylene chloride	ND	5.0	1.0	ug/l	
78-93-3	Methyl ethyl ketone	ND	5.0	2.0	ug/l	
100-42-5	Styrene	ND	1.0	0.20	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	1.0	0.29	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.0	0.37	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	1.0	0.30	ug/l	
127-18-4	Tetrachloroethylene	ND	1.0	0.25	ug/l	
108-88-3	Toluene	ND	1.0	0.27	ug/l	
79-01-6	Trichloroethylene	ND	1.0	0.38	ug/l	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	TB072407W		
Lab Sample ID:	F51275-6	**Date Sampled:**	07/24/07
Matrix:	AQ - Trip Blank Water	**Date Received:**	07/25/07
Method:	SW846 8260B	**Percent Solids:**	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
75-01-4	Vinyl chloride	ND	1.0	0.34	ug/l	
	m,p-Xylene	ND	2.0	0.36	ug/l	
95-47-6	o-Xylene	ND	1.0	0.20	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	104%		87-116%
17060-07-0	1,2-Dichloroethane-D4	102%		76-127%
2037-26-5	Toluene-D8	95%		86-112%
460-00-4	4-Bromofluorobenzene	104%		84-120%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Shaw Environmental, Inc.
2790 Mosside Blvd
Monroeville, PA
412-858-3335
FAX: 412-372-8968

Shaw® Shaw Environmental, Inc.

MEMORANDUM

TO: Jeff Parks, Shaw E&I Radford Army Ammunition Plant (RFAAP) Project Manager

FROM: Richard McCracken, Shaw E&I Project Chemist

SUBJECT: RFAAP Data Validation – Explosives, PETN, & Nitroglycerin
Accutest Laboratories, Inc., SDG F51300

DATE: December 28, 2007

The purpose of this memorandum is to present the data validation report for the samples collected at RFAAP on July 25, 2007. The samples were analyzed for explosives using USEPA SW846 Method 8330A, and nitroglycerin & PETN using USEPA SW-846 Method 8332A. A total of 1 aqueous and 30 soil samples were validated. The sample IDs are:

Field Sample ID	Lab Sample ID	Field Sample ID	Lab Sample ID
59SB06A	F51300-1	43SB06C	F51300-17
59SB06B	F51300-2	43SB07A	F51300-18
59SB06C	F51300-3	43SB07B	F51300-19
59SB05A	F51300-4	43SB07C	F51300-20
59SB05B	F51300-5	43SB08A	F51300-21
59SB05C	F51300-6	43SB08B	F51300-22
59SB04A	F51300-7	43SB08C	F51300-23
59SB04B	F51300-8	43SB09A	F51300-24
59SB04C	F51300-9	43SB09B	F51300-25
TMSB04C	F51300-10	43SB09C	F51300-26
59SB02A	F51300-11	43SB10A	F51300-27
59SB02B	F51300-12	43SB10B	F51300-28
TMSB02B	F51300-13	43SB10C	F51300-29
59SB02C	F51300-14	TMSB10B	F51300-30
43SB06A	F51300-15	072507R	F51300-31
43SB06B	F51300-16		

Data were reviewed by Richard McCracken and validated using a combination of project QAPP, *Quality Systems Manual for Environmental Laboratories, Final Version 3, January, 2006* (DoD, 2006) (DoD QSM), method-specific criteria, and laboratory SOP criteria. The data qualifier scheme was consistent with the *Region III Modifications to the National Functional Guidelines for Organic Data Review* (September 1994). Parameters evaluated are presented in **Table 1**. Data associated with parameters in compliance with quality control specifications have not been qualified. Data associated with parameters that did not comply with quality control specifications and directly impacted project data have been qualified in accordance with USEPA Region III specifications.

Table 1 Laboratory Performance Criteria

Qualified		Parameter
Yes	No	
	X	Holding Times and Preservation
	X	Blank Analysis
	X	Initial Calibration
	X	Continuing Calibration
	X	System Monitoring Compounds
	X	Laboratory Control Sample
	X	Matrix Spike/Spike Duplicate
	X	Field Duplicate
	X	Quantitation Verification

The quality of data collected in support of this sampling activity is considered acceptable.

Richard McCracken, Chemist

12/28/07
Date

RFAAP VALIDATION REPORT
EXPLOSIVES REVIEW
SDG F51300

I-Holding Times and Preservation

The objective is to ascertain the validity of results based on the holding time of the sample from time of collection to time of sample extraction and analysis. Solid samples must be cooled @4°C ± 2°C, with a maximum holding time of 14 days from sample collection to preparative extraction and 40 days from preparative extraction to determinative analysis. Aqueous samples must be cooled @4°C ± 2°C, with a maximum holding time of 7 days from sample collection to preparative extraction and 40 days from preparative extraction to determinative analysis.

- Temperature Review: A temperature blank was sent with each cooler and recorded by the laboratory upon receipt. The samples collected on 7/25/07 were sent in five coolers, and were received by the laboratory on 7/26/07 at temperatures ranging from 2.6 °C to 4.0 °C. No qualifiers were applied.

- Holding Time Review: The samples were collected on 7/25/07. The water sample was extracted on 7/31/07, while the soils were extracted on 8/7/07. The water sample was analyzed for all explosives on 8/1/07; the soils were analyzed for PETN & nitroglycerine on 8/8/07, and for all other explosives on 8/9/07 & 8/10/07. All criteria were met. No qualifiers were applied.

II-Blank Analysis

The purpose of laboratory or field blank analyses is to determine the existence and magnitude of contamination problems resulting from laboratory or field activities. One method blank per analytical batch must be run on each instrument used to analyze samples. No contaminants should be present in the blanks. The DoD QSM criterion specifies all concentrations should be less than one-half MRL. Positive sample results are reported and qualified "B", if the concentration of the compound in the sample is ≤5 times (5x) the maximum amount for explosive target compounds. **Table 2** summarizes the blank contamination analysis.

Table 2 Blank Contamination Analysis Summary

Analysis Date	QC Blank ID	Compound	Max Conc. µg/L	Action Level µg/L	B qualified samples
8/1/07	OP21682-MB	All target explosives <½MRL	NA	NA	None
8/1/07	OP21682-MB	PETN & NG <½MRL	NA	NA	None
8/9/07	OP21778-MB	All target explosives <½MRL	NA	NA	None
8/8/07	OP21778-MB	PETN & NG <½MRL	NA	NA	None
8/9/07	OP21779-MB	All target explosives <½MRL	NA	NA	None
8/8/07	OP21779-MB	PETN & NG <½MRL	NA	NA	None
8/1/07	072507R	All target explosives <½MRL	NA	NA	None
8/1/07	072507R	PETN & NG <½MRL	NA	NA	None
8/1/07	072607R	All target explosives <½MRL	NA	NA	None
8/1/07	072607R	PETN & NG <½MRL	NA	NA	None

072507R and 072606R are rinsate blanks.
MRL = Method Reporting Limit
NA = Not Applicable

III-Initial Calibration

Compliance requirements for satisfactory instrument calibration are established to ensure that the instrument is capable of producing acceptable qualitative and quantitative data for the target compounds. The initial 5-point calibration demonstrates that the instrument is capable of acceptable performance in the beginning of the analytical run. The DoD QSM specifies that the correlation coefficient (r^2) must be ≥0.990 and/or the percent relative standard deviation (%RSD) must be ≤20%. All detects were qualified as estimated "J" for where there were exceeding %RSDs, and all non-detects were qualified as estimated "UJ" for where there were grossly exceeding recoveries. Grossly exceeding is defined as twice the established criteria limits.

- During the explosives initial calibration performed on 10/18/06 on instrument G1315B, all criteria were met for target compounds. No qualifiers were applied. All samples were analyzed in conjunction with this initial calibration.

- During the PETN and nitroglycerine initial calibration performed on 03/15/07 on instrument G1315B, all criteria were met for target compounds. No qualifiers were applied. All samples were analyzed in conjunction with this initial calibration.

IV-Continuing Calibration

Compliance requirements for satisfactory instrument calibration are established to ensure that the instrument is capable of producing acceptable qualitative and quantitative data for the target compounds. Continuing calibration standards are analyzed after every 10 injections, and at the end of the analysis sequence. The DoD QSM specifies that the percent difference (%D) from initial calibration should be no greater than ±20%. All detects were qualified as estimated "J" for where there were exceeding %Ds, and all non-detects were qualified as estimated "UJ" for where there were grossly exceeding recoveries. Grossly exceeding is defined as twice the established criteria limits.

- During the explosives initial calibration verification performed on 10/18/06 @1739 on instrument G1315B, all criteria were met for target compounds. No qualifiers were applied. No samples were analyzed after this initial calibration verification.

- During the explosives initial calibration verification performed on 10/19/06 @1344 on instrument G1315B, all criteria were met for target compounds. No qualifiers were applied. No samples were analyzed after this initial calibration verification.

- During the explosives continuing calibration verification performed on 8/1/07 @1220 on instrument G1315B, all criteria were met for target compounds. No qualifiers were applied. Sample F51300-31 was analyzed following this continuing calibration.

- During the explosives continuing calibration verification performed on 8/1/07 @1705 on instrument G1315B, all criteria were met for target compounds. No qualifiers were applied. Sample F51300-31 was analyzed before this continuing calibration.

- During the explosives continuing calibration verification performed on 8/8/07 @2354 on instrument G1315B, all criteria were met for target compounds. No qualifiers were applied. Samples 51300-19, -20, -21, -22, -23, -24, and -26 were analyzed after this continuing calibration.

- During the explosives continuing calibration verification performed on 8/9/07 @0457 on instrument G1315B, all criteria were met for target compounds. No qualifiers were applied. Samples 51300-19, -20, -21, -22, -23, -24, and -26 were analyzed before this continuing calibration, while samples 51300-27, -28, -29, and -30 were analyzed after this continuing calibration.

- During the explosives continuing calibration verification performed on 8/9/07 @0915 on instrument G1315B, all criteria were met for target compounds. No qualifiers were applied. Samples 51300-27, -28, -29, and -30 were analyzed before this continuing calibration.

- During the explosives continuing calibration verification performed on 8/9/07 @1050 on instrument G1315B, all criteria were met for target compounds. No qualifiers were applied. Samples F51300-1, -2, -3, -4, -5, and -6 were analyzed after this continuing calibration.

- During the explosives continuing calibration verification performed on 8/9/07 @1553 on instrument G1315B, all criteria were met for target compounds. No qualifiers were applied. Samples F51300-1, -2, -3, -4, -5, and -6 were analyzed before this continuing calibration, while samples F51300-7, -8, -9, -10, -11, -12, -13, -14, -15, and -16 were analyzed after this continuing calibration.

- During the explosives continuing calibration verification performed on 8/9/07 @2123 on instrument G1315B, all criteria were met for target compounds. No qualifiers were applied. Samples F51300-7, -8, -9, -10, -11, -12, -13, -14, -15, and -16 were analyzed before this continuing calibration, while samples F51300-17, -18, -25, and -27 were analyzed after this continuing calibration.

- During the explosives continuing calibration verification performed on 8/10/07 @0254 on instrument G1315B, all criteria were met for target compounds. No qualifiers were applied. Samples F51300-17, -18, -25, and -27 were analyzed before this continuing calibration.

- During the PETN and nitroglycerin initial calibration verification performed on 3/15/07 @1235 on instrument G1315B, all criteria were met for target compounds. No qualifiers were applied. No samples were analyzed in conjunction with this initial calibration verification.

- During the PETN and nitroglycerin continuing calibration performed on 8/1/07 @1027 on instrument G1315B, all criteria were met for target compounds. No qualifiers were applied. Sample F51300-31 was analyzed after this continuing calibration.

- During the PETN and nitroglycerin continuing calibration performed on 8/1/07 @1136 on instrument G1315B, all criteria were met for target compounds. No qualifiers were applied. Sample F51300-31 was analyzed before this continuing calibration.

- During the PETN and nitroglycerin continuing calibration performed on 8/8/07 @1717 on instrument G1315B, all criteria were met for target compounds. No qualifiers were applied. Samples 51300-19, -20, -21, -22, -23, -24, and -26 were analyzed after this continuing calibration.

- During the PETN and nitroglycerin continuing calibration performed on 8/8/07 @1843 on instrument G1315B, all criteria were met for target compounds. No qualifiers were applied. Samples 51300-19, -20, -21, -22, -23, -24, and -26 were analyzed before this continuing calibration, while samples F51300-27, -28, -29, -30, -1, and -2 were analyzed after this continuing calibration.

- During the PETN and nitroglycerin continuing calibration performed on 8/8/07 @2026 on instrument G1315B, all criteria were met for target compounds. No qualifiers were applied. Samples F51300-27, -28, -29, -30, -1, and -2 were analyzed before this continuing calibration, while samples F51300-3, -4, -5, -6, -7, -8, -9, -10, -11, and -12 were analyzed after this continuing calibration.

- During the PETN and nitroglycerin continuing calibration performed on 8/8/07 @2209 on instrument G1315B, all criteria were met for target compounds. No qualifiers were applied. Samples F51300-3, -4, -5, -6, -7, -8, -9, -10, -11, and -12 were analyzed before this continuing calibration, while samples F51300-13, -14, -15, -16, -17, -18, -25, and -27 were analyzed after this continuing calibration.

- During the PETN and nitroglycerin continuing calibration performed on 8/8/07 @2352 on instrument G1315B, all criteria were met for target compounds. No qualifiers were applied. Samples F51300-13, -14, -15, -16, -17, -18, -25, and -27 were analyzed before this continuing calibration.

V-System Monitoring Compound (Surrogates)

Laboratory performance on individual samples is established by means of spiking activities. The percent recovery (%R) for all samples and blanks must be within the laboratory control limits. DoD surrogate recovery limits are specified in Table D-3 of the DoD QSM (DoD, 2006). If the surrogate is not listed, then the laboratory criteria shall be used.

Solid Criteria: 3,4-dinitrotoluene (72-145%)

Aqueous Criteria: 3,4-dinitrotoluene (70-136%)

- Sample F51300-21 had high recoveries from both signals during explosives (202.54%, 202.18%), and PETN & nitroglycerin (211.59%, 217.05%) analyses. The lab reported that they suspected a double spike of the surrogate. No target compounds were detected in F51300-21, no data qualification was required.

- All other samples met surrogate recovery criteria during explosives, PETN, and nitroglycerin analyses. No qualifiers were applied.

VI-Laboratory Control Sample

Laboratory control samples (LCS) are used to monitor long-term accuracy of the analytical method. The analysis is performed at a frequency of 1 per analytical batch. The percent recoveries (%Rs) must be within the laboratory control limits. DoD QSM solid matrix LCS recovery limits are specified in Table D-13 of the DoD QSM (DoD, 2006), while the aqueous LCS recovery limits are specified in Table D-12 of the DoD QSM. If the compound is not listed, then the laboratory criteria shall be used.

- Sample OP21682-BS was used as the aqueous LCS for explosives, PETN, and nitroglycerin analysis. All compounds met recovery criteria. Sample F51300-31 was analyzed in conjunction with this LCS.

- Sample OP21778-BS was used as the solid LCS for explosives, PETN, and nitroglycerin analysis. All compounds met recovery criteria. Samples F51300-1, -2, -3, -4, -5, -6, -7, -8, -9, -10, -11, -12, -13, -14, -15, -16, -17, -18, -25, and -27 were analyzed in conjunction with this LCS.

- Sample OP21779-BS was used as the solid LCS for explosives, PETN, and nitroglycerin analysis. All compounds met recovery criteria. Samples F51300-19, -20, -21, -22, -23, -24, -26, -27, -28, -29, and -30 were analyzed in conjunction with this LCS.

VII-Matrix Spike/Matrix Spike Duplicate

Data for matrix spike/matrix spike duplicates (MS/MSD) are generated to determine long-term precision and accuracy of the analytical method on various matrices and to demonstrate acceptable compound recovery by the laboratory at the time of sample analysis. The percent recoveries (%Rs) and the relative percent difference (RPD) must be within the laboratory control limits. DoD MS/MSD recovery limits follow the LCS criteria specified in Table D-12 (aqueous) and D-13 (solid matrix) of the DoD QSM (DoD, 2006). If the compound is not listed, then the laboratory criteria shall be used.

- Sample F51300-31 was used as the aqueous MS/MSD during PETN & nitroglycerine analysis. All compounds met criteria. Sample F51300-31 was analyzed in conjunction with this MS/MSD.

- Sample F51300-27 was used as a solid MS/MSD during PETN & nitroglycerine analysis. All compounds met criteria. Sample F51300-27 was analyzed in conjunction with this MS/MSD.

- Sample F51300-29 was used as a solid MS/MSD during explosives analysis. p-Nitrotoluene (126%) had a high recovery, but no p-nitrotoluene was detected in any samples. All other compounds met criteria. Samples F51300-19, -20, -21, -22, -23, -24, -26, -28, -29, and -30 were analyzed in conjunction with this MS/MSD.

- Sample F51300-25 was used as a solid MS/MSD during explosives analysis. All compounds met criteria. Samples F51300-1 thru -18 and -25 were analyzed in conjunction with this MS/MSD.

VIII-Field Duplicate Sample Analysis
Field duplicates were collected to identify the cumulative precision of the sampling and analytical process and sent to the laboratory blind. The RPD was calculated only for those analytes which were detected at levels exceeding the method reporting limits in both samples of the duplicate pair. Analytes that were rejected (R-qualified) in either sample of the duplicate pair were excluded from the duplicate assessment. Precision control criterion was established at 50% RPD for the aqueous and solid samples. Analytical results were qualified as estimated (J) for any RPDs exceeding criteria.

- Field duplicate pairs in this data package included 59SB04C (F51300-9) & TMSB04C (F51300-10), 59SB02B (F51300-12) & TMSB02B (F51300-13), and 43SB10B (F51300-28) & TMSB10B (F51300-30). All compounds detected above the reporting limit (RL) met RPD criteria.

IX-Quantitation Verification
The accuracy of analytical results was verified through the calculation of several parameters. The calculation was based calibration factors. The absolute percent difference (%D) between the calculated and the reported value must be within 10% difference. All values >MDL and <MRL or <3*MDL (whichever was greater) were qualified as estimated "J".

Sample: OP21778-BS, HMX

Conc. µg/kg = (Ax * Vt * DF) / (CF * Vi * Ws * Ps * 1000)

where: Ax = Area response for the compound being measured
Vt = Total volume of extract, taking into account dilutions (uL)
DF = Dilution factor
CF = Calibration Factor from initial calibration (area/pg)
Vi = Volume of extract injected (uL)
Ws = weight of sample (g)
Ps = percent solids/100

Conc. µg/kg = (1696865 * 20000 * 1) / (2764 * 1 * 2 * 1 * 1000)
= 6140 ug/kg

Reported Value = 6140 µg/kg
% Difference = 0.0%, values were within 10% difference

Sample: OP21779-BS2, nitroglycerin

Conc. µg/kg = (Ax * Vt * DF) / (CF * Vi * Ws * Ps * 1000)

where: Ax = Area response for the compound being measured
Vt = Total volume of extract, taking into account dilutions (uL)
DF = Dilution factor
CF = Calibration Factor from initial calibration (area/pg)
Vi = Volume of extract injected (uL)
Ws = weight of sample (g)
Ps = percent solids/100

Conc. µg/kg = (3484549 * 20000 * 1) / (1228 * 1 * 2.0 * 1 * 1000)
= 28400 ug/kg

Reported Value = 28400 µg/kg
% Difference = 0.0%, values were within 10% difference

USEPA Region III Validation Qualifiers

(No Code) = Confirmed identification.

B = The analyte has been detected in the sample and the associated laboratory or field blank.

J = Indicates an estimated value for (1) estimated value due to QC non-conformance. Reported value may not be accurate or precise, (2) estimating a concentration as a tentatively identified compound as indicated by the mass spectral and retention time data, or (3) estimating a concentration ≥ MDL and <MRL or <3*MDL, whichever is greater.

K = Analyte present. Reported value may be biased high (estimated) due to QC non-conformance.

L = Analyte present. Reported value may be biased low (estimated) due to QC non-conformance.

R = Unreliable result. Analyte may or may not be present in the sample due to QC non-conformance.

UL = Value is estimated bias low and not detected due to QC non-conformance. Reporting limit may be inaccurate or imprecise. Quantitation limit is probably higher.

UJ = Value is estimated and not detected due to QC non-conformance. Reporting limit may be inaccurate or imprecise.

Laboratory Qualifiers

(No Code) = Confirmed identification.

U = Not detected. The associated number indicates the compound reporting limit for the sample.

A (Dioxins) = B (Metals) = The reported value was obtained from a reading <MRL and ≥MDL and is considered estimated.

B (Organics) = The analyte or compound has been detected in the sample and laboratory method blank. It indicates probable blank contamination.

E (Metals) = Reported value is estimated because of the presence of interferences.

E (Organics) = Identifies compounds whose concentrations exceed the upper level of the calibration range.

EMPC (Dioxins) = The ion-abundance ratio between the two characteristic PCDD/PCDF ions was outside accepted ranges. The detected PCDD/PCDF was reported as an estimated maximum possible concentration (EMPC).

D = Indicates sample was analyzed at a dilution.

J = Indicates an estimated value for (1) estimating a concentration as a tentatively identified compound as indicated by the mass spectral and retention time data, or (2) estimating a concentration <MRL and ≥ MDL.

N (Organics) = Indicates presumptive evidence of a compound for tentatively identified compounds using a library search.

N (Metals) = Laboratory spike sample recovery not within control limits.

P (Organics) = Target analyte confirmation >40% difference for detected compound between the primary and secondary columns. The lower of the two values was reported.

* (Metals) = Duplicate analysis not within control limits.

* (Organics) = Surrogate outside of QC limits on both original and re-analysis.

Raw Data: GG023257.D PP022134.D

Accutest Laboratories

Report of Analysis

Client Sample ID:	59SB06A		
Lab Sample ID:	F51300-1	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8330A SW846 8330A	Percent Solids:	91.9
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GG023257.D	1	08/09/07	NAF	08/07/07	OP21778	GGG996
Run #2	PP022134.D	1	08/08/07	NAF	08/07/07	OP21778	GPP766

	Initial Weight	Final Volume
Run #1	2.11 g	20.0 ml
Run #2	2.11 g	20.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q
2691-41-0	HMX	ND	240	49	ug/kg	
121-82-4	RDX	ND	240	47	ug/kg	
99-65-0	1,3-Dinitrobenzene	ND	240	47	ug/kg	
606-20-2	2,6-Dinitrotoluene	ND	240	84	ug/kg	
121-14-2	2,4-Dinitrotoluene	ND	240	47	ug/kg	
35572-78-2	2-amino-4,6-Dinitrotoluene	ND	240	47	ug/kg	
19406-51-0	4-amino-2,6-Dinitrotoluene	ND	240	51	ug/kg	
98-95-3	Nitrobenzene	ND	240	67	ug/kg	
88-72-2	o-Nitrotoluene	ND	240	73	ug/kg	
99-08-1	m-Nitrotoluene	ND	240	98	ug/kg	
99-99-0	p-Nitrotoluene	ND	240	65	ug/kg	
479-45-8	Tetryl	ND	470	130	ug/kg	
99-35-4	1,3,5-Trinitrobenzene	ND	240	56	ug/kg	
118-96-7	2,4,6-Trinitrotoluene	ND	240	47	ug/kg	
55-63-0	Nitroglycerine	ND [a]	1900	710	ug/kg	
78-11-5	PETN	ND [a]	1900	710	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
610-39-9	3,4-Dinitrotoluene	108%	109%	72-145%

(a) Result is from Run# 2

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: GG023258.D PP022135.D

Accutest Laboratories

Report of Analysis

Client Sample ID:	59SB06B		
Lab Sample ID:	F51300-2	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8330A SW846 8330A	Percent Solids:	88.5
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GG023258.D	1	08/09/07	NAF	08/07/07	OP21778	GGG996
Run #2	PP022135.D	1	08/08/07	NAF	08/07/07	OP21778	GPP766

	Initial Weight	Final Volume
Run #1	2.14 g	20.0 ml
Run #2	2.14 g	20.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q
2691-41-0	HMX	ND	230	49	ug/kg	
121-82-4	RDX	ND	230	47	ug/kg	
99-65-0	1,3-Dinitrobenzene	ND	230	47	ug/kg	
606-20-2	2,6-Dinitrotoluene	ND	230	83	ug/kg	
121-14-2	2,4-Dinitrotoluene	ND	230	47	ug/kg	
35572-78-2	2-amino-4,6-Dinitrotoluene	ND	230	47	ug/kg	
19406-51-0	4-amino-2,6-Dinitrotoluene	ND	230	50	ug/kg	
98-95-3	Nitrobenzene	ND	230	66	ug/kg	
88-72-2	o-Nitrotoluene	ND	230	72	ug/kg	
99-08-1	m-Nitrotoluene	ND	230	96	ug/kg	
99-99-0	p-Nitrotoluene	ND	230	64	ug/kg	
479-45-8	Tetryl	ND	470	130	ug/kg	
99-35-4	1,3,5-Trinitrobenzene	ND	230	55	ug/kg	
118-96-7	2,4,6-Trinitrotoluene	ND	230	47	ug/kg	
55-63-0	Nitroglycerine	ND [a]	1900	700	ug/kg	
78-11-5	PETN	ND [a]	1900	700	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
610-39-9	3,4-Dinitrotoluene	107%	108%	72-145%

(a) Result is from Run# 2

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: GG023259.D PP022138.D

Accutest Laboratories

Report of Analysis

Client Sample ID:	59SB06C		
Lab Sample ID:	F51300-3	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8330A SW846 8330A	Percent Solids:	86.2
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GG023259.D	1	08/09/07	NAF	08/07/07	OP21778	GGG996
Run #2	PP022138.D	1	08/08/07	NAF	08/07/07	OP21778	GPP766

	Initial Weight	Final Volume
Run #1	2.03 g	20.0 ml
Run #2	2.03 g	20.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q
2691-41-0	HMX	ND	250	51	ug/kg	
121-82-4	RDX	ND	250	49	ug/kg	
99-65-0	1,3-Dinitrobenzene	ND	250	49	ug/kg	
606-20-2	2,6-Dinitrotoluene	ND	250	88	ug/kg	
121-14-2	2,4-Dinitrotoluene	ND	250	49	ug/kg	
35572-78-2	2-amino-4,6-Dinitrotoluene	ND	250	49	ug/kg	
19406-51-0	4-amino-2,6-Dinitrotoluene	ND	250	53	ug/kg	
98-95-3	Nitrobenzene	ND	250	70	ug/kg	
88-72-2	o-Nitrotoluene	ND	250	76	ug/kg	
99-08-1	m-Nitrotoluene	ND	250	100	ug/kg	
99-99-0	p-Nitrotoluene	ND	250	68	ug/kg	
479-45-8	Tetryl	ND	490	140	ug/kg	
99-35-4	1,3,5-Trinitrobenzene	ND	250	58	ug/kg	
118-96-7	2,4,6-Trinitrotoluene	ND	250	49	ug/kg	
55-63-0	Nitroglycerine	ND [a]	2000	740	ug/kg	
78-11-5	PETN	ND [a]	2000	740	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
610-39-9	3,4-Dinitrotoluene	107%	108%	72-145%

(a) Result is from Run# 2

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: GG023260.D PP022139.D

Accutest Laboratories

Report of Analysis

Client Sample ID:	59SB05A		
Lab Sample ID:	F51300-4	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8330A SW846 8330A	Percent Solids:	89.5
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GG023260.D	1	08/09/07	NAF	08/07/07	OP21778	GGG996
Run #2	PP022139.D	1	08/08/07	NAF	08/07/07	OP21778	GPP766

	Initial Weight	Final Volume
Run #1	2.13 g	20.0 ml
Run #2	2.13 g	20.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q
2691-41-0	HMX	ND	230	49	ug/kg	
121-82-4	RDX	ND	230	47	ug/kg	
99-65-0	1,3-Dinitrobenzene	ND	230	47	ug/kg	
606-20-2	2,6-Dinitrotoluene	ND	230	84	ug/kg	
121-14-2	2,4-Dinitrotoluene	ND	230	47	ug/kg	
35572-78-2	2-amino-4,6-Dinitrotoluene	ND	230	47	ug/kg	
19406-51-0	4-amino-2,6-Dinitrotoluene	ND	230	51	ug/kg	
98-95-3	Nitrobenzene	ND	230	67	ug/kg	
88-72-2	o-Nitrotoluene	ND	230	72	ug/kg	
99-08-1	m-Nitrotoluene	ND	230	97	ug/kg	
99-99-0	p-Nitrotoluene	ND	230	65	ug/kg	
479-45-8	Tetryl	ND	470	130	ug/kg	
99-35-4	1,3,5-Trinitrobenzene	ND	230	55	ug/kg	
118-96-7	2,4,6-Trinitrotoluene	ND	230	47	ug/kg	
55-63-0	Nitroglycerine	ND [a]	1900	700	ug/kg	
78-11-5	PETN	ND [a]	1900	700	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
610-39-9	3,4-Dinitrotoluene	108%	106%	72-145%

(a) Result is from Run# 2

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: GG023261.D PP022140.D

Accutest Laboratories

Report of Analysis

Client Sample ID:	59SB05B		
Lab Sample ID:	F51300-5	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8330A SW846 8330A	Percent Solids:	84.2
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GG023261.D	1	08/09/07	NAF	08/07/07	OP21778	GGG996
Run #2	PP022140.D	1	08/08/07	NAF	08/07/07	OP21778	GPP766

	Initial Weight	Final Volume
Run #1	2.17 g	20.0 ml
Run #2	2.17 g	20.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q
2691-41-0	HMX	ND	230	48	ug/kg	
121-82-4	RDX	ND	230	46	ug/kg	
99-65-0	1,3-Dinitrobenzene	ND	230	46	ug/kg	
606-20-2	2,6-Dinitrotoluene	ND	230	82	ug/kg	
121-14-2	2,4-Dinitrotoluene	ND	230	46	ug/kg	
35572-78-2	2-amino-4,6-Dinitrotoluene	ND	230	46	ug/kg	
19406-51-0	4-amino-2,6-Dinitrotoluene	ND	230	50	ug/kg	
98-95-3	Nitrobenzene	ND	230	65	ug/kg	
88-72-2	o-Nitrotoluene	ND	230	71	ug/kg	
99-08-1	m-Nitrotoluene	ND	230	95	ug/kg	
99-99-0	p-Nitrotoluene	ND	230	64	ug/kg	
479-45-8	Tetryl	ND	460	130	ug/kg	
99-35-4	1,3,5-Trinitrobenzene	ND	230	54	ug/kg	
118-96-7	2,4,6-Trinitrotoluene	ND	230	46	ug/kg	
55-63-0	Nitroglycerine	ND [a]	1800	690	ug/kg	
78-11-5	PETN	ND [a]	1800	690	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
610-39-9	3,4-Dinitrotoluene	109%	109%	72-145%

(a) Result is from Run# 2

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: GG023262.D PP022141.D

Accutest Laboratories

Report of Analysis

Client Sample ID:	59SB05C		
Lab Sample ID:	F51300-6	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8330A SW846 8330A	Percent Solids:	86.3
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GG023262.D	1	08/09/07	NAF	08/07/07	OP21778	GGG996
Run #2	PP022141.D	1	08/08/07	NAF	08/07/07	OP21778	GPP766

	Initial Weight	Final Volume
Run #1	2.14 g	20.0 ml
Run #2	2.14 g	20.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q
2691-41-0	HMX	ND	230	49	ug/kg	
121-82-4	RDX	ND	230	47	ug/kg	
99-65-0	1,3-Dinitrobenzene	ND	230	47	ug/kg	
606-20-2	2,6-Dinitrotoluene	ND	230	83	ug/kg	
121-14-2	2,4-Dinitrotoluene	ND	230	47	ug/kg	
35572-78-2	2-amino-4,6-Dinitrotoluene	ND	230	47	ug/kg	
19406-51-0	4-amino-2,6-Dinitrotoluene	ND	230	50	ug/kg	
98-95-3	Nitrobenzene	ND	230	66	ug/kg	
88-72-2	o-Nitrotoluene	ND	230	72	ug/kg	
99-08-1	m-Nitrotoluene	ND	230	96	ug/kg	
99-99-0	p-Nitrotoluene	ND	230	64	ug/kg	
479-45-8	Tetryl	ND	470	130	ug/kg	
99-35-4	1,3,5-Trinitrobenzene	ND	230	55	ug/kg	
118-96-7	2,4,6-Trinitrotoluene	ND	230	47	ug/kg	
55-63-0	Nitroglycerine	ND [a]	1900	700	ug/kg	
78-11-5	PETN	ND [a]	1900	700	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
610-39-9	3,4-Dinitrotoluene	111%	107%	72-145%

(a) Result is from Run# 2

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: GG023265.D PP022142.D

Accutest Laboratories

Report of Analysis

Client Sample ID:	59SB04A		
Lab Sample ID:	F51300-7	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8330A SW846 8330A	Percent Solids:	86.6
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GG023265.D	1	08/09/07	NAF	08/07/07	OP21778	GGG996
Run #2	PP022142.D	1	08/08/07	NAF	08/07/07	OP21778	GPP766

	Initial Weight	Final Volume
Run #1	2.03 g	20.0 ml
Run #2	2.03 g	20.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q
2691-41-0	HMX	ND	250	51	ug/kg	
121-82-4	RDX	ND	250	49	ug/kg	
99-65-0	1,3-Dinitrobenzene	ND	250	49	ug/kg	
606-20-2	2,6-Dinitrotoluene	ND	250	88	ug/kg	
121-14-2	2,4-Dinitrotoluene	ND	250	49	ug/kg	
35572-78-2	2-amino-4,6-Dinitrotoluene	ND	250	49	ug/kg	
19406-51-0	4-amino-2,6-Dinitrotoluene	ND	250	53	ug/kg	
98-95-3	Nitrobenzene	ND	250	70	ug/kg	
88-72-2	o-Nitrotoluene	ND	250	76	ug/kg	
99-08-1	m-Nitrotoluene	ND	250	100	ug/kg	
99-99-0	p-Nitrotoluene	ND	250	68	ug/kg	
479-45-8	Tetryl	ND	490	140	ug/kg	
99-35-4	1,3,5-Trinitrobenzene	ND	250	58	ug/kg	
118-96-7	2,4,6-Trinitrotoluene	ND	250	49	ug/kg	
55-63-0	Nitroglycerine	ND [a]	2000	740	ug/kg	
78-11-5	PETN	ND [a]	2000	740	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
610-39-9	3,4-Dinitrotoluene	111%	104%	72-145%

(a) Result is from Run# 2

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: GG023266.D PP022143.D

Accutest Laboratories

Report of Analysis

Client Sample ID:	59SB04B		
Lab Sample ID:	F51300-8	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8330A SW846 8330A	Percent Solids:	83.2
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GG023266.D	1	08/09/07	NAF	08/07/07	OP21778	GGG996
Run #2	PP022143.D	1	08/08/07	NAF	08/07/07	OP21778	GPP766

	Initial Weight	Final Volume
Run #1	2.25 g	20.0 ml
Run #2	2.25 g	20.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q
2691-41-0	HMX	ND	220	46	ug/kg	
121-82-4	RDX	ND	220	44	ug/kg	
99-65-0	1,3-Dinitrobenzene	ND	220	44	ug/kg	
606-20-2	2,6-Dinitrotoluene	ND	220	79	ug/kg	
121-14-2	2,4-Dinitrotoluene	ND	220	44	ug/kg	
35572-78-2	2-amino-4,6-Dinitrotoluene	ND	220	44	ug/kg	
19406-51-0	4-amino-2,6-Dinitrotoluene	ND	220	48	ug/kg	
98-95-3	Nitrobenzene	ND	220	63	ug/kg	
88-72-2	o-Nitrotoluene	ND	220	68	ug/kg	
99-08-1	m-Nitrotoluene	ND	220	92	ug/kg	
99-99-0	p-Nitrotoluene	ND	220	61	ug/kg	
479-45-8	Tetryl	ND	440	130	ug/kg	
99-35-4	1,3,5-Trinitrobenzene	ND	220	52	ug/kg	
118-96-7	2,4,6-Trinitrotoluene	ND	220	44	ug/kg	
55-63-0	Nitroglycerine	ND [a]	1800	670	ug/kg	
78-11-5	PETN	ND [a]	1800	670	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
610-39-9	3,4-Dinitrotoluene	114%	118%	72-145%

(a) Result is from Run# 2

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: GG023267.D PP022144.D

Accutest Laboratories

Report of Analysis

Client Sample ID:	59SB04C		
Lab Sample ID:	F51300-9	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8330A SW846 8330A	Percent Solids:	85.8
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GG023267.D	1	08/09/07	NAF	08/07/07	OP21778	GGG996
Run #2	PP022144.D	1	08/08/07	NAF	08/07/07	OP21778	GPP766

	Initial Weight	Final Volume
Run #1	2.21 g	20.0 ml
Run #2	2.21 g	20.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q
2691-41-0	HMX	ND	230	47	ug/kg	
121-82-4	RDX	ND	230	45	ug/kg	
99-65-0	1,3-Dinitrobenzene	ND	230	45	ug/kg	
606-20-2	2,6-Dinitrotoluene	ND	230	81	ug/kg	
121-14-2	2,4-Dinitrotoluene	ND	230	45	ug/kg	
35572-78-2	2-amino-4,6-Dinitrotoluene	ND	230	45	ug/kg	
19406-51-0	4-amino-2,6-Dinitrotoluene	ND	230	49	ug/kg	
98-95-3	Nitrobenzene	ND	230	64	ug/kg	
88-72-2	o-Nitrotoluene	ND	230	70	ug/kg	
99-08-1	m-Nitrotoluene	ND	230	93	ug/kg	
99-99-0	p-Nitrotoluene	ND	230	62	ug/kg	
479-45-8	Tetryl	ND	450	130	ug/kg	
99-35-4	1,3,5-Trinitrobenzene	ND	230	53	ug/kg	
118-96-7	2,4,6-Trinitrotoluene	ND	230	45	ug/kg	
55-63-0	Nitroglycerine	ND [a]	1800	680	ug/kg	
78-11-5	PETN	ND [a]	1800	680	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
610-39-9	3,4-Dinitrotoluene	113%	118%	72-145%

(a) Result is from Run# 2

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	TMSB04C		
Lab Sample ID:	F51300-10	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8330A SW846 8330A	Percent Solids:	83.9
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GG023268.D	1	08/09/07	NAF	08/07/07	OP21778	GGG996
Run #2	PP022145.D	1	08/08/07	NAF	08/07/07	OP21778	GPP766

	Initial Weight	Final Volume
Run #1	2.05 g	20.0 ml
Run #2	2.05 g	20.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q
2691-41-0	HMX	ND	240	51	ug/kg	
121-82-4	RDX	ND	240	49	ug/kg	
99-65-0	1,3-Dinitrobenzene	ND	240	49	ug/kg	
606-20-2	2,6-Dinitrotoluene	ND	240	87	ug/kg	
121-14-2	2,4-Dinitrotoluene	ND	240	49	ug/kg	
35572-78-2	2-amino-4,6-Dinitrotoluene	ND	240	49	ug/kg	
19406-51-0	4-amino-2,6-Dinitrotoluene	ND	240	53	ug/kg	
98-95-3	Nitrobenzene	ND	240	69	ug/kg	
88-72-2	o-Nitrotoluene	ND	240	75	ug/kg	
99-08-1	m-Nitrotoluene	ND	240	100	ug/kg	
99-99-0	p-Nitrotoluene	ND	240	67	ug/kg	
479-45-8	Tetryl	ND	490	140	ug/kg	
99-35-4	1,3,5-Trinitrobenzene	ND	240	58	ug/kg	
118-96-7	2,4,6-Trinitrotoluene	ND	240	49	ug/kg	
55-63-0	Nitroglycerine	ND [a]	2000	730	ug/kg	
78-11-5	PETN	ND [a]	2000	730	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
610-39-9	3,4-Dinitrotoluene	109%	111%	72-145%

(a) Result is from Run# 2

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: GG023269.D PP022146.D

Accutest Laboratories

Report of Analysis

Client Sample ID:	59SB02A		
Lab Sample ID:	F51300-11	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8330A SW846 8330A	Percent Solids:	89.5
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GG023269.D	1	08/09/07	NAF	08/07/07	OP21778	GGG996
Run #2	PP022146.D	1	08/08/07	NAF	08/07/07	OP21778	GPP766

	Initial Weight	Final Volume
Run #1	2.12 g	20.0 ml
Run #2	2.12 g	20.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q
2691-41-0	HMX	ND	240	49	ug/kg	
121-82-4	RDX	ND	240	47	ug/kg	
99-65-0	1,3-Dinitrobenzene	ND	240	47	ug/kg	
606-20-2	2,6-Dinitrotoluene	ND	240	84	ug/kg	
121-14-2	2,4-Dinitrotoluene	ND	240	47	ug/kg	
35572-78-2	2-amino-4,6-Dinitrotoluene	ND	240	47	ug/kg	
19406-51-0	4-amino-2,6-Dinitrotoluene	ND	240	51	ug/kg	
98-95-3	Nitrobenzene	ND	240	67	ug/kg	
88-72-2	o-Nitrotoluene	ND	240	73	ug/kg	
99-08-1	m-Nitrotoluene	ND	240	97	ug/kg	
99-99-0	p-Nitrotoluene	ND	240	65	ug/kg	
479-45-8	Tetryl	ND	470	130	ug/kg	
99-35-4	1,3,5-Trinitrobenzene	ND	240	56	ug/kg	
118-96-7	2,4,6-Trinitrotoluene	ND	240	47	ug/kg	
55-63-0	Nitroglycerine	ND [a]	1900	710	ug/kg	
78-11-5	PETN	ND [a]	1900	710	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
610-39-9	3,4-Dinitrotoluene	108%	111%	72-145%

(a) Result is from Run# 2

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: GG023270.D PP022147.D

Accutest Laboratories

Report of Analysis

Client Sample ID:	59SB02B		
Lab Sample ID:	F51300-12	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8330A SW846 8330A	Percent Solids:	83.3
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GG023270.D	1	08/09/07	NAF	08/07/07	OP21778	GGG996
Run #2	PP022147.D	1	08/08/07	NAF	08/07/07	OP21778	GPP766

	Initial Weight	Final Volume
Run #1	2.12 g	20.0 ml
Run #2	2.12 g	20.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q
2691-41-0	HMX	ND	240	49	ug/kg	
121-82-4	RDX	ND	240	47	ug/kg	
99-65-0	1,3-Dinitrobenzene	ND	240	47	ug/kg	
606-20-2	2,6-Dinitrotoluene	ND	240	84	ug/kg	
121-14-2	2,4-Dinitrotoluene	ND	240	47	ug/kg	
35572-78-2	2-amino-4,6-Dinitrotoluene	ND	240	47	ug/kg	
19406-51-0	4-amino-2,6-Dinitrotoluene	ND	240	51	ug/kg	
98-95-3	Nitrobenzene	ND	240	67	ug/kg	
88-72-2	o-Nitrotoluene	ND	240	73	ug/kg	
99-08-1	m-Nitrotoluene	ND	240	97	ug/kg	
99-99-0	p-Nitrotoluene	ND	240	65	ug/kg	
479-45-8	Tetryl	ND	470	130	ug/kg	
99-35-4	1,3,5-Trinitrobenzene	ND	240	56	ug/kg	
118-96-7	2,4,6-Trinitrotoluene	ND	240	47	ug/kg	
55-63-0	Nitroglycerine	ND [a]	1900	710	ug/kg	
78-11-5	PETN	ND [a]	1900	710	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
610-39-9	3,4-Dinitrotoluene	106%	110%	72-145%

(a) Result is from Run# 2

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	TMSB02B		
Lab Sample ID:	F51300-13	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8330A SW846 8330A	Percent Solids:	85.3
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GG023271.D	1	08/09/07	NAF	08/07/07	OP21778	GGG996
Run #2	PP022150.D	1	08/08/07	NAF	08/07/07	OP21778	GPP766

	Initial Weight	Final Volume
Run #1	2.15 g	20.0 ml
Run #2	2.15 g	20.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q
2691-41-0	HMX	ND	230	48	ug/kg	
121-82-4	RDX	ND	230	47	ug/kg	
99-65-0	1,3-Dinitrobenzene	ND	230	47	ug/kg	
606-20-2	2,6-Dinitrotoluene	ND	230	83	ug/kg	
121-14-2	2,4-Dinitrotoluene	ND	230	47	ug/kg	
35572-78-2	2-amino-4,6-Dinitrotoluene	ND	230	47	ug/kg	
19406-51-0	4-amino-2,6-Dinitrotoluene	ND	230	50	ug/kg	
98-95-3	Nitrobenzene	ND	230	66	ug/kg	
88-72-2	o-Nitrotoluene	ND	230	72	ug/kg	
99-08-1	m-Nitrotoluene	ND	230	96	ug/kg	
99-99-0	p-Nitrotoluene	ND	230	64	ug/kg	
479-45-8	Tetryl	ND	470	130	ug/kg	
99-35-4	1,3,5-Trinitrobenzene	ND	230	55	ug/kg	
118-96-7	2,4,6-Trinitrotoluene	ND	230	47	ug/kg	
55-63-0	Nitroglycerine	ND [a]	1900	700	ug/kg	
78-11-5	PETN	ND [a]	1900	700	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
610-39-9	3,4-Dinitrotoluene	106%	108%	72-145%

(a) Result is from Run# 2

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: GG023272.D PP022151.D

Accutest Laboratories

Report of Analysis

Client Sample ID:	59SB02C		
Lab Sample ID:	F51300-14	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8330A SW846 8330A	Percent Solids:	83.2
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GG023272.D	1	08/09/07	NAF	08/07/07	OP21778	GGG996
Run #2	PP022151.D	1	08/08/07	NAF	08/07/07	OP21778	GPP766

	Initial Weight	Final Volume
Run #1	2.11 g	20.0 ml
Run #2	2.11 g	20.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q
2691-41-0	HMX	ND	240	49	ug/kg	
121-82-4	RDX	ND	240	47	ug/kg	
99-65-0	1,3-Dinitrobenzene	ND	240	47	ug/kg	
606-20-2	2,6-Dinitrotoluene	ND	240	84	ug/kg	
121-14-2	2,4-Dinitrotoluene	ND	240	47	ug/kg	
35572-78-2	2-amino-4,6-Dinitrotoluene	ND	240	47	ug/kg	
19406-51-0	4-amino-2,6-Dinitrotoluene	ND	240	51	ug/kg	
98-95-3	Nitrobenzene	ND	240	67	ug/kg	
88-72-2	o-Nitrotoluene	ND	240	73	ug/kg	
99-08-1	m-Nitrotoluene	ND	240	98	ug/kg	
99-99-0	p-Nitrotoluene	ND	240	65	ug/kg	
479-45-8	Tetryl	ND	470	130	ug/kg	
99-35-4	1,3,5-Trinitrobenzene	ND	240	56	ug/kg	
118-96-7	2,4,6-Trinitrotoluene	ND	240	47	ug/kg	
55-63-0	Nitroglycerine	ND [a]	1900	710	ug/kg	
78-11-5	PETN	ND [a]	1900	710	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
610-39-9	3,4-Dinitrotoluene	106%	110%	72-145%

(a) Result is from Run# 2

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: GG023273.D PP022152.D

Accutest Laboratories

Report of Analysis

Client Sample ID:	43SB06A		
Lab Sample ID:	F51300-15	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8330A SW846 8330A	Percent Solids:	85.6
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GG023273.D	1	08/09/07	NAF	08/07/07	OP21778	GGG996
Run #2	PP022152.D	1	08/08/07	NAF	08/07/07	OP21778	GPP766

	Initial Weight	Final Volume
Run #1	2.03 g	20.0 ml
Run #2	2.03 g	20.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q
2691-41-0	HMX	ND	250	51	ug/kg	
121-82-4	RDX	ND	250	49	ug/kg	
99-65-0	1,3-Dinitrobenzene	ND	250	49	ug/kg	
606-20-2	2,6-Dinitrotoluene	ND	250	88	ug/kg	
121-14-2	2,4-Dinitrotoluene	ND	250	49	ug/kg	
35572-78-2	2-amino-4,6-Dinitrotoluene	ND	250	49	ug/kg	
19406-51-0	4-amino-2,6-Dinitrotoluene	ND	250	53	ug/kg	
98-95-3	Nitrobenzene	ND	250	70	ug/kg	
88-72-2	o-Nitrotoluene	ND	250	76	ug/kg	
99-08-1	m-Nitrotoluene	ND	250	100	ug/kg	
99-99-0	p-Nitrotoluene	ND	250	68	ug/kg	
479-45-8	Tetryl	ND	490	140	ug/kg	
99-35-4	1,3,5-Trinitrobenzene	ND	250	58	ug/kg	
118-96-7	2,4,6-Trinitrotoluene	ND	250	49	ug/kg	
55-63-0	Nitroglycerine	ND [a]	2000	740	ug/kg	
78-11-5	PETN	ND [a]	2000	740	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
610-39-9	3,4-Dinitrotoluene	105%	101%	72-145%

(a) Result is from Run# 2

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: GG023274.D PP022153.D

Accutest Laboratories

Report of Analysis

Client Sample ID:	43SB06B		
Lab Sample ID:	F51300-16	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8330A SW846 8330A	Percent Solids:	81.7
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GG023274.D	1	08/09/07	NAF	08/07/07	OP21778	GGG996
Run #2	PP022153.D	1	08/08/07	NAF	08/07/07	OP21778	GPP766

	Initial Weight	Final Volume
Run #1	2.12 g	20.0 ml
Run #2	2.12 g	20.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q
2691-41-0	HMX	ND	240	49	ug/kg	
121-82-4	RDX	ND	240	47	ug/kg	
99-65-0	1,3-Dinitrobenzene	ND	240	47	ug/kg	
606-20-2	2,6-Dinitrotoluene	ND	240	84	ug/kg	
121-14-2	2,4-Dinitrotoluene	ND	240	47	ug/kg	
35572-78-2	2-amino-4,6-Dinitrotoluene	ND	240	47	ug/kg	
19406-51-0	4-amino-2,6-Dinitrotoluene	ND	240	51	ug/kg	
98-95-3	Nitrobenzene	ND	240	67	ug/kg	
88-72-2	o-Nitrotoluene	ND	240	73	ug/kg	
99-08-1	m-Nitrotoluene	ND	240	97	ug/kg	
99-99-0	p-Nitrotoluene	ND	240	65	ug/kg	
479-45-8	Tetryl	ND	470	130	ug/kg	
99-35-4	1,3,5-Trinitrobenzene	ND	240	56	ug/kg	
118-96-7	2,4,6-Trinitrotoluene	ND	240	47	ug/kg	
55-63-0	Nitroglycerine	ND [a]	1900	710	ug/kg	
78-11-5	PETN	ND [a]	1900	710	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
610-39-9	3,4-Dinitrotoluene	112%	110%	72-145%

(a) Result is from Run# 2

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: GG023277.D PP022154.D

Accutest Laboratories

Report of Analysis

Client Sample ID:	43SB06C		
Lab Sample ID:	F51300-17	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8330A SW846 8330A	Percent Solids:	89.4
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GG023277.D	1	08/09/07	NAF	08/07/07	OP21778	GGG996
Run #2	PP022154.D	1	08/08/07	NAF	08/07/07	OP21778	GPP766

	Initial Weight	Final Volume
Run #1	2.22 g	20.0 ml
Run #2	2.22 g	20.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q
2691-41-0	HMX	ND	230	47	ug/kg	
121-82-4	RDX	ND	230	45	ug/kg	
99-65-0	1,3-Dinitrobenzene	ND	230	45	ug/kg	
606-20-2	2,6-Dinitrotoluene	ND	230	80	ug/kg	
121-14-2	2,4-Dinitrotoluene	ND	230	45	ug/kg	
35572-78-2	2-amino-4,6-Dinitrotoluene	ND	230	45	ug/kg	
19406-51-0	4-amino-2,6-Dinitrotoluene	ND	230	49	ug/kg	
98-95-3	Nitrobenzene	ND	230	64	ug/kg	
88-72-2	o-Nitrotoluene	ND	230	69	ug/kg	
99-08-1	m-Nitrotoluene	ND	230	93	ug/kg	
99-99-0	p-Nitrotoluene	ND	230	62	ug/kg	
479-45-8	Tetryl	ND	450	130	ug/kg	
99-35-4	1,3,5-Trinitrobenzene	ND	230	53	ug/kg	
118-96-7	2,4,6-Trinitrotoluene	ND	230	45	ug/kg	
55-63-0	Nitroglycerine	ND [a]	1800	680	ug/kg	
78-11-5	PETN	ND [a]	1800	680	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
610-39-9	3,4-Dinitrotoluene	111%	114%	72-145%

(a) Result is from Run# 2

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: GG023278.D PP022155.D

Accutest Laboratories

Report of Analysis

Client Sample ID:	43SB07A		
Lab Sample ID:	F51300-18	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8330A SW846 8330A	Percent Solids:	90.2
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GG023278.D	1	08/09/07	NAF	08/07/07	OP21778	GGG996
Run #2	PP022155.D	1	08/08/07	NAF	08/07/07	OP21778	GPP766

	Initial Weight	Final Volume
Run #1	2.20 g	20.0 ml
Run #2	2.20 g	20.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q
2691-41-0	HMX	ND	230	47	ug/kg	
121-82-4	RDX	ND	230	45	ug/kg	
99-65-0	1,3-Dinitrobenzene	ND	230	45	ug/kg	
606-20-2	2,6-Dinitrotoluene	ND	230	81	ug/kg	
121-14-2	2,4-Dinitrotoluene	ND	230	45	ug/kg	
35572-78-2	2-amino-4,6-Dinitrotoluene	ND	230	45	ug/kg	
19406-51-0	4-amino-2,6-Dinitrotoluene	ND	230	49	ug/kg	
98-95-3	Nitrobenzene	ND	230	65	ug/kg	
88-72-2	o-Nitrotoluene	ND	230	70	ug/kg	
99-08-1	m-Nitrotoluene	ND	230	94	ug/kg	
99-99-0	p-Nitrotoluene	ND	230	63	ug/kg	
479-45-8	Tetryl	ND	450	130	ug/kg	
99-35-4	1,3,5-Trinitrobenzene	ND	230	54	ug/kg	
118-96-7	2,4,6-Trinitrotoluene	ND	230	45	ug/kg	
55-63-0	Nitroglycerine	ND [a]	1800	680	ug/kg	
78-11-5	PETN	ND [a]	1800	680	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
610-39-9	3,4-Dinitrotoluene	112%	106%	72-145%

(a) Result is from Run# 2

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	43SB07B		
Lab Sample ID:	F51300-19	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8330A SW846 3550B	Percent Solids:	86.2
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GG023234.D	1	08/09/07	NAF	08/07/07	OP21779	GGG995
Run #2	PP022117.D	1	08/08/07	NAF	08/07/07	OP21779	GPP766

	Initial Weight	Final Volume
Run #1	2.09 g	20.0 ml
Run #2	2.09 g	20.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q
2691-41-0	HMX	ND	240	50	ug/kg	
121-82-4	RDX	ND	240	48	ug/kg	
99-65-0	1,3-Dinitrobenzene	ND	240	48	ug/kg	
606-20-2	2,6-Dinitrotoluene	ND	240	85	ug/kg	
121-14-2	2,4-Dinitrotoluene	ND	240	48	ug/kg	
35572-78-2	2-amino-4,6-Dinitrotoluene	ND	240	48	ug/kg	
19406-51-0	4-amino-2,6-Dinitrotoluene	ND	240	52	ug/kg	
98-95-3	Nitrobenzene	ND	240	68	ug/kg	
88-72-2	o-Nitrotoluene	ND	240	74	ug/kg	
99-08-1	m-Nitrotoluene	ND	240	99	ug/kg	
99-99-0	p-Nitrotoluene	ND	240	66	ug/kg	
479-45-8	Tetryl	ND	480	130	ug/kg	
99-35-4	1,3,5-Trinitrobenzene	ND	240	56	ug/kg	
118-96-7	2,4,6-Trinitrotoluene	ND	240	48	ug/kg	
55-63-0	Nitroglycerine	ND [a]	1900	720	ug/kg	
78-11-5	PETN	ND [a]	1900	720	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
610-39-9	3,4-Dinitrotoluene	108%	102%	72-145%

(a) Result is from Run# 2

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: GG023235.D PP022118.D

Accutest Laboratories

Report of Analysis

Client Sample ID:	43SB07C		
Lab Sample ID:	F51300-20	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8330A SW846 3550B	Percent Solids:	84.3
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GG023235.D	1	08/09/07	NAF	08/07/07	OP21779	GGG995
Run #2	PP022118.D	1	08/08/07	NAF	08/07/07	OP21779	GPP766

	Initial Weight	Final Volume
Run #1	2.11 g	20.0 ml
Run #2	2.11 g	20.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q
2691-41-0	HMX	ND	240	49	ug/kg	
121-82-4	RDX	ND	240	47	ug/kg	
99-65-0	1,3-Dinitrobenzene	ND	240	47	ug/kg	
606-20-2	2,6-Dinitrotoluene	ND	240	84	ug/kg	
121-14-2	2,4-Dinitrotoluene	ND	240	47	ug/kg	
35572-78-2	2-amino-4,6-Dinitrotoluene	ND	240	47	ug/kg	
19406-51-0	4-amino-2,6-Dinitrotoluene	ND	240	51	ug/kg	
98-95-3	Nitrobenzene	ND	240	67	ug/kg	
88-72-2	o-Nitrotoluene	ND	240	73	ug/kg	
99-08-1	m-Nitrotoluene	ND	240	98	ug/kg	
99-99-0	p-Nitrotoluene	ND	240	65	ug/kg	
479-45-8	Tetryl	ND	470	130	ug/kg	
99-35-4	1,3,5-Trinitrobenzene	ND	240	56	ug/kg	
118-96-7	2,4,6-Trinitrotoluene	ND	240	47	ug/kg	
55-63-0	Nitroglycerine	ND [a]	1900	710	ug/kg	
78-11-5	PETN	ND [a]	1900	710	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
610-39-9	3,4-Dinitrotoluene	95%	92%	72-145%

(a) Result is from Run# 2

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: GG023236.D PP022119.D

Accutest Laboratories

Report of Analysis

Client Sample ID:	43SB08A		
Lab Sample ID:	F51300-21	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8330A SW846 3550B	Percent Solids:	96.1
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GG023236.D	1	08/09/07	NAF	08/07/07	OP21779	GGG995
Run #2	PP022119.D	1	08/08/07	NAF	08/07/07	OP21779	GPP766

	Initial Weight	Final Volume
Run #1	2.04 g	20.0 ml
Run #2	2.04 g	20.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q
2691-41-0	HMX	ND	250	51	ug/kg	
121-82-4	RDX	ND	250	49	ug/kg	
99-65-0	1,3-Dinitrobenzene	ND	250	49	ug/kg	
606-20-2	2,6-Dinitrotoluene	ND	250	87	ug/kg	
121-14-2	2,4-Dinitrotoluene	ND	250	49	ug/kg	
35572-78-2	2-amino-4,6-Dinitrotoluene	ND	250	49	ug/kg	
19406-51-0	4-amino-2,6-Dinitrotoluene	ND	250	53	ug/kg	
98-95-3	Nitrobenzene	ND	250	70	ug/kg	
88-72-2	o-Nitrotoluene	ND	250	75	ug/kg	
99-08-1	m-Nitrotoluene	ND	250	100	ug/kg	
99-99-0	p-Nitrotoluene	ND	250	68	ug/kg	
479-45-8	Tetryl	ND	490	140	ug/kg	
99-35-4	1,3,5-Trinitrobenzene	ND	250	58	ug/kg	
118-96-7	2,4,6-Trinitrotoluene	ND	250	49	ug/kg	
55-63-0	Nitroglycerine	ND [a]	2000	740	ug/kg	
78-11-5	PETN	ND [a]	2000	740	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
610-39-9	3,4-Dinitrotoluene	203% [b]	212% [b]	72-145%

(a) Result is from Run# 2
(b) Outside control limits. Suspected double surrogate; however, sample was ND.

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	43SB08B		
Lab Sample ID:	F51300-22	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8330A SW846 3550B	Percent Solids:	84.5
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GG023237.D	1	08/09/07	NAF	08/07/07	OP21779	GGG995
Run #2	PP022120.D	1	08/08/07	NAF	08/07/07	OP21779	GPP766

	Initial Weight	Final Volume
Run #1	2.08 g	20.0 ml
Run #2	2.08 g	20.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q
2691-41-0	HMX	ND	240	50	ug/kg	
121-82-4	RDX	ND	240	48	ug/kg	
99-65-0	1,3-Dinitrobenzene	ND	240	48	ug/kg	
606-20-2	2,6-Dinitrotoluene	ND	240	86	ug/kg	
121-14-2	2,4-Dinitrotoluene	ND	240	48	ug/kg	
35572-78-2	2-amino-4,6-Dinitrotoluene	ND	240	48	ug/kg	
19406-51-0	4-amino-2,6-Dinitrotoluene	ND	240	52	ug/kg	
98-95-3	Nitrobenzene	ND	240	68	ug/kg	
88-72-2	o-Nitrotoluene	ND	240	74	ug/kg	
99-08-1	m-Nitrotoluene	ND	240	99	ug/kg	
99-99-0	p-Nitrotoluene	ND	240	66	ug/kg	
479-45-8	Tetryl	ND	480	140	ug/kg	
99-35-4	1,3,5-Trinitrobenzene	ND	240	57	ug/kg	
118-96-7	2,4,6-Trinitrotoluene	ND	240	48	ug/kg	
55-63-0	Nitroglycerine	ND [a]	1900	720	ug/kg	
78-11-5	PETN	ND [a]	1900	720	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
610-39-9	3,4-Dinitrotoluene	109%	114%	72-145%

(a) Result is from Run# 2

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	43SB08C		
Lab Sample ID:	F51300-23	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8330A SW846 3550B	Percent Solids:	87.5
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GG023238.D	1	08/09/07	NAF	08/07/07	OP21779	GGG995
Run #2	PP022121.D	1	08/08/07	NAF	08/07/07	OP21779	GPP766

	Initial Weight	Final Volume
Run #1	2.18 g	20.0 ml
Run #2	2.18 g	20.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q
2691-41-0	HMX	ND	230	48	ug/kg	
121-82-4	RDX	ND	230	46	ug/kg	
99-65-0	1,3-Dinitrobenzene	ND	230	46	ug/kg	
606-20-2	2,6-Dinitrotoluene	ND	230	82	ug/kg	
121-14-2	2,4-Dinitrotoluene	ND	230	46	ug/kg	
35572-78-2	2-amino-4,6-Dinitrotoluene	ND	230	46	ug/kg	
19406-51-0	4-amino-2,6-Dinitrotoluene	ND	230	50	ug/kg	
98-95-3	Nitrobenzene	ND	230	65	ug/kg	
88-72-2	o-Nitrotoluene	ND	230	71	ug/kg	
99-08-1	m-Nitrotoluene	ND	230	94	ug/kg	
99-99-0	p-Nitrotoluene	ND	230	63	ug/kg	
479-45-8	Tetryl	ND	460	130	ug/kg	
99-35-4	1,3,5-Trinitrobenzene	ND	230	54	ug/kg	
118-96-7	2,4,6-Trinitrotoluene	ND	230	46	ug/kg	
55-63-0	Nitroglycerine	ND [a]	1800	690	ug/kg	
78-11-5	PETN	ND [a]	1800	690	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
610-39-9	3,4-Dinitrotoluene	110%	115%	72-145%

(a) Result is from Run# 2

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	43SB09A		
Lab Sample ID:	F51300-24	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8330A SW846 3550B	Percent Solids:	90.3
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GG023239.D	1	08/09/07	NAF	08/07/07	OP21779	GGG995
Run #2	PP022122.D	1	08/08/07	NAF	08/07/07	OP21779	GPP766

	Initial Weight	Final Volume
Run #1	2.09 g	20.0 ml
Run #2	2.09 g	20.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q
2691-41-0	HMX	ND	240	50	ug/kg	
121-82-4	RDX	ND	240	48	ug/kg	
99-65-0	1,3-Dinitrobenzene	ND	240	48	ug/kg	
606-20-2	2,6-Dinitrotoluene	ND	240	85	ug/kg	
121-14-2	2,4-Dinitrotoluene	ND	240	48	ug/kg	
35572-78-2	2-amino-4,6-Dinitrotoluene	ND	240	48	ug/kg	
19406-51-0	4-amino-2,6-Dinitrotoluene	ND	240	52	ug/kg	
98-95-3	Nitrobenzene	ND	240	68	ug/kg	
88-72-2	o-Nitrotoluene	ND	240	74	ug/kg	
99-08-1	m-Nitrotoluene	ND	240	99	ug/kg	
99-99-0	p-Nitrotoluene	ND	240	66	ug/kg	
479-45-8	Tetryl	ND	480	130	ug/kg	
99-35-4	1,3,5-Trinitrobenzene	ND	240	56	ug/kg	
118-96-7	2,4,6-Trinitrotoluene	ND	240	48	ug/kg	
55-63-0	Nitroglycerine	ND [a]	1900	720	ug/kg	
78-11-5	PETN	ND [a]	1900	720	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
610-39-9	3,4-Dinitrotoluene	110%	117%	72-145%

(a) Result is from Run# 2

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: GG023279.D PP022156.D

Accutest Laboratories

Report of Analysis

Client Sample ID:	43SB09B		
Lab Sample ID:	F51300-25	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8330A SW846 8330A	Percent Solids:	86.9
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GG023279.D	1	08/09/07	NAF	08/07/07	OP21778	GGG996
Run #2	PP022156.D	1	08/08/07	NAF	08/07/07	OP21778	GPP766

	Initial Weight	Final Volume
Run #1	2.11 g	20.0 ml
Run #2	2.11 g	20.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q
2691-41-0	HMX	ND	240	49	ug/kg	
121-82-4	RDX	ND	240	47	ug/kg	
99-65-0	1,3-Dinitrobenzene	ND	240	47	ug/kg	
606-20-2	2,6-Dinitrotoluene	ND	240	84	ug/kg	
121-14-2	2,4-Dinitrotoluene	ND	240	47	ug/kg	
35572-78-2	2-amino-4,6-Dinitrotoluene	ND	240	47	ug/kg	
19406-51-0	4-amino-2,6-Dinitrotoluene	ND	240	51	ug/kg	
98-95-3	Nitrobenzene	ND	240	67	ug/kg	
88-72-2	o-Nitrotoluene	ND	240	73	ug/kg	
99-08-1	m-Nitrotoluene	ND	240	98	ug/kg	
99-99-0	p-Nitrotoluene	ND	240	65	ug/kg	
479-45-8	Tetryl	ND	470	130	ug/kg	
99-35-4	1,3,5-Trinitrobenzene	ND	240	56	ug/kg	
118-96-7	2,4,6-Trinitrotoluene	ND	240	47	ug/kg	
55-63-0	Nitroglycerine	ND [a]	1900	710	ug/kg	
78-11-5	PETN	ND [a]	1900	710	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
610-39-9	3,4-Dinitrotoluene	110%	109%	72-145%

(a) Result is from Run# 2

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: GG023240.D PP022123.D

Accutest Laboratories

Report of Analysis

Client Sample ID:	43SB09C		
Lab Sample ID:	F51300-26	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8330A SW846 3550B	Percent Solids:	87.1
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GG023240.D	1	08/09/07	NAF	08/07/07	OP21779	GGG995
Run #2	PP022123.D	1	08/08/07	NAF	08/07/07	OP21779	GPP766

	Initial Weight	Final Volume
Run #1	2.03 g	20.0 ml
Run #2	2.03 g	20.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q
2691-41-0	HMX	ND	250	51	ug/kg	
121-82-4	RDX	ND	250	49	ug/kg	
99-65-0	1,3-Dinitrobenzene	ND	250	49	ug/kg	
606-20-2	2,6-Dinitrotoluene	ND	250	88	ug/kg	
121-14-2	2,4-Dinitrotoluene	ND	250	49	ug/kg	
35572-78-2	2-amino-4,6-Dinitrotoluene	ND	250	49	ug/kg	
19406-51-0	4-amino-2,6-Dinitrotoluene	ND	250	53	ug/kg	
98-95-3	Nitrobenzene	ND	250	70	ug/kg	
88-72-2	o-Nitrotoluene	ND	250	76	ug/kg	
99-08-1	m-Nitrotoluene	ND	250	100	ug/kg	
99-99-0	p-Nitrotoluene	ND	250	68	ug/kg	
479-45-8	Tetryl	ND	490	140	ug/kg	
99-35-4	1,3,5-Trinitrobenzene	ND	250	58	ug/kg	
118-96-7	2,4,6-Trinitrotoluene	ND	250	49	ug/kg	
55-63-0	Nitroglycerine	ND [a]	2000	740	ug/kg	
78-11-5	PETN	ND [a]	2000	740	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
610-39-9	3,4-Dinitrotoluene	108%	113%	72-145%

(a) Result is from Run# 2

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	43SB10A		
Lab Sample ID:	F51300-27	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8330A SW846 3550B	Percent Solids:	87.1
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GG023243.D	1	08/09/07	NAF	08/07/07	OP21779	GGG995
Run #2	PP022126.D	1	08/08/07	NAF	08/07/07	OP21779	GPP766
Run #3	PP022157.D	1	08/08/07	NAF	08/07/07	OP21778	GPP766
Run #4	GG023282.D	1	08/10/07	NAF	08/07/07	OP21778	GGG996

	Initial Weight	Final Volume
Run #1	2.02 g	20.0 ml
Run #2	2.02 g	20.0 ml
Run #3	2.02 g	20.0 ml
Run #4	2.02 g	20.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q
2691-41-0	HMX	ND	250	51	ug/kg	
121-82-4	RDX	ND	250	50	ug/kg	
99-65-0	1,3-Dinitrobenzene	ND	250	50	ug/kg	
606-20-2	2,6-Dinitrotoluene	ND	250	88	ug/kg	
121-14-2	2,4-Dinitrotoluene	ND	250	50	ug/kg	
35572-78-2	2-amino-4,6-Dinitrotoluene	ND	250	50	ug/kg	
19406-51-0	4-amino-2,6-Dinitrotoluene	ND	250	53	ug/kg	
98-95-3	Nitrobenzene	ND	250	70	ug/kg	
88-72-2	o-Nitrotoluene	ND	250	76	ug/kg	
99-08-1	m-Nitrotoluene	ND	250	100	ug/kg	
99-99-0	p-Nitrotoluene	ND	250	68	ug/kg	
479-45-8	Tetryl	ND	500	140	ug/kg	
99-35-4	1,3,5-Trinitrobenzene	ND	250	58	ug/kg	
118-96-7	2,4,6-Trinitrotoluene	ND	250	50	ug/kg	
55-63-0	Nitroglycerine	ND [a]	2000	740	ug/kg	
78-11-5	PETN	ND [a]	2000	740	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Run# 3	Limits
610-39-9	3,4-Dinitrotoluene	106%	111%	110%	72-145%
610-39-9	3,4-Dinitrotoluene				72-145%

(a) Result is from Run# 2

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	43SB10B		
Lab Sample ID:	F51300-28	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8330A SW846 3550B	Percent Solids:	86.6
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GG023244.D	1	08/09/07	NAF	08/07/07	OP21779	GGG995
Run #2	PP022129.D	1	08/08/07	NAF	08/07/07	OP21779	GPP766

	Initial Weight	Final Volume
Run #1	2.22 g	20.0 ml
Run #2	2.22 g	20.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q
2691-41-0	HMX	ND	230	47	ug/kg	
121-82-4	RDX	ND	230	45	ug/kg	
99-65-0	1,3-Dinitrobenzene	ND	230	45	ug/kg	
606-20-2	2,6-Dinitrotoluene	ND	230	80	ug/kg	
121-14-2	2,4-Dinitrotoluene	ND	230	45	ug/kg	
35572-78-2	2-amino-4,6-Dinitrotoluene	ND	230	45	ug/kg	
19406-51-0	4-amino-2,6-Dinitrotoluene	ND	230	49	ug/kg	
98-95-3	Nitrobenzene	ND	230	64	ug/kg	
88-72-2	o-Nitrotoluene	ND	230	69	ug/kg	
99-08-1	m-Nitrotoluene	ND	230	93	ug/kg	
99-99-0	p-Nitrotoluene	ND	230	62	ug/kg	
479-45-8	Tetryl	ND	450	130	ug/kg	
99-35-4	1,3,5-Trinitrobenzene	ND	230	53	ug/kg	
118-96-7	2,4,6-Trinitrotoluene	ND	230	45	ug/kg	
55-63-0	Nitroglycerine	ND [a]	1800	680	ug/kg	
78-11-5	PETN	ND [a]	1800	680	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
610-39-9	3,4-Dinitrotoluene	105%	110%	72-145%

(a) Result is from Run# 2

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: GG023245.D PP022130.D

Accutest Laboratories

Report of Analysis

Client Sample ID:	43SB10C		
Lab Sample ID:	F51300-29	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8330A SW846 3550B	Percent Solids:	83.8
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GG023245.D	1	08/09/07	NAF	08/07/07	OP21779	GGG995
Run #2	PP022130.D	1	08/08/07	NAF	08/07/07	OP21779	GPP766

	Initial Weight	Final Volume
Run #1	2.03 g	20.0 ml
Run #2	2.03 g	20.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q
2691-41-0	HMX	ND	250	51	ug/kg	
121-82-4	RDX	ND	250	49	ug/kg	
99-65-0	1,3-Dinitrobenzene	ND	250	49	ug/kg	
606-20-2	2,6-Dinitrotoluene	ND	250	88	ug/kg	
121-14-2	2,4-Dinitrotoluene	ND	250	49	ug/kg	
35572-78-2	2-amino-4,6-Dinitrotoluene	ND	250	49	ug/kg	
19406-51-0	4-amino-2,6-Dinitrotoluene	ND	250	53	ug/kg	
98-95-3	Nitrobenzene	ND	250	70	ug/kg	
88-72-2	o-Nitrotoluene	ND	250	76	ug/kg	
99-08-1	m-Nitrotoluene	ND	250	100	ug/kg	
99-99-0	p-Nitrotoluene	ND	250	68	ug/kg	
479-45-8	Tetryl	ND	490	140	ug/kg	
99-35-4	1,3,5-Trinitrobenzene	ND	250	58	ug/kg	
118-96-7	2,4,6-Trinitrotoluene	ND	250	49	ug/kg	
55-63-0	Nitroglycerine	ND [a]	2000	740	ug/kg	
78-11-5	PETN	ND [a]	2000	740	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
610-39-9	3,4-Dinitrotoluene	104%	112%	72-145%

(a) Result is from Run# 2

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	TMSB10B		
Lab Sample ID:	F51300-30	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8330A SW846 3550B	Percent Solids:	85.9
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GG023248.D	1	08/09/07	NAF	08/07/07	OP21779	GGG995
Run #2	PP022131.D	1	08/08/07	NAF	08/07/07	OP21779	GPP766

	Initial Weight	Final Volume
Run #1	2.15 g	20.0 ml
Run #2	2.15 g	20.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q
2691-41-0	HMX	ND	230	48	ug/kg	
121-82-4	RDX	ND	230	47	ug/kg	
99-65-0	1,3-Dinitrobenzene	ND	230	47	ug/kg	
606-20-2	2,6-Dinitrotoluene	ND	230	83	ug/kg	
121-14-2	2,4-Dinitrotoluene	ND	230	47	ug/kg	
35572-78-2	2-amino-4,6-Dinitrotoluene	ND	230	47	ug/kg	
19406-51-0	4-amino-2,6-Dinitrotoluene	ND	230	50	ug/kg	
98-95-3	Nitrobenzene	ND	230	66	ug/kg	
88-72-2	o-Nitrotoluene	ND	230	72	ug/kg	
99-08-1	m-Nitrotoluene	ND	230	96	ug/kg	
99-99-0	p-Nitrotoluene	ND	230	64	ug/kg	
479-45-8	Tetryl	ND	470	130	ug/kg	
99-35-4	1,3,5-Trinitrobenzene	ND	230	55	ug/kg	
118-96-7	2,4,6-Trinitrotoluene	ND	230	47	ug/kg	
55-63-0	Nitroglycerine	ND [a]	1900	700	ug/kg	
78-11-5	PETN	ND [a]	1900	700	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
610-39-9	3,4-Dinitrotoluene	111%	114%	72-145%

(a) Result is from Run# 2

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	072507R		
Lab Sample ID:	F51300-31	Date Sampled:	07/25/07
Matrix:	AQ - Equipment Blank	Date Received:	07/26/07
Method:	SW846 8330A SW846 3535A	Percent Solids:	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GG023035.D	1	08/01/07	NAF	07/31/07	OP21682	GGG990
Run #2	PP021891.D	1	08/01/07	NAF	07/31/07	OP21682	GPP756

	Initial Volume	Final Volume
Run #1	1000 ml	10.0 ml
Run #2	1000 ml	10.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q
2691-41-0	HMX	ND	0.20	0.051	ug/l	
121-82-4	RDX	ND	0.20	0.060	ug/l	
99-65-0	1,3-Dinitrobenzene	ND	0.20	0.056	ug/l	
606-20-2	2,6-Dinitrotoluene	ND	0.20	0.071	ug/l	
121-14-2	2,4-Dinitrotoluene	ND	0.20	0.097	ug/l	
35572-78-2	2-amino-4,6-Dinitrotoluene	ND	0.20	0.065	ug/l	
19406-51-0	4-amino-2,6-Dinitrotoluene	ND	0.20	0.056	ug/l	
98-95-3	Nitrobenzene	ND	0.20	0.073	ug/l	
88-72-2	o-Nitrotoluene	ND	0.20	0.12	ug/l	
99-08-1	m-Nitrotoluene	ND	0.20	0.078	ug/l	
99-99-0	p-Nitrotoluene	ND	0.20	0.10	ug/l	
479-45-8	Tetryl	ND	0.20	0.068	ug/l	
99-35-4	1,3,5-Trinitrobenzene	ND	0.20	0.065	ug/l	
118-96-7	2,4,6-Trinitrotoluene	ND	0.20	0.050	ug/l	
55-63-0	Nitroglycerine	ND [a]	2.0	0.50	ug/l	
78-11-5	PETN	ND [a]	2.0	0.50	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
610-39-9	3,4-Dinitrotoluene	95%	91%	70-136%

(a) Result is from Run# 2

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Shaw Environmental, Inc.
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Shaw® Shaw Environmental, Inc.

MEMORANDUM

TO: Jeff Parks, Shaw E&I Radford Army Ammunition Plant (RFAAP) Project Manager

FROM: Richard McCracken, Shaw E&I Project Chemist

SUBJECT: RFAAP Data Validation – Dioxin Furans
SGS Paradigm Analytical Laboratories, Inc. Project G383-585
(Accutest SDG F51300)

DATE: January 8, 2008

The purpose of this memorandum is to present the data validation report for the samples collected at RFAAP on July 25, 2007. The samples were analyzed for Dioxin and Furan compounds using USEPA SW-846 Method 8290 High Resolution Gas Chromatography/High Resolution Mass Spectroscopy (HRGC/HRMS). A total of 1 aqueous and 17 soil samples were validated, as follows:

Field Sample ID	Lab Sample ID	**Field Sample ID**	Lab Sample ID
59SB06A	F51300-1	TMSB04C	F51300-10
59SB06B	F51300-2	59SB02A	F51300-11
59SB06C	F51300-3	59SB02B	F51300-12
59SB05A	F51300-4	TMSB02B	F51300-13
59SB05B	F51300-5	59SB02C	F51300-14
59SB05C	F51300-6	43SB08A	F51300-21
59SB04A	F51300-7	43SB08B	F51300-22
59SB04B	F51300-8	43SB08C	F51300-23
59SB04C	F51300-9	072507R	F51300-31

Data were reviewed and validated using a combination of project QAPP, *DOD Quality Systems Manual for Environmental Laboratories, Final Version 3, January, 2006* (DoD, 2006) (DoD QSM), method-specific criteria, and laboratory SOP criteria. The data qualifier scheme was consistent with the *USEPA Region III Dioxin/Furan Data Validation Guidance* (March, 1999). Parameters evaluated are presented in **Table 1**. Data associated with parameters in compliance with quality control specifications have not been qualified. Data associated with parameters that did not comply with quality control specifications and directly impacted project data have been qualified in accordance with USEPA Region III specifications.

Table 1 Laboratory Performance Criteria

Qualified		Parameter
Yes	No	
	X	Holding Times and Preservation
X		Blank Analysis
	X	Instrument Performance Check
	X	Initial Calibration
	X	Continuing Calibration
	X	Internal Standards (IS) Recovery Standard Solutions
	X	Cleanup Standards
	X	Laboratory Control Standard or Ongoing Precision Result (OPR)
	X	Matrix Spike and Spike Duplicate
X		Field Duplicate
X		Quantitation Verification

The quality of data collected in support of this sampling activity is considered acceptable with noted qualifications.

Richard M. Cracken

Richard McCracken, Chemist

1/8/08

Date

RFAAP VALIDATION REPORT
DIOXIN FURAN REVIEW
SDG G383-587
(Accutest SDG F51300)

I-Holding Times and Preservation

The objective is to ascertain the validity of results based on the holding time of the sample from time of collection to time of sample extraction and analysis. Dioxin and furan samples must be shipped @4°C ± 2°C, with a maximum holding time of 30 days from sample collection to preparative extraction and 45 days from preparative extraction to determinative analysis.

- Temperature Review: A temperature blank was sent with each cooler and recorded by the laboratory upon receipt. The samples collected on 7/25/07 were sent in five coolers, and were received by the laboratory on 7/26/07 at temperatures ranging from 2.6 °C to 4.0 °C. No qualifiers were applied. Accutest shipped the dioxin aliquots to SGS Paradigm Analytical Laboratories on 7/27/07, and they were received by SGS Paradigm on 7/31/07 at 4.6°C. No qualifiers were applied.

- Holding Time Review: The samples were collected on 7/25/07; the water sample was extracted on 8/1/07; the soil samples were extracted on 8/5/07, 8/7/07, & 8/13/07; the water sample was analyzed on 8/3/07; and the soil samples were analyzed on 8/8/07, 8/9/07, 8/10/07, & 8/20/07. All criteria were met. No qualifiers were applied.

II-Blank Analysis

The purpose of laboratory (or field) blank analyses is to determine the existence and magnitude of contamination problems resulting from field and laboratory activities. No contamination should be found in any of the blanks >EDL (estimated detection limit). The DoD QSM criteria specifies all concentrations should be less than ½ MRL (<MRL for common laboratory contaminants OCDD and OCDF) and <2EDL for the calibration blanks. Positive sample results are reported and qualified "B", if the concentration of the compound in the sample is ≤10 times (10x) the maximum amount in any blank for the common laboratory contaminants OCDD or OCDF, or 5 times (5X) the maximum amount for other target compounds. **Table 2** summarizes the blank contamination.

Table 2 Blank Contamination Analysis Summary

Analysis Date	QC Blank ID	Compound	Max Conc. pg/g	Action Level pg/g	B qualified samples
8/2/07	LMB14393	All	ND	NA	None
8/8/07	LMB14398	OCDD	3.63	36.3	F51300-23
8/8/07	LMB14398	1,2,3,4,6,7,8-HpCDF	0.966	4.83	F51300-1 thru -5, -7 thru -14, -23
8/8/07	LMB14398	OCDF	1.78	17.8	F51300-1, -4, -6, -7, -8, -10 thru -14, -23
8/9/07	LMB14402	1,2,3,4,6,7,8-HpCDD	0.446	2.23	F51300-9, -10, -23
8/9/07	LMB14402	OCDD	2.84	28.4	None
8/9/07	LMB14402	1,2,3,4,7,8-HxCDF	0.258	1.29	F51300-4, -5, -9, -10, -12, -13, -14, -21
8/9/07	LMB14402	1,2,3,6,7,8-HxCDF	0.126	0.63	F51300-4, -9, -11, -21
8/9/07	LMB14402	1,2,3,4,6,7,8-HpCDF	1.23	6.15	F51300-1 thru -5, -7 thru -14, -23
8/9/07	LMB14402	OCDF	1.95	19.5	F51300-1, -4, -6, -7, -8, -10 thru -14, -21 -23
8/16/07	LMB14410	All	ND	NA	None
8/3/07	F51300-31	1,2,3,4,6,7,8-HpCDF	0.00849 ng/L	0.000017	None
8/3/07	F51300-31	OCDF	0.0142 ng/L	0.000028	None
8/3/07	F51353-8	1,2,3,4,6,7,8-HpCDF	0.0137 ng/L	0.000027	None
8/3/07	F51353-8	OCDF	0.0254 ng/L	0.000051	None

F51300-31 and F51353-8 are rinsate blanks
J = Estimated value <MRL and >EDL.

III-Instrument Performance Check
Instrument must be tuned with perfluorokerosene (PFK) to achieve a static resolving power of at least 10,000 (10% valley) and lock-mass ion between lowest and highest masses for each descriptor and level of reference compound ≤10%. Documentation of the mass spectrometer resolving power is accomplished by recording the peak profile of the high-mass reference signal (typically m/z 330.9792) obtained during a peak examination by using the low-mass PFK ion at m/z 292.9825 or lower in mass as reference. At the beginning of the each 12-hour period, the chromatographic resolution is verified in the same fashion as in the initial calibration through the analysis of HRCC solution on the DB-5 (or equivalent) column or through the analysis of the column performance solution on the SP-2331 or SP-225 (or equivalent) column. A 25% valley must be achieved between the close eluters.

- All PFK forms were verified and found to be in compliance with method specification. No qualifiers were applied.

IV-Initial Calibration
Once the window defining mix has been analyzed and the descriptor switching times have been verified, the five point calibration solutions can be analyzed prior to sample analysis. Per method and DoD QSM, the initial calibration criteria are as follows:

  - The percent relative standard deviations for the mean response factors RRF(n) from the 17 unlabeled standards must not exceed ±20%, and those for the labeled reference compounds must not exceed ±30%;
  - The signal to noise ratio ≥10% for all target ions;
  - Ion abundance ratios must be within the specified control limits in Table 8 (SW846 Method 8290).

- During initial calibration performed on 07/10/07 using instrument HRMS1, all compounds met criteria. No qualifiers were applied. Sample F51300-2, -3, was analyzed in conjunction with this initial calibration.

- During initial calibration performed on 11/2/06 using instrument HRMS3, all compounds met criteria. No qualifiers were applied. Samples F51300-1, -4 thru -14, and -21 thru -23 were analyzed in conjunction with this initial calibration.

V-Continuing Calibration
The continuing calibration consists of two parts: evaluation of the mass resolution and retention time check. Per method and DoD QSM, the following stipulates the continuing calibration criteria.

  - The signal signal-to-noise ratio (S/N) must be at least 10:1 for each selected ion current profile (SICP) and for each GC signal representing the elution of a target analyte or labeled standard for each analyte.
  - The relative response factor of each analyte for the unlabeled standard must be within ±20% of the average RF obtained from the initial calibration, and the RRF of each labeled standard must be within ±30% of the average RRF established during initial calibration. This is expressed in term of percent difference %D.
  - Ion abundance ratios must be within the specified control limits in Table 8 (SW846 Method 8290).

- During the continuing calibration performed on 8/2/07 @1603 on instrument HRMS1, all criteria were met. No qualifiers were applied. Sample F51300-31 was analyzed after this continuing calibration.

- During the continuing calibration performed on 8/3/07 @0324 on instrument HRMS1, all criteria were met. No qualifiers were applied. Sample F51300-31 was analyzed before this continuing calibration.

- During the continuing calibration performed on 8/8/07 @0947 on instrument HRMS3, 13C-1,2,3,4-TCDD (38.9%) and 13C-1,2,3,7,8,9-HxCDD (35.8%) had high %D. These labeled standards are injection standards only, the standards used for quantitation met criteria, so no data qualifiers were applied. All other standards met criteria. No field samples were analyzed after this continuing calibration.

- During the continuing calibration performed on 8/8/07 @1436 on instrument HRMS3, 13C-1,2,3,4-TCDD (46.8%) and 13C-1,2,3,7,8,9-HxCDD (47.6%) had high %D. These labeled standards are injection standards only, the standards used for quantitation met criteria, so no data qualifiers were applied. All other standards met criteria. Samples F51300-1, -4, -5, -6, -7, -8, were analyzed after this continuing calibration.

- During the continuing calibration performed on 8/9/07 @0159 on instrument HRMS3, 13C-1,2,3,4-TCDD (46.6 %) and 13C-1,2,3,7,8,9-HxCDD (48.0%) had high %D. These labeled standards are injection standards only, the standards used for quantitation met criteria, so no data qualifiers were applied. All other standards met criteria. Samples F51300-1, -4, -5, -6, -7, -8, were analyzed before this continuing calibration, while samples F51300-9 and -10 were analyzed after this continuing calibration.

- During the continuing calibration performed on 8/9/07 @1323 on instrument HRMS3, all criteria were met. No qualifiers were applied. Samples F51300-9 and -10 were analyzed before this continuing calibration.

- During the continuing calibration performed on 8/9/07 @2234 on instrument HRMS3, 13C-1,2,3,4-TCDD (37.2%) and 13C-1,2,3,7,8,9-HxCDD (36.4%) had high %D. These labeled standards are injection standards only, the standards used for quantitation met criteria, so no data qualifiers were applied. All other standards met criteria. Samples F51300-11 thru -17 were analyzed after this continuing calibration.

- During the continuing calibration performed on 8/10/07 @0555 on instrument HRMS3, 13C-1,2,3,4-TCDD (36.6%) and 13C-1,2,3,7,8,9-HxCDD (31.0%) had high %D. These labeled standards are injection standards only, the standards used for quantitation met criteria, so no data qualifiers were applied. All other standards met criteria. Samples F51300-11 thru -17 were analyzed before this continuing calibration.

- During the continuing calibration performed on 8/20/07 @0949 on instrument HRMS1, all criteria were met. No qualifiers were applied. Samples F51300-2 and -3 were analyzed after this continuing calibration.

- During the continuing calibration performed on 8/20/07 @2111 on instrument HRMS1, all criteria were met. No qualifiers were applied. Samples F51300-2 and -3 were analyzed before this continuing calibration.

VI-Internal Standards (IS) Recovery Standard Solutions

Internal standards performance criteria ensure that GC/MS sensitivity and response are stable during every analytical run. Specific criteria include: Recoveries of the isotopically-labeled recovery standards to fall within the 40 to 135 percent range for the tetra- through octachlorinated congeners, or as stated in the data package (DoD QSM limits 40-135%).

- All field samples met criteria. No qualifiers were applied.

VII-Cleanup Standards
Cleanup standards are added to every sample, blank, quality control sample, and calibration solution. This compound is added to the samples after extraction but prior to cleanup and is used to verify the percent recovery obtained using the isotope dilution technique. The control limits are 40 to 135 percent (DoD QSM limits 40-135%).

- All field samples met criteria. No qualifiers were applied.

VIII-Laboratory Control Standard (LCS) or Ongoing Precision Result (OPR)
LCSs are used to monitor laboratory accuracy and precision by calculating the percent recoveries of the spiked compounds. Per DOD QSM and method criteria, acceptable performance is determined by:

1. Recoveries of the isotopically-labeled extraction standards to fall within 40-135% control limits for the tetra- through octachlorinated congeners, or as stated in the data package;

2. Recoveries (accuracy) of the unlabeled compounds should be within $\pm$35% when spiked at the method quantitation limit and within $\pm$30% when spiked above 20 times the method quantitation limit, or as stated in the data package;

3. When duplicate OPR are required, the relative percent difference (RPD) of the unlabeled analytes concentrations should be within 30% when spiked at the method quantitation limit and within $\pm$20% when spiked above 20 times the method quantitation limit.

- Sample OPR14393 was used as the aqueous LCS/LCSD during the 8/2/07 analytical run. All criteria were met. No qualifiers were applied. Sample F51300-31 was were analyzed in conjunction with this LCS.

- Sample OPR14398 was used as the solid LCS/LCSD during the 8/8/07 analytical run. All criteria were met. No qualifiers were applied. Samples F51300-1, -4 thru -14, and -21 thru -23 were analyzed in conjunction with this LCS.

- Sample OPR14402 was used as the solid LCS/LCSD during the 8/9/07 analytical run. All criteria were met. No qualifiers were applied. Samples F51300-1, -4 thru -14, and -21 thru -23 were analyzed in conjunction with this LCS.

- Sample OPR14410 was used as the solid LCS/LCSD during the 8/16/07 analytical run. All criteria were met. No qualifiers were applied. Samples F51300-2 and -3 were analyzed in conjunction with this LCS.

IX-Matrix Spike/Matrix Spike Duplicate
Data for matrix spike/matrix spike duplicates (MS/MSD) are generated to determine long-term precision and accuracy of the analytical method on various matrices and to demonstrate acceptable compound recovery by the laboratory at the time of sample analysis. The percent recoveries (%Rs) and the relative percent difference (RPD) must be within the specified control limits. Per DoD QSM, MS/MSD recoveries must be within in-house laboratory limits (75-125%) and RPD $\leq$20%.

- MS/MSD analysis was not performed on an RFAAP sample. No data qualification was required.

X-Field Duplicate Sample Analysis
Field duplicates were collected to identify the cumulative precision of the sampling and analytical process and sent to the laboratory blind. The RPD was calculated only for those analytes which were detected in both samples of the duplicate pair. Analytes that were rejected (R-qualified) in either sample of the duplicate pair were excluded from the duplicate assessment. Precision control criterion was established at 50% RPD for the aqueous and solid samples. Analytical results were qualified as estimated (J) for any RPDs exceeding criteria.

- Field duplicate pairs in this data package included F51300-9 & F51300-10, and F51300-12 & F51300-13. Analytes with high RPDs included OCDD (83%) in duplicate pair F51300-9/10; and 1,2,3,4,6,7,8-HpCDD (119%), OCDD (133%), 1,2,3,4,6,7,8-HpCDF (54%), and OCDF (85%). All results for these four compounds have been qualified "J/UJ".

XI-Quantitation Verification
The accuracy of analytical results was verified through the calculation of at least one the several parameters such as the %D, %RSD, % recovery, and/or compound concentration. Values were found to be within 10%. Any value reported by the laboratory as estimated "A" based on an analyte to internal standard ratio below the calibration curve was qualified as estimated "J". The signal signal-to-noise ratio (S/N) must be greater than 2.5 for each selected ion current profile (SICP) and for each GC signal representing the elution of a target analyte or labeled standard. Any detected value with ether interference (I-lab flag) was qualified as estimated "J". When the ion ratio failed the 25% criteria (*-lab flag), the estimated maximum possible concentration (EMPC) was reported and flagged estimated "J". If of quantitation interference was present (Q-lab flag), the date was flagged estimated "J" for detects and "UJ" for non-detects.

- The 2,3,7,8-TCDF, 1,2,3,4,6,7,8-HpCDF, and OCDF results in F51300-1 have been qualified "J" as estimated since the amount detected was less than the Lower Method Calibration Limit.

- The 1,2,3,4,6,7,8-HpCDF result in F51300-2 has been qualified "J" as estimated since the amount detected was less than the Lower Method Calibration Limit, while the OCDD result has been qualified "J" as estimated because the detected amount exceeded the Upper Calibration Limit.

- The 1,2,3,4,6,7,8-HpCDF result in F51300-3 has been qualified "J" as estimated since the amount detected was less than the Lower Method Calibration Limit. The lab reported 1,2,3,4,7,8,9-HpCDF as an EMPC, but with a EMPC of 0.00 pg/g – the result should therefore be used as a non-detect (ND) at an EDL of 1.22 pg/g.

- The 1,2,3,4,7,8-HxCDD, 1,2,3,6,7,8-HxCDD, 1,2,3,7,8,9-HxCDD, 1,2,3,4,7,8-HxCDF, 1,2,3,6,7,8-HxCDF, 1,2,3,4,6,7,8-HpCDF, and OCDF results in F51300-4 have been qualified "J" as estimated since the amount detected was less than the Lower Method Calibration Limit. The ion abundance ratios for 1,2,3,4,7,8-HxCDD, 1,2,3,7,8,9-HxCDD, and 1,2,3,4,7,8-HxCDF did not meet criteria and have been reported as an Estimated Maximum Possible Concentration (EPMC). Since the results have already been qualified "J", no further qualification is required. The OCDD result has been qualified "J" as estimated because the detected amount exceeded the Upper Calibration Limit.

- The 2,3,7,8-TCDF, 1,2,3,4,7,8-HxCDF, and 1,2,3,4,6,7,8-HpCDF results in F51300-5 have been qualified "J" as estimated since the amount detected was less than the Lower Method Calibration Limit. The ion abundance ratio for 2,3,7,8-TCDF did not meet criteria and has been reported as an Estimated Maximum Possible Concentration (EPMC). Since the result has already been qualified "J", no further qualification is required.

- The 2,3,7,8-TCDF and OCDF results in F51300-6 have been qualified "J" as estimated since the amount detected was less than the Lower Method Calibration Limit. The ion abundance ratio for 2,3,7,8-TCDF did not meet criteria and has been reported as an Estimated Maximum Possible Concentration (EPMC). Since the result has already been qualified "J", no further qualification is required.

- The 1,2,3,6,7,8-HxCDD, 1,2,3,7,8,9-HxCDD, 2,3,7,8-TCDF, 1,2,3,4,6,7,8-HpCDF, and OCDF results in F51300-7 have been qualified "J" as estimated since the amount detected was less than the Lower Method Calibration Limit. The ion abundance ratio for 1,2,3,7,8,9-HxCDD did not meet criteria and has been reported as an Estimated Maximum Possible Concentration (EPMC). Since the results have already been qualified "J", no further qualification is required. The OCDD result has been qualified "J" as estimated because the detected amount exceeded the Upper Calibration Limit.

- The 1,2,3,7,8,9-HxCDD, 2,3,7,8-TCDF, 1,2,3,4,6,7,8-HpCDF, and OCDF results in F51300-8 have been qualified "J" as estimated since the amount detected was less than the Lower Method Calibration Limit. The ion abundance ratios for 1,2,3,7,8,9-HxCDD, 1,2,3,4,6,7,8-HpCDF, and OCDF did not meet criteria and have been reported as an Estimated Maximum Possible Concentration (EPMC). Since the results have already been qualified "J", no further qualification is required.

- The 2,3,7,8-TCDD, 1,2,3,4,6,7,8-HpCDD, 2,3,7,8-TCDF, 1,2,3,7,8-PeCDF, 1,2,3,4,7,8-HxCDF, 1,2,3,6,7,8-HxCDF, and 1,2,3,4,6,7,8-HpCDF results in F51300-9 have been qualified "J" as estimated since the amount detected was less than the Lower Method Calibration Limit. The ion abundance ratios for 2,3,7,8-TCDD, 2,3,7,8-TCDF, 1,2,3,7,8-PeCDF, and 1,2,3,4,7,8-HxCDF did not meet criteria and have been reported as an Estimated Maximum Possible Concentration (EPMC). Since the results have already been qualified "J", no further qualification is required.

- The 1,2,3,4,6,7,8-HpCDD, 2,3,7,8-TCDF, 2,3,4,7,8-PeCDF, 1,2,3,4,7,8-HxCDF, 1,2,3,4,6,7,8-HpCDF, OCDF results in F51300-10 have been qualified "J" as estimated since the amount detected was less than the Lower Method Calibration Limit. The ion abundance ratios for 1,2,3,4,6,7,8-HpCDD, 2,3,4,7,8-PeCDF, 1,2,3,4,7,8-HxCDF, 1,2,3,4,6,7,8-HpCDF did not meet criteria and have been reported as an Estimated Maximum Possible Concentration (EPMC). Since the results have already been qualified "J", no further qualification is required.

- The 1,2,3,7,8-PeCDD, 1,2,3,4,7,8-HxCDD, 1,2,3,6,7,8-HxCDD, 1,2,3,7,8,9-HxCDD, 2,3,7,8-TCDF, 1,2,3,7,8-PeCDF, 2,3,4,7,8-PeCDF, 1,2,3,4,7,8-HxCDF, 1,2,3,6,7,8-HxCDF, 2,3,4,6,7,8-HxCDF, 1,2,3,7,8,9-HxCDF, 1,2,3,4,6,7,8-HpCDF, 1,2,3,4,7,8,9-HpCDF, and OCDF results in F51300-11 have been qualified "J" as estimated since the amount detected was less than the Lower Method Calibration Limit. The ion abundance ratios for 1,2,3,7,8-PeCDD, 1,2,3,4,7,8-HxCDD, 1,2,3,6,7,8-HxCDD, 2,3,7,8-TCDF, and 1,2,3,7,8-PeCDF did not meet criteria and have been reported as an Estimated Maximum Possible Concentration (EPMC). Since the results have already been qualified "J", no further qualification is required.

- The 2,3,7,8-TCDF, 1,2,3,4,7,8-HxCDF, 1,2,3,4,6,7,8-HpCDF, and OCDF results in F51300-12 have been qualified "J" as estimated since the amount detected was less than the Lower Method Calibration Limit. The ion abundance ratio for 2,3,7,8-TCDF did not meet criteria and has been reported as an Estimated Maximum Possible Concentration (EPMC). Since the result has already been qualified "J", no further qualification is required.

- The 1,2,3,7,8,9-HxCDD, 1,2,3,4,7,8-HxCDF, 1,2,3,4,6,7,8-HpCDF, and OCDF results in F51300-13 have been qualified "J" as estimated since the amount detected was less than the Lower Method Calibration Limit. The OCDD result has been qualified "J" as estimated because the detected amount exceeded the Upper Calibration Limit.

- The 1,2,3,6,7,8-HxCDD, 1,2,3,4,7,8-HxCDF, 1,2,3,4,6,7,8-HpCDF, and OCDF results in F51300-14 have been qualified "J" as estimated since the amount detected was less than the Lower Method Calibration Limit. The ion abundance ratio for 1,2,3,6,7,8-HxCDD did not meet criteria and has been reported as an Estimated Maximum Possible Concentration (EPMC). Since the result has already been qualified "J", no further qualification is required.

- The 1,2,3,7,8-PeCDD, 1,2,3,4,7,8-HxCDD, 1,2,3,6,7,8-HxCDD, 1,2,3,7,8,9-HxCDD, 2,3,7,8-TCDF, 1,2,3,7,8-PeCDF, 2,3,4,7,8-PeCDF, 1,2,3,4,7,8-HxCDF, 1,2,3,6,7,8-HxCDF, 2,3,4,6,7,8-HxCDF, and 1,2,3,4,7,8,9-HpCDF results in F51300-21 have been qualified "J" as estimated since the amount detected was less than the Lower Method Calibration Limit. The ion abundance ratios for 1,2,3,7,8-PeCDD, 1,2,3,4,7,8-HxCDD, and 1,2,3,4,7,8,9-HpCDF did not meet criteria and have been reported as an Estimated Maximum Possible Concentration (EPMC). Since the results have already been qualified "J", no further qualification is required.

- The 2,3,7,8-TCDD, 1,2,3,7,8-PeCDD, 1,2,3,4,7,8-HxCDD, 1,2,3,6,7,8-HxCDD, 1,2,3,7,8,9-HxCDD, 1,2,3,7,8-PeCDF, 2,3,4,7,8-PeCDF, 1,2,3,4,7,8-HxCDF, 1,2,3,6,7,8-HxCDF, 2,3,4,6,7,8-HxCDF, 1,2,3,7,8,9-HxCDF, and 1,2,3,4,6,7,8-HpCDF results in F51300-22 have been qualified "J" as estimated since the amount detected was less than the Lower Method Calibration Limit. The ion abundance ratios for 2,3,7,8-TCDD and 1,2,3,7,8-PeCDD did not meet criteria and have been reported as an Estimated Maximum Possible Concentration (EPMC). Since the results have already been qualified "J", no further qualification is required.

- The 1,2,3,4,6,7,8-HpCDD, 2,3,7,8-TCDF, 1,2,3,7,8-PeCDF, 1,2,3,4,6,7,8-HpCDF, and OCDF results in F51300-23 have been qualified "J" as estimated since the amount detected was less than the Lower Method Calibration Limit. The ion abundance ratios for 1,2,3,7,8-PeCDF and OCDF did not meet criteria and have been reported as an Estimated Maximum Possible Concentration (EPMC). Since the results have already been qualified "J", no further qualification is required.

- The 1,2,3,4,6,7,8-HpCDF, and OCDF results in F51300-31 have been qualified "J" as estimated since the amount detected was less than the Lower Method Calibration Limit.

Sample: F51300-3, OCDD

A(x) = sum of the integrated ion abundances of the quantitation ions for the unlabeled ions;
A(is) = sum of the integrated ion abundances of the quantitation ions for the labeled ions;
Q(is) = quantity, in ng/ul, of the internal standard added to the sample before extraction;
Avg. RRF = calculated mean relative response factor for the unlabeled analyte.
Ws = weight of sample (g)
Ps = percent solids/100

$$\text{Conc. (ng/L)} = \frac{(A(x)) * Q(is) * 1000}{A(is) * \text{Avg. RRF} * Ws * Ps} = \frac{(232000000) * 4.0 * 1000}{(41200000) * 1.0783 * 11.94 * 0.824} = 2120 \text{ pg/g}$$

Reported Value = 2120 pg/g
% Difference = 0.0%
Values were within 10% difference

USEPA Region III Validation Qualifiers

(No Code) = Confirmed identification.

B = The analyte has been detected in the sample and the associated laboratory or field blank.

J = Indicates an estimated value for (1) estimated value due to QC non-conformance. Reported value may not be accurate or precise, (2) estimating a concentration as a tentatively identified compound as indicated by the mass spectral and retention time data, or (3) estimating a concentration ≥ EDL and <MRL or <3*EDL, whichever is greater.

K = Analyte present. Reported value may be biased high (estimated) due to QC non-conformance.

L = Analyte present. Reported value may be biased low (estimated) due to QC non-conformance.

R = Unreliable result. Analyte may or may not be present in the sample due to QC non-conformance.

UL = Value is estimated bias low and not detected due to QC non-conformance. Reporting limit may be inaccurate or imprecise. Quantitation limit is probably higher.

UJ = Value is estimated and not detected due to QC non-conformance. Reporting limit may be inaccurate or imprecise.

Laboratory Qualifiers

(No Code) = Confirmed identification.

U = Not detected. The associated number indicates the compound reporting limit for the sample.

A (Dioxins) = B (Metals) = The reported value was obtained from a reading <MRL and ≥EDL and is considered estimated.

B (Organics) = The analyte or compound has been detected in the sample and laboratory method blank. It indicates probable blank contamination.

E (Metals) = Reported value is estimated because of the presence of interferences.

E (Organics) = Identifies compounds whose concentrations exceed the upper level of the calibration range.

EMPC (Dioxins) = The ion-abundance ratio between the two characteristic PCDD/PCDF ions was outside accepted ranges. The detected PCDD/PCDF was reported as an estimated maximum possible concentration (EMPC).

D = Indicates sample was analyzed at a dilution.

J = Indicates an estimated value for (1) estimating a concentration as a tentatively identified compound as indicated by the mass spectral and retention time data, or (2) estimating a concentration <MRL and ≥ EDL.

N (Organics) = Indicates presumptive evidence of a compound for tentatively identified compounds using a library search.

N (Metals) = Laboratory spike sample recovery not within control limits.

P (Organics) = Target analyte confirmation >40% difference for detected compound between the primary and secondary columns. The lower of the two values was reported.

* (Metals) = Duplicate analysis not within control limits.

* (Organics) = Surrogate outside of QC limits on both original and re-analysis.

Method 8290
F51300-1
Accutest

DATA VAL

Analytical Data Summary Sheet

Analyte	Amount (pg/g)	EDL (pg/g)	EMPC (pg/g)	RT (min.)	Ratio	Qualifier	QUALIFIER
2,3,7,8-TCDD	ND	0.369					
1,2,3,7,8-PeCDD	ND	0.475					
1,2,3,4,7,8-HxCDD	ND	0.475					
1,2,3,6,7,8-HxCDD	ND	0.475					
1,2,3,7,8,9-HxCDD	ND	0.475					
1,2,3,4,6,7,8-HpCDD	9.48			39.91	1.03		J
OCDD	441			44.03	0.91		J
2,3,7,8-TCDF	0.340			30.25	0.69	A	J
1,2,3,7,8-PeCDF	ND	0.475					
2,3,4,7,8-PeCDF	ND	0.475					
1,2,3,4,7,8-HxCDF	ND	0.475					
1,2,3,6,7,8-HxCDF	ND	0.475					
2,3,4,6,7,8-HxCDF	ND	0.475					
1,2,3,7,8,9-HxCDF	ND	0.475					
1,2,3,4,6,7,8-HpCDF	0.838			38.68	1.10	A	BJ
1,2,3,4,7,8,9-HpCDF	ND	0.475					
OCDF	2.11			44.32	0.89	A	BJ
Total TCDDs	ND	0.369					
Total PeCDDs	ND	0.475					
Total HxCDDs	0.927		2.01				
Total HpCDDs	29.5						
Total TCDFs	0.340						
Total PeCDFs	ND	0.475					
Total HxCDFs	ND	0.475	0.450				
Total HpCDFs	2.03						
WHO-2005 TEQ (ND=0)	0.270		0.270				
WHO-2005 TEQ (ND=½)	0.939		0.939				

Client Information			**Sample Information**	
Project Name:	F51300		Report Basis:	Dry
			Matrix:	Solid
Sample ID:	F51300-1		Weight / Volume:	11.59 g
			Solids / Lipids:	90.8 %
			Original pH :	NA
Laboratory Information			Batch ID:	WG14398
Project ID:	G383-585		Instrument:	HRMS3
Sample ID:	G383-585-1B		Filename:	c08aug07a_2-6
Collection Date/Time:	07/25/07	7:25	Retchk:	c08aug07a-7
Receipt Date/Time:	07/31/07	10:20	Begin ConCal:	c08aug07a-7
Extraction Date:	08/05/07		End ConCal:	c08aug07a_2-14
Analysis Date/Time:	08/08/07	19:33	Initial Cal:	m8290-c110206a

Method 8290
F51300-2
Accutest

Analytical Data Summary Sheet

DATA VAL QUALIFIER

Analyte	Amount pg/g	EDL pg/g	EMPC pg/g	RT (min.)	Ratio	Qualifier	
2,3,7,8-TCDD	ND	0.532					
1,2,3,7,8-PeCDD	ND	0.637					
1,2,3,4,7,8-HxCDD	ND	0.859					
1,2,3,6,7,8-HxCDD	ND	0.874					
1,2,3,7,8,9-HxCDD	ND	0.887					
1,2,3,4,6,7,8-HpCDD	26.7			40:42	1.07		J
OCDD	4990			45:15	0.89	E	J
2,3,7,8-TCDF	ND	0.379					
1,2,3,7,8-PeCDF	ND	0.552					
2,3,4,7,8-PeCDF	ND	0.552					
1,2,3,4,7,8-HxCDF	ND	0.568					
1,2,3,6,7,8-HxCDF	ND	0.552					
2,3,4,6,7,8-HxCDF	ND	0.565					
1,2,3,7,8,9-HxCDF	ND	0.658					
1,2,3,4,6,7,8-HpCDF	0.845			39:24	1.11	A	BJ
1,2,3,4,7,8,9-HpCDF	ND	1.14					
OCDF	ND	2.69					UJ
Total TCDDs	ND	0.532					
Total PeCDDs	ND	0.637					
Total HxCDDs	1.81						
Total HpCDDs	53.6						
Total TCDFs	ND	0.379					
Total PeCDFs	ND	0.552					
Total HxCDFs	ND	0.658					
Total HpCDFs	0.845						
WHO-2005 TEQ (ND=0)	1.77		1.77				
WHO-2005 TEQ (ND=½)	2.72		2.72				

Client Information			**Sample Information**	
Project Name:	F51300		Report Basis:	Dry
			Matrix:	Solid
Sample ID:	F51300-2		Weight / Volume:	10.52 g
			Solids / Lipids:	86.1 %
			Original pH :	NA
Laboratory Information			Batch ID:	WG14410
Project ID:	G383-585		Instrument:	HRMS1
Sample ID:	G383-585-2C		Filename:	a18aug07a_5-8
Collection Date/Time:	07/25/07	7:35	Retchk:	a18aug07a_4-14
Receipt Date/Time:	07/31/07	10:20	Begin ConCal:	a18aug07a_4-14
Extraction Date:	08/13/07		End ConCal:	a18aug07a_5-14
Analysis Date/Time:	08/20/07	16:21	Initial Cal:	m8290-071007a

Method 8290
F51300-3
Accutest

Analytical Data Summary Sheet

DATA VAL QUALIFIER

Analyte	Amount pg/g	EDL pg/g	EMPC pg/g	RT (min.)	Ratio		Qualifier	
2,3,7,8-TCDD	ND	0.528						
1,2,3,7,8-PeCDD	ND	0.579						
1,2,3,4,7,8-HxCDD	ND	0.852						
1,2,3,6,7,8-HxCDD	ND	0.867						
1,2,3,7,8,9-HxCDD	ND	0.880						
1,2,3,4,6,7,8-HpCDD	11.0			40:42	1.02			J
OCDD	2120			45:15	0.90			J
2,3,7,8-TCDF	ND	0.357						
1,2,3,7,8-PeCDF	ND	0.508						
2,3,4,7,8-PeCDF	ND	0.508						
1,2,3,4,7,8-HxCDF	ND	0.575						
1,2,3,6,7,8-HxCDF	ND	0.542						
2,3,4,6,7,8-HxCDF	ND	0.571						
1,2,3,7,8,9-HxCDF	ND	0.665						
1,2,3,4,6,7,8-HpCDF	EMPC	0.959	0.821	39:22	0.81	*	A	BJ
1,2,3,4,7,8,9-HpCDF	EMPC	1.22	0.00	0:00	0.00	*		U
OCDF	ND	3.09						UJ
Total TCDDs	ND	0.528						
Total PeCDDs	ND	0.579						
Total HxCDDs	ND	0.880	0.648					
Total HpCDDs	25.3							
Total TCDFs	ND	0.357						
Total PeCDFs	ND	0.508						
Total HxCDFs	ND	0.665						
Total HpCDFs	1.53							
WHO-2005 TEQ (ND=0)	0.746		0.754					
WHO-2005 TEQ (ND=½)	1.66		1.66					

Client Information			**Sample Information**	
Project Name:	F51300		Report Basis:	Dry
			Matrix:	Solid
Sample ID:	F51300-3		Weight / Volume:	11.94 g
			Solids / Lipids:	82.4 %
			Original pH :	NA
Laboratory Information			Batch ID:	WG14410
Project ID:	G383-585		Instrument:	HRMS1
Sample ID:	G383-585-3C		Filename:	a18aug07a_5-9
Collection Date/Time:	07/25/07	7:45	Retchk:	a18aug07a_4-14
Receipt Date/Time:	07/31/07	10:20	Begin ConCal:	a18aug07a_4-14
Extraction Date:	08/13/07		End ConCal:	a18aug07a_5-14
Analysis Date/Time:	08/20/07	17:09	Initial Cal:	m8290-071007a

Method 8290
F51300-4
Accutest

DATA VAL
QUALIFIER

Analytical Data Summary Sheet

Analyte	Amount (pg/g)	EDL (pg/g)	EMPC (pg/g)	RT (min.)	Ratio		Qualifier	
2,3,7,8-TCDD	ND	0.240						
1,2,3,7,8-PeCDD	ND	0.548						
1,2,3,4,7,8-HxCDD	EMPC	0.548	0.235	36.57	0.68	*	A	J
1,2,3,6,7,8-HxCDD	0.318			36.67	1.33		A	
1,2,3,7,8,9-HxCDD	EMPC	0.548	0.432	36.89	1.45	*	A	
1,2,3,4,6,7,8-HpCDD	51.0			39.90	1.09			
OCDD	5350			44.04	0.91		E	
2,3,7,8-TCDF	ND	0.243						
1,2,3,7,8-PeCDF	ND	0.548						
2,3,4,7,8-PeCDF	ND	0.548						
1,2,3,4,7,8-HxCDF	EMPC	0.548	0.423	35.87	0.91	*	A	BJ
1,2,3,6,7,8-HxCDF	0.125			35.97	1.17		A	BJ
2,3,4,6,7,8-HxCDF	ND	0.548						
1,2,3,7,8,9-HxCDF	ND	0.548						
1,2,3,4,6,7,8-HpCDF	2.00			38.65	1.05		A	BJ
1,2,3,4,7,8,9-HpCDF	ND	0.548						
OCDF	2.83			44.32	0.84		A	BJ
Total TCDDs	ND	0.240						
Total PeCDDs	ND	0.548	0.248					
Total HxCDDs	2.68		3.97					
Total HpCDDs	133							
Total TCDFs	ND	0.243	0.189					
Total PeCDFs	ND	0.548						
Total HxCDFs	0.316		0.739					
Total HpCDFs	2.00		2.33					
WHO-2005 TEQ (ND=0)	2.18		2.29					
WHO-2005 TEQ (ND=½)	2.82		2.84					

Client Information			**Sample Information**		
Project Name:	F51300		Report Basis:	Dry	
			Matrix:	Solid	
Sample ID:	F51300-4		Weight / Volume:	12.68 g	
			Solids / Lipids:	72.0	%
			Original pH :	NA	
Laboratory Information			Batch ID:	WG14398	
Project ID:	G383-585		Instrument:	HRMS3	
Sample ID:	G383-585-4B		Filename:	c08aug07a_2-9	
Collection Date/Time:	07/25/07	8:00	Retchk:	c08aug07a-7	
Receipt Date/Time:	07/31/07	10:20	Begin ConCal:	c08aug07a-7	
Extraction Date:	08/05/07		End ConCal:	c08aug07a_2-14	
Analysis Date/Time:	08/08/07	21:57	Initial Cal:	m8290-c110206a	

Method 8290
F51300-5
Accutest

Analytical Data Summary Sheet

Analyte	Amount (pg/g)	EDL (pg/g)	EMPC (pg/g)	RT (min.)	Ratio	Qualifier	DATA VAL QUALIFIER
2,3,7,8-TCDD	ND	0.219					
1,2,3,7,8-PeCDD	ND	0.559					
1,2,3,4,7,8-HxCDD	ND	0.559					
1,2,3,6,7,8-HxCDD	ND	0.559					
1,2,3,7,8,9-HxCDD	ND	0.559					
1,2,3,4,6,7,8-HpCDD	11.8			39.90	1.07		J
OCDD	1830			44.03	0.91		J
2,3,7,8-TCDF	EMPC	0.264	0.320	30.22	0.51 *	A	J
1,2,3,7,8-PeCDF	ND	0.559					
2,3,4,7,8-PeCDF	ND	0.559					
1,2,3,4,7,8-HxCDF	0.137			35.88	1.22	A	BJ
1,2,3,6,7,8-HxCDF	ND	0.559					
2,3,4,6,7,8-HxCDF	ND	0.559					
1,2,3,7,8,9-HxCDF	ND	0.559					
1,2,3,4,6,7,8-HpCDF	0.723			38.67	1.19	A	BJ
1,2,3,4,7,8,9-HpCDF	ND	0.559					
OCDF	ND	1.12					UJ
Total TCDDs	ND	0.219					
Total PeCDDs	ND	0.559					
Total HxCDDs	ND	0.559	0.911				
Total HpCDDs	31.9						
Total TCDFs	0.255		0.575				
Total PeCDFs	ND	0.559					
Total HxCDFs	0.137		0.273				
Total HpCDFs	0.985						
WHO-2005 TEQ (ND=0)	0.688		0.720				
WHO-2005 TEQ (ND=½)	1.35		1.37				

Client Information			**Sample Information**	
Project Name:	F51300		Report Basis:	Dry
			Matrix:	Solid
Sample ID:	F51300-5		Weight / Volume:	11.14 g
			Solids / Lipids:	80.2 %
			Original pH :	NA
Laboratory Information			Batch ID:	WG14402
Project ID:	G383-585		Instrument:	HRMS3
Sample ID:	G383-585-5B		Filename:	c08aug07a_2-10
Collection Date/Time:	07/25/07	8:10	Retchk:	c08aug07a-7
Receipt Date/Time:	07/31/07	10:20	Begin ConCal:	c08aug07a-7
Extraction Date:	08/07/07		End ConCal:	c08aug07a_2-14
Analysis Date/Time:	08/08/07	22:46	Initial Cal:	m8290-c110206a

Method 8290
F51300-6
Accutest

Analytical Data Summary Sheet

Analyte	Amount (pg/g)	EDL (pg/g)	EMPC (pg/g)	RT (min.)	Ratio		Qualifier	DATA VAL QUALIFIER
2,3,7,8-TCDD	ND	0.199						
1,2,3,7,8-PeCDD	ND	0.525						
1,2,3,4,7,8-HxCDD	ND	0.525						
1,2,3,6,7,8-HxCDD	ND	0.525						
1,2,3,7,8,9-HxCDD	ND	0.525						
1,2,3,4,6,7,8-HpCDD	7.69			39.91	1.02			J
OCDD	894			44.03	0.90			J
2,3,7,8-TCDF	EMPC	0.212	0.181	30.19	0.32	*	A	J
1,2,3,7,8-PeCDF	ND	0.525						
2,3,4,7,8-PeCDF	ND	0.525						
1,2,3,4,7,8-HxCDF	ND	0.525						
1,2,3,6,7,8-HxCDF	ND	0.525						
2,3,4,6,7,8-HxCDF	ND	0.525						
1,2,3,7,8,9-HxCDF	ND	0.525						
1,2,3,4,6,7,8-HpCDF	ND	0.525						UJ
1,2,3,4,7,8,9-HpCDF	ND	0.525						
OCDF	0.963			44.34	0.97		A	BJ
Total TCDDs	ND	0.199						
Total PeCDDs	ND	0.525						
Total HxCDDs	ND	0.525	0.462					
Total HpCDDs	19.3							
Total TCDFs	0.174		0.355					
Total PeCDFs	ND	0.525						
Total HxCDFs	0.172							
Total HpCDFs	ND	0.525						
WHO-2005 TEQ (ND=0)	0.345		0.363					
WHO-2005 TEQ (ND=½)	0.994		1.00					

Client Information			**Sample Information**	
Project Name:	F51300		Report Basis:	Dry
			Matrix:	Solid
Sample ID:	F51300-6		Weight / Volume:	11.46 g
			Solids / Lipids:	83.0 %
			Original pH :	NA
Laboratory Information			Batch ID:	WG14402
Project ID:	G383-585		Instrument:	HRMS3
Sample ID:	G383-585-6B		Filename:	c08aug07a_2-11
Collection Date/Time:	07/25/07	8:20	Retchk:	c08aug07a-7
Receipt Date/Time:	07/31/07	10:20	Begin ConCal:	c08aug07a-7
Extraction Date:	08/07/07		End ConCal:	c08aug07a_2-14
Analysis Date/Time:	08/08/07	23:34	Initial Cal:	m8290-c110206a

Method 8290
F51300-7
Accutest

Analytical Data Summary Sheet

Analyte	Amount (pg/g)	EDL (pg/g)	EMPC (pg/g)	RT (min.)	Ratio		Qualifier
2,3,7,8-TCDD	ND	0.294					
1,2,3,7,8-PeCDD	ND	0.528					
1,2,3,4,7,8-HxCDD	ND	0.528					
1,2,3,6,7,8-HxCDD	0.558			36.69	1.31		A
1,2,3,7,8,9-HxCDD	EMPC	0.543	0.682	36.91	1.50	*	A
1,2,3,4,6,7,8-HpCDD	46.4			39.90	1.03		
OCDD	5980			44.04	0.90		E
2,3,7,8-TCDF	0.378			30.22	0.76		A
1,2,3,7,8-PeCDF	ND	0.528					
2,3,4,7,8-PeCDF	ND	0.528					
1,2,3,4,7,8-HxCDF	ND	0.528					
1,2,3,6,7,8-HxCDF	ND	0.528					
2,3,4,6,7,8-HxCDF	ND	0.528					
1,2,3,7,8,9-HxCDF	ND	0.528					
1,2,3,4,6,7,8-HpCDF	2.19			38.68	1.07		A
1,2,3,4,7,8,9-HpCDF	ND	0.528					
OCDF	5.17			44.31	0.76		A
Total TCDDs	ND	0.294					
Total PeCDDs	0.714		1.04				
Total HxCDDs	4.20		5.28				
Total HpCDDs	125						
Total TCDFs	0.378		0.860				
Total PeCDFs	ND	0.528	0.177				
Total HxCDFs	1.02		1.42				
Total HpCDFs	5.52						
WHO-2005 TEQ (ND=0)	2.38		2.44				
WHO-2005 TEQ (ND=½)	3.03		3.08				

DATA VAL QUALIFIER

J

BJ

BJ

Client Information			**Sample Information**	
Project Name:	F51300		Report Basis:	Dry
			Matrix:	Solid
Sample ID:	F51300-7		Weight / Volume:	11.29 g
			Solids / Lipids:	83.9 %
			Original pH :	NA
Laboratory Information			Batch ID:	WG14402
Project ID:	G383-585		Instrument:	HRMS3
Sample ID:	G383-585-7B		Filename:	c08aug07a_2-12
Collection Date/Time:	07/25/07	8:15	Retchk:	c08aug07a-7
Receipt Date/Time:	07/31/07	10:20	Begin ConCal:	c08aug07a-7
Extraction Date:	08/07/07		End ConCal:	c08aug07a_2-14
Analysis Date/Time:	08/09/07	0:23	Initial Cal:	m8290-c110206a

Method 8290
F51300-8
Accutest

Analytical Data Summary Sheet

Analyte	Amount (pg/g)	EDL (pg/g)	EMPC (pg/g)	RT (min.)	Ratio		Qualifier
2,3,7,8-TCDD	ND	0.220					
1,2,3,7,8-PeCDD	ND	0.515					
1,2,3,4,7,8-HxCDD	ND	0.515					
1,2,3,6,7,8-HxCDD	ND	0.515					
1,2,3,7,8,9-HxCDD	EMPC	0.515	0.233	36.92	0.93	*	A
1,2,3,4,6,7,8-HpCDD	21.2			39.91	1.03		
OCDD	2990			44.04	0.89		
2,3,7,8-TCDF	0.328			30.25	0.85		A
1,2,3,7,8-PeCDF	ND	0.515					
2,3,4,7,8-PeCDF	ND	0.515					
1,2,3,4,7,8-HxCDF	ND	0.515					
1,2,3,6,7,8-HxCDF	ND	0.515					
2,3,4,6,7,8-HxCDF	ND	0.515					
1,2,3,7,8,9-HxCDF	ND	0.515					
1,2,3,4,6,7,8-HpCDF	EMPC	0.515	0.389	38.68	0.82	*	A
1,2,3,4,7,8,9-HpCDF	ND	0.515					
OCDF	EMPC	1.03	0.661	44.30	1.08	*	A
Total TCDDs	ND	0.220					
Total PeCDDs	ND	0.515	0.124				
Total HxCDDs	1.26		1.50				
Total HpCDDs	61.3						
Total TCDFs	0.328		0.649				
Total PeCDFs	ND	0.515					
Total HxCDFs	0.103						
Total HpCDFs	ND	0.515	0.707				
WHO-2005 TEQ (ND=0)	1.14		1.17				
WHO-2005 TEQ (ND=½)	1.78		1.78				

DATA VAL QUALIFIER

J

BJ

BJ

Client Information			**Sample Information**	
Project Name:	F51300		Report Basis:	Dry
			Matrix:	Solid
Sample ID:	F51300-8		Weight / Volume:	12.15 g
			Solids / Lipids:	79.9 %
			Original pH :	NA
Laboratory Information			Batch ID:	WG14402
Project ID:	G383-585		Instrument:	HRMS3
Sample ID:	G383-585-8B		Filename:	c08aug07a_2-13
Collection Date/Time:	07/25/07	8:25	Retchk:	c08aug07a-7
Receipt Date/Time:	07/31/07	10:20	Begin ConCal:	c08aug07a-7
Extraction Date:	08/07/07		End ConCal:	c08aug07a_2-14
Analysis Date/Time:	08/09/07	1:11	Initial Cal:	m8290-c110206a

Method 8290
F51300-9
Accutest

Analytical Data Summary Sheet

Analyte	Amount (pg/g)	EDL (pg/g)	EMPC (pg/g)	RT (min.)	Ratio		Qualifier
2,3,7,8-TCDD	EMPC	0.231	0.166	31.02	0.35	*	A
1,2,3,7,8-PeCDD	ND	0.531					
1,2,3,4,7,8-HxCDD	ND	0.531					
1,2,3,6,7,8-HxCDD	ND	0.531					
1,2,3,7,8,9-HxCDD	ND	0.531					
1,2,3,4,6,7,8-HpCDD	1.14			39.91	1.01		A
OCDD	56.8			44.04	0.93		
2,3,7,8-TCDF	EMPC	0.230	0.272	30.21	1.08	*	A
1,2,3,7,8-PeCDF	EMPC	0.531	0.0807	33.23	2.50	*	A
2,3,4,7,8-PeCDF	ND	0.531					
1,2,3,4,7,8-HxCDF	EMPC	0.531	0.159	35.90	1.60	*	A
1,2,3,6,7,8-HxCDF	0.0807			36.00	1.42		A
2,3,4,6,7,8-HxCDF	ND	0.531					
1,2,3,7,8,9-HxCDF	ND	0.531					
1,2,3,4,6,7,8-HpCDF	0.593			38.69	1.04		A
1,2,3,4,7,8,9-HpCDF	ND	0.531					
OCDF	ND	1.06					
Total TCDDs	ND	0.231	0.166				
Total PeCDDs	ND	0.531					
Total HxCDDs	ND	0.531					
Total HpCDDs	2.45						
Total TCDFs	ND	0.230	0.272				
Total PeCDFs	ND	0.531	0.0807				
Total HxCDFs	0.198		0.395				
Total HpCDFs	0.807						
WHO-2005 TEQ (ND=0)	0.0424		0.254				
WHO-2005 TEQ (ND=½)	0.685		0.735				

DATA VAL QUALIFIER
J
BJ
J
J
J
BJ
BJ
BJ
UJ

Client Information			**Sample Information**	
Project Name:	F51300		Report Basis:	Dry
			Matrix:	Solid
Sample ID:	F51300-9		Weight / Volume:	11.42 g
			Solids / Lipids:	82.5 %
			Original pH :	NA
Laboratory Information			Batch ID:	WG14402
Project ID:	G383-585		Instrument:	HRMS3
Sample ID:	G383-585-9B		Filename:	c08aug07a_3-4
Collection Date/Time:	07/25/07	8:35	Retchk:	c08aug07a_2-14
Receipt Date/Time:	07/31/07	10:20	Begin ConCal:	c08aug07a_2-14
Extraction Date:	08/07/07		End ConCal:	c08aug07a_3-14
Analysis Date/Time:	08/09/07	5:20	Initial Cal:	m8290-c110206a

Method 8290
F51300-10
Accutest

Analytical Data Summary Sheet

Analyte	Amount (pg/g)	EDL (pg/g)	EMPC (pg/g)	RT (min.)	Ratio		Qualifier	DATA VAL QUALIFIER
2,3,7,8-TCDD	ND	0.170						
1,2,3,7,8-PeCDD	ND	0.533						
1,2,3,4,7,8-HxCDD	ND	0.533						
1,2,3,6,7,8-HxCDD	ND	0.533						
1,2,3,7,8,9-HxCDD	ND	0.533						
1,2,3,4,6,7,8-HpCDD	EMPC	0.533	1.38	39.89	1.24	*	A	BJ
OCDD	138			44.02	0.87			J
2,3,7,8-TCDF	0.258			30.23	0.75		A	J
1,2,3,7,8-PeCDF	ND	0.533						
2,3,4,7,8-PeCDF	EMPC	0.533	0.0746	33.83	1.30	*	A	J
1,2,3,4,7,8-HxCDF	EMPC	0.533	0.141	35.88	0.79	*	A	BJ
1,2,3,6,7,8-HxCDF	ND	0.533						
2,3,4,6,7,8-HxCDF	ND	0.533						
1,2,3,7,8,9-HxCDF	ND	0.533						
1,2,3,4,6,7,8-HpCDF	EMPC	0.533	0.449	38.68	0.86	*	A	BJ
1,2,3,4,7,8,9-HpCDF	ND	0.533						
OCDF	1.16			44.32	0.80		A	BJ
Total TCDDs	ND	0.170						
Total PeCDDs	ND	0.533	0.102					
Total HxCDDs	ND	0.533						
Total HpCDDs	2.22		3.60					
Total TCDFs	0.354							
Total PeCDFs	ND	0.533	0.0746					
Total HxCDFs	ND	0.533	0.241					
Total HpCDFs	ND	0.533	0.449					
WHO-2005 TEQ (ND=0)	0.0675		0.122					
WHO-2005 TEQ (ND=½)	0.701		0.644					

Client Information			**Sample Information**	
Project Name:	F51300		Report Basis:	Dry
			Matrix:	Solid
Sample ID:	F51300-10		Weight / Volume:	11.59 g
			Solids / Lipids:	81.0 %
			Original pH :	NA
Laboratory Information			Batch ID:	WG14402
Project ID:	G383-585		Instrument:	HRMS3
Sample ID:	G383-585-10B		Filename:	c08aug07a_3-5
Collection Date/Time:	07/25/07	8:35	Retchk:	c08aug07a_2-14
Receipt Date/Time:	07/31/07	10:20	Begin ConCal:	c08aug07a_2-14
Extraction Date:	08/07/07		End ConCal:	c08aug07a_3-14
Analysis Date/Time:	08/09/07	6:08	Initial Cal:	m8290-c110206a

Method 8290
F51300-11
Accutest

Analytical Data Summary Sheet

Analyte	Amount (pg/g)	EDL (pg/g)	EMPC (pg/g)	RT (min.)	Ratio		Qualifier
2,3,7,8-TCDD	ND	0.137					
1,2,3,7,8-PeCDD	EMPC	0.446	0.119	34.01	0.84	*	A
1,2,3,4,7,8-HxCDD	EMPC	0.446	0.148	36.58	0.90	*	A
1,2,3,6,7,8-HxCDD	EMPC	0.446	0.310	36.66	0.92	*	A
1,2,3,7,8,9-HxCDD	0.308			36.90	1.36		A
1,2,3,4,6,7,8-HpCDD	14.8			39.89	1.12		
OCDD	736			44.03	0.91		
2,3,7,8-TCDF	EMPC	0.148	0.157	30.23	1.86	*	A
1,2,3,7,8-PeCDF	EMPC	0.446	0.291	33.21	1.97	*	A
2,3,4,7,8-PeCDF	0.282			33.81	1.34		A
1,2,3,4,7,8-HxCDF	1.92			35.87	1.40		A
1,2,3,6,7,8-HxCDF	0.683			35.96	1.07		A
2,3,4,6,7,8-HxCDF	0.246			36.46	1.06		A
1,2,3,7,8,9-HxCDF	0.121			37.24	1.26		A
1,2,3,4,6,7,8-HpCDF	3.51			38.67	1.02		A
1,2,3,4,7,8,9-HpCDF	0.287			40.57	0.92		A
OCDF	6.93			44.31	0.93		A
Total TCDDs	ND	0.137	0.0606				
Total PeCDDs	0.504		0.704				
Total HxCDDs	2.91		3.62				
Total HpCDDs	43.3						
Total TCDFs	0.225		1.24				
Total PeCDFs	0.877		2.01				
Total HxCDFs	5.71						
Total HpCDFs	8.43		8.60				
WHO-2005 TEQ (ND=0)	0.821		1.01				
WHO-2005 TEQ (ND=½)	1.17		1.08				

DATA VAL QUALIFIER

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Client Information			**Sample Information**	
Project Name:	F51300		Report Basis:	Dry
			Matrix:	Solid
Sample ID:	F51300-11		Weight / Volume:	14.27 g
			Solids / Lipids:	78.6 %
			Original pH :	NA
Laboratory Information			Batch ID:	WG14402
Project ID:	G383-585		Instrument:	HRMS3
Sample ID:	G383-585-11B		Filename:	c08aug07a_5-2
Collection Date/Time:	07/25/07	8:50	Retchk:	c08aug07a_4-10
Receipt Date/Time:	07/31/07	10:20	Begin ConCal:	c08aug07a_4-10
Extraction Date:	08/07/07		End ConCal:	c08aug07a_5-9
Analysis Date/Time:	08/10/07	0:17	Initial Cal:	m8290-c110206a

Method 8290
F51300-12
Accutest

Analytical Data Summary Sheet

DAM VAL QUALIFIER

Analyte	Amount (pg/g)	EDL (pg/g)	EMPC (pg/g)	RT (min.)	Ratio		Qualifier	
2,3,7,8-TCDD	ND	0.198						
1,2,3,7,8-PeCDD	ND	0.619						
1,2,3,4,7,8-HxCDD	ND	0.619						
1,2,3,6,7,8-HxCDD	ND	0.619						
1,2,3,7,8,9-HxCDD	ND	0.619						
1,2,3,4,6,7,8-HpCDD	9.87			39.90	1.08			J
OCDD	1490			44.03	0.90			J
2,3,7,8-TCDF	EMPC	0.182	0.260	30.25	0.92	*	A	J
1,2,3,7,8-PeCDF	ND	0.619						
2,3,4,7,8-PeCDF	ND	0.619						
1,2,3,4,7,8-HxCDF	0.144			35.87	1.12		A	BJ
1,2,3,6,7,8-HxCDF	ND	0.619						
2,3,4,6,7,8-HxCDF	ND	0.619						
1,2,3,7,8,9-HxCDF	ND	0.619						
1,2,3,4,6,7,8-HpCDF	0.617			38.68	0.98		A	BJ
1,2,3,4,7,8,9-HpCDF	ND	0.619						
OCDF	1.30			44.30	0.89		A	BJ
Total TCDDs	ND	0.198						
Total PeCDDs	ND	0.619	0.384					
Total HxCDDs	0.268							
Total HpCDDs	25.8							
Total TCDFs	ND	0.182	0.349					
Total PeCDFs	ND	0.619						
Total HxCDFs	0.235		0.384					
Total HpCDFs	1.23							
WHO-2005 TEQ (ND=0)	0.567		0.593					
WHO-2005 TEQ (ND=½)	1.28		1.29					

Client Information			**Sample Information**	
Project Name:	F51300		Report Basis:	Dry
			Matrix:	Solid
Sample ID:	F51300-12		Weight / Volume:	10.02 g
			Solids / Lipids:	80.6 %
			Original pH :	NA
Laboratory Information			Batch ID:	WG14402
Project ID:	G383-585		Instrument:	HRMS3
Sample ID:	G383-585-12B		Filename:	c08aug07a_5-3
Collection Date/Time:	07/25/07	8:50	Retchk:	c08aug07a_4-10
Receipt Date/Time:	07/31/07	10:20	Begin ConCal:	c08aug07a_4-10
Extraction Date:	08/07/07		End ConCal:	c08aug07a_5-9
Analysis Date/Time:	08/10/07	1:05	Initial Cal:	m8290-c110206a

Method 8290
F51300-13
Accutest

Analytical Data Summary Sheet

Analyte	Amount (pg/g)	EDL (pg/g)	EMPC (pg/g)	RT (min.)	Ratio	Qualifier
2,3,7,8-TCDD	ND	0.172				
1,2,3,7,8-PeCDD	ND	0.594				
1,2,3,4,7,8-HxCDD	ND	0.594				
1,2,3,6,7,8-HxCDD	ND	0.594				
1,2,3,7,8,9-HxCDD	0.188			36.88	1.33	A
1,2,3,4,6,7,8-HpCDD	39.1			39.90	1.08	
OCDD	7470			44.03	0.90	E
2,3,7,8-TCDF	ND	0.196				
1,2,3,7,8-PeCDF	ND	0.594				
2,3,4,7,8-PeCDF	ND	0.594				
1,2,3,4,7,8-HxCDF	0.185			35.88	1.11	A
1,2,3,6,7,8-HxCDF	ND	0.594				
2,3,4,6,7,8-HxCDF	ND	0.594				
1,2,3,7,8,9-HxCDF	ND	0.594				
1,2,3,4,6,7,8-HpCDF	1.07			38.68	1.06	A
1,2,3,4,7,8,9-HpCDF	ND	0.594				
OCDF	3.23			44.30	0.91	A
Total TCDDs	ND	0.172				
Total PeCDDs	ND	0.594	0.330			
Total HxCDDs	0.625		1.70			
Total HpCDDs	98.7					
Total TCDFs	ND	0.196	0.200			
Total PeCDFs	ND	0.594	0.0689			
Total HxCDFs	0.575					
Total HpCDFs	3.19					
WHO-2005 TEQ (ND=0)	2.68		2.68			
WHO-2005 TEQ (ND=½)	3.32		3.32			

DATA VAL QUALIFIER

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Client Information			**Sample Information**	
Project Name:	F51300		Report Basis:	Dry
			Matrix:	Solid
Sample ID:	F51300-13		Weight / Volume:	10.51 g
			Solids / Lipids:	80.0 %
			Original pH :	NA
Laboratory Information			Batch ID:	WG14402
Project ID:	G383-585		Instrument:	HRMS3
Sample ID:	G383-585-13B		Filename:	c08aug07a_5-4
Collection Date/Time:	07/25/07	9:00	Retchk:	c08aug07a_4-10
Receipt Date/Time:	07/31/07	10:20	Begin ConCal:	c08aug07a_4-10
Extraction Date:	08/07/07		End ConCal:	c08aug07a_5-9
Analysis Date/Time:	08/10/07	1:54	Initial Cal:	m8290-c110206a

Method 8290
F51300-14
Accutest

Analytical Data Summary Sheet

DATA VAL QUALIFIER

Analyte	Amount (pg/g)	EDL (pg/g)	EMPC (pg/g)	RT (min.)	Ratio		Qualifier	
2,3,7,8-TCDD	ND	0.192						
1,2,3,7,8-PeCDD	ND	0.540						
1,2,3,4,7,8-HxCDD	ND	0.540						
1,2,3,6,7,8-HxCDD	EMPC	0.540	0.106	36.69	0.98	*	A	J
1,2,3,7,8,9-HxCDD	ND	0.540						
1,2,3,4,6,7,8-HpCDD	7.82			39.90	1.05			J
OCDD	987			44.03	0.89			J
2,3,7,8-TCDF	ND	0.147						
1,2,3,7,8-PeCDF	ND	0.540						
2,3,4,7,8-PeCDF	ND	0.540						
1,2,3,4,7,8-HxCDF	0.177			35.87	1.11		A	BJ
1,2,3,6,7,8-HxCDF	ND	0.540						
2,3,4,6,7,8-HxCDF	ND	0.540						
1,2,3,7,8,9-HxCDF	ND	0.540						
1,2,3,4,6,7,8-HpCDF	0.984			38.69	1.19		A	BJ
1,2,3,4,7,8,9-HpCDF	ND	0.540						
OCDF	1.70			44.32	0.94		A	BJ
Total TCDDs	ND	0.192						
Total PeCDDs	ND	0.540	0.192					
Total HxCDDs	ND	0.540	0.650					
Total HpCDDs	17.8							
Total TCDFs	0.0669		0.246					
Total PeCDFs	0.0410							
Total HxCDFs	0.432		0.622					
Total HpCDFs	1.93							
WHO-2005 TEQ (ND=0)	0.402		0.413					
WHO-2005 TEQ (ND=½)	1.03		1.01					

Client Information			**Sample Information**	
Project Name:	F51300		Report Basis:	Dry
			Matrix:	Solid
Sample ID:	F51300-14		Weight / Volume:	11.19 g
			Solids / Lipids:	82.8 %
			Original pH :	NA
Laboratory Information			Batch ID:	WG14402
Project ID:	G383-585		Instrument:	HRMS3
Sample ID:	G383-585-14B		Filename:	c08aug07a_5-5
Collection Date/Time:	07/25/07	9:10	Retchk:	c08aug07a_4-10
Receipt Date/Time:	07/31/07	10:20	Begin ConCal:	c08aug07a_4-10
Extraction Date:	08/07/07		End ConCal:	c08aug07a_5-9
Analysis Date/Time:	08/10/07	2:42	Initial Cal:	m8290-c110206a

Method 8290
F51300-21
Accutest

Analytical Data Summary Sheet

Analyte	Amount (pg/g)	EDL (pg/g)	EMPC (pg/g)	RT (min.)	Ratio		Qualifier
2,3,7,8-TCDD	ND	0.180					
1,2,3,7,8-PeCDD	EMPC	0.519	0.320	34.01	1.94	*	A
1,2,3,4,7,8-HxCDD	EMPC	0.519	0.521	36.61	0.92	*	A
1,2,3,6,7,8-HxCDD	1.78			36.69	1.14		A
1,2,3,7,8,9-HxCDD	1.25			36.92	1.27		A
1,2,3,4,6,7,8-HpCDD	42.8			39.90	1.06		
OCDD	764			44.04	0.90		
2,3,7,8-TCDF	0.415			30.22	0.80		A
1,2,3,7,8-PeCDF	0.178			33.21	1.61		A
2,3,4,7,8-PeCDF	0.369			33.84	1.49		A
1,2,3,4,7,8-HxCDF	0.934			35.88	1.19		A
1,2,3,6,7,8-HxCDF	0.417			35.97	1.22		A
2,3,4,6,7,8-HxCDF	0.562			36.47	1.23		A
1,2,3,7,8,9-HxCDF	ND	0.519					
1,2,3,4,6,7,8-HpCDF	8.29			38.68	1.00		
1,2,3,4,7,8,9-HpCDF	EMPC	0.519	0.502	40.57	1.25	*	A
OCDF	21.1			44.31	0.94		
Total TCDDs	0.237		1.05				
Total PeCDDs	1.05		2.55				
Total HxCDDs	8.90		9.92				
Total HpCDDs	91.3						
Total TCDFs	0.853		1.47				
Total PeCDFs	1.20		2.59				
Total HxCDFs	8.52		8.62				
Total HpCDFs	25.5		26.0				
WHO-2005 TEQ (ND=0)	1.40		1.78				
WHO-2005 TEQ (ND=½)	1.80		1.89				

DATA VAL QUALIFIER

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Client Information			**Sample Information**	
Project Name:	F51300		Report Basis:	Dry
			Matrix:	Solid
Sample ID:	F51300-21		Weight / Volume:	10.72 g
			Solids / Lipids:	89.9 %
			Original pH :	NA
Laboratory Information			Batch ID:	WG14402
Project ID:	G383-585		Instrument:	HRMS3
Sample ID:	G383-585-15B		Filename:	c08aug07a_5-6
Collection Date/Time:	07/25/07	12:15	Retchk:	c08aug07a_4-10
Receipt Date/Time:	07/31/07	10:20	Begin ConCal:	c08aug07a_4-10
Extraction Date:	08/07/07		End ConCal:	c08aug07a_5-9
Analysis Date/Time:	08/10/07	3:30	Initial Cal:	m8290-c110206a

Method 8290
F51300-22
Accutest

Analytical Data Summary Sheet

Analyte	Amount (pg/g)	EDL (pg/g)	EMPC (pg/g)	RT (min.)	Ratio		Qualifier
2,3,7,8-TCDD	EMPC	0.186	0.659	31.08	0.60	*	A
1,2,3,7,8-PeCDD	EMPC	0.590	0.576	34.03	1.03	*	A
1,2,3,4,7,8-HxCDD	0.468			36.60	1.22		A
1,2,3,6,7,8-HxCDD	5.62			36.69	1.25		A
1,2,3,7,8,9-HxCDD	2.37			36.92	1.21		A
1,2,3,4,6,7,8-HpCDD	169			39.91	1.04		
OCDD	2080			44.05	0.92		
2,3,7,8-TCDF	5.53			30.25	0.75		
1,2,3,7,8-PeCDF	0.593			33.22	1.47		A
2,3,4,7,8-PeCDF	0.924			33.85	1.66		A
1,2,3,4,7,8-HxCDF	2.14			35.90	1.30		A
1,2,3,6,7,8-HxCDF	1.09			35.99	1.17		A
2,3,4,6,7,8-HxCDF	1.02			36.46	1.11		A
1,2,3,7,8,9-HxCDF	0.508			37.25	1.27		A
1,2,3,4,6,7,8-HpCDF	24.3			38.69	1.04		
1,2,3,4,7,8,9-HpCDF	1.88			40.57	0.97		A
OCDF	103			44.33	0.89		
Total TCDDs	0.475		1.35				
Total PeCDDs	3.40		5.04				
Total HxCDDs	34.2		35.2				
Total HpCDDs	379						
Total TCDFs	15.8		17.1				
Total PeCDFs	4.97		6.56				
Total HxCDFs	22.0		23.8				
Total HpCDFs	108		108				
WHO-2005 TEQ (ND=0)	4.78		6.01				
WHO-2005 TEQ (ND=½)	5.16		6.01				

DATA VAL QUALIFIER
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Client Information			**Sample Information**	
Project Name:	F51300		Report Basis:	Dry
			Matrix:	Solid
Sample ID:	F51300-22		Weight / Volume:	10.33 g
			Solids / Lipids:	82.0 %
			Original pH :	NA
Laboratory Information			Batch ID:	WG14402
Project ID:	G383-585		Instrument:	HRMS3
Sample ID:	G383-585-16B		Filename:	c08aug07a_5-7
Collection Date/Time:	07/25/07	12:30	Retchk:	c08aug07a_4-10
Receipt Date/Time:	07/31/07	10:20	Begin ConCal:	c08aug07a_4-10
Extraction Date:	08/07/07		End ConCal:	c08aug07a_5-9
Analysis Date/Time:	08/10/07	4:19	Initial Cal:	m8290-c110206a

Method 8290
F51300-23
Accutest

Analytical Data Summary Sheet

Analyte	Amount (pg/g)	EDL (pg/g)	EMPC (pg/g)	RT (min.)	Ratio		Qualifier	DATA VAL QUALIFIER
2,3,7,8-TCDD	ND	0.143						
1,2,3,7,8-PeCDD	ND	0.519						
1,2,3,4,7,8-HxCDD	ND	0.519						
1,2,3,6,7,8-HxCDD	ND	0.519						
1,2,3,7,8,9-HxCDD	ND	0.519						
1,2,3,4,6,7,8-HpCDD	1.65			39.92	0.98		A	BJ
OCDD	32.9			44.03	0.93			BJ
2,3,7,8-TCDF	0.268			30.19	0.80		A	J
1,2,3,7,8-PeCDF	EMPC	0.519	0.0914	33.22	1.08	*	A	J
2,3,4,7,8-PeCDF	ND	0.519						
1,2,3,4,7,8-HxCDF	ND	0.519						
1,2,3,6,7,8-HxCDF	ND	0.519						
2,3,4,6,7,8-HxCDF	ND	0.519						
1,2,3,7,8,9-HxCDF	ND	0.519						
1,2,3,4,6,7,8-HpCDF	0.515			38.68	1.08		A	BJ
1,2,3,4,7,8,9-HpCDF	ND	0.519						
OCDF	EMPC	1.04	1.54	44.32	1.06	*	A	BJ
Total TCDDs	ND	0.143						
Total PeCDDs	0.316							
Total HxCDDs	ND	0.519	0.453					
Total HpCDDs	4.47							
Total TCDFs	0.268		0.567					
Total PeCDFs	ND	0.519	0.143					
Total HxCDFs	0.0748		0.164					
Total HpCDFs	1.13							
WHO-2005 TEQ (ND=0)	0.0583		0.0615					
WHO-2005 TEQ (ND=½)	0.660		0.655					

Client Information			**Sample Information**		
Project Name:	F51300		Report Basis:	Dry	
			Matrix:	Solid	
Sample ID:	F51300-23		Weight / Volume:	11.19 g	
			Solids / Lipids:	86.1	%
			Original pH :	NA	
Laboratory Information			Batch ID:	WG14402	
Project ID:	G383-585		Instrument:	HRMS3	
Sample ID:	G383-585-17B		Filename:	c08aug07a_5-8	
Collection Date/Time:	07/25/07	12:45	Retchk:	c08aug07a_4-10	
Receipt Date/Time:	07/31/07	10:20	Begin ConCal:	c08aug07a_4-10	
Extraction Date:	08/07/07		End ConCal:	c08aug07a_5-9	
Analysis Date/Time:	08/10/07	5:07	Initial Cal:	m8290-c110206a	

Method 8290
F51300-31
Accutest

Analytical Data Summary Sheet

DATA VAL QUALIFIER

Analyte	Amount ng/L	EDL ng/L	EMPC ng/L	RT (min.)	Ratio	Qualifier	
2,3,7,8-TCDD	ND	0.00482					
1,2,3,7,8-PeCDD	ND	0.00605					
1,2,3,4,7,8-HxCDD	ND	0.00777					
1,2,3,6,7,8-HxCDD	ND	0.00791					
1,2,3,7,8,9-HxCDD	ND	0.00802					
1,2,3,4,6,7,8-HpCDD	ND	0.00702					
OCDD	ND	0.0186					
2,3,7,8-TCDF	ND	0.00376					
1,2,3,7,8-PeCDF	ND	0.00605					
2,3,4,7,8-PeCDF	ND	0.00605					
1,2,3,4,7,8-HxCDF	ND	0.00605					
1,2,3,6,7,8-HxCDF	ND	0.00605					
2,3,4,6,7,8-HxCDF	ND	0.00605					
1,2,3,7,8,9-HxCDF	ND	0.00605					
1,2,3,4,6,7,8-HpCDF	0.00849			39:19	0.95	A	J
1,2,3,4,7,8,9-HpCDF	ND	0.00714					
OCDF	0.0142			45:24	0.95	A	J
Total TCDDs	ND	0.00482					
Total PeCDDs	ND	0.00605					
Total HxCDDs	ND	0.00802					
Total HpCDDs	ND	0.00702					
Total TCDFs	ND	0.00376					
Total PeCDFs	ND	0.00605					
Total HxCDFs	ND	0.00605					
Total HpCDFs	0.00849						
WHO-2005 TEQ (ND=0)	0.0000892		0.0000892				
WHO-2005 TEQ (ND=½)	0.00918		0.00918				

Client Information			**Sample Information**	
Project Name:	F51300		Report Basis:	Wet
			Matrix:	Water
Sample ID:	F51300-31		Weight / Volume:	827 mL
			Solids / Lipids:	NA %
			Original pH :	7
Laboratory Information			Batch ID:	WG14393
Project ID:	G383-585		Instrument:	HRMS1
Sample ID:	G383-585-18C		Filename:	a30jul07a_9-10
Collection Date/Time:	07/25/07	14:35	Retchk:	a30jul07a_8-4
Receipt Date/Time:	07/31/07	10:20	Begin ConCal:	a30jul07a_8-4
Extraction Date:	08/01/07		End ConCal:	a30jul07a_9-14
Analysis Date/Time:	08/03/07	0:11	Initial Cal:	m8290-071007a

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MEMORANDUM

TO: Jeff Parks, Shaw E&I RFAAP Project Manager

FROM: Richard McCracken, Shaw E&I RFAAP Project Chemist

SUBJECT: Radford Army Ammunition Plant (RFAAP) Data Validation – Herbicides
Accutest Laboratories, Inc., SDG F51300

DATE: December 28, 2007

The purpose of this memorandum is to present the data validation report for the samples collected at RFAAP on July 25, 2007. The samples were analyzed for chlorinated herbicides using USEPA SW846 Method 8151A. A total of 1 aqueous and 30 soil samples were validated. The sample IDs are:

Field Sample ID	Lab Sample ID	Field Sample ID	Lab Sample ID
59SB06A	F51300-1	43SB06C	F51300-17
59SB06B	F51300-2	43SB07A	F51300-18
59SB06C	F51300-3	43SB07B	F51300-19
59SB05A	F51300-4	43SB07C	F51300-20
59SB05B	F51300-5	43SB08A	F51300-21
59SB05C	F51300-6	43SB08B	F51300-22
59SB04A	F51300-7	43SB08C	F51300-23
59SB04B	F51300-8	43SB09A	F51300-24
59SB04C	F51300-9	43SB09B	F51300-25
TMSB04C	F51300-10	43SB09C	F51300-26
59SB02A	F51300-11	43SB10A	F51300-27
59SB02B	F51300-12	43SB10B	F51300-28
TMSB02B	F51300-13	43SB10C	F51300-29
59SB02C	F51300-14	TMSB10B	F51300-30
43SB06A	F51300-15	072507R	F51300-31
43SB06B	F51300-16		

Data were reviewed by Richard McCracken and validated using a combination of project QAPP, *Quality Systems Manual for Environmental Laboratories, Final Version 3, January, 2006* (DoD, 2006) (DoD QSM), method-specific criteria, and laboratory SOP criteria. The data qualifier scheme was consistent with the *Region III Modifications to the National Functional Guidelines for Organic Data Review* (September 1994). Parameters evaluated are presented in **Table 1**. Data associated with parameters in compliance with quality control specifications have not been qualified. Data associated with parameters that did not comply with quality control specifications and directly impacted project data have been qualified in accordance with USEPA Region III specifications.

Table 1 Laboratory Performance Criteria

Qualified		Parameter
Yes	No	
	X	Holding Times
X		Initial Calibration
	X	Continuing Calibration
	X	Blank Analysis
	X	System Monitoring Compounds
	X	Laboratory Control Sample
X		Matrix Spike/Spike Duplicate
	X	Field Duplicate
	X	Quantitation Verification

The quality of data collected in support of this sampling activity is considered acceptable with noted qualifications.

Richard McCracken, Chemist

12/28/08
Date

RFAAP VALIDATION REPORT
CHLORINATED HERBICIDES REVIEW
SDG F51300

I-Holding Times

The objective is to ascertain the validity of results based on the holding time of the sample from time of collection to time of sample extraction and analysis. Solid samples must be cooled @4°C ± 2°C, with a maximum holding time of 14 days from sample collection to preparative extraction and 40 days from preparative extraction to determinative analysis. Aqueous samples must be cooled @4°C ± 2°C, with a maximum holding time of 7 days from sample collection to preparative extraction and 40 days from preparative extraction to determinative analysis.

- Temperature Review: A temperature blank was sent with each cooler and recorded by the laboratory upon receipt. The samples collected on 7/25/07 were sent in five coolers, and were received by the laboratory on 7/26/07 at temperatures ranging from 2.6 °C to 4.0 °C. No qualifiers were applied.

- Holding Time Review: The samples were collected on 7/25/07; extracted on 7/31/07 (water & soils) & 8/2/07 (soils only); and analyzed on 8/2/07, 8/3/07, 8/4/07, & 8/6/07. All criteria were met. No qualifiers were applied.

II-Initial Calibration

Compliance requirements for satisfactory instrument calibration are established to ensure that the instrument used is capable of producing acceptable qualitative and quantitative data for semivolatile target compounds. Initial calibration demonstrates that the instrument is capable of acceptable performance in the beginning of the analytical run and of producing a linear calibration curve. The DoD QSM specifies that the percent relative standard deviation (%RSD) for a 5-point standard calibration should be ≤20% for each target compound.

- No initial calibration data was provided for MCPP or MCPA. During discussions with the laboratory, they indicated that they perform a one-point calibration each day that analysis for MCPP or MCPA is conducted. A five-point initial calibration was not performed, therefore all data for these two compounds has been qualified "J/UJ".

- During the initial calibration performed on 8/1/07 on instrument GC-GG, pentachlorophenol (20.65%) and 2,4,5-TP (Silvex) (20.32%) had %RSD > 20% on signal #1 - the results for these two compounds have been qualified "J/UJ". The other target compounds (except MCPP and MCPA – see above) met criteria for signal #1 and signal #2. All samples were analyzed following this initial calibration.

III-Continuing Calibration

Compliance requirements for satisfactory instrument calibration are established to ensure that the instrument used is capable of producing acceptable qualitative and quantitative data for semivolatile target compounds. Continuing calibration establishes the response factors on which the quantitations are based and checks satisfactory performance of the instrument on a day-to-day basis. The DoD QSM specifies that the percent difference (%D) between the initial calibration CF and the continuing calibration CF must be ≤20%.

- A one-point daily calibration from 8/2/07 @1149, 8/3/07 @1729, and was provided for MCPP and MCPA, indicating that the lab is able to detect and quantitate both compounds. %D data was not supplied since a five-point initial calibration was not performed. All MCPP and MCPA data has already been qualified (see initial calibration), no additional qualification is required.

- During continuing calibration performed on 8/2/07 @1244 on instrument GC-GG, all target compounds (except MCPP and MCPA – see above) met criteria for signal #1 and signal #2. No qualifiers were applied. Samples F51300-1, -2, -3, -4, and -5 were analyzed after this continuing calibration.

- During continuing calibration performed on 8/2/07 @2009 on instrument GC-GG, all target compounds (except MCPP and MCPA – see above) met criteria for signal #1 and signal #2. No qualifiers were applied. Samples F51300-1, -2, -3, -4, and -5 were analyzed before this continuing calibration, while samples F51300-7, -8, -9, -10, -11, -12, -13, -14, -15, and -16 were analyzed after this continuing calibration.

- During continuing calibration performed on 8/3/07 @0134 on instrument GC-GG, all target compounds (except MCPP and MCPA – see above) met criteria for signal #1 and signal #2. No qualifiers were applied. Samples F51300-7, -8, -9, -10, -11, -12, -13, -14, -15, and -16 were analyzed before this continuing calibration, while sample F51300-25 was analyzed after this continuing calibration.

- During continuing calibration performed on 8/3/07 @0350 on instrument GC-GG, all target compounds (except MCPP and MCPA – see above) met criteria for signal #1 and signal #2. No qualifiers were applied. Sample F51300-25 was analyzed before this continuing calibration, while sample F51300-6 was analyzed after this continuing calibration.

- During continuing calibration performed on 8/3/07 @0805 on instrument GC-GG, all target compounds (except MCPP and MCPA – see above) met criteria for signal #1 and signal #2. No qualifiers were applied. Sample F51300-6 was analyzed before this continuing calibration.

- During continuing calibration performed on 8/3/07 @1756 on instrument GC-GG, all target compounds (except MCPP and MCPA – see above) met criteria for signal #1 and signal #2. No qualifiers were applied. Samples F51300-31 and -17 were analyzed after this continuing calibration.

- During continuing calibration performed on 8/3/07 @2322 on instrument GC-GG, all target compounds (except MCPP and MCPA – see above) met criteria for signal #1 and signal #2. No qualifiers were applied. Sample F51300-31 and -17 were analyzed before this continuing calibration, while samples F51300-18, -22, -23, -28, -29, and -30 were analyzed after this continuing calibration.

- During continuing calibration performed on 8/6/07 @1221 on instrument GC-GG, all target compounds (except MCPP and MCPA – see above) met criteria for signal #1 and signal #2. No qualifiers were applied. Sample F51300-19, -20, -21, -24, -26, and -27 were analyzed after this continuing calibration.

- During continuing calibration performed on 8/6/07 @1722 on instrument GC-GG, all target compounds (except MCPP and MCPA – see above) met criteria for signal #1 and signal #2. No qualifiers were applied. Sample F51300-19, -20, -21, -24, -26, and -27 were analyzed before this continuing calibration.

IV-Blank Analysis

The purpose of blank analyses is to determine the presence and magnitude of contamination problems resulting from field or laboratory activities. No contaminants should be detected in any of the associated blanks. The DoD QSM criterion specifies all concentrations should be less than one-half MRL. Positive sample results are qualified "B" if the concentration of the analyte is ≤ five times (5x) the absolute maximum blank concentration. **Table 2** summarizes the blank contamination analysis.

Table 2 Blank Contamination Analysis Summary

Analysis Date	QC Blank ID	Compound	Max Conc. µg/L or ug/kg	Action Level µg/L	B qualified samples
8/2/07	OP7785-MB	All target compounds <½MRL	NA	NA	None
8/3/07	OP7790-MB	All target compounds <½MRL	NA	NA	None
8/3/07	OP7792-MB	All target compounds <½MRL	NA	NA	None
8/3/07	072507R	All target compounds <½MRL	NA	NA	None
8/3/07	072607R	All target compounds <½MRL	NA	NA	None

072507R and 072607R are rinsate blanks.
NA = Not applicable. MRL = Method reporting limit.

V-System Monitoring Compounds (Surrogates)
Laboratory performance on individual samples is established by means of spiking activities. All samples are spiked with surrogate compounds prior to sample preparation. Spike recoveries must be within the specified control limits. DoD surrogate recovery limits are specified in Table D-3 of the DoD QSM (DoD, 2006). If the surrogate is not listed, then the laboratory criteria shall be used.

Control Limit: 2,4-DCAA (34-179%)

- All samples met recovery criteria.

VI-Laboratory Control Samples
Data for laboratory control samples (LCS) are generated to determine long-term precision and accuracy of the analytical method. Percent recoveries must be within the specified control limits. DoD LCS recovery limits are specified in Tables D-8 (aqueous) and D-9 (solid matrix) of the DoD QSM (DoD, 2006). If the compound is not listed, then the laboratory criteria shall be used.

- Sample OP7785-BS was used as a solid matrix LCS during the 8/2/07 run. All herbicides were within criteria, no data qualifiers were applied. Samples F51300-1 thru -16 and -25 were analyzed in conjunction with this LCS.

- Sample OP7790-BS was used as a aqueous LCS during the 8/3/07 run. All herbicides were within criteria, no data qualifiers were applied. Sample F51300-31 was analyzed in conjunction with this LCS.

- Sample OP7792-BS was used as a solid matrix LCS during the 8/2/07 run. All herbicides were within criteria, no data qualifiers were applied. Samples F51300-17 thru -24 and -26 thru -30 were analyzed in conjunction with this LCS.

VII-Matrix Spike/Matrix Spike Duplicate
Data for matrix spike/matrix spike duplicates (MS/MSD) are generated to determine long-term precision and accuracy of the analytical method on various matrices and to demonstrate acceptable compound recovery by the laboratory at the time of sample analysis. The percent recoveries (%Rs) and the relative percent difference (RPD) must be within the specified control limits. DoD MS/MSD recovery limits follow the LCS criteria specified in Tables D-8 (aqueous) and D-9 (solid matrix) of the DoD QSM (DoD, 2006). If the compound is not listed, then the laboratory criteria shall be used.

- Solid matrix MS/MSD analysis was performed on F51300-25. Dichloroprop (65%) had a low recovery in the MS – the dichloroprop results in associated samples have been qualified "J/UJ". 2,4,5-TP (Silvex), 2,4,5-T, and dalapon had high RPDs – no data qualification is performed on RPD data alone. All other herbicides met recovery and RPD criteria. Samples F51300-1 thru -16 and -25 were analyzed in conjunction with this MS/MSD.

- Aqueous MS/MSD analysis was performed on F51275-1 (an RFAAP sample analyzed in Accutest project F51275). Dinoseb (13%, 14%) had a low recovery in the MS & MSD, the dinoseb results in associated samples have been qualified "J/UJ". All other herbicides met recovery and RPD criteria. Sample F51300-31 was analyzed in conjunction with this LCS.

- Solid matrix MS/MSD analysis was performed on F51300-29. 2,4,5-TP (Silvex) (30%), 2,4,5-T (35%), dinoseb (0%, 0%), dalapon (0%, 0%), dichloroprop (49%), and 2,4-DB (44%) had low recoveries in the MS or both the MS & MSD – the results for these compounds in associated samples have been qualified "J/UJ". 2,4-D, 2,4,5-TP (Silvex), 2,4,5-T, dicamba, dichloroprop, and 2,4-DB had high RPDs – no data qualification is performed on RPD data alone. All other herbicides met recovery and RPD criteria. Samples F51300-17 thru -24 and -26 thru -30 were analyzed in conjunction with this MS/MSD.

VIII-Field Duplicate Sample Analysis

Field duplicates were collected to identify the cumulative precision of the sampling and analytical process and sent to the laboratory blind. The RPD was calculated only for those analytes which were detected at levels exceeding the method reporting limits in both samples of the duplicate pair. Analytes that were qualified because of blank contamination (B-qualified) or were rejected (R-qualified) in either sample of the duplicate pair were excluded from the duplicate assessment. Precision control criterion was established at 50% RPD for the aqueous and solid samples. Analytical results were qualified as estimated (J) for any RPDs exceeding criteria.

- Field duplicate pairs in this data package included 59SB04C (F51300-9) & TMSB04C (F51300-10), 59SB02B (F51300-12) & TMSB02B (F51300-13), and 43SB10B (F51300-28) & TMSB10B (F51300-30). All compounds detected above the reporting limit (RL) met RPD criteria.

IX-Quantitation Verification

The accuracy of analytical results is verified through the calculation of several parameters. Percent difference (%D) between the calculated value and the reported value must be within 10%. All positive values must have less than or equal to 40% %D between the primary and secondary columns. Any sample value >MDL and <MRL is qualified as estimated, "J." All criteria were met. No qualifiers were applied.

- The %D between the primary and secondary columns was within criteria for all detected chlorinated herbicides.

Sample: OP7785-BS, 2,4-D

Conc. µg/kg = (Ax * Vt * DF) / (CF * Vi * Ws * Ps * 1000)

where:
- Ax = Area response for the compound being measured
- Vt = Total volume of extract, taking into account dilutions (uL)
- DF = Dilution factor
- CF = Calibration Factor from initial calibration (area/pg)
- Vi = Volume of extract injected (uL)
- Ws = weight of sample (g)
- Ps = percent solids/100

Conc. µg/kg = (1643574 * 10000 * 1) / (9670 * 1 * 30.11 * 1 * 1000)
= 56.5 ug/kg

Reported Conc. = 56.6 µg/kg
%D = 0.2%
Values were within 10% difference

USEPA Region III Validation Qualifiers

(No Code) = Confirmed identification.

B = The analyte has been detected in the sample and the associated laboratory or field blank.

J = Indicates an estimated value for (1) estimated value due to QC non-conformance. Reported value may not be accurate or precise, (2) estimating a concentration as a tentatively identified compound as indicated by the mass spectral and retention time data, or (3) estimating a concentration ≥ MDL and <MRL or <3*MDL, whichever is greater.

K = Analyte present. Reported value may be biased high (estimated) due to QC non-conformance.

L = Analyte present. Reported value may be biased low (estimated) due to QC non-conformance.

R = Unreliable result. Analyte may or may not be present in the sample due to QC non-conformance.

UL = Value is estimated bias low and not detected due to QC non-conformance. Reporting limit may be inaccurate or imprecise. Quantitation limit is probably higher.

UJ = Value is estimated and not detected due to QC non-conformance. Reporting limit may be inaccurate or imprecise.

Laboratory Qualifiers

(No Code) = Confirmed identification.

A (Dioxins) = MDL is based upon the signal-to-noise measurement.

B (Metals) = The reported value was obtained from a reading <MRL and ≥MDL and is considered estimated.

B (Organics and Dioxins) = The analyte or compound has been detected in the sample and laboratory method blank. It indicates probable blank contamination.

D (Organics) = Indicates sample was analyzed at a dilution.

E (Metals) = Reported value is estimated because of the presence of interferences.

E (Organics) = Identifies compounds whose concentrations exceed the upper level of the calibration range.

E (Dioxins) = Reported value is estimated because of the presence of ether interferences.

EMPC (Dioxins) = The ion-abundance ratio between the two characteristic PCDD/F ions is outside accepted ranges. The detected PCDD/F is reported as an estimated maximum possible concentration (EMPC).

I (Dioxins) = Reported value is estimated because of the incorrect isotope rations were obtained.

J (All) = Indicates an estimated value for (1) estimating a concentration as a tentatively identified compound as indicated by the mass spectral and retention time data, (2) estimating a concentration <MRL and ≥ MDL, or estimating a concentration below the calibration range.

N (Organics) = Indicates presumptive evidence of a compound for tentatively identified compounds using a library search.

N (Metals) = Laboratory spike sample recovery not within control limits.

P (Organics) = Target analyte confirmation >40% difference for detected compound between the primary and secondary columns. The lower of the two values was reported.

U (All) = ND = BQL = Not detected. The associated number indicates the compound reporting limit for the sample.

* (Metals) = Duplicate analysis not within control limits.

* (Organics) = Surrogate outside of QC limits on both original and re-analysis.

Accutest Laboratories

Report of Analysis

Client Sample ID:	59SB06A		
Lab Sample ID:	F51300-1	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8151 SW846 3550B	Percent Solids:	91.9
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	GG36495.D	1	08/02/07	ATX	07/31/07	T:OP7785	T:GGG1140
Run #2							

	Initial Weight	Final Volume
Run #1	30.0 g	10.0 ml
Run #2		

Herbicide List

DATA VAL QUALIFIER

CAS No.	Compound	Result	RL	MDL	Units	Q
94-75-7	2,4-D	ND	36	15	ug/kg	
93-72-1	2,4,5-TP (Silvex)	ND	15	13	ug/kg	
93-76-5	2,4,5-T	ND	7.3	3.6	ug/kg	
1918-00-9	Dicamba	ND	7.3	5.4	ug/kg	
88-85-7	Dinoseb	ND	7.3	4.7	ug/kg	
75-99-0	Dalapon	ND	36	25	ug/kg	
120-36-5	Dichloroprop	ND	36	9.8	ug/kg	UJ
94-82-6	2,4-DB	ND	73	59	ug/kg	
93-65-2	MCPP	ND	180		ug/kg	UJ
94-74-6	MCPA	ND	180		ug/kg	UJ

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
19719-28-9	2,4-DCAA	90%		34-179%

(a) Analysis performed at Accutest Laboratories, Houston, TX.

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	59SB06B		
Lab Sample ID:	F51300-2	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8151 SW846 3550B	Percent Solids:	88.5
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	GG36496.D	1	08/02/07	ATX	07/31/07	T:OP7785	T:GGG1140
Run #2							

	Initial Weight	Final Volume
Run #1	30.0 g	10.0 ml
Run #2		

Herbicide List

DATA VAL QUALIFIER

CAS No.	Compound	Result	RL	MDL	Units	Q
94-75-7	2,4-D	ND	38	15	ug/kg	
93-72-1	2,4,5-TP (Silvex)	ND	15	13	ug/kg	
93-76-5	2,4,5-T	ND	7.5	3.8	ug/kg	
1918-00-9	Dicamba	ND	7.5	5.6	ug/kg	
88-85-7	Dinoseb	ND	7.5	4.9	ug/kg	
75-99-0	Dalapon	ND	38	26	ug/kg	
120-36-5	Dichloroprop	ND	38	10	ug/kg	UJ
94-82-6	2,4-DB	ND	75	61	ug/kg	
93-65-2	MCPP	ND	190		ug/kg	UJ
94-74-6	MCPA	ND	190		ug/kg	UJ

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
19719-28-9	2,4-DCAA	104%		34-179%

(a) Analysis performed at Accutest Laboratories, Houston, TX.

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	59SB06C		
Lab Sample ID:	F51300-3	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8151 SW846 3550B	Percent Solids:	86.2
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	GG36497.D	1	08/02/07	ATX	07/31/07	T:OP7785	T:GGG1140
Run #2							

	Initial Weight	Final Volume
Run #1	30.6 g	10.0 ml
Run #2		

Herbicide List

DATA VAL QUALIFIER

CAS No.	Compound	Result	RL	MDL	Units	Q
94-75-7	2,4-D	ND	38	15	ug/kg	
93-72-1	2,4,5-TP (Silvex)	ND	15	13	ug/kg	
93-76-5	2,4,5-T	ND	7.6	3.8	ug/kg	
1918-00-9	Dicamba	ND	7.6	5.7	ug/kg	
88-85-7	Dinoseb	ND	7.6	4.9	ug/kg	
75-99-0	Dalapon	ND	38	27	ug/kg	
120-36-5	Dichloroprop	ND	38	10	ug/kg	UJ
94-82-6	2,4-DB	ND	76	62	ug/kg	
93-65-2	MCPP	ND	190		ug/kg	UJ
94-74-6	MCPA	ND	190		ug/kg	UJ

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
19719-28-9	2,4-DCAA	105%		34-179%

(a) Analysis performed at Accutest Laboratories, Houston, TX.

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	59SB05A		
Lab Sample ID:	F51300-4	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8151 SW846 3550B	Percent Solids:	89.5
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	GG36498.D	1	08/02/07	ATX	07/31/07	T:OP7785	T:GGG1140
Run #2							

	Initial Weight	Final Volume
Run #1	30.3 g	10.0 ml
Run #2		

Herbicide List

DATA VAL QUALIFIER

CAS No.	Compound	Result	RL	MDL	Units	Q
94-75-7	2,4-D	ND	37	15	ug/kg	
93-72-1	2,4,5-TP (Silvex)	ND	15	13	ug/kg	
93-76-5	2,4,5-T	ND	7.4	3.7	ug/kg	
1918-00-9	Dicamba	ND	7.4	5.5	ug/kg	
88-85-7	Dinoseb	ND	7.4	4.8	ug/kg	
75-99-0	Dalapon	ND	37	26	ug/kg	
120-36-5	Dichloroprop	ND	37	10	ug/kg	UJ
94-82-6	2,4-DB	ND	74	60	ug/kg	
93-65-2	MCPP	ND	180		ug/kg	UJ
94-74-6	MCPA	ND	180		ug/kg	UJ

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
19719-28-9	2,4-DCAA	60%		34-179%

(a) Analysis performed at Accutest Laboratories, Houston, TX.

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	59SB05B		
Lab Sample ID:	F51300-5	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8151 SW846 3550B	Percent Solids:	84.2
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	GG36499.D	1	08/02/07	ATX	07/31/07	T:OP7785	T:GGG1140
Run #2							

	Initial Weight	Final Volume
Run #1	30.0 g	10.0 ml
Run #2		

Herbicide List

CAS No.	Compound	Result	RL	MDL	Units	Q (DATA VAL QUALIFIER)
94-75-7	2,4-D	ND	40	16	ug/kg	
93-72-1	2,4,5-TP (Silvex)	ND	16	14	ug/kg	
93-76-5	2,4,5-T	ND	7.9	4.0	ug/kg	
1918-00-9	Dicamba	ND	7.9	5.9	ug/kg	
88-85-7	Dinoseb	ND	7.9	5.1	ug/kg	
75-99-0	Dalapon	ND	40	28	ug/kg	
120-36-5	Dichloroprop	ND	40	11	ug/kg	UJ
94-82-6	2,4-DB	ND	79	65	ug/kg	
93-65-2	MCPP	ND	200		ug/kg	UJ
94-74-6	MCPA	ND	200		ug/kg	UJ

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
19719-28-9	2,4-DCAA	104%		34-179%

(a) Analysis performed at Accutest Laboratories, Houston, TX.

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	59SB05C		
Lab Sample ID:	F51300-6	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8151 SW846 3550B	Percent Solids:	86.3
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	GG36520.D	1	08/03/07	ATX	07/31/07	T:OP7785	T:GGG1140
Run #2							

	Initial Weight	Final Volume
Run #1	30.4 g	10.0 ml
Run #2		

Herbicide List

CAS No.	Compound	Result	RL	MDL	Units	Q (DATA VAL QUALIFIER)
94-75-7	2,4-D	ND	38	15	ug/kg	
93-72-1	2,4,5-TP (Silvex)	ND	15	13	ug/kg	
93-76-5	2,4,5-T	ND	7.6	3.8	ug/kg	
1918-00-9	Dicamba	ND	7.6	5.7	ug/kg	
88-85-7	Dinoseb	ND	7.6	5.0	ug/kg	
75-99-0	Dalapon	ND	38	27	ug/kg	
120-36-5	Dichloroprop	ND	38	10	ug/kg	UJ
94-82-6	2,4-DB	ND	76	62	ug/kg	
93-65-2	MCPP	ND	190		ug/kg	UJ
94-74-6	MCPA	ND	190		ug/kg	UJ

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
19719-28-9	2,4-DCAA	105%		34-179%

(a) Analysis performed at Accutest Laboratories, Houston, TX.

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	59SB04A		
Lab Sample ID:	F51300-7	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8151 SW846 3550B	Percent Solids:	86.6
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	GG36503.D	1	08/02/07	ATX	07/31/07	T:OP7785	T:GGG1140
Run #2							

	Initial Weight	Final Volume
Run #1	30.0 g	10.0 ml
Run #2		

Herbicide List

CAS No.	Compound	Result	RL	MDL	Units	Q (DATA VAL QUALIFIER)
94-75-7	2,4-D	ND	38	15	ug/kg	
93-72-1	2,4,5-TP (Silvex)	ND	15	13	ug/kg	
93-76-5	2,4,5-T	ND	7.7	3.8	ug/kg	
1918-00-9	Dicamba	ND	7.7	5.8	ug/kg	
88-85-7	Dinoseb	ND	7.7	5.0	ug/kg	
75-99-0	Dalapon	ND	38	27	ug/kg	
120-36-5	Dichloroprop	ND	38	10	ug/kg	UJ
94-82-6	2,4-DB	ND	77	63	ug/kg	
93-65-2	MCPP	ND	190		ug/kg	UJ
94-74-6	MCPA	ND	190		ug/kg	UJ

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
19719-28-9	2,4-DCAA	98%		34-179%

(a) Analysis performed at Accutest Laboratories, Houston, TX.

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	59SB04B		
Lab Sample ID:	F51300-8	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8151 SW846 3550B	Percent Solids:	83.2
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	GG36504.D	1	08/02/07	ATX	07/31/07	T:OP7785	T:GGG1140
Run #2							

	Initial Weight	Final Volume
Run #1	30.6 g	10.0 ml
Run #2		

Herbicide List

DATA VAL QUALIFIER

CAS No.	Compound	Result	RL	MDL	Units	Q
94-75-7	2,4-D	ND	39	16	ug/kg	
93-72-1	2,4,5-TP (Silvex)	ND	16	14	ug/kg	
93-76-5	2,4,5-T	ND	7.9	3.9	ug/kg	
1918-00-9	Dicamba	ND	7.9	5.9	ug/kg	
88-85-7	Dinoseb	ND	7.9	5.1	ug/kg	
75-99-0	Dalapon	ND	39	28	ug/kg	
120-36-5	Dichloroprop	ND	39	11	ug/kg	UJ
94-82-6	2,4-DB	ND	79	64	ug/kg	
93-65-2	MCPP	ND	200		ug/kg	UJ
94-74-6	MCPA	ND	200		ug/kg	UJ

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
19719-28-9	2,4-DCAA	77%		34-179%

(a) Analysis performed at Accutest Laboratories, Houston, TX.

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	59SB04C		
Lab Sample ID:	F51300-9	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8151 SW846 3550B	Percent Solids:	85.8
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	GG36505.D	1	08/02/07	ATX	07/31/07	T:OP7785	T:GGG1140
Run #2							

	Initial Weight	Final Volume
Run #1	30.7 g	10.0 ml
Run #2		

Herbicide List

CAS No.	Compound	Result	RL	MDL	Units	Q	DATA VAL QUALIFIER
94-75-7	2,4-D	ND	38	15	ug/kg		
93-72-1	2,4,5-TP (Silvex)	ND	15	13	ug/kg		
93-76-5	2,4,5-T	ND	7.6	3.8	ug/kg		
1918-00-9	Dicamba	ND	7.6	5.7	ug/kg		
88-85-7	Dinoseb	ND	7.6	4.9	ug/kg		
75-99-0	Dalapon	ND	38	27	ug/kg		
120-36-5	Dichloroprop	ND	38	10	ug/kg		UJ
94-82-6	2,4-DB	ND	76	62	ug/kg		
93-65-2	MCPP	ND	190		ug/kg		UJ
94-74-6	MCPA	ND	190		ug/kg		UJ

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
19719-28-9	2,4-DCAA	95%		34-179%

(a) Analysis performed at Accutest Laboratories, Houston, TX.

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	TMSB04C		
Lab Sample ID:	F51300-10	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8151 SW846 3550B	Percent Solids:	83.9
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	GG36506.D	1	08/02/07	ATX	07/31/07	T:OP7785	T:GGG1140
Run #2							

	Initial Weight	Final Volume
Run #1	30.4 g	10.0 ml
Run #2		

Herbicide List

DATA VAL QUALIFIER

CAS No.	Compound	Result	RL	MDL	Units	Q
94-75-7	2,4-D	ND	39	16	ug/kg	
93-72-1	2,4,5-TP (Silvex)	ND	16	14	ug/kg	
93-76-5	2,4,5-T	ND	7.8	3.9	ug/kg	
1918-00-9	Dicamba	ND	7.8	5.9	ug/kg	
88-85-7	Dinoseb	ND	7.8	5.1	ug/kg	
75-99-0	Dalapon	ND	39	27	ug/kg	
120-36-5	Dichloroprop	ND	39	11	ug/kg	UJ
94-82-6	2,4-DB	ND	78	64	ug/kg	
93-65-2	MCPP	ND	200		ug/kg	UJ
94-74-6	MCPA	ND	200		ug/kg	UJ

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
19719-28-9	2,4-DCAA	103%		34-179%

(a) Analysis performed at Accutest Laboratories, Houston, TX.

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	59SB02A		
Lab Sample ID:	F51300-11	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8151 SW846 3550B	Percent Solids:	89.5
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	GG36507.D	1	08/02/07	ATX	07/31/07	T:OP7785	T:GGG1140
Run #2							

	Initial Weight	Final Volume
Run #1	30.0 g	10.0 ml
Run #2		

Herbicide List

CAS No.	Compound	Result	RL	MDL	Units	Q	DATA VAL QUALIFIER
94-75-7	2,4-D	ND	37	15	ug/kg		
93-72-1	2,4,5-TP (Silvex)	ND	15	13	ug/kg		
93-76-5	2,4,5-T	ND	7.4	3.7	ug/kg		
1918-00-9	Dicamba	ND	7.4	5.6	ug/kg		
88-85-7	Dinoseb	ND	7.4	4.8	ug/kg		
75-99-0	Dalapon	ND	37	26	ug/kg		
120-36-5	Dichloroprop	ND	37	10	ug/kg		UJ
94-82-6	2,4-DB	ND	74	61	ug/kg		
93-65-2	MCPP	ND	190		ug/kg		UJ
94-74-6	MCPA	ND	190		ug/kg		UJ

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
19719-28-9	2,4-DCAA	103%		34-179%

(a) Analysis performed at Accutest Laboratories, Houston, TX.

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	59SB02B		
Lab Sample ID:	F51300-12	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8151 SW846 3550B	Percent Solids:	83.3
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	GG36508.D	1	08/02/07	ATX	07/31/07	T:OP7785	T:GGG1140
Run #2							

	Initial Weight	Final Volume
Run #1	30.0 g	10.0 ml
Run #2		

Herbicide List

DATA VAL QUALIFIER

CAS No.	Compound	Result	RL	MDL	Units	Q
94-75-7	2,4-D	ND	40	16	ug/kg	
93-72-1	2,4,5-TP (Silvex)	ND	16	14	ug/kg	
93-76-5	2,4,5-T	ND	8.0	4.0	ug/kg	
1918-00-9	Dicamba	ND	8.0	6.0	ug/kg	
88-85-7	Dinoseb	ND	8.0	5.2	ug/kg	
75-99-0	Dalapon	ND	40	28	ug/kg	
120-36-5	Dichloroprop	ND	40	11	ug/kg	UJ
94-82-6	2,4-DB	ND	80	65	ug/kg	
93-65-2	MCPP	ND	200		ug/kg	UJ
94-74-6	MCPA	ND	200		ug/kg	UJ

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
19719-28-9	2,4-DCAA	95%		34-179%

(a) Analysis performed at Accutest Laboratories, Houston, TX.

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	TMSB02B		
Lab Sample ID:	F51300-13	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8151 SW846 3550B	Percent Solids:	85.3
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	GG36509.D	1	08/02/07	ATX	07/31/07	T:OP7785	T:GGG1140
Run #2							

	Initial Weight	Final Volume
Run #1	30.5 g	10.0 ml
Run #2		

Herbicide List

CAS No.	Compound	Result	RL	MDL	Units	Q (DATA VAL QUALIFIER)
94-75-7	2,4-D	ND	39	15	ug/kg	
93-72-1	2,4,5-TP (Silvex)	ND	15	13	ug/kg	
93-76-5	2,4,5-T	ND	7.7	3.9	ug/kg	
1918-00-9	Dicamba	ND	7.7	5.8	ug/kg	
88-85-7	Dinoseb	ND	7.7	5.0	ug/kg	
75-99-0	Dalapon	ND	39	27	ug/kg	
120-36-5	Dichloroprop	ND	39	10	ug/kg	UJ
94-82-6	2,4-DB	ND	77	63	ug/kg	
93-65-2	MCPP	ND	190		ug/kg	UJ
94-74-6	MCPA	ND	190		ug/kg	UJ

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
19719-28-9	2,4-DCAA	116%		34-179%

(a) Analysis performed at Accutest Laboratories, Houston, TX.

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	59SB02C		
Lab Sample ID:	F51300-14	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8151 SW846 3550B	Percent Solids:	83.2
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	GG36510.D	1	08/03/07	ATX	07/31/07	T:OP7785	T:GGG1140
Run #2							

	Initial Weight	Final Volume
Run #1	30.0 g	10.0 ml
Run #2		

Herbicide List

CAS No.	Compound	Result	RL	MDL	Units	Q (DATA VAL QUALIFIER)
94-75-7	2,4-D	ND	40	16	ug/kg	
93-72-1	2,4,5-TP (Silvex)	ND	16	14	ug/kg	
93-76-5	2,4,5-T	ND	8.0	4.0	ug/kg	
1918-00-9	Dicamba	ND	8.0	6.0	ug/kg	
88-85-7	Dinoseb	ND	8.0	5.2	ug/kg	
75-99-0	Dalapon	ND	40	28	ug/kg	
120-36-5	Dichloroprop	ND	40	11	ug/kg	UJ
94-82-6	2,4-DB	ND	80	65	ug/kg	
93-65-2	MCPP	ND	200		ug/kg	UJ
94-74-6	MCPA	ND	200		ug/kg	UJ

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
19719-28-9	2,4-DCAA	127%		34-179%

(a) Analysis performed at Accutest Laboratories, Houston, TX.

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	43SB06A		
Lab Sample ID:	F51300-15	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8151 SW846 3550B	Percent Solids:	85.6
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	GG36511.D	1	08/03/07	ATX	07/31/07	T:OP7785	T:GGG1140
Run #2							

	Initial Weight	Final Volume
Run #1	30.7 g	10.0 ml
Run #2		

Herbicide List

CAS No.	Compound	Result	RL	MDL	Units	Q	DATA VAL QUALIFIER
94-75-7	2,4-D	ND	38	15	ug/kg		
93-72-1	2,4,5-TP (Silvex)	ND	15	13	ug/kg		
93-76-5	2,4,5-T	ND	7.6	3.8	ug/kg		
1918-00-9	Dicamba	ND	7.6	5.7	ug/kg		
88-85-7	Dinoseb	ND	7.6	5.0	ug/kg		
75-99-0	Dalapon	ND	38	27	ug/kg		
120-36-5	Dichloroprop	ND	38	10	ug/kg		UJ
94-82-6	2,4-DB	ND	76	62	ug/kg		
93-65-2	MCPP	ND	190		ug/kg		UJ
94-74-6	MCPA	ND	190		ug/kg		UJ

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
19719-28-9	2,4-DCAA	100%		34-179%

(a) Analysis performed at Accutest Laboratories, Houston, TX.

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	43SB06B		
Lab Sample ID:	F51300-16	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8151 SW846 3550B	Percent Solids:	81.7
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	GG36512.D	1	08/03/07	ATX	07/31/07	T:OP7785	T:GGG1140
Run #2							

	Initial Weight	Final Volume
Run #1	30.1 g	10.0 ml
Run #2		

Herbicide List

CAS No.	Compound	Result	RL	MDL	Units	Q	DATA VAL QUALIFIER
94-75-7	2,4-D	ND	41	16	ug/kg		
93-72-1	2,4,5-TP (Silvex)	ND	16	14	ug/kg		
93-76-5	2,4,5-T	ND	8.1	4.1	ug/kg		
1918-00-9	Dicamba	ND	8.1	6.1	ug/kg		
88-85-7	Dinoseb	ND	8.1	5.3	ug/kg		
75-99-0	Dalapon	ND	41	29	ug/kg		
120-36-5	Dichloroprop	ND	41	11	ug/kg		UJ
94-82-6	2,4-DB	ND	81	66	ug/kg		
93-65-2	MCPP	ND	200		ug/kg		UJ
94-74-6	MCPA	ND	200		ug/kg		UJ

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
19719-28-9	2,4-DCAA	97%		34-179%

(a) Analysis performed at Accutest Laboratories, Houston, TX.

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	43SB06C		
Lab Sample ID:	F51300-17	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8151 SW846 3550B	Percent Solids:	89.4
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	GG36541.D	1	08/03/07	ATX	08/02/07	T:OP7792	T:GGG1141
Run #2							

	Initial Weight	Final Volume
Run #1	30.1 g	10.0 ml
Run #2		

Herbicide List

CAS No.	Compound	Result	RL	MDL	Units	Q (DATA VAL QUALIFIER)
94-75-7	2,4-D	ND	37	15	ug/kg	
93-72-1	2,4,5-TP (Silvex)	ND	15	13	ug/kg	UJ
93-76-5	2,4,5-T	ND	7.4	3.7	ug/kg	UJ
1918-00-9	Dicamba	ND	7.4	5.6	ug/kg	
88-85-7	Dinoseb	ND	7.4	4.8	ug/kg	UJ
75-99-0	Dalapon	ND	37	26	ug/kg	UJ
120-36-5	Dichloroprop	ND	37	10	ug/kg	UJ
94-82-6	2,4-DB	ND	74	61	ug/kg	UJ
93-65-2	MCPP	ND	190		ug/kg	UJ
94-74-6	MCPA	ND	190		ug/kg	UJ

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
19719-28-9	2,4-DCAA	99%		34-179%

(a) Analysis performed at Accutest Laboratories, Houston, TX.

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	43SB07A		
Lab Sample ID:	F51300-18	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8151 SW846 3550B	Percent Solids:	90.2
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	GG36544.D	1	08/04/07	ATX	08/02/07	T:OP7792	T:GGG1141
Run #2							

	Initial Weight	Final Volume
Run #1	30.7 g	10.0 ml
Run #2		

Herbicide List

DATA VAL QUALIFIER

CAS No.	Compound	Result	RL	MDL	Units	Q
94-75-7	2,4-D	ND	36	14	ug/kg	
93-72-1	2,4,5-TP (Silvex)	ND	14	13	ug/kg	UJ
93-76-5	2,4,5-T	ND	7.2	3.6	ug/kg	UJ
1918-00-9	Dicamba	ND	7.2	5.4	ug/kg	
88-85-7	Dinoseb	ND	7.2	4.7	ug/kg	UJ
75-99-0	Dalapon	ND	36	25	ug/kg	
120-36-5	Dichloroprop	ND	36	9.7	ug/kg	
94-82-6	2,4-DB	ND	72	59	ug/kg	
93-65-2	MCPP	ND	180		ug/kg	
94-74-6	MCPA	ND	180		ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
19719-28-9	2,4-DCAA	59%		34-179%

(a) Analysis performed at Accutest Laboratories, Houston, TX.

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	43SB07B		
Lab Sample ID:	F51300-19	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8151 SW846 3550B	Percent Solids:	86.2
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	GG36564.D	1	08/06/07	ATX	08/02/07	T:OP7792	T:GGG1142
Run #2							

	Initial Weight	Final Volume
Run #1	30.1 g	10.0 ml
Run #2		

Herbicide List

CAS No.	Compound	Result	RL	MDL	Units	Q
94-75-7	2,4-D	ND	39	15	ug/kg	
93-72-1	2,4,5-TP (Silvex)	ND	15	13	ug/kg	UJ
93-76-5	2,4,5-T	ND	7.7	3.9	ug/kg	UJ
1918-00-9	Dicamba	ND	7.7	5.8	ug/kg	
88-85-7	Dinoseb	ND	7.7	5.0	ug/kg	UJ
75-99-0	Dalapon	ND	39	27	ug/kg	
120-36-5	Dichloroprop	ND	39	10	ug/kg	
94-82-6	2,4-DB	ND	77	63	ug/kg	
93-65-2	MCPP	ND	190		ug/kg	
94-74-6	MCPA	ND	190		ug/kg	

DATA VAL QUALIFIER

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
19719-28-9	2,4-DCAA	82%		34-179%

(a) Analysis performed at Accutest Laboratories, Houston, TX.

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	43SB07C		
Lab Sample ID:	F51300-20	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8151 SW846 3550B	Percent Solids:	84.3
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	GG36565.D	1	08/06/07	ATX	08/02/07	T:OP7792	T:GGG1142
Run #2							

	Initial Weight	Final Volume
Run #1	30.8 g	10.0 ml
Run #2		

Herbicide List

DATA VAL QUALIFIER

CAS No.	Compound	Result	RL	MDL	Units	Q
94-75-7	2,4-D	ND	39	15	ug/kg	
93-72-1	2,4,5-TP (Silvex)	ND	15	13	ug/kg	UJ
93-76-5	2,4,5-T	ND	7.7	3.9	ug/kg	UJ
1918-00-9	Dicamba	ND	7.7	5.8	ug/kg	
88-85-7	Dinoseb	ND	7.7	5.0	ug/kg	UJ
75-99-0	Dalapon	ND	39	27	ug/kg	
120-36-5	Dichloroprop	ND	39	10	ug/kg	
94-82-6	2,4-DB	ND	77	63	ug/kg	
93-65-2	MCPP	ND	190		ug/kg	
94-74-6	MCPA	ND	190		ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
19719-28-9	2,4-DCAA	78%		34-179%

(a) Analysis performed at Accutest Laboratories, Houston, TX.

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	43SB08A		
Lab Sample ID:	F51300-21	**Date Sampled:**	07/25/07
Matrix:	SO - Soil	**Date Received:**	07/26/07
Method:	SW846 8151 SW846 3550B	**Percent Solids:**	96.1
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	GG36566.D	1	08/06/07	ATX	08/02/07	T:OP7792	T:GGG1142
Run #2							

	Initial Weight	Final Volume
Run #1	30.3 g	10.0 ml
Run #2		

Herbicide List

CAS No.	Compound	Result	RL	MDL	Units	Q
94-75-7	2,4-D	ND	34	14	ug/kg	
93-72-1	2,4,5-TP (Silvex)	ND	14	12	ug/kg	UJ
93-76-5	2,4,5-T	ND	6.9	3.4	ug/kg	UJ
1918-00-9	Dicamba	ND	6.9	5.1	ug/kg	
88-85-7	Dinoseb	ND	6.9	4.5	ug/kg	UJ
75-99-0	Dalapon	ND	34	24	ug/kg	
120-36-5	Dichloroprop	ND	34	9.3	ug/kg	
94-82-6	2,4-DB	ND	69	56	ug/kg	
93-65-2	MCPP	ND	170		ug/kg	
94-74-6	MCPA	ND	170		ug/kg	

DATA VAL QUALIFIER

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
19719-28-9	2,4-DCAA	60%		34-179%

(a) Analysis performed at Accutest Laboratories, Houston, TX.

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	43SB08B		
Lab Sample ID:	F51300-22	**Date Sampled:**	07/25/07
Matrix:	SO - Soil	**Date Received:**	07/26/07
Method:	SW846 8151 SW846 3550B	**Percent Solids:**	84.5
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	GG36545.D	1	08/04/07	ATX	08/02/07	T:OP7792	T:GGG1141
Run #2							

	Initial Weight	Final Volume
Run #1	30.7 g	10.0 ml
Run #2		

Herbicide List

DATA VAL QUALIFIER

CAS No.	Compound	Result	RL	MDL	Units	Q
94-75-7	2,4-D	ND	39	15	ug/kg	
93-72-1	2,4,5-TP (Silvex)	ND	15	14	ug/kg	UJ
93-76-5	2,4,5-T	ND	7.7	3.9	ug/kg	UJ
1918-00-9	Dicamba	ND	7.7	5.8	ug/kg	
88-85-7	Dinoseb	ND	7.7	5.0	ug/kg	UJ
75-99-0	Dalapon	ND	39	27	ug/kg	
120-36-5	Dichloroprop	ND	39	10	ug/kg	
94-82-6	2,4-DB	ND	77	63	ug/kg	
93-65-2	MCPP	ND	190		ug/kg	
94-74-6	MCPA	ND	190		ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
19719-28-9	2,4-DCAA	66%		34-179%

(a) Analysis performed at Accutest Laboratories, Houston, TX.

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	43SB08C		
Lab Sample ID:	F51300-23	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8151 SW846 3550B	Percent Solids:	87.5
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	GG36547.D	1	08/04/07	ATX	08/02/07	T:OP7792	T:GGG1141
Run #2							

	Initial Weight	Final Volume
Run #1	30.0 g	10.0 ml
Run #2		

Herbicide List

DATA VAL QUALIFIER

CAS No.	Compound	Result	RL	MDL	Units	Q
94-75-7	2,4-D	ND	38	15	ug/kg	
93-72-1	2,4,5-TP (Silvex)	ND	15	13	ug/kg	UJ
93-76-5	2,4,5-T	ND	7.6	3.8	ug/kg	UJ
1918-00-9	Dicamba	ND	7.6	5.7	ug/kg	
88-85-7	Dinoseb	ND	7.6	5.0	ug/kg	UJ
75-99-0	Dalapon	ND	38	27	ug/kg	
120-36-5	Dichloroprop	ND	38	10	ug/kg	
94-82-6	2,4-DB	ND	76	62	ug/kg	
93-65-2	MCPP	ND	190		ug/kg	
94-74-6	MCPA	ND	190		ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
19719-28-9	2,4-DCAA	73%		34-179%

(a) Analysis performed at Accutest Laboratories, Houston, TX.

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

3.24

Client Sample ID:	43SB09A		
Lab Sample ID:	F51300-24	**Date Sampled:**	07/25/07
Matrix:	SO - Soil	**Date Received:**	07/26/07
Method:	SW846 8151 SW846 3550B	**Percent Solids:**	90.3
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	GG36567.D	1	08/06/07	ATX	08/02/07	T:OP7792	T:GGG1142
Run #2							

	Initial Weight	Final Volume
Run #1	30.1 g	10.0 ml
Run #2		

Herbicide List

CAS No.	Compound	Result	RL	MDL	Units	Q
94-75-7	2,4-D	ND	37	15	ug/kg	
93-72-1	2,4,5-TP (Silvex)	ND	15	13	ug/kg	UJ
93-76-5	2,4,5-T	ND	7.4	3.7	ug/kg	UJ
1918-00-9	Dicamba	ND	7.4	5.5	ug/kg	
88-85-7	Dinoseb	ND	7.4	4.8	ug/kg	UJ
75-99-0	Dalapon	ND	37	26	ug/kg	
120-36-5	Dichloroprop	ND	37	9.9	ug/kg	
94-82-6	2,4-DB	ND	74	60	ug/kg	
93-65-2	MCPP	ND	180		ug/kg	
94-74-6	MCPA	ND	180		ug/kg	

DATA VAL QUALIFIER

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
19719-28-9	2,4-DCAA	54%		34-179%

(a) Analysis performed at Accutest Laboratories, Houston, TX.

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	43SB09B		
Lab Sample ID:	F51300-25	**Date Sampled:**	07/25/07
Matrix:	SO - Soil	**Date Received:**	07/26/07
Method:	SW846 8151 SW846 3550B	**Percent Solids:**	86.9
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	GG36515.D	1	08/03/07	ATX	07/31/07	T:OP7785	T:GGG1140
Run #2							

	Initial Weight	Final Volume
Run #1	30.1 g	10.0 ml
Run #2		

Herbicide List

DATA VAL QUALIFIER

CAS No.	Compound	Result	RL	MDL	Units	Q
94-75-7	2,4-D	ND	38	15	ug/kg	
93-72-1	2,4,5-TP (Silvex)	ND	15	13	ug/kg	
93-76-5	2,4,5-T	ND	7.7	3.8	ug/kg	
1918-00-9	Dicamba	ND	7.7	5.7	ug/kg	
88-85-7	Dinoseb	ND	7.7	5.0	ug/kg	
75-99-0	Dalapon	ND	38	27	ug/kg	
120-36-5	Dichloroprop	ND	38	10	ug/kg	UJ
94-82-6	2,4-DB	ND	77	62	ug/kg	
93-65-2	MCPP	ND	190		ug/kg	UJ
94-74-6	MCPA	ND	190		ug/kg	UJ

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
19719-28-9	2,4-DCAA	141%		34-179%

(a) Analysis performed at Accutest Laboratories, Houston, TX.

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	43SB09C		
Lab Sample ID:	F51300-26	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8151 SW846 3550B	Percent Solids:	87.1
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	GG36568.D	1	08/06/07	ATX	08/02/07	T:OP7792	T:GGG1142
Run #2							

	Initial Weight	Final Volume
Run #1	30.2 g	10.0 ml
Run #2		

Herbicide List

CAS No.	Compound	Result	RL	MDL	Units	Q
94-75-7	2,4-D	ND	38	15	ug/kg	
93-72-1	2,4,5-TP (Silvex)	ND	15	13	ug/kg	UJ
93-76-5	2,4,5-T	ND	7.6	3.8	ug/kg	UJ
1918-00-9	Dicamba	ND	7.6	5.7	ug/kg	
88-85-7	Dinoseb	ND	7.6	4.9	ug/kg	UJ
75-99-0	Dalapon	ND	38	27	ug/kg	
120-36-5	Dichloroprop	ND	38	10	ug/kg	
94-82-6	2,4-DB	ND	76	62	ug/kg	
93-65-2	MCPP	ND	190		ug/kg	
94-74-6	MCPA	ND	190		ug/kg	

DATA VAL QUALIFIER

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
19719-28-9	2,4-DCAA	94%		34-179%

(a) Analysis performed at Accutest Laboratories, Houston, TX.

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	43SB10A		
Lab Sample ID:	F51300-27	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8151 SW846 3550B	Percent Solids:	87.1
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	GG36569.D	1	08/06/07	ATX	08/02/07	T:OP7792	T:GGG1142
Run #2							

	Initial Weight	Final Volume
Run #1	30.3 g	10.0 ml
Run #2		

Herbicide List

CAS No.	Compound	Result	RL	MDL	Units	Q
94-75-7	2,4-D	ND	38	15	ug/kg	
93-72-1	2,4,5-TP (Silvex)	ND	15	13	ug/kg	U
93-76-5	2,4,5-T	ND	7.6	3.8	ug/kg	U
1918-00-9	Dicamba	ND	7.6	5.7	ug/kg	
88-85-7	Dinoseb	ND	7.6	4.9	ug/kg	U
75-99-0	Dalapon	ND	38	27	ug/kg	
120-36-5	Dichloroprop	ND	38	10	ug/kg	
94-82-6	2,4-DB	ND	76	62	ug/kg	
93-65-2	MCPP	ND	190		ug/kg	
94-74-6	MCPA	ND	190		ug/kg	

DATA VAL QUALIFIER

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
19719-28-9	2,4-DCAA	38%		34-179%

(a) Analysis performed at Accutest Laboratories, Houston, TX.

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	43SB10B		
Lab Sample ID:	F51300-28	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8151 SW846 3550B	Percent Solids:	86.6
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	GG36548.D	1	08/04/07	ATX	08/02/07	T:OP7792	T:GGG1141
Run #2							

	Initial Weight	Final Volume
Run #1	30.3 g	10.0 ml
Run #2		

Herbicide List

CAS No.	Compound	Result	RL	MDL	Units	Q
94-75-7	2,4-D	ND	38	15	ug/kg	
93-72-1	2,4,5-TP (Silvex)	ND	15	13	ug/kg	UJ
93-76-5	2,4,5-T	ND	7.6	3.8	ug/kg	UJ
1918-00-9	Dicamba	ND	7.6	5.7	ug/kg	
88-85-7	Dinoseb	ND	7.6	5.0	ug/kg	UJ
75-99-0	Dalapon	ND	38	27	ug/kg	
120-36-5	Dichloroprop	ND	38	10	ug/kg	
94-82-6	2,4-DB	ND	76	62	ug/kg	
93-65-2	MCPP	ND	190		ug/kg	
94-74-6	MCPA	ND	190		ug/kg	

DATA VAL QUALIFIER

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
19719-28-9	2,4-DCAA	72%		34-179%

(a) Analysis performed at Accutest Laboratories, Houston, TX.

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	43SB10C		
Lab Sample ID:	F51300-29	**Date Sampled:**	07/25/07
Matrix:	SO - Soil	**Date Received:**	07/26/07
Method:	SW846 8151 SW846 3550B	**Percent Solids:**	83.8
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	GG36549.D	1	08/04/07	ATX	08/02/07	T:OP7792	T:GGG1141
Run #2							

	Initial Weight	Final Volume
Run #1	30.0 g	10.0 ml
Run #2		

Herbicide List

CAS No.	Compound	Result	RL	MDL	Units	Q
94-75-7	2,4-D	ND	40	16	ug/kg	
93-72-1	2,4,5-TP (Silvex)	ND	16	14	ug/kg	UJ
93-76-5	2,4,5-T	ND	7.9	4.0	ug/kg	UJ
1918-00-9	Dicamba	ND	7.9	6.0	ug/kg	
88-85-7	Dinoseb	ND	7.9	5.2	ug/kg	UJ
75-99-0	Dalapon	ND	40	28	ug/kg	
120-36-5	Dichloroprop	ND	40	11	ug/kg	
94-82-6	2,4-DB	ND	79	65	ug/kg	
93-65-2	MCPP	ND	200		ug/kg	
94-74-6	MCPA	ND	200		ug/kg	

DATA VAL QUALIFIER

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
19719-28-9	2,4-DCAA	100%		34-179%

(a) Analysis performed at Accutest Laboratories, Houston, TX.

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	TMSB10B		
Lab Sample ID:	F51300-30	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8151 SW846 3550B	Percent Solids:	85.9
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	GG36550.D	1	08/04/07	ATX	08/02/07	T:OP7792	T:GGG1141
Run #2							

	Initial Weight	Final Volume
Run #1	30.4 g	10.0 ml
Run #2		

Herbicide List

CAS No.	Compound	Result	RL	MDL	Units	Q
94-75-7	2,4-D	ND	38	15	ug/kg	
93-72-1	2,4,5-TP (Silvex)	ND	15	13	ug/kg	UJ
93-76-5	2,4,5-T	ND	7.7	3.8	ug/kg	UJ
1918-00-9	Dicamba	ND	7.7	5.7	ug/kg	
88-85-7	Dinoseb	ND	7.7	5.0	ug/kg	UJ
75-99-0	Dalapon	ND	38	27	ug/kg	
120-36-5	Dichloroprop	ND	38	10	ug/kg	
94-82-6	2,4-DB	ND	77	62	ug/kg	
93-65-2	MCPP	ND	190		ug/kg	
94-74-6	MCPA	ND	190		ug/kg	

DATA VAL QUALIFIER

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
19719-28-9	2,4-DCAA	92%		34-179%

(a) Analysis performed at Accutest Laboratories, Houston, TX.

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	072507R		
Lab Sample ID:	F51300-31	**Date Sampled:**	07/25/07
Matrix:	AQ - Equipment Blank	**Date Received:**	07/26/07
Method:	SW846 8151 SW846 3510C	**Percent Solids:**	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	GG36537.D	1	08/03/07	ATX	07/31/07	T:OP7790	T:GGG1141
Run #2							

	Initial Volume	Final Volume
Run #1	1000 ml	10.0 ml
Run #2		

Herbicide List

CAS No.	Compound	Result	RL	MDL	Units	Q	DATA VAL QUALIFIER
94-75-7	2,4-D	ND	1.5	0.80	ug/l		
93-72-1	2,4,5-TP (Silvex)	ND	0.20	0.15	ug/l		
93-76-5	2,4,5-T	ND	0.20	0.12	ug/l		
1918-00-9	Dicamba	ND	0.20	0.080	ug/l		
88-85-7	Dinoseb	ND	0.20	0.090	ug/l		UJ
75-99-0	Dalapon	ND	1.0	1.0	ug/l		
120-36-5	Dichloroprop	ND	1.0	0.51	ug/l		
94-82-6	2,4-DB	ND	2.0	1.9	ug/l		
93-65-2	MCPP	ND	50		ug/l		UJ
94-74-6	MCPA	ND	50		ug/l		UJ
87-86-5	Pentachlorophenol	ND	0.050	0.040	ug/l		

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
19719-28-9	2,4-DCAA	66%		34-179%

(a) Analysis performed at Accutest Laboratories, Houston, TX.

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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MEMORANDUM

TO: Jeff Parks, Shaw E&I Radford Army Ammunition Plant (RFAAP) Project Manager

FROM: Richard McCracken, Shaw E&I Project Chemist

SUBJECT: RFAAP Data Validation – TAL Metals
Accutest Laboratories, Inc., SDG F51300

DATE: January 2, 2008

The purpose of this memorandum is to present the data validation report for the samples collected at RFAAP on July 25, 2007. The samples were analyzed for target analyte list (TAL) metals using USEPA SW-846 3010A/6010B (aqueous) and 3050B/6010B (solid matrix) for ICP metals; and SW-846 7470A (aqueous) and 7471A (solid matrix) for mercury. A total of 1 aqueous and 30 soil samples were validated. The sample IDs are:

Field Sample ID	Lab Sample ID	**Field Sample ID**	Lab Sample ID
59SB06A	F51300-1	43SB06C	F51300-17
59SB06B	F51300-2	43SB07A	F51300-18
59SB06C	F51300-3	43SB07B	F51300-19
59SB05A	F51300-4	43SB07C	F51300-20
59SB05B	F51300-5	43SB08A	F51300-21
59SB05C	F51300-6	43SB08B	F51300-22
59SB04A	F51300-7	43SB08C	F51300-23
59SB04B	F51300-8	43SB09A	F51300-24
59SB04C	F51300-9	43SB09B	F51300-25
TMSB04C	F51300-10	43SB09C	F51300-26
59SB02A	F51300-11	43SB10A	F51300-27
59SB02B	F51300-12	43SB10B	F51300-28
TMSB02B	F51300-13	43SB10C	F51300-29
59SB02C	F51300-14	TMSB10B	F51300-30
43SB06A	F51300-15	072507R	F51300-31
43SB06B	F51300-16		

Data were reviewed by Richard McCracken and validated using a combination of project QAPP, *Quality Systems Manual for Environmental Laboratories, Final Version 3, January, 2006* (DoD, 2006) (DoD QSM), method-specific criteria, and laboratory SOP criteria. The data qualifier scheme was consistent with the *Region III Modifications to the National Functional Guidelines for Inorganic Data Review* (April, 1993). Parameters evaluated are presented in **Table 1**. Data associated with parameters in compliance with quality control specifications have not been qualified. Data associated with parameters that did not comply with quality control specifications and directly impacted project data have been qualified in accordance with USEPA Region III specifications.

Table 1 Laboratory Performance Criteria

Qualified		Parameter
Yes	No	
	X	Holding Times
X		Initial and Continuing Calibration
X		Blank Analysis
	X	ICP Interference Check Sample (ICS)
	X	Laboratory Control Sample (LCS)
X		Laboratory Sample Duplicate
X		Matrix Spike and Spike Duplicate
X		ICP Serial Dilution
	X	Field Sample Duplicate
X		Quantitation Verification

The quality of data collected in support of this sampling activity is considered acceptable with noted qualifications.

Richard McCracken, Chemist

1/2/08
Date

RFAAP VALIDATION REPORT
METALS REVIEW
SDG F51300

I-Holding Times

The primary objective is to ascertain the validity of results based on the holding time of the sample from time of collection to time of sample analysis. Holding time criteria: Solid samples must be cooled @4°C±2°C with a maximum holding time of 180 days for ICP metals and 28 days for mercury. Aqueous samples must be preserved to pH<2 with HNO_3 and cooled @4°C±2°C, with a maximum holding time of 180 days for ICP metals and 28 days for mercury.

- Temperature Review: A temperature blank was sent with each cooler and recorded by the laboratory upon receipt. The samples collected on 7/25/07 were sent in five coolers, and were received by the laboratory on 7/26/07 at temperatures ranging from 2.6 °C to 4.0 °C. No qualifiers were applied.

- Holding Time Review: The samples were collected 7/25/07 for metals analysis, digested for mercury on 7/27/07 and 7/28/07, analyzed for mercury on 7/27/07 and 7/28/07, digested for ICP metals on 7/27/07 and 7/30/07, and analyzed for ICP metals on 7/28/07, 7/30/07, & 7/31/07. All criteria were met. No qualifiers were applied.

II-Initial and Continuing Calibration

Requirements for satisfactory instrument calibration are established to ensure that the instrument is capable of producing acceptable quantitative data. Initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of the analysis run, and continuing calibration verification documents that the initial calibration is still valid.

ICP:	1- blank (DoD QSM <½ MRL) 3 – standards (r≥0.995) ICV/CCV (90-110%) (DoD QSM 90-110%) MRL (70-130%) (DoD QSM 80-120%) High Std. (95-105%)	Hg:	1 – blank (DoD QSM <½ MRL) 5 – standards (r≥0.995) ICV/CCV (80-120%)(DoD QSM ICV 90-110% & CCV 80-120%) MRL (80-120%) (DoD QSM 80-120%) High Std. (95-105%)

- Mercury analysis was performed on 7/27/07, with a correlation coefficient of 0.999.

- Mercury analysis was performed on 7/28/07, with a correlation coefficient of 0.999.

- The mercury ICVs and CCVs met recovery criteria.

- Sample F51300-31 was analyzed for ICP metals on 7/28/07 between CCV21 and CCV22. Both CCVs met recovery criteria.

- Samples F51300-1 thru -30 were analyzed for ICP metals between CCV6 and CCV11 during the 7/30/07 metals run. All CCVs in this interval met recovery criteria.

- Selected samples were analyzed for iron and manganese between CCV3 and CCV6 during the 7/31/07 metals run. All CCVs in this interval met recovery criteria.

- All metals met recovery criteria during the High Standard analysis.

- **Table 2** summarizes the MRL standard analysis. Samples with concentrations detected less than two times the MRL with out of criteria MRL recovery were qualified.

Table 2 MRL Analysis Summary

Analysis Date	Analysis	MRL	MRL %Recovery	Qualified samples @ <2xMRL	Validation Qualifiers
7/27/07	Hg	0.2 ug/l	150.0	F51300-17, -23	K
7/28/07	Hg	0.2 ug/l	Met criteria	None	None
7/27/07	ICP-Al	200 ug/l	79.0	F51300-31	J
7/27/07	ICP-Sb	5 ug/l	0	F51300-31	J
7/27/07	ICP-Be	5 ug/l	126.0	None	None
7/27/07	ICP-Tl	10 ug/l	139.0	None	None
7/30/07	ICP-Sb	5 ug/l	130.0	None	None
7/30/07	ICP-Be	5 ug/l	124.0	None	None
7/30/07	ICP-Pb	5 ug/l	124.0	None	None
7/30/07	ICP-Tl	10 ug/l	125.0	None	None
7/31/07	ICP metals	Various	Met criteria	None	None

III-Blanks

Blanks (preparation and calibration blanks) are assessed to determine the existence and magnitude of contamination problems. No contaminants should be detected (i.e. <MDL) in any of the associated blanks. DoD QSM limits are <½MRL for the method blank and <2*MDL for the calibration blanks. Samples are qualified "B" when they are less than 5x the absolute value of the maximum blank concentration. **Table 3** summarizes the blank contamination analysis.

Table 3 Blank Contamination Analysis Summary

Analysis Date	Analysis	QC Blank ID	Max Conc.	Action Level	B qualified samples
7/27/07	ICP-Sb	ICB/CCB	9.2 ug/l	46.0	None
7/27/07	ICP-Fe	ICB/CCB	25.2 ug/l	126.0	None
7/27/07	ICP-K	ICB/CCB	1780 ug/l	8900	F51300-31
7/27/07	ICP-Mg	ICB/CCB	10.6	53.0	None
7/27/07	ICP-Na	ICB/CCB	2120 ug/l	10600	F51300-31
7/27/07	ICP-Se	ICB/CCB	5.0 ug/l	25.0	None
7/27/07	ICP-Tl	ICB/CCB	8.1 ug/l	40.5	None
7/30/07	ICP-Al	ICB/CCB	0.902 mg/kg	4.51	None
7/30/07	ICP-Sb	ICB/CCB	0.264 mg/kg	1.32	F51300-2 thru -30
7/30/07	ICP-Be	ICB/CCB	0.048 mg/kg	0.24	None
7/30/07	ICP-K	ICB/CCB	9.06 mg/kg	45.3	None
7/30/07	ICP-Tl	ICB/CCB	0.288 mg/kg	1.44	None
7/30/07	ICP-Zn	ICB/CCB	0.080 mg/kg	0.40	None
7/31/07	ICP-Fe, Mn	ICB/CCB	<2*MDL	NA	None
7/27/07	Mercury	ICB/CCB	<2*MDL	NA	None
7/28/07	Mercury	ICB/CCB	<2*MDL	NA	None
7/27/07	ICP Metals	MP12593-MB	<½MRL	NA	None
7/30/07	ICP-Be	MP12608-MB	0.14 mg/kg	0.70	F51300-2, -3, -4, -5, -6, -8, -9, -10, -12, -13, -14, -16, -17
7/30/07	ICP-Be	MP12609-MB	0.14 mg/kg	0.70	F51300-2, -3, -4, -5, -6, -8, -9, -10, -12, -13, -14, -16, -17
7/28/07	Mercury	MP12585-MB	<½MRL	NA	None
7/28/07	Mercury	MP12586-MB	<½MRL	NA	None
7/28/07	Mercury	MP12598-MB	<½MRL	<2*MDL	None
7/27/07	Potassium	F51300-31	1700 ug/l	170	None
7/27/07	Sodium	F51300-31	2130 ug/l	213	F51300-1, -2, -3, -4, -6, -9, -10, -11
7/28/07	Mercury	F51300-31	<½MRL	NA	None
7/31/07	Nickel	F51353-8	1.3 ug/l	0.13	None
7/31/07	Potassium	F51353-8	1730 ug/l	173	None
7/31/07	Sodium	F51353-8	1950 ug/l	195	F51300-1, -2, -3, -9, -10, -11

F51300-31 and F51353-8 are rinsate blanks.
J = Estimated value <MRL and >MDL.

IV-ICP Interference Check Sample (ICS)
The ICP interference check sample (ICS) verifies interelement and background correction factors. ICP Interference Check is performed at the beginning and end of each sample analysis run. Control limits are 80-120% (DoD QSM limits 80-120%).

- All criteria were met. No qualifiers were applied.

V-Laboratory Control Samples (LCS)
The laboratory control sample (LCS) serves as a monitor of the overall performance of each step during the analysis, including the sample preparation. The DoD LCS recovery limits are specified in Tables D-18 (aqueous) and D-19 (solid matrix) of the DoD QSM (DoD, 2006). If the compound is not listed, then the laboratory criteria shall be used.

- Sample MP12593-BS was used as an aqueous LCS during ICP metals analysis. All criteria were met. No qualifiers were applied. Sample F51300-31 was analyzed in conjunction with this LCS.

- Sample MP12608-BS was used as a solid matrix LCS during ICP metals analysis. All criteria were met. No qualifiers were applied. Samples F51300-1 thru -19 and -25 were analyzed in conjunction with this LCS.

- Sample MP12609-BS was used as a solid matrix LCS during ICP metals analysis. All criteria were met. No qualifiers were applied. Samples F51300-20 thru -24, and -26 thru -30 were analyzed in conjunction with this LCS.

- Sample MP12585-BS was used as a solid matrix LCS during mercury analysis. All criteria were met. No qualifiers were applied. Samples F51300-1 thru -12 and -25 were analyzed in conjunction with this LCS.

- Sample MP12586-BS was used as a solid matrix LCS during mercury analysis. All criteria were met. No qualifiers were applied. Samples F51300-13 thru -24 and -26 thru -30 were analyzed in conjunction with this LCS.

- Sample MP12598-BS was used as the LCS during aqueous ICP metals analysis. All criteria were met. No qualifiers were applied. Sample F51300-31 was analyzed in conjunction with this LCS.

VI-Laboratory Duplicate Sample Analysis
Duplicate sample determinations are used to demonstrate acceptable method precision by the laboratory at the time of analysis. Duplicate analyses are also performed to generate data in order to determine the long-term precision of the analytical method on various matrices. RPDs must be within established control limits. DoD QSM limits for metals are 20% RPD for ICP metals and mercury.

- Sample F51300-25 was analyzed in duplicate during solid matrix ICP metals analysis. Antimony (27.8%), arsenic (92.5%), calcium (108.9%), copper (34.1%), iron (48.0%), lead (83.5%), magnesium (65.7%), and zinc (35.4%) had RPDs above criteria – all results for these metals have been qualified "J/UJ". The other metals met RPD criteria. Samples F51300-1 thru -19 and -25 were analyzed in conjunction with this laboratory duplicate.

- Sample F51300-29 was analyzed in duplicate during solid matrix ICP metals analysis. Calcium (21.4%), cobalt (64.0%), lead (21.4%), manganese (67.0%), and selenium (40.0%) had RPDs above criteria – all results for these metals have been qualified "J/UJ". The other metals met RPD criteria. Samples F51300-20 thru -24, and -26 thru -30 were analyzed in conjunction with this laboratory duplicate.

- Sample F51289-13 was analyzed in duplicate during aqueous ICP metals analysis. The sample was not a RFAAP site sample; therefore, it was not evaluated. Sample F51300-31 was analyzed in conjunction with this laboratory duplicate.

- Sample F51300-25 was analyzed in duplicate during solid matrix mercury analysis, and met RPD criteria. Samples F51300-1 thru -12 and -25 were analyzed in conjunction with this laboratory duplicate.

- Sample F51300-29 was analyzed in duplicate during solid matrix mercury analysis, and met RPD criteria. Samples F51300-13 thru -24 and -26 thru -30 were analyzed in conjunction with this laboratory duplicate.

- Sample F51314-1 was analyzed in duplicate during aqueous mercury analysis. The sample was not a RFAAP site sample; therefore, it was not evaluated. Sample F51300-31 was analyzed in conjunction with this laboratory duplicate.

VII-Matrix Spike/Spike Duplicate

MS/MSD are generated to determine long-term precision and accuracy of the analytical method on various matrices and to demonstrate acceptable compound recovery by the laboratory at the time of sample analysis. Specific criteria include the analyses of matrix spike and matrix spike duplicate samples at a frequency of one MS and MSD per 20 samples of similar matrix. MS and MSD recoveries and relative percent differences between MS and MSD recoveries should be within the specified limits. DoD MS/MSD recovery limits follow the LCS criteria specified in Tables D-18 (aqueous) and D-19 (sold matrix) of the DoD QSM (DoD, 2006). If the compound is not listed, then the laboratory criteria shall be used. Post digestion spikes limits are 75-125% for ICP metals and mercury.

- Sample F51300-25 was used as an MS/MSD during solid matrix ICP metals analysis. Antimony (19.1%, 18.3%), arsenic (55.1%, 58.9%), barium (68.0%, 73.8%), cadmium (69.3%, 71.6%), calcium (0%, 0%), cobalt (69.3%, 75.9%), copper (38.7%, 46.5%), iron (140.4%, 27.5%), lead (48.9%, 60.1%), magnesium (0%, 0%), nickel (69.3%, 77.0%), potassium (72.3%, 77.3%), selenium (56.8%, 60.9%), thallium (67.2%, 70.0%), and zinc (0%, 18.3%) had low recoveries in the MS & MSD, while chromium (70.3%), manganese (0%), silver (73.0%), and sodium (79.4%) had low recoveries in the MS or MSD. The sample concentration was >4 times the spike added for calcium, iron, magnesium, and manganese; therefore, no qualifiers were applied for these four metals. The results for the other metals listed have been qualified "L/UL". The other metals met recovery criteria, and all metals met RPD criteria. Samples F51300-1 thru -19 and -25 were analyzed in conjunction with this MS/MSD.

- Sample F51300-29 was used as an MS/MSD during solid matrix ICP metals analysis. Aluminum (0%, 49.7%), antimony (29.0%, 27.1%), arsenic (69.6%, 71.4%), barium (73.4%, 75.2%), cadmium (74.5%, 73.7%), cobalt (61.3%, 53.3%), lead (76.2%, 78.4%), magnesium (68.4%, 69.1%), manganese (0%, 0%), nickel (74.1%, 77.8%), potassium (71.1%, 77.8%), selenium (66.5%, 68.5%), and thallium (75.8%, 77.4%) had low recoveries in the MS & MSD, while chromium (77.0%), iron (6.4%), vanadium (79.1%), and zinc (78.5%) had low recoveries in the MS or MSD. The sample concentration was >4 times the spike added for aluminum, iron, and manganese; therefore, no qualifiers were applied for these three metals. The results for the other metals listed have been qualified "L/UL". The other metals met recovery criteria, and all metals met RPD criteria. Samples F51300-20 thru -24, and -26 thru -30 were analyzed in conjunction with this MS/MSD.

- Sample F51289-3 was used as an MS/MSD during aqueous ICP metals analysis. The spiked sample was not a RFAAP site sample; therefore, it was not evaluated. Sample F51300-31 was analyzed in conjunction with this MS/MSD.

- Sample F51300-25 was used as an MS/MSD during solid matrix mercury analysis. Both MS and the MSD (0%, 0%) had low recoveries. The sample concentration was >4 times the spike added; therefore, no qualifiers were applied. Samples F51300-1 thru -12 and -25 were analyzed in conjunction with this laboratory duplicate.

- Sample F51300-29 was used as an MS/MSD during solid matrix mercury analysis, and met the recovery and RPD criteria. Samples F51300-13 thru -24 and -26 thru -30 were analyzed in conjunction with this MS/MSD.

- Sample F51314-1 was used as the MS/MSD during aqueous mercury analysis. The spiked sample was not a RFAAP site sample; therefore, it was not evaluated. Sample F51300-31 was analyzed in conjunction with this MS/MSD.

VIII-ICP Serial Dilution

An ICP serial dilution is performed to determine whether significant physical or chemical interferences exist due to sample matrix at high concentrations. An analysis of a 5-fold dilution should agree within 10% difference of the original result when the concentration in sample is a factor of 50 above MDL.

- Sample F51300-25 was used as the serial dilution during solid matrix ICP metals analysis. Aluminum (24.4%), barium (25.0%), calcium (32.4%), chromium (29.6%), cobalt (28.2%), copper (13.4%), iron (32.3%), lead (34.2%), magnesium (38.0%), manganese (32.8%), nickel (33.8%), potassium (17.2%), vanadium (28.3%), and zinc (28.6%) had %D > 10%. All detections for these metals have been qualified "J/UJ". The other metals met criteria. Samples F51300-1 thru -19 and -25 were analyzed in conjunction with this serial dilution.

- Sample F51300-29 was used as the serial dilution during solid matrix ICP metals analysis. Aluminum (23.4%), barium (23.9%), calcium (24.5%), chromium (22.8%), cobalt (23.5%), copper (12.1%), iron (27.6%), lead (37.4%), magnesium (35.3%), manganese (27.2%), nickel (26.4%), potassium (21.5%), vanadium (22.5%), and zinc (24.4%) had %D > 10%. All detections for these metals have been qualified "J/UJ". The other metals met criteria. Samples F51300-20 thru -24, and -26 thru -30 were analyzed in conjunction with this serial dilution.

- Sample F51289-3 was used as the serial dilution during aqueous ICP metals analysis. The spiked sample was not a RFAAP site sample; therefore, it was not evaluated. Sample F51300-31 was analyzed in conjunction with this serial dilution.

- Sample F51300-25 was used as the serial dilution during solid matrix mercury analysis, and met %D criteria. No data qualifiers were applied. Samples F51300-1 thru -12 and -25 were analyzed in conjunction with this laboratory duplicate.

- Sample F51300-29 was used as the serial dilution during solid matrix mercury analysis, and met %D criteria. No data qualifiers were applied. Samples F51300-13 thru -24 and -26 thru -30 were analyzed in conjunction with this laboratory duplicate.

- Sample F51314-1 was used as the serial dilution during aqueous mercury analysis. The spiked sample was not a RFAAP site sample; therefore, it was not evaluated. Sample F51300-31 was analyzed in conjunction with this serial dilution.

IX-Field Duplicate Sample Analysis
Field duplicates were collected to identify the cumulative precision of the sampling and analytical process and sent to the laboratory blind. The RPD was calculated only for those analytes which were detected at levels exceeding the method reporting limits in both samples of the duplicate pair. Analytes that were rejected (R-qualified) in either sample of the duplicate pair were excluded from the duplicate assessment. Precision control criterion was established at 35% RPD for the aqueous and solid samples. Analytical results were qualified as estimated (J) for any RPDs exceeding criteria.

- Field duplicate pairs in this data package included 59SB04C (F51300-9) & TMSB04C (F51300-10), 59SB02B (F51300-12) & TMSB02B (F51300-13), and 43SB10B (F51300-28) & TMSB10B (F51300-30). All compounds detected above the reporting limit (RL) met RPD criteria.

X-Quantitation Verification
The accuracy of analytical results is verified through the calculation of several parameters. The percent difference (%D) between the calculated and the reported values should be within 10%. Any sample value >MDL and <MRL or <3*MDL (whichever is greater) was qualified as estimated, "J." The following calculations were performed for verification.

ICP Sample: F51300-13, Chromium

Conc. (mg/kg) = (conc. μg/L) *(Final Volume L) * (DF) / (Sample weight g) * (Percent solids/100)

Conc. (mg/kg) = (275.8 μg/L)*(0.05 L)*(1) / (1.01)*(0.853) = 16.0 mg/kg

Reported concentration = 16.0 mg/kg
%D = 0.0%
Values were within 10% difference.

CVAA Sample: F51300-13, Mercury

Conc. (mg/kg) = (conc. μg/L) *(Final Volume L) * (DF) / (Sample weight g) * (Percent solids/100)

Conc. (mg/kg) = (1.20 μg/L)*(0.05 L)*(1) / (0.69)*(0.853) = 0.10 mg/kg

Reported concentration = 0.10 mg/kg
%D = 0.0%.
Values were within 10% difference.

USEPA Region III Validation Qualifiers

(No Code) = Confirmed identification.

B = The analyte has been detected in the sample and the associated laboratory or field blank.

J = Indicates an estimated value for (1) estimated value due to QC non-conformance. Reported value may not be accurate or precise, (2) estimating a concentration as a tentatively identified compound as indicated by the mass spectral and retention time data, or (3) estimating a concentration ≥MDL and <MRL or <3*MDL, whichever is greater.

K = Analyte present. Reported value may be biased high (estimated) due to QC non-conformance.

L = Analyte present. Reported value may be biased low (estimated) due to QC non-conformance.

R = Unreliable result. Analyte may or may not be present in the sample due to QC non-conformance.

UL = Value is estimated bias low and not detected due to QC non-conformance. Reporting limit may be inaccurate or imprecise. Quantitation limit is probably higher.

UJ = Value is estimated and not detected due to QC non-conformance. Reporting limit may be inaccurate or imprecise.

Laboratory Qualifiers

(No Code) = Confirmed identification.

U = Not detected. The associated number indicates the compound reporting limit for the sample.

A (Dioxins) = B (Metals) = The reported value was obtained from a reading <MRL and ≥MDL and is considered estimated.

B (Organics) = The analyte or compound has been detected in the sample and laboratory method blank. It indicates probable blank contamination.

E (Metals) = Reported value is estimated because of the presence of interferences.

E (Organics) = Identifies compounds whose concentrations exceed the upper level of the calibration range.

D = Indicates sample was analyzed at a dilution.

EMPC (Dioxins) = The ion-abundance ratio between the two characteristic PCDD/PCDF ions was outside accepted ranges. The detected PCDD/PCDF was reported as an estimated maximum possible concentration (EMPC).

J = Indicates an estimated value for (1) estimating a concentration as a tentatively identified compound as indicated by the mass spectral and retention time data, or (2) estimating a concentration <MRL and ≥ MDL.

N (Organics) = Indicates presumptive evidence of a compound for tentatively identified compounds using a library search.

P (Organics) = Target analyte confirmation >40% difference for detected compound between the primary and secondary columns. The lower of the two values was reported.

N (Metals) = Laboratory spike sample recovery not within control limits.

* (Metals) = Duplicate analysis not within control limits.

* (Organics) = Surrogate outside of QC limits on both original and re-analysis.

Accutest Laboratories

Report of Analysis

Client Sample ID:	59SB06A		
Lab Sample ID:	F51300-1	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
		Percent Solids:	91.9
Project:	WPA 019 Field Investigation; Radford AAP, VA		

Metals Analysis DATA VAL QUALIFIER

Analyte	Result	RL	MDL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Aluminum	7210 J	11	1.2	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Antimony	0.29 U UJ	3.2	0.29	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Arsenic	2.3 J	0.43	0.21	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Barium	178 J	11	0.27	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Beryllium	1.3	0.27	0.054	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Cadmium	0.054 U UL	0.22	0.054	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Calcium	411 J	270	3.1	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Chromium	9.2	0.54	0.048	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Cobalt	6.6	2.7	0.054	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Copper	3.3	1.3	0.048	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Iron	6270	5.4	0.65	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Lead	15.1	5.4	0.11	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Magnesium	295	270	0.40	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Manganese	3630	16	1.1	mg/kg	20	07/30/07	07/31/07	NS	SW846 6010B [3]	SW846 3050B [5]
Mercury	0.041 J J	0.088	0.0070	mg/kg	1	07/27/07	07/27/07	MS	SW846 7471A [1]	SW846 7471A [4]
Nickel	5.2 J	2.2	0.054	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Potassium	302 J J	540	5.4	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Selenium	0.70 J L	5.4	0.11	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Silver	0.048 U UL	0.54	0.048	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Sodium	109 J BJ	540	44	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Thallium [a]	2.4 U UL	4.4	2.4	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Vanadium	15.1 J	2.7	0.032	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Zinc	12.9 J	1.1	0.070	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]

(1) Instrument QC Batch: MA5879
(2) Instrument QC Batch: MA5884
(3) Instrument QC Batch: MA5886
(4) Prep QC Batch: MP12585
(5) Prep QC Batch: MP12608

(a) Elevated reporting limit(s) due to matrix interference.

RL = Reporting Limit
MDL = Method Detection Limit

U = Indicates a result < MDL
J = Indicates a result > = MDL but < RL

Accutest Laboratories

Report of Analysis

Client Sample ID:	59SB06B		
Lab Sample ID:	F51300-2	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
		Percent Solids:	88.5
Project:	WPA 019 Field Investigation; Radford AAP, VA		

Metals Analysis DATA VAL QUALIFIER

Analyte	Result		RL	MDL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Aluminum	12200	J	11	1.2	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Antimony	0.83	J B J	3.3	0.29	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Arsenic	2.7	J	0.44	0.22	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Barium	56.4	J	11	0.28	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Beryllium	0.45	B	0.28	0.055	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Cadmium [a]	0.55	U VL	1.1	0.55	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Calcium	531	J	280	3.2	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Chromium	33.0		0.55	0.050	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Cobalt	7.0		2.8	0.055	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Copper	6.3		1.4	0.050	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Iron	13800		5.5	0.66	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Lead	11.6		5.5	0.11	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Magnesium	563		280	0.41	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Manganese	1320		8.3	0.55	mg/kg	10	07/30/07	07/31/07	NS	SW846 6010B [3]	SW846 3050B [5]
Mercury	0.10		0.091	0.0073	mg/kg	1	07/27/07	07/27/07	MS	SW846 7471A [1]	SW846 7471A [4]
Nickel	6.1	J	2.2	0.055	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Potassium	607	J	550	5.5	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Selenium	0.39	J L	5.5	0.11	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Silver	0.050	U VL	0.55	0.050	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Sodium	162	J B J	550	46	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Thallium [a]	2.6	U VL	4.4	2.6	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Vanadium	34.6	J	2.8	0.033	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Zinc	19.6	J	1.1	0.072	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]

(1) Instrument QC Batch: MA5879
(2) Instrument QC Batch: MA5884
(3) Instrument QC Batch: MA5886
(4) Prep QC Batch: MP12585
(5) Prep QC Batch: MP12608

(a) Elevated reporting limit(s) due to matrix interference.

RL = Reporting Limit
MDL = Method Detection Limit

U = Indicates a result < MDL
J = Indicates a result > = MDL but < RL

Accutest Laboratories

Report of Analysis

Client Sample ID:	59SB06C		
Lab Sample ID:	F51300-3	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
		Percent Solids:	86.2
Project:	WPA 019 Field Investigation; Radford AAP, VA		

Metals Analysis

DATA VAL QUALIFIER

Analyte	Result	RL	MDL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Aluminum	12900 J	11	1.2	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Antimony	0.87 J BJ	3.3	0.29	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Arsenic	1.9 J	0.44	0.22	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Barium	56.6 J	11	0.28	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Beryllium	0.42 B	0.28	0.055	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Cadmium [a]	0.55 U UL	1.1	0.55	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Calcium	545 J	280	3.1	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Chromium	25.9	0.55	0.050	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Cobalt	7.5	2.8	0.055	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Copper	6.6	1.4	0.050	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Iron	13700	5.5	0.66	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Lead	10.6	5.5	0.11	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Magnesium	503	280	0.41	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Manganese	943	8.3	0.55	mg/kg	10	07/30/07	07/31/07	NS	SW846 6010B [3]	SW846 3050B [5]
Mercury	0.12	0.084	0.0067	mg/kg	1	07/27/07	07/27/07	MS	SW846 7471A [1]	SW846 7471A [4]
Nickel	6.0 J	2.2	0.055	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Potassium	586 J	550	5.5	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Selenium	0.38 J L	5.5	0.11	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Silver	0.050 U UL	0.55	0.050	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Sodium	195 J BJ	550	46	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Thallium [a]	1.3 U UL	2.2	1.3	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Vanadium	34.2 J	2.8	0.033	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Zinc	20.3 J	1.1	0.072	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]

(1) Instrument QC Batch: MA5879
(2) Instrument QC Batch: MA5884
(3) Instrument QC Batch: MA5886
(4) Prep QC Batch: MP12585
(5) Prep QC Batch: MP12608

(a) Elevated reporting limit(s) due to matrix interference.

RL = Reporting Limit
MDL = Method Detection Limit

U = Indicates a result < MDL
J = Indicates a result > = MDL but < RL

Accutest Laboratories

Report of Analysis

Client Sample ID:	59SB05A		
Lab Sample ID:	F51300-4	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
		Percent Solids:	89.5
Project:	WPA 019 Field Investigation; Radford AAP, VA		

Metals Analysis DATA VAL QUALIFIER

Analyte	Result	RL	MDL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Aluminum	15500 J	11	1.2	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Antimony	1.0 J BJ	3.3	0.29	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Arsenic	2.4 J	0.44	0.21	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Barium	88.6 J	11	0.27	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Beryllium	0.60 B	0.27	0.055	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Cadmium [a]	0.55 U VL	1.1	0.55	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Calcium	596 J	270	3.1	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Chromium	21.5	0.55	0.049	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Cobalt	7.2	2.7	0.055	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Copper	8.3	1.4	0.049	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Iron	19200	5.5	0.66	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Lead	9.7	5.5	0.11	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Magnesium	609	270	0.41	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Manganese	446	4.1	0.27	mg/kg	5	07/30/07	07/31/07	NS	SW846 6010B [3]	SW846 3050B [5]
Mercury	0.12	0.085	0.0068	mg/kg	1	07/27/07	07/27/07	MS	SW846 7471A [1]	SW846 7471A [4]
Nickel	6.8 J	2.2	0.055	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Potassium	656 J	550	5.5	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Selenium	0.26 J	5.5	0.11	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Silver	0.049 U VL	0.55	0.049	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Sodium	230 J BJ	550	45	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Thallium [b]	0.26 U VL	1.1	0.26	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Vanadium	47.2 J	2.7	0.033	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Zinc	22.9 J	1.1	0.071	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]

(1) Instrument QC Batch: MA5879
(2) Instrument QC Batch: MA5884
(3) Instrument QC Batch: MA5886
(4) Prep QC Batch: MP12585
(5) Prep QC Batch: MP12608

(a) Elevated reporting limit(s) due to matrix interference.
(b) Elevated RL/MDL due to negative bias of Method Blank.

RL = Reporting Limit
MDL = Method Detection Limit

U = Indicates a result < MDL
J = Indicates a result > = MDL but < RL

Accutest Laboratories

Report of Analysis

Client Sample ID:	59SB05B		
Lab Sample ID:	F51300-5	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
		Percent Solids:	84.2
Project:	WPA 019 Field Investigation; Radford AAP, VA		

Metals Analysis DATA VAL QUALIFIER

Analyte	Result	RL	MDL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Aluminum	24800 J	12	1.3	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [4]
Antimony	1.1 J BJ	3.6	0.31	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [4]
Arsenic	1.2 J	0.48	0.23	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [4]
Barium	38.7 J	12	0.30	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [4]
Beryllium	0.63 B	0.30	0.059	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [4]
Cadmium [a]	0.60 U UL	1.2	0.60	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [4]
Calcium	245 J J	300	3.4	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [4]
Chromium	20.0	0.59	0.053	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [4]
Cobalt	3.3	3.0	0.059	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [4]
Copper	13.6	1.5	0.053	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [4]
Iron	27800	5.9	0.71	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [4]
Lead	7.6	5.9	0.12	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [4]
Magnesium	983	300	0.44	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [4]
Manganese	119	0.89	0.036	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [4]
Mercury	0.068 J J	0.097	0.0078	mg/kg	1	07/27/07	07/27/07	MS	SW846 7471A [1]	SW846 7471A [3]
Nickel	9.8 J	2.4	0.059	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [4]
Potassium	1250 J	590	5.9	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [4]
Selenium	0.12 U UL	5.9	0.12	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [4]
Silver	0.053 U UL	0.59	0.053	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [4]
Sodium	383 J L	590	49	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [4]
Thallium [b]	0.28 U UL	1.2	0.28	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [4]
Vanadium	64.9 J	3.0	0.036	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [4]
Zinc	32.3 J	1.2	0.077	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [4]

(1) Instrument QC Batch: MA5879
(2) Instrument QC Batch: MA5884
(3) Prep QC Batch: MP12585
(4) Prep QC Batch: MP12608

(a) Elevated reporting limit(s) due to matrix interference.
(b) Elevated RL/MDL due to negative bias of Method Blank.

RL = Reporting Limit
MDL = Method Detection Limit

U = Indicates a result < MDL
J = Indicates a result > = MDL but < RL

Accutest Laboratories

Report of Analysis

Client Sample ID:	59SB05C		
Lab Sample ID:	F51300-6	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
		Percent Solids:	86.3
Project:	WPA 019 Field Investigation; Radford AAP, VA		

Metals Analysis DATA VAL QUALIFIER

Analyte	Result	RL	MDL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Aluminum	18600 J	11	1.2	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Antimony	0.63 J	3.4	0.30	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Arsenic	0.97 J	0.45	0.22	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Barium	31.6 J	11	0.28	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Beryllium	0.61 B	0.28	0.056	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Cadmium [a]	0.56 U UL	1.1	0.56	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Calcium	40.7 J J	280	3.2	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Chromium	22.9	0.56	0.051	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Cobalt	6.2	2.8	0.056	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Copper	10.3	1.4	0.051	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Iron	14600	5.6	0.67	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Lead	3.8 J	5.6	0.11	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Magnesium	648	280	0.42	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Manganese	296	1.7	0.11	mg/kg	2	07/30/07	07/31/07	NS	SW846 6010B [3]	SW846 3050B [5]
Mercury	0.039 J J	0.089	0.0071	mg/kg	1	07/27/07	07/27/07	MS	SW846 7471A [1]	SW846 7471A [4]
Nickel	8.1 J	2.2	0.056	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Potassium	718 J	560	5.6	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Selenium	0.19 J L	5.6	0.11	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Silver	0.051 U UL	0.56	0.051	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Sodium	227 J B J	560	46	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Thallium [b]	0.26 U UL	1.1	0.26	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Vanadium	24.3 J	2.8	0.034	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Zinc	20.0 J	1.1	0.073	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]

(1) Instrument QC Batch: MA5879
(2) Instrument QC Batch: MA5884
(3) Instrument QC Batch: MA5886
(4) Prep QC Batch: MP12585
(5) Prep QC Batch: MP12608

(a) Elevated reporting limit(s) due to matrix interference.
(b) Elevated RL/MDL due to negative bias of Method Blank.

RL = Reporting Limit
MDL = Method Detection Limit

U = Indicates a result < MDL
J = Indicates a result > = MDL but < RL

Accutest Laboratories

Report of Analysis

317
3

Client Sample ID:	59SB04A		
Lab Sample ID:	F51300-7	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
		Percent Solids:	86.6
Project:	WPA 019 Field Investigation; Radford AAP, VA		

Metals Analysis DATA VAL QUALIFIER

Analyte	Result	RL	MDL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Aluminum	17800 J	11	1.2	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [4]
Antimony	0.72 J BJ	3.3	0.29	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [4]
Arsenic	1.6 J	0.44	0.22	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [4]
Barium	94.7 J	11	0.28	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [4]
Beryllium	1.1	0.28	0.056	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [4]
Cadmium [a]	0.56 U UL	1.1	0.56	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [4]
Calcium	937 J	280	3.2	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [4]
Chromium	28.8	0.56	0.050	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [4]
Cobalt	9.6	2.8	0.056	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [4]
Copper	12.8	1.4	0.050	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [4]
Iron	24400	5.6	0.67	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [4]
Lead	8.3	5.6	0.11	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [4]
Magnesium	1830	280	0.41	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [4]
Manganese	216	0.83	0.033	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [4]
Mercury	0.082 J	0.084	0.0067	mg/kg	1	07/27/07	07/27/07	MS	SW846 7471A [1]	SW846 7471A [3]
Nickel	11.5	2.2	0.056	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [4]
Potassium	935	560	5.6	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [4]
Selenium	0.11 U UL	5.6	0.11	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [4]
Silver	0.050 U UL	0.56	0.050	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [4]
Sodium	370 J L	560	46	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [4]
Thallium [b]	0.26 U UL	1.1	0.26	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [4]
Vanadium	50.6 J	2.8	0.033	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [4]
Zinc	42.8 J	1.1	0.072	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [4]

(1) Instrument QC Batch: MA5879
(2) Instrument QC Batch: MA5884
(3) Prep QC Batch: MP12585
(4) Prep QC Batch: MP12608

(a) Elevated reporting limit(s) due to matrix interference.
(b) Elevated RL/MDL due to negative bias of Method Blank.

RL = Reporting Limit
MDL = Method Detection Limit

U = Indicates a result < MDL
J = Indicates a result > = MDL but < RL

Accutest Laboratories

Report of Analysis

Client Sample ID:	59SB04B		
Lab Sample ID:	F51300-8	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
		Percent Solids:	83.2
Project:	WPA 019 Field Investigation; Radford AAP, VA		

Metals Analysis DATA VAL QUALIFIER

Analyte	Result	RL	MDL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Aluminum	25900 J	12	1.3	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Antimony	0.84 J B J	3.6	0.32	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Arsenic	1.2 J	0.48	0.23	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Barium	43.6 J	12	0.30	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Beryllium	0.66 B	0.30	0.060	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Cadmium [a]	0.60 U UL	1.2	0.60	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Calcium	530 J	300	3.4	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Chromium	21.0 J	0.60	0.054	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Cobalt	2.9 J	3.0	0.060	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Copper	12.8	1.5	0.054	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Iron	37000	12	1.7	mg/kg	2	07/30/07	07/31/07	NS	SW846 6010B [3]	SW846 3050B [5]
Lead	8.4	6.0	0.12	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Magnesium	806	300	0.44	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Manganese	112	0.89	0.036	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Mercury	0.087 J	0.094	0.0075	mg/kg	1	07/27/07	07/27/07	MS	SW846 7471A [1]	SW846 7471A [4]
Nickel	9.6	2.4	0.060	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Potassium	1050	600	6.0	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Selenium	0.12 U UL	6.0	0.12	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Silver	0.054 U UL	0.60	0.054	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Sodium	396 J L	600	49	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Thallium [b]	0.28 U UL	1.2	0.28	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Vanadium	74.5 J	3.0	0.036	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Zinc	32.5 J	1.2	0.077	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]

(1) Instrument QC Batch: MA5879
(2) Instrument QC Batch: MA5884
(3) Instrument QC Batch: MA5886
(4) Prep QC Batch: MP12585
(5) Prep QC Batch: MP12608

(a) Elevated reporting limit(s) due to matrix interference.
(b) Elevated RL/MDL due to negative bias of Method Blank.

RL = Reporting Limit
MDL = Method Detection Limit

U = Indicates a result < MDL
J = Indicates a result > = MDL but < RL

Accutest Laboratories

Report of Analysis

Client Sample ID:	59SB04C		
Lab Sample ID:	F51300-9	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
		Percent Solids:	85.8
Project:	WPA 019 Field Investigation; Radford AAP, VA		

Metals Analysis DATA VAL QUALIFIER

Analyte	Result	RL	MDL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Aluminum	17100 J	11	1.3	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Antimony	0.61 J BJ	3.4	0.30	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Arsenic	1.3 J	0.46	0.22	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Barium	44.6 J	11	0.29	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Beryllium	0.67 B	0.29	0.057	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Cadmium [a]	0.57 U UL	1.2	0.57	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Calcium	184 J J	290	3.3	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Chromium	16.7	0.57	0.051	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Cobalt	8.2	2.9	0.057	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Copper	7.3	1.4	0.051	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Iron	14900	5.7	0.69	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Lead	4.7 J	5.7	0.11	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Magnesium	714	290	0.42	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Manganese	452	4.3	0.29	mg/kg	5	07/30/07	07/31/07	NS	SW846 6010B [3]	SW846 3050B [5]
Mercury	0.030 J	0.096	0.0076	mg/kg	1	07/27/07	07/27/07	MS	SW846 7471A [1]	SW846 7471A [4]
Nickel	8.1	2.3	0.057	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Potassium	813	570	5.7	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Selenium	0.20 J L	5.7	0.11	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Silver	0.051 U UL	0.57	0.051	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Sodium	225 J BJ	570	47	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Thallium [b]	0.26 U UL	1.1	0.26	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Vanadium	27.4 J	2.9	0.034	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Zinc	18.9 J	1.1	0.074	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]

(1) Instrument QC Batch: MA5879
(2) Instrument QC Batch: MA5884
(3) Instrument QC Batch: MA5886
(4) Prep QC Batch: MP12585
(5) Prep QC Batch: MP12608

(a) Elevated reporting limit(s) due to matrix interference.
(b) Elevated RL/MDL due to negative bias of Method Blank.

RL = Reporting Limit
MDL = Method Detection Limit

U = Indicates a result < MDL
J = Indicates a result > = MDL but < RL

Accutest Laboratories

Report of Analysis

3.10
3

Client Sample ID:	TMSB04C		
Lab Sample ID:	F51300-10	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
		Percent Solids:	83.9
Project:	WPA 019 Field Investigation; Radford AAP, VA		

Metals Analysis DAM VAL QUALIFIER

Analyte	Result	RL	MDL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Aluminum	19100 J	12	1.3	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Antimony	0.72 J B	3.5	0.31	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Arsenic	1.3 J	0.47	0.23	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Barium	41.8 J	12	0.29	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Beryllium	0.65 B	0.29	0.058	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Cadmium [a]	0.58 U UL	1.2	0.58	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Calcium	209 J J	290	3.3	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Chromium	18.0	0.58	0.053	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Cobalt	8.0	2.9	0.058	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Copper	9.4	1.5	0.053	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Iron	15700	5.8	0.70	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Lead	5.4 J	5.8	0.12	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Magnesium	641	290	0.43	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Manganese	388	4.4	0.29	mg/kg	5	07/30/07	07/31/07	NS	SW846 6010B [3]	SW846 3050B [5]
Mercury	0.050 J	0.099	0.0079	mg/kg	1	07/27/07	07/27/07	MS	SW846 7471A [1]	SW846 7471A [4]
Nickel	8.0	2.3	0.058	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Potassium	781	580	5.8	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Selenium	0.13 J L	5.8	0.12	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Silver	0.053 U UL	0.58	0.053	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Sodium	229 J B J	580	48	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Thallium [b]	0.26 U UL	1.2	0.26	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Vanadium	29.1 J	2.9	0.035	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Zinc	20.3 J	1.2	0.076	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]

(1) Instrument QC Batch: MA5879
(2) Instrument QC Batch: MA5884
(3) Instrument QC Batch: MA5886
(4) Prep QC Batch: MP12585
(5) Prep QC Batch: MP12608

(a) Elevated reporting limit(s) due to matrix interference.
(b) Elevated RL/MDL due to negative bias of Method Blank.

RL = Reporting Limit
MDL = Method Detection Limit

U = Indicates a result < MDL
J = Indicates a result > = MDL but < RL

Accutest Laboratories

Report of Analysis

Client Sample ID:	59SB02A		
Lab Sample ID:	F51300-11	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
		Percent Solids:	89.5
Project:	WPA 019 Field Investigation; Radford AAP, VA		

Metals Analysis

DATA VAL QUALIFIER

Analyte	Result	RL	MDL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Aluminum	7210 J	11	1.2	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Antimony	0.37 J B	3.3	0.29	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Arsenic	5.2 J	0.44	0.21	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Barium	140 J	11	0.27	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Beryllium	1.0	0.27	0.055	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Cadmium [a]	0.55 U UL	1.1	0.55	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Calcium	192 J J	270	3.1	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Chromium	11.6	0.55	0.049	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Cobalt	2.9	2.7	0.055	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Copper	10.9	1.4	0.049	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Iron	10800	5.5	0.66	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Lead	9.9	5.5	0.11	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Magnesium	382	270	0.41	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Manganese	337 V	4.1	0.27	mg/kg	5	07/30/07	07/31/07	NS	SW846 6010B [3]	SW846 3050B [5]
Mercury	0.24	0.089	0.0071	mg/kg	1	07/27/07	07/27/07	MS	SW846 7471A [1]	SW846 7471A [4]
Nickel	5.3 J	2.2	0.055	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Potassium	365 J J	550	5.5	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Selenium	0.63 J L	5.5	0.11	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Silver	0.049 U UL	0.55	0.049	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Sodium	187 J B J	550	45	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Thallium [b]	0.26 U UL	1.1	0.26	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Vanadium	20.5 J	2.7	0.033	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Zinc	22.6 J	1.1	0.071	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]

(1) Instrument QC Batch: MA5879
(2) Instrument QC Batch: MA5884
(3) Instrument QC Batch: MA5886
(4) Prep QC Batch: MP12585
(5) Prep QC Batch: MP12608

(a) Elevated reporting limit(s) due to matrix interference.
(b) Elevated RL/MDL due to negative bias of Method Blank.

RL = Reporting Limit
MDL = Method Detection Limit

U = Indicates a result < MDL
J = Indicates a result > = MDL but < RL

Accutest Laboratories

Report of Analysis

Client Sample ID:	59SB02B		
Lab Sample ID:	F51300-12	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
		Percent Solids:	83.3
Project:	WPA 019 Field Investigation; Radford AAP, VA		

Metals Analysis

DATA VAL QUALIFIER

Analyte	Result	RL	MDL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Aluminum	22900 J	12	1.3	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [4]
Antimony	0.76 J	3.5	0.31	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [4]
Arsenic	1.3	0.47	0.23	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [4]
Barium	45.5	12	0.29	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [4]
Beryllium	0.70	0.29	0.059	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [4]
Cadmium [a]	0.59 U	1.2	0.59	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [4]
Calcium	539	290	3.4	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [4]
Chromium	16.8	0.59	0.053	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [4]
Cobalt	3.7	2.9	0.059	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [4]
Copper	12.1	1.5	0.053	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [4]
Iron	26400	5.9	0.71	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [4]
Lead	10.1	5.9	0.12	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [4]
Magnesium	1010	290	0.44	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [4]
Manganese	167	0.88	0.035	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [4]
Mercury	0.10	0.097	0.0077	mg/kg	1	07/27/07	07/27/07	MS	SW846 7471A [1]	SW846 7471A [3]
Nickel	9.5	2.4	0.059	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [4]
Potassium	1080	590	5.9	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [4]
Selenium	0.12 U	5.9	0.12	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [4]
Silver	0.053 U	0.59	0.053	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [4]
Sodium	366 J	590	49	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [4]
Thallium [b]	0.28 U	1.2	0.28	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [4]
Vanadium	63.4	2.9	0.035	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [4]
Zinc	30.6	1.2	0.077	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [4]

(1) Instrument QC Batch: MA5879
(2) Instrument QC Batch: MA5884
(3) Prep QC Batch: MP12585
(4) Prep QC Batch: MP12608

(a) Elevated reporting limit(s) due to matrix interference.
(b) Elevated RL/MDL due to negative bias of Method Blank.

RL = Reporting Limit
MDL = Method Detection Limit

U = Indicates a result < MDL
J = Indicates a result > = MDL but < RL

Accutest Laboratories

Report of Analysis

Client Sample ID:	TMSB02B		
Lab Sample ID:	F51300-13	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
		Percent Solids:	85.3
Project:	WPA 019 Field Investigation; Radford AAP, VA		

Metals Analysis

DATA VAL QUALIFIER

Analyte	Result	RL	MDL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Aluminum	21600 J	12	1.3	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [4]
Antimony	0.80 J BJ	3.5	0.31	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [4]
Arsenic	0.94 J	0.46	0.23	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [4]
Barium	42.7 J	12	0.29	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [4]
Beryllium	0.66 B	0.29	0.058	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [4]
Cadmium [a]	0.58 U UL	1.2	0.58	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [4]
Calcium	541 J	290	3.3	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [4]
Chromium	16.0	0.58	0.052	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [4]
Cobalt	3.6	2.9	0.058	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [4]
Copper	12.1	1.5	0.052	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [4]
Iron	26300	5.8	0.70	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [4]
Lead	10.7	5.8	0.12	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [4]
Magnesium	1000	290	0.43	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [4]
Manganese	161 J	0.87	0.035	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [4]
Mercury	0.10	0.085	0.0068	mg/kg	1	07/27/07	07/27/07	MS	SW846 7471A [1]	SW846 7471A [3]
Nickel	9.1 J	2.3	0.058	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [4]
Potassium	1050 J	580	5.8	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [4]
Selenium	0.12 U UL	5.8	0.12	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [4]
Silver	0.052 U UL	0.58	0.052	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [4]
Sodium	357 J L	580	48	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [4]
Thallium [b]	0.26 U UL	1.2	0.26	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [4]
Vanadium	61.8 J	2.9	0.035	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [4]
Zinc	28.4 J	1.2	0.075	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [4]

(1) Instrument QC Batch: MA5879
(2) Instrument QC Batch: MA5884
(3) Prep QC Batch: MP12586
(4) Prep QC Batch: MP12608

(a) Elevated reporting limit(s) due to matrix interference.
(b) Elevated RL/MDL due to negative bias of Method Blank.

RL = Reporting Limit
MDL = Method Detection Limit

U = Indicates a result < MDL
J = Indicates a result > = MDL but < RL

Accutest Laboratories

Report of Analysis

3.14

Client Sample ID:	59SB02C		
Lab Sample ID:	F51300-14	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
		Percent Solids:	83.2
Project:	WPA 019 Field Investigation; Radford AAP, VA		

Metals Analysis DATA VAL QUALIFIER

Analyte	Result	RL	MDL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Aluminum	19800 J	12	1.3	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Antimony	0.86 J	3.6	0.32	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Arsenic	1.4	0.48	0.23	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Barium	38.6	12	0.30	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Beryllium	0.71	0.30	0.060	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Cadmium [a]	0.60 U	1.2	0.60	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Calcium	323	300	3.4	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Chromium	17.3	0.60	0.054	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Cobalt	7.8	3.0	0.060	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Copper	9.7	1.5	0.054	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Iron	20000	6.0	0.71	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Lead	6.6	6.0	0.12	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Magnesium	1060	300	0.44	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Manganese	378	4.5	0.30	mg/kg	5	07/30/07	07/31/07	NS	SW846 6010B [3]	SW846 3050B [5]
Mercury	0.066 J	0.095	0.0076	mg/kg	1	07/27/07	07/27/07	MS	SW846 7471A [1]	SW846 7471A [4]
Nickel	8.6	2.4	0.060	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Potassium	948	600	6.0	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Selenium	0.29 J	6.0	0.12	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Silver	0.054 U	0.60	0.054	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Sodium	315 J	600	49	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Thallium [b]	0.28 U	1.2	0.28	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Vanadium	42.3	3.0	0.036	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Zinc	24.4	1.2	0.077	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]

(1) Instrument QC Batch: MA5879
(2) Instrument QC Batch: MA5884
(3) Instrument QC Batch: MA5886
(4) Prep QC Batch: MP12586
(5) Prep QC Batch: MP12608

(a) Elevated reporting limit(s) due to matrix interference.
(b) Elevated RL/MDL due to negative bias of Method Blank.

RL = Reporting Limit
MDL = Method Detection Limit

U = Indicates a result < MDL
J = Indicates a result > = MDL but < RL

Accutest Laboratories

Report of Analysis

Client Sample ID:	43SB06A		
Lab Sample ID:	F51300-15	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
		Percent Solids:	85.6
Project:	WPA 019 Field Investigation; Radford AAP, VA		

Metals Analysis DATA VAL QUALIFIER

Analyte	Result	RL	MDL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Aluminum	15600 J	12	1.3	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Antimony	0.71 J	3.5	0.31	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Arsenic	1.4	0.46	0.23	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Barium	192	12	0.29	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Beryllium	1.3	0.29	0.058	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Cadmium [a]	0.29 U	0.46	0.29	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Calcium	2150	290	3.3	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Chromium	24.3	0.58	0.052	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Cobalt	9.9	2.9	0.058	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Copper	14.0	1.4	0.052	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Iron	19800	5.8	0.69	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Lead	16.4	5.8	0.12	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Magnesium	3130	290	0.43	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Manganese	428	4.3	0.29	mg/kg	5	07/30/07	07/31/07	NS	SW846 6010B [3]	SW846 3050B [5]
Mercury	0.061 J	0.087	0.0070	mg/kg	1	07/27/07	07/27/07	MS	SW846 7471A [1]	SW846 7471A [4]
Nickel	12.6	2.3	0.058	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Potassium	1030	580	5.8	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Selenium	0.12 U	5.8	0.12	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Silver	0.052 U	0.58	0.052	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Sodium	369 J	580	48	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Thallium [b]	0.26 U	1.2	0.26	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Vanadium	42.4	2.9	0.035	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Zinc	89.9	1.2	0.075	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]

(1) Instrument QC Batch: MA5879
(2) Instrument QC Batch: MA5884
(3) Instrument QC Batch: MA5886
(4) Prep QC Batch: MP12586
(5) Prep QC Batch: MP12608

(a) Elevated reporting limit(s) due to matrix interference.
(b) Elevated RL/MDL due to negative bias of Method Blank.

RL = Reporting Limit
MDL = Method Detection Limit

U = Indicates a result < MDL
J = Indicates a result > = MDL but < RL

Accutest Laboratories

Report of Analysis

Client Sample ID:	43SB06B		
Lab Sample ID:	F51300-16	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
		Percent Solids:	81.7
Project:	WPA 019 Field Investigation; Radford AAP, VA		

Metals Analysis DATA VAL QUALIFIER

Analyte	Result	RL	MDL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Aluminum	6990 J	12	1.3	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [4]
Antimony	0.73 J BJ	3.6	0.32	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [4]
Arsenic	6.8 J	0.48	0.24	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [4]
Barium	83.9 J	12	0.30	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [4]
Beryllium	0.77 B	0.30	0.061	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [4]
Cadmium	0.061 U UL	0.24	0.061	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [4]
Calcium	15200 J	300	3.5	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [4]
Chromium	13.2	0.61	0.055	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [4]
Cobalt	5.0	3.0	0.061	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [4]
Copper	45.1	1.5	0.055	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [4]
Iron	21000	6.1	0.73	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [4]
Lead	19.6	6.1	0.12	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [4]
Magnesium	5670	300	0.45	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [4]
Manganese	238	0.91	0.036	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [4]
Mercury	0.40	0.096	0.0076	mg/kg	1	07/27/07	07/27/07	MS	SW846 7471A [1]	SW846 7471A [3]
Nickel	10.5 J	2.4	0.061	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [4]
Potassium	886 J	610	6.1	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [4]
Selenium	0.51 J L	6.1	0.12	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [4]
Silver	0.18 J L	0.61	0.055	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [4]
Sodium	390 J L	610	50	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [4]
Thallium [a]	0.28 U UL	1.2	0.28	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [4]
Vanadium	17.6 J	3.0	0.036	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [4]
Zinc	111 J	1.2	0.079	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [4]

(1) Instrument QC Batch: MA5879
(2) Instrument QC Batch: MA5884
(3) Prep QC Batch: MP12586
(4) Prep QC Batch: MP12608

(a) Elevated RL/MDL due to negative bias of Method Blank.

RL = Reporting Limit
MDL = Method Detection Limit

U = Indicates a result < MDL
J = Indicates a result > = MDL but < RL

Accutest Laboratories

Report of Analysis

3.1.7 S

Client Sample ID:	43SB06C		
Lab Sample ID:	F51300-17	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
		Percent Solids:	89.4
Project:	WPA 019 Field Investigation; Radford AAP, VA		

Metals Analysis DATA VAL QUALIFIER

Analyte	Result	RL	MDL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Aluminum	7010 J	11	1.2	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Antimony	0.47 J BJ	3.3	0.29	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Arsenic	1.5 J	0.44	0.21	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Barium	54.7 J	11	0.27	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Beryllium	0.77 B	0.27	0.055	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Cadmium [a]	0.55 U UL	1.1	0.55	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Calcium	773 J	270	3.1	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Chromium	13.4	0.55	0.049	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Cobalt	7.3	2.7	0.055	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Copper	9.9	1.4	0.049	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Iron	14300	5.5	0.66	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Lead	5.8	5.5	0.11	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Magnesium	2180	270	0.41	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Manganese	411 V	4.1	0.27	mg/kg	5	07/30/07	07/31/07	NS	SW846 6010B [3]	SW846 3050B [5]
Mercury	0.015 J K	0.089	0.0071	mg/kg	1	07/27/07	07/27/07	MS	SW846 7471A [1]	SW846 7471A [4]
Nickel	9.9 J	2.2	0.055	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Potassium	840 J	550	5.5	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Selenium	0.19 J L	5.5	0.11	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Silver	0.049 U UL	0.55	0.049	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Sodium	340 J L	550	45	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Thallium [a]	1.3 U UL	2.2	1.3	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Vanadium	22.8 J	2.7	0.033	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Zinc	29.3 J	1.1	0.071	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]

(1) Instrument QC Batch: MA5879
(2) Instrument QC Batch: MA5884
(3) Instrument QC Batch: MA5886
(4) Prep QC Batch: MP12586
(5) Prep QC Batch: MP12608

(a) Elevated reporting limit(s) due to matrix interference.

RL = Reporting Limit
MDL = Method Detection Limit

U = Indicates a result < MDL
J = Indicates a result > = MDL but < RL

Accutest Laboratories

Report of Analysis

Client Sample ID:	43SB07A		
Lab Sample ID:	F51300-18	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
		Percent Solids:	90.2
Project:	WPA 019 Field Investigation; Radford AAP, VA		

Metals Analysis DATA VAL QUALIFIER

Analyte	Result	RL	MDL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Aluminum	11900 J	11	1.2	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Antimony	0.67 J BJ	3.2	0.29	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Arsenic	17.7 J	0.43	0.21	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Barium	142 J	11	0.27	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Beryllium	1.1	0.27	0.054	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Cadmium	0.054 U UL	0.22	0.054	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Calcium	1840 J	270	3.1	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Chromium	18.4	0.54	0.048	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Cobalt	10.7	2.7	0.054	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Copper	16.8	1.3	0.048	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Iron	19800	5.4	0.65	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Lead	16.2	5.4	0.11	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Magnesium	2400	270	0.40	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Manganese	708	8.1	0.54	mg/kg	10	07/30/07	07/31/07	NS	SW846 6010B [3]	SW846 3050B [5]
Mercury	0.31	0.092	0.0074	mg/kg	1	07/27/07	07/27/07	MS	SW846 7471A [1]	SW846 7471A [4]
Nickel	11.7 J	2.2	0.054	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Potassium	1090 J	540	5.4	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Selenium	0.31 J L	5.4	0.11	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Silver	0.048 U UL	0.54	0.048	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Sodium	381 J L	540	44	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Thallium [a]	1.2 U UL	2.2	1.2	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Vanadium	33.0 J	2.7	0.032	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Zinc	68.4 J	1.1	0.070	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]

(1) Instrument QC Batch: MA5879
(2) Instrument QC Batch: MA5884
(3) Instrument QC Batch: MA5886
(4) Prep QC Batch: MP12586
(5) Prep QC Batch: MP12608

(a) Elevated reporting limit(s) due to matrix interference.

RL = Reporting Limit
MDL = Method Detection Limit

U = Indicates a result < MDL
J = Indicates a result > = MDL but < RL

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Report of Analysis

Client Sample ID:	43SB07B		
Lab Sample ID:	F51300-19	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
		Percent Solids:	86.2
Project:	WPA 019 Field Investigation; Radford AAP, VA		

Metals Analysis DATA VAL QUALIFIER

Analyte	Result	RL	MDL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Aluminum	8040 J	11	1.2	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Antimony	0.54 J B J	3.4	0.30	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Arsenic	1.1 J	0.45	0.22	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Barium	104 J	11	0.28	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Beryllium	0.89	0.28	0.056	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Cadmium	0.056 U UL	0.23	0.056	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Calcium	3090 J	280	3.2	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Chromium	14.3	0.56	0.051	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Cobalt	8.1	2.8	0.056	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Copper	8.9	1.4	0.051	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Iron	13700	5.6	0.68	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Lead	28.4	5.6	0.11	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Magnesium	2800	280	0.42	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Manganese	655	8.4	0.56	mg/kg	10	07/30/07	07/31/07	NS	SW846 6010B [3]	SW846 3050B [5]
Mercury	0.47	0.091	0.0073	mg/kg	1	07/27/07	07/27/07	MS	SW846 7471A [1]	SW846 7471A [4]
Nickel	9.6 J	2.3	0.056	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Potassium	1040 J	560	5.6	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Selenium	0.27 J L	5.6	0.11	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Silver	0.051 U UL	0.56	0.051	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Sodium	356 J L	560	46	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Thallium [a]	2.6 U UL	4.4	2.6	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Vanadium	21.3 J	2.8	0.034	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Zinc	115 J	1.1	0.073	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]

(1) Instrument QC Batch: MA5879
(2) Instrument QC Batch: MA5884
(3) Instrument QC Batch: MA5886
(4) Prep QC Batch: MP12586
(5) Prep QC Batch: MP12608

(a) Elevated reporting limit(s) due to matrix interference.

RL = Reporting Limit
MDL = Method Detection Limit

U = Indicates a result < MDL
J = Indicates a result > = MDL but < RL

Accutest Laboratories

Report of Analysis

3.20

Client Sample ID:	43SB07C		
Lab Sample ID:	F51300-20	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
		Percent Solids:	84.3
Project:	WPA 019 Field Investigation; Radford AAP, VA		

Metals Analysis

DATA VAL QUALIFIER

Analyte	Result	RL	MDL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Aluminum	11500 J	11	1.3	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Antimony	0.59 J	3.4	0.30	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Arsenic	1.3	0.46	0.22	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Barium	67.6	11	0.29	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Beryllium	1.0	0.29	0.057	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Cadmium [a]	0.57 U	1.2	0.57	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Calcium	765	290	3.3	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Chromium	16.9	0.57	0.051	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Cobalt	8.2	2.9	0.057	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Copper	12.4	1.4	0.051	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Iron	17700	5.7	0.68	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Lead	5.0 J	5.7	0.11	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Magnesium	2760	290	0.42	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Manganese	404	4.3	0.29	mg/kg	5	07/30/07	07/31/07	NS	SW846 6010B [3]	SW846 3050B [5]
Mercury	0.023 J	0.086	0.0069	mg/kg	1	07/27/07	07/27/07	MS	SW846 7471A [1]	SW846 7471A [4]
Nickel	10.6	2.3	0.057	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Potassium	1310	570	5.7	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Selenium	0.17 J	5.7	0.11	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Silver	0.051 U	0.57	0.051	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Sodium	557 J	570	47	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Thallium [a]	2.6 U	4.4	2.6	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Vanadium	33.7	2.9	0.034	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Zinc	39.3	1.1	0.074	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]

(1) Instrument QC Batch: MA5879
(2) Instrument QC Batch: MA5884
(3) Instrument QC Batch: MA5886
(4) Prep QC Batch: MP12586
(5) Prep QC Batch: MP12609

(a) Elevated reporting limit(s) due to matrix interference.

RL = Reporting Limit
MDL = Method Detection Limit

U = Indicates a result < MDL
J = Indicates a result > = MDL but < RL

Report of Analysis

Client Sample ID:	43SB08A		
Lab Sample ID:	F51300-21	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
		Percent Solids:	96.1
Project:	WPA 019 Field Investigation; Radford AAP, VA		

Metals Analysis DATA VAL QUALIFIER

Analyte	Result	RL	MDL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Aluminum	8690 J	10	1.1	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Antimony	0.53 J BJ	3.1	0.28	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Arsenic	2.8 L	0.42	0.20	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Barium	98.9 J	10	0.26	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Beryllium	0.75	0.26	0.052	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Cadmium	0.93 L	0.21	0.052	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Calcium	15900 J	260	3.0	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Chromium	14.4	0.52	0.047	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Cobalt	6.6	2.6	0.052	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Copper	10.3	1.3	0.047	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Iron	12600	5.2	0.62	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Lead	13.5	5.2	0.10	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Magnesium	8180	260	0.39	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Manganese	349	3.9	0.26	mg/kg	5	07/30/07	07/31/07	NS	SW846 6010B [3]	SW846 3050B [5]
Mercury	0.071 J	0.087	0.0069	mg/kg	1	07/27/07	07/27/07	MS	SW846 7471A [1]	SW846 7471A [4]
Nickel	9.1	2.1	0.052	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Potassium	1220	520	5.2	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Selenium	1.3 J	5.2	0.10	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Silver	0.047 U	0.52	0.047	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Sodium	348 J J	520	43	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Thallium [a]	2.4 U UL	4.0	2.4	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Vanadium	22.3 J	2.6	0.031	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Zinc	92.5 J	1.0	0.068	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]

(1) Instrument QC Batch: MA5879
(2) Instrument QC Batch: MA5884
(3) Instrument QC Batch: MA5886
(4) Prep QC Batch: MP12586
(5) Prep QC Batch: MP12609

(a) Elevated reporting limit(s) due to matrix interference.

RL = Reporting Limit
MDL = Method Detection Limit

U = Indicates a result < MDL
J = Indicates a result > = MDL but < RL

Accutest Laboratories

Report of Analysis

3.22
S

Client Sample ID:	43SB08B		
Lab Sample ID:	F51300-22	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
		Percent Solids:	84.5
Project:	WPA 019 Field Investigation; Radford AAP, VA		

Metals Analysis

DATA VAL QUALIFIER

Analyte	Result	RL	MDL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Aluminum	11800 J	12	1.3	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Antimony	0.83 J BJ	3.5	0.31	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Arsenic	2.9 L	0.47	0.23	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Barium	97.1 J	12	0.29	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Beryllium	0.99	0.29	0.059	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Cadmium	0.059 U UL	0.23	0.059	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Calcium	1910 J	290	3.3	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Chromium	20.4	0.59	0.053	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Cobalt	9.8	2.9	0.059	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Copper	20.3	1.5	0.053	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Iron	18500	5.9	0.70	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Lead	29.2	5.9	0.12	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Magnesium	3030	290	0.43	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Manganese	377	4.4	0.29	mg/kg	5	07/30/07	07/31/07	NS	SW846 6010B [3]	SW846 3050B [5]
Mercury	0.087	0.087	0.0070	mg/kg	1	07/27/07	07/27/07	MS	SW846 7471A [1]	SW846 7471A [4]
Nickel	12.3 J	2.3	0.059	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Potassium	1430 J	590	5.9	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Selenium	0.38 J J	5.9	0.12	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Silver	0.053 U	0.59	0.053	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Sodium	514 J J	590	48	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Thallium [a]	2.6 U UL	4.8	2.6	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Vanadium	33.6 J	2.9	0.035	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Zinc	77.0 J	1.2	0.076	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]

(1) Instrument QC Batch: MA5879
(2) Instrument QC Batch: MA5884
(3) Instrument QC Batch: MA5886
(4) Prep QC Batch: MP12586
(5) Prep QC Batch: MP12609

(a) Elevated reporting limit(s) due to matrix interference.

RL = Reporting Limit
MDL = Method Detection Limit

U = Indicates a result < MDL
J = Indicates a result > = MDL but < RL

Report of Analysis

Client Sample ID:	43SB08C		
Lab Sample ID:	F51300-23	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
		Percent Solids:	87.5
Project:	WPA 019 Field Investigation; Radford AAP, VA		

Metals Analysis DATA VAL QUALIFIER

Analyte	Result	RL	MDL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Aluminum	9260 J	11	1.2	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Antimony	0.67 J BJ	3.4	0.30	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Arsenic	1.5 L	0.45	0.22	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Barium	69.1 J	11	0.28	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Beryllium	0.88	0.28	0.056	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Cadmium [a]	0.56 U UL	1.1	0.56	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Calcium	747 J	280	3.2	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Chromium	15.0	0.56	0.050	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Cobalt	8.9	2.8	0.056	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Copper	11.3	1.4	0.050	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Iron	16000	5.6	0.67	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Lead	3.4 J	5.6	0.11	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Magnesium	2380	280	0.41	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Manganese	455	4.2	0.28	mg/kg	5	07/30/07	07/31/07	NS	SW846 6010B [3]	SW846 3050B [5]
Mercury	0.015 J K	0.091	0.0073	mg/kg	1	07/27/07	07/27/07	MS	SW846 7471A [1]	SW846 7471A [4]
Nickel	10.3 J	2.2	0.056	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Potassium	1270 J	560	5.6	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Selenium	0.25 J J	5.6	0.11	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Silver	0.050 U	0.56	0.050	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Sodium	462 J J	560	46	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Thallium [a]	2.6 U UL	4.8	2.6	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Vanadium	28.5 J	2.8	0.034	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Zinc	34.1 J	1.1	0.073	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]

(1) Instrument QC Batch: MA5879
(2) Instrument QC Batch: MA5884
(3) Instrument QC Batch: MA5886
(4) Prep QC Batch: MP12586
(5) Prep QC Batch: MP12609

(a) Elevated reporting limit(s) due to matrix interference.

RL = Reporting Limit
MDL = Method Detection Limit

U = Indicates a result < MDL
J = Indicates a result >= MDL but < RL

Report of Analysis

Client Sample ID:	43SB09A		
Lab Sample ID:	F51300-24	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
		Percent Solids:	90.3
Project:	WPA 019 Field Investigation; Radford AAP, VA		

Metals Analysis DATA VAL QUALIFIER

Analyte	Result	RL	MDL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Aluminum	11900 J	11	1.2	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Antimony	0.65 J BJ	3.2	0.28	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Arsenic	2.1 L	0.42	0.21	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Barium	199 J	11	0.26	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Beryllium	1.0	0.26	0.053	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Cadmium [a]	0.53 U UL	1.0	0.53	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Calcium	3470 J	260	3.0	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Chromium	22.1	0.53	0.047	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Cobalt	12.6	2.6	0.053	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Copper	10.5	1.3	0.047	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Iron	20100	5.3	0.63	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Lead	12.6	5.3	0.11	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Magnesium	2490	260	0.39	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Manganese	1710	7.9	0.53	mg/kg	10	07/30/07	07/31/07	NS	SW846 6010B [3]	SW846 3050B [5]
Mercury	0.037 J	0.091	0.0073	mg/kg	1	07/27/07	07/27/07	MS	SW846 7471A [1]	SW846 7471A [4]
Nickel	9.8	2.1	0.053	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Potassium	856	530	5.3	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Selenium	0.70 J	5.3	0.11	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Silver	0.047 U	0.53	0.047	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Sodium	313 J	530	44	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Thallium [a]	2.4 U UL	4.0	2.4	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Vanadium	34.9 J	2.6	0.032	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Zinc	66.0 J	1.1	0.069	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]

(1) Instrument QC Batch: MA5879
(2) Instrument QC Batch: MA5884
(3) Instrument QC Batch: MA5886
(4) Prep QC Batch: MP12586
(5) Prep QC Batch: MP12609

(a) Elevated reporting limit(s) due to matrix interference.

RL = Reporting Limit
MDL = Method Detection Limit

U = Indicates a result < MDL
J = Indicates a result > = MDL but < RL

Accutest Laboratories

Report of Analysis

3.25 B

Client Sample ID:	43SB09B		
Lab Sample ID:	F51300-25	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
		Percent Solids:	86.9
Project:	WPA 019 Field Investigation; Radford AAP, VA		

Metals Analysis DATA VAL QUALIFIER

Analyte	Result	RL	MDL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Aluminum	11300 J	11	1.2	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Antimony	0.68 J	3.4	0.30	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Arsenic	6.1	0.45	0.22	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Barium	90.5	11	0.28	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Beryllium	0.97	0.28	0.056	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Cadmium	0.056 U	0.23	0.056	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Calcium	9430	280	3.2	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Chromium	18.5	0.56	0.051	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Cobalt	7.8	2.8	0.056	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Copper	19.2	1.4	0.051	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Iron	17900	5.6	0.68	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Lead	11.2	5.6	0.11	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Magnesium	6490	280	0.42	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Manganese	383	1.7	0.11	mg/kg	2	07/30/07	07/31/07	NS	SW846 6010B [3]	SW846 3050B [5]
Mercury	1.9	0.52	0.042	mg/kg	6	07/27/07	07/27/07	MS	SW846 7471A [1]	SW846 7471A [4]
Nickel	11.4	2.3	0.056	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Potassium	1630	560	5.6	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Selenium	0.11 U	5.6	0.11	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Silver	0.051 U	0.56	0.051	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Sodium	472 J	560	47	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Thallium [a]	2.6 U	4.4	2.6	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Vanadium	31.6	2.8	0.034	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Zinc	69.5	1.1	0.073	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]

(1) Instrument QC Batch: MA5879
(2) Instrument QC Batch: MA5884
(3) Instrument QC Batch: MA5886
(4) Prep QC Batch: MP12585
(5) Prep QC Batch: MP12608

(a) Elevated reporting limit(s) due to matrix interference.

RL = Reporting Limit
MDL = Method Detection Limit

U = Indicates a result < MDL
J = Indicates a result > = MDL but < RL

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Report of Analysis

3.26

Client Sample ID:	43SB09C		
Lab Sample ID:	F51300-26	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
		Percent Solids:	87.1
Project:	WPA 019 Field Investigation; Radford AAP, VA		

Metals Analysis DATA VAL QUALIFIER

Analyte	Result	RL	MDL	Units	DF	Prep	Analyzed By	Method	Prep Method
Aluminum	10500 J	11	1.2	mg/kg	1	07/30/07	07/30/07 MS	SW846 6010B [2]	SW846 3050B [4]
Antimony	0.68 J BJ	3.3	0.30	mg/kg	1	07/30/07	07/30/07 MS	SW846 6010B [2]	SW846 3050B [4]
Arsenic	1.4 L	0.45	0.22	mg/kg	1	07/30/07	07/30/07 MS	SW846 6010B [2]	SW846 3050B [4]
Barium	72.4 J	11	0.28	mg/kg	1	07/30/07	07/30/07 MS	SW846 6010B [2]	SW846 3050B [4]
Beryllium	0.92	0.28	0.056	mg/kg	1	07/30/07	07/30/07 MS	SW846 6010B [2]	SW846 3050B [4]
Cadmium [a]	0.56 U UL	1.1	0.56	mg/kg	1	07/30/07	07/30/07 MS	SW846 6010B [2]	SW846 3050B [4]
Calcium	633 J	280	3.2	mg/kg	1	07/30/07	07/30/07 MS	SW846 6010B [2]	SW846 3050B [4]
Chromium	17.4	0.56	0.050	mg/kg	1	07/30/07	07/30/07 MS	SW846 6010B [2]	SW846 3050B [4]
Cobalt	9.3	2.8	0.056	mg/kg	1	07/30/07	07/30/07 MS	SW846 6010B [2]	SW846 3050B [4]
Copper	12.4	1.4	0.050	mg/kg	1	07/30/07	07/30/07 MS	SW846 6010B [2]	SW846 3050B [4]
Iron	18000	5.6	0.67	mg/kg	1	07/30/07	07/30/07 MS	SW846 6010B [2]	SW846 3050B [4]
Lead	4.0 J	5.6	0.11	mg/kg	1	07/30/07	07/30/07 MS	SW846 6010B [2]	SW846 3050B [4]
Magnesium	2700	280	0.41	mg/kg	1	07/30/07	07/30/07 MS	SW846 6010B [2]	SW846 3050B [4]
Manganese	169	0.84	0.033	mg/kg	1	07/30/07	07/30/07 MS	SW846 6010B [2]	SW846 3050B [4]
Mercury	0.029 J	0.091	0.0073	mg/kg	1	07/27/07	07/27/07 MS	SW846 7471A [1]	SW846 7471A [3]
Nickel	12.0	2.2	0.056	mg/kg	1	07/30/07	07/30/07 MS	SW846 6010B [2]	SW846 3050B [4]
Potassium	1350	560	5.6	mg/kg	1	07/30/07	07/30/07 MS	SW846 6010B [2]	SW846 3050B [4]
Selenium	0.14 J	5.6	0.11	mg/kg	1	07/30/07	07/30/07 MS	SW846 6010B [2]	SW846 3050B [4]
Silver	0.050 U	0.56	0.050	mg/kg	1	07/30/07	07/30/07 MS	SW846 6010B [2]	SW846 3050B [4]
Sodium	482 J	560	46	mg/kg	1	07/30/07	07/30/07 MS	SW846 6010B [2]	SW846 3050B [4]
Thallium [b]	0.26 U UL	1.1	0.26	mg/kg	1	07/30/07	07/30/07 MS	SW846 6010B [2]	SW846 3050B [4]
Vanadium	31.3 J	2.8	0.033	mg/kg	1	07/30/07	07/30/07 MS	SW846 6010B [2]	SW846 3050B [4]
Zinc	39.5 J	1.1	0.072	mg/kg	1	07/30/07	07/30/07 MS	SW846 6010B [2]	SW846 3050B [4]

(1) Instrument QC Batch: MA5879
(2) Instrument QC Batch: MA5884
(3) Prep QC Batch: MP12586
(4) Prep QC Batch: MP12609

(a) Elevated reporting limit(s) due to matrix interference.
(b) Elevated RL/MDL due to negative bias of Method Blank.

RL = Reporting Limit
MDL = Method Detection Limit

U = Indicates a result < MDL
J = Indicates a result > = MDL but < RL

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Report of Analysis

3.27 3

Client Sample ID:	43SB10A		
Lab Sample ID:	F51300-27	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
		Percent Solids:	87.1
Project:	WPA 019 Field Investigation; Radford AAP, VA		

Metals Analysis DATA VAL QUALIFIER

Analyte	Result	RL	MDL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Aluminum	14400 J	11	1.2	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Antimony	0.89 J	3.4	0.30	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Arsenic	1.2	0.45	0.22	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Barium	121	11	0.28	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Beryllium	1.2	0.28	0.056	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Cadmium	0.056 U	0.23	0.056	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Calcium	1690	280	3.2	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Chromium	22.2	0.56	0.051	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Cobalt	10.9	2.8	0.056	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Copper	12.9	1.4	0.051	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Iron	19900	5.6	0.68	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Lead	7.0	5.6	0.11	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Magnesium	3500	280	0.42	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Manganese	521	4.2	0.28	mg/kg	5	07/30/07	07/31/07	NS	SW846 6010B [3]	SW846 3050B [5]
Mercury	0.042 J	0.094	0.0075	mg/kg	1	07/27/07	07/27/07	MS	SW846 7471A [1]	SW846 7471A [4]
Nickel	13.6	2.3	0.056	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Potassium	1440	560	5.6	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Selenium	0.11 U	5.6	0.11	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Silver	0.051 U	0.56	0.051	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Sodium	523 J	560	46	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Thallium [a]	2.6 U	4.8	2.6	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Vanadium	39.6	2.8	0.034	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Zinc	57.1	1.1	0.073	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]

(1) Instrument QC Batch: MA5879
(2) Instrument QC Batch: MA5884
(3) Instrument QC Batch: MA5886
(4) Prep QC Batch: MP12586
(5) Prep QC Batch: MP12609

(a) Elevated reporting limit(s) due to matrix interference.

RL = Reporting Limit
MDL = Method Detection Limit

U = Indicates a result < MDL
J = Indicates a result > = MDL but < RL

Accutest Laboratories

Report of Analysis

3.28
S

Client Sample ID:	43SB10B		
Lab Sample ID:	F51300-28	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
		Percent Solids:	86.6
Project:	WPA 019 Field Investigation; Radford AAP, VA		

Metals Analysis DATA VAL QUALIFIER

Analyte	Result	RL	MDL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Aluminum	11100 J	11	1.3	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Antimony	0.89 J	3.4	0.30	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Arsenic	1.2	0.46	0.22	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Barium	89.5 J	11	0.29	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Beryllium	0.99	0.29	0.057	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Cadmium [a]	0.28 U	0.46	0.28	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Calcium	945 J	290	3.3	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Chromium	17.4	0.57	0.051	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Cobalt	10.4	2.9	0.057	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Copper	11.0	1.4	0.051	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Iron	17000	5.7	0.69	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Lead	4.0 J	5.7	0.11	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Magnesium	2890	290	0.42	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Manganese	490	4.3	0.29	mg/kg	5	07/30/07	07/31/07	NS	SW846 6010B [3]	SW846 3050B [5]
Mercury	0.028 J	0.086	0.0069	mg/kg	1	07/27/07	07/27/07	MS	SW846 7471A [1]	SW846 7471A [4]
Nickel	11.0	2.3	0.057	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Potassium	1260	570	5.7	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Selenium	0.22 J	5.7	0.11	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Silver	0.051 U	0.57	0.051	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Sodium	495 J	570	47	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Thallium [a]	2.6 U	4.8	2.6	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Vanadium	31.5 J	2.9	0.034	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Zinc	45.9 J	1.1	0.074	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]

(1) Instrument QC Batch: MA5879
(2) Instrument QC Batch: MA5884
(3) Instrument QC Batch: MA5886
(4) Prep QC Batch: MP12586
(5) Prep QC Batch: MP12609

(a) Elevated reporting limit(s) due to matrix interference.

RL = Reporting Limit
MDL = Method Detection Limit

U = Indicates a result < MDL
J = Indicates a result > = MDL but < RL

Accutest Laboratories

Report of Analysis

Client Sample ID:	43SB10C		
Lab Sample ID:	F51300-29	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
		Percent Solids:	83.8
Project:	WPA 019 Field Investigation; Radford AAP, VA		

Metals Analysis

DATA VAL QUALIFIER

Analyte	Result	RL	MDL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Aluminum	10600 J	12	1.3	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Antimony	0.72 J BJ	3.5	0.31	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Arsenic	1.9 L	0.47	0.23	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Barium	94.3 J	12	0.30	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Beryllium	0.97	0.30	0.059	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Cadmium [a]	0.30 U UL	0.48	0.30	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Calcium	1880 J	300	3.4	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Chromium	18.3	0.59	0.053	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Cobalt	16.5	3.0	0.059	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Copper	10.5	1.5	0.053	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Iron	15400	5.9	0.71	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Lead	5.7 J	5.9	0.12	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Magnesium	3250	300	0.44	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Manganese	337	1.8	0.12	mg/kg	2	07/30/07	07/31/07	NS	SW846 6010B [3]	SW846 3050B [5]
Mercury	0.036 J	0.086	0.0069	mg/kg	1	07/27/07	07/27/07	MS	SW846 7471A [1]	SW846 7471A [4]
Nickel	12.0	2.4	0.059	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Potassium	1070	590	5.9	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Selenium	0.24 J	5.9	0.12	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Silver	0.053 U	0.59	0.053	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Sodium	399 J	590	49	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Thallium [a]	1.4 U UL	2.4	1.4	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Vanadium	26.9 J	3.0	0.035	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Zinc	43.4 J	1.2	0.077	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]

(1) Instrument QC Batch: MA5879
(2) Instrument QC Batch: MA5884
(3) Instrument QC Batch: MA5886
(4) Prep QC Batch: MP12586
(5) Prep QC Batch: MP12609

(a) Elevated reporting limit(s) due to matrix interference.

RL = Reporting Limit
MDL = Method Detection Limit

U = Indicates a result < MDL
J = Indicates a result > = MDL but < RL

Accutest Laboratories

Report of Analysis

Client Sample ID:	TMSB10B		
Lab Sample ID:	F51300-30	**Date Sampled:**	07/25/07
Matrix:	SO - Soil	**Date Received:**	07/26/07
		Percent Solids:	85.9
Project:	WPA 019 Field Investigation; Radford AAP, VA		

Metals Analysis DATA VAL QUALIFIER

Analyte	Result	RL	MDL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Aluminum	11100 J	11	1.2	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Antimony	0.76 J	3.3	0.29	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Arsenic	1.1	0.44	0.22	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Barium	92.5 J	11	0.28	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Beryllium	1.0	0.28	0.055	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Cadmium [a]	0.28 U UL	0.44	0.28	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Calcium	955 J	280	3.2	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Chromium	17.2	0.55	0.050	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Cobalt	9.6	2.8	0.055	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Copper	11.2	1.4	0.050	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Iron	17200	5.5	0.67	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Lead	4.2 J	5.5	0.11	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Magnesium	2990	280	0.41	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Manganese	492	4.2	0.28	mg/kg	5	07/30/07	07/31/07	NS	SW846 6010B [3]	SW846 3050B [5]
Mercury	0.024 J	0.090	0.0072	mg/kg	1	07/27/07	07/27/07	MS	SW846 7471A [1]	SW846 7471A [4]
Nickel	11.2	2.2	0.055	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Potassium	1230	550	5.5	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Selenium	0.23 J	5.5	0.11	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Silver	0.050 U	0.55	0.050	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Sodium	476 J	550	46	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Thallium [a]	2.6 U UL	4.4	2.6	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Vanadium	31.4 J	2.8	0.033	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]
Zinc	46.7 J	1.1	0.072	mg/kg	1	07/30/07	07/30/07	MS	SW846 6010B [2]	SW846 3050B [5]

(1) Instrument QC Batch: MA5879
(2) Instrument QC Batch: MA5884
(3) Instrument QC Batch: MA5886
(4) Prep QC Batch: MP12586
(5) Prep QC Batch: MP12609

(a) Elevated reporting limit(s) due to matrix interference.

RL = Reporting Limit
MDL = Method Detection Limit

U = Indicates a result < MDL
J = Indicates a result > = MDL but < RL

Accutest Laboratories

Report of Analysis

3131

3

Client Sample ID:	072507R		
Lab Sample ID:	F51300-31	Date Sampled:	07/25/07
Matrix:	AQ - Equipment Blank	Date Received:	07/26/07
		Percent Solids:	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

Metals Analysis DATA VAL QUALIFIER

Analyte	Result	RL	MDL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Aluminum	18 U UJ	200	18	ug/l	1	07/27/07	07/28/07	RS	SW846 6010B [2]	SW846 3010A [3]
Antimony	3.4 U UJ	6.0	3.4	ug/l	1	07/27/07	07/28/07	RS	SW846 6010B [2]	SW846 3010A [3]
Arsenic	2.8 U	10	2.8	ug/l	1	07/27/07	07/28/07	RS	SW846 6010B [2]	SW846 3010A [3]
Barium	5.0 U	200	5.0	ug/l	1	07/27/07	07/28/07	RS	SW846 6010B [2]	SW846 3010A [3]
Beryllium	1.0 U	4.0	1.0	ug/l	1	07/27/07	07/28/07	RS	SW846 6010B [2]	SW846 3010A [3]
Cadmium	1.0 U	5.0	1.0	ug/l	1	07/27/07	07/28/07	RS	SW846 6010B [2]	SW846 3010A [3]
Calcium	42 U	1000	42	ug/l	1	07/27/07	07/28/07	RS	SW846 6010B [2]	SW846 3010A [3]
Chromium	0.60 U	10	0.60	ug/l	1	07/27/07	07/28/07	RS	SW846 6010B [2]	SW846 3010A [3]
Cobalt	1.0 U	50	1.0	ug/l	1	07/27/07	07/28/07	RS	SW846 6010B [2]	SW846 3010A [3]
Copper	1.0 U	25	1.0	ug/l	1	07/27/07	07/28/07	RS	SW846 6010B [2]	SW846 3010A [3]
Iron	15 U	300	15	ug/l	1	07/27/07	07/28/07	RS	SW846 6010B [2]	SW846 3010A [3]
Lead	1.7 U	5.0	1.7	ug/l	1	07/27/07	07/28/07	RS	SW846 6010B [2]	SW846 3010A [3]
Magnesium	4.3 U	5000	4.3	ug/l	1	07/27/07	07/28/07	RS	SW846 6010B [2]	SW846 3010A [3]
Manganese	1.5 U	15	1.5	ug/l	1	07/27/07	07/28/07	RS	SW846 6010B [2]	SW846 3010A [3]
Mercury	0.10 U	1.0	0.10	ug/l	1	07/28/07	07/28/07	MS	SW846 7470A [1]	SW846 7470A [4]
Nickel	1.0 U	40	1.0	ug/l	1	07/27/07	07/28/07	RS	SW846 6010B [2]	SW846 3010A [3]
Potassium	1770 J BJ	10000	100	ug/l	1	07/27/07	07/28/07	RS	SW846 6010B [2]	SW846 3010A [3]
Selenium	2.8 U	10	2.8	ug/l	1	07/27/07	07/28/07	RS	SW846 6010B [2]	SW846 3010A [3]
Silver	0.90 U	10	0.90	ug/l	1	07/27/07	07/28/07	RS	SW846 6010B [2]	SW846 3010A [3]
Sodium	2130 J BJ	10000	500	ug/l	1	07/27/07	07/28/07	RS	SW846 6010B [2]	SW846 3010A [3]
Thallium [a]	5.8 U	20	5.8	ug/l	1	07/27/07	07/28/07	RS	SW846 6010B [2]	SW846 3010A [3]
Vanadium	1.1 U	50	1.1	ug/l	1	07/27/07	07/28/07	RS	SW846 6010B [2]	SW846 3010A [3]
Zinc	1.6 U	20	1.6	ug/l	1	07/27/07	07/28/07	RS	SW846 6010B [2]	SW846 3010A [3]

(1) Instrument QC Batch: MA5882
(2) Instrument QC Batch: MA5883
(3) Prep QC Batch: MP12593
(4) Prep QC Batch: MP12598

(a) Elevated RL/MDL due to negative bias of Method Blank.

RL = Reporting Limit
MDL = Method Detection Limit

U = Indicates a result < MDL
J = Indicates a result > = MDL but < RL

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Monroeville, PA
412-858-3335
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Shaw® Shaw Environmental, Inc.

MEMORANDUM

TO: Jeff Parks, Shaw E&I Radford Army Ammunition Plant (RFAAP) Project Manager

FROM: Richard McCracken, Shaw E&I Project Chemist

SUBJECT: RFAAP Data Validation – Pesticides and PCBs
Accutest Laboratories, Inc., SDG F51300

DATE: December 21, 2007

The purpose of this memorandum is to present the data validation report for the samples collected at RFAAP on July 25, 2007. Samples were analyzed for pesticides using USEPA Methods 3550B/8081A (soils) and 3510C/8081A (waters); and for PCBs using USEPA Methods 3550B/8082 (soils) and 3510C/8082 (waters), respectively. A total of 1 aqueous and 30 soil samples were validated. The sample IDs are:

Field Sample ID	Lab Sample ID	Field Sample ID	Lab Sample ID
59SB06A	F51300-1	43SB06C	F51300-17
59SB06B	F51300-2	43SB07A	F51300-18
59SB06C	F51300-3	43SB07B	F51300-19
59SB05A	F51300-4	43SB07C	F51300-20
59SB05B	F51300-5	43SB08A	F51300-21
59SB05C	F51300-6	43SB08B	F51300-22
59SB04A	F51300-7	43SB08C	F51300-23
59SB04B	F51300-8	43SB09A	F51300-24
59SB04C	F51300-9	43SB09B	F51300-25
TMSB04C	F51300-10	43SB09C	F51300-26
59SB02A	F51300-11	43SB10A	F51300-27
59SB02B	F51300-12	43SB10B	F51300-28
TMSB02B	F51300-13	43SB10C	F51300-29
59SB02C	F51300-14	TMSB10B	F51300-30
43SB06A	F51300-15	072507R	F51300-31
43SB06B	F51300-16		

Data were reviewed by Richard McCracken and validated using a combination of project QAPP, *Quality Systems Manual for Environmental Laboratories, Final Version 3, January, 2006* (DoD, 2006) (DoD QSM), method-specific criteria, and laboratory SOP criteria. The data qualifier scheme was consistent with the *Region III Modifications to the National Functional Guidelines for Organic Data Review* (September 1994). Parameters evaluated are presented in **Table 1**. Data associated with parameters in compliance with quality control specifications have not been qualified. Data associated with parameters that did not comply with quality control specifications and directly impacted project data have been qualified in accordance with USEPA Region III specifications.

Table 1 Laboratory Performance Criteria

Qualified		Parameter
Yes	No	
	X	Holding Times and Preservation
	X	Instrument Performance Check
	X	Initial Calibration
X		Continuing Calibration
	X	Blank Analysis
X		System Monitoring Compounds
X		Laboratory Control Samples
X		Matrix Spike/Spike Duplicate
	X	Field Duplicate
X		Quantitation Verification

The quality of data collected in support of this sampling activity is considered acceptable with noted qualifications.

Richard M. Cracken

Richard McCracken, Chemist

12/21/07

Date

RFAAP VALIDATION REPORT
PESTICIDE/PCB REVIEW
SDG F51300

I-Holding Times and Preservation
The objective is to ascertain the validity of results based on the holding time of the sample from time of collection to time of sample extraction and analysis. Holding time criteria: Solid samples must be stored @4°C ± 2°C with a maximum holding time of 14 days from sample collection to preparative extraction and 40 days from preparative extraction to determinative analysis. Aqueous samples must be cooled @4°C ± 2°C with a maximum holding time of 7 days from sample collection to preparative extraction and 40 days from preparative extraction to determinative analysis.

- Temperature Review: A temperature blank was sent with each cooler and recorded by the laboratory upon receipt. The samples collected on 7/25/07 were sent in five coolers, and were received by the laboratory on 7/26/07 at temperatures ranging from 2.6 °C to 4.0 °C. No qualifiers were applied.

- Holding Time Review: The samples were collected on 7/25/07. The aqueous sample was extracted for pesticides and PCBs on 7/30/07, analyzed for pesticides on 8/10/07, and analyzed for PCBs on 8/1/07. The solid samples were extracted for pesticides and PCBs on 8/2/07 & 8/3/07, analyzed for pesticides on 8/8/07, 8/9/07, 8/10/07, & 8/11/07, and analyzed for PCBs on 8/6/07, 8/7/07, 8/8/07, & 8/13/07. All criteria were met. No qualifiers were applied.

II-Instrument Performance Check (Degradation Standard)
Performance checks on the gas chromatograph with electron capture detector (GC/ECD) system are performed to ensure adequate resolution and instrument sensitivity. The performance evaluation mixture (PEM) must be analyzed at the beginning of the analytical sequence. The breakdown of Endrin and 4,4'-DDT must be ≤15% on both signals.

- During the analysis beginning 8/6/07 @0925, endrin and 4,4'-DDT percent breakdowns were 11.2% and 7.1% on signal #1, and 10.7% and 5.6% on signal #2, respectively. All criteria were met. No qualifiers were applied.

- During the analysis beginning 8/8/07 @1046, endrin and 4,4'-DDT percent breakdowns were 4.6% and 4.2% on signal #1, and 4.6% and 3.1% on signal #2, respectively. All criteria were met. No qualifiers were applied.

- During the analysis beginning 8/9/07 @1538, endrin and 4,4'-DDT percent breakdowns were 3.8% and 3.5% on signal #1, and 4.0% and 2.8% on signal #2, respectively. All criteria were met. No qualifiers were applied.

- During the analysis beginning 8/10/07 @1538, endrin and 4,4'-DDT percent breakdowns were 3.7% and 2.5% on signal #1, and 3.9% and 2.0% on signal #2, respectively. All criteria were met. No qualifiers were applied.

- During the analysis beginning 8/11/07 @1054, endrin and 4,4'-DDT percent breakdowns were 3.4% and 2.3% on signal #1, and 3.5% and 2.1% on signal #2, respectively. All criteria were met. No qualifiers were applied.

- During the analysis beginning 8/13/07 @1116, endrin and 4,4'-DDT percent breakdowns were 2.7% and 1.4% on signal #1, and 2.6% and 1.1% on signal #2, respectively. All criteria were met. No qualifiers were applied.

III-Initial Calibration
Compliance requirements for satisfactory instrument calibration are established to ensure that the instrument is capable of producing acceptable qualitative and quantitative data for the target compounds. The initial 5 point calibration demonstrates that the instrument is capable of acceptable performance in the beginning of the analytical run. Calibration factors are generated for each compound. The DoD QSM specifies that the percent relative standard deviation (%RSD) for all single peak target analytes, and aroclors 1016, 1242, 1254, and 1260 must be <20% or the mean %RSD for all analytes in the standard must be ≤20%. If linear regression is used, the correlation coefficient must be ≥0.990. All detects are qualified as estimated "J" for where there were exceeding %RSDs, and all non-detects are qualified as estimated "UJ" for where there were grossly exceeding recoveries, unless determined to be unusable "R". Grossly exceeding is defined as twice the established criteria limits.

- During the pesticide initial calibration performed on 8/6/07 on instrument ECD6, all criteria were met. No qualifiers were applied. Samples F51300-1 thru -17 were analyzed following this initial calibration.

- During the pesticide initial calibration performed on 8/9/07 on instrument ECD6, all criteria were met. No qualifiers were applied. Samples F51300-18, -19, -20, -21, -22, -23, -24, -25, -26, -27, -28, -29, and -30 were analyzed following this initial calibration.

- During the pesticide initial calibration performed on 8/10/07 on instrument ECD6, all criteria were met. No qualifiers were applied. Sample F51300-31 analysis plus the reanalyses of samples F51300-9, -10, -11, -12, -13, -14, -15, -16, -17, and -22 were performed following this initial calibration.

- During the PCB initial calibration performed on 7/28/07 on instrument ECD3, all criteria were met. No qualifiers were applied. Sample F51300-31 was analyzed following this initial calibration.

- During the PCB initial calibration performed on 8/6/07 on instrument ECD3, all criteria were met. No qualifiers were applied. Samples F51300-1 thru -17 were analyzed following this initial calibration.

- During the PCB initial calibration performed on 8/7/07 on instrument ECD3, all criteria were met. No qualifiers were applied. Samples F51300-18 thru -30 were analyzed following this initial calibration.

- During the PCB initial calibration performed on 8/13/07 on instrument ECD3, all criteria were met. No qualifiers were applied. The reanalyses of samples F51300-16, -17, and -22 were performed following this initial calibration.

IV-Continuing Calibration
Compliance requirements for satisfactory instrument calibration are established to ensure that the instrument is capable of producing acceptable qualitative and quantitative data for pesticide/PCB target compounds. Continuing calibration standards containing both target compounds and surrogates are analyzed at the beginning of each 12-hour analytical shift and after every 20 samples. The DoD QSM specifies that the percent difference (%D) or the average %Ds for all analytes in the standard from the calibration should be no greater than ±20%.

- During the pesticide initial calibration verification performed on 8/6/07 @1229 on instrument ECD6, all criteria were met. No qualifiers were applied. No samples were analyzed in conjunction with this ICV.

- During the pesticide continuing calibration performed on 8/8/07 @1131 on instrument ECD6, all criteria were met. No qualifiers were applied. Samples F51300-1, -2, -3, -4, -5 -6, -7, and -8 were analyzed following this continuing calibration.

- During the pesticide continuing calibration performed on 8/8/07 @1153 on instrument ECD6, the 4th chlordane peak (20.4%) from signal #2 had a %D outside criteria, but the average %D of all six chlordane peaks was 7.9% which met criteria. No qualifiers were applied. Samples F51300-1, -2, -3, -4, -5 -6, -7, and -8 were analyzed following this continuing calibration.

- During the pesticide continuing calibration performed on 8/8/07 @1209 on instrument ECD6, all criteria were met. No qualifiers were applied. Samples F51300-1, -2, -3, -4, -5 -6, -7, and -8 were analyzed following this continuing calibration.

- During the pesticide continuing calibration performed on 8/8/07 @1528 on instrument ECD6, all criteria were met. No qualifiers were applied. Samples F51300-1, -2, -3, -4, -5 -6, -7, and -8 were analyzed before this continuing calibration, while samples F51300-9, -10, -11, -12, -13, -14, -15, and -16 were analyzed after this continuing calibration.

- During the pesticide continuing calibration performed on 8/8/07 @1838 on instrument ECD6, endrin aldehyde (21.3%) had a high %D on signal #1, while 4,4'-DDT (28.3%, 25.2%) and methoxychlor (25.6%, 24.4%) had a high %D on both signals. The results for these compounds have been qualified "J/UJ" in associated samples. All other compounds met criteria. Samples F51300-9, -10, -11, -12, -13, -14, -15, and -16 were analyzed before this continuing calibration, while sample F51300-17 was analyzed after this continuing calibration.

- During the pesticide continuing calibration performed on 8/8/07 @1926 on instrument ECD6, heptachlor (24.0%, 23.1%), endrin aldehyde (21.9%, 22.4%), 4,4'-DDT(31.8%, 31.8%), and methoxychlor (31.3%, 32.5%) had a high %D on both signals. The results for these compounds have been qualified "J/UJ" in associated samples. All other compounds met criteria. Sample F51300-17 was analyzed before this continuing calibration.

- During the pesticide initial calibration verification performed on 8/9/07 @1840 on instrument ECD6, all criteria were met. No qualifiers were applied. Samples F51300-18, -19, -20, -21, -22, -23, -24, and -25 were analyzed following this ICV.

- During the pesticide continuing calibration performed on 8/9/07 @2134 on instrument ECD6, 4,4'-DDT(26.7%) and methoxychlor (22.2%) had a high %D on signal #1. The results for these compounds have been qualified "J/UJ" in associated samples. All other compounds met criteria. Samples F51300-18, -19, -20, -21, -22, -23, -24, and -25 were analyzed before this continuing calibration, while samples F51300-26, -27, -28, -29, and -30 were analyzed after this continuing calibration.

- During the pesticide continuing calibration performed on 8/9/07 @2356 on instrument ECD6, methoxychlor (20.6%) had a high %D on signal #1. The methoxychlor results have been qualified "J/UJ" in associated samples. All other compounds met criteria. Samples F51300-26, -27, -28, -29, and -30 were analyzed before this continuing calibration.

- During the pesticide initial calibration verification performed on 8/10/07 @1840 on instrument ECD6, all criteria were met. No qualifiers were applied. No samples were analyzed following this ICV.

- During the pesticide continuing calibration performed on 8/10/07 @2015 on instrument ECD6, all criteria were met. No qualifiers were applied. Sample F51300-31 was analyzed following with this continuing calibration.

- During the pesticide continuing calibration performed on 8/10/07 @2205 on instrument ECD6, all criteria were met. No qualifiers were applied. Sample F51300-31 was analyzed before with this continuing calibration.

- During the pesticide continuing calibration performed on 8/10/07 @2309 on instrument ECD6, all criteria were met. No qualifiers were applied. The reanalyses of samples F51300-9, -10, -11, -12, -13, -14, and -15 were performed after this continuing calibration.

- During the pesticide continuing calibration performed on 8/11/07 @ 0202 on instrument ECD6, all criteria were met. No qualifiers were applied. The reanalyses of samples F51300-9, -10, -11, -12, -13, -14, and -15 were performed before this continuing calibration.

- During the pesticide continuing calibration performed on 8/11/07 @1110 on instrument ECD6, all criteria were met. No qualifiers were applied. The reanalyses of samples F51300-14, 16, and 17 were performed after this continuing calibration.

- During the pesticide continuing calibration performed on 8/11/07 @1132 on instrument ECD6, all criteria were met. No qualifiers were applied. The reanalyses of samples F51300-14, 16, and 17 were performed after this continuing calibration.

- During the pesticide continuing calibration performed on 8/11/07 @1148 on instrument ECD6, all criteria were met. No qualifiers were applied. The reanalyses of samples F51300-14, 16, and 17 were performed after this continuing calibration.

- During the pesticide continuing calibration performed on 8/11/07 @1400 on instrument ECD6, all criteria were met. No qualifiers were applied. The reanalyses of samples F51300-14, 16, and 17 were performed before this continuing calibration, while the reanalysis of F51300-22 was performed after this continuing calibration.

- During the pesticide continuing calibration performed on 8/11/07 @1447 on instrument ECD6, all criteria were met. No qualifiers were applied. The reanalysis of F51300-22 was performed before this continuing calibration.

- During the PCB 1016/1260 initial calibration verification performed on 7/28/07 @1459 on instrument ECD3, all criteria were met. No qualifiers were applied. No samples were analyzed following this initial calibration verification.

- During the PCB 1016/1260 continuing calibration performed on 8/1/07 @1521 on instrument ECD3, all criteria were met. No qualifiers were applied. The aqueous method blank, the aqueous LCS, and the aqueous MS/MSD were analyzed following this continuing calibration.

- During the PCB 1016/1260 continuing calibration performed on 8/1/07 @1833 on instrument ECD3, all criteria were met. No qualifiers were applied. The aqueous method blank, the aqueous LCS, and the aqueous MS/MSD were analyzed before this continuing calibration, while sample F51300-31 was analyzed after this continuing calibration.

- During the PCB 1016/1260 continuing calibration performed on 8/1/07 @2015 on instrument ECD3, all criteria were met. No qualifiers were applied. Sample F51300-31 was analyzed before this continuing calibration.

- During the PCB 1016/1260 initial calibration verification performed on 8/6/07 @1556 on instrument ECD3, all criteria were met. No qualifiers were applied. No samples were analyzed following this initial calibration verification.

- During the PCB 1016/1260 continuing calibration performed on 8/6/07 @1906 on instrument ECD3, all criteria were met. No qualifiers were applied. Samples F51300-1 thru -3 plus a solid method blank, a solid LCS, and a solid MS/MSD were analyzed after this continuing calibration.

- During the PCB 1016/1260 continuing calibration performed on 8/6/07 @2214 on instrument ECD3, all criteria were met. No qualifiers were applied. Samples F51300-1 thru -3 plus a solid method blank, a solid LCS, and a solid MS/MSD were analyzed before this continuing calibration, while samples F51300-4, -5, -6, -7, -8, -9, -10, -11, and -12 were analyzed after this continuing calibration.

- During the PCB 1016/1260 continuing calibration performed on 8/7/07 @0121 on instrument ECD3, all criteria were met. No qualifiers were applied. Samples F51300-4, -5, -6, -7, -8, -9, -10, -11, and -12 were analyzed before this continuing calibration, while samples F51300-13, -14, -15, -16, and -17 were analyzed after this continuing calibration.

- During the PCB 1016/1260 continuing calibration performed on 8/7/07 @0321 on instrument ECD3, all criteria were met. No qualifiers were applied. Samples F51300-13, -14, -15, -16, and -17 were analyzed before this continuing calibration.

- During the PCB 1016/1260 initial calibration verification performed on 8/7/07 @1923 on instrument ECD3, all criteria were met. No qualifiers were applied. Samples F51300-18, -19, -20, -21, -22, -23, -24, and -25 were analyzed following this initial calibration verification.

- During the PCB 1016/1260 continuing calibration performed on 8/7/07 @2231 on instrument ECD3, all criteria were met. No qualifiers were applied. Samples F51300-18, -19, -20, -21, -22, -23, -24, and -25 were analyzed before this continuing calibration, while samples F51300-26, -27, -28, -29, and -30 plus an MS/MSD were analyzed after this continuing calibration.

- During the PCB 1016/1260 continuing calibration performed on 8/8/07 @0155 on instrument ECD3, all criteria were met. No qualifiers were applied. Samples F51300-26, -27, -28, -29, and -30 plus an MS/MSD were analyzed before this continuing calibration.

- During the PCB 1016/1260 initial calibration verification performed on 8/13/07 @1416 on instrument ECD3, all criteria were met. No qualifiers were applied. The reanalyses of samples F51300-16, -17, and -22 were performed following this initial calibration verification.

- During the PCB 1016/1260 continuing calibration performed on 8/13/07 @1719 on instrument ECD3, all criteria were met. No qualifiers were applied. The reanalyses of samples F51300-16, -17, and -22 were performed before this continuing calibration.

V-Blank Analysis

The purpose of laboratory or field blank analyses is to determine the existence and magnitude of contamination problems resulting from laboratory or field activities. One method blank per analytical batch must be run on each instrument used to analyze samples. The DoD QSM criterion specifies all concentrations should be less than one-half MRL. Positive sample results are reported and qualified "B", if the concentration of the compound in the sample is ≤5 times (5X) the maximum amount for pesticide and PCB target compounds. **Table 2** summarizes the blank contamination analysis.

Table 2 Blank Contamination Analysis Summary

Parameter	Analysis Date	QC Blank ID	Compound	Max Conc. µg/L	Action Level µg/L	B qualified samples
Pesticides	8/10/07	OP21657-MB	All target <½MRL	NA	NA	None
Pesticides	8/8/07	OP21716-MB	All target <½MRL	NA	NA	None
Pesticides	8/10/07	OP21716-MB	All target <½MRL	NA	NA	None
Pesticides	8/11/07	OP21716-MB	All target <½MRL	NA	NA	None
Pesticides	8/9/07	OP21730-MB	All target <½MRL	NA	NA	None
Pesticides	8/11/07	OP21730-MB	All target <½MRL	NA	NA	None
Pesticides	8/10/07	072507R	All target <½MRL	NA	NA	None
Pesticides	8/10/07	072607R	All target <½MRL	NA	NA	None
PCBs	8/1/07	OP21658-MB	All target <½MRL	NA	NA	None
PCBs	8/6/07	OP21715-MB	All target <½MRL	NA	NA	None
PCBs	8/13/07	OP21715-MB	All target <½MRL	NA	NA	None
PCBs	8/7/07	OP21731-MB	All target <½MRL	NA	NA	None
PCBs	8/13/07	OP21731-MB	All target <½MRL	NA	NA	None
PCBs	8/1/07	072507R	All target <½MRL	NA	NA	None
PCBs	8/1/07	072607R	All target <½MRL	NA	NA	None

072507R and 072607R are rinsate blanks.
NA = Not Applicable
MRL = Method Reporting Limit

VI-System Monitoring Compound (Surrogates)

Laboratory performance on individual samples is evaluated through the review of surrogate spike samples. Surrogate spikes are added to all samples and blanks to measure their recovery in sample and blank matrices. The percent recoveries (%Rs) must be within the specified control limits. DoD surrogate recovery limits are specified in Table D-3 of the DoD QSM (DoD, 2006). If the surrogate is not listed, then the laboratory criteria shall be used.

Aqueous Criteria:	Pesticides:	Tetrachloro-m-xylene: 42-127% (DoD QSM 25-140%) Decachlorobiphenyl: 27-127% (DoD QSM 30-135%)
	PCBs:	Tetrachloro-m-xylene: 38-127% (DoD QSM Not Listed) Decachlorobiphenyl: 25-137% (DoD QSM 40-135%)
Solid Criteria:	Pesticides:	Tetrachloro-m-xylene: 46-122% (DoD QSM 70-125%) Decachlorobiphenyl: 50-133% (DoD QSM 55-130%)
	PCBs:	Tetrachloro-m-xylene: 44-126% (DoD QSM Not Listed) Decachlorobiphenyl: 39-157% (DoD QSM 60-125%)

- Sample F51300-1 had low tetrachloro-m-xylene recoveries (65.26%, 66.78%) from both signals during pesticide analysis. The pesticide results in F51300-1 have been qualified "J/UJ".
- Sample F51300-16 had low tetrachloro-m-xylene recoveries (61.38%, 61.83%) from both signals during pesticide analysis. The pesticide results in F51300-16 have been qualified "J/UJ".
- Sample F51300-18 had a low tetrachloro-m-xylene recovery (68.79%) from signal #1 during pesticide analysis. No data qualification is required unless two surrogates are outside criteria.
- Sample F51300-19 had low tetrachloro-m-xylene recoveries (56.59%, 54.33%) from both signals during pesticide analysis. The pesticide results in F51300-19 have been qualified "J/UJ".
- Sample F51300-25 had low tetrachloro-m-xylene recoveries (54.02%, 53.34%) from both signals during pesticide analysis. The pesticide results in F51300-25 have been qualified "J/UJ".

- Sample F51300-26 had low tetrachloro-m-xylene recoveries (69.57%, 69.36%) from both signals during pesticide analysis. The pesticide results in F51300-26 have been qualified "J/UJ".

- Sample F51300-27 had low tetrachloro-m-xylene recoveries (68.12%, 67.60%) from both signals during pesticide analysis. The pesticide results in F51300-27 have been qualified "J/UJ".

- Sample F51300-28 had low tetrachloro-m-xylene recoveries (68.09%, 68.42%) from both signals during pesticide analysis. The pesticide results in F51300-28 have been qualified "J/UJ".

- Sample F51300-30 had low tetrachloro-m-xylene recoveries (67.97%, 68.90%) from both signals during pesticide analysis. The pesticide results in F51300-30 have been qualified "J/UJ".

- All other samples met surrogate recovery criteria during pesticide analysis.

- Sample F51300-25 had a low decachlorobiphenyl recovery (47.60%) from signal #1 during PCB analysis. No data qualification is required unless two surrogates are outside criteria.

- All samples met surrogate recovery criteria during PCB analysis.

VII-Laboratory Control Samples

Laboratory control samples (LCS) are used to monitor laboratory accuracy by calculating the percent recoveries of the spiked compounds. All LCS percent recoveries must be within the specified control limits. DoD QSM solid matrix LCS recovery limits are specified in Tables D-15 and D-17 of the DoD QSM (DoD, 2006), while aqueous LCS recovery limits are specified in Tables D-14 and D-16 of the DoD QSM. If the compound is not listed, then the laboratory criteria shall be used.

- Sample OP21657-BS was used as the aqueous LCS during the 8/10/07 pesticide analysis. Endrin aldehyde (15%) had a low recovery, and was not detected in any field samples – the endrin aldehyde results have been qualified "UL" as estimated in associated samples. All other pesticides met recovery criteria. Sample F51300-31 was analyzed in conjunction with this LCS.

- Sample OP21716-BS was used as the solid LCS during the 8/8/07 pesticide analysis. Delta-BHC (53%) and endrin aldehyde (12%) had low recoveries, and were not detected in any field samples. The results for both compounds have been qualified "UL" as estimated in associated samples. All other pesticides met recovery criteria. Samples F51300-1 thru -17 were analyzed in conjunction with this LCS.

- Sample OP21730-BS was used as the solid LCS during the 8/9/07 pesticide analysis. Endrin aldehyde (11%) had a low recovery, and was not detected in any field samples – the endrin aldehyde results have been qualified "UL" as estimated in associated samples. All other pesticides met recovery criteria. Samples F51300-18 thru -30 were analyzed in conjunction with this LCS.

- Sample OP21658-BS was used as the aqueous LCS during the 8/1/07 PCB analysis. All criteria were met. No qualifiers were applied.

- Sample OP21715-BS was used as the solid LCS during the 8/6/07 PCB analysis. All criteria were met. No qualifiers were applied.

- Sample OP21731-BS was used as the solid LCS during the 8/7/07 PCB analysis. All criteria were met. No qualifiers were applied.

VIII-Matrix Spike/Matrix Spike Duplicate
Data for matrix spike/matrix spike duplicates (MS/MSD) are generated to determine long-term precision and accuracy of the analytical method on various matrices and to demonstrate acceptable compound recovery by the laboratory at the time of sample analysis. The percent recoveries (%Rs) and the relative percent difference (RPD) must be within the specified control limits. DoD solid matrix MS/MSD recovery limits follow the LCS criteria specified in Tables D-15 and D-17 of the DoD QSM (DoD, 2006), while aqueous MS/MSD recovery limits follow the LCS criteria specified in Tables D-14 and D-16 of the DoD QSM. If the compound is not listed, then the laboratory criteria shall be used.

- Sample F51353-8 was used for the aqueous pesticide MS/MSD analysis. The spiked sample was not a RFAAP site sample; therefore, it was not evaluated. Sample F51300-31 was analyzed in conjunction with this MS/MSD.

- Sample F51300-11 was used for the solid matrix pesticide MS/MSD analysis. Delta-BHC (51%) and endrin aldehyde (0%, 0%) had low recoveries in the MS and MSD, as well as having low recoveries in the associated LCS. All sample results have already been qualified "UL", no further qualification is required. All other pesticides met criteria. Samples F51300-1 thru -17 were analyzed in conjunction with this MS/MSD.

- Sample F51300-29 was used for the solid matrix pesticide MS/MSD analysis. Endrin aldehyde (16%, 16%) had low recoveries in the MS and MSD, as well as having low recoveries in the associated LCS. All sample results have already been qualified "UL", no further qualification is required. All other pesticides met criteria. Samples F51300-18 thru -30 were analyzed in conjunction with this MS/MSD.

- Sample F51314-1 was used for the aqueous PCB MS/MSD analysis. The spiked sample was not a RFAAP site sample; therefore, it was not evaluated. Sample F51300-31 was analyzed in conjunction with this MS/MSD.

- Sample F51300-1 was used for the solid matrix PCB MS/MSD analysis. All PCBs met criteria. No data qualifiers were applied. Samples F51300-1 thru -17 were analyzed in conjunction with this MS/MSD.

- Sample F51300-29 was used for the solid matrix PCB MS/MSD analysis. All PCBs met criteria. No data qualifiers were applied. Samples F51300-1 thru -17 were analyzed in conjunction with this MS/MSD.

IX-Field Duplicate Sample Analysis
Field duplicates were collected to identify the cumulative precision of the sampling and analytical process and sent to the laboratory blind. The RPD was calculated only for those analytes which were detected at levels exceeding the method reporting limits in both samples of the duplicate pair. Analytes that were rejected (R-qualified) in either sample of the duplicate pair were excluded from the duplicate assessment. Precision control criterion was established at 50% RPD for the aqueous and solid samples. Analytical results were qualified as estimated (J) for any RPDs exceeding criteria.

- Field duplicate pairs in this data package included 59SB04C (F51300-9) & TMSB04C (F51300-10), 59SB02B (F51300-12) & TMSB02B (F51300-13), and 43SB10B (F51300-28) & TMSB10B (F51300-30). All compounds detected above the reporting limit (RL) met RPD criteria.

X-Quantitation Verification
The accuracy of analytical results was verified through the calculation of several parameters. The difference between the calculated value and the reported value must be within 10% difference. All positive values must have less than or equal to 40% %D between the primary and secondary columns. Any sample value >MDL and <MRL or <3*MDL (whichever is greater) was qualified as estimated, "J." All criteria were met.

- During analysis of F51300-16, dieldrin (100%) %D was outside criteria. All other target compounds were within criteria. The dieldrin results have been qualified "J" as estimated.

Sample: OP21716-BS, beta-BHC

Conc. µg/kg = (Ax * Vt * DF) / (CF * Vi * Ws * Ps * 1000)

where: Ax = Area response for the compound being measured
Vt = Total volume of extract, taking into account dilutions (uL)
DF = Dilution factor
CF = Calibration Factor from initial calibration (area/pg)
Vi = Volume of extract injected (uL)
Ws = weight of sample (g)
Ps = percent solids/100

Conc. µg/kg = (705390 * 10000 * 1) / (19750 * 1 * 30 * 1 * 1000)
= 11.9 ug/kg

Reported Conc. = 11.9 µg/kg
%D = 0.0%
Values were within 10% difference

Sample: OP21715-BS, Aroclor 1260

Conc. µg/kg = (Ax * Vt * DF) / (CF * Vi * Ws * Ps * 1000)

where: Ax = Area response for the compound being measured
Vt = Total volume of extract, taking into account dilutions (uL)
DF = Dilution factor
CF = Calibration Factor from initial calibration (area/pg)
Vi = Volume of extract injected (uL)
Ws = weight of sample (g)
Ps = percent solids/100

Signal #1
Conc1 µg/L = (3211932 * 10000* 1) / (8380 * 1 * 30 * 1000) = 127.76 µg/kg
Conc2 µg/L = (4273339 * 10000* 1) / (10410 * 1 * 30 * 1000) = 136.83 µg/kg
Conc3 µg/L = (4293784 * 10000* 1) / (10450 * 1 * 30 * 1000) = 136.96 µg/kg
Conc4 µg/L = (2923739 * 10000* 1) / (7516 * 1 * 30 * 1000) = 129.67 µg/kg
Conc5 µg/L = (6792273 * 10000* 1) / (17360 * 1 * 30 * 1000) = 130.42 µg/kg
Conc6 µg/L = (3912029 * 10000* 1) / (9980 * 1 * 30 * 1000) = 130.66 µg/kg
Average concentration = 132 µg/kg

Reported Value = 132 µg/kg (from signal #1)
% Difference = 0.0%
Values were within 10% difference.

USEPA Region III Validation Qualifiers

(No Code) = Confirmed identification.

B = The analyte has been detected in the sample and the associated laboratory or field blank.

J = Indicates an estimated value for (1) estimated value due to QC non-conformance. Reported value may not be accurate or precise, (2) estimating a concentration as a tentatively identified compound as indicated by the mass spectral and retention time data, or (3) estimating a concentration ≥ MDL and <MRL or <3*MDL, whichever is greater.

K = Analyte present. Reported value may be biased high (estimated) due to QC non-conformance.

L = Analyte present. Reported value may be biased low (estimated) due to QC non-conformance.

R = Unreliable result. Analyte may or may not be present in the sample due to QC non-conformance.

UL = Value is estimated bias low and not detected due to QC non-conformance. Reporting limit may be inaccurate or imprecise. Quantitation limit is probably higher.

UJ = Value is estimated and not detected due to QC non-conformance. Reporting limit may be inaccurate or imprecise.

Laboratory Qualifiers

(No Code) = Confirmed identification.

U = Not detected. The associated number indicates the compound reporting limit for the sample.

A (Dioxins) = B (Metals) = The reported value was obtained from a reading <MRL and ≥MDL and is considered estimated.

B (Organics) = The analyte or compound has been detected in the sample and laboratory method blank. It indicates probable blank contamination.

E (Metals) = Reported value is estimated because of the presence of interferences.

E (Organics) = Identifies compounds whose concentrations exceed the upper level of the calibration range.

EMPC (Dioxins) = The ion-abundance ratio between the two characteristic PCDD/PCDF ions was outside accepted ranges. The detected PCDD/PCDF was reported as an estimated maximum possible concentration (EMPC).

D = Indicates sample was analyzed at a dilution.

J = Indicates an estimated value for (1) estimating a concentration as a tentatively identified compound as indicated by the mass spectral and retention time data, or (2) estimating a concentration <MRL and ≥ MDL.

N (Organics) = Indicates presumptive evidence of a compound for tentatively identified compounds using a library search.

P (Organics) = Target analyte confirmation >40% difference for detected compound between the primary and secondary columns. The lower of the two values was reported.

N (Metals) = Laboratory spike sample recovery not within control limits.

* (Metals) = Duplicate analysis not within control limits.

* (Organics) = Surrogate outside of QC limits on both original and re-analysis.

Raw Data: TT08215.D

Accutest LabLink@72038 11:39 19-Dec-2007

Report of Analysis

3.1

Client Sample ID:	59SB06A		
Lab Sample ID:	F51300-1	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8081A SW846 3550B	Percent Solids:	91.9
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	TT08215.D	1	08/08/07	FS	08/02/07	OP21716	GTT279
Run #2							

	Initial Weight	Final Volume
Run #1	30.7 g	10.0 ml
Run #2		

Pesticide TCL List

DATA VAL QUALIFIER

CAS No.	Compound	Result	RL	MDL	Units	Q
309-00-2	Aldrin	ND	1.8	0.43	ug/kg	
319-84-6	alpha-BHC	ND	1.8	0.50	ug/kg	
319-85-7	beta-BHC	ND	1.8	0.46	ug/kg	
319-86-8	delta-BHC	ND	1.8	0.78	ug/kg	
58-89-9	gamma-BHC (Lindane)	ND	1.8	0.60	ug/kg	
5103-71-9	alpha-Chlordane	ND	1.8	0.35	ug/kg	
5103-74-2	gamma-Chlordane	ND	1.8	0.39	ug/kg	
60-57-1	Dieldrin	ND	1.8	0.39	ug/kg	
72-54-8	4,4'-DDD	ND	3.5	0.71	ug/kg	
72-55-9	4,4'-DDE	ND	3.5	0.71	ug/kg	
50-29-3	4,4'-DDT	ND	3.5	0.82	ug/kg	
72-20-8	Endrin	ND	3.5	0.71	ug/kg	
1031-07-8	Endosulfan sulfate	ND	3.5	1.2	ug/kg	
7421-93-4	Endrin aldehyde	ND	3.5	1.1	ug/kg	
53494-70-5	Endrin ketone	ND	3.5	0.71	ug/kg	
959-98-8	Endosulfan-I	ND	1.8	0.39	ug/kg	
33213-65-9	Endosulfan-II	ND	3.5	0.53	ug/kg	
76-44-8	Heptachlor	ND	1.8	0.50	ug/kg	
1024-57-3	Heptachlor epoxide	ND	1.8	0.35	ug/kg	
72-43-5	Methoxychlor	ND	3.5	0.71	ug/kg	
8001-35-2	Toxaphene	ND	89	44	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	65%		46-122%
2051-24-3	Decachlorobiphenyl	62%		50-133%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: ST64548.D

Accutest Laboratories

Report of Analysis

Client Sample ID:	59SB06A		
Lab Sample ID:	F51300-1	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8082 SW846 3550B	Percent Solids:	91.9
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	ST64548.D	1	08/06/07	JB	08/02/07	OP21715	GST1701
Run #2							

	Initial Weight	Final Volume
Run #1	30.7 g	10.0 ml
Run #2		

PCB List

CAS No.	Compound	Result	RL	MDL	Units	Q
12674-11-2	Aroclor 1016	ND	18	8.9	ug/kg	
11104-28-2	Aroclor 1221	ND	18	14	ug/kg	
11141-16-5	Aroclor 1232	ND	18	14	ug/kg	
53469-21-9	Aroclor 1242	ND	18	8.9	ug/kg	
12672-29-6	Aroclor 1248	ND	18	8.9	ug/kg	
11097-69-1	Aroclor 1254	ND	18	8.9	ug/kg	
11096-82-5	Aroclor 1260	ND	18	8.9	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	79%		44-126%
2051-24-3	Decachlorobiphenyl	79%		39-157%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: TT08216.D

Accutest Laboratories

Report of Analysis

Client Sample ID:	59SB06B		
Lab Sample ID:	F51300-2	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8081A SW846 3550B	Percent Solids:	88.5
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	TT08216.D	1	08/08/07	FS	08/02/07	OP21716	GTT279
Run #2							

	Initial Weight	Final Volume
Run #1	30.1 g	10.0 ml
Run #2		

Pesticide TCL List

DATA VAL QUALIFIER

CAS No.	Compound	Result	RL	MDL	Units	Q
309-00-2	Aldrin	ND	1.9	0.45	ug/kg	
319-84-6	alpha-BHC	ND	1.9	0.53	ug/kg	
319-85-7	beta-BHC	ND	1.9	0.49	ug/kg	
319-86-8	delta-BHC	ND	1.9	0.83	ug/kg	UL
58-89-9	gamma-BHC (Lindane)	ND	1.9	0.64	ug/kg	
5103-71-9	alpha-Chlordane	ND	1.9	0.38	ug/kg	
5103-74-2	gamma-Chlordane	ND	1.9	0.41	ug/kg	
60-57-1	Dieldrin	ND	1.9	0.41	ug/kg	
72-54-8	4,4'-DDD	ND	3.8	0.75	ug/kg	
72-55-9	4,4'-DDE	ND	3.8	0.75	ug/kg	
50-29-3	4,4'-DDT	ND	3.8	0.86	ug/kg	
72-20-8	Endrin	ND	3.8	0.75	ug/kg	
1031-07-8	Endosulfan sulfate	ND	3.8	1.2	ug/kg	
7421-93-4	Endrin aldehyde	ND	3.8	1.1	ug/kg	UL
53494-70-5	Endrin ketone	ND	3.8	0.75	ug/kg	
959-98-8	Endosulfan-I	ND	1.9	0.41	ug/kg	
33213-65-9	Endosulfan-II	ND	3.8	0.56	ug/kg	
76-44-8	Heptachlor	ND	1.9	0.53	ug/kg	
1024-57-3	Heptachlor epoxide	ND	1.9	0.38	ug/kg	
72-43-5	Methoxychlor	ND	3.8	0.75	ug/kg	
8001-35-2	Toxaphene	ND	94	47	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	71%		46-122%
2051-24-3	Decachlorobiphenyl	67%		50-133%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: ST64551.D

Accutest Laboratories

Report of Analysis

Client Sample ID:	59SB06B		
Lab Sample ID:	F51300-2	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8082 SW846 3550B	Percent Solids:	88.5
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	ST64551.D	1	08/06/07	JB	08/02/07	OP21715	GST1701
Run #2							

	Initial Weight	Final Volume
Run #1	30.1 g	10.0 ml
Run #2		

PCB List

CAS No.	Compound	Result	RL	MDL	Units	Q
12674-11-2	Aroclor 1016	ND	19	9.4	ug/kg	
11104-28-2	Aroclor 1221	ND	19	15	ug/kg	
11141-16-5	Aroclor 1232	ND	19	15	ug/kg	
53469-21-9	Aroclor 1242	ND	19	9.4	ug/kg	
12672-29-6	Aroclor 1248	ND	19	9.4	ug/kg	
11097-69-1	Aroclor 1254	ND	19	9.4	ug/kg	
11096-82-5	Aroclor 1260	ND	19	9.4	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	83%		44-126%
2051-24-3	Decachlorobiphenyl	87%		39-157%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: TT08217.D

Accutest Laboratories

Report of Analysis

Client Sample ID:	59SB06C		
Lab Sample ID:	F51300-3	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8081A SW846 3550B	Percent Solids:	86.2
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	TT08217.D	1	08/08/07	FS	08/02/07	OP21716	GTT279
Run #2							

	Initial Weight	Final Volume
Run #1	30.8 g	10.0 ml
Run #2		

Pesticide TCL List

DATA VAL QUALIFIER

CAS No.	Compound	Result	RL	MDL	Units	Q
309-00-2	Aldrin	ND	1.9	0.45	ug/kg	
319-84-6	alpha-BHC	ND	1.9	0.53	ug/kg	
319-85-7	beta-BHC	ND	1.9	0.49	ug/kg	
319-86-8	delta-BHC	ND	1.9	0.83	ug/kg	UL
58-89-9	gamma-BHC (Lindane)	ND	1.9	0.64	ug/kg	
5103-71-9	alpha-Chlordane	ND	1.9	0.38	ug/kg	
5103-74-2	gamma-Chlordane	ND	1.9	0.41	ug/kg	
60-57-1	Dieldrin	ND	1.9	0.41	ug/kg	
72-54-8	4,4'-DDD	ND	3.8	0.75	ug/kg	
72-55-9	4,4'-DDE	ND	3.8	0.75	ug/kg	
50-29-3	4,4'-DDT	ND	3.8	0.87	ug/kg	
72-20-8	Endrin	ND	3.8	0.75	ug/kg	
1031-07-8	Endosulfan sulfate	ND	3.8	1.2	ug/kg	
7421-93-4	Endrin aldehyde	ND	3.8	1.1	ug/kg	UL
53494-70-5	Endrin ketone	ND	3.8	0.75	ug/kg	
959-98-8	Endosulfan-I	ND	1.9	0.41	ug/kg	
33213-65-9	Endosulfan-II	ND	3.8	0.56	ug/kg	
76-44-8	Heptachlor	ND	1.9	0.53	ug/kg	
1024-57-3	Heptachlor epoxide	ND	1.9	0.38	ug/kg	
72-43-5	Methoxychlor	ND	3.8	0.75	ug/kg	
8001-35-2	Toxaphene	ND	94	47	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	74%		46-122%
2051-24-3	Decachlorobiphenyl	69%		50-133%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: ST64552.D

Accutest Laboratories

Report of Analysis

Client Sample ID:	59SB06C		
Lab Sample ID:	F51300-3	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8082 SW846 3550B	Percent Solids:	86.2
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	ST64552.D	1	08/06/07	JB	08/02/07	OP21715	GST1701
Run #2							

	Initial Weight	Final Volume
Run #1	30.8 g	10.0 ml
Run #2		

PCB List

CAS No.	Compound	Result	RL	MDL	Units	Q
12674-11-2	Aroclor 1016	ND	19	9.4	ug/kg	
11104-28-2	Aroclor 1221	ND	19	15	ug/kg	
11141-16-5	Aroclor 1232	ND	19	15	ug/kg	
53469-21-9	Aroclor 1242	ND	19	9.4	ug/kg	
12672-29-6	Aroclor 1248	ND	19	9.4	ug/kg	
11097-69-1	Aroclor 1254	ND	19	9.4	ug/kg	
11096-82-5	Aroclor 1260	ND	19	9.4	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	88%		44-126%
2051-24-3	Decachlorobiphenyl	89%		39-157%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: TT08218.D

Accutest Laboratories

Report of Analysis

Client Sample ID:	59SB05A		
Lab Sample ID:	F51300-4	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8081A SW846 3550B	Percent Solids:	89.5
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	TT08218.D	1	08/08/07	FS	08/02/07	OP21716	GTT279
Run #2							

	Initial Weight	Final Volume
Run #1	30.0 g	10.0 ml
Run #2		

Pesticide TCL List

DATA VAL QUALIFIER

CAS No.	Compound	Result	RL	MDL	Units	Q
309-00-2	Aldrin	ND	1.9	0.45	ug/kg	
319-84-6	alpha-BHC	ND	1.9	0.52	ug/kg	
319-85-7	beta-BHC	ND	1.9	0.48	ug/kg	
319-86-8	delta-BHC	ND	1.9	0.82	ug/kg	UL
58-89-9	gamma-BHC (Lindane)	ND	1.9	0.63	ug/kg	
5103-71-9	alpha-Chlordane	ND	1.9	0.37	ug/kg	
5103-74-2	gamma-Chlordane	ND	1.9	0.41	ug/kg	
60-57-1	Dieldrin	ND	1.9	0.41	ug/kg	
72-54-8	4,4'-DDD	ND	3.7	0.74	ug/kg	
72-55-9	4,4'-DDE	ND	3.7	0.74	ug/kg	
50-29-3	4,4'-DDT	ND	3.7	0.86	ug/kg	
72-20-8	Endrin	ND	3.7	0.74	ug/kg	
1031-07-8	Endosulfan sulfate	ND	3.7	1.2	ug/kg	
7421-93-4	Endrin aldehyde	ND	3.7	1.1	ug/kg	UL
53494-70-5	Endrin ketone	ND	3.7	0.74	ug/kg	
959-98-8	Endosulfan-I	ND	1.9	0.41	ug/kg	
33213-65-9	Endosulfan-II	ND	3.7	0.56	ug/kg	
76-44-8	Heptachlor	ND	1.9	0.52	ug/kg	
1024-57-3	Heptachlor epoxide	ND	1.9	0.37	ug/kg	
72-43-5	Methoxychlor	ND	3.7	0.74	ug/kg	
8001-35-2	Toxaphene	ND	93	47	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	74%		46-122%
2051-24-3	Decachlorobiphenyl	70%		50-133%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	59SB05A		
Lab Sample ID:	F51300-4	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8082 SW846 3550B	Percent Solids:	89.5
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	ST64555.D	1	08/06/07	JB	08/02/07	OP21715	GST1701
Run #2							

	Initial Weight	Final Volume
Run #1	30.0 g	10.0 ml
Run #2		

PCB List

CAS No.	Compound	Result	RL	MDL	Units	Q
12674-11-2	Aroclor 1016	ND	19	9.3	ug/kg	
11104-28-2	Aroclor 1221	ND	19	15	ug/kg	
11141-16-5	Aroclor 1232	ND	19	15	ug/kg	
53469-21-9	Aroclor 1242	ND	19	9.3	ug/kg	
12672-29-6	Aroclor 1248	ND	19	9.3	ug/kg	
11097-69-1	Aroclor 1254	ND	19	9.3	ug/kg	
11096-82-5	Aroclor 1260	ND	19	9.3	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	86%		44-126%
2051-24-3	Decachlorobiphenyl	93%		39-157%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: TT08219.D

Accutest Laboratories

Report of Analysis

Client Sample ID:	59SB05B		
Lab Sample ID:	F51300-5	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8081A SW846 3550B	Percent Solids:	84.2
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	TT08219.D	1	08/08/07	FS	08/02/07	OP21716	GTT279
Run #2							

	Initial Weight	Final Volume
Run #1	30.3 g	10.0 ml
Run #2		

Pesticide TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q	DATA VAL QUALIFIER
309-00-2	Aldrin	ND	2.0	0.47	ug/kg		
319-84-6	alpha-BHC	ND	2.0	0.55	ug/kg		
319-85-7	beta-BHC	ND	2.0	0.51	ug/kg		
319-86-8	delta-BHC	ND	2.0	0.86	ug/kg		UL
58-89-9	gamma-BHC (Lindane)	ND	2.0	0.67	ug/kg		
5103-71-9	alpha-Chlordane	ND	2.0	0.39	ug/kg		
5103-74-2	gamma-Chlordane	ND	2.0	0.43	ug/kg		
60-57-1	Dieldrin	ND	2.0	0.43	ug/kg		
72-54-8	4,4'-DDD	ND	3.9	0.78	ug/kg		
72-55-9	4,4'-DDE	ND	3.9	0.78	ug/kg		
50-29-3	4,4'-DDT	ND	3.9	0.90	ug/kg		
72-20-8	Endrin	ND	3.9	0.78	ug/kg		
1031-07-8	Endosulfan sulfate	ND	3.9	1.3	ug/kg		
7421-93-4	Endrin aldehyde	ND	3.9	1.2	ug/kg		UL
53494-70-5	Endrin ketone	ND	3.9	0.78	ug/kg		
959-98-8	Endosulfan-I	ND	2.0	0.43	ug/kg		
33213-65-9	Endosulfan-II	ND	3.9	0.59	ug/kg		
76-44-8	Heptachlor	ND	2.0	0.55	ug/kg		
1024-57-3	Heptachlor epoxide	ND	2.0	0.39	ug/kg		
72-43-5	Methoxychlor	ND	3.9	0.78	ug/kg		
8001-35-2	Toxaphene	ND	98	49	ug/kg		

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	76%		46-122%
2051-24-3	Decachlorobiphenyl	70%		50-133%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	59SB05B		
Lab Sample ID:	F51300-5	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8082 SW846 3550B	Percent Solids:	84.2
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	ST64556.D	1	08/06/07	JB	08/02/07	OP21715	GST1701
Run #2							

	Initial Weight	Final Volume
Run #1	30.3 g	10.0 ml
Run #2		

PCB List

CAS No.	Compound	Result	RL	MDL	Units	Q
12674-11-2	Aroclor 1016	ND	20	9.8	ug/kg	
11104-28-2	Aroclor 1221	ND	20	16	ug/kg	
11141-16-5	Aroclor 1232	ND	20	16	ug/kg	
53469-21-9	Aroclor 1242	ND	20	9.8	ug/kg	
12672-29-6	Aroclor 1248	ND	20	9.8	ug/kg	
11097-69-1	Aroclor 1254	ND	20	9.8	ug/kg	
11096-82-5	Aroclor 1260	ND	20	9.8	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	92%		44-126%
2051-24-3	Decachlorobiphenyl	93%		39-157%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: TT08220.D

Accutest Laboratories

Report of Analysis

Client Sample ID:	59SB05C		
Lab Sample ID:	F51300-6	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8081A SW846 3550B	Percent Solids:	86.3
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	TT08220.D	1	08/08/07	FS	08/02/07	OP21716	GTT279
Run #2							

	Initial Weight	Final Volume
Run #1	30.5 g	10.0 ml
Run #2		

Pesticide TCL List

DATA VAL QUALIFIER

CAS No.	Compound	Result	RL	MDL	Units	Q
309-00-2	Aldrin	ND	1.9	0.46	ug/kg	
319-84-6	alpha-BHC	ND	1.9	0.53	ug/kg	
319-85-7	beta-BHC	ND	1.9	0.49	ug/kg	
319-86-8	delta-BHC	ND	1.9	0.84	ug/kg	UL
58-89-9	gamma-BHC (Lindane)	ND	1.9	0.65	ug/kg	
5103-71-9	alpha-Chlordane	ND	1.9	0.38	ug/kg	
5103-74-2	gamma-Chlordane	ND	1.9	0.42	ug/kg	
60-57-1	Dieldrin	ND	1.9	0.42	ug/kg	
72-54-8	4,4'-DDD	ND	3.8	0.76	ug/kg	
72-55-9	4,4'-DDE	ND	3.8	0.76	ug/kg	
50-29-3	4,4'-DDT	ND	3.8	0.87	ug/kg	
72-20-8	Endrin	ND	3.8	0.76	ug/kg	
1031-07-8	Endosulfan sulfate	ND	3.8	1.3	ug/kg	
7421-93-4	Endrin aldehyde	ND	3.8	1.1	ug/kg	UL
53494-70-5	Endrin ketone	ND	3.8	0.76	ug/kg	
959-98-8	Endosulfan-I	ND	1.9	0.42	ug/kg	
33213-65-9	Endosulfan-II	ND	3.8	0.57	ug/kg	
76-44-8	Heptachlor	ND	1.9	0.53	ug/kg	
1024-57-3	Heptachlor epoxide	ND	1.9	0.38	ug/kg	
72-43-5	Methoxychlor	ND	3.8	0.76	ug/kg	
8001-35-2	Toxaphene	ND	95	47	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	76%		46-122%
2051-24-3	Decachlorobiphenyl	73%		50-133%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: ST64557.D

Accutest Laboratories

Report of Analysis

Client Sample ID:	59SB05C		
Lab Sample ID:	F51300-6	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8082 SW846 3550B	Percent Solids:	86.3
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	ST64557.D	1	08/06/07	JB	08/02/07	OP21715	GST1701
Run #2							

	Initial Weight	Final Volume
Run #1	30.5 g	10.0 ml
Run #2		

PCB List

CAS No.	Compound	Result	RL	MDL	Units	Q
12674-11-2	Aroclor 1016	ND	19	9.5	ug/kg	
11104-28-2	Aroclor 1221	ND	19	15	ug/kg	
11141-16-5	Aroclor 1232	ND	19	15	ug/kg	
53469-21-9	Aroclor 1242	ND	19	9.5	ug/kg	
12672-29-6	Aroclor 1248	ND	19	9.5	ug/kg	
11097-69-1	Aroclor 1254	ND	19	9.5	ug/kg	
11096-82-5	Aroclor 1260	ND	19	9.5	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	88%		44-126%
2051-24-3	Decachlorobiphenyl	94%		39-157%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: TT08221.D

Accutest Laboratories

Report of Analysis

Client Sample ID:	59SB04A		
Lab Sample ID:	F51300-7	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8081A SW846 3550B	Percent Solids:	86.6
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	TT08221.D	1	08/08/07	FS	08/02/07	OP21716	GTT279
Run #2							

	Initial Weight	Final Volume
Run #1	30.7 g	10.0 ml
Run #2		

Pesticide TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q	DATA VAL QUALIFIER
309-00-2	Aldrin	ND	1.9	0.45	ug/kg		
319-84-6	alpha-BHC	ND	1.9	0.53	ug/kg		
319-85-7	beta-BHC	ND	1.9	0.49	ug/kg		
319-86-8	delta-BHC	ND	1.9	0.83	ug/kg		UL
58-89-9	gamma-BHC (Lindane)	ND	1.9	0.64	ug/kg		
5103-71-9	alpha-Chlordane	ND	1.9	0.38	ug/kg		
5103-74-2	gamma-Chlordane	ND	1.9	0.41	ug/kg		
60-57-1	Dieldrin	ND	1.9	0.41	ug/kg		
72-54-8	4,4'-DDD	ND	3.8	0.75	ug/kg		
72-55-9	4,4'-DDE	ND	3.8	0.75	ug/kg		
50-29-3	4,4'-DDT	ND	3.8	0.87	ug/kg		
72-20-8	Endrin	ND	3.8	0.75	ug/kg		
1031-07-8	Endosulfan sulfate	ND	3.8	1.2	ug/kg		
7421-93-4	Endrin aldehyde	ND	3.8	1.1	ug/kg		UL
53494-70-5	Endrin ketone	ND	3.8	0.75	ug/kg		
959-98-8	Endosulfan-I	ND	1.9	0.41	ug/kg		
33213-65-9	Endosulfan-II	ND	3.8	0.56	ug/kg		
76-44-8	Heptachlor	ND	1.9	0.53	ug/kg		
1024-57-3	Heptachlor epoxide	ND	1.9	0.38	ug/kg		
72-43-5	Methoxychlor	ND	3.8	0.75	ug/kg		
8001-35-2	Toxaphene	ND	94	47	ug/kg		

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	73%		46-122%
2051-24-3	Decachlorobiphenyl	70%		50-133%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: ST64558.D

Accutest Laboratories

Report of Analysis

Client Sample ID:	59SB04A		
Lab Sample ID:	F51300-7	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8082 SW846 3550B	Percent Solids:	86.6
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	ST64558.D	1	08/06/07	JB	08/02/07	OP21715	GST1701
Run #2							

	Initial Weight	Final Volume
Run #1	30.7 g	10.0 ml
Run #2		

PCB List

CAS No.	Compound	Result	RL	MDL	Units	Q
12674-11-2	Aroclor 1016	ND	19	9.4	ug/kg	
11104-28-2	Aroclor 1221	ND	19	15	ug/kg	
11141-16-5	Aroclor 1232	ND	19	15	ug/kg	
53469-21-9	Aroclor 1242	ND	19	9.4	ug/kg	
12672-29-6	Aroclor 1248	ND	19	9.4	ug/kg	
11097-69-1	Aroclor 1254	ND	19	9.4	ug/kg	
11096-82-5	Aroclor 1260	ND	19	9.4	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	84%		44-126%
2051-24-3	Decachlorobiphenyl	89%		39-157%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: TT08222.D

Accutest Laboratories

Report of Analysis

Client Sample ID:	59SB04B		
Lab Sample ID:	F51300-8	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8081A SW846 3550B	Percent Solids:	83.2
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	TT08222.D	1	08/08/07	FS	08/02/07	OP21716	GTT279
Run #2							

	Initial Weight	Final Volume
Run #1	30.0 g	10.0 ml
Run #2		

Pesticide TCL List

DATA VAL QUALIFIER

CAS No.	Compound	Result	RL	MDL	Units	Q
309-00-2	Aldrin	ND	2.0	0.48	ug/kg	
319-84-6	alpha-BHC	ND	2.0	0.56	ug/kg	
319-85-7	beta-BHC	ND	2.0	0.52	ug/kg	
319-86-8	delta-BHC	ND	2.0	0.88	ug/kg	UL
58-89-9	gamma-BHC (Lindane)	ND	2.0	0.68	ug/kg	
5103-71-9	alpha-Chlordane	ND	2.0	0.40	ug/kg	
5103-74-2	gamma-Chlordane	ND	2.0	0.44	ug/kg	
60-57-1	Dieldrin	ND	2.0	0.44	ug/kg	
72-54-8	4,4'-DDD	ND	4.0	0.80	ug/kg	
72-55-9	4,4'-DDE	ND	4.0	0.80	ug/kg	
50-29-3	4,4'-DDT	ND	4.0	0.92	ug/kg	
72-20-8	Endrin	ND	4.0	0.80	ug/kg	
1031-07-8	Endosulfan sulfate	ND	4.0	1.3	ug/kg	
7421-93-4	Endrin aldehyde	ND	4.0	1.2	ug/kg	UL
53494-70-5	Endrin ketone	ND	4.0	0.80	ug/kg	
959-98-8	Endosulfan-I	ND	2.0	0.44	ug/kg	
33213-65-9	Endosulfan-II	ND	4.0	0.60	ug/kg	
76-44-8	Heptachlor	ND	2.0	0.56	ug/kg	
1024-57-3	Heptachlor epoxide	ND	2.0	0.40	ug/kg	
72-43-5	Methoxychlor	ND	4.0	0.80	ug/kg	
8001-35-2	Toxaphene	ND	100	50	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	74%		46-122%
2051-24-3	Decachlorobiphenyl	72%		50-133%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	59SB04B		
Lab Sample ID:	F51300-8	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8082 SW846 3550B	Percent Solids:	83.2
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	ST64559.D	1	08/06/07	JB	08/02/07	OP21715	GST1701
Run #2							

	Initial Weight	Final Volume
Run #1	30.0 g	10.0 ml
Run #2		

PCB List

CAS No.	Compound	Result	RL	MDL	Units	Q
12674-11-2	Aroclor 1016	ND	20	10	ug/kg	
11104-28-2	Aroclor 1221	ND	20	16	ug/kg	
11141-16-5	Aroclor 1232	ND	20	16	ug/kg	
53469-21-9	Aroclor 1242	ND	20	10	ug/kg	
12672-29-6	Aroclor 1248	ND	20	10	ug/kg	
11097-69-1	Aroclor 1254	ND	20	10	ug/kg	
11096-82-5	Aroclor 1260	ND	20	10	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	84%		44-126%
2051-24-3	Decachlorobiphenyl	93%		39-157%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: TT08225.D TT08319.D

Accutest Laboratories

Report of Analysis

Client Sample ID:	59SB04C		
Lab Sample ID:	F51300-9	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8081A SW846 3550B	Percent Solids:	85.8
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	TT08225.D	1	08/08/07	FS	08/02/07	OP21716	GTT279
Run #2	TT08319.D	5	08/10/07	FS	08/02/07	OP21716	GTT281

	Initial Weight	Final Volume
Run #1	30.2 g	10.0 ml
Run #2	30.2 g	10.0 ml

Pesticide TCL List

DATA VAL QUALIFIER

CAS No.	Compound	Result	RL	MDL	Units	Q
309-00-2	Aldrin	ND	1.9	0.46	ug/kg	
319-84-6	alpha-BHC	ND	1.9	0.54	ug/kg	
319-85-7	beta-BHC	ND	1.9	0.50	ug/kg	
319-86-8	delta-BHC	ND	1.9	0.85	ug/kg	UL
58-89-9	gamma-BHC (Lindane)	ND	1.9	0.66	ug/kg	
5103-71-9	alpha-Chlordane	ND	1.9	0.39	ug/kg	
5103-74-2	gamma-Chlordane	ND	1.9	0.42	ug/kg	
60-57-1	Dieldrin	ND	1.9	0.42	ug/kg	
72-54-8	4,4'-DDD	ND	3.9	0.77	ug/kg	
72-55-9	4,4'-DDE	ND	3.9	0.77	ug/kg	
50-29-3	4,4'-DDT	ND	3.9	0.89	ug/kg	UJ
72-20-8	Endrin	ND	3.9	0.77	ug/kg	
1031-07-8	Endosulfan sulfate	ND	3.9	1.3	ug/kg	
7421-93-4	Endrin aldehyde	ND	3.9	1.2	ug/kg	UJ
53494-70-5	Endrin ketone	ND	3.9	0.77	ug/kg	
959-98-8	Endosulfan-I	ND	1.9	0.42	ug/kg	
33213-65-9	Endosulfan-II	ND	3.9	0.58	ug/kg	
76-44-8	Heptachlor	ND [a]	9.6	2.7	ug/kg	
1024-57-3	Heptachlor epoxide	ND	1.9	0.39	ug/kg	
72-43-5	Methoxychlor	ND	3.9	0.77	ug/kg	UJ
8001-35-2	Toxaphene	ND	96	48	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	73%	81%	46-122%
2051-24-3	Decachlorobiphenyl	71%	96%	50-133%

(a) Result is from Run# 2

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	59SB04C		
Lab Sample ID:	F51300-9	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8082 SW846 3550B	Percent Solids:	85.8
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	ST64560.D	1	08/07/07	JB	08/02/07	OP21715	GST1701
Run #2							

	Initial Weight	Final Volume
Run #1	30.2 g	10.0 ml
Run #2		

PCB List

CAS No.	Compound	Result	RL	MDL	Units	Q
12674-11-2	Aroclor 1016	ND	19	9.6	ug/kg	
11104-28-2	Aroclor 1221	ND	19	15	ug/kg	
11141-16-5	Aroclor 1232	ND	19	15	ug/kg	
53469-21-9	Aroclor 1242	ND	19	9.6	ug/kg	
12672-29-6	Aroclor 1248	ND	19	9.6	ug/kg	
11097-69-1	Aroclor 1254	ND	19	9.6	ug/kg	
11096-82-5	Aroclor 1260	ND	19	9.6	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	84%		44-126%
2051-24-3	Decachlorobiphenyl	91%		39-157%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: TT08226.D TT08320.D

Accutest Laboratories

Report of Analysis

Client Sample ID:	TMSB04C		
Lab Sample ID:	F51300-10	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8081A SW846 3550B	Percent Solids:	83.9
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	TT08226.D	1	08/08/07	FS	08/02/07	OP21716	GTT279
Run #2	TT08320.D	5	08/11/07	FS	08/02/07	OP21716	GTT281

	Initial Weight	Final Volume
Run #1	30.3 g	10.0 ml
Run #2	30.3 g	10.0 ml

Pesticide TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q	DATA VAL QUALIFIER
309-00-2	Aldrin	ND	2.0	0.47	ug/kg		
319-84-6	alpha-BHC	ND	2.0	0.55	ug/kg		
319-85-7	beta-BHC	ND	2.0	0.51	ug/kg		
319-86-8	delta-BHC	ND	2.0	0.87	ug/kg		UL
58-89-9	gamma-BHC (Lindane)	ND	2.0	0.67	ug/kg		
5103-71-9	alpha-Chlordane	ND	2.0	0.39	ug/kg		
5103-74-2	gamma-Chlordane	ND	2.0	0.43	ug/kg		
60-57-1	Dieldrin	ND	2.0	0.43	ug/kg		
72-54-8	4,4'-DDD	ND	3.9	0.79	ug/kg		
72-55-9	4,4'-DDE	ND	3.9	0.79	ug/kg		
50-29-3	4,4'-DDT	ND	3.9	0.90	ug/kg		UT
72-20-8	Endrin	ND	3.9	0.79	ug/kg		
1031-07-8	Endosulfan sulfate	ND	3.9	1.3	ug/kg		
7421-93-4	Endrin aldehyde	ND	3.9	1.2	ug/kg		UJ
53494-70-5	Endrin ketone	ND	3.9	0.79	ug/kg		
959-98-8	Endosulfan-I	ND	2.0	0.43	ug/kg		
33213-65-9	Endosulfan-II	ND	3.9	0.59	ug/kg		
76-44-8	Heptachlor	ND [a]	9.8	2.8	ug/kg		
1024-57-3	Heptachlor epoxide	ND	2.0	0.39	ug/kg		
72-43-5	Methoxychlor	ND	3.9	0.79	ug/kg		UT
8001-35-2	Toxaphene	ND	98	49	ug/kg		

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	70%	72%	46-122%
2051-24-3	Decachlorobiphenyl	70%	89%	50-133%

(a) Result is from Run# 2

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	TMSB04C		
Lab Sample ID:	F51300-10	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8082 SW846 3550B	Percent Solids:	83.9
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	ST64561.D	1	08/07/07	JB	08/02/07	OP21715	GST1701
Run #2							

	Initial Weight	Final Volume
Run #1	30.3 g	10.0 ml
Run #2		

PCB List

CAS No.	Compound	Result	RL	MDL	Units	Q
12674-11-2	Aroclor 1016	ND	20	9.8	ug/kg	
11104-28-2	Aroclor 1221	ND	20	16	ug/kg	
11141-16-5	Aroclor 1232	ND	20	16	ug/kg	
53469-21-9	Aroclor 1242	ND	20	9.8	ug/kg	
12672-29-6	Aroclor 1248	ND	20	9.8	ug/kg	
11097-69-1	Aroclor 1254	ND	20	9.8	ug/kg	
11096-82-5	Aroclor 1260	ND	20	9.8	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	80%		44-126%
2051-24-3	Decachlorobiphenyl	88%		39-157%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: TT08227.D TT08321.D

Accutest Laboratories

Report of Analysis

Client Sample ID:	59SB02A		
Lab Sample ID:	F51300-11	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8081A SW846 3550B	Percent Solids:	89.5
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	TT08227.D	1	08/08/07	FS	08/02/07	OP21716	GTT279
Run #2	TT08321.D	5	08/11/07	FS	08/02/07	OP21716	GTT281

	Initial Weight	Final Volume
Run #1	30.2 g	10.0 ml
Run #2	30.2 g	10.0 ml

Pesticide TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q	DATA VAL QUALIFIER
309-00-2	Aldrin	ND	1.8	0.44	ug/kg		
319-84-6	alpha-BHC	ND	1.8	0.52	ug/kg		
319-85-7	beta-BHC	ND	1.8	0.48	ug/kg		
319-86-8	delta-BHC	ND	1.8	0.81	ug/kg		UL
58-89-9	gamma-BHC (Lindane)	ND	1.8	0.63	ug/kg		
5103-71-9	alpha-Chlordane	ND	1.8	0.37	ug/kg		
5103-74-2	gamma-Chlordane	ND	1.8	0.41	ug/kg		
60-57-1	Dieldrin	ND	1.8	0.41	ug/kg		
72-54-8	4,4'-DDD	ND	3.7	0.74	ug/kg		
72-55-9	4,4'-DDE	ND	3.7	0.74	ug/kg		
50-29-3	4,4'-DDT	ND	3.7	0.85	ug/kg		UJ
72-20-8	Endrin	ND	3.7	0.74	ug/kg		
1031-07-8	Endosulfan sulfate	ND	3.7	1.2	ug/kg		
7421-93-4	Endrin aldehyde	ND	3.7	1.1	ug/kg		UJ
53494-70-5	Endrin ketone	ND	3.7	0.74	ug/kg		
959-98-8	Endosulfan-I	ND	1.8	0.41	ug/kg		
33213-65-9	Endosulfan-II	ND	3.7	0.55	ug/kg		
76-44-8	Heptachlor	ND [a]	9.2	2.6	ug/kg		
1024-57-3	Heptachlor epoxide	ND	1.8	0.37	ug/kg		
72-43-5	Methoxychlor	ND	3.7	0.74	ug/kg		UJ
8001-35-2	Toxaphene	ND	92	46	ug/kg		

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	71%	78%	46-122%
2051-24-3	Decachlorobiphenyl	70%	93%	50-133%

(a) Result is from Run# 2

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: ST64562.D

Accutest Laboratories

Report of Analysis

Client Sample ID:	59SB02A		
Lab Sample ID:	F51300-11	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8082 SW846 3550B	Percent Solids:	89.5
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	ST64562.D	1	08/07/07	JB	08/02/07	OP21715	GST1701
Run #2							

	Initial Weight	Final Volume
Run #1	30.2 g	10.0 ml
Run #2		

PCB List

CAS No.	Compound	Result	RL	MDL	Units	Q
12674-11-2	Aroclor 1016	ND	18	9.2	ug/kg	
11104-28-2	Aroclor 1221	ND	18	15	ug/kg	
11141-16-5	Aroclor 1232	ND	18	15	ug/kg	
53469-21-9	Aroclor 1242	ND	18	9.2	ug/kg	
12672-29-6	Aroclor 1248	ND	18	9.2	ug/kg	
11097-69-1	Aroclor 1254	ND	18	9.2	ug/kg	
11096-82-5	Aroclor 1260	ND	18	9.2	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	84%		44-126%
2051-24-3	Decachlorobiphenyl	82%		39-157%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	59SB02B		
Lab Sample ID:	F51300-12	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8081A SW846 3550B	Percent Solids:	83.3
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	TT08228.D	1	08/08/07	FS	08/02/07	OP21716	GTT279
Run #2	TT08324.D	5	08/11/07	FS	08/02/07	OP21716	GTT281

	Initial Weight	Final Volume
Run #1	30.1 g	10.0 ml
Run #2	30.1 g	10.0 ml

Pesticide TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q	DATA VAL QUALIFIER
309-00-2	Aldrin	ND	2.0	0.48	ug/kg		
319-84-6	alpha-BHC	ND	2.0	0.56	ug/kg		
319-85-7	beta-BHC	ND	2.0	0.52	ug/kg		
319-86-8	delta-BHC	ND	2.0	0.88	ug/kg		UL
58-89-9	gamma-BHC (Lindane)	ND	2.0	0.68	ug/kg		
5103-71-9	alpha-Chlordane	ND	2.0	0.40	ug/kg		
5103-74-2	gamma-Chlordane	ND	2.0	0.44	ug/kg		
60-57-1	Dieldrin	ND	2.0	0.44	ug/kg		
72-54-8	4,4'-DDD	ND	4.0	0.80	ug/kg		
72-55-9	4,4'-DDE	ND	4.0	0.80	ug/kg		
50-29-3	4,4'-DDT	ND	4.0	0.92	ug/kg		UJ
72-20-8	Endrin	ND	4.0	0.80	ug/kg		
1031-07-8	Endosulfan sulfate	ND	4.0	1.3	ug/kg		
7421-93-4	Endrin aldehyde	ND	4.0	1.2	ug/kg		UJ
53494-70-5	Endrin ketone	ND	4.0	0.80	ug/kg		
959-98-8	Endosulfan-I	ND	2.0	0.44	ug/kg		
33213-65-9	Endosulfan-II	ND	4.0	0.60	ug/kg		
76-44-8	Heptachlor	ND [a]	10	2.8	ug/kg		
1024-57-3	Heptachlor epoxide	ND	2.0	0.40	ug/kg		
72-43-5	Methoxychlor	ND	4.0	0.80	ug/kg		UJ
8001-35-2	Toxaphene	ND	100	50	ug/kg		

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	75%	86%	46-122%
2051-24-3	Decachlorobiphenyl	72%	100%	50-133%

(a) Result is from Run# 2

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: ST64563.D

Accutest Laboratories

Report of Analysis

Client Sample ID:	59SB02B		
Lab Sample ID:	F51300-12	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8082 SW846 3550B	Percent Solids:	83.3
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	ST64563.D	1	08/07/07	JB	08/02/07	OP21715	GST1701
Run #2							

	Initial Weight	Final Volume
Run #1	30.2 g	10.0 ml
Run #2		

PCB List

CAS No.	Compound	Result	RL	MDL	Units	Q
12674-11-2	Aroclor 1016	ND	20	9.9	ug/kg	
11104-28-2	Aroclor 1221	ND	20	16	ug/kg	
11141-16-5	Aroclor 1232	ND	20	16	ug/kg	
53469-21-9	Aroclor 1242	ND	20	9.9	ug/kg	
12672-29-6	Aroclor 1248	ND	20	9.9	ug/kg	
11097-69-1	Aroclor 1254	ND	20	9.9	ug/kg	
11096-82-5	Aroclor 1260	ND	20	9.9	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	89%		44-126%
2051-24-3	Decachlorobiphenyl	92%		39-157%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: TT08229.D TT08325.D

Accutest Laboratories

Report of Analysis

Client Sample ID:	TMSB02B		
Lab Sample ID:	F51300-13	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8081A SW846 3550B	Percent Solids:	85.3
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	TT08229.D	1	08/08/07	FS	08/02/07	OP21716	GTT279
Run #2	TT08325.D	5	08/11/07	FS	08/02/07	OP21716	GTT281

	Initial Weight	Final Volume
Run #1	30.6 g	10.0 ml
Run #2	30.6 g	10.0 ml

Pesticide TCL List

DATA VAL QUALIFIER

CAS No.	Compound	Result	RL	MDL	Units	Q
309-00-2	Aldrin	ND	1.9	0.46	ug/kg	
319-84-6	alpha-BHC	ND	1.9	0.54	ug/kg	
319-85-7	beta-BHC	ND	1.9	0.50	ug/kg	
319-86-8	delta-BHC	ND	1.9	0.84	ug/kg	UL
58-89-9	gamma-BHC (Lindane)	ND	1.9	0.65	ug/kg	
5103-71-9	alpha-Chlordane	ND	1.9	0.38	ug/kg	
5103-74-2	gamma-Chlordane	ND	1.9	0.42	ug/kg	
60-57-1	Dieldrin	ND	1.9	0.42	ug/kg	
72-54-8	4,4'-DDD	ND	3.8	0.77	ug/kg	
72-55-9	4,4'-DDE	ND	3.8	0.77	ug/kg	
50-29-3	4,4'-DDT	ND	3.8	0.88	ug/kg	UJ
72-20-8	Endrin	ND	3.8	0.77	ug/kg	
1031-07-8	Endosulfan sulfate	ND	3.8	1.3	ug/kg	
7421-93-4	Endrin aldehyde	ND	3.8	1.1	ug/kg	UJ
53494-70-5	Endrin ketone	ND	3.8	0.77	ug/kg	
959-98-8	Endosulfan-I	ND	1.9	0.42	ug/kg	
33213-65-9	Endosulfan-II	ND	3.8	0.57	ug/kg	
76-44-8	Heptachlor	ND [a]	9.6	2.7	ug/kg	
1024-57-3	Heptachlor epoxide	ND	1.9	0.38	ug/kg	
72-43-5	Methoxychlor	ND	3.8	0.77	ug/kg	UJ
8001-35-2	Toxaphene	ND	96	48	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	72%	80%	46-122%
2051-24-3	Decachlorobiphenyl	71%	93%	50-133%

(a) Result is from Run# 2

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: ST64566.D

Accutest Laboratories

Report of Analysis

Client Sample ID:	TMSB02B		
Lab Sample ID:	F51300-13	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8082 SW846 3550B	Percent Solids:	85.3
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	ST64566.D	1	08/07/07	JB	08/02/07	OP21715	GST1701
Run #2							

	Initial Weight	Final Volume
Run #1	30.5 g	10.0 ml
Run #2		

PCB List

CAS No.	Compound	Result	RL	MDL	Units	Q
12674-11-2	Aroclor 1016	ND	19	9.6	ug/kg	
11104-28-2	Aroclor 1221	ND	19	15	ug/kg	
11141-16-5	Aroclor 1232	ND	19	15	ug/kg	
53469-21-9	Aroclor 1242	ND	19	9.6	ug/kg	
12672-29-6	Aroclor 1248	ND	19	9.6	ug/kg	
11097-69-1	Aroclor 1254	ND	19	9.6	ug/kg	
11096-82-5	Aroclor 1260	ND	19	9.6	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	82%		44-126%
2051-24-3	Decachlorobiphenyl	93%		39-157%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: TT08230.D TT08338.D TT08326.D

Accutest Laboratories

Report of Analysis

Client Sample ID:	59SB02C		
Lab Sample ID:	F51300-14	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8081A SW846 3550B	Percent Solids:	83.2
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	TT08230.D	1	08/08/07	FS	08/02/07	OP21716	GTT279
Run #2	TT08338.D	5	08/11/07	FS	08/02/07	OP21716	GTT282
Run #3	TT08326.D	5	08/11/07	FS	08/02/07	OP21716	GTT281

	Initial Weight	Final Volume
Run #1	30.2 g	10.0 ml
Run #2	30.9 g	10.0 ml
Run #3	30.2 g	10.0 ml

Pesticide TCL List

DATA VAL QUALIFIER

CAS No.	Compound	Result	RL	MDL	Units	Q
309-00-2	Aldrin	ND	2.0	0.48	ug/kg	
319-84-6	alpha-BHC	ND	2.0	0.56	ug/kg	
319-85-7	beta-BHC	ND	2.0	0.52	ug/kg	
319-86-8	delta-BHC	ND	2.0	0.88	ug/kg	UL
58-89-9	gamma-BHC (Lindane)	ND	2.0	0.68	ug/kg	
5103-71-9	alpha-Chlordane	ND	2.0	0.40	ug/kg	
5103-74-2	gamma-Chlordane	ND	2.0	0.44	ug/kg	
60-57-1	Dieldrin	ND	2.0	0.44	ug/kg	
72-54-8	4,4'-DDD	ND	4.0	0.80	ug/kg	
72-55-9	4,4'-DDE	ND	4.0	0.80	ug/kg	
~~50-29-3~~	~~4,4'-DDT~~	~~ND~~	~~4.0~~	~~0.92~~	~~ug/kg~~	R
50-29-3	4,4'-DDT	ND [a]	19	4.5	ug/kg	
72-20-8	Endrin	ND	4.0	0.80	ug/kg	
1031-07-8	Endosulfan sulfate	ND	4.0	1.3	ug/kg	
7421-93-4	Endrin aldehyde	ND	4.0	1.2	ug/kg	UJ
53494-70-5	Endrin ketone	ND	4.0	0.80	ug/kg	
959-98-8	Endosulfan-I	ND	2.0	0.44	ug/kg	
33213-65-9	Endosulfan-II	ND	4.0	0.60	ug/kg	
~~76-44-8~~	~~Heptachlor~~	~~ND [b]~~	~~9.9~~	~~2.8~~	~~ug/kg~~	R
76-44-8	Heptachlor	ND [a]	9.7	2.7	ug/kg	
1024-57-3	Heptachlor epoxide	ND	2.0	0.40	ug/kg	
~~72-43-5~~	~~Methoxychlor~~	~~ND~~	~~4.0~~	~~0.80~~	~~ug/kg~~	R
72-43-5	Methoxychlor	ND [a]	19	3.9	ug/kg	
8001-35-2	Toxaphene	ND	99	50	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Run# 3	Limits
877-09-8	Tetrachloro-m-xylene	71%	81%	78%	46-122%
2051-24-3	Decachlorobiphenyl	67%	85%	93%	50-133%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	59SB02C		
Lab Sample ID:	F51300-14	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8081A SW846 3550B	Percent Solids:	83.2
Project:	WPA 019 Field Investigation; Radford AAP, VA		

Pesticide TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q

(a) Result is from Run# 2
(b) Result is from Run# 3

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: ST64567.D

Accutest Laboratories

Report of Analysis

Client Sample ID:	59SB02C		
Lab Sample ID:	F51300-14	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8082 SW846 3550B	Percent Solids:	83.2
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	ST64567.D	1	08/07/07	JB	08/02/07	OP21715	GST1701
Run #2							

	Initial Weight	Final Volume
Run #1	30.9 g	10.0 ml
Run #2		

PCB List

CAS No.	Compound	Result	RL	MDL	Units	Q
12674-11-2	Aroclor 1016	ND	19	9.7	ug/kg	
11104-28-2	Aroclor 1221	ND	19	16	ug/kg	
11141-16-5	Aroclor 1232	ND	19	16	ug/kg	
53469-21-9	Aroclor 1242	ND	19	9.7	ug/kg	
12672-29-6	Aroclor 1248	ND	19	9.7	ug/kg	
11097-69-1	Aroclor 1254	ND	19	9.7	ug/kg	
11096-82-5	Aroclor 1260	ND	19	9.7	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	85%		44-126%
2051-24-3	Decachlorobiphenyl	94%		39-157%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: TT08233.D TT08318.D

Accutest Laboratories

Report of Analysis

Client Sample ID:	43SB06A		
Lab Sample ID:	F51300-15	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8081A SW846 3550B	Percent Solids:	85.6
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	TT08233.D	1	08/08/07	FS	08/02/07	OP21716	GTT279
Run #2	TT08318.D	5	08/10/07	FS	08/02/07	OP21716	GTT281

	Initial Weight	Final Volume
Run #1	30.6 g	10.0 ml
Run #2	30.6 g	10.0 ml

Pesticide TCL List

DATA VAL QUALIFIER

CAS No.	Compound	Result	RL	MDL	Units	Q
309-00-2	Aldrin	ND	1.9	0.46	ug/kg	
319-84-6	alpha-BHC	ND	1.9	0.53	ug/kg	
319-85-7	beta-BHC	ND	1.9	0.50	ug/kg	
319-86-8	delta-BHC	ND	1.9	0.84	ug/kg	UL
58-89-9	gamma-BHC (Lindane)	ND	1.9	0.65	ug/kg	
5103-71-9	alpha-Chlordane	ND	1.9	0.38	ug/kg	
5103-74-2	gamma-Chlordane	ND	1.9	0.42	ug/kg	
60-57-1	Dieldrin	ND	1.9	0.42	ug/kg	
72-54-8	4,4'-DDD	ND	3.8	0.76	ug/kg	
72-55-9	4,4'-DDE	ND	3.8	0.76	ug/kg	
50-29-3	4,4'-DDT	ND	3.8	0.88	ug/kg	UJ
72-20-8	Endrin	ND	3.8	0.76	ug/kg	
1031-07-8	Endosulfan sulfate	ND	3.8	1.3	ug/kg	
7421-93-4	Endrin aldehyde	ND	3.8	1.1	ug/kg	UJ
53494-70-5	Endrin ketone	ND	3.8	0.76	ug/kg	
959-98-8	Endosulfan-I	ND	1.9	0.42	ug/kg	
33213-65-9	Endosulfan-II	ND	3.8	0.57	ug/kg	
76-44-8	Heptachlor	ND [a]	9.5	2.7	ug/kg	
1024-57-3	Heptachlor epoxide	ND	1.9	0.38	ug/kg	
72-43-5	Methoxychlor	ND	3.8	0.76	ug/kg	UJ
8001-35-2	Toxaphene	ND	95	48	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	75%	80%	46-122%
2051-24-3	Decachlorobiphenyl	70%	90%	50-133%

(a) Result is from Run# 2

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: ST64568.D

Accutest Laboratories

Report of Analysis

Client Sample ID:	43SB06A		
Lab Sample ID:	F51300-15	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8082 SW846 3550B	Percent Solids:	85.6
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	ST64568.D	1	08/07/07	JB	08/02/07	OP21715	GST1701
Run #2							

	Initial Weight	Final Volume
Run #1	30.6 g	10.0 ml
Run #2		

PCB List

CAS No.	Compound	Result	RL	MDL	Units	Q
12674-11-2	Aroclor 1016	ND	19	9.5	ug/kg	
11104-28-2	Aroclor 1221	ND	19	15	ug/kg	
11141-16-5	Aroclor 1232	ND	19	15	ug/kg	
53469-21-9	Aroclor 1242	ND	19	9.5	ug/kg	
12672-29-6	Aroclor 1248	ND	19	9.5	ug/kg	
11097-69-1	Aroclor 1254	ND	19	9.5	ug/kg	
11096-82-5	Aroclor 1260	ND	19	9.5	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	84%		44-126%
2051-24-3	Decachlorobiphenyl	88%		39-157%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	43SB06B		
Lab Sample ID:	F51300-16	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8081A SW846 3550B	Percent Solids:	81.7
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	TT08369.D	1	08/11/07	FS	08/02/07	OP21716	GTT282
Run #2							

	Initial Weight	Final Volume
Run #1	30.0 g	10.0 ml
Run #2		

Pesticide TCL List

DATA VAL QUALIFIER

CAS No.	Compound	Result	RL	MDL	Units	Q	
309-00-2	Aldrin	ND	2.0	0.49	ug/kg		UJ
319-84-6	alpha-BHC	ND	2.0	0.57	ug/kg		
319-85-7	beta-BHC	ND	2.0	0.53	ug/kg		
319-86-8	delta-BHC	ND	2.0	0.90	ug/kg		
58-89-9	gamma-BHC (Lindane)	ND	2.0	0.69	ug/kg		
5103-71-9	alpha-Chlordane	ND	2.0	0.41	ug/kg		
5103-74-2	gamma-Chlordane	ND	2.0	0.45	ug/kg		
60-57-1	Dieldrin	0.85	2.0	0.45	ug/kg	J	J
72-54-8	4,4'-DDD	ND	4.1	0.82	ug/kg		UJ
72-55-9	4,4'-DDE	ND	4.1	0.82	ug/kg		
50-29-3	4,4'-DDT	ND	4.1	0.94	ug/kg		
72-20-8	Endrin	ND	4.1	0.82	ug/kg		
1031-07-8	Endosulfan sulfate	ND	4.1	1.3	ug/kg		
7421-93-4	Endrin aldehyde	ND	4.1	1.2	ug/kg		
53494-70-5	Endrin ketone	ND	4.1	0.82	ug/kg		
959-98-8	Endosulfan-I	ND	2.0	0.45	ug/kg		
33213-65-9	Endosulfan-II	ND	4.1	4.1	ug/kg		
76-44-8	Heptachlor	ND	2.0	0.57	ug/kg		
1024-57-3	Heptachlor epoxide	ND	2.0	0.41	ug/kg		
72-43-5	Methoxychlor	ND	4.1	0.82	ug/kg		
8001-35-2	Toxaphene	ND	100	51	ug/kg		

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	61%		46-122%
2051-24-3	Decachlorobiphenyl	86%		50-133%

(a) All hits confirmed by dual column analysis.

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: ST64789.D

Accutest Laboratories

Report of Analysis

Client Sample ID:	43SB06B		
Lab Sample ID:	F51300-16	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8082 SW846 3550B	Percent Solids:	81.7
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	ST64789.D	1	08/13/07	JB	08/02/07	OP21715	GST1707
Run #2							

	Initial Weight	Final Volume
Run #1	30.0 g	10.0 ml
Run #2		

PCB List

CAS No.	Compound	Result	RL	MDL	Units	Q
12674-11-2	Aroclor 1016	ND	20	10	ug/kg	
11104-28-2	Aroclor 1221	ND	20	16	ug/kg	
11141-16-5	Aroclor 1232	ND	20	16	ug/kg	
53469-21-9	Aroclor 1242	ND	20	10	ug/kg	
12672-29-6	Aroclor 1248	ND	20	10	ug/kg	
11097-69-1	Aroclor 1254 [b]	29.9	20	10	ug/kg	J
11096-82-5	Aroclor 1260 [b]	39.8	20	10	ug/kg	J

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	53%		44-126%
2051-24-3	Decachlorobiphenyl	70%		39-157%

(a) All hits confirmed by dual column analysis.
(b) Estimated value due to the presence of multiple overlapping Aroclor patterns.

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: TT08370.D

Accutest Laboratories

Report of Analysis

Client Sample ID:	43SB06C		
Lab Sample ID:	F51300-17	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8081A SW846 3550B	Percent Solids:	89.4
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	TT08370.D	1	08/11/07	FS	08/02/07	OP21716	GTT282
Run #2							

	Initial Weight	Final Volume
Run #1	30.3 g	10.0 ml
Run #2		

Pesticide TCL List

DATA VAL QUALIFIER

CAS No.	Compound	Result	RL	MDL	Units	Q
309-00-2	Aldrin	ND	1.8	0.44	ug/kg	
319-84-6	alpha-BHC	ND	1.8	0.52	ug/kg	
319-85-7	beta-BHC	ND	1.8	0.48	ug/kg	
319-86-8	delta-BHC	ND	1.8	0.81	ug/kg	UL
58-89-9	gamma-BHC (Lindane)	ND	1.8	0.63	ug/kg	
5103-71-9	alpha-Chlordane	ND	1.8	0.37	ug/kg	
5103-74-2	gamma-Chlordane	ND	1.8	0.41	ug/kg	
60-57-1	Dieldrin	ND	1.8	0.41	ug/kg	
72-54-8	4,4'-DDD	ND	3.7	0.74	ug/kg	
72-55-9	4,4'-DDE	ND	3.7	0.74	ug/kg	
50-29-3	4,4'-DDT	ND	3.7	0.85	ug/kg	UJ
72-20-8	Endrin	ND	3.7	0.74	ug/kg	
1031-07-8	Endosulfan sulfate	ND	3.7	1.2	ug/kg	
7421-93-4	Endrin aldehyde	ND	3.7	1.1	ug/kg	UJ
53494-70-5	Endrin ketone	ND	3.7	0.74	ug/kg	
959-98-8	Endosulfan-I	ND	1.8	0.41	ug/kg	
33213-65-9	Endosulfan-II	ND	3.7	0.55	ug/kg	
76-44-8	Heptachlor	ND	1.8	0.52	ug/kg	UJ
1024-57-3	Heptachlor epoxide	ND	1.8	0.37	ug/kg	
72-43-5	Methoxychlor	ND	3.7	0.74	ug/kg	UJ
8001-35-2	Toxaphene	ND	92	46	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	82%		46-122%
2051-24-3	Decachlorobiphenyl	84%		50-133%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	43SB06C		
Lab Sample ID:	F51300-17	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8082 SW846 3550B	Percent Solids:	89.4
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	ST64790.D	1	08/13/07	JB	08/02/07	OP21715	GST1707
Run #2							

	Initial Weight	Final Volume
Run #1	30.3 g	10.0 ml
Run #2		

PCB List

CAS No.	Compound	Result	RL	MDL	Units	Q
12674-11-2	Aroclor 1016	ND	18	9.2	ug/kg	
11104-28-2	Aroclor 1221	ND	18	15	ug/kg	
11141-16-5	Aroclor 1232	ND	18	15	ug/kg	
53469-21-9	Aroclor 1242	ND	18	9.2	ug/kg	
12672-29-6	Aroclor 1248	ND	18	9.2	ug/kg	
11097-69-1	Aroclor 1254	ND	18	9.2	ug/kg	
11096-82-5	Aroclor 1260	ND	18	9.2	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	84%		44-126%
2051-24-3	Decachlorobiphenyl	79%		39-157%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: TT08261.D

Accutest LabLink@72038 11:39 19-Dec-2007

Report of Analysis

Client Sample ID:	43SB07A		
Lab Sample ID:	F51300-18	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8081A SW846 3550B	Percent Solids:	90.2
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	TT08261.D	1	08/09/07	FS	08/03/07	OP21730	GTT280
Run #2							

	Initial Weight	Final Volume
Run #1	30.0 g	10.0 ml
Run #2		

Pesticide TCL List

DATA VAL QUALIFIER

CAS No.	Compound	Result	RL	MDL	Units	Q
309-00-2	Aldrin	ND	1.8	0.44	ug/kg	
319-84-6	alpha-BHC	ND	1.8	0.52	ug/kg	
319-85-7	beta-BHC	ND	1.8	0.48	ug/kg	
319-86-8	delta-BHC	ND	1.8	0.81	ug/kg	
58-89-9	gamma-BHC (Lindane)	ND	1.8	0.63	ug/kg	
5103-71-9	alpha-Chlordane	ND	1.8	0.37	ug/kg	
5103-74-2	gamma-Chlordane	ND	1.8	0.41	ug/kg	
60-57-1	Dieldrin	ND	1.8	0.41	ug/kg	
72-54-8	4,4'-DDD	ND	3.7	0.74	ug/kg	
72-55-9	4,4'-DDE	ND	3.7	0.74	ug/kg	
50-29-3	4,4'-DDT	ND	3.7	3.7	ug/kg	UJ
72-20-8	Endrin	ND	3.7	0.74	ug/kg	
1031-07-8	Endosulfan sulfate	ND	3.7	1.2	ug/kg	
7421-93-4	Endrin aldehyde	ND	3.7	1.1	ug/kg	UL
53494-70-5	Endrin ketone	ND	3.7	0.74	ug/kg	
959-98-8	Endosulfan-I	ND	1.8	0.41	ug/kg	
33213-65-9	Endosulfan-II	ND	3.7	0.55	ug/kg	
76-44-8	Heptachlor	ND	1.8	0.52	ug/kg	
1024-57-3	Heptachlor epoxide	ND	1.8	0.37	ug/kg	
72-43-5	Methoxychlor	ND	3.7	0.74	ug/kg	UJ
8001-35-2	Toxaphene	ND	92	46	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	70%		46-122%
2051-24-3	Decachlorobiphenyl	76%		50-133%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	43SB07A		
Lab Sample ID:	F51300-18	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8082 SW846 3550B	Percent Solids:	90.2
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	ST64628.D	1	08/07/07	JB	08/03/07	OP21731	GST1702
Run #2							

	Initial Weight	Final Volume
Run #1	30.0 g	10.0 ml
Run #2		

PCB List

CAS No.	Compound	Result	RL	MDL	Units	Q
12674-11-2	Aroclor 1016	ND	18	9.2	ug/kg	
11104-28-2	Aroclor 1221	ND	18	15	ug/kg	
11141-16-5	Aroclor 1232	ND	18	15	ug/kg	
53469-21-9	Aroclor 1242	ND	18	9.2	ug/kg	
12672-29-6	Aroclor 1248	ND	18	9.2	ug/kg	
11097-69-1	Aroclor 1254	71.2	18	9.2	ug/kg	
11096-82-5	Aroclor 1260	ND	18	9.2	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	75%		44-126%
2051-24-3	Decachlorobiphenyl	73%		39-157%

(a) All hits confirmed by dual column analysis.

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: TT08262.D

Accutest Laboratories

Report of Analysis

Client Sample ID:	43SB07B		
Lab Sample ID:	F51300-19	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8081A SW846 3550B	Percent Solids:	86.2
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	TT08262.D	1	08/09/07	FS	08/03/07	OP21730	GTT280
Run #2							

	Initial Weight	Final Volume
Run #1	30.0 g	10.0 ml
Run #2		

Pesticide TCL List

DATA VAL QUALIFIER

CAS No.	Compound	Result	RL	MDL	Units	Q
309-00-2	Aldrin	ND	1.9	0.46	ug/kg	UJ
319-84-6	alpha-BHC	ND	1.9	0.54	ug/kg	
319-85-7	beta-BHC	ND	1.9	0.50	ug/kg	
319-86-8	delta-BHC	ND	1.9	0.85	ug/kg	
58-89-9	gamma-BHC (Lindane)	ND	1.9	0.66	ug/kg	
5103-71-9	alpha-Chlordane	ND	1.9	0.39	ug/kg	
5103-74-2	gamma-Chlordane	ND	1.9	0.43	ug/kg	
60-57-1	Dieldrin	ND	1.9	0.43	ug/kg	
72-54-8	4,4'-DDD	ND	3.9	0.77	ug/kg	
72-55-9	4,4'-DDE	ND	3.9	0.77	ug/kg	
50-29-3	4,4'-DDT	ND	3.9	0.89	ug/kg	
72-20-8	Endrin	ND	3.9	0.77	ug/kg	
1031-07-8	Endosulfan sulfate	ND	3.9	1.3	ug/kg	
7421-93-4	Endrin aldehyde	ND	3.9	1.2	ug/kg	
53494-70-5	Endrin ketone	ND	3.9	0.77	ug/kg	
959-98-8	Endosulfan-I	ND	1.9	0.43	ug/kg	
33213-65-9	Endosulfan-II	ND	3.9	0.58	ug/kg	
76-44-8	Heptachlor	ND	1.9	0.54	ug/kg	
1024-57-3	Heptachlor epoxide	ND	1.9	0.39	ug/kg	
72-43-5	Methoxychlor	ND	3.9	0.77	ug/kg	
8001-35-2	Toxaphene	ND	97	48	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	57%		46-122%
2051-24-3	Decachlorobiphenyl	72%		50-133%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: ST64629.D

Accutest Laboratories

Report of Analysis

Client Sample ID:	43SB07B		
Lab Sample ID:	F51300-19	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8082 SW846 3550B	Percent Solids:	86.2
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	ST64629.D	1	08/07/07	JB	08/03/07	OP21731	GST1702
Run #2							

	Initial Weight	Final Volume
Run #1	30.0 g	10.0 ml
Run #2		

PCB List

CAS No.	Compound	Result	RL	MDL	Units	Q
12674-11-2	Aroclor 1016	ND	19	9.7	ug/kg	
11104-28-2	Aroclor 1221	ND	19	15	ug/kg	
11141-16-5	Aroclor 1232	ND	19	15	ug/kg	
53469-21-9	Aroclor 1242	ND	19	9.7	ug/kg	
12672-29-6	Aroclor 1248	ND	19	9.7	ug/kg	
11097-69-1	Aroclor 1254 [b]	43.0	19	9.7	ug/kg	J
11096-82-5	Aroclor 1260 [b]	17.4	19	9.7	ug/kg	J

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	55%		44-126%
2051-24-3	Decachlorobiphenyl	63%		39-157%

(a) All hits confirmed by dual column analysis.
(b) Estimated value due to the presence of multiple overlapping Aroclor patterns.

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: TT08263.D

Accutest Laboratories

Report of Analysis

3320

Client Sample ID:	43SB07C		
Lab Sample ID:	F51300-20	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8081A SW846 3550B	Percent Solids:	84.3
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	TT08263.D	1	08/09/07	FS	08/03/07	OP21730	GTT280
Run #2							

	Initial Weight	Final Volume
Run #1	30.3 g	10.0 ml
Run #2		

Pesticide TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
309-00-2	Aldrin	ND	2.0	0.47	ug/kg	
319-84-6	alpha-BHC	ND	2.0	0.55	ug/kg	
319-85-7	beta-BHC	ND	2.0	0.51	ug/kg	
319-86-8	delta-BHC	ND	2.0	0.86	ug/kg	
58-89-9	gamma-BHC (Lindane)	ND	2.0	0.67	ug/kg	
5103-71-9	alpha-Chlordane	ND	2.0	0.39	ug/kg	
5103-74-2	gamma-Chlordane	ND	2.0	0.43	ug/kg	
60-57-1	Dieldrin	ND	2.0	0.43	ug/kg	
72-54-8	4,4'-DDD	ND	3.9	0.78	ug/kg	
72-55-9	4,4'-DDE	ND	3.9	0.78	ug/kg	
50-29-3	4,4'-DDT	ND	3.9	0.90	ug/kg	UJ
72-20-8	Endrin	ND	3.9	0.78	ug/kg	
1031-07-8	Endosulfan sulfate	ND	3.9	1.3	ug/kg	
7421-93-4	Endrin aldehyde	ND	3.9	1.2	ug/kg	UL
53494-70-5	Endrin ketone	ND	3.9	0.78	ug/kg	
959-98-8	Endosulfan-I	ND	2.0	0.43	ug/kg	
33213-65-9	Endosulfan-II	ND	3.9	0.59	ug/kg	
76-44-8	Heptachlor	ND	2.0	0.55	ug/kg	
1024-57-3	Heptachlor epoxide	ND	2.0	0.39	ug/kg	
72-43-5	Methoxychlor	ND	3.9	0.78	ug/kg	UJ
8001-35-2	Toxaphene	ND	98	49	ug/kg	

DATA VAL QUALIFIER

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	72%		46-122%
2051-24-3	Decachlorobiphenyl	80%		50-133%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: ST64630.D

Accutest Laboratories

Report of Analysis

Client Sample ID:	43SB07C		
Lab Sample ID:	F51300-20	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8082 SW846 3550B	Percent Solids:	84.3
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	ST64630.D	1	08/07/07	JB	08/03/07	OP21731	GST1702
Run #2							

	Initial Weight	Final Volume
Run #1	30.3 g	10.0 ml
Run #2		

PCB List

CAS No.	Compound	Result	RL	MDL	Units	Q
12674-11-2	Aroclor 1016	ND	20	9.8	ug/kg	
11104-28-2	Aroclor 1221	ND	20	16	ug/kg	
11141-16-5	Aroclor 1232	ND	20	16	ug/kg	
53469-21-9	Aroclor 1242	ND	20	9.8	ug/kg	
12672-29-6	Aroclor 1248	ND	20	9.8	ug/kg	
11097-69-1	Aroclor 1254	ND	20	9.8	ug/kg	
11096-82-5	Aroclor 1260	ND	20	9.8	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	79%		44-126%
2051-24-3	Decachlorobiphenyl	89%		39-157%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: TT08264.D

Accutest Laboratories

Report of Analysis

3.21
3

Client Sample ID:	43SB08A		
Lab Sample ID:	F51300-21	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8081A SW846 3550B	Percent Solids:	96.1
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	TT08264.D	1	08/09/07	FS	08/03/07	OP21730	GTT280
Run #2							

	Initial Weight	Final Volume
Run #1	30.3 g	10.0 ml
Run #2		

Pesticide TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q	DATA VAL QUALIFIER
309-00-2	Aldrin	ND	1.7	0.41	ug/kg		
319-84-6	alpha-BHC	ND	1.7	0.48	ug/kg		
319-85-7	beta-BHC	ND	1.7	0.45	ug/kg		
319-86-8	delta-BHC	ND	1.7	0.76	ug/kg		
58-89-9	gamma-BHC (Lindane)	ND	1.7	0.58	ug/kg		
5103-71-9	alpha-Chlordane	ND	1.7	0.34	ug/kg		
5103-74-2	gamma-Chlordane	ND	1.7	0.38	ug/kg		
60-57-1	Dieldrin	ND	1.7	0.38	ug/kg		
72-54-8	4,4'-DDD	ND	3.4	0.69	ug/kg		
72-55-9	4,4'-DDE	ND	3.4	0.69	ug/kg		
50-29-3	4,4'-DDT	ND	3.4	0.79	ug/kg		UJ
72-20-8	Endrin	ND	3.4	0.69	ug/kg		
1031-07-8	Endosulfan sulfate	ND	3.4	1.1	ug/kg		
7421-93-4	Endrin aldehyde	ND	3.4	1.0	ug/kg		UL
53494-70-5	Endrin ketone	ND	3.4	0.69	ug/kg		
959-98-8	Endosulfan-I	ND	1.7	0.38	ug/kg		
33213-65-9	Endosulfan-II	ND	3.4	0.52	ug/kg		
76-44-8	Heptachlor	ND	1.7	0.48	ug/kg		
1024-57-3	Heptachlor epoxide	ND	1.7	0.34	ug/kg		
72-43-5	Methoxychlor	ND	3.4	0.69	ug/kg		
8001-35-2	Toxaphene	ND	86	43	ug/kg		UJ

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	70%		46-122%
2051-24-3	Decachlorobiphenyl	75%		50-133%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: ST64631.D

Accutest Laboratories

Report of Analysis

Client Sample ID:	43SB08A		
Lab Sample ID:	F51300-21	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8082 SW846 3550B	Percent Solids:	96.1
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	ST64631.D	1	08/07/07	JB	08/03/07	OP21731	GST1702
Run #2							

	Initial Weight	Final Volume
Run #1	30.3 g	10.0 ml
Run #2		

PCB List

CAS No.	Compound	Result	RL	MDL	Units	Q
12674-11-2	Aroclor 1016	ND	17	8.6	ug/kg	
11104-28-2	Aroclor 1221	ND	17	14	ug/kg	
11141-16-5	Aroclor 1232	ND	17	14	ug/kg	
53469-21-9	Aroclor 1242	ND	17	8.6	ug/kg	
12672-29-6	Aroclor 1248	ND	17	8.6	ug/kg	
11097-69-1	Aroclor 1254	ND	17	8.6	ug/kg	
11096-82-5	Aroclor 1260	ND	17	8.6	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	73%		44-126%
2051-24-3	Decachlorobiphenyl	76%		39-157%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: TT08343.D

Accutest Laboratories

Report of Analysis

3-22
3

Client Sample ID:	43SB08B		
Lab Sample ID:	F51300-22	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8081A SW846 3550B	Percent Solids:	84.5
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	TT08343.D	1	08/11/07	FS	08/03/07	OP21730	GTT282
Run #2							

	Initial Weight	Final Volume
Run #1	30.2 g	10.0 ml
Run #2		

Pesticide TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q	DATA VAL QUALIFIER
309-00-2	Aldrin	ND	2.0	0.47	ug/kg		
319-84-6	alpha-BHC	ND	2.0	0.55	ug/kg		
319-85-7	beta-BHC	ND	2.0	0.51	ug/kg		
319-86-8	delta-BHC	ND	2.0	0.86	ug/kg		
58-89-9	gamma-BHC (Lindane)	ND	2.0	0.67	ug/kg		
5103-71-9	alpha-Chlordane	ND	2.0	0.39	ug/kg		
5103-74-2	gamma-Chlordane	ND	2.0	0.43	ug/kg		
60-57-1	Dieldrin	ND	2.0	0.43	ug/kg		
72-54-8	4,4'-DDD	ND	3.9	0.78	ug/kg		
72-55-9	4,4'-DDE	ND	3.9	0.78	ug/kg		
50-29-3	4,4'-DDT	ND	3.9	0.90	ug/kg		UJ
72-20-8	Endrin	ND	3.9	0.78	ug/kg		
1031-07-8	Endosulfan sulfate	ND	3.9	1.3	ug/kg		
7421-93-4	Endrin aldehyde	ND	3.9	1.2	ug/kg		UL
53494-70-5	Endrin ketone	ND	3.9	0.78	ug/kg		
959-98-8	Endosulfan-I	ND	2.0	0.43	ug/kg		
33213-65-9	Endosulfan-II	ND	3.9	0.59	ug/kg		
76-44-8	Heptachlor	ND	2.0	0.55	ug/kg		
1024-57-3	Heptachlor epoxide	ND	2.0	0.39	ug/kg		
72-43-5	Methoxychlor	ND	3.9	0.78	ug/kg		UJ
8001-35-2	Toxaphene	ND	98	49	ug/kg		

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	79%		46-122%
2051-24-3	Decachlorobiphenyl	81%		50-133%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	43SB08B		
Lab Sample ID:	F51300-22	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8082 SW846 3550B	Percent Solids:	84.5
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	ST64793.D	1	08/13/07	JB	08/03/07	OP21731	GST1707
Run #2							

	Initial Weight	Final Volume
Run #1	30.2 g	10.0 ml
Run #2		

PCB List

CAS No.	Compound	Result	RL	MDL	Units	Q
12674-11-2	Aroclor 1016 [b]	84.8	20	9.8	ug/kg	J
11104-28-2	Aroclor 1221	ND	20	16	ug/kg	
11141-16-5	Aroclor 1232	ND	20	16	ug/kg	
53469-21-9	Aroclor 1242	ND	20	9.8	ug/kg	
12672-29-6	Aroclor 1248	ND	20	9.8	ug/kg	
11097-69-1	Aroclor 1254 [b]	220	20	9.8	ug/kg	J
11096-82-5	Aroclor 1260	ND	20	9.8	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	79%		44-126%
2051-24-3	Decachlorobiphenyl	65%		39-157%

(a) All hits confirmed by dual column analysis.
(b) Estimated value due to the presence of multiple overlapping Aroclor patterns.

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: TT08266.D

Accutest Laboratories

Report of Analysis

Client Sample ID:	43SB08C		
Lab Sample ID:	F51300-23	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8081A SW846 3550B	Percent Solids:	87.5
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	TT08266.D	1	08/09/07	FS	08/03/07	OP21730	GTT280
Run #2							

	Initial Weight	Final Volume
Run #1	30.2 g	10.0 ml
Run #2		

Pesticide TCL List

DATA VAL QUALIFIER

CAS No.	Compound	Result	RL	MDL	Units	Q	
309-00-2	Aldrin	ND	1.9	0.45	ug/kg		
319-84-6	alpha-BHC	ND	1.9	0.53	ug/kg		
319-85-7	beta-BHC	ND	1.9	0.49	ug/kg		
319-86-8	delta-BHC	ND	1.9	0.83	ug/kg		
58-89-9	gamma-BHC (Lindane)	ND	1.9	0.64	ug/kg		
5103-71-9	alpha-Chlordane	ND	1.9	0.38	ug/kg		
5103-74-2	gamma-Chlordane	ND	1.9	0.42	ug/kg		
60-57-1	Dieldrin	ND	1.9	0.42	ug/kg		
72-54-8	4,4'-DDD	ND	3.8	0.76	ug/kg		
72-55-9	4,4'-DDE	ND	3.8	0.76	ug/kg		
50-29-3	4,4'-DDT	ND	3.8	0.87	ug/kg		UJ
72-20-8	Endrin	ND	3.8	0.76	ug/kg		
1031-07-8	Endosulfan sulfate	ND	3.8	1.2	ug/kg		
7421-93-4	Endrin aldehyde	ND	3.8	1.1	ug/kg		UL
53494-70-5	Endrin ketone	ND	3.8	0.76	ug/kg		
959-98-8	Endosulfan-I	ND	1.9	0.42	ug/kg		
33213-65-9	Endosulfan-II	ND	3.8	0.57	ug/kg		
76-44-8	Heptachlor	ND	1.9	0.53	ug/kg		
1024-57-3	Heptachlor epoxide	ND	1.9	0.38	ug/kg		
72-43-5	Methoxychlor	ND	3.8	0.76	ug/kg		UJ
8001-35-2	Toxaphene	ND	95	47	ug/kg		

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	72%		46-122%
2051-24-3	Decachlorobiphenyl	79%		50-133%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	43SB08C		
Lab Sample ID:	F51300-23	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8082 SW846 3550B	Percent Solids:	87.5
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	ST64633.D	1	08/07/07	JB	08/03/07	OP21731	GST1702
Run #2							

	Initial Weight	Final Volume
Run #1	30.2 g	10.0 ml
Run #2		

PCB List

CAS No.	Compound	Result	RL	MDL	Units	Q
12674-11-2	Aroclor 1016	ND	19	9.5	ug/kg	
11104-28-2	Aroclor 1221	ND	19	15	ug/kg	
11141-16-5	Aroclor 1232	ND	19	15	ug/kg	
53469-21-9	Aroclor 1242	ND	19	9.5	ug/kg	
12672-29-6	Aroclor 1248	ND	19	9.5	ug/kg	
11097-69-1	Aroclor 1254	ND	19	9.5	ug/kg	
11096-82-5	Aroclor 1260	ND	19	9.5	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	76%		44-126%
2051-24-3	Decachlorobiphenyl	81%		39-157%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: TT08267.D

Accutest Laboratories

Report of Analysis

3.2.4 3

Client Sample ID:	43SB09A		
Lab Sample ID:	F51300-24	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8081A SW846 3550B	Percent Solids:	90.3
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	TT08267.D	1	08/09/07	FS	08/03/07	OP21730	GTT280
Run #2							

	Initial Weight	Final Volume
Run #1	30.2 g	10.0 ml
Run #2		

Pesticide TCL List

DATA VAL QUALIFIER

CAS No.	Compound	Result	RL	MDL	Units	Q
309-00-2	Aldrin	ND	1.8	0.44	ug/kg	
319-84-6	alpha-BHC	ND	1.8	0.51	ug/kg	
319-85-7	beta-BHC	ND	1.8	0.48	ug/kg	
319-86-8	delta-BHC	ND	1.8	0.81	ug/kg	
58-89-9	gamma-BHC (Lindane)	ND	1.8	0.62	ug/kg	
5103-71-9	alpha-Chlordane	ND	1.8	0.37	ug/kg	
5103-74-2	gamma-Chlordane	ND	1.8	0.40	ug/kg	
60-57-1	Dieldrin	ND	1.8	0.40	ug/kg	
72-54-8	4,4'-DDD	ND	3.7	0.73	ug/kg	
72-55-9	4,4'-DDE	ND	3.7	0.73	ug/kg	
50-29-3	4,4'-DDT	ND	3.7	0.84	ug/kg	UJ
72-20-8	Endrin	ND	3.7	0.73	ug/kg	
1031-07-8	Endosulfan sulfate	ND	3.7	1.2	ug/kg	
7421-93-4	Endrin aldehyde	ND	3.7	1.1	ug/kg	UL
53494-70-5	Endrin ketone	ND	3.7	0.73	ug/kg	
959-98-8	Endosulfan-I	ND	1.8	0.40	ug/kg	
33213-65-9	Endosulfan-II	ND	3.7	0.55	ug/kg	
76-44-8	Heptachlor	ND	1.8	0.51	ug/kg	
1024-57-3	Heptachlor epoxide	ND	1.8	0.37	ug/kg	
72-43-5	Methoxychlor	ND	3.7	0.73	ug/kg	UJ
8001-35-2	Toxaphene	ND	92	46	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	71%		46-122%
2051-24-3	Decachlorobiphenyl	77%		50-133%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	43SB09A		
Lab Sample ID:	F51300-24	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8082 SW846 3550B	Percent Solids:	90.3
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	ST64634.D	1	08/07/07	JB	08/03/07	OP21731	GST1702
Run #2							

	Initial Weight	Final Volume
Run #1	30.2 g	10.0 ml
Run #2		

PCB List

CAS No.	Compound	Result	RL	MDL	Units	Q
12674-11-2	Aroclor 1016	ND	18	9.2	ug/kg	
11104-28-2	Aroclor 1221	ND	18	15	ug/kg	
11141-16-5	Aroclor 1232	ND	18	15	ug/kg	
53469-21-9	Aroclor 1242	ND	18	9.2	ug/kg	
12672-29-6	Aroclor 1248	ND	18	9.2	ug/kg	
11097-69-1	Aroclor 1254	ND	18	9.2	ug/kg	
11096-82-5	Aroclor 1260	ND	18	9.2	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	74%		44-126%
2051-24-3	Decachlorobiphenyl	61%		39-157%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: TT08268.D

Accutest Laboratories

Report of Analysis

3.2.5 3

Client Sample ID:	43SB09B		
Lab Sample ID:	F51300-25	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8081A SW846 3550B	Percent Solids:	86.9
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	TT08268.D	1	08/09/07	FS	08/03/07	OP21730	GTT280
Run #2							

	Initial Weight	Final Volume
Run #1	30.7 g	10.0 ml
Run #2		

Pesticide TCL List

DATA VAL QUALIFIER

CAS No.	Compound	Result	RL	MDL	Units	Q
309-00-2	Aldrin	ND	1.9	0.45	ug/kg	UJ
319-84-6	alpha-BHC	ND	1.9	0.52	ug/kg	
319-85-7	beta-BHC	ND	1.9	0.49	ug/kg	
319-86-8	delta-BHC	ND	1.9	0.82	ug/kg	
58-89-9	gamma-BHC (Lindane)	ND	1.9	0.64	ug/kg	
5103-71-9	alpha-Chlordane	ND	1.9	0.37	ug/kg	
5103-74-2	gamma-Chlordane	ND	1.9	0.41	ug/kg	
60-57-1	Dieldrin	ND	1.9	1.9	ug/kg	
72-54-8	4,4'-DDD [b]	ND	7.4	7.4	ug/kg	
72-55-9	4,4'-DDE	ND	3.7	0.75	ug/kg	
50-29-3	4,4'-DDT	ND	3.7	0.86	ug/kg	
72-20-8	Endrin	ND	3.7	0.75	ug/kg	
1031-07-8	Endosulfan sulfate	ND	3.7	1.2	ug/kg	
7421-93-4	Endrin aldehyde	ND	3.7	1.1	ug/kg	
53494-70-5	Endrin ketone	ND	3.7	0.75	ug/kg	
959-98-8	Endosulfan-I	ND	1.9	0.41	ug/kg	
33213-65-9	Endosulfan-II	ND	3.7	0.56	ug/kg	
76-44-8	Heptachlor	ND	1.9	0.52	ug/kg	
1024-57-3	Heptachlor epoxide	ND	1.9	0.37	ug/kg	
72-43-5	Methoxychlor	ND	3.7	0.75	ug/kg	
8001-35-2	Toxaphene	ND	94	47	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	54%		46-122%
2051-24-3	Decachlorobiphenyl	66%		50-133%

(a) All hits confirmed by dual column analysis.
(b) Elevated reporting limits due to matrix interference.

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	43SB09B		
Lab Sample ID:	F51300-25	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8082 SW846 3550B	Percent Solids:	86.9
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	ST64635.D	1	08/07/07	JB	08/03/07	OP21731	GST1702
Run #2							

	Initial Weight	Final Volume
Run #1	30.7 g	10.0 ml
Run #2		

PCB List

CAS No.	Compound	Result	RL	MDL	Units	Q
12674-11-2	Aroclor 1016 [b]	49.3	19	9.4	ug/kg	J
11104-28-2	Aroclor 1221	ND	19	15	ug/kg	
11141-16-5	Aroclor 1232	ND	19	15	ug/kg	
53469-21-9	Aroclor 1242	ND	19	9.4	ug/kg	
12672-29-6	Aroclor 1248	ND	19	9.4	ug/kg	
11097-69-1	Aroclor 1254 [b]	112	19	9.4	ug/kg	J
11096-82-5	Aroclor 1260	ND	19	9.4	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	49%		44-126%
2051-24-3	Decachlorobiphenyl	48%		39-157%

(a) All hits confirmed by dual column analysis.
(b) Estimated value due to the presence of multiple overlapping Aroclor patterns.

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: TT08271.D

Accutest Laboratories

Report of Analysis

Client Sample ID:	43SB09C		
Lab Sample ID:	F51300-26	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8081A SW846 3550B	Percent Solids:	87.1
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	TT08271.D	1	08/09/07	FS	08/03/07	OP21730	GTT280
Run #2							

	Initial Weight	Final Volume
Run #1	30.1 g	10.0 ml
Run #2		

Pesticide TCL List

DATA VAL QUALIFIER

UJ

CAS No.	Compound	Result	RL	MDL	Units	Q
309-00-2	Aldrin	ND	1.9	0.46	ug/kg	
319-84-6	alpha-BHC	ND	1.9	0.53	ug/kg	
319-85-7	beta-BHC	ND	1.9	0.50	ug/kg	
319-86-8	delta-BHC	ND	1.9	0.84	ug/kg	
58-89-9	gamma-BHC (Lindane)	ND	1.9	0.65	ug/kg	
5103-71-9	alpha-Chlordane	ND	1.9	0.38	ug/kg	
5103-74-2	gamma-Chlordane	ND	1.9	0.42	ug/kg	
60-57-1	Dieldrin	ND	1.9	0.42	ug/kg	
72-54-8	4,4'-DDD	ND	3.8	0.76	ug/kg	
72-55-9	4,4'-DDE	ND	3.8	0.76	ug/kg	
50-29-3	4,4'-DDT	ND	3.8	0.88	ug/kg	
72-20-8	Endrin	ND	3.8	0.76	ug/kg	
1031-07-8	Endosulfan sulfate	ND	3.8	1.3	ug/kg	
7421-93-4	Endrin aldehyde	ND	3.8	1.1	ug/kg	
53494-70-5	Endrin ketone	ND	3.8	0.76	ug/kg	
959-98-8	Endosulfan-I	ND	1.9	0.42	ug/kg	
33213-65-9	Endosulfan-II	ND	3.8	0.57	ug/kg	
76-44-8	Heptachlor	ND	1.9	0.53	ug/kg	
1024-57-3	Heptachlor epoxide	ND	1.9	0.38	ug/kg	
72-43-5	Methoxychlor	ND	3.8	0.76	ug/kg	
8001-35-2	Toxaphene	ND	95	48	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	70%		46-122%
2051-24-3	Decachlorobiphenyl	75%		50-133%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: ST64638.D

Accutest Laboratories

Report of Analysis

Client Sample ID:	43SB09C		
Lab Sample ID:	F51300-26	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8082 SW846 3550B	Percent Solids:	87.1
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	ST64638.D	1	08/07/07	JB	08/03/07	OP21731	GST1702
Run #2							

	Initial Weight	Final Volume
Run #1	30.1 g	10.0 ml
Run #2		

PCB List

CAS No.	Compound	Result	RL	MDL	Units	Q
12674-11-2	Aroclor 1016	ND	19	9.5	ug/kg	
11104-28-2	Aroclor 1221	ND	19	15	ug/kg	
11141-16-5	Aroclor 1232	ND	19	15	ug/kg	
53469-21-9	Aroclor 1242	ND	19	9.5	ug/kg	
12672-29-6	Aroclor 1248	ND	19	9.5	ug/kg	
11097-69-1	Aroclor 1254	ND	19	9.5	ug/kg	
11096-82-5	Aroclor 1260	ND	19	9.5	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	73%		44-126%
2051-24-3	Decachlorobiphenyl	80%		39-157%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: TT08272.D

Accutest Laboratories

Report of Analysis

3.27
3

Client Sample ID:	43SB10A		
Lab Sample ID:	F51300-27	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8081A SW846 3550B	Percent Solids:	87.1
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	TT08272.D	1	08/09/07	FS	08/03/07	OP21730	GTT280
Run #2							

	Initial Weight	Final Volume
Run #1	30.8 g	10.0 ml
Run #2		

Pesticide TCL List

DATA VAL QUALIFIER

UJ

CAS No.	Compound	Result	RL	MDL	Units	Q
309-00-2	Aldrin	ND	1.9	0.45	ug/kg	
319-84-6	alpha-BHC	ND	1.9	0.52	ug/kg	
319-85-7	beta-BHC	ND	1.9	0.48	ug/kg	
319-86-8	delta-BHC	ND	1.9	0.82	ug/kg	
58-89-9	gamma-BHC (Lindane)	ND	1.9	0.63	ug/kg	
5103-71-9	alpha-Chlordane	ND	1.9	0.37	ug/kg	
5103-74-2	gamma-Chlordane	ND	1.9	0.41	ug/kg	
60-57-1	Dieldrin	ND	1.9	0.41	ug/kg	
72-54-8	4,4'-DDD	ND	3.7	0.75	ug/kg	
72-55-9	4,4'-DDE	ND	3.7	0.75	ug/kg	
50-29-3	4,4'-DDT	ND	3.7	0.86	ug/kg	
72-20-8	Endrin	ND	3.7	0.75	ug/kg	
1031-07-8	Endosulfan sulfate	ND	3.7	1.2	ug/kg	
7421-93-4	Endrin aldehyde	ND	3.7	1.1	ug/kg	
53494-70-5	Endrin ketone	ND	3.7	0.75	ug/kg	
959-98-8	Endosulfan-I	ND	1.9	0.41	ug/kg	
33213-65-9	Endosulfan-II	ND	3.7	0.56	ug/kg	
76-44-8	Heptachlor	ND	1.9	0.52	ug/kg	
1024-57-3	Heptachlor epoxide	ND	1.9	0.37	ug/kg	
72-43-5	Methoxychlor	ND	3.7	0.75	ug/kg	
8001-35-2	Toxaphene	ND	93	47	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	68%		46-122%
2051-24-3	Decachlorobiphenyl	71%		50-133%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: ST64639.D

Accutest Laboratories

Report of Analysis

Client Sample ID:	43SB10A		
Lab Sample ID:	F51300-27	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8082 SW846 3550B	Percent Solids:	87.1
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	ST64639.D	1	08/07/07	JB	08/03/07	OP21731	GST1702
Run #2							

	Initial Weight	Final Volume
Run #1	30.8 g	10.0 ml
Run #2		

PCB List

CAS No.	Compound	Result	RL	MDL	Units	Q
12674-11-2	Aroclor 1016	ND	19	9.3	ug/kg	
11104-28-2	Aroclor 1221	ND	19	15	ug/kg	
11141-16-5	Aroclor 1232	ND	19	15	ug/kg	
53469-21-9	Aroclor 1242	ND	19	9.3	ug/kg	
12672-29-6	Aroclor 1248	ND	19	9.3	ug/kg	
11097-69-1	Aroclor 1254	ND	19	9.3	ug/kg	
11096-82-5	Aroclor 1260	ND	19	9.3	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	71%		44-126%
2051-24-3	Decachlorobiphenyl	80%		39-157%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: TT08273.D

Accutest Laboratories

Report of Analysis

3.2.8

Client Sample ID:	43SB10B		
Lab Sample ID:	F51300-28	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8081A SW846 3550B	Percent Solids:	86.6
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	TT08273.D	1	08/09/07	FS	08/03/07	OP21730	GTT280
Run #2							

	Initial Weight	Final Volume
Run #1	30.6 g	10.0 ml
Run #2		

Pesticide TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q	DATA VAL QUALIFIER
309-00-2	Aldrin	ND	1.9	0.45	ug/kg		UJ
319-84-6	alpha-BHC	ND	1.9	0.53	ug/kg		
319-85-7	beta-BHC	ND	1.9	0.49	ug/kg		
319-86-8	delta-BHC	ND	1.9	0.83	ug/kg		
58-89-9	gamma-BHC (Lindane)	ND	1.9	0.64	ug/kg		
5103-71-9	alpha-Chlordane	ND	1.9	0.38	ug/kg		
5103-74-2	gamma-Chlordane	ND	1.9	0.42	ug/kg		
60-57-1	Dieldrin	ND	1.9	0.42	ug/kg		
72-54-8	4,4'-DDD	ND	3.8	0.75	ug/kg		
72-55-9	4,4'-DDE	ND	3.8	0.75	ug/kg		
50-29-3	4,4'-DDT	ND	3.8	0.87	ug/kg		
72-20-8	Endrin	ND	3.8	0.75	ug/kg		
1031-07-8	Endosulfan sulfate	ND	3.8	1.2	ug/kg		
7421-93-4	Endrin aldehyde	ND	3.8	1.1	ug/kg		
53494-70-5	Endrin ketone	ND	3.8	0.75	ug/kg		
959-98-8	Endosulfan-I	ND	1.9	0.42	ug/kg		
33213-65-9	Endosulfan-II	ND	3.8	0.57	ug/kg		
76-44-8	Heptachlor	ND	1.9	0.53	ug/kg		
1024-57-3	Heptachlor epoxide	ND	1.9	0.38	ug/kg		
72-43-5	Methoxychlor	ND	3.8	0.75	ug/kg		
8001-35-2	Toxaphene	ND	94	47	ug/kg		

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	68%		46-122%
2051-24-3	Decachlorobiphenyl	78%		50-133%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	43SB10B		
Lab Sample ID:	F51300-28	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8082 SW846 3550B	Percent Solids:	86.6
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	ST64640.D	1	08/07/07	JB	08/03/07	OP21731	GST1702
Run #2							

	Initial Weight	Final Volume
Run #1	30.6 g	10.0 ml
Run #2		

PCB List

CAS No.	Compound	Result	RL	MDL	Units	Q
12674-11-2	Aroclor 1016	ND	19	9.4	ug/kg	
11104-28-2	Aroclor 1221	ND	19	15	ug/kg	
11141-16-5	Aroclor 1232	ND	19	15	ug/kg	
53469-21-9	Aroclor 1242	ND	19	9.4	ug/kg	
12672-29-6	Aroclor 1248	ND	19	9.4	ug/kg	
11097-69-1	Aroclor 1254	ND	19	9.4	ug/kg	
11096-82-5	Aroclor 1260	ND	19	9.4	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	69%		44-126%
2051-24-3	Decachlorobiphenyl	87%		39-157%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	43SB10C		
Lab Sample ID:	F51300-29	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8081A SW846 3550B	Percent Solids:	83.8
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	TT08274.D	1	08/09/07	FS	08/03/07	OP21730	GTT280
Run #2							

	Initial Weight	Final Volume
Run #1	30.2 g	10.0 ml
Run #2		

Pesticide TCL List

DATA VAL QUALIFIER

CAS No.	Compound	Result	RL	MDL	Units	Q
309-00-2	Aldrin	ND	2.0	0.47	ug/kg	
319-84-6	alpha-BHC	ND	2.0	0.55	ug/kg	
319-85-7	beta-BHC	ND	2.0	0.51	ug/kg	
319-86-8	delta-BHC	ND	2.0	0.87	ug/kg	
58-89-9	gamma-BHC (Lindane)	ND	2.0	0.67	ug/kg	
5103-71-9	alpha-Chlordane	ND	2.0	0.40	ug/kg	
5103-74-2	gamma-Chlordane	ND	2.0	0.43	ug/kg	
60-57-1	Dieldrin	ND	2.0	0.43	ug/kg	
72-54-8	4,4'-DDD	ND	4.0	0.79	ug/kg	
72-55-9	4,4'-DDE	ND	4.0	0.79	ug/kg	
50-29-3	4,4'-DDT	ND	4.0	0.91	ug/kg	UJ
72-20-8	Endrin	ND	4.0	0.79	ug/kg	
1031-07-8	Endosulfan sulfate	ND	4.0	1.3	ug/kg	
7421-93-4	Endrin aldehyde	ND	4.0	1.2	ug/kg	UL
53494-70-5	Endrin ketone	ND	4.0	0.79	ug/kg	
959-98-8	Endosulfan-I	ND	2.0	0.43	ug/kg	
33213-65-9	Endosulfan-II	ND	4.0	0.59	ug/kg	
76-44-8	Heptachlor	ND	2.0	0.55	ug/kg	
1024-57-3	Heptachlor epoxide	ND	2.0	0.40	ug/kg	
72-43-5	Methoxychlor	ND	4.0	0.79	ug/kg	UJ
8001-35-2	Toxaphene	ND	99	49	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	71%		46-122%
2051-24-3	Decachlorobiphenyl	74%		50-133%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	43SB10C		
Lab Sample ID:	F51300-29	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8082 SW846 3550B	Percent Solids:	83.8
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	ST64641.D	1	08/07/07	JB	08/03/07	OP21731	GST1702
Run #2							

	Initial Weight	Final Volume
Run #1	30.2 g	10.0 ml
Run #2		

PCB List

CAS No.	Compound	Result	RL	MDL	Units	Q
12674-11-2	Aroclor 1016	ND	20	9.9	ug/kg	
11104-28-2	Aroclor 1221	ND	20	16	ug/kg	
11141-16-5	Aroclor 1232	ND	20	16	ug/kg	
53469-21-9	Aroclor 1242	ND	20	9.9	ug/kg	
12672-29-6	Aroclor 1248	ND	20	9.9	ug/kg	
11097-69-1	Aroclor 1254	ND	20	9.9	ug/kg	
11096-82-5	Aroclor 1260	ND	20	9.9	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	75%		44-126%
2051-24-3	Decachlorobiphenyl	84%		39-157%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: TT08277.D

Accutest Laboratories

Report of Analysis

Client Sample ID:	TMSB10B		
Lab Sample ID:	F51300-30	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8081A SW846 3550B	Percent Solids:	85.9
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	TT08277.D	1	08/09/07	FS	08/03/07	OP21730	GTT280
Run #2							

	Initial Weight	Final Volume
Run #1	30.2 g	10.0 ml
Run #2		

Pesticide TCL List

DATA VAL QUALIFIER

CAS No.	Compound	Result	RL	MDL	Units	Q
309-00-2	Aldrin	ND	1.9	0.46	ug/kg	UJ
319-84-6	alpha-BHC	ND	1.9	0.54	ug/kg	
319-85-7	beta-BHC	ND	1.9	0.50	ug/kg	
319-86-8	delta-BHC	ND	1.9	0.85	ug/kg	
58-89-9	gamma-BHC (Lindane)	ND	1.9	0.66	ug/kg	
5103-71-9	alpha-Chlordane	ND	1.9	0.39	ug/kg	
5103-74-2	gamma-Chlordane	ND	1.9	0.42	ug/kg	
60-57-1	Dieldrin	ND	1.9	0.42	ug/kg	
72-54-8	4,4'-DDD	ND	3.9	0.77	ug/kg	
72-55-9	4,4'-DDE	ND	3.9	0.77	ug/kg	
50-29-3	4,4'-DDT	ND	3.9	0.89	ug/kg	
72-20-8	Endrin	ND	3.9	0.77	ug/kg	
1031-07-8	Endosulfan sulfate	ND	3.9	1.3	ug/kg	
7421-93-4	Endrin aldehyde	ND	3.9	1.2	ug/kg	
53494-70-5	Endrin ketone	ND	3.9	0.77	ug/kg	
959-98-8	Endosulfan-I	ND	1.9	0.42	ug/kg	
33213-65-9	Endosulfan-II	ND	3.9	0.58	ug/kg	
76-44-8	Heptachlor	ND	1.9	0.54	ug/kg	
1024-57-3	Heptachlor epoxide	ND	1.9	0.39	ug/kg	
72-43-5	Methoxychlor	ND	3.9	0.77	ug/kg	
8001-35-2	Toxaphene	ND	96	48	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	68%		46-122%
2051-24-3	Decachlorobiphenyl	74%		50-133%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	TMSB10B		
Lab Sample ID:	F51300-30	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8082 SW846 3550B	Percent Solids:	85.9
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	ST64644.D	1	08/08/07	JB	08/03/07	OP21731	GST1702
Run #2							

	Initial Weight	Final Volume
Run #1	30.2 g	10.0 ml
Run #2		

PCB List

CAS No.	Compound	Result	RL	MDL	Units	Q
12674-11-2	Aroclor 1016	ND	19	9.6	ug/kg	
11104-28-2	Aroclor 1221	ND	19	15	ug/kg	
11141-16-5	Aroclor 1232	ND	19	15	ug/kg	
53469-21-9	Aroclor 1242	ND	19	9.6	ug/kg	
12672-29-6	Aroclor 1248	ND	19	9.6	ug/kg	
11097-69-1	Aroclor 1254	ND	19	9.6	ug/kg	
11096-82-5	Aroclor 1260	ND	19	9.6	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	76%		44-126%
2051-24-3	Decachlorobiphenyl	82%		39-157%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: TT08308.D

Accutest Laboratories

Report of Analysis

Client Sample ID:	072507R		
Lab Sample ID:	F51300-31	Date Sampled:	07/25/07
Matrix:	AQ - Equipment Blank	Date Received:	07/26/07
Method:	SW846 8081A SW846 3510C	Percent Solids:	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	TT08308.D	1	08/10/07	FS	07/30/07	OP21657	GTT281
Run #2							

	Initial Volume	Final Volume
Run #1	1000 ml	10.0 ml
Run #2		

Pesticide TCL List

DATA VAL QUALIFIER

CAS No.	Compound	Result	RL	MDL	Units	Q
309-00-2	Aldrin	ND	0.050	0.010	ug/l	
319-84-6	alpha-BHC	ND	0.050	0.010	ug/l	
319-85-7	beta-BHC	ND	0.050	0.011	ug/l	
319-86-8	delta-BHC	ND	0.050	0.010	ug/l	
58-89-9	gamma-BHC (Lindane)	ND	0.050	0.010	ug/l	
5103-71-9	alpha-Chlordane	ND	0.050	0.010	ug/l	
5103-74-2	gamma-Chlordane	ND	0.050	0.010	ug/l	
60-57-1	Dieldrin	ND	0.050	0.010	ug/l	
72-54-8	4,4'-DDD	ND	0.10	0.020	ug/l	
72-55-9	4,4'-DDE	ND	0.10	0.020	ug/l	
50-29-3	4,4'-DDT	ND	0.10	0.020	ug/l	
72-20-8	Endrin	ND	0.10	0.020	ug/l	
1031-07-8	Endosulfan sulfate	ND	0.10	0.020	ug/l	
7421-93-4	Endrin aldehyde	ND	0.10	0.030	ug/l	UL
53494-70-5	Endrin ketone	ND	0.10	0.020	ug/l	
959-98-8	Endosulfan-I	ND	0.050	0.010	ug/l	
33213-65-9	Endosulfan-II	ND	0.10	0.010	ug/l	
76-44-8	Heptachlor	ND	0.050	0.010	ug/l	
1024-57-3	Heptachlor epoxide	ND	0.050	0.010	ug/l	
72-43-5	Methoxychlor	ND	0.10	0.020	ug/l	
8001-35-2	Toxaphene	ND	2.5	1.3	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	81%		42-127%
2051-24-3	Decachlorobiphenyl	79%		27-127%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: ST64321.D

Accutest Laboratories

Report of Analysis

Client Sample ID:	072507R		
Lab Sample ID:	F51300-31	Date Sampled:	07/25/07
Matrix:	AQ - Equipment Blank	Date Received:	07/26/07
Method:	SW846 8082 SW846 3510C	Percent Solids:	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	ST64321.D	1	08/01/07	JB	07/30/07	OP21658	GST1698
Run #2							

	Initial Volume	Final Volume
Run #1	1000 ml	10.0 ml
Run #2		

PCB List

CAS No.	Compound	Result	RL	MDL	Units	Q
12674-11-2	Aroclor 1016	ND	0.50	0.25	ug/l	
11104-28-2	Aroclor 1221	ND	0.50	0.40	ug/l	
11141-16-5	Aroclor 1232	ND	0.50	0.40	ug/l	
53469-21-9	Aroclor 1242	ND	0.50	0.25	ug/l	
12672-29-6	Aroclor 1248	ND	0.50	0.25	ug/l	
11097-69-1	Aroclor 1254	ND	0.50	0.25	ug/l	
11096-82-5	Aroclor 1260	ND	0.50	0.25	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	81%		38-127%
2051-24-3	Decachlorobiphenyl	84%		25-137%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Monroeville, PA
412-858-3335
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Shaw® Shaw Environmental, Inc.

MEMORANDUM

TO: Jeff Parks, Shaw E&I Radford Army Ammunition Plant (RFAAP) Project Manager

FROM: Richard McCracken, Shaw E&I Project Chemist

SUBJECT: RFAAP Data Validation – Semi-Volatiles & Polynuclear Aromatic Hydrocarbons Accutest Laboratories, Inc., SDG F51300

DATE: December 20, 2007

The purpose of this memorandum is to present the data validation report for the samples collected at RFAAP on July 25, 2007. Samples were analyzed for semivolatile organic compounds (SVOCs) using USEPA SW846 Methods 3550B/8270C (solids) and 3510C/8270C (aqueous). The polynuclear aromatic hydrocarbons (PAHs) were analyzed using selective ion monitoring (SIM) techniques. A total of 1 aqueous and 30 soil samples were validated. The sample IDs are:

Field Sample ID	Lab Sample ID	Field Sample ID	Lab Sample ID
59SB06A	F51300-1	43SB06C	F51300-17
59SB06B	F51300-2	43SB07A	F51300-18
59SB06C	F51300-3	43SB07B	F51300-19
59SB05A	F51300-4	43SB07C	F51300-20
59SB05B	F51300-5	43SB08A	F51300-21
59SB05C	F51300-6	43SB08B	F51300-22
59SB04A	F51300-7	43SB08C	F51300-23
59SB04B	F51300-8	43SB09A	F51300-24
59SB04C	F51300-9	43SB09B	F51300-25
TMSB04C	F51300-10	43SB09C	F51300-26
59SB02A	F51300-11	43SB10A	F51300-27
59SB02B	F51300-12	43SB10B	F51300-28
TMSB02B	F51300-13	43SB10C	F51300-29
59SB02C	F51300-14	TMSB10B	F51300-30
43SB06A	F51300-15	072507R	F51300-31
43SB06B	F51300-16		

Data were reviewed by Richard McCracken and validated using a combination of project QAPP, *Quality Systems Manual for Environmental Laboratories, Final Version 3, January, 2006* (DoD, 2006) (DoD QSM), method-specific criteria, and laboratory SOP criteria. The data qualifier scheme was consistent with the *Region III Modifications to the National Functional Guidelines for Organic Data Review* (September 1994). Parameters evaluated are presented in **Table 1**. Data associated with parameters in compliance with quality control specifications have not been qualified. Data associated with parameters that did not comply with quality control specifications and directly impacted project data have been qualified in accordance with USEPA Region III specifications.

Table 1 Laboratory Performance Criteria

Qualified		Parameter
Yes	No	
	X	Holding Times and Preservation
	X	Instrument Performance Check
	X	Initial Calibration
	X	Continuing Calibration
	X	Blank Analysis
	X	Surrogate Spikes
	X	Internal Standards
	X	Laboratory Control Sample
X		Matrix Spike/Spike Duplicate
	X	Field Duplicate
X		Quantitation Verification

The quality of data collected in support of this sampling activity is considered acceptable with noted qualifications.

Richard M. McCracken

Richard McCracken, Chemist

10/20/07

Date

RFAAP VALIDATION REPORT
SEMIVOLATILES AND PAH REVIEW
SDG F51300

I-Holding Times and Preservation

The objective is to ascertain the validity of results based on the holding time of the sample from time of collection to time of sample extraction and analysis. Holding time criteria: Solid samples must be stored @4°C ± 2°C with a maximum holding time of 14 days from sample collection to preparative extraction and 40 days from preparative extraction to determinative analysis. Aqueous samples must be cooled @4°C ± 2°C with a maximum holding time of 7 days from sample collection to preparative extraction and 40 days from preparative extraction to determinative analysis.

- Temperature Review: A temperature blank was sent with each cooler and recorded by the laboratory upon receipt. The samples collected on 7/25/07 were sent in five coolers, and were received by the laboratory on 7/26/07 at temperatures ranging from 2.6 °C to 4.0 °C. No qualifiers were applied.

- Holding Time Review: The samples were collected on 7/25/07. The aqueous sample was extracted for SVOCs on 7/31/07, extracted for PAHs by SIM on 7/31/07, analyzed for SVOCs on 8/2/07, and analyzed for PAHs by SIM on 8/2/07. The solid matrix samples were extracted for SVOCs on 8/2/07 & 8/3/07; extracted for PAHs by SIM on 8/2/07 & 8/3/07; analyzed for SVOCs on 8/3/07, 8/6/07, & 8/7/07; and analyzed for PAHs by SIM on 8/7/07 & 8/8/07. All criteria were met. No qualifiers were applied.

II-Instrument Performance Check

GC/MS instrument performance checks are performed to ensure mass resolution, identification and, to some degree, sensitivity. The analysis of the instrument performance check solution must be performed at the beginning of each 12-hour period during which samples are analyzed.

- The instrument performance check, decafluorotriphenylphosphine (DFTPP), met the ion abundance criteria. No qualification was applied.

III-Initial Calibration

Compliance requirements for satisfactory instrument calibration are established to ensure that the instrument used is capable of producing acceptable qualitative and quantitative data for compounds on the semivolatile target compound list (TCL). Initial calibration demonstrates that the instrument is capable of acceptable performance in the beginning of the analytical run and of producing a linear calibration curve. For compounds analyzed using linear regression or second order, correlation coefficients must be >0.995 and coefficients of determination >0.99. The minimum relative response factor (RRF) criteria must be ≥0.05. The DoD QSM specifies that the initial calibration percent relative standard deviation (%RSD) must be ≤15% on the average for all compounds (<30% for CCCs). All detects are qualified as estimated "J" for where there were exceeding %RSDs, and all non-detects are qualified as estimated "UJ" for where there were grossly exceeding recoveries, unless determined to be unusable "R". Grossly exceeding is defined as twice the established criteria limits. For where there were low RRFs, all detects are qualified as estimated "J" and non-detects are rejected "R".

- Initial calibration for the SVOCs was performed on 7/5/07 using instrument MSBNA02 (GCMSL). Target compounds 2,4-dinitrophenol (19.68%) and 4,6-dinitro-2-methylphenol (25.87%) had %RSDs outside criteria. All other target compounds were within criteria (%RSD≤15% or ≤30%; RRF≥0.05). The compounds with high %RSD were quantified using linear or second order regression, and had correlation coefficients ≥0.995; therefore no qualifiers were applied. Sample F51300-31 were analyzed in conjunction with this initial calibration.

- Initial calibration for the PAHs-SIM was performed on 7/18/07 using instrument MSBNA3 (GCMSR). All target compounds were within criteria (%RSD≤15% or ≤30%; RRF≥0.05); no qualifiers were applied. All samples were analyzed in conjunction with this initial calibration.

- Initial calibration for the SVOCs was performed on 7/13/07 using instrument MSBNA04 (GCMSU). Target compounds 2,4-dinitrophenol (42.04%) and 4,6-dinitro-2-methylphenol (24.04%) had %RSDs outside criteria. All other target compounds were within criteria (%RSD≤15% or ≤30%; RRF≥0.05). The compounds with high %RSD were quantified using linear or second order regression, and had correlation coefficients ≥0.995; therefore no qualifiers were applied. All solid matrix samples (F51300-1 thru -30) were analyzed in conjunction with this initial calibration.

IV-Continuing Calibration

Compliance requirements for satisfactory instrument calibration are established to ensure that the instrument used was capable of producing acceptable qualitative and quantitative data for semivolatile target compounds. Continuing calibration standards containing both target and surrogates compounds are analyzed at the beginning of each 12-hour analysis period following the analysis of the instrument performance check and prior to the analysis of blanks and samples. The minimum relative response factors (RRF) for semivolatile target compounds and surrogates must be ≥0.05. The DoD QSM specifies that the percent difference (%D) between the initial calibration RRF and the continuing calibration RRF must be within ±20% for all target compounds. Grossly exceeding is defined where %D>40%. All detects are qualified as estimated "J" for where there were exceeding %Ds, and all non-detects are qualified as estimated "UJ" for where there were grossly exceeding recoveries, unless determined to be unusable "R". Grossly exceeding is defined as twice the established criteria limits. For where there were low RRFs, all detects are qualified as estimated "J" and non-detects are rejected "R".

- During the SVOC initial calibration verification performed on 7/5/07 @1527 using instrument MSBNA02 (GCMSL), 3-nitroaniline (26.0%) had %D outside criteria. All other target compounds met criteria. No samples were analyzed following this initial calibration verification, no qualifiers were applied.

- During the SVOC initial calibration verification performed on 7/5/07 @1555 using instrument MSBNA02 (GCMSL), all target compounds met criteria. No samples were analyzed following this initial calibration verification, no qualifiers were applied.

- During the SVOC continuing calibration performed on 8/1/07 @1616 using instrument MSBNA02 (GCMSL), 2,4-dinitrophenol (33.0%) and 4,6-dinitro-2-methylphenol (22.1%) had %D outside criteria. All other target compounds met criteria. The MS and MSD were the only samples analyzed following this continuing calibration. Therefore, no qualifiers were applied.

- During the SVOC continuing calibration performed on 8/2/07 @1324 using instrument MSBNA02 (GCMSL), all target compounds met criteria. No qualifiers were applied. Sample F51300-31 was analyzed following this continuing calibration.

- During the PAH-SIM initial calibration verification performed on 7/18/07 @0634 using instrument MSBNA3 (GCMSR), all criteria were met for all target compounds. No qualifiers were applied. No samples were analyzed following this initial calibration verification.

- During the PAH-SIM continuing calibration performed on 8/2/07 @1000 using instrument MSBNA3 (GCMSR), all criteria were met for all target compounds. No qualifiers were applied. Sample F51300-31 was analyzed following this continuing calibration.

- During the PAH-SIM continuing calibration performed on 8/6/07 @2107 using instrument MSBNA3 (GCMSR), all criteria were met for all target compounds. No qualifiers were applied. Samples F51300-1, -2, -3, -4, -5, -6, -7, -8, -9, -10, -11, -12, -13, -14, -15, and -16 were analyzed following this continuing calibration.

- During the PAH-SIM continuing calibration performed on 8/7/07 @1245 using instrument MSBNA3 (GCMSR), all criteria were met for all target compounds. No qualifiers were applied. Sample F51300-17 was analyzed following this continuing calibration.

- During the PAH-SIM continuing calibration performed on 8/8/07 @1443 using instrument MSBNA3 (GCMSR), all criteria were met for all target compounds. No qualifiers were applied. Samples F51300-18, -19, -20, -21, -22 -23, -24, -25, -26, -27, -28, -29 and -30 were analyzed following this continuing calibration.

- During the SVOC initial calibration verification performed on 7/13/07 @1348 using instrument MSBNA04 (GCMSU), 4-chloroaniline (38.2%) and 3-nitroaniline (39.0%) had %D outside criteria. All other target compounds met criteria. No samples were analyzed following this initial calibration verification, no qualifiers were applied.

- During the SVOC initial calibration verification performed on 7/13/07 @1419 using instrument MSBNA04 (GCMSU), all target compounds met criteria. No samples were analyzed following this initial calibration verification, no qualifiers were applied.

- During the SVOC continuing calibration performed on 8/3/07 @0952 using instrument MSBNA04 (GCMSU), all target compounds met criteria. No qualifiers were applied. Samples F51300-1, -2, -3, -4, -5, -6, -7, -8, -9, -10, -11, -12, and -13 were analyzed following this continuing calibration.

- During the SVOC continuing calibration performed on 8/6/07 @1128 using instrument MSBNA04 (GCMSU), all target compounds met criteria. No qualifiers were applied. Samples F51300-14, -15, -16, and -17 were analyzed following this continuing calibration.

- During the SVOC continuing calibration performed on 8/7/07 @0942 using instrument MSBNA04 (GCMSU), all target compounds met criteria. No qualifiers were applied. Samples F51300-18, -19, -20, -21, -22 -23, -24, -25, -26, -27, -28, -29 and -30 were analyzed following this continuing calibration.

V-Blank Analysis

The purpose of blank analyses is to determine the presence and magnitude of contamination problems resulting from field and laboratory activities. A method blank analysis must be performed after the calibration standards and once every 12-hour time period beginning with the injection of DFTPP. No contaminants should be detected in any of the associated blanks > the MDL. DoD QSM criteria specifies all concentrations should be less than one-half MRL (<MRL for common laboratory contaminants phthalate esters). Positive sample results are reported and qualified "B", if the concentration of the compound in the sample is ≤10 times (10x) the maximum amount in any blank for the common laboratory contaminants phthalate esters, or 5 times (5X) the maximum amount for other semivolatile target compounds. **Table 2** summarizes the blank contamination analysis.

Table 2 Blank Contamination Analysis Summary

Analysis Date	QC Blank ID	Compound	Max Conc. µg/kg	Action Level µg/kg	B qualified samples
8/2/07	OP21675-MB	All SVOC target <½MRL	NA	NA	None
8/3/07	OP21718-MB	All SVOC target <½MRL	NA	NA	None
8/6/07	OP21718-MB	All SVOC target <½MRL	NA	NA	None
8/7/07	OP21737-MB	All SVOC target <½MRL	NA	NA	None
8/2/07	OP21676-MB	All PAH SIM target <½MRL	NA	NA	None
8/6/07	OP21719-MB	All PAH SIM target <½MRL	NA	NA	None
8/7/07	OP21719-MB	All PAH SIM target <½MRL	NA	NA	None
8/8/07	OP21738-MB	All PAH SIM target <½MRL	NA	NA	None
8/2/07	072507R	All SVOC target <½MRL	NA	NA	None
8/2/07	072507R	All PAH SIM target <½MRL	NA	NA	None
8/2/07	072607R	All SVOC target <½MRL	NA	NA	None
8/2/07	072607R	All PAH SIM target <½MRL	NA	NA	None

072507R & 072607R are rinsate blanks.
NA = Not applicable.
MRL = Method reporting limit.

VI-Surrogate Spikes

Laboratory performance on individual samples is evaluated through the review of surrogate spike samples. Surrogate spikes are added to all samples and blanks to measure their recovery in sample and blank matrices. The percent recoveries (%Rs) must be within the specified control limits. DoD surrogate recovery limits are specified in Tables D-2 & D-3 of the DoD QSM (DoD, 2006). If the surrogate is not listed, then the laboratory criteria shall be used.

Aqueous Criteria:
2-Fluorophenol (14-62%) – (DoD QSM = 20-110%)
Phenol-d5 (10-40%) – (DoD QSM = 10-115%)
2,4,6-Tribromophenol (33-118%) – (DoD QSM = 40-125%)
Nitrobenzene-d5 (42-108%) – (DoD QSM = 40-110%)
2-Fluorobiphenyl (40-106%) – (DoD QSM = 50-110%)
p-Terphenyl-d14 (39-121%) – (DoD QSM = 50-135%)

Solid Criteria:
2-Fluorophenol (40-102%) – (DoD QSM = 35-105%)
Phenol-d5 (41-100%) – (DoD QSM = 40-100%)
2,4,6-Tribromophenol (42-108%) – (DoD QSM = 35-125%)
Nitrobenzene-d5 (40-105%) – (DoD QSM = 35-100%)
2-Fluorobiphenyl (43-107%) – (DoD QSM = 45-105%)
p-Terphenyl-d14 (45-119%) – (DoD QSM = 30-125%)

- All samples met surrogate recovery criteria. No qualifiers were applied.

VII-Internal Standards

Internal standards performance criteria ensure that GC/MS sensitivity and response are stable during every analytical run. Internal standard area counts for samples and blanks must not vary by more than a factor of two (-50% to +100%) from the associated calibration standard. The retention time of the internal standards in samples and blanks must not vary by more than ±30 seconds from the retention time of the associated calibration standard.

- All samples met criteria. No qualifiers were applied.

VIII-Laboratory Control Sample

Laboratory control samples (LCS) are used to monitor laboratory accuracy by calculating the percent recoveries of the spiked compounds. All LCS percent recoveries must be within the specified control limits. DoD solid matrix LCS recovery limits are specified in Table D-7 of the DoD QSM (DoD, 2006), while aqueous recovery limits are specified in Table D-6 of the DoD QSM. If the compound is not listed, then the laboratory criteria shall be used.

- Sample OP21675-BS was used as the aqueous LCS during SVOC analysis on 8/2/07. All compounds met recovery criteria. No qualifiers were applied. Sample 072507R was analyzed in conjunction with this LCS.

- Sample OP21718-BS was used as the solid LCS during SVOC analysis on 8/3/07. All compounds met recovery criteria. No qualifiers were applied. Samples F51300-1 thru -17 were analyzed in conjunction with this LCS.

- Sample OP21737-BS was used as the solid LCS during SVOC analysis on 8/7/07. All compounds met recovery criteria. No qualifiers were applied. Samples F51300-18 thru -30 were analyzed in conjunction with this LCS.

- Sample OP21676-BS was used as the aqueous LCS for the PAH-SIM analysis on 8/2/07. All compounds met recovery criteria. No qualifiers were applied. Sample F51300-31 was analyzed in conjunction with this LCS.

- Sample OP21719-BS was used as the solid LCS for the PAH-SIM analysis on 8/6/07. All compounds met recovery criteria. No qualifiers were applied. Samples F51300-1 thru -17 were analyzed in conjunction with this LCS.

- Sample OP21738-BS was used as the solid LCS for the PAH-SIM analysis on 8/8/07. All compounds met recovery criteria. No qualifiers were applied. Samples F51300-18 thru -30 were analyzed in conjunction with this LCS.

IX-Matrix Spike/Matrix Spike Duplicate

Data for matrix spike/matrix spike duplicates (MS/MSD) are generated to determine long-term precision and accuracy of the analytical method on various matrices and to demonstrate acceptable compound recovery by the laboratory at the time of sample analysis. The percent recoveries (%Rs) and the relative percent difference (RPD) must be within the specified control limits. DoD solid matrix MS/MSD recovery limits follow the LCS criteria specified in Table D-7 of the DoD QSM (DoD, 2006), while aqueous recovery limits follow the LCS criteria in Table D-6 of the DoD QSM. If the compound is not listed, then the laboratory criteria shall be used.

- Sample F51272-6 was used as the aqueous MS/MSD during SVOC analysis on 8/1/07. The spiked sample was not a RFAAP site sample; therefore, it was not evaluated. Sample F51300-31 was analyzed in conjunction with this MS/MSD.

- Sample F51300-5 was used as the solid MS/MSD during SVOC analysis on 8/3/07. All target compounds met recovery criteria. No qualifiers were applied. Samples F51300-1 thru -17 were analyzed in conjunction with this MS/MSD.

- Sample F51300-25 was used as the solid MS/MSD during SVOC analysis on 8/7/07. All target compounds met recovery criteria. No qualifiers were applied. Samples F51300-18 thru -30 were analyzed in conjunction with this MS/MSD.

- Sample F53100-31 was used as the aqueous MS/MSD during PAH SIM analysis on 8/2/07. All compounds met recovery criteria. No qualifiers were applied. Sample F51300-31 was analyzed in conjunction with this MS/MSD.

- Sample F53100-7 was used as the solid MS/MSD during PAH SIM analysis on 8/7/07. Chrysene (52%, 53%) and 1-methylnaphthalene (56%, 57%) had low recoveries in the MS & MSD; all chrysene and 1-methylnaphthalene results in associated samples have been qualified "J/UJ". All other target compounds met recovery criteria. Samples F51300-1 thru -17 were analyzed in conjunction with this MS/MSD.

- Sample F53100-25 was used as the solid MS/MSD during PAH SIM analysis on 8/8/07. All target compounds met recovery criteria. Samples F51300-18 thru -30 were analyzed in conjunction with this MS/MSD.

X-Field Duplicate Sample Analysis

Field duplicates were collected to identify the cumulative precision of the sampling and analytical process and sent to the laboratory blind. The RPD was calculated only for those analytes which were detected at levels exceeding the method reporting limits in both samples of the duplicate pair. Analytes that were rejected (R-qualified) in either sample of the duplicate pair were excluded from the duplicate assessment. Precision control criterion was established at 50% RPD for the aqueous and solid samples. Analytical results were qualified as estimated (J) for any RPDs exceeding criteria.

- Field duplicate pairs in this data package included 59SB04C (F51300-9) & TMSB04C (F51300-10), 59SB02B (F51300-12) & TMSB02B (F51300-13), and 43SB10B (F51300-28) & TMSB10B (F51300-30). All compounds detected above the reporting limit (RL) met RPD criteria.

XI-Quantitation Verification

The accuracy of analytical results was verified through the calculation of several parameters. Percent difference (%D) between the calculated and reported values must be ≤10%. Any sample value >MDL and <MRL or <3*MDL (whichever is greater) was qualified as estimated, "J."

Sample: F51300-16, di-n-butyl phthalate

Conc. (µg/kg) = {(Ax)*(Is)*(Vt)*(DF)}/{(Ais)*(RRF)*(V_i)*(Ws)*(Ps)}

where:	Conc	=	Sample concentration in µg/kg
	A_x	=	Area of characteristic ion for compound being measured.
	I_s	=	Amount of internal standard injected (ng).
	V_t	=	Volume of total extract, taking into account dilutions (i.e., a 1-to-10 dilution of a 1-mL extract will mean V(t) = 10,000 µL.
	DF	=	Dilution Factor
	A_{is}	=	Area of characteristic ion for the internal standard.
	RRF_A	=	Average relative response factor for compound being measured
	V_i	=	Volume of extract injected (µL).
	Ws	=	weight of sample (g)
	Ps	=	percent solids/100

Conc. µg/L = (735472 * 40 * 1000 * 2) / (691959 *1.457 * 1 * 30.4 * 0.817) = 2350 ug/kg

Reported Value = 2350 µg/kg
% Difference = 0.0%
Values were within 10% difference.

Sample: F51300-11, chrysene

Conc. (µg/kg) = {(Ax)*(Is)*(Vt)*(DF)}/{(Ais)*(RRF)*(V_i)*(Ws)*(Ps)}

where:	Conc	=	Sample concentration in µg/kg
	A_x	=	Area of characteristic ion for compound being measured.
	I_s	=	Amount of internal standard injected (ng).
	V_t	=	Volume of total extract, taking into account dilutions (i.e., a 1-to-10 dilution of a 1-mL extract will mean V(t) = 10,000 µL.
	DF	=	Dilution Factor
	A_{is}	=	Area of characteristic ion for the internal standard.
	RRF_A	=	Average relative response factor for compound being measured
	V_i	=	Volume of extract injected (µL).
	Ws	=	weight of sample (g)
	Ps	=	percent solids/100

Conc. µg/L = (6444 * 4 * 1000 * 4) / (121726 * 1.586 * 1 * 30.8 * 0.895) = 19.4 ug/kg

Reported Value = 19.4 µg/kg
% Difference = 0.1%
Values were within 10% difference.

USEPA Region III Validation Qualifiers

(No Code) = Confirmed identification.

B = The analyte has been detected in the sample and the associated laboratory or field blank.

J = Indicates an estimated value for (1) estimated value due to QC non-conformance. Reported value may not be accurate or precise, (2) estimating a concentration as a tentatively identified compound as indicated by the mass spectral and retention time data, or (3) estimating a concentration ≥MDL and <MRL or <3*MDL, whichever is greater.

K = Analyte present. Reported value may be biased high (estimated) due to QC non-conformance.

L = Analyte present. Reported value may be biased low (estimated) due to QC non-conformance.

R = Unreliable result. Analyte may or may not be present in the sample due to QC non-conformance.

UL = Value is estimated bias low and not detected due to QC non-conformance. Reporting limit may be inaccurate or imprecise. Quantitation limit is probably higher.

UJ = Value is estimated and not detected due to QC non-conformance. Reporting limit may be inaccurate or imprecise.

Laboratory Qualifiers

(No Code) = Confirmed identification.

U = Not detected. The associated number indicates the compound reporting limit for the sample.

A (Dioxins) = B (Metals) = The reported value was obtained from a reading <MRL and ≥MDL and is considered estimated.

B (Organics) = The analyte or compound has been detected in the sample and laboratory method blank. It indicates probable blank contamination.

E (Metals) = Reported value is estimated because of the presence of interferences.

E (Organics) = Identifies compounds whose concentrations exceed the upper level of the calibration range.

EMPC (Dioxins) = The ion-abundance ratio between the two characteristic PCDD/PCDF ions was outside accepted ranges. The detected PCDD/PCDF was reported as an estimated maximum possible concentration (EMPC).

D = Indicates sample was analyzed at a dilution.

J = Indicates an estimated value for (1) estimating a concentration as a tentatively identified compound as indicated by the mass spectral and retention time data, or (2) estimating a concentration <MRL and ≥MDL.

N (Organics) = Indicates presumptive evidence of a compound for tentatively identified compounds using a library search.

N (Metals) = Laboratory spike sample recovery not within control limits.

P (Organics) = Target analyte confirmation >40% difference for detected compound between the primary and secondary columns. The lower of the two values was reported.

* (Metals) = Duplicate analysis not within control limits.

* (Organics) = Surrogate outside of QC limits on both original and re-analysis.

Accutest Laboratories

Report of Analysis

Client Sample ID:	59SB06A		
Lab Sample ID:	F51300-1	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8270C SW846 3550B	Percent Solids:	91.9
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	U003745.D	1	08/03/07	NJ	08/02/07	OP21718	SU183
Run #2							

	Initial Weight	Final Volume
Run #1	30.3 g	1.0 ml
Run #2		

ABN TCL List w/o PAHs

CAS No.	Compound	Result	RL	MDL	Units	Q
65-85-0	Benzoic acid	ND	900	360	ug/kg	
95-57-8	2-Chlorophenol	ND	180	36	ug/kg	
59-50-7	4-Chloro-3-methyl phenol	ND	180	36	ug/kg	
120-83-2	2,4-Dichlorophenol	ND	180	36	ug/kg	
105-67-9	2,4-Dimethylphenol	ND	180	36	ug/kg	
51-28-5	2,4-Dinitrophenol	ND	900	360	ug/kg	
534-52-1	4,6-Dinitro-o-cresol	ND	360	72	ug/kg	
95-48-7	2-Methylphenol	ND	180	36	ug/kg	
	3&4-Methylphenol	ND	180	36	ug/kg	
88-75-5	2-Nitrophenol	ND	180	36	ug/kg	
100-02-7	4-Nitrophenol	ND	900	360	ug/kg	
87-86-5	Pentachlorophenol	ND	900	360	ug/kg	
108-95-2	Phenol	ND	180	36	ug/kg	
95-95-4	2,4,5-Trichlorophenol	ND	180	36	ug/kg	
88-06-2	2,4,6-Trichlorophenol	ND	180	36	ug/kg	
101-55-3	4-Bromophenyl phenyl ether	ND	180	36	ug/kg	
85-68-7	Butyl benzyl phthalate	ND	360	90	ug/kg	
100-51-6	Benzyl Alcohol	ND	180	36	ug/kg	
91-58-7	2-Chloronaphthalene	ND	180	36	ug/kg	
106-47-8	4-Chloroaniline	ND	180	72	ug/kg	
86-74-8	Carbazole	ND	180	36	ug/kg	
111-91-1	bis(2-Chloroethoxy)methane	ND	180	36	ug/kg	
111-44-4	bis(2-Chloroethyl)ether	ND	180	36	ug/kg	
108-60-1	bis(2-Chloroisopropyl)ether	ND	180	36	ug/kg	
7005-72-3	4-Chlorophenyl phenyl ether	ND	180	36	ug/kg	
95-50-1	1,2-Dichlorobenzene	ND	180	36	ug/kg	
541-73-1	1,3-Dichlorobenzene	ND	180	36	ug/kg	
106-46-7	1,4-Dichlorobenzene	ND	180	36	ug/kg	
121-14-2	2,4-Dinitrotoluene	ND	180	36	ug/kg	
606-20-2	2,6-Dinitrotoluene	ND	180	36	ug/kg	
91-94-1	3,3'-Dichlorobenzidine	ND	360	72	ug/kg	
132-64-9	Dibenzofuran	ND	180	36	ug/kg	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	59SB06A		
Lab Sample ID:	F51300-1	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8270C SW846 3550B	Percent Solids:	91.9
Project:	WPA 019 Field Investigation; Radford AAP, VA		

ABN TCL List w/o PAHs

CAS No.	Compound	Result	RL	MDL	Units	Q
84-74-2	Di-n-butyl phthalate	ND	360	90	ug/kg	
117-84-0	Di-n-octyl phthalate	ND	360	90	ug/kg	
84-66-2	Diethyl phthalate	ND	360	180	ug/kg	
131-11-3	Dimethyl phthalate	ND	360	90	ug/kg	
117-81-7	bis(2-Ethylhexyl)phthalate	ND	360	180	ug/kg	
118-74-1	Hexachlorobenzene	ND	180	36	ug/kg	
87-68-3	Hexachlorobutadiene	ND	180	36	ug/kg	
77-47-4	Hexachlorocyclopentadiene	ND	180	36	ug/kg	
67-72-1	Hexachloroethane	ND	180	36	ug/kg	
78-59-1	Isophorone	ND	180	36	ug/kg	
88-74-4	2-Nitroaniline	ND	360	72	ug/kg	
99-09-2	3-Nitroaniline	ND	360	72	ug/kg	
100-01-6	4-Nitroaniline	ND	360	72	ug/kg	
98-95-3	Nitrobenzene	ND	180	36	ug/kg	
621-64-7	N-Nitroso-di-n-propylamine	ND	180	36	ug/kg	
86-30-6	N-Nitrosodiphenylamine	ND	180	36	ug/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	180	36	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol	61%		40-102%
4165-62-2	Phenol-d5	67%		41-100%
118-79-6	2,4,6-Tribromophenol	61%		42-108%
4165-60-0	Nitrobenzene-d5	56%		40-105%
321-60-8	2-Fluorobiphenyl	59%		43-107%
1718-51-0	Terphenyl-d14	67%		45-119%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: R09626.D

Accutest Laboratories

Report of Analysis

Client Sample ID:	59SB06A		
Lab Sample ID:	F51300-1	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8270C BY SIM SW846 3550B	Percent Solids:	91.9
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	R09626.D	4	08/07/07	NJ	08/02/07	OP21719	SR455
Run #2							

	Initial Weight	Final Volume
Run #1	30.3 g	1.0 ml
Run #2		

BN PAH List

CAS No.	Compound	Result	RL	MDL	Units	Q	DATA VAL QUALIFIER
83-32-9	Acenaphthene	ND	290	72	ug/kg		
208-96-8	Acenaphthylene	ND	290	72	ug/kg		
120-12-7	Anthracene	ND	290	43	ug/kg		
56-55-3	Benzo(a)anthracene	ND	57	14	ug/kg		
50-32-8	Benzo(a)pyrene	ND	57	14	ug/kg		
205-99-2	Benzo(b)fluoranthene	ND	57	14	ug/kg		
191-24-2	Benzo(g,h,i)perylene	ND	57	14	ug/kg		
207-08-9	Benzo(k)fluoranthene	ND	57	14	ug/kg		
218-01-9	Chrysene	ND	57	14	ug/kg		UJ
53-70-3	Dibenzo(a,h)anthracene	ND	57	14	ug/kg		
206-44-0	Fluoranthene	ND	290	50	ug/kg		
86-73-7	Fluorene	ND	290	43	ug/kg		
193-39-5	Indeno(1,2,3-cd)pyrene	ND	57	14	ug/kg		
90-12-0	1-Methylnaphthalene	ND	290	43	ug/kg		UJ
91-57-6	2-Methylnaphthalene	ND	290	43	ug/kg		
91-20-3	Naphthalene	ND	290	43	ug/kg		
85-01-8	Phenanthrene	ND	290	43	ug/kg		
129-00-0	Pyrene	ND	290	50	ug/kg		

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	59SB06B		
Lab Sample ID:	F51300-2	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8270C SW846 3550B	Percent Solids:	88.5
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	U003746.D	1	08/03/07	NJ	08/02/07	OP21718	SU183
Run #2							

	Initial Weight	Final Volume
Run #1	30.5 g	1.0 ml
Run #2		

ABN TCL List w/o PAHs

CAS No.	Compound	Result	RL	MDL	Units	Q
65-85-0	Benzoic acid	ND	930	370	ug/kg	
95-57-8	2-Chlorophenol	ND	190	37	ug/kg	
59-50-7	4-Chloro-3-methyl phenol	ND	190	37	ug/kg	
120-83-2	2,4-Dichlorophenol	ND	190	37	ug/kg	
105-67-9	2,4-Dimethylphenol	ND	190	37	ug/kg	
51-28-5	2,4-Dinitrophenol	ND	930	370	ug/kg	
534-52-1	4,6-Dinitro-o-cresol	ND	370	74	ug/kg	
95-48-7	2-Methylphenol	ND	190	37	ug/kg	
	3&4-Methylphenol	ND	190	37	ug/kg	
88-75-5	2-Nitrophenol	ND	190	37	ug/kg	
100-02-7	4-Nitrophenol	ND	930	370	ug/kg	
87-86-5	Pentachlorophenol	ND	930	370	ug/kg	
108-95-2	Phenol	ND	190	37	ug/kg	
95-95-4	2,4,5-Trichlorophenol	ND	190	37	ug/kg	
88-06-2	2,4,6-Trichlorophenol	ND	190	37	ug/kg	
101-55-3	4-Bromophenyl phenyl ether	ND	190	37	ug/kg	
85-68-7	Butyl benzyl phthalate	ND	370	93	ug/kg	
100-51-6	Benzyl Alcohol	ND	190	37	ug/kg	
91-58-7	2-Chloronaphthalene	ND	190	37	ug/kg	
106-47-8	4-Chloroaniline	ND	190	74	ug/kg	
86-74-8	Carbazole	ND	190	37	ug/kg	
111-91-1	bis(2-Chloroethoxy)methane	ND	190	37	ug/kg	
111-44-4	bis(2-Chloroethyl)ether	ND	190	37	ug/kg	
108-60-1	bis(2-Chloroisopropyl)ether	ND	190	37	ug/kg	
7005-72-3	4-Chlorophenyl phenyl ether	ND	190	37	ug/kg	
95-50-1	1,2-Dichlorobenzene	ND	190	37	ug/kg	
541-73-1	1,3-Dichlorobenzene	ND	190	37	ug/kg	
106-46-7	1,4-Dichlorobenzene	ND	190	37	ug/kg	
121-14-2	2,4-Dinitrotoluene	ND	190	37	ug/kg	
606-20-2	2,6-Dinitrotoluene	ND	190	37	ug/kg	
91-94-1	3,3'-Dichlorobenzidine	ND	370	74	ug/kg	
132-64-9	Dibenzofuran	ND	190	37	ug/kg	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	59SB06B		
Lab Sample ID:	F51300-2	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8270C SW846 3550B	Percent Solids:	88.5
Project:	WPA 019 Field Investigation; Radford AAP, VA		

ABN TCL List w/o PAHs

CAS No.	Compound	Result	RL	MDL	Units	Q
84-74-2	Di-n-butyl phthalate	ND	370	93	ug/kg	
117-84-0	Di-n-octyl phthalate	ND	370	93	ug/kg	
84-66-2	Diethyl phthalate	ND	370	190	ug/kg	
131-11-3	Dimethyl phthalate	ND	370	93	ug/kg	
117-81-7	bis(2-Ethylhexyl)phthalate	ND	370	190	ug/kg	
118-74-1	Hexachlorobenzene	ND	190	37	ug/kg	
87-68-3	Hexachlorobutadiene	ND	190	37	ug/kg	
77-47-4	Hexachlorocyclopentadiene	ND	190	37	ug/kg	
67-72-1	Hexachloroethane	ND	190	37	ug/kg	
78-59-1	Isophorone	ND	190	37	ug/kg	
88-74-4	2-Nitroaniline	ND	370	74	ug/kg	
99-09-2	3-Nitroaniline	ND	370	74	ug/kg	
100-01-6	4-Nitroaniline	ND	370	74	ug/kg	
98-95-3	Nitrobenzene	ND	190	37	ug/kg	
621-64-7	N-Nitroso-di-n-propylamine	ND	190	37	ug/kg	
86-30-6	N-Nitrosodiphenylamine	ND	190	37	ug/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	190	37	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol	54%		40-102%
4165-62-2	Phenol-d5	58%		41-100%
118-79-6	2,4,6-Tribromophenol	72%		42-108%
4165-60-0	Nitrobenzene-d5	49%		40-105%
321-60-8	2-Fluorobiphenyl	51%		43-107%
1718-51-0	Terphenyl-d14	76%		45-119%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	59SB06B		
Lab Sample ID:	F51300-2	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8270C BY SIM SW846 3550B	Percent Solids:	88.5
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	R09627.D	4	08/07/07	NJ	08/02/07	OP21719	SR455
Run #2							

	Initial Weight	Final Volume
Run #1	30.5 g	1.0 ml
Run #2		

BN PAH List

CAS No.	Compound	Result	RL	MDL	Units	Q	DATA VAL QUALIFIER
83-32-9	Acenaphthene	ND	300	74	ug/kg		
208-96-8	Acenaphthylene	ND	300	74	ug/kg		
120-12-7	Anthracene	ND	300	44	ug/kg		
56-55-3	Benzo(a)anthracene	ND	59	15	ug/kg		
50-32-8	Benzo(a)pyrene	ND	59	15	ug/kg		
205-99-2	Benzo(b)fluoranthene	ND	59	15	ug/kg		
191-24-2	Benzo(g,h,i)perylene	ND	59	15	ug/kg		
207-08-9	Benzo(k)fluoranthene	ND	59	15	ug/kg		
218-01-9	Chrysene	ND	59	15	ug/kg		UJ
53-70-3	Dibenzo(a,h)anthracene	ND	59	15	ug/kg		
206-44-0	Fluoranthene	ND	300	52	ug/kg		
86-73-7	Fluorene	ND	300	44	ug/kg		
193-39-5	Indeno(1,2,3-cd)pyrene	ND	59	15	ug/kg		
90-12-0	1-Methylnaphthalene	ND	300	44	ug/kg		UJ
91-57-6	2-Methylnaphthalene	ND	300	44	ug/kg		
91-20-3	Naphthalene	ND	300	44	ug/kg		
85-01-8	Phenanthrene	ND	300	44	ug/kg		
129-00-0	Pyrene	ND	300	52	ug/kg		

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	59SB06C		
Lab Sample ID:	F51300-3	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8270C SW846 3550B	Percent Solids:	86.2
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	U003747.D	1	08/03/07	NJ	08/02/07	OP21718	SU183
Run #2							

	Initial Weight	Final Volume
Run #1	30.2 g	1.0 ml
Run #2		

ABN TCL List w/o PAHs

CAS No.	Compound	Result	RL	MDL	Units	Q
65-85-0	Benzoic acid	ND	960	380	ug/kg	
95-57-8	2-Chlorophenol	ND	190	38	ug/kg	
59-50-7	4-Chloro-3-methyl phenol	ND	190	38	ug/kg	
120-83-2	2,4-Dichlorophenol	ND	190	38	ug/kg	
105-67-9	2,4-Dimethylphenol	ND	190	38	ug/kg	
51-28-5	2,4-Dinitrophenol	ND	960	380	ug/kg	
534-52-1	4,6-Dinitro-o-cresol	ND	380	77	ug/kg	
95-48-7	2-Methylphenol	ND	190	38	ug/kg	
	3&4-Methylphenol	ND	190	38	ug/kg	
88-75-5	2-Nitrophenol	ND	190	38	ug/kg	
100-02-7	4-Nitrophenol	ND	960	380	ug/kg	
87-86-5	Pentachlorophenol	ND	960	380	ug/kg	
108-95-2	Phenol	ND	190	38	ug/kg	
95-95-4	2,4,5-Trichlorophenol	ND	190	38	ug/kg	
88-06-2	2,4,6-Trichlorophenol	ND	190	38	ug/kg	
101-55-3	4-Bromophenyl phenyl ether	ND	190	38	ug/kg	
85-68-7	Butyl benzyl phthalate	ND	380	96	ug/kg	
100-51-6	Benzyl Alcohol	ND	190	38	ug/kg	
91-58-7	2-Chloronaphthalene	ND	190	38	ug/kg	
106-47-8	4-Chloroaniline	ND	190	77	ug/kg	
86-74-8	Carbazole	ND	190	38	ug/kg	
111-91-1	bis(2-Chloroethoxy)methane	ND	190	38	ug/kg	
111-44-4	bis(2-Chloroethyl)ether	ND	190	38	ug/kg	
108-60-1	bis(2-Chloroisopropyl)ether	ND	190	38	ug/kg	
7005-72-3	4-Chlorophenyl phenyl ether	ND	190	38	ug/kg	
95-50-1	1,2-Dichlorobenzene	ND	190	38	ug/kg	
541-73-1	1,3-Dichlorobenzene	ND	190	38	ug/kg	
106-46-7	1,4-Dichlorobenzene	ND	190	38	ug/kg	
121-14-2	2,4-Dinitrotoluene	ND	190	38	ug/kg	
606-20-2	2,6-Dinitrotoluene	ND	190	38	ug/kg	
91-94-1	3,3'-Dichlorobenzidine	ND	380	77	ug/kg	
132-64-9	Dibenzofuran	ND	190	38	ug/kg	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	59SB06C		
Lab Sample ID:	F51300-3	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8270C SW846 3550B	Percent Solids:	86.2
Project:	WPA 019 Field Investigation; Radford AAP, VA		

ABN TCL List w/o PAHs

CAS No.	Compound	Result	RL	MDL	Units	Q
84-74-2	Di-n-butyl phthalate	ND	380	96	ug/kg	
117-84-0	Di-n-octyl phthalate	ND	380	96	ug/kg	
84-66-2	Diethyl phthalate	ND	380	190	ug/kg	
131-11-3	Dimethyl phthalate	ND	380	96	ug/kg	
117-81-7	bis(2-Ethylhexyl)phthalate	ND	380	190	ug/kg	
118-74-1	Hexachlorobenzene	ND	190	38	ug/kg	
87-68-3	Hexachlorobutadiene	ND	190	38	ug/kg	
77-47-4	Hexachlorocyclopentadiene	ND	190	38	ug/kg	
67-72-1	Hexachloroethane	ND	190	38	ug/kg	
78-59-1	Isophorone	ND	190	38	ug/kg	
88-74-4	2-Nitroaniline	ND	380	77	ug/kg	
99-09-2	3-Nitroaniline	ND	380	77	ug/kg	
100-01-6	4-Nitroaniline	ND	380	77	ug/kg	
98-95-3	Nitrobenzene	ND	190	38	ug/kg	
621-64-7	N-Nitroso-di-n-propylamine	ND	190	38	ug/kg	
86-30-6	N-Nitrosodiphenylamine	ND	190	38	ug/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	190	38	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol	64%		40-102%
4165-62-2	Phenol-d5	68%		41-100%
118-79-6	2,4,6-Tribromophenol	77%		42-108%
4165-60-0	Nitrobenzene-d5	56%		40-105%
321-60-8	2-Fluorobiphenyl	58%		43-107%
1718-51-0	Terphenyl-d14	76%		45-119%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: R09628.D

Accutest Laboratories

Report of Analysis

Client Sample ID:	59SB06C		
Lab Sample ID:	F51300-3	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8270C BY SIM SW846 3550B	Percent Solids:	86.2
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	R09628.D	4	08/07/07	NJ	08/02/07	OP21719	SR455
Run #2							

	Initial Weight	Final Volume
Run #1	30.2 g	1.0 ml
Run #2		

BN PAH List

CAS No.	Compound	Result	RL	MDL	Units	Q (DATA VAL QUALIFIER)
83-32-9	Acenaphthene	ND	310	77	ug/kg	
208-96-8	Acenaphthylene	ND	310	77	ug/kg	
120-12-7	Anthracene	ND	310	46	ug/kg	
56-55-3	Benzo(a)anthracene	ND	61	15	ug/kg	
50-32-8	Benzo(a)pyrene	ND	61	15	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	61	15	ug/kg	
191-24-2	Benzo(g,h,i)perylene	ND	61	15	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	61	15	ug/kg	
218-01-9	Chrysene	ND	61	15	ug/kg	UJ
53-70-3	Dibenzo(a,h)anthracene	ND	61	15	ug/kg	
206-44-0	Fluoranthene	ND	310	54	ug/kg	
86-73-7	Fluorene	ND	310	46	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	61	15	ug/kg	
90-12-0	1-Methylnaphthalene	ND	310	46	ug/kg	UJ
91-57-6	2-Methylnaphthalene	ND	310	46	ug/kg	
91-20-3	Naphthalene	ND	310	46	ug/kg	
85-01-8	Phenanthrene	ND	310	46	ug/kg	
129-00-0	Pyrene	ND	310	54	ug/kg	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	59SB05A		
Lab Sample ID:	F51300-4	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8270C SW846 3550B	Percent Solids:	89.5
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	U003748.D	1	08/03/07	NJ	08/02/07	OP21718	SU183
Run #2							

	Initial Weight	Final Volume
Run #1	30.5 g	1.0 ml
Run #2		

ABN TCL List w/o PAHs

CAS No.	Compound	Result	RL	MDL	Units	Q
65-85-0	Benzoic acid	ND	920	370	ug/kg	
95-57-8	2-Chlorophenol	ND	180	37	ug/kg	
59-50-7	4-Chloro-3-methyl phenol	ND	180	37	ug/kg	
120-83-2	2,4-Dichlorophenol	ND	180	37	ug/kg	
105-67-9	2,4-Dimethylphenol	ND	180	37	ug/kg	
51-28-5	2,4-Dinitrophenol	ND	920	370	ug/kg	
534-52-1	4,6-Dinitro-o-cresol	ND	370	73	ug/kg	
95-48-7	2-Methylphenol	ND	180	37	ug/kg	
	3&4-Methylphenol	ND	180	37	ug/kg	
88-75-5	2-Nitrophenol	ND	180	37	ug/kg	
100-02-7	4-Nitrophenol	ND	920	370	ug/kg	
87-86-5	Pentachlorophenol	ND	920	370	ug/kg	
108-95-2	Phenol	ND	180	37	ug/kg	
95-95-4	2,4,5-Trichlorophenol	ND	180	37	ug/kg	
88-06-2	2,4,6-Trichlorophenol	ND	180	37	ug/kg	
101-55-3	4-Bromophenyl phenyl ether	ND	180	37	ug/kg	
85-68-7	Butyl benzyl phthalate	ND	370	92	ug/kg	
100-51-6	Benzyl Alcohol	ND	180	37	ug/kg	
91-58-7	2-Chloronaphthalene	ND	180	37	ug/kg	
106-47-8	4-Chloroaniline	ND	180	73	ug/kg	
86-74-8	Carbazole	ND	180	37	ug/kg	
111-91-1	bis(2-Chloroethoxy)methane	ND	180	37	ug/kg	
111-44-4	bis(2-Chloroethyl)ether	ND	180	37	ug/kg	
108-60-1	bis(2-Chloroisopropyl)ether	ND	180	37	ug/kg	
7005-72-3	4-Chlorophenyl phenyl ether	ND	180	37	ug/kg	
95-50-1	1,2-Dichlorobenzene	ND	180	37	ug/kg	
541-73-1	1,3-Dichlorobenzene	ND	180	37	ug/kg	
106-46-7	1,4-Dichlorobenzene	ND	180	37	ug/kg	
121-14-2	2,4-Dinitrotoluene	ND	180	37	ug/kg	
606-20-2	2,6-Dinitrotoluene	ND	180	37	ug/kg	
91-94-1	3,3'-Dichlorobenzidine	ND	370	73	ug/kg	
132-64-9	Dibenzofuran	ND	180	37	ug/kg	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	59SB05A		
Lab Sample ID:	F51300-4	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8270C SW846 3550B	Percent Solids:	89.5
Project:	WPA 019 Field Investigation; Radford AAP, VA		

ABN TCL List w/o PAHs

CAS No.	Compound	Result	RL	MDL	Units	Q
84-74-2	Di-n-butyl phthalate	ND	370	92	ug/kg	
117-84-0	Di-n-octyl phthalate	ND	370	92	ug/kg	
84-66-2	Diethyl phthalate	ND	370	180	ug/kg	
131-11-3	Dimethyl phthalate	ND	370	92	ug/kg	
117-81-7	bis(2-Ethylhexyl)phthalate	ND	370	180	ug/kg	
118-74-1	Hexachlorobenzene	ND	180	37	ug/kg	
87-68-3	Hexachlorobutadiene	ND	180	37	ug/kg	
77-47-4	Hexachlorocyclopentadiene	ND	180	37	ug/kg	
67-72-1	Hexachloroethane	ND	180	37	ug/kg	
78-59-1	Isophorone	ND	180	37	ug/kg	
88-74-4	2-Nitroaniline	ND	370	73	ug/kg	
99-09-2	3-Nitroaniline	ND	370	73	ug/kg	
100-01-6	4-Nitroaniline	ND	370	73	ug/kg	
98-95-3	Nitrobenzene	ND	180	37	ug/kg	
621-64-7	N-Nitroso-di-n-propylamine	ND	180	37	ug/kg	
86-30-6	N-Nitrosodiphenylamine	ND	180	37	ug/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	180	37	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol	73%		40-102%
4165-62-2	Phenol-d5	79%		41-100%
118-79-6	2,4,6-Tribromophenol	80%		42-108%
4165-60-0	Nitrobenzene-d5	64%		40-105%
321-60-8	2-Fluorobiphenyl	67%		43-107%
1718-51-0	Terphenyl-d14	81%		45-119%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	59SB05A		
Lab Sample ID:	F51300-4	**Date Sampled:**	07/25/07
Matrix:	SO - Soil	**Date Received:**	07/26/07
Method:	SW846 8270C BY SIM SW846 3550B	**Percent Solids:**	89.5
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	R09629.D	4	08/07/07	NJ	08/02/07	OP21719	SR455
Run #2							

	Initial Weight	Final Volume
Run #1	30.5 g	1.0 ml
Run #2		

BN PAH List

CAS No.	Compound	Result	RL	MDL	Units	Q (DATA VAL QUALIFIER)
83-32-9	Acenaphthene	ND	290	73	ug/kg	
208-96-8	Acenaphthylene	ND	290	73	ug/kg	
120-12-7	Anthracene	ND	290	44	ug/kg	
56-55-3	Benzo(a)anthracene	ND	59	15	ug/kg	
50-32-8	Benzo(a)pyrene	ND	59	15	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	59	15	ug/kg	
191-24-2	Benzo(g,h,i)perylene	ND	59	15	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	59	15	ug/kg	
218-01-9	Chrysene	ND	59	15	ug/kg	UJ
53-70-3	Dibenzo(a,h)anthracene	ND	59	15	ug/kg	
206-44-0	Fluoranthene	ND	290	51	ug/kg	
86-73-7	Fluorene	ND	290	44	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	59	15	ug/kg	
90-12-0	1-Methylnaphthalene	ND	290	44	ug/kg	UJ
91-57-6	2-Methylnaphthalene	ND	290	44	ug/kg	
91-20-3	Naphthalene	ND	290	44	ug/kg	
85-01-8	Phenanthrene	ND	290	44	ug/kg	
129-00-0	Pyrene	ND	290	51	ug/kg	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	59SB05B		
Lab Sample ID:	F51300-5	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8270C SW846 3550B	Percent Solids:	84.2
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	U003749.D	1	08/03/07	NJ	08/02/07	OP21718	SU183
Run #2							

	Initial Weight	Final Volume
Run #1	30.9 g	1.0 ml
Run #2		

ABN TCL List w/o PAHs

CAS No.	Compound	Result	RL	MDL	Units	Q
65-85-0	Benzoic acid	ND	960	380	ug/kg	
95-57-8	2-Chlorophenol	ND	190	38	ug/kg	
59-50-7	4-Chloro-3-methyl phenol	ND	190	38	ug/kg	
120-83-2	2,4-Dichlorophenol	ND	190	38	ug/kg	
105-67-9	2,4-Dimethylphenol	ND	190	38	ug/kg	
51-28-5	2,4-Dinitrophenol	ND	960	380	ug/kg	
534-52-1	4,6-Dinitro-o-cresol	ND	380	77	ug/kg	
95-48-7	2-Methylphenol	ND	190	38	ug/kg	
	3&4-Methylphenol	ND	190	38	ug/kg	
88-75-5	2-Nitrophenol	ND	190	38	ug/kg	
100-02-7	4-Nitrophenol	ND	960	380	ug/kg	
87-86-5	Pentachlorophenol	ND	960	380	ug/kg	
108-95-2	Phenol	ND	190	38	ug/kg	
95-95-4	2,4,5-Trichlorophenol	ND	190	38	ug/kg	
88-06-2	2,4,6-Trichlorophenol	ND	190	38	ug/kg	
101-55-3	4-Bromophenyl phenyl ether	ND	190	38	ug/kg	
85-68-7	Butyl benzyl phthalate	ND	380	96	ug/kg	
100-51-6	Benzyl Alcohol	ND	190	38	ug/kg	
91-58-7	2-Chloronaphthalene	ND	190	38	ug/kg	
106-47-8	4-Chloroaniline	ND	190	77	ug/kg	
86-74-8	Carbazole	ND	190	38	ug/kg	
111-91-1	bis(2-Chloroethoxy)methane	ND	190	38	ug/kg	
111-44-4	bis(2-Chloroethyl)ether	ND	190	38	ug/kg	
108-60-1	bis(2-Chloroisopropyl)ether	ND	190	38	ug/kg	
7005-72-3	4-Chlorophenyl phenyl ether	ND	190	38	ug/kg	
95-50-1	1,2-Dichlorobenzene	ND	190	38	ug/kg	
541-73-1	1,3-Dichlorobenzene	ND	190	38	ug/kg	
106-46-7	1,4-Dichlorobenzene	ND	190	38	ug/kg	
121-14-2	2,4-Dinitrotoluene	ND	190	38	ug/kg	
606-20-2	2,6-Dinitrotoluene	ND	190	38	ug/kg	
91-94-1	3,3'-Dichlorobenzidine	ND	380	77	ug/kg	
132-64-9	Dibenzofuran	ND	190	38	ug/kg	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	59SB05B		
Lab Sample ID:	F51300-5	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8270C SW846 3550B	Percent Solids:	84.2
Project:	WPA 019 Field Investigation; Radford AAP, VA		

ABN TCL List w/o PAHs

CAS No.	Compound	Result	RL	MDL	Units	Q
84-74-2	Di-n-butyl phthalate	ND	380	96	ug/kg	
117-84-0	Di-n-octyl phthalate	ND	380	96	ug/kg	
84-66-2	Diethyl phthalate	ND	380	190	ug/kg	
131-11-3	Dimethyl phthalate	ND	380	96	ug/kg	
117-81-7	bis(2-Ethylhexyl)phthalate	ND	380	190	ug/kg	
118-74-1	Hexachlorobenzene	ND	190	38	ug/kg	
87-68-3	Hexachlorobutadiene	ND	190	38	ug/kg	
77-47-4	Hexachlorocyclopentadiene	ND	190	38	ug/kg	
67-72-1	Hexachloroethane	ND	190	38	ug/kg	
78-59-1	Isophorone	ND	190	38	ug/kg	
88-74-4	2-Nitroaniline	ND	380	77	ug/kg	
99-09-2	3-Nitroaniline	ND	380	77	ug/kg	
100-01-6	4-Nitroaniline	ND	380	77	ug/kg	
98-95-3	Nitrobenzene	ND	190	38	ug/kg	
621-64-7	N-Nitroso-di-n-propylamine	ND	190	38	ug/kg	
86-30-6	N-Nitrosodiphenylamine	ND	190	38	ug/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	190	38	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol	63%		40-102%
4165-62-2	Phenol-d5	68%		41-100%
118-79-6	2,4,6-Tribromophenol	67%		42-108%
4165-60-0	Nitrobenzene-d5	56%		40-105%
321-60-8	2-Fluorobiphenyl	58%		43-107%
1718-51-0	Terphenyl-d14	70%		45-119%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	59SB05B		
Lab Sample ID:	F51300-5	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8270C BY SIM SW846 3550B	Percent Solids:	84.2
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	R09630.D	4	08/07/07	NJ	08/02/07	OP21719	SR455
Run #2							

	Initial Weight	Final Volume
Run #1	30.9 g	1.0 ml
Run #2		

BN PAH List

CAS No.	Compound	Result	RL	MDL	Units	Q (DATA VAL QUALIFIER)
83-32-9	Acenaphthene	ND	310	77	ug/kg	
208-96-8	Acenaphthylene	ND	310	77	ug/kg	
120-12-7	Anthracene	ND	310	46	ug/kg	
56-55-3	Benzo(a)anthracene	ND	61	15	ug/kg	
50-32-8	Benzo(a)pyrene	ND	61	15	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	61	15	ug/kg	
191-24-2	Benzo(g,h,i)perylene	ND	61	15	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	61	15	ug/kg	
218-01-9	Chrysene	ND	61	15	ug/kg	UJ
53-70-3	Dibenzo(a,h)anthracene	ND	61	15	ug/kg	
206-44-0	Fluoranthene	ND	310	54	ug/kg	
86-73-7	Fluorene	ND	310	46	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	61	15	ug/kg	
90-12-0	1-Methylnaphthalene	ND	310	46	ug/kg	UJ
91-57-6	2-Methylnaphthalene	ND	310	46	ug/kg	
91-20-3	Naphthalene	ND	310	46	ug/kg	
85-01-8	Phenanthrene	ND	310	46	ug/kg	
129-00-0	Pyrene	ND	310	54	ug/kg	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	59SB05C		
Lab Sample ID:	F51300-6	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8270C SW846 3550B	Percent Solids:	86.3
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	U003752.D	1	08/03/07	NJ	08/02/07	OP21718	SU183
Run #2							

	Initial Weight	Final Volume
Run #1	30.5 g	1.0 ml
Run #2		

ABN TCL List w/o PAHs

CAS No.	Compound	Result	RL	MDL	Units	Q
65-85-0	Benzoic acid	ND	950	380	ug/kg	
95-57-8	2-Chlorophenol	ND	190	38	ug/kg	
59-50-7	4-Chloro-3-methyl phenol	ND	190	38	ug/kg	
120-83-2	2,4-Dichlorophenol	ND	190	38	ug/kg	
105-67-9	2,4-Dimethylphenol	ND	190	38	ug/kg	
51-28-5	2,4-Dinitrophenol	ND	950	380	ug/kg	
534-52-1	4,6-Dinitro-o-cresol	ND	380	76	ug/kg	
95-48-7	2-Methylphenol	ND	190	38	ug/kg	
	3&4-Methylphenol	ND	190	38	ug/kg	
88-75-5	2-Nitrophenol	ND	190	38	ug/kg	
100-02-7	4-Nitrophenol	ND	950	380	ug/kg	
87-86-5	Pentachlorophenol	ND	950	380	ug/kg	
108-95-2	Phenol	ND	190	38	ug/kg	
95-95-4	2,4,5-Trichlorophenol	ND	190	38	ug/kg	
88-06-2	2,4,6-Trichlorophenol	ND	190	38	ug/kg	
101-55-3	4-Bromophenyl phenyl ether	ND	190	38	ug/kg	
85-68-7	Butyl benzyl phthalate	ND	380	95	ug/kg	
100-51-6	Benzyl Alcohol	ND	190	38	ug/kg	
91-58-7	2-Chloronaphthalene	ND	190	38	ug/kg	
106-47-8	4-Chloroaniline	ND	190	76	ug/kg	
86-74-8	Carbazole	ND	190	38	ug/kg	
111-91-1	bis(2-Chloroethoxy)methane	ND	190	38	ug/kg	
111-44-4	bis(2-Chloroethyl)ether	ND	190	38	ug/kg	
108-60-1	bis(2-Chloroisopropyl)ether	ND	190	38	ug/kg	
7005-72-3	4-Chlorophenyl phenyl ether	ND	190	38	ug/kg	
95-50-1	1,2-Dichlorobenzene	ND	190	38	ug/kg	
541-73-1	1,3-Dichlorobenzene	ND	190	38	ug/kg	
106-46-7	1,4-Dichlorobenzene	ND	190	38	ug/kg	
121-14-2	2,4-Dinitrotoluene	ND	190	38	ug/kg	
606-20-2	2,6-Dinitrotoluene	ND	190	38	ug/kg	
91-94-1	3,3'-Dichlorobenzidine	ND	380	76	ug/kg	
132-64-9	Dibenzofuran	ND	190	38	ug/kg	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	59SB05C		
Lab Sample ID:	F51300-6	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8270C SW846 3550B	Percent Solids:	86.3
Project:	WPA 019 Field Investigation; Radford AAP, VA		

ABN TCL List w/o PAHs

CAS No.	Compound	Result	RL	MDL	Units	Q
84-74-2	Di-n-butyl phthalate	ND	380	95	ug/kg	
117-84-0	Di-n-octyl phthalate	ND	380	95	ug/kg	
84-66-2	Diethyl phthalate	ND	380	190	ug/kg	
131-11-3	Dimethyl phthalate	ND	380	95	ug/kg	
117-81-7	bis(2-Ethylhexyl)phthalate	ND	380	190	ug/kg	
118-74-1	Hexachlorobenzene	ND	190	38	ug/kg	
87-68-3	Hexachlorobutadiene	ND	190	38	ug/kg	
77-47-4	Hexachlorocyclopentadiene	ND	190	38	ug/kg	
67-72-1	Hexachloroethane	ND	190	38	ug/kg	
78-59-1	Isophorone	ND	190	38	ug/kg	
88-74-4	2-Nitroaniline	ND	380	76	ug/kg	
99-09-2	3-Nitroaniline	ND	380	76	ug/kg	
100-01-6	4-Nitroaniline	ND	380	76	ug/kg	
98-95-3	Nitrobenzene	ND	190	38	ug/kg	
621-64-7	N-Nitroso-di-n-propylamine	ND	190	38	ug/kg	
86-30-6	N-Nitrosodiphenylamine	ND	190	38	ug/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	190	38	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol	67%		40-102%
4165-62-2	Phenol-d5	71%		41-100%
118-79-6	2,4,6-Tribromophenol	76%		42-108%
4165-60-0	Nitrobenzene-d5	61%		40-105%
321-60-8	2-Fluorobiphenyl	62%		43-107%
1718-51-0	Terphenyl-d14	78%		45-119%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	59SB05C		
Lab Sample ID:	F51300-6	**Date Sampled:**	07/25/07
Matrix:	SO - Soil	**Date Received:**	07/26/07
Method:	SW846 8270C BY SIM SW846 3550B	**Percent Solids:**	86.3
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	R09631.D	4	08/07/07	NJ	08/02/07	OP21719	SR455
Run #2							

	Initial Weight	Final Volume
Run #1	30.5 g	1.0 ml
Run #2		

BN PAH List

CAS No.	Compound	Result	RL	MDL	Units	Q DATA VAL QUALIFIER
83-32-9	Acenaphthene	ND	300	76	ug/kg	
208-96-8	Acenaphthylene	ND	300	76	ug/kg	
120-12-7	Anthracene	ND	300	46	ug/kg	
56-55-3	Benzo(a)anthracene	ND	61	15	ug/kg	
50-32-8	Benzo(a)pyrene	ND	61	15	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	61	15	ug/kg	
191-24-2	Benzo(g,h,i)perylene	ND	61	15	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	61	15	ug/kg	
218-01-9	Chrysene	ND	61	15	ug/kg	UJ
53-70-3	Dibenzo(a,h)anthracene	ND	61	15	ug/kg	
206-44-0	Fluoranthene	ND	300	53	ug/kg	
86-73-7	Fluorene	ND	300	46	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	61	15	ug/kg	
90-12-0	1-Methylnaphthalene	ND	300	46	ug/kg	UJ
91-57-6	2-Methylnaphthalene	ND	300	46	ug/kg	
91-20-3	Naphthalene	ND	300	46	ug/kg	
85-01-8	Phenanthrene	ND	300	46	ug/kg	
129-00-0	Pyrene	ND	300	53	ug/kg	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	59SB04A		
Lab Sample ID:	F51300-7	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8270C SW846 3550B	Percent Solids:	86.6
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	U003753.D	1	08/03/07	NJ	08/02/07	OP21718	SU183
Run #2							

	Initial Weight	Final Volume
Run #1	30.7 g	1.0 ml
Run #2		

ABN TCL List w/o PAHs

CAS No.	Compound	Result	RL	MDL	Units	Q
65-85-0	Benzoic acid	ND	940	380	ug/kg	
95-57-8	2-Chlorophenol	ND	190	38	ug/kg	
59-50-7	4-Chloro-3-methyl phenol	ND	190	38	ug/kg	
120-83-2	2,4-Dichlorophenol	ND	190	38	ug/kg	
105-67-9	2,4-Dimethylphenol	ND	190	38	ug/kg	
51-28-5	2,4-Dinitrophenol	ND	940	380	ug/kg	
534-52-1	4,6-Dinitro-o-cresol	ND	380	75	ug/kg	
95-48-7	2-Methylphenol	ND	190	38	ug/kg	
	3&4-Methylphenol	ND	190	38	ug/kg	
88-75-5	2-Nitrophenol	ND	190	38	ug/kg	
100-02-7	4-Nitrophenol	ND	940	380	ug/kg	
87-86-5	Pentachlorophenol	ND	940	380	ug/kg	
108-95-2	Phenol	ND	190	38	ug/kg	
95-95-4	2,4,5-Trichlorophenol	ND	190	38	ug/kg	
88-06-2	2,4,6-Trichlorophenol	ND	190	38	ug/kg	
101-55-3	4-Bromophenyl phenyl ether	ND	190	38	ug/kg	
85-68-7	Butyl benzyl phthalate	ND	380	94	ug/kg	
100-51-6	Benzyl Alcohol	ND	190	38	ug/kg	
91-58-7	2-Chloronaphthalene	ND	190	38	ug/kg	
106-47-8	4-Chloroaniline	ND	190	75	ug/kg	
86-74-8	Carbazole	ND	190	38	ug/kg	
111-91-1	bis(2-Chloroethoxy)methane	ND	190	38	ug/kg	
111-44-4	bis(2-Chloroethyl)ether	ND	190	38	ug/kg	
108-60-1	bis(2-Chloroisopropyl)ether	ND	190	38	ug/kg	
7005-72-3	4-Chlorophenyl phenyl ether	ND	190	38	ug/kg	
95-50-1	1,2-Dichlorobenzene	ND	190	38	ug/kg	
541-73-1	1,3-Dichlorobenzene	ND	190	38	ug/kg	
106-46-7	1,4-Dichlorobenzene	ND	190	38	ug/kg	
121-14-2	2,4-Dinitrotoluene	ND	190	38	ug/kg	
606-20-2	2,6-Dinitrotoluene	ND	190	38	ug/kg	
91-94-1	3,3'-Dichlorobenzidine	ND	380	75	ug/kg	
132-64-9	Dibenzofuran	ND	190	38	ug/kg	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	59SB04A		
Lab Sample ID:	F51300-7	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8270C SW846 3550B	Percent Solids:	86.6
Project:	WPA 019 Field Investigation; Radford AAP, VA		

ABN TCL List w/o PAHs

CAS No.	Compound	Result	RL	MDL	Units	Q
84-74-2	Di-n-butyl phthalate	ND	380	94	ug/kg	
117-84-0	Di-n-octyl phthalate	ND	380	94	ug/kg	
84-66-2	Diethyl phthalate	ND	380	190	ug/kg	
131-11-3	Dimethyl phthalate	ND	380	94	ug/kg	
117-81-7	bis(2-Ethylhexyl)phthalate	ND	380	190	ug/kg	
118-74-1	Hexachlorobenzene	ND	190	38	ug/kg	
87-68-3	Hexachlorobutadiene	ND	190	38	ug/kg	
77-47-4	Hexachlorocyclopentadiene	ND	190	38	ug/kg	
67-72-1	Hexachloroethane	ND	190	38	ug/kg	
78-59-1	Isophorone	ND	190	38	ug/kg	
88-74-4	2-Nitroaniline	ND	380	75	ug/kg	
99-09-2	3-Nitroaniline	ND	380	75	ug/kg	
100-01-6	4-Nitroaniline	ND	380	75	ug/kg	
98-95-3	Nitrobenzene	ND	190	38	ug/kg	
621-64-7	N-Nitroso-di-n-propylamine	ND	190	38	ug/kg	
86-30-6	N-Nitrosodiphenylamine	ND	190	38	ug/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	190	38	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol	57%		40-102%
4165-62-2	Phenol-d5	61%		41-100%
118-79-6	2,4,6-Tribromophenol	72%		42-108%
4165-60-0	Nitrobenzene-d5	51%		40-105%
321-60-8	2-Fluorobiphenyl	55%		43-107%
1718-51-0	Terphenyl-d14	72%		45-119%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	59SB04A		
Lab Sample ID:	F51300-7	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8270C BY SIM SW846 3550B	Percent Solids:	86.6
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	R09632.D	4	08/07/07	NJ	08/02/07	OP21719	SR455
Run #2							

	Initial Weight	Final Volume
Run #1	30.7 g	1.0 ml
Run #2		

BN PAH List

CAS No.	Compound	Result	RL	MDL	Units	Q (DATA VAL QUALIFIER)
83-32-9	Acenaphthene	ND	300	75	ug/kg	
208-96-8	Acenaphthylene	ND	300	75	ug/kg	
120-12-7	Anthracene	ND	300	45	ug/kg	
56-55-3	Benzo(a)anthracene	ND	60	15	ug/kg	
50-32-8	Benzo(a)pyrene	ND	60	15	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	60	15	ug/kg	
191-24-2	Benzo(g,h,i)perylene	ND	60	15	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	60	15	ug/kg	
218-01-9	Chrysene	ND	60	15	ug/kg	UJ
53-70-3	Dibenzo(a,h)anthracene	ND	60	15	ug/kg	
206-44-0	Fluoranthene	ND	300	53	ug/kg	
86-73-7	Fluorene	ND	300	45	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	60	15	ug/kg	
90-12-0	1-Methylnaphthalene	ND	300	45	ug/kg	UJ
91-57-6	2-Methylnaphthalene	ND	300	45	ug/kg	
91-20-3	Naphthalene	ND	300	45	ug/kg	
85-01-8	Phenanthrene	ND	300	45	ug/kg	
129-00-0	Pyrene	ND	300	53	ug/kg	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	59SB04B		
Lab Sample ID:	F51300-8	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8270C SW846 3550B	Percent Solids:	83.2
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	U003754.D	1	08/03/07	NJ	08/02/07	OP21718	SU183
Run #2							

	Initial Weight	Final Volume
Run #1	30.0 g	1.0 ml
Run #2		

ABN TCL List w/o PAHs

CAS No.	Compound	Result	RL	MDL	Units	Q
65-85-0	Benzoic acid	ND	1000	400	ug/kg	
95-57-8	2-Chlorophenol	ND	200	40	ug/kg	
59-50-7	4-Chloro-3-methyl phenol	ND	200	40	ug/kg	
120-83-2	2,4-Dichlorophenol	ND	200	40	ug/kg	
105-67-9	2,4-Dimethylphenol	ND	200	40	ug/kg	
51-28-5	2,4-Dinitrophenol	ND	1000	400	ug/kg	
534-52-1	4,6-Dinitro-o-cresol	ND	400	80	ug/kg	
95-48-7	2-Methylphenol	ND	200	40	ug/kg	
	3&4-Methylphenol	ND	200	40	ug/kg	
88-75-5	2-Nitrophenol	ND	200	40	ug/kg	
100-02-7	4-Nitrophenol	ND	1000	400	ug/kg	
87-86-5	Pentachlorophenol	ND	1000	400	ug/kg	
108-95-2	Phenol	ND	200	40	ug/kg	
95-95-4	2,4,5-Trichlorophenol	ND	200	40	ug/kg	
88-06-2	2,4,6-Trichlorophenol	ND	200	40	ug/kg	
101-55-3	4-Bromophenyl phenyl ether	ND	200	40	ug/kg	
85-68-7	Butyl benzyl phthalate	ND	400	100	ug/kg	
100-51-6	Benzyl Alcohol	ND	200	40	ug/kg	
91-58-7	2-Chloronaphthalene	ND	200	40	ug/kg	
106-47-8	4-Chloroaniline	ND	200	80	ug/kg	
86-74-8	Carbazole	ND	200	40	ug/kg	
111-91-1	bis(2-Chloroethoxy)methane	ND	200	40	ug/kg	
111-44-4	bis(2-Chloroethyl)ether	ND	200	40	ug/kg	
108-60-1	bis(2-Chloroisopropyl)ether	ND	200	40	ug/kg	
7005-72-3	4-Chlorophenyl phenyl ether	ND	200	40	ug/kg	
95-50-1	1,2-Dichlorobenzene	ND	200	40	ug/kg	
541-73-1	1,3-Dichlorobenzene	ND	200	40	ug/kg	
106-46-7	1,4-Dichlorobenzene	ND	200	40	ug/kg	
121-14-2	2,4-Dinitrotoluene	ND	200	40	ug/kg	
606-20-2	2,6-Dinitrotoluene	ND	200	40	ug/kg	
91-94-1	3,3'-Dichlorobenzidine	ND	400	80	ug/kg	
132-64-9	Dibenzofuran	ND	200	40	ug/kg	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	59SB04B		
Lab Sample ID:	F51300-8	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8270C SW846 3550B	Percent Solids:	83.2
Project:	WPA 019 Field Investigation; Radford AAP, VA		

ABN TCL List w/o PAHs

CAS No.	Compound	Result	RL	MDL	Units	Q
84-74-2	Di-n-butyl phthalate	ND	400	100	ug/kg	
117-84-0	Di-n-octyl phthalate	ND	400	100	ug/kg	
84-66-2	Diethyl phthalate	ND	400	200	ug/kg	
131-11-3	Dimethyl phthalate	ND	400	100	ug/kg	
117-81-7	bis(2-Ethylhexyl)phthalate	ND	400	200	ug/kg	
118-74-1	Hexachlorobenzene	ND	200	40	ug/kg	
87-68-3	Hexachlorobutadiene	ND	200	40	ug/kg	
77-47-4	Hexachlorocyclopentadiene	ND	200	40	ug/kg	
67-72-1	Hexachloroethane	ND	200	40	ug/kg	
78-59-1	Isophorone	ND	200	40	ug/kg	
88-74-4	2-Nitroaniline	ND	400	80	ug/kg	
99-09-2	3-Nitroaniline	ND	400	80	ug/kg	
100-01-6	4-Nitroaniline	ND	400	80	ug/kg	
98-95-3	Nitrobenzene	ND	200	40	ug/kg	
621-64-7	N-Nitroso-di-n-propylamine	ND	200	40	ug/kg	
86-30-6	N-Nitrosodiphenylamine	ND	200	40	ug/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	200	40	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol	74%		40-102%
4165-62-2	Phenol-d5	78%		41-100%
118-79-6	2,4,6-Tribromophenol	76%		42-108%
4165-60-0	Nitrobenzene-d5	66%		40-105%
321-60-8	2-Fluorobiphenyl	68%		43-107%
1718-51-0	Terphenyl-d14	78%		45-119%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	59SB04B		
Lab Sample ID:	F51300-8	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8270C BY SIM SW846 3550B	Percent Solids:	83.2
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	R09635.D	4	08/07/07	NJ	08/02/07	OP21719	SR455
Run #2							

	Initial Weight	Final Volume
Run #1	30.0 g	1.0 ml
Run #2		

BN PAH List

CAS No.	Compound	Result	RL	MDL	Units	Q
83-32-9	Acenaphthene	ND	320	80	ug/kg	
208-96-8	Acenaphthylene	ND	320	80	ug/kg	
120-12-7	Anthracene	ND	320	48	ug/kg	
56-55-3	Benzo(a)anthracene	ND	64	16	ug/kg	
50-32-8	Benzo(a)pyrene	ND	64	16	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	64	16	ug/kg	
191-24-2	Benzo(g,h,i)perylene	ND	64	16	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	64	16	ug/kg	
218-01-9	Chrysene	ND	64	16	ug/kg	UJ
53-70-3	Dibenzo(a,h)anthracene	ND	64	16	ug/kg	
206-44-0	Fluoranthene	ND	320	56	ug/kg	
86-73-7	Fluorene	ND	320	48	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	64	16	ug/kg	
90-12-0	1-Methylnaphthalene	ND	320	48	ug/kg	UJ
91-57-6	2-Methylnaphthalene	ND	320	48	ug/kg	
91-20-3	Naphthalene	ND	320	48	ug/kg	
85-01-8	Phenanthrene	ND	320	48	ug/kg	
129-00-0	Pyrene	ND	320	56	ug/kg	

DATA VAL QUALIFIER

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	59SB04C		
Lab Sample ID:	F51300-9	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8270C SW846 3550B	Percent Solids:	85.8
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	U003755.D	1	08/03/07	NJ	08/02/07	OP21718	SU183
Run #2							

	Initial Weight	Final Volume
Run #1	30.7 g	1.0 ml
Run #2		

ABN TCL List w/o PAHs

CAS No.	Compound	Result	RL	MDL	Units	Q
65-85-0	Benzoic acid	ND	950	380	ug/kg	
95-57-8	2-Chlorophenol	ND	190	38	ug/kg	
59-50-7	4-Chloro-3-methyl phenol	ND	190	38	ug/kg	
120-83-2	2,4-Dichlorophenol	ND	190	38	ug/kg	
105-67-9	2,4-Dimethylphenol	ND	190	38	ug/kg	
51-28-5	2,4-Dinitrophenol	ND	950	380	ug/kg	
534-52-1	4,6-Dinitro-o-cresol	ND	380	76	ug/kg	
95-48-7	2-Methylphenol	ND	190	38	ug/kg	
	3&4-Methylphenol	ND	190	38	ug/kg	
88-75-5	2-Nitrophenol	ND	190	38	ug/kg	
100-02-7	4-Nitrophenol	ND	950	380	ug/kg	
87-86-5	Pentachlorophenol	ND	950	380	ug/kg	
108-95-2	Phenol	ND	190	38	ug/kg	
95-95-4	2,4,5-Trichlorophenol	ND	190	38	ug/kg	
88-06-2	2,4,6-Trichlorophenol	ND	190	38	ug/kg	
101-55-3	4-Bromophenyl phenyl ether	ND	190	38	ug/kg	
85-68-7	Butyl benzyl phthalate	ND	380	95	ug/kg	
100-51-6	Benzyl Alcohol	ND	190	38	ug/kg	
91-58-7	2-Chloronaphthalene	ND	190	38	ug/kg	
106-47-8	4-Chloroaniline	ND	190	76	ug/kg	
86-74-8	Carbazole	ND	190	38	ug/kg	
111-91-1	bis(2-Chloroethoxy)methane	ND	190	38	ug/kg	
111-44-4	bis(2-Chloroethyl)ether	ND	190	38	ug/kg	
108-60-1	bis(2-Chloroisopropyl)ether	ND	190	38	ug/kg	
7005-72-3	4-Chlorophenyl phenyl ether	ND	190	38	ug/kg	
95-50-1	1,2-Dichlorobenzene	ND	190	38	ug/kg	
541-73-1	1,3-Dichlorobenzene	ND	190	38	ug/kg	
106-46-7	1,4-Dichlorobenzene	ND	190	38	ug/kg	
121-14-2	2,4-Dinitrotoluene	ND	190	38	ug/kg	
606-20-2	2,6-Dinitrotoluene	ND	190	38	ug/kg	
91-94-1	3,3'-Dichlorobenzidine	ND	380	76	ug/kg	
132-64-9	Dibenzofuran	ND	190	38	ug/kg	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	59SB04C		
Lab Sample ID:	F51300-9	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8270C SW846 3550B	Percent Solids:	85.8
Project:	WPA 019 Field Investigation; Radford AAP, VA		

ABN TCL List w/o PAHs

CAS No.	Compound	Result	RL	MDL	Units	Q
84-74-2	Di-n-butyl phthalate	ND	380	95	ug/kg	
117-84-0	Di-n-octyl phthalate	ND	380	95	ug/kg	
84-66-2	Diethyl phthalate	ND	380	190	ug/kg	
131-11-3	Dimethyl phthalate	ND	380	95	ug/kg	
117-81-7	bis(2-Ethylhexyl)phthalate	ND	380	190	ug/kg	
118-74-1	Hexachlorobenzene	ND	190	38	ug/kg	
87-68-3	Hexachlorobutadiene	ND	190	38	ug/kg	
77-47-4	Hexachlorocyclopentadiene	ND	190	38	ug/kg	
67-72-1	Hexachloroethane	ND	190	38	ug/kg	
78-59-1	Isophorone	ND	190	38	ug/kg	
88-74-4	2-Nitroaniline	ND	380	76	ug/kg	
99-09-2	3-Nitroaniline	ND	380	76	ug/kg	
100-01-6	4-Nitroaniline	ND	380	76	ug/kg	
98-95-3	Nitrobenzene	ND	190	38	ug/kg	
621-64-7	N-Nitroso-di-n-propylamine	ND	190	38	ug/kg	
86-30-6	N-Nitrosodiphenylamine	ND	190	38	ug/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	190	38	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol	69%		40-102%
4165-62-2	Phenol-d5	74%		41-100%
118-79-6	2,4,6-Tribromophenol	82%		42-108%
4165-60-0	Nitrobenzene-d5	63%		40-105%
321-60-8	2-Fluorobiphenyl	68%		43-107%
1718-51-0	Terphenyl-d14	89%		45-119%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	59SB04C		
Lab Sample ID:	F51300-9	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8270C BY SIM SW846 3550B	Percent Solids:	85.8
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	R09636.D	4	08/07/07	NJ	08/02/07	OP21719	SR455
Run #2							

	Initial Weight	Final Volume
Run #1	30.7 g	1.0 ml
Run #2		

BN PAH List

CAS No.	Compound	Result	RL	MDL	Units	Q (DMA VAL QUALIFIER)
83-32-9	Acenaphthene	ND	300	76	ug/kg	
208-96-8	Acenaphthylene	ND	300	76	ug/kg	
120-12-7	Anthracene	ND	300	46	ug/kg	
56-55-3	Benzo(a)anthracene	ND	61	15	ug/kg	
50-32-8	Benzo(a)pyrene	ND	61	15	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	61	15	ug/kg	
191-24-2	Benzo(g,h,i)perylene	ND	61	15	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	61	15	ug/kg	
218-01-9	Chrysene	ND	61	15	ug/kg	UJ
53-70-3	Dibenzo(a,h)anthracene	ND	61	15	ug/kg	
206-44-0	Fluoranthene	ND	300	53	ug/kg	
86-73-7	Fluorene	ND	300	46	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	61	15	ug/kg	
90-12-0	1-Methylnaphthalene	ND	300	46	ug/kg	UJ
91-57-6	2-Methylnaphthalene	ND	300	46	ug/kg	
91-20-3	Naphthalene	ND	300	46	ug/kg	
85-01-8	Phenanthrene	ND	300	46	ug/kg	
129-00-0	Pyrene	ND	300	53	ug/kg	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	TMSB04C		
Lab Sample ID:	F51300-10	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8270C SW846 3550B	Percent Solids:	83.9
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	U003756.D	1	08/03/07	NJ	08/02/07	OP21718	SU183
Run #2							

	Initial Weight	Final Volume
Run #1	30.3 g	1.0 ml
Run #2		

ABN TCL List w/o PAHs

CAS No.	Compound	Result	RL	MDL	Units	Q
65-85-0	Benzoic acid	ND	980	390	ug/kg	
95-57-8	2-Chlorophenol	ND	200	39	ug/kg	
59-50-7	4-Chloro-3-methyl phenol	ND	200	39	ug/kg	
120-83-2	2,4-Dichlorophenol	ND	200	39	ug/kg	
105-67-9	2,4-Dimethylphenol	ND	200	39	ug/kg	
51-28-5	2,4-Dinitrophenol	ND	980	390	ug/kg	
534-52-1	4,6-Dinitro-o-cresol	ND	390	79	ug/kg	
95-48-7	2-Methylphenol	ND	200	39	ug/kg	
	3&4-Methylphenol	ND	200	39	ug/kg	
88-75-5	2-Nitrophenol	ND	200	39	ug/kg	
100-02-7	4-Nitrophenol	ND	980	390	ug/kg	
87-86-5	Pentachlorophenol	ND	980	390	ug/kg	
108-95-2	Phenol	ND	200	39	ug/kg	
95-95-4	2,4,5-Trichlorophenol	ND	200	39	ug/kg	
88-06-2	2,4,6-Trichlorophenol	ND	200	39	ug/kg	
101-55-3	4-Bromophenyl phenyl ether	ND	200	39	ug/kg	
85-68-7	Butyl benzyl phthalate	ND	390	98	ug/kg	
100-51-6	Benzyl Alcohol	ND	200	39	ug/kg	
91-58-7	2-Chloronaphthalene	ND	200	39	ug/kg	
106-47-8	4-Chloroaniline	ND	200	79	ug/kg	
86-74-8	Carbazole	ND	200	39	ug/kg	
111-91-1	bis(2-Chloroethoxy)methane	ND	200	39	ug/kg	
111-44-4	bis(2-Chloroethyl)ether	ND	200	39	ug/kg	
108-60-1	bis(2-Chloroisopropyl)ether	ND	200	39	ug/kg	
7005-72-3	4-Chlorophenyl phenyl ether	ND	200	39	ug/kg	
95-50-1	1,2-Dichlorobenzene	ND	200	39	ug/kg	
541-73-1	1,3-Dichlorobenzene	ND	200	39	ug/kg	
106-46-7	1,4-Dichlorobenzene	ND	200	39	ug/kg	
121-14-2	2,4-Dinitrotoluene	ND	200	39	ug/kg	
606-20-2	2,6-Dinitrotoluene	ND	200	39	ug/kg	
91-94-1	3,3'-Dichlorobenzidine	ND	390	79	ug/kg	
132-64-9	Dibenzofuran	ND	200	39	ug/kg	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	TMSB04C		
Lab Sample ID:	F51300-10	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8270C SW846 3550B	Percent Solids:	83.9
Project:	WPA 019 Field Investigation; Radford AAP, VA		

ABN TCL List w/o PAHs

CAS No.	Compound	Result	RL	MDL	Units	Q
84-74-2	Di-n-butyl phthalate	ND	390	98	ug/kg	
117-84-0	Di-n-octyl phthalate	ND	390	98	ug/kg	
84-66-2	Diethyl phthalate	ND	390	200	ug/kg	
131-11-3	Dimethyl phthalate	ND	390	98	ug/kg	
117-81-7	bis(2-Ethylhexyl)phthalate	ND	390	200	ug/kg	
118-74-1	Hexachlorobenzene	ND	200	39	ug/kg	
87-68-3	Hexachlorobutadiene	ND	200	39	ug/kg	
77-47-4	Hexachlorocyclopentadiene	ND	200	39	ug/kg	
67-72-1	Hexachloroethane	ND	200	39	ug/kg	
78-59-1	Isophorone	ND	200	39	ug/kg	
88-74-4	2-Nitroaniline	ND	390	79	ug/kg	
99-09-2	3-Nitroaniline	ND	390	79	ug/kg	
100-01-6	4-Nitroaniline	ND	390	79	ug/kg	
98-95-3	Nitrobenzene	ND	200	39	ug/kg	
621-64-7	N-Nitroso-di-n-propylamine	ND	200	39	ug/kg	
86-30-6	N-Nitrosodiphenylamine	ND	200	39	ug/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	200	39	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol	63%		40-102%
4165-62-2	Phenol-d5	68%		41-100%
118-79-6	2,4,6-Tribromophenol	70%		42-108%
4165-60-0	Nitrobenzene-d5	57%		40-105%
321-60-8	2-Fluorobiphenyl	59%		43-107%
1718-51-0	Terphenyl-d14	74%		45-119%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	TMSB04C		
Lab Sample ID:	F51300-10	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8270C BY SIM SW846 3550B	Percent Solids:	83.9
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	R09637.D	4	08/07/07	NJ	08/02/07	OP21719	SR455
Run #2							

	Initial Weight	Final Volume
Run #1	30.3 g	1.0 ml
Run #2		

BN PAH List

CAS No.	Compound	Result	RL	MDL	Units	Q
83-32-9	Acenaphthene	ND	310	79	ug/kg	
208-96-8	Acenaphthylene	ND	310	79	ug/kg	
120-12-7	Anthracene	ND	310	47	ug/kg	
56-55-3	Benzo(a)anthracene	ND	63	16	ug/kg	
50-32-8	Benzo(a)pyrene	ND	63	16	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	63	16	ug/kg	
191-24-2	Benzo(g,h,i)perylene	ND	63	16	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	63	16	ug/kg	
218-01-9	Chrysene	ND	63	16	ug/kg	UJ
53-70-3	Dibenzo(a,h)anthracene	ND	63	16	ug/kg	
206-44-0	Fluoranthene	ND	310	55	ug/kg	
86-73-7	Fluorene	ND	310	47	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	63	16	ug/kg	
90-12-0	1-Methylnaphthalene	ND	310	47	ug/kg	UJ
91-57-6	2-Methylnaphthalene	ND	310	47	ug/kg	
91-20-3	Naphthalene	ND	310	47	ug/kg	
85-01-8	Phenanthrene	ND	310	47	ug/kg	
129-00-0	Pyrene	ND	310	55	ug/kg	

DATA VAL QUALIFIER

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	59SB02A		
Lab Sample ID:	F51300-11	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8270C SW846 3550B	Percent Solids:	89.5
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	U003757.D	1	08/03/07	NJ	08/02/07	OP21718	SU183
Run #2							

	Initial Weight	Final Volume
Run #1	30.8 g	1.0 ml
Run #2		

ABN TCL List w/o PAHs

CAS No.	Compound	Result	RL	MDL	Units	Q
65-85-0	Benzoic acid	ND	910	360	ug/kg	
95-57-8	2-Chlorophenol	ND	180	36	ug/kg	
59-50-7	4-Chloro-3-methyl phenol	ND	180	36	ug/kg	
120-83-2	2,4-Dichlorophenol	ND	180	36	ug/kg	
105-67-9	2,4-Dimethylphenol	ND	180	36	ug/kg	
51-28-5	2,4-Dinitrophenol	ND	910	360	ug/kg	
534-52-1	4,6-Dinitro-o-cresol	ND	360	73	ug/kg	
95-48-7	2-Methylphenol	ND	180	36	ug/kg	
	3&4-Methylphenol	ND	180	36	ug/kg	
88-75-5	2-Nitrophenol	ND	180	36	ug/kg	
100-02-7	4-Nitrophenol	ND	910	360	ug/kg	
87-86-5	Pentachlorophenol	ND	910	360	ug/kg	
108-95-2	Phenol	ND	180	36	ug/kg	
95-95-4	2,4,5-Trichlorophenol	ND	180	36	ug/kg	
88-06-2	2,4,6-Trichlorophenol	ND	180	36	ug/kg	
101-55-3	4-Bromophenyl phenyl ether	ND	180	36	ug/kg	
85-68-7	Butyl benzyl phthalate	ND	360	91	ug/kg	
100-51-6	Benzyl Alcohol	ND	180	36	ug/kg	
91-58-7	2-Chloronaphthalene	ND	180	36	ug/kg	
106-47-8	4-Chloroaniline	ND	180	73	ug/kg	
86-74-8	Carbazole	ND	180	36	ug/kg	
111-91-1	bis(2-Chloroethoxy)methane	ND	180	36	ug/kg	
111-44-4	bis(2-Chloroethyl)ether	ND	180	36	ug/kg	
108-60-1	bis(2-Chloroisopropyl)ether	ND	180	36	ug/kg	
7005-72-3	4-Chlorophenyl phenyl ether	ND	180	36	ug/kg	
95-50-1	1,2-Dichlorobenzene	ND	180	36	ug/kg	
541-73-1	1,3-Dichlorobenzene	ND	180	36	ug/kg	
106-46-7	1,4-Dichlorobenzene	ND	180	36	ug/kg	
121-14-2	2,4-Dinitrotoluene	ND	180	36	ug/kg	
606-20-2	2,6-Dinitrotoluene	ND	180	36	ug/kg	
91-94-1	3,3'-Dichlorobenzidine	ND	360	73	ug/kg	
132-64-9	Dibenzofuran	ND	180	36	ug/kg	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	59SB02A		
Lab Sample ID:	F51300-11	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8270C SW846 3550B	Percent Solids:	89.5
Project:	WPA 019 Field Investigation; Radford AAP, VA		

ABN TCL List w/o PAHs

CAS No.	Compound	Result	RL	MDL	Units	Q
84-74-2	Di-n-butyl phthalate	ND	360	91	ug/kg	
117-84-0	Di-n-octyl phthalate	ND	360	91	ug/kg	
84-66-2	Diethyl phthalate	ND	360	180	ug/kg	
131-11-3	Dimethyl phthalate	ND	360	91	ug/kg	
117-81-7	bis(2-Ethylhexyl)phthalate	ND	360	180	ug/kg	
118-74-1	Hexachlorobenzene	ND	180	36	ug/kg	
87-68-3	Hexachlorobutadiene	ND	180	36	ug/kg	
77-47-4	Hexachlorocyclopentadiene	ND	180	36	ug/kg	
67-72-1	Hexachloroethane	ND	180	36	ug/kg	
78-59-1	Isophorone	ND	180	36	ug/kg	
88-74-4	2-Nitroaniline	ND	360	73	ug/kg	
99-09-2	3-Nitroaniline	ND	360	73	ug/kg	
100-01-6	4-Nitroaniline	ND	360	73	ug/kg	
98-95-3	Nitrobenzene	ND	180	36	ug/kg	
621-64-7	N-Nitroso-di-n-propylamine	ND	180	36	ug/kg	
86-30-6	N-Nitrosodiphenylamine	ND	180	36	ug/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	180	36	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol	74%		40-102%
4165-62-2	Phenol-d5	79%		41-100%
118-79-6	2,4,6-Tribromophenol	80%		42-108%
4165-60-0	Nitrobenzene-d5	66%		40-105%
321-60-8	2-Fluorobiphenyl	69%		43-107%
1718-51-0	Terphenyl-d14	80%		45-119%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: R09638.D

Accutest Laboratories

Report of Analysis

Client Sample ID:	59SB02A		
Lab Sample ID:	F51300-11	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8270C BY SIM SW846 3550B	Percent Solids:	89.5
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	R09638.D	4	08/07/07	NJ	08/02/07	OP21719	SR455
Run #2							

	Initial Weight	Final Volume
Run #1	30.8 g	1.0 ml
Run #2		

BN PAH List

DATA VAL QUALIFIER

CAS No.	Compound	Result	RL	MDL	Units	Q	
83-32-9	Acenaphthene	ND	290	73	ug/kg		
208-96-8	Acenaphthylene	ND	290	73	ug/kg		
120-12-7	Anthracene	ND	290	44	ug/kg		
56-55-3	Benzo(a)anthracene	ND	58	15	ug/kg		
50-32-8	Benzo(a)pyrene	ND	58	15	ug/kg		
205-99-2	Benzo(b)fluoranthene	16.6	58	15	ug/kg	J	J
191-24-2	Benzo(g,h,i)perylene	ND	58	15	ug/kg		
207-08-9	Benzo(k)fluoranthene	ND	58	15	ug/kg		
218-01-9	Chrysene	19.4	58	15	ug/kg	J	J
53-70-3	Dibenzo(a,h)anthracene	ND	58	15	ug/kg		
206-44-0	Fluoranthene	ND	290	51	ug/kg		
86-73-7	Fluorene	ND	290	44	ug/kg		
193-39-5	Indeno(1,2,3-cd)pyrene	ND	58	15	ug/kg		
90-12-0	1-Methylnaphthalene	ND	290	44	ug/kg		UJ
91-57-6	2-Methylnaphthalene	ND	290	44	ug/kg		
91-20-3	Naphthalene	ND	290	44	ug/kg		
85-01-8	Phenanthrene	ND	290	44	ug/kg		
129-00-0	Pyrene	ND	290	51	ug/kg		

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	59SB02B		
Lab Sample ID:	F51300-12	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8270C SW846 3550B	Percent Solids:	83.3
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	U003758.D	1	08/03/07	NJ	08/02/07	OP21718	SU183
Run #2							

	Initial Weight	Final Volume
Run #1	30.2 g	1.0 ml
Run #2		

ABN TCL List w/o PAHs

CAS No.	Compound	Result	RL	MDL	Units	Q
65-85-0	Benzoic acid	ND	990	400	ug/kg	
95-57-8	2-Chlorophenol	ND	200	40	ug/kg	
59-50-7	4-Chloro-3-methyl phenol	ND	200	40	ug/kg	
120-83-2	2,4-Dichlorophenol	ND	200	40	ug/kg	
105-67-9	2,4-Dimethylphenol	ND	200	40	ug/kg	
51-28-5	2,4-Dinitrophenol	ND	990	400	ug/kg	
534-52-1	4,6-Dinitro-o-cresol	ND	400	80	ug/kg	
95-48-7	2-Methylphenol	ND	200	40	ug/kg	
	3&4-Methylphenol	ND	200	40	ug/kg	
88-75-5	2-Nitrophenol	ND	200	40	ug/kg	
100-02-7	4-Nitrophenol	ND	990	400	ug/kg	
87-86-5	Pentachlorophenol	ND	990	400	ug/kg	
108-95-2	Phenol	ND	200	40	ug/kg	
95-95-4	2,4,5-Trichlorophenol	ND	200	40	ug/kg	
88-06-2	2,4,6-Trichlorophenol	ND	200	40	ug/kg	
101-55-3	4-Bromophenyl phenyl ether	ND	200	40	ug/kg	
85-68-7	Butyl benzyl phthalate	ND	400	99	ug/kg	
100-51-6	Benzyl Alcohol	ND	200	40	ug/kg	
91-58-7	2-Chloronaphthalene	ND	200	40	ug/kg	
106-47-8	4-Chloroaniline	ND	200	80	ug/kg	
86-74-8	Carbazole	ND	200	40	ug/kg	
111-91-1	bis(2-Chloroethoxy)methane	ND	200	40	ug/kg	
111-44-4	bis(2-Chloroethyl)ether	ND	200	40	ug/kg	
108-60-1	bis(2-Chloroisopropyl)ether	ND	200	40	ug/kg	
7005-72-3	4-Chlorophenyl phenyl ether	ND	200	40	ug/kg	
95-50-1	1,2-Dichlorobenzene	ND	200	40	ug/kg	
541-73-1	1,3-Dichlorobenzene	ND	200	40	ug/kg	
106-46-7	1,4-Dichlorobenzene	ND	200	40	ug/kg	
121-14-2	2,4-Dinitrotoluene	ND	200	40	ug/kg	
606-20-2	2,6-Dinitrotoluene	ND	200	40	ug/kg	
91-94-1	3,3'-Dichlorobenzidine	ND	400	80	ug/kg	
132-64-9	Dibenzofuran	ND	200	40	ug/kg	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	59SB02B		
Lab Sample ID:	F51300-12	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8270C SW846 3550B	Percent Solids:	83.3
Project:	WPA 019 Field Investigation; Radford AAP, VA		

ABN TCL List w/o PAHs

CAS No.	Compound	Result	RL	MDL	Units	Q
84-74-2	Di-n-butyl phthalate	ND	400	99	ug/kg	
117-84-0	Di-n-octyl phthalate	ND	400	99	ug/kg	
84-66-2	Diethyl phthalate	ND	400	200	ug/kg	
131-11-3	Dimethyl phthalate	ND	400	99	ug/kg	
117-81-7	bis(2-Ethylhexyl)phthalate	ND	400	200	ug/kg	
118-74-1	Hexachlorobenzene	ND	200	40	ug/kg	
87-68-3	Hexachlorobutadiene	ND	200	40	ug/kg	
77-47-4	Hexachlorocyclopentadiene	ND	200	40	ug/kg	
67-72-1	Hexachloroethane	ND	200	40	ug/kg	
78-59-1	Isophorone	ND	200	40	ug/kg	
88-74-4	2-Nitroaniline	ND	400	80	ug/kg	
99-09-2	3-Nitroaniline	ND	400	80	ug/kg	
100-01-6	4-Nitroaniline	ND	400	80	ug/kg	
98-95-3	Nitrobenzene	ND	200	40	ug/kg	
621-64-7	N-Nitroso-di-n-propylamine	ND	200	40	ug/kg	
86-30-6	N-Nitrosodiphenylamine	ND	200	40	ug/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	200	40	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol	62%		40-102%
4165-62-2	Phenol-d5	68%		41-100%
118-79-6	2,4,6-Tribromophenol	70%		42-108%
4165-60-0	Nitrobenzene-d5	51%		40-105%
321-60-8	2-Fluorobiphenyl	52%		43-107%
1718-51-0	Terphenyl-d14	71%		45-119%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	59SB02B		
Lab Sample ID:	F51300-12	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8270C BY SIM SW846 3550B	Percent Solids:	83.3
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	R09639.D	4	08/07/07	NJ	08/02/07	OP21719	SR455
Run #2							

	Initial Weight	Final Volume
Run #1	30.2 g	1.0 ml
Run #2		

BN PAH List

CAS No.	Compound	Result	RL	MDL	Units	Q (DATA VAL QUALIFIER)
83-32-9	Acenaphthene	ND	320	80	ug/kg	
208-96-8	Acenaphthylene	ND	320	80	ug/kg	
120-12-7	Anthracene	ND	320	48	ug/kg	
56-55-3	Benzo(a)anthracene	ND	64	16	ug/kg	
50-32-8	Benzo(a)pyrene	ND	64	16	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	64	16	ug/kg	
191-24-2	Benzo(g,h,i)perylene	ND	64	16	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	64	16	ug/kg	
218-01-9	Chrysene	ND	64	16	ug/kg	UJ
53-70-3	Dibenzo(a,h)anthracene	ND	64	16	ug/kg	
206-44-0	Fluoranthene	ND	320	56	ug/kg	
86-73-7	Fluorene	ND	320	48	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	64	16	ug/kg	
90-12-0	1-Methylnaphthalene	ND	320	48	ug/kg	UJ
91-57-6	2-Methylnaphthalene	ND	320	48	ug/kg	
91-20-3	Naphthalene	ND	320	48	ug/kg	
85-01-8	Phenanthrene	ND	320	48	ug/kg	
129-00-0	Pyrene	ND	320	56	ug/kg	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	TMSB02B		
Lab Sample ID:	F51300-13	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8270C SW846 3550B	Percent Solids:	85.3
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	U003759.D	1	08/03/07	NJ	08/02/07	OP21718	SU183
Run #2							

	Initial Weight	Final Volume
Run #1	30.2 g	1.0 ml
Run #2		

ABN TCL List w/o PAHs

CAS No.	Compound	Result	RL	MDL	Units	Q
65-85-0	Benzoic acid	ND	970	390	ug/kg	
95-57-8	2-Chlorophenol	ND	190	39	ug/kg	
59-50-7	4-Chloro-3-methyl phenol	ND	190	39	ug/kg	
120-83-2	2,4-Dichlorophenol	ND	190	39	ug/kg	
105-67-9	2,4-Dimethylphenol	ND	190	39	ug/kg	
51-28-5	2,4-Dinitrophenol	ND	970	390	ug/kg	
534-52-1	4,6-Dinitro-o-cresol	ND	390	78	ug/kg	
95-48-7	2-Methylphenol	ND	190	39	ug/kg	
	3&4-Methylphenol	ND	190	39	ug/kg	
88-75-5	2-Nitrophenol	ND	190	39	ug/kg	
100-02-7	4-Nitrophenol	ND	970	390	ug/kg	
87-86-5	Pentachlorophenol	ND	970	390	ug/kg	
108-95-2	Phenol	ND	190	39	ug/kg	
95-95-4	2,4,5-Trichlorophenol	ND	190	39	ug/kg	
88-06-2	2,4,6-Trichlorophenol	ND	190	39	ug/kg	
101-55-3	4-Bromophenyl phenyl ether	ND	190	39	ug/kg	
85-68-7	Butyl benzyl phthalate	ND	390	97	ug/kg	
100-51-6	Benzyl Alcohol	ND	190	39	ug/kg	
91-58-7	2-Chloronaphthalene	ND	190	39	ug/kg	
106-47-8	4-Chloroaniline	ND	190	78	ug/kg	
86-74-8	Carbazole	ND	190	39	ug/kg	
111-91-1	bis(2-Chloroethoxy)methane	ND	190	39	ug/kg	
111-44-4	bis(2-Chloroethyl)ether	ND	190	39	ug/kg	
108-60-1	bis(2-Chloroisopropyl)ether	ND	190	39	ug/kg	
7005-72-3	4-Chlorophenyl phenyl ether	ND	190	39	ug/kg	
95-50-1	1,2-Dichlorobenzene	ND	190	39	ug/kg	
541-73-1	1,3-Dichlorobenzene	ND	190	39	ug/kg	
106-46-7	1,4-Dichlorobenzene	ND	190	39	ug/kg	
121-14-2	2,4-Dinitrotoluene	ND	190	39	ug/kg	
606-20-2	2,6-Dinitrotoluene	ND	190	39	ug/kg	
91-94-1	3,3'-Dichlorobenzidine	ND	390	78	ug/kg	
132-64-9	Dibenzofuran	ND	190	39	ug/kg	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	TMSB02B		
Lab Sample ID:	F51300-13	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8270C SW846 3550B	Percent Solids:	85.3
Project:	WPA 019 Field Investigation; Radford AAP, VA		

ABN TCL List w/o PAHs

CAS No.	Compound	Result	RL	MDL	Units	Q
84-74-2	Di-n-butyl phthalate	ND	390	97	ug/kg	
117-84-0	Di-n-octyl phthalate	ND	390	97	ug/kg	
84-66-2	Diethyl phthalate	ND	390	190	ug/kg	
131-11-3	Dimethyl phthalate	ND	390	97	ug/kg	
117-81-7	bis(2-Ethylhexyl)phthalate	ND	390	190	ug/kg	
118-74-1	Hexachlorobenzene	ND	190	39	ug/kg	
87-68-3	Hexachlorobutadiene	ND	190	39	ug/kg	
77-47-4	Hexachlorocyclopentadiene	ND	190	39	ug/kg	
67-72-1	Hexachloroethane	ND	190	39	ug/kg	
78-59-1	Isophorone	ND	190	39	ug/kg	
88-74-4	2-Nitroaniline	ND	390	78	ug/kg	
99-09-2	3-Nitroaniline	ND	390	78	ug/kg	
100-01-6	4-Nitroaniline	ND	390	78	ug/kg	
98-95-3	Nitrobenzene	ND	190	39	ug/kg	
621-64-7	N-Nitroso-di-n-propylamine	ND	190	39	ug/kg	
86-30-6	N-Nitrosodiphenylamine	ND	190	39	ug/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	190	39	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol	61%		40-102%
4165-62-2	Phenol-d5	66%		41-100%
118-79-6	2,4,6-Tribromophenol	69%		42-108%
4165-60-0	Nitrobenzene-d5	53%		40-105%
321-60-8	2-Fluorobiphenyl	56%		43-107%
1718-51-0	Terphenyl-d14	71%		45-119%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	TMSB02B		
Lab Sample ID:	F51300-13	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8270C BY SIM SW846 3550B	Percent Solids:	85.3
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	R09640.D	4	08/07/07	NJ	08/02/07	OP21719	SR455
Run #2							

	Initial Weight	Final Volume
Run #1	30.2 g	1.0 ml
Run #2		

BN PAH List

CAS No.	Compound	Result	RL	MDL	Units	Q (DATA VAL QUALIFIER)
83-32-9	Acenaphthene	ND	310	78	ug/kg	
208-96-8	Acenaphthylene	ND	310	78	ug/kg	
120-12-7	Anthracene	ND	310	47	ug/kg	
56-55-3	Benzo(a)anthracene	ND	62	16	ug/kg	
50-32-8	Benzo(a)pyrene	ND	62	16	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	62	16	ug/kg	
191-24-2	Benzo(g,h,i)perylene	ND	62	16	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	62	16	ug/kg	
218-01-9	Chrysene	ND	62	16	ug/kg	UJ
53-70-3	Dibenzo(a,h)anthracene	ND	62	16	ug/kg	
206-44-0	Fluoranthene	ND	310	54	ug/kg	
86-73-7	Fluorene	ND	310	47	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	62	16	ug/kg	
90-12-0	1-Methylnaphthalene	ND	310	47	ug/kg	UJ
91-57-6	2-Methylnaphthalene	ND	310	47	ug/kg	
91-20-3	Naphthalene	ND	310	47	ug/kg	
85-01-8	Phenanthrene	ND	310	47	ug/kg	
129-00-0	Pyrene	ND	310	54	ug/kg	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: U003782.D

Accutest Laboratories

Report of Analysis

Client Sample ID:	59SB02C		
Lab Sample ID:	F51300-14	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8270C SW846 3550B	Percent Solids:	83.2
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	U003782.D	1	08/06/07	NJ	08/02/07	OP21718	SU184
Run #2							

	Initial Weight	Final Volume
Run #1	30.7 g	1.0 ml
Run #2		

ABN TCL List w/o PAHs

CAS No.	Compound	Result	RL	MDL	Units	Q
65-85-0	Benzoic acid	ND	980	390	ug/kg	
95-57-8	2-Chlorophenol	ND	200	39	ug/kg	
59-50-7	4-Chloro-3-methyl phenol	ND	200	39	ug/kg	
120-83-2	2,4-Dichlorophenol	ND	200	39	ug/kg	
105-67-9	2,4-Dimethylphenol	ND	200	39	ug/kg	
51-28-5	2,4-Dinitrophenol	ND	980	390	ug/kg	
534-52-1	4,6-Dinitro-o-cresol	ND	390	78	ug/kg	
95-48-7	2-Methylphenol	ND	200	39	ug/kg	
	3&4-Methylphenol	ND	200	39	ug/kg	
88-75-5	2-Nitrophenol	ND	200	39	ug/kg	
100-02-7	4-Nitrophenol	ND	980	390	ug/kg	
87-86-5	Pentachlorophenol	ND	980	390	ug/kg	
108-95-2	Phenol	ND	200	39	ug/kg	
95-95-4	2,4,5-Trichlorophenol	ND	200	39	ug/kg	
88-06-2	2,4,6-Trichlorophenol	ND	200	39	ug/kg	
101-55-3	4-Bromophenyl phenyl ether	ND	200	39	ug/kg	
85-68-7	Butyl benzyl phthalate	ND	390	98	ug/kg	
100-51-6	Benzyl Alcohol	ND	200	39	ug/kg	
91-58-7	2-Chloronaphthalene	ND	200	39	ug/kg	
106-47-8	4-Chloroaniline	ND	200	78	ug/kg	
86-74-8	Carbazole	ND	200	39	ug/kg	
111-91-1	bis(2-Chloroethoxy)methane	ND	200	39	ug/kg	
111-44-4	bis(2-Chloroethyl)ether	ND	200	39	ug/kg	
108-60-1	bis(2-Chloroisopropyl)ether	ND	200	39	ug/kg	
7005-72-3	4-Chlorophenyl phenyl ether	ND	200	39	ug/kg	
95-50-1	1,2-Dichlorobenzene	ND	200	39	ug/kg	
541-73-1	1,3-Dichlorobenzene	ND	200	39	ug/kg	
106-46-7	1,4-Dichlorobenzene	ND	200	39	ug/kg	
121-14-2	2,4-Dinitrotoluene	ND	200	39	ug/kg	
606-20-2	2,6-Dinitrotoluene	ND	200	39	ug/kg	
91-94-1	3,3'-Dichlorobenzidine	ND	390	78	ug/kg	
132-64-9	Dibenzofuran	ND	200	39	ug/kg	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	59SB02C		
Lab Sample ID:	F51300-14	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8270C SW846 3550B	Percent Solids:	83.2
Project:	WPA 019 Field Investigation; Radford AAP, VA		

ABN TCL List w/o PAHs

CAS No.	Compound	Result	RL	MDL	Units	Q
84-74-2	Di-n-butyl phthalate	ND	390	98	ug/kg	
117-84-0	Di-n-octyl phthalate	ND	390	98	ug/kg	
84-66-2	Diethyl phthalate	ND	390	200	ug/kg	
131-11-3	Dimethyl phthalate	ND	390	98	ug/kg	
117-81-7	bis(2-Ethylhexyl)phthalate	ND	390	200	ug/kg	
118-74-1	Hexachlorobenzene	ND	200	39	ug/kg	
87-68-3	Hexachlorobutadiene	ND	200	39	ug/kg	
77-47-4	Hexachlorocyclopentadiene	ND	200	39	ug/kg	
67-72-1	Hexachloroethane	ND	200	39	ug/kg	
78-59-1	Isophorone	ND	200	39	ug/kg	
88-74-4	2-Nitroaniline	ND	390	78	ug/kg	
99-09-2	3-Nitroaniline	ND	390	78	ug/kg	
100-01-6	4-Nitroaniline	ND	390	78	ug/kg	
98-95-3	Nitrobenzene	ND	200	39	ug/kg	
621-64-7	N-Nitroso-di-n-propylamine	ND	200	39	ug/kg	
86-30-6	N-Nitrosodiphenylamine	ND	200	39	ug/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	200	39	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol	64%		40-102%
4165-62-2	Phenol-d5	66%		41-100%
118-79-6	2,4,6-Tribromophenol	70%		42-108%
4165-60-0	Nitrobenzene-d5	57%		40-105%
321-60-8	2-Fluorobiphenyl	61%		43-107%
1718-51-0	Terphenyl-d14	71%		45-119%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: R09641.D

Accutest Laboratories

Report of Analysis

Client Sample ID:	59SB02C		
Lab Sample ID:	F51300-14	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8270C BY SIM SW846 3550B	Percent Solids:	83.2
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	R09641.D	4	08/07/07	NJ	08/02/07	OP21719	SR455
Run #2							

	Initial Weight	Final Volume
Run #1	30.7 g	1.0 ml
Run #2		

BN PAH List

CAS No.	Compound	Result	RL	MDL	Units	Q
83-32-9	Acenaphthene	ND	310	78	ug/kg	
208-96-8	Acenaphthylene	ND	310	78	ug/kg	
120-12-7	Anthracene	ND	310	47	ug/kg	
56-55-3	Benzo(a)anthracene	ND	63	16	ug/kg	
50-32-8	Benzo(a)pyrene	ND	63	16	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	63	16	ug/kg	
191-24-2	Benzo(g,h,i)perylene	ND	63	16	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	63	16	ug/kg	
218-01-9	Chrysene	ND	63	16	ug/kg	UJ
53-70-3	Dibenzo(a,h)anthracene	ND	63	16	ug/kg	
206-44-0	Fluoranthene	ND	310	55	ug/kg	
86-73-7	Fluorene	ND	310	47	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	63	16	ug/kg	
90-12-0	1-Methylnaphthalene	ND	310	47	ug/kg	UJ
91-57-6	2-Methylnaphthalene	ND	310	47	ug/kg	
91-20-3	Naphthalene	ND	310	47	ug/kg	
85-01-8	Phenanthrene	ND	310	47	ug/kg	
129-00-0	Pyrene	ND	310	55	ug/kg	

DANA VAL QUALIFIER

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	43SB06A		
Lab Sample ID:	F51300-15	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8270C SW846 3550B	Percent Solids:	85.6
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	U003783.D	1	08/06/07	NJ	08/02/07	OP21718	SU184
Run #2							

	Initial Weight	Final Volume
Run #1	30.2 g	1.0 ml
Run #2		

ABN TCL List w/o PAHs

CAS No.	Compound	Result	RL	MDL	Units	Q
65-85-0	Benzoic acid	ND	970	390	ug/kg	
95-57-8	2-Chlorophenol	ND	190	39	ug/kg	
59-50-7	4-Chloro-3-methyl phenol	ND	190	39	ug/kg	
120-83-2	2,4-Dichlorophenol	ND	190	39	ug/kg	
105-67-9	2,4-Dimethylphenol	ND	190	39	ug/kg	
51-28-5	2,4-Dinitrophenol	ND	970	390	ug/kg	
534-52-1	4,6-Dinitro-o-cresol	ND	390	77	ug/kg	
95-48-7	2-Methylphenol	ND	190	39	ug/kg	
	3&4-Methylphenol	ND	190	39	ug/kg	
88-75-5	2-Nitrophenol	ND	190	39	ug/kg	
100-02-7	4-Nitrophenol	ND	970	390	ug/kg	
87-86-5	Pentachlorophenol	ND	970	390	ug/kg	
108-95-2	Phenol	ND	190	39	ug/kg	
95-95-4	2,4,5-Trichlorophenol	ND	190	39	ug/kg	
88-06-2	2,4,6-Trichlorophenol	ND	190	39	ug/kg	
101-55-3	4-Bromophenyl phenyl ether	ND	190	39	ug/kg	
85-68-7	Butyl benzyl phthalate	ND	390	97	ug/kg	
100-51-6	Benzyl Alcohol	ND	190	39	ug/kg	
91-58-7	2-Chloronaphthalene	ND	190	39	ug/kg	
106-47-8	4-Chloroaniline	ND	190	77	ug/kg	
86-74-8	Carbazole	ND	190	39	ug/kg	
111-91-1	bis(2-Chloroethoxy)methane	ND	190	39	ug/kg	
111-44-4	bis(2-Chloroethyl)ether	ND	190	39	ug/kg	
108-60-1	bis(2-Chloroisopropyl)ether	ND	190	39	ug/kg	
7005-72-3	4-Chlorophenyl phenyl ether	ND	190	39	ug/kg	
95-50-1	1,2-Dichlorobenzene	ND	190	39	ug/kg	
541-73-1	1,3-Dichlorobenzene	ND	190	39	ug/kg	
106-46-7	1,4-Dichlorobenzene	ND	190	39	ug/kg	
121-14-2	2,4-Dinitrotoluene	ND	190	39	ug/kg	
606-20-2	2,6-Dinitrotoluene	ND	190	39	ug/kg	
91-94-1	3,3'-Dichlorobenzidine	ND	390	77	ug/kg	
132-64-9	Dibenzofuran	ND	190	39	ug/kg	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	43SB06A		
Lab Sample ID:	F51300-15	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8270C SW846 3550B	Percent Solids:	85.6
Project:	WPA 019 Field Investigation; Radford AAP, VA		

ABN TCL List w/o PAHs

CAS No.	Compound	Result	RL	MDL	Units	Q
84-74-2	Di-n-butyl phthalate	ND	390	97	ug/kg	
117-84-0	Di-n-octyl phthalate	ND	390	97	ug/kg	
84-66-2	Diethyl phthalate	ND	390	190	ug/kg	
131-11-3	Dimethyl phthalate	ND	390	97	ug/kg	
117-81-7	bis(2-Ethylhexyl)phthalate	ND	390	190	ug/kg	
118-74-1	Hexachlorobenzene	ND	190	39	ug/kg	
87-68-3	Hexachlorobutadiene	ND	190	39	ug/kg	
77-47-4	Hexachlorocyclopentadiene	ND	190	39	ug/kg	
67-72-1	Hexachloroethane	ND	190	39	ug/kg	
78-59-1	Isophorone	ND	190	39	ug/kg	
88-74-4	2-Nitroaniline	ND	390	77	ug/kg	
99-09-2	3-Nitroaniline	ND	390	77	ug/kg	
100-01-6	4-Nitroaniline	ND	390	77	ug/kg	
98-95-3	Nitrobenzene	ND	190	39	ug/kg	
621-64-7	N-Nitroso-di-n-propylamine	ND	190	39	ug/kg	
86-30-6	N-Nitrosodiphenylamine	ND	190	39	ug/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	190	39	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol	59%		40-102%
4165-62-2	Phenol-d5	62%		41-100%
118-79-6	2,4,6-Tribromophenol	71%		42-108%
4165-60-0	Nitrobenzene-d5	54%		40-105%
321-60-8	2-Fluorobiphenyl	57%		43-107%
1718-51-0	Terphenyl-d14	72%		45-119%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	43SB06A		
Lab Sample ID:	F51300-15	**Date Sampled:**	07/25/07
Matrix:	SO - Soil	**Date Received:**	07/26/07
Method:	SW846 8270C BY SIM SW846 3550B	**Percent Solids:**	85.6
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	R09642.D	4	08/07/07	NJ	08/02/07	OP21719	SR455
Run #2							

	Initial Weight	Final Volume
Run #1	30.2 g	1.0 ml
Run #2		

BN PAH List

CAS No.	Compound	Result	RL	MDL	Units	Q
83-32-9	Acenaphthene	ND	310	77	ug/kg	
208-96-8	Acenaphthylene	ND	310	77	ug/kg	
120-12-7	Anthracene	ND	310	46	ug/kg	
56-55-3	Benzo(a)anthracene	ND	62	15	ug/kg	
50-32-8	Benzo(a)pyrene	ND	62	15	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	62	15	ug/kg	
191-24-2	Benzo(g,h,i)perylene	ND	62	15	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	62	15	ug/kg	
218-01-9	Chrysene	ND	62	15	ug/kg	UJ
53-70-3	Dibenzo(a,h)anthracene	ND	62	15	ug/kg	
206-44-0	Fluoranthene	ND	310	54	ug/kg	
86-73-7	Fluorene	ND	310	46	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	62	15	ug/kg	
90-12-0	1-Methylnaphthalene	ND	310	46	ug/kg	UJ
91-57-6	2-Methylnaphthalene	ND	310	46	ug/kg	
91-20-3	Naphthalene	ND	310	46	ug/kg	
85-01-8	Phenanthrene	ND	310	46	ug/kg	
129-00-0	Pyrene	ND	310	54	ug/kg	

DATA VAL QUALIFIER

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	43SB06B		
Lab Sample ID:	F51300-16	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8270C SW846 3550B	Percent Solids:	81.7
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	U003784.D	2	08/06/07	NJ	08/02/07	OP21718	SU184
Run #2							

	Initial Weight	Final Volume
Run #1	30.4 g	1.0 ml
Run #2		

ABN TCL List w/o PAHs

CAS No.	Compound	Result	RL	MDL	Units	Q
65-85-0	Benzoic acid	ND	2000	810	ug/kg	
95-57-8	2-Chlorophenol	ND	400	81	ug/kg	
59-50-7	4-Chloro-3-methyl phenol	ND	400	81	ug/kg	
120-83-2	2,4-Dichlorophenol	ND	400	81	ug/kg	
105-67-9	2,4-Dimethylphenol	ND	400	81	ug/kg	
51-28-5	2,4-Dinitrophenol	ND	2000	810	ug/kg	
534-52-1	4,6-Dinitro-o-cresol	ND	810	160	ug/kg	
95-48-7	2-Methylphenol	ND	400	81	ug/kg	
	3&4-Methylphenol	ND	400	81	ug/kg	
88-75-5	2-Nitrophenol	ND	400	81	ug/kg	
100-02-7	4-Nitrophenol	ND	2000	810	ug/kg	
87-86-5	Pentachlorophenol	ND	2000	810	ug/kg	
108-95-2	Phenol	ND	400	81	ug/kg	
95-95-4	2,4,5-Trichlorophenol	ND	400	81	ug/kg	
88-06-2	2,4,6-Trichlorophenol	ND	400	81	ug/kg	
101-55-3	4-Bromophenyl phenyl ether	ND	400	81	ug/kg	
85-68-7	Butyl benzyl phthalate	ND	810	200	ug/kg	
100-51-6	Benzyl Alcohol	ND	400	81	ug/kg	
91-58-7	2-Chloronaphthalene	ND	400	81	ug/kg	
106-47-8	4-Chloroaniline	ND	400	160	ug/kg	
86-74-8	Carbazole	ND	400	81	ug/kg	
111-91-1	bis(2-Chloroethoxy)methane	ND	400	81	ug/kg	
111-44-4	bis(2-Chloroethyl)ether	ND	400	81	ug/kg	
108-60-1	bis(2-Chloroisopropyl)ether	ND	400	81	ug/kg	
7005-72-3	4-Chlorophenyl phenyl ether	ND	400	81	ug/kg	
95-50-1	1,2-Dichlorobenzene	ND	400	81	ug/kg	
541-73-1	1,3-Dichlorobenzene	ND	400	81	ug/kg	
106-46-7	1,4-Dichlorobenzene	ND	400	81	ug/kg	
121-14-2	2,4-Dinitrotoluene	ND	400	81	ug/kg	
606-20-2	2,6-Dinitrotoluene	ND	400	81	ug/kg	
91-94-1	3,3'-Dichlorobenzidine	ND	810	160	ug/kg	
132-64-9	Dibenzofuran	ND	400	81	ug/kg	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	43SB06B		
Lab Sample ID:	F51300-16	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8270C SW846 3550B	Percent Solids:	81.7
Project:	WPA 019 Field Investigation; Radford AAP, VA		

ABN TCL List w/o PAHs

CAS No.	Compound	Result	RL	MDL	Units	Q
84-74-2	Di-n-butyl phthalate	2350	810	200	ug/kg	
117-84-0	Di-n-octyl phthalate	ND	810	200	ug/kg	
84-66-2	Diethyl phthalate	ND	810	400	ug/kg	
131-11-3	Dimethyl phthalate	ND	810	200	ug/kg	
117-81-7	bis(2-Ethylhexyl)phthalate	ND	810	400	ug/kg	
118-74-1	Hexachlorobenzene	ND	400	81	ug/kg	
87-68-3	Hexachlorobutadiene	ND	400	81	ug/kg	
77-47-4	Hexachlorocyclopentadiene	ND	400	81	ug/kg	
67-72-1	Hexachloroethane	ND	400	81	ug/kg	
78-59-1	Isophorone	ND	400	81	ug/kg	
88-74-4	2-Nitroaniline	ND	810	160	ug/kg	
99-09-2	3-Nitroaniline	ND	810	160	ug/kg	
100-01-6	4-Nitroaniline	ND	810	160	ug/kg	
98-95-3	Nitrobenzene	ND	400	81	ug/kg	
621-64-7	N-Nitroso-di-n-propylamine	ND	400	81	ug/kg	
86-30-6	N-Nitrosodiphenylamine	ND	400	81	ug/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	400	81	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol	67%		40-102%
4165-62-2	Phenol-d5	70%		41-100%
118-79-6	2,4,6-Tribromophenol	73%		42-108%
4165-60-0	Nitrobenzene-d5	58%		40-105%
321-60-8	2-Fluorobiphenyl	63%		43-107%
1718-51-0	Terphenyl-d14	63%		45-119%

(a) Dilution required due to matrix interference.

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

3.15

Client Sample ID:	43SB06B		
Lab Sample ID:	F51300-16	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8270C BY SIM SW846 3550B	Percent Solids:	81.7
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	R09643.D	4	08/07/07	NJ	08/02/07	OP21719	SR455
Run #2							

	Initial Weight	Final Volume
Run #1	30.4 g	1.0 ml
Run #2		

BN PAH List

CAS No.	Compound	Result	RL	MDL	Units	Q
83-32-9	Acenaphthene	ND	320	81	ug/kg	
208-96-8	Acenaphthylene	ND	320	81	ug/kg	
120-12-7	Anthracene	ND	320	48	ug/kg	
56-55-3	Benzo(a)anthracene	ND	64	16	ug/kg	
50-32-8	Benzo(a)pyrene	ND	64	16	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	64	16	ug/kg	
191-24-2	Benzo(g,h,i)perylene	ND	64	16	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	64	16	ug/kg	
218-01-9	Chrysene	ND	64	16	ug/kg	UJ
53-70-3	Dibenzo(a,h)anthracene	ND	64	16	ug/kg	
206-44-0	Fluoranthene	ND	320	56	ug/kg	
86-73-7	Fluorene	ND	320	48	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	64	16	ug/kg	
90-12-0	1-Methylnaphthalene	ND	320	48	ug/kg	UJ
91-57-6	2-Methylnaphthalene	ND	320	48	ug/kg	
91-20-3	Naphthalene	ND	320	48	ug/kg	
85-01-8	Phenanthrene	ND	320	48	ug/kg	
129-00-0	Pyrene	ND	320	56	ug/kg	

DATA VAL QUALIFIER

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	43SB06C		
Lab Sample ID:	F51300-17	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8270C SW846 3550B	Percent Solids:	89.4
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	U003785.D	1	08/06/07	NJ	08/02/07	OP21718	SU184
Run #2							

	Initial Weight	Final Volume
Run #1	30.5 g	1.0 ml
Run #2		

ABN TCL List w/o PAHs

CAS No.	Compound	Result	RL	MDL	Units	Q
65-85-0	Benzoic acid	ND	920	370	ug/kg	
95-57-8	2-Chlorophenol	ND	180	37	ug/kg	
59-50-7	4-Chloro-3-methyl phenol	ND	180	37	ug/kg	
120-83-2	2,4-Dichlorophenol	ND	180	37	ug/kg	
105-67-9	2,4-Dimethylphenol	ND	180	37	ug/kg	
51-28-5	2,4-Dinitrophenol	ND	920	370	ug/kg	
534-52-1	4,6-Dinitro-o-cresol	ND	370	73	ug/kg	
95-48-7	2-Methylphenol	ND	180	37	ug/kg	
	3&4-Methylphenol	ND	180	37	ug/kg	
88-75-5	2-Nitrophenol	ND	180	37	ug/kg	
100-02-7	4-Nitrophenol	ND	920	370	ug/kg	
87-86-5	Pentachlorophenol	ND	920	370	ug/kg	
108-95-2	Phenol	ND	180	37	ug/kg	
95-95-4	2,4,5-Trichlorophenol	ND	180	37	ug/kg	
88-06-2	2,4,6-Trichlorophenol	ND	180	37	ug/kg	
101-55-3	4-Bromophenyl phenyl ether	ND	180	37	ug/kg	
85-68-7	Butyl benzyl phthalate	ND	370	92	ug/kg	
100-51-6	Benzyl Alcohol	ND	180	37	ug/kg	
91-58-7	2-Chloronaphthalene	ND	180	37	ug/kg	
106-47-8	4-Chloroaniline	ND	180	73	ug/kg	
86-74-8	Carbazole	ND	180	37	ug/kg	
111-91-1	bis(2-Chloroethoxy)methane	ND	180	37	ug/kg	
111-44-4	bis(2-Chloroethyl)ether	ND	180	37	ug/kg	
108-60-1	bis(2-Chloroisopropyl)ether	ND	180	37	ug/kg	
7005-72-3	4-Chlorophenyl phenyl ether	ND	180	37	ug/kg	
95-50-1	1,2-Dichlorobenzene	ND	180	37	ug/kg	
541-73-1	1,3-Dichlorobenzene	ND	180	37	ug/kg	
106-46-7	1,4-Dichlorobenzene	ND	180	37	ug/kg	
121-14-2	2,4-Dinitrotoluene	ND	180	37	ug/kg	
606-20-2	2,6-Dinitrotoluene	ND	180	37	ug/kg	
91-94-1	3,3'-Dichlorobenzidine	ND	370	73	ug/kg	
132-64-9	Dibenzofuran	ND	180	37	ug/kg	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	43SB06C		
Lab Sample ID:	F51300-17	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8270C SW846 3550B	Percent Solids:	89.4
Project:	WPA 019 Field Investigation; Radford AAP, VA		

ABN TCL List w/o PAHs

CAS No.	Compound	Result	RL	MDL	Units	Q
84-74-2	Di-n-butyl phthalate	ND	370	92	ug/kg	
117-84-0	Di-n-octyl phthalate	ND	370	92	ug/kg	
84-66-2	Diethyl phthalate	ND	370	180	ug/kg	
131-11-3	Dimethyl phthalate	ND	370	92	ug/kg	
117-81-7	bis(2-Ethylhexyl)phthalate	ND	370	180	ug/kg	
118-74-1	Hexachlorobenzene	ND	180	37	ug/kg	
87-68-3	Hexachlorobutadiene	ND	180	37	ug/kg	
77-47-4	Hexachlorocyclopentadiene	ND	180	37	ug/kg	
67-72-1	Hexachloroethane	ND	180	37	ug/kg	
78-59-1	Isophorone	ND	180	37	ug/kg	
88-74-4	2-Nitroaniline	ND	370	73	ug/kg	
99-09-2	3-Nitroaniline	ND	370	73	ug/kg	
100-01-6	4-Nitroaniline	ND	370	73	ug/kg	
98-95-3	Nitrobenzene	ND	180	37	ug/kg	
621-64-7	N-Nitroso-di-n-propylamine	ND	180	37	ug/kg	
86-30-6	N-Nitrosodiphenylamine	ND	180	37	ug/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	180	37	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol	59%		40-102%
4165-62-2	Phenol-d5	64%		41-100%
118-79-6	2,4,6-Tribromophenol	67%		42-108%
4165-60-0	Nitrobenzene-d5	54%		40-105%
321-60-8	2-Fluorobiphenyl	57%		43-107%
1718-51-0	Terphenyl-d14	67%		45-119%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	43SB06C		
Lab Sample ID:	F51300-17	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8270C BY SIM SW846 3550B	Percent Solids:	89.4
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	R09667.D	4	08/07/07	NJ	08/02/07	OP21719	SR456
Run #2							

	Initial Weight	Final Volume
Run #1	30.5 g	1.0 ml
Run #2		

BN PAH List

CAS No.	Compound	Result	RL	MDL	Units	Q	DATA VAL QUALIFIER
83-32-9	Acenaphthene	ND	290	73	ug/kg		
208-96-8	Acenaphthylene	ND	290	73	ug/kg		
120-12-7	Anthracene	ND	290	44	ug/kg		
56-55-3	Benzo(a)anthracene	ND	59	15	ug/kg		
50-32-8	Benzo(a)pyrene	ND	59	15	ug/kg		
205-99-2	Benzo(b)fluoranthene	ND	59	15	ug/kg		
191-24-2	Benzo(g,h,i)perylene	ND	59	15	ug/kg		
207-08-9	Benzo(k)fluoranthene	ND	59	15	ug/kg		
218-01-9	Chrysene	ND	59	15	ug/kg		UJ
53-70-3	Dibenzo(a,h)anthracene	ND	59	15	ug/kg		
206-44-0	Fluoranthene	ND	290	51	ug/kg		
86-73-7	Fluorene	ND	290	44	ug/kg		
193-39-5	Indeno(1,2,3-cd)pyrene	ND	59	15	ug/kg		
90-12-0	1-Methylnaphthalene	ND	290	44	ug/kg		UJ
91-57-6	2-Methylnaphthalene	ND	290	44	ug/kg		
91-20-3	Naphthalene	ND	290	44	ug/kg		
85-01-8	Phenanthrene	ND	290	44	ug/kg		
129-00-0	Pyrene	ND	290	51	ug/kg		

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	43SB07A		
Lab Sample ID:	F51300-18	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8270C SW846 3550B	Percent Solids:	90.2
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	U003799.D	1	08/07/07	NJ	08/03/07	OP21737	SU185
Run #2							

	Initial Weight	Final Volume
Run #1	30.0 g	1.0 ml
Run #2		

ABN TCL List w/o PAHs

CAS No.	Compound	Result	RL	MDL	Units	Q
65-85-0	Benzoic acid	ND	920	370	ug/kg	
95-57-8	2-Chlorophenol	ND	180	37	ug/kg	
59-50-7	4-Chloro-3-methyl phenol	ND	180	37	ug/kg	
120-83-2	2,4-Dichlorophenol	ND	180	37	ug/kg	
105-67-9	2,4-Dimethylphenol	ND	180	37	ug/kg	
51-28-5	2,4-Dinitrophenol	ND	920	370	ug/kg	
534-52-1	4,6-Dinitro-o-cresol	ND	370	74	ug/kg	
95-48-7	2-Methylphenol	ND	180	37	ug/kg	
	3&4-Methylphenol	ND	180	37	ug/kg	
88-75-5	2-Nitrophenol	ND	180	37	ug/kg	
100-02-7	4-Nitrophenol	ND	920	370	ug/kg	
87-86-5	Pentachlorophenol	ND	920	370	ug/kg	
108-95-2	Phenol	ND	180	37	ug/kg	
95-95-4	2,4,5-Trichlorophenol	ND	180	37	ug/kg	
88-06-2	2,4,6-Trichlorophenol	ND	180	37	ug/kg	
101-55-3	4-Bromophenyl phenyl ether	ND	180	37	ug/kg	
85-68-7	Butyl benzyl phthalate	ND	370	92	ug/kg	
100-51-6	Benzyl Alcohol	ND	180	37	ug/kg	
91-58-7	2-Chloronaphthalene	ND	180	37	ug/kg	
106-47-8	4-Chloroaniline	ND	180	74	ug/kg	
86-74-8	Carbazole	ND	180	37	ug/kg	
111-91-1	bis(2-Chloroethoxy)methane	ND	180	37	ug/kg	
111-44-4	bis(2-Chloroethyl)ether	ND	180	37	ug/kg	
108-60-1	bis(2-Chloroisopropyl)ether	ND	180	37	ug/kg	
7005-72-3	4-Chlorophenyl phenyl ether	ND	180	37	ug/kg	
95-50-1	1,2-Dichlorobenzene	ND	180	37	ug/kg	
541-73-1	1,3-Dichlorobenzene	ND	180	37	ug/kg	
106-46-7	1,4-Dichlorobenzene	ND	180	37	ug/kg	
121-14-2	2,4-Dinitrotoluene	ND	180	37	ug/kg	
606-20-2	2,6-Dinitrotoluene	ND	180	37	ug/kg	
91-94-1	3,3'-Dichlorobenzidine	ND	370	74	ug/kg	
132-64-9	Dibenzofuran	ND	180	37	ug/kg	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	43SB07A		
Lab Sample ID:	F51300-18	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8270C SW846 3550B	Percent Solids:	90.2
Project:	WPA 019 Field Investigation; Radford AAP, VA		

ABN TCL List w/o PAHs

CAS No.	Compound	Result	RL	MDL	Units	Q
84-74-2	Di-n-butyl phthalate	ND	370	92	ug/kg	
117-84-0	Di-n-octyl phthalate	ND	370	92	ug/kg	
84-66-2	Diethyl phthalate	ND	370	180	ug/kg	
131-11-3	Dimethyl phthalate	ND	370	92	ug/kg	
117-81-7	bis(2-Ethylhexyl)phthalate	ND	370	180	ug/kg	
118-74-1	Hexachlorobenzene	ND	180	37	ug/kg	
87-68-3	Hexachlorobutadiene	ND	180	37	ug/kg	
77-47-4	Hexachlorocyclopentadiene	ND	180	37	ug/kg	
67-72-1	Hexachloroethane	ND	180	37	ug/kg	
78-59-1	Isophorone	ND	180	37	ug/kg	
88-74-4	2-Nitroaniline	ND	370	74	ug/kg	
99-09-2	3-Nitroaniline	ND	370	74	ug/kg	
100-01-6	4-Nitroaniline	ND	370	74	ug/kg	
98-95-3	Nitrobenzene	ND	180	37	ug/kg	
621-64-7	N-Nitroso-di-n-propylamine	ND	180	37	ug/kg	
86-30-6	N-Nitrosodiphenylamine	ND	180	37	ug/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	180	37	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol	60%		40-102%
4165-62-2	Phenol-d5	66%		41-100%
118-79-6	2,4,6-Tribromophenol	66%		42-108%
4165-60-0	Nitrobenzene-d5	54%		40-105%
321-60-8	2-Fluorobiphenyl	61%		43-107%
1718-51-0	Terphenyl-d14	71%		45-119%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	43SB07A		
Lab Sample ID:	F51300-18	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8270C BY SIM SW846 3550B	Percent Solids:	90.2
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	R09700.D	4	08/08/07	NJ	08/03/07	OP21738	SR458
Run #2							

	Initial Weight	Final Volume
Run #1	30.0 g	1.0 ml
Run #2		

BN PAH List

CAS No.	Compound	Result	RL	MDL	Units	Q
83-32-9	Acenaphthene	ND	300	74	ug/kg	
208-96-8	Acenaphthylene	ND	300	74	ug/kg	
120-12-7	Anthracene	ND	300	44	ug/kg	
56-55-3	Benzo(a)anthracene	ND	59	15	ug/kg	
50-32-8	Benzo(a)pyrene	ND	59	15	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	59	15	ug/kg	
191-24-2	Benzo(g,h,i)perylene	ND	59	15	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	59	15	ug/kg	
218-01-9	Chrysene	ND	59	15	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	59	15	ug/kg	
206-44-0	Fluoranthene	ND	300	52	ug/kg	
86-73-7	Fluorene	ND	300	44	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	59	15	ug/kg	
90-12-0	1-Methylnaphthalene	ND	300	44	ug/kg	
91-57-6	2-Methylnaphthalene	ND	300	44	ug/kg	
91-20-3	Naphthalene	ND	300	44	ug/kg	
85-01-8	Phenanthrene	ND	300	44	ug/kg	
129-00-0	Pyrene	ND	300	52	ug/kg	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	43SB07B		
Lab Sample ID:	F51300-19	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8270C SW846 3550B	Percent Solids:	86.2
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	U003800.D	1	08/07/07	NJ	08/03/07	OP21737	SU185
Run #2							

	Initial Weight	Final Volume
Run #1	29.7 g	1.0 ml
Run #2		

ABN TCL List w/o PAHs

CAS No.	Compound	Result	RL	MDL	Units	Q
65-85-0	Benzoic acid	ND	980	390	ug/kg	
95-57-8	2-Chlorophenol	ND	200	39	ug/kg	
59-50-7	4-Chloro-3-methyl phenol	ND	200	39	ug/kg	
120-83-2	2,4-Dichlorophenol	ND	200	39	ug/kg	
105-67-9	2,4-Dimethylphenol	ND	200	39	ug/kg	
51-28-5	2,4-Dinitrophenol	ND	980	390	ug/kg	
534-52-1	4,6-Dinitro-o-cresol	ND	390	78	ug/kg	
95-48-7	2-Methylphenol	ND	200	39	ug/kg	
	3&4-Methylphenol	ND	200	39	ug/kg	
88-75-5	2-Nitrophenol	ND	200	39	ug/kg	
100-02-7	4-Nitrophenol	ND	980	390	ug/kg	
87-86-5	Pentachlorophenol	ND	980	390	ug/kg	
108-95-2	Phenol	ND	200	39	ug/kg	
95-95-4	2,4,5-Trichlorophenol	ND	200	39	ug/kg	
88-06-2	2,4,6-Trichlorophenol	ND	200	39	ug/kg	
101-55-3	4-Bromophenyl phenyl ether	ND	200	39	ug/kg	
85-68-7	Butyl benzyl phthalate	ND	390	98	ug/kg	
100-51-6	Benzyl Alcohol	ND	200	39	ug/kg	
91-58-7	2-Chloronaphthalene	ND	200	39	ug/kg	
106-47-8	4-Chloroaniline	ND	200	78	ug/kg	
86-74-8	Carbazole	ND	200	39	ug/kg	
111-91-1	bis(2-Chloroethoxy)methane	ND	200	39	ug/kg	
111-44-4	bis(2-Chloroethyl)ether	ND	200	39	ug/kg	
108-60-1	bis(2-Chloroisopropyl)ether	ND	200	39	ug/kg	
7005-72-3	4-Chlorophenyl phenyl ether	ND	200	39	ug/kg	
95-50-1	1,2-Dichlorobenzene	ND	200	39	ug/kg	
541-73-1	1,3-Dichlorobenzene	ND	200	39	ug/kg	
106-46-7	1,4-Dichlorobenzene	ND	200	39	ug/kg	
121-14-2	2,4-Dinitrotoluene	ND	200	39	ug/kg	
606-20-2	2,6-Dinitrotoluene	ND	200	39	ug/kg	
91-94-1	3,3'-Dichlorobenzidine	ND	390	78	ug/kg	
132-64-9	Dibenzofuran	ND	200	39	ug/kg	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

3.19

Client Sample ID:	43SB07B		
Lab Sample ID:	F51300-19	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8270C SW846 3550B	Percent Solids:	86.2
Project:	WPA 019 Field Investigation; Radford AAP, VA		

ABN TCL List w/o PAHs

CAS No.	Compound	Result	RL	MDL	Units	Q	DATA VAL QUALIFIER
84-74-2	Di-n-butyl phthalate	ND	390	98	ug/kg		
117-84-0	Di-n-octyl phthalate	ND	390	98	ug/kg		
84-66-2	Diethyl phthalate	ND	390	200	ug/kg		
131-11-3	Dimethyl phthalate	ND	390	98	ug/kg		
117-81-7	bis(2-Ethylhexyl)phthalate	373	390	200	ug/kg	J	J
118-74-1	Hexachlorobenzene	ND	200	39	ug/kg		
87-68-3	Hexachlorobutadiene	ND	200	39	ug/kg		
77-47-4	Hexachlorocyclopentadiene	ND	200	39	ug/kg		
67-72-1	Hexachloroethane	ND	200	39	ug/kg		
78-59-1	Isophorone	ND	200	39	ug/kg		
88-74-4	2-Nitroaniline	ND	390	78	ug/kg		
99-09-2	3-Nitroaniline	ND	390	78	ug/kg		
100-01-6	4-Nitroaniline	ND	390	78	ug/kg		
98-95-3	Nitrobenzene	ND	200	39	ug/kg		
621-64-7	N-Nitroso-di-n-propylamine	ND	200	39	ug/kg		
86-30-6	N-Nitrosodiphenylamine	ND	200	39	ug/kg		
120-82-1	1,2,4-Trichlorobenzene	ND	200	39	ug/kg		

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol	60%		40-102%
4165-62-2	Phenol-d5	77%		41-100%
118-79-6	2,4,6-Tribromophenol	84%		42-108%
4165-60-0	Nitrobenzene-d5	57%		40-105%
321-60-8	2-Fluorobiphenyl	72%		43-107%
1718-51-0	Terphenyl-d14	87%		45-119%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	43SB07B		
Lab Sample ID:	F51300-19	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8270C BY SIM SW846 3550B	Percent Solids:	86.2
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	R09701.D	4	08/08/07	NJ	08/03/07	OP21738	SR458
Run #2							

	Initial Weight	Final Volume
Run #1	29.7 g	1.0 ml
Run #2		

BN PAH List

DATA VAL QUALIFIER

CAS No.	Compound	Result	RL	MDL	Units	Q	
83-32-9	Acenaphthene	ND	310	78	ug/kg		
208-96-8	Acenaphthylene	ND	310	78	ug/kg		
120-12-7	Anthracene	ND	310	47	ug/kg		
56-55-3	Benzo(a)anthracene	ND	62	16	ug/kg		
50-32-8	Benzo(a)pyrene	ND	62	16	ug/kg		
205-99-2	Benzo(b)fluoranthene	ND	62	16	ug/kg		
191-24-2	Benzo(g,h,i)perylene	ND	62	16	ug/kg		
207-08-9	Benzo(k)fluoranthene	ND	62	16	ug/kg		
218-01-9	Chrysene	ND	62	16	ug/kg		
53-70-3	Dibenzo(a,h)anthracene	ND	62	16	ug/kg		
206-44-0	Fluoranthene	ND	310	55	ug/kg		
86-73-7	Fluorene	ND	310	47	ug/kg		
193-39-5	Indeno(1,2,3-cd)pyrene	ND	62	16	ug/kg		
90-12-0	1-Methylnaphthalene	ND	310	47	ug/kg		
91-57-6	2-Methylnaphthalene	ND	310	47	ug/kg		
91-20-3	Naphthalene	65.8	310	47	ug/kg	J	J
85-01-8	Phenanthrene	ND	310	47	ug/kg		
129-00-0	Pyrene	ND	310	55	ug/kg		

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	43SB07C		
Lab Sample ID:	F51300-20	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8270C SW846 3550B	Percent Solids:	84.3
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	U003801.D	1	08/07/07	NJ	08/03/07	OP21737	SU185
Run #2							

	Initial Weight	Final Volume
Run #1	30.3 g	1.0 ml
Run #2		

ABN TCL List w/o PAHs

CAS No.	Compound	Result	RL	MDL	Units	Q
65-85-0	Benzoic acid	ND	980	390	ug/kg	
95-57-8	2-Chlorophenol	ND	200	39	ug/kg	
59-50-7	4-Chloro-3-methyl phenol	ND	200	39	ug/kg	
120-83-2	2,4-Dichlorophenol	ND	200	39	ug/kg	
105-67-9	2,4-Dimethylphenol	ND	200	39	ug/kg	
51-28-5	2,4-Dinitrophenol	ND	980	390	ug/kg	
534-52-1	4,6-Dinitro-o-cresol	ND	390	78	ug/kg	
95-48-7	2-Methylphenol	ND	200	39	ug/kg	
	3&4-Methylphenol	ND	200	39	ug/kg	
88-75-5	2-Nitrophenol	ND	200	39	ug/kg	
100-02-7	4-Nitrophenol	ND	980	390	ug/kg	
87-86-5	Pentachlorophenol	ND	980	390	ug/kg	
108-95-2	Phenol	ND	200	39	ug/kg	
95-95-4	2,4,5-Trichlorophenol	ND	200	39	ug/kg	
88-06-2	2,4,6-Trichlorophenol	ND	200	39	ug/kg	
101-55-3	4-Bromophenyl phenyl ether	ND	200	39	ug/kg	
85-68-7	Butyl benzyl phthalate	ND	390	98	ug/kg	
100-51-6	Benzyl Alcohol	ND	200	39	ug/kg	
91-58-7	2-Chloronaphthalene	ND	200	39	ug/kg	
106-47-8	4-Chloroaniline	ND	200	78	ug/kg	
86-74-8	Carbazole	ND	200	39	ug/kg	
111-91-1	bis(2-Chloroethoxy)methane	ND	200	39	ug/kg	
111-44-4	bis(2-Chloroethyl)ether	ND	200	39	ug/kg	
108-60-1	bis(2-Chloroisopropyl)ether	ND	200	39	ug/kg	
7005-72-3	4-Chlorophenyl phenyl ether	ND	200	39	ug/kg	
95-50-1	1,2-Dichlorobenzene	ND	200	39	ug/kg	
541-73-1	1,3-Dichlorobenzene	ND	200	39	ug/kg	
106-46-7	1,4-Dichlorobenzene	ND	200	39	ug/kg	
121-14-2	2,4-Dinitrotoluene	ND	200	39	ug/kg	
606-20-2	2,6-Dinitrotoluene	ND	200	39	ug/kg	
91-94-1	3,3'-Dichlorobenzidine	ND	390	78	ug/kg	
132-64-9	Dibenzofuran	ND	200	39	ug/kg	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	43SB07C		
Lab Sample ID:	F51300-20	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8270C SW846 3550B	Percent Solids:	84.3
Project:	WPA 019 Field Investigation; Radford AAP, VA		

ABN TCL List w/o PAHs

CAS No.	Compound	Result	RL	MDL	Units	Q
84-74-2	Di-n-butyl phthalate	ND	390	98	ug/kg	
117-84-0	Di-n-octyl phthalate	ND	390	98	ug/kg	
84-66-2	Diethyl phthalate	ND	390	200	ug/kg	
131-11-3	Dimethyl phthalate	ND	390	98	ug/kg	
117-81-7	bis(2-Ethylhexyl)phthalate	ND	390	200	ug/kg	
118-74-1	Hexachlorobenzene	ND	200	39	ug/kg	
87-68-3	Hexachlorobutadiene	ND	200	39	ug/kg	
77-47-4	Hexachlorocyclopentadiene	ND	200	39	ug/kg	
67-72-1	Hexachloroethane	ND	200	39	ug/kg	
78-59-1	Isophorone	ND	200	39	ug/kg	
88-74-4	2-Nitroaniline	ND	390	78	ug/kg	
99-09-2	3-Nitroaniline	ND	390	78	ug/kg	
100-01-6	4-Nitroaniline	ND	390	78	ug/kg	
98-95-3	Nitrobenzene	ND	200	39	ug/kg	
621-64-7	N-Nitroso-di-n-propylamine	ND	200	39	ug/kg	
86-30-6	N-Nitrosodiphenylamine	ND	200	39	ug/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	200	39	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol	57%		40-102%
4165-62-2	Phenol-d5	60%		41-100%
118-79-6	2,4,6-Tribromophenol	59%		42-108%
4165-60-0	Nitrobenzene-d5	53%		40-105%
321-60-8	2-Fluorobiphenyl	55%		43-107%
1718-51-0	Terphenyl-d14	61%		45-119%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	43SB07C		
Lab Sample ID:	F51300-20	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8270C BY SIM SW846 3550B	Percent Solids:	84.3
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	R09702.D	4	08/08/07	NJ	08/03/07	OP21738	SR458
Run #2							

	Initial Weight	Final Volume
Run #1	30.3 g	1.0 ml
Run #2		

BN PAH List

CAS No.	Compound	Result	RL	MDL	Units	Q
83-32-9	Acenaphthene	ND	310	78	ug/kg	
208-96-8	Acenaphthylene	ND	310	78	ug/kg	
120-12-7	Anthracene	ND	310	47	ug/kg	
56-55-3	Benzo(a)anthracene	ND	63	16	ug/kg	
50-32-8	Benzo(a)pyrene	ND	63	16	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	63	16	ug/kg	
191-24-2	Benzo(g,h,i)perylene	ND	63	16	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	63	16	ug/kg	
218-01-9	Chrysene	ND	63	16	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	63	16	ug/kg	
206-44-0	Fluoranthene	ND	310	55	ug/kg	
86-73-7	Fluorene	ND	310	47	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	63	16	ug/kg	
90-12-0	1-Methylnaphthalene	ND	310	47	ug/kg	
91-57-6	2-Methylnaphthalene	ND	310	47	ug/kg	
91-20-3	Naphthalene	ND	310	47	ug/kg	
85-01-8	Phenanthrene	ND	310	47	ug/kg	
129-00-0	Pyrene	ND	310	55	ug/kg	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	43SB08A		
Lab Sample ID:	F51300-21	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8270C SW846 3550B	Percent Solids:	96.1
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	U003802.D	1	08/07/07	NJ	08/03/07	OP21737	SU185
Run #2							

	Initial Weight	Final Volume
Run #1	30.5 g	1.0 ml
Run #2		

ABN TCL List w/o PAHs

CAS No.	Compound	Result	RL	MDL	Units	Q
65-85-0	Benzoic acid	ND	850	340	ug/kg	
95-57-8	2-Chlorophenol	ND	170	34	ug/kg	
59-50-7	4-Chloro-3-methyl phenol	ND	170	34	ug/kg	
120-83-2	2,4-Dichlorophenol	ND	170	34	ug/kg	
105-67-9	2,4-Dimethylphenol	ND	170	34	ug/kg	
51-28-5	2,4-Dinitrophenol	ND	850	340	ug/kg	
534-52-1	4,6-Dinitro-o-cresol	ND	340	68	ug/kg	
95-48-7	2-Methylphenol	ND	170	34	ug/kg	
	3&4-Methylphenol	ND	170	34	ug/kg	
88-75-5	2-Nitrophenol	ND	170	34	ug/kg	
100-02-7	4-Nitrophenol	ND	850	340	ug/kg	
87-86-5	Pentachlorophenol	ND	850	340	ug/kg	
108-95-2	Phenol	ND	170	34	ug/kg	
95-95-4	2,4,5-Trichlorophenol	ND	170	34	ug/kg	
88-06-2	2,4,6-Trichlorophenol	ND	170	34	ug/kg	
101-55-3	4-Bromophenyl phenyl ether	ND	170	34	ug/kg	
85-68-7	Butyl benzyl phthalate	ND	340	85	ug/kg	
100-51-6	Benzyl Alcohol	ND	170	34	ug/kg	
91-58-7	2-Chloronaphthalene	ND	170	34	ug/kg	
106-47-8	4-Chloroaniline	ND	170	68	ug/kg	
86-74-8	Carbazole	ND	170	34	ug/kg	
111-91-1	bis(2-Chloroethoxy)methane	ND	170	34	ug/kg	
111-44-4	bis(2-Chloroethyl)ether	ND	170	34	ug/kg	
108-60-1	bis(2-Chloroisopropyl)ether	ND	170	34	ug/kg	
7005-72-3	4-Chlorophenyl phenyl ether	ND	170	34	ug/kg	
95-50-1	1,2-Dichlorobenzene	ND	170	34	ug/kg	
541-73-1	1,3-Dichlorobenzene	ND	170	34	ug/kg	
106-46-7	1,4-Dichlorobenzene	ND	170	34	ug/kg	
121-14-2	2,4-Dinitrotoluene	ND	170	34	ug/kg	
606-20-2	2,6-Dinitrotoluene	ND	170	34	ug/kg	
91-94-1	3,3'-Dichlorobenzidine	ND	340	68	ug/kg	
132-64-9	Dibenzofuran	ND	170	34	ug/kg	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	43SB08A		
Lab Sample ID:	F51300-21	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8270C SW846 3550B	Percent Solids:	96.1
Project:	WPA 019 Field Investigation; Radford AAP, VA		

ABN TCL List w/o PAHs

CAS No.	Compound	Result	RL	MDL	Units	Q
84-74-2	Di-n-butyl phthalate	ND	340	85	ug/kg	
117-84-0	Di-n-octyl phthalate	ND	340	85	ug/kg	
84-66-2	Diethyl phthalate	ND	340	170	ug/kg	
131-11-3	Dimethyl phthalate	ND	340	85	ug/kg	
117-81-7	bis(2-Ethylhexyl)phthalate	ND	340	170	ug/kg	
118-74-1	Hexachlorobenzene	ND	170	34	ug/kg	
87-68-3	Hexachlorobutadiene	ND	170	34	ug/kg	
77-47-4	Hexachlorocyclopentadiene	ND	170	34	ug/kg	
67-72-1	Hexachloroethane	ND	170	34	ug/kg	
78-59-1	Isophorone	ND	170	34	ug/kg	
88-74-4	2-Nitroaniline	ND	340	68	ug/kg	
99-09-2	3-Nitroaniline	ND	340	68	ug/kg	
100-01-6	4-Nitroaniline	ND	340	68	ug/kg	
98-95-3	Nitrobenzene	ND	170	34	ug/kg	
621-64-7	N-Nitroso-di-n-propylamine	ND	170	34	ug/kg	
86-30-6	N-Nitrosodiphenylamine	ND	170	34	ug/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	170	34	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol	70%		40-102%
4165-62-2	Phenol-d5	75%		41-100%
118-79-6	2,4,6-Tribromophenol	77%		42-108%
4165-60-0	Nitrobenzene-d5	65%		40-105%
321-60-8	2-Fluorobiphenyl	70%		43-107%
1718-51-0	Terphenyl-d14	82%		45-119%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	43SB08A		
Lab Sample ID:	F51300-21	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8270C BY SIM SW846 3550B	Percent Solids:	96.1
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	R09703.D	4	08/08/07	NJ	08/03/07	OP21738	SR458
Run #2							

	Initial Weight	Final Volume
Run #1	30.5 g	1.0 ml
Run #2		

BN PAH List

CAS No.	Compound	Result	RL	MDL	Units	Q
83-32-9	Acenaphthene	ND	270	68	ug/kg	
208-96-8	Acenaphthylene	ND	270	68	ug/kg	
120-12-7	Anthracene	ND	270	41	ug/kg	
56-55-3	Benzo(a)anthracene	ND	55	14	ug/kg	
50-32-8	Benzo(a)pyrene	ND	55	14	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	55	14	ug/kg	
191-24-2	Benzo(g,h,i)perylene	ND	55	14	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	55	14	ug/kg	
218-01-9	Chrysene	ND	55	14	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	55	14	ug/kg	
206-44-0	Fluoranthene	ND	270	48	ug/kg	
86-73-7	Fluorene	ND	270	41	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	55	14	ug/kg	
90-12-0	1-Methylnaphthalene	ND	270	41	ug/kg	
91-57-6	2-Methylnaphthalene	ND	270	41	ug/kg	
91-20-3	Naphthalene	ND	270	41	ug/kg	
85-01-8	Phenanthrene	ND	270	41	ug/kg	
129-00-0	Pyrene	ND	270	48	ug/kg	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	43SB08B		
Lab Sample ID:	F51300-22	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8270C SW846 3550B	Percent Solids:	84.5
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	U003803.D	1	08/07/07	NJ	08/03/07	OP21737	SU185
Run #2							

	Initial Weight	Final Volume
Run #1	30.9 g	1.0 ml
Run #2		

ABN TCL List w/o PAHs

CAS No.	Compound	Result	RL	MDL	Units	Q
65-85-0	Benzoic acid	ND	960	380	ug/kg	
95-57-8	2-Chlorophenol	ND	190	38	ug/kg	
59-50-7	4-Chloro-3-methyl phenol	ND	190	38	ug/kg	
120-83-2	2,4-Dichlorophenol	ND	190	38	ug/kg	
105-67-9	2,4-Dimethylphenol	ND	190	38	ug/kg	
51-28-5	2,4-Dinitrophenol	ND	960	380	ug/kg	
534-52-1	4,6-Dinitro-o-cresol	ND	380	77	ug/kg	
95-48-7	2-Methylphenol	ND	190	38	ug/kg	
	3&4-Methylphenol	ND	190	38	ug/kg	
88-75-5	2-Nitrophenol	ND	190	38	ug/kg	
100-02-7	4-Nitrophenol	ND	960	380	ug/kg	
87-86-5	Pentachlorophenol	ND	960	380	ug/kg	
108-95-2	Phenol	ND	190	38	ug/kg	
95-95-4	2,4,5-Trichlorophenol	ND	190	38	ug/kg	
88-06-2	2,4,6-Trichlorophenol	ND	190	38	ug/kg	
101-55-3	4-Bromophenyl phenyl ether	ND	190	38	ug/kg	
85-68-7	Butyl benzyl phthalate	ND	380	96	ug/kg	
100-51-6	Benzyl Alcohol	ND	190	38	ug/kg	
91-58-7	2-Chloronaphthalene	ND	190	38	ug/kg	
106-47-8	4-Chloroaniline	ND	190	77	ug/kg	
86-74-8	Carbazole	ND	190	38	ug/kg	
111-91-1	bis(2-Chloroethoxy)methane	ND	190	38	ug/kg	
111-44-4	bis(2-Chloroethyl)ether	ND	190	38	ug/kg	
108-60-1	bis(2-Chloroisopropyl)ether	ND	190	38	ug/kg	
7005-72-3	4-Chlorophenyl phenyl ether	ND	190	38	ug/kg	
95-50-1	1,2-Dichlorobenzene	ND	190	38	ug/kg	
541-73-1	1,3-Dichlorobenzene	ND	190	38	ug/kg	
106-46-7	1,4-Dichlorobenzene	ND	190	38	ug/kg	
121-14-2	2,4-Dinitrotoluene	ND	190	38	ug/kg	
606-20-2	2,6-Dinitrotoluene	ND	190	38	ug/kg	
91-94-1	3,3'-Dichlorobenzidine	ND	380	77	ug/kg	
132-64-9	Dibenzofuran	ND	190	38	ug/kg	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	43SB08B		
Lab Sample ID:	F51300-22	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8270C SW846 3550B	Percent Solids:	84.5
Project:	WPA 019 Field Investigation; Radford AAP, VA		

ABN TCL List w/o PAHs

CAS No.	Compound	Result	RL	MDL	Units	Q
84-74-2	Di-n-butyl phthalate	ND	380	96	ug/kg	
117-84-0	Di-n-octyl phthalate	ND	380	96	ug/kg	
84-66-2	Diethyl phthalate	ND	380	190	ug/kg	
131-11-3	Dimethyl phthalate	ND	380	96	ug/kg	
117-81-7	bis(2-Ethylhexyl)phthalate	ND	380	190	ug/kg	
118-74-1	Hexachlorobenzene	ND	190	38	ug/kg	
87-68-3	Hexachlorobutadiene	ND	190	38	ug/kg	
77-47-4	Hexachlorocyclopentadiene	ND	190	38	ug/kg	
67-72-1	Hexachloroethane	ND	190	38	ug/kg	
78-59-1	Isophorone	ND	190	38	ug/kg	
88-74-4	2-Nitroaniline	ND	380	77	ug/kg	
99-09-2	3-Nitroaniline	ND	380	77	ug/kg	
100-01-6	4-Nitroaniline	ND	380	77	ug/kg	
98-95-3	Nitrobenzene	ND	190	38	ug/kg	
621-64-7	N-Nitroso-di-n-propylamine	ND	190	38	ug/kg	
86-30-6	N-Nitrosodiphenylamine	ND	190	38	ug/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	190	38	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol	70%		40-102%
4165-62-2	Phenol-d5	76%		41-100%
118-79-6	2,4,6-Tribromophenol	76%		42-108%
4165-60-0	Nitrobenzene-d5	65%		40-105%
321-60-8	2-Fluorobiphenyl	69%		43-107%
1718-51-0	Terphenyl-d14	75%		45-119%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	43SB08B		
Lab Sample ID:	F51300-22	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8270C BY SIM SW846 3550B	Percent Solids:	84.5
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	R09704.D	4	08/08/07	NJ	08/03/07	OP21738	SR458
Run #2							

	Initial Weight	Final Volume
Run #1	30.9 g	1.0 ml
Run #2		

BN PAH List

CAS No.	Compound	Result	RL	MDL	Units	Q
83-32-9	Acenaphthene	ND	310	77	ug/kg	
208-96-8	Acenaphthylene	ND	310	77	ug/kg	
120-12-7	Anthracene	ND	310	46	ug/kg	
56-55-3	Benzo(a)anthracene	ND	61	15	ug/kg	
50-32-8	Benzo(a)pyrene	ND	61	15	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	61	15	ug/kg	
191-24-2	Benzo(g,h,i)perylene	ND	61	15	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	61	15	ug/kg	
218-01-9	Chrysene	ND	61	15	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	61	15	ug/kg	
206-44-0	Fluoranthene	ND	310	54	ug/kg	
86-73-7	Fluorene	ND	310	46	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	61	15	ug/kg	
90-12-0	1-Methylnaphthalene	ND	310	46	ug/kg	
91-57-6	2-Methylnaphthalene	ND	310	46	ug/kg	
91-20-3	Naphthalene	ND	310	46	ug/kg	
85-01-8	Phenanthrene	ND	310	46	ug/kg	
129-00-0	Pyrene	ND	310	54	ug/kg	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	43SB08C		
Lab Sample ID:	F51300-23	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8270C SW846 3550B	Percent Solids:	87.5
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	U003804.D	1	08/07/07	NJ	08/03/07	OP21737	SU185
Run #2							

	Initial Weight	Final Volume
Run #1	30.8 g	1.0 ml
Run #2		

ABN TCL List w/o PAHs

CAS No.	Compound	Result	RL	MDL	Units	Q
65-85-0	Benzoic acid	ND	930	370	ug/kg	
95-57-8	2-Chlorophenol	ND	190	37	ug/kg	
59-50-7	4-Chloro-3-methyl phenol	ND	190	37	ug/kg	
120-83-2	2,4-Dichlorophenol	ND	190	37	ug/kg	
105-67-9	2,4-Dimethylphenol	ND	190	37	ug/kg	
51-28-5	2,4-Dinitrophenol	ND	930	370	ug/kg	
534-52-1	4,6-Dinitro-o-cresol	ND	370	74	ug/kg	
95-48-7	2-Methylphenol	ND	190	37	ug/kg	
	3&4-Methylphenol	ND	190	37	ug/kg	
88-75-5	2-Nitrophenol	ND	190	37	ug/kg	
100-02-7	4-Nitrophenol	ND	930	370	ug/kg	
87-86-5	Pentachlorophenol	ND	930	370	ug/kg	
108-95-2	Phenol	ND	190	37	ug/kg	
95-95-4	2,4,5-Trichlorophenol	ND	190	37	ug/kg	
88-06-2	2,4,6-Trichlorophenol	ND	190	37	ug/kg	
101-55-3	4-Bromophenyl phenyl ether	ND	190	37	ug/kg	
85-68-7	Butyl benzyl phthalate	ND	370	93	ug/kg	
100-51-6	Benzyl Alcohol	ND	190	37	ug/kg	
91-58-7	2-Chloronaphthalene	ND	190	37	ug/kg	
106-47-8	4-Chloroaniline	ND	190	74	ug/kg	
86-74-8	Carbazole	ND	190	37	ug/kg	
111-91-1	bis(2-Chloroethoxy)methane	ND	190	37	ug/kg	
111-44-4	bis(2-Chloroethyl)ether	ND	190	37	ug/kg	
108-60-1	bis(2-Chloroisopropyl)ether	ND	190	37	ug/kg	
7005-72-3	4-Chlorophenyl phenyl ether	ND	190	37	ug/kg	
95-50-1	1,2-Dichlorobenzene	ND	190	37	ug/kg	
541-73-1	1,3-Dichlorobenzene	ND	190	37	ug/kg	
106-46-7	1,4-Dichlorobenzene	ND	190	37	ug/kg	
121-14-2	2,4-Dinitrotoluene	ND	190	37	ug/kg	
606-20-2	2,6-Dinitrotoluene	ND	190	37	ug/kg	
91-94-1	3,3'-Dichlorobenzidine	ND	370	74	ug/kg	
132-64-9	Dibenzofuran	ND	190	37	ug/kg	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	43SB08C		
Lab Sample ID:	F51300-23	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8270C SW846 3550B	Percent Solids:	87.5
Project:	WPA 019 Field Investigation; Radford AAP, VA		

ABN TCL List w/o PAHs

CAS No.	Compound	Result	RL	MDL	Units	Q
84-74-2	Di-n-butyl phthalate	ND	370	93	ug/kg	
117-84-0	Di-n-octyl phthalate	ND	370	93	ug/kg	
84-66-2	Diethyl phthalate	ND	370	190	ug/kg	
131-11-3	Dimethyl phthalate	ND	370	93	ug/kg	
117-81-7	bis(2-Ethylhexyl)phthalate	ND	370	190	ug/kg	
118-74-1	Hexachlorobenzene	ND	190	37	ug/kg	
87-68-3	Hexachlorobutadiene	ND	190	37	ug/kg	
77-47-4	Hexachlorocyclopentadiene	ND	190	37	ug/kg	
67-72-1	Hexachloroethane	ND	190	37	ug/kg	
78-59-1	Isophorone	ND	190	37	ug/kg	
88-74-4	2-Nitroaniline	ND	370	74	ug/kg	
99-09-2	3-Nitroaniline	ND	370	74	ug/kg	
100-01-6	4-Nitroaniline	ND	370	74	ug/kg	
98-95-3	Nitrobenzene	ND	190	37	ug/kg	
621-64-7	N-Nitroso-di-n-propylamine	ND	190	37	ug/kg	
86-30-6	N-Nitrosodiphenylamine	ND	190	37	ug/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	190	37	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol	55%		40-102%
4165-62-2	Phenol-d5	58%		41-100%
118-79-6	2,4,6-Tribromophenol	59%		42-108%
4165-60-0	Nitrobenzene-d5	50%		40-105%
321-60-8	2-Fluorobiphenyl	53%		43-107%
1718-51-0	Terphenyl-d14	60%		45-119%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	43SB08C		
Lab Sample ID:	F51300-23	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8270C BY SIM SW846 3550B	Percent Solids:	87.5
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	R09705.D	4	08/08/07	NJ	08/03/07	OP21738	SR458
Run #2							

	Initial Weight	Final Volume
Run #1	30.8 g	1.0 ml
Run #2		

BN PAH List

CAS No.	Compound	Result	RL	MDL	Units	Q
83-32-9	Acenaphthene	ND	300	74	ug/kg	
208-96-8	Acenaphthylene	ND	300	74	ug/kg	
120-12-7	Anthracene	ND	300	45	ug/kg	
56-55-3	Benzo(a)anthracene	ND	59	15	ug/kg	
50-32-8	Benzo(a)pyrene	ND	59	15	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	59	15	ug/kg	
191-24-2	Benzo(g,h,i)perylene	ND	59	15	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	59	15	ug/kg	
218-01-9	Chrysene	ND	59	15	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	59	15	ug/kg	
206-44-0	Fluoranthene	ND	300	52	ug/kg	
86-73-7	Fluorene	ND	300	45	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	59	15	ug/kg	
90-12-0	1-Methylnaphthalene	ND	300	45	ug/kg	
91-57-6	2-Methylnaphthalene	ND	300	45	ug/kg	
91-20-3	Naphthalene	ND	300	45	ug/kg	
85-01-8	Phenanthrene	ND	300	45	ug/kg	
129-00-0	Pyrene	ND	300	52	ug/kg	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	43SB09A		
Lab Sample ID:	F51300-24	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8270C SW846 3550B	Percent Solids:	90.3
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	U003805.D	1	08/07/07	NJ	08/03/07	OP21737	SU185
Run #2							

	Initial Weight	Final Volume
Run #1	30.1 g	1.0 ml
Run #2		

ABN TCL List w/o PAHs

CAS No.	Compound	Result	RL	MDL	Units	Q
65-85-0	Benzoic acid	ND	920	370	ug/kg	
95-57-8	2-Chlorophenol	ND	180	37	ug/kg	
59-50-7	4-Chloro-3-methyl phenol	ND	180	37	ug/kg	
120-83-2	2,4-Dichlorophenol	ND	180	37	ug/kg	
105-67-9	2,4-Dimethylphenol	ND	180	37	ug/kg	
51-28-5	2,4-Dinitrophenol	ND	920	370	ug/kg	
534-52-1	4,6-Dinitro-o-cresol	ND	370	74	ug/kg	
95-48-7	2-Methylphenol	ND	180	37	ug/kg	
	3&4-Methylphenol	ND	180	37	ug/kg	
88-75-5	2-Nitrophenol	ND	180	37	ug/kg	
100-02-7	4-Nitrophenol	ND	920	370	ug/kg	
87-86-5	Pentachlorophenol	ND	920	370	ug/kg	
108-95-2	Phenol	ND	180	37	ug/kg	
95-95-4	2,4,5-Trichlorophenol	ND	180	37	ug/kg	
88-06-2	2,4,6-Trichlorophenol	ND	180	37	ug/kg	
101-55-3	4-Bromophenyl phenyl ether	ND	180	37	ug/kg	
85-68-7	Butyl benzyl phthalate	ND	370	92	ug/kg	
100-51-6	Benzyl Alcohol	ND	180	37	ug/kg	
91-58-7	2-Chloronaphthalene	ND	180	37	ug/kg	
106-47-8	4-Chloroaniline	ND	180	74	ug/kg	
86-74-8	Carbazole	ND	180	37	ug/kg	
111-91-1	bis(2-Chloroethoxy)methane	ND	180	37	ug/kg	
111-44-4	bis(2-Chloroethyl)ether	ND	180	37	ug/kg	
108-60-1	bis(2-Chloroisopropyl)ether	ND	180	37	ug/kg	
7005-72-3	4-Chlorophenyl phenyl ether	ND	180	37	ug/kg	
95-50-1	1,2-Dichlorobenzene	ND	180	37	ug/kg	
541-73-1	1,3-Dichlorobenzene	ND	180	37	ug/kg	
106-46-7	1,4-Dichlorobenzene	ND	180	37	ug/kg	
121-14-2	2,4-Dinitrotoluene	ND	180	37	ug/kg	
606-20-2	2,6-Dinitrotoluene	ND	180	37	ug/kg	
91-94-1	3,3'-Dichlorobenzidine	ND	370	74	ug/kg	
132-64-9	Dibenzofuran	ND	180	37	ug/kg	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	43SB09A		
Lab Sample ID:	F51300-24	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8270C SW846 3550B	Percent Solids:	90.3
Project:	WPA 019 Field Investigation; Radford AAP, VA		

ABN TCL List w/o PAHs

CAS No.	Compound	Result	RL	MDL	Units	Q
84-74-2	Di-n-butyl phthalate	ND	370	92	ug/kg	
117-84-0	Di-n-octyl phthalate	ND	370	92	ug/kg	
84-66-2	Diethyl phthalate	ND	370	180	ug/kg	
131-11-3	Dimethyl phthalate	ND	370	92	ug/kg	
117-81-7	bis(2-Ethylhexyl)phthalate	ND	370	180	ug/kg	
118-74-1	Hexachlorobenzene	ND	180	37	ug/kg	
87-68-3	Hexachlorobutadiene	ND	180	37	ug/kg	
77-47-4	Hexachlorocyclopentadiene	ND	180	37	ug/kg	
67-72-1	Hexachloroethane	ND	180	37	ug/kg	
78-59-1	Isophorone	ND	180	37	ug/kg	
88-74-4	2-Nitroaniline	ND	370	74	ug/kg	
99-09-2	3-Nitroaniline	ND	370	74	ug/kg	
100-01-6	4-Nitroaniline	ND	370	74	ug/kg	
98-95-3	Nitrobenzene	ND	180	37	ug/kg	
621-64-7	N-Nitroso-di-n-propylamine	ND	180	37	ug/kg	
86-30-6	N-Nitrosodiphenylamine	ND	180	37	ug/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	180	37	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol	81%		40-102%
4165-62-2	Phenol-d5	87%		41-100%
118-79-6	2,4,6-Tribromophenol	83%		42-108%
4165-60-0	Nitrobenzene-d5	77%		40-105%
321-60-8	2-Fluorobiphenyl	81%		43-107%
1718-51-0	Terphenyl-d14	85%		45-119%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

3.2.4
B

Client Sample ID:	43SB09A		
Lab Sample ID:	F51300-24	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8270C BY SIM SW846 3550B	Percent Solids:	90.3
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	R09706.D	4	08/08/07	NJ	08/03/07	OP21738	SR458
Run #2							

	Initial Weight	Final Volume
Run #1	30.1 g	1.0 ml
Run #2		

BN PAH List

CAS No.	Compound	Result	RL	MDL	Units	Q	DATA VAL QUALIFIER
83-32-9	Acenaphthene	ND	290	74	ug/kg		
208-96-8	Acenaphthylene	ND	290	74	ug/kg		
120-12-7	Anthracene	ND	290	44	ug/kg		
56-55-3	Benzo(a)anthracene	88.8	59	15	ug/kg		
50-32-8	Benzo(a)pyrene	140	59	15	ug/kg		
205-99-2	Benzo(b)fluoranthene	80.1	59	15	ug/kg		
191-24-2	Benzo(g,h,i)perylene	65.5	59	15	ug/kg		
207-08-9	Benzo(k)fluoranthene	93.5	59	15	ug/kg		
218-01-9	Chrysene	81.8	59	15	ug/kg		
53-70-3	Dibenzo(a,h)anthracene	ND	59	15	ug/kg		
206-44-0	Fluoranthene	69.4	290	52	ug/kg	J	J
86-73-7	Fluorene	ND	290	44	ug/kg		
193-39-5	Indeno(1,2,3-cd)pyrene	72.8	59	15	ug/kg		
90-12-0	1-Methylnaphthalene	ND	290	44	ug/kg		
91-57-6	2-Methylnaphthalene	ND	290	44	ug/kg		
91-20-3	Naphthalene	ND	290	44	ug/kg		
85-01-8	Phenanthrene	ND	290	44	ug/kg		
129-00-0	Pyrene	118	290	52	ug/kg	J	J

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: U003806.D

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Report of Analysis

3.2.5

Client Sample ID:	43SB09B		
Lab Sample ID:	F51300-25	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8270C SW846 3550B	Percent Solids:	86.9
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	U003806.D	1	08/07/07	NJ	08/03/07	OP21737	SU185
Run #2							

	Initial Weight	Final Volume
Run #1	30.0 g	1.0 ml
Run #2		

ABN TCL List w/o PAHs

DATA VAL QUALIFIER

CAS No.	Compound	Result	RL	MDL	Units	Q	
65-85-0	Benzoic acid	ND	960	380	ug/kg		
95-57-8	2-Chlorophenol	ND	190	38	ug/kg		
59-50-7	4-Chloro-3-methyl phenol	ND	190	38	ug/kg		
120-83-2	2,4-Dichlorophenol	ND	190	38	ug/kg		
105-67-9	2,4-Dimethylphenol	ND	190	38	ug/kg		
51-28-5	2,4-Dinitrophenol	ND	960	380	ug/kg		
534-52-1	4,6-Dinitro-o-cresol	ND	380	77	ug/kg		
95-48-7	2-Methylphenol	ND	190	38	ug/kg		
	3&4-Methylphenol	ND	190	38	ug/kg		
88-75-5	2-Nitrophenol	ND	190	38	ug/kg		
100-02-7	4-Nitrophenol	ND	960	380	ug/kg		
87-86-5	Pentachlorophenol	ND	960	380	ug/kg		
108-95-2	Phenol	ND	190	38	ug/kg		
95-95-4	2,4,5-Trichlorophenol	ND	190	38	ug/kg		
88-06-2	2,4,6-Trichlorophenol	ND	190	38	ug/kg		
101-55-3	4-Bromophenyl phenyl ether	ND	190	38	ug/kg		
85-68-7	Butyl benzyl phthalate	ND	380	96	ug/kg		
100-51-6	Benzyl Alcohol	ND	190	38	ug/kg		
91-58-7	2-Chloronaphthalene	ND	190	38	ug/kg		
106-47-8	4-Chloroaniline	ND	190	77	ug/kg		
86-74-8	Carbazole	ND	190	38	ug/kg		
111-91-1	bis(2-Chloroethoxy)methane	ND	190	38	ug/kg		
111-44-4	bis(2-Chloroethyl)ether	ND	190	38	ug/kg		
108-60-1	bis(2-Chloroisopropyl)ether	ND	190	38	ug/kg		
7005-72-3	4-Chlorophenyl phenyl ether	ND	190	38	ug/kg		
95-50-1	1,2-Dichlorobenzene	ND	190	38	ug/kg		
541-73-1	1,3-Dichlorobenzene	ND	190	38	ug/kg		
106-46-7	1,4-Dichlorobenzene	ND	190	38	ug/kg		
121-14-2	2,4-Dinitrotoluene	ND	190	38	ug/kg		
606-20-2	2,6-Dinitrotoluene	ND	190	38	ug/kg		
91-94-1	3,3'-Dichlorobenzidine	ND	380	77	ug/kg		
132-64-9	Dibenzofuran	105	190	38	ug/kg	J	J

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	43SB09B		
Lab Sample ID:	F51300-25	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8270C SW846 3550B	Percent Solids:	86.9
Project:	WPA 019 Field Investigation; Radford AAP, VA		

ABN TCL List w/o PAHs

CAS No.	Compound	Result	RL	MDL	Units	Q	DATA VAL QUALIFIER
84-74-2	Di-n-butyl phthalate	96.4	380	96	ug/kg	J	J
117-84-0	Di-n-octyl phthalate	ND	380	96	ug/kg		
84-66-2	Diethyl phthalate	210	380	190	ug/kg	J	J
131-11-3	Dimethyl phthalate	ND	380	96	ug/kg		
117-81-7	bis(2-Ethylhexyl)phthalate	707	380	190	ug/kg		
118-74-1	Hexachlorobenzene	ND	190	38	ug/kg		
87-68-3	Hexachlorobutadiene	ND	190	38	ug/kg		
77-47-4	Hexachlorocyclopentadiene	ND	190	38	ug/kg		
67-72-1	Hexachloroethane	ND	190	38	ug/kg		
78-59-1	Isophorone	ND	190	38	ug/kg		
88-74-4	2-Nitroaniline	ND	380	77	ug/kg		
99-09-2	3-Nitroaniline	ND	380	77	ug/kg		
100-01-6	4-Nitroaniline	ND	380	77	ug/kg		
98-95-3	Nitrobenzene	ND	190	38	ug/kg		
621-64-7	N-Nitroso-di-n-propylamine	ND	190	38	ug/kg		
86-30-6	N-Nitrosodiphenylamine	280	190	38	ug/kg		
120-82-1	1,2,4-Trichlorobenzene	ND	190	38	ug/kg		

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol	67%		40-102%
4165-62-2	Phenol-d5	72%		41-100%
118-79-6	2,4,6-Tribromophenol	74%		42-108%
4165-60-0	Nitrobenzene-d5	61%		40-105%
321-60-8	2-Fluorobiphenyl	68%		43-107%
1718-51-0	Terphenyl-d14	77%		45-119%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	43SB09B		
Lab Sample ID:	F51300-25	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8270C BY SIM SW846 3550B	Percent Solids:	86.9
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	R09707.D	4	08/08/07	NJ	08/03/07	OP21738	SR458
Run #2							

	Initial Weight	Final Volume
Run #1	30.0 g	1.0 ml
Run #2		

BN PAH List

DATA VAL QUALIFIER

CAS No.	Compound	Result	RL	MDL	Units	Q	
83-32-9	Acenaphthene	152	310	77	ug/kg	J	J
208-96-8	Acenaphthylene	ND	310	77	ug/kg		
120-12-7	Anthracene	ND	310	46	ug/kg		
56-55-3	Benzo(a)anthracene	ND	61	15	ug/kg		
50-32-8	Benzo(a)pyrene	ND	61	15	ug/kg		
205-99-2	Benzo(b)fluoranthene	ND	61	15	ug/kg		
191-24-2	Benzo(g,h,i)perylene	ND	61	15	ug/kg		
207-08-9	Benzo(k)fluoranthene	ND	61	15	ug/kg		
218-01-9	Chrysene	ND	61	15	ug/kg		
53-70-3	Dibenzo(a,h)anthracene	ND	61	15	ug/kg		
206-44-0	Fluoranthene	77.7	310	54	ug/kg	J	J
86-73-7	Fluorene	160	310	46	ug/kg	J	J
193-39-5	Indeno(1,2,3-cd)pyrene	ND	61	15	ug/kg		
90-12-0	1-Methylnaphthalene	95.9	310	46	ug/kg	J	J
91-57-6	2-Methylnaphthalene	152	310	46	ug/kg	J	J
91-20-3	Naphthalene	92.1	310	46	ug/kg	J	J
85-01-8	Phenanthrene	347	310	46	ug/kg		
129-00-0	Pyrene	ND	310	54	ug/kg		

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	43SB09C		
Lab Sample ID:	F51300-26	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8270C SW846 3550B	Percent Solids:	87.1
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	U003814.D	1	08/07/07	NJ	08/03/07	OP21737	SU185
Run #2							

	Initial Weight	Final Volume
Run #1	30.9 g	1.0 ml
Run #2		

ABN TCL List w/o PAHs

CAS No.	Compound	Result	RL	MDL	Units	Q
65-85-0	Benzoic acid	ND	930	370	ug/kg	
95-57-8	2-Chlorophenol	ND	190	37	ug/kg	
59-50-7	4-Chloro-3-methyl phenol	ND	190	37	ug/kg	
120-83-2	2,4-Dichlorophenol	ND	190	37	ug/kg	
105-67-9	2,4-Dimethylphenol	ND	190	37	ug/kg	
51-28-5	2,4-Dinitrophenol	ND	930	370	ug/kg	
534-52-1	4,6-Dinitro-o-cresol	ND	370	74	ug/kg	
95-48-7	2-Methylphenol	ND	190	37	ug/kg	
	3&4-Methylphenol	ND	190	37	ug/kg	
88-75-5	2-Nitrophenol	ND	190	37	ug/kg	
100-02-7	4-Nitrophenol	ND	930	370	ug/kg	
87-86-5	Pentachlorophenol	ND	930	370	ug/kg	
108-95-2	Phenol	ND	190	37	ug/kg	
95-95-4	2,4,5-Trichlorophenol	ND	190	37	ug/kg	
88-06-2	2,4,6-Trichlorophenol	ND	190	37	ug/kg	
101-55-3	4-Bromophenyl phenyl ether	ND	190	37	ug/kg	
85-68-7	Butyl benzyl phthalate	ND	370	93	ug/kg	
100-51-6	Benzyl Alcohol	ND	190	37	ug/kg	
91-58-7	2-Chloronaphthalene	ND	190	37	ug/kg	
106-47-8	4-Chloroaniline	ND	190	74	ug/kg	
86-74-8	Carbazole	ND	190	37	ug/kg	
111-91-1	bis(2-Chloroethoxy)methane	ND	190	37	ug/kg	
111-44-4	bis(2-Chloroethyl)ether	ND	190	37	ug/kg	
108-60-1	bis(2-Chloroisopropyl)ether	ND	190	37	ug/kg	
7005-72-3	4-Chlorophenyl phenyl ether	ND	190	37	ug/kg	
95-50-1	1,2-Dichlorobenzene	ND	190	37	ug/kg	
541-73-1	1,3-Dichlorobenzene	ND	190	37	ug/kg	
106-46-7	1,4-Dichlorobenzene	ND	190	37	ug/kg	
121-14-2	2,4-Dinitrotoluene	ND	190	37	ug/kg	
606-20-2	2,6-Dinitrotoluene	ND	190	37	ug/kg	
91-94-1	3,3'-Dichlorobenzidine	ND	370	74	ug/kg	
132-64-9	Dibenzofuran	ND	190	37	ug/kg	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

3.26
B

Client Sample ID:	43SB09C		
Lab Sample ID:	F51300-26	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8270C SW846 3550B	Percent Solids:	87.1
Project:	WPA 019 Field Investigation; Radford AAP, VA		

ABN TCL List w/o PAHs

DATA VAL QUALIFIER

CAS No.	Compound	Result	RL	MDL	Units	Q	
84-74-2	Di-n-butyl phthalate	ND	370	93	ug/kg		
117-84-0	Di-n-octyl phthalate	ND	370	93	ug/kg		
84-66-2	Diethyl phthalate	ND	370	190	ug/kg		
131-11-3	Dimethyl phthalate	ND	370	93	ug/kg		
117-81-7	bis(2-Ethylhexyl)phthalate	ND	370	190	ug/kg		
118-74-1	Hexachlorobenzene	ND	190	37	ug/kg		
87-68-3	Hexachlorobutadiene	ND	190	37	ug/kg		
77-47-4	Hexachlorocyclopentadiene	ND	190	37	ug/kg		
67-72-1	Hexachloroethane	ND	190	37	ug/kg		
78-59-1	Isophorone	ND	190	37	ug/kg		
88-74-4	2-Nitroaniline	ND	370	74	ug/kg		
99-09-2	3-Nitroaniline	ND	370	74	ug/kg		
100-01-6	4-Nitroaniline	ND	370	74	ug/kg		
98-95-3	Nitrobenzene	ND	190	37	ug/kg		
621-64-7	N-Nitroso-di-n-propylamine	ND	190	37	ug/kg		
86-30-6	N-Nitrosodiphenylamine	124	190	37	ug/kg	J	J
120-82-1	1,2,4-Trichlorobenzene	ND	190	37	ug/kg		

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol	59%		40-102%
4165-62-2	Phenol-d5	61%		41-100%
118-79-6	2,4,6-Tribromophenol	57%		42-108%
4165-60-0	Nitrobenzene-d5	56%		40-105%
321-60-8	2-Fluorobiphenyl	53%		43-107%
1718-51-0	Terphenyl-d14	59%		45-119%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	43SB09C		
Lab Sample ID:	F51300-26	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8270C BY SIM SW846 3550B	Percent Solids:	87.1
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	R09710.D	4	08/08/07	NJ	08/03/07	OP21738	SR458
Run #2							

	Initial Weight	Final Volume
Run #1	30.9 g	1.0 ml
Run #2		

BN PAH List

CAS No.	Compound	Result	RL	MDL	Units	Q
83-32-9	Acenaphthene	ND	300	74	ug/kg	
208-96-8	Acenaphthylene	ND	300	74	ug/kg	
120-12-7	Anthracene	ND	300	45	ug/kg	
56-55-3	Benzo(a)anthracene	ND	59	15	ug/kg	
50-32-8	Benzo(a)pyrene	ND	59	15	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	59	15	ug/kg	
191-24-2	Benzo(g,h,i)perylene	ND	59	15	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	59	15	ug/kg	
218-01-9	Chrysene	ND	59	15	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	59	15	ug/kg	
206-44-0	Fluoranthene	ND	300	52	ug/kg	
86-73-7	Fluorene	ND	300	45	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	59	15	ug/kg	
90-12-0	1-Methylnaphthalene	ND	300	45	ug/kg	
91-57-6	2-Methylnaphthalene	ND	300	45	ug/kg	
91-20-3	Naphthalene	ND	300	45	ug/kg	
85-01-8	Phenanthrene	ND	300	45	ug/kg	
129-00-0	Pyrene	ND	300	52	ug/kg	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: U003815.D

Accutest Laboratories

Report of Analysis

Client Sample ID:	43SB10A		
Lab Sample ID:	F51300-27	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8270C SW846 3550B	Percent Solids:	87.1
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	U003815.D	1	08/07/07	NJ	08/03/07	OP21737	SU185
Run #2							

	Initial Weight	Final Volume
Run #1	30.3 g	1.0 ml
Run #2		

ABN TCL List w/o PAHs

CAS No.	Compound	Result	RL	MDL	Units	Q
65-85-0	Benzoic acid	ND	950	380	ug/kg	
95-57-8	2-Chlorophenol	ND	190	38	ug/kg	
59-50-7	4-Chloro-3-methyl phenol	ND	190	38	ug/kg	
120-83-2	2,4-Dichlorophenol	ND	190	38	ug/kg	
105-67-9	2,4-Dimethylphenol	ND	190	38	ug/kg	
51-28-5	2,4-Dinitrophenol	ND	950	380	ug/kg	
534-52-1	4,6-Dinitro-o-cresol	ND	380	76	ug/kg	
95-48-7	2-Methylphenol	ND	190	38	ug/kg	
	3&4-Methylphenol	ND	190	38	ug/kg	
88-75-5	2-Nitrophenol	ND	190	38	ug/kg	
100-02-7	4-Nitrophenol	ND	950	380	ug/kg	
87-86-5	Pentachlorophenol	ND	950	380	ug/kg	
108-95-2	Phenol	ND	190	38	ug/kg	
95-95-4	2,4,5-Trichlorophenol	ND	190	38	ug/kg	
88-06-2	2,4,6-Trichlorophenol	ND	190	38	ug/kg	
101-55-3	4-Bromophenyl phenyl ether	ND	190	38	ug/kg	
85-68-7	Butyl benzyl phthalate	ND	380	95	ug/kg	
100-51-6	Benzyl Alcohol	ND	190	38	ug/kg	
91-58-7	2-Chloronaphthalene	ND	190	38	ug/kg	
106-47-8	4-Chloroaniline	ND	190	76	ug/kg	
86-74-8	Carbazole	ND	190	38	ug/kg	
111-91-1	bis(2-Chloroethoxy)methane	ND	190	38	ug/kg	
111-44-4	bis(2-Chloroethyl)ether	ND	190	38	ug/kg	
108-60-1	bis(2-Chloroisopropyl)ether	ND	190	38	ug/kg	
7005-72-3	4-Chlorophenyl phenyl ether	ND	190	38	ug/kg	
95-50-1	1,2-Dichlorobenzene	ND	190	38	ug/kg	
541-73-1	1,3-Dichlorobenzene	ND	190	38	ug/kg	
106-46-7	1,4-Dichlorobenzene	ND	190	38	ug/kg	
121-14-2	2,4-Dinitrotoluene	ND	190	38	ug/kg	
606-20-2	2,6-Dinitrotoluene	ND	190	38	ug/kg	
91-94-1	3,3'-Dichlorobenzidine	ND	380	76	ug/kg	
132-64-9	Dibenzofuran	ND	190	38	ug/kg	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	43SB10A		
Lab Sample ID:	F51300-27	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8270C SW846 3550B	Percent Solids:	87.1
Project:	WPA 019 Field Investigation; Radford AAP, VA		

ABN TCL List w/o PAHs

CAS No.	Compound	Result	RL	MDL	Units	Q
84-74-2	Di-n-butyl phthalate	ND	380	95	ug/kg	
117-84-0	Di-n-octyl phthalate	ND	380	95	ug/kg	
84-66-2	Diethyl phthalate	ND	380	190	ug/kg	
131-11-3	Dimethyl phthalate	ND	380	95	ug/kg	
117-81-7	bis(2-Ethylhexyl)phthalate	ND	380	190	ug/kg	
118-74-1	Hexachlorobenzene	ND	190	38	ug/kg	
87-68-3	Hexachlorobutadiene	ND	190	38	ug/kg	
77-47-4	Hexachlorocyclopentadiene	ND	190	38	ug/kg	
67-72-1	Hexachloroethane	ND	190	38	ug/kg	
78-59-1	Isophorone	ND	190	38	ug/kg	
88-74-4	2-Nitroaniline	ND	380	76	ug/kg	
99-09-2	3-Nitroaniline	ND	380	76	ug/kg	
100-01-6	4-Nitroaniline	ND	380	76	ug/kg	
98-95-3	Nitrobenzene	ND	190	38	ug/kg	
621-64-7	N-Nitroso-di-n-propylamine	ND	190	38	ug/kg	
86-30-6	N-Nitrosodiphenylamine	ND	190	38	ug/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	190	38	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol	67%		40-102%
4165-62-2	Phenol-d5	74%		41-100%
118-79-6	2,4,6-Tribromophenol	63%		42-108%
4165-60-0	Nitrobenzene-d5	62%		40-105%
321-60-8	2-Fluorobiphenyl	60%		43-107%
1718-51-0	Terphenyl-d14	67%		45-119%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	43SB10A		
Lab Sample ID:	F51300-27	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8270C BY SIM SW846 3550B	Percent Solids:	87.1
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	R09711.D	4	08/08/07	NJ	08/03/07	OP21738	SR458
Run #2							

	Initial Weight	Final Volume
Run #1	30.3 g	1.0 ml
Run #2		

BN PAH List

CAS No.	Compound	Result	RL	MDL	Units	Q
83-32-9	Acenaphthene	ND	300	76	ug/kg	
208-96-8	Acenaphthylene	ND	300	76	ug/kg	
120-12-7	Anthracene	ND	300	45	ug/kg	
56-55-3	Benzo(a)anthracene	ND	61	15	ug/kg	
50-32-8	Benzo(a)pyrene	ND	61	15	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	61	15	ug/kg	
191-24-2	Benzo(g,h,i)perylene	ND	61	15	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	61	15	ug/kg	
218-01-9	Chrysene	ND	61	15	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	61	15	ug/kg	
206-44-0	Fluoranthene	ND	300	53	ug/kg	
86-73-7	Fluorene	ND	300	45	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	61	15	ug/kg	
90-12-0	1-Methylnaphthalene	ND	300	45	ug/kg	
91-57-6	2-Methylnaphthalene	ND	300	45	ug/kg	
91-20-3	Naphthalene	ND	300	45	ug/kg	
85-01-8	Phenanthrene	ND	300	45	ug/kg	
129-00-0	Pyrene	ND	300	53	ug/kg	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	43SB10B		
Lab Sample ID:	F51300-28	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8270C SW846 3550B	Percent Solids:	86.6
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	U003816.D	1	08/07/07	NJ	08/03/07	OP21737	SU185
Run #2							

	Initial Weight	Final Volume
Run #1	30.9 g	1.0 ml
Run #2		

ABN TCL List w/o PAHs

CAS No.	Compound	Result	RL	MDL	Units	Q
65-85-0	Benzoic acid	ND	930	370	ug/kg	
95-57-8	2-Chlorophenol	ND	190	37	ug/kg	
59-50-7	4-Chloro-3-methyl phenol	ND	190	37	ug/kg	
120-83-2	2,4-Dichlorophenol	ND	190	37	ug/kg	
105-67-9	2,4-Dimethylphenol	ND	190	37	ug/kg	
51-28-5	2,4-Dinitrophenol	ND	930	370	ug/kg	
534-52-1	4,6-Dinitro-o-cresol	ND	370	75	ug/kg	
95-48-7	2-Methylphenol	ND	190	37	ug/kg	
	3&4-Methylphenol	ND	190	37	ug/kg	
88-75-5	2-Nitrophenol	ND	190	37	ug/kg	
100-02-7	4-Nitrophenol	ND	930	370	ug/kg	
87-86-5	Pentachlorophenol	ND	930	370	ug/kg	
108-95-2	Phenol	ND	190	37	ug/kg	
95-95-4	2,4,5-Trichlorophenol	ND	190	37	ug/kg	
88-06-2	2,4,6-Trichlorophenol	ND	190	37	ug/kg	
101-55-3	4-Bromophenyl phenyl ether	ND	190	37	ug/kg	
85-68-7	Butyl benzyl phthalate	ND	370	93	ug/kg	
100-51-6	Benzyl Alcohol	ND	190	37	ug/kg	
91-58-7	2-Chloronaphthalene	ND	190	37	ug/kg	
106-47-8	4-Chloroaniline	ND	190	75	ug/kg	
86-74-8	Carbazole	ND	190	37	ug/kg	
111-91-1	bis(2-Chloroethoxy)methane	ND	190	37	ug/kg	
111-44-4	bis(2-Chloroethyl)ether	ND	190	37	ug/kg	
108-60-1	bis(2-Chloroisopropyl)ether	ND	190	37	ug/kg	
7005-72-3	4-Chlorophenyl phenyl ether	ND	190	37	ug/kg	
95-50-1	1,2-Dichlorobenzene	ND	190	37	ug/kg	
541-73-1	1,3-Dichlorobenzene	ND	190	37	ug/kg	
106-46-7	1,4-Dichlorobenzene	ND	190	37	ug/kg	
121-14-2	2,4-Dinitrotoluene	ND	190	37	ug/kg	
606-20-2	2,6-Dinitrotoluene	ND	190	37	ug/kg	
91-94-1	3,3'-Dichlorobenzidine	ND	370	75	ug/kg	
132-64-9	Dibenzofuran	ND	190	37	ug/kg	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	43SB10B		
Lab Sample ID:	F51300-28	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8270C SW846 3550B	Percent Solids:	86.6
Project:	WPA 019 Field Investigation; Radford AAP, VA		

ABN TCL List w/o PAHs

CAS No.	Compound	Result	RL	MDL	Units	Q
84-74-2	Di-n-butyl phthalate	ND	370	93	ug/kg	
117-84-0	Di-n-octyl phthalate	ND	370	93	ug/kg	
84-66-2	Diethyl phthalate	ND	370	190	ug/kg	
131-11-3	Dimethyl phthalate	ND	370	93	ug/kg	
117-81-7	bis(2-Ethylhexyl)phthalate	ND	370	190	ug/kg	
118-74-1	Hexachlorobenzene	ND	190	37	ug/kg	
87-68-3	Hexachlorobutadiene	ND	190	37	ug/kg	
77-47-4	Hexachlorocyclopentadiene	ND	190	37	ug/kg	
67-72-1	Hexachloroethane	ND	190	37	ug/kg	
78-59-1	Isophorone	ND	190	37	ug/kg	
88-74-4	2-Nitroaniline	ND	370	75	ug/kg	
99-09-2	3-Nitroaniline	ND	370	75	ug/kg	
100-01-6	4-Nitroaniline	ND	370	75	ug/kg	
98-95-3	Nitrobenzene	ND	190	37	ug/kg	
621-64-7	N-Nitroso-di-n-propylamine	ND	190	37	ug/kg	
86-30-6	N-Nitrosodiphenylamine	ND	190	37	ug/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	190	37	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol	65%		40-102%
4165-62-2	Phenol-d5	73%		41-100%
118-79-6	2,4,6-Tribromophenol	68%		42-108%
4165-60-0	Nitrobenzene-d5	68%		40-105%
321-60-8	2-Fluorobiphenyl	65%		43-107%
1718-51-0	Terphenyl-d14	73%		45-119%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	43SB10B		
Lab Sample ID:	F51300-28	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8270C BY SIM SW846 3550B	Percent Solids:	86.6
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	R09712.D	4	08/08/07	NJ	08/03/07	OP21738	SR458
Run #2							

	Initial Weight	Final Volume
Run #1	30.9 g	1.0 ml
Run #2		

BN PAH List

CAS No.	Compound	Result	RL	MDL	Units	Q
83-32-9	Acenaphthene	ND	300	75	ug/kg	
208-96-8	Acenaphthylene	ND	300	75	ug/kg	
120-12-7	Anthracene	ND	300	45	ug/kg	
56-55-3	Benzo(a)anthracene	ND	60	15	ug/kg	
50-32-8	Benzo(a)pyrene	ND	60	15	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	60	15	ug/kg	
191-24-2	Benzo(g,h,i)perylene	ND	60	15	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	60	15	ug/kg	
218-01-9	Chrysene	ND	60	15	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	60	15	ug/kg	
206-44-0	Fluoranthene	ND	300	52	ug/kg	
86-73-7	Fluorene	ND	300	45	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	60	15	ug/kg	
90-12-0	1-Methylnaphthalene	ND	300	45	ug/kg	
91-57-6	2-Methylnaphthalene	ND	300	45	ug/kg	
91-20-3	Naphthalene	ND	300	45	ug/kg	
85-01-8	Phenanthrene	ND	300	45	ug/kg	
129-00-0	Pyrene	ND	300	52	ug/kg	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	43SB10C		
Lab Sample ID:	F51300-29	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8270C SW846 3550B	Percent Solids:	83.8
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	U003817.D	1	08/07/07	NJ	08/03/07	OP21737	SU185
Run #2							

	Initial Weight	Final Volume
Run #1	30.0 g	1.0 ml
Run #2		

ABN TCL List w/o PAHs

CAS No.	Compound	Result	RL	MDL	Units	Q
65-85-0	Benzoic acid	ND	990	400	ug/kg	
95-57-8	2-Chlorophenol	ND	200	40	ug/kg	
59-50-7	4-Chloro-3-methyl phenol	ND	200	40	ug/kg	
120-83-2	2,4-Dichlorophenol	ND	200	40	ug/kg	
105-67-9	2,4-Dimethylphenol	ND	200	40	ug/kg	
51-28-5	2,4-Dinitrophenol	ND	990	400	ug/kg	
534-52-1	4,6-Dinitro-o-cresol	ND	400	80	ug/kg	
95-48-7	2-Methylphenol	ND	200	40	ug/kg	
	3&4-Methylphenol	ND	200	40	ug/kg	
88-75-5	2-Nitrophenol	ND	200	40	ug/kg	
100-02-7	4-Nitrophenol	ND	990	400	ug/kg	
87-86-5	Pentachlorophenol	ND	990	400	ug/kg	
108-95-2	Phenol	ND	200	40	ug/kg	
95-95-4	2,4,5-Trichlorophenol	ND	200	40	ug/kg	
88-06-2	2,4,6-Trichlorophenol	ND	200	40	ug/kg	
101-55-3	4-Bromophenyl phenyl ether	ND	200	40	ug/kg	
85-68-7	Butyl benzyl phthalate	ND	400	99	ug/kg	
100-51-6	Benzyl Alcohol	ND	200	40	ug/kg	
91-58-7	2-Chloronaphthalene	ND	200	40	ug/kg	
106-47-8	4-Chloroaniline	ND	200	80	ug/kg	
86-74-8	Carbazole	ND	200	40	ug/kg	
111-91-1	bis(2-Chloroethoxy)methane	ND	200	40	ug/kg	
111-44-4	bis(2-Chloroethyl)ether	ND	200	40	ug/kg	
108-60-1	bis(2-Chloroisopropyl)ether	ND	200	40	ug/kg	
7005-72-3	4-Chlorophenyl phenyl ether	ND	200	40	ug/kg	
95-50-1	1,2-Dichlorobenzene	ND	200	40	ug/kg	
541-73-1	1,3-Dichlorobenzene	ND	200	40	ug/kg	
106-46-7	1,4-Dichlorobenzene	ND	200	40	ug/kg	
121-14-2	2,4-Dinitrotoluene	ND	200	40	ug/kg	
606-20-2	2,6-Dinitrotoluene	ND	200	40	ug/kg	
91-94-1	3,3'-Dichlorobenzidine	ND	400	80	ug/kg	
132-64-9	Dibenzofuran	ND	200	40	ug/kg	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	43SB10C		
Lab Sample ID:	F51300-29	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8270C SW846 3550B	Percent Solids:	83.8
Project:	WPA 019 Field Investigation; Radford AAP, VA		

ABN TCL List w/o PAHs

CAS No.	Compound	Result	RL	MDL	Units	Q
84-74-2	Di-n-butyl phthalate	ND	400	99	ug/kg	
117-84-0	Di-n-octyl phthalate	ND	400	99	ug/kg	
84-66-2	Diethyl phthalate	ND	400	200	ug/kg	
131-11-3	Dimethyl phthalate	ND	400	99	ug/kg	
117-81-7	bis(2-Ethylhexyl)phthalate	ND	400	200	ug/kg	
118-74-1	Hexachlorobenzene	ND	200	40	ug/kg	
87-68-3	Hexachlorobutadiene	ND	200	40	ug/kg	
77-47-4	Hexachlorocyclopentadiene	ND	200	40	ug/kg	
67-72-1	Hexachloroethane	ND	200	40	ug/kg	
78-59-1	Isophorone	ND	200	40	ug/kg	
88-74-4	2-Nitroaniline	ND	400	80	ug/kg	
99-09-2	3-Nitroaniline	ND	400	80	ug/kg	
100-01-6	4-Nitroaniline	ND	400	80	ug/kg	
98-95-3	Nitrobenzene	ND	200	40	ug/kg	
621-64-7	N-Nitroso-di-n-propylamine	ND	200	40	ug/kg	
86-30-6	N-Nitrosodiphenylamine	ND	200	40	ug/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	200	40	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol	66%		40-102%
4165-62-2	Phenol-d5	71%		41-100%
118-79-6	2,4,6-Tribromophenol	76%		42-108%
4165-60-0	Nitrobenzene-d5	77%		40-105%
321-60-8	2-Fluorobiphenyl	68%		43-107%
1718-51-0	Terphenyl-d14	78%		45-119%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	43SB10C		
Lab Sample ID:	F51300-29	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8270C BY SIM SW846 3550B	Percent Solids:	83.8
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	R09713.D	4	08/08/07	NJ	08/03/07	OP21738	SR458
Run #2							

	Initial Weight	Final Volume
Run #1	30.0 g	1.0 ml
Run #2		

BN PAH List

CAS No.	Compound	Result	RL	MDL	Units	Q
83-32-9	Acenaphthene	ND	320	80	ug/kg	
208-96-8	Acenaphthylene	ND	320	80	ug/kg	
120-12-7	Anthracene	ND	320	48	ug/kg	
56-55-3	Benzo(a)anthracene	ND	64	16	ug/kg	
50-32-8	Benzo(a)pyrene	ND	64	16	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	64	16	ug/kg	
191-24-2	Benzo(g,h,i)perylene	ND	64	16	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	64	16	ug/kg	
218-01-9	Chrysene	ND	64	16	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	64	16	ug/kg	
206-44-0	Fluoranthene	ND	320	56	ug/kg	
86-73-7	Fluorene	ND	320	48	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	64	16	ug/kg	
90-12-0	1-Methylnaphthalene	ND	320	48	ug/kg	
91-57-6	2-Methylnaphthalene	ND	320	48	ug/kg	
91-20-3	Naphthalene	ND	320	48	ug/kg	
85-01-8	Phenanthrene	ND	320	48	ug/kg	
129-00-0	Pyrene	ND	320	56	ug/kg	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	TMSB10B		
Lab Sample ID:	F51300-30	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8270C SW846 3550B	Percent Solids:	85.9
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	U003818.D	1	08/07/07	NJ	08/03/07	OP21737	SU185
Run #2							

	Initial Weight	Final Volume
Run #1	29.5 g	1.0 ml
Run #2		

ABN TCL List w/o PAHs

CAS No.	Compound	Result	RL	MDL	Units	Q
65-85-0	Benzoic acid	ND	990	390	ug/kg	
95-57-8	2-Chlorophenol	ND	200	39	ug/kg	
59-50-7	4-Chloro-3-methyl phenol	ND	200	39	ug/kg	
120-83-2	2,4-Dichlorophenol	ND	200	39	ug/kg	
105-67-9	2,4-Dimethylphenol	ND	200	39	ug/kg	
51-28-5	2,4-Dinitrophenol	ND	990	390	ug/kg	
534-52-1	4,6-Dinitro-o-cresol	ND	390	79	ug/kg	
95-48-7	2-Methylphenol	ND	200	39	ug/kg	
	3&4-Methylphenol	ND	200	39	ug/kg	
88-75-5	2-Nitrophenol	ND	200	39	ug/kg	
100-02-7	4-Nitrophenol	ND	990	390	ug/kg	
87-86-5	Pentachlorophenol	ND	990	390	ug/kg	
108-95-2	Phenol	ND	200	39	ug/kg	
95-95-4	2,4,5-Trichlorophenol	ND	200	39	ug/kg	
88-06-2	2,4,6-Trichlorophenol	ND	200	39	ug/kg	
101-55-3	4-Bromophenyl phenyl ether	ND	200	39	ug/kg	
85-68-7	Butyl benzyl phthalate	ND	390	99	ug/kg	
100-51-6	Benzyl Alcohol	ND	200	39	ug/kg	
91-58-7	2-Chloronaphthalene	ND	200	39	ug/kg	
106-47-8	4-Chloroaniline	ND	200	79	ug/kg	
86-74-8	Carbazole	ND	200	39	ug/kg	
111-91-1	bis(2-Chloroethoxy)methane	ND	200	39	ug/kg	
111-44-4	bis(2-Chloroethyl)ether	ND	200	39	ug/kg	
108-60-1	bis(2-Chloroisopropyl)ether	ND	200	39	ug/kg	
7005-72-3	4-Chlorophenyl phenyl ether	ND	200	39	ug/kg	
95-50-1	1,2-Dichlorobenzene	ND	200	39	ug/kg	
541-73-1	1,3-Dichlorobenzene	ND	200	39	ug/kg	
106-46-7	1,4-Dichlorobenzene	ND	200	39	ug/kg	
121-14-2	2,4-Dinitrotoluene	ND	200	39	ug/kg	
606-20-2	2,6-Dinitrotoluene	ND	200	39	ug/kg	
91-94-1	3,3'-Dichlorobenzidine	ND	390	79	ug/kg	
132-64-9	Dibenzofuran	ND	200	39	ug/kg	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	TMSB10B		
Lab Sample ID:	F51300-30	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8270C SW846 3550B	Percent Solids:	85.9
Project:	WPA 019 Field Investigation; Radford AAP, VA		

ABN TCL List w/o PAHs

CAS No.	Compound	Result	RL	MDL	Units	Q
84-74-2	Di-n-butyl phthalate	ND	390	99	ug/kg	
117-84-0	Di-n-octyl phthalate	ND	390	99	ug/kg	
84-66-2	Diethyl phthalate	ND	390	200	ug/kg	
131-11-3	Dimethyl phthalate	ND	390	99	ug/kg	
117-81-7	bis(2-Ethylhexyl)phthalate	ND	390	200	ug/kg	
118-74-1	Hexachlorobenzene	ND	200	39	ug/kg	
87-68-3	Hexachlorobutadiene	ND	200	39	ug/kg	
77-47-4	Hexachlorocyclopentadiene	ND	200	39	ug/kg	
67-72-1	Hexachloroethane	ND	200	39	ug/kg	
78-59-1	Isophorone	ND	200	39	ug/kg	
88-74-4	2-Nitroaniline	ND	390	79	ug/kg	
99-09-2	3-Nitroaniline	ND	390	79	ug/kg	
100-01-6	4-Nitroaniline	ND	390	79	ug/kg	
98-95-3	Nitrobenzene	ND	200	39	ug/kg	
621-64-7	N-Nitroso-di-n-propylamine	ND	200	39	ug/kg	
86-30-6	N-Nitrosodiphenylamine	ND	200	39	ug/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	200	39	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol	63%		40-102%
4165-62-2	Phenol-d5	66%		41-100%
118-79-6	2,4,6-Tribromophenol	60%		42-108%
4165-60-0	Nitrobenzene-d5	57%		40-105%
321-60-8	2-Fluorobiphenyl	57%		43-107%
1718-51-0	Terphenyl-d14	62%		45-119%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	TMSB10B		
Lab Sample ID:	F51300-30	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8270C BY SIM SW846 3550B	Percent Solids:	85.9
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	R09714.D	4	08/08/07	NJ	08/03/07	OP21738	SR458
Run #2							

	Initial Weight	Final Volume
Run #1	29.5 g	1.0 ml
Run #2		

BN PAH List

CAS No.	Compound	Result	RL	MDL	Units	Q
83-32-9	Acenaphthene	ND	320	79	ug/kg	
208-96-8	Acenaphthylene	ND	320	79	ug/kg	
120-12-7	Anthracene	ND	320	47	ug/kg	
56-55-3	Benzo(a)anthracene	ND	63	16	ug/kg	
50-32-8	Benzo(a)pyrene	ND	63	16	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	63	16	ug/kg	
191-24-2	Benzo(g,h,i)perylene	ND	63	16	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	63	16	ug/kg	
218-01-9	Chrysene	ND	63	16	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	63	16	ug/kg	
206-44-0	Fluoranthene	ND	320	55	ug/kg	
86-73-7	Fluorene	ND	320	47	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	63	16	ug/kg	
90-12-0	1-Methylnaphthalene	ND	320	47	ug/kg	
91-57-6	2-Methylnaphthalene	ND	320	47	ug/kg	
91-20-3	Naphthalene	ND	320	47	ug/kg	
85-01-8	Phenanthrene	ND	320	47	ug/kg	
129-00-0	Pyrene	ND	320	55	ug/kg	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	072507R		
Lab Sample ID:	F51300-31	Date Sampled:	07/25/07
Matrix:	AQ - Equipment Blank	Date Received:	07/26/07
Method:	SW846 8270C SW846 3510C	Percent Solids:	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	L037578.D	1	08/02/07	RB	07/31/07	OP21675	SL1922
Run #2							

	Initial Volume	Final Volume
Run #1	890 ml	1.0 ml
Run #2		

ABN TCL List w/o PAHs

CAS No.	Compound	Result	RL	MDL	Units	Q
65-85-0	Benzoic Acid	ND	28	11	ug/l	
95-57-8	2-Chlorophenol	ND	5.6	1.1	ug/l	
59-50-7	4-Chloro-3-methyl phenol	ND	5.6	2.2	ug/l	
120-83-2	2,4-Dichlorophenol	ND	5.6	1.1	ug/l	
105-67-9	2,4-Dimethylphenol	ND	5.6	2.2	ug/l	
51-28-5	2,4-Dinitrophenol	ND	28	11	ug/l	
534-52-1	4,6-Dinitro-o-cresol	ND	11	2.2	ug/l	
95-48-7	2-Methylphenol	ND	5.6	1.1	ug/l	
	3&4-Methylphenol	ND	5.6	1.5	ug/l	
88-75-5	2-Nitrophenol	ND	5.6	1.1	ug/l	
100-02-7	4-Nitrophenol	ND	28	11	ug/l	
87-86-5	Pentachlorophenol	ND	28	11	ug/l	
108-95-2	Phenol	ND	5.6	2.2	ug/l	
95-95-4	2,4,5-Trichlorophenol	ND	5.6	1.1	ug/l	
88-06-2	2,4,6-Trichlorophenol	ND	5.6	1.1	ug/l	
101-55-3	4-Bromophenyl phenyl ether	ND	5.6	1.3	ug/l	
85-68-7	Butyl benzyl phthalate	ND	5.6	2.2	ug/l	
100-51-6	Benzyl Alcohol	ND	5.6	1.1	ug/l	
91-58-7	2-Chloronaphthalene	ND	5.6	1.5	ug/l	
106-47-8	4-Chloroaniline	ND	5.6	2.2	ug/l	
86-74-8	Carbazole	ND	5.6	1.1	ug/l	
111-91-1	bis(2-Chloroethoxy)methane	ND	5.6	1.1	ug/l	
111-44-4	bis(2-Chloroethyl)ether	ND	5.6	1.1	ug/l	
108-60-1	bis(2-Chloroisopropyl)ether	ND	5.6	1.1	ug/l	
7005-72-3	4-Chlorophenyl phenyl ether	ND	5.6	1.5	ug/l	
95-50-1	1,2-Dichlorobenzene	ND	5.6	1.7	ug/l	
541-73-1	1,3-Dichlorobenzene	ND	5.6	1.8	ug/l	
106-46-7	1,4-Dichlorobenzene	ND	5.6	1.7	ug/l	
121-14-2	2,4-Dinitrotoluene	ND	5.6	1.1	ug/l	
606-20-2	2,6-Dinitrotoluene	ND	5.6	1.1	ug/l	
91-94-1	3,3'-Dichlorobenzidine	ND	11	2.2	ug/l	
132-64-9	Dibenzofuran	ND	5.6	1.1	ug/l	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	072507R		
Lab Sample ID:	F51300-31	Date Sampled:	07/25/07
Matrix:	AQ - Equipment Blank	Date Received:	07/26/07
Method:	SW846 8270C SW846 3510C	Percent Solids:	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

ABN TCL List w/o PAHs

CAS No.	Compound	Result	RL	MDL	Units	Q
84-74-2	Di-n-butyl phthalate	ND	5.6	2.2	ug/l	
117-84-0	Di-n-octyl phthalate	ND	5.6	2.2	ug/l	
84-66-2	Diethyl phthalate	ND	5.6	2.2	ug/l	
131-11-3	Dimethyl phthalate	ND	5.6	2.2	ug/l	
117-81-7	bis(2-Ethylhexyl)phthalate	ND	5.6	2.2	ug/l	
118-74-1	Hexachlorobenzene	ND	5.6	1.3	ug/l	
87-68-3	Hexachlorobutadiene	ND	5.6	1.9	ug/l	
77-47-4	Hexachlorocyclopentadiene	ND	5.6	1.7	ug/l	
67-72-1	Hexachloroethane	ND	5.6	2.1	ug/l	
78-59-1	Isophorone	ND	5.6	1.1	ug/l	
88-74-4	2-Nitroaniline	ND	11	2.2	ug/l	
99-09-2	3-Nitroaniline	ND	11	2.2	ug/l	
100-01-6	4-Nitroaniline	ND	11	2.2	ug/l	
98-95-3	Nitrobenzene	ND	5.6	1.1	ug/l	
621-64-7	N-Nitroso-di-n-propylamine	ND	5.6	1.1	ug/l	
86-30-6	N-Nitrosodiphenylamine	ND	5.6	1.1	ug/l	
120-82-1	1,2,4-Trichlorobenzene	ND	5.6	1.7	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol	44%		14-62%
4165-62-2	Phenol-d5	30%		10-40%
118-79-6	2,4,6-Tribromophenol	90%		33-118%
4165-60-0	Nitrobenzene-d5	81%		42-108%
321-60-8	2-Fluorobiphenyl	80%		40-106%
1718-51-0	Terphenyl-d14	84%		39-121%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	072507R		
Lab Sample ID:	F51300-31	**Date Sampled:**	07/25/07
Matrix:	AQ - Equipment Blank	**Date Received:**	07/26/07
Method:	SW846 8270C BY SIM SW846 3510C	**Percent Solids:**	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	R09531.D	1	08/02/07	NJ	07/31/07	OP21676	SR451
Run #2							

	Initial Volume	Final Volume
Run #1	890 ml	1.0 ml
Run #2		

BN PAH List

CAS No.	Compound	Result	RL	MDL	Units	Q
83-32-9	Acenaphthene	ND	1.1	0.56	ug/l	
208-96-8	Acenaphthylene	ND	1.1	0.56	ug/l	
120-12-7	Anthracene	ND	1.1	0.56	ug/l	
56-55-3	Benzo(a)anthracene	ND	0.22	0.056	ug/l	
50-32-8	Benzo(a)pyrene	ND	0.22	0.11	ug/l	
205-99-2	Benzo(b)fluoranthene	ND	0.22	0.056	ug/l	
191-24-2	Benzo(g,h,i)perylene	ND	0.22	0.11	ug/l	
207-08-9	Benzo(k)fluoranthene	ND	0.22	0.11	ug/l	
218-01-9	Chrysene	ND	0.22	0.11	ug/l	
53-70-3	Dibenzo(a,h)anthracene	ND	0.22	0.056	ug/l	
206-44-0	Fluoranthene	ND	1.1	0.28	ug/l	
86-73-7	Fluorene	ND	1.1	0.28	ug/l	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	0.22	0.056	ug/l	
90-12-0	1-Methylnaphthalene	ND	1.1	0.28	ug/l	
91-57-6	2-Methylnaphthalene	ND	1.1	0.28	ug/l	
91-20-3	Naphthalene	ND	1.1	0.28	ug/l	
85-01-8	Phenanthrene	ND	1.1	0.56	ug/l	
129-00-0	Pyrene	ND	1.1	0.28	ug/l	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Shaw® Shaw Environmental, Inc.

MEMORANDUM

TO: Jeff Parks, Shaw E&I Radford Army Ammunition Plant (RFAAP) Project Manager

FROM: Richard McCracken, Shaw E&I Project Chemist

SUBJECT: RFAAP Data Validation - Volatiles
Accutest Laboratories, Inc., SDG F51300

DATE: December 19, 2007

The purpose of this memorandum is to present the data validation report for the samples collected at RFAAP on July 25, 2007. The samples were analyzed for target compound list (TCL) volatile organic compounds (VOCs) using USEPA SW846 Method 5030B/8260B for aqueous samples and 5035A/8260B for soil samples. A total of 3 aqueous and 30 soil samples were validated. The sample IDs are:

Field Sample ID	Lab Sample ID	Field Sample ID	Lab Sample ID
59SB06A	F51300-1	43SB07A	F51300-18
59SB06B	F51300-2	43SB07B	F51300-19
59SB06C	F51300-3	43SB07C	F51300-20
59SB05A	F51300-4	43SB08A	F51300-21
59SB05B	F51300-5	43SB08B	F51300-22
59SB05C	F51300-6	43SB08C	F51300-23
59SB04A	F51300-7	43SB09A	F51300-24
59SB04B	F51300-8	43SB09B	F51300-25
59SB04C	F51300-9	43SB09C	F51300-26
TMSB04C	F51300-10	43SB10A	F51300-27
59SB02A	F51300-11	43SB10B	F51300-28
59SB02B	F51300-12	43SB10C	F51300-29
TMSB02B	F51300-13	TMSB10B	F51300-30
59SB02C	F51300-14	072507R	F51300-31
43SB06A	F51300-15	TB072507S	F51300-32
43SB06B	F51300-16	TB072507W	F51300-33
43SB06C	F51300-17		

Data were reviewed by Richard McCracken and validated using a combination of project QAPP, *Quality Systems Manual for Environmental Laboratories, Final Version 3, January, 2006* (DoD, 2006) (DoD QSM), method-specific criteria, and laboratory SOP criteria. The data qualifier scheme was consistent with the *Region III Modifications to the National Functional Guidelines for Organic Data Review* (September 1994). Parameters evaluated are presented in **Table 1**. Data associated with parameters in compliance with quality control specifications have not been qualified. Data associated with parameters that did not comply with quality control specifications and directly impacted project data have been qualified in accordance with USEPA Region III specifications.

Table 1 Laboratory Performance Criteria

Qualified		Parameter
Yes	No	
	X	Holding Times and Preservation
	X	Instrument Performance Results
X		Initial Calibration
X		Continuing Calibration
	X	Blank Analysis
	X	Laboratory Control Sample
X		Matrix Spike / Spike Duplicate Sample
	X	System Monitoring Compounds
X		Internal Standards
	X	Field Sample Duplicate
X		Quantitation Verification

The quality of data collected in support of this sampling activity is considered acceptable with noted qualifications.

Richard M. Cracken

Richard McCracken, Chemist

12/19/07

Date

RFAAP VALIDATION REPORT
VOLATILES REVIEW
SDG F51300

I-Holding Times and Preservation
The objective is to ascertain the validity of results based on the holding time of the sample from time of collection to time of analysis. Holding time criteria: Aqueous samples must be cooled @ 4°C±2°C and acidified to pH<2 with HCl, with a maximum holding time of 14 days (7 days if no HCl added) from sample collection to analysis. Soil samples must be cooled @ 4°C±2°C, with a maximum holding time of 14 days from sample collection to analysis.

- Temperature Review: A temperature blank was sent with each cooler and recorded by the laboratory upon receipt. The samples collected on 7/25/07 were sent in five coolers, and were received by the laboratory on 7/26/07 at temperatures ranging from 2.6 °C to 4.0 °C. No qualifiers were applied.

- Holding Time Review: All samples were collected for VOCs on 7/25/07, and were analyzed on 7/31/07, 8/1/07, and 8/2/07. All criteria were met. No qualifiers were applied.

II-Instrument Performance Check
The analysis of the instrument performance check solution must be performed at the beginning of each 12-hour period during which samples are analyzed.

- The instrument performance check, bromofluorobenzene (BFB), met the ion abundance criteria. No qualification was applied.

III-Initial Calibration
Compliance requirements for satisfactory instrument calibration are established to ensure that the instrument used is capable of producing acceptable qualitative and quantitative data for volatile target compounds. Initial calibration demonstrates that the instrument is capable of acceptable performance in the beginning of the analytical run and of producing a linear calibration curve. The RRF must be greater than 0.1 for chloromethane, 1,1-dichloroethane, and bromoform and greater than 0.3 for 1,1,2,2-tetrachloroethane and chlorobenzene. The minimum relative response factor (RRF) must be ≥0.05 for all other compounds. The DoD QSM specifies that the percent relative standard deviation (%RSD) must be ≤15% for each target compound and must be ≤30% for each calibration check compound. For compounds analyzed using linear regression or second order, correlation coefficients must be >0.995 and coefficients of determination >0.99. All detects are qualified as estimated "J" for exceeding %RSDs, and all non-detects are qualified as estimated "UJ" for grossly exceeding recoveries, unless determined to be unusable "R". Grossly exceeding is defined as twice the established criteria limits. For compounds with low RRFs, all detects are qualified as estimated "J" and non-detects are rejected "R".

- During the initial calibration performed on 07/25/07 on instrument MSVOA9 (GCMSF), target compounds methylene chloride (49.21%) and acetone (21.26%) were outside %RSD criteria. All other target compounds met %RSD criteria, and all compounds met RRF criteria. The compounds with high %RSD were quantified using linear or second order regression, and had correlation coefficients >0.995; therefore, no qualifiers were applied. Samples F51300-1 and F51300-2 were analyzed in conjunction with this initial calibration.

- During the initial calibration performed on 07/31/07 on instrument MSVOA1 (GCMSG), target compounds chloromethane (19.70%), vinyl chloride (16.26%), bromomethane (33.30%), chloroethane (18.67%), acetone (17.23%), and methylene chloride (41.28%) were outside %RSD criteria. All other target compounds met %RSD criteria, and all compounds met RRF criteria. The compounds with high %RSD (except chloromethane) were quantified using linear or second order regression, and had correlation coefficients >0.995 (except bromomethane which had a correlation coefficient of 0.994). No chloromethane (listed on Form I as methyl chloride) was detected in the associated samples so qualifiers were applied to the chloromethane data. Bromomethane (listed on Form I as methyl bromide) results in associated samples have been qualified "J/UJ". Samples F51300-15, -16, -17, -18, -19, -20, -21, -22, -23, -24, -25, -26, -27, -28, -30, and -32 were analyzed in conjunction with this initial calibration.

- During the initial calibration performed on 07/16/07 on instrument MSVOA3 (GCMSH), target compounds acetone (18.53%), methylene chloride (32.02%), trichloroethene (24.48%), ethylbenzene (15.12%), m,p-xylene (16.56%), and o-xylene (15.44%) were outside %RSD criteria. All other target compounds met %RSD criteria, and all compounds met RRF criteria. The compounds with high %RSD were quantified using linear or second order regression, and had correlation coefficients >0.995; therefore, no qualifiers were applied. Samples F51300-3, -4, -5, -6, -7, -8, -9, -10, -11, -12, -13, -14, and -29 were analyzed in conjunction with this initial calibration.

- During the initial calibration performed on 07/31/07 on instrument MSVOA6 (GCMSJ), target compounds bromomethane (22.0%), chloroethane (21.95%), methylene chloride (123.02%), and trans-1,3-dichloropropene (21.19%) were outside %RSD criteria. All other target compounds met %RSD criteria, and all compounds met RRF criteria. The compounds with high %RSD were quantified using linear or second order regression, and had correlation coefficients >0.995; therefore, no qualifiers were applied. Samples F51300-31 & -33 were analyzed in conjunction with this initial calibration.

IV-Continuing Calibration

Compliance requirements for satisfactory instrument calibration are established to ensure that the instrument used is capable of producing acceptable qualitative and quantitative data for volatile target compounds. Continuing calibration establishes the 12-hour relative response factors on which the quantitations are based and checks satisfactory performance of the instrument on a day-to-day basis. The RRF must be greater than 0.1 for chloromethane, 1,1-dichloroethane, and bromoform and greater than 0.3 for 1,1,2,2-tetrachloroethane and chlorobenzene. The minimum relative response factor (RRF) must be ≥0.05 for all other compounds. The DoD QSM specifies that the percent difference (%D) between the initial calibration RRF and the continuing calibration RRF must be within 20% for all target compounds. All detects are qualified as estimated "J" for exceeding %Ds, and all non-detects are qualified as estimated "UJ" for grossly exceeding recoveries, unless determined to be unusable "R". Grossly exceeding is defined as twice the established criteria limits. For low RRFs, all detects are qualified as estimated "J" and non-detects are rejected "R".

- During the initial calibration verification performed on 7/25/07 @1534 on instrument MSVOA9 (GCMSF), bromomethane (28.8%) had a %D outside criteria. All other target compounds were within criteria (%D≤20%; %Drift≤20%; RRF≥0.05). No samples were analyzed following this initial calibration verification.

- During the continuing calibration performed on 7/31/07 @1226 on instrument MSVOA9 (GCMSF), all target compounds were within criteria (%D≤20%; %Drift≤20%; RRF≥0.05). Samples F51300-1 and F51300-2 were analyzed following this continuing calibration.

- During the initial calibration verification performed on 7/31/07 @1408 on instrument MSVOA1 (GCMSG), vinyl chloride (23.5%), bromomethane (29.6%), chloroethane (24.1%), acetone (25.2%) had %D outside criteria. All other target compounds were within criteria (%D≤20%; %Drift≤20%; RRF≥0.05). No samples were analyzed following this initial calibration verification.

- During the continuing calibration performed on 7/31/07 @1532 on instrument MSVOA1 (GCMSG), all target compounds were within criteria (%D≤20%; %Drift≤20%; RRF≥0.05). No qualifiers were applied. Samples F51300-15, -16, -17, -18, -19, -21, -22, -24, -25, -26, -27, -28, -30, and -32 were analyzed following this initial calibration.

- During the continuing calibration performed on 8/1/07 @0917 on instrument MSVOA1 (GCMSG), acetone (23.8%) and carbon tetrachloride (32.1%) had %D/%drift outside criteria. All other target compounds were within criteria (%D≤20%; %Drift≤20%; RRF≥0.05). Detections of these volatiles in the associated samples have been qualified "J", non-detects were not qualified. Samples F51300-20 and -23 were analyzed following this continuing calibration.

- During the initial calibration verification performed on 7/16/07 @1820 on instrument MSVOA3 (GCMSH), bromomethane (36.1%) had a %D outside criteria. All other target compounds were within criteria (%D≤20%; %Drift≤20%; RRF≥0.05). No samples were analyzed following this initial calibration verification.

- During the continuing calibration performed on 7/31/07 @1112 on instrument MSVOA3 (GCMSH), bromomethane (27.9%), chloroethane (25.4%), acetone (75.0%), 2-butanone (22.9%), and trichloroethene (20.7%) had %D/%drift outside criteria. All other target compounds were within criteria (%D≤20%; %Drift≤20%; RRF≥0.05). Detections of these volatiles in the associated samples have been qualified "J", acetone non-detects have been qualified "UJ", all other non-detects were not qualified. Samples F51300-3, -4, -5, -6, -8, -9, -10, -14, and -29 were analyzed following this continuing calibration.

- During the continuing calibration performed on 8/1/07 @1018 on instrument MSVOA3 (GCMSH), acetone (81.3%), 2-butanone (27.8%), and carbon tetrachloride (21.5%) had %D/%drift outside criteria. All other target compounds were within criteria (%D≤20%; %Drift≤20%; RRF≥0.05). Detections of these volatiles in the associated samples have been qualified "J", acetone non-detects have been qualified "UJ", all other non-detects were not qualified. Samples F51300-7, -11, -12, and -13 were analyzed following this continuing calibration.

- During the initial calibration verification performed on 7/31/07 @1339 on instrument MSVOA6 (GCMSJ), bromomethane (21.8%), acetone (22.5%), trans-1,3-dichloropropene (20.5%), had a %D outside criteria. All other target compounds were within criteria (%D≤20%; %Drift≤20%; RRF≥0.05). No samples were analyzed following this initial calibration verification.

- During the continuing calibration performed on 8/2/07 @0947 on instrument MSVOA6 (GCMSJ), all target compounds were within criteria (%D≤20%; %Drift≤20%; RRF≥0.05). Samples F51300-31 & -33 were analyzed following this initial calibration verification.

V-Blank Analysis

The purpose of blank analyses is to determine the presence and magnitude of contamination problems resulting from field and laboratory activities. A method blank analysis must be performed after the calibration standards and once every 12-hour time period beginning with the injection of BFB. No contaminants should be detected in any of the associated blanks > the MDL. The DoD QSM criteria specifies all concentrations should be less than one-half MRL (<MRL for common laboratory contaminants methylene chloride, acetone, and 2-butanone). Positive sample results are reported and qualified "B", if the concentration of the compound in the sample is ≤10 times (10x) the maximum amount in any blank for the common laboratory contaminants methylene chloride, acetone, and 2-butanone (MEK), or 5 times (5X) the maximum amount for other volatile target compounds. **Table 2** summarizes the blank contamination analysis.

Table 2 Blank Contamination Analysis Summary

Analysis Date	QC Blank ID	Compound	Max Conc. µg/L	Action Level µg/L	B qualified samples
7/31/07	VH1665-MB	All target <½MRL	NA	NA	None
7/31/07	VF416-MB	All target <½MRL	NA	NA	None
7/31/07	VG1720-MB	All target <½MRL	NA	NA	None
8/1/07	VG1721-MB	All target <½MRL	NA	NA	None
8/1/07	VH1666-MB	All target <½MRL	NA	NA	None
8/2/07	VJ2193-MB	All target <½MRL	NA	NA	None
8/2/07	072507R	All target <½MRL	NA	NA	None
8/6/07	072607R	All target <½MRL	NA	NA	None
7/31/07	TB072507S	All target <½MRL	NA	NA	None
8/2/07	TB072507W	All target <½MRL	NA	NA	None

072507R and 072607R are rinsate blanks.
NA = Not Applicable
MRL = Method Reporting Limit

VI-Laboratory Control Sample

Data for laboratory control samples (LCS) are evaluated to determine long-term accuracy of the analytical method on various matrices. Percent recoveries (%Rs) should be within the specified control limits. The aqueous LCS recovery limits are specified in Table D-4 of the DoD QSM (DoD, 2006), while the solid matrix LCS recovery limits are specified in Table D-5 of the DoD QSM. If the compound is not listed, then the laboratory criteria shall be used.

- Sample VH1665-BS was the solid LCS for the VOC analysis using instrument H on 7/31/07. All target compound recoveries were within criteria, no data qualification was required. Samples F51300-3, -4, -5, -6, -8, -9, -10, -14, and -29 were analyzed in conjunction with this LCS.

- Sample VF416-BS was the solid LCS for the VOC analysis using instrument F on 7/31/07. All target compound recoveries were within criteria, no data qualification was required. Samples F51300-1 and -2 were analyzed in conjunction with this LCS.

- Sample VG1720-BS was the solid LCS for the VOC analysis using instrument G on 7/31/07. All target compound recoveries were within criteria, no data qualification was required. Samples F51300-15, -16, -17, -18, -19, -21, -22, -24, -25, -26, -27, -28, -30, and -32 were analyzed in conjunction with this LCS.

- Sample VG1721-BS was the solid LCS for the VOC analysis using instrument G on 8/1/07. Vinyl chloride (126%) had a high recovery, but no vinyl chloride was detected in the associated samples so no data qualification was required. All other target compound recoveries were within criteria. Samples F51300-20 and -23 were analyzed in conjunction with this LCS.

- Sample VH1666-BS was the solid LCS for the VOC analysis using instrument H on 8/1/07. All target compound recoveries were within criteria, no data qualification was required. Samples F51300-7, -11, -12, and -13 were analyzed in conjunction with this LCS.

- Sample VJ2193-BS was the aqueous LCS for the VOC analysis using instrument J on 8/2/07. All target compound recoveries were within criteria, no data qualification was required. Samples F51300-31 and -33 were analyzed in conjunction with this LCS.

VII-Matrix Spike/Matrix Spike Duplicate

Data for matrix spike/matrix spike duplicates (MS/MSD) are generated to determine long-term precision and accuracy of the analytical method on various matrices and to demonstrate acceptable compound recovery by the laboratory at the time of sample analysis. The percent recoveries (%Rs) and the relative percent difference (RPD) must be within the specified control limits. The MS/MSD aqueous recovery limits follow the LCS criteria specified in Table D-4 of the DoD QSM (DoD, 2006), while the solid matrix recovery limits follow the LCS criteria specified in Table D-5 of the DoD QSM. If the compound is not listed, then the laboratory criteria shall be used.

- Sample F51300-29 was used for solid matrix MS/MSD analysis on 7/31/07. Carbon tetrachloride (139%, 141%), toluene (133%), and trichloroethene (130%) were outside DoD QSM recovery criteria. Detections of these compounds have been qualified "J" in the associated samples; non-detects were not qualified. All other target compounds met recovery criteria. All samples were analyzed in conjunction with this MS/MSD.

- Sample F51300-25 was used for the solid MS/MSD analysis on 07/31/07. Ethylbenzene (0%) 1,1,2,2-tetrachloroethane (187%), 1,1,2-trichloroethane (162%), and vinyl chloride (129%), were outside DoD QSM recovery criteria. All ethylbenzene results (detections and non-detects) have been qualified "J/UJ" in the associated samples. Detections of the other compounds with high recoveries have been qualified "J" in the associated samples. The other target compounds met recovery criteria. All samples were analyzed in conjunction with this MS/MSD.

VIII-System Monitoring Compounds (Surrogates)

Laboratory performance on individual samples is evaluated through the review of surrogate spike samples. Recoveries for system monitoring compounds in volatile samples and blanks must be within the specified control limits. DoD surrogate recovery limits are specified in Table D-3 of the DoD QSM (DoD, 2006). If the surrogate is not listed, then the laboratory criteria shall be used.

Aqueous criteria:	Dibromofluoromethane (87-116%) (DoD QSM = 85-115%) 1,2-Dichloroethane-d4 (76-127%) (DoD QSM = 70-120%) Toluene-d8 (86-112%) (DoD QSM = 85-120%) 4-Bromofluorobenzene (84-120%) (DoD QSM = 75-120%)
Solid matrix criteria:	Dibromofluoromethane (80-121%) (DoD QSM = none) 1,2-Dichloroethane-d4 (77-123%) (DoD QSM = none) Toluene-d8 (71-130%) (DoD QSM = 85-115%) 4-Bromofluorobenzene (59-148%) (DoD QSM = 85-120%)

- All solid matrix samples and all aqueous samples met surrogate recovery criteria. No qualifiers were applied.

IX-Internal Standards (IS)

Internal standards performance criteria ensure that GC/MS sensitivity and response are stable during every analytical run. Specific criteria include: area counts (-50% to +100%) of the associated calibration standard, and retention time (± 30 seconds) from that of the associated calibration standard.

- Sample F51300-25 had a low 1,4-dichlorobenzene-d4 area count. All volatiles quantitated from this internal standard have been qualified "J/UJ".

- All other solid matrix samples and all aqueous samples met criteria. No qualifiers were applied.

X-Field Duplicate Sample Analysis
Field duplicates were collected to identify the cumulative precision of the sampling and analytical process and sent to the laboratory blind. The RPD was calculated only for those analytes which were detected at levels exceeding the method reporting limits in both samples of the duplicate pair. Analytes that were rejected (R-qualified) in either sample of the duplicate pair were excluded from the duplicate assessment. Precision control criterion was established at 50% RPD for the aqueous and solid samples. Analytical results were qualified as estimated (J) for any RPDs exceeding criteria.

- Field duplicate pairs in this data package included 59SB04C (F51300-9) & TMSB04C (F51300-10), 59SB02B (F51300-12) & TMSB02B (F51300-13), and 43SB10B (F51300-28) & TMSB10B (F51300-30). All compounds detected above the reporting limit (RL) met RPD criteria.

XI-Quantitation Verification
The accuracy of analytical results is verified through the calculation of several parameters. The percent difference (%D) between the calculated and the reported values should be within 10%. Any sample value >MDL and <MRL or <3*MDL (whichever is greater) was qualified as estimated, "J."

Sample: 43SB09B (F51300-25), ethylbenzene

Conc. (µg/kg) = (Ax * Is * DF)/(Ais * RRF * Ws * Ps)

where:	Conc	=	sample concentration in µg/kg
	Ax	=	area of characteristic ion for compound being measured
	Is	=	amount of internal standard added (ng)
	DF	=	dilution factor
	Ais	=	Area of characteristic ion for the internal standard
	RRF	=	average relative response factor
	Ws	=	weight of sample (g)
	Ps	=	percent solids/100

Conc. µg/L = (1215748 * 250 ng * 1) / (551729 * 1.977 * 5.19 * 0.869) = 61.8 µg/kg

Reported Conc. = 61.8 µg/kg
%D = 0.0%
Values were within 10% difference.

USEPA Region III Validation Qualifiers

(No Code) = Confirmed identification.

B = The analyte has been detected in the sample and the associated laboratory or field blank.

J = Indicates an estimated value for (1) estimated value due to QC non-conformance. Reported value may not be accurate or precise, (2) estimating a concentration as a tentatively identified compound as indicated by the mass spectral and retention time data, or (3) estimating a concentration ≥MDL and <MRL or <3*MDL, whichever is greater.

K = Analyte present. Reported value may be biased high (estimated) due to QC non-conformance.

L = Analyte present. Reported value may be biased low (estimated) due to QC non-conformance.

R = Unreliable result. Analyte may or may not be present in the sample due to QC non-conformance.

UL = Value is estimated bias low and not detected due to QC non-conformance. Reporting limit may be inaccurate or imprecise. Quantitation limit is probably higher.

UJ = Value is estimated and not detected due to QC non-conformance. Reporting limit may be inaccurate or imprecise.

Laboratory Qualifiers

(No Code) = Confirmed identification.

U = Not detected. The associated number indicates the compound reporting limit for the sample.

A (Dioxins) = B (Metals) = The reported value was obtained from a reading <MRL and ≥MDL and is considered estimated.

B (Organics) = The analyte or compound has been detected in the sample and laboratory method blank. It indicates probable blank contamination.

E (Metals) = Reported value is estimated because of the presence of interferences.

E (Organics) = Identifies compounds whose concentrations exceed the upper level of the calibration range.

EMPC (Dioxins) = The ion-abundance ratio between the two characteristic PCDD/PCDF ions was outside accepted ranges. The detected PCDD/PCDF was reported as an estimated maximum possible concentration (EMPC).

D = Indicates sample was analyzed at a dilution.

J = Indicates an estimated value for (1) estimating a concentration as a tentatively identified compound as indicated by the mass spectral and retention time data, or (2) estimating a concentration <MRL and ≥ MDL.

N (Organics) = Indicates presumptive evidence of a compound for tentatively identified compounds using a library search.

N (Metals) = Laboratory spike sample recovery not within control limits.

P (Organics) = Target analyte confirmation >40% difference for detected compound between the primary and secondary columns. The lower of the two values was reported.

* (Metals) = Duplicate analysis not within control limits.

* (Organics) = Surrogate outside of QC limits on both original and re-analysis.

Accutest Laboratories

Report of Analysis

Client Sample ID:	59SB06A		
Lab Sample ID:	F51300-1	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8260B	Percent Solids:	91.9
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	F022553.D	1	07/31/07	WJ	n/a	n/a	VF416
Run #2							

	Initial Weight
Run #1	4.61 g
Run #2	

VOA TCL List

DATA VAL QUALIFIER

CAS No.	Compound	Result	RL	MDL	Units	Q	
67-64-1	Acetone	46.3	59	30	ug/kg	J	J
71-43-2	Benzene	ND	5.9	1.2	ug/kg		
75-27-4	Bromodichloromethane	ND	5.9	1.2	ug/kg		
75-25-2	Bromoform	ND	5.9	1.2	ug/kg		
108-90-7	Chlorobenzene	ND	5.9	1.2	ug/kg		
75-00-3	Chloroethane	ND	5.9	3.1	ug/kg		
67-66-3	Chloroform	ND	5.9	1.2	ug/kg		
75-15-0	Carbon disulfide	ND	5.9	1.2	ug/kg		
56-23-5	Carbon tetrachloride	ND	5.9	1.5	ug/kg		
75-34-3	1,1-Dichloroethane	ND	5.9	1.3	ug/kg		
75-35-4	1,1-Dichloroethylene	ND	5.9	1.2	ug/kg		
107-06-2	1,2-Dichloroethane	ND	5.9	1.2	ug/kg		
78-87-5	1,2-Dichloropropane	ND	5.9	1.5	ug/kg		
124-48-1	Dibromochloromethane	ND	5.9	1.2	ug/kg		
156-59-2	cis-1,2-Dichloroethylene	ND	5.9	1.2	ug/kg		
10061-01-5	cis-1,3-Dichloropropene	ND	5.9	1.2	ug/kg		
156-60-5	trans-1,2-Dichloroethylene	ND	5.9	1.2	ug/kg		
10061-02-6	trans-1,3-Dichloropropene	ND	5.9	1.2	ug/kg		
100-41-4	Ethylbenzene	ND	5.9	1.2	ug/kg		WJ
591-78-6	2-Hexanone	ND	30	12	ug/kg		
108-10-1	4-Methyl-2-pentanone	ND	30	12	ug/kg		
74-83-9	Methyl bromide	ND	5.9	2.1	ug/kg		
74-87-3	Methyl chloride	ND	5.9	2.4	ug/kg		
75-09-2	Methylene chloride	ND	12	5.9	ug/kg		
78-93-3	Methyl ethyl ketone	ND	30	12	ug/kg		
100-42-5	Styrene	ND	5.9	1.2	ug/kg		
71-55-6	1,1,1-Trichloroethane	ND	5.9	1.2	ug/kg		
79-34-5	1,1,2,2-Tetrachloroethane	ND	5.9	1.5	ug/kg		
79-00-5	1,1,2-Trichloroethane	ND	5.9	1.2	ug/kg		
127-18-4	Tetrachloroethylene	ND	5.9	1.2	ug/kg		
108-88-3	Toluene	ND	5.9	1.2	ug/kg		
79-01-6	Trichloroethylene	ND	5.9	1.2	ug/kg		

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	59SB06A		
Lab Sample ID:	F51300-1	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8260B	Percent Solids:	91.9
Project:	WPA 019 Field Investigation; Radford AAP, VA		

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
75-01-4	Vinyl chloride	ND	5.9	1.7	ug/kg	
	m,p-Xylene	ND	12	1.3	ug/kg	
95-47-6	o-Xylene	ND	5.9	1.2	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	110%		80-121%
2037-26-5	Toluene-D8	102%		71-130%
460-00-4	4-Bromofluorobenzene	112%		59-148%
17060-07-0	1,2-Dichloroethane-D4	112%		77-123%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	59SB06B		
Lab Sample ID:	F51300-2	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8260B	Percent Solids:	88.5
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	F022554.D	1	07/31/07	WJ	n/a	n/a	VF416
Run #2							

	Initial Weight
Run #1	6.00 g
Run #2	

VOA TCL List

DATA VAL QUALIFIER

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	47	24	ug/kg	
71-43-2	Benzene	ND	4.7	0.94	ug/kg	
75-27-4	Bromodichloromethane	ND	4.7	0.94	ug/kg	
75-25-2	Bromoform	ND	4.7	0.94	ug/kg	
108-90-7	Chlorobenzene	ND	4.7	0.94	ug/kg	
75-00-3	Chloroethane	ND	4.7	2.4	ug/kg	
67-66-3	Chloroform	ND	4.7	0.94	ug/kg	
75-15-0	Carbon disulfide	ND	4.7	0.94	ug/kg	
56-23-5	Carbon tetrachloride	ND	4.7	1.2	ug/kg	
75-34-3	1,1-Dichloroethane	ND	4.7	1.0	ug/kg	
75-35-4	1,1-Dichloroethylene	ND	4.7	0.94	ug/kg	
107-06-2	1,2-Dichloroethane	ND	4.7	0.94	ug/kg	
78-87-5	1,2-Dichloropropane	ND	4.7	1.2	ug/kg	
124-48-1	Dibromochloromethane	ND	4.7	0.94	ug/kg	
156-59-2	cis-1,2-Dichloroethylene	ND	4.7	0.94	ug/kg	
10061-01-5	cis-1,3-Dichloropropene	ND	4.7	0.94	ug/kg	
156-60-5	trans-1,2-Dichloroethylene	ND	4.7	0.94	ug/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	4.7	0.94	ug/kg	
100-41-4	Ethylbenzene	ND	4.7	0.94	ug/kg	WJ
591-78-6	2-Hexanone	ND	24	9.4	ug/kg	
108-10-1	4-Methyl-2-pentanone	ND	24	9.4	ug/kg	
74-83-9	Methyl bromide	ND	4.7	1.7	ug/kg	
74-87-3	Methyl chloride	ND	4.7	1.9	ug/kg	
75-09-2	Methylene chloride	ND	9.4	4.7	ug/kg	
78-93-3	Methyl ethyl ketone	ND	24	9.4	ug/kg	
100-42-5	Styrene	ND	4.7	0.94	ug/kg	
71-55-6	1,1,1-Trichloroethane	ND	4.7	0.94	ug/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	4.7	1.2	ug/kg	
79-00-5	1,1,2-Trichloroethane	ND	4.7	0.94	ug/kg	
127-18-4	Tetrachloroethylene	ND	4.7	0.94	ug/kg	
108-88-3	Toluene	ND	4.7	0.94	ug/kg	
79-01-6	Trichloroethylene	ND	4.7	0.94	ug/kg	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	59SB06B		
Lab Sample ID:	F51300-2	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8260B	Percent Solids:	88.5
Project:	WPA 019 Field Investigation; Radford AAP, VA		

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
75-01-4	Vinyl chloride	ND	4.7	1.3	ug/kg	
	m,p-Xylene	ND	9.4	1.0	ug/kg	
95-47-6	o-Xylene	ND	4.7	0.94	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	113%		80-121%
2037-26-5	Toluene-D8	93%		71-130%
460-00-4	4-Bromofluorobenzene	100%		59-148%
17060-07-0	1,2-Dichloroethane-D4	114%		77-123%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	59SB06C		
Lab Sample ID:	F51300-3	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8260B	Percent Solids:	86.2
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	H044767.D	1	07/31/07	SH	n/a	n/a	VH1665
Run #2							

	Initial Weight
Run #1	6.23 g
Run #2	

VOA TCL List

DATA VAL QUALIFIER

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	47	23	ug/kg	UJ
71-43-2	Benzene	ND	4.7	0.93	ug/kg	
75-27-4	Bromodichloromethane	ND	4.7	0.93	ug/kg	
75-25-2	Bromoform	ND	4.7	0.93	ug/kg	
108-90-7	Chlorobenzene	ND	4.7	0.93	ug/kg	
75-00-3	Chloroethane	ND	4.7	2.4	ug/kg	
67-66-3	Chloroform	ND	4.7	0.93	ug/kg	
75-15-0	Carbon disulfide	ND	4.7	0.93	ug/kg	
56-23-5	Carbon tetrachloride	ND	4.7	1.2	ug/kg	
75-34-3	1,1-Dichloroethane	ND	4.7	1.0	ug/kg	
75-35-4	1,1-Dichloroethylene	ND	4.7	0.93	ug/kg	
107-06-2	1,2-Dichloroethane	ND	4.7	0.93	ug/kg	
78-87-5	1,2-Dichloropropane	ND	4.7	1.2	ug/kg	
124-48-1	Dibromochloromethane	ND	4.7	0.93	ug/kg	
156-59-2	cis-1,2-Dichloroethylene	ND	4.7	0.93	ug/kg	
10061-01-5	cis-1,3-Dichloropropene	ND	4.7	0.93	ug/kg	
156-60-5	trans-1,2-Dichloroethylene	ND	4.7	0.93	ug/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	4.7	0.93	ug/kg	
100-41-4	Ethylbenzene	ND	4.7	0.93	ug/kg	UJ
591-78-6	2-Hexanone	ND	23	9.3	ug/kg	
108-10-1	4-Methyl-2-pentanone	ND	23	9.3	ug/kg	
74-83-9	Methyl bromide	ND	4.7	1.7	ug/kg	
74-87-3	Methyl chloride	ND	4.7	1.9	ug/kg	
75-09-2	Methylene chloride	ND	9.3	4.7	ug/kg	
78-93-3	Methyl ethyl ketone	ND	23	9.3	ug/kg	
100-42-5	Styrene	ND	4.7	0.93	ug/kg	
71-55-6	1,1,1-Trichloroethane	ND	4.7	0.93	ug/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	4.7	1.2	ug/kg	
79-00-5	1,1,2-Trichloroethane	ND	4.7	0.93	ug/kg	
127-18-4	Tetrachloroethylene	ND	4.7	0.93	ug/kg	
108-88-3	Toluene	ND	4.7	0.93	ug/kg	
79-01-6	Trichloroethylene	ND	4.7	0.93	ug/kg	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	59SB06C		
Lab Sample ID:	F51300-3	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8260B	Percent Solids:	86.2
Project:	WPA 019 Field Investigation; Radford AAP, VA		

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
75-01-4	Vinyl chloride	ND	4.7	1.3	ug/kg	
	m,p-Xylene	ND	9.3	1.0	ug/kg	
95-47-6	o-Xylene	ND	4.7	0.93	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	108%		80-121%
2037-26-5	Toluene-D8	95%		71-130%
460-00-4	4-Bromofluorobenzene	116%		59-148%
17060-07-0	1,2-Dichloroethane-D4	119%		77-123%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	59SB05A		
Lab Sample ID:	F51300-4	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8260B	Percent Solids:	89.5
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	H044768.D	1	07/31/07	SH	n/a	n/a	VH1665
Run #2							

	Initial Weight
Run #1	4.98 g
Run #2	

VOA TCL List

DATA VAL QUALIFIER

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	56	28	ug/kg	UJ
71-43-2	Benzene	ND	5.6	1.1	ug/kg	
75-27-4	Bromodichloromethane	ND	5.6	1.1	ug/kg	
75-25-2	Bromoform	ND	5.6	1.1	ug/kg	
108-90-7	Chlorobenzene	ND	5.6	1.1	ug/kg	
75-00-3	Chloroethane	ND	5.6	2.9	ug/kg	
67-66-3	Chloroform	ND	5.6	1.1	ug/kg	
75-15-0	Carbon disulfide	ND	5.6	1.1	ug/kg	
56-23-5	Carbon tetrachloride	ND	5.6	1.5	ug/kg	
75-34-3	1,1-Dichloroethane	ND	5.6	1.2	ug/kg	
75-35-4	1,1-Dichloroethylene	ND	5.6	1.1	ug/kg	
107-06-2	1,2-Dichloroethane	ND	5.6	1.1	ug/kg	
78-87-5	1,2-Dichloropropane	ND	5.6	1.5	ug/kg	
124-48-1	Dibromochloromethane	ND	5.6	1.1	ug/kg	
156-59-2	cis-1,2-Dichloroethylene	ND	5.6	1.1	ug/kg	
10061-01-5	cis-1,3-Dichloropropene	ND	5.6	1.1	ug/kg	
156-60-5	trans-1,2-Dichloroethylene	ND	5.6	1.1	ug/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	5.6	1.1	ug/kg	
100-41-4	Ethylbenzene	ND	5.6	1.1	ug/kg	UJ
591-78-6	2-Hexanone	ND	28	11	ug/kg	
108-10-1	4-Methyl-2-pentanone	ND	28	11	ug/kg	
74-83-9	Methyl bromide	ND	5.6	2.0	ug/kg	
74-87-3	Methyl chloride	ND	5.6	2.2	ug/kg	
75-09-2	Methylene chloride	ND	11	5.6	ug/kg	
78-93-3	Methyl ethyl ketone	ND	28	11	ug/kg	
100-42-5	Styrene	ND	5.6	1.1	ug/kg	
71-55-6	1,1,1-Trichloroethane	ND	5.6	1.1	ug/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	5.6	1.5	ug/kg	
79-00-5	1,1,2-Trichloroethane	ND	5.6	1.1	ug/kg	
127-18-4	Tetrachloroethylene	ND	5.6	1.1	ug/kg	
108-88-3	Toluene	ND	5.6	1.1	ug/kg	
79-01-6	Trichloroethylene	ND	5.6	1.1	ug/kg	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	59SB05A		
Lab Sample ID:	F51300-4	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8260B	Percent Solids:	89.5
Project:	WPA 019 Field Investigation; Radford AAP, VA		

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
75-01-4	Vinyl chloride	ND	5.6	1.6	ug/kg	
	m,p-Xylene	ND	11	1.2	ug/kg	
95-47-6	o-Xylene	ND	5.6	1.1	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	109%		80-121%
2037-26-5	Toluene-D8	97%		71-130%
460-00-4	4-Bromofluorobenzene	112%		59-148%
17060-07-0	1,2-Dichloroethane-D4	119%		77-123%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	59SB05B		
Lab Sample ID:	F51300-5	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8260B	Percent Solids:	84.2
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	H044769.D	1	07/31/07	SH	n/a	n/a	VH1665
Run #2							

	Initial Weight
Run #1	5.04 g
Run #2	

VOA TCL List

DATA VAL QUALIFIER

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	59	29	ug/kg	UJ
71-43-2	Benzene	ND	5.9	1.2	ug/kg	
75-27-4	Bromodichloromethane	ND	5.9	1.2	ug/kg	
75-25-2	Bromoform	ND	5.9	1.2	ug/kg	
108-90-7	Chlorobenzene	ND	5.9	1.2	ug/kg	
75-00-3	Chloroethane	ND	5.9	3.1	ug/kg	
67-66-3	Chloroform	ND	5.9	1.2	ug/kg	
75-15-0	Carbon disulfide	ND	5.9	1.2	ug/kg	
56-23-5	Carbon tetrachloride	ND	5.9	1.5	ug/kg	
75-34-3	1,1-Dichloroethane	ND	5.9	1.3	ug/kg	
75-35-4	1,1-Dichloroethylene	ND	5.9	1.2	ug/kg	
107-06-2	1,2-Dichloroethane	ND	5.9	1.2	ug/kg	
78-87-5	1,2-Dichloropropane	ND	5.9	1.5	ug/kg	
124-48-1	Dibromochloromethane	ND	5.9	1.2	ug/kg	
156-59-2	cis-1,2-Dichloroethylene	ND	5.9	1.2	ug/kg	
10061-01-5	cis-1,3-Dichloropropene	ND	5.9	1.2	ug/kg	
156-60-5	trans-1,2-Dichloroethylene	ND	5.9	1.2	ug/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	5.9	1.2	ug/kg	
100-41-4	Ethylbenzene	ND	5.9	1.2	ug/kg	UJ
591-78-6	2-Hexanone	ND	29	12	ug/kg	
108-10-1	4-Methyl-2-pentanone	ND	29	12	ug/kg	
74-83-9	Methyl bromide	ND	5.9	2.1	ug/kg	
74-87-3	Methyl chloride	ND	5.9	2.4	ug/kg	
75-09-2	Methylene chloride	ND	12	5.9	ug/kg	
78-93-3	Methyl ethyl ketone	ND	29	12	ug/kg	
100-42-5	Styrene	ND	5.9	1.2	ug/kg	
71-55-6	1,1,1-Trichloroethane	ND	5.9	1.2	ug/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	5.9	1.5	ug/kg	
79-00-5	1,1,2-Trichloroethane	ND	5.9	1.2	ug/kg	
127-18-4	Tetrachloroethylene	ND	5.9	1.2	ug/kg	
108-88-3	Toluene	ND	5.9	1.2	ug/kg	
79-01-6	Trichloroethylene	ND	5.9	1.2	ug/kg	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	59SB05B		
Lab Sample ID:	F51300-5	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8260B	Percent Solids:	84.2
Project:	WPA 019 Field Investigation; Radford AAP, VA		

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
75-01-4	Vinyl chloride	ND	5.9	1.6	ug/kg	
	m,p-Xylene	ND	12	1.3	ug/kg	
95-47-6	o-Xylene	ND	5.9	1.2	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	109%		80-121%
2037-26-5	Toluene-D8	97%		71-130%
460-00-4	4-Bromofluorobenzene	111%		59-148%
17060-07-0	1,2-Dichloroethane-D4	116%		77-123%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	59SB05C		
Lab Sample ID:	F51300-6	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8260B	Percent Solids:	86.3
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	H044770.D	1	07/31/07	SH	n/a	n/a	VH1665
Run #2							

	Initial Weight
Run #1	5.48 g
Run #2	

VOA TCL List

DATA VAL QUALIFIER

CAS No.	Compound	Result	RL	MDL	Units	Q	
67-64-1	Acetone [a]	51.3	53	26	ug/kg	J	J
71-43-2	Benzene	ND	5.3	1.1	ug/kg		
75-27-4	Bromodichloromethane	ND	5.3	1.1	ug/kg		
75-25-2	Bromoform	ND	5.3	1.1	ug/kg		
108-90-7	Chlorobenzene	ND	5.3	1.1	ug/kg		
75-00-3	Chloroethane	ND	5.3	2.7	ug/kg		
67-66-3	Chloroform	ND	5.3	1.1	ug/kg		
75-15-0	Carbon disulfide	ND	5.3	1.1	ug/kg		
56-23-5	Carbon tetrachloride	ND	5.3	1.4	ug/kg		
75-34-3	1,1-Dichloroethane	ND	5.3	1.2	ug/kg		
75-35-4	1,1-Dichloroethylene	ND	5.3	1.1	ug/kg		
107-06-2	1,2-Dichloroethane	ND	5.3	1.1	ug/kg		
78-87-5	1,2-Dichloropropane	ND	5.3	1.4	ug/kg		
124-48-1	Dibromochloromethane	ND	5.3	1.1	ug/kg		
156-59-2	cis-1,2-Dichloroethylene	ND	5.3	1.1	ug/kg		
10061-01-5	cis-1,3-Dichloropropene	ND	5.3	1.1	ug/kg		
156-60-5	trans-1,2-Dichloroethylene	ND	5.3	1.1	ug/kg		
10061-02-6	trans-1,3-Dichloropropene	ND	5.3	1.1	ug/kg		
100-41-4	Ethylbenzene	ND	5.3	1.1	ug/kg		UJ
591-78-6	2-Hexanone	ND	26	11	ug/kg		
108-10-1	4-Methyl-2-pentanone	ND	26	11	ug/kg		
74-83-9	Methyl bromide	ND	5.3	1.9	ug/kg		
74-87-3	Methyl chloride	ND	5.3	2.1	ug/kg		
75-09-2	Methylene chloride	ND	11	5.3	ug/kg		
78-93-3	Methyl ethyl ketone	ND	26	11	ug/kg		
100-42-5	Styrene	ND	5.3	1.1	ug/kg		
71-55-6	1,1,1-Trichloroethane	ND	5.3	1.1	ug/kg		
79-34-5	1,1,2,2-Tetrachloroethane	ND	5.3	1.4	ug/kg		
79-00-5	1,1,2-Trichloroethane	ND	5.3	1.1	ug/kg		
127-18-4	Tetrachloroethylene	ND	5.3	1.1	ug/kg		
108-88-3	Toluene	ND	5.3	1.1	ug/kg		
79-01-6	Trichloroethylene	ND	5.3	1.1	ug/kg		

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	59SB05C		
Lab Sample ID:	F51300-6	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8260B	Percent Solids:	86.3
Project:	WPA 019 Field Investigation; Radford AAP, VA		

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
75-01-4	Vinyl chloride	ND	5.3	1.5	ug/kg	
	m,p-Xylene	ND	11	1.2	ug/kg	
95-47-6	o-Xylene	ND	5.3	1.1	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	110%		80-121%
2037-26-5	Toluene-D8	97%		71-130%
460-00-4	4-Bromofluorobenzene	115%		59-148%
17060-07-0	1,2-Dichloroethane-D4	120%		77-123%

(a) CCV outside of control limits; results may be biased high.

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	59SB04A		
Lab Sample ID:	F51300-7	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8260B	Percent Solids:	86.6
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	H044788.D	1	08/01/07	SH	n/a	n/a	VH1666
Run #2							

	Initial Weight
Run #1	5.05 g
Run #2	

VOA TCL List

DATA VAL QUALIFIER

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	57	29	ug/kg	UJ
71-43-2	Benzene	ND	5.7	1.1	ug/kg	
75-27-4	Bromodichloromethane	ND	5.7	1.1	ug/kg	
75-25-2	Bromoform	ND	5.7	1.1	ug/kg	
108-90-7	Chlorobenzene	ND	5.7	1.1	ug/kg	
75-00-3	Chloroethane	ND	5.7	3.0	ug/kg	
67-66-3	Chloroform	ND	5.7	1.1	ug/kg	
75-15-0	Carbon disulfide	ND	5.7	1.1	ug/kg	
56-23-5	Carbon tetrachloride	ND	5.7	1.5	ug/kg	
75-34-3	1,1-Dichloroethane	ND	5.7	1.3	ug/kg	
75-35-4	1,1-Dichloroethylene	ND	5.7	1.1	ug/kg	
107-06-2	1,2-Dichloroethane	ND	5.7	1.1	ug/kg	
78-87-5	1,2-Dichloropropane	ND	5.7	1.5	ug/kg	
124-48-1	Dibromochloromethane	ND	5.7	1.1	ug/kg	
156-59-2	cis-1,2-Dichloroethylene	ND	5.7	1.1	ug/kg	
10061-01-5	cis-1,3-Dichloropropene	ND	5.7	1.1	ug/kg	
156-60-5	trans-1,2-Dichloroethylene	ND	5.7	1.1	ug/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	5.7	1.1	ug/kg	
100-41-4	Ethylbenzene	ND	5.7	1.1	ug/kg	UJ
591-78-6	2-Hexanone	ND	29	11	ug/kg	
108-10-1	4-Methyl-2-pentanone	ND	29	11	ug/kg	
74-83-9	Methyl bromide	ND	5.7	2.1	ug/kg	
74-87-3	Methyl chloride	ND	5.7	2.3	ug/kg	
75-09-2	Methylene chloride	ND	11	5.7	ug/kg	
78-93-3	Methyl ethyl ketone	ND	29	11	ug/kg	
100-42-5	Styrene	ND	5.7	1.1	ug/kg	
71-55-6	1,1,1-Trichloroethane	ND	5.7	1.1	ug/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	5.7	1.5	ug/kg	
79-00-5	1,1,2-Trichloroethane	ND	5.7	1.1	ug/kg	
127-18-4	Tetrachloroethylene	ND	5.7	1.1	ug/kg	
108-88-3	Toluene	ND	5.7	1.1	ug/kg	
79-01-6	Trichloroethylene	ND	5.7	1.1	ug/kg	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	59SB04A		
Lab Sample ID:	F51300-7	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8260B	Percent Solids:	86.6
Project:	WPA 019 Field Investigation; Radford AAP, VA		

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
75-01-4	Vinyl chloride	ND	5.7	1.6	ug/kg	
	m,p-Xylene	ND	11	1.3	ug/kg	
95-47-6	o-Xylene	ND	5.7	1.1	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	99%		80-121%
2037-26-5	Toluene-D8	100%		71-130%
460-00-4	4-Bromofluorobenzene	114%		59-148%
17060-07-0	1,2-Dichloroethane-D4	99%		77-123%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: H044772.D

Accutest Laboratories

Report of Analysis

Client Sample ID:	59SB04B		
Lab Sample ID:	F51300-8	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8260B	Percent Solids:	83.2
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	H044772.D	1	07/31/07	SH	n/a	n/a	VH1665
Run #2							

	Initial Weight
Run #1	5.75 g
Run #2	

VOA TCL List

DATA VAL QUALIFIER

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	52	26	ug/kg	UJ
71-43-2	Benzene	ND	5.2	1.0	ug/kg	
75-27-4	Bromodichloromethane	ND	5.2	1.0	ug/kg	
75-25-2	Bromoform	ND	5.2	1.0	ug/kg	
108-90-7	Chlorobenzene	ND	5.2	1.0	ug/kg	
75-00-3	Chloroethane	ND	5.2	2.7	ug/kg	
67-66-3	Chloroform	ND	5.2	1.0	ug/kg	
75-15-0	Carbon disulfide	ND	5.2	1.0	ug/kg	
56-23-5	Carbon tetrachloride	ND	5.2	1.4	ug/kg	
75-34-3	1,1-Dichloroethane	ND	5.2	1.1	ug/kg	
75-35-4	1,1-Dichloroethylene	ND	5.2	1.0	ug/kg	
107-06-2	1,2-Dichloroethane	ND	5.2	1.0	ug/kg	
78-87-5	1,2-Dichloropropane	ND	5.2	1.4	ug/kg	
124-48-1	Dibromochloromethane	ND	5.2	1.0	ug/kg	
156-59-2	cis-1,2-Dichloroethylene	ND	5.2	1.0	ug/kg	
10061-01-5	cis-1,3-Dichloropropene	ND	5.2	1.0	ug/kg	
156-60-5	trans-1,2-Dichloroethylene	ND	5.2	1.0	ug/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	5.2	1.0	ug/kg	
100-41-4	Ethylbenzene	ND	5.2	1.0	ug/kg	UJ
591-78-6	2-Hexanone	ND	26	10	ug/kg	
108-10-1	4-Methyl-2-pentanone	ND	26	10	ug/kg	
74-83-9	Methyl bromide	ND	5.2	1.9	ug/kg	
74-87-3	Methyl chloride	ND	5.2	2.1	ug/kg	
75-09-2	Methylene chloride	ND	10	5.2	ug/kg	
78-93-3	Methyl ethyl ketone	ND	26	10	ug/kg	
100-42-5	Styrene	ND	5.2	1.0	ug/kg	
71-55-6	1,1,1-Trichloroethane	ND	5.2	1.0	ug/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	5.2	1.4	ug/kg	
79-00-5	1,1,2-Trichloroethane	ND	5.2	1.0	ug/kg	
127-18-4	Tetrachloroethylene	ND	5.2	1.0	ug/kg	
108-88-3	Toluene	ND	5.2	1.0	ug/kg	
79-01-6	Trichloroethylene	ND	5.2	1.0	ug/kg	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	59SB04B		
Lab Sample ID:	F51300-8	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8260B	Percent Solids:	83.2
Project:	WPA 019 Field Investigation; Radford AAP, VA		

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
75-01-4	Vinyl chloride	ND	5.2	1.5	ug/kg	
	m,p-Xylene	ND	10	1.1	ug/kg	
95-47-6	o-Xylene	ND	5.2	1.0	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	107%		80-121%
2037-26-5	Toluene-D8	97%		71-130%
460-00-4	4-Bromofluorobenzene	110%		59-148%
17060-07-0	1,2-Dichloroethane-D4	119%		77-123%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	59SB04C		
Lab Sample ID:	F51300-9	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8260B	Percent Solids:	85.8
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	H044773.D	1	07/31/07	SH	n/a	n/a	VH1665
Run #2							

	Initial Weight
Run #1	6.00 g
Run #2	

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q (DATA VAL QUALIFIER)
67-64-1	Acetone	ND	49	24	ug/kg	UJ
71-43-2	Benzene	ND	4.9	0.97	ug/kg	
75-27-4	Bromodichloromethane	ND	4.9	0.97	ug/kg	
75-25-2	Bromoform	ND	4.9	0.97	ug/kg	
108-90-7	Chlorobenzene	ND	4.9	0.97	ug/kg	
75-00-3	Chloroethane	ND	4.9	2.5	ug/kg	
67-66-3	Chloroform	ND	4.9	0.97	ug/kg	
75-15-0	Carbon disulfide	ND	4.9	0.97	ug/kg	
56-23-5	Carbon tetrachloride	ND	4.9	1.3	ug/kg	
75-34-3	1,1-Dichloroethane	ND	4.9	1.1	ug/kg	
75-35-4	1,1-Dichloroethylene	ND	4.9	0.97	ug/kg	
107-06-2	1,2-Dichloroethane	ND	4.9	0.97	ug/kg	
78-87-5	1,2-Dichloropropane	ND	4.9	1.3	ug/kg	
124-48-1	Dibromochloromethane	ND	4.9	0.97	ug/kg	
156-59-2	cis-1,2-Dichloroethylene	ND	4.9	0.97	ug/kg	
10061-01-5	cis-1,3-Dichloropropene	ND	4.9	0.97	ug/kg	
156-60-5	trans-1,2-Dichloroethylene	ND	4.9	0.97	ug/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	4.9	0.97	ug/kg	
100-41-4	Ethylbenzene	ND	4.9	0.97	ug/kg	UJ
591-78-6	2-Hexanone	ND	24	9.7	ug/kg	
108-10-1	4-Methyl-2-pentanone	ND	24	9.7	ug/kg	
74-83-9	Methyl bromide	ND	4.9	1.7	ug/kg	
74-87-3	Methyl chloride	ND	4.9	1.9	ug/kg	
75-09-2	Methylene chloride	ND	9.7	4.9	ug/kg	
78-93-3	Methyl ethyl ketone	ND	24	9.7	ug/kg	
100-42-5	Styrene	ND	4.9	0.97	ug/kg	
71-55-6	1,1,1-Trichloroethane	ND	4.9	0.97	ug/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	4.9	1.3	ug/kg	
79-00-5	1,1,2-Trichloroethane	ND	4.9	0.97	ug/kg	
127-18-4	Tetrachloroethylene	ND	4.9	0.97	ug/kg	
108-88-3	Toluene	ND	4.9	0.97	ug/kg	
79-01-6	Trichloroethylene	ND	4.9	0.97	ug/kg	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	59SB04C		
Lab Sample ID:	F51300-9	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8260B	Percent Solids:	85.8
Project:	WPA 019 Field Investigation; Radford AAP, VA		

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
75-01-4	Vinyl chloride	ND	4.9	1.4	ug/kg	
	m,p-Xylene	ND	9.7	1.1	ug/kg	
95-47-6	o-Xylene	ND	4.9	0.97	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	111%		80-121%
2037-26-5	Toluene-D8	97%		71-130%
460-00-4	4-Bromofluorobenzene	114%		59-148%
17060-07-0	1,2-Dichloroethane-D4	121%		77-123%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	TMSB04C		
Lab Sample ID:	F51300-10	**Date Sampled:**	07/25/07
Matrix:	SO - Soil	**Date Received:**	07/26/07
Method:	SW846 8260B	**Percent Solids:**	83.9
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	H044774.D	1	07/31/07	SH	n/a	n/a	VH1665
Run #2							

	Initial Weight
Run #1	4.96 g
Run #2	

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q	DATA VAL QUALIFIER
67-64-1	Acetone [a]	56.6	60	30	ug/kg	J	J
71-43-2	Benzene	ND	6.0	1.2	ug/kg		
75-27-4	Bromodichloromethane	ND	6.0	1.2	ug/kg		
75-25-2	Bromoform	ND	6.0	1.2	ug/kg		
108-90-7	Chlorobenzene	ND	6.0	1.2	ug/kg		
75-00-3	Chloroethane	ND	6.0	3.1	ug/kg		
67-66-3	Chloroform	ND	6.0	1.2	ug/kg		
75-15-0	Carbon disulfide	ND	6.0	1.2	ug/kg		
56-23-5	Carbon tetrachloride	ND	6.0	1.6	ug/kg		
75-34-3	1,1-Dichloroethane	ND	6.0	1.3	ug/kg		
75-35-4	1,1-Dichloroethylene	ND	6.0	1.2	ug/kg		
107-06-2	1,2-Dichloroethane	ND	6.0	1.2	ug/kg		
78-87-5	1,2-Dichloropropane	ND	6.0	1.6	ug/kg		
124-48-1	Dibromochloromethane	ND	6.0	1.2	ug/kg		
156-59-2	cis-1,2-Dichloroethylene	ND	6.0	1.2	ug/kg		
10061-01-5	cis-1,3-Dichloropropene	ND	6.0	1.2	ug/kg		
156-60-5	trans-1,2-Dichloroethylene	ND	6.0	1.2	ug/kg		
10061-02-6	trans-1,3-Dichloropropene	ND	6.0	1.2	ug/kg		
100-41-4	Ethylbenzene	ND	6.0	1.2	ug/kg		UJ
591-78-6	2-Hexanone	ND	30	12	ug/kg		
108-10-1	4-Methyl-2-pentanone	ND	30	12	ug/kg		
74-83-9	Methyl bromide	ND	6.0	2.2	ug/kg		
74-87-3	Methyl chloride	ND	6.0	2.4	ug/kg		
75-09-2	Methylene chloride	ND	12	6.0	ug/kg		
78-93-3	Methyl ethyl ketone	ND	30	12	ug/kg		
100-42-5	Styrene	ND	6.0	1.2	ug/kg		
71-55-6	1,1,1-Trichloroethane	ND	6.0	1.2	ug/kg		
79-34-5	1,1,2,2-Tetrachloroethane	ND	6.0	1.6	ug/kg		
79-00-5	1,1,2-Trichloroethane	ND	6.0	1.2	ug/kg		
127-18-4	Tetrachloroethylene	ND	6.0	1.2	ug/kg		
108-88-3	Toluene	ND	6.0	1.2	ug/kg		
79-01-6	Trichloroethylene	ND	6.0	1.2	ug/kg		

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	TMSB04C		
Lab Sample ID:	F51300-10	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8260B	Percent Solids:	83.9
Project:	WPA 019 Field Investigation; Radford AAP, VA		

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
75-01-4	Vinyl chloride	ND	6.0	1.7	ug/kg	
	m,p-Xylene	ND	12	1.3	ug/kg	
95-47-6	o-Xylene	ND	6.0	1.2	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	111%		80-121%
2037-26-5	Toluene-D8	97%		71-130%
460-00-4	4-Bromofluorobenzene	114%		59-148%
17060-07-0	1,2-Dichloroethane-D4	120%		77-123%

(a) CCV outside of control limits; results may be biased high.

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	59SB02A		
Lab Sample ID:	F51300-11	**Date Sampled:**	07/25/07
Matrix:	SO - Soil	**Date Received:**	07/26/07
Method:	SW846 8260B	**Percent Solids:**	89.5
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	H044789.D	1	08/01/07	SH	n/a	n/a	VH1666
Run #2							

	Initial Weight
Run #1	5.00 g
Run #2	

VOA TCL List

DATA VAL QUALIFIER

CAS No.	Compound	Result	RL	MDL	Units	Q	
67-64-1	Acetone	ND	56	28	ug/kg		UJ
71-43-2	Benzene	ND	5.6	1.1	ug/kg		
75-27-4	Bromodichloromethane	ND	5.6	1.1	ug/kg		
75-25-2	Bromoform	ND	5.6	1.1	ug/kg		
108-90-7	Chlorobenzene	ND	5.6	1.1	ug/kg		
75-00-3	Chloroethane	ND	5.6	2.9	ug/kg		
67-66-3	Chloroform	ND	5.6	1.1	ug/kg		
75-15-0	Carbon disulfide	ND	5.6	1.1	ug/kg		
56-23-5	Carbon tetrachloride	ND	5.6	1.5	ug/kg		
75-34-3	1,1-Dichloroethane	ND	5.6	1.2	ug/kg		
75-35-4	1,1-Dichloroethylene	ND	5.6	1.1	ug/kg		
107-06-2	1,2-Dichloroethane	ND	5.6	1.1	ug/kg		
78-87-5	1,2-Dichloropropane	ND	5.6	1.5	ug/kg		
124-48-1	Dibromochloromethane	ND	5.6	1.1	ug/kg		
156-59-2	cis-1,2-Dichloroethylene	ND	5.6	1.1	ug/kg		
10061-01-5	cis-1,3-Dichloropropene	ND	5.6	1.1	ug/kg		
156-60-5	trans-1,2-Dichloroethylene	ND	5.6	1.1	ug/kg		
10061-02-6	trans-1,3-Dichloropropene	ND	5.6	1.1	ug/kg		
100-41-4	Ethylbenzene	ND	5.6	1.1	ug/kg		UJ
591-78-6	2-Hexanone	ND	28	11	ug/kg		
108-10-1	4-Methyl-2-pentanone	ND	28	11	ug/kg		
74-83-9	Methyl bromide	ND	5.6	2.0	ug/kg		
74-87-3	Methyl chloride	ND	5.6	2.2	ug/kg		
75-09-2	Methylene chloride	ND	11	5.6	ug/kg		
78-93-3	Methyl ethyl ketone	ND	28	11	ug/kg		
100-42-5	Styrene	ND	5.6	1.1	ug/kg		
71-55-6	1,1,1-Trichloroethane	ND	5.6	1.1	ug/kg		
79-34-5	1,1,2,2-Tetrachloroethane	ND	5.6	1.5	ug/kg		
79-00-5	1,1,2-Trichloroethane	ND	5.6	1.1	ug/kg		
127-18-4	Tetrachloroethylene	ND	5.6	1.1	ug/kg		
108-88-3	Toluene	ND	5.6	1.1	ug/kg		
79-01-6	Trichloroethylene	ND	5.6	1.1	ug/kg		

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	59SB02A		
Lab Sample ID:	F51300-11	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8260B	Percent Solids:	89.5
Project:	WPA 019 Field Investigation; Radford AAP, VA		

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
75-01-4	Vinyl chloride	ND	5.6	1.6	ug/kg	
	m,p-Xylene	ND	11	1.2	ug/kg	
95-47-6	o-Xylene	ND	5.6	1.1	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	103%		80-121%
2037-26-5	Toluene-D8	102%		71-130%
460-00-4	4-Bromofluorobenzene	125%		59-148%
17060-07-0	1,2-Dichloroethane-D4	107%		77-123%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	59SB02B		
Lab Sample ID:	F51300-12	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8260B	Percent Solids:	83.3
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	H044790.D	1	08/01/07	SH	n/a	n/a	VH1666
Run #2							

	Initial Weight
Run #1	5.76 g
Run #2	

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q (DATA VAL QUALIFIER)
67-64-1	Acetone	ND	52	26	ug/kg	UJ
71-43-2	Benzene	ND	5.2	1.0	ug/kg	
75-27-4	Bromodichloromethane	ND	5.2	1.0	ug/kg	
75-25-2	Bromoform	ND	5.2	1.0	ug/kg	
108-90-7	Chlorobenzene	ND	5.2	1.0	ug/kg	
75-00-3	Chloroethane	ND	5.2	2.7	ug/kg	
67-66-3	Chloroform	ND	5.2	1.0	ug/kg	
75-15-0	Carbon disulfide	ND	5.2	1.0	ug/kg	
56-23-5	Carbon tetrachloride	ND	5.2	1.4	ug/kg	
75-34-3	1,1-Dichloroethane	ND	5.2	1.1	ug/kg	
75-35-4	1,1-Dichloroethylene	ND	5.2	1.0	ug/kg	
107-06-2	1,2-Dichloroethane	ND	5.2	1.0	ug/kg	
78-87-5	1,2-Dichloropropane	ND	5.2	1.4	ug/kg	
124-48-1	Dibromochloromethane	ND	5.2	1.0	ug/kg	
156-59-2	cis-1,2-Dichloroethylene	ND	5.2	1.0	ug/kg	
10061-01-5	cis-1,3-Dichloropropene	ND	5.2	1.0	ug/kg	
156-60-5	trans-1,2-Dichloroethylene	ND	5.2	1.0	ug/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	5.2	1.0	ug/kg	
100-41-4	Ethylbenzene	ND	5.2	1.0	ug/kg	UJ
591-78-6	2-Hexanone	ND	26	10	ug/kg	
108-10-1	4-Methyl-2-pentanone	ND	26	10	ug/kg	
74-83-9	Methyl bromide	ND	5.2	1.9	ug/kg	
74-87-3	Methyl chloride	ND	5.2	2.1	ug/kg	
75-09-2	Methylene chloride	ND	10	5.2	ug/kg	
78-93-3	Methyl ethyl ketone	ND	26	10	ug/kg	
100-42-5	Styrene	ND	5.2	1.0	ug/kg	
71-55-6	1,1,1-Trichloroethane	ND	5.2	1.0	ug/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	5.2	1.4	ug/kg	
79-00-5	1,1,2-Trichloroethane	ND	5.2	1.0	ug/kg	
127-18-4	Tetrachloroethylene	ND	5.2	1.0	ug/kg	
108-88-3	Toluene	ND	5.2	1.0	ug/kg	
79-01-6	Trichloroethylene	ND	5.2	1.0	ug/kg	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	59SB02B		
Lab Sample ID:	F51300-12	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8260B	Percent Solids:	83.3
Project:	WPA 019 Field Investigation; Radford AAP, VA		

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
75-01-4	Vinyl chloride	ND	5.2	1.5	ug/kg	
	m,p-Xylene	ND	10	1.1	ug/kg	
95-47-6	o-Xylene	ND	5.2	1.0	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	105%		80-121%
2037-26-5	Toluene-D8	98%		71-130%
460-00-4	4-Bromofluorobenzene	115%		59-148%
17060-07-0	1,2-Dichloroethane-D4	109%		77-123%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	TMSB02B		
Lab Sample ID:	F51300-13	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8260B	Percent Solids:	85.3
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	H044791.D	1	08/01/07	SH	n/a	n/a	VH1666
Run #2							

	Initial Weight
Run #1	5.51 g
Run #2	

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q (DATA VAC QUALIFIER)
67-64-1	Acetone	ND	53	27	ug/kg	UJ
71-43-2	Benzene	ND	5.3	1.1	ug/kg	
75-27-4	Bromodichloromethane	ND	5.3	1.1	ug/kg	
75-25-2	Bromoform	ND	5.3	1.1	ug/kg	
108-90-7	Chlorobenzene	ND	5.3	1.1	ug/kg	
75-00-3	Chloroethane	ND	5.3	2.8	ug/kg	
67-66-3	Chloroform	ND	5.3	1.1	ug/kg	
75-15-0	Carbon disulfide	ND	5.3	1.1	ug/kg	
56-23-5	Carbon tetrachloride	ND	5.3	1.4	ug/kg	
75-34-3	1,1-Dichloroethane	ND	5.3	1.2	ug/kg	
75-35-4	1,1-Dichloroethylene	ND	5.3	1.1	ug/kg	
107-06-2	1,2-Dichloroethane	ND	5.3	1.1	ug/kg	
78-87-5	1,2-Dichloropropane	ND	5.3	1.4	ug/kg	
124-48-1	Dibromochloromethane	ND	5.3	1.1	ug/kg	
156-59-2	cis-1,2-Dichloroethylene	ND	5.3	1.1	ug/kg	
10061-01-5	cis-1,3-Dichloropropene	ND	5.3	1.1	ug/kg	
156-60-5	trans-1,2-Dichloroethylene	ND	5.3	1.1	ug/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	5.3	1.1	ug/kg	
100-41-4	Ethylbenzene	ND	5.3	1.1	ug/kg	UJ
591-78-6	2-Hexanone	ND	27	11	ug/kg	
108-10-1	4-Methyl-2-pentanone	ND	27	11	ug/kg	
74-83-9	Methyl bromide	ND	5.3	1.9	ug/kg	
74-87-3	Methyl chloride	ND	5.3	2.1	ug/kg	
75-09-2	Methylene chloride	ND	11	5.3	ug/kg	
78-93-3	Methyl ethyl ketone	ND	27	11	ug/kg	
100-42-5	Styrene	ND	5.3	1.1	ug/kg	
71-55-6	1,1,1-Trichloroethane	ND	5.3	1.1	ug/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	5.3	1.4	ug/kg	
79-00-5	1,1,2-Trichloroethane	ND	5.3	1.1	ug/kg	
127-18-4	Tetrachloroethylene	ND	5.3	1.1	ug/kg	
108-88-3	Toluene	ND	5.3	1.1	ug/kg	
79-01-6	Trichloroethylene	ND	5.3	1.1	ug/kg	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	TMSB02B		
Lab Sample ID:	F51300-13	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8260B	Percent Solids:	85.3
Project:	WPA 019 Field Investigation; Radford AAP, VA		

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
75-01-4	Vinyl chloride	ND	5.3	1.5	ug/kg	
	m,p-Xylene	ND	11	1.2	ug/kg	
95-47-6	o-Xylene	ND	5.3	1.1	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	106%		80-121%
2037-26-5	Toluene-D8	96%		71-130%
460-00-4	4-Bromofluorobenzene	112%		59-148%
17060-07-0	1,2-Dichloroethane-D4	113%		77-123%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	59SB02C		
Lab Sample ID:	F51300-14	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8260B	Percent Solids:	83.2
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	H044778.D	1	07/31/07	SH	n/a	n/a	VH1665
Run #2							

	Initial Weight
Run #1	4.90 g
Run #2	

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q	DATA VAL QUALIFIER
67-64-1	Acetone	ND	61	31	ug/kg		UJ
71-43-2	Benzene	ND	6.1	1.2	ug/kg		
75-27-4	Bromodichloromethane	ND	6.1	1.2	ug/kg		
75-25-2	Bromoform	ND	6.1	1.2	ug/kg		
108-90-7	Chlorobenzene	ND	6.1	1.2	ug/kg		
75-00-3	Chloroethane	ND	6.1	3.2	ug/kg		
67-66-3	Chloroform	ND	6.1	1.2	ug/kg		
75-15-0	Carbon disulfide	ND	6.1	1.2	ug/kg		
56-23-5	Carbon tetrachloride	ND	6.1	1.6	ug/kg		
75-34-3	1,1-Dichloroethane	ND	6.1	1.3	ug/kg		
75-35-4	1,1-Dichloroethylene	ND	6.1	1.2	ug/kg		
107-06-2	1,2-Dichloroethane	ND	6.1	1.2	ug/kg		
78-87-5	1,2-Dichloropropane	ND	6.1	1.6	ug/kg		
124-48-1	Dibromochloromethane	ND	6.1	1.2	ug/kg		
156-59-2	cis-1,2-Dichloroethylene	ND	6.1	1.2	ug/kg		
10061-01-5	cis-1,3-Dichloropropene	ND	6.1	1.2	ug/kg		
156-60-5	trans-1,2-Dichloroethylene	ND	6.1	1.2	ug/kg		
10061-02-6	trans-1,3-Dichloropropene	ND	6.1	1.2	ug/kg		
100-41-4	Ethylbenzene	ND	6.1	1.2	ug/kg		UJ
591-78-6	2-Hexanone	ND	31	12	ug/kg		
108-10-1	4-Methyl-2-pentanone	ND	31	12	ug/kg		
74-83-9	Methyl bromide	ND	6.1	2.2	ug/kg		
74-87-3	Methyl chloride	ND	6.1	2.5	ug/kg		
75-09-2	Methylene chloride	ND	12	6.1	ug/kg		
78-93-3	Methyl ethyl ketone	ND	31	12	ug/kg		
100-42-5	Styrene	ND	6.1	1.2	ug/kg		
71-55-6	1,1,1-Trichloroethane	ND	6.1	1.2	ug/kg		
79-34-5	1,1,2,2-Tetrachloroethane	ND	6.1	1.6	ug/kg		
79-00-5	1,1,2-Trichloroethane	ND	6.1	1.2	ug/kg		
127-18-4	Tetrachloroethylene	ND	6.1	1.2	ug/kg		
108-88-3	Toluene	ND	6.1	1.2	ug/kg		
79-01-6	Trichloroethylene	ND	6.1	1.2	ug/kg		

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	59SB02C		
Lab Sample ID:	F51300-14	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8260B	Percent Solids:	83.2
Project:	WPA 019 Field Investigation; Radford AAP, VA		

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
75-01-4	Vinyl chloride	ND	6.1	1.7	ug/kg	
	m,p-Xylene	ND	12	1.3	ug/kg	
95-47-6	o-Xylene	ND	6.1	1.2	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	112%		80-121%
2037-26-5	Toluene-D8	100%		71-130%
460-00-4	4-Bromofluorobenzene	116%		59-148%
17060-07-0	1,2-Dichloroethane-D4	123%		77-123%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	43SB06A		
Lab Sample ID:	F51300-15	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8260B	Percent Solids:	85.6
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	G0045271.D	1	07/31/07	SH	n/a	n/a	VG1720
Run #2							

	Initial Weight
Run #1	6.30 g
Run #2	

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q	DATA VAL QUALIFIER
67-64-1	Acetone	29.1	46	23	ug/kg	J	J
71-43-2	Benzene	ND	4.6	0.93	ug/kg		
75-27-4	Bromodichloromethane	ND	4.6	0.93	ug/kg		
75-25-2	Bromoform	ND	4.6	0.93	ug/kg		
108-90-7	Chlorobenzene	ND	4.6	0.93	ug/kg		
75-00-3	Chloroethane	ND	4.6	2.4	ug/kg		
67-66-3	Chloroform	ND	4.6	0.93	ug/kg		
75-15-0	Carbon disulfide	ND	4.6	0.93	ug/kg		
56-23-5	Carbon tetrachloride	ND	4.6	1.2	ug/kg		
75-34-3	1,1-Dichloroethane	ND	4.6	1.0	ug/kg		
75-35-4	1,1-Dichloroethylene	ND	4.6	0.93	ug/kg		
107-06-2	1,2-Dichloroethane	ND	4.6	0.93	ug/kg		
78-87-5	1,2-Dichloropropane	ND	4.6	1.2	ug/kg		
124-48-1	Dibromochloromethane	ND	4.6	0.93	ug/kg		
156-59-2	cis-1,2-Dichloroethylene	ND	4.6	0.93	ug/kg		
10061-01-5	cis-1,3-Dichloropropene	ND	4.6	0.93	ug/kg		
156-60-5	trans-1,2-Dichloroethylene	ND	4.6	0.93	ug/kg		
10061-02-6	trans-1,3-Dichloropropene	ND	4.6	0.93	ug/kg		
100-41-4	Ethylbenzene	ND	4.6	0.93	ug/kg		UJ
591-78-6	2-Hexanone	ND	23	9.3	ug/kg		
108-10-1	4-Methyl-2-pentanone	ND	23	9.3	ug/kg		
74-83-9	Methyl bromide	ND	4.6	1.7	ug/kg		UJ
74-87-3	Methyl chloride	ND	4.6	1.9	ug/kg		
75-09-2	Methylene chloride	ND	9.3	4.6	ug/kg		
78-93-3	Methyl ethyl ketone	ND	23	9.3	ug/kg		
100-42-5	Styrene	ND	4.6	0.93	ug/kg		
71-55-6	1,1,1-Trichloroethane	ND	4.6	0.93	ug/kg		
79-34-5	1,1,2,2-Tetrachloroethane	ND	4.6	1.2	ug/kg		
79-00-5	1,1,2-Trichloroethane	ND	4.6	0.93	ug/kg		
127-18-4	Tetrachloroethylene	ND	4.6	0.93	ug/kg		
108-88-3	Toluene	ND	4.6	0.93	ug/kg		
79-01-6	Trichloroethylene	ND	4.6	0.93	ug/kg		

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	43SB06A		
Lab Sample ID:	F51300-15	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8260B	Percent Solids:	85.6
Project:	WPA 019 Field Investigation; Radford AAP, VA		

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
75-01-4	Vinyl chloride	ND	4.6	1.3	ug/kg	
	m,p-Xylene	ND	9.3	1.0	ug/kg	
95-47-6	o-Xylene	ND	4.6	0.93	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	100%		80-121%
2037-26-5	Toluene-D8	96%		71-130%
460-00-4	4-Bromofluorobenzene	107%		59-148%
17060-07-0	1,2-Dichloroethane-D4	103%		77-123%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: G0045272.D

Accutest Laboratories

Report of Analysis

Client Sample ID:	43SB06B		
Lab Sample ID:	F51300-16	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8260B	Percent Solids:	81.7
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	G0045272.D	1	07/31/07	SH	n/a	n/a	VG1720
Run #2							

	Initial Weight
Run #1	4.30 g
Run #2	

VOA TCL List

DATA VAL QUALIFIER

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	94.0	71	36	ug/kg	
71-43-2	Benzene	ND	7.1	1.4	ug/kg	
75-27-4	Bromodichloromethane	ND	7.1	1.4	ug/kg	
75-25-2	Bromoform	ND	7.1	1.4	ug/kg	
108-90-7	Chlorobenzene	ND	7.1	1.4	ug/kg	
75-00-3	Chloroethane	ND	7.1	3.7	ug/kg	
67-66-3	Chloroform	ND	7.1	1.4	ug/kg	
75-15-0	Carbon disulfide	ND	7.1	1.4	ug/kg	
56-23-5	Carbon tetrachloride	ND	7.1	1.9	ug/kg	
75-34-3	1,1-Dichloroethane	ND	7.1	1.6	ug/kg	
75-35-4	1,1-Dichloroethylene	ND	7.1	1.4	ug/kg	
107-06-2	1,2-Dichloroethane	ND	7.1	1.4	ug/kg	
78-87-5	1,2-Dichloropropane	ND	7.1	1.9	ug/kg	
124-48-1	Dibromochloromethane	ND	7.1	1.4	ug/kg	
156-59-2	cis-1,2-Dichloroethylene	ND	7.1	1.4	ug/kg	
10061-01-5	cis-1,3-Dichloropropene	ND	7.1	1.4	ug/kg	
156-60-5	trans-1,2-Dichloroethylene	ND	7.1	1.4	ug/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	7.1	1.4	ug/kg	
100-41-4	Ethylbenzene	ND	7.1	1.4	ug/kg	UJ
591-78-6	2-Hexanone	ND	36	14	ug/kg	
108-10-1	4-Methyl-2-pentanone	ND	36	14	ug/kg	
74-83-9	Methyl bromide	ND	7.1	2.6	ug/kg	UJ
74-87-3	Methyl chloride	ND	7.1	2.8	ug/kg	
75-09-2	Methylene chloride	ND	14	7.1	ug/kg	
78-93-3	Methyl ethyl ketone	ND	36	14	ug/kg	
100-42-5	Styrene	ND	7.1	1.4	ug/kg	
71-55-6	1,1,1-Trichloroethane	ND	7.1	1.4	ug/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	7.1	1.9	ug/kg	
79-00-5	1,1,2-Trichloroethane	ND	7.1	1.4	ug/kg	
127-18-4	Tetrachloroethylene	ND	7.1	1.4	ug/kg	
108-88-3	Toluene	ND	7.1	1.4	ug/kg	
79-01-6	Trichloroethylene	ND	7.1	1.4	ug/kg	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	43SB06B		
Lab Sample ID:	F51300-16	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8260B	Percent Solids:	81.7
Project:	WPA 019 Field Investigation; Radford AAP, VA		

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
75-01-4	Vinyl chloride	ND	7.1	2.0	ug/kg	
	m,p-Xylene	ND	14	1.6	ug/kg	
95-47-6	o-Xylene	ND	7.1	1.4	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	109%		80-121%
2037-26-5	Toluene-D8	97%		71-130%
460-00-4	4-Bromofluorobenzene	105%		59-148%
17060-07-0	1,2-Dichloroethane-D4	97%		77-123%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

3.17 3

Client Sample ID:	43SB06C		
Lab Sample ID:	F51300-17	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8260B	Percent Solids:	89.4
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	G0045273.D	1	07/31/07	SH	n/a	n/a	VG1720
Run #2							

	Initial Weight
Run #1	5.99 g
Run #2	

VOA TCL List

DATA VAL QUALIFIER

CAS No.	Compound	Result	RL	MDL	Units	Q	
67-64-1	Acetone	43.5	47	23	ug/kg	J	J
71-43-2	Benzene	ND	4.7	0.93	ug/kg		
75-27-4	Bromodichloromethane	ND	4.7	0.93	ug/kg		
75-25-2	Bromoform	ND	4.7	0.93	ug/kg		
108-90-7	Chlorobenzene	ND	4.7	0.93	ug/kg		
75-00-3	Chloroethane	ND	4.7	2.4	ug/kg		
67-66-3	Chloroform	ND	4.7	0.93	ug/kg		
75-15-0	Carbon disulfide	ND	4.7	0.93	ug/kg		
56-23-5	Carbon tetrachloride	ND	4.7	1.2	ug/kg		
75-34-3	1,1-Dichloroethane	ND	4.7	1.0	ug/kg		
75-35-4	1,1-Dichloroethylene	ND	4.7	0.93	ug/kg		
107-06-2	1,2-Dichloroethane	ND	4.7	0.93	ug/kg		
78-87-5	1,2-Dichloropropane	ND	4.7	1.2	ug/kg		
124-48-1	Dibromochloromethane	ND	4.7	0.93	ug/kg		
156-59-2	cis-1,2-Dichloroethylene	ND	4.7	0.93	ug/kg		
10061-01-5	cis-1,3-Dichloropropene	ND	4.7	0.93	ug/kg		
156-60-5	trans-1,2-Dichloroethylene	ND	4.7	0.93	ug/kg		
10061-02-6	trans-1,3-Dichloropropene	ND	4.7	0.93	ug/kg		
100-41-4	Ethylbenzene	ND	4.7	0.93	ug/kg		UJ
591-78-6	2-Hexanone	ND	23	9.3	ug/kg		
108-10-1	4-Methyl-2-pentanone	ND	23	9.3	ug/kg		
74-83-9	Methyl bromide	ND	4.7	1.7	ug/kg		UJ
74-87-3	Methyl chloride	ND	4.7	1.9	ug/kg		
75-09-2	Methylene chloride	ND	9.3	4.7	ug/kg		
78-93-3	Methyl ethyl ketone	ND	23	9.3	ug/kg		
100-42-5	Styrene	ND	4.7	0.93	ug/kg		
71-55-6	1,1,1-Trichloroethane	ND	4.7	0.93	ug/kg		
79-34-5	1,1,2,2-Tetrachloroethane	ND	4.7	1.2	ug/kg		
79-00-5	1,1,2-Trichloroethane	ND	4.7	0.93	ug/kg		
127-18-4	Tetrachloroethylene	ND	4.7	0.93	ug/kg		
108-88-3	Toluene	ND	4.7	0.93	ug/kg		
79-01-6	Trichloroethylene	ND	4.7	0.93	ug/kg		

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	43SB06C		
Lab Sample ID:	F51300-17	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8260B	Percent Solids:	89.4
Project:	WPA 019 Field Investigation; Radford AAP, VA		

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
75-01-4	Vinyl chloride	ND	4.7	1.3	ug/kg	
	m,p-Xylene	ND	9.3	1.0	ug/kg	
95-47-6	o-Xylene	ND	4.7	0.93	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	104%		80-121%
2037-26-5	Toluene-D8	92%		71-130%
460-00-4	4-Bromofluorobenzene	104%		59-148%
17060-07-0	1,2-Dichloroethane-D4	100%		77-123%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	43SB07A		
Lab Sample ID:	F51300-18	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8260B	Percent Solids:	90.2
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	G0045274.D	1	07/31/07	SH	n/a	n/a	VG1720
Run #2							

	Initial Weight
Run #1	3.85 g
Run #2	

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q	DATA VAL QUALIFIER
67-64-1	Acetone	ND	72	36	ug/kg		
71-43-2	Benzene	ND	7.2	1.4	ug/kg		
75-27-4	Bromodichloromethane	ND	7.2	1.4	ug/kg		
75-25-2	Bromoform	ND	7.2	1.4	ug/kg		
108-90-7	Chlorobenzene	ND	7.2	1.4	ug/kg		
75-00-3	Chloroethane	ND	7.2	3.7	ug/kg		
67-66-3	Chloroform	ND	7.2	1.4	ug/kg		
75-15-0	Carbon disulfide	ND	7.2	1.4	ug/kg		
56-23-5	Carbon tetrachloride	ND	7.2	1.9	ug/kg		
75-34-3	1,1-Dichloroethane	ND	7.2	1.6	ug/kg		
75-35-4	1,1-Dichloroethylene	ND	7.2	1.4	ug/kg		
107-06-2	1,2-Dichloroethane	ND	7.2	1.4	ug/kg		
78-87-5	1,2-Dichloropropane	ND	7.2	1.9	ug/kg		
124-48-1	Dibromochloromethane	ND	7.2	1.4	ug/kg		
156-59-2	cis-1,2-Dichloroethylene	ND	7.2	1.4	ug/kg		
10061-01-5	cis-1,3-Dichloropropene	ND	7.2	1.4	ug/kg		
156-60-5	trans-1,2-Dichloroethylene	ND	7.2	1.4	ug/kg		
10061-02-6	trans-1,3-Dichloropropene	ND	7.2	1.4	ug/kg		
100-41-4	Ethylbenzene	ND	7.2	1.4	ug/kg		UJ
591-78-6	2-Hexanone	ND	36	14	ug/kg		
108-10-1	4-Methyl-2-pentanone	ND	36	14	ug/kg		
74-83-9	Methyl bromide	ND	7.2	2.6	ug/kg		UJ
74-87-3	Methyl chloride	ND	7.2	2.9	ug/kg		
75-09-2	Methylene chloride	ND	14	7.2	ug/kg		
78-93-3	Methyl ethyl ketone	ND	36	14	ug/kg		
100-42-5	Styrene	ND	7.2	1.4	ug/kg		
71-55-6	1,1,1-Trichloroethane	ND	7.2	1.4	ug/kg		
79-34-5	1,1,2,2-Tetrachloroethane	ND	7.2	1.9	ug/kg		
79-00-5	1,1,2-Trichloroethane	ND	7.2	1.4	ug/kg		
127-18-4	Tetrachloroethylene	ND	7.2	1.4	ug/kg		
108-88-3	Toluene	ND	7.2	1.4	ug/kg		
79-01-6	Trichloroethylene	ND	7.2	1.4	ug/kg		

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	43SB07A		
Lab Sample ID:	F51300-18	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8260B	Percent Solids:	90.2
Project:	WPA 019 Field Investigation; Radford AAP, VA		

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
75-01-4	Vinyl chloride	ND	7.2	2.0	ug/kg	
	m,p-Xylene	ND	14	1.6	ug/kg	
95-47-6	o-Xylene	ND	7.2	1.4	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	100%		80-121%
2037-26-5	Toluene-D8	98%		71-130%
460-00-4	4-Bromofluorobenzene	118%		59-148%
17060-07-0	1,2-Dichloroethane-D4	99%		77-123%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	43SB07B		
Lab Sample ID:	F51300-19	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8260B	Percent Solids:	86.2
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	G0045275.D	1	08/01/07	SH	n/a	n/a	VG1720
Run #2							

	Initial Weight
Run #1	5.35 g
Run #2	

VOA TCL List

DATA VAL QUALIFIER

CAS No.	Compound	Result	RL	MDL	Units	Q	
67-64-1	Acetone	44.8	54	27	ug/kg	J	J
71-43-2	Benzene	ND	5.4	1.1	ug/kg		
75-27-4	Bromodichloromethane	ND	5.4	1.1	ug/kg		
75-25-2	Bromoform	ND	5.4	1.1	ug/kg		
108-90-7	Chlorobenzene	ND	5.4	1.1	ug/kg		
75-00-3	Chloroethane	ND	5.4	2.8	ug/kg		
67-66-3	Chloroform	ND	5.4	1.1	ug/kg		
75-15-0	Carbon disulfide	ND	5.4	1.1	ug/kg		
56-23-5	Carbon tetrachloride	ND	5.4	1.4	ug/kg		
75-34-3	1,1-Dichloroethane	ND	5.4	1.2	ug/kg		
75-35-4	1,1-Dichloroethylene	ND	5.4	1.1	ug/kg		
107-06-2	1,2-Dichloroethane	ND	5.4	1.1	ug/kg		
78-87-5	1,2-Dichloropropane	ND	5.4	1.4	ug/kg		
124-48-1	Dibromochloromethane	ND	5.4	1.1	ug/kg		
156-59-2	cis-1,2-Dichloroethylene	ND	5.4	1.1	ug/kg		
10061-01-5	cis-1,3-Dichloropropene	ND	5.4	1.1	ug/kg		
156-60-5	trans-1,2-Dichloroethylene	ND	5.4	1.1	ug/kg		
10061-02-6	trans-1,3-Dichloropropene	ND	5.4	1.1	ug/kg		
100-41-4	Ethylbenzene	ND	5.4	1.1	ug/kg		UJ
591-78-6	2-Hexanone	ND	27	11	ug/kg		
108-10-1	4-Methyl-2-pentanone	ND	27	11	ug/kg		
74-83-9	Methyl bromide	ND	5.4	2.0	ug/kg		UJ
74-87-3	Methyl chloride	ND	5.4	2.2	ug/kg		
75-09-2	Methylene chloride	ND	11	5.4	ug/kg		
78-93-3	Methyl ethyl ketone	ND	27	11	ug/kg		
100-42-5	Styrene	ND	5.4	1.1	ug/kg		
71-55-6	1,1,1-Trichloroethane	ND	5.4	1.1	ug/kg		
79-34-5	1,1,2,2-Tetrachloroethane	ND	5.4	1.4	ug/kg		
79-00-5	1,1,2-Trichloroethane	ND	5.4	1.1	ug/kg		
127-18-4	Tetrachloroethylene	ND	5.4	1.1	ug/kg		
108-88-3	Toluene	ND	5.4	1.1	ug/kg		
79-01-6	Trichloroethylene	ND	5.4	1.1	ug/kg		

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	43SB07B		
Lab Sample ID:	F51300-19	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8260B	Percent Solids:	86.2
Project:	WPA 019 Field Investigation; Radford AAP, VA		

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
75-01-4	Vinyl chloride	ND	5.4	1.5	ug/kg	
	m,p-Xylene	9.8	11	1.2	ug/kg	J
95-47-6	o-Xylene	ND	5.4	1.1	ug/kg	

DATA VAL QUALIFIER J

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	105%		80-121%
2037-26-5	Toluene-D8	89%		71-130%
460-00-4	4-Bromofluorobenzene	103%		59-148%
17060-07-0	1,2-Dichloroethane-D4	95%		77-123%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	43SB07C		
Lab Sample ID:	F51300-20	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8260B	Percent Solids:	84.3
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	G0045297.D	1	08/01/07	SH	n/a	n/a	VG1721
Run #2							

	Initial Weight
Run #1	5.27 g
Run #2	

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	56	28	ug/kg	
71-43-2	Benzene	ND	5.6	1.1	ug/kg	
75-27-4	Bromodichloromethane	ND	5.6	1.1	ug/kg	
75-25-2	Bromoform	ND	5.6	1.1	ug/kg	
108-90-7	Chlorobenzene	ND	5.6	1.1	ug/kg	
75-00-3	Chloroethane	ND	5.6	2.9	ug/kg	
67-66-3	Chloroform	ND	5.6	1.1	ug/kg	
75-15-0	Carbon disulfide	ND	5.6	1.1	ug/kg	
56-23-5	Carbon tetrachloride	ND	5.6	1.5	ug/kg	
75-34-3	1,1-Dichloroethane	ND	5.6	1.2	ug/kg	
75-35-4	1,1-Dichloroethylene	ND	5.6	1.1	ug/kg	
107-06-2	1,2-Dichloroethane	ND	5.6	1.1	ug/kg	
78-87-5	1,2-Dichloropropane	ND	5.6	1.5	ug/kg	
124-48-1	Dibromochloromethane	ND	5.6	1.1	ug/kg	
156-59-2	cis-1,2-Dichloroethylene	ND	5.6	1.1	ug/kg	
10061-01-5	cis-1,3-Dichloropropene	ND	5.6	1.1	ug/kg	
156-60-5	trans-1,2-Dichloroethylene	ND	5.6	1.1	ug/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	5.6	1.1	ug/kg	
100-41-4	Ethylbenzene	ND	5.6	1.1	ug/kg	UJ
591-78-6	2-Hexanone	ND	28	11	ug/kg	
108-10-1	4-Methyl-2-pentanone	ND	28	11	ug/kg	
74-83-9	Methyl bromide	ND	5.6	2.0	ug/kg	UJ
74-87-3	Methyl chloride	ND	5.6	2.3	ug/kg	
75-09-2	Methylene chloride	ND	11	5.6	ug/kg	
78-93-3	Methyl ethyl ketone	ND	28	11	ug/kg	
100-42-5	Styrene	ND	5.6	1.1	ug/kg	
71-55-6	1,1,1-Trichloroethane	ND	5.6	1.1	ug/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	5.6	1.5	ug/kg	
79-00-5	1,1,2-Trichloroethane	ND	5.6	1.1	ug/kg	
127-18-4	Tetrachloroethylene	ND	5.6	1.1	ug/kg	
108-88-3	Toluene	ND	5.6	1.1	ug/kg	
79-01-6	Trichloroethylene	ND	5.6	1.1	ug/kg	

DATA VAL QUALIFIER

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	43SB07C		
Lab Sample ID:	F51300-20	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8260B	Percent Solids:	84.3
Project:	WPA 019 Field Investigation; Radford AAP, VA		

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
75-01-4	Vinyl chloride	ND	5.6	1.6	ug/kg	
	m,p-Xylene	ND	11	1.2	ug/kg	
95-47-6	o-Xylene	ND	5.6	1.1	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	104%		80-121%
2037-26-5	Toluene-D8	99%		71-130%
460-00-4	4-Bromofluorobenzene	99%		59-148%
17060-07-0	1,2-Dichloroethane-D4	99%		77-123%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	43SB08A		
Lab Sample ID:	F51300-21	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8260B	Percent Solids:	96.1
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	G0045262.D	1	07/31/07	SH	n/a	n/a	VG1720
Run #2							

	Initial Weight
Run #1	5.45 g
Run #2	

VOA TCL List

DATA VAL QUALIFIER

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	48	24	ug/kg	
71-43-2	Benzene	ND	4.8	0.95	ug/kg	
75-27-4	Bromodichloromethane	ND	4.8	0.95	ug/kg	
75-25-2	Bromoform	ND	4.8	0.95	ug/kg	
108-90-7	Chlorobenzene	ND	4.8	0.95	ug/kg	
75-00-3	Chloroethane	ND	4.8	2.5	ug/kg	
67-66-3	Chloroform	ND	4.8	0.95	ug/kg	
75-15-0	Carbon disulfide	ND	4.8	0.95	ug/kg	
56-23-5	Carbon tetrachloride	ND	4.8	1.2	ug/kg	
75-34-3	1,1-Dichloroethane	ND	4.8	1.1	ug/kg	
75-35-4	1,1-Dichloroethylene	ND	4.8	0.95	ug/kg	
107-06-2	1,2-Dichloroethane	ND	4.8	0.95	ug/kg	
78-87-5	1,2-Dichloropropane	ND	4.8	1.2	ug/kg	
124-48-1	Dibromochloromethane	ND	4.8	0.95	ug/kg	
156-59-2	cis-1,2-Dichloroethylene	ND	4.8	0.95	ug/kg	
10061-01-5	cis-1,3-Dichloropropene	ND	4.8	0.95	ug/kg	
156-60-5	trans-1,2-Dichloroethylene	ND	4.8	0.95	ug/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	4.8	0.95	ug/kg	
100-41-4	Ethylbenzene	ND	4.8	0.95	ug/kg	UJ
591-78-6	2-Hexanone	ND	24	9.5	ug/kg	
108-10-1	4-Methyl-2-pentanone	ND	24	9.5	ug/kg	
74-83-9	Methyl bromide	ND	4.8	1.7	ug/kg	UJ
74-87-3	Methyl chloride	ND	4.8	1.9	ug/kg	
75-09-2	Methylene chloride	ND	9.5	4.8	ug/kg	
78-93-3	Methyl ethyl ketone	ND	24	9.5	ug/kg	
100-42-5	Styrene	ND	4.8	0.95	ug/kg	
71-55-6	1,1,1-Trichloroethane	ND	4.8	0.95	ug/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	4.8	1.2	ug/kg	
79-00-5	1,1,2-Trichloroethane	ND	4.8	0.95	ug/kg	
127-18-4	Tetrachloroethylene	ND	4.8	0.95	ug/kg	
108-88-3	Toluene	ND	4.8	0.95	ug/kg	
79-01-6	Trichloroethylene	ND	4.8	0.95	ug/kg	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	43SB08A		
Lab Sample ID:	F51300-21	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8260B	Percent Solids:	96.1
Project:	WPA 019 Field Investigation; Radford AAP, VA		

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
75-01-4	Vinyl chloride	ND	4.8	1.3	ug/kg	
	m,p-Xylene	ND	9.5	1.1	ug/kg	
95-47-6	o-Xylene	ND	4.8	0.95	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	98%		80-121%
2037-26-5	Toluene-D8	102%		71-130%
460-00-4	4-Bromofluorobenzene	110%		59-148%
17060-07-0	1,2-Dichloroethane-D4	101%		77-123%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

3.22 3

Client Sample ID:	43SB08B		
Lab Sample ID:	F51300-22	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8260B	Percent Solids:	84.5
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	G0045263.D	1	07/31/07	SH	n/a	n/a	VG1720
Run #2							

	Initial Weight
Run #1	5.80 g
Run #2	

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	95.2	51	26	ug/kg	
71-43-2	Benzene	ND	5.1	1.0	ug/kg	
75-27-4	Bromodichloromethane	ND	5.1	1.0	ug/kg	
75-25-2	Bromoform	ND	5.1	1.0	ug/kg	
108-90-7	Chlorobenzene	ND	5.1	1.0	ug/kg	
75-00-3	Chloroethane	ND	5.1	2.7	ug/kg	
67-66-3	Chloroform	ND	5.1	1.0	ug/kg	
75-15-0	Carbon disulfide	2.1	5.1	1.0	ug/kg	J
56-23-5	Carbon tetrachloride	ND	5.1	1.3	ug/kg	
75-34-3	1,1-Dichloroethane	ND	5.1	1.1	ug/kg	
75-35-4	1,1-Dichloroethylene	ND	5.1	1.0	ug/kg	
107-06-2	1,2-Dichloroethane	ND	5.1	1.0	ug/kg	
78-87-5	1,2-Dichloropropane	ND	5.1	1.3	ug/kg	
124-48-1	Dibromochloromethane	ND	5.1	1.0	ug/kg	
156-59-2	cis-1,2-Dichloroethylene	ND	5.1	1.0	ug/kg	
10061-01-5	cis-1,3-Dichloropropene	ND	5.1	1.0	ug/kg	
156-60-5	trans-1,2-Dichloroethylene	ND	5.1	1.0	ug/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	5.1	1.0	ug/kg	
100-41-4	Ethylbenzene	ND	5.1	1.0	ug/kg	UJ
591-78-6	2-Hexanone	ND	26	10	ug/kg	
108-10-1	4-Methyl-2-pentanone	ND	26	10	ug/kg	
74-83-9	Methyl bromide	ND	5.1	1.8	ug/kg	UJ
74-87-3	Methyl chloride	ND	5.1	2.0	ug/kg	
75-09-2	Methylene chloride	ND	10	5.1	ug/kg	
78-93-3	Methyl ethyl ketone	ND	26	10	ug/kg	
100-42-5	Styrene	ND	5.1	1.0	ug/kg	
71-55-6	1,1,1-Trichloroethane	ND	5.1	1.0	ug/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	5.1	1.3	ug/kg	
79-00-5	1,1,2-Trichloroethane	ND	5.1	1.0	ug/kg	
127-18-4	Tetrachloroethylene	ND	5.1	1.0	ug/kg	
108-88-3	Toluene	ND	5.1	1.0	ug/kg	
79-01-6	Trichloroethylene	ND	5.1	1.0	ug/kg	

DATA VAL QUALIFIER

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	43SB08B		
Lab Sample ID:	F51300-22	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8260B	Percent Solids:	84.5
Project:	WPA 019 Field Investigation; Radford AAP, VA		

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
75-01-4	Vinyl chloride	ND	5.1	1.4	ug/kg	
	m,p-Xylene	ND	10	1.1	ug/kg	
95-47-6	o-Xylene	ND	5.1	1.0	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	102%		80-121%
2037-26-5	Toluene-D8	98%		71-130%
460-00-4	4-Bromofluorobenzene	94%		59-148%
17060-07-0	1,2-Dichloroethane-D4	107%		77-123%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	43SB08C		
Lab Sample ID:	F51300-23	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8260B	Percent Solids:	87.5
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	G0045298.D	1	08/01/07	SH	n/a	n/a	VG1721
Run #2							

	Initial Weight
Run #1	4.85 g
Run #2	

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q	DATA VAL QUALIFIER
67-64-1	Acetone [a]	33.5	59	29	ug/kg	J	J
71-43-2	Benzene	ND	5.9	1.2	ug/kg		
75-27-4	Bromodichloromethane	ND	5.9	1.2	ug/kg		
75-25-2	Bromoform	ND	5.9	1.2	ug/kg		
108-90-7	Chlorobenzene	ND	5.9	1.2	ug/kg		
75-00-3	Chloroethane	ND	5.9	3.1	ug/kg		
67-66-3	Chloroform	ND	5.9	1.2	ug/kg		
75-15-0	Carbon disulfide	ND	5.9	1.2	ug/kg		
56-23-5	Carbon tetrachloride	ND	5.9	1.5	ug/kg		
75-34-3	1,1-Dichloroethane	ND	5.9	1.3	ug/kg		
75-35-4	1,1-Dichloroethylene	ND	5.9	1.2	ug/kg		
107-06-2	1,2-Dichloroethane	ND	5.9	1.2	ug/kg		
78-87-5	1,2-Dichloropropane	ND	5.9	1.5	ug/kg		
124-48-1	Dibromochloromethane	ND	5.9	1.2	ug/kg		
156-59-2	cis-1,2-Dichloroethylene	ND	5.9	1.2	ug/kg		
10061-01-5	cis-1,3-Dichloropropene	ND	5.9	1.2	ug/kg		
156-60-5	trans-1,2-Dichloroethylene	ND	5.9	1.2	ug/kg		
10061-02-6	trans-1,3-Dichloropropene	ND	5.9	1.2	ug/kg		
100-41-4	Ethylbenzene	ND	5.9	1.2	ug/kg		UJ
591-78-6	2-Hexanone	ND	29	12	ug/kg		
108-10-1	4-Methyl-2-pentanone	ND	29	12	ug/kg		
74-83-9	Methyl bromide	ND	5.9	2.1	ug/kg		UJ
74-87-3	Methyl chloride	ND	5.9	2.4	ug/kg		
75-09-2	Methylene chloride	ND	12	5.9	ug/kg		
78-93-3	Methyl ethyl ketone	ND	29	12	ug/kg		
100-42-5	Styrene	ND	5.9	1.2	ug/kg		
71-55-6	1,1,1-Trichloroethane	ND	5.9	1.2	ug/kg		
79-34-5	1,1,2,2-Tetrachloroethane	ND	5.9	1.5	ug/kg		
79-00-5	1,1,2-Trichloroethane	ND	5.9	1.2	ug/kg		
127-18-4	Tetrachloroethylene	ND	5.9	1.2	ug/kg		
108-88-3	Toluene	ND	5.9	1.2	ug/kg		
79-01-6	Trichloroethylene	ND	5.9	1.2	ug/kg		

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	43SB08C		
Lab Sample ID:	F51300-23	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8260B	Percent Solids:	87.5
Project:	WPA 019 Field Investigation; Radford AAP, VA		

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
75-01-4	Vinyl chloride	ND	5.9	1.6	ug/kg	
	m,p-Xylene	ND	12	1.3	ug/kg	
95-47-6	o-Xylene	ND	5.9	1.2	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	106%		80-121%
2037-26-5	Toluene-D8	94%		71-130%
460-00-4	4-Bromofluorobenzene	101%		59-148%
17060-07-0	1,2-Dichloroethane-D4	103%		77-123%

(a) CCV outside of control limits; results may be biased high.

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

3.24 B

Client Sample ID:	43SB09A		
Lab Sample ID:	F51300-24	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8260B	Percent Solids:	90.3
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	G0045265.D	1	07/31/07	SH	n/a	n/a	VG1720
Run #2							

	Initial Weight
Run #1	3.88 g
Run #2	

VOA TCL List

DATA VAL QUALIFIER

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	71	36	ug/kg	
71-43-2	Benzene	ND	7.1	1.4	ug/kg	
75-27-4	Bromodichloromethane	ND	7.1	1.4	ug/kg	
75-25-2	Bromoform	ND	7.1	1.4	ug/kg	
108-90-7	Chlorobenzene	ND	7.1	1.4	ug/kg	
75-00-3	Chloroethane	ND	7.1	3.7	ug/kg	
67-66-3	Chloroform	ND	7.1	1.4	ug/kg	
75-15-0	Carbon disulfide	ND	7.1	1.4	ug/kg	
56-23-5	Carbon tetrachloride	ND	7.1	1.9	ug/kg	
75-34-3	1,1-Dichloroethane	ND	7.1	1.6	ug/kg	
75-35-4	1,1-Dichloroethylene	ND	7.1	1.4	ug/kg	
107-06-2	1,2-Dichloroethane	ND	7.1	1.4	ug/kg	
78-87-5	1,2-Dichloropropane	ND	7.1	1.9	ug/kg	
124-48-1	Dibromochloromethane	ND	7.1	1.4	ug/kg	
156-59-2	cis-1,2-Dichloroethylene	ND	7.1	1.4	ug/kg	
10061-01-5	cis-1,3-Dichloropropene	ND	7.1	1.4	ug/kg	
156-60-5	trans-1,2-Dichloroethylene	ND	7.1	1.4	ug/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	7.1	1.4	ug/kg	
100-41-4	Ethylbenzene	ND	7.1	1.4	ug/kg	UJ
591-78-6	2-Hexanone	ND	36	14	ug/kg	
108-10-1	4-Methyl-2-pentanone	ND	36	14	ug/kg	
74-83-9	Methyl bromide	ND	7.1	2.6	ug/kg	UJ
74-87-3	Methyl chloride	ND	7.1	2.9	ug/kg	
75-09-2	Methylene chloride	ND	14	7.1	ug/kg	
78-93-3	Methyl ethyl ketone	ND	36	14	ug/kg	
100-42-5	Styrene	ND	7.1	1.4	ug/kg	
71-55-6	1,1,1-Trichloroethane	ND	7.1	1.4	ug/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	7.1	1.9	ug/kg	
79-00-5	1,1,2-Trichloroethane	ND	7.1	1.4	ug/kg	
127-18-4	Tetrachloroethylene	ND	7.1	1.4	ug/kg	
108-88-3	Toluene	ND	7.1	1.4	ug/kg	
79-01-6	Trichloroethylene	ND	7.1	1.4	ug/kg	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	43SB09A		
Lab Sample ID:	F51300-24	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8260B	Percent Solids:	90.3
Project:	WPA 019 Field Investigation; Radford AAP, VA		

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
75-01-4	Vinyl chloride	ND	7.1	2.0	ug/kg	
	m,p-Xylene	ND	14	1.6	ug/kg	
95-47-6	o-Xylene	ND	7.1	1.4	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	101%		80-121%
2037-26-5	Toluene-D8	98%		71-130%
460-00-4	4-Bromofluorobenzene	105%		59-148%
17060-07-0	1,2-Dichloroethane-D4	100%		77-123%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

3.25

Client Sample ID:	43SB09B		
Lab Sample ID:	F51300-25	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8260B	Percent Solids:	86.9
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	G0045259.D	1	07/31/07	SH	n/a	n/a	VG1720
Run #2 [a]	G0045299.D	1	08/01/07	SH	n/a	n/a	VG1721

	Initial Weight
Run #1	5.19 g
Run #2	5.86 g

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q (DATA VAL QUALIFIER)
67-64-1	Acetone	61.2	55	28	ug/kg	
71-43-2	Benzene	ND	5.5	1.1	ug/kg	
75-27-4	Bromodichloromethane	ND	5.5	1.1	ug/kg	
75-25-2	Bromoform	ND	5.5	1.1	ug/kg	
108-90-7	Chlorobenzene	ND	5.5	1.1	ug/kg	
75-00-3	Chloroethane	ND	5.5	2.9	ug/kg	
67-66-3	Chloroform	ND	5.5	1.1	ug/kg	
75-15-0	Carbon disulfide	7.3	5.5	1.1	ug/kg	
56-23-5	Carbon tetrachloride	ND	5.5	1.4	ug/kg	
75-34-3	1,1-Dichloroethane	ND	5.5	1.2	ug/kg	
75-35-4	1,1-Dichloroethylene	ND	5.5	1.1	ug/kg	
107-06-2	1,2-Dichloroethane	ND	5.5	1.1	ug/kg	
78-87-5	1,2-Dichloropropane	ND	5.5	1.4	ug/kg	
124-48-1	Dibromochloromethane	ND	5.5	1.1	ug/kg	
156-59-2	cis-1,2-Dichloroethylene	ND	5.5	1.1	ug/kg	
10061-01-5	cis-1,3-Dichloropropene	ND	5.5	1.1	ug/kg	
156-60-5	trans-1,2-Dichloroethylene	ND	5.5	1.1	ug/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	5.5	1.1	ug/kg	
100-41-4	Ethylbenzene	61.8	5.5	1.1	ug/kg	J
591-78-6	2-Hexanone	ND	28	11	ug/kg	
108-10-1	4-Methyl-2-pentanone	ND	28	11	ug/kg	
74-83-9	Methyl bromide	ND	5.5	2.0	ug/kg	UJ
74-87-3	Methyl chloride	ND	5.5	2.2	ug/kg	
75-09-2	Methylene chloride	ND	11	5.5	ug/kg	
78-93-3	Methyl ethyl ketone	ND	28	11	ug/kg	
100-42-5	Styrene	ND	5.5	1.1	ug/kg	
71-55-6	1,1,1-Trichloroethane	ND	5.5	1.1	ug/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	5.5	1.4	ug/kg	UJ
79-00-5	1,1,2-Trichloroethane	ND	5.5	1.1	ug/kg	
127-18-4	Tetrachloroethylene	ND	5.5	1.1	ug/kg	
108-88-3	Toluene	2.7	5.5	1.1	ug/kg	J J
79-01-6	Trichloroethylene	ND	5.5	1.1	ug/kg	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	43SB09B		
Lab Sample ID:	F51300-25	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8260B	Percent Solids:	86.9
Project:	WPA 019 Field Investigation; Radford AAP, VA		

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
75-01-4	Vinyl chloride	ND	5.5	1.6	ug/kg	
	m,p-Xylene	12.4	11	1.2	ug/kg	
95-47-6	o-Xylene	8.9	5.5	1.1	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	99%	103%	80-121%
2037-26-5	Toluene-D8	106%	97%	71-130%
460-00-4	4-Bromofluorobenzene	116%	104%	59-148%
17060-07-0	1,2-Dichloroethane-D4	98%	97%	77-123%

(a) Confirmation run.

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	43SB09C		
Lab Sample ID:	F51300-26	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8260B	Percent Solids:	87.1
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	G0045266.D	1	07/31/07	SH	n/a	n/a	VG1720
Run #2							

	Initial Weight
Run #1	4.34 g
Run #2	

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q	DATA VAL QUALIFIER
67-64-1	Acetone	33.6	66	33	ug/kg	J	J
71-43-2	Benzene	ND	6.6	1.3	ug/kg		
75-27-4	Bromodichloromethane	ND	6.6	1.3	ug/kg		
75-25-2	Bromoform	ND	6.6	1.3	ug/kg		
108-90-7	Chlorobenzene	ND	6.6	1.3	ug/kg		
75-00-3	Chloroethane	ND	6.6	3.4	ug/kg		
67-66-3	Chloroform	ND	6.6	1.3	ug/kg		
75-15-0	Carbon disulfide	ND	6.6	1.3	ug/kg		
56-23-5	Carbon tetrachloride	ND	6.6	1.7	ug/kg		
75-34-3	1,1-Dichloroethane	ND	6.6	1.5	ug/kg		
75-35-4	1,1-Dichloroethylene	ND	6.6	1.3	ug/kg		
107-06-2	1,2-Dichloroethane	ND	6.6	1.3	ug/kg		
78-87-5	1,2-Dichloropropane	ND	6.6	1.7	ug/kg		
124-48-1	Dibromochloromethane	ND	6.6	1.3	ug/kg		
156-59-2	cis-1,2-Dichloroethylene	ND	6.6	1.3	ug/kg		
10061-01-5	cis-1,3-Dichloropropene	ND	6.6	1.3	ug/kg		
156-60-5	trans-1,2-Dichloroethylene	ND	6.6	1.3	ug/kg		
10061-02-6	trans-1,3-Dichloropropene	ND	6.6	1.3	ug/kg		
100-41-4	Ethylbenzene	ND	6.6	1.3	ug/kg		UJ
591-78-6	2-Hexanone	ND	33	13	ug/kg		
108-10-1	4-Methyl-2-pentanone	ND	33	13	ug/kg		
74-83-9	Methyl bromide	ND	6.6	2.4	ug/kg		UJ
74-87-3	Methyl chloride	ND	6.6	2.6	ug/kg		
75-09-2	Methylene chloride	ND	13	6.6	ug/kg		
78-93-3	Methyl ethyl ketone	ND	33	13	ug/kg		
100-42-5	Styrene	ND	6.6	1.3	ug/kg		
71-55-6	1,1,1-Trichloroethane	ND	6.6	1.3	ug/kg		
79-34-5	1,1,2,2-Tetrachloroethane	ND	6.6	1.7	ug/kg		
79-00-5	1,1,2-Trichloroethane	ND	6.6	1.3	ug/kg		
127-18-4	Tetrachloroethylene	ND	6.6	1.3	ug/kg		
108-88-3	Toluene	ND	6.6	1.3	ug/kg		
79-01-6	Trichloroethylene	ND	6.6	1.3	ug/kg		

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	43SB09C		
Lab Sample ID:	F51300-26	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8260B	Percent Solids:	87.1
Project:	WPA 019 Field Investigation; Radford AAP, VA		

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
75-01-4	Vinyl chloride	ND	6.6	1.9	ug/kg	
	m,p-Xylene	ND	13	1.5	ug/kg	
95-47-6	o-Xylene	ND	6.6	1.3	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	102%		80-121%
2037-26-5	Toluene-D8	94%		71-130%
460-00-4	4-Bromofluorobenzene	100%		59-148%
17060-07-0	1,2-Dichloroethane-D4	102%		77-123%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

3.27 3

Client Sample ID:	43SB10A		
Lab Sample ID:	F51300-27	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8260B	Percent Solids:	87.1
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	G0045267.D	1	07/31/07	SH	n/a	n/a	VG1720
Run #2							

	Initial Weight
Run #1	4.09 g
Run #2	

VOA TCL List

DATA VAL QUALIFIED

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	70	35	ug/kg	
71-43-2	Benzene	ND	7.0	1.4	ug/kg	
75-27-4	Bromodichloromethane	ND	7.0	1.4	ug/kg	
75-25-2	Bromoform	ND	7.0	1.4	ug/kg	
108-90-7	Chlorobenzene	ND	7.0	1.4	ug/kg	
75-00-3	Chloroethane	ND	7.0	3.6	ug/kg	
67-66-3	Chloroform	ND	7.0	1.4	ug/kg	
75-15-0	Carbon disulfide	ND	7.0	1.4	ug/kg	
56-23-5	Carbon tetrachloride	ND	7.0	1.8	ug/kg	
75-34-3	1,1-Dichloroethane	ND	7.0	1.5	ug/kg	
75-35-4	1,1-Dichloroethylene	ND	7.0	1.4	ug/kg	
107-06-2	1,2-Dichloroethane	ND	7.0	1.4	ug/kg	
78-87-5	1,2-Dichloropropane	ND	7.0	1.8	ug/kg	
124-48-1	Dibromochloromethane	ND	7.0	1.4	ug/kg	
156-59-2	cis-1,2-Dichloroethylene	ND	7.0	1.4	ug/kg	
10061-01-5	cis-1,3-Dichloropropene	ND	7.0	1.4	ug/kg	
156-60-5	trans-1,2-Dichloroethylene	ND	7.0	1.4	ug/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	7.0	1.4	ug/kg	
100-41-4	Ethylbenzene	ND	7.0	1.4	ug/kg	UJ
591-78-6	2-Hexanone	ND	35	14	ug/kg	
108-10-1	4-Methyl-2-pentanone	ND	35	14	ug/kg	
74-83-9	Methyl bromide	ND	7.0	2.5	ug/kg	UJ
74-87-3	Methyl chloride	ND	7.0	2.8	ug/kg	
75-09-2	Methylene chloride	ND	14	7.0	ug/kg	
78-93-3	Methyl ethyl ketone	ND	35	14	ug/kg	
100-42-5	Styrene	ND	7.0	1.4	ug/kg	
71-55-6	1,1,1-Trichloroethane	ND	7.0	1.4	ug/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	7.0	1.8	ug/kg	
79-00-5	1,1,2-Trichloroethane	ND	7.0	1.4	ug/kg	
127-18-4	Tetrachloroethylene	ND	7.0	1.4	ug/kg	
108-88-3	Toluene	ND	7.0	1.4	ug/kg	
79-01-6	Trichloroethylene	ND	7.0	1.4	ug/kg	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	43SB10A		
Lab Sample ID:	F51300-27	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8260B	Percent Solids:	87.1
Project:	WPA 019 Field Investigation; Radford AAP, VA		

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
75-01-4	Vinyl chloride	ND	7.0	2.0	ug/kg	
	m,p-Xylene	ND	14	1.5	ug/kg	
95-47-6	o-Xylene	ND	7.0	1.4	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	101%		80-121%
2037-26-5	Toluene-D8	96%		71-130%
460-00-4	4-Bromofluorobenzene	96%		59-148%
17060-07-0	1,2-Dichloroethane-D4	97%		77-123%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

3-28
3

Client Sample ID:	43SB10B		
Lab Sample ID:	F51300-28	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8260B	Percent Solids:	86.6
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	G0045268.D	1	07/31/07	SH	n/a	n/a	VG1720
Run #2							

	Initial Weight
Run #1	4.92 g
Run #2	

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q	DATA VAL QUALIFIER
67-64-1	Acetone	ND	59	29	ug/kg		
71-43-2	Benzene	ND	5.9	1.2	ug/kg		
75-27-4	Bromodichloromethane	ND	5.9	1.2	ug/kg		
75-25-2	Bromoform	ND	5.9	1.2	ug/kg		
108-90-7	Chlorobenzene	ND	5.9	1.2	ug/kg		
75-00-3	Chloroethane	ND	5.9	3.1	ug/kg		
67-66-3	Chloroform	ND	5.9	1.2	ug/kg		
75-15-0	Carbon disulfide	ND	5.9	1.2	ug/kg		
56-23-5	Carbon tetrachloride	ND	5.9	1.5	ug/kg		
75-34-3	1,1-Dichloroethane	ND	5.9	1.3	ug/kg		
75-35-4	1,1-Dichloroethylene	ND	5.9	1.2	ug/kg		
107-06-2	1,2-Dichloroethane	ND	5.9	1.2	ug/kg		
78-87-5	1,2-Dichloropropane	ND	5.9	1.5	ug/kg		
124-48-1	Dibromochloromethane	ND	5.9	1.2	ug/kg		
156-59-2	cis-1,2-Dichloroethylene	ND	5.9	1.2	ug/kg		
10061-01-5	cis-1,3-Dichloropropene	ND	5.9	1.2	ug/kg		
156-60-5	trans-1,2-Dichloroethylene	ND	5.9	1.2	ug/kg		
10061-02-6	trans-1,3-Dichloropropene	ND	5.9	1.2	ug/kg		
100-41-4	Ethylbenzene	ND	5.9	1.2	ug/kg		UJ
591-78-6	2-Hexanone	ND	29	12	ug/kg		
108-10-1	4-Methyl-2-pentanone	ND	29	12	ug/kg		
74-83-9	Methyl bromide	ND	5.9	2.1	ug/kg		UJ
74-87-3	Methyl chloride	ND	5.9	2.3	ug/kg		
75-09-2	Methylene chloride	ND	12	5.9	ug/kg		
78-93-3	Methyl ethyl ketone	ND	29	12	ug/kg		
100-42-5	Styrene	ND	5.9	1.2	ug/kg		
71-55-6	1,1,1-Trichloroethane	ND	5.9	1.2	ug/kg		
79-34-5	1,1,2,2-Tetrachloroethane	ND	5.9	1.5	ug/kg		
79-00-5	1,1,2-Trichloroethane	ND	5.9	1.2	ug/kg		
127-18-4	Tetrachloroethylene	ND	5.9	1.2	ug/kg		
108-88-3	Toluene	ND	5.9	1.2	ug/kg		
79-01-6	Trichloroethylene	ND	5.9	1.2	ug/kg		

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	43SB10B		
Lab Sample ID:	F51300-28	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8260B	Percent Solids:	86.6
Project:	WPA 019 Field Investigation; Radford AAP, VA		

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
75-01-4	Vinyl chloride	ND	5.9	1.6	ug/kg	
	m,p-Xylene	ND	12	1.3	ug/kg	
95-47-6	o-Xylene	ND	5.9	1.2	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	104%		80-121%
2037-26-5	Toluene-D8	92%		71-130%
460-00-4	4-Bromofluorobenzene	93%		59-148%
17060-07-0	1,2-Dichloroethane-D4	103%		77-123%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

3.2.6 C3

Client Sample ID:	43SB10C		
Lab Sample ID:	F51300-29	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8260B	Percent Solids:	83.8
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	H044779.D	1	07/31/07	SH	n/a	n/a	VH1665
Run #2							

	Initial Weight
Run #1	6.77 g
Run #2	

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q (DATA VAL QUALIFIER)
67-64-1	Acetone	ND	44	22	ug/kg	UJ
71-43-2	Benzene	ND	4.4	0.88	ug/kg	
75-27-4	Bromodichloromethane	ND	4.4	0.88	ug/kg	
75-25-2	Bromoform	ND	4.4	0.88	ug/kg	
108-90-7	Chlorobenzene	ND	4.4	0.88	ug/kg	
75-00-3	Chloroethane	ND	4.4	2.3	ug/kg	
67-66-3	Chloroform	ND	4.4	0.88	ug/kg	
75-15-0	Carbon disulfide	ND	4.4	0.88	ug/kg	
56-23-5	Carbon tetrachloride	ND	4.4	1.1	ug/kg	
75-34-3	1,1-Dichloroethane	ND	4.4	0.97	ug/kg	
75-35-4	1,1-Dichloroethylene	ND	4.4	0.88	ug/kg	
107-06-2	1,2-Dichloroethane	ND	4.4	0.88	ug/kg	
78-87-5	1,2-Dichloropropane	ND	4.4	1.1	ug/kg	
124-48-1	Dibromochloromethane	ND	4.4	0.88	ug/kg	
156-59-2	cis-1,2-Dichloroethylene	ND	4.4	0.88	ug/kg	
10061-01-5	cis-1,3-Dichloropropene	ND	4.4	0.88	ug/kg	
156-60-5	trans-1,2-Dichloroethylene	ND	4.4	0.88	ug/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	4.4	0.88	ug/kg	
100-41-4	Ethylbenzene	ND	4.4	0.88	ug/kg	UJ
591-78-6	2-Hexanone	ND	22	8.8	ug/kg	
108-10-1	4-Methyl-2-pentanone	ND	22	8.8	ug/kg	
74-83-9	Methyl bromide	ND	4.4	1.6	ug/kg	
74-87-3	Methyl chloride	ND	4.4	1.8	ug/kg	
75-09-2	Methylene chloride	ND	8.8	4.4	ug/kg	
78-93-3	Methyl ethyl ketone	ND	22	8.8	ug/kg	
100-42-5	Styrene	ND	4.4	0.88	ug/kg	
71-55-6	1,1,1-Trichloroethane	ND	4.4	0.88	ug/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	4.4	1.1	ug/kg	
79-00-5	1,1,2-Trichloroethane	ND	4.4	0.88	ug/kg	
127-18-4	Tetrachloroethylene	ND	4.4	0.88	ug/kg	
108-88-3	Toluene	ND	4.4	0.88	ug/kg	
79-01-6	Trichloroethylene	ND	4.4	0.88	ug/kg	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	43SB10C		
Lab Sample ID:	F51300-29	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8260B	Percent Solids:	83.8
Project:	WPA 019 Field Investigation; Radford AAP, VA		

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
75-01-4	Vinyl chloride	ND	4.4	1.2	ug/kg	
	m,p-Xylene	ND	8.8	0.97	ug/kg	
95-47-6	o-Xylene	ND	4.4	0.88	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	113%		80-121%
2037-26-5	Toluene-D8	101%		71-130%
460-00-4	4-Bromofluorobenzene	119%		59-148%
17060-07-0	1,2-Dichloroethane-D4	122%		77-123%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	TMSB10B		
Lab Sample ID:	F51300-30	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8260B	Percent Solids:	85.9
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	G0045269.D	1	07/31/07	SH	n/a	n/a	VG1720
Run #2							

	Initial Weight
Run #1	5.31 g
Run #2	

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q (DATA VAL QUALIFIER)
67-64-1	Acetone	ND	55	27	ug/kg	
71-43-2	Benzene	ND	5.5	1.1	ug/kg	
75-27-4	Bromodichloromethane	ND	5.5	1.1	ug/kg	
75-25-2	Bromoform	ND	5.5	1.1	ug/kg	
108-90-7	Chlorobenzene	ND	5.5	1.1	ug/kg	
75-00-3	Chloroethane	ND	5.5	2.9	ug/kg	
67-66-3	Chloroform	ND	5.5	1.1	ug/kg	
75-15-0	Carbon disulfide	ND	5.5	1.1	ug/kg	
56-23-5	Carbon tetrachloride	ND	5.5	1.4	ug/kg	
75-34-3	1,1-Dichloroethane	ND	5.5	1.2	ug/kg	
75-35-4	1,1-Dichloroethylene	ND	5.5	1.1	ug/kg	
107-06-2	1,2-Dichloroethane	ND	5.5	1.1	ug/kg	
78-87-5	1,2-Dichloropropane	ND	5.5	1.4	ug/kg	
124-48-1	Dibromochloromethane	ND	5.5	1.1	ug/kg	
156-59-2	cis-1,2-Dichloroethylene	ND	5.5	1.1	ug/kg	
10061-01-5	cis-1,3-Dichloropropene	ND	5.5	1.1	ug/kg	
156-60-5	trans-1,2-Dichloroethylene	ND	5.5	1.1	ug/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	5.5	1.1	ug/kg	
100-41-4	Ethylbenzene	ND	5.5	1.1	ug/kg	UJ
591-78-6	2-Hexanone	ND	27	11	ug/kg	
108-10-1	4-Methyl-2-pentanone	ND	27	11	ug/kg	
74-83-9	Methyl bromide	ND	5.5	2.0	ug/kg	UJ
74-87-3	Methyl chloride	ND	5.5	2.2	ug/kg	
75-09-2	Methylene chloride	ND	11	5.5	ug/kg	
78-93-3	Methyl ethyl ketone	ND	27	11	ug/kg	
100-42-5	Styrene	ND	5.5	1.1	ug/kg	
71-55-6	1,1,1-Trichloroethane	ND	5.5	1.1	ug/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	5.5	1.4	ug/kg	
79-00-5	1,1,2-Trichloroethane	ND	5.5	1.1	ug/kg	
127-18-4	Tetrachloroethylene	ND	5.5	1.1	ug/kg	
108-88-3	Toluene	ND	5.5	1.1	ug/kg	
79-01-6	Trichloroethylene	ND	5.5	1.1	ug/kg	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	TMSB10B		
Lab Sample ID:	F51300-30	Date Sampled:	07/25/07
Matrix:	SO - Soil	Date Received:	07/26/07
Method:	SW846 8260B	Percent Solids:	85.9
Project:	WPA 019 Field Investigation; Radford AAP, VA		

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
75-01-4	Vinyl chloride	ND	5.5	1.5	ug/kg	
	m,p-Xylene	ND	11	1.2	ug/kg	
95-47-6	o-Xylene	ND	5.5	1.1	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	106%		80-121%
2037-26-5	Toluene-D8	91%		71-130%
460-00-4	4-Bromofluorobenzene	94%		59-148%
17060-07-0	1,2-Dichloroethane-D4	102%		77-123%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	072507R		
Lab Sample ID:	F51300-31	Date Sampled:	07/25/07
Matrix:	AQ - Equipment Blank	Date Received:	07/26/07
Method:	SW846 8260B	Percent Solids:	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	J031592.D	1	08/02/07	LD	n/a	n/a	VJ2193
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	25	10	ug/l	
71-43-2	Benzene	ND	1.0	0.20	ug/l	
75-27-4	Bromodichloromethane	ND	1.0	0.29	ug/l	
75-25-2	Bromoform	ND	1.0	0.28	ug/l	
108-90-7	Chlorobenzene	ND	1.0	0.20	ug/l	
75-00-3	Chloroethane	ND	2.0	0.46	ug/l	
67-66-3	Chloroform	ND	1.0	0.21	ug/l	
75-15-0	Carbon disulfide	ND	2.0	0.20	ug/l	
56-23-5	Carbon tetrachloride	ND	1.0	0.29	ug/l	
75-34-3	1,1-Dichloroethane	ND	1.0	0.25	ug/l	
75-35-4	1,1-Dichloroethylene	ND	1.0	0.23	ug/l	
107-06-2	1,2-Dichloroethane	ND	1.0	0.20	ug/l	
78-87-5	1,2-Dichloropropane	ND	1.0	0.25	ug/l	
124-48-1	Dibromochloromethane	ND	1.0	0.20	ug/l	
156-59-2	cis-1,2-Dichloroethylene	ND	1.0	0.28	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	1.0	0.24	ug/l	
156-60-5	trans-1,2-Dichloroethylene	ND	1.0	0.20	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	1.0	0.21	ug/l	
100-41-4	Ethylbenzene	ND	1.0	0.20	ug/l	
591-78-6	2-Hexanone	ND	10	2.9	ug/l	
108-10-1	4-Methyl-2-pentanone	ND	5.0	2.2	ug/l	
74-83-9	Methyl bromide	ND	2.0	0.54	ug/l	
74-87-3	Methyl chloride	ND	2.0	0.38	ug/l	
75-09-2	Methylene chloride	ND	5.0	1.0	ug/l	
78-93-3	Methyl ethyl ketone	ND	5.0	2.0	ug/l	
100-42-5	Styrene	ND	1.0	0.20	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	1.0	0.29	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.0	0.37	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	1.0	0.30	ug/l	
127-18-4	Tetrachloroethylene	ND	1.0	0.25	ug/l	
108-88-3	Toluene	ND	1.0	0.27	ug/l	
79-01-6	Trichloroethylene	ND	1.0	0.38	ug/l	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	072507R		
Lab Sample ID:	F51300-31	Date Sampled:	07/25/07
Matrix:	AQ - Equipment Blank	Date Received:	07/26/07
Method:	SW846 8260B	Percent Solids:	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
75-01-4	Vinyl chloride	ND	1.0	0.34	ug/l	
	m,p-Xylene	ND	2.0	0.36	ug/l	
95-47-6	o-Xylene	ND	1.0	0.20	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	104%		87-116%
17060-07-0	1,2-Dichloroethane-D4	99%		76-127%
2037-26-5	Toluene-D8	96%		86-112%
460-00-4	4-Bromofluorobenzene	102%		84-120%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	TB072507S		
Lab Sample ID:	F51300-32	**Date Sampled:**	07/25/07
Matrix:	SO - Trip Blank Soil	**Date Received:**	07/26/07
Method:	SW846 8260B	**Percent Solids:**	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	G0045270.D	1	07/31/07	SH	n/a	n/a	VG1720
Run #2							

	Initial Weight
Run #1	5.00 g
Run #2	

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q	DATA VAL QUALIFIER
67-64-1	Acetone	ND	50	25	ug/kg		
71-43-2	Benzene	ND	5.0	1.0	ug/kg		
75-27-4	Bromodichloromethane	ND	5.0	1.0	ug/kg		
75-25-2	Bromoform	ND	5.0	1.0	ug/kg		
108-90-7	Chlorobenzene	ND	5.0	1.0	ug/kg		
75-00-3	Chloroethane	ND	5.0	2.6	ug/kg		
67-66-3	Chloroform	ND	5.0	1.0	ug/kg		
75-15-0	Carbon disulfide	ND	5.0	1.0	ug/kg		
56-23-5	Carbon tetrachloride	ND	5.0	1.3	ug/kg		
75-34-3	1,1-Dichloroethane	ND	5.0	1.1	ug/kg		
75-35-4	1,1-Dichloroethylene	ND	5.0	1.0	ug/kg		
107-06-2	1,2-Dichloroethane	ND	5.0	1.0	ug/kg		
78-87-5	1,2-Dichloropropane	ND	5.0	1.3	ug/kg		
124-48-1	Dibromochloromethane	ND	5.0	1.0	ug/kg		
156-59-2	cis-1,2-Dichloroethylene	ND	5.0	1.0	ug/kg		
10061-01-5	cis-1,3-Dichloropropene	ND	5.0	1.0	ug/kg		
156-60-5	trans-1,2-Dichloroethylene	ND	5.0	1.0	ug/kg		
10061-02-6	trans-1,3-Dichloropropene	ND	5.0	1.0	ug/kg		
100-41-4	Ethylbenzene	ND	5.0	1.0	ug/kg		
591-78-6	2-Hexanone	ND	25	10	ug/kg		
108-10-1	4-Methyl-2-pentanone	ND	25	10	ug/kg		
74-83-9	Methyl bromide	ND	5.0	1.8	ug/kg		UJ
74-87-3	Methyl chloride	ND	5.0	2.0	ug/kg		
75-09-2	Methylene chloride	ND	10	5.0	ug/kg		
78-93-3	Methyl ethyl ketone	ND	25	10	ug/kg		
100-42-5	Styrene	ND	5.0	1.0	ug/kg		
71-55-6	1,1,1-Trichloroethane	ND	5.0	1.0	ug/kg		
79-34-5	1,1,2,2-Tetrachloroethane	ND	5.0	1.3	ug/kg		
79-00-5	1,1,2-Trichloroethane	ND	5.0	1.0	ug/kg		
127-18-4	Tetrachloroethylene	ND	5.0	1.0	ug/kg		
108-88-3	Toluene	ND	5.0	1.0	ug/kg		
79-01-6	Trichloroethylene	ND	5.0	1.0	ug/kg		

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	TB072507S		
Lab Sample ID:	F51300-32	Date Sampled:	07/25/07
Matrix:	SO - Trip Blank Soil	Date Received:	07/26/07
Method:	SW846 8260B	Percent Solids:	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
75-01-4	Vinyl chloride	ND	5.0	1.4	ug/kg	
	m,p-Xylene	ND	10	1.1	ug/kg	
95-47-6	o-Xylene	ND	5.0	1.0	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	102%		80-121%
2037-26-5	Toluene-D8	92%		71-130%
460-00-4	4-Bromofluorobenzene	99%		59-148%
17060-07-0	1,2-Dichloroethane-D4	98%		77-123%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	TB072507W		
Lab Sample ID:	F51300-33	Date Sampled:	07/25/07
Matrix:	AQ - Trip Blank Soil	Date Received:	07/26/07
Method:	SW846 8260B	Percent Solids:	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	J031593.D	1	08/02/07	LD	n/a	n/a	VJ2193
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	25	10	ug/l	
71-43-2	Benzene	ND	1.0	0.20	ug/l	
75-27-4	Bromodichloromethane	ND	1.0	0.29	ug/l	
75-25-2	Bromoform	ND	1.0	0.28	ug/l	
108-90-7	Chlorobenzene	ND	1.0	0.20	ug/l	
75-00-3	Chloroethane	ND	2.0	0.46	ug/l	
67-66-3	Chloroform	ND	1.0	0.21	ug/l	
75-15-0	Carbon disulfide	ND	2.0	0.20	ug/l	
56-23-5	Carbon tetrachloride	ND	1.0	0.29	ug/l	
75-34-3	1,1-Dichloroethane	ND	1.0	0.25	ug/l	
75-35-4	1,1-Dichloroethylene	ND	1.0	0.23	ug/l	
107-06-2	1,2-Dichloroethane	ND	1.0	0.20	ug/l	
78-87-5	1,2-Dichloropropane	ND	1.0	0.25	ug/l	
124-48-1	Dibromochloromethane	ND	1.0	0.20	ug/l	
156-59-2	cis-1,2-Dichloroethylene	ND	1.0	0.28	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	1.0	0.24	ug/l	
156-60-5	trans-1,2-Dichloroethylene	ND	1.0	0.20	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	1.0	0.21	ug/l	
100-41-4	Ethylbenzene	ND	1.0	0.20	ug/l	
591-78-6	2-Hexanone	ND	10	2.9	ug/l	
108-10-1	4-Methyl-2-pentanone	ND	5.0	2.2	ug/l	
74-83-9	Methyl bromide	ND	2.0	0.54	ug/l	
74-87-3	Methyl chloride	ND	2.0	0.38	ug/l	
75-09-2	Methylene chloride	ND	5.0	1.0	ug/l	
78-93-3	Methyl ethyl ketone	ND	5.0	2.0	ug/l	
100-42-5	Styrene	ND	1.0	0.20	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	1.0	0.29	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.0	0.37	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	1.0	0.30	ug/l	
127-18-4	Tetrachloroethylene	ND	1.0	0.25	ug/l	
108-88-3	Toluene	ND	1.0	0.27	ug/l	
79-01-6	Trichloroethylene	ND	1.0	0.38	ug/l	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	TB072507W		
Lab Sample ID:	F51300-33	Date Sampled:	07/25/07
Matrix:	AQ - Trip Blank Soil	Date Received:	07/26/07
Method:	SW846 8260B	Percent Solids:	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
75-01-4	Vinyl chloride	ND	1.0	0.34	ug/l	
	m,p-Xylene	ND	2.0	0.36	ug/l	
95-47-6	o-Xylene	ND	1.0	0.20	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	104%		87-116%
17060-07-0	1,2-Dichloroethane-D4	100%		76-127%
2037-26-5	Toluene-D8	95%		86-112%
460-00-4	4-Bromofluorobenzene	104%		84-120%

ND = Not detected MDL - Method Detection Limit
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E = Indicates value exceeds calibration range
J = Indicates an estimated value
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N = Indicates presumptive evidence of a compound

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Shaw® Shaw Environmental, Inc.

MEMORANDUM

TO: Jeff Parks, Shaw E&I Radford Army Ammunition Plant (RFAAP) Project Manager

FROM: Richard McCracken, Shaw E&I Project Chemist

SUBJECT: RFAAP Data Validation – Dioxin Furans
SGS Paradigm Analytical Laboratories, Inc. Project G383-600
(Accutest SDG F52170)

DATE: November 7, 2007

The purpose of this memorandum is to present the data validation report for the samples collected at RFAAP on August 29, 2007. The samples were analyzed for Dioxin and Furan compounds using USEPA SW-846 Method 8290 High Resolution Gas Chromatography/High Resolution Mass Spectroscopy (HRGC/HRMS). A total of eight aqueous samples were validated. The sample IDs are:

Field Sample ID	Lab Sample ID	Field Sample ID	Lab Sample ID
59MW01	F52170-1	48MW3	F52170-5
48MW1	F52170-2	TMMW3	F52170-6
TMMW01	F52170-3	48MW4	F52170-7
48MW2	F52170-4	49MW1	F52170-8

Data were reviewed and validated using a combination of project QAPP, *DOD Quality Systems Manual for Environmental Laboratories, Final Version 3, January, 2006* (DoD, 2006) (DoD QSM), method-specific criteria, and laboratory SOP criteria. The data qualifier scheme was consistent with the *USEPA Region III Dioxin/Furan Data Validation Guidance* (March, 1999). Parameters evaluated are presented in **Table 1**. Data associated with parameters in compliance with quality control specifications have not been qualified. Data associated with parameters that did not comply with quality control specifications and directly impacted project data have been qualified in accordance with USEPA Region III specifications.

Table 1 Laboratory Performance Criteria

Qualified		Parameter
Yes	No	
	X	Holding Times and Preservation
	X	Blank Analysis
	X	Instrument Performance Check
	X	Initial Calibration
X		Continuing Calibration
	X	Internal Standards (IS) Recovery Standard Solutions
	X	Cleanup Standards
	X	Laboratory Control Standard or Ongoing Precision Result (OPR)
	X	Matrix Spike and Spike Duplicate
	X	Field Duplicate
X		Quantitation Verification

The quality of data collected in support of this sampling activity is considered acceptable with noted qualifications.

Richard McCracken, Chemist

11/7/07
Date

RFAAP VALIDATION REPORT
DIOXIN FURAN REVIEW
SDG G383-600
(Accutest SDG F52170)

I-Holding Times and Preservation

The objective is to ascertain the validity of results based on the holding time of the sample from time of collection to time of sample extraction and analysis. For aqueous samples, dioxin and furans are shipped @4°C ± 2°C, with a maximum holding time of 30 days from sample collection to preparative extraction and 45 days from preparative extraction to determinative analysis.

- Temperature Review: A temperature blank was sent with each cooler and recorded by the laboratory upon receipt. The samples collected on 8/29/07 were sent in 20 coolers, and were received by the laboratory on 8/30/07 at temperatures ranging from 0.8°C to 3.6°C, with 9 of the 20 coolers having temperatures below 2.0°C. The low sample temperatures are not expected to have an adverse impact on the analytical results. Accutest shipped the dioxin aliquot to SGS Paradigm Analytical Laboratories on 8/30/07, they were received by DataChem on 8/31/07 at 2.6°C. No qualifiers were applied.

- Holding Time Review: The samples were collected on 8/29/07, extracted on 9/10/07, and analyzed on 9/12/07. All criteria were met. No qualifiers were applied.

II-Blank Analysis

The purpose of laboratory (or field) blank analyses is to determine the existence and magnitude of contamination problems resulting from field and laboratory activities. No contamination should be found in any of the blanks >EDL (estimated detection limit). The DoD QSM criteria specifies all concentrations should be less than ½ MRL (<MRL for common laboratory contaminants OCDD and OCDF) and <2EDL for the calibration blanks. Positive sample results are reported and qualified "B", if the concentration of the compound in the sample is ≤10 times (10x) the maximum amount in any blank for the common laboratory contaminants OCDD or OCDF, or 5 times (5X) the maximum amount for other target compounds. **Table 2** summarizes the blank contamination analysis.

Table 2 Blank Contamination Analysis Summary

Analysis Date	QC Blank ID	Compound	Max Conc. ng/L	Action Level ng/L	B qualified samples
9/8/07	LMB14461	All congeners <EDL	NA	NA	None
9/9/07	RB083007	All congeners <EDL	NA	NA	None

J = Estimated value <MRL and >EDL.

III-Instrument Performance Check

Instrument must be tuned with perfluorokerosene (PFK) to achieve a static resolving power of at least 10,000 (10% valley) and lock-mass ion between lowest and highest masses for each descriptor and level of reference compound ≤10%. Documentation of the mass spectrometer resolving power is accomplished by recording the peak profile of the high-mass reference signal (typically m/z 330.9792) obtained during a peak examination by using the low-mass PFK ion at m/z 292.9825 or lower in mass as reference. At the beginning of the each 12-hour period, the chromatographic resolution is verified in the same fashion as in the initial calibration through the analysis of HRCC solution on the DB-5 (or equivalent) column or through the analysis of the column performance solution on the SP-2331 or SP-225 (or equivalent) column. A 25% valley must be achieved between the close eluters.

- All PFK forms were verified and found to be in compliance with method specification. No qualifiers were applied.

IV-Initial Calibration
Once the window defining mix has been analyzed and the descriptor switching times have been verified, the five point calibration solutions can be analyzed prior to sample analysis. Per method and DoD QSM, the initial calibration criteria are as follows:

- The percent relative standard deviations for the mean response factors RRF(n) from the 17 unlabeled standards must not exceed ±20%, and those for the labeled reference compounds must not exceed ±30%;
- The signal to noise ratio ≥10% for all target ions;
- Ion abundance ratios must be within the specified control limits in Table 8 (SW846 Method 8290).

- During initial calibration performed on 07/10/07 using instrument HRMS1, all compounds met criteria. No qualifiers were applied. All samples were analyzed in conjunction with this initial calibration.

V-Continuing Calibration
The continuing calibration consists of two parts: evaluation of the mass resolution and retention time check. Per method and DoD QSM, the following stipulates the continuing calibration criteria.

- The signal signal-to-noise ratio (S/N) must be at least 10:1 for each selected ion current profile (SICP) and for each GC signal representing the elution of a target analyte or labeled standard for each analyte.
- The relative response factor of each analyte for the unlabeled standard must be within ±20% of the average RF obtained from the initial calibration, and the RRF of each labeled standard must be within ±30% of the average RRF established during initial calibration. This is expressed in term of percent difference %D.
- Ion abundance ratios must be within the specified control limits in Table 8 (SW846 Method 8290).

- During the continuing calibration performed on 9/12/07 @0856 on instrument HRMS1, all criteria were met. No qualifiers were applied. All samples were analyzed following this continuing calibration.

- During the continuing calibration performed on 9/12/07 @2012 on instrument HRMS1, the following labeled standards had RFs >30%: 13C-1,2,3,7,8-PeCDD (31.1%), 13C-1,2,3,7,8-PeCDF; 13C-2,3,4,7,8-PeCDF. All PeCDDs and PeCDFs have been qualified "J/UJ". The other labeled and unlabeled standards met criteria. All samples were analyzed before this continuing calibration.

- During the continuing calibration performed on 9/13/07 @0753 on instrument HRMS1, all criteria were met. No qualifiers were applied. No samples were analyzed in conjunction with this continuing calibration.

VI-Internal Standards (IS) Recovery Standard Solutions
Internal standards performance criteria ensure that GC/MS sensitivity and response are stable during every analytical run. Specific criteria include: Recoveries of the isotopically-labeled recovery standards to fall within the 40 to 135 percent range for the tetra- through octachlorinated congeners, or as stated in the data package (DoD QSM limits 40-135%).

- All criteria were met. No qualifiers were applied.

VII-Cleanup Standards
Cleanup standards are added to every sample, blank, quality control sample, and calibration solution. This compound is added to the samples after extraction but prior to cleanup and is used to verify the percent recovery obtained using the isotope dilution technique. The control limits are 40 to 135 percent (DoD QSM limits 40-135%).

- All criteria were met. No qualifiers were applied.

VIII-Laboratory Control Standard (LCS) or Ongoing Precision Result (OPR)
LCSs are used to monitor laboratory accuracy and precision by calculating the percent recoveries of the spiked compounds. Per DOD QSM and method criteria, acceptable performance is determined by:

1. Recoveries of the isotopically-labeled extraction standards to fall within 40-135% control limits for the tetra- through octachlorinated congeners, or as stated in the data package;

2. Recoveries (accuracy) of the unlabeled compounds should be within ±35% when spiked at the method quantitation limit and within ±30% when spiked above 20 times the method quantitation limit, or as stated in the data package;

3. When duplicate OPR are required, the relative percent difference (RPD) of the unlabeled analytes concentrations should be within 30% when spiked at the method quantitation limit and within ±20% when spiked above 20 times the method quantitation limit.

- Sample OPR14461 was used as LCS and LCSD during the 9/12/07 analytical run. All criteria were met. No qualifiers were applied. All samples were analyzed in conjunction with this LCS.

IX-Matrix Spike/Matrix Spike Duplicate
Data for matrix spike/matrix spike duplicates (MS/MSD) are generated to determine long-term precision and accuracy of the analytical method on various matrices and to demonstrate acceptable compound recovery by the laboratory at the time of sample analysis. The percent recoveries (%Rs) and the relative percent difference (RPD) must be within the specified control limits. Per DoD QSM, MS/MSD recoveries must be within in-house laboratory limits (75-125%) and RPD ≤20%.

- MS/MSD analysis was performed on 48MW3. All analytes met recovery & RPD criteria.

X-Field Duplicate Sample Analysis
Field duplicates were collected to identify the cumulative precision of the sampling and analytical process and sent to the laboratory blind. The RPD was calculated only for those analytes which were detected in both samples of the duplicate pair. Analytes that were rejected (R-qualified) in either sample of the duplicate pair were excluded from the duplicate assessment. Precision control criterion was established at 50% RPD for the aqueous and solid samples. Analytical results were qualified as estimated (J) for any RPDs exceeding criteria.

- Field duplicate pairs in this data set included 59MW01 (F52170-1) & TMMW01 (F52170-3), and 48MW3 (F52170-5) & TMMW3 (F52170-6). All compounds detected in 59MW01 & TMMW01 had RPDs > 50%, but the detections were below the lower method calibration limit where analytical precision is not expected. No data qualifiers were applied. No target analytes were detected in 48MW3 or TMMW3.

XI-Quantitation Verification

The accuracy of analytical results was verified through the calculation of at least one the several parameters such as the %D, %RSD, % recovery, and/or compound concentration. Values were found to be within 10%. Any value reported by the laboratory as estimated "A" based on an analyte to internal standard ratio below the calibration curve was qualified as estimated "J". The signal signal-to-noise ratio (S/N) must be greater than 2.5 for each selected ion current profile (SICP) and for each GC signal representing the elution of a target analyte or labeled standard. Any detected value with ether interference (I-lab flag) was qualified as estimated "J". For where the ion ratio failed the 25% criteria (*-lab flag), the estimated maximum possible concentration (EMPC) was reported and flagged estimated "J". For where presence of quantitation interference (Q-lab flag), the date was flagged estimated "J" for detects and "UJ" for non-detects.

- The 1,2,3,7,8-PeCDD, OCDD, 1,2,3,7,8-PeCDF, 2,3,4,7,8-PeCDF, 1,2,3,4,7,8-HxCDF, 1,2,3,6,7,8-HxCDF, 2,3,4,6,7,8-HxCDF, 1,2,3,7,8,9-HxCDF, and 1,2,3,4,6,7,8-HpCDF results in 59MW01 (F52170-1) have been qualified "J" as estimated since the amounts detected were less than the Lower Method Calibration Limit. The ion abundance ratio for 2,3,4,6,7,8-HxCDF did not meet criteria and has been reported as an Estimated Maximum Possible Concentration (EPMC). Since the result has already been qualified "J", no further qualification is required.

- The OCDD result in 48MW1 (F52170-2) has been qualified "J" as estimated since the amount detected was less than the Lower Method Calibration Limit. The ion abundance ratio for OCDD did not meet criteria and has been reported as an Estimated Maximum Possible Concentration (EPMC). Since the result has already been qualified "J", no further qualification is required.

- All target analytes were detected in TMMW01 (F52170-3) at concentrations less than the Lower Method Calibration Limit, and have been qualified "J" as estimated. The ion abundance ratio for OCDD did not meet criteria and has been reported as an Estimated Maximum Possible Concentration (EPMC). Since the result has already been qualified "J", no further qualification is required.

- The OCDD result in 48MW2 (F52170-4) has been qualified "J" as estimated since the amount detected was less than the Lower Method Calibration Limit.

- The OCDD result in 48MW4 (F52170-7) has been qualified "J" as estimated since the amount detected was less than the Lower Method Calibration Limit.

- The 1,2,3,4,6,7,8-HpCDD, 2,3,7,8-TCDF, 1,2,3,4,6,7,8-HpCDF, and OCDF results in 49MW01 (F52170-8) have been qualified "J" as estimated since the amount of each compound detected was less than the Lower Method Calibration Limit. The ion abundance ratio for OCDF did not meet criteria and has been reported as an Estimated Maximum Possible Concentration (EPMC). Since the result has already been qualified "J", no further qualification is required.

Sample: 49MW01 (F52170-8), OCDD

A(x) = sum of the integrated ion abundances of the quantitation ions for the unlabeled ions;
A(is) = sum of the integrated ion abundances of the quantitation ions for the labeled ions;
Q(is) = quantity, in ng/ul, of the internal standard added to the sample before extraction;
V = volume in mL of the aqueous sample; and
Avg. RRF(n) = calculated mean relative response factor for the unlabeled analyte.

$$\text{Conc. (ng/L)} = \frac{(A(x)) * Q(is) * 1000}{A(is) * V * \text{Avg. RRF}} = \frac{(3450000) * 4.0 * 1000}{(31600000) * 1000 * 1.1174} = 0.391 \text{ ng/L}$$

Reported Value = 0.391 ng/L
% Difference = 0.0%
Values were within 10% difference

USEPA Region III Validation Qualifiers

(No Code) = Confirmed identification.

B = The analyte has been detected in the sample and the associated laboratory or field blank.

J = Indicates an estimated value for (1) estimated value due to QC non-conformance. Reported value may not be accurate or precise, (2) estimating a concentration as a tentatively identified compound as indicated by the mass spectral and retention time data, or (3) estimating a concentration ≥ EDL and <MRL or <3*EDL, whichever is greater.

K = Analyte present. Reported value may be biased high (estimated) due to QC non-conformance.

L = Analyte present. Reported value may be biased low (estimated) due to QC non-conformance.

R = Unreliable result. Analyte may or may not be present in the sample due to QC non-conformance.

UL = Value is estimated bias low and not detected due to QC non-conformance. Reporting limit may be inaccurate or imprecise. Quantitation limit is probably higher.

UJ = Value is estimated and not detected due to QC non-conformance. Reporting limit may be inaccurate or imprecise.

Laboratory Qualifiers

(No Code) = Confirmed identification.

U = Not detected. The associated number indicates the compound reporting limit for the sample.

A (Dioxins) = B (Metals) = The reported value was obtained from a reading <MRL and ≥EDL and is considered estimated.

B (Organics) = The analyte or compound has been detected in the sample and laboratory method blank. It indicates probable blank contamination.

E (Metals) = Reported value is estimated because of the presence of interferences.

E (Organics) = Identifies compounds whose concentrations exceed the upper level of the calibration range.

EMPC (Dioxins) = The ion-abundance ratio between the two characteristic PCDD/PCDF ions was outside accepted ranges. The detected PCDD/PCDF was reported as an estimated maximum possible concentration (EMPC).

D = Indicates sample was analyzed at a dilution.

J = Indicates an estimated value for (1) estimating a concentration as a tentatively identified compound as indicated by the mass spectral and retention time data, or (2) estimating a concentration <MRL and ≥ EDL.

N (Organics) = Indicates presumptive evidence of a compound for tentatively identified compounds using a library search.

N (Metals) = Laboratory spike sample recovery not within control limits.

P (Organics) = Target analyte confirmation >40% difference for detected compound between the primary and secondary columns. The lower of the two values was reported.

* (Metals) = Duplicate analysis not within control limits.

* (Organics) = Surrogate outside of QC limits on both original and re-analysis.

Method 8290
F52170-1
Accutest

Analytical Data Summary Sheet

DATA VAL QUALIFIER

Analyte	Amount ng/L	EDL ng/L	EMPC ng/L	RT (min.)	Ratio		Qualifier	
2,3,7,8-TCDD	ND	0.00314						
1,2,3,7,8-PeCDD	0.00302			34:10	1.38		A	J
1,2,3,4,7,8-HxCDD	ND	0.00560						
1,2,3,6,7,8-HxCDD	ND	0.00560						
1,2,3,7,8,9-HxCDD	ND	0.00560						
1,2,3,4,6,7,8-HpCDD	ND	0.00560						
OCDD	0.00703			44:34	1.02		A	J
2,3,7,8-TCDF	ND	0.00248						
1,2,3,7,8-PeCDF	0.00370			33:22	1.37		A	J
2,3,4,7,8-PeCDF	0.00298			33:58	1.68		A	
1,2,3,4,7,8-HxCDF	0.00307			36:03	1.24		A	
1,2,3,6,7,8-HxCDF	0.00271			36:10	1.31		A	
2,3,4,6,7,8-HxCDF	EMPC	0.00560	0.00190	36:39	0.82	*	A	
1,2,3,7,8,9-HxCDF	0.00253			37:25	1.40		A	
1,2,3,4,6,7,8-HpCDF	0.00309			38:57	1.15		A	
1,2,3,4,7,8,9-HpCDF	ND	0.00560						
OCDF	ND	0.0112						
Total TCDDs	ND	0.00314						
Total PeCDDs	0.00302							
Total HxCDDs	ND	0.00560						
Total HpCDDs	ND	0.00560						
Total TCDFs	ND	0.00248						
Total PeCDFs	0.00667							
Total HxCDFs	0.0102							
Total HpCDFs	0.00309							
WHO-2005 TEQ (ND=0)	0.00489		0.00508					
WHO-2005 TEQ (ND=½)	0.00776		0.00767					

Client Information			**Sample Information**		
Project Name:	F52170		Report Basis:	Wet	
			Matrix:	Water	
Sample ID:	F52170-1		Weight / Volume:	893 mL	
			Solids / Lipids:	NA	%
			Original pH :	8	
Laboratory Information			Batch ID:	WG14461	
Project ID:	G383-600		Instrument:	HRMS1	
Sample ID:	G383-600-1C		Filename:	a12sep07a-5	
Collection Date/Time:	08/24/07	6:50	Retchk:	a12sep07a-1	
Receipt Date/Time:	08/31/07	10:25	Begin ConCal:	a12sep07a-1	
Extraction Date:	09/10/07		End ConCal:	a12sep07a-15	
Analysis Date/Time:	09/12/07	12:09	Initial Cal:	m8290cc-091207a	

Method 8290
F52170-2
Accutest

Analytical Data Summary Sheet

DATA VAL QUALIFIER

Analyte	Amount ng/L	EDL ng/L	EMPC ng/L	RT (min.)	Ratio		Qualifier	
2,3,7,8-TCDD	ND	0.00409						
1,2,3,7,8-PeCDD	ND	0.00514						UJ
1,2,3,4,7,8-HxCDD	ND	0.00514						
1,2,3,6,7,8-HxCDD	ND	0.00514						
1,2,3,7,8,9-HxCDD	ND	0.00514						
1,2,3,4,6,7,8-HpCDD	ND	0.00519						
OCDD	EMPC	0.0103	0.00652	44:34	1.03	*	A	J
2,3,7,8-TCDF	ND	0.00271						
1,2,3,7,8-PeCDF	ND	0.00514						UJ
2,3,4,7,8-PeCDF	ND	0.00514						UJ
1,2,3,4,7,8-HxCDF	ND	0.00514						
1,2,3,6,7,8-HxCDF	ND	0.00514						
2,3,4,6,7,8-HxCDF	ND	0.00514						
1,2,3,7,8,9-HxCDF	ND	0.00514						
1,2,3,4,6,7,8-HpCDF	ND	0.00514						
1,2,3,4,7,8,9-HpCDF	ND	0.00514						
OCDF	ND	0.0103						
Total TCDDs	ND	0.00409						
Total PeCDDs	ND	0.00514						
Total HxCDDs	ND	0.00514						
Total HpCDDs	ND	0.00519						
Total TCDFs	ND	0.00271						
Total PeCDFs	ND	0.00514						
Total HxCDFs	ND	0.00514						
Total HpCDFs	ND	0.00514						
WHO-2005 TEQ (ND=0)	ND		0.00000196					
WHO-2005 TEQ (ND=½)	0.00748		0.00748					

Client Information			**Sample Information**	
Project Name:	F52170		Report Basis:	Wet
			Matrix:	Water
Sample ID:	F52170-2		Weight / Volume:	973 mL
			Solids / Lipids:	NA %
			Original pH :	8
Laboratory Information			Batch ID:	WG14461
Project ID:	G383-600		Instrument:	HRMS1
Sample ID:	G383-600-2C		Filename:	a12sep07a-6
Collection Date/Time:	08/24/07	8:20	Retchk:	a12sep07a-1
Receipt Date/Time:	08/31/07	10:25	Begin ConCal:	a12sep07a-1
Extraction Date:	09/10/07		End ConCal:	a12sep07a-15
Analysis Date/Time:	09/12/07	12:57	Initial Cal:	m8290cc-091207a

Method 8290
F52170-3
Accutest

Analytical Data Summary Sheet

Analyte	Amount ng/L	EDL ng/L	EMPC ng/L	RT (min.)	Ratio		Qualifier
2,3,7,8-TCDD	0.00595			31:18	0.71		A
1,2,3,7,8-PeCDD	0.0169			34:10	1.60		A
1,2,3,4,7,8-HxCDD	0.0137			36:46	1.37		A
1,2,3,6,7,8-HxCDD	0.0125			36:51	1.35		A
1,2,3,7,8,9-HxCDD	0.0130			37:06	1.30		A
1,2,3,4,6,7,8-HpCDD	0.0120			40:13	1.16		A
OCDD	0.0189			44:34	0.95		A
2,3,7,8-TCDF	EMPC	0.00243	0.00355	30:39	0.91	*	A
1,2,3,7,8-PeCDF	0.0178			33:22	1.61		A
2,3,4,7,8-PeCDF	0.0135			33:58	1.48		A
1,2,3,4,7,8-HxCDF	0.0144			36:03	1.35		A
1,2,3,6,7,8-HxCDF	0.0141			36:10	1.27		A
2,3,4,6,7,8-HxCDF	0.0110			36:39	1.26		A
1,2,3,7,8,9-HxCDF	0.0137			37:25	1.38		A
1,2,3,4,6,7,8-HpCDF	0.0113			38:57	1.07		A
1,2,3,4,7,8,9-HpCDF	0.0104			40:52	1.03		A
OCDF	0.0178			44:51	0.95		A
Total TCDDs	0.00595						
Total PeCDDs	0.0169						
Total HxCDDs	0.0392						
Total HpCDDs	0.0120						
Total TCDFs	ND	0.00243	0.00355				
Total PeCDFs	0.0313						
Total HxCDFs	0.0532						
Total HpCDFs	0.0217						
WHO-2005 TEQ (ND=0)	0.0370		0.0374				
WHO-2005 TEQ (ND=½)	0.0371		0.0374				

DATA VAL QUALIFIER

Client Information			**Sample Information**		
Project Name:	F52170		Report Basis:	Wet	
			Matrix:	Water	
Sample ID:	F52170-3		Weight / Volume:	952 mL	
			Solids / Lipids:	NA	%
			Original pH :	8	
Laboratory Information			Batch ID:	WG14461	
Project ID:	G383-600		Instrument:	HRMS1	
Sample ID:	G383-600-3C		Filename:	a12sep07a-7	
Collection Date/Time:	08/24/07	6:50	Retchk:	a12sep07a-1	
Receipt Date/Time:	08/31/07	10:25	Begin ConCal:	a12sep07a-1	
Extraction Date:	09/10/07		End ConCal:	a12sep07a-15	
Analysis Date/Time:	09/12/07	13:46	Initial Cal:	m8290cc-091207a	

Method 8290
F52170-4
Accutest

Analytical Data Summary Sheet

Analyte	Amount ng/L	EDL ng/L	EMPC ng/L	RT (min.)	Ratio	Qualifier	DATA VAL QUALIFIER
2,3,7,8-TCDD	ND	0.00310					
1,2,3,7,8-PeCDD	ND	0.00524					UJ
1,2,3,4,7,8-HxCDD	ND	0.00524					
1,2,3,6,7,8-HxCDD	ND	0.00524					
1,2,3,7,8,9-HxCDD	ND	0.00524					
1,2,3,4,6,7,8-HpCDD	ND	0.00524					
OCDD	0.0480			44:34	0.90	A	J
2,3,7,8-TCDF	ND	0.00262					
1,2,3,7,8-PeCDF	ND	0.00524					UJ
2,3,4,7,8-PeCDF	ND	0.00524					UJ
1,2,3,4,7,8-HxCDF	ND	0.00524					
1,2,3,6,7,8-HxCDF	ND	0.00524					
2,3,4,6,7,8-HxCDF	ND	0.00524					
1,2,3,7,8,9-HxCDF	ND	0.00524					
1,2,3,4,6,7,8-HpCDF	ND	0.00524					
1,2,3,4,7,8,9-HpCDF	ND	0.00524					
OCDF	ND	0.0105					
Total TCDDs	ND	0.00310					
Total PeCDDs	ND	0.00524					
Total HxCDDs	ND	0.00524					
Total HpCDDs	ND	0.00524					
Total TCDFs	ND	0.00262					
Total PeCDFs	ND	0.00524					
Total HxCDFs	ND	0.00524					
Total HpCDFs	ND	0.00524					
WHO-2005 TEQ (ND=0)	0.0000144		0.0000144				
WHO-2005 TEQ (ND=½)	0.00709		0.00709				

Client Information			**Sample Information**	
Project Name:	F52170		Report Basis:	Wet
			Matrix:	Water
Sample ID:	F52170-4		Weight / Volume:	955 mL
			Solids / Lipids:	NA %
			Original pH :	8
Laboratory Information			Batch ID:	WG14461
Project ID:	G383-600		Instrument:	HRMS1
Sample ID:	G383-600-4C		Filename:	a12sep07a-8
Collection Date/Time:	08/24/07	8:40	Retchk:	a12sep07a-1
Receipt Date/Time:	08/31/07	10:25	Begin ConCal:	a12sep07a-1
Extraction Date:	09/10/07		End ConCal:	a12sep07a-15
Analysis Date/Time:	09/12/07	14:34	Initial Cal:	m8290cc-091207a

Method 8290
F52170-5
Accutest

Analytical Data Summary Sheet

Analyte	Amount ng/L	EDL ng/L	EMPC ng/L	RT (min.)	Ratio	Qualifier	DATA VAL QUALIFIER
2,3,7,8-TCDD	ND	0.00305					
1,2,3,7,8-PeCDD	ND	0.00483					UJ
1,2,3,4,7,8-HxCDD	ND	0.00483					
1,2,3,6,7,8-HxCDD	ND	0.00483					
1,2,3,7,8,9-HxCDD	ND	0.00483					
1,2,3,4,6,7,8-HpCDD	ND	0.00483					
OCDD	ND	0.00965					
2,3,7,8-TCDF	ND	0.00233					
1,2,3,7,8-PeCDF	ND	0.00483					UJ
2,3,4,7,8-PeCDF	ND	0.00483					UJ
1,2,3,4,7,8-HxCDF	ND	0.00483					
1,2,3,6,7,8-HxCDF	ND	0.00483					
2,3,4,6,7,8-HxCDF	ND	0.00483					
1,2,3,7,8,9-HxCDF	ND	0.00483					
1,2,3,4,6,7,8-HpCDF	ND	0.00483					
1,2,3,4,7,8,9-HpCDF	ND	0.00483					
OCDF	ND	0.00965					
Total TCDDs	ND	0.00305					
Total PeCDDs	ND	0.00483					
Total HxCDDs	ND	0.00483					
Total HpCDDs	ND	0.00483					
Total TCDFs	ND	0.00233					
Total PeCDFs	ND	0.00483					
Total HxCDFs	ND	0.00483					
Total HpCDFs	ND	0.00483					
WHO-2005 TEQ (ND=0)	ND		ND				
WHO-2005 TEQ (ND=½)	0.00661		0.00661				

Client Information			**Sample Information**	
Project Name:	F52170		Report Basis:	Wet
			Matrix:	Water
Sample ID:	F52170-5		Weight / Volume:	1036 mL
			Solids / Lipids:	NA %
			Original pH :	8
Laboratory Information			Batch ID:	WG14461
Project ID:	G383-600		Instrument:	HRMS1
Sample ID:	G383-600-5C		Filename:	a12sep07a-9
Collection Date/Time:	08/24/07	10:30	Retchk:	a12sep07a-1
Receipt Date/Time:	08/31/07	10:25	Begin ConCal:	a12sep07a-1
Extraction Date:	09/10/07		End ConCal:	a12sep07a-15
Analysis Date/Time:	09/12/07	15:22	Initial Cal:	m8290cc-091207a

Method 8290
F52170-6
Accutest

Analytical Data Summary Sheet

Analyte	Amount ng/L	EDL ng/L	EMPC ng/L	RT (min.)	Ratio	Qualifier	DATA VAL QUALIFIER
2,3,7,8-TCDD	ND	0.00280					
1,2,3,7,8-PeCDD	ND	0.00509					UJ
1,2,3,4,7,8-HxCDD	ND	0.00509					
1,2,3,6,7,8-HxCDD	ND	0.00509					
1,2,3,7,8,9-HxCDD	ND	0.00509					
1,2,3,4,6,7,8-HpCDD	ND	0.00509					
OCDD	ND	0.0102					
2,3,7,8-TCDF	ND	0.00222					
1,2,3,7,8-PeCDF	ND	0.00509					UJ
2,3,4,7,8-PeCDF	ND	0.00509					UJ
1,2,3,4,7,8-HxCDF	ND	0.00509					
1,2,3,6,7,8-HxCDF	ND	0.00509					
2,3,4,6,7,8-HxCDF	ND	0.00509					
1,2,3,7,8,9-HxCDF	ND	0.00509					
1,2,3,4,6,7,8-HpCDF	ND	0.00509					
1,2,3,4,7,8,9-HpCDF	ND	0.00509					
OCDF	ND	0.0102					
Total TCDDs	ND	0.00280					
Total PeCDDs	ND	0.00509					
Total HxCDDs	ND	0.00509					
Total HpCDDs	ND	0.00509					
Total TCDFs	ND	0.00222					
Total PeCDFs	ND	0.00509					
Total HxCDFs	ND	0.00509					
Total HpCDFs	0.00264						
WHO-2005 TEQ (ND=0)	ND		ND				
WHO-2005 TEQ (ND=½)	0.00675		0.00675				

Client Information			**Sample Information**	
Project Name:	F52170		Report Basis:	Wet
			Matrix:	Water
Sample ID:	F52170-6		Weight / Volume:	983 mL
			Solids / Lipids:	NA %
			Original pH :	8
Laboratory Information			Batch ID:	WG14461
Project ID:	G383-600		Instrument:	HRMS1
Sample ID:	G383-600-8C		Filename:	a12sep07a-12
Collection Date/Time:	08/24/07	10:30	Retchk:	a12sep07a-1
Receipt Date/Time:	08/31/07	10:25	Begin ConCal:	a12sep07a-1
Extraction Date:	09/10/07		End ConCal:	a12sep07a-15
Analysis Date/Time:	09/12/07	17:47	Initial Cal:	m8290cc-091207a

Method 8290
F52170-7
Accutest

Analytical Data Summary Sheet

DATA VAL QUALIFIER

Analyte	Amount ng/L	EDL ng/L	EMPC ng/L	RT (min.)	Ratio	Qualifier	
2,3,7,8-TCDD	ND	0.00272					
1,2,3,7,8-PeCDD	ND	0.00482					UJ
1,2,3,4,7,8-HxCDD	ND	0.00482					
1,2,3,6,7,8-HxCDD	ND	0.00482					
1,2,3,7,8,9-HxCDD	ND	0.00482					
1,2,3,4,6,7,8-HpCDD	ND	0.00482					
OCDD	0.00743			44:34	0.95	A	J
2,3,7,8-TCDF	ND	0.00237					
1,2,3,7,8-PeCDF	ND	0.00482					UJ
2,3,4,7,8-PeCDF	ND	0.00482					UJ
1,2,3,4,7,8-HxCDF	ND	0.00482					
1,2,3,6,7,8-HxCDF	ND	0.00482					
2,3,4,6,7,8-HxCDF	ND	0.00482					
1,2,3,7,8,9-HxCDF	ND	0.00482					
1,2,3,4,6,7,8-HpCDF	ND	0.00482					
1,2,3,4,7,8,9-HpCDF	ND	0.00482					
OCDF	ND	0.00964					
Total TCDDs	ND	0.00272					
Total PeCDDs	ND	0.00482					
Total HxCDDs	ND	0.00482					
Total HpCDDs	ND	0.00482					
Total TCDFs	ND	0.00237					
Total PeCDFs	ND	0.00482					
Total HxCDFs	ND	0.00482					
Total HpCDFs	ND	0.00482					
WHO-2005 TEQ (ND=0)	0.00000223		0.00000223				
WHO-2005 TEQ (ND=½)	0.00645		0.00645				

Client Information			**Sample Information**	
Project Name:	F52170		Report Basis:	Wet
			Matrix:	Water
Sample ID:	F52170-7		Weight / Volume:	1037 mL
			Solids / Lipids:	NA %
			Original pH :	8
Laboratory Information			Batch ID:	WG14461
Project ID:	G383-600		Instrument:	HRMS1
Sample ID:	G383-600-9C		Filename:	a12sep07a-13
Collection Date/Time:	08/24/07	14:10	Retchk:	a12sep07a-1
Receipt Date/Time:	08/31/07	10:25	Begin ConCal:	a12sep07a-1
Extraction Date:	09/10/07		End ConCal:	a12sep07a-15
Analysis Date/Time:	09/12/07	18:36	Initial Cal:	m8290cc-091207a

Method 8290
F52170-8
Accutest

Analytical Data Summary Sheet

Analyte	Amount ng/L	EDL ng/L	EMPC ng/L	RT (min.)	Ratio		Qualifier	DATA VAL QUALIFIER
2,3,7,8-TCDD	ND	0.00471						
1,2,3,7,8-PeCDD	ND	0.00500						UJ
1,2,3,4,7,8-HxCDD	ND	0.00570						
1,2,3,6,7,8-HxCDD	ND	0.00543						
1,2,3,7,8,9-HxCDD	ND	0.00571						
1,2,3,4,6,7,8-HpCDD	0.0110			40:18	1.06		A	J
OCDD	0.391			44:40	0.89			
2,3,7,8-TCDF	0.00380			30:43	0.72		A	J
1,2,3,7,8-PeCDF	ND	0.00500						UJ
2,3,4,7,8-PeCDF	ND	0.00500						UJ
1,2,3,4,7,8-HxCDF	ND	0.00551						
1,2,3,6,7,8-HxCDF	ND	0.00523						
2,3,4,6,7,8-HxCDF	ND	0.00556						
1,2,3,7,8,9-HxCDF	ND	0.00653						
1,2,3,4,6,7,8-HpCDF	0.00594			39:04	1.00		A	J
1,2,3,4,7,8,9-HpCDF	ND	0.00583						
OCDF	EMPC	0.0105	0.0109	44:58	0.72	*	A	J
Total TCDDs	ND	0.00471						
Total PeCDDs	ND	0.00500						
Total HxCDDs	ND	0.00571						
Total HpCDDs	0.0200							
Total TCDFs	0.00380							
Total PeCDFs	ND	0.00500						
Total HxCDFs	ND	0.00653						
Total HpCDFs	0.00594							
WHO-2005 TEQ (ND=0)	0.000667		0.000670					
WHO-2005 TEQ (ND=½)	0.00836		0.00836					

Client Information			**Sample Information**	
Project Name:	F52170		Report Basis:	Wet
			Matrix:	Water
Sample ID:	F52170-8		Weight / Volume:	1000 mL
			Solids / Lipids:	NA %
			Original pH :	7
Laboratory Information			Batch ID:	WG14461
Project ID:	G383-600		Instrument:	HRMS1
Sample ID:	G383-600-10C		Filename:	a12sep07a-14
Collection Date/Time:	08/24/07	14:00	Retchk:	a12sep07a-1
Receipt Date/Time:	08/31/07	10:25	Begin ConCal:	a12sep07a-1
Extraction Date:	09/10/07		End ConCal:	a12sep07a-15
Analysis Date/Time:	09/12/07	19:24	Initial Cal:	m8290cc-091207a

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MEMORANDUM

TO: Jeff Parks, Shaw E&I Radford Army Ammunition Plant (RFAAP) Project Manager

FROM: Richard McCracken, Shaw E&I Project Chemist

SUBJECT: RFAAP Data Validation – Explosives, PETN, & Nitroglycerin
Accutest Laboratories, Inc., SDG F52170

DATE: November 7, 2007

The purpose of this memorandum is to present the data validation report for the samples collected at RFAAP on August 29, 2007. The samples were analyzed for explosives, nitroglycerin, and PETN using USEPA SW-846 3535A/8330A. A total of eight aqueous samples were validated. The sample IDs are:

Field Sample ID	Lab Sample ID	**Field Sample ID**	Lab Sample ID
59MW01	F52170-1	48MW3	F52170-5
48MW1	F52170-2	TMMW3	F52170-6
TMMW01	F52170-3	48MW4	F52170-7
48MW2	F52170-4	49MW1	F52170-8

Data were reviewed by Richard McCracken and validated using a combination of project QAPP, *Quality Systems Manual for Environmental Laboratories, Final Version 3, January, 2006* (DoD, 2006) (DoD QSM), method-specific criteria, and laboratory SOP criteria. The data qualifier scheme was consistent with the *Region III Modifications to the National Functional Guidelines for Organic Data Review* (September 1994). Parameters evaluated are presented in **Table 1**. Data associated with parameters in compliance with quality control specifications have not been qualified. Data associated with parameters that did not comply with quality control specifications and directly impacted project data have been qualified in accordance with USEPA Region III specifications.

Table 1 Laboratory Performance Criteria

Qualified		Parameter
Yes	No	
	X	Holding Times and Preservation
	X	Blank Analysis
	X	Initial Calibration
	X	Continuing Calibration
	X	System Monitoring Compounds
	X	Laboratory Control Sample
	X	Matrix Spike/Spike Duplicate
	X	Field Duplicate
	X	Quantitation Verification

The quality of data collected in support of this sampling activity is considered acceptable.

Richard McCracken, Chemist

11/7/07
Date

RFAAP VALIDATION REPORT
EXPLOSIVES REVIEW
SDG F52170

I-Holding Times and Preservation

The objective is to ascertain the validity of results based on the holding time of the sample from time of collection to time of sample extraction and analysis. For aqueous samples, explosive compounds are shipped @4°C ± 2°C, with a maximum holding time of 7 days from sample collection to preparative extraction and 40 days from preparative extraction to determinative analysis.

- Temperature Review: A temperature blank was sent with each cooler and recorded by the laboratory upon receipt. The samples collected on 8/29/07 were sent in 20 coolers, and were received by the laboratory on 8/30/07 at temperatures ranging from 0.8°C to 3.6°C, with 9 of the 20 coolers having temperatures below 2.0°C. The low sample temperatures are not expected to have an adverse impact on the analytical results. No qualifiers were applied.

- Holding Time Review: The samples were collected on 8/29/07, extracted on 9/4/07, analyzed for PETN and nitroglycerine on 9/7/07, and analyzed for all other explosives on 9/6/07 & 9/13/07. All criteria were met. No qualifiers were applied.

II-Blank Analysis

The purpose of laboratory or field blank analyses is to determine the existence and magnitude of contamination problems resulting from laboratory or field activities. One method blank per analytical batch must be run on each instrument used to analyze samples. No contaminants should be present in the blanks. The DoD QSM criterion specifies all concentrations should be less than one-half MRL. Positive sample results are reported and qualified "B", if the concentration of the compound in the sample is ≤5 times (5x) the maximum amount for explosive target compounds. **Table 2** summarizes the blank contamination analysis.

Table 2 Blank Contamination Analysis Summary

Analysis Date	QC Blank ID	Compound	Max Conc. µg/L	Action Level µg/L	B qualified samples
9/6/07	OP22176-MB	All target explosives <½MRL	NA	NA	None
9/7/07	OP22176-MB	PETN & NG <½MRL	NA	NA	None
9/13/07	OP22176-MB	PETN & NG <½MRL	NA	NA	None
9/11/07	RB083007	All target explosives <½MRL	NA	NA	None
9/07/07	RB083007	PETN & NG <½MRL	NA	NA	None

MRL = Method Reporting Limit
NA = Not Applicable

III-Initial Calibration

Compliance requirements for satisfactory instrument calibration are established to ensure that the instrument is capable of producing acceptable qualitative and quantitative data for the target compounds. The initial 5-point calibration demonstrates that the instrument is capable of acceptable performance in the beginning of the analytical run. The DoD QSM specifies that the correlation coefficient (r^2) must be ≥0.990 and/or the percent relative standard deviation (%RSD) must be ≤20%. All detects were qualified as estimated "J" for where there were exceeding %RSDs, and all non-detects were qualified as estimated "UJ" for where there were grossly exceeding recoveries. Grossly exceeding is defined as twice the established criteria limits.

- During the explosives initial calibration performed on 8/21/07 on instrument G1315B, all criteria were met for target compounds. No qualifiers were applied. All samples were analyzed in conjunction with this initial calibration.

- During the PETN and nitroglycerine initial calibration performed on 03/15/07 on instrument G1315B, all criteria were met for target compounds. No qualifiers were applied. All samples were analyzed in conjunction with this initial calibration.

IV-Continuing Calibration

Compliance requirements for satisfactory instrument calibration are established to ensure that the instrument is capable of producing acceptable qualitative and quantitative data for the target compounds. Continuing calibration standards are analyzed after every 10 injections, and at the end of the analysis sequence. The DoD QSM specifies that the percent difference (%D) from initial calibration should be no greater than ±20%. All detects were qualified as estimated "J" for where there were exceeding %Ds, and all non-detects were qualified as estimated "UJ" for where there were grossly exceeding recoveries. Grossly exceeding is defined as twice the established criteria limits.

- During the explosives initial calibration verification performed on 8/21/07 @1716 on instrument G1315B, all criteria were met for target compounds. No qualifiers were applied. No samples were analyzed after this initial calibration verification.

- During the explosives continuing calibration verification performed on 9/6/07 @0242 on instrument G1315B, tetryl (24.5%) had a high %D from signal #1. All other target compounds met %D criteria. The method blank and LCS are the only analyses associated with this continuing calibration. No data qualifiers were applied.

- During the explosives continuing calibration verification performed on 9/6/07 @0824 on instrument G1315B, all criteria were met for target compounds. No qualifiers were applied. All samples were analyzed following this continuing calibration.

- During the explosives continuing calibration verification performed on 9/6/07 @1407 on instrument G1315B, all criteria were met for target compounds. No qualifiers were applied. All samples were analyzed prior to this continuing calibration.

- During the PETN and nitroglycerin initial calibration verification performed on 3/15/07 @1235 on instrument G1315B, all criteria were met for target compounds. No qualifiers were applied. No samples were analyzed in conjunction with this initial calibration verification.

- During the PETN and nitroglycerin continuing calibration performed on 9/7/07 @1242 on instrument G1315B, all criteria were met for target compounds. No qualifiers were applied. Samples 59MW01, 48MW1, TMMW01, 48MW2, 48MW3, and TMMW3 were analyzed after this continuing calibration.

- During the PETN and nitroglycerin continuing calibration performed on 9/7/07 @1417 on instrument G1315B, all criteria were met for target compounds. No qualifiers were applied. Samples 59MW01, 48MW1, TMMW01, 48MW2, 48MW3, and TMMW3 were analyzed prior to this continuing calibration, and sample 48MW4 was analyzed after this continuing calibration.

- During the PETN and nitroglycerin continuing calibration performed on 9/7/07 @1600 on instrument G1315B, all criteria were met for target compounds. No qualifiers were applied. Samples 48MW4 was analyzed after this continuing calibration.

- During the PETN and nitroglycerin continuing calibration performed on 9/13/07 @1031 on instrument G1315B, all criteria were met for target compounds. No qualifiers were applied. Sample 49MW01 was analyzed after this continuing calibration.

- During the PETN and nitroglycerin continuing calibration performed on 9/13/07 @1148 on instrument G1315B, all criteria were met for target compounds. No qualifiers were applied. Sample 49MW01 was analyzed prior to this continuing calibration.

V-System Monitoring Compound (Surrogates)
Laboratory performance on individual samples is established by means of spiking activities. The percent recovery (%R) for all samples and blanks must be within the laboratory control limits. DoD surrogate recovery limits are specified in Table D-3 of the DoD QSM (DoD, 2006). If the surrogate is not listed, then the laboratory criteria shall be used.

Aqueous Criteria: 3,4-dinitrotoluene (70-136%)

- All criteria were met for explosives, PETN, and nitroglycerin. No qualifiers were applied.

VI-Laboratory Control Sample
Laboratory control samples (LCS) are used to monitor long-term accuracy of the analytical method. The analysis is performed at a frequency of 1 per analytical batch. The percent recoveries (%Rs) must be within the laboratory control limits. DoD QSM aqueous LCS recovery limits are specified in Table D-12 of the DoD QSM (DoD, 2006). If the compound is not listed, then the laboratory criteria shall be used.

- Sample OP22176-BS was used as the LCS for PETN, nitroglycerin, and explosives analysis. HMX (128%) had a high recovery, but no HMX was detected in any samples so no qualifiers were applied. All other compounds met recovery criteria. All samples were analyzed in conjunction with this LCS.

VII-Matrix Spike/Matrix Spike Duplicate
Data for matrix spike/matrix spike duplicates (MS/MSD) are generated to determine long-term precision and accuracy of the analytical method on various matrices and to demonstrate acceptable compound recovery by the laboratory at the time of sample analysis. The percent recoveries (%Rs) and the relative percent difference (RPD) must be within the laboratory control limits. DoD QSM aqueous MS/MSD recovery limits follow the LCS criteria and are specified in Table D-12 of the DoD QSM (DoD, 2006). If the compound is not listed, then the laboratory criteria shall be used.

- Sample 48MW3 was used as the MS/MSD for the explosive analysis. 2,4-Dinitrotoluene (118%) had a high recovery in the MS, and tetryl (131%, 129%) had high recoveries in the MS and MSD. Neither compound was detected in any samples so no data qualification was required. PETN had a high RPD, but the MS and MSD recoveries met criteria, no action is taken on RPD alone. All other compounds met criteria. All samples were analyzed in conjunction with this MS/MSD.

VIII-Field Duplicate Sample Analysis
Field duplicates were collected to identify the cumulative precision of the sampling and analytical process and sent to the laboratory blind. The RPD was calculated only for those analytes which were detected at levels exceeding the method reporting limits in both samples of the duplicate pair. Analytes that were rejected (R-qualified) in either sample of the duplicate pair were excluded from the duplicate assessment. Precision control criterion was established at 50% RPD for the aqueous and solid samples. Analytical results were qualified as estimated (J) for any RPDs exceeding criteria.

- Field duplicate pairs in this data set included 59MW01 & TMMW01, and 48MW3 & TMMW3. All explosives detected above the MDL met RPD criteria. No data qualifiers were applied.

IX-Quantitation Verification
The accuracy of analytical results was verified through the calculation of several parameters. The calculation was based calibration factors. The absolute percent difference (%D) between the calculated and the reported value must be within 10% difference. All values >MDL and <MRL or <3*MDL (whichever was greater) were qualified as estimated "J".

- The %D between the primary and secondary columns was within criteria for all detected explosives, PETN, and nitroglycerin.

Sample: OP22176-BS, HMX

Conc. µg/L = (Ax * Vt * DF) / (CF * Vs)

where: Conc. = Sample concentration in µg/L
Ax = Area of characteristic ion for compound being measured
Vt = Volume of total extract (mL)
DF = Dilution factor
CF = Average relative calibration factor for compound being measured (from ICAL)
Vs = Volume of sample extracted (mL)

Conc. µg/L = (1607036 * 10 * 1) / (3262 * 1000) = 4.9 µg/L

Reported Value = 4.9 µg/L
% Difference = 0.0%
Values were within 10% difference

Sample: OP22176-BS, nitroglycerin

Conc. µg/L = (Ax * Vt * DF) / (CF * Vs)

where: Conc. = Sample concentration in µg/L
Ax = Area of characteristic ion for compound being measured.
Vt = Volume of total extract (mL).
DF = Dilution factor
CF = Average relative calibration factor for compound being measured (from ICAL)
Vs = Volume of sample extracted (mL).

Conc. µg/L = (3361818 * 10 * 1) / (1228 * 1000) = 27.4 µg/L

Reported Value = 27.4 µg/L
% Difference = 0.0%
Values were within 10% difference

USEPA Region III Validation Qualifiers

(No Code) = Confirmed identification.

B = The analyte has been detected in the sample and the associated laboratory or field blank.

J = Indicates an estimated value for (1) estimated value due to QC non-conformance. Reported value may not be accurate or precise, (2) estimating a concentration as a tentatively identified compound as indicated by the mass spectral and retention time data, or (3) estimating a concentration ≥ MDL and <MRL or <3*MDL, whichever is greater.

K = Analyte present. Reported value may be biased high (estimated) due to QC non-conformance.

L = Analyte present. Reported value may be biased low (estimated) due to QC non-conformance.

R = Unreliable result. Analyte may or may not be present in the sample due to QC non-conformance.

UL = Value is estimated bias low and not detected due to QC non-conformance. Reporting limit may be inaccurate or imprecise. Quantitation limit is probably higher.

UJ = Value is estimated and not detected due to QC non-conformance. Reporting limit may be inaccurate or imprecise.

Laboratory Qualifiers

(No Code) = Confirmed identification.

U = Not detected. The associated number indicates the compound reporting limit for the sample.

A (Dioxins) = B (Metals) = The reported value was obtained from a reading <MRL and ≥MDL and is considered estimated.

B (Organics) = The analyte or compound has been detected in the sample and laboratory method blank. It indicates probable blank contamination.

E (Metals) = Reported value is estimated because of the presence of interferences.

E (Organics) = Identifies compounds whose concentrations exceed the upper level of the calibration range.

EMPC (Dioxins) = The ion-abundance ratio between the two characteristic PCDD/PCDF ions was outside accepted ranges. The detected PCDD/PCDF was reported as an estimated maximum possible concentration (EMPC).

D = Indicates sample was analyzed at a dilution.

J = Indicates an estimated value for (1) estimating a concentration as a tentatively identified compound as indicated by the mass spectral and retention time data, or (2) estimating a concentration <MRL and ≥ MDL.

N (Organics) = Indicates presumptive evidence of a compound for tentatively identified compounds using a library search.

N (Metals) = Laboratory spike sample recovery not within control limits.

P (Organics) = Target analyte confirmation >40% difference for detected compound between the primary and secondary columns. The lower of the two values was reported.

* (Metals) = Duplicate analysis not within control limits.

* (Organics) = Surrogate outside of QC limits on both original and re-analysis.

Accutest Laboratories

Report of Analysis

Client Sample ID:	59MW01		
Lab Sample ID:	F52170-1	**Date Sampled:**	08/29/07
Matrix:	AQ - Ground Water	**Date Received:**	08/30/07
Method:	SW846 8330A SW846 3535A	**Percent Solids:**	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	PP022776.D	1	09/06/07	MRE	09/04/07	OP22176	GPP792
Run #2	PP022827.D	1	09/07/07	MRE	09/04/07	OP22176	GPP795

	Initial Volume	Final Volume
Run #1	1000 ml	10.0 ml
Run #2	1000 ml	10.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q
2691-41-0	HMX	ND	0.20	0.051	ug/l	
121-82-4	RDX	ND	0.20	0.060	ug/l	
99-65-0	1,3-Dinitrobenzene	ND	0.20	0.056	ug/l	
606-20-2	2,6-Dinitrotoluene	ND	0.20	0.071	ug/l	
121-14-2	2,4-Dinitrotoluene	ND	0.20	0.097	ug/l	
35572-78-2	2-amino-4,6-Dinitrotoluene	ND	0.20	0.065	ug/l	
19406-51-0	4-amino-2,6-Dinitrotoluene	ND	0.20	0.056	ug/l	
98-95-3	Nitrobenzene	ND	0.20	0.073	ug/l	
88-72-2	o-Nitrotoluene	ND	0.20	0.12	ug/l	
99-08-1	m-Nitrotoluene	ND	0.20	0.078	ug/l	
99-99-0	p-Nitrotoluene	ND	0.20	0.10	ug/l	
479-45-8	Tetryl	ND	0.20	0.068	ug/l	
99-35-4	1,3,5-Trinitrobenzene	ND	0.20	0.065	ug/l	
118-96-7	2,4,6-Trinitrotoluene	ND	0.20	0.050	ug/l	
55-63-0	Nitroglycerine	ND [a]	2.0	0.50	ug/l	
78-11-5	PETN	ND [a]	2.0	0.50	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
610-39-9	3,4-Dinitrotoluene	107%	115%	70-136%

(a) Result is from Run# 2

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	48MW1		
Lab Sample ID:	F52170-2	**Date Sampled:**	08/29/07
Matrix:	AQ - Ground Water	**Date Received:**	08/30/07
Method:	SW846 8330A SW846 3535A	**Percent Solids:**	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	PP022777.D	1	09/06/07	MRE	09/04/07	OP22176	GPP792
Run #2	PP022828.D	1	09/07/07	MRE	09/04/07	OP22176	GPP795

	Initial Volume	Final Volume
Run #1	950 ml	10.0 ml
Run #2	950 ml	10.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q
2691-41-0	HMX	ND	0.21	0.054	ug/l	
121-82-4	RDX	ND	0.21	0.063	ug/l	
99-65-0	1,3-Dinitrobenzene	ND	0.21	0.059	ug/l	
606-20-2	2,6-Dinitrotoluene	ND	0.21	0.075	ug/l	
121-14-2	2,4-Dinitrotoluene	ND	0.21	0.10	ug/l	
35572-78-2	2-amino-4,6-Dinitrotoluene	ND	0.21	0.068	ug/l	
19406-51-0	4-amino-2,6-Dinitrotoluene	ND	0.21	0.059	ug/l	
98-95-3	Nitrobenzene	ND	0.21	0.077	ug/l	
88-72-2	o-Nitrotoluene	ND	0.21	0.12	ug/l	
99-08-1	m-Nitrotoluene	ND	0.21	0.082	ug/l	
99-99-0	p-Nitrotoluene	ND	0.21	0.11	ug/l	
479-45-8	Tetryl	ND	0.21	0.072	ug/l	
99-35-4	1,3,5-Trinitrobenzene	ND	0.21	0.068	ug/l	
118-96-7	2,4,6-Trinitrotoluene	ND	0.21	0.053	ug/l	
55-63-0	Nitroglycerine	ND [a]	2.1	0.53	ug/l	
78-11-5	PETN	ND [a]	2.1	0.53	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
610-39-9	3,4-Dinitrotoluene	114%	136%	70-136%

(a) Result is from Run# 2

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	TMMW01		
Lab Sample ID:	F52170-3	**Date Sampled:**	08/29/07
Matrix:	AQ - Ground Water	**Date Received:**	08/30/07
Method:	SW846 8330A SW846 3535A	**Percent Solids:**	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	PP022778.D	1	09/06/07	MRE	09/04/07	OP22176	GPP792
Run #2	PP022829.D	1	09/07/07	MRE	09/04/07	OP22176	GPP795

	Initial Volume	Final Volume
Run #1	1010 ml	10.0 ml
Run #2	1010 ml	10.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q
2691-41-0	HMX	ND	0.20	0.050	ug/l	
121-82-4	RDX	ND	0.20	0.059	ug/l	
99-65-0	1,3-Dinitrobenzene	ND	0.20	0.055	ug/l	
606-20-2	2,6-Dinitrotoluene	ND	0.20	0.070	ug/l	
121-14-2	2,4-Dinitrotoluene	ND	0.20	0.096	ug/l	
35572-78-2	2-amino-4,6-Dinitrotoluene	ND	0.20	0.064	ug/l	
19406-51-0	4-amino-2,6-Dinitrotoluene	ND	0.20	0.055	ug/l	
98-95-3	Nitrobenzene	ND	0.20	0.072	ug/l	
88-72-2	o-Nitrotoluene	ND	0.20	0.11	ug/l	
99-08-1	m-Nitrotoluene	ND	0.20	0.077	ug/l	
99-99-0	p-Nitrotoluene	ND	0.20	0.10	ug/l	
479-45-8	Tetryl	ND	0.20	0.067	ug/l	
99-35-4	1,3,5-Trinitrobenzene	ND	0.20	0.064	ug/l	
118-96-7	2,4,6-Trinitrotoluene	ND	0.20	0.050	ug/l	
55-63-0	Nitroglycerine	ND [a]	2.0	0.50	ug/l	
78-11-5	PETN	ND [a]	2.0	0.50	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
610-39-9	3,4-Dinitrotoluene	102%	118%	70-136%

(a) Result is from Run# 2

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	48MW2		
Lab Sample ID:	F52170-4	Date Sampled:	08/29/07
Matrix:	AQ - Ground Water	Date Received:	08/30/07
Method:	SW846 8330A SW846 3535A	Percent Solids:	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	PP022779.D	1	09/06/07	MRE	09/04/07	OP22176	GPP792
Run #2	PP022830.D	1	09/07/07	MRE	09/04/07	OP22176	GPP795

	Initial Volume	Final Volume
Run #1	960 ml	10.0 ml
Run #2	960 ml	10.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q
2691-41-0	HMX	ND	0.21	0.053	ug/l	
121-82-4	RDX	ND	0.21	0.063	ug/l	
99-65-0	1,3-Dinitrobenzene	ND	0.21	0.058	ug/l	
606-20-2	2,6-Dinitrotoluene	ND	0.21	0.074	ug/l	
121-14-2	2,4-Dinitrotoluene	ND	0.21	0.10	ug/l	
35572-78-2	2-amino-4,6-Dinitrotoluene	ND	0.21	0.068	ug/l	
19406-51-0	4-amino-2,6-Dinitrotoluene	ND	0.21	0.058	ug/l	
98-95-3	Nitrobenzene	ND	0.21	0.076	ug/l	
88-72-2	o-Nitrotoluene	ND	0.21	0.12	ug/l	
99-08-1	m-Nitrotoluene	ND	0.21	0.081	ug/l	
99-99-0	p-Nitrotoluene	ND	0.21	0.11	ug/l	
479-45-8	Tetryl	ND	0.21	0.071	ug/l	
99-35-4	1,3,5-Trinitrobenzene	ND	0.21	0.068	ug/l	
118-96-7	2,4,6-Trinitrotoluene	ND	0.21	0.052	ug/l	
55-63-0	Nitroglycerine	ND [a]	2.1	0.52	ug/l	
78-11-5	PETN	ND [a]	2.1	0.52	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
610-39-9	3,4-Dinitrotoluene	94%	83%	70-136%

(a) Result is from Run# 2

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	48MW3		
Lab Sample ID:	F52170-5	**Date Sampled:**	08/29/07
Matrix:	AQ - Ground Water	**Date Received:**	08/30/07
Method:	SW846 8330A SW846 3535A	**Percent Solids:**	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	PP022780.D	1	09/06/07	MRE	09/04/07	OP22176	GPP792
Run #2	PP022833.D	1	09/07/07	MRE	09/04/07	OP22176	GPP795

	Initial Volume	Final Volume
Run #1	1000 ml	10.0 ml
Run #2	1000 ml	10.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q
2691-41-0	HMX	ND	0.20	0.051	ug/l	
121-82-4	RDX	ND	0.20	0.060	ug/l	
99-65-0	1,3-Dinitrobenzene	ND	0.20	0.056	ug/l	
606-20-2	2,6-Dinitrotoluene	ND	0.20	0.071	ug/l	
121-14-2	2,4-Dinitrotoluene	ND	0.20	0.097	ug/l	
35572-78-2	2-amino-4,6-Dinitrotoluene	ND	0.20	0.065	ug/l	
19406-51-0	4-amino-2,6-Dinitrotoluene	ND	0.20	0.056	ug/l	
98-95-3	Nitrobenzene	ND	0.20	0.073	ug/l	
88-72-2	o-Nitrotoluene	ND	0.20	0.12	ug/l	
99-08-1	m-Nitrotoluene	ND	0.20	0.078	ug/l	
99-99-0	p-Nitrotoluene	ND	0.20	0.10	ug/l	
479-45-8	Tetryl	ND	0.20	0.068	ug/l	
99-35-4	1,3,5-Trinitrobenzene	ND	0.20	0.065	ug/l	
118-96-7	2,4,6-Trinitrotoluene	ND	0.20	0.050	ug/l	
55-63-0	Nitroglycerine	ND [a]	2.0	0.50	ug/l	
78-11-5	PETN	ND [a]	2.0	0.50	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
610-39-9	3,4-Dinitrotoluene	110%	104%	70-136%

(a) Result is from Run# 2

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	TMMW3		
Lab Sample ID:	F52170-6	**Date Sampled:**	08/29/07
Matrix:	AQ - Ground Water	**Date Received:**	08/30/07
Method:	SW846 8330A SW846 3535A	**Percent Solids:**	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	PP022783.D	1	09/06/07	MRE	09/04/07	OP22176	GPP792
Run #2	PP022834.D	1	09/07/07	MRE	09/04/07	OP22176	GPP795

	Initial Volume	Final Volume
Run #1	1040 ml	10.0 ml
Run #2	1040 ml	10.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q
2691-41-0	HMX	ND	0.19	0.049	ug/l	
121-82-4	RDX	ND	0.19	0.058	ug/l	
99-65-0	1,3-Dinitrobenzene	ND	0.19	0.054	ug/l	
606-20-2	2,6-Dinitrotoluene	ND	0.19	0.068	ug/l	
121-14-2	2,4-Dinitrotoluene	ND	0.19	0.093	ug/l	
35572-78-2	2-amino-4,6-Dinitrotoluene	ND	0.19	0.062	ug/l	
19406-51-0	4-amino-2,6-Dinitrotoluene	ND	0.19	0.054	ug/l	
98-95-3	Nitrobenzene	ND	0.19	0.070	ug/l	
88-72-2	o-Nitrotoluene	ND	0.19	0.11	ug/l	
99-08-1	m-Nitrotoluene	ND	0.19	0.075	ug/l	
99-99-0	p-Nitrotoluene	ND	0.19	0.097	ug/l	
479-45-8	Tetryl	ND	0.19	0.065	ug/l	
99-35-4	1,3,5-Trinitrobenzene	ND	0.19	0.062	ug/l	
118-96-7	2,4,6-Trinitrotoluene	ND	0.19	0.048	ug/l	
55-63-0	Nitroglycerine	ND [a]	1.9	0.48	ug/l	
78-11-5	PETN	ND [a]	1.9	0.48	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
610-39-9	3,4-Dinitrotoluene	104%	93%	70-136%

(a) Result is from Run# 2

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	48MW4		
Lab Sample ID:	F52170-7	**Date Sampled:**	08/29/07
Matrix:	AQ - Ground Water	**Date Received:**	08/30/07
Method:	SW846 8330A SW846 3535A	**Percent Solids:**	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	PP022784.D	1	09/06/07	MRE	09/04/07	OP22176	GPP792
Run #2	PP022837.D	1	09/07/07	MRE	09/04/07	OP22176	GPP795

	Initial Volume	Final Volume
Run #1	1030 ml	10.0 ml
Run #2	1030 ml	10.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q
2691-41-0	HMX	ND	0.19	0.050	ug/l	
121-82-4	RDX	ND	0.19	0.058	ug/l	
99-65-0	1,3-Dinitrobenzene	ND	0.19	0.054	ug/l	
606-20-2	2,6-Dinitrotoluene	ND	0.19	0.069	ug/l	
121-14-2	2,4-Dinitrotoluene	ND	0.19	0.094	ug/l	
35572-78-2	2-amino-4,6-Dinitrotoluene	ND	0.19	0.063	ug/l	
19406-51-0	4-amino-2,6-Dinitrotoluene	ND	0.19	0.054	ug/l	
98-95-3	Nitrobenzene	ND	0.19	0.071	ug/l	
88-72-2	o-Nitrotoluene	ND	0.19	0.11	ug/l	
99-08-1	m-Nitrotoluene	ND	0.19	0.076	ug/l	
99-99-0	p-Nitrotoluene	ND	0.19	0.098	ug/l	
479-45-8	Tetryl	ND	0.19	0.066	ug/l	
99-35-4	1,3,5-Trinitrobenzene	ND	0.19	0.063	ug/l	
118-96-7	2,4,6-Trinitrotoluene	ND	0.19	0.049	ug/l	
55-63-0	Nitroglycerine	ND [a]	1.9	0.49	ug/l	
78-11-5	PETN	ND [a]	1.9	0.49	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
610-39-9	3,4-Dinitrotoluene	106%	98%	70-136%

(a) Result is from Run# 2

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	49MW01		
Lab Sample ID:	F52170-8	**Date Sampled:**	08/29/07
Matrix:	AQ - Ground Water	**Date Received:**	08/30/07
Method:	SW846 8330A SW846 3535A	**Percent Solids:**	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	PP022785.D	1	09/06/07	MRE	09/04/07	OP22176	GPP792
Run #2	PP022922.D	1	09/13/07	NAF	09/04/07	OP22176	GPP799

	Initial Volume	Final Volume
Run #1	900 ml	10.0 ml
Run #2	900 ml	10.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q
2691-41-0	HMX	ND	0.22	0.057	ug/l	
121-82-4	RDX	ND	0.22	0.067	ug/l	
99-65-0	1,3-Dinitrobenzene	ND	0.22	0.062	ug/l	
606-20-2	2,6-Dinitrotoluene	ND	0.22	0.079	ug/l	
121-14-2	2,4-Dinitrotoluene	ND	0.22	0.11	ug/l	
35572-78-2	2-amino-4,6-Dinitrotoluene	ND	0.22	0.072	ug/l	
19406-51-0	4-amino-2,6-Dinitrotoluene	ND	0.22	0.062	ug/l	
98-95-3	Nitrobenzene	ND	0.22	0.081	ug/l	
88-72-2	o-Nitrotoluene	ND	0.22	0.13	ug/l	
99-08-1	m-Nitrotoluene	ND	0.22	0.087	ug/l	
99-99-0	p-Nitrotoluene	ND	0.22	0.11	ug/l	
479-45-8	Tetryl	ND	0.22	0.076	ug/l	
99-35-4	1,3,5-Trinitrobenzene	ND	0.22	0.072	ug/l	
118-96-7	2,4,6-Trinitrotoluene	ND	0.22	0.056	ug/l	
55-63-0	Nitroglycerine	ND [a]	2.2	0.56	ug/l	
78-11-5	PETN	ND [a]	2.2	0.56	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
610-39-9	3,4-Dinitrotoluene	109%	99%	70-136%

(a) Result is from Run# 2

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Shaw® Shaw Environmental, Inc.

MEMORANDUM

TO: Jeff Parks, Shaw E&I RFAAP Project Manager

FROM: Richard McCracken, Shaw E&I RFAAP Project Chemist

SUBJECT: Radford Army Ammunition Plant (RFAAP) Data Validation – Herbicides
Accutest Laboratories, Inc., SDG F52170

DATE: November 6, 2007

The purpose of this memorandum is to present the data validation report for the samples collected at RFAAP on August 29, 2007. Aqueous samples were analyzed for chlorinated herbicides using USEPA SW846 Method 3510C/8151A. A total of eight aqueous samples were validated. The sample IDs are:

Field Sample ID	Lab Sample ID	Field Sample ID	Lab Sample ID
59MW01	F52170-1	48MW3	F52170-5
48MW1	F52170-2	TMMW3	F52170-6
TMMW01	F52170-3	48MW4	F52170-7
48MW2	F52170-4	49MW1	F52170-8

Data were reviewed by Richard McCracken and validated using a combination of project QAPP, *Quality Systems Manual for Environmental Laboratories, Final Version 3, January, 2006* (DoD, 2006) (DoD QSM), method-specific criteria, and laboratory SOP criteria. The data qualifier scheme was consistent with the *Region III Modifications to the National Functional Guidelines for Organic Data Review* (September 1994). Parameters evaluated are presented in **Table 1**. Data associated with parameters in compliance with quality control specifications have not been qualified. Data associated with parameters that did not comply with quality control specifications and directly impacted project data have been qualified in accordance with USEPA Region III specifications.

Table 1 Laboratory Performance Criteria

Qualified		Parameter
Yes	No	
	X	Holding Times
	X	Initial Calibration
	X	Continuing Calibration
	X	Blank Analysis
	X	System Monitoring Compounds
	X	Laboratory Control Sample
	X	Matrix Spike/Spike Duplicate
	X	Field Duplicate
	X	Quantitation Verification

The quality of data collected in support of this sampling activity is considered acceptable.

Richard M. Cracken

Richard McCracken, Chemist

11/6/07

Date

RFAAP VALIDATION REPORT
CHLORINATED HERBICIDES REVIEW
SDG F52170

I-Holding Times

The objective is to ascertain the validity of results based on the holding time of the sample from time of collection to time of sample extraction and analysis. For aqueous samples, chlorinated herbicides compounds are shipped @4°C ± 2°C, with a maximum holding time of 7 days from sample collection to preparative extraction and 40 days from preparative extraction to determinative analysis.

- Temperature Review: A temperature blank was sent with each cooler and recorded by the laboratory upon receipt. The samples collected on 8/29/07 were sent in 20 coolers, and were received by the laboratory on 8/30/07 at temperatures ranging from 0.8°C to 3.6°C, with 9 of the 20 coolers having temperatures below 2.0°C. The low sample temperatures are not expected to have an adverse impact on the analytical results. No qualifiers were applied.

- Holding Time Review: The samples were collected on 8/29/07, extracted on 9/1/07, and analyzed on 9/10/07. All criteria were met. No qualifiers were applied.

II-Initial Calibration

Compliance requirements for satisfactory instrument calibration are established to ensure that the instrument used is capable of producing acceptable qualitative and quantitative data for semivolatile target compounds. Initial calibration demonstrates that the instrument is capable of acceptable performance in the beginning of the analytical run and of producing a linear calibration curve. The DoD QSM specifies that the percent relative standard deviation (%RSD) for a 5-point standard calibration should be ≤20% for each target compound.

- No initial calibration data was provided for MCPP or MCPA. During discussions with the laboratory, they indicated that they perform a one-point calibration each day that analysis for MCPP or MCPA is conducted. A five-point initial calibration was not performed, therefore all data for these two compounds has been qualified "J/UJ".

- During the initial calibration performed on 9/9/07 on instrument GC-GG, all target compounds (except MCPP and MCPA – see above) met criteria for signal #1 and signal #2. No qualifiers were applied. All samples were analyzed in conjunction with this initial calibration.

III-Continuing Calibration

Compliance requirements for satisfactory instrument calibration are established to ensure that the instrument used is capable of producing acceptable qualitative and quantitative data for semivolatile target compounds. Continuing calibration establishes the response factors on which the quantitations are based and checks satisfactory performance of the instrument on a day-to-day basis. The DoD QSM specifies that the percent difference (%D) between the initial calibration CF and the continuing calibration CF must be ≤20%.

- A one-point daily calibration was provided for MCPP and MCPA, indicating that the lab is able to detect and quantitate both compounds. %D data was not supplied since a five-point initial calibration was not performed. All MCPP and MCPA data has already been qualified (see initial calibration), no additional qualification is required.

- During continuing calibration performed on 9/10/07 @0136 on instrument GC-GG, all target compounds (except MCPP and MCPA – see above) met criteria for signal #1 and signal #2. No qualifiers were applied. All samples were analyzed following this continuing calibration.

- During continuing calibration performed on 9/10/07 @0750 on instrument GC-GG, all target compounds (except MCPP and MCPA – see above) met criteria for signal #1 and signal #2. No qualifiers were applied. All samples were analyzed following this continuing calibration.

- During continuing calibration performed on 9/10/07 @1424 on instrument GC-GG, all target compounds (except MCPP and MCPA – see above) met criteria for signal #1 and signal #2. No qualifiers were applied. All samples were analyzed prior to this continuing calibration.

IV-Blank Analysis

The purpose of blank analyses is to determine the presence and magnitude of contamination problems resulting from field or laboratory activities. No contaminants should be detected in any of the associated blanks. The DoD QSM criterion specifies all concentrations should be less than one-half MRL. Positive sample results are qualified "B" if the concentration of the analyte is ≤ five times (5x) the absolute maximum blank concentration. **Table 2** summarizes the blank contamination analysis.

Table 2 Blank Contamination Analysis Summary

Analysis Date	QC Blank ID	Compound	Max Conc. µg/L	Action Level µg/L	B qualified samples
9/10/07	OP7992-MB	All target compounds <½MRL	NA	NA	None
9/10/07	RB083007	All target compounds <½MRL	NA	NA	None

V-System Monitoring Compounds (Surrogates)

Laboratory performance on individual samples is established by means of spiking activities. All samples are spiked with surrogate compounds prior to sample preparation. Spike recoveries must be within the specified control limits. DoD surrogate recovery limits are specified in Table D-3 of the DoD QSM (DoD, 2006). If the surrogate is not listed, then the laboratory criteria shall be used.

Aqueous Control Limit: 2,4-DCAA (34-179%)

- All samples met recovery criteria.

VI-Laboratory Control Samples

Data for laboratory control samples (LCS) are generated to determine long-term precision and accuracy of the analytical method. Percent recoveries must be within the specified control limits. DoD QSM aqueous LCS recovery limits are specified in Table D-8 of the DoD QSM (DoD, 2006). If the compound is not listed, then the laboratory criteria shall be used.

- Sample OP7992-BS was used as the LCS during the 9/10/07 run. 2,4,5-T (115%) and dicamba (115%) had high recoveries, but neither compound was detected in any samples so no qualifiers were applied. All other herbicides were within criteria. All samples were analyzed in conjunction with this LCS.

VII-Matrix Spike/Matrix Spike Duplicate

Data for matrix spike/matrix spike duplicates (MS/MSD) are generated to determine long-term precision and accuracy of the analytical method on various matrices and to demonstrate acceptable compound recovery by the laboratory at the time of sample analysis. The percent recoveries (%Rs) and the relative percent difference (RPD) must be within the specified control limits. DoD QSM aqueous MS/MSD recovery limits follow the LCS criteria and are specified in Table D-8 of the DoD QSM (DoD, 2006). If the compound is not listed, then the laboratory criteria shall be used.

- MS/MSD analysis was performed on 48MW3. 2,4,5-TP (Silvex) (121%, 118%) had high recoveries in the MS and MSD, and 2,4,5-T (111%) had a high recovery in the MS - neither compound was detected in any samples so no qualifiers were applied. Dinoseb had a high RPD, but the recoveries in the MS & MSD met criteria - no action is taken on RPD data alone. All other herbicides met recovery and RPD criteria.

VIII-Field Duplicate Sample Analysis

Field duplicates were collected to identify the cumulative precision of the sampling and analytical process and sent to the laboratory blind. The RPD was calculated only for those analytes which were detected at levels exceeding the method reporting limits in both samples of the duplicate pair. Analytes that were qualified because of blank contamination (B-qualified) or were rejected (R-qualified) in either sample of the duplicate pair were excluded from the duplicate assessment. Precision control criterion was established at 50% RPD for the aqueous and solid samples. Analytical results were qualified as estimated (J) for any RPDs exceeding criteria.

- Field duplicate pairs in this data set included 59MW01 & TMMW01, and 48MW3 & TMMW3. All herbicides detected above the MDL met RPD criteria. No data qualifiers were applied.

IX-Quantitation Verification

The accuracy of analytical results is verified through the calculation of several parameters. Percent difference (%D) between the calculated value and the reported value must be within 10%. All positive values must have less than or equal to 40% %D between the primary and secondary columns. Any sample value >MDL and <MRL is qualified as estimated, "J." All criteria were met. No qualifiers were applied.

- The %D between the primary and secondary columns was within criteria for all detected chlorinated herbicides.

Sample: OP7992-BS, 2,4,5-TP (Silvex)

Conc. µg/L = (A * DF * Vt) / (CF * Vo)

where: A = Area response of the sample
CF = Calibration Factor from initial calibration (area/(ug/L))
Vt = volume of final extract (mL)
DF = dilution factor
Vo = volume of the sample extracted (mL)

Conc. µg/L = (3796785 * 1 * 10 mL) / (83090 * 1000 mL)
= 0.46 ng/mL = 0.46 µg/L

Reported Conc. = 0.46 µg/L
%D = 0.0%
Values were within 10% difference

USEPA Region III Validation Qualifiers

(No Code) = Confirmed identification.

B = The analyte has been detected in the sample and the associated laboratory or field blank.

J = Indicates an estimated value for (1) estimated value due to QC non-conformance. Reported value may not be accurate or precise, (2) estimating a concentration as a tentatively identified compound as indicated by the mass spectral and retention time data, or (3) estimating a concentration ≥ MDL and <MRL or <3*MDL, whichever is greater.

K = Analyte present. Reported value may be biased high (estimated) due to QC non-conformance.

L = Analyte present. Reported value may be biased low (estimated) due to QC non-conformance.

R = Unreliable result. Analyte may or may not be present in the sample due to QC non-conformance.

UL = Value is estimated bias low and not detected due to QC non-conformance. Reporting limit may be inaccurate or imprecise. Quantitation limit is probably higher.

UJ = Value is estimated and not detected due to QC non-conformance. Reporting limit may be inaccurate or imprecise.

Laboratory Qualifiers

(No Code) = Confirmed identification.

A (Dioxins) = MDL is based upon the signal-to-noise measurement.

B (Metals) = The reported value was obtained from a reading <MRL and ≥MDL and is considered estimated.

B (Organics and Dioxins) = The analyte or compound has been detected in the sample and laboratory method blank. It indicates probable blank contamination.

D (Organics) = Indicates sample was analyzed at a dilution.

E (Metals) = Reported value is estimated because of the presence of interferences.

E (Organics) = Identifies compounds whose concentrations exceed the upper level of the calibration range.

E (Dioxins) = Reported value is estimated because of the presence of ether interferences.

EMPC (Dioxins) = The ion-abundance ratio between the two characteristic PCDD/F ions is outside accepted ranges. The detected PCDD/F is reported as an estimated maximum possible concentration (EMPC).

I (Dioxins) = Reported value is estimated because of the incorrect isotope rations were obtained.

J (All) = Indicates an estimated value for (1) estimating a concentration as a tentatively identified compound as indicated by the mass spectral and retention time data, (2) estimating a concentration <MRL and ≥ MDL, or estimating a concentration below the calibration range.

N (Organics) = Indicates presumptive evidence of a compound for tentatively identified compounds using a library search.

N (Metals) = Laboratory spike sample recovery not within control limits.

P (Organics) = Target analyte confirmation >40% difference for detected compound between the primary and secondary columns. The lower of the two values was reported.

U (All) = ND = BQL = Not detected. The associated number indicates the compound reporting limit for the sample.

* (Metals) = Duplicate analysis not within control limits.

* (Organics) = Surrogate outside of QC limits on both original and re-analysis.

Accutest LabLink@70447 14:42 01-Nov-2007

Report of Analysis

Client Sample ID:	59MW01		
Lab Sample ID:	F52170-1	Date Sampled:	08/29/07
Matrix:	AQ - Ground Water	Date Received:	08/30/07
Method:	SW846 8151 SW846 3510C	Percent Solids:	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	GG37477.D	1	09/10/07	ATX	09/01/07	T:OP7992	T:GGG1164
Run #2							

	Initial Volume	Final Volume
Run #1	1000 ml	10.0 ml
Run #2		

Herbicide List

CAS No.	Compound	Result	RL	MDL	Units	Q (DATA VAL QUALIFIER)
94-75-7	2,4-D	ND	1.5	0.80	ug/l	
93-72-1	2,4,5-TP (Silvex)	ND	0.20	0.15	ug/l	
93-76-5	2,4,5-T	ND	0.20	0.12	ug/l	
1918-00-9	Dicamba	ND	0.20	0.080	ug/l	
88-85-7	Dinoseb	ND	0.20	0.090	ug/l	
75-99-0	Dalapon	ND	1.0	1.0	ug/l	
120-36-5	Dichloroprop	ND	1.0	0.51	ug/l	
94-82-6	2,4-DB	ND	2.0	1.9	ug/l	
93-65-2	MCPP	ND	50		ug/l	UJ
94-74-6	MCPA	ND	50		ug/l	UJ
87-86-5	Pentachlorophenol	ND	0.050	0.040	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
19719-28-9	2,4-DCAA	71%		34-179%

(a) Analysis performed at Accutest Laboratories, Houston, TX.

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest LabLink@70447 14:42 01-Nov-2007

Report of Analysis

Client Sample ID:	48MW1		
Lab Sample ID:	F52170-2	Date Sampled:	08/29/07
Matrix:	AQ - Ground Water	Date Received:	08/30/07
Method:	SW846 8151 SW846 3510C	Percent Solids:	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	GG37478.D	1	09/10/07	ATX	09/01/07	T:OP7992	T:GGG1164
Run #2							

	Initial Volume	Final Volume
Run #1	1000 ml	10.0 ml
Run #2		

Herbicide List

CAS No.	Compound	Result	RL	MDL	Units	Q	DATA VAL QUALIFIER
94-75-7	2,4-D	ND	1.5	0.80	ug/l		
93-72-1	2,4,5-TP (Silvex)	ND	0.20	0.15	ug/l		
93-76-5	2,4,5-T	ND	0.20	0.12	ug/l		
1918-00-9	Dicamba	ND	0.20	0.080	ug/l		
88-85-7	Dinoseb	ND	0.20	0.090	ug/l		
75-99-0	Dalapon	ND	1.0	1.0	ug/l		
120-36-5	Dichloroprop	ND	1.0	0.51	ug/l		
94-82-6	2,4-DB	ND	2.0	1.9	ug/l		
93-65-2	MCPP	ND	50		ug/l		UJ
94-74-6	MCPA	ND	50		ug/l		UJ
87-86-5	Pentachlorophenol	ND	0.050	0.040	ug/l		

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
19719-28-9	2,4-DCAA	65%		34-179%

(a) Analysis performed at Accutest Laboratories, Houston, TX.

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest LabLink@70447 14:42 01-Nov-2007

Report of Analysis

Client Sample ID:	TMMW01		
Lab Sample ID:	F52170-3	Date Sampled:	08/29/07
Matrix:	AQ - Ground Water	Date Received:	08/30/07
Method:	SW846 8151 SW846 3510C	Percent Solids:	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	GG37479.D	1	09/10/07	ATX	09/01/07	T:OP7992	T:GGG1164
Run #2							

	Initial Volume	Final Volume
Run #1	1000 ml	10.0 ml
Run #2		

Herbicide List

CAS No.	Compound	Result	RL	MDL	Units	Q	DATA VAL QUALIFIER
94-75-7	2,4-D	ND	1.5	0.80	ug/l		
93-72-1	2,4,5-TP (Silvex)	ND	0.20	0.15	ug/l		
93-76-5	2,4,5-T	ND	0.20	0.12	ug/l		
1918-00-9	Dicamba	ND	0.20	0.080	ug/l		
88-85-7	Dinoseb	ND	0.20	0.090	ug/l		
75-99-0	Dalapon	ND	1.0	1.0	ug/l		
120-36-5	Dichloroprop	ND	1.0	0.51	ug/l		
94-82-6	2,4-DB	ND	2.0	1.9	ug/l		
93-65-2	MCPP	ND	50		ug/l		UJ
94-74-6	MCPA	ND	50		ug/l		UJ
87-86-5	Pentachlorophenol	ND	0.050	0.040	ug/l		

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
19719-28-9	2,4-DCAA	55%		34-179%

(a) Analysis performed at Accutest Laboratories, Houston, TX.

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest LabLink@70447 14:42 01-Nov-2007

Report of Analysis

Client Sample ID:	48MW2		
Lab Sample ID:	F52170-4	Date Sampled:	08/29/07
Matrix:	AQ - Ground Water	Date Received:	08/30/07
Method:	SW846 8151 SW846 3510C	Percent Solids:	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	GG37480.D	1	09/10/07	ATX	09/01/07	T:OP7992	T:GGG1164
Run #2							

	Initial Volume	Final Volume
Run #1	1000 ml	10.0 ml
Run #2		

Herbicide List

DATA VAL QUALIFIER

CAS No.	Compound	Result	RL	MDL	Units	Q	
94-75-7	2,4-D	ND	1.5	0.80	ug/l		
93-72-1	2,4,5-TP (Silvex)	ND	0.20	0.15	ug/l		
93-76-5	2,4,5-T	ND	0.20	0.12	ug/l		
1918-00-9	Dicamba	ND	0.20	0.080	ug/l		
88-85-7	Dinoseb	ND	0.20	0.090	ug/l		
75-99-0	Dalapon	ND	1.0	1.0	ug/l		
120-36-5	Dichloroprop	ND	1.0	0.51	ug/l		
94-82-6	2,4-DB	ND	2.0	1.9	ug/l		
93-65-2	MCPP	ND	50		ug/l	UJ	
94-74-6	MCPA	ND	50		ug/l	UJ	
87-86-5	Pentachlorophenol	ND	0.050	0.040	ug/l		

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
19719-28-9	2,4-DCAA	40%		34-179%

(a) Analysis performed at Accutest Laboratories, Houston, TX.

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest LabLink@70447 14:42 01-Nov-2007

Report of Analysis

Client Sample ID:	48MW3		
Lab Sample ID:	F52170-5	Date Sampled:	08/29/07
Matrix:	AQ - Ground Water	Date Received:	08/30/07
Method:	SW846 8151 SW846 3510C	Percent Solids:	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	GG37481.D	1	09/10/07	ATX	09/01/07	T:OP7992	T:GGG1164
Run #2							

	Initial Volume	Final Volume
Run #1	1000 ml	10.0 ml
Run #2		

Herbicide List

CAS No.	Compound	Result	RL	MDL	Units	Q	DATA VAL QUALIFIER
94-75-7	2,4-D	ND	1.5	0.80	ug/l		
93-72-1	2,4,5-TP (Silvex)	ND	0.20	0.15	ug/l		
93-76-5	2,4,5-T	ND	0.20	0.12	ug/l		
1918-00-9	Dicamba	ND	0.20	0.080	ug/l		
88-85-7	Dinoseb	ND	0.20	0.090	ug/l		
75-99-0	Dalapon	ND	1.0	1.0	ug/l		
120-36-5	Dichloroprop	ND	1.0	0.51	ug/l		
94-82-6	2,4-DB	ND	2.0	1.9	ug/l		
93-65-2	MCPP	ND	50		ug/l		UJ
94-74-6	MCPA	ND	50		ug/l		UJ
87-86-5	Pentachlorophenol	ND	0.050	0.040	ug/l		

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
19719-28-9	2,4-DCAA	60%		34-179%

(a) Analysis performed at Accutest Laboratories, Houston, TX.

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: GG37482.D

Accutest LabLink@70447 14:42 01-Nov-2007

Report of Analysis

3.6

Client Sample ID:	TMMW3		
Lab Sample ID:	F52170-6	Date Sampled:	08/29/07
Matrix:	AQ - Ground Water	Date Received:	08/30/07
Method:	SW846 8151 SW846 3510C	Percent Solids:	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	GG37482.D	1	09/10/07	ATX	09/01/07	T:OP7992	T:GGG1164
Run #2							

	Initial Volume	Final Volume
Run #1	1000 ml	10.0 ml
Run #2		

Herbicide List

CAS No.	Compound	Result	RL	MDL	Units	Q	DATA VAL QUALIFIER
94-75-7	2,4-D	ND	1.5	0.80	ug/l		
93-72-1	2,4,5-TP (Silvex)	ND	0.20	0.15	ug/l		
93-76-5	2,4,5-T	ND	0.20	0.12	ug/l		
1918-00-9	Dicamba	ND	0.20	0.080	ug/l		
88-85-7	Dinoseb	ND	0.20	0.090	ug/l		
75-99-0	Dalapon	ND	1.0	1.0	ug/l		
120-36-5	Dichloroprop	ND	1.0	0.51	ug/l		
94-82-6	2,4-DB	ND	2.0	1.9	ug/l		
93-65-2	MCPP	ND	50		ug/l		UJ
94-74-6	MCPA	ND	50		ug/l		UJ
87-86-5	Pentachlorophenol	ND	0.050	0.040	ug/l		

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
19719-28-9	2,4-DCAA	57%		34-179%

(a) Analysis performed at Accutest Laboratories, Houston, TX.

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest LabLink@70447 14:42 01-Nov-2007

Report of Analysis

Client Sample ID:	48MW4		
Lab Sample ID:	F52170-7	Date Sampled:	08/29/07
Matrix:	AQ - Ground Water	Date Received:	08/30/07
Method:	SW846 8151 SW846 3510C	Percent Solids:	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	GG37483.D	1	09/10/07	ATX	09/01/07	T:OP7992	T:GGG1164
Run #2							

	Initial Volume	Final Volume
Run #1	1000 ml	10.0 ml
Run #2		

Herbicide List

CAS No.	Compound	Result	RL	MDL	Units	Q (DATA VAL QUALIFIER)
94-75-7	2,4-D	ND	1.5	0.80	ug/l	
93-72-1	2,4,5-TP (Silvex)	ND	0.20	0.15	ug/l	
93-76-5	2,4,5-T	ND	0.20	0.12	ug/l	
1918-00-9	Dicamba	ND	0.20	0.080	ug/l	
88-85-7	Dinoseb	ND	0.20	0.090	ug/l	
75-99-0	Dalapon	ND	1.0	1.0	ug/l	
120-36-5	Dichloroprop	ND	1.0	0.51	ug/l	
94-82-6	2,4-DB	ND	2.0	1.9	ug/l	
93-65-2	MCPP	ND	50		ug/l	UJ
94-74-6	MCPA	ND	50		ug/l	UJ
87-86-5	Pentachlorophenol	ND	0.050	0.040	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
19719-28-9	2,4-DCAA	61%		34-179%

(a) Analysis performed at Accutest Laboratories, Houston, TX.

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest LabLink@70447 14:42 01-Nov-2007

Report of Analysis

Client Sample ID:	49MW01		
Lab Sample ID:	F52170-8	Date Sampled:	08/29/07
Matrix:	AQ - Ground Water	Date Received:	08/30/07
Method:	SW846 8151 SW846 3510C	Percent Solids:	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	GG37484.D	1	09/10/07	ATX	09/01/07	T:OP7992	T:GGG1164
Run #2							

	Initial Volume	Final Volume
Run #1	1000 ml	10.0 ml
Run #2		

Herbicide List

DATA VAL QUALIFIER

CAS No.	Compound	Result	RL	MDL	Units	Q	
94-75-7	2,4-D	ND	1.5	0.80	ug/l		
93-72-1	2,4,5-TP (Silvex)	ND	0.20	0.15	ug/l		
93-76-5	2,4,5-T	ND	0.20	0.12	ug/l		
1918-00-9	Dicamba	ND	0.20	0.080	ug/l		
88-85-7	Dinoseb	ND	0.20	0.090	ug/l		
75-99-0	Dalapon	ND	1.0	1.0	ug/l		
120-36-5	Dichloroprop	ND	1.0	0.51	ug/l		
94-82-6	2,4-DB	ND	2.0	1.9	ug/l		
93-65-2	MCPP	ND	50		ug/l		UJ
94-74-6	MCPA	ND	50		ug/l		UJ
87-86-5	Pentachlorophenol	ND	0.050	0.040	ug/l		

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
19719-28-9	2,4-DCAA	57%		34-179%

(a) Analysis performed at Accutest Laboratories, Houston, TX.

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Shaw® Shaw Environmental, Inc.

MEMORANDUM

TO: Jeff Parks, Shaw E&I Radford Army Ammunition Plant (RFAAP) Project Manager

FROM: Richard McCracken, Shaw E&I Project Chemist

SUBJECT: RFAAP Data Validation – TAL Metals
Accutest Laboratories, Inc., SDG F52170

DATE: November 6, 2007

The purpose of this memorandum is to present the data validation report for the samples collected at RFAAP on August 29, 2007. The samples were analyzed for target analyte list (TAL) metals using USEPA SW-846 3010A/6010B for ICP metals and SW-846 7470A for mercury. A total of eight aqueous samples were validated. The sample IDs are:

Field Sample ID	Lab Sample ID	Field Sample ID	Lab Sample ID
59MW01	F52170-1	48MW3	F52170-5
48MW1	F52170-2	TMMW3	F52170-6
TMMW01	F52170-3	48MW4	F52170-7
48MW2	F52170-4	49MW1	F52170-8

Data were reviewed by Richard McCracken and validated using a combination of project QAPP, *Quality Systems Manual for Environmental Laboratories, Final Version 3, January, 2006* (DoD, 2006) (DoD QSM), method-specific criteria, and laboratory SOP criteria. The data qualifier scheme was consistent with the *Region III Modifications to the National Functional Guidelines for Inorganic Data Review* (April, 1993). Parameters evaluated are presented in **Table 1**. Data associated with parameters in compliance with quality control specifications have not been qualified. Data associated with parameters that did not comply with quality control specifications and directly impacted project data have been qualified in accordance with USEPA Region III specifications.

Table 1 Laboratory Performance Criteria

Qualified		Parameter
Yes	No	
	X	Holding Times
X		Initial and Continuing Calibration
X		Blank Analysis
	X	ICP Interference Check Sample (ICS)
	X	Laboratory Control Sample (LCS)
	X	Laboratory Sample Duplicate
	X	Matrix Spike and Spike Duplicate
	X	ICP Serial Dilution
	X	Field Sample Duplicate
X		Quantitation Verification

The quality of data collected in support of this sampling activity is considered acceptable with noted qualifications.

Richard McCracken, Chemist

11/6/07
Date

RFAAP VALIDATION REPORT
METALS REVIEW
SDG F52170

I-Holding Times

The primary objective is to ascertain the validity of results based on the holding time of the sample from time of collection to time of sample analysis. Holding time criteria: For aqueous matrices, the samples are shipped cool @4°C±2°C and preserved to pH<2 with HNO_3 with a maximum holding time is 180 days for ICP metals and 28 days for mercury.

- Temperature Review: A temperature blank was sent with each cooler and recorded by the laboratory upon receipt. The samples collected on 8/29/07 were sent in 20 coolers, and were received by the laboratory on 8/30/07 at temperatures ranging from 0.8°C to 3.6°C, with 9 of the 20 coolers having temperatures below 2.0°C. The low sample temperatures are not expected to have an adverse impact on the analytical results. No qualifiers were applied.

- Holding Time Review: The samples were collected 8/29/07 for metals analysis, digested for mercury on 9/5/07, analyzed for mercury on 9/5/07, digested for ICP metals on 9/12/07 & 9/14/07, and analyzed for ICP metals on 9/13/07 & 9/17/07. All criteria were met. No qualifiers were applied.

II-Initial and Continuing Calibration

Requirements for satisfactory instrument calibration are established to ensure that the instrument is capable of producing acceptable quantitative data. Initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of the analysis run, and continuing calibration verification documents that the initial calibration is still valid.

ICP:	1- blank (DoD QSM <½ MRL) 3 – standards (r≥0.995) ICV/CCV (90-110%) (DoD QSM 90-110%) MRL (70-130%) (DoD QSM 80-120%) High Std. (95-105%)	Hg:	1 – blank (DoD QSM <½ MRL) 5 – standards (r≥0.995) ICV/CCV (80-120%)(DoD QSM ICV 90-110% & CCV 80-120%) MRL (80-120%) (DoD QSM 80-120%) High Std. (95-105%)

- Mercury analysis was performed on 9/5/07, with a correlation coefficient of 0.9999.

- CCV20, CCV21, CCV22, and CCV23 from 9/12/07 had low nickel (88.0%, 89.0%, 88.5%, 88.5%) recoveries, but no samples from this data set were analyzed on 9/12/07 so no data qualifiers were applied. All CCVs from 9/13 & 9/17 met criteria.

- Aluminum (105.5%) and sodium (108.1%) had a high recoveries during the High Standard analysis on 9/12/07. No field samples were analyzed on 9/12/07, no data qualifiers were applied.

- All metals met recovery criteria during the 9/13/07 High Standard analysis.

- Calcium (94.3%) and iron (94.0%) had low recoveries, and sodium (106.3%) had a high recovery during the 9/17/07 High Standard analysis. The calcium and iron results have been qualified "L/UL", and the sodium detections have been qualified "K" in associated samples 48MW3, TMMW3, 48MW4, and 49MW01.

- All ICVs and CCVs met recovery criteria. **Table 2** summarizes the MRL standard analysis. Samples with concentrations detected less than two times the MRL with out of criteria MRL recovery were qualified.

Table 2 MRL Analysis Summary

Analysis Date	Analysis	MRL (µg/L)	MRL %Recovery	Qualified samples @ <2xMRL	Validation Qualifiers
9/5/07	Hg	0.2	Met criteria	None	None
9/12/07	ICP-Sb	5.0	124.0	None	None
9/12/07	ICP-As	10	122.0	None	None
9/12/07	ICP-Pb	5.0	130.0	None	None
9/13/07	ICP-Sb	5.0	122.0	None	None
9/17/07	ICP-Sb	5.0	130.0	None	None
9/17/07	ICP-Be	5.0	122.0	None	None
9/17/07	ICP-Pb	5.0	136.0	48MW3, 48MW4	K
9/17/07	ICP-Se	10	130.0	None	None
9/17/07	ICP-Tl	10	76.0	48MW3, TMMW3, 48MW4, 49MW01	UL

III-Blanks

Blanks (preparation and calibration blanks) are assessed to determine the existence and magnitude of contamination problems. No contaminants should be detected (i.e. <MDL) in any of the associated blanks. DoD QSM limits are <½MRL for the method blank and <2*MDL for the calibration blanks. Samples are qualified "B" when they are less than 5x the absolute value of the maximum blank concentration. **Table 3** summarizes the blank contamination analysis.

Table 3 Blank Contamination Analysis Summary

Analysis Date	Analysis	QC Blank ID	Max Conc. µg/L	Action Level µg/L	B qualified samples
9/13/07	Antimony	ICB/CCBs	12.0	60.0	None
9/13/07	Potassium	ICB/CCBs	457 J	2285	59MW01, 48MW1, TMMW01
9/17/07	Antimony	ICB/CCBs	7.7	38.5	None
9/17/07	Copper	ICB/CCBs	5.4 J	27.0	None
9/17/07	Potassium	ICB/CCBs	1710 J	8550	All
9/17/07	Sodium	ICB/CCBs	1860 J	9300	48MW3, TMMW3
9/5/07	Mercury	ICB/CCBs	<2*MDL	NA	None
9/5/07	Mercury	MP12873-MB	<½MRL	NA	None
9/14/07	Lead	MP12936-MB	3.0 J	15.0	48MW3, 48MW4
9/17/07	Potassium	RB083007	1740 J	8700	All
9/17/07	Sodium	RB083007	1860 J	9300	48MW3, TMMW3
09/05/07	Mercury	RB083007	<2*MDL	NA	None

J = Estimated value <MRL and >MDL.

IV-ICP Interference Check Sample (ICS)

The ICP interference check sample (ICS) verifies interelement and background correction factors. ICP Interference Check is performed at the beginning and end of each sample analysis run. Control limits are 80-120% (DoD QSM limits 80-120%).

- All criteria were met. No qualifiers were applied.

V-Laboratory Control Samples (LCS)

The laboratory control sample (LCS) serves as a monitor of the overall performance of each step during the analysis, including the sample preparation. All aqueous LCS results must fall within the control limits. The DoD QSM aqueous LCS recovery limits are specified in Table D-18 of the DoD QSM (DoD, 2006). If the compound is not listed, then the laboratory criteria shall be used.

- Sample MP12936-BS was used as the LCS during ICP metals analysis. All criteria were met. No qualifiers were applied. All samples were analyzed in conjunction with this LCS.

- Sample MP12873-BS was used as the LCS during mercury analysis. All criteria were met. No qualifiers were applied. All samples were analyzed in conjunction with this LCS.

VI-Laboratory Duplicate Sample Analysis
Duplicate sample determinations are used to demonstrate acceptable method precision by the laboratory at the time of analysis. Duplicate analyses are also performed to generate data in order to determine the long-term precision of the analytical method on various matrices. RPDs must be within established control limits. DoD QSM limits for metals are 20% RPD for ICP metals and mercury.

- Sample 48MW3 was analyzed in duplicate during ICP metals analysis. All metals met RPD criteria. No data qualifiers were applied.

- Sample 48MW3 was used analyzed in duplicate during mercury analysis, and met RPD criteria. No qualifiers were applied.

VII-Matrix Spike/Spike Duplicate
MS/MSD are generated to determine long-term precision and accuracy of the analytical method on various matrices and to demonstrate acceptable compound recovery by the laboratory at the time of sample analysis. Specific criteria include the analyses of matrix spike and matrix spike duplicate samples at a frequency of one MS and MSD per 20 samples of similar matrix. MS and MSD recoveries and relative percent differences between MS and MSD recoveries should be within the specified limits. DoD QSM aqueous MS/MSD recovery limits follow the LCS criteria and are specified in Table D-18 of the DoD QSM (DoD, 2006). If the compound is not listed, then the laboratory criteria shall be used. Post digestion spikes limits are 75-125% for ICP metals and mercury.

- Sample 48MW3 was used as the MS/MSD during ICP metals analysis. All metals met recovery and RPD criteria. No data qualifiers were applied.

- Sample 48MW3 was used as the MS/MSD during mercury analysis, and met recovery & RPD criteria. No data qualifiers were applied.

VIII-ICP Serial Dilution
An ICP serial dilution is performed to determine whether significant physical or chemical interferences exist due to sample matrix at high concentrations. An analysis of a 5-fold dilution should agree within 10% difference of the original result when the concentration in sample is a factor of 50 above MDL.

- Sample 48MW3 was used as the serial dilution during ICP metals analysis. All metals met criteria. No data qualifiers were applied.

IX-Field Duplicate Sample Analysis
Field duplicates were collected to identify the cumulative precision of the sampling and analytical process and sent to the laboratory blind. The RPD was calculated only for those analytes which were detected at levels exceeding the method reporting limits in both samples of the duplicate pair. Analytes that were rejected (R-qualified) in either sample of the duplicate pair were excluded from the duplicate assessment. Precision control criterion was established at 35% RPD for the aqueous and solid samples. Analytical results were qualified as estimated (J) for any RPDs exceeding criteria.

- Field duplicate pairs in this data set included 59MW01 & TMMW01, and 48MW3 & TMMW3. All metals detected above the MDL met RPD criteria. No data qualifiers were applied.

X-Quantitation Verification
The accuracy of analytical results is verified through the calculation of several parameters. The percent difference (%D) between the calculated and the reported values should be within 10%. Any sample value >MDL and <MRL or <3*MDL (whichever is greater) was qualified as estimated, "J." The following calculations were performed for verification.

ICP Sample: 59MW01, Manganese

Conc. (µg/L) = (conc. µg/L) *(Final Volume mL) * (DF) / (Volume Sample mL)

Conc. (µg/L) = (20.5 µg/L)*(50 mL)*(1) / (50 mL) = 20.5 µg/L

Reported concentration = 20.5 µg/L
%D = 0.0%
Values were within 10% difference.

CVAA Sample: 48MW3 MSD, Mercury

Conc. (µg/L) = (conc. µg/L) *(Final Volume mL) * (DF) / (Volume Sample mL)

Conc. (µg/L) = (2.88 µg/L)*(50 mL)*(1) / (50 mL) = 2.9 µg/L

Reported concentration = 2.9 µg/L
%D = 0.0%.
Values were within 10% difference.

USEPA Region III Validation Qualifiers

(No Code) = Confirmed identification.

B = The analyte has been detected in the sample and the associated laboratory or field blank.

J = Indicates an estimated value for (1) estimated value due to QC non-conformance. Reported value may not be accurate or precise, (2) estimating a concentration as a tentatively identified compound as indicated by the mass spectral and retention time data, or (3) estimating a concentration ≥MDL and <MRL or <3*MDL, whichever is greater.

K = Analyte present. Reported value may be biased high (estimated) due to QC non-conformance.

L = Analyte present. Reported value may be biased low (estimated) due to QC non-conformance.

R = Unreliable result. Analyte may or may not be present in the sample due to QC non-conformance.

UL = Value is estimated bias low and not detected due to QC non-conformance. Reporting limit may be inaccurate or imprecise. Quantitation limit is probably higher.

UJ = Value is estimated and not detected due to QC non-conformance. Reporting limit may be inaccurate or imprecise.

Laboratory Qualifiers

(No Code) = Confirmed identification.

U = Not detected. The associated number indicates the compound reporting limit for the sample.

A (Dioxins) = B (Metals) = The reported value was obtained from a reading <MRL and ≥MDL and is considered estimated.

B (Organics) = The analyte or compound has been detected in the sample and laboratory method blank. It indicates probable blank contamination.

E (Metals) = Reported value is estimated because of the presence of interferences.

E (Organics) = Identifies compounds whose concentrations exceed the upper level of the calibration range.

D = Indicates sample was analyzed at a dilution.

EMPC (Dioxins) = The ion-abundance ratio between the two characteristic PCDD/PCDF ions was outside accepted ranges. The detected PCDD/PCDF was reported as an estimated maximum possible concentration (EMPC).

J = Indicates an estimated value for (1) estimating a concentration as a tentatively identified compound as indicated by the mass spectral and retention time data, or (2) estimating a concentration <MRL and ≥ MDL.

N (Organics) = Indicates presumptive evidence of a compound for tentatively identified compounds using a library search.

P (Organics) = Target analyte confirmation >40% difference for detected compound between the primary and secondary columns. The lower of the two values was reported.

N (Metals) = Laboratory spike sample recovery not within control limits.

* (Metals) = Duplicate analysis not within control limits.

* (Organics) = Surrogate outside of QC limits on both original and re-analysis.

Accutest Laboratories

Report of Analysis

3.1

3

Client Sample ID:	59MW01		
Lab Sample ID:	F52170-1	**Date Sampled:**	08/29/07
Matrix:	AQ - Ground Water	**Date Received:**	08/30/07
		Percent Solids:	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

Metals Analysis DATA VAL QUALIFIER

Analyte	Result	RL	MDL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Aluminum	725	200	79	ug/l	1	09/12/07	09/13/07	DM	SW846 6010B [2]	SW846 3010A [4]
Antimony	3.3 U	6.0	3.3	ug/l	1	09/12/07	09/13/07	DM	SW846 6010B [2]	SW846 3010A [4]
Arsenic	3.7 U	10	3.7	ug/l	1	09/12/07	09/13/07	DM	SW846 6010B [2]	SW846 3010A [4]
Barium	214	200	5.0	ug/l	1	09/12/07	09/13/07	DM	SW846 6010B [2]	SW846 3010A [4]
Beryllium	1.0 U	4.0	1.0	ug/l	1	09/12/07	09/13/07	DM	SW846 6010B [2]	SW846 3010A [4]
Cadmium	1.0 U	5.0	1.0	ug/l	1	09/12/07	09/13/07	DM	SW846 6010B [2]	SW846 3010A [4]
Calcium	30700	1000	100	ug/l	1	09/12/07	09/13/07	DM	SW846 6010B [2]	SW846 3010A [4]
Chromium	9.8 J J	10	0.92	ug/l	1	09/12/07	09/13/07	DM	SW846 6010B [2]	SW846 3010A [4]
Cobalt	1.0 U	50	1.0	ug/l	1	09/12/07	09/13/07	DM	SW846 6010B [2]	SW846 3010A [4]
Copper	1.2 U	25	1.2	ug/l	1	09/12/07	09/13/07	DM	SW846 6010B [2]	SW846 3010A [4]
Iron	801	300	15	ug/l	1	09/12/07	09/13/07	DM	SW846 6010B [2]	SW846 3010A [4]
Lead	2.1 U	5.0	2.1	ug/l	1	09/12/07	09/13/07	DM	SW846 6010B [2]	SW846 3010A [4]
Magnesium	23800	5000	100	ug/l	1	09/12/07	09/13/07	DM	SW846 6010B [2]	SW846 3010A [4]
Manganese	20.5	15	1.0	ug/l	1	09/12/07	09/13/07	DM	SW846 6010B [2]	SW846 3010A [4]
Mercury	0.11 U	1.0	0.11	ug/l	1	09/05/07	09/05/07	RS	SW846 7470A [1]	SW846 7470A [3]
Nickel	5.8 J J	40	1.0	ug/l	1	09/12/07	09/13/07	DM	SW846 6010B [2]	SW846 3010A [4]
Potassium	2090 J J B	10000	100	ug/l	1	09/12/07	09/13/07	DM	SW846 6010B [2]	SW846 3010A [4]
Selenium	4.0 U	10	4.0	ug/l	1	09/12/07	09/13/07	DM	SW846 6010B [2]	SW846 3010A [4]
Silver	0.77 U	10	0.77	ug/l	1	09/12/07	09/13/07	DM	SW846 6010B [2]	SW846 3010A [4]
Sodium	1460 J J	10000	500	ug/l	1	09/12/07	09/13/07	DM	SW846 6010B [2]	SW846 3010A [4]
Thallium	6.5 U	10	6.5	ug/l	1	09/12/07	09/13/07	DM	SW846 6010B [2]	SW846 3010A [4]
Vanadium	1.8 J J	50	1.1	ug/l	1	09/12/07	09/13/07	DM	SW846 6010B [2]	SW846 3010A [4]
Zinc	5.0 U	20	5.0	ug/l	1	09/12/07	09/13/07	DM	SW846 6010B [2]	SW846 3010A [4]

(1) Instrument QC Batch: MA5953
(2) Instrument QC Batch: MA5974
(3) Prep QC Batch: MP12873
(4) Prep QC Batch: MP12917

RL = Reporting Limit
MDL = Method Detection Limit

U = Indicates a result < MDL
J = Indicates a result > = MDL but < RL

Report of Analysis

Client Sample ID:	48MW1		
Lab Sample ID:	F52170-2	**Date Sampled:**	08/29/07
Matrix:	AQ - Ground Water	**Date Received:**	08/30/07
		Percent Solids:	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

Metals Analysis DATA VAL QUALIFIER

Analyte	Result	RL	MDL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Aluminum	79 U	200	79	ug/l	1	09/12/07	09/13/07	DM	SW846 6010B [2]	SW846 3010A [4]
Antimony	3.3 U	6.0	3.3	ug/l	1	09/12/07	09/13/07	DM	SW846 6010B [2]	SW846 3010A [4]
Arsenic	3.7 U	10	3.7	ug/l	1	09/12/07	09/13/07	DM	SW846 6010B [2]	SW846 3010A [4]
Barium	75.5 J J	200	5.0	ug/l	1	09/12/07	09/13/07	DM	SW846 6010B [2]	SW846 3010A [4]
Beryllium	1.0 U	4.0	1.0	ug/l	1	09/12/07	09/13/07	DM	SW846 6010B [2]	SW846 3010A [4]
Cadmium	1.0 U	5.0	1.0	ug/l	1	09/12/07	09/13/07	DM	SW846 6010B [2]	SW846 3010A [4]
Calcium	96400	1000	100	ug/l	1	09/12/07	09/13/07	DM	SW846 6010B [2]	SW846 3010A [4]
Chromium	9.9 J J	10	0.92	ug/l	1	09/12/07	09/13/07	DM	SW846 6010B [2]	SW846 3010A [4]
Cobalt	1.0 U	50	1.0	ug/l	1	09/12/07	09/13/07	DM	SW846 6010B [2]	SW846 3010A [4]
Copper	1.2 U	25	1.2	ug/l	1	09/12/07	09/13/07	DM	SW846 6010B [2]	SW846 3010A [4]
Iron	36.0 J J	300	15	ug/l	1	09/12/07	09/13/07	DM	SW846 6010B [2]	SW846 3010A [4]
Lead	2.1 U	5.0	2.1	ug/l	1	09/12/07	09/13/07	DM	SW846 6010B [2]	SW846 3010A [4]
Magnesium	44300	5000	100	ug/l	1	09/12/07	09/13/07	DM	SW846 6010B [2]	SW846 3010A [4]
Manganese	7.4 J J	15	1.0	ug/l	1	09/12/07	09/13/07	DM	SW846 6010B [2]	SW846 3010A [4]
Mercury	0.11 U	1.0	0.11	ug/l	1	09/05/07	09/05/07	RS	SW846 7470A [1]	SW846 7470A [3]
Nickel	5.7 J J	40	1.0	ug/l	1	09/12/07	09/13/07	DM	SW846 6010B [2]	SW846 3010A [4]
Potassium	1950 J SB	10000	100	ug/l	1	09/12/07	09/13/07	DM	SW846 6010B [2]	SW846 3010A [4]
Selenium	4.0 U	10	4.0	ug/l	1	09/12/07	09/13/07	DM	SW846 6010B [2]	SW846 3010A [4]
Silver	0.77 U	10	0.77	ug/l	1	09/12/07	09/13/07	DM	SW846 6010B [2]	SW846 3010A [4]
Sodium	2090 J J	10000	500	ug/l	1	09/12/07	09/13/07	DM	SW846 6010B [2]	SW846 3010A [4]
Thallium	6.5 U	10	6.5	ug/l	1	09/12/07	09/13/07	DM	SW846 6010B [2]	SW846 3010A [4]
Vanadium	1.1 J J	50	1.1	ug/l	1	09/12/07	09/13/07	DM	SW846 6010B [2]	SW846 3010A [4]
Zinc	6.3 J J	20	5.0	ug/l	1	09/12/07	09/13/07	DM	SW846 6010B [2]	SW846 3010A [4]

(1) Instrument QC Batch: MA5953
(2) Instrument QC Batch: MA5974
(3) Prep QC Batch: MP12873
(4) Prep QC Batch: MP12917

RL = Reporting Limit
MDL = Method Detection Limit

U = Indicates a result < MDL
J = Indicates a result > = MDL but < RL

Report of Analysis

Client Sample ID:	TMMW01		
Lab Sample ID:	F52170-3	**Date Sampled:**	08/29/07
Matrix:	AQ - Ground Water	**Date Received:**	08/30/07
		Percent Solids:	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

Metals Analysis DATA VAL QUALIFIER

Analyte	Result	RL	MDL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Aluminum	786	200	79	ug/l	1	09/12/07	09/13/07	DM	SW846 6010B [2]	SW846 3010A [4]
Antimony	3.3 U	6.0	3.3	ug/l	1	09/12/07	09/13/07	DM	SW846 6010B [2]	SW846 3010A [4]
Arsenic	3.7 U	10	3.7	ug/l	1	09/12/07	09/13/07	DM	SW846 6010B [2]	SW846 3010A [4]
Barium	246	200	5.0	ug/l	1	09/12/07	09/13/07	DM	SW846 6010B [2]	SW846 3010A [4]
Beryllium	1.0 U	4.0	1.0	ug/l	1	09/12/07	09/13/07	DM	SW846 6010B [2]	SW846 3010A [4]
Cadmium	1.0 U	5.0	1.0	ug/l	1	09/12/07	09/13/07	DM	SW846 6010B [2]	SW846 3010A [4]
Calcium	33200	1000	100	ug/l	1	09/12/07	09/13/07	DM	SW846 6010B [2]	SW846 3010A [4]
Chromium	10.2	10	0.92	ug/l	1	09/12/07	09/13/07	DM	SW846 6010B [2]	SW846 3010A [4]
Cobalt	1.0 U	50	1.0	ug/l	1	09/12/07	09/13/07	DM	SW846 6010B [2]	SW846 3010A [4]
Copper	1.2 U	25	1.2	ug/l	1	09/12/07	09/13/07	DM	SW846 6010B [2]	SW846 3010A [4]
Iron	859	300	15	ug/l	1	09/12/07	09/13/07	DM	SW846 6010B [2]	SW846 3010A [4]
Lead	2.1 U	5.0	2.1	ug/l	1	09/12/07	09/13/07	DM	SW846 6010B [2]	SW846 3010A [4]
Magnesium	25800	5000	100	ug/l	1	09/12/07	09/13/07	DM	SW846 6010B [2]	SW846 3010A [4]
Manganese	22.6	15	1.0	ug/l	1	09/12/07	09/13/07	DM	SW846 6010B [2]	SW846 3010A [4]
Mercury	0.11 U	1.0	0.11	ug/l	1	09/05/07	09/05/07	RS	SW846 7470A [1]	SW846 7470A [3]
Nickel	6.1 J J	40	1.0	ug/l	1	09/12/07	09/13/07	DM	SW846 6010B [2]	SW846 3010A [4]
Potassium	2230 J J B	10000	100	ug/l	1	09/12/07	09/13/07	DM	SW846 6010B [2]	SW846 3010A [4]
Selenium	4.0 U	10	4.0	ug/l	1	09/12/07	09/13/07	DM	SW846 6010B [2]	SW846 3010A [4]
Silver	0.77 U	10	0.77	ug/l	1	09/12/07	09/13/07	DM	SW846 6010B [2]	SW846 3010A [4]
Sodium	1250 J J	10000	500	ug/l	1	09/12/07	09/13/07	DM	SW846 6010B [2]	SW846 3010A [4]
Thallium	6.5 U	10	6.5	ug/l	1	09/12/07	09/13/07	DM	SW846 6010B [2]	SW846 3010A [4]
Vanadium	1.6 J J	50	1.1	ug/l	1	09/12/07	09/13/07	DM	SW846 6010B [2]	SW846 3010A [4]
Zinc	5.0 U	20	5.0	ug/l	1	09/12/07	09/13/07	DM	SW846 6010B [2]	SW846 3010A [4]

(1) Instrument QC Batch: MA5953
(2) Instrument QC Batch: MA5974
(3) Prep QC Batch: MP12873
(4) Prep QC Batch: MP12917

RL = Reporting Limit
MDL = Method Detection Limit

U = Indicates a result < MDL
J = Indicates a result > = MDL but < RL

Accutest Laboratories

Report of Analysis

Client Sample ID:	48MW2		
Lab Sample ID:	F52170-4	**Date Sampled:**	08/29/07
Matrix:	AQ - Ground Water	**Date Received:**	08/30/07
		Percent Solids:	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

Metals Analysis DATA VAL QUALIFIER

Analyte	Result	RL	MDL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Aluminum	14300	200	79	ug/l	1	09/12/07	09/13/07	DM	SW846 6010B [2]	SW846 3010A [4]
Antimony	3.3 U	6.0	3.3	ug/l	1	09/12/07	09/13/07	DM	SW846 6010B [2]	SW846 3010A [4]
Arsenic	4.4 J J	10	3.7	ug/l	1	09/12/07	09/13/07	DM	SW846 6010B [2]	SW846 3010A [4]
Barium	607	200	5.0	ug/l	1	09/12/07	09/13/07	DM	SW846 6010B [2]	SW846 3010A [4]
Beryllium	1.0 U	4.0	1.0	ug/l	1	09/12/07	09/13/07	DM	SW846 6010B [2]	SW846 3010A [4]
Cadmium	1.0 U	5.0	1.0	ug/l	1	09/12/07	09/13/07	DM	SW846 6010B [2]	SW846 3010A [4]
Calcium	185000	1000	100	ug/l	1	09/12/07	09/13/07	DM	SW846 6010B [2]	SW846 3010A [4]
Chromium	195	10	0.92	ug/l	1	09/12/07	09/13/07	DM	SW846 6010B [2]	SW846 3010A [4]
Cobalt	13.8 J J	50	1.0	ug/l	1	09/12/07	09/13/07	DM	SW846 6010B [2]	SW846 3010A [4]
Copper	19.7 J J	25	1.2	ug/l	1	09/12/07	09/13/07	DM	SW846 6010B [2]	SW846 3010A [4]
Iron	17200	300	15	ug/l	1	09/12/07	09/13/07	DM	SW846 6010B [2]	SW846 3010A [4]
Lead	2.1 U	5.0	2.1	ug/l	1	09/12/07	09/13/07	DM	SW846 6010B [2]	SW846 3010A [4]
Magnesium	109000	5000	100	ug/l	1	09/12/07	09/13/07	DM	SW846 6010B [2]	SW846 3010A [4]
Manganese	286	15	1.0	ug/l	1	09/12/07	09/13/07	DM	SW846 6010B [2]	SW846 3010A [4]
Mercury	0.11 U	1.0	0.11	ug/l	1	09/05/07	09/05/07	RS	SW846 7470A [1]	SW846 7470A [3]
Nickel	132	40	1.0	ug/l	1	09/12/07	09/13/07	DM	SW846 6010B [2]	SW846 3010A [4]
Potassium	6080 J J	10000	100	ug/l	1	09/12/07	09/13/07	DM	SW846 6010B [2]	SW846 3010A [4]
Selenium	4.0 U	10	4.0	ug/l	1	09/12/07	09/13/07	DM	SW846 6010B [2]	SW846 3010A [4]
Silver	0.77 U	10	0.77	ug/l	1	09/12/07	09/13/07	DM	SW846 6010B [2]	SW846 3010A [4]
Sodium	2240 J J	10000	500	ug/l	1	09/12/07	09/13/07	DM	SW846 6010B [2]	SW846 3010A [4]
Thallium	6.5 U	10	6.5	ug/l	1	09/12/07	09/13/07	DM	SW846 6010B [2]	SW846 3010A [4]
Vanadium	35.6 J J	50	1.1	ug/l	1	09/12/07	09/13/07	DM	SW846 6010B [2]	SW846 3010A [4]
Zinc	36.5	20	5.0	ug/l	1	09/12/07	09/13/07	DM	SW846 6010B [2]	SW846 3010A [4]

(1) Instrument QC Batch: MA5953
(2) Instrument QC Batch: MA5974
(3) Prep QC Batch: MP12873
(4) Prep QC Batch: MP12917

RL = Reporting Limit
MDL = Method Detection Limit

U = Indicates a result < MDL
J = Indicates a result >= MDL but < RL

Accutest Laboratories

Report of Analysis

Client Sample ID:	48MW3		
Lab Sample ID:	F52170-5	**Date Sampled:**	08/29/07
Matrix:	AQ - Ground Water	**Date Received:**	08/30/07
		Percent Solids:	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

Metals Analysis DATA VAL QUALIFIER

Analyte	Result		RL	MDL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Aluminum	79 U		200	79	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [4]
Antimony	3.3 U		6.0	3.3	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [4]
Arsenic	3.7 U		10	3.7	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [4]
Barium	66.0 J	J	200	5.0	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [4]
Beryllium	1.0 U		4.0	1.0	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [4]
Cadmium	1.0 U		5.0	1.0	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [4]
Calcium	93600	L	1000	100	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [4]
Chromium	8.1 J	J	10	0.92	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [4]
Cobalt	1.0 U		50	1.0	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [4]
Copper	1.2 U		25	1.2	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [4]
Iron	15 U	UL	300	15	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [4]
Lead	3.5 J	KB	5.0	2.1	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [4]
Magnesium	42700		5000	100	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [4]
Manganese	7.0 J	J	15	1.0	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [4]
Mercury	0.11 U		1.0	0.11	ug/l	1	09/05/07	09/05/07	RS	SW846 7470A [1]	SW846 7470A [3]
Nickel	5.0 J	J	40	1.0	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [4]
Potassium	3160 J	J	10000	100	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [4]
Selenium	4.0 U		10	4.0	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [4]
Silver	0.77 U		10	0.77	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [4]
Sodium	3660 J	KB	10000	500	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [4]
Thallium	6.5 U	UL	10	6.5	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [4]
Vanadium	1.1 U		50	1.1	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [4]
Zinc	5.0 U		20	5.0	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [4]

(1) Instrument QC Batch: MA5953
(2) Instrument QC Batch: MA5981
(3) Prep QC Batch: MP12873
(4) Prep QC Batch: MP12936

RL = Reporting Limit
MDL = Method Detection Limit

U = Indicates a result < MDL
J = Indicates a result > = MDL but < RL

Accutest Laboratories

Report of Analysis

Client Sample ID:	TMMW3		
Lab Sample ID:	F52170-6	**Date Sampled:**	08/29/07
Matrix:	AQ - Ground Water	**Date Received:**	08/30/07
		Percent Solids:	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

Metals Analysis DATA VAL QUALIFIER

Analyte	Result		RL	MDL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Aluminum	79 U		200	79	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [4]
Antimony	3.3 U		6.0	3.3	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [4]
Arsenic	3.7 U		10	3.7	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [4]
Barium	70.6 J	J	200	5.0	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [4]
Beryllium	1.0 U		4.0	1.0	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [4]
Cadmium	1.0 U		5.0	1.0	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [4]
Calcium	93000	L	1000	100	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [4]
Chromium	10		10	0.92	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [4]
Cobalt	1.0 U		50	1.0	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [4]
Copper	1.2 U		25	1.2	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [4]
Iron	15 U	UL	300	15	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [4]
Lead	2.1 U		5.0	2.1	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [4]
Magnesium	43500		5000	100	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [4]
Manganese	8.0 J	J	15	1.0	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [4]
Mercury	0.11 U		1.0	0.11	ug/l	1	09/05/07	09/05/07	RS	SW846 7470A [1]	SW846 7470A [3]
Nickel	6.8 J	J	40	1.0	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [4]
Potassium	3190 J	J	10000	100	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [4]
Selenium	4.0 U		10	4.0	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [4]
Silver	0.77 U		10	0.77	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [4]
Sodium	3590 J	KB	10000	500	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [4]
Thallium	6.5 U	UL	10	6.5	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [4]
Vanadium	1.1 U		50	1.1	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [4]
Zinc	5.0 U		20	5.0	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [4]

(1) Instrument QC Batch: MA5953
(2) Instrument QC Batch: MA5981
(3) Prep QC Batch: MP12873
(4) Prep QC Batch: MP12936

RL = Reporting Limit
MDL = Method Detection Limit

U = Indicates a result < MDL
J = Indicates a result > = MDL but < RL

Accutest Laboratories

Report of Analysis

3.7
3

Client Sample ID:	48MW4		
Lab Sample ID:	F52170-7	**Date Sampled:**	08/29/07
Matrix:	AQ - Ground Water	**Date Received:**	08/30/07
		Percent Solids:	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

Metals Analysis DATA VAL QUALIFIER

Analyte	Result	RL	MDL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Aluminum	79 U	200	79	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [4]
Antimony	3.3 U	6.0	3.3	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [4]
Arsenic	3.7 U	10	3.7	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [4]
Barium	148 J J	200	5.0	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [4]
Beryllium	1.0 U	4.0	1.0	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [4]
Cadmium	1.0 U	5.0	1.0	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [4]
Calcium	58900 L	1000	100	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [4]
Chromium	9.4 J J	10	0.92	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [4]
Cobalt	1.0 U	50	1.0	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [4]
Copper	1.2 U	25	1.2	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [4]
Iron	15 U UL	300	15	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [4]
Lead	2.1 J KB	5.0	2.1	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [4]
Magnesium	51900	5000	100	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [4]
Manganese	8.6 J J	15	1.0	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [4]
Mercury	0.11 U	1.0	0.11	ug/l	1	09/05/07	09/05/07	RS	SW846 7470A [1]	SW846 7470A [3]
Nickel	5.7 J J	40	1.0	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [4]
Potassium	3800 J J	10000	100	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [4]
Selenium	4.0 U	10	4.0	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [4]
Silver	0.77 U	10	0.77	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [4]
Sodium	12400 K	10000	500	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [4]
Thallium	6.5 U UL	10	6.5	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [4]
Vanadium	1.1 U	50	1.1	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [4]
Zinc	5.0 U	20	5.0	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [4]

(1) Instrument QC Batch: MA5953
(2) Instrument QC Batch: MA5981
(3) Prep QC Batch: MP12873
(4) Prep QC Batch: MP12936

RL = Reporting Limit
MDL = Method Detection Limit

U = Indicates a result < MDL
J = Indicates a result > = MDL but < RL

Report of Analysis

Client Sample ID:	49MW01		
Lab Sample ID:	F52170-8	**Date Sampled:**	08/29/07
Matrix:	AQ - Ground Water	**Date Received:**	08/30/07
		Percent Solids:	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

Metals Analysis

DATA VAL QUALIFIER

Analyte	Result		RL	MDL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Aluminum	437		200	79	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [4]
Antimony	3.3 U		6.0	3.3	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [4]
Arsenic	3.7 U		10	3.7	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [4]
Barium	137 J	J	200	5.0	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [4]
Beryllium	1.0 U		4.0	1.0	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [4]
Cadmium	1.0 U		5.0	1.0	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [4]
Calcium	40800	L	1000	100	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [4]
Chromium	23.8		10	0.92	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [4]
Cobalt	3.1 J	J	50	1.0	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [4]
Copper	1.2 U		25	1.2	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [4]
Iron	623	L	300	15	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [4]
Lead	2.1 U		5.0	2.1	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [4]
Magnesium	31000		5000	100	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [4]
Manganese	15.1		15	1.0	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [4]
Mercury	0.11 U		1.0	0.11	ug/l	1	09/05/07	09/05/07	RS	SW846 7470A [1]	SW846 7470A [3]
Nickel	14.5 J	J	40	1.0	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [4]
Potassium	3420 J	J	10000	100	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [4]
Selenium	4.0 U		10	4.0	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [4]
Silver	0.77 U		10	0.77	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [4]
Sodium	11400	K	10000	500	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [4]
Thallium	6.5 U	UL	10	6.5	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [4]
Vanadium	1.1 U		50	1.1	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [4]
Zinc	5.4 J	J	20	5.0	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [4]

(1) Instrument QC Batch: MA5953
(2) Instrument QC Batch: MA5981
(3) Prep QC Batch: MP12873
(4) Prep QC Batch: MP12936

RL = Reporting Limit
MDL = Method Detection Limit

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J = Indicates a result > = MDL but < RL

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Shaw® Shaw Environmental, Inc.

MEMORANDUM

TO: Jeff Parks, Shaw E&I Radford Army Ammunition Plant (RFAAP) Project Manager

FROM: Richard McCracken, Shaw E&I Project Chemist

SUBJECT: RFAAP Data Validation – Perchlorate
Datachem Laboratories, Inc. SDG 07E-0785-01
(Accutest Laboratories, Inc., SDG F52170)

DATE: November 7, 2007

The purpose of this memorandum is to present the data validation report for the samples collected at RFAAP August 29, 2007. The aqueous samples were analyzed for perchlorate analysis using liquid chromatography mass spectroscopy (LC/MS) SW-846 method LC-MS-CLO4/6850 in selective ion monitoring (SIM) mode. A total of eight aqueous samples were validated. The sample IDs are:

Field Sample ID	Lab Sample ID	Field Sample ID	Lab Sample ID
59MW01	F52170-1	48MW3	F52170-5
48MW1	F52170-2	TMMW3	F52170-6
TMMW01	F52170-3	48MW4	F52170-7
48MW2	F52170-4	49MW1	F52170-8

Data were reviewed and validated using a combination of project QAPP, *DOD Quality Systems Manual for Environmental Laboratories, Final Version 3, January, 2006* (DoD, 2006), *DoD Perchlorate Handbook August, Rev1, Change 1, 2007* (DoD, 2007), method-specific criteria, and laboratory SOP criteria. The data qualifier scheme was consistent with the *Region III Modifications to the National Functional Guidelines for Inorganic Data Review* (April, 1993). Parameters evaluated are presented in **Table 1**. Data associated with parameters in compliance with quality control specifications have not been qualified. Data associated with parameters that did not comply with quality control specifications and directly impacted project data have been qualified in accordance with USEPA Region III specifications.

Table 1 Laboratory Performance Criteria

Qualified		Parameter
Yes	No	
	X	Holding Times and Preservation
	X	Instrument Performance Check
X		Initial and Continuing Calibration
	X	Blank Analysis
	X	Internal Standards
	X	Laboratory Control Sample (LCS)
	X	Matrix Spike (MS) and Spike Duplicate (MSD)
	X	Field Duplicate
	X	Quantitation Verification

The quality of data collected in support of this sampling activity is considered acceptable with noted qualifications.

Richard McCracken, Chemist

11/7/07
Date

RFAAP VALIDATION REPORT
PERCHLORATE REVIEW
SDG 07E-0785-01 (F52170)

I-Holding Times and Preservation

The primary objective is to ascertain the validity of results based on the holding time of the sample from time of collection to time of sample analysis. For perchlorate analysis, aqueous samples are shipped and stored at @4°C±2°C with a maximum holding time of 28 days from collection (DoD Perchlorate Handbook criteria).

- Temperature Review: A temperature blank was sent with each cooler and recorded by the laboratory upon receipt. The samples collected on 8/29/07 were sent in 20 coolers, and were received by the laboratory on 8/30/07 at temperatures ranging from 0.8°C to 3.6°C, with 9 of the 20 coolers having temperatures below 2.0°C. The low sample temperatures are not expected to have an adverse impact on the analytical results. Accutest shipped the perchlorate aliquot to DataChem Laboratories on 8/30/07, they were received by DataChem on 8/31/07 at 4°C. No qualifiers were applied.

- Holding Time Review: The aqueous samples were collected on 8/29/07, prepped on 9/18/07, and analyzed on 9/18/07. All holding time criteria were met. No qualifiers were applied.

II-Instrument Performance Check

LC/MS instrument performance checks are performed to ensure mass resolution, identification and, to some degree, sensitivity. The analysis of the instrument performance check solution must be performed at the beginning of each 12-hour period during which samples are analyzed.

- The instrument performance check target compounds - $^{35}Cl^{16}O_3$, $^{37}Cl^{16}O_3$, and $^{35}Cl^{18}O_3$ - met the mass calibration criteria. No qualification was applied.

III-Initial and Continuing Calibration

Requirements for satisfactory instrument calibration are established to ensure that the instrument is capable of producing acceptable quantitative data. Initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of the analysis run, and continuing calibration verification documents that the initial calibration is still valid.

Perchlorate:	1- blank (<1/2MRL DoD Perchlorate Handbook)
	5 – standards (r≥0.995 DoD Perchlorate Handbook)
	ICV (±15%D DoD Perchlorate Handbook)
	CCV (±15%D DoD Perchlorate Handbook)
	ICS, LODV (±30%D DoD Perchlorate Handbook)

- The perchlorate samples were analyzed on 9/18/07.

- Perchlorate was calibrated using a second order equation on 9/18/07, and had a correlation coefficient of 0.9998.

- The perchlorate recovery in LODV2 (74.2%) was above criteria, which the lab attributed to a positive interference at m/z 83. The eight samples in this data set were analyzed between LODV1 and LODV2, and the perchlorate results from all samples have been qualified "J/UJ" as estimated.

- All other ICVs, CCVs, ICSs, and LODVs were within criteria.

IV-Blanks

The purpose of blank analyses is to determine the presence and magnitude of contamination problems resulting from field and laboratory activities. One method blank per analytical batch must be run on each instrument used to analyze samples. No contaminants should be detected in any of the associated blanks >MDL. The DoD Perchlorate Handbook criterion specifies all concentrations should be less than ½ MRL for method blanks. Positive sample results are reported and qualified "B", if the concentration of the compound in the sample is ≤5 times (5X) the maximum amount for target compounds. **Table 2** summarizes the blank contamination analysis. Action levels are based upon dilution factor of one.

Table 2 Blank Contamination Analysis Summary

Analysis Date	Analysis	QC Blank ID	Max Conc. µg/L	Action Level µg/L	B qualified samples
9/18/07	Perchlorate	BL-259711-1	<½MRL	NA	None
9/18/07	Perchlorate	RB083007	<½MRL	NA	None

MRL = Method Reporting Limit.
NA = Not Applicable.

V-Internal Standards

Internal standard performance criteria ensure that GC/MS sensitivity and response are stable during every analytical run. Internal standard area counts for samples and blanks must not vary by more than a factor of two (-50% to +100%) from the associated calibration standard. The DoD Handbook specifies relative retention times (RRT) of 1.0 ± 2% of last calibration standard. The mass ratio of ions 83:85 for each sample and standard should be 3.06, and must fall between 2.3 and 3.8 to confirm the presence of perchlorate. The laboratory 83:85 mass ratio limit range is 2.21 to 4.10.

- LODV1 and LODV3 did not meet the 83:85 mass ratio criteria, but all eight samples and the associated MS/MSD met the 83:85 mass ratio criteria. No data qualifiers were applied.

- All samples met area and RRT criteria, and all samples other than the three listed above met 83:85 mass ratio criteria.

VI-Laboratory Control Samples (LCS)

The laboratory control sample (LCS) serves as a monitor of the overall performance of each step during the analysis, including the sample preparation. DoD Perchlorate Handbook and laboratory aqueous limits are 85-115%.

- Sample QC-259711-1 was used as the aqueous LCS for perchlorate analysis on 9/18/07. All criteria were met. No qualifiers were applied.

VII-Matrix Spike (MS) and Spike Duplicate (MSD)

MS and MSD are generated to determine long-term accuracy and precision of the analytical method on various matrices and to demonstrate acceptable compound recovery by the laboratory at the time of sample analysis. Specific criteria include the analyses of matrix spike samples at a frequency of one MS/MSD per 20 samples of similar matrix. MS/MSD recoveries and relative percent differences between MS recoveries should be within the specified limits. DoD Perchlorate Handbook aqueous limits are 75-125%; RPD≤20%. The laboratory limits are 80-120%; RPD≤15%.

- Sample 48MW03 (F52170-5) was used for the MS/MSD analysis. All criteria were met. All samples were analyzed in conjunction with this MS/MSD.

VIII-Field Duplicate Sample Analysis
Field duplicates were collected to identify the cumulative precision of the sampling and analytical process and sent to the laboratory blind. The RPD was calculated only for those analytes which were detected at levels exceeding the method reporting limits in both samples of the duplicate pair. Analytes that were rejected (R-qualified) in either sample of the duplicate pair were excluded from the duplicate assessment. Precision control criterion was established at 50% RPD for the aqueous samples. Analytical results were qualified as estimated (J) for any RPDs exceeding criteria.

- Field duplicate pairs in this data set included 59MW01 (F52170-1) & TMMW01 (F52170-3), and 48MW3 (F52170-5) & TMMW3 (F52170-6). All compounds detected above the MDL met RPD criteria. No data qualifiers were applied.

IX-Quantitation Verification
The accuracy of analytical results is verified through the calculation of several parameters. The percent difference (%D) between the calculated and the reported values should be within 10%. Any sample value >MDL and <MRL or <3*MDL (whichever was greater) was qualified as estimated, "J." The following calculations were performed for verification.

Sample: TMMW3 (F52170-6, 07E04505), Perchlorate

y (area ratio) = (Sample Area/Area EIC89) = (6924.26/49747.7) = 0.1392 = ax^2 + bx + c

solve for x
x = [-b ± SQRT(b^2-4ac)] / (2a)

where: x is the amount ratio

a = 0.0225735 b = 1.36878 c = - 0.0186592 - 0.1392 = -0.15786

amount ratio ={-1.36878± [SQRT{(1.36878^2) – (4*0.0225735*-0.15786)}] / (2*0.0225735)
={-1.36878± [SQRT (1.8735587+0.014254)]}/0.045147
={-1.36878±[SQRT 1.887813]} / 0.045147
={ -1.36878±1.37398 }/0.045147
=0.1152

Conc. µg/L = (Amount ratio * Is * DF)

where: Conc. = Sample concentration in ug/L
I_s = Amount of internal standard (µg/L).
DF = Dilution factor

Conc. µg/L = (Amount ratio * Is * DF)
= (0.1152* 5 µg/L * 1) = 0.576 µg/L

Reported concentration = 0.576 µg/L
%D = 0.0%
Values were within 10% difference.

USEPA Region III Validation Qualifiers

(No Code) = Confirmed identification.

B = The analyte has been detected in the sample and the associated laboratory or field blank.

J = Indicates an estimated value for (1) estimated value due to QC non-conformance. Reported value may not be accurate or precise, (2) estimating a concentration as a tentatively identified compound as indicated by the mass spectral and retention time data, or (3) estimating a concentration ≥MDL and <MRL or <3*MDL, whichever is greater.

K = Analyte present. Reported value may be biased high (estimated) due to QC non-conformance.

L = Analyte present. Reported value may be biased low (estimated) due to QC non-conformance.

R = Unreliable result. Analyte may or may not be present in the sample due to QC non-conformance.

UL = Value is estimated bias low and not detected due to QC non-conformance. Reporting limit may be inaccurate or imprecise. Quantitation limit is probably higher.

UJ = Value is estimated and not detected due to QC non-conformance. Reporting limit may be inaccurate or imprecise.

Laboratory Qualifiers

(No Code) = Confirmed identification.

U = Not detected. The associated number indicates the compound reporting limit for the sample.

A (Dioxins) = B (Metals) = The reported value was obtained from a reading <MRL and ≥MDL and is considered estimated.

B (Organics) = The analyte or compound has been detected in the sample and laboratory method blank. It indicates probable blank contamination.

E (Metals) = Reported value is estimated because of the presence of interferences.

E (Organics) = Identifies compounds whose concentrations exceed the upper level of the calibration range.

EMPC (Dioxins) = The ion-abundance ratio between the two characteristic PCDD/PCDF ions was outside accepted ranges. The detected PCDD/PCDF was reported as an estimated maximum possible concentration (EMPC).

D = Indicates sample was analyzed at a dilution.

J = Indicates an estimated value for (1) estimating a concentration as a tentatively identified compound as indicated by the mass spectral and retention time data, or (2) estimating a concentration <MRL and ≥MDL.

N (Organics) = Indicates presumptive evidence of a compound for tentatively identified compounds using a library search.

N (Metals) = Laboratory spike sample recovery not within control limits.

P (Organics) = Target analyte confirmation >40% difference for detected compound between the primary and secondary columns. The lower of the two values was reported.

* (Metals) = Duplicate analysis not within control limits.

* (Organics) = Surrogate outside of QC limits on both original and re-analysis.

DATA CHEM LABORATORIES
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FORM A (TYPE I)
SINGLE METHOD ANALYSES

SAMPLE ANALYSIS DATA SHEET

S077Z02F

Date Printed.....: 21-SEP-07 10:48

Client Name.....: ACCUTEST Laboratories
Client Ref Number....: Not Provided
Sampling Site.....: F52170
Release Number.....: Not Provided

Date Received.....: 31-AUG-07 00:00

Client Sample Name: **F52170-1**
DCL Sample Name...: **07E04500**
DCL Report Group..: **07E-0785-01**

Matrix.....: WATER
Date Sampled.....: 29-AUG-07 06:50
Reporting Units...: ug/L
Report Basis.....: [X] As Received [ ] Dried

DCL Preparation Group: Not Applicable
Date Prepared.....: 18-SEP-07 00:00
Preparation Method...: 6850
Aliquot Weight/Volume: Not Applicable
Net Weight/Volume....: Not Required

DCL Analysis Group: G078K00V
Analysis Method...: 6850
Instrument Type...: LC/MS
Instrument ID.....: LCMS02
Column Type.....: KP-RPPX250
[X] Primary
[ ] Confirmation

Analytical Results

DATA VAL QUALIFIER

Analyte	Date Analyzed	MDL	Result	Comment	Qual.	Dilution	PQL
Perchlorate	18-SEP-07 17:56	0.0663	0.283			1	0.200

J

960 West LeVoy Drive / Salt Lake City, Utah 84123-2547
Phone (801) 266-7700 Web Page: www.datachem.com
FAX (801) 268-9992 E-mail: lab@datachem.com

DATA CHEM LABORATORIES
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FORM A (TYPE I)
SINGLE METHOD ANALYSES

SAMPLE ANALYSIS DATA SHEET

Form RLIMS63A-V1.4
09210710484034

S077Z02G

Date Printed.....: 21-SEP-07 10:48

Client Name.....: ACCUTEST Laboratories
Client Ref Number....: Not Provided
Sampling Site.....: F52170
Release Number.....: Not Provided

Date Received.....: 31-AUG-07 00:00

Client Sample Name: **F52170-2**
DCL Sample Name...: **07E04501**
DCL Report Group..: **07E-0785-01**

Matrix.....: WATER
Date Sampled.....: 29-AUG-07 08:20
Reporting Units...: ug/L
Report Basis.....: [X] As Received [ ] Dried

DCL Preparation Group: Not Applicable
Date Prepared.....: 18-SEP-07 00:00
Preparation Method...: 6850
Aliquot Weight/Volume: Not Applicable
Net Weight/Volume....: Not Required

DCL Analysis Group: G078K00V
Analysis Method...: 6850
Instrument Type...: LC/MS
Instrument ID.....: LCMS02
Column Type.....: KP-RPPX250
[X] Primary
[ ] Confirmation

Analytical Results

DATA VAL QUALIFIER J

Analyte	Date Analyzed	MDL	Result	Comment	Qual.	Dilution	PQL
Perchlorate	18-SEP-07 18:16	0.0663	0.190		J	1	0.200

960 West LeVoy Drive / Salt Lake City, Utah 84123-2547
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FAX (801) 268-9992 E-mail: lab@datachem.com

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FORM A (TYPE I)
SINGLE METHOD ANALYSES

SAMPLE ANALYSIS DATA SHEET

S077Z02H

Date Printed.....: 21-SEP-07 10:48

Client Name.....: ACCUTEST Laboratories
Client Ref Number....: Not Provided
Sampling Site.....: F52170
Release Number.....: Not Provided

Date Received.....: 31-AUG-07 00:00

Client Sample Name: **F52170-3**
DCL Sample Name...: **07E04502**
DCL Report Group..: **07E-0785-01**

Matrix.....: WATER
Date Sampled.....: 29-AUG-07 06:50
Reporting Units...: ug/L
Report Basis.....: ☒ As Received ☐ Dried

DCL Preparation Group: Not Applicable
Date Prepared.....: 18-SEP-07 00:00
Preparation Method...: 6850
Aliquot Weight/Volume: Not Applicable
Net Weight/Volume....: Not Required

DCL Analysis Group: G078K00V
Analysis Method...: 6850
Instrument Type...: LC/MS
Instrument ID.....: LCMS02
Column Type.....: KP-RPPX250
☒ Primary
☐ Confirmation

DATA VAL QUALIFIER

Analytical Results

Analyte	Date Analyzed	MDL	Result	Comment	Qual.	Dilution	PQL	
Perchlorate	18-SEP-07 18:35	0.0663	0.239			1	0.200	J

960 West LeVoy Drive / Salt Lake City, Utah 84123-2547
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FAX (801) 268-9992 E-mail: lab@datachem.com

DATA CHEM LABORATORIES
A Sorenson Company

FORM A (TYPE I)
SINGLE METHOD ANALYSES

SAMPLE ANALYSIS DATA SHEET

Form RLIMS63A-V1.4
09210710484034

S077Z02J

Date Printed.....: 21-SEP-07 10:48

Client Name.....: ACCUTEST Laboratories
Client Ref Number....: Not Provided
Sampling Site.....: F52170
Release Number.....: Not Provided

Date Received.....: 31-AUG-07 00:00

Client Sample Name: **F52170-4**
DCL Sample Name...: **07E04503**
DCL Report Group..: **07E-0785-01**

Matrix.....: WATER
Date Sampled.....: 29-AUG-07 08:40
Reporting Units...: ug/L
Report Basis.....: [X] As Received [ ] Dried

DCL Preparation Group: Not Applicable
Date Prepared.....: 18-SEP-07 00:00
Preparation Method...: 6850
Aliquot Weight/Volume: Not Applicable
Net Weight/Volume....: Not Required

DCL Analysis Group: G078K00V
Analysis Method...: 6850
Instrument Type...: LC/MS
Instrument ID.....: LCMS02
Column Type.....: KP-RPPX250
[X] Primary
[ ] Confirmation

Analytical Results

DATA VAL QUALIFIER

Analyte	Date Analyzed	MDL	Result	Comment	Qual.	Dilution	PQL	
Perchlorate	18-SEP-07 18:55	0.0663	0.548			1	0.200	J

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FORM A (TYPE I)
SINGLE METHOD ANALYSES

SAMPLE ANALYSIS DATA SHEET

S077Z02K

Date Printed.....: 21-SEP-07 10:48

Client Name.....: ACCUTEST Laboratories
Client Ref Number....: Not Provided
Sampling Site.....: F52170
Release Number.....: Not Provided

Date Received.....: 31-AUG-07 00:00

Client Sample Name: **F52170-5**
DCL Sample Name...: **07E04504**
DCL Report Group..: **07E-0785-01**

Matrix.....: WATER
Date Sampled.....: 29-AUG-07 10:30
Reporting Units...: ug/L
Report Basis.....: [X] As Received [ ] Dried

DCL Preparation Group: Not Applicable
Date Prepared.....: 18-SEP-07 00:00
Preparation Method...: 6850
Aliquot Weight/Volume: Not Applicable
Net Weight/Volume....: Not Required

DCL Analysis Group: G078K00V
Analysis Method...: 6850
Instrument Type...: LC/MS
Instrument ID.....: LCMS02
Column Type.....: KP-RPPX250
[X] Primary
[ ] Confirmation

DATA VAL QUALIFIER

Analytical Results

Analyte	Date Analyzed	MDL	Result	Comment	Qual.	Dilution	PQL
Perchlorate	18-SEP-07 19:14	0.0663	0.407			1	0.200

J

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FORM A (TYPE I)
SINGLE METHOD ANALYSES

SAMPLE ANALYSIS DATA SHEET

S077Z02N

Date Printed.....: 21-SEP-07 16:07

Client Name.....: ACCUTEST Laboratories
Client Ref Number....: Not Provided
Sampling Site.....: F52170
Release Number.....: Not Provided

Date Received.....: 31-AUG-07 00:00

Client Sample Name: **F52170-6**
DCL Sample Name...: **07E04505**
DCL Report Group..: **07E-0785-01**

Matrix.....: WATER
Date Sampled.....: 29-AUG-07 10:30
Reporting Units...: ug/L
Report Basis.....: ☒ As Received ☐ Dried

DCL Preparation Group: Not Applicable
Date Prepared.....: 18-SEP-07 00:00
Preparation Method...: 6850
Aliquot Weight/Volume: Not Applicable
Net Weight/Volume....: Not Required

DCL Analysis Group: G078K00V
Analysis Method...: 6850
Instrument Type...: LC/MS
Instrument ID.....: LCMS02
Column Type.....: KP-RPPX250
☒ Primary
☐ Confirmation

DATA VAL QUALIFIER

Analytical Results

Analyte	Date Analyzed	MDL	Result	Comment	Qual.	Dilution	PQL
Perchlorate	18-SEP-07 20:13	0.0663	0.576			1	0.200

J

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FORM A (TYPE I)
SINGLE METHOD ANALYSES

SAMPLE ANALYSIS DATA SHEET

S077Z02P

Date Printed.....: 21-SEP-07 10:48

Client Name.....: ACCUTEST Laboratories
Client Ref Number....: Not Provided
Sampling Site.....: F52170
Release Number.....: Not Provided

Date Received.....: 31-AUG-07 00:00

Client Sample Name: **F52170-7**
DCL Sample Name...: **07E04506**
DCL Report Group..: **07E-0785-01**

Matrix.....: WATER
Date Sampled.....: 29-AUG-07 14:10
Reporting Units...: ug/L
Report Basis.....: [X] As Received [ ] Dried

DCL Preparation Group: Not Applicable
Date Prepared.....: 18-SEP-07 00:00
Preparation Method...: 6850
Aliquot Weight/Volume: Not Applicable
Net Weight/Volume....: Not Required

DCL Analysis Group: G078K00V
Analysis Method...: 6850
Instrument Type...: LC/MS
Instrument ID.....: LCMS02
Column Type.....: KP-RPPX250
[X] Primary
[ ] Confirmation

DATA VAL QUALIFIED

Analytical Results

Analyte	Date Analyzed	MDL	Result	Comment	Qual.	Dilution	PQL
Perchlorate	18-SEP-07 20:33	0.0663	0.311			1	0.200

J

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FORM A (TYPE I)
SINGLE METHOD ANALYSES

SAMPLE ANALYSIS DATA SHEET

S077Z02Q

Date Printed.....: 21-SEP-07 10:48

Client Name.....: ACCUTEST Laboratories
Client Ref Number....: Not Provided
Sampling Site.....: F52170
Release Number.....: Not Provided

Date Received.....: 31-AUG-07 00:00

Client Sample Name: **F52170-8**
DCL Sample Name...: **07E04507**
DCL Report Group..: **07E-0785-01**

Matrix.....: WATER
Date Sampled.....: 29-AUG-07 14:00
Reporting Units...: ug/L
Report Basis.....: ☒ As Received ☐ Dried

DCL Preparation Group: Not Applicable
Date Prepared.....: 18-SEP-07 00:00
Preparation Method...: 6850
Aliquot Weight/Volume: Not Applicable
Net Weight/Volume....: Not Required

DCL Analysis Group: GC78K00V
Analysis Method...: 6850
Instrument Type...: LC/MS
Instrument ID.....: LCMS02
Column Type.....: KP-RPPX250
☒ Primary
☐ Confirmation

DATA VAL QUALIFIER

Analytical Results

Analyte	Date Analyzed	MDL	Result	Comment	Qual.	Dilution	PQL
Perchlorate	18-SEP-07 20:53	0.0663	0.193		J	1	0.200

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Shaw Environmental, Inc.
2790 Mosside Blvd
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412-858-3335
FAX: 412-372-8968

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MEMORANDUM

TO: Jeff Parks, Shaw E&I Radford Army Ammunition Plant (RFAAP) Project Manager

FROM: Richard McCracken, Shaw E&I Project Chemist

SUBJECT: RFAAP Data Validation – Pesticides and PCBs
Accutest Laboratories, Inc., SDG F52170

DATE: November 6, 2007

The purpose of this memorandum is to present the data validation report for the samples collected at RFAAP on August 29, 2007. Samples were analyzed for pesticides and PCBs using USEPA Methods 510C/8081A and 3510C/8082, respectively. A total of eight aqueous samples were validated. The sample IDs are:

Field Sample ID	Lab Sample ID	Field Sample ID	Lab Sample ID
59MW01	F52170-1	48MW3	F52170-5
48MW1	F52170-2	TMMW3	F52170-6
TMMW01	F52170-3	48MW4	F52170-7
48MW2	F52170-4	49MW1	F52170-8

Data were reviewed by Richard McCracken and validated using a combination of project QAPP, *Quality Systems Manual for Environmental Laboratories, Final Version 3, January, 2006* (DoD, 2006) (DoD QSM), method-specific criteria, and laboratory SOP criteria. The data qualifier scheme was consistent with the *Region III Modifications to the National Functional Guidelines for Organic Data Review* (September 1994). Parameters evaluated are presented in **Table 1**. Data associated with parameters in compliance with quality control specifications have not been qualified. Data associated with parameters that did not comply with quality control specifications and directly impacted project data have been qualified in accordance with USEPA Region III specifications.

Table 1 Laboratory Performance Criteria

Qualified		Parameter
Yes	No	
	X	Holding Times and Preservation
	X	Instrument Performance Check
	X	Initial Calibration
X		Continuing Calibration
	X	Blank Analysis
X		System Monitoring Compounds
X		Laboratory Control Samples
X		Matrix Spike/Spike Duplicate
	X	Field Duplicate
	X	Quantitation Verification

The quality of data collected in support of this sampling activity is considered acceptable with noted qualifications.

Richard M. Cracken

Richard McCracken, Chemist

11/6/07

Date

RFAAP VALIDATION REPORT
PESTICIDE/PCB REVIEW
SDG F52170

I-Holding Times and Preservation
The objective is to ascertain the validity of results based on the holding time of the sample from time of collection to time of sample extraction and analysis. For aqueous samples, pesticide and PCB compounds are shipped @4°C ± 2°C, with a maximum holding time of 7 days from sample collection to preparative extraction and 40 days from preparative extraction to determinative analysis.

- Temperature Review: A temperature blank was sent with each cooler and recorded by the laboratory upon receipt. The samples collected on 8/29/07 were sent in 20 coolers, and were received by the laboratory on 8/30/07 at temperatures ranging from 0.8°C to 3.6°C, with 9 of the 20 coolers having temperatures below 2.0°C. The low sample temperatures are not expected to have an adverse impact on the analytical results. No qualifiers were applied.

- Holding Time Review: The samples were collected on 8/29/07, extracted for pesticides and PCBs on 9/4/07, analyzed for pesticides on 9/17/07 & 9/18/07, and analyzed for PCBs on 9/19/07. All criteria were met. No qualifiers were applied.

II-Instrument Performance Check (Degradation Standard)
Performance checks on the gas chromatograph with electron capture detector (GC/ECD) system are performed to ensure adequate resolution and instrument sensitivity. The performance evaluation mixture (PEM) must be analyzed at the beginning of the analytical sequence. The breakdown of Endrin and 4,4'-DDT must be ≤15% on both signals.

- During analysis performed on 9/13/07 @1124, endrin and 4,4'-DDT percent breakdowns were 7.5% and 3.3% on signal #1, and 6.8% and 2.7% on signal #2, respectively. All criteria were met. No qualifiers were applied.

- During analysis performed on 9/17/07 @1541, endrin and 4,4'-DDT percent breakdowns were 8.6% and 11.3% on signal #1, and 8.2% and 9.8% on signal #2, respectively. All criteria were met. No qualifiers were applied.

III-Initial Calibration
Compliance requirements for satisfactory instrument calibration are established to ensure that the instrument is capable of producing acceptable qualitative and quantitative data for the target compounds. The initial 5 point calibration demonstrates that the instrument is capable of acceptable performance in the beginning of the analytical run. Calibration factors are generated for each compound. The DoD QSM specifies that the percent relative standard deviation (%RSD) for all single peak target analytes, and aroclors 1016, 1242, 1254, and 1260 must be <20% or the mean %RSD for all analytes in the standard must be ≤20%. If linear regression is used, the correlation coefficient must be ≥0.990. All detects are qualified as estimated "J" for where there were exceeding %RSDs, and all non-detects are qualified as estimated "UJ" for where there were grossly exceeding recoveries, unless determined to be unusable "R". Grossly exceeding is defined as twice the established criteria limits.

- During the pesticide initial calibration performed on 9/13/07 on instrument ECD6, all criteria were met. No qualifiers were applied. All samples were analyzed following this initial calibration.

- During the PCB initial calibration performed on 9/17/07 on instrument ECD3, all criteria were met. No qualifiers were applied. All samples were analyzed following this initial calibration.

IV-Continuing Calibration

Compliance requirements for satisfactory instrument calibration are established to ensure that the instrument is capable of producing acceptable qualitative and quantitative data for pesticide/PCB target compounds. Continuing calibration standards containing both target compounds and surrogates are analyzed at the beginning of each 12-hour analytical shift and after every 20 samples. The DoD QSM specifies that the percent difference (%D) or the average %Ds for all analytes in the standard from the calibration should be no greater than ±20%.

- During the pesticide initial calibration verification performed on 9/13/07 @1346 on instrument ECD6, all criteria were met. No qualifiers were applied. No samples were analyzed in conjunction with this ICV.

- During the pesticide continuing calibration performed on 9/17/07 @2040 on instrument ECD6, all criteria were met. No qualifiers were applied. Samples 59MW01, 48MW1, TMMW01, 48MW2, and 48MW3 were analyzed after this continuing calibration.

- During the pesticide continuing calibration performed on 9/17/07 @2318 on instrument ECD6, endrin ketone (20.8%) had a high %D on signal #2. All endrin ketone results in associated samples have been qualified "J/UJ". All other compounds met criteria. Samples 59MW01, 48MW1, TMMW01, 48MW2, and 48MW3 were analyzed prior to this continuing calibration, while samples TMMW3, 48MW4, and 49MW01 were analyzed after to this continuing calibration.

- During the pesticide continuing calibration performed on 9/18/07 @0036 on instrument ECD6, all criteria were met. No qualifiers were applied. Samples TMMW3, 48MW4, and 48MW01 were analyzed prior to this continuing calibration.

- During the PCB 1016/1260 initial calibration verification performed on 9/17/07 @1518 on instrument ECD3, all criteria were met. No qualifiers were applied. No samples were analyzed following this initial calibration verification.

- During the PCB 1016/1260 continuing calibration performed on 9/19/07 @1156 on instrument ECD3, all criteria were met. No qualifiers were applied. Samples 59MW01, 48MW1, TMMW01, and 48MW2 were analyzed after this continuing calibration.

- During the PCB 1016/1260 continuing calibration performed on 9/19/07 @1509 on instrument ECD3, aroclor 1016 peak #1 had high %D on signal #1 (22.3%) and signal #2 (23.2%). The average %D from all six peaks was < 20% on signal #1 (9.0%) and signal #2 (9.3%), so no qualifiers were applied. The aroclor 1260 peaks met criteria. Samples 59MW01, 48MW1, TMMW01, and 48MW2 were analyzed prior to this continuing calibration, while samples 48MW3, TMMW3, 48MW4, and 49MW01 were analyzed after this continuing calibration.

- During the PCB 1016/1260 continuing calibration performed on 9/19/07 @1734 on instrument ECD3, aroclor 1016 peak #1 had high %D on signal #1 (25.5%) and signal #2 (24.8%). The average %D from all six peaks was < 20% on signal #1 (11.0%) and signal #2 (9.9%), so no qualifiers were applied. The aroclor 1260 peaks met criteria. Samples 48MW3, TMMW3, 48MW4, and 49MW01 were analyzed prior to this continuing calibration.

V-Blank Analysis

The purpose of laboratory or field blank analyses is to determine the existence and magnitude of contamination problems resulting from laboratory or field activities. One method blank per analytical batch must be run on each instrument used to analyze samples. The DoD QSM criterion specifies all concentrations should be less than one-half MRL. Positive sample results are reported and qualified "B", if the concentration of the compound in the sample is ≤5 times (5X) the maximum amount for pesticide and PCB target compounds. **Table 2** summarizes the blank contamination analysis.

Table 2 Blank Contamination Analysis Summary

Parameter	Analysis Date	QC Blank ID	Compound	Max Conc. µg/L	Action Level µg/L	B qualified samples
Pesticides	9/17/07	OP22191-MB	All target <½MRL	NA	NA	None
Pesticides	9/24/07	RB083007	All target <½MRL	NA	NA	None
PCBs	9/19/07	OP22188-MB	All target <½MRL	NA	NA	None
PCBs	9/14/07	RB083007	All target <½MRL	NA	NA	None

NA = Not Applicable
MRL = Method Reporting Limit

VI-System Monitoring Compound (Surrogates)
Laboratory performance on individual samples is evaluated through the review of surrogate spike samples. Surrogate spikes are added to all samples and blanks to measure their recovery in sample and blank matrices. The percent recoveries (%Rs) must be within the specified control limits. DoD surrogate recovery limits are specified in Table D-3 of the DoD QSM (DoD, 2006). If the surrogate is not listed, then the laboratory criteria shall be used.

Aqueous Criteria:	Tetrachloro-m-xylene:	Pesticides: 42-127% (DoD QSM 25-140%)
	Decachlorobiphenyl:	Pesticides: 27-127% (DoD QSM 30-135%)
	Tetrachloro-m-xylene:	PCBs: 38-127% (DoD QSM Not Listed)
	Decachlorobiphenyl:	PCBs: 25-137% (DoD QSM 40-135%)

- Sample 48MW2 had a low decachlorobiphenyl recovery (29.2%) from signal #2 during pesticide analysis. Decachlorobiphenyl met recovery criteria on signal #1, and tetrachloro-m-xylene was within criteria on both signals. No qualifiers are required when only one surrogate is outside criteria from one signal.

- All other samples met surrogate recovery criteria during pesticide analysis.

- Sample 48MW2 had low decachlorobiphenyl recoveries (28.7%, 29.6%) from both signals during PCB analysis. The PCB results from 48MW2 have been qualified "J/UJ" as estimated.

- All other samples met surrogate recovery criteria during PCB analysis.

VII-Laboratory Control Samples
Laboratory control samples (LCS) are used to monitor laboratory accuracy by calculating the percent recoveries of the spiked compounds. All LCS percent recoveries must be within the specified control limits. DoD QSM aqueous LCS recovery limits are specified in Table D-14 and Table D-16 of the DoD QSM (DoD, 2006). If the compound is not listed, then the laboratory criteria shall be used.

- Sample OP22191-BS was used as the LCS during 9/17/07 pesticide analysis. Endrin aldehyde (24%) had a low recovery, and was not detected in any field samples – the results have been qualified "UL" as estimated. All other pesticides met recovery criteria.

- Sample OP22188-BS was used as the LCS during the 9/19/07 PCB analysis. All criteria were met. No qualifiers were applied.

VIII-Matrix Spike/Matrix Spike Duplicate
Data for matrix spike/matrix spike duplicates (MS/MSD) are generated to determine long-term precision and accuracy of the analytical method on various matrices and to demonstrate acceptable compound recovery by the laboratory at the time of sample analysis. The percent recoveries (%Rs) and the relative percent difference (RPD) must be within the specified control limits. DoD aqueous MS/MSD recovery limits follow the LCS criteria and are specified in Table D-14 and Table D-16 of the DoD QSM (DoD, 2006). If the compound is not listed, then the laboratory criteria shall be used.

- Sample 48MW3 was used for the pesticide MS/MSD analysis. Endrin aldehyde (20%, 27%) had a low recovery in the MS and MSD, as well as having a low recovery in the associated LCS. All sample results have already been qualified "UL", no further qualification is required. All other pesticides met criteria. All samples were analyzed in conjunction with this MS/MSD.

- Sample 48MW3 was used for the PCB MS/MSD analysis. All criteria were met. No qualifiers were applied. All samples were analyzed in conjunction with this MS/MSD.

IX-Field Duplicate Sample Analysis
Field duplicates were collected to identify the cumulative precision of the sampling and analytical process and sent to the laboratory blind. The RPD was calculated only for those analytes which were detected at levels exceeding the method reporting limits in both samples of the duplicate pair. Analytes that were rejected (R-qualified) in either sample of the duplicate pair were excluded from the duplicate assessment. Precision control criterion was established at 50% RPD for the aqueous and solid samples. Analytical results were qualified as estimated (J) for any RPDs exceeding criteria.

- Field duplicate pairs in this data set included 59MW01 & TMMW01, and 48MW3 & TMMW3. All pesticides detected above the MDL met RPD criteria. No data qualifiers were applied.

X-Quantitation Verification
The accuracy of analytical results was verified through the calculation of several parameters. The difference between the calculated value and the reported value must be within 10% difference. All positive values must have less than or equal to 40% %D between the primary and secondary columns. Any sample value >MDL and <MRL or <3*MDL (whichever is greater) was qualified as estimated, "J." All criteria were met.

Sample: 48MW3MSD, dieldrin

Conc. µg/L = (Ax * Vt * DF) / (CF * Vi * Vs *1000)

where: Ax = Area response for the compound being measured
Vt = Total volume of extract, taking into account dilutions (uL)
DF = Dilution factor
CF = Calibration Factor from initial calibration (area/pg)
Vi = Volume of extract injected (uL)
Vs = Volume of the sample extracted (mL)

Conc. µg/L = (2737226 * 1 * 10000) / (48810 * 520 * 1 * 1000)
= 1.1 ng/mL = 1.1 ug/L

Reported Conc. = 1.1 µg/L
%D = 0.0%
Values were within 10% difference

Sample: 48MW3MS, Aroclor 1260

Conc. µg/L = (Ax * Vt * DF) / (CF * Vi * Vs * 1000)

where: Conc. = Sample concentration in µg/L
Ax = Area response for compound being measured.
Vt = Total volume of extract, taking into account dilutions (µL)
DF = Dilution factor
CF = Calibration factor from ICAL (area/pg)
Vi = Volume of extract injected (µL).
Vs = Volume of sample extracted (mL).

Signal #1
Conc1 µg/L = (3361004 * 10000* 1) / (8730 * 1 * 510 * 1000) = 7.55 µg/L
Conc2 µg/L = (3706286 * 10000* 1) / (10130 * 1 * 510 * 1000) = 7.17 µg/L
Conc3 µg/L = (4017626 * 10000* 1) / (10500 * 1 * 510 * 1000) = 7.50 µg/L
Conc4 µg/L = (2901174 * 10000* 1) / (7745 * 1 * 510 * 1000) = 7.34 µg/L
Conc5 µg/L = (6662020 * 10000* 1) / (18130 * 1 * 510 * 1000) = 7.20 µg/L
Conc6 µg/L = (3693262 * 10000* 1) / (10080 * 1 * 510 * 1000) = 7.18 µg/L
Average concentration = 7.3 µg/L

Reported Value = 7.3 µg/L (from signal #1)
% Difference = 0.0%
Values were within 10% difference.

USEPA Region III Validation Qualifiers

(No Code) = Confirmed identification.

B = The analyte has been detected in the sample and the associated laboratory or field blank.

J = Indicates an estimated value for (1) estimated value due to QC non-conformance. Reported value may not be accurate or precise, (2) estimating a concentration as a tentatively identified compound as indicated by the mass spectral and retention time data, or (3) estimating a concentration ≥ MDL and <MRL or <3*MDL, whichever is greater.

K = Analyte present. Reported value may be biased high (estimated) due to QC non-conformance.

L = Analyte present. Reported value may be biased low (estimated) due to QC non-conformance.

R = Unreliable result. Analyte may or may not be present in the sample due to QC non-conformance.

UL = Value is estimated bias low and not detected due to QC non-conformance. Reporting limit may be inaccurate or imprecise. Quantitation limit is probably higher.

UJ = Value is estimated and not detected due to QC non-conformance. Reporting limit may be inaccurate or imprecise.

Laboratory Qualifiers

(No Code) = Confirmed identification.

U = Not detected. The associated number indicates the compound reporting limit for the sample.

A (Dioxins) = B (Metals) = The reported value was obtained from a reading <MRL and ≥MDL and is considered estimated.

B (Organics) = The analyte or compound has been detected in the sample and laboratory method blank. It indicates probable blank contamination.

E (Metals) = Reported value is estimated because of the presence of interferences.

E (Organics) = Identifies compounds whose concentrations exceed the upper level of the calibration range.

EMPC (Dioxins) = The ion-abundance ratio between the two characteristic PCDD/PCDF ions was outside accepted ranges. The detected PCDD/PCDF was reported as an estimated maximum possible concentration (EMPC).

D = Indicates sample was analyzed at a dilution.

J = Indicates an estimated value for (1) estimating a concentration as a tentatively identified compound as indicated by the mass spectral and retention time data, or (2) estimating a concentration <MRL and ≥ MDL.

N (Organics) = Indicates presumptive evidence of a compound for tentatively identified compounds using a library search.

P (Organics) = Target analyte confirmation >40% difference for detected compound between the primary and secondary columns. The lower of the two values was reported.

N (Metals) = Laboratory spike sample recovery not within control limits.

* (Metals) = Duplicate analysis not within control limits.

* (Organics) = Surrogate outside of QC limits on both original and re-analysis.

Raw Data: **TT09140.D**

Accutest Laboratories

Report of Analysis

Client Sample ID:	59MW01		
Lab Sample ID:	F52170-1	**Date Sampled:**	08/29/07
Matrix:	AQ - Ground Water	**Date Received:**	08/30/07
Method:	SW846 8081A SW846 3510C	**Percent Solids:**	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	TT09140.D	1	09/17/07	FS	09/04/07	OP22191	GTT302
Run #2							

	Initial Volume	Final Volume
Run #1	1000 ml	10.0 ml
Run #2		

Pesticide TCL List

DATA VAL QUALIFIER

CAS No.	Compound	Result	RL	MDL	Units	Q
309-00-2	Aldrin	ND	0.050	0.010	ug/l	
319-84-6	alpha-BHC	ND	0.050	0.010	ug/l	
319-85-7	beta-BHC	ND	0.050	0.011	ug/l	
319-86-8	delta-BHC	ND	0.050	0.010	ug/l	
58-89-9	gamma-BHC (Lindane)	ND	0.050	0.010	ug/l	
5103-71-9	alpha-Chlordane	ND	0.050	0.010	ug/l	
5103-74-2	gamma-Chlordane	ND	0.050	0.010	ug/l	
60-57-1	Dieldrin	ND	0.050	0.010	ug/l	
72-54-8	4,4'-DDD	ND	0.10	0.020	ug/l	
72-55-9	4,4'-DDE	ND	0.10	0.020	ug/l	
50-29-3	4,4'-DDT	ND	0.10	0.020	ug/l	
72-20-8	Endrin	ND	0.10	0.020	ug/l	
1031-07-8	Endosulfan sulfate	ND	0.10	0.020	ug/l	
7421-93-4	Endrin aldehyde	ND	0.10	0.030	ug/l	UL
53494-70-5	Endrin ketone	ND	0.10	0.020	ug/l	UJ
959-98-8	Endosulfan-I	ND	0.050	0.010	ug/l	
33213-65-9	Endosulfan-II	ND	0.10	0.010	ug/l	
76-44-8	Heptachlor	ND	0.050	0.010	ug/l	
1024-57-3	Heptachlor epoxide	ND	0.050	0.010	ug/l	
72-43-5	Methoxychlor	ND	0.10	0.020	ug/l	
8001-35-2	Toxaphene	ND	2.5	1.3	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	88%		42-127%
2051-24-3	Decachlorobiphenyl	86%		27-127%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: **ST66815.D**

Accutest Laboratories

Report of Analysis

Client Sample ID:	59MW01		
Lab Sample ID:	F52170-1	**Date Sampled:**	08/29/07
Matrix:	AQ - Ground Water	**Date Received:**	08/30/07
Method:	SW846 8082 SW846 3510C	**Percent Solids:**	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	ST66815.D	1	09/19/07	JB	09/04/07	OP22188	GST1734
Run #2							

	Initial Volume	Final Volume
Run #1	1000 ml	10.0 ml
Run #2		

PCB List

CAS No.	Compound	Result	RL	MDL	Units	Q
12674-11-2	Aroclor 1016	ND	0.50	0.25	ug/l	
11104-28-2	Aroclor 1221	ND	0.50	0.40	ug/l	
11141-16-5	Aroclor 1232	ND	0.50	0.40	ug/l	
53469-21-9	Aroclor 1242	ND	0.50	0.25	ug/l	
12672-29-6	Aroclor 1248	ND	0.50	0.25	ug/l	
11097-69-1	Aroclor 1254	ND	0.50	0.25	ug/l	
11096-82-5	Aroclor 1260	ND	0.50	0.25	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	86%		38-127%
2051-24-3	Decachlorobiphenyl	78%		25-137%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: **TT09141.D**

Accutest Laboratories

Report of Analysis

Client Sample ID:	48MW1		
Lab Sample ID:	F52170-2	**Date Sampled:**	08/29/07
Matrix:	AQ - Ground Water	**Date Received:**	08/30/07
Method:	SW846 8081A SW846 3510C	**Percent Solids:**	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	TT09141.D	1	09/17/07	FS	09/04/07	OP22191	GTT302
Run #2							

	Initial Volume	Final Volume
Run #1	1000 ml	10.0 ml
Run #2		

Pesticide TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q (DATA VAL QUALIFIER)
309-00-2	Aldrin	ND	0.050	0.010	ug/l	
319-84-6	alpha-BHC	ND	0.050	0.010	ug/l	
319-85-7	beta-BHC	ND	0.050	0.011	ug/l	
319-86-8	delta-BHC	ND	0.050	0.010	ug/l	
58-89-9	gamma-BHC (Lindane)	ND	0.050	0.010	ug/l	
5103-71-9	alpha-Chlordane	ND	0.050	0.010	ug/l	
5103-74-2	gamma-Chlordane	ND	0.050	0.010	ug/l	
60-57-1	Dieldrin	ND	0.050	0.010	ug/l	
72-54-8	4,4'-DDD	ND	0.10	0.020	ug/l	
72-55-9	4,4'-DDE	ND	0.10	0.020	ug/l	
50-29-3	4,4'-DDT	ND	0.10	0.020	ug/l	
72-20-8	Endrin	ND	0.10	0.020	ug/l	
1031-07-8	Endosulfan sulfate	ND	0.10	0.020	ug/l	
7421-93-4	Endrin aldehyde	ND	0.10	0.030	ug/l	UL
53494-70-5	Endrin ketone	ND	0.10	0.020	ug/l	UJ
959-98-8	Endosulfan-I	ND	0.050	0.010	ug/l	
33213-65-9	Endosulfan-II	ND	0.10	0.010	ug/l	
76-44-8	Heptachlor	ND	0.050	0.010	ug/l	
1024-57-3	Heptachlor epoxide	ND	0.050	0.010	ug/l	
72-43-5	Methoxychlor	ND	0.10	0.020	ug/l	
8001-35-2	Toxaphene	ND	2.5	1.3	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	86%		42-127%
2051-24-3	Decachlorobiphenyl	62%		27-127%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	48MW1		
Lab Sample ID:	F52170-2	**Date Sampled:**	08/29/07
Matrix:	AQ - Ground Water	**Date Received:**	08/30/07
Method:	SW846 8082 SW846 3510C	**Percent Solids:**	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	ST66816.D	1	09/19/07	JB	09/04/07	OP22188	GST1734
Run #2							

	Initial Volume	Final Volume
Run #1	1000 ml	10.0 ml
Run #2		

PCB List

CAS No.	Compound	Result	RL	MDL	Units	Q
12674-11-2	Aroclor 1016	ND	0.50	0.25	ug/l	
11104-28-2	Aroclor 1221	ND	0.50	0.40	ug/l	
11141-16-5	Aroclor 1232	ND	0.50	0.40	ug/l	
53469-21-9	Aroclor 1242	ND	0.50	0.25	ug/l	
12672-29-6	Aroclor 1248	ND	0.50	0.25	ug/l	
11097-69-1	Aroclor 1254	ND	0.50	0.25	ug/l	
11096-82-5	Aroclor 1260	ND	0.50	0.25	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	91%		38-127%
2051-24-3	Decachlorobiphenyl	55%		25-137%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	TMMW01		
Lab Sample ID:	F52170-3	**Date Sampled:**	08/29/07
Matrix:	AQ - Ground Water	**Date Received:**	08/30/07
Method:	SW846 8081A SW846 3510C	**Percent Solids:**	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	TT09142.D	1	09/17/07	FS	09/04/07	OP22191	GTT302
Run #2							

	Initial Volume	Final Volume
Run #1	1000 ml	10.0 ml
Run #2		

Pesticide TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q	DATA VAL QUALIFIER
309-00-2	Aldrin	ND	0.050	0.010	ug/l		
319-84-6	alpha-BHC	ND	0.050	0.010	ug/l		
319-85-7	beta-BHC	ND	0.050	0.011	ug/l		
319-86-8	delta-BHC	ND	0.050	0.010	ug/l		
58-89-9	gamma-BHC (Lindane)	ND	0.050	0.010	ug/l		
5103-71-9	alpha-Chlordane	ND	0.050	0.010	ug/l		
5103-74-2	gamma-Chlordane	ND	0.050	0.010	ug/l		
60-57-1	Dieldrin	ND	0.050	0.010	ug/l		
72-54-8	4,4'-DDD	ND	0.10	0.020	ug/l		
72-55-9	4,4'-DDE	ND	0.10	0.020	ug/l		
50-29-3	4,4'-DDT	ND	0.10	0.020	ug/l		
72-20-8	Endrin	ND	0.10	0.020	ug/l		
1031-07-8	Endosulfan sulfate	ND	0.10	0.020	ug/l		
7421-93-4	Endrin aldehyde	ND	0.10	0.030	ug/l		UL
53494-70-5	Endrin ketone	ND	0.10	0.020	ug/l		UJ
959-98-8	Endosulfan-I	ND	0.050	0.010	ug/l		
33213-65-9	Endosulfan-II	ND	0.10	0.010	ug/l		
76-44-8	Heptachlor	ND	0.050	0.010	ug/l		
1024-57-3	Heptachlor epoxide	ND	0.050	0.010	ug/l		
72-43-5	Methoxychlor	ND	0.10	0.020	ug/l		
8001-35-2	Toxaphene	ND	2.5	1.3	ug/l		

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	86%		42-127%
2051-24-3	Decachlorobiphenyl	90%		27-127%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: **ST66817.D**

Accutest Laboratories

Report of Analysis

Client Sample ID:	TMMW01		
Lab Sample ID:	F52170-3	**Date Sampled:**	08/29/07
Matrix:	AQ - Ground Water	**Date Received:**	08/30/07
Method:	SW846 8082 SW846 3510C	**Percent Solids:**	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	ST66817.D	1	09/19/07	JB	09/04/07	OP22188	GST1734
Run #2							

	Initial Volume	Final Volume
Run #1	1000 ml	10.0 ml
Run #2		

PCB List

CAS No.	Compound	Result	RL	MDL	Units	Q
12674-11-2	Aroclor 1016	ND	0.50	0.25	ug/l	
11104-28-2	Aroclor 1221	ND	0.50	0.40	ug/l	
11141-16-5	Aroclor 1232	ND	0.50	0.40	ug/l	
53469-21-9	Aroclor 1242	ND	0.50	0.25	ug/l	
12672-29-6	Aroclor 1248	ND	0.50	0.25	ug/l	
11097-69-1	Aroclor 1254	ND	0.50	0.25	ug/l	
11096-82-5	Aroclor 1260	ND	0.50	0.25	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	81%		38-127%
2051-24-3	Decachlorobiphenyl	87%		25-137%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: **TT09143.D**

Accutest Laboratories

Report of Analysis

Client Sample ID:	48MW2		
Lab Sample ID:	F52170-4	**Date Sampled:**	08/29/07
Matrix:	AQ - Ground Water	**Date Received:**	08/30/07
Method:	SW846 8081A SW846 3510C	**Percent Solids:**	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	TT09143.D	1	09/17/07	FS	09/04/07	OP22191	GTT302
Run #2							

	Initial Volume	Final Volume
Run #1	1050 ml	10.0 ml
Run #2		

Pesticide TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
309-00-2	Aldrin	ND	0.048	0.0095	ug/l	
319-84-6	alpha-BHC	ND	0.048	0.0095	ug/l	
319-85-7	beta-BHC	ND	0.048	0.010	ug/l	
319-86-8	delta-BHC	ND	0.048	0.0095	ug/l	
58-89-9	gamma-BHC (Lindane)	ND	0.048	0.0095	ug/l	
5103-71-9	alpha-Chlordane	ND	0.048	0.0095	ug/l	
5103-74-2	gamma-Chlordane	ND	0.048	0.0095	ug/l	
60-57-1	Dieldrin	ND	0.048	0.0095	ug/l	
72-54-8	4,4'-DDD	ND	0.095	0.019	ug/l	
72-55-9	4,4'-DDE	ND	0.095	0.019	ug/l	
50-29-3	4,4'-DDT	ND	0.095	0.019	ug/l	
72-20-8	Endrin	ND	0.095	0.019	ug/l	
1031-07-8	Endosulfan sulfate	ND	0.095	0.019	ug/l	
7421-93-4	Endrin aldehyde	ND	0.095	0.029	ug/l	UL
53494-70-5	Endrin ketone	ND	0.095	0.019	ug/l	UJ
959-98-8	Endosulfan-I	ND	0.048	0.0095	ug/l	
33213-65-9	Endosulfan-II	ND	0.095	0.0095	ug/l	
76-44-8	Heptachlor	ND	0.048	0.0095	ug/l	
1024-57-3	Heptachlor epoxide	ND	0.048	0.0095	ug/l	
72-43-5	Methoxychlor	ND	0.095	0.019	ug/l	
8001-35-2	Toxaphene	ND	2.4	1.2	ug/l	

DATA VAL QUALIFIER

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	80%		42-127%
2051-24-3	Decachlorobiphenyl	31%		27-127%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: **ST66818.D**

Accutest Laboratories

Report of Analysis

Client Sample ID:	48MW2		
Lab Sample ID:	F52170-4	**Date Sampled:**	08/29/07
Matrix:	AQ - Ground Water	**Date Received:**	08/30/07
Method:	SW846 8082 SW846 3510C	**Percent Solids:**	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	ST66818.D	1	09/19/07	JB	09/04/07	OP22188	GST1734
Run #2							

	Initial Volume	Final Volume
Run #1	1050 ml	10.0 ml
Run #2		

PCB List

CAS No.	Compound	Result	RL	MDL	Units	Q
12674-11-2	Aroclor 1016	ND	0.48	0.24	ug/l	
11104-28-2	Aroclor 1221	ND	0.48	0.38	ug/l	
11141-16-5	Aroclor 1232	ND	0.48	0.38	ug/l	
53469-21-9	Aroclor 1242	ND	0.48	0.24	ug/l	
12672-29-6	Aroclor 1248	ND	0.48	0.24	ug/l	
11097-69-1	Aroclor 1254	ND	0.48	0.24	ug/l	
11096-82-5	Aroclor 1260	ND	0.48	0.24	ug/l	

DATA VAL QUALIFIER UJ

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	80%		38-127%
2051-24-3	Decachlorobiphenyl	29%		25-137%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: **TT09144.D**

Accutest Laboratories

Report of Analysis

Client Sample ID:	48MW3		
Lab Sample ID:	F52170-5	**Date Sampled:**	08/29/07
Matrix:	AQ - Ground Water	**Date Received:**	08/30/07
Method:	SW846 8081A SW846 3510C	**Percent Solids:**	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	TT09144.D	1	09/17/07	FS	09/04/07	OP22191	GTT302
Run #2							

	Initial Volume	Final Volume
Run #1	1030 ml	10.0 ml
Run #2		

Pesticide TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
309-00-2	Aldrin	ND	0.049	0.0097	ug/l	
319-84-6	alpha-BHC	ND	0.049	0.0097	ug/l	
319-85-7	beta-BHC	ND	0.049	0.011	ug/l	
319-86-8	delta-BHC	ND	0.049	0.0097	ug/l	
58-89-9	gamma-BHC (Lindane)	ND	0.049	0.0097	ug/l	
5103-71-9	alpha-Chlordane	ND	0.049	0.0097	ug/l	
5103-74-2	gamma-Chlordane	ND	0.049	0.0097	ug/l	
60-57-1	Dieldrin	ND	0.049	0.0097	ug/l	
72-54-8	4,4'-DDD	ND	0.097	0.019	ug/l	
72-55-9	4,4'-DDE	ND	0.097	0.019	ug/l	
50-29-3	4,4'-DDT	ND	0.097	0.019	ug/l	
72-20-8	Endrin	ND	0.097	0.019	ug/l	
1031-07-8	Endosulfan sulfate	ND	0.097	0.019	ug/l	
7421-93-4	Endrin aldehyde	ND	0.097	0.029	ug/l	UL
53494-70-5	Endrin ketone	ND	0.097	0.019	ug/l	UJ
959-98-8	Endosulfan-I	ND	0.049	0.0097	ug/l	
33213-65-9	Endosulfan-II	ND	0.097	0.0097	ug/l	
76-44-8	Heptachlor	ND	0.049	0.0097	ug/l	
1024-57-3	Heptachlor epoxide	ND	0.049	0.0097	ug/l	
72-43-5	Methoxychlor	ND	0.097	0.019	ug/l	
8001-35-2	Toxaphene	ND	2.4	1.2	ug/l	

DATA VAL QUALIFIER

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	83%		42-127%
2051-24-3	Decachlorobiphenyl	95%		27-127%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: **ST66821.D**

Accutest Laboratories

Report of Analysis

Client Sample ID:	48MW3		
Lab Sample ID:	F52170-5	**Date Sampled:**	08/29/07
Matrix:	AQ - Ground Water	**Date Received:**	08/30/07
Method:	SW846 8082 SW846 3510C	**Percent Solids:**	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	ST66821.D	1	09/19/07	JB	09/04/07	OP22188	GST1734
Run #2							

	Initial Volume	Final Volume
Run #1	1030 ml	10.0 ml
Run #2		

PCB List

CAS No.	Compound	Result	RL	MDL	Units	Q
12674-11-2	Aroclor 1016	ND	0.49	0.24	ug/l	
11104-28-2	Aroclor 1221	ND	0.49	0.39	ug/l	
11141-16-5	Aroclor 1232	ND	0.49	0.39	ug/l	
53469-21-9	Aroclor 1242	ND	0.49	0.24	ug/l	
12672-29-6	Aroclor 1248	ND	0.49	0.24	ug/l	
11097-69-1	Aroclor 1254	ND	0.49	0.24	ug/l	
11096-82-5	Aroclor 1260	ND	0.49	0.24	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	78%		38-127%
2051-24-3	Decachlorobiphenyl	91%		25-137%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: TT09149.D

Accutest Laboratories

Report of Analysis

Client Sample ID:	TMMW3		
Lab Sample ID:	F52170-6	**Date Sampled:**	08/29/07
Matrix:	AQ - Ground Water	**Date Received:**	08/30/07
Method:	SW846 8081A SW846 3510C	**Percent Solids:**	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	TT09149.D	1	09/17/07	FS	09/04/07	OP22191	GTT302
Run #2							

	Initial Volume	Final Volume
Run #1	1020 ml	10.0 ml
Run #2		

Pesticide TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
309-00-2	Aldrin	ND	0.049	0.0098	ug/l	
319-84-6	alpha-BHC	ND	0.049	0.0098	ug/l	
319-85-7	beta-BHC	ND	0.049	0.011	ug/l	
319-86-8	delta-BHC	ND	0.049	0.0098	ug/l	
58-89-9	gamma-BHC (Lindane)	ND	0.049	0.0098	ug/l	
5103-71-9	alpha-Chlordane	ND	0.049	0.0098	ug/l	
5103-74-2	gamma-Chlordane	ND	0.049	0.0098	ug/l	
60-57-1	Dieldrin	ND	0.049	0.0098	ug/l	
72-54-8	4,4'-DDD	ND	0.098	0.020	ug/l	
72-55-9	4,4'-DDE	ND	0.098	0.020	ug/l	
50-29-3	4,4'-DDT	ND	0.098	0.020	ug/l	
72-20-8	Endrin	ND	0.098	0.020	ug/l	
1031-07-8	Endosulfan sulfate	ND	0.098	0.020	ug/l	
7421-93-4	Endrin aldehyde	ND	0.098	0.029	ug/l	UL
53494-70-5	Endrin ketone	ND	0.098	0.020	ug/l	UJ
959-98-8	Endosulfan-I	ND	0.049	0.0098	ug/l	
33213-65-9	Endosulfan-II	ND	0.098	0.0098	ug/l	
76-44-8	Heptachlor	ND	0.049	0.0098	ug/l	
1024-57-3	Heptachlor epoxide	ND	0.049	0.0098	ug/l	
72-43-5	Methoxychlor	ND	0.098	0.020	ug/l	
8001-35-2	Toxaphene	ND	2.5	1.2	ug/l	

DATA VAL QUALIFIER

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	86%		42-127%
2051-24-3	Decachlorobiphenyl	88%		27-127%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	TMMW3		
Lab Sample ID:	F52170-6	**Date Sampled:**	08/29/07
Matrix:	AQ - Ground Water	**Date Received:**	08/30/07
Method:	SW846 8082 SW846 3510C	**Percent Solids:**	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	ST66824.D	1	09/19/07	JB	09/04/07	OP22188	GST1734
Run #2							

	Initial Volume	Final Volume
Run #1	1020 ml	10.0 ml
Run #2		

PCB List

CAS No.	Compound	Result	RL	MDL	Units	Q
12674-11-2	Aroclor 1016	ND	0.49	0.25	ug/l	
11104-28-2	Aroclor 1221	ND	0.49	0.39	ug/l	
11141-16-5	Aroclor 1232	ND	0.49	0.39	ug/l	
53469-21-9	Aroclor 1242	ND	0.49	0.25	ug/l	
12672-29-6	Aroclor 1248	ND	0.49	0.25	ug/l	
11097-69-1	Aroclor 1254	ND	0.49	0.25	ug/l	
11096-82-5	Aroclor 1260	ND	0.49	0.25	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	80%		38-127%
2051-24-3	Decachlorobiphenyl	83%		25-137%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: **TT09150.D**

Accutest Laboratories

Report of Analysis

Client Sample ID:	48MW4		
Lab Sample ID:	F52170-7	**Date Sampled:**	08/29/07
Matrix:	AQ - Ground Water	**Date Received:**	08/30/07
Method:	SW846 8081A SW846 3510C	**Percent Solids:**	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	TT09150.D	1	09/18/07	FS	09/04/07	OP22191	GTT302
Run #2							

	Initial Volume	Final Volume
Run #1	1020 ml	10.0 ml
Run #2		

Pesticide TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
309-00-2	Aldrin	ND	0.049	0.0098	ug/l	
319-84-6	alpha-BHC	ND	0.049	0.0098	ug/l	
319-85-7	beta-BHC	ND	0.049	0.011	ug/l	
319-86-8	delta-BHC	ND	0.049	0.0098	ug/l	
58-89-9	gamma-BHC (Lindane)	ND	0.049	0.0098	ug/l	
5103-71-9	alpha-Chlordane	ND	0.049	0.0098	ug/l	
5103-74-2	gamma-Chlordane	ND	0.049	0.0098	ug/l	
60-57-1	Dieldrin	ND	0.049	0.0098	ug/l	
72-54-8	4,4'-DDD	ND	0.098	0.020	ug/l	
72-55-9	4,4'-DDE	ND	0.098	0.020	ug/l	
50-29-3	4,4'-DDT	ND	0.098	0.020	ug/l	
72-20-8	Endrin	ND	0.098	0.020	ug/l	
1031-07-8	Endosulfan sulfate	ND	0.098	0.020	ug/l	
7421-93-4	Endrin aldehyde	ND	0.098	0.029	ug/l	UL
53494-70-5	Endrin ketone	ND	0.098	0.020	ug/l	UJ
959-98-8	Endosulfan-I	ND	0.049	0.0098	ug/l	
33213-65-9	Endosulfan-II	ND	0.098	0.0098	ug/l	
76-44-8	Heptachlor	ND	0.049	0.0098	ug/l	
1024-57-3	Heptachlor epoxide	ND	0.049	0.0098	ug/l	
72-43-5	Methoxychlor	ND	0.098	0.020	ug/l	
8001-35-2	Toxaphene	ND	2.5	1.2	ug/l	

DATA VAL QUALIFIER

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	83%		42-127%
2051-24-3	Decachlorobiphenyl	90%		27-127%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: **ST66825.D**

Accutest Laboratories

Report of Analysis

Client Sample ID:	48MW4		
Lab Sample ID:	F52170-7	**Date Sampled:**	08/29/07
Matrix:	AQ - Ground Water	**Date Received:**	08/30/07
Method:	SW846 8082 SW846 3510C	**Percent Solids:**	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	ST66825.D	1	09/19/07	JB	09/04/07	OP22188	GST1734
Run #2							

	Initial Volume	Final Volume
Run #1	1020 ml	10.0 ml
Run #2		

PCB List

CAS No.	Compound	Result	RL	MDL	Units	Q
12674-11-2	Aroclor 1016	ND	0.49	0.25	ug/l	
11104-28-2	Aroclor 1221	ND	0.49	0.39	ug/l	
11141-16-5	Aroclor 1232	ND	0.49	0.39	ug/l	
53469-21-9	Aroclor 1242	ND	0.49	0.25	ug/l	
12672-29-6	Aroclor 1248	ND	0.49	0.25	ug/l	
11097-69-1	Aroclor 1254	ND	0.49	0.25	ug/l	
11096-82-5	Aroclor 1260	ND	0.49	0.25	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	79%		38-127%
2051-24-3	Decachlorobiphenyl	93%		25-137%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: **TT09151.D**

Accutest Laboratories

Report of Analysis

Client Sample ID:	49MW01		
Lab Sample ID:	F52170-8	**Date Sampled:**	08/29/07
Matrix:	AQ - Ground Water	**Date Received:**	08/30/07
Method:	SW846 8081A SW846 3510C	**Percent Solids:**	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	TT09151.D	1	09/18/07	FS	09/04/07	OP22191	GTT302
Run #2							

	Initial Volume	Final Volume
Run #1	1000 ml	10.0 ml
Run #2		

Pesticide TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
309-00-2	Aldrin	ND	0.050	0.010	ug/l	
319-84-6	alpha-BHC	ND	0.050	0.010	ug/l	
319-85-7	beta-BHC	ND	0.050	0.011	ug/l	
319-86-8	delta-BHC	ND	0.050	0.010	ug/l	
58-89-9	gamma-BHC (Lindane)	ND	0.050	0.010	ug/l	
5103-71-9	alpha-Chlordane	ND	0.050	0.010	ug/l	
5103-74-2	gamma-Chlordane	ND	0.050	0.010	ug/l	
60-57-1	Dieldrin	ND	0.050	0.010	ug/l	
72-54-8	4,4'-DDD	ND	0.10	0.020	ug/l	
72-55-9	4,4'-DDE	ND	0.10	0.020	ug/l	
50-29-3	4,4'-DDT	ND	0.10	0.020	ug/l	
72-20-8	Endrin	ND	0.10	0.020	ug/l	
1031-07-8	Endosulfan sulfate	ND	0.10	0.020	ug/l	
7421-93-4	Endrin aldehyde	ND	0.10	0.030	ug/l	UL
53494-70-5	Endrin ketone	ND	0.10	0.020	ug/l	UJ
959-98-8	Endosulfan-I	ND	0.050	0.010	ug/l	
33213-65-9	Endosulfan-II	ND	0.10	0.010	ug/l	
76-44-8	Heptachlor	ND	0.050	0.010	ug/l	
1024-57-3	Heptachlor epoxide	ND	0.050	0.010	ug/l	
72-43-5	Methoxychlor	ND	0.10	0.020	ug/l	
8001-35-2	Toxaphene	ND	2.5	1.3	ug/l	

DATA VAL QUALIFIER

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	82%		42-127%
2051-24-3	Decachlorobiphenyl	44%		27-127%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	49MW01		
Lab Sample ID:	F52170-8	**Date Sampled:**	08/29/07
Matrix:	AQ - Ground Water	**Date Received:**	08/30/07
Method:	SW846 8082 SW846 3510C	**Percent Solids:**	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	ST66826.D	1	09/19/07	JB	09/04/07	OP22188	GST1734
Run #2							

	Initial Volume	Final Volume
Run #1	1000 ml	10.0 ml
Run #2		

PCB List

CAS No.	Compound	Result	RL	MDL	Units	Q
12674-11-2	Aroclor 1016	ND	0.50	0.25	ug/l	
11104-28-2	Aroclor 1221	ND	0.50	0.40	ug/l	
11141-16-5	Aroclor 1232	ND	0.50	0.40	ug/l	
53469-21-9	Aroclor 1242	ND	0.50	0.25	ug/l	
12672-29-6	Aroclor 1248	ND	0.50	0.25	ug/l	
11097-69-1	Aroclor 1254	ND	0.50	0.25	ug/l	
11096-82-5	Aroclor 1260	ND	0.50	0.25	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	74%		38-127%
2051-24-3	Decachlorobiphenyl	41%		25-137%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Shaw® Shaw Environmental, Inc.

MEMORANDUM

TO: Jeff Parks, Shaw E&I Radford Army Ammunition Plant (RFAAP) Project Manager

FROM: Richard McCracken, Shaw E&I Project Chemist

SUBJECT: RFAAP Data Validation – Semi-Volatiles & Polynuclear Aromatic Hydrocarbons Accutest Laboratories, Inc., SDG F52170

DATE: November 5, 2007

The purpose of this memorandum is to present the data validation report for the samples collected at RFAAP on August 29, 2007. Samples were analyzed for semivolatile organic compounds (SVOCs) using USEPA SW846 Methods 3510C/8270C. The polynuclear aromatic hydrocarbons (PAHs) were analyzed using selective ion monitoring (SIM) techniques. A total of eight aqueous samples were validated. The sample IDs are:

Field Sample ID	Lab Sample ID	Field Sample ID	Lab Sample ID
59MW01	F52170-1	48MW3	F52170-5
48MW1	F52170-2	TMMW3	F52170-6
TMMW01	F52170-3	48MW4	F52170-7
48MW2	F52170-4	49MW1	F52170-8

Data were reviewed by Richard McCracken and validated using a combination of project QAPP, *Quality Systems Manual for Environmental Laboratories, Final Version 3, January, 2006* (DoD, 2006) (DoD QSM), method-specific criteria, and laboratory SOP criteria. The data qualifier scheme was consistent with the *Region III Modifications to the National Functional Guidelines for Organic Data Review* (September 1994). Parameters evaluated are presented in **Table 1**. Data associated with parameters in compliance with quality control specifications have not been qualified. Data associated with parameters that did not comply with quality control specifications and directly impacted project data have been qualified in accordance with USEPA Region III specifications.

Table 1 Laboratory Performance Criteria

Qualified		Parameter
Yes	No	
	X	Holding Times and Preservation
	X	Instrument Performance Check
	X	Initial Calibration
	X	Continuing Calibration
	X	Blank Analysis
	X	Surrogate Spikes
	X	Internal Standards
	X	Laboratory Control Sample
	X	Matrix Spike/Spike Duplicate
	X	Field Duplicate
	X	Quantitation Verification

The quality of data collected in support of this sampling activity is considered acceptable.

Richard McCracken, Chemist

11/5/07
Date

RFAAP VALIDATION REPORT
SEMIVOLATILES AND PAH REVIEW
SDG F52170

I-Holding Times and Preservation
The objective is to ascertain the validity of results based on the holding time of the sample from time of collection to time of sample extraction and analysis. Holding time criteria: For semivolatile (SVOC) and polynuclear aromatic hydrocarbons (PAH) compounds, the samples are cooled @4°C ± 2°C for aqueous samples with a maximum holding time of 7 days from sample collection to preparative extraction and 40 days from preparative extraction to determinative analysis.

- Temperature Review: A temperature blank was sent with each cooler and recorded by the laboratory upon receipt. The samples collected on 8/29/07 were sent in 20 coolers, and were received by the laboratory on 8/30/07 at temperatures ranging from 0.8°C to 3.6°C, with 9 of the 20 coolers having temperatures below 2.0°C. The low sample temperatures are not expected to have an adverse impact on the analytical results. No qualifiers were applied.

- Holding Time Review: The aqueous samples were collected on 8/29/07, extracted for SVOCs on 9/5/07, extracted for PAHs by SIM on 9/5/07, analyzed for SVOCs on 9/11/07 & 9/12/07, and analyzed for PAHs by SIM on 9/21/07. All criteria were met. No qualifiers were applied.

II-Instrument Performance Check
GC/MS instrument performance checks are performed to ensure mass resolution, identification and, to some degree, sensitivity. The analysis of the instrument performance check solution must be performed at the beginning of each 12-hour period during which samples are analyzed.

- The instrument performance check, decafluorotriphenylphosphine (DFTPP), met the ion abundance criteria. No qualification was applied.

III-Initial Calibration
Compliance requirements for satisfactory instrument calibration are established to ensure that the instrument used is capable of producing acceptable qualitative and quantitative data for compounds on the semivolatile target compound list (TCL). Initial calibration demonstrates that the instrument is capable of acceptable performance in the beginning of the analytical run and of producing a linear calibration curve. For compounds analyzed using linear regression or second order, correlation coefficients must be >0.995 and coefficients of determination >0.99. The minimum relative response factor (RRF) criteria must be ≥0.05. The DoD QSM specifies that the initial calibration percent relative standard deviation (%RSD) must be ≤15% on the average for all compounds (<30% for CCCs). All detects are qualified as estimated "J" for where there were exceeding %RSDs, and all non-detects are qualified as estimated "UJ" for where there were grossly exceeding recoveries, unless determined to be unusable "R". Grossly exceeding is defined as twice the established criteria limits. For where there were low RRFs, all detects are qualified as estimated "J" and non-detects are rejected "R".

- Initial calibration for the SVOCs was performed on 9/11/07 using instrument GCMSU. Target compounds 2,4-dinitrophenol (45.04%) and 4,6-dinitro-2-methylphenol (21.03%) had %RSDs outside criteria. All other target compounds were within criteria (%RSD≤15% or ≤30%; RRF≥0.05). The compounds with high %RSD were quantified using second order regression, and had correlation coefficients >0.995; therefore no qualifiers were applied. All samples were analyzed in conjunction with this initial calibration.

- Initial calibration for the PAHs-SIM was performed on 9/20/07 using instrument GCMSW, all target compounds were within criteria (%RSD≤15% or ≤30%; RRF≥0.05). No qualifiers were applied. All samples were analyzed in conjunction with this initial calibration.

IV-Continuing Calibration

Compliance requirements for satisfactory instrument calibration are established to ensure that the instrument used was capable of producing acceptable qualitative and quantitative data for semivolatile target compounds. Continuing calibration standards containing both target and surrogates compounds are analyzed at the beginning of each 12-hour analysis period following the analysis of the instrument performance check and prior to the analysis of blanks and samples. The minimum relative response factors (RRF) for semivolatile target compounds and surrogates must be ≥0.05. The DoD QSM specifies that the percent difference (%D) between the initial calibration RRF and the continuing calibration RRF must be within ±20% for all target compounds. Grossly exceeding is defined where %D>40%. All detects are qualified as estimated "J" for where there were exceeding %Ds, and all non-detects are qualified as estimated "UJ" for where there were grossly exceeding recoveries, unless determined to be unusable "R". Grossly exceeding is defined as twice the established criteria limits. For where there were low RRFs, all detects are qualified as estimated "J" and non-detects are rejected "R".

- During the SVOC initial calibration verification performed on 9/11/07 @1630 using instrument GCMSU, bis(2-chloroethoxy)methane (24.5%), 4-chloroaniline (34.3%), and 3-nitroaniline (29.7%) had %D outside criteria. All other target compounds met criteria. No samples were analyzed following this initial calibration verification, no qualifiers were applied.

- During the SVOC continuing calibration performed on 9/11/07 @1741 using instrument GCMSU, all criteria were met for all target compounds. No qualifiers were applied. All samples were analyzed following this continuing calibration.

- During the PAH-SIM initial calibration verification performed on 9/20/07 @1643 using instrument GCMSW, all criteria were met for all target compounds. No qualifiers were applied. No samples were analyzed following this initial calibration verification.

- During the PAH-SIM continuing calibration performed on 9/20/07 @1811 using instrument GCMSW, all criteria were met for all target compounds. No qualifiers were applied. All samples were analyzed following this continuing calibration.

V-Blank Analysis

The purpose of blank analyses is to determine the presence and magnitude of contamination problems resulting from field and laboratory activities. A method blank analysis must be performed after the calibration standards and once every 12-hour time period beginning with the injection of DFTPP. No contaminants should be detected in any of the associated blanks > the MDL. DoD QSM criteria specifies all concentrations should be less than one-half MRL (<MRL for common laboratory contaminants phthalate esters). Positive sample results are reported and qualified "B", if the concentration of the compound in the sample is ≤10 times (10x) the maximum amount in any blank for the common laboratory contaminants phthalate esters, or 5 times (5X) the maximum amount for other semivolatile target compounds. **Table 2** summarizes the blank contamination analysis.

Table 2 Blank Contamination Analysis Summary

Analysis Date	QC Blank ID	Compound	Max Conc. µg/L	Action Level µg/L	B qualified samples
9/11/07	OP22198-MB	All SVOC target <½MRL	NA	NA	None
9/21/07	OP22199-MB	All PAH SIM target <½MRL	NA	NA	None
9/15/07	RB083007	All SVOC target <½MRL	NA	NA	None
9/20/07	RB083007	All PAH SIM target <½MRL	NA	NA	None

NA = Not applicable.
MRL = Method reporting limit.

VI-Surrogate Spikes
Laboratory performance on individual samples is evaluated through the review of surrogate spike samples. Surrogate spikes are added to all samples and blanks to measure their recovery in sample and blank matrices. The percent recoveries (%Rs) must be within the specified control limits. DoD surrogate recovery limits are specified in Table D-2 and Table D-3 of the DoD QSM (DoD, 2006). If the surrogate is not listed, then the laboratory criteria shall be used.

Aqueous Criteria:
2-Fluorophenol (14-62%) – (DoD QSM = 20-110%)
Phenol – d5 (10-40%) – (DoD QSM = 10-115%)
2,4,6-Tribromophenol (33-118%) – (DoD QSM = 40-125%)
Nitrobenzene-d5 (42-108%) – (DoD QSM = 40-110%)
2-Fluorobiphenyl (40-106%) – (DoD QSM = 50-110%)
p-Terphenyl – d14 (39-121%) – (DoD QSM = 50-135%)

- The MS had a high phenol-d5 (50.0%) recovery, while the MSD had a low high 2-fluorobiphenyl (48.0%) recovery. The unspiked sample surrogate recoveries met criteria, no qualifiers were applied.

- All other field samples met surrogate recovery criteria. No qualifiers were applied.

VII-Internal Standards
Internal standards performance criteria ensure that GC/MS sensitivity and response are stable during every analytical run. Internal standard area counts for samples and blanks must not vary by more than a factor of two (-50% to +100%) from the associated calibration standard. The retention time of the internal standards in samples and blanks must not vary by more than ±30 seconds from the retention time of the associated calibration standard.

- All criteria were met. No qualifiers were applied.

VIII-Laboratory Control Sample
Laboratory control samples (LCS) are used to monitor laboratory accuracy by calculating the percent recoveries of the spiked compounds. All LCS percent recoveries must be within the specified control limits. DoD LCS aqueous recovery limits are specified in Table D-2 and Table D-6 of the DoD QSM (DoD, 2006). If the compound is not listed, then the laboratory criteria shall be used.

- Sample OP22198-BS was used as the aqueous LCS for the SVOC analysis on 9/11/07. All compounds met recovery criteria. No qualifiers were applied. All samples were analyzed in conjunction with this LCS.

- Sample OP22199-BS was used as the aqueous LCS for the PAH-SIM analysis on 9/20/07. All compounds met recovery criteria. No qualifiers were applied. All samples were analyzed in conjunction with this LCS.

IX-Matrix Spike/Matrix Spike Duplicate
Data for matrix spike/matrix spike duplicates (MS/MSD) are generated to determine long-term precision and accuracy of the analytical method on various matrices and to demonstrate acceptable compound recovery by the laboratory at the time of sample analysis. The percent recoveries (%Rs) and the relative percent difference (RPD) must be within the specified control limits. DoD aqueous MS/MSD recovery limits follow the LCS criteria and are specified in Table D-2 and Table D-6 of the DoD QSM (DoD, 2006). If the compound is not listed, then the laboratory criteria shall be used.

- Sample 52160-2 was used for the aqueous MS/MSD during SVOC analysis on 9/11/07. The spiked sample was not a RFAAP site sample; therefore, it was not evaluated. All samples were analyzed in conjunction with this MS/MSD.

- Sample 48MW3 was used for the MS/MSD for the solid PAH SIM analysis on 9/21/07. All compounds met recovery criteria. No qualifiers were applied. All samples were analyzed in conjunction with this MS/MSD.

X-Field Duplicate Sample Analysis

Field duplicates were collected to identify the cumulative precision of the sampling and analytical process and sent to the laboratory blind. The RPD was calculated only for those analytes which were detected at levels exceeding the method reporting limits in both samples of the duplicate pair. Analytes that were rejected (R-qualified) in either sample of the duplicate pair were excluded from the duplicate assessment. Precision control criterion was established at 50% RPD for the aqueous and solid samples. Analytical results were qualified as estimated (J) for any RPDs exceeding criteria.

- Field duplicate pairs in this data set included 59MW01 & TMMW01, and 48MW3 & TMMW3. All compounds detected above the MDL met RPD criteria. No data qualifiers were applied.

XI-Quantitation Verification

The accuracy of analytical results was verified through the calculation of several parameters. Percent difference (%D) between the calculated and reported values must be ≤10%. Any sample value >MDL and <MRL or <3*MDL (whichever is greater) was qualified as estimated, "J."

Sample: OP22198-BS, benzoic acid

Conc. (µg/L) = {(Ax)*(Is)*(Vt)*(DF)}/{(Ais)*(RRF)*(V_o)*(V_i)}

where:	$Conc_{sample}$	=	Sample concentration in µg/L
	A_x	=	Area of characteristic ion for compound being measured.
	I_s	=	Amount of internal standard injected (ng).
	V_t	=	Volume of total extract, taking into account dilutions (i.e., a 1-to-10 dilution of a 1-mL extract will mean V(t) = 10,000 µL.
	A_{is}	=	Area of characteristic ion for the internal standard.
	RRF_A	=	Average relative response factor for compound being measured
	V_o	=	Volume of water extracted (mL).
	V_i	=	Volume of extract injected (µL).
	DF	=	Dilution Factor

Conc. µg/L = (95631 * 40 * 1000 * 1) / (780594 * 0.323 * 1000 * 1) = 15.2 ng/mL
= 15.2 µg/L

Reported Value = 15.2 µg/L
% Difference = 0.0%
Values were within 10% difference.

Sample: OP22199-BS, bezno(a)pyrene

Conc. (µg/L) = {(Ax)*(Is)*(Vt)*(DF)}/{(Ais)*(RRF)*(V_o)*(V_i)}

where:	$Conc_{sample}$	=	Sample concentration in µg/L
	A_x	=	Area of characteristic ion for compound being measured.
	I_s	=	Amount of internal standard injected (ng).
	V_t	=	Volume of total extract, taking into account dilutions (i.e., a 1-to-10 dilution of a 1-mL extract will mean V(t) = 10,000 µL.
	A_{is}	=	Area of characteristic ion for the internal standard.
	RRF_A	=	Average relative response factor for compound being measured
	V_o	=	Volume of water extracted (mL).
	V_i	=	Volume of extract injected (µL).
	DF	=	Dilution Factor

Conc. µg/L = (68314 * 4 * 1000 * 1) / (98767 * 1.335 * 1000 * 1) = 2.1 ng/mL
= 2.1 µg/L

Reported Value = 2.1 µg/L
% Difference = 0.0%
Values were within 10% difference.

USEPA Region III Validation Qualifiers

(No Code) = Confirmed identification.

B = The analyte has been detected in the sample and the associated laboratory or field blank.

J = Indicates an estimated value for (1) estimated value due to QC non-conformance. Reported value may not be accurate or precise, (2) estimating a concentration as a tentatively identified compound as indicated by the mass spectral and retention time data, or (3) estimating a concentration ≥MDL and <MRL or <3*MDL, whichever is greater.

K = Analyte present. Reported value may be biased high (estimated) due to QC non-conformance.

L = Analyte present. Reported value may be biased low (estimated) due to QC non-conformance.

R = Unreliable result. Analyte may or may not be present in the sample due to QC non-conformance.

UL = Value is estimated bias low and not detected due to QC non-conformance. Reporting limit may be inaccurate or imprecise. Quantitation limit is probably higher.

UJ = Value is estimated and not detected due to QC non-conformance. Reporting limit may be inaccurate or imprecise.

Laboratory Qualifiers

(No Code) = Confirmed identification.

U = Not detected. The associated number indicates the compound reporting limit for the sample.

A (Dioxins) = B (Metals) = The reported value was obtained from a reading <MRL and ≥MDL and is considered estimated.

B (Organics) = The analyte or compound has been detected in the sample and laboratory method blank. It indicates probable blank contamination.

E (Metals) = Reported value is estimated because of the presence of interferences.

E (Organics) = Identifies compounds whose concentrations exceed the upper level of the calibration range.

EMPC (Dioxins) = The ion-abundance ratio between the two characteristic PCDD/PCDF ions was outside accepted ranges. The detected PCDD/PCDF was reported as an estimated maximum possible concentration (EMPC).

D = Indicates sample was analyzed at a dilution.

J = Indicates an estimated value for (1) estimating a concentration as a tentatively identified compound as indicated by the mass spectral and retention time data, or (2) estimating a concentration <MRL and ≥MDL.

N (Organics) = Indicates presumptive evidence of a compound for tentatively identified compounds using a library search.

N (Metals) = Laboratory spike sample recovery not within control limits.

P (Organics) = Target analyte confirmation >40% difference for detected compound between the primary and secondary columns. The lower of the two values was reported.

* (Metals) = Duplicate analysis not within control limits.

* (Organics) = Surrogate outside of QC limits on both original and re-analysis.

Raw Data: U004532.D

Accutest Laboratories

Report of Analysis

Client Sample ID:	59MW01		
Lab Sample ID:	F52170-1	Date Sampled:	08/29/07
Matrix:	AQ - Ground Water	Date Received:	08/30/07
Method:	SW846 8270C SW846 3510C	Percent Solids:	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	U004532.D	1	09/11/07	NJ	09/05/07	OP22198	SU216
Run #2							

	Initial Volume	Final Volume
Run #1	1000 ml	1.0 ml
Run #2		

ABN TCL List w/o PAHs

CAS No.	Compound	Result	RL	MDL	Units	Q
65-85-0	Benzoic Acid	ND	25	10	ug/l	
95-57-8	2-Chlorophenol	ND	5.0	1.0	ug/l	
59-50-7	4-Chloro-3-methyl phenol	ND	5.0	2.0	ug/l	
120-83-2	2,4-Dichlorophenol	ND	5.0	1.0	ug/l	
105-67-9	2,4-Dimethylphenol	ND	5.0	2.0	ug/l	
51-28-5	2,4-Dinitrophenol	ND	25	10	ug/l	
534-52-1	4,6-Dinitro-o-cresol	ND	10	2.0	ug/l	
95-48-7	2-Methylphenol	ND	5.0	1.0	ug/l	
	3&4-Methylphenol	ND	5.0	1.3	ug/l	
88-75-5	2-Nitrophenol	ND	5.0	1.0	ug/l	
100-02-7	4-Nitrophenol	ND	25	10	ug/l	
87-86-5	Pentachlorophenol	ND	25	10	ug/l	
108-95-2	Phenol	ND	5.0	2.0	ug/l	
95-95-4	2,4,5-Trichlorophenol	ND	5.0	1.0	ug/l	
88-06-2	2,4,6-Trichlorophenol	ND	5.0	1.0	ug/l	
101-55-3	4-Bromophenyl phenyl ether	ND	5.0	1.2	ug/l	
85-68-7	Butyl benzyl phthalate	ND	5.0	2.0	ug/l	
100-51-6	Benzyl Alcohol	ND	5.0	1.0	ug/l	
91-58-7	2-Chloronaphthalene	ND	5.0	1.3	ug/l	
106-47-8	4-Chloroaniline	ND	5.0	2.0	ug/l	
86-74-8	Carbazole	ND	5.0	1.0	ug/l	
111-91-1	bis(2-Chloroethoxy)methane	ND	5.0	1.0	ug/l	
111-44-4	bis(2-Chloroethyl)ether	ND	5.0	1.0	ug/l	
108-60-1	bis(2-Chloroisopropyl)ether	ND	5.0	1.0	ug/l	
7005-72-3	4-Chlorophenyl phenyl ether	ND	5.0	1.3	ug/l	
95-50-1	1,2-Dichlorobenzene	ND	5.0	1.5	ug/l	
541-73-1	1,3-Dichlorobenzene	ND	5.0	1.6	ug/l	
106-46-7	1,4-Dichlorobenzene	ND	5.0	1.5	ug/l	
121-14-2	2,4-Dinitrotoluene	ND	5.0	1.0	ug/l	
606-20-2	2,6-Dinitrotoluene	ND	5.0	1.0	ug/l	
91-94-1	3,3'-Dichlorobenzidine	ND	10	2.0	ug/l	
132-64-9	Dibenzofuran	ND	5.0	1.0	ug/l	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	59MW01		
Lab Sample ID:	F52170-1	**Date Sampled:**	08/29/07
Matrix:	AQ - Ground Water	**Date Received:**	08/30/07
Method:	SW846 8270C SW846 3510C	**Percent Solids:**	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

ABN TCL List w/o PAHs

CAS No.	Compound	Result	RL	MDL	Units	Q
84-74-2	Di-n-butyl phthalate	ND	5.0	2.0	ug/l	
117-84-0	Di-n-octyl phthalate	ND	5.0	2.0	ug/l	
84-66-2	Diethyl phthalate	ND	5.0	2.0	ug/l	
131-11-3	Dimethyl phthalate	ND	5.0	2.0	ug/l	
117-81-7	bis(2-Ethylhexyl)phthalate	ND	5.0	2.0	ug/l	
118-74-1	Hexachlorobenzene	ND	5.0	1.2	ug/l	
87-68-3	Hexachlorobutadiene	ND	5.0	1.7	ug/l	
77-47-4	Hexachlorocyclopentadiene	ND	5.0	1.5	ug/l	
67-72-1	Hexachloroethane	ND	5.0	1.9	ug/l	
78-59-1	Isophorone	ND	5.0	1.0	ug/l	
88-74-4	2-Nitroaniline	ND	10	2.0	ug/l	
99-09-2	3-Nitroaniline	ND	10	2.0	ug/l	
100-01-6	4-Nitroaniline	ND	10	2.0	ug/l	
98-95-3	Nitrobenzene	ND	5.0	1.0	ug/l	
621-64-7	N-Nitroso-di-n-propylamine	ND	5.0	1.0	ug/l	
86-30-6	N-Nitrosodiphenylamine	ND	5.0	1.0	ug/l	
120-82-1	1,2,4-Trichlorobenzene	ND	5.0	1.5	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol	38%		14-62%
4165-62-2	Phenol-d5	29%		10-40%
118-79-6	2,4,6-Tribromophenol	77%		33-118%
4165-60-0	Nitrobenzene-d5	73%		42-108%
321-60-8	2-Fluorobiphenyl	75%		40-106%
1718-51-0	Terphenyl-d14	78%		39-121%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: W037000.D

Accutest Laboratories

Report of Analysis

Client Sample ID:	59MW01		
Lab Sample ID:	F52170-1	**Date Sampled:**	08/29/07
Matrix:	AQ - Ground Water	**Date Received:**	08/30/07
Method:	SW846 8270C BY SIM SW846 3510C	**Percent Solids:**	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	W037000.D	1	09/21/07	RB	09/05/07	OP22199	SW1906
Run #2							

	Initial Volume	Final Volume
Run #1	1000 ml	1.0 ml
Run #2		

BN PAH List

CAS No.	Compound	Result	RL	MDL	Units	Q
83-32-9	Acenaphthene	ND	1.0	0.50	ug/l	
208-96-8	Acenaphthylene	ND	1.0	0.50	ug/l	
120-12-7	Anthracene	ND	1.0	0.50	ug/l	
56-55-3	Benzo(a)anthracene	ND	0.20	0.050	ug/l	
50-32-8	Benzo(a)pyrene	ND	0.20	0.10	ug/l	
205-99-2	Benzo(b)fluoranthene	ND	0.20	0.050	ug/l	
191-24-2	Benzo(g,h,i)perylene	ND	0.20	0.10	ug/l	
207-08-9	Benzo(k)fluoranthene	ND	0.20	0.10	ug/l	
218-01-9	Chrysene	ND	0.20	0.10	ug/l	
53-70-3	Dibenzo(a,h)anthracene	ND	0.20	0.050	ug/l	
206-44-0	Fluoranthene	ND	1.0	0.25	ug/l	
86-73-7	Fluorene	ND	1.0	0.25	ug/l	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	0.20	0.050	ug/l	
90-12-0	1-Methylnaphthalene	ND	1.0	0.25	ug/l	
91-57-6	2-Methylnaphthalene	ND	1.0	0.25	ug/l	
91-20-3	Naphthalene	ND	1.0	0.25	ug/l	
85-01-8	Phenanthrene	ND	1.0	0.50	ug/l	
129-00-0	Pyrene	ND	1.0	0.25	ug/l	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	48MW1		
Lab Sample ID:	F52170-2	**Date Sampled:**	08/29/07
Matrix:	AQ - Ground Water	**Date Received:**	08/30/07
Method:	SW846 8270C SW846 3510C	**Percent Solids:**	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	U004533.D	1	09/11/07	NJ	09/05/07	OP22198	SU216
Run #2							

	Initial Volume	Final Volume
Run #1	980 ml	1.0 ml
Run #2		

ABN TCL List w/o PAHs

CAS No.	Compound	Result	RL	MDL	Units	Q
65-85-0	Benzoic Acid	ND	26	10	ug/l	
95-57-8	2-Chlorophenol	ND	5.1	1.0	ug/l	
59-50-7	4-Chloro-3-methyl phenol	ND	5.1	2.0	ug/l	
120-83-2	2,4-Dichlorophenol	ND	5.1	1.0	ug/l	
105-67-9	2,4-Dimethylphenol	ND	5.1	2.0	ug/l	
51-28-5	2,4-Dinitrophenol	ND	26	10	ug/l	
534-52-1	4,6-Dinitro-o-cresol	ND	10	2.0	ug/l	
95-48-7	2-Methylphenol	ND	5.1	1.0	ug/l	
	3&4-Methylphenol	ND	5.1	1.3	ug/l	
88-75-5	2-Nitrophenol	ND	5.1	1.0	ug/l	
100-02-7	4-Nitrophenol	ND	26	10	ug/l	
87-86-5	Pentachlorophenol	ND	26	10	ug/l	
108-95-2	Phenol	ND	5.1	2.0	ug/l	
95-95-4	2,4,5-Trichlorophenol	ND	5.1	1.0	ug/l	
88-06-2	2,4,6-Trichlorophenol	ND	5.1	1.0	ug/l	
101-55-3	4-Bromophenyl phenyl ether	ND	5.1	1.2	ug/l	
85-68-7	Butyl benzyl phthalate	ND	5.1	2.0	ug/l	
100-51-6	Benzyl Alcohol	ND	5.1	1.0	ug/l	
91-58-7	2-Chloronaphthalene	ND	5.1	1.3	ug/l	
106-47-8	4-Chloroaniline	ND	5.1	2.0	ug/l	
86-74-8	Carbazole	ND	5.1	1.0	ug/l	
111-91-1	bis(2-Chloroethoxy)methane	ND	5.1	1.0	ug/l	
111-44-4	bis(2-Chloroethyl)ether	ND	5.1	1.0	ug/l	
108-60-1	bis(2-Chloroisopropyl)ether	ND	5.1	1.0	ug/l	
7005-72-3	4-Chlorophenyl phenyl ether	ND	5.1	1.3	ug/l	
95-50-1	1,2-Dichlorobenzene	ND	5.1	1.5	ug/l	
541-73-1	1,3-Dichlorobenzene	ND	5.1	1.6	ug/l	
106-46-7	1,4-Dichlorobenzene	ND	5.1	1.5	ug/l	
121-14-2	2,4-Dinitrotoluene	ND	5.1	1.0	ug/l	
606-20-2	2,6-Dinitrotoluene	ND	5.1	1.0	ug/l	
91-94-1	3,3'-Dichlorobenzidine	ND	10	2.0	ug/l	
132-64-9	Dibenzofuran	ND	5.1	1.0	ug/l	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	48MW1		
Lab Sample ID:	F52170-2	**Date Sampled:**	08/29/07
Matrix:	AQ - Ground Water	**Date Received:**	08/30/07
Method:	SW846 8270C SW846 3510C	**Percent Solids:**	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

ABN TCL List w/o PAHs

CAS No.	Compound	Result	RL	MDL	Units	Q
84-74-2	Di-n-butyl phthalate	ND	5.1	2.0	ug/l	
117-84-0	Di-n-octyl phthalate	ND	5.1	2.0	ug/l	
84-66-2	Diethyl phthalate	ND	5.1	2.0	ug/l	
131-11-3	Dimethyl phthalate	ND	5.1	2.0	ug/l	
117-81-7	bis(2-Ethylhexyl)phthalate	ND	5.1	2.0	ug/l	
118-74-1	Hexachlorobenzene	ND	5.1	1.2	ug/l	
87-68-3	Hexachlorobutadiene	ND	5.1	1.7	ug/l	
77-47-4	Hexachlorocyclopentadiene	ND	5.1	1.5	ug/l	
67-72-1	Hexachloroethane	ND	5.1	1.9	ug/l	
78-59-1	Isophorone	ND	5.1	1.0	ug/l	
88-74-4	2-Nitroaniline	ND	10	2.0	ug/l	
99-09-2	3-Nitroaniline	ND	10	2.0	ug/l	
100-01-6	4-Nitroaniline	ND	10	2.0	ug/l	
98-95-3	Nitrobenzene	ND	5.1	1.0	ug/l	
621-64-7	N-Nitroso-di-n-propylamine	ND	5.1	1.0	ug/l	
86-30-6	N-Nitrosodiphenylamine	ND	5.1	1.0	ug/l	
120-82-1	1,2,4-Trichlorobenzene	ND	5.1	1.5	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol	39%		14-62%
4165-62-2	Phenol-d5	30%		10-40%
118-79-6	2,4,6-Tribromophenol	77%		33-118%
4165-60-0	Nitrobenzene-d5	70%		42-108%
321-60-8	2-Fluorobiphenyl	71%		40-106%
1718-51-0	Terphenyl-d14	81%		39-121%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	48MW1		
Lab Sample ID:	F52170-2	**Date Sampled:**	08/29/07
Matrix:	AQ - Ground Water	**Date Received:**	08/30/07
Method:	SW846 8270C BY SIM SW846 3510C	**Percent Solids:**	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	W037001.D	1	09/21/07	RB	09/05/07	OP22199	SW1906
Run #2							

	Initial Volume	Final Volume
Run #1	980 ml	1.0 ml
Run #2		

BN PAH List

CAS No.	Compound	Result	RL	MDL	Units	Q
83-32-9	Acenaphthene	ND	1.0	0.51	ug/l	
208-96-8	Acenaphthylene	ND	1.0	0.51	ug/l	
120-12-7	Anthracene	ND	1.0	0.51	ug/l	
56-55-3	Benzo(a)anthracene	ND	0.20	0.051	ug/l	
50-32-8	Benzo(a)pyrene	ND	0.20	0.10	ug/l	
205-99-2	Benzo(b)fluoranthene	ND	0.20	0.051	ug/l	
191-24-2	Benzo(g,h,i)perylene	ND	0.20	0.10	ug/l	
207-08-9	Benzo(k)fluoranthene	ND	0.20	0.10	ug/l	
218-01-9	Chrysene	ND	0.20	0.10	ug/l	
53-70-3	Dibenzo(a,h)anthracene	ND	0.20	0.051	ug/l	
206-44-0	Fluoranthene	ND	1.0	0.26	ug/l	
86-73-7	Fluorene	ND	1.0	0.26	ug/l	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	0.20	0.051	ug/l	
90-12-0	1-Methylnaphthalene	ND	1.0	0.26	ug/l	
91-57-6	2-Methylnaphthalene	ND	1.0	0.26	ug/l	
91-20-3	Naphthalene	ND	1.0	0.26	ug/l	
85-01-8	Phenanthrene	ND	1.0	0.51	ug/l	
129-00-0	Pyrene	ND	1.0	0.26	ug/l	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: U004534.D

Accutest Laboratories

Report of Analysis

Client Sample ID:	TMMW01		
Lab Sample ID:	F52170-3	**Date Sampled:**	08/29/07
Matrix:	AQ - Ground Water	**Date Received:**	08/30/07
Method:	SW846 8270C SW846 3510C	**Percent Solids:**	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	U004534.D	1	09/11/07	NJ	09/05/07	OP22198	SU216
Run #2							

	Initial Volume	Final Volume
Run #1	1000 ml	1.0 ml
Run #2		

ABN TCL List w/o PAHs

CAS No.	Compound	Result	RL	MDL	Units	Q
65-85-0	Benzoic Acid	ND	25	10	ug/l	
95-57-8	2-Chlorophenol	ND	5.0	1.0	ug/l	
59-50-7	4-Chloro-3-methyl phenol	ND	5.0	2.0	ug/l	
120-83-2	2,4-Dichlorophenol	ND	5.0	1.0	ug/l	
105-67-9	2,4-Dimethylphenol	ND	5.0	2.0	ug/l	
51-28-5	2,4-Dinitrophenol	ND	25	10	ug/l	
534-52-1	4,6-Dinitro-o-cresol	ND	10	2.0	ug/l	
95-48-7	2-Methylphenol	ND	5.0	1.0	ug/l	
	3&4-Methylphenol	ND	5.0	1.3	ug/l	
88-75-5	2-Nitrophenol	ND	5.0	1.0	ug/l	
100-02-7	4-Nitrophenol	ND	25	10	ug/l	
87-86-5	Pentachlorophenol	ND	25	10	ug/l	
108-95-2	Phenol	ND	5.0	2.0	ug/l	
95-95-4	2,4,5-Trichlorophenol	ND	5.0	1.0	ug/l	
88-06-2	2,4,6-Trichlorophenol	ND	5.0	1.0	ug/l	
101-55-3	4-Bromophenyl phenyl ether	ND	5.0	1.2	ug/l	
85-68-7	Butyl benzyl phthalate	ND	5.0	2.0	ug/l	
100-51-6	Benzyl Alcohol	ND	5.0	1.0	ug/l	
91-58-7	2-Chloronaphthalene	ND	5.0	1.3	ug/l	
106-47-8	4-Chloroaniline	ND	5.0	2.0	ug/l	
86-74-8	Carbazole	ND	5.0	1.0	ug/l	
111-91-1	bis(2-Chloroethoxy)methane	ND	5.0	1.0	ug/l	
111-44-4	bis(2-Chloroethyl)ether	ND	5.0	1.0	ug/l	
108-60-1	bis(2-Chloroisopropyl)ether	ND	5.0	1.0	ug/l	
7005-72-3	4-Chlorophenyl phenyl ether	ND	5.0	1.3	ug/l	
95-50-1	1,2-Dichlorobenzene	ND	5.0	1.5	ug/l	
541-73-1	1,3-Dichlorobenzene	ND	5.0	1.6	ug/l	
106-46-7	1,4-Dichlorobenzene	ND	5.0	1.5	ug/l	
121-14-2	2,4-Dinitrotoluene	ND	5.0	1.0	ug/l	
606-20-2	2,6-Dinitrotoluene	ND	5.0	1.0	ug/l	
91-94-1	3,3'-Dichlorobenzidine	ND	10	2.0	ug/l	
132-64-9	Dibenzofuran	ND	5.0	1.0	ug/l	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	TMMW01		
Lab Sample ID:	F52170-3	**Date Sampled:**	08/29/07
Matrix:	AQ - Ground Water	**Date Received:**	08/30/07
Method:	SW846 8270C SW846 3510C	**Percent Solids:**	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

ABN TCL List w/o PAHs

CAS No.	Compound	Result	RL	MDL	Units	Q
84-74-2	Di-n-butyl phthalate	ND	5.0	2.0	ug/l	
117-84-0	Di-n-octyl phthalate	ND	5.0	2.0	ug/l	
84-66-2	Diethyl phthalate	ND	5.0	2.0	ug/l	
131-11-3	Dimethyl phthalate	ND	5.0	2.0	ug/l	
117-81-7	bis(2-Ethylhexyl)phthalate	ND	5.0	2.0	ug/l	
118-74-1	Hexachlorobenzene	ND	5.0	1.2	ug/l	
87-68-3	Hexachlorobutadiene	ND	5.0	1.7	ug/l	
77-47-4	Hexachlorocyclopentadiene	ND	5.0	1.5	ug/l	
67-72-1	Hexachloroethane	ND	5.0	1.9	ug/l	
78-59-1	Isophorone	ND	5.0	1.0	ug/l	
88-74-4	2-Nitroaniline	ND	10	2.0	ug/l	
99-09-2	3-Nitroaniline	ND	10	2.0	ug/l	
100-01-6	4-Nitroaniline	ND	10	2.0	ug/l	
98-95-3	Nitrobenzene	ND	5.0	1.0	ug/l	
621-64-7	N-Nitroso-di-n-propylamine	ND	5.0	1.0	ug/l	
86-30-6	N-Nitrosodiphenylamine	ND	5.0	1.0	ug/l	
120-82-1	1,2,4-Trichlorobenzene	ND	5.0	1.5	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol	34%		14-62%
4165-62-2	Phenol-d5	26%		10-40%
118-79-6	2,4,6-Tribromophenol	75%		33-118%
4165-60-0	Nitrobenzene-d5	67%		42-108%
321-60-8	2-Fluorobiphenyl	69%		40-106%
1718-51-0	Terphenyl-d14	82%		39-121%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	TMMW01		
Lab Sample ID:	F52170-3	**Date Sampled:**	08/29/07
Matrix:	AQ - Ground Water	**Date Received:**	08/30/07
Method:	SW846 8270C BY SIM SW846 3510C	**Percent Solids:**	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	W037002.D	1	09/21/07	RB	09/05/07	OP22199	SW1906
Run #2							

	Initial Volume	Final Volume
Run #1	1000 ml	1.0 ml
Run #2		

BN PAH List

CAS No.	Compound	Result	RL	MDL	Units	Q
83-32-9	Acenaphthene	ND	1.0	0.50	ug/l	
208-96-8	Acenaphthylene	ND	1.0	0.50	ug/l	
120-12-7	Anthracene	ND	1.0	0.50	ug/l	
56-55-3	Benzo(a)anthracene	ND	0.20	0.050	ug/l	
50-32-8	Benzo(a)pyrene	ND	0.20	0.10	ug/l	
205-99-2	Benzo(b)fluoranthene	ND	0.20	0.050	ug/l	
191-24-2	Benzo(g,h,i)perylene	ND	0.20	0.10	ug/l	
207-08-9	Benzo(k)fluoranthene	ND	0.20	0.10	ug/l	
218-01-9	Chrysene	ND	0.20	0.10	ug/l	
53-70-3	Dibenzo(a,h)anthracene	ND	0.20	0.050	ug/l	
206-44-0	Fluoranthene	ND	1.0	0.25	ug/l	
86-73-7	Fluorene	ND	1.0	0.25	ug/l	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	0.20	0.050	ug/l	
90-12-0	1-Methylnaphthalene	ND	1.0	0.25	ug/l	
91-57-6	2-Methylnaphthalene	ND	1.0	0.25	ug/l	
91-20-3	Naphthalene	ND	1.0	0.25	ug/l	
85-01-8	Phenanthrene	ND	1.0	0.50	ug/l	
129-00-0	Pyrene	ND	1.0	0.25	ug/l	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	48MW2		
Lab Sample ID:	F52170-4	**Date Sampled:**	08/29/07
Matrix:	AQ - Ground Water	**Date Received:**	08/30/07
Method:	SW846 8270C SW846 3510C	**Percent Solids:**	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	U004535.D	1	09/11/07	NJ	09/05/07	OP22198	SU216
Run #2							

	Initial Volume	Final Volume
Run #1	1000 ml	1.0 ml
Run #2		

ABN TCL List w/o PAHs

CAS No.	Compound	Result	RL	MDL	Units	Q
65-85-0	Benzoic Acid	ND	25	10	ug/l	
95-57-8	2-Chlorophenol	ND	5.0	1.0	ug/l	
59-50-7	4-Chloro-3-methyl phenol	ND	5.0	2.0	ug/l	
120-83-2	2,4-Dichlorophenol	ND	5.0	1.0	ug/l	
105-67-9	2,4-Dimethylphenol	ND	5.0	2.0	ug/l	
51-28-5	2,4-Dinitrophenol	ND	25	10	ug/l	
534-52-1	4,6-Dinitro-o-cresol	ND	10	2.0	ug/l	
95-48-7	2-Methylphenol	ND	5.0	1.0	ug/l	
	3&4-Methylphenol	ND	5.0	1.3	ug/l	
88-75-5	2-Nitrophenol	ND	5.0	1.0	ug/l	
100-02-7	4-Nitrophenol	ND	25	10	ug/l	
87-86-5	Pentachlorophenol	ND	25	10	ug/l	
108-95-2	Phenol	ND	5.0	2.0	ug/l	
95-95-4	2,4,5-Trichlorophenol	ND	5.0	1.0	ug/l	
88-06-2	2,4,6-Trichlorophenol	ND	5.0	1.0	ug/l	
101-55-3	4-Bromophenyl phenyl ether	ND	5.0	1.2	ug/l	
85-68-7	Butyl benzyl phthalate	ND	5.0	2.0	ug/l	
100-51-6	Benzyl Alcohol	ND	5.0	1.0	ug/l	
91-58-7	2-Chloronaphthalene	ND	5.0	1.3	ug/l	
106-47-8	4-Chloroaniline	ND	5.0	2.0	ug/l	
86-74-8	Carbazole	ND	5.0	1.0	ug/l	
111-91-1	bis(2-Chloroethoxy)methane	ND	5.0	1.0	ug/l	
111-44-4	bis(2-Chloroethyl)ether	ND	5.0	1.0	ug/l	
108-60-1	bis(2-Chloroisopropyl)ether	ND	5.0	1.0	ug/l	
7005-72-3	4-Chlorophenyl phenyl ether	ND	5.0	1.3	ug/l	
95-50-1	1,2-Dichlorobenzene	ND	5.0	1.5	ug/l	
541-73-1	1,3-Dichlorobenzene	ND	5.0	1.6	ug/l	
106-46-7	1,4-Dichlorobenzene	ND	5.0	1.5	ug/l	
121-14-2	2,4-Dinitrotoluene	ND	5.0	1.0	ug/l	
606-20-2	2,6-Dinitrotoluene	ND	5.0	1.0	ug/l	
91-94-1	3,3'-Dichlorobenzidine	ND	10	2.0	ug/l	
132-64-9	Dibenzofuran	ND	5.0	1.0	ug/l	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	48MW2		
Lab Sample ID:	F52170-4	Date Sampled:	08/29/07
Matrix:	AQ - Ground Water	Date Received:	08/30/07
Method:	SW846 8270C SW846 3510C	Percent Solids:	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

ABN TCL List w/o PAHs

CAS No.	Compound	Result	RL	MDL	Units	Q
84-74-2	Di-n-butyl phthalate	ND	5.0	2.0	ug/l	
117-84-0	Di-n-octyl phthalate	ND	5.0	2.0	ug/l	
84-66-2	Diethyl phthalate	ND	5.0	2.0	ug/l	
131-11-3	Dimethyl phthalate	ND	5.0	2.0	ug/l	
117-81-7	bis(2-Ethylhexyl)phthalate	ND	5.0	2.0	ug/l	
118-74-1	Hexachlorobenzene	ND	5.0	1.2	ug/l	
87-68-3	Hexachlorobutadiene	ND	5.0	1.7	ug/l	
77-47-4	Hexachlorocyclopentadiene	ND	5.0	1.5	ug/l	
67-72-1	Hexachloroethane	ND	5.0	1.9	ug/l	
78-59-1	Isophorone	ND	5.0	1.0	ug/l	
88-74-4	2-Nitroaniline	ND	10	2.0	ug/l	
99-09-2	3-Nitroaniline	ND	10	2.0	ug/l	
100-01-6	4-Nitroaniline	ND	10	2.0	ug/l	
98-95-3	Nitrobenzene	ND	5.0	1.0	ug/l	
621-64-7	N-Nitroso-di-n-propylamine	ND	5.0	1.0	ug/l	
86-30-6	N-Nitrosodiphenylamine	ND	5.0	1.0	ug/l	
120-82-1	1,2,4-Trichlorobenzene	ND	5.0	1.5	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol	34%		14-62%
4165-62-2	Phenol-d5	26%		10-40%
118-79-6	2,4,6-Tribromophenol	71%		33-118%
4165-60-0	Nitrobenzene-d5	62%		42-108%
321-60-8	2-Fluorobiphenyl	65%		40-106%
1718-51-0	Terphenyl-d14	67%		39-121%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: W037003.D

Accutest Laboratories

Report of Analysis

Client Sample ID:	48MW2		
Lab Sample ID:	F52170-4	**Date Sampled:**	08/29/07
Matrix:	AQ - Ground Water	**Date Received:**	08/30/07
Method:	SW846 8270C BY SIM SW846 3510C	**Percent Solids:**	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	W037003.D	1	09/21/07	RB	09/05/07	OP22199	SW1906
Run #2							

	Initial Volume	Final Volume
Run #1	1000 ml	1.0 ml
Run #2		

BN PAH List

CAS No.	Compound	Result	RL	MDL	Units	Q
83-32-9	Acenaphthene	ND	1.0	0.50	ug/l	
208-96-8	Acenaphthylene	ND	1.0	0.50	ug/l	
120-12-7	Anthracene	ND	1.0	0.50	ug/l	
56-55-3	Benzo(a)anthracene	ND	0.20	0.050	ug/l	
50-32-8	Benzo(a)pyrene	ND	0.20	0.10	ug/l	
205-99-2	Benzo(b)fluoranthene	ND	0.20	0.050	ug/l	
191-24-2	Benzo(g,h,i)perylene	ND	0.20	0.10	ug/l	
207-08-9	Benzo(k)fluoranthene	ND	0.20	0.10	ug/l	
218-01-9	Chrysene	ND	0.20	0.10	ug/l	
53-70-3	Dibenzo(a,h)anthracene	ND	0.20	0.050	ug/l	
206-44-0	Fluoranthene	ND	1.0	0.25	ug/l	
86-73-7	Fluorene	ND	1.0	0.25	ug/l	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	0.20	0.050	ug/l	
90-12-0	1-Methylnaphthalene	ND	1.0	0.25	ug/l	
91-57-6	2-Methylnaphthalene	ND	1.0	0.25	ug/l	
91-20-3	Naphthalene	ND	1.0	0.25	ug/l	
85-01-8	Phenanthrene	ND	1.0	0.50	ug/l	
129-00-0	Pyrene	ND	1.0	0.25	ug/l	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	48MW3		
Lab Sample ID:	F52170-5	**Date Sampled:**	08/29/07
Matrix:	AQ - Ground Water	**Date Received:**	08/30/07
Method:	SW846 8270C SW846 3510C	**Percent Solids:**	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	U004536.D	1	09/11/07	NJ	09/05/07	OP22198	SU216
Run #2							

	Initial Volume	Final Volume
Run #1	1020 ml	1.0 ml
Run #2		

ABN TCL List w/o PAHs

CAS No.	Compound	Result	RL	MDL	Units	Q
65-85-0	Benzoic Acid	ND	25	9.8	ug/l	
95-57-8	2-Chlorophenol	ND	4.9	0.98	ug/l	
59-50-7	4-Chloro-3-methyl phenol	ND	4.9	2.0	ug/l	
120-83-2	2,4-Dichlorophenol	ND	4.9	0.98	ug/l	
105-67-9	2,4-Dimethylphenol	ND	4.9	2.0	ug/l	
51-28-5	2,4-Dinitrophenol	ND	25	9.8	ug/l	
534-52-1	4,6-Dinitro-o-cresol	ND	9.8	2.0	ug/l	
95-48-7	2-Methylphenol	ND	4.9	0.98	ug/l	
	3&4-Methylphenol	ND	4.9	1.3	ug/l	
88-75-5	2-Nitrophenol	ND	4.9	0.98	ug/l	
100-02-7	4-Nitrophenol	ND	25	9.8	ug/l	
87-86-5	Pentachlorophenol	ND	25	9.8	ug/l	
108-95-2	Phenol	ND	4.9	2.0	ug/l	
95-95-4	2,4,5-Trichlorophenol	ND	4.9	0.98	ug/l	
88-06-2	2,4,6-Trichlorophenol	ND	4.9	0.98	ug/l	
101-55-3	4-Bromophenyl phenyl ether	ND	4.9	1.2	ug/l	
85-68-7	Butyl benzyl phthalate	ND	4.9	2.0	ug/l	
100-51-6	Benzyl Alcohol	ND	4.9	0.98	ug/l	
91-58-7	2-Chloronaphthalene	ND	4.9	1.3	ug/l	
106-47-8	4-Chloroaniline	ND	4.9	2.0	ug/l	
86-74-8	Carbazole	ND	4.9	0.98	ug/l	
111-91-1	bis(2-Chloroethoxy)methane	ND	4.9	0.98	ug/l	
111-44-4	bis(2-Chloroethyl)ether	ND	4.9	0.98	ug/l	
108-60-1	bis(2-Chloroisopropyl)ether	ND	4.9	0.98	ug/l	
7005-72-3	4-Chlorophenyl phenyl ether	ND	4.9	1.3	ug/l	
95-50-1	1,2-Dichlorobenzene	ND	4.9	1.5	ug/l	
541-73-1	1,3-Dichlorobenzene	ND	4.9	1.6	ug/l	
106-46-7	1,4-Dichlorobenzene	ND	4.9	1.5	ug/l	
121-14-2	2,4-Dinitrotoluene	ND	4.9	0.98	ug/l	
606-20-2	2,6-Dinitrotoluene	ND	4.9	0.98	ug/l	
91-94-1	3,3'-Dichlorobenzidine	ND	9.8	2.0	ug/l	
132-64-9	Dibenzofuran	ND	4.9	0.98	ug/l	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	48MW3		
Lab Sample ID:	F52170-5	**Date Sampled:**	08/29/07
Matrix:	AQ - Ground Water	**Date Received:**	08/30/07
Method:	SW846 8270C SW846 3510C	**Percent Solids:**	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

ABN TCL List w/o PAHs

CAS No.	Compound	Result	RL	MDL	Units	Q
84-74-2	Di-n-butyl phthalate	ND	4.9	2.0	ug/l	
117-84-0	Di-n-octyl phthalate	ND	4.9	2.0	ug/l	
84-66-2	Diethyl phthalate	ND	4.9	2.0	ug/l	
131-11-3	Dimethyl phthalate	ND	4.9	2.0	ug/l	
117-81-7	bis(2-Ethylhexyl)phthalate	ND	4.9	2.0	ug/l	
118-74-1	Hexachlorobenzene	ND	4.9	1.2	ug/l	
87-68-3	Hexachlorobutadiene	ND	4.9	1.7	ug/l	
77-47-4	Hexachlorocyclopentadiene	ND	4.9	1.5	ug/l	
67-72-1	Hexachloroethane	ND	4.9	1.9	ug/l	
78-59-1	Isophorone	ND	4.9	0.98	ug/l	
88-74-4	2-Nitroaniline	ND	9.8	2.0	ug/l	
99-09-2	3-Nitroaniline	ND	9.8	2.0	ug/l	
100-01-6	4-Nitroaniline	ND	9.8	2.0	ug/l	
98-95-3	Nitrobenzene	ND	4.9	0.98	ug/l	
621-64-7	N-Nitroso-di-n-propylamine	ND	4.9	0.98	ug/l	
86-30-6	N-Nitrosodiphenylamine	ND	4.9	0.98	ug/l	
120-82-1	1,2,4-Trichlorobenzene	ND	4.9	1.5	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol	30%		14-62%
4165-62-2	Phenol-d5	23%		10-40%
118-79-6	2,4,6-Tribromophenol	69%		33-118%
4165-60-0	Nitrobenzene-d5	57%		42-108%
321-60-8	2-Fluorobiphenyl	59%		40-106%
1718-51-0	Terphenyl-d14	79%		39-121%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	48MW3		
Lab Sample ID:	F52170-5	**Date Sampled:**	08/29/07
Matrix:	AQ - Ground Water	**Date Received:**	08/30/07
Method:	SW846 8270C BY SIM SW846 3510C	**Percent Solids:**	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	W037004.D	1	09/21/07	RB	09/05/07	OP22199	SW1906
Run #2							

	Initial Volume	Final Volume
Run #1	1020 ml	1.0 ml
Run #2		

BN PAH List

CAS No.	Compound	Result	RL	MDL	Units	Q
83-32-9	Acenaphthene	ND	0.98	0.49	ug/l	
208-96-8	Acenaphthylene	ND	0.98	0.49	ug/l	
120-12-7	Anthracene	ND	0.98	0.49	ug/l	
56-55-3	Benzo(a)anthracene	ND	0.20	0.049	ug/l	
50-32-8	Benzo(a)pyrene	ND	0.20	0.098	ug/l	
205-99-2	Benzo(b)fluoranthene	ND	0.20	0.049	ug/l	
191-24-2	Benzo(g,h,i)perylene	ND	0.20	0.098	ug/l	
207-08-9	Benzo(k)fluoranthene	ND	0.20	0.098	ug/l	
218-01-9	Chrysene	ND	0.20	0.098	ug/l	
53-70-3	Dibenzo(a,h)anthracene	ND	0.20	0.049	ug/l	
206-44-0	Fluoranthene	ND	0.98	0.25	ug/l	
86-73-7	Fluorene	ND	0.98	0.25	ug/l	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	0.20	0.049	ug/l	
90-12-0	1-Methylnaphthalene	ND	0.98	0.25	ug/l	
91-57-6	2-Methylnaphthalene	ND	0.98	0.25	ug/l	
91-20-3	Naphthalene	ND	0.98	0.25	ug/l	
85-01-8	Phenanthrene	ND	0.98	0.49	ug/l	
129-00-0	Pyrene	ND	0.98	0.25	ug/l	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	TMMW3		
Lab Sample ID:	F52170-6	**Date Sampled:**	08/29/07
Matrix:	AQ - Ground Water	**Date Received:**	08/30/07
Method:	SW846 8270C SW846 3510C	**Percent Solids:**	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	U004537.D	1	09/11/07	NJ	09/05/07	OP22198	SU216
Run #2							

	Initial Volume	Final Volume
Run #1	1020 ml	1.0 ml
Run #2		

ABN TCL List w/o PAHs

CAS No.	Compound	Result	RL	MDL	Units	Q
65-85-0	Benzoic Acid	ND	25	9.8	ug/l	
95-57-8	2-Chlorophenol	ND	4.9	0.98	ug/l	
59-50-7	4-Chloro-3-methyl phenol	ND	4.9	2.0	ug/l	
120-83-2	2,4-Dichlorophenol	ND	4.9	0.98	ug/l	
105-67-9	2,4-Dimethylphenol	ND	4.9	2.0	ug/l	
51-28-5	2,4-Dinitrophenol	ND	25	9.8	ug/l	
534-52-1	4,6-Dinitro-o-cresol	ND	9.8	2.0	ug/l	
95-48-7	2-Methylphenol	ND	4.9	0.98	ug/l	
	3&4-Methylphenol	ND	4.9	1.3	ug/l	
88-75-5	2-Nitrophenol	ND	4.9	0.98	ug/l	
100-02-7	4-Nitrophenol	ND	25	9.8	ug/l	
87-86-5	Pentachlorophenol	ND	25	9.8	ug/l	
108-95-2	Phenol	ND	4.9	2.0	ug/l	
95-95-4	2,4,5-Trichlorophenol	ND	4.9	0.98	ug/l	
88-06-2	2,4,6-Trichlorophenol	ND	4.9	0.98	ug/l	
101-55-3	4-Bromophenyl phenyl ether	ND	4.9	1.2	ug/l	
85-68-7	Butyl benzyl phthalate	ND	4.9	2.0	ug/l	
100-51-6	Benzyl Alcohol	ND	4.9	0.98	ug/l	
91-58-7	2-Chloronaphthalene	ND	4.9	1.3	ug/l	
106-47-8	4-Chloroaniline	ND	4.9	2.0	ug/l	
86-74-8	Carbazole	ND	4.9	0.98	ug/l	
111-91-1	bis(2-Chloroethoxy)methane	ND	4.9	0.98	ug/l	
111-44-4	bis(2-Chloroethyl)ether	ND	4.9	0.98	ug/l	
108-60-1	bis(2-Chloroisopropyl)ether	ND	4.9	0.98	ug/l	
7005-72-3	4-Chlorophenyl phenyl ether	ND	4.9	1.3	ug/l	
95-50-1	1,2-Dichlorobenzene	ND	4.9	1.5	ug/l	
541-73-1	1,3-Dichlorobenzene	ND	4.9	1.6	ug/l	
106-46-7	1,4-Dichlorobenzene	ND	4.9	1.5	ug/l	
121-14-2	2,4-Dinitrotoluene	ND	4.9	0.98	ug/l	
606-20-2	2,6-Dinitrotoluene	ND	4.9	0.98	ug/l	
91-94-1	3,3'-Dichlorobenzidine	ND	9.8	2.0	ug/l	
132-64-9	Dibenzofuran	ND	4.9	0.98	ug/l	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	TMMW3		
Lab Sample ID:	F52170-6	**Date Sampled:**	08/29/07
Matrix:	AQ - Ground Water	**Date Received:**	08/30/07
Method:	SW846 8270C SW846 3510C	**Percent Solids:**	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

ABN TCL List w/o PAHs

CAS No.	Compound	Result	RL	MDL	Units	Q
84-74-2	Di-n-butyl phthalate	ND	4.9	2.0	ug/l	
117-84-0	Di-n-octyl phthalate	ND	4.9	2.0	ug/l	
84-66-2	Diethyl phthalate	ND	4.9	2.0	ug/l	
131-11-3	Dimethyl phthalate	ND	4.9	2.0	ug/l	
117-81-7	bis(2-Ethylhexyl)phthalate	ND	4.9	2.0	ug/l	
118-74-1	Hexachlorobenzene	ND	4.9	1.2	ug/l	
87-68-3	Hexachlorobutadiene	ND	4.9	1.7	ug/l	
77-47-4	Hexachlorocyclopentadiene	ND	4.9	1.5	ug/l	
67-72-1	Hexachloroethane	ND	4.9	1.9	ug/l	
78-59-1	Isophorone	ND	4.9	0.98	ug/l	
88-74-4	2-Nitroaniline	ND	9.8	2.0	ug/l	
99-09-2	3-Nitroaniline	ND	9.8	2.0	ug/l	
100-01-6	4-Nitroaniline	ND	9.8	2.0	ug/l	
98-95-3	Nitrobenzene	ND	4.9	0.98	ug/l	
621-64-7	N-Nitroso-di-n-propylamine	ND	4.9	0.98	ug/l	
86-30-6	N-Nitrosodiphenylamine	ND	4.9	0.98	ug/l	
120-82-1	1,2,4-Trichlorobenzene	ND	4.9	1.5	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol	37%		14-62%
4165-62-2	Phenol-d5	27%		10-40%
118-79-6	2,4,6-Tribromophenol	73%		33-118%
4165-60-0	Nitrobenzene-d5	67%		42-108%
321-60-8	2-Fluorobiphenyl	68%		40-106%
1718-51-0	Terphenyl-d14	76%		39-121%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	TMMW3		
Lab Sample ID:	F52170-6	**Date Sampled:**	08/29/07
Matrix:	AQ - Ground Water	**Date Received:**	08/30/07
Method:	SW846 8270C BY SIM SW846 3510C	**Percent Solids:**	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	W037007.D	1	09/21/07	RB	09/05/07	OP22199	SW1906
Run #2							

	Initial Volume	Final Volume
Run #1	1020 ml	1.0 ml
Run #2		

BN PAH List

CAS No.	Compound	Result	RL	MDL	Units	Q
83-32-9	Acenaphthene	ND	0.98	0.49	ug/l	
208-96-8	Acenaphthylene	ND	0.98	0.49	ug/l	
120-12-7	Anthracene	ND	0.98	0.49	ug/l	
56-55-3	Benzo(a)anthracene	ND	0.20	0.049	ug/l	
50-32-8	Benzo(a)pyrene	ND	0.20	0.098	ug/l	
205-99-2	Benzo(b)fluoranthene	ND	0.20	0.049	ug/l	
191-24-2	Benzo(g,h,i)perylene	ND	0.20	0.098	ug/l	
207-08-9	Benzo(k)fluoranthene	ND	0.20	0.098	ug/l	
218-01-9	Chrysene	ND	0.20	0.098	ug/l	
53-70-3	Dibenzo(a,h)anthracene	ND	0.20	0.049	ug/l	
206-44-0	Fluoranthene	ND	0.98	0.25	ug/l	
86-73-7	Fluorene	ND	0.98	0.25	ug/l	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	0.20	0.049	ug/l	
90-12-0	1-Methylnaphthalene	ND	0.98	0.25	ug/l	
91-57-6	2-Methylnaphthalene	ND	0.98	0.25	ug/l	
91-20-3	Naphthalene	ND	0.98	0.25	ug/l	
85-01-8	Phenanthrene	ND	0.98	0.49	ug/l	
129-00-0	Pyrene	ND	0.98	0.25	ug/l	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	48MW4		
Lab Sample ID:	F52170-7	**Date Sampled:**	08/29/07
Matrix:	AQ - Ground Water	**Date Received:**	08/30/07
Method:	SW846 8270C SW846 3510C	**Percent Solids:**	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	U004538.D	1	09/11/07	NJ	09/05/07	OP22198	SU216
Run #2							

	Initial Volume	Final Volume
Run #1	1020 ml	1.0 ml
Run #2		

ABN TCL List w/o PAHs

CAS No.	Compound	Result	RL	MDL	Units	Q
65-85-0	Benzoic Acid	ND	25	9.8	ug/l	
95-57-8	2-Chlorophenol	ND	4.9	0.98	ug/l	
59-50-7	4-Chloro-3-methyl phenol	ND	4.9	2.0	ug/l	
120-83-2	2,4-Dichlorophenol	ND	4.9	0.98	ug/l	
105-67-9	2,4-Dimethylphenol	ND	4.9	2.0	ug/l	
51-28-5	2,4-Dinitrophenol	ND	25	9.8	ug/l	
534-52-1	4,6-Dinitro-o-cresol	ND	9.8	2.0	ug/l	
95-48-7	2-Methylphenol	ND	4.9	0.98	ug/l	
	3&4-Methylphenol	ND	4.9	1.3	ug/l	
88-75-5	2-Nitrophenol	ND	4.9	0.98	ug/l	
100-02-7	4-Nitrophenol	ND	25	9.8	ug/l	
87-86-5	Pentachlorophenol	ND	25	9.8	ug/l	
108-95-2	Phenol	ND	4.9	2.0	ug/l	
95-95-4	2,4,5-Trichlorophenol	ND	4.9	0.98	ug/l	
88-06-2	2,4,6-Trichlorophenol	ND	4.9	0.98	ug/l	
101-55-3	4-Bromophenyl phenyl ether	ND	4.9	1.2	ug/l	
85-68-7	Butyl benzyl phthalate	ND	4.9	2.0	ug/l	
100-51-6	Benzyl Alcohol	ND	4.9	0.98	ug/l	
91-58-7	2-Chloronaphthalene	ND	4.9	1.3	ug/l	
106-47-8	4-Chloroaniline	ND	4.9	2.0	ug/l	
86-74-8	Carbazole	ND	4.9	0.98	ug/l	
111-91-1	bis(2-Chloroethoxy)methane	ND	4.9	0.98	ug/l	
111-44-4	bis(2-Chloroethyl)ether	ND	4.9	0.98	ug/l	
108-60-1	bis(2-Chloroisopropyl)ether	ND	4.9	0.98	ug/l	
7005-72-3	4-Chlorophenyl phenyl ether	ND	4.9	1.3	ug/l	
95-50-1	1,2-Dichlorobenzene	ND	4.9	1.5	ug/l	
541-73-1	1,3-Dichlorobenzene	ND	4.9	1.6	ug/l	
106-46-7	1,4-Dichlorobenzene	ND	4.9	1.5	ug/l	
121-14-2	2,4-Dinitrotoluene	ND	4.9	0.98	ug/l	
606-20-2	2,6-Dinitrotoluene	ND	4.9	0.98	ug/l	
91-94-1	3,3'-Dichlorobenzidine	ND	9.8	2.0	ug/l	
132-64-9	Dibenzofuran	ND	4.9	0.98	ug/l	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	48MW4		
Lab Sample ID:	F52170-7	**Date Sampled:**	08/29/07
Matrix:	AQ - Ground Water	**Date Received:**	08/30/07
Method:	SW846 8270C SW846 3510C	**Percent Solids:**	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

ABN TCL List w/o PAHs

CAS No.	Compound	Result	RL	MDL	Units	Q
84-74-2	Di-n-butyl phthalate	ND	4.9	2.0	ug/l	
117-84-0	Di-n-octyl phthalate	ND	4.9	2.0	ug/l	
84-66-2	Diethyl phthalate	ND	4.9	2.0	ug/l	
131-11-3	Dimethyl phthalate	ND	4.9	2.0	ug/l	
117-81-7	bis(2-Ethylhexyl)phthalate	ND	4.9	2.0	ug/l	
118-74-1	Hexachlorobenzene	ND	4.9	1.2	ug/l	
87-68-3	Hexachlorobutadiene	ND	4.9	1.7	ug/l	
77-47-4	Hexachlorocyclopentadiene	ND	4.9	1.5	ug/l	
67-72-1	Hexachloroethane	ND	4.9	1.9	ug/l	
78-59-1	Isophorone	ND	4.9	0.98	ug/l	
88-74-4	2-Nitroaniline	ND	9.8	2.0	ug/l	
99-09-2	3-Nitroaniline	ND	9.8	2.0	ug/l	
100-01-6	4-Nitroaniline	ND	9.8	2.0	ug/l	
98-95-3	Nitrobenzene	ND	4.9	0.98	ug/l	
621-64-7	N-Nitroso-di-n-propylamine	ND	4.9	0.98	ug/l	
86-30-6	N-Nitrosodiphenylamine	ND	4.9	0.98	ug/l	
120-82-1	1,2,4-Trichlorobenzene	ND	4.9	1.5	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol	33%		14-62%
4165-62-2	Phenol-d5	24%		10-40%
118-79-6	2,4,6-Tribromophenol	67%		33-118%
4165-60-0	Nitrobenzene-d5	62%		42-108%
321-60-8	2-Fluorobiphenyl	63%		40-106%
1718-51-0	Terphenyl-d14	73%		39-121%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	48MW4		
Lab Sample ID:	F52170-7	**Date Sampled:**	08/29/07
Matrix:	AQ - Ground Water	**Date Received:**	08/30/07
Method:	SW846 8270C BY SIM SW846 3510C	**Percent Solids:**	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	W037008.D	1	09/21/07	RB	09/05/07	OP22199	SW1906
Run #2							

	Initial Volume	Final Volume
Run #1	1020 ml	1.0 ml
Run #2		

BN PAH List

CAS No.	Compound	Result	RL	MDL	Units	Q
83-32-9	Acenaphthene	ND	0.98	0.49	ug/l	
208-96-8	Acenaphthylene	ND	0.98	0.49	ug/l	
120-12-7	Anthracene	ND	0.98	0.49	ug/l	
56-55-3	Benzo(a)anthracene	ND	0.20	0.049	ug/l	
50-32-8	Benzo(a)pyrene	ND	0.20	0.098	ug/l	
205-99-2	Benzo(b)fluoranthene	ND	0.20	0.049	ug/l	
191-24-2	Benzo(g,h,i)perylene	ND	0.20	0.098	ug/l	
207-08-9	Benzo(k)fluoranthene	ND	0.20	0.098	ug/l	
218-01-9	Chrysene	ND	0.20	0.098	ug/l	
53-70-3	Dibenzo(a,h)anthracene	ND	0.20	0.049	ug/l	
206-44-0	Fluoranthene	ND	0.98	0.25	ug/l	
86-73-7	Fluorene	ND	0.98	0.25	ug/l	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	0.20	0.049	ug/l	
90-12-0	1-Methylnaphthalene	ND	0.98	0.25	ug/l	
91-57-6	2-Methylnaphthalene	ND	0.98	0.25	ug/l	
91-20-3	Naphthalene	ND	0.98	0.25	ug/l	
85-01-8	Phenanthrene	ND	0.98	0.49	ug/l	
129-00-0	Pyrene	ND	0.98	0.25	ug/l	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	49MW01		
Lab Sample ID:	F52170-8	**Date Sampled:**	08/29/07
Matrix:	AQ - Ground Water	**Date Received:**	08/30/07
Method:	SW846 8270C SW846 3510C	**Percent Solids:**	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	U004539.D	1	09/12/07	NJ	09/05/07	OP22198	SU216
Run #2							

	Initial Volume	Final Volume
Run #1	1000 ml	1.0 ml
Run #2		

ABN TCL List w/o PAHs

CAS No.	Compound	Result	RL	MDL	Units	Q
65-85-0	Benzoic Acid	ND	25	10	ug/l	
95-57-8	2-Chlorophenol	ND	5.0	1.0	ug/l	
59-50-7	4-Chloro-3-methyl phenol	ND	5.0	2.0	ug/l	
120-83-2	2,4-Dichlorophenol	ND	5.0	1.0	ug/l	
105-67-9	2,4-Dimethylphenol	ND	5.0	2.0	ug/l	
51-28-5	2,4-Dinitrophenol	ND	25	10	ug/l	
534-52-1	4,6-Dinitro-o-cresol	ND	10	2.0	ug/l	
95-48-7	2-Methylphenol	ND	5.0	1.0	ug/l	
	3&4-Methylphenol	ND	5.0	1.3	ug/l	
88-75-5	2-Nitrophenol	ND	5.0	1.0	ug/l	
100-02-7	4-Nitrophenol	ND	25	10	ug/l	
87-86-5	Pentachlorophenol	ND	25	10	ug/l	
108-95-2	Phenol	ND	5.0	2.0	ug/l	
95-95-4	2,4,5-Trichlorophenol	ND	5.0	1.0	ug/l	
88-06-2	2,4,6-Trichlorophenol	ND	5.0	1.0	ug/l	
101-55-3	4-Bromophenyl phenyl ether	ND	5.0	1.2	ug/l	
85-68-7	Butyl benzyl phthalate	ND	5.0	2.0	ug/l	
100-51-6	Benzyl Alcohol	ND	5.0	1.0	ug/l	
91-58-7	2-Chloronaphthalene	ND	5.0	1.3	ug/l	
106-47-8	4-Chloroaniline	ND	5.0	2.0	ug/l	
86-74-8	Carbazole	ND	5.0	1.0	ug/l	
111-91-1	bis(2-Chloroethoxy)methane	ND	5.0	1.0	ug/l	
111-44-4	bis(2-Chloroethyl)ether	ND	5.0	1.0	ug/l	
108-60-1	bis(2-Chloroisopropyl)ether	ND	5.0	1.0	ug/l	
7005-72-3	4-Chlorophenyl phenyl ether	ND	5.0	1.3	ug/l	
95-50-1	1,2-Dichlorobenzene	ND	5.0	1.5	ug/l	
541-73-1	1,3-Dichlorobenzene	ND	5.0	1.6	ug/l	
106-46-7	1,4-Dichlorobenzene	ND	5.0	1.5	ug/l	
121-14-2	2,4-Dinitrotoluene	ND	5.0	1.0	ug/l	
606-20-2	2,6-Dinitrotoluene	ND	5.0	1.0	ug/l	
91-94-1	3,3'-Dichlorobenzidine	ND	10	2.0	ug/l	
132-64-9	Dibenzofuran	ND	5.0	1.0	ug/l	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	49MW01		
Lab Sample ID:	F52170-8	**Date Sampled:**	08/29/07
Matrix:	AQ - Ground Water	**Date Received:**	08/30/07
Method:	SW846 8270C SW846 3510C	**Percent Solids:**	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

ABN TCL List w/o PAHs

CAS No.	Compound	Result	RL	MDL	Units	Q
84-74-2	Di-n-butyl phthalate	ND	5.0	2.0	ug/l	
117-84-0	Di-n-octyl phthalate	ND	5.0	2.0	ug/l	
84-66-2	Diethyl phthalate	ND	5.0	2.0	ug/l	
131-11-3	Dimethyl phthalate	ND	5.0	2.0	ug/l	
117-81-7	bis(2-Ethylhexyl)phthalate	ND	5.0	2.0	ug/l	
118-74-1	Hexachlorobenzene	ND	5.0	1.2	ug/l	
87-68-3	Hexachlorobutadiene	ND	5.0	1.7	ug/l	
77-47-4	Hexachlorocyclopentadiene	ND	5.0	1.5	ug/l	
67-72-1	Hexachloroethane	ND	5.0	1.9	ug/l	
78-59-1	Isophorone	ND	5.0	1.0	ug/l	
88-74-4	2-Nitroaniline	ND	10	2.0	ug/l	
99-09-2	3-Nitroaniline	ND	10	2.0	ug/l	
100-01-6	4-Nitroaniline	ND	10	2.0	ug/l	
98-95-3	Nitrobenzene	ND	5.0	1.0	ug/l	
621-64-7	N-Nitroso-di-n-propylamine	ND	5.0	1.0	ug/l	
86-30-6	N-Nitrosodiphenylamine	ND	5.0	1.0	ug/l	
120-82-1	1,2,4-Trichlorobenzene	ND	5.0	1.5	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol	36%		14-62%
4165-62-2	Phenol-d5	27%		10-40%
118-79-6	2,4,6-Tribromophenol	77%		33-118%
4165-60-0	Nitrobenzene-d5	65%		42-108%
321-60-8	2-Fluorobiphenyl	69%		40-106%
1718-51-0	Terphenyl-d14	64%		39-121%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	49MW01		
Lab Sample ID:	F52170-8	**Date Sampled:**	08/29/07
Matrix:	AQ - Ground Water	**Date Received:**	08/30/07
Method:	SW846 8270C BY SIM SW846 3510C	**Percent Solids:**	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	W037009.D	1	09/21/07	RB	09/05/07	OP22199	SW1906
Run #2							

	Initial Volume	Final Volume
Run #1	1000 ml	1.0 ml
Run #2		

BN PAH List

CAS No.	Compound	Result	RL	MDL	Units	Q
83-32-9	Acenaphthene	ND	1.0	0.50	ug/l	
208-96-8	Acenaphthylene	ND	1.0	0.50	ug/l	
120-12-7	Anthracene	ND	1.0	0.50	ug/l	
56-55-3	Benzo(a)anthracene	ND	0.20	0.050	ug/l	
50-32-8	Benzo(a)pyrene	ND	0.20	0.10	ug/l	
205-99-2	Benzo(b)fluoranthene	ND	0.20	0.050	ug/l	
191-24-2	Benzo(g,h,i)perylene	ND	0.20	0.10	ug/l	
207-08-9	Benzo(k)fluoranthene	ND	0.20	0.10	ug/l	
218-01-9	Chrysene	ND	0.20	0.10	ug/l	
53-70-3	Dibenzo(a,h)anthracene	ND	0.20	0.050	ug/l	
206-44-0	Fluoranthene	ND	1.0	0.25	ug/l	
86-73-7	Fluorene	ND	1.0	0.25	ug/l	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	0.20	0.050	ug/l	
90-12-0	1-Methylnaphthalene	ND	1.0	0.25	ug/l	
91-57-6	2-Methylnaphthalene	ND	1.0	0.25	ug/l	
91-20-3	Naphthalene	ND	1.0	0.25	ug/l	
85-01-8	Phenanthrene	ND	1.0	0.50	ug/l	
129-00-0	Pyrene	ND	1.0	0.25	ug/l	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Shaw Environmental, Inc.
2790 Mosside Blvd
Monroeville, PA
412-858-3335
FAX: 412-372-8968

Shaw® Shaw Environmental, Inc.

MEMORANDUM

TO: Jeff Parks, Shaw E&I Radford Army Ammunition Plant (RFAAP) Project Manager

FROM: Richard McCracken, Shaw E&I Project Chemist

SUBJECT: RFAAP Data Validation - Volatiles
Accutest Laboratories, Inc., SDG F52170

DATE: November 5, 2007

The purpose of this memorandum is to present the data validation report for the samples collected at RFAAP on August 29, 2007. The samples were analyzed for target compound list (TCL) volatile organic compounds (VOCs) using USEPA SW846 Method 5030B/8260B. A total of nine aqueous samples were validated. The sample IDs are:

Field Sample ID	Lab Sample ID	Field Sample ID	Lab Sample ID
59MW01	F52170-1	TMMW3	F52170-6
48MW1	F52170-2	48MW4	F52170-7
TMMW01	F52170-3	49MW1	F52170-8
48MW2	F52170-4	TB082907	F52170-9
48MW3	F52170-5		

Data were reviewed by Richard McCracken and validated using a combination of project QAPP, *Quality Systems Manual for Environmental Laboratories, Final Version 3, January, 2006* (DoD, 2006) (DoD QSM), method-specific criteria, and laboratory SOP criteria. The data qualifier scheme was consistent with the *Region III Modifications to the National Functional Guidelines for Organic Data Review* (September 1994). Parameters evaluated are presented in **Table 1**. Data associated with parameters in compliance with quality control specifications have not been qualified. Data associated with parameters that did not comply with quality control specifications and directly impacted project data have been qualified in accordance with USEPA Region III specifications.

Table 1 Laboratory Performance Criteria

Qualified		Parameter
Yes	No	
	X	Holding Times and Preservation
	X	Instrument Performance Results
	X	Initial Calibration
	X	Continuing Calibration
	X	Blank Analysis
	X	Laboratory Control Sample
	X	Matrix Spike / Spike Duplicate Sample
	X	System Monitoring Compounds
	X	Internal Standards
	X	Field Sample Duplicate
X		Quantitation Verification

The quality of data collected in support of this sampling activity is considered acceptable with noted qualifications.

Richard M. Cracken

Richard McCracken, Chemist

11/5/07

Date

RFAAP VALIDATION REPORT
VOLATILES REVIEW
SDG F52170

I-Holding Times and Preservation
The objective is to ascertain the validity of results based on the holding time of the sample from time of collection to time of analysis. Holding time criteria: For aqueous samples cooled @ 4°C±2°C; pH<2 HCl, the maximum holding time is 14 days (7 days if no HCl added) from sample collection to analysis. For soil samples cooled @ 4°C±2°C; the maximum holding time is 14 days from sample collection to analysis.

- Temperature Review: A temperature blank was sent with each cooler and recorded by the laboratory upon receipt. The samples collected on 8/29/07 were sent in 20 coolers, and were received by the laboratory on 8/30/07 at temperatures ranging from 0.8°C to 3.6°C, with 9 of the 20 coolers having temperatures below 2.0°C. The low sample temperatures are not expected to have an adverse impact on the analytical results. No qualifiers were applied.

- Holding Time Review: The aqueous samples were collected for VOCs on 08/29/07 and analyzed on 9/10/07 and 9/12/07. All criteria were met. No qualifiers were applied.

II-Instrument Performance Check
The analysis of the instrument performance check solution must be performed at the beginning of each 12-hour period during which samples are analyzed.

- The instrument performance check, bromofluorobenzene (BFB), met the ion abundance criteria. No qualification was applied.

III-Initial Calibration
Compliance requirements for satisfactory instrument calibration are established to ensure that the instrument used is capable of producing acceptable qualitative and quantitative data for volatile target compounds. Initial calibration demonstrates that the instrument is capable of acceptable performance in the beginning of the analytical run and of producing a linear calibration curve. The RRF must be greater than 0.1 for chloromethane, 1,1-dichloroethane, and bromoform and greater than 0.3 for 1,1,2,2-tetrachloroethane and chlorobenzene. The minimum relative response factor (RRF) must be ≥0.05 for all other compounds. The DoD QSM specifies that the percent relative standard deviation (%RSD) must be ≤15% for each target compound and must be ≤30% for each calibration check compound. For compounds analyzed using linear regression or second order, correlation coefficients must be >0.995 and coefficients of determination >0.99. All detects are qualified as estimated "J" for where there were exceeding %RSDs, and all non-detects are qualified as estimated "UJ" for where there were grossly exceeding recoveries, unless determined to be unusable "R". Grossly exceeding is defined as twice the established criteria limits. For where there were low RRFs, all detects are qualified as estimated "J" and non-detects are rejected "R".

- During the 9/7/07 initial calibration performed on instrument MSVOA4, target compounds acetone (15.12%), chloroethane (15.55%), 2-hexanone (20.41%), 4-methyl-2-pentanone (24.74%), methylene chloride (33.22%), and styrene (17.15%) were outside %RSD criteria. All other target compounds met %RSD criteria, and all compounds met RRF criteria. The compounds with high %RSD were quantified using second order regression, and had correlation coefficients >0.995; therefore, no qualifiers were applied. All samples were analyzed in conjunction with this initial calibration.

IV-Continuing Calibration

Compliance requirements for satisfactory instrument calibration are established to ensure that the instrument used is capable of producing acceptable qualitative and quantitative data for volatile target compounds. Continuing calibration establishes the 12-hour relative response factors on which the quantitations are based and checks satisfactory performance of the instrument on a day-to-day basis. The RRF must be greater than 0.1 for chloromethane, 1,1-dichloroethane, and bromoform and greater than 0.3 for 1,1,2,2-tetrachloroethane and chlorobenzene. The minimum relative response factor (RRF) must be ≥0.05 for all other compounds. The DoD QSM specifies that the percent difference (%D) between the initial calibration RRF and the continuing calibration RRF must be within 20% for all target compounds. All detects are qualified as estimated "J" for where there were exceeding %Ds, and all non-detects are qualified as estimated "UJ" for where there were grossly exceeding recoveries, unless determined to be unusable "R". Grossly exceeding is defined as twice the established criteria limits. For where there were low RRFs, all detects are qualified as estimated "J" and non-detects are rejected "R".

- During the initial calibration verification performed on 9/7/07 @1307 on instrument MSVOA4, acetone (31.6%) had a %drift outside criteria. All other target compounds were within criteria (%D≤20%; %Drift≤20%; RRF≥0.05). No samples were analyzed following this initial calibration verification, therefore no qualifiers were applied.

- During the continuing calibration performed on 9/10/07 @1158 on instrument MSVOA4, acetone (28.8%) and methylene chloride (33.7%) had %drift outside criteria. All other target compounds were within criteria (%D≤20%; %Drift≤20%; RRF≥0.05). No acetone or methylene chloride was detected in any of the associated samples, so no data qualification was required. Samples 59MW01, 48MW1, and TMMW01 were analyzed following this continuing calibration.

- During the continuing calibration performed on 9/12/07 @1010 on instrument MSVOA4, all target compounds were within criteria (%D≤20%; %Drift≤20%; RRF≥0.05). No data qualification was required. Samples 48MW2, 48MW3, TMMW3, 48MW4, 49MW01, and TB082907 were analyzed following this continuing calibration.

V-Blank Analysis

The purpose of blank analyses is to determine the presence and magnitude of contamination problems resulting from field and laboratory activities. A method blank analysis must be performed after the calibration standards and once every 12-hour time period beginning with the injection of BFB. No contaminants should be detected in any of the associated blanks > the MDL. The DoD QSM criteria specifies all concentrations should be less than one-half MRL (<MRL for common laboratory contaminants methylene chloride, acetone, and 2-butanone). Positive sample results are reported and qualified "B", if the concentration of the compound in the sample is ≤10 times (10x) the maximum amount in any blank for the common laboratory contaminants methylene chloride, acetone, and 2-butanone (MEK), or 5 times (5X) the maximum amount for other volatile target compounds. **Table 2** summarizes the blank contamination analysis.

Table 2 Blank Contamination Analysis Summary

Analysis Date	QC Blank ID	Compound	Max Conc. µg/L	Action Level µg/L	B qualified samples
9/10/07	VB2032-MB	All target <½MRL	NA	NA	None
9/12/07	VB2034-MB	Chloroform	0.62 J	3.1	None
9/12/07	VB2034-MB	Methylene chloride	4.7 J	47	None
9/12/07	TB083007	All target <½MRL	NA	NA	None
9/13/07	RB083007	All target <½MRL	NA	NA	None

NA = Not Applicable
MRL = Method Reporting Limit

VI-Laboratory Control Sample
Data for laboratory control samples (LCS) are evaluated to determine long-term accuracy of the analytical method on various matrices. Percent recoveries (%Rs) should be within the specified control limits. The DoD aqueous LCS recovery limits are specified in Table D-4 of the DoD QSM (DoD, 2006). If the compound is not listed, then the laboratory criteria shall be used.

- Sample VB2032-BS was used as the aqueous LCS for the VOC analysis on 9/10/07. All target compound recoveries were within criteria. No data qualifiers were applied. Samples 59MW01, 48MW1, and TMMW01 were analyzed in conjunction with this LCS.

- Sample VB2034-BS was used as the aqueous LCS for the VOC analysis on 9/12/07. Methyl chloride (135%) was above the DoD QSM criteria. No methyl chloride was detected in any samples, therefore no data qualifiers were applied. All other target compound recoveries were within criteria. Samples 48MW2, 48MW3, TMMW3, 48MW4, 49MW01, and TB082907 were analyzed in conjunction with this LCS.

VII-Matrix Spike/Matrix Spike Duplicate
Data for matrix spike/matrix spike duplicates (MS/MSD) are generated to determine long-term precision and accuracy of the analytical method on various matrices and to demonstrate acceptable compound recovery by the laboratory at the time of sample analysis. The percent recoveries (%Rs) and the relative percent difference (RPD) must be within the specified control limits. The DoD MS/MSD aqueous recovery limits follow the LCS criteria and are specified in Table D-4 of the DoD QSM (DoD, 2006). If the compound is not listed, then the laboratory criteria shall be used.

- Sample 48MW3 was used for the aqueous MS/MSD analysis on 9/12/07. Methyl chloride (147%, 143%) was above the DoD QSM criteria. No methyl chloride was detected in any samples, therefore no data qualifiers were applied. All other target compound recoveries were within criteria. All samples were analyzed in conjunction with this MS/MSD.

VIII-System Monitoring Compounds (Surrogates)
Laboratory performance on individual samples is evaluated through the review of surrogate spike samples. Recoveries for system monitoring compounds in volatile samples and blanks must be within the specified control limits. DoD surrogate recovery limits are specified in Table D-3 of the DoD QSM (DoD, 2006). If the surrogate is not listed, then the laboratory criteria shall be used.

Aqueous Criteria: Dibromofluoromethane (87-116%) (DoD QSM = 85-115%)
1,2-Dichloroethane-d4 (76-127%) (DoD QSM = 70-120%)
Toluene-d8 (86-112%) (DoD QSM = 85-120%)
4-Bromofluorobenzene (84-120%) (DoD QSM = 75-120%)

- All samples met criteria. No qualifiers were applied.

IX-Internal Standards (IS)
Internal standards performance criteria ensure that GC/MS sensitivity and response are stable during every analytical run. Specific criteria include: area counts (-50% to +100%) of the associated calibration standard, and retention time (± 30 seconds) from that of the associated calibration standard.

- All samples met criteria. No qualifiers were applied.

X-Field Duplicate Sample Analysis
Field duplicates were collected to identify the cumulative precision of the sampling and analytical process and sent to the laboratory blind. The RPD was calculated only for those analytes which were detected at levels exceeding the method reporting limits in both samples of the duplicate pair. Analytes that were rejected (R-qualified) in either sample of the duplicate pair were excluded from the duplicate assessment. Precision control criterion was established at 50% RPD for the aqueous and solid samples. Analytical results were qualified as estimated (J) for any RPDs exceeding criteria.

- Field duplicate pairs in this data set included 59MW01 & TMMW01, and 48MW3 & TMMW3. All compounds detected above the MDL met RPD criteria. No data qualifiers were applied.

XI-Quantitation Verification
The accuracy of analytical results is verified through the calculation of several parameters. The percent difference (%D) between the calculated and the reported values should be within 10%. Any sample value >MDL and <MRL or <3*MDL (whichever is greater) was qualified as estimated, "J."

Sample: 48MW3, carbon tetrachloride

Conc. (μg/L) = (Ax * Is * DF)/(Ais * RRF * Vo)

where: Ax is the compound area
Is is the amount of internal standard added (ng)
DF is the dilution factor
Ais is the internal standard area
RRF is the relative response factor
Vo is the volume of water purged (ml)

Conc. μg/L = (768096 * 250 * 1) / (1677869 * 0.379 * 5) = 60.4 μg/L

Reported Conc. = 60.3 μg/L
%D = 0.17%
Values were within 10% difference.

USEPA Region III Validation Qualifiers

(No Code) = Confirmed identification.

B = The analyte has been detected in the sample and the associated laboratory or field blank.

J = Indicates an estimated value for (1) estimated value due to QC non-conformance. Reported value may not be accurate or precise, (2) estimating a concentration as a tentatively identified compound as indicated by the mass spectral and retention time data, or (3) estimating a concentration ≥MDL and <MRL or <3*MDL, whichever is greater.

K = Analyte present. Reported value may be biased high (estimated) due to QC non-conformance.

L = Analyte present. Reported value may be biased low (estimated) due to QC non-conformance.

R = Unreliable result. Analyte may or may not be present in the sample due to QC non-conformance.

UL = Value is estimated bias low and not detected due to QC non-conformance. Reporting limit may be inaccurate or imprecise. Quantitation limit is probably higher.

UJ = Value is estimated and not detected due to QC non-conformance. Reporting limit may be inaccurate or imprecise.

Laboratory Qualifiers

(No Code) = Confirmed identification.

U = Not detected. The associated number indicates the compound reporting limit for the sample.

A (Dioxins) = B (Metals) = The reported value was obtained from a reading <MRL and ≥MDL and is considered estimated.

B (Organics) = The analyte or compound has been detected in the sample and laboratory method blank. It indicates probable blank contamination.

E (Metals) = Reported value is estimated because of the presence of interferences.

E (Organics) = Identifies compounds whose concentrations exceed the upper level of the calibration range.

EMPC (Dioxins) = The ion-abundance ratio between the two characteristic PCDD/PCDF ions was outside accepted ranges. The detected PCDD/PCDF was reported as an estimated maximum possible concentration (EMPC).

D = Indicates sample was analyzed at a dilution.

J = Indicates an estimated value for (1) estimating a concentration as a tentatively identified compound as indicated by the mass spectral and retention time data, or (2) estimating a concentration <MRL and ≥ MDL.

N (Organics) = Indicates presumptive evidence of a compound for tentatively identified compounds using a library search.

N (Metals) = Laboratory spike sample recovery not within control limits.

P (Organics) = Target analyte confirmation >40% difference for detected compound between the primary and secondary columns. The lower of the two values was reported.

* (Metals) = Duplicate analysis not within control limits.

* (Organics) = Surrogate outside of QC limits on both original and re-analysis.

Accutest Laboratories

Report of Analysis

Client Sample ID:	59MW01		
Lab Sample ID:	F52170-1	**Date Sampled:**	08/29/07
Matrix:	AQ - Ground Water	**Date Received:**	08/30/07
Method:	SW846 8260B	**Percent Solids:**	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	B048359.D	1	09/10/07	LD	n/a	n/a	VB2032
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	25	10	ug/l	
71-43-2	Benzene	ND	1.0	0.20	ug/l	
75-27-4	Bromodichloromethane	ND	1.0	0.29	ug/l	
75-25-2	Bromoform	ND	1.0	0.28	ug/l	
108-90-7	Chlorobenzene	ND	1.0	0.20	ug/l	
75-00-3	Chloroethane	ND	2.0	0.46	ug/l	
67-66-3	Chloroform	ND	1.0	0.21	ug/l	
75-15-0	Carbon disulfide	ND	2.0	0.20	ug/l	
56-23-5	Carbon tetrachloride	ND	1.0	0.29	ug/l	
75-34-3	1,1-Dichloroethane	ND	1.0	0.25	ug/l	
75-35-4	1,1-Dichloroethylene	ND	1.0	0.23	ug/l	
107-06-2	1,2-Dichloroethane	ND	1.0	0.20	ug/l	
78-87-5	1,2-Dichloropropane	ND	1.0	0.25	ug/l	
124-48-1	Dibromochloromethane	ND	1.0	0.20	ug/l	
156-59-2	cis-1,2-Dichloroethylene	ND	1.0	0.28	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	1.0	0.24	ug/l	
156-60-5	trans-1,2-Dichloroethylene	ND	1.0	0.20	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	1.0	0.21	ug/l	
100-41-4	Ethylbenzene	ND	1.0	0.20	ug/l	
591-78-6	2-Hexanone	ND	10	2.9	ug/l	
108-10-1	4-Methyl-2-pentanone	ND	5.0	2.2	ug/l	
74-83-9	Methyl bromide	ND	2.0	0.54	ug/l	
74-87-3	Methyl chloride	ND	2.0	0.38	ug/l	
75-09-2	Methylene chloride	ND	5.0	1.0	ug/l	
78-93-3	Methyl ethyl ketone	ND	5.0	2.0	ug/l	
100-42-5	Styrene	ND	1.0	0.20	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	1.0	0.29	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.0	0.37	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	1.0	0.30	ug/l	
127-18-4	Tetrachloroethylene	ND	1.0	0.25	ug/l	
108-88-3	Toluene	ND	1.0	0.27	ug/l	
79-01-6	Trichloroethylene	ND	1.0	0.38	ug/l	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	59MW01		
Lab Sample ID:	F52170-1	**Date Sampled:**	08/29/07
Matrix:	AQ - Ground Water	**Date Received:**	08/30/07
Method:	SW846 8260B	**Percent Solids:**	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
75-01-4	Vinyl chloride	ND	1.0	0.34	ug/l	
	m,p-Xylene	ND	2.0	0.36	ug/l	
95-47-6	o-Xylene	ND	1.0	0.20	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	99%		87-116%
17060-07-0	1,2-Dichloroethane-D4	105%		76-127%
2037-26-5	Toluene-D8	102%		86-112%
460-00-4	4-Bromofluorobenzene	112%		84-120%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	48MW1		
Lab Sample ID:	F52170-2	**Date Sampled:**	08/29/07
Matrix:	AQ - Ground Water	**Date Received:**	08/30/07
Method:	SW846 8260B	**Percent Solids:**	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	B048360.D	1	09/10/07	LD	n/a	n/a	VB2032
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

VOA TCL List

DATA VAL QUALIFIER

CAS No.	Compound	Result	RL	MDL	Units	Q	
67-64-1	Acetone	ND	25	10	ug/l		
71-43-2	Benzene	ND	1.0	0.20	ug/l		
75-27-4	Bromodichloromethane	ND	1.0	0.29	ug/l		
75-25-2	Bromoform	ND	1.0	0.28	ug/l		
108-90-7	Chlorobenzene	ND	1.0	0.20	ug/l		
75-00-3	Chloroethane	ND	2.0	0.46	ug/l		
67-66-3	Chloroform	ND	1.0	0.21	ug/l		
75-15-0	Carbon disulfide	ND	2.0	0.20	ug/l		
56-23-5	Carbon tetrachloride	ND	1.0	0.29	ug/l		
75-34-3	1,1-Dichloroethane	ND	1.0	0.25	ug/l		
75-35-4	1,1-Dichloroethylene	ND	1.0	0.23	ug/l		
107-06-2	1,2-Dichloroethane	ND	1.0	0.20	ug/l		
78-87-5	1,2-Dichloropropane	ND	1.0	0.25	ug/l		
124-48-1	Dibromochloromethane	ND	1.0	0.20	ug/l		
156-59-2	cis-1,2-Dichloroethylene	ND	1.0	0.28	ug/l		
10061-01-5	cis-1,3-Dichloropropene	ND	1.0	0.24	ug/l		
156-60-5	trans-1,2-Dichloroethylene	ND	1.0	0.20	ug/l		
10061-02-6	trans-1,3-Dichloropropene	ND	1.0	0.21	ug/l		
100-41-4	Ethylbenzene	ND	1.0	0.20	ug/l		
591-78-6	2-Hexanone	ND	10	2.9	ug/l		
108-10-1	4-Methyl-2-pentanone	ND	5.0	2.2	ug/l		
74-83-9	Methyl bromide	ND	2.0	0.54	ug/l		
74-87-3	Methyl chloride	ND	2.0	0.38	ug/l		
75-09-2	Methylene chloride	ND	5.0	1.0	ug/l		
78-93-3	Methyl ethyl ketone	ND	5.0	2.0	ug/l		
100-42-5	Styrene	ND	1.0	0.20	ug/l		
71-55-6	1,1,1-Trichloroethane	0.46	1.0	0.29	ug/l	J	J
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.0	0.37	ug/l		
79-00-5	1,1,2-Trichloroethane	ND	1.0	0.30	ug/l		
127-18-4	Tetrachloroethylene	ND	1.0	0.25	ug/l		
108-88-3	Toluene	ND	1.0	0.27	ug/l		
79-01-6	Trichloroethylene	1.6	1.0	0.38	ug/l		

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	48MW1		
Lab Sample ID:	F52170-2	**Date Sampled:**	08/29/07
Matrix:	AQ - Ground Water	**Date Received:**	08/30/07
Method:	SW846 8260B	**Percent Solids:**	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
75-01-4	Vinyl chloride	ND	1.0	0.34	ug/l	
	m,p-Xylene	ND	2.0	0.36	ug/l	
95-47-6	o-Xylene	ND	1.0	0.20	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	100%		87-116%
17060-07-0	1,2-Dichloroethane-D4	106%		76-127%
2037-26-5	Toluene-D8	103%		86-112%
460-00-4	4-Bromofluorobenzene	113%		84-120%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	TMMW01		
Lab Sample ID:	F52170-3	**Date Sampled:**	08/29/07
Matrix:	AQ - Ground Water	**Date Received:**	08/30/07
Method:	SW846 8260B	**Percent Solids:**	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	B048361.D	1	09/10/07	LD	n/a	n/a	VB2032
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	25	10	ug/l	
71-43-2	Benzene	ND	1.0	0.20	ug/l	
75-27-4	Bromodichloromethane	ND	1.0	0.29	ug/l	
75-25-2	Bromoform	ND	1.0	0.28	ug/l	
108-90-7	Chlorobenzene	ND	1.0	0.20	ug/l	
75-00-3	Chloroethane	ND	2.0	0.46	ug/l	
67-66-3	Chloroform	ND	1.0	0.21	ug/l	
75-15-0	Carbon disulfide	ND	2.0	0.20	ug/l	
56-23-5	Carbon tetrachloride	ND	1.0	0.29	ug/l	
75-34-3	1,1-Dichloroethane	ND	1.0	0.25	ug/l	
75-35-4	1,1-Dichloroethylene	ND	1.0	0.23	ug/l	
107-06-2	1,2-Dichloroethane	ND	1.0	0.20	ug/l	
78-87-5	1,2-Dichloropropane	ND	1.0	0.25	ug/l	
124-48-1	Dibromochloromethane	ND	1.0	0.20	ug/l	
156-59-2	cis-1,2-Dichloroethylene	ND	1.0	0.28	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	1.0	0.24	ug/l	
156-60-5	trans-1,2-Dichloroethylene	ND	1.0	0.20	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	1.0	0.21	ug/l	
100-41-4	Ethylbenzene	ND	1.0	0.20	ug/l	
591-78-6	2-Hexanone	ND	10	2.9	ug/l	
108-10-1	4-Methyl-2-pentanone	ND	5.0	2.2	ug/l	
74-83-9	Methyl bromide	ND	2.0	0.54	ug/l	
74-87-3	Methyl chloride	ND	2.0	0.38	ug/l	
75-09-2	Methylene chloride	ND	5.0	1.0	ug/l	
78-93-3	Methyl ethyl ketone	ND	5.0	2.0	ug/l	
100-42-5	Styrene	ND	1.0	0.20	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	1.0	0.29	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.0	0.37	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	1.0	0.30	ug/l	
127-18-4	Tetrachloroethylene	ND	1.0	0.25	ug/l	
108-88-3	Toluene	ND	1.0	0.27	ug/l	
79-01-6	Trichloroethylene	ND	1.0	0.38	ug/l	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	TMMW01		
Lab Sample ID:	F52170-3	**Date Sampled:**	08/29/07
Matrix:	AQ - Ground Water	**Date Received:**	08/30/07
Method:	SW846 8260B	**Percent Solids:**	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
75-01-4	Vinyl chloride	ND	1.0	0.34	ug/l	
	m,p-Xylene	ND	2.0	0.36	ug/l	
95-47-6	o-Xylene	ND	1.0	0.20	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	99%		87-116%
17060-07-0	1,2-Dichloroethane-D4	104%		76-127%
2037-26-5	Toluene-D8	102%		86-112%
460-00-4	4-Bromofluorobenzene	111%		84-120%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	48MW2		
Lab Sample ID:	F52170-4	**Date Sampled:**	08/29/07
Matrix:	AQ - Ground Water	**Date Received:**	08/30/07
Method:	SW846 8260B	**Percent Solids:**	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	B048407.D	1	09/12/07	LD	n/a	n/a	VB2034
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	25	10	ug/l	
71-43-2	Benzene	ND	1.0	0.20	ug/l	
75-27-4	Bromodichloromethane	ND	1.0	0.29	ug/l	
75-25-2	Bromoform	ND	1.0	0.28	ug/l	
108-90-7	Chlorobenzene	ND	1.0	0.20	ug/l	
75-00-3	Chloroethane	ND	2.0	0.46	ug/l	
67-66-3	Chloroform	ND	1.0	0.21	ug/l	
75-15-0	Carbon disulfide	ND	2.0	0.20	ug/l	
56-23-5	Carbon tetrachloride	94.6	1.0	0.29	ug/l	
75-34-3	1,1-Dichloroethane	ND	1.0	0.25	ug/l	
75-35-4	1,1-Dichloroethylene	ND	1.0	0.23	ug/l	
107-06-2	1,2-Dichloroethane	ND	1.0	0.20	ug/l	
78-87-5	1,2-Dichloropropane	ND	1.0	0.25	ug/l	
124-48-1	Dibromochloromethane	ND	1.0	0.20	ug/l	
156-59-2	cis-1,2-Dichloroethylene	ND	1.0	0.28	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	1.0	0.24	ug/l	
156-60-5	trans-1,2-Dichloroethylene	ND	1.0	0.20	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	1.0	0.21	ug/l	
100-41-4	Ethylbenzene	ND	1.0	0.20	ug/l	
591-78-6	2-Hexanone	ND	10	2.9	ug/l	
108-10-1	4-Methyl-2-pentanone	ND	5.0	2.2	ug/l	
74-83-9	Methyl bromide	ND	2.0	0.54	ug/l	
74-87-3	Methyl chloride	ND	2.0	0.38	ug/l	
75-09-2	Methylene chloride	ND	5.0	1.0	ug/l	
78-93-3	Methyl ethyl ketone	ND	5.0	2.0	ug/l	
100-42-5	Styrene	ND	1.0	0.20	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	1.0	0.29	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.0	0.37	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	1.0	0.30	ug/l	
127-18-4	Tetrachloroethylene	ND	1.0	0.25	ug/l	
108-88-3	Toluene	ND	1.0	0.27	ug/l	
79-01-6	Trichloroethylene	11.2	1.0	0.38	ug/l	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	48MW2		
Lab Sample ID:	F52170-4	**Date Sampled:**	08/29/07
Matrix:	AQ - Ground Water	**Date Received:**	08/30/07
Method:	SW846 8260B	**Percent Solids:**	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
75-01-4	Vinyl chloride	ND	1.0	0.34	ug/l	
	m,p-Xylene	ND	2.0	0.36	ug/l	
95-47-6	o-Xylene	ND	1.0	0.20	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	100%		87-116%
17060-07-0	1,2-Dichloroethane-D4	107%		76-127%
2037-26-5	Toluene-D8	102%		86-112%
460-00-4	4-Bromofluorobenzene	108%		84-120%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	48MW3		
Lab Sample ID:	F52170-5	**Date Sampled:**	08/29/07
Matrix:	AQ - Ground Water	**Date Received:**	08/30/07
Method:	SW846 8260B	**Percent Solids:**	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	B048408.D	1	09/12/07	LD	n/a	n/a	VB2034
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	25	10	ug/l	
71-43-2	Benzene	ND	1.0	0.20	ug/l	
75-27-4	Bromodichloromethane	ND	1.0	0.29	ug/l	
75-25-2	Bromoform	ND	1.0	0.28	ug/l	
108-90-7	Chlorobenzene	ND	1.0	0.20	ug/l	
75-00-3	Chloroethane	ND	2.0	0.46	ug/l	
67-66-3	Chloroform	ND	1.0	0.21	ug/l	
75-15-0	Carbon disulfide	ND	2.0	0.20	ug/l	
56-23-5	Carbon tetrachloride	60.3	1.0	0.29	ug/l	
75-34-3	1,1-Dichloroethane	ND	1.0	0.25	ug/l	
75-35-4	1,1-Dichloroethylene	ND	1.0	0.23	ug/l	
107-06-2	1,2-Dichloroethane	ND	1.0	0.20	ug/l	
78-87-5	1,2-Dichloropropane	ND	1.0	0.25	ug/l	
124-48-1	Dibromochloromethane	ND	1.0	0.20	ug/l	
156-59-2	cis-1,2-Dichloroethylene	ND	1.0	0.28	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	1.0	0.24	ug/l	
156-60-5	trans-1,2-Dichloroethylene	ND	1.0	0.20	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	1.0	0.21	ug/l	
100-41-4	Ethylbenzene	ND	1.0	0.20	ug/l	
591-78-6	2-Hexanone	ND	10	2.9	ug/l	
108-10-1	4-Methyl-2-pentanone	ND	5.0	2.2	ug/l	
74-83-9	Methyl bromide	ND	2.0	0.54	ug/l	
74-87-3	Methyl chloride	ND	2.0	0.38	ug/l	
75-09-2	Methylene chloride	ND	5.0	1.0	ug/l	
78-93-3	Methyl ethyl ketone	ND	5.0	2.0	ug/l	
100-42-5	Styrene	ND	1.0	0.20	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	1.0	0.29	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.0	0.37	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	1.0	0.30	ug/l	
127-18-4	Tetrachloroethylene	ND	1.0	0.25	ug/l	
108-88-3	Toluene	ND	1.0	0.27	ug/l	
79-01-6	Trichloroethylene	10.1	1.0	0.38	ug/l	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	48MW3		
Lab Sample ID:	F52170-5	**Date Sampled:**	08/29/07
Matrix:	AQ - Ground Water	**Date Received:**	08/30/07
Method:	SW846 8260B	**Percent Solids:**	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
75-01-4	Vinyl chloride	ND	1.0	0.34	ug/l	
	m,p-Xylene	ND	2.0	0.36	ug/l	
95-47-6	o-Xylene	ND	1.0	0.20	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	99%		87-116%
17060-07-0	1,2-Dichloroethane-D4	108%		76-127%
2037-26-5	Toluene-D8	101%		86-112%
460-00-4	4-Bromofluorobenzene	110%		84-120%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	TMMW3		
Lab Sample ID:	F52170-6	**Date Sampled:**	08/29/07
Matrix:	AQ - Ground Water	**Date Received:**	08/30/07
Method:	SW846 8260B	**Percent Solids:**	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	B048409.D	1	09/12/07	LD	n/a	n/a	VB2034
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	25	10	ug/l	
71-43-2	Benzene	ND	1.0	0.20	ug/l	
75-27-4	Bromodichloromethane	ND	1.0	0.29	ug/l	
75-25-2	Bromoform	ND	1.0	0.28	ug/l	
108-90-7	Chlorobenzene	ND	1.0	0.20	ug/l	
75-00-3	Chloroethane	ND	2.0	0.46	ug/l	
67-66-3	Chloroform	ND	1.0	0.21	ug/l	
75-15-0	Carbon disulfide	ND	2.0	0.20	ug/l	
56-23-5	Carbon tetrachloride	59.6	1.0	0.29	ug/l	
75-34-3	1,1-Dichloroethane	ND	1.0	0.25	ug/l	
75-35-4	1,1-Dichloroethylene	ND	1.0	0.23	ug/l	
107-06-2	1,2-Dichloroethane	ND	1.0	0.20	ug/l	
78-87-5	1,2-Dichloropropane	ND	1.0	0.25	ug/l	
124-48-1	Dibromochloromethane	ND	1.0	0.20	ug/l	
156-59-2	cis-1,2-Dichloroethylene	ND	1.0	0.28	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	1.0	0.24	ug/l	
156-60-5	trans-1,2-Dichloroethylene	ND	1.0	0.20	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	1.0	0.21	ug/l	
100-41-4	Ethylbenzene	ND	1.0	0.20	ug/l	
591-78-6	2-Hexanone	ND	10	2.9	ug/l	
108-10-1	4-Methyl-2-pentanone	ND	5.0	2.2	ug/l	
74-83-9	Methyl bromide	ND	2.0	0.54	ug/l	
74-87-3	Methyl chloride	ND	2.0	0.38	ug/l	
75-09-2	Methylene chloride	ND	5.0	1.0	ug/l	
78-93-3	Methyl ethyl ketone	ND	5.0	2.0	ug/l	
100-42-5	Styrene	ND	1.0	0.20	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	1.0	0.29	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.0	0.37	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	1.0	0.30	ug/l	
127-18-4	Tetrachloroethylene	ND	1.0	0.25	ug/l	
108-88-3	Toluene	ND	1.0	0.27	ug/l	
79-01-6	Trichloroethylene	10.3	1.0	0.38	ug/l	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	TMMW3		
Lab Sample ID:	F52170-6	**Date Sampled:**	08/29/07
Matrix:	AQ - Ground Water	**Date Received:**	08/30/07
Method:	SW846 8260B	**Percent Solids:**	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
75-01-4	Vinyl chloride	ND	1.0	0.34	ug/l	
	m,p-Xylene	ND	2.0	0.36	ug/l	
95-47-6	o-Xylene	ND	1.0	0.20	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	100%		87-116%
17060-07-0	1,2-Dichloroethane-D4	106%		76-127%
2037-26-5	Toluene-D8	103%		86-112%
460-00-4	4-Bromofluorobenzene	112%		84-120%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	48MW4		
Lab Sample ID:	F52170-7	**Date Sampled:**	08/29/07
Matrix:	AQ - Ground Water	**Date Received:**	08/30/07
Method:	SW846 8260B	**Percent Solids:**	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	B048410.D	1	09/12/07	LD	n/a	n/a	VB2034
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	25	10	ug/l	
71-43-2	Benzene	ND	1.0	0.20	ug/l	
75-27-4	Bromodichloromethane	ND	1.0	0.29	ug/l	
75-25-2	Bromoform	ND	1.0	0.28	ug/l	
108-90-7	Chlorobenzene	ND	1.0	0.20	ug/l	
75-00-3	Chloroethane	ND	2.0	0.46	ug/l	
67-66-3	Chloroform	ND	1.0	0.21	ug/l	
75-15-0	Carbon disulfide	ND	2.0	0.20	ug/l	
56-23-5	Carbon tetrachloride	ND	1.0	0.29	ug/l	
75-34-3	1,1-Dichloroethane	ND	1.0	0.25	ug/l	
75-35-4	1,1-Dichloroethylene	ND	1.0	0.23	ug/l	
107-06-2	1,2-Dichloroethane	ND	1.0	0.20	ug/l	
78-87-5	1,2-Dichloropropane	ND	1.0	0.25	ug/l	
124-48-1	Dibromochloromethane	ND	1.0	0.20	ug/l	
156-59-2	cis-1,2-Dichloroethylene	ND	1.0	0.28	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	1.0	0.24	ug/l	
156-60-5	trans-1,2-Dichloroethylene	ND	1.0	0.20	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	1.0	0.21	ug/l	
100-41-4	Ethylbenzene	ND	1.0	0.20	ug/l	
591-78-6	2-Hexanone	ND	10	2.9	ug/l	
108-10-1	4-Methyl-2-pentanone	ND	5.0	2.2	ug/l	
74-83-9	Methyl bromide	ND	2.0	0.54	ug/l	
74-87-3	Methyl chloride	ND	2.0	0.38	ug/l	
75-09-2	Methylene chloride	ND	5.0	1.0	ug/l	
78-93-3	Methyl ethyl ketone	ND	5.0	2.0	ug/l	
100-42-5	Styrene	ND	1.0	0.20	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	1.0	0.29	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.0	0.37	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	1.0	0.30	ug/l	
127-18-4	Tetrachloroethylene	ND	1.0	0.25	ug/l	
108-88-3	Toluene	ND	1.0	0.27	ug/l	
79-01-6	Trichloroethylene	ND	1.0	0.38	ug/l	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	48MW4		
Lab Sample ID:	F52170-7	**Date Sampled:**	08/29/07
Matrix:	AQ - Ground Water	**Date Received:**	08/30/07
Method:	SW846 8260B	**Percent Solids:**	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
75-01-4	Vinyl chloride	ND	1.0	0.34	ug/l	
	m,p-Xylene	ND	2.0	0.36	ug/l	
95-47-6	o-Xylene	ND	1.0	0.20	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	99%		87-116%
17060-07-0	1,2-Dichloroethane-D4	107%		76-127%
2037-26-5	Toluene-D8	102%		86-112%
460-00-4	4-Bromofluorobenzene	108%		84-120%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	49MW01		
Lab Sample ID:	F52170-8	**Date Sampled:**	08/29/07
Matrix:	AQ - Ground Water	**Date Received:**	08/30/07
Method:	SW846 8260B	**Percent Solids:**	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	B048411.D	1	09/12/07	LD	n/a	n/a	VB2034
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	25	10	ug/l	
71-43-2	Benzene	ND	1.0	0.20	ug/l	
75-27-4	Bromodichloromethane	ND	1.0	0.29	ug/l	
75-25-2	Bromoform	ND	1.0	0.28	ug/l	
108-90-7	Chlorobenzene	ND	1.0	0.20	ug/l	
75-00-3	Chloroethane	ND	2.0	0.46	ug/l	
67-66-3	Chloroform	ND	1.0	0.21	ug/l	
75-15-0	Carbon disulfide	ND	2.0	0.20	ug/l	
56-23-5	Carbon tetrachloride	3.8	1.0	0.29	ug/l	
75-34-3	1,1-Dichloroethane	ND	1.0	0.25	ug/l	
75-35-4	1,1-Dichloroethylene	ND	1.0	0.23	ug/l	
107-06-2	1,2-Dichloroethane	ND	1.0	0.20	ug/l	
78-87-5	1,2-Dichloropropane	ND	1.0	0.25	ug/l	
124-48-1	Dibromochloromethane	ND	1.0	0.20	ug/l	
156-59-2	cis-1,2-Dichloroethylene	ND	1.0	0.28	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	1.0	0.24	ug/l	
156-60-5	trans-1,2-Dichloroethylene	ND	1.0	0.20	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	1.0	0.21	ug/l	
100-41-4	Ethylbenzene	ND	1.0	0.20	ug/l	
591-78-6	2-Hexanone	ND	10	2.9	ug/l	
108-10-1	4-Methyl-2-pentanone	ND	5.0	2.2	ug/l	
74-83-9	Methyl bromide	ND	2.0	0.54	ug/l	
74-87-3	Methyl chloride	ND	2.0	0.38	ug/l	
75-09-2	Methylene chloride	ND	5.0	1.0	ug/l	
78-93-3	Methyl ethyl ketone	ND	5.0	2.0	ug/l	
100-42-5	Styrene	ND	1.0	0.20	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	1.0	0.29	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.0	0.37	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	1.0	0.30	ug/l	
127-18-4	Tetrachloroethylene	ND	1.0	0.25	ug/l	
108-88-3	Toluene	ND	1.0	0.27	ug/l	
79-01-6	Trichloroethylene	ND	1.0	0.38	ug/l	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	49MW01		
Lab Sample ID:	F52170-8	**Date Sampled:**	08/29/07
Matrix:	AQ - Ground Water	**Date Received:**	08/30/07
Method:	SW846 8260B	**Percent Solids:**	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
75-01-4	Vinyl chloride	ND	1.0	0.34	ug/l	
	m,p-Xylene	ND	2.0	0.36	ug/l	
95-47-6	o-Xylene	ND	1.0	0.20	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	101%		87-116%
17060-07-0	1,2-Dichloroethane-D4	108%		76-127%
2037-26-5	Toluene-D8	102%		86-112%
460-00-4	4-Bromofluorobenzene	109%		84-120%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	TB082907		
Lab Sample ID:	F52170-9	**Date Sampled:**	08/29/07
Matrix:	AQ - Trip Blank Water	**Date Received:**	08/30/07
Method:	SW846 8260B	**Percent Solids:**	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	B048412.D	1	09/12/07	LD	n/a	n/a	VB2034
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	25	10	ug/l	
71-43-2	Benzene	ND	1.0	0.20	ug/l	
75-27-4	Bromodichloromethane	ND	1.0	0.29	ug/l	
75-25-2	Bromoform	ND	1.0	0.28	ug/l	
108-90-7	Chlorobenzene	ND	1.0	0.20	ug/l	
75-00-3	Chloroethane	ND	2.0	0.46	ug/l	
67-66-3	Chloroform	ND	1.0	0.21	ug/l	
75-15-0	Carbon disulfide	ND	2.0	0.20	ug/l	
56-23-5	Carbon tetrachloride	ND	1.0	0.29	ug/l	
75-34-3	1,1-Dichloroethane	ND	1.0	0.25	ug/l	
75-35-4	1,1-Dichloroethylene	ND	1.0	0.23	ug/l	
107-06-2	1,2-Dichloroethane	ND	1.0	0.20	ug/l	
78-87-5	1,2-Dichloropropane	ND	1.0	0.25	ug/l	
124-48-1	Dibromochloromethane	ND	1.0	0.20	ug/l	
156-59-2	cis-1,2-Dichloroethylene	ND	1.0	0.28	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	1.0	0.24	ug/l	
156-60-5	trans-1,2-Dichloroethylene	ND	1.0	0.20	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	1.0	0.21	ug/l	
100-41-4	Ethylbenzene	ND	1.0	0.20	ug/l	
591-78-6	2-Hexanone	ND	10	2.9	ug/l	
108-10-1	4-Methyl-2-pentanone	ND	5.0	2.2	ug/l	
74-83-9	Methyl bromide	ND	2.0	0.54	ug/l	
74-87-3	Methyl chloride	ND	2.0	0.38	ug/l	
75-09-2	Methylene chloride	ND	5.0	1.0	ug/l	
78-93-3	Methyl ethyl ketone	ND	5.0	2.0	ug/l	
100-42-5	Styrene	ND	1.0	0.20	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	1.0	0.29	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.0	0.37	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	1.0	0.30	ug/l	
127-18-4	Tetrachloroethylene	ND	1.0	0.25	ug/l	
108-88-3	Toluene	ND	1.0	0.27	ug/l	
79-01-6	Trichloroethylene	ND	1.0	0.38	ug/l	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	TB082907		
Lab Sample ID:	F52170-9	**Date Sampled:**	08/29/07
Matrix:	AQ - Trip Blank Water	**Date Received:**	08/30/07
Method:	SW846 8260B	**Percent Solids:**	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
75-01-4	Vinyl chloride	ND	1.0	0.34	ug/l	
	m,p-Xylene	ND	2.0	0.36	ug/l	
95-47-6	o-Xylene	ND	1.0	0.20	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	100%		87-116%
17060-07-0	1,2-Dichloroethane-D4	109%		76-127%
2037-26-5	Toluene-D8	101%		86-112%
460-00-4	4-Bromofluorobenzene	110%		84-120%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Shaw Environmental, Inc.
2790 Mosside Blvd
Monroeville, PA
412-858-3335
FAX: 412-372-8968

Shaw® Shaw Environmental, Inc.

MEMORANDUM

TO: Jeff Parks, Shaw E&I Radford Army Ammunition Plant (RFAAP) Project Manager

FROM: Richard McCracken, Shaw E&I Project Chemist

SUBJECT: RFAAP Data Validation – Dioxin Furans
SGS Paradigm Analytical Laboratories, Inc. Project G383-602
(Accutest SDG F52208)

DATE: November 2, 2007

The purpose of this memorandum is to present the data validation report for the samples collected at RFAAP on August 30, 2007. The samples were analyzed for Dioxin and Furan compounds using USEPA SW-846 Method 8290 High Resolution Gas Chromatography/High Resolution Mass Spectroscopy (HRGC/HRMS). A total of six aqueous samples were validated. The sample IDs are:

Field Sample ID	Lab Sample ID	Field Sample ID	Lab Sample ID
RB083007	F52208-1	50MW02	F52208-4
50MW01	F52208-2	48MW05	F52208-5
48MW07	F52208-3	48MW06	F52208-6

Data were reviewed and validated using a combination of project QAPP, *DOD Quality Systems Manual for Environmental Laboratories, Final Version 3, January, 2006* (DoD, 2006) (DoD QSM), method-specific criteria, and laboratory SOP criteria. The data qualifier scheme was consistent with the *USEPA Region III Dioxin/Furan Data Validation Guidance* (March, 1999). Parameters evaluated are presented in **Table 1**. Data associated with parameters in compliance with quality control specifications have not been qualified. Data associated with parameters that did not comply with quality control specifications and directly impacted project data have been qualified in accordance with USEPA Region III specifications.

Table 1 Laboratory Performance Criteria

Qualified		Parameter
Yes	No	
	X	Holding Times and Preservation
	X	Blank Analysis
	X	Instrument Performance Check
	X	Initial Calibration
	X	Continuing Calibration
	X	Internal Standards (IS) Recovery Standard Solutions
	X	Cleanup Standards
	X	Laboratory Control Standard or Ongoing Precision Result (OPR)
	X	Matrix Spike and Spike Duplicate
	X	Field Duplicate
X		Quantitation Verification

The quality of data collected in support of this sampling activity is considered acceptable with noted qualifications.

Richard McCracken, Chemist

11/2/07
Date

RFAAP VALIDATION REPORT
DIOXIN FURAN REVIEW
SDG G383-602
(Accutest SDG F52208)

I-Holding Times and Preservation

The objective is to ascertain the validity of results based on the holding time of the sample from time of collection to time of sample extraction and analysis. For aqueous samples, dioxin and furans are shipped @4°C ± 2°C, with a maximum holding time of 30 days from sample collection to preparative extraction and 45 days from preparative extraction to determinative analysis.

- Temperature Review: A temperature blank was sent with each cooler and recorded by the laboratory upon receipt. The samples collected on 8/30/07 were sent in 15 coolers, and were received by the laboratory on 8/31/07 at temperatures ranging from 0.6°C to 2.2°C, with 12 of the 15 coolers having temperatures below 2.0°C. The low sample temperatures are not expected to have an adverse impact on the analytical results. Accutest shipped the dioxin aliquot to SGS Paradigm Analytical Laboratories on 9/4/07, they were received by DataChem on 9/5/07 at 4.3°C. No qualifiers were applied.

- Holding Time Review: The samples were collected on 8/30/07, extracted on 9/6/07, and analyzed on 9/8/07 & 9/9/07. All criteria were met. No qualifiers were applied.

II-Blank Analysis

The purpose of laboratory (or field) blank analyses is to determine the existence and magnitude of contamination problems resulting from field and laboratory activities. No contamination should be found in any of the blanks >EDL (estimated detection limit). The DoD QSM criteria specifies all concentrations should be less than ½ MRL (<MRL for common laboratory contaminants OCDD and OCDF) and <2EDL for the calibration blanks. Positive sample results are reported and qualified "B", if the concentration of the compound in the sample is ≤10 times (10x) the maximum amount in any blank for the common laboratory contaminants OCDD or OCDF, or 5 times (5X) the maximum amount for other target compounds. **Table 2** summarizes the blank contamination analysis.

Table 2 Blank Contamination Analysis Summary

Analysis Date	QC Blank ID	Compound	Max Conc. ng/L	Action Level ng/L	B qualified samples
9/8/07	LMB14381	All congeners <EDL	NA	NA	None
9/09/07	RB083007	All congeners <EDL	NA	NA	None

J = Estimated value <MRL and >EDL.

III-Instrument Performance Check

Instrument must be tuned with perfluorokerosene (PFK) to achieve a static resolving power of at least 10,000 (10% valley) and lock-mass ion between lowest and highest masses for each descriptor and level of reference compound ≤10%. Documentation of the mass spectrometer resolving power is accomplished by recording the peak profile of the high-mass reference signal (typically m/z 330.9792) obtained during a peak examination by using the low-mass PFK ion at m/z 292.9825 or lower in mass as reference. At the beginning of the each 12-hour period, the chromatographic resolution is verified in the same fashion as in the initial calibration through the analysis of HRCC solution on the DB-5 (or equivalent) column or through the analysis of the column performance solution on the SP-2331 or SP-225 (or equivalent) column. A 25% valley must be achieved between the close eluters.

- All PFK forms were verified and found to be in compliance with method specification. No qualifiers were applied.

IV-Initial Calibration
Once the window defining mix has been analyzed and the descriptor switching times have been verified, the five point calibration solutions can be analyzed prior to sample analysis. Per method and DoD QSM, the initial calibration criteria are as follows:

- The percent relative standard deviations for the mean response factors RRF(n) from the 17 unlabeled standards must not exceed ±20%, and those for the labeled reference compounds must not exceed ±30%;
- The signal to noise ratio ≥10% for all target ions;
- Ion abundance ratios must be within the specified control limits in Table 8 (SW846 Method 8290).

- During initial calibration performed on 07/10/07 using instrument HRMS1, all compounds met criteria. No qualifiers were applied. All samples were analyzed in conjunction with this initial calibration.

V-Continuing Calibration
The continuing calibration consists of two parts: evaluation of the mass resolution and retention time check. Per method and DoD QSM, the following stipulates the continuing calibration criteria.

- The signal signal-to-noise ratio (S/N) must be at least 10:1 for each selected ion current profile (SICP) and for each GC signal representing the elution of a target analyte or labeled standard for each analyte.
- The relative response factor of each analyte for the unlabeled standard must be within ±20% of the average RF obtained from the initial calibration, and the RRF of each labeled standard must be within ±30% of the average RRF established during initial calibration. This is expressed in term of percent difference %D.
- Ion abundance ratios must be within the specified control limits in Table 8 (SW846 Method 8290).

- During the continuing calibration performed on 9/8/07 @1115 on instrument HRMS1, all criteria were met. No qualifiers were applied. Samples 48MW07, 50MW02, and 48MW05 were analyzed following this continuing calibration.

- During the continuing calibration performed on 9/8/07 @2236 on instrument HRMS1, all criteria were met. No qualifiers were applied. Samples 48MW07, 50MW02, and 48MW05 were analyzed before this continuing calibration, while samples RB083007, 50MW01, and 48MW06 were analyzed following this continuing calibration.

- During the continuing calibration performed on 9/9/07 @0958 on instrument HRMS1, all criteria were met. No qualifiers were applied. Samples RB083007, 50MW01, and 48MW06 were analyzed before this continuing calibration.

VI-Internal Standards (IS) Recovery Standard Solutions
Internal standards performance criteria ensure that GC/MS sensitivity and response are stable during every analytical run. Specific criteria include: Recoveries of the isotopically-labeled recovery standards to fall within the 40 to 135 percent range for the tetra- through octachlorinated congeners, or as stated in the data package (DoD QSM limits 40-135%).

- All criteria were met. No qualifiers were applied.

VII-Cleanup Standards
Cleanup standards are added to every sample, blank, quality control sample, and calibration solution. This compound is added to the samples after extraction but prior to cleanup and is used to verify the percent recovery obtained using the isotope dilution technique. The control limits are 40 to 135 percent (DoD QSM limits 40-135%).

- All criteria were met. No qualifiers were applied.

VIII-Laboratory Control Standard (LCS) or Ongoing Precision Result (OPR)
LCSs are used to monitor laboratory accuracy and precision by calculating the percent recoveries of the spiked compounds. Per DOD QSM and method criteria, acceptable performance is determined by:

1. Recoveries of the isotopically-labeled extraction standards to fall within 40-135% control limits for the tetra- through octachlorinated congeners, or as stated in the data package;

2. Recoveries (accuracy) of the unlabeled compounds should be within ±35% when spiked at the method quantitation limit and within ±30% when spiked above 20 times the method quantitation limit, or as stated in the data package;

3. When duplicate OPR are required, the relative percent difference (RPD) of the unlabeled analytes concentrations should be within 30% when spiked at the method quantitation limit and within ±20% when spiked above 20 times the method quantitation limit.

- Sample OPR14457 was used as LCS and LCSD on 9/8/07 analytical run. All criteria were met. No qualifiers were applied. All samples were analyzed in conjunction with this LCS.

IX-Matrix Spike/Matrix Spike Duplicate
Data for matrix spike/matrix spike duplicates (MS/MSD) are generated to determine long-term precision and accuracy of the analytical method on various matrices and to demonstrate acceptable compound recovery by the laboratory at the time of sample analysis. The percent recoveries (%Rs) and the relative percent difference (RPD) must be within the specified control limits. Per DoD QSM, MS/MSD recoveries must be within in-house laboratory limits (75-125%) and RPD ≤20%.

- No project specific MS/MSD was performed; therefore, it was not evaluated.

X-Field Duplicate Sample Analysis
Field duplicates were collected to identify the cumulative precision of the sampling and analytical process and sent to the laboratory blind. The RPD was calculated only for those analytes which were detected in both samples of the duplicate pair. Analytes that were rejected (R-qualified) in either sample of the duplicate pair were excluded from the duplicate assessment. Precision control criterion was established at 50% RPD for the aqueous and solid samples. Analytical results were qualified as estimated (J) for any RPDs exceeding criteria.

- No field duplicates were included in this data set.

XI-Quantitation Verification

The accuracy of analytical results was verified through the calculation of at least one the several parameters such as the %D, %RSD, % recovery, and/or compound concentration. Values were found to be within 10%. Any value reported by the laboratory as estimated "A" based on an analyte to internal standard ratio below the calibration curve was qualified as estimated "J". The signal signal-to-noise ratio (S/N) must be greater than 2.5 for each selected ion current profile (SICP) and for each GC signal representing the elution of a target analyte or labeled standard. Any detected value with ether interference (I-lab flag) was qualified as estimated "J". For where the ion ratio failed the 25% criteria (*-lab flag), the estimated maximum possible concentration (EMPC) was reported and flagged estimated "J". For where presence of quantitation interference (Q-lab flag), the date was flagged estimated "J" for detects and "UJ" for non-detects.

- The OCDD result in 50MW01 (F52208-2) has been qualified "J" as estimated since the amount detected was less than the Lower Method Calibration Limit.

- The OCDD result in 48MW07 (F52208-3) has been qualified "J" as estimated since the amount detected was less than the Lower Method Calibration Limit.

- The 1,2,3,7,8,9-HxCDD, 1,2,3,4,6,7,8-HpCDD, OCDD, 2,3,7,8-TCDF, 1,2,3,4,7,8-HxCDF, 1,2,3,4,6,7,8-HpCDF, and OCDF results in 50MW02 (F52208-4) have been qualified "J" as estimated since the amount of each compound detected was less than the Lower Method Calibration Limit. Note that the ion abundance ratio for 1,2,3,7,8,9-HxCDD did not meet criteria and has been reported as an Estimated Maximum Possible Concentration (EPMC). Since the result has already been qualified "J", no further qualification is required.

- The OCDD and 1,2,3,4,6,7,8-HpCDF results in 48MW06 (F52208-6) have been qualified "J" as estimated since the amount of each compound detected was less than the Lower Method Calibration Limit.

Sample: 50MW01 (F52208-2), OCDD

A(x) = sum of the integrated ion abundances of the quantitation ions for the unlabeled ions;
A(is) = sum of the integrated ion abundances of the quantitation ions for the labeled ions;
Q(is) = quantity, in ng/ul, of the internal standard added to the sample before extraction;
V = volume in mL of the aqueous sample; and
Avg. RRF(n) = calculated mean relative response factor for the unlabeled analyte.

$$\text{Conc. (ng/L)} = \frac{(A(x))\ *Q(is)*1000}{A(is)\ *\ V\ *\ \text{Avg. RRF}} = \frac{(305000)*4.0*1000}{(66900000)\ *\ 919\ *\ 1.0783} = 0.0184 \text{ ng/L}$$

Reported Value = 0.0184 ng/L
% Difference = 0.0%
Values were within 10% difference

USEPA Region III Validation Qualifiers

(No Code) = Confirmed identification.

B = The analyte has been detected in the sample and the associated laboratory or field blank.

J = Indicates an estimated value for (1) estimated value due to QC non-conformance. Reported value may not be accurate or precise, (2) estimating a concentration as a tentatively identified compound as indicated by the mass spectral and retention time data, or (3) estimating a concentration ≥ EDL and <MRL or <3*EDL, whichever is greater.

K = Analyte present. Reported value may be biased high (estimated) due to QC non-conformance.

L = Analyte present. Reported value may be biased low (estimated) due to QC non-conformance.

R = Unreliable result. Analyte may or may not be present in the sample due to QC non-conformance.

UL = Value is estimated bias low and not detected due to QC non-conformance. Reporting limit may be inaccurate or imprecise. Quantitation limit is probably higher.

UJ = Value is estimated and not detected due to QC non-conformance. Reporting limit may be inaccurate or imprecise.

Laboratory Qualifiers

(No Code) = Confirmed identification.

U = Not detected. The associated number indicates the compound reporting limit for the sample.

A (Dioxins) = B (Metals) = The reported value was obtained from a reading <MRL and ≥EDL and is considered estimated.

B (Organics) = The analyte or compound has been detected in the sample and laboratory method blank. It indicates probable blank contamination.

E (Metals) = Reported value is estimated because of the presence of interferences.

E (Organics) = Identifies compounds whose concentrations exceed the upper level of the calibration range.

EMPC (Dioxins) = The ion-abundance ratio between the two characteristic PCDD/PCDF ions was outside accepted ranges. The detected PCDD/PCDF was reported as an estimated maximum possible concentration (EMPC).

D = Indicates sample was analyzed at a dilution.

J = Indicates an estimated value for (1) estimating a concentration as a tentatively identified compound as indicated by the mass spectral and retention time data, or (2) estimating a concentration <MRL and ≥ EDL.

N (Organics) = Indicates presumptive evidence of a compound for tentatively identified compounds using a library search.

N (Metals) = Laboratory spike sample recovery not within control limits.

P (Organics) = Target analyte confirmation >40% difference for detected compound between the primary and secondary columns. The lower of the two values was reported.

* (Metals) = Duplicate analysis not within control limits.

* (Organics) = Surrogate outside of QC limits on both original and re-analysis.

Method 8290
F52208-1
Accutest

Analytical Data Summary Sheet

Analyte	Amount ng/L	EDL ng/L	EMPC ng/L	RT (min.)	Ratio	Qualifier
2,3,7,8-TCDD	ND	0.00260				
1,2,3,7,8-PeCDD	ND	0.00525				
1,2,3,4,7,8-HxCDD	ND	0.00525				
1,2,3,6,7,8-HxCDD	ND	0.00525				
1,2,3,7,8,9-HxCDD	ND	0.00525				
1,2,3,4,6,7,8-HpCDD	ND	0.00687				
OCDD	ND	0.0118				
2,3,7,8-TCDF	ND	0.00194				
1,2,3,7,8-PeCDF	ND	0.00525				
2,3,4,7,8-PeCDF	ND	0.00525				
1,2,3,4,7,8-HxCDF	ND	0.00525				
1,2,3,6,7,8-HxCDF	ND	0.00525				
2,3,4,6,7,8-HxCDF	ND	0.00525				
1,2,3,7,8,9-HxCDF	ND	0.00525				
1,2,3,4,6,7,8-HpCDF	ND	0.00525				
1,2,3,4,7,8,9-HpCDF	ND	0.00525				
OCDF	ND	0.0105				
Total TCDDs	ND	0.00260				
Total PeCDDs	ND	0.00525				
Total HxCDDs	ND	0.00525				
Total HpCDDs	ND	0.00687				
Total TCDFs	ND	0.00194				
Total PeCDFs	ND	0.00525				
Total HxCDFs	ND	0.00525				
Total HpCDFs	ND	0.00525				
WHO-2005 TEQ (ND=0)	ND		ND			
WHO-2005 TEQ (ND=½)	0.00682		0.00682			

Client Information			**Sample Information**	
Project Name:	F52208		Report Basis:	Wet
			Matrix:	Water
Sample ID:	F52208-1		Weight / Volume:	952 mL
			Solids / Lipids:	NA %
			Original pH :	7
Laboratory Information			Batch ID:	WG14457
Project ID:	G383-602		Instrument:	HRMS1
Sample ID:	G383-602-1B		Filename:	a07sep07a_5-11
Collection Date/Time:	08/30/07	6:45	Retchk:	a07sep07a_4-14
Receipt Date/Time:	09/05/07	10:30	Begin ConCal:	a07sep07a_4-14
Extraction Date:	09/06/07		End ConCal:	a07sep07a_5-14
Analysis Date/Time:	09/09/07	7:33	Initial Cal:	m8290-071007a

Method 8290
F52208-2
Accutest

Analytical Data Summary Sheet

Analyte	Amount ng/L	EDL ng/L	EMPC ng/L	RT (min.)	Ratio	Qualifier
2,3,7,8-TCDD	ND	0.00222				
1,2,3,7,8-PeCDD	ND	0.00544				
1,2,3,4,7,8-HxCDD	ND	0.00544				
1,2,3,6,7,8-HxCDD	ND	0.00544				
1,2,3,7,8,9-HxCDD	ND	0.00544				
1,2,3,4,6,7,8-HpCDD	ND	0.00544				
OCDD	0.0184			45:00	0.90	A
2,3,7,8-TCDF	ND	0.00165				
1,2,3,7,8-PeCDF	ND	0.00544				
2,3,4,7,8-PeCDF	ND	0.00544				
1,2,3,4,7,8-HxCDF	ND	0.00544				
1,2,3,6,7,8-HxCDF	ND	0.00544				
2,3,4,6,7,8-HxCDF	ND	0.00544				
1,2,3,7,8,9-HxCDF	ND	0.00544				
1,2,3,4,6,7,8-HpCDF	ND	0.00544				
1,2,3,4,7,8,9-HpCDF	ND	0.00544				
OCDF	ND	0.0109				
Total TCDDs	ND	0.00222				
Total PeCDDs	ND	0.00544				
Total HxCDDs	ND	0.00544				
Total HpCDDs	ND	0.00544				
Total TCDFs	ND	0.00165				
Total PeCDFs	ND	0.00544				
Total HxCDFs	ND	0.00544				
Total HpCDFs	ND	0.00544				
WHO-2005 TEQ (ND=0)	0.00000552		0.00000552			
WHO-2005 TEQ (ND=½)	0.00680		0.00680			

DATA VAL QUALIFIER

J

Client Information			**Sample Information**	
Project Name:	F52208		Report Basis:	Wet
			Matrix:	Water
Sample ID:	F52208-2		Weight / Volume:	919 mL
			Solids / Lipids:	NA %
			Original pH :	7
Laboratory Information			Batch ID:	WG14457
Project ID:	G383-602		Instrument:	HRMS1
Sample ID:	G383-602-2B		Filename:	a07sep07a_5-12
Collection Date/Time:	08/30/07	8:00	Retchk:	a07sep07a_4-14
Receipt Date/Time:	09/05/07	10:30	Begin ConCal:	a07sep07a_4-14
Extraction Date:	09/06/07		End ConCal:	a07sep07a_5-14
Analysis Date/Time:	09/09/07	8:21	Initial Cal:	m8290-071007a

Method 8290
F52208-3
Accutest

Analytical Data Summary Sheet

Analyte	Amount ng/L	EDL ng/L	EMPC ng/L	RT (min.)	Ratio	Qualifier
2,3,7,8-TCDD	ND	0.00369				
1,2,3,7,8-PeCDD	ND	0.00494				
1,2,3,4,7,8-HxCDD	ND	0.00494				
1,2,3,6,7,8-HxCDD	ND	0.00494				
1,2,3,7,8,9-HxCDD	ND	0.00494				
1,2,3,4,6,7,8-HpCDD	ND	0.00801				
OCDD	0.0146			45:00	0.98	A
2,3,7,8-TCDF	ND	0.00253				
1,2,3,7,8-PeCDF	ND	0.00494				
2,3,4,7,8-PeCDF	ND	0.00494				
1,2,3,4,7,8-HxCDF	ND	0.00494				
1,2,3,6,7,8-HxCDF	ND	0.00494				
2,3,4,6,7,8-HxCDF	ND	0.00494				
1,2,3,7,8,9-HxCDF	ND	0.00494				
1,2,3,4,6,7,8-HpCDF	ND	0.00494				
1,2,3,4,7,8,9-HpCDF	ND	0.00594				
OCDF	ND	0.0127				
Total TCDDs	ND	0.00369				
Total PeCDDs	ND	0.00494				
Total HxCDDs	ND	0.00494				
Total HpCDDs	ND	0.00801				
Total TCDFs	ND	0.00253				
Total PeCDFs	ND	0.00494				
Total HxCDFs	ND	0.00494				
Total HpCDFs	ND	0.00594				
WHO-2005 TEQ (ND=0)	0.00000438		0.00000438			
WHO-2005 TEQ (ND=½)	0.00708		0.00708			

DATA VAL QUALIFIER

J

Client Information			**Sample Information**	
Project Name:	F52208		Report Basis:	Wet
			Matrix:	Water
Sample ID:	F52208-3		Weight / Volume:	1012 mL
			Solids / Lipids:	NA %
			Original pH :	7
Laboratory Information			Batch ID:	WG14457
Project ID:	G383-602		Instrument:	HRMS1
Sample ID:	G383-602-3B		Filename:	a07sep07a_4-4
Collection Date/Time:	08/30/07	9:10	Retchk:	a07sep07a_3-14
Receipt Date/Time:	09/05/07	10:30	Begin ConCal:	a07sep07a_3-14
Extraction Date:	09/06/07		End ConCal:	a07sep07a_4-14
Analysis Date/Time:	09/08/07	14:33	Initial Cal:	m8290-071007a

Method 8290
F52208-4
Accutest

Analytical Data Summary Sheet

Analyte	Amount ng/L	EDL ng/L	EMPC ng/L	RT (min.)	Ratio		Qualifier	DATA VAL QUALIFIER
2,3,7,8-TCDD	ND	0.00389						
1,2,3,7,8-PeCDD	ND	0.00546						
1,2,3,4,7,8-HxCDD	ND	0.00546						
1,2,3,6,7,8-HxCDD	ND	0.00546						
1,2,3,7,8,9-HxCDD	EMPC	0.00548	0.00501	37:19	0.89	*	A	J
1,2,3,4,6,7,8-HpCDD	0.0338			40:31	0.99		A	J
OCDD	1.10			45:01	0.90			
2,3,7,8-TCDF	0.00337			30:57	0.80		A	J
1,2,3,7,8-PeCDF	ND	0.00546						
2,3,4,7,8-PeCDF	ND	0.00546						
1,2,3,4,7,8-HxCDF	0.00376			36:15	1.23		A	J
1,2,3,6,7,8-HxCDF	ND	0.00546						
2,3,4,6,7,8-HxCDF	ND	0.00546						
1,2,3,7,8,9-HxCDF	ND	0.00546						
1,2,3,4,6,7,8-HpCDF	0.0238			39:13	1.03		A	J
1,2,3,4,7,8,9-HpCDF	ND	0.00691						
OCDF	0.0513			45:16	0.95		A	J
Total TCDDs	ND	0.00389						
Total PeCDDs	ND	0.00546						
Total HxCDDs	0.0197							
Total HpCDDs	0.0802							
Total TCDFs	0.00509							
Total PeCDFs	ND	0.00546						
Total HxCDFs	0.00704							
Total HpCDFs	0.0238							
WHO-2005 TEQ (ND=0)	0.00163		0.00214					
WHO-2005 TEQ (ND=½)	0.00889		0.00912					

Client Information			**Sample Information**		
Project Name:	F52208		Report Basis:	Wet	
			Matrix:	Water	
Sample ID:	F52208-4		Weight / Volume:	915 mL	
			Solids / Lipids:	NA	%
			Original pH :	7	
Laboratory Information			Batch ID:	WG14457	
Project ID:	G383-602		Instrument:	HRMS1	
Sample ID:	G383-602-4B		Filename:	a07sep07a_4-5	
Collection Date/Time:	08/30/07	9:00	Retchk:	a07sep07a_3-14	
Receipt Date/Time:	09/05/07	10:30	Begin ConCal:	a07sep07a_3-14	
Extraction Date:	09/06/07		End ConCal:	a07sep07a_4-14	
Analysis Date/Time:	09/08/07	15:21	Initial Cal:	m8290-071007a	

Method 8290
F52208-5
Accutest

Analytical Data Summary Sheet

Analyte	Amount ng/L	EDL ng/L	EMPC ng/L	RT (min.)	Ratio	Qualifier
2,3,7,8-TCDD	ND	0.00344				
1,2,3,7,8-PeCDD	ND	0.00538				
1,2,3,4,7,8-HxCDD	ND	0.00538				
1,2,3,6,7,8-HxCDD	ND	0.00538				
1,2,3,7,8,9-HxCDD	ND	0.00538				
1,2,3,4,6,7,8-HpCDD	ND	0.00816				
OCDD	ND	0.0180				
2,3,7,8-TCDF	ND	0.00246				
1,2,3,7,8-PeCDF	ND	0.00538				
2,3,4,7,8-PeCDF	ND	0.00538				
1,2,3,4,7,8-HxCDF	ND	0.00538				
1,2,3,6,7,8-HxCDF	ND	0.00538				
2,3,4,6,7,8-HxCDF	ND	0.00538				
1,2,3,7,8,9-HxCDF	ND	0.00538				
1,2,3,4,6,7,8-HpCDF	ND	0.00538				
1,2,3,4,7,8,9-HpCDF	ND	0.00584				
OCDF	ND	0.0129				
Total TCDDs	ND	0.00344				
Total PeCDDs	ND	0.00538				
Total HxCDDs	ND	0.00538				
Total HpCDDs	ND	0.00816				
Total TCDFs	ND	0.00246				
Total PeCDFs	ND	0.00538				
Total HxCDFs	ND	0.00538				
Total HpCDFs	ND	0.00584				
WHO-2005 TEQ (ND=0)	ND		ND			
WHO-2005 TEQ (ND=½)	0.00741		0.00741			

Client Information			**Sample Information**	
Project Name:	F52208		Report Basis:	Wet
			Matrix:	Water
Sample ID:	F52208-5		Weight / Volume:	929 mL
			Solids / Lipids:	NA %
			Original pH :	8
Laboratory Information			Batch ID:	WG14457
Project ID:	G383-602		Instrument:	HRMS1
Sample ID:	G383-602-5B		Filename:	a07sep07a_4-6
Collection Date/Time:	08/30/07	11:00	Retchk:	a07sep07a_3-14
Receipt Date/Time:	09/05/07	10:30	Begin ConCal:	a07sep07a_3-14
Extraction Date:	09/06/07		End ConCal:	a07sep07a_4-14
Analysis Date/Time:	09/08/07	16:10	Initial Cal:	m8290-071007a

Method 8290
F52208-6
Accutest

Analytical Data Summary Sheet

Analyte	Amount ng/L	EDL ng/L	EMPC ng/L	RT (min.)	Ratio	Qualifier
2,3,7,8-TCDD	ND	0.00196				
1,2,3,7,8-PeCDD	ND	0.00508				
1,2,3,4,7,8-HxCDD	ND	0.00508				
1,2,3,6,7,8-HxCDD	ND	0.00508				
1,2,3,7,8,9-HxCDD	ND	0.00508				
1,2,3,4,6,7,8-HpCDD	ND	0.00508				
OCDD	0.00859			45:01	1.00	A
2,3,7,8-TCDF	ND	0.00148				
1,2,3,7,8-PeCDF	ND	0.00508				
2,3,4,7,8-PeCDF	ND	0.00508				
1,2,3,4,7,8-HxCDF	ND	0.00508				
1,2,3,6,7,8-HxCDF	ND	0.00508				
2,3,4,6,7,8-HxCDF	ND	0.00508				
1,2,3,7,8,9-HxCDF	ND	0.00508				
1,2,3,4,6,7,8-HpCDF	0.00177			39:13	1.06	A
1,2,3,4,7,8,9-HpCDF	ND	0.00508				
OCDF	ND	0.0102				
Total TCDDs	ND	0.00196				
Total PeCDDs	ND	0.00508				
Total HxCDDs	ND	0.00508				
Total HpCDDs	ND	0.00508				
Total TCDFs	ND	0.00148				
Total PeCDFs	ND	0.00508				
Total HxCDFs	ND	0.00508				
Total HpCDFs	0.00177					
WHO-2005 TEQ (ND=0)	0.0000203		0.0000203			
WHO-2005 TEQ (ND=½)	0.00628		0.00628			

DATA VAL QUALIFIER

J

J

Client Information			**Sample Information**	
Project Name:	F52208		Report Basis:	Wet
			Matrix:	Water
Sample ID:	F52208-6		Weight / Volume:	985 mL
			Solids / Lipids:	NA %
			Original pH :	7
Laboratory Information			Batch ID:	WG14457
Project ID:	G383-602		Instrument:	HRMS1
Sample ID:	G383-602-6B		Filename:	a07sep07a_5-13
Collection Date/Time:	08/30/07	11:45	Retchk:	a07sep07a_4-14
Receipt Date/Time:	09/05/07	10:30	Begin ConCal:	a07sep07a_4-14
Extraction Date:	09/06/07		End ConCal:	a07sep07a_5-14
Analysis Date/Time:	09/09/07	9:09	Initial Cal:	m8290-071007a

Shaw Environmental, Inc.
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Monroeville, PA
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Shaw® Shaw Environmental, Inc.

MEMORANDUM

TO: Jeff Parks, Shaw E&I Radford Army Ammunition Plant (RFAAP) Project Manager

FROM: Richard McCracken, Shaw E&I Project Chemist

SUBJECT: RFAAP Data Validation – Explosives, PETN, & Nitroglycerin
Accutest Laboratories, Inc., SDG F52208

DATE: November 1, 2007

The purpose of this memorandum is to present the data validation report for the samples collected at RFAAP on August 30, 2007. The samples were analyzed for explosives, nitroglycerin, and PETN using USEPA SW-846 3535A/8330A. A total of six aqueous samples were validated. The sample IDs are:

Field Sample ID	Lab Sample ID	Field Sample ID	Lab Sample ID
RB083007	F52208-1	50MW02	F52208-4
50MW01	F52208-2	48MW05	F52208-5
48MW07	F52208-3	48MW06	F52208-6

Data were reviewed by Richard McCracken and validated using a combination of project QAPP, *Quality Systems Manual for Environmental Laboratories, Final Version 3, January, 2006* (DoD, 2006) (DoD QSM), method-specific criteria, and laboratory SOP criteria. The data qualifier scheme was consistent with the *Region III Modifications to the National Functional Guidelines for Organic Data Review* (September 1994). Parameters evaluated are presented in **Table 1**. Data associated with parameters in compliance with quality control specifications have not been qualified. Data associated with parameters that did not comply with quality control specifications and directly impacted project data have been qualified in accordance with USEPA Region III specifications.

Table 1 Laboratory Performance Criteria

Qualified		Parameter
Yes	No	
	X	Holding Times and Preservation
	X	Blank Analysis
	X	Initial Calibration
	X	Continuing Calibration
	X	System Monitoring Compounds
	X	Laboratory Control Sample
	X	Matrix Spike/Spike Duplicate
	X	Field Duplicate
	X	Quantitation Verification

The quality of data collected in support of this sampling activity is considered acceptable.

Richard McCracken, Chemist

11/1/07
Date

RFAAP VALIDATION REPORT
EXPLOSIVES REVIEW
SDG F52208

I-Holding Times and Preservation

The objective is to ascertain the validity of results based on the holding time of the sample from time of collection to time of sample extraction and analysis. For aqueous samples, explosive compounds are shipped @4°C ± 2°C, with a maximum holding time of 7 days from sample collection to preparative extraction and 40 days from preparative extraction to determinative analysis.

- Temperature Review: A temperature blank was sent with each cooler and recorded by the laboratory upon receipt. The samples collected on 8/30/07 were sent in 15 coolers, and were received by the laboratory on 8/31/07 at temperatures ranging from 0.6°C to 2.2°C, with 12 of the 15 coolers having temperatures below 2.0°C. The low sample temperatures are not expected to have an adverse impact on the analytical results. No qualifiers were applied.

- Holding Time Review: The samples were collected on 8/30/07, extracted on 9/5/07, analyzed for PETN and nitroglycerine on 9/7/07, and analyzed for all other explosives on 9/12/07. All criteria were met. No qualifiers were applied.

II-Blank Analysis

The purpose of laboratory or field blank analyses is to determine the existence and magnitude of contamination problems resulting from laboratory or field activities. One method blank per analytical batch must be run on each instrument used to analyze samples. No contaminants should be present in the blanks. The DoD QSM criterion specifies all concentrations should be less than one-half MRL. Positive sample results are reported and qualified "B", if the concentration of the compound in the sample is ≤5 times (5x) the maximum amount for explosive target compounds. **Table 2** summarizes the blank contamination analysis.

Table 2 Blank Contamination Analysis Summary

Analysis Date	QC Blank ID	Compound	Max Conc. µg/L	Action Level µg/L	B qualified samples
9/11/07	OP22200-MB	All target explosives <½MRL	NA	NA	None
9/12/07	OP22200-MB	All target explosives <½MRL	NA	NA	None
9/7/07	OP22200-MB	PETN & NG <½MRL	NA	NA	None
9/11/07	RB083007	All target explosives <½MRL	NA	NA	None
9/07/07	RB083007	PETN & NG <½MRL	NA	NA	None

MRL = Method Reporting Limit
NA = Not Applicable

III-Initial Calibration

Compliance requirements for satisfactory instrument calibration are established to ensure that the instrument is capable of producing acceptable qualitative and quantitative data for the target compounds. The initial 5-point calibration demonstrates that the instrument is capable of acceptable performance in the beginning of the analytical run. The DoD QSM specifies that the correlation coefficient (r^2) must be ≥0.990 and/or the percent relative standard deviation (%RSD) must be ≤20%. All detects were qualified as estimated "J" for where there were exceeding %RSDs, and all non-detects were qualified as estimated "UJ" for where there were grossly exceeding recoveries. Grossly exceeding is defined as twice the established criteria limits.

- During the explosives initial calibration performed on 9/11/07 on instrument G1315B, all criteria were met for target compounds. No qualifiers were applied. All samples were analyzed in conjunction with this initial calibration.

- During the PETN and nitroglycerine initial calibration performed on 03/15/07 on instrument G1315B, all criteria were met for target compounds. No qualifiers were applied. All samples were analyzed in conjunction with this initial calibration.

IV-Continuing Calibration
Compliance requirements for satisfactory instrument calibration are established to ensure that the instrument is capable of producing acceptable qualitative and quantitative data for the target compounds. Continuing calibration standards are analyzed after every 10 injections, and at the end of the analysis sequence. The DoD QSM specifies that the percent difference (%D) from initial calibration should be no greater than ±20%. All detects were qualified as estimated "J" for where there were exceeding %Ds, and all non-detects were qualified as estimated "UJ" for where there were grossly exceeding recoveries. Grossly exceeding is defined as twice the established criteria limits.

- During the explosives initial calibration verification performed on 9/11/07 @2153 on instrument G1315B, all criteria were met for target compounds. No qualifiers were applied. Samples RB083007, 50MW01, 48MW07, 50MW02, and 48MW05 were analyzed after this initial calibration verification.

- During the explosives continuing calibration verification performed on 9/12/07 @0256 on instrument G1315B, all criteria were met for target compounds. No qualifiers were applied. Samples RB083007, 50MW01, 48MW07, 50MW02, and 48MW05 were analyzed prior to this continuing calibration, while 48MW06 was analyzed after this continuing calibration.

- During the explosives continuing calibration verification performed on 9/12/07 @0446 on instrument G1315B, all criteria were met for target compounds. No qualifiers were applied. Sample 48MW06 was analyzed prior to this continuing calibration.

- During the PETN and nitroglycerin initial calibration verification performed on 3/15/07 @1235 on instrument G1315B, all criteria were met for target compounds. No qualifiers were applied. No samples were analyzed in conjunction with this initial calibration verification.

- During the PETN and nitroglycerin continuing calibration performed on 9/7/07 @1417 on instrument G1315B, all criteria were met for target compounds. No qualifiers were applied. Samples RB083007, 50MW01, 48MW07, 50MW02, and 48MW05 were analyzed after this continuing calibration.

- During the PETN and nitroglycerin continuing calibration performed on 9/7/07 @1600 on instrument G1315B, all criteria were met for target compounds. No qualifiers were applied. Samples RB083007, 50MW01, 48MW07, 50MW02, and 48MW05 were analyzed prior to this continuing calibration, while 48MW06 was analyzed after this continuing calibration.

- During the PETN and nitroglycerin continuing calibration performed on 9/7/07 @1638 on instrument G1315B, all criteria were met for target compounds. No qualifiers were applied. Sample 48MW06 was analyzed prior to this continuing calibration.

V-System Monitoring Compound (Surrogates)
Laboratory performance on individual samples is established by means of spiking activities. The percent recovery (%R) for all samples and blanks must be within the laboratory control limits. DoD surrogate recovery limits are specified in Table D-3 of the DoD QSM (DoD, 2006). If the surrogate is not listed, then the laboratory criteria shall be used.

Aqueous Criteria: 3,4-dinitrotoluene (70-136%)

- All criteria were met for explosives, PETN, and nitroglycerin. No qualifiers were applied.

VI-Laboratory Control Sample
Laboratory control samples (LCS) are used to monitor long-term accuracy of the analytical method. The analysis is performed at a frequency of 1 per analytical batch. The percent recoveries (%Rs) must be within the laboratory control limits. DoD QSM aqueous LCS recovery limits are specified in Table D-12 of the DoD QSM (DoD, 2006). If the compound is not listed, then the laboratory criteria shall be used.

- Sample OP22200-BS was used as the LCS for PETN, nitroglycerin, and explosives analysis on 9/11/07. HMX (116%) had a high recovery, but no HMX was detected in any samples so no qualifiers were applied. All other compounds met recovery criteria. All samples were analyzed in conjunction with this LCS.

VII-Matrix Spike/Matrix Spike Duplicate
Data for matrix spike/matrix spike duplicates (MS/MSD) are generated to determine long-term precision and accuracy of the analytical method on various matrices and to demonstrate acceptable compound recovery by the laboratory at the time of sample analysis. The percent recoveries (%Rs) and the relative percent difference (RPD) must be within the laboratory control limits. DoD QSM aqueous MS/MSD recovery limits follow the LCS criteria and are specified in Table D-12 of the DoD QSM (DoD, 2006). If the compound is not listed, then the laboratory criteria shall be used.

- Sample 48MW07 was used as the MS/MSD for the explosive analysis. All compounds met criteria. No qualifiers were applied. All samples were analyzed in conjunction with this MS/MSD.

VIII-Field Duplicate Sample Analysis
Field duplicates were collected to identify the cumulative precision of the sampling and analytical process and sent to the laboratory blind. The RPD was calculated only for those analytes which were detected at levels exceeding the method reporting limits in both samples of the duplicate pair. Analytes that were rejected (R-qualified) in either sample of the duplicate pair were excluded from the duplicate assessment. Precision control criterion was established at 50% RPD for the aqueous and solid samples. Analytical results were qualified as estimated (J) for any RPDs exceeding criteria.

- No field duplicates were included in this data set.

IX-Quantitation Verification
The accuracy of analytical results was verified through the calculation of several parameters. The calculation was based calibration factors. The absolute percent difference (%D) between the calculated and the reported value must be within 10% difference. All values >MDL and <MRL or <3*MDL (whichever was greater) were qualified as estimated "J".

- The %D between the primary and secondary columns was within criteria for all detected explosives, PETN, and nitroglycerin.

Sample: RB083007MS,HMX

Conc. µg/L = (Ax * Vt * DF) / (CF * Vs)

where: Conc. = Sample concentration in µg/L
Ax = Area of characteristic ion for compound being measured
Vt = Volume of total extract (mL)
DF = Dilution factor
CF = Average relative calibration factor for compound being measured (from ICAL)
Vs = Volume of sample extracted (mL)

Conc. µg/L = (1474974 * 10 * 1) / (2921 * 500) = 10.1 µg/L

Reported Value = 10.1 µg/L
% Difference = 0.0%
Values were within 10% difference

Sample: RB083007MS, nitroglycerin

Conc. µg/L = (Ax * Vt * DF) / (CF * Vs)

where: Conc. = Sample concentration in µg/L
Ax = Area of characteristic ion for compound being measured.
Vt = Volume of total extract (mL).
DF = Dilution factor
CF = Average relative calibration factor for compound being measured (from ICAL)
Vs = Volume of sample extracted (mL).

Conc. µg/L = (3118401 * 10 * 1) / (1228 * 500) = 50.8 µg/L

Reported Value = 50.8 µg/L
% Difference = 0.0%
Values were within 10% difference

USEPA Region III Validation Qualifiers

(No Code) = Confirmed identification.

B = The analyte has been detected in the sample and the associated laboratory or field blank.

J = Indicates an estimated value for (1) estimated value due to QC non-conformance. Reported value may not be accurate or precise, (2) estimating a concentration as a tentatively identified compound as indicated by the mass spectral and retention time data, or (3) estimating a concentration ≥ MDL and <MRL or <3*MDL, whichever is greater.

K = Analyte present. Reported value may be biased high (estimated) due to QC non-conformance.

L = Analyte present. Reported value may be biased low (estimated) due to QC non-conformance.

R = Unreliable result. Analyte may or may not be present in the sample due to QC non-conformance.

UL = Value is estimated bias low and not detected due to QC non-conformance. Reporting limit may be inaccurate or imprecise. Quantitation limit is probably higher.

UJ = Value is estimated and not detected due to QC non-conformance. Reporting limit may be inaccurate or imprecise.

Laboratory Qualifiers

(No Code) = Confirmed identification.

U = Not detected. The associated number indicates the compound reporting limit for the sample.

A (Dioxins) = B (Metals) = The reported value was obtained from a reading <MRL and ≥MDL and is considered estimated.

B (Organics) = The analyte or compound has been detected in the sample and laboratory method blank. It indicates probable blank contamination.

E (Metals) = Reported value is estimated because of the presence of interferences.

E (Organics) = Identifies compounds whose concentrations exceed the upper level of the calibration range.

EMPC (Dioxins) = The ion-abundance ratio between the two characteristic PCDD/PCDF ions was outside accepted ranges. The detected PCDD/PCDF was reported as an estimated maximum possible concentration (EMPC).

D = Indicates sample was analyzed at a dilution.

J = Indicates an estimated value for (1) estimating a concentration as a tentatively identified compound as indicated by the mass spectral and retention time data, or (2) estimating a concentration <MRL and ≥ MDL.

N (Organics) = Indicates presumptive evidence of a compound for tentatively identified compounds using a library search.

N (Metals) = Laboratory spike sample recovery not within control limits.

P (Organics) = Target analyte confirmation >40% difference for detected compound between the primary and secondary columns. The lower of the two values was reported.

* (Metals) = Duplicate analysis not within control limits.

* (Organics) = Surrogate outside of QC limits on both original and re-analysis.

Accutest LabLink@70184 17:26 25-Oct-2007

Report of Analysis

Client Sample ID:	RB083007		
Lab Sample ID:	F52208-1	Date Sampled:	08/30/07
Matrix:	AQ - Ground Water	Date Received:	08/31/07
Method:	SW846 8330A SW846 3535A	Percent Solids:	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GG024003.D	1	09/11/07	NAF	09/05/07	OP22200	GGG1021
Run #2	PP022840.D	1	09/07/07	MRE	09/05/07	OP22200	GPP795

	Initial Volume	Final Volume
Run #1	1020 ml	10.0 ml
Run #2	1020 ml	10.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q
2691-41-0	HMX	ND	0.20	0.050	ug/l	
121-82-4	RDX	ND	0.20	0.059	ug/l	
99-65-0	1,3-Dinitrobenzene	ND	0.20	0.055	ug/l	
606-20-2	2,6-Dinitrotoluene	ND	0.20	0.070	ug/l	
121-14-2	2,4-Dinitrotoluene	ND	0.20	0.095	ug/l	
35572-78-2	2-amino-4,6-Dinitrotoluene	ND	0.20	0.064	ug/l	
19406-51-0	4-amino-2,6-Dinitrotoluene	ND	0.20	0.055	ug/l	
98-95-3	Nitrobenzene	ND	0.20	0.072	ug/l	
88-72-2	o-Nitrotoluene	ND	0.20	0.11	ug/l	
99-08-1	m-Nitrotoluene	ND	0.20	0.076	ug/l	
99-99-0	p-Nitrotoluene	ND	0.20	0.099	ug/l	
479-45-8	Tetryl	ND	0.20	0.067	ug/l	
99-35-4	1,3,5-Trinitrobenzene	ND	0.20	0.064	ug/l	
118-96-7	2,4,6-Trinitrotoluene	ND	0.20	0.049	ug/l	
55-63-0	Nitroglycerine	ND [a]	2.0	0.49	ug/l	
78-11-5	PETN	ND [a]	2.0	0.49	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
610-39-9	3,4-Dinitrotoluene	122%	97%	70-136%

(a) Result is from Run# 2

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest LabLink@70184 17:26 25-Oct-2007

Report of Analysis

Client Sample ID:	50MW01		
Lab Sample ID:	F52208-2	Date Sampled:	08/30/07
Matrix:	AQ - Ground Water	Date Received:	08/31/07
Method:	SW846 8330A SW846 3535A	Percent Solids:	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GG024006.D	1	09/12/07	NAF	09/05/07	OP22200	GGG1021
Run #2	PP022841.D	1	09/07/07	MRE	09/05/07	OP22200	GPP795

	Initial Volume	Final Volume
Run #1	970 ml	10.0 ml
Run #2	970 ml	10.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q
2691-41-0	HMX	ND	0.21	0.053	ug/l	
121-82-4	RDX	ND	0.21	0.062	ug/l	
99-65-0	1,3-Dinitrobenzene	ND	0.21	0.058	ug/l	
606-20-2	2,6-Dinitrotoluene	ND	0.21	0.073	ug/l	
121-14-2	2,4-Dinitrotoluene	ND	0.21	0.10	ug/l	
35572-78-2	2-amino-4,6-Dinitrotoluene	ND	0.21	0.067	ug/l	
19406-51-0	4-amino-2,6-Dinitrotoluene	ND	0.21	0.058	ug/l	
98-95-3	Nitrobenzene	ND	0.21	0.075	ug/l	
88-72-2	o-Nitrotoluene	ND	0.21	0.12	ug/l	
99-08-1	m-Nitrotoluene	ND	0.21	0.080	ug/l	
99-99-0	p-Nitrotoluene	ND	0.21	0.10	ug/l	
479-45-8	Tetryl	ND	0.21	0.070	ug/l	
99-35-4	1,3,5-Trinitrobenzene	ND	0.21	0.067	ug/l	
118-96-7	2,4,6-Trinitrotoluene	ND	0.21	0.052	ug/l	
55-63-0	Nitroglycerine	ND [a]	2.1	0.52	ug/l	
78-11-5	PETN	ND [a]	2.1	0.52	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
610-39-9	3,4-Dinitrotoluene	103%	114%	70-136%

(a) Result is from Run# 2

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest LabLink@70184 17:26 25-Oct-2007

Report of Analysis

Client Sample ID:	48MW07		
Lab Sample ID:	F52208-3	Date Sampled:	08/30/07
Matrix:	AQ - Ground Water	Date Received:	08/31/07
Method:	SW846 8330A SW846 3535A	Percent Solids:	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GG024007.D	1	09/12/07	NAF	09/05/07	OP22200	GGG1021
Run #2	PP022842.D	1	09/07/07	MRE	09/05/07	OP22200	GPP795

	Initial Volume	Final Volume
Run #1	1000 ml	10.0 ml
Run #2	1000 ml	10.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q
2691-41-0	HMX	ND	0.20	0.051	ug/l	
121-82-4	RDX	ND	0.20	0.060	ug/l	
99-65-0	1,3-Dinitrobenzene	ND	0.20	0.056	ug/l	
606-20-2	2,6-Dinitrotoluene	ND	0.20	0.071	ug/l	
121-14-2	2,4-Dinitrotoluene	ND	0.20	0.097	ug/l	
35572-78-2	2-amino-4,6-Dinitrotoluene	ND	0.20	0.065	ug/l	
19406-51-0	4-amino-2,6-Dinitrotoluene	ND	0.20	0.056	ug/l	
98-95-3	Nitrobenzene	ND	0.20	0.073	ug/l	
88-72-2	o-Nitrotoluene	ND	0.20	0.12	ug/l	
99-08-1	m-Nitrotoluene	ND	0.20	0.078	ug/l	
99-99-0	p-Nitrotoluene	ND	0.20	0.10	ug/l	
479-45-8	Tetryl	ND	0.20	0.068	ug/l	
99-35-4	1,3,5-Trinitrobenzene	ND	0.20	0.065	ug/l	
118-96-7	2,4,6-Trinitrotoluene	ND	0.20	0.050	ug/l	
55-63-0	Nitroglycerine	ND [a]	2.0	0.50	ug/l	
78-11-5	PETN	ND [a]	2.0	0.50	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
610-39-9	3,4-Dinitrotoluene	102%	114%	70-136%

(a) Result is from Run# 2

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest LabLink@70184 17:26 25-Oct-2007

Report of Analysis

Client Sample ID:	50MW02		
Lab Sample ID:	F52208-4	Date Sampled:	08/30/07
Matrix:	AQ - Ground Water	Date Received:	08/31/07
Method:	SW846 8330A SW846 3535A	Percent Solids:	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GG024008.D	1	09/12/07	NAF	09/05/07	OP22200	GGG1021
Run #2	PP022845.D	1	09/07/07	MRE	09/05/07	OP22200	GPP795

	Initial Volume	Final Volume
Run #1	850 ml	10.0 ml
Run #2	850 ml	10.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q
2691-41-0	HMX	ND	0.24	0.060	ug/l	
121-82-4	RDX	ND	0.24	0.071	ug/l	
99-65-0	1,3-Dinitrobenzene	ND	0.24	0.066	ug/l	
606-20-2	2,6-Dinitrotoluene	ND	0.24	0.084	ug/l	
121-14-2	2,4-Dinitrotoluene	ND	0.24	0.11	ug/l	
35572-78-2	2-amino-4,6-Dinitrotoluene	ND	0.24	0.076	ug/l	
19406-51-0	4-amino-2,6-Dinitrotoluene	ND	0.24	0.066	ug/l	
98-95-3	Nitrobenzene	ND	0.24	0.086	ug/l	
88-72-2	o-Nitrotoluene	ND	0.24	0.14	ug/l	
99-08-1	m-Nitrotoluene	ND	0.24	0.092	ug/l	
99-99-0	p-Nitrotoluene	ND	0.24	0.12	ug/l	
479-45-8	Tetryl	ND	0.24	0.080	ug/l	
99-35-4	1,3,5-Trinitrobenzene	ND	0.24	0.076	ug/l	
118-96-7	2,4,6-Trinitrotoluene	ND	0.24	0.059	ug/l	
55-63-0	Nitroglycerine	ND [a]	2.4	0.59	ug/l	
78-11-5	PETN	ND [a]	2.4	0.59	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
610-39-9	3,4-Dinitrotoluene	105%	99%	70-136%

(a) Result is from Run# 2

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest LabLink@70184 17:26 25-Oct-2007

Report of Analysis

Client Sample ID:	48MW05		
Lab Sample ID:	F52208-5	Date Sampled:	08/30/07
Matrix:	AQ - Ground Water	Date Received:	08/31/07
Method:	SW846 8330A SW846 3535A	Percent Solids:	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GG024009.D	1	09/12/07	NAF	09/05/07	OP22200	GGG1021
Run #2	PP022846.D	1	09/07/07	MRE	09/05/07	OP22200	GPP795

	Initial Volume	Final Volume
Run #1	950 ml	10.0 ml
Run #2	950 ml	10.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q
2691-41-0	HMX	ND	0.21	0.054	ug/l	
121-82-4	RDX	ND	0.21	0.063	ug/l	
99-65-0	1,3-Dinitrobenzene	ND	0.21	0.059	ug/l	
606-20-2	2,6-Dinitrotoluene	ND	0.21	0.075	ug/l	
121-14-2	2,4-Dinitrotoluene	ND	0.21	0.10	ug/l	
35572-78-2	2-amino-4,6-Dinitrotoluene	ND	0.21	0.068	ug/l	
19406-51-0	4-amino-2,6-Dinitrotoluene	ND	0.21	0.059	ug/l	
98-95-3	Nitrobenzene	ND	0.21	0.077	ug/l	
88-72-2	o-Nitrotoluene	ND	0.21	0.12	ug/l	
99-08-1	m-Nitrotoluene	ND	0.21	0.082	ug/l	
99-99-0	p-Nitrotoluene	ND	0.21	0.11	ug/l	
479-45-8	Tetryl	ND	0.21	0.072	ug/l	
99-35-4	1,3,5-Trinitrobenzene	ND	0.21	0.068	ug/l	
118-96-7	2,4,6-Trinitrotoluene	ND	0.21	0.053	ug/l	
55-63-0	Nitroglycerine	ND [a]	2.1	0.53	ug/l	
78-11-5	PETN	ND [a]	2.1	0.53	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
610-39-9	3,4-Dinitrotoluene	105%	110%	70-136%

(a) Result is from Run# 2

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest LabLink@70184 17:26 25-Oct-2007

Report of Analysis

Client Sample ID:	48MW06		
Lab Sample ID:	F52208-6	Date Sampled:	08/30/07
Matrix:	AQ - Ground Water	Date Received:	08/31/07
Method:	SW846 8330A SW846 3535A	Percent Solids:	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GG024012.D	1	09/12/07	NAF	09/05/07	OP22200	GGG1021
Run #2	PP022849.D	1	09/07/07	MRE	09/05/07	OP22200	GPP795

	Initial Volume	Final Volume
Run #1	980 ml	10.0 ml
Run #2	980 ml	10.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q
2691-41-0	HMX	ND	0.20	0.052	ug/l	
121-82-4	RDX	ND	0.20	0.061	ug/l	
99-65-0	1,3-Dinitrobenzene	ND	0.20	0.057	ug/l	
606-20-2	2,6-Dinitrotoluene	ND	0.20	0.072	ug/l	
121-14-2	2,4-Dinitrotoluene	ND	0.20	0.099	ug/l	
35572-78-2	2-amino-4,6-Dinitrotoluene	ND	0.20	0.066	ug/l	
19406-51-0	4-amino-2,6-Dinitrotoluene	ND	0.20	0.057	ug/l	
98-95-3	Nitrobenzene	ND	0.20	0.074	ug/l	
88-72-2	o-Nitrotoluene	ND	0.20	0.12	ug/l	
99-08-1	m-Nitrotoluene	ND	0.20	0.080	ug/l	
99-99-0	p-Nitrotoluene	ND	0.20	0.10	ug/l	
479-45-8	Tetryl	ND	0.20	0.069	ug/l	
99-35-4	1,3,5-Trinitrobenzene	ND	0.20	0.066	ug/l	
118-96-7	2,4,6-Trinitrotoluene	ND	0.20	0.051	ug/l	
55-63-0	Nitroglycerine	ND [a]	2.0	0.51	ug/l	
78-11-5	PETN	ND [a]	2.0	0.51	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
610-39-9	3,4-Dinitrotoluene	92%	100%	70-136%

(a) Result is from Run# 2

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Shaw® Shaw Environmental, Inc.

MEMORANDUM

TO: Jeff Parks, Shaw E&I RFAAP Project Manager

FROM: Richard McCracken, Shaw E&I RFAAP Project Chemist

SUBJECT: Radford Army Ammunition Plant (RFAAP) Data Validation – Herbicides
Accutest Laboratories, Inc., SDG F52208

DATE: October 31, 2007

The purpose of this memorandum is to present the data validation report for the samples collected at RFAAP on August 30, 2007. Aqueous samples were analyzed for chlorinated herbicides using USEPA SW846 Method 3510C/8151A. A total of six aqueous samples were validated. The sample IDs are:

Field Sample ID	Lab Sample ID	Field Sample ID	Lab Sample ID
RB083007	F52208-1	50MW02	F52208-4
50MW01	F52208-2	48MW05	F52208-5
48MW07	F52208-3	48MW06	F52208-6

Data were reviewed by Richard McCracken and validated using a combination of project QAPP, *Quality Systems Manual for Environmental Laboratories, Final Version 3, January, 2006* (DoD, 2006) (DoD QSM), method-specific criteria, and laboratory SOP criteria. The data qualifier scheme was consistent with the *Region III Modifications to the National Functional Guidelines for Organic Data Review* (September 1994). Parameters evaluated are presented in **Table 1**. Data associated with parameters in compliance with quality control specifications have not been qualified. Data associated with parameters that did not comply with quality control specifications and directly impacted project data have been qualified in accordance with USEPA Region III specifications.

Table 1 Laboratory Performance Criteria

Qualified		Parameter
Yes	No	
	X	Holding Times
	X	Initial Calibration
	X	Continuing Calibration
	X	Blank Analysis
	X	System Monitoring Compounds
X		Laboratory Control Sample
	X	Matrix Spike/Spike Duplicate
	X	Field Duplicate
	X	Quantitation Verification

The dalapon results have been rejected in all samples due to a 0% recovery in the LCS. The quality of all other data collected in support of this sampling activity is considered acceptable with noted qualifications.

Richard McCracken, Chemist

10/31/07
Date

RFAAP VALIDATION REPORT
CHLORINATED HERBICIDES REVIEW
SDG F52208

I-Holding Times

The objective is to ascertain the validity of results based on the holding time of the sample from time of collection to time of sample extraction and analysis. For aqueous samples, chlorinated herbicides compounds are shipped @4°C ± 2°C, with a maximum holding time of 7 days from sample collection to preparative extraction and 40 days from preparative extraction to determinative analysis.

- Temperature Review: A temperature blank was sent with each cooler and recorded by the laboratory upon receipt. The samples collected on 8/30/07 were sent in 15 coolers, and were received by the laboratory on 8/31/07 at temperatures ranging from 0.6°C to 2.2°C, with 12 of the 15 coolers having temperatures below 2.0°C. The low sample temperatures are not expected to have an adverse impact on the analytical results. No qualifiers were applied.

- Holding Time Review: The samples were collected on 8/30/07, extracted on 9/6/07, and analyzed on 9/10/07. All criteria were met. No qualifiers were applied.

II-Initial Calibration

Compliance requirements for satisfactory instrument calibration are established to ensure that the instrument used is capable of producing acceptable qualitative and quantitative data for semivolatile target compounds. Initial calibration demonstrates that the instrument is capable of acceptable performance in the beginning of the analytical run and of producing a linear calibration curve. The DoD QSM specifies that the percent relative standard deviation (%RSD) for a 5-point standard calibration should be ≤20% for each target compound.

- No initial calibration data was provided for MCPP or MCPA. During discussions with the laboratory, they indicated that they perform a one-point calibration each day that analysis for MCPP or MCPA is conducted. A five-point initial calibration was not performed, therefore all data for these two compounds has been qualified "J/UJ".

- During the initial calibration performed on 9/9/07 on instrument GC-GG, all target compounds (except MCPP and MCPA – see above) met criteria for signal #1 and signal #2. No qualifiers were applied. All samples were analyzed in conjunction with this initial calibration.

III-Continuing Calibration

Compliance requirements for satisfactory instrument calibration are established to ensure that the instrument used is capable of producing acceptable qualitative and quantitative data for semivolatile target compounds. Continuing calibration establishes the response factors on which the quantitations are based and checks satisfactory performance of the instrument on a day-to-day basis. The DoD QSM specifies that the percent difference (%D) between the initial calibration CF and the continuing calibration CF must be ≤20%.

- A one-point daily calibration was provided for MCPP and MCPA, indicating that the lab is able to detect and quantitate both compounds. %D data was not supplied since a five-point initial calibration was not performed. All MCPP and MCPA data has already been qualified (see initial calibration), no additional qualification is required.

- During continuing calibration performed on 9/10/07 @0750 on instrument GC-GG, all target compounds (except MCPP and MCPA – see above) met criteria for signal #1 and signal #2. No qualifiers were applied. All samples were analyzed following this continuing calibration.

- During continuing calibration performed on 9/10/07 @1424 on instrument GC-GG, all target compounds (except MCPP and MCPA – see above) met criteria for signal #1 and signal #2. No qualifiers were applied. All samples were analyzed prior to this continuing calibration.

IV-Blank Analysis

The purpose of blank analyses is to determine the presence and magnitude of contamination problems resulting from field or laboratory activities. No contaminants should be detected in any of the associated blanks. The DoD QSM criterion specifies all concentrations should be less than one-half MRL. Positive sample results are qualified "B" if the concentration of the analyte is ≤ five times (5x) the absolute maximum blank concentration. **Table 2** summarizes the blank contamination analysis.

Table 2 Blank Contamination Analysis Summary

Analysis Date	QC Blank ID	Compound	Max Conc. µg/L	Action Level µg/L	B qualified samples
9/10/07	OP8030-MB	All target compounds <½MRL	NA	NA	None
9/10/07	RB083007	All target compounds <½MRL	NA	NA	None

V-System Monitoring Compounds (Surrogates)

Laboratory performance on individual samples is established by means of spiking activities. All samples are spiked with surrogate compounds prior to sample preparation. Spike recoveries must be within the specified control limits. DoD surrogate recovery limits are specified in Table D-3 of the DoD QSM (DoD, 2006). If the surrogate is not listed, then the laboratory criteria shall be used.

Aqueous Control Limit: 2,4-DCAA (34-179%)

- All samples met recovery criteria.

VI-Laboratory Control Samples

Data for laboratory control samples (LCS) are generated to determine long-term precision and accuracy of the analytical method. Percent recoveries must be within the specified control limits. DoD QSM aqueous LCS recovery limits are specified in Table D-8 of the DoD QSM (DoD, 2006). If the compound is not listed, then the laboratory criteria shall be used.

- Sample OP8030-BS was used as the LCS during the 9/10/07 run. 2,4,5-TP (Silvex) (118%) had a high recovery, but no 2,4,5-TP was detected in any samples so no qualifiers were applied. Dalapon met recovery criteria in the LCS, but had a 0% recovery in the LCS duplicate. No dalapon was detected in any samples, all dalapon results have been rejected "R". Five compounds (besides dalapon) had RPDs above the laboratory criteria, but all recoveries for these compounds met criteria, no action is taken on RPD alone. All other herbicides were within criteria. All samples were analyzed in conjunction with this LCS.

VII-Matrix Spike/Matrix Spike Duplicate

Data for matrix spike/matrix spike duplicates (MS/MSD) are generated to determine long-term precision and accuracy of the analytical method on various matrices and to demonstrate acceptable compound recovery by the laboratory at the time of sample analysis. The percent recoveries (%Rs) and the relative percent difference (RPD) must be within the specified control limits. DoD QSM aqueous MS/MSD recovery limits follow the LCS criteria and are specified in Table D-8 of the DoD QSM (DoD, 2006). If the compound is not listed, then the laboratory criteria shall be used.

- MS/MSD analysis was not performed due to insufficient sample volume. No data qualifiers were applied.

VIII-Field Duplicate Sample Analysis
Field duplicates were collected to identify the cumulative precision of the sampling and analytical process and sent to the laboratory blind. The RPD was calculated only for those analytes which were detected at levels exceeding the method reporting limits in both samples of the duplicate pair. Analytes that were qualified because of blank contamination (B-qualified) or were rejected (R-qualified) in either sample of the duplicate pair were excluded from the duplicate assessment. Precision control criterion was established at 50% RPD for the aqueous and solid samples. Analytical results were qualified as estimated (J) for any RPDs exceeding criteria.

- No field duplicates were included in this data set.

IX-Quantitation Verification
The accuracy of analytical results is verified through the calculation of several parameters. Percent difference (%D) between the calculated value and the reported value must be within 10%. All positive values must have less than or equal to 40% %D between the primary and secondary columns. Any sample value >MDL and <MRL is qualified as estimated, "J." All criteria were met. No qualifiers were applied.

- The %D between the primary and secondary columns was within criteria for all detected chlorinated herbicides.

Sample: OP8030-BS duplicate, 2,4,5-TP (Silvex)

Conc. µg/L = (A * DF * Vt) / (CF * Vo)

where: A = Area response of the sample
CF = Calibration Factor from initial calibration (area/(ug/L))
Vt = volume of final extract (mL)
DF = dilution factor
Vo = volume of the sample extracted (mL)

Conc. µg/L = (3898147 * 1 * 10 mL) / (83090 * 1000 mL)
= 0.47 ng/mL = 0.47 µg/L

Reported Conc. = 0.47 µg/L
%D = 0.0%
Values were within 10% difference

USEPA Region III Validation Qualifiers

(No Code) = Confirmed identification.

B = The analyte has been detected in the sample and the associated laboratory or field blank.

J = Indicates an estimated value for (1) estimated value due to QC non-conformance. Reported value may not be accurate or precise, (2) estimating a concentration as a tentatively identified compound as indicated by the mass spectral and retention time data, or (3) estimating a concentration ≥ MDL and <MRL or <3*MDL, whichever is greater.

K = Analyte present. Reported value may be biased high (estimated) due to QC non-conformance.

L = Analyte present. Reported value may be biased low (estimated) due to QC non-conformance.

R = Unreliable result. Analyte may or may not be present in the sample due to QC non-conformance.

UL = Value is estimated bias low and not detected due to QC non-conformance. Reporting limit may be inaccurate or imprecise. Quantitation limit is probably higher.

UJ = Value is estimated and not detected due to QC non-conformance. Reporting limit may be inaccurate or imprecise.

Laboratory Qualifiers

(No Code) = Confirmed identification.

A (Dioxins) = MDL is based upon the signal-to-noise measurement.

B (Metals) = The reported value was obtained from a reading <MRL and ≥MDL and is considered estimated.

B (Organics and Dioxins) = The analyte or compound has been detected in the sample and laboratory method blank. It indicates probable blank contamination.

D (Organics) = Indicates sample was analyzed at a dilution.

E (Metals) = Reported value is estimated because of the presence of interferences.

E (Organics) = Identifies compounds whose concentrations exceed the upper level of the calibration range.

E (Dioxins) = Reported value is estimated because of the presence of ether interferences.

EMPC (Dioxins) = The ion-abundance ratio between the two characteristic PCDD/F ions is outside accepted ranges. The detected PCDD/F is reported as an estimated maximum possible concentration (EMPC).

I (Dioxins) = Reported value is estimated because of the incorrect isotope rations were obtained.

J (All) = Indicates an estimated value for (1) estimating a concentration as a tentatively identified compound as indicated by the mass spectral and retention time data, (2) estimating a concentration <MRL and ≥ MDL, or estimating a concentration below the calibration range.

N (Organics) = Indicates presumptive evidence of a compound for tentatively identified compounds using a library search.

N (Metals) = Laboratory spike sample recovery not within control limits.

P (Organics) = Target analyte confirmation >40% difference for detected compound between the primary and secondary columns. The lower of the two values was reported.

U (All) = ND = BQL = Not detected. The associated number indicates the compound reporting limit for the sample.

* (Metals) = Duplicate analysis not within control limits.

* (Organics) = Surrogate outside of QC limits on both original and re-analysis.

Raw Data: GG37492.D

Accutest LabLink@70184 17:26 25-Oct-2007

Report of Analysis

Client Sample ID:	RB083007		
Lab Sample ID:	F52208-1	Date Sampled:	08/30/07
Matrix:	AQ - Ground Water	Date Received:	08/31/07
Method:	SW846 8151 SW846 3510C	Percent Solids:	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	GG37492.D	1	09/10/07	ATX	09/06/07	T:OP8030	T:GGG1164
Run #2							

	Initial Volume	Final Volume
Run #1	1000 ml	10.0 ml
Run #2		

Herbicide List

DATA VAL QUALIFIER

CAS No.	Compound	Result	RL	MDL	Units	Q	
94-75-7	2,4-D	ND	1.5	0.80	ug/l		
93-72-1	2,4,5-TP (Silvex)	ND	0.20	0.15	ug/l		
93-76-5	2,4,5-T	ND	0.20	0.12	ug/l		
1918-00-9	Dicamba	ND	0.20	0.080	ug/l		
88-85-7	Dinoseb	ND	0.20	0.090	ug/l		
75-99-0	Dalapon	ND	1.0	1.0	ug/l		R
120-36-5	Dichloroprop	ND	1.0	0.51	ug/l		
94-82-6	2,4-DB	ND	2.0	1.9	ug/l		
93-65-2	MCPP	ND	50		ug/l		UJ
94-74-6	MCPA	ND	50		ug/l		UJ
87-86-5	Pentachlorophenol	ND	0.050	0.040	ug/l		

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
19719-28-9	2,4-DCAA	50%		34-179%

(a) Analysis performed at Accutest Laboratories, Houston, TX.

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: GG37493.D

Accutest LabLink@70184 17:26 25-Oct-2007

Report of Analysis

Client Sample ID:	50MW01		
Lab Sample ID:	F52208-2	Date Sampled:	08/30/07
Matrix:	AQ - Ground Water	Date Received:	08/31/07
Method:	SW846 8151 SW846 3510C	Percent Solids:	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	GG37493.D	1	09/10/07	ATX	09/06/07	T:OP8030	T:GGG1164
Run #2							

	Initial Volume	Final Volume
Run #1	1000 ml	10.0 ml
Run #2		

Herbicide List

DATA VAL QUALIFIER

CAS No.	Compound	Result	RL	MDL	Units	Q
94-75-7	2,4-D	ND	1.5	0.80	ug/l	
93-72-1	2,4,5-TP (Silvex)	ND	0.20	0.15	ug/l	
93-76-5	2,4,5-T	ND	0.20	0.12	ug/l	
1918-00-9	Dicamba	ND	0.20	0.080	ug/l	
88-85-7	Dinoseb	ND	0.20	0.090	ug/l	
75-99-0	Dalapon	ND	1.0	1.0	ug/l	R
120-36-5	Dichloroprop	ND	1.0	0.51	ug/l	
94-82-6	2,4-DB	ND	2.0	1.9	ug/l	
93-65-2	MCPP	ND	50		ug/l	UJ
94-74-6	MCPA	ND	50		ug/l	UJ
87-86-5	Pentachlorophenol	ND	0.050	0.040	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
19719-28-9	2,4-DCAA	59%		34-179%

(a) Analysis performed at Accutest Laboratories, Houston, TX.

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: GG37494.D

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Report of Analysis

3.3

Client Sample ID:	48MW07		
Lab Sample ID:	F52208-3	Date Sampled:	08/30/07
Matrix:	AQ - Ground Water	Date Received:	08/31/07
Method:	SW846 8151 SW846 3510C	Percent Solids:	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	GG37494.D	1	09/10/07	ATX	09/06/07	T:OP8030	T:GGG1164
Run #2							

	Initial Volume	Final Volume
Run #1	1000 ml	10.0 ml
Run #2		

Herbicide List

CAS No.	Compound	Result	RL	MDL	Units	Q	DATA VAL QUALIFIER
94-75-7	2,4-D	ND	1.5	0.80	ug/l		
93-72-1	2,4,5-TP (Silvex)	ND	0.20	0.15	ug/l		
93-76-5	2,4,5-T	ND	0.20	0.12	ug/l		
1918-00-9	Dicamba	ND	0.20	0.080	ug/l		
88-85-7	Dinoseb	ND	0.20	0.090	ug/l		
75-99-0	Dalapon	ND	1.0	1.0	ug/l		R
120-36-5	Dichloroprop	ND	1.0	0.51	ug/l		
94-82-6	2,4-DB	ND	2.0	1.9	ug/l		
93-65-2	MCPP	ND	50		ug/l		UJ
94-74-6	MCPA	ND	50		ug/l		UJ
87-86-5	Pentachlorophenol	ND	0.050	0.040	ug/l		

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
19719-28-9	2,4-DCAA	52%		34-179%

(a) Analysis performed at Accutest Laboratories, Houston, TX.

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	50MW02		
Lab Sample ID:	F52208-4	Date Sampled:	08/30/07
Matrix:	AQ - Ground Water	Date Received:	08/31/07
Method:	SW846 8151 SW846 3510C	Percent Solids:	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	GG37495.D	1	09/10/07	ATX	09/06/07	T:OP8030	T:GGG1164
Run #2							

	Initial Volume	Final Volume
Run #1	1000 ml	10.0 ml
Run #2		

Herbicide List

DATA VAL QUALIFIER

CAS No.	Compound	Result	RL	MDL	Units	Q	
94-75-7	2,4-D	ND	1.5	0.80	ug/l		
93-72-1	2,4,5-TP (Silvex)	ND	0.20	0.15	ug/l		
93-76-5	2,4,5-T	ND	0.20	0.12	ug/l		
1918-00-9	Dicamba	ND	0.20	0.080	ug/l		
88-85-7	Dinoseb	ND	0.20	0.090	ug/l		
75-99-0	Dalapon	ND	1.0	1.0	ug/l		R
120-36-5	Dichloroprop	ND	1.0	0.51	ug/l		
94-82-6	2,4-DB	ND	2.0	1.9	ug/l		
93-65-2	MCPP	ND	50		ug/l		UJ
94-74-6	MCPA	ND	50		ug/l		UJ
87-86-5	Pentachlorophenol	ND	0.050	0.040	ug/l		

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
19719-28-9	2,4-DCAA	51%		34-179%

(a) Analysis performed at Accutest Laboratories, Houston, TX.

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	48MW05		
Lab Sample ID:	F52208-5	Date Sampled:	08/30/07
Matrix:	AQ - Ground Water	Date Received:	08/31/07
Method:	SW846 8151 SW846 3510C	Percent Solids:	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	GG37496.D	1	09/10/07	ATX	09/06/07	T:OP8030	T:GGG1164
Run #2							

	Initial Volume	Final Volume
Run #1	1000 ml	10.0 ml
Run #2		

Herbicide List

DATA VAL QUALIFIER

CAS No.	Compound	Result	RL	MDL	Units	Q
94-75-7	2,4-D	ND	1.5	0.80	ug/l	
93-72-1	2,4,5-TP (Silvex)	ND	0.20	0.15	ug/l	
93-76-5	2,4,5-T	ND	0.20	0.12	ug/l	
1918-00-9	Dicamba	ND	0.20	0.080	ug/l	
88-85-7	Dinoseb	ND	0.20	0.090	ug/l	
75-99-0	Dalapon	ND	1.0	1.0	ug/l	R
120-36-5	Dichloroprop	ND	1.0	0.51	ug/l	
94-82-6	2,4-DB	ND	2.0	1.9	ug/l	
93-65-2	MCPP	ND	50		ug/l	UJ
94-74-6	MCPA	ND	50		ug/l	UJ
87-86-5	Pentachlorophenol	ND	0.050	0.040	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
19719-28-9	2,4-DCAA	65%		34-179%

(a) Analysis performed at Accutest Laboratories, Houston, TX.

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest LabLink@70184 17:26 25-Oct-2007

Report of Analysis

Client Sample ID:	48MW06		
Lab Sample ID:	F52208-6	Date Sampled:	08/30/07
Matrix:	AQ - Ground Water	Date Received:	08/31/07
Method:	SW846 8151 SW846 3510C	Percent Solids:	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	GG37499.D	1	09/10/07	ATX	09/06/07	T:OP8030	T:GGG1164
Run #2 [a]	GG37500.D	5	09/10/07	ATX	09/06/07	T:OP8030	T:GGG1164

	Initial Volume	Final Volume
Run #1	1000 ml	10.0 ml
Run #2	1000 ml	10.0 ml

Herbicide List

CAS No.	Compound	Result	RL	MDL	Units	Q	DATA VAL QUALIFIER
94-75-7	2,4-D	ND	1.5	0.80	ug/l		
93-72-1	2,4,5-TP (Silvex)	ND	0.20	0.15	ug/l		
93-76-5	2,4,5-T	ND	0.20	0.12	ug/l		
1918-00-9	Dicamba	ND	0.20	0.080	ug/l		
88-85-7	Dinoseb	ND	0.20	0.090	ug/l		
75-99-0	Dalapon	ND	1.0	1.0	ug/l		R
120-36-5	Dichloroprop	ND	1.0	0.51	ug/l		
94-82-6	2,4-DB	ND	2.0	1.9	ug/l		
93-65-2	MCPP	ND	50		ug/l		UJ
94-74-6	MCPA	ND	50		ug/l		UJ
87-86-5	Pentachlorophenol	0.65 [b]	0.25	0.20	ug/l		

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
19719-28-9	2,4-DCAA	70%	67%	34-179%

(a) Analysis performed at Accutest Laboratories, Houston, TX.
(b) Result is from Run# 2

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Shaw® Shaw Environmental, Inc.

MEMORANDUM

TO: Jeff Parks, Shaw E&I Radford Army Ammunition Plant (RFAAP) Project Manager

FROM: Richard McCracken, Shaw E&I Project Chemist

SUBJECT: RFAAP Data Validation – TAL Metals
Accutest Laboratories, Inc., SDG F52208

DATE: October 31, 2007

The purpose of this memorandum is to present the data validation report for the samples collected at RFAAP on August 30, 2007. The samples were analyzed for target analyte list (TAL) metals using USEPA SW-846 3010A/6010B for ICP metals and SW-846 7470A for mercury. A total of six aqueous samples were validated. The sample IDs are:

Field Sample ID	Lab Sample ID	Field Sample ID	Lab Sample ID
RB083007	F52208-1	50MW02	F52208-4
50MW01	F52208-2	48MW05	F52208-5
48MW07	F52208-3	48MW06	F52208-6

Data were reviewed by Richard McCracken and validated using a combination of project QAPP, *Quality Systems Manual for Environmental Laboratories, Final Version 3, January, 2006* (DoD, 2006) (DoD QSM), method-specific criteria, and laboratory SOP criteria. The data qualifier scheme was consistent with the *Region III Modifications to the National Functional Guidelines for Inorganic Data Review* (April, 1993). Parameters evaluated are presented in **Table 1**. Data associated with parameters in compliance with quality control specifications have not been qualified. Data associated with parameters that did not comply with quality control specifications and directly impacted project data have been qualified in accordance with USEPA Region III specifications.

Table 1 Laboratory Performance Criteria

Qualified		Parameter
Yes	No	
	X	Holding Times
X		Initial and Continuing Calibration
X		Blank Analysis
	X	ICP Interference Check Sample (ICS)
	X	Laboratory Control Sample (LCS)
	X	Laboratory Sample Duplicate
	X	Matrix Spike and Spike Duplicate
	X	ICP Serial Dilution
	X	Field Sample Duplicate
X		Quantitation Verification

The quality of data collected in support of this sampling activity is considered acceptable with noted qualifications.

Richard M. Cracken

Richard McCracken, Chemist

10/31/07

Date

RFAAP VALIDATION REPORT
METALS REVIEW
SDG F52208

I-Holding Times

The primary objective is to ascertain the validity of results based on the holding time of the sample from time of collection to time of sample analysis. Holding time criteria: For aqueous matrices, the samples are shipped cool @4°C±2°C and preserved to pH<2 with HNO_3 with a maximum holding time is 180 days for ICP metals and 28 days for mercury.

- Temperature Review: A temperature blank was sent with each cooler and recorded by the laboratory upon receipt. The samples collected on 8/30/07 were sent in 15 coolers, and were received by the laboratory on 8/31/07 at temperatures ranging from 0.6°C to 2.2°C, with 12 of the 15 coolers having temperatures below 2.0°C. The low sample temperatures are not expected to have an adverse impact on the analytical results. No qualifiers were applied.

- Holding Time Review: The samples were collected 8/30/07 for metals analysis, digested for mercury on 9/5/07, analyzed for mercury on 9/5/07, digested for ICP metals on 9/14/07, and analyzed for ICP metals on 9/17/07 & 9/18/07. All criteria were met. No qualifiers were applied.

II-Initial and Continuing Calibration

Requirements for satisfactory instrument calibration are established to ensure that the instrument is capable of producing acceptable quantitative data. Initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of the analysis run, and continuing calibration verification documents that the initial calibration is still valid.

ICP:
1- blank (DoD QSM <½ MRL)
3 – standards (r≥0.995)
ICV/CCV (90-110%) (DoD QSM 90-110%)
MRL (70-130%) (DoD QSM 80-120%)
High Std. (95-105%)

Hg:
1 – blank (DoD QSM <½ MRL)
5 – standards (r≥0.995)
ICV/CCV (80-120%)(DoD QSM ICV 90-110% & CCV 80-120%)
MRL (80-120%) (DoD QSM 80-120%)
High Std. (95-105%)

- The samples were analyzed for ICP metals on 9/17/07 & 9/18/07. Mercury analysis was performed on 9/5/07, with a correlation coefficient of 0.9999. Iron (94%) had a low recovery during the High Standard analysis, and all iron results have been qualified "L". All ICVs and CCVs, and all other High Standards were met recovery criteria. **Table 2** summarizes the MRL standard analysis. Samples with concentrations detected less than two times the MRL with out of criteria MRL recovery were qualified.

Table 2 MRL Analysis Summary

Analysis Date	Analysis	MRL (µg/L)	MRL %Recovery	Qualified samples @ <2xMRL	Validation Qualifiers
9/5/07	Hg	0.2	Met criteria	None	None
9/17/07	ICP-Be	10	122.0%	50MW01, 48MW05, 48MW06	K
9/17/07	ICP-Pb	10	136.0%	48MW07, 48MW06	K
9/17/07	ICP-Se	20	130.0%	48MW06	K
9/17/07	ICP-Tl	20	76.0%	All	L/UL

III-Blanks

Blanks (preparation and calibration blanks) are assessed to determine the existence and magnitude of contamination problems. No contaminants should be detected (i.e. <MDL) in any of the associated blanks. DoD QSM limits are <½MRL for the method blank and <2*MDL for the calibration blanks. Samples are qualified "B" when they are less than 5x the absolute value of the maximum blank concentration. **Table 3** summarizes the blank contamination analysis.

Table 3 Blank Contamination Analysis Summary

Analysis Date	Analysis	QC Blank ID	Max Conc. µg/L	Action Level µg/L	B qualified samples
9/17/07	Antimony	ICB/CCBs	7.7 J	38.5	48MW05, 48MW06
9/17/07	Copper	ICB/CCBs	5.4 J	27.0	50MW01, 48MW07, 50MW02,
9/17/07	Potassium	ICB/CCBs	1710 J	8550	48MW07, 50MW02
9/17/07	Sodium	ICB/CCBs	1860 J	9300	48MW07
9/5/07	Mercury	ICB/CCBs	<2*MDL	NA	None
9/5/07	Mercury	MP12873-MB	<½MRL	NA	None
9/14/07	Lead	MP12936-MB	3.0 J	15.0	48MW07, 48MW06
9/17/07	Potassium	RB083007	1740 J	8700	48MW07, 50MW02
9/17/07	Sodium	RB083007	1860 J	9300	48MW07
09/05/07	Mercury	RB083007	<2*MDL	NA	None

J = Estimated value <MRL and >MDL.

IV-ICP Interference Check Sample (ICS)

The ICP interference check sample (ICS) verifies interelement and background correction factors. ICP Interference Check is performed at the beginning and end of each sample analysis run. Control limits are 80-120% (DoD QSM limits 80-120%).

- All criteria were met. No qualifiers were applied.

V-Laboratory Control Samples (LCS)

The laboratory control sample (LCS) serves as a monitor of the overall performance of each step during the analysis, including the sample preparation. All aqueous LCS results must fall within the control limits. The DoD QSM aqueous LCS recovery limits are specified in Table D-18 of the DoD QSM (DoD, 2006). If the compound is not listed, then the laboratory criteria shall be used.

- Sample MP12936-BS was used as the LCS during ICP metals analysis. All criteria were met. No qualifiers were applied. All samples were analyzed in conjunction with this LCS.

- Sample MP12873-BS was used as the LCS during mercury analysis. All criteria were met. No qualifiers were applied. All samples were analyzed in conjunction with this LCS.

VI-Laboratory Duplicate Sample Analysis

Duplicate sample determinations are used to demonstrate acceptable method precision by the laboratory at the time of analysis. Duplicate analyses are also performed to generate data in order to determine the long-term precision of the analytical method on various matrices. RPDs must be within established control limits. DoD QSM limits for metals are 20% RPD for ICP metals and mercury.

- Sample 48MW3 (F52170-5) was analyzed in duplicate during ICP metals analysis. All metals met RPD criteria. No data qualifiers were applied.

- Sample 48MW3 (F52170-5) was used analyzed in duplicate during mercury analysis, and met RPD criteria. No qualifiers were applied.

VII-Matrix Spike/Spike Duplicate
MS/MSD are generated to determine long-term precision and accuracy of the analytical method on various matrices and to demonstrate acceptable compound recovery by the laboratory at the time of sample analysis. Specific criteria include the analyses of matrix spike and matrix spike duplicate samples at a frequency of one MS and MSD per 20 samples of similar matrix. MS and MSD recoveries and relative percent differences between MS and MSD recoveries should be within the specified limits. DoD QSM aqueous MS/MSD recovery limits follow the LCS criteria and are specified in Table D-18 of the DoD QSM (DoD, 2006). If the compound is not listed, then the laboratory criteria shall be used. Post digestion spikes limits are 75-125% for ICP metals and mercury.

- Sample 48MW3 (F52170-5) was used as the MS/MSD during ICP metals analysis. All metals met recovery and RPD criteria. No data qualifiers were applied.

- Sample 48MW3 (F52170-5) was used as the MS/MSD during mercury analysis, and met recovery & RPD criteria. No data qualifiers were applied.

VIII-ICP Serial Dilution
An ICP serial dilution is performed to determine whether significant physical or chemical interferences exist due to sample matrix at high concentrations. An analysis of a 5-fold dilution should agree within 10% difference of the original result when the concentration in sample is a factor of 50 above MDL.

- Sample 48MW3 (F52170-5) was used as the serial dilution during ICP metals analysis. All metals met criteria. No data qualifiers were applied.

IX-Field Duplicate Sample Analysis
Field duplicates were collected to identify the cumulative precision of the sampling and analytical process and sent to the laboratory blind. The RPD was calculated only for those analytes which were detected at levels exceeding the method reporting limits in both samples of the duplicate pair. Analytes that were rejected (R-qualified) in either sample of the duplicate pair were excluded from the duplicate assessment. Precision control criterion was established at 35% RPD for the aqueous and solid samples. Analytical results were qualified as estimated (J) for any RPDs exceeding criteria.

- No field duplicates were included in this data set.

X-Quantitation Verification
The accuracy of analytical results is verified through the calculation of several parameters. The percent difference (%D) between the calculated and the reported values should be within 10%. Any sample value >MDL and <MRL or <3*MDL (whichever is greater) was qualified as estimated, "J." The following calculations were performed for verification.

ICP Sample: 50MW01, Manganese

Conc. (μg/L) = (conc. μg/L) *(Final Volume mL) * (DF) / (Volume Sample mL)

Conc. (μg/L) = (1226 μg/L)*(50 mL)*(1) / (50 mL) = 1230 μg/L

Reported concentration = 1230 μg/L
%D = 0.0%
Values were within 10% difference.

CVAA Sample: 50MW01, Mercury

Conc. (μg/L) = (conc. μg/L) *(Final Volume mL) * (DF) / (Volume Sample mL)

Conc. (μg/L) = (0.129 μg/L)*(50 mL)*(1) / (50 mL) = 0.13 μg/L

Reported concentration = 0.13 μg/L
%D = 0.0%.
Values were within 10% difference.

USEPA Region III Validation Qualifiers

(No Code) = Confirmed identification.

B = The analyte has been detected in the sample and the associated laboratory or field blank.

J = Indicates an estimated value for (1) estimated value due to QC non-conformance. Reported value may not be accurate or precise, (2) estimating a concentration as a tentatively identified compound as indicated by the mass spectral and retention time data, or (3) estimating a concentration ≥MDL and <MRL or <3*MDL, whichever is greater.

K = Analyte present. Reported value may be biased high (estimated) due to QC non-conformance.

L = Analyte present. Reported value may be biased low (estimated) due to QC non-conformance.

R = Unreliable result. Analyte may or may not be present in the sample due to QC non-conformance.

UL = Value is estimated bias low and not detected due to QC non-conformance. Reporting limit may be inaccurate or imprecise. Quantitation limit is probably higher.

UJ = Value is estimated and not detected due to QC non-conformance. Reporting limit may be inaccurate or imprecise.

Laboratory Qualifiers

(No Code) = Confirmed identification.

U = Not detected. The associated number indicates the compound reporting limit for the sample.

A (Dioxins) = B (Metals) = The reported value was obtained from a reading <MRL and ≥MDL and is considered estimated.

B (Organics) = The analyte or compound has been detected in the sample and laboratory method blank. It indicates probable blank contamination.

E (Metals) = Reported value is estimated because of the presence of interferences.

E (Organics) = Identifies compounds whose concentrations exceed the upper level of the calibration range.

D = Indicates sample was analyzed at a dilution.

EMPC (Dioxins) = The ion-abundance ratio between the two characteristic PCDD/PCDF ions was outside accepted ranges. The detected PCDD/PCDF was reported as an estimated maximum possible concentration (EMPC).

J = Indicates an estimated value for (1) estimating a concentration as a tentatively identified compound as indicated by the mass spectral and retention time data, or (2) estimating a concentration <MRL and ≥ MDL.

N (Organics) = Indicates presumptive evidence of a compound for tentatively identified compounds using a library search.

P (Organics) = Target analyte confirmation >40% difference for detected compound between the primary and secondary columns. The lower of the two values was reported.

N (Metals) = Laboratory spike sample recovery not within control limits.

* (Metals) = Duplicate analysis not within control limits.

* (Organics) = Surrogate outside of QC limits on both original and re-analysis.

Report of Analysis

Client Sample ID:	RB083007		
Lab Sample ID:	F52208-1	Date Sampled:	08/30/07
Matrix:	AQ - Ground Water	Date Received:	08/31/07
		Percent Solids:	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

Metals Analysis DATA VAL QUALIFIER

Analyte	Result	RL	MDL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Aluminum	79 U	200	79	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [4]
Antimony	3.3 U	6.0	3.3	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [4]
Arsenic	3.7 U	10	3.7	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [4]
Barium	5.0 U	200	5.0	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [4]
Beryllium	1.0 U	4.0	1.0	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [4]
Cadmium	1.0 U	5.0	1.0	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [4]
Calcium	100 U	1000	100	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [4]
Chromium	0.92 U	10	0.92	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [4]
Cobalt	1.0 U	50	1.0	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [4]
Copper	1.2 U	25	1.2	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [4]
Iron	15 U	300	15	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [4]
Lead	2.1 U	5.0	2.1	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [4]
Magnesium	100 U	5000	100	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [4]
Manganese	1.0 U	15	1.0	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [4]
Mercury	0.11 U	1.0	0.11	ug/l	1	09/05/07	09/05/07	RS	SW846 7470A [1]	SW846 7470A [3]
Nickel	1.0 U	40	1.0	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [4]
Potassium	1740 J J	10000	100	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [4]
Selenium	4.0 U	10	4.0	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [4]
Silver	0.77 U	10	0.77	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [4]
Sodium	1860 J J	10000	500	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [4]
Thallium	6.5 U UL	10	6.5	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [4]
Vanadium	1.1 U	50	1.1	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [4]
Zinc	5.0 U	20	5.0	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [4]

(1) Instrument QC Batch: MA5953
(2) Instrument QC Batch: MA5981
(3) Prep QC Batch: MP12873
(4) Prep QC Batch: MP12936

RL = Reporting Limit
MDL = Method Detection Limit

U = Indicates a result < MDL
J = Indicates a result > = MDL but < RL

Report of Analysis

Client Sample ID:	50MW01		
Lab Sample ID:	F52208-2	Date Sampled:	08/30/07
Matrix:	AQ - Ground Water	Date Received:	08/31/07
		Percent Solids:	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

Metals Analysis

DATA VAL QUALIFIER

Analyte	Result	RL	MDL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Aluminum	38600	200	79	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [5]
Antimony [a]	12 U J	24	12	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [5]
Arsenic	9.1 J J	10	3.7	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [5]
Barium	357	200	5.0	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [5]
Beryllium	1.8 J K	4.0	1.0	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [5]
Cadmium	3.0 J J	5.0	1.0	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [5]
Calcium	2770000	10000	1000	ug/l	10	09/14/07	09/18/07	RS	SW846 6010B [3]	SW846 3010A [5]
Chromium	78.7	10	0.92	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [5]
Cobalt	19.6 J J	50	1.0	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [5]
Copper	17.8 J J B	25	1.2	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [5]
Iron	40900	300	15	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [5]
Lead	237	5.0	2.1	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [5]
Magnesium	1720000	50000	1000	ug/l	10	09/14/07	09/18/07	RS	SW846 6010B [3]	SW846 3010A [5]
Manganese	1230	15	1.0	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [5]
Mercury	0.13 J J	1.0	0.11	ug/l	1	09/05/07	09/05/07	RS	SW846 7470A [1]	SW846 7470A [4]
Nickel	49.8	40	1.0	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [5]
Potassium	19300	10000	100	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [5]
Selenium [a]	200 U	400	200	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [5]
Silver	0.77 U	10	0.77	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [5]
Sodium	19900	10000	500	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [5]
Thallium	6.5 U UL	10	6.5	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [5]
Vanadium	138	50	1.1	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [5]
Zinc	223	20	5.0	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [5]

(1) Instrument QC Batch: MA5953
(2) Instrument QC Batch: MA5981
(3) Instrument QC Batch: MA5983
(4) Prep QC Batch: MP12873
(5) Prep QC Batch: MP12936

(a) Elevated reporting limit(s) due to matrix interference.

RL = Reporting Limit
MDL = Method Detection Limit

U = Indicates a result < MDL
J = Indicates a result >= MDL but < RL

Report of Analysis

Client Sample ID:	48MW07		
Lab Sample ID:	F52208-3	Date Sampled:	08/30/07
Matrix:	AQ - Ground Water	Date Received:	08/31/07
		Percent Solids:	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

Metals Analysis DATA VAL QUALIFIER

Analyte	Result	RL	MDL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Aluminum	457	200	79	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [4]
Antimony	3.3 U	6.0	3.3	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [4]
Arsenic	3.7 U	10	3.7	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [4]
Barium	76.8 J J	200	5.0	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [4]
Beryllium	1.0 U	4.0	1.0	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [4]
Cadmium	1.0 U	5.0	1.0	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [4]
Calcium	22200	1000	100	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [4]
Chromium	11.9	10	0.92	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [4]
Cobalt	1.0 U	50	1.0	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [4]
Copper	1.2 J JB	25	1.2	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [4]
Iron	861	300	15	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [4]
Lead	2.1 J KB	5.0	2.1	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [4]
Magnesium	12100	5000	100	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [4]
Manganese	32.3	15	1.0	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [4]
Mercury	0.11 U	1.0	0.11	ug/l	1	09/05/07	09/05/07	RS	SW846 7470A [1]	SW846 7470A [3]
Nickel	6.9 J J	40	1.0	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [4]
Potassium	2910 J JB	10000	100	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [4]
Selenium	4.0 U	10	4.0	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [4]
Silver	0.77 U	10	0.77	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [4]
Sodium	2470 J JB	10000	500	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [4]
Thallium	6.5 U UL	10	6.5	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [4]
Vanadium	1.1 U	50	1.1	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [4]
Zinc	5.0 U	20	5.0	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [4]

(1) Instrument QC Batch: MA5953
(2) Instrument QC Batch: MA5981
(3) Prep QC Batch: MP12873
(4) Prep QC Batch: MP12936

RL = Reporting Limit
MDL = Method Detection Limit

U = Indicates a result < MDL
J = Indicates a result >= MDL but < RL

Report of Analysis

Client Sample ID:	50MW02		
Lab Sample ID:	F52208-4	Date Sampled:	08/30/07
Matrix:	AQ - Ground Water	Date Received:	08/31/07
		Percent Solids:	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

Metals Analysis DATA VAL QUALIFIER

Analyte	Result	RL	MDL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Aluminum	8210	200	79	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [4]
Antimony	3.3 U	6.0	3.3	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [4]
Arsenic	3.7 U	10	3.7	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [4]
Barium	191 J J	200	5.0	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [4]
Beryllium	1.0 U	4.0	1.0	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [4]
Cadmium	1.0 U	5.0	1.0	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [4]
Calcium	146000	1000	100	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [4]
Chromium	18.2	10	0.92	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [4]
Cobalt	3.8 J J	50	1.0	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [4]
Copper	9.3 J J B	25	1.2	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [4]
Iron	8850	300	15	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [4]
Lead	65.7	5.0	2.1	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [4]
Magnesium	59100	5000	100	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [4]
Manganese	245	15	1.0	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [4]
Mercury	0.11 U	1.0	0.11	ug/l	1	09/05/07	09/05/07	RS	SW846 7470A [1]	SW846 7470A [3]
Nickel	22.3 J J	40	1.0	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [4]
Potassium	6940 J J B	10000	100	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [4]
Selenium [a]	16 U	20	16	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [4]
Silver	0.77 U	10	0.77	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [4]
Sodium	14500	10000	500	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [4]
Thallium	6.5 U UL	10	6.5	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [4]
Vanadium	18.5 J J	50	1.1	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [4]
Zinc	137	20	5.0	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [4]

(1) Instrument QC Batch: MA5953
(2) Instrument QC Batch: MA5981
(3) Prep QC Batch: MP12873
(4) Prep QC Batch: MP12936

(a) Elevated reporting limit(s) due to matrix interference.

RL = Reporting Limit
MDL = Method Detection Limit

U = Indicates a result < MDL
J = Indicates a result >= MDL but < RL

Report of Analysis

Client Sample ID:	48MW05		
Lab Sample ID:	F52208-5	Date Sampled:	08/30/07
Matrix:	AQ - Ground Water	Date Received:	08/31/07
		Percent Solids:	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

Metals Analysis

DATA VAL QUALIFIER

Analyte	Result	RL	MDL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Aluminum	61500	200	79	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [5]
Antimony	6.3 B	6.0	3.3	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [5]
Arsenic	16.3	10	3.7	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [5]
Barium	5560	2000	50	ug/l	10	09/14/07	09/18/07	RS	SW846 6010B [3]	SW846 3010A [5]
Beryllium	3.8 J K	4.0	1.0	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [5]
Cadmium	5.0	5.0	1.0	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [5]
Calcium	1560000	10000	1000	ug/l	10	09/14/07	09/18/07	RS	SW846 6010B [3]	SW846 3010A [5]
Chromium	397	10	0.92	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [5]
Cobalt	135	50	1.0	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [5]
Copper	53.7	25	1.2	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [5]
Iron	137000	300	15	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [5]
Lead	29.7	5.0	2.1	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [5]
Magnesium	762000	50000	1000	ug/l	10	09/14/07	09/18/07	RS	SW846 6010B [3]	SW846 3010A [5]
Manganese	4980	150	10	ug/l	10	09/14/07	09/18/07	RS	SW846 6010B [3]	SW846 3010A [5]
Mercury	0.11 U	1.0	0.11	ug/l	1	09/05/07	09/05/07	RS	SW846 7470A [1]	SW846 7470A [4]
Nickel	325	40	1.0	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [5]
Potassium	18200	10000	100	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [5]
Selenium [a]	100 U	200	100	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [5]
Silver	8.8 J J	10	0.77	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [5]
Sodium	19600	10000	500	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [5]
Thallium	6.5 U UL	10	6.5	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [5]
Vanadium	73.9	50	1.1	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [5]
Zinc	93.6	20	5.0	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [5]

(1) Instrument QC Batch: MA5953
(2) Instrument QC Batch: MA5981
(3) Instrument QC Batch: MA5983
(4) Prep QC Batch: MP12873
(5) Prep QC Batch: MP12936

(a) Elevated reporting limit(s) due to matrix interference.

RL = Reporting Limit
MDL = Method Detection Limit

U = Indicates a result < MDL
J = Indicates a result >= MDL but < RL

Report of Analysis

Client Sample ID:	48MW06		
Lab Sample ID:	F52208-6	Date Sampled:	08/30/07
Matrix:	AQ - Ground Water	Date Received:	08/31/07
		Percent Solids:	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

Metals Analysis DATA VAL QUALIFIER

Analyte	Result	RL	MDL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Aluminum	26600 B	200	79	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [4]
Antimony	6.9	6.0	3.3	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [4]
Arsenic	11.9	10	3.7	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [4]
Barium	335	200	5.0	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [4]
Beryllium	1.5 J K	4.0	1.0	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [4]
Cadmium	1.0 U	5.0	1.0	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [4]
Calcium	157000	1000	100	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [4]
Chromium	140	10	0.92	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [4]
Cobalt	42.8 J J	50	1.0	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [4]
Copper	119	25	1.2	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [4]
Iron	89800	300	15	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [4]
Lead	8.4 KB	5.0	2.1	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [4]
Magnesium	119000	5000	100	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [4]
Manganese	2550	15	1.0	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [4]
Mercury	0.11 U	1.0	0.11	ug/l	1	09/05/07	09/05/07	RS	SW846 7470A [1]	SW846 7470A [3]
Nickel	117	40	1.0	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [4]
Potassium	9740 J J	10000	100	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [4]
Selenium	10 K	10	4.0	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [4]
Silver	0.77 U	10	0.77	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [4]
Sodium	60500	10000	500	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [4]
Thallium	6.5 U UL	10	6.5	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [4]
Vanadium	46.3 J J	50	1.1	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [4]
Zinc	41.8	20	5.0	ug/l	1	09/14/07	09/17/07	DM	SW846 6010B [2]	SW846 3010A [4]

(1) Instrument QC Batch: MA5953
(2) Instrument QC Batch: MA5981
(3) Prep QC Batch: MP12873
(4) Prep QC Batch: MP12936

RL = Reporting Limit
MDL = Method Detection Limit

U = Indicates a result < MDL
J = Indicates a result > = MDL but < RL

Shaw Environmental, Inc.
2790 Mosside Blvd
Monroeville, PA
412-858-3335
FAX: 412-3728968

Shaw® Shaw Environmental, Inc.

MEMORANDUM

TO: Jeff Parks, Shaw E&I Radford Army Ammunition Plant (RFAAP) Project Manager

FROM: Richard McCracken, Shaw E&I Project Chemist

SUBJECT: RFAAP Data Validation – Perchlorate
Datachem Laboratories, Inc. SDG 07E-0792-01
(Accutest Laboratories, Inc., SDG F52208)

DATE: November 1, 2007

The purpose of this memorandum is to present the data validation report for the samples collected at RFAAP August 30, 2007. The aqueous samples were analyzed for perchlorate analysis using liquid chromatography mass spectroscopy (LC/MS) SW-846 method LC-MS-CLO4/6850 in selective ion monitoring (SIM) mode. A total of six aqueous samples were validated. The sample IDs are:

Field Sample ID	Lab Sample ID	Field Sample ID	Lab Sample ID
RB083007	F52208-1	50MW02	F52208-4
50MW01	F52208-2	48MW05	F52208-5
48MW07	F52208-3	48MW06	F52208-6

Data were reviewed and validated using a combination of project QAPP, *DOD Quality Systems Manual for Environmental Laboratories, Final Version 3, January, 2006* (DoD, 2006), *DoD Perchlorate Handbook August, Rev1, Change 1, 2007* (DoD, 2007), method-specific criteria, and laboratory SOP criteria. The data qualifier scheme was consistent with the *Region III Modifications to the National Functional Guidelines for Inorganic Data Review* (April, 1993). Parameters evaluated are presented in **Table 1**. Data associated with parameters in compliance with quality control specifications have not been qualified. Data associated with parameters that did not comply with quality control specifications and directly impacted project data have been qualified in accordance with USEPA Region III specifications.

Table 1 Laboratory Performance Criteria

Qualified		Parameter
Yes	No	
	X	Holding Times and Preservation
	X	Instrument Performance Check
X		Initial and Continuing Calibration
	X	Blank Analysis
X		Internal Standards
	X	Laboratory Control Sample (LCS)
	X	Matrix Spike (MS) and Spike Duplicate (MSD)
	X	Field Duplicate
X		Quantitation Verification

The quality of data collected in support of this sampling activity is considered acceptable with noted qualifications.

Richard McCracken, Chemist

11/1/07
Date

RFAAP VALIDATION REPORT
PERCHLORATE REVIEW
SDG 07E-0792-01 (F52208)

I-Holding Times and Preservation

The primary objective is to ascertain the validity of results based on the holding time of the sample from time of collection to time of sample analysis. For perchlorate analysis, aqueous samples are shipped and stored at @4°C±2°C with a maximum holding time of 28 days from collection (DoD Perchlorate Handbook criteria).

- Temperature Review: A temperature blank was sent with each cooler and recorded by the laboratory upon receipt. The samples collected on 8/30/07 were sent in 15 coolers, and were received by the laboratory on 8/31/07 at temperatures ranging from 0.6°C to 2.2°C, with 12 of the 15 coolers having temperatures below 2.0°C. The low sample temperatures are not expected to have an adverse impact on the analytical results. Accutest shipped the perchlorate aliquot to DataChem Laboratories on 9/4/07, they were received by DataChem on 9/5/07 at 4°C. No qualifiers were applied.

- Holding Time Review: The aqueous samples were collected on 8/30/07, prepped on 9/18/07, and analyzed on 9/18/07 and 9/19/07. All holding time criteria were met. No qualifiers were applied.

II-Instrument Performance Check

LC/MS instrument performance checks are performed to ensure mass resolution, identification and, to some degree, sensitivity. The analysis of the instrument performance check solution must be performed at the beginning of each 12-hour period during which samples are analyzed.

- The instrument performance check target compounds - $^{35}Cl^{16}O_3$, $^{37}Cl^{16}O_3$, and $^{35}Cl^{18}O_3$ - met the mass calibration criteria. No qualification was applied.

III-Initial and Continuing Calibration

Requirements for satisfactory instrument calibration are established to ensure that the instrument is capable of producing acceptable quantitative data. Initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of the analysis run, and continuing calibration verification documents that the initial calibration is still valid.

Perchlorate:
1- blank (<1/2MRL DoD Perchlorate Handbook)
5 – standards (r≥0.995 DoD Perchlorate Handbook)
ICV (±15%D DoD Perchlorate Handbook)
CCV (±15%D DoD Perchlorate Handbook)
ICS, LODV (±30%D DoD Perchlorate Handbook)

- The perchlorate samples were analyzed on 9/18/07 and 9/19/07.

- Perchlorate was calibrated using a second order equation on 9/18/07, and had a correlation coefficient of 0.9998.

- The perchlorate recovery in LODV2 (74.2%) was above criteria, which the lab attributed to a positive interference at m/z 83. The six samples in this data set were analyzed immediately after LODV2, and the perchlorate results from all samples have been qualified "J/UJ" as estimated.

- All other ICVs, CCVs, ICSs, and LODVs were within criteria.

IV-Blanks

The purpose of blank analyses is to determine the presence and magnitude of contamination problems resulting from field and laboratory activities. One method blank per analytical batch must be run on each instrument used to analyze samples. No contaminants should be detected in any of the associated blanks >MDL. The DoD Perchlorate Handbook criterion specifies all concentrations should be less than ½ MRL for method blanks. Positive sample results are reported and qualified "B", if the concentration of the compound in the sample is ≤5 times (5X) the maximum amount for target compounds. **Table 2** summarizes the blank contamination analysis. Action levels are based upon dilution factor of one.

Table 2 Blank Contamination Analysis Summary

Analysis Date	Analysis	QC Blank ID	Max Conc. µg/L	Action Level µg/L	B qualified samples
9/18/07	Perchlorate	BL-259711-1	<½MRL	NA	None
9/18/07	Perchlorate	RB083007	<½MRL	NA	None

MRL = Method Reporting Limit.
NA = Not Applicable.

V-Internal Standards

Internal standard performance criteria ensure that GC/MS sensitivity and response are stable during every analytical run. Internal standard area counts for samples and blanks must not vary by more than a factor of two (-50% to +100%) from the associated calibration standard. The DoD Handbook specifies relative retention times (RRT) of 1.0 ± 2% of last calibration standard. The mass ratio of ions 83:85 for each sample and standard should be 3.06, and must fall between 2.3 and 3.8 to confirm the presence of perchlorate. The laboratory 83:85 mass ratio limit range is 2.21 to 4.10.

- LODV1, LODV3, 50MW01, 48MW07, and 48MW06 did not meet the 83:85 mass ratio criteria. All results for these three samples have been qualified "J/UJ".

- All samples met area and RRT criteria, and all samples other than the three listed above met 83:85 mass ratio criteria.

VI-Laboratory Control Samples (LCS)

The laboratory control sample (LCS) serves as a monitor of the overall performance of each step during the analysis, including the sample preparation. DoD Perchlorate Handbook and laboratory aqueous limits are 85-115%.

- Sample QC-259711-1 was used as the aqueous LCS for perchlorate analysis on 9/18/07. All criteria were met. No qualifiers were applied.

VII-Matrix Spike (MS) and Spike Duplicate (MSD)

MS and MSD are generated to determine long-term accuracy and precision of the analytical method on various matrices and to demonstrate acceptable compound recovery by the laboratory at the time of sample analysis. Specific criteria include the analyses of matrix spike samples at a frequency of one MS/MSD per 20 samples of similar matrix. MS/MSD recoveries and relative percent differences between MS recoveries should be within the specified limits. DoD Perchlorate Handbook aqueous limits are 75-125%; RPD≤20%. The laboratory limits are 80-120%; RPD≤15%.

- Sample 48MW03 (F52170-5) was used for the MS/MSD analysis. All criteria were met. All samples were analyzed in conjunction with this MS/MSD.

VIII-Field Duplicate Sample Analysis
Field duplicates were collected to identify the cumulative precision of the sampling and analytical process and sent to the laboratory blind. The RPD was calculated only for those analytes which were detected at levels exceeding the method reporting limits in both samples of the duplicate pair. Analytes that were rejected (R-qualified) in either sample of the duplicate pair were excluded from the duplicate assessment. Precision control criterion was established at 50% RPD for the aqueous samples. Analytical results were qualified as estimated (J) for any RPDs exceeding criteria.

- No field duplicates were included in this data set.

IX-Quantitation Verification
The accuracy of analytical results is verified through the calculation of several parameters. The percent difference (%D) between the calculated and the reported values should be within 10%. Any sample value >MDL and <MRL or <3*MDL (whichever was greater) was qualified as estimated, "J." The following calculations were performed for verification.

Sample: 48MW07 (F52208-3, 07E04544), Perchlorate

y (area ratio) = (Sample Area/Area EIC89) = (5222.35/77952) = 0.0670 = ax^2 + bx + c

solve for x
x = [-b ± SQRT(b^2-4ac)] / (2a)

where: x is the amount ratio

a = 0.0225735 b = 1.36878 c = - 0.0186592 - 0.0670 = -0.0856592

amount ratio ={-1.36878± [SQRT{(1.36878^2) – (4*0.0225735*-0.0856592)}] / (2*0.0225735)
={-1.36878± [SQRT (1.8735587+0.0077345)]}/0.045147
={-1.36878±[SQRT 1.881293]} / 0.045147
={ -1.36878±1.3716 }/0.045147
=0.066246

Conc. µg/L = (Amount ratio * Is * DF)

where: Conc. = Sample concentration in ug/L
Is = Amount of internal standard (µg/L).
DF = Dilution factor

Conc. µg/L = (Amount ratio * Is * DF)
= (0.066246* 5 µg/L * 1) = 0.312 µg/L

Reported concentration = 0.313 µg/L
%D = 0.3%
Values were within 10% difference.

USEPA Region III Validation Qualifiers

(No Code) = Confirmed identification.

B = The analyte has been detected in the sample and the associated laboratory or field blank.

J = Indicates an estimated value for (1) estimated value due to QC non-conformance. Reported value may not be accurate or precise, (2) estimating a concentration as a tentatively identified compound as indicated by the mass spectral and retention time data, or (3) estimating a concentration ≥MDL and <MRL or <3*MDL, whichever is greater.

K = Analyte present. Reported value may be biased high (estimated) due to QC non-conformance.

L = Analyte present. Reported value may be biased low (estimated) due to QC non-conformance.

R = Unreliable result. Analyte may or may not be present in the sample due to QC non-conformance.

UL = Value is estimated bias low and not detected due to QC non-conformance. Reporting limit may be inaccurate or imprecise. Quantitation limit is probably higher.

UJ = Value is estimated and not detected due to QC non-conformance. Reporting limit may be inaccurate or imprecise.

Laboratory Qualifiers

(No Code) = Confirmed identification.

U = Not detected. The associated number indicates the compound reporting limit for the sample.

A (Dioxins) = B (Metals) = The reported value was obtained from a reading <MRL and ≥MDL and is considered estimated.

B (Organics) = The analyte or compound has been detected in the sample and laboratory method blank. It indicates probable blank contamination.

E (Metals) = Reported value is estimated because of the presence of interferences.

E (Organics) = Identifies compounds whose concentrations exceed the upper level of the calibration range.

EMPC (Dioxins) = The ion-abundance ratio between the two characteristic PCDD/PCDF ions was outside accepted ranges. The detected PCDD/PCDF was reported as an estimated maximum possible concentration (EMPC).

D = Indicates sample was analyzed at a dilution.

J = Indicates an estimated value for (1) estimating a concentration as a tentatively identified compound as indicated by the mass spectral and retention time data, or (2) estimating a concentration <MRL and ≥MDL.

N (Organics) = Indicates presumptive evidence of a compound for tentatively identified compounds using a library search.

N (Metals) = Laboratory spike sample recovery not within control limits.

P (Organics) = Target analyte confirmation >40% difference for detected compound between the primary and secondary columns. The lower of the two values was reported.

* (Metals) = Duplicate analysis not within control limits.

* (Organics) = Surrogate outside of QC limits on both original and re-analysis.

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FORM A (TYPE I)
SINGLE METHOD ANALYSES

SAMPLE ANALYSIS DATA SHEET

Form RLIMS63A-V1.4
09210716035338
Page 3

S0785003

Date Printed.....: 21-SEP-07 16:03

Client Name.....: ACCUTEST Laboratories
Client Ref Number....: Not Provided
Sampling Site.....: F52208
Release Number.....: Not Provided

Date Received.....: 05-SEP-07 00:00

Client Sample Name: F52208-1
DCL Sample Name...: 07M04542
DCL Report Group..: 07M-0792-01

Matrix.....: WATER
Date Sampled.....: 30-AUG-07 06:45
Reporting Units...: ug/L
Report Basis.....: [X] As Received [ ] Dried

DCL Preparation Group: Not Applicable
Date Prepared.....: 18-SEP-07 00:00
Preparation Method...: 6850
Aliquot Weight/Volume: Not Applicable
Net Weight/Volume....: Not Required

DCL Analysis Group: G078K00V
Analysis Method...: 6850
Instrument Type...: LC/MS
Instrument ID.....: LCMS02
Column Type.....: KP-RPPX250
[X] Primary
[ ] Confirmation

DATA VAL QUALIFIER UJ

Analytical Results

Analyte	Date Analyzed	MDL	Result	Comment	Qual.	Dilution	PQL
Perchlorate	18-SEP-07 22:31	0.0663	ND		U	1	0.200

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FORM A (TYPE I)
SINGLE METHOD ANALYSES

SAMPLE ANALYSIS DATA SHEET

Date Printed.....: 21-SEP-07 16:03

Client Name.....: ACCUTEST Laboratories
Client Ref Number....: Not Provided
Sampling Site.....: F52208
Release Number.....: Not Provided

Date Received.....: 05-SEP-07 00:00

Client Sample Name: F52208-2
DCL Sample Name...: 07E04543
DCL Report Group..: 07E-0792-01

Matrix.....: WATER
Date Sampled.....: 30-AUG-07 08:00
Reporting Units...: ug/L
Report Basis.....: [X] As Received [ ] Dried

DCL Preparation Group: Not Applicable
Date Prepared.....: 18-SEP-07 00:00
Preparation Method...: 6850
Aliquot Weight/Volume: Not Applicable
Net Weight/Volume....: Not Required

DCL Analysis Group: G078K00V
Analysis Method...: 6850
Instrument Type...: LC/MS
Instrument ID.....: LCMS02
Column Type.....: KP-RPPX250
[X] Primary
[ ] Confirmation

Analytical Results

Analyte	Date Analyzed	MDL	Result	Comment	Qual.	Dilution	PQL
Perchlorate	18-SEP-07 22:51	0.0663	0.203			1	0.200

DATA VAL QUALIFIER J

DATA CHEM LABORATORIES
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FORM A (TYPE I)
SINGLE METHOD ANALYSES

SAMPLE ANALYSIS DATA SHEET

S0705005

Date Printed.....: 21-SEP-07 16:03

Client Name.....: ACCUTEST Laboratories
Client Ref Number....: Not Provided
Sampling Site.....: F52208
Release Number.....: Not Provided

Date Received.....: 05-SEP-07 00:00

Client Sample Name: F52208-3
DCL Sample Name...: 07E04544
DCL Report Group..: 07E-0792-01

Matrix.....: WATER
Date Sampled.....: 30-AUG-07 09:10
Reporting Units...: ug/L
Report Basis.....: [X] As Received [ ] Dried

DCL Preparation Group: Not Applicable
Date Prepared.....: 18-SEP-07 00:00
Preparation Method...: 6850
Aliquot Weight/Volume: Not Applicable
Net Weight/Volume....: Not Required

DCL Analysis Group: G078K00V
Analysis Method...: 6850
Instrument Type...: LC/MS
Instrument ID.....: LCMS02
Column Type.....: KP-RPPX250
[X] Primary
[ ] Confirmation

Analytical Results

DATA VAL QUALIFIER J

Analyte	Date Analyzed	MDL	Result	Comment	Qual.	Dilution	PQL
Perchlorate	18-SEP-07 23:10	0.0663	0.313			1	0.200

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FORM A (TYPE I)
SINGLE METHOD ANALYSES

SAMPLE ANALYSIS DATA SHEET

Form RLIMS63A-V1.4
09210716035338

80785006

Date Printed.....: 21-SEP-07 16:03

Client Name.....: ACCUTEST Laboratories
Client Ref Number....: Not Provided
Sampling Site.....: F52208
Release Number.....: Not Provided

Date Received.....: 05-SEP-07 00:00

Client Sample Name: F52208-4
DCL Sample Name...: 07E04545
DCL Report Group..: 07E-0792-01

Matrix.....: WATER
Date Sampled.....: 30-AUG-07 09:00
Reporting Units...: ug/L
Report Basis.....: [X] As Received [ ] Dried

DCL Preparation Group: Not Applicable
Date Prepared.....: 18-SEP-07 00:00
Preparation Method...: 6850
Aliquot Weight/Volume: Not Applicable
Net Weight/Volume....: Not Required

DCL Analysis Group: G078K00V
Analysis Method...: 6850
Instrument Type...: LC/MS
Instrument ID.....: LCMS02
Column Type.....: KP-RPPX250
[X] Primary
[ ] Confirmation

Analytical Results

DATA VAL QUALIFIED J

Analyte	Date Analyzed	MDL	Result	Comment	Qual.	Dilution	PQL
Perchlorate	18-SEP-07 23:30	0.0663	0.288			1	0.200

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FORM A (TYPE I)
SINGLE METHOD ANALYSES

SAMPLE ANALYSIS DATA SHEET

Form RLIMS63A-V1.4
09210716035338

S0785007

Date Printed.....: 21-SEP-07 16:03

Client Name.....: ACCUTEST Laboratories
Client Ref Number....: Not Provided
Sampling Site.....: F52208
Release Number.....: Not Provided

Date Received.....: 05-SEP-07 00:00

Client Sample Name: F52208-5
DCL Sample Name...: 07E04546
DCL Report Group..: 07E-0792-01

Matrix.....: WATER
Date Sampled.....: 30-AUG-07 11:00
Reporting Units...: ug/L
Report Basis.....: [X] As Received [ ] Dried

DCL Preparation Group: Not Applicable
Date Prepared.....: 18-SEP-07 00:00
Preparation Method...: 6850
Aliquot Weight/Volume: Not Applicable
Net Weight/Volume....: Not Required

DCL Analysis Group: G078K00V
Analysis Method...: 6850
Instrument Type...: LC/MS
Instrument ID.....: LCMS02
Column Type.....: KP-RPPX250
[X] Primary
[ ] Confirmation

Analytical Results

DATA VAL QUALIFIER J

Analyte	Date Analyzed	MDL	Result	Comment	Qual.	Dilution	PQL
Perchlorate	18-SEP-07 23:50	0.0663	0.186		J	1	0.200

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FORM A (TYPE I)
SINGLE METHOD ANALYSES

SAMPLE ANALYSIS DATA SHEET

S0785008

Date Printed.....: 21-SEP-07 16:03

Client Name.....: ACCUTEST Laboratories
Client Ref Number....: Not Provided
Sampling Site.....: F52208
Release Number.....: Not Provided

Date Received.....: 05-SEP-07 00:00

Client Sample Name: F52208-6
DCL Sample Name...: 07E04547
DCL Report Group..: 07E-0792-01

Matrix.....: WATER
Date Sampled.....: 30-AUG-07 11:45
Reporting Units...: ug/L
Report Basis.....: [X] As Received [ ] Dried

DCL Preparation Group: Not Applicable
Date Prepared.....: 18-SEP-07 00:00
Preparation Method...: 6850
Aliquot Weight/Volume: Not Applicable
Net Weight/Volume....: Not Required

DCL Analysis Group: G078K00V
Analysis Method...: 6850
Instrument Type...: LC/MS
Instrument ID.....: LCMS02
Column Type.....: KP-RPPX250
[X] Primary
[ ] Confirmation

Analytical Results

DATA VAL QUALIFIER J

Analyte	Date Analyzed	MDL	Result	Comment	Qual.	Dilution	PQL
Perchlorate	19-SEP-07 00:09	0.0663	0.236			1	0.200

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MEMORANDUM

TO: Jeff Parks, Shaw E&I Radford Army Ammunition Plant (RFAAP) Project Manager

FROM: Richard McCracken, Shaw E&I Project Chemist

SUBJECT: RFAAP Data Validation – Pesticides and PCBs
Accutest Laboratories, Inc., SDG F52208

DATE: October 30, 2007

The purpose of this memorandum is to present the data validation report for the samples collected at RFAAP on August 30, 2007. Samples were analyzed for pesticides and PCBs using USEPA Methods 510C/8081A and 3510C/8082, respectively. A total of six aqueous samples were validated. The sample IDs are:

Field Sample ID	Lab Sample ID	Field Sample ID	Lab Sample ID
RB083007	F52208-1	50MW02	F52208-4
50MW01	F52208-2	48MW05	F52208-5
48MW07	F52208-3	48MW06	F52208-6

Data were reviewed by Richard McCracken and validated using a combination of project QAPP, *Quality Systems Manual for Environmental Laboratories, Final Version 3, January, 2006* (DoD, 2006) (DoD QSM), method-specific criteria, and laboratory SOP criteria. The data qualifier scheme was consistent with the *Region III Modifications to the National Functional Guidelines for Organic Data Review* (September 1994). Parameters evaluated are presented in **Table 1**. Data associated with parameters in compliance with quality control specifications have not been qualified. Data associated with parameters that did not comply with quality control specifications and directly impacted project data have been qualified in accordance with USEPA Region III specifications.

Table 1 Laboratory Performance Criteria

Qualified		Parameter
Yes	No	
	X	Holding Times and Preservation
	X	Instrument Performance Check
	X	Initial Calibration
	X	Continuing Calibration
	X	Blank Analysis
X		System Monitoring Compounds
X		Laboratory Control Samples
X		Matrix Spike/Spike Duplicate
	X	Field Duplicate
	X	Quantitation Verification

The quality of data collected in support of this sampling activity is considered acceptable with noted qualifications.

Richard McCracken

Richard McCracken, Chemist

10/31/07

Date

RFAAP VALIDATION REPORT
PESTICIDE/PCB REVIEW
SDG F52208

I-Holding Times and Preservation
The objective is to ascertain the validity of results based on the holding time of the sample from time of collection to time of sample extraction and analysis. For aqueous samples, pesticide and PCB compounds are shipped @4°C ± 2°C, with a maximum holding time of 7 days from sample collection to preparative extraction and 40 days from preparative extraction to determinative analysis.

- Temperature Review: A temperature blank was sent with each cooler and recorded by the laboratory upon receipt. The samples collected on 8/30/07 were sent in 15 coolers, and were received by the laboratory on 8/31/07 at temperatures ranging from 0.6°C to 2.2°C, with 12 of the 15 coolers having temperatures below 2.0°C. The low sample temperatures are not expected to have an adverse impact on the analytical results. No qualifiers were applied.

- Holding Time Review: The samples were collected on 8/30/07, extracted for pesticides and PCBs on 9/6/07, analyzed for pesticides on 9/24/07, and analyzed for PCBs on 9/14/07. All criteria were met. No qualifiers were applied.

II-Instrument Performance Check (Degradation Standard)
Performance checks on the gas chromatograph with electron capture detector (GC/ECD) system are performed to ensure adequate resolution and instrument sensitivity. The performance evaluation mixture (PEM) must be analyzed at the beginning of the analytical sequence. The breakdown of Endrin and 4,4'-DDT must be ≤15% on both signals.

- For analysis performed on 9/24/07 @1450, endrin and 4,4'-DDT percent breakdowns were 9.6% and 4.8% on signal #1 and 8.4% and 4.1% on signal #2, respectively. All criteria were met. No qualifiers were applied.

III-Initial Calibration
Compliance requirements for satisfactory instrument calibration are established to ensure that the instrument is capable of producing acceptable qualitative and quantitative data for the target compounds. The initial 5 point calibration demonstrates that the instrument is capable of acceptable performance in the beginning of the analytical run. Calibration factors are generated for each compound. The DoD QSM specifies that the percent relative standard deviation (%RSD) for all single peak target analytes, and aroclors 1016, 1242, 1254, and 1260 must be <20% or the mean %RSD for all analytes in the standard must be ≤20%. If linear regression is used, the correlation coefficient must be ≥0.990. All detects are qualified as estimated "J" for where there were exceeding %RSDs, and all non-detects are qualified as estimated "UJ" for where there were grossly exceeding recoveries, unless determined to be unusable "R". Grossly exceeding is defined as twice the established criteria limits.

- During the pesticide initial calibration performed on 9/24/07 on instrument ECD5, all criteria were met. No qualifiers were applied. All samples were analyzed following this initial calibration.

- During the PCB initial calibration performed on 9/14/07 on instrument ECD3, all criteria were met. No qualifiers were applied. All samples were analyzed following this initial calibration.

IV-Continuing Calibration

Compliance requirements for satisfactory instrument calibration are established to ensure that the instrument is capable of producing acceptable qualitative and quantitative data for pesticide/PCB target compounds. Continuing calibration standards containing both target compounds and surrogates are analyzed at the beginning of each 12-hour analytical shift and after every 20 samples. The DoD QSM specifies that the percent difference (%D) or the average %Ds for all analytes in the standard from the calibration should be no greater than ±20%.

- During the pesticide initial calibration verification performed on 9/24/07 @1713 on instrument ECD5, all criteria were met. No qualifiers were applied. Samples RB083007, 50MW01, and 50MW02 were analyzed after this initial calibration verification.

- During the pesticide continuing calibration performed on 9/24/07 @2007 on instrument ECD5, all criteria were met. No qualifiers were applied. Samples RB083007, 50MW01, and 50MW02 were analyzed prior to this continuing calibration, while samples 48MW07, 48MW05, and 48MW06 were analyzed after this continuing calibration.

- During the pesticide continuing calibration performed on 9/24/07 @2158 on instrument ECD5, all criteria were met. No qualifiers were applied. Samples 48MW07, 48MW05, and 48MW06 were analyzed prior to this continuing calibration.

- During the PCB 1016/1260 initial calibration verification performed on 9/14/07 @1309 on instrument ECD3, peak #1 (21.1%) of aroclor 1016 had a %D >20% on signal #1, but the average of all 6 peaks was 13.8%. All other PCBs met criteria on signal #1, and all PCBs met criteria on signal #2. No qualifiers were applied. All samples were analyzed following this initial calibration verification.

- During the PCB 1016/1260 continuing calibration performed on 9/14/07 @1817 on instrument ECD3, all criteria were met. No qualifiers were applied. All samples were analyzed following this continuing calibration.

- During the PCB 1016/1260 continuing calibration performed on 9/14/07 @2148 on instrument ECD3, all criteria were met. No qualifiers were applied. All samples were analyzed prior to this continuing calibration.

V-Blank Analysis

The purpose of laboratory or field blank analyses is to determine the existence and magnitude of contamination problems resulting from laboratory or field activities. One method blank per analytical batch must be run on each instrument used to analyze samples. The DoD QSM criterion specifies all concentrations should be less than one-half MRL. Positive sample results are reported and qualified "B", if the concentration of the compound in the sample is ≤5 times (5X) the maximum amount for pesticide and PCB target compounds. **Table 2** summarizes the blank contamination analysis.

Table 2 Blank Contamination Analysis Summary

Parameter	Analysis Date	QC Blank ID	Compound	Max Conc. µg/L	Action Level µg/L	B qualified samples
Pesticides	9/24/07	OP22237-MB	All target <½MRL	NA	NA	None
Pesticides	9/24/07	RB083007	All target <½MRL	NA	NA	None
PCBs	9/14/07	OP22238-MB	All target <½MRL	NA	NA	None
PCBs	9/14/07	RB083007	All target <½MRL	NA	NA	None

NA = Not Applicable
MRL = Method Reporting Limit

VI-System Monitoring Compound (Surrogates)
Laboratory performance on individual samples is evaluated through the review of surrogate spike samples. Surrogate spikes are added to all samples and blanks to measure their recovery in sample and blank matrices. The percent recoveries (%Rs) must be within the specified control limits. DoD surrogate recovery limits are specified in Table D-3 of the DoD QSM (DoD, 2006). If the surrogate is not listed, then the laboratory criteria shall be used.

Aqueous Criteria:	Tetrachloro-m-xylene:	Pesticides: 42-127% (DoD QSM 25-140%)
	Decachlorobiphenyl:	Pesticides: 27-127% (DoD QSM 30-135%)
	Tetrachloro-m-xylene:	PCBs: 38-127% (DoD QSM Not Listed)
	Decachlorobiphenyl:	PCBs: 25-137% (DoD QSM 40-135%)

- Sample 50MW02 had low decachlorobiphenyl recoveries (27.8%, 27.6%) from both signals during pesticide analysis. The pesticide results from 50MW02 have been qualified "J/UJ" as estimated.

- All other samples met surrogate recovery criteria during pesticide analysis.

- Sample 50MW01 had a low decachlorobiphenyl recovery (37.4%) from signal #1 during PCB analysis. Tetrachloro-m-xylene was within criteria on both signals. No qualifiers are required when only one surrogate is outside criteria.

- Sample 50MW02 had low decachlorobiphenyl recoveries (25.5%, 28.3%) from both signals during PCB analysis. The PCB results from 50MW02 have been qualified "J/UJ" as estimated.

- Sample 48MW05 had low decachlorobiphenyl recoveries (33.9%, 37.9%) from both signals during PCB analysis. The PCB results from 48MW05 have been qualified "J/UJ" as estimated.

- All other samples met surrogate recovery criteria during PCB analysis.

VII-Laboratory Control Samples
Laboratory control samples (LCS) are used to monitor laboratory accuracy by calculating the percent recoveries of the spiked compounds. All LCS percent recoveries must be within the specified control limits. DoD QSM aqueous LCS recovery limits are specified in Table D-14 and Table D-16 of the DoD QSM (DoD, 2006). If the compound is not listed, then the laboratory criteria shall be used.

- Sample OP22237-BS was used as the LCS during 9/24/07 pesticide analysis. Endrin aldehyde (16%) had a low recovery and was not detected in any field samples – the results have been qualified "UL" as estimated. All other pesticides met recovery criteria. All samples were analyzed in conjunction with this LCS.

- Sample OP22238-BS was used as the LCS during the 9/14/07 PCB analysis. All criteria were met. No qualifiers were applied.

VIII-Matrix Spike/Matrix Spike Duplicate
Data for matrix spike/matrix spike duplicates (MS/MSD) are generated to determine long-term precision and accuracy of the analytical method on various matrices and to demonstrate acceptable compound recovery by the laboratory at the time of sample analysis. The percent recoveries (%Rs) and the relative percent difference (RPD) must be within the specified control limits. DoD aqueous MS/MSD recovery limits follow the LCS criteria and are specified in Table D-14 and Table D-16 of the DoD QSM (DoD, 2006). If the compound is not listed, then the laboratory criteria shall be used.

- Sample 48MW07 was used for the pesticide MS/MSD analysis. Endrin aldehyde (15%, 14%) had a low recovery in the MS and MSD, as well as having a low recovery in the associated LCS. All sample results have already been qualified "UL", no further qualification is required. All other pesticides met criteria. All samples were analyzed in conjunction with this MS/MSD.

- Sample RB083007 was used for the PCB MS/MSD analysis. All criteria were met. No qualifiers were applied. All samples were analyzed in conjunction with this MS/MSD.

IX-Field Duplicate Sample Analysis
Field duplicates were collected to identify the cumulative precision of the sampling and analytical process and sent to the laboratory blind. The RPD was calculated only for those analytes which were detected at levels exceeding the method reporting limits in both samples of the duplicate pair. Analytes that were rejected (R-qualified) in either sample of the duplicate pair were excluded from the duplicate assessment. Precision control criterion was established at 50% RPD for the aqueous and solid samples. Analytical results were qualified as estimated (J) for any RPDs exceeding criteria.

- No field duplicates were included in this data set.

X-Quantitation Verification
The accuracy of analytical results was verified through the calculation of several parameters. The difference between the calculated value and the reported value must be within 10% difference. All positive values must have less than or equal to 40% %D between the primary and secondary columns. Any sample value >MDL and <MRL or <3*MDL (whichever is greater) was qualified as estimated, "J." All criteria were met.

Sample: 48MW07MSD, dieldrin

Conc. µg/L = (Ax * Vt * DF) / (CF * Vi * Vs *1000)

where: Ax = Area response for the compound being measured
Vt = Total volume of extract, taking into account dilutions (uL)
DF = Dilution factor
CF = Calibration Factor from initial calibration (area/pg)
Vi = Volume of extract injected (uL)
Vs = Volume of the sample extracted (mL)

Conc. µg/L = (5863511 * 1 * 10000) / (115500 * 510 * 1 * 1000)
= 1.0 ng/mL = 1.0 ug/L

Reported Conc. = 1.0 µg/L
%D = 0.0%
Values were within 10% difference

Sample: RB083007MS, Aroclor 1260

Conc. µg/L = (Ax * Vt * DF) / (CF * Vi * Vs * 1000)

where: Conc. = Sample concentration in µg/L
Ax = Area response for compound being measured.
Vt = Total volume of extract, taking into account dilutions (µL)
DF = Dilution factor
CF = Calibration factor from ICAL (area/pg)
Vi = Volume of extract injected (µL).
Vs = Volume of sample extracted (mL).

Signal #1
Conc1 µg/L = (3749063 * 10000* 1) / (9420 * 1 * 500 * 1000) = 7.96 µg/L
Conc2 µg/L = (4578443 * 10000* 1) / (11530 * 1 * 500 * 1000) = 7.94 µg/L
Conc3 µg/L = (4780110 * 10000* 1) / (12050 * 1 * 500 * 1000) = 7.93 µg/L
Conc4 µg/L = (3201148 * 10000* 1) / (8700 * 1 * 500 * 1000) = 7.36 µg/L
Conc5 µg/L = (7782711 * 10000* 1) / (20690 * 1 * 500 * 1000) = 7.52 µg/L
Conc6 µg/L = (4259347 * 10000* 1) / (12120 * 1 * 500 * 1000) = 7.03 µg/L
Average concentration = 7.6 µg/L

Reported Value = 7.6 µg/L (from signal #1)
% Difference = 0.0%
Values were within 10% difference.

USEPA Region III Validation Qualifiers

(No Code) = Confirmed identification.

B = The analyte has been detected in the sample and the associated laboratory or field blank.

J = Indicates an estimated value for (1) estimated value due to QC non-conformance. Reported value may not be accurate or precise, (2) estimating a concentration as a tentatively identified compound as indicated by the mass spectral and retention time data, or (3) estimating a concentration ≥ MDL and <MRL or <3*MDL, whichever is greater.

K = Analyte present. Reported value may be biased high (estimated) due to QC non-conformance.

L = Analyte present. Reported value may be biased low (estimated) due to QC non-conformance.

R = Unreliable result. Analyte may or may not be present in the sample due to QC non-conformance.

UL = Value is estimated bias low and not detected due to QC non-conformance. Reporting limit may be inaccurate or imprecise. Quantitation limit is probably higher.

UJ = Value is estimated and not detected due to QC non-conformance. Reporting limit may be inaccurate or imprecise.

Laboratory Qualifiers

(No Code) = Confirmed identification.

U = Not detected. The associated number indicates the compound reporting limit for the sample.

A (Dioxins) = B (Metals) = The reported value was obtained from a reading <MRL and ≥MDL and is considered estimated.

B (Organics) = The analyte or compound has been detected in the sample and laboratory method blank. It indicates probable blank contamination.

E (Metals) = Reported value is estimated because of the presence of interferences.

E (Organics) = Identifies compounds whose concentrations exceed the upper level of the calibration range.

EMPC (Dioxins) = The ion-abundance ratio between the two characteristic PCDD/PCDF ions was outside accepted ranges. The detected PCDD/PCDF was reported as an estimated maximum possible concentration (EMPC).

D = Indicates sample was analyzed at a dilution.

J = Indicates an estimated value for (1) estimating a concentration as a tentatively identified compound as indicated by the mass spectral and retention time data, or (2) estimating a concentration <MRL and ≥ MDL.

N (Organics) = Indicates presumptive evidence of a compound for tentatively identified compounds using a library search.

P (Organics) = Target analyte confirmation >40% difference for detected compound between the primary and secondary columns. The lower of the two values was reported.

N (Metals) = Laboratory spike sample recovery not within control limits.

* (Metals) = Duplicate analysis not within control limits.

* (Organics) = Surrogate outside of QC limits on both original and re-analysis.

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Report of Analysis

Client Sample ID:	RB083007		
Lab Sample ID:	F52208-1	Date Sampled:	08/30/07
Matrix:	AQ - Ground Water	Date Received:	08/31/07
Method:	SW846 8081A SW846 3510C	Percent Solids:	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	KK21923.D	1	09/24/07	FS	09/06/07	OP22237	GKK792
Run #2							

	Initial Volume	Final Volume
Run #1	1000 ml	10.0 ml
Run #2		

Pesticide TCL List

DATA VAL QUALIFIER

CAS No.	Compound	Result	RL	MDL	Units	Q
309-00-2	Aldrin	ND	0.050	0.010	ug/l	
319-84-6	alpha-BHC	ND	0.050	0.010	ug/l	
319-85-7	beta-BHC	ND	0.050	0.011	ug/l	
319-86-8	delta-BHC	ND	0.050	0.010	ug/l	
58-89-9	gamma-BHC (Lindane)	ND	0.050	0.010	ug/l	
5103-71-9	alpha-Chlordane	ND	0.050	0.010	ug/l	
5103-74-2	gamma-Chlordane	ND	0.050	0.010	ug/l	
60-57-1	Dieldrin	ND	0.050	0.010	ug/l	
72-54-8	4,4'-DDD	ND	0.10	0.020	ug/l	
72-55-9	4,4'-DDE	ND	0.10	0.020	ug/l	
50-29-3	4,4'-DDT	ND	0.10	0.020	ug/l	
72-20-8	Endrin	ND	0.10	0.020	ug/l	
1031-07-8	Endosulfan sulfate	ND	0.10	0.020	ug/l	
7421-93-4	Endrin aldehyde	ND	0.10	0.030	ug/l	UL
53494-70-5	Endrin ketone	ND	0.10	0.020	ug/l	
959-98-8	Endosulfan-I	ND	0.050	0.010	ug/l	
33213-65-9	Endosulfan-II	ND	0.10	0.010	ug/l	
76-44-8	Heptachlor	ND	0.050	0.010	ug/l	
1024-57-3	Heptachlor epoxide	ND	0.050	0.010	ug/l	
72-43-5	Methoxychlor	ND	0.10	0.020	ug/l	
8001-35-2	Toxaphene	ND	2.5	1.3	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	85%		42-127%
2051-24-3	Decachlorobiphenyl	83%		27-127%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	RB083007		
Lab Sample ID:	F52208-1	Date Sampled:	08/30/07
Matrix:	AQ - Ground Water	Date Received:	08/31/07
Method:	SW846 8082 SW846 3510C	Percent Solids:	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	ST66576.D	1	09/14/07	JB	09/06/07	OP22238	GST1731
Run #2							

	Initial Volume	Final Volume
Run #1	1000 ml	10.0 ml
Run #2		

PCB List

CAS No.	Compound	Result	RL	MDL	Units	Q
12674-11-2	Aroclor 1016	ND	0.50	0.25	ug/l	
11104-28-2	Aroclor 1221	ND	0.50	0.40	ug/l	
11141-16-5	Aroclor 1232	ND	0.50	0.40	ug/l	
53469-21-9	Aroclor 1242	ND	0.50	0.25	ug/l	
12672-29-6	Aroclor 1248	ND	0.50	0.25	ug/l	
11097-69-1	Aroclor 1254	ND	0.50	0.25	ug/l	
11096-82-5	Aroclor 1260	ND	0.50	0.25	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	80%		38-127%
2051-24-3	Decachlorobiphenyl	82%		25-137%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: KK21924.D

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Report of Analysis

3.2

Client Sample ID:	50MW01		
Lab Sample ID:	F52208-2	Date Sampled:	08/30/07
Matrix:	AQ - Ground Water	Date Received:	08/31/07
Method:	SW846 8081A SW846 3510C	Percent Solids:	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	KK21924.D	1	09/24/07	FS	09/06/07	OP22237	GKK792
Run #2							

	Initial Volume	Final Volume
Run #1	1000 ml	10.0 ml
Run #2		

Pesticide TCL List

DATA VAL QUALIFIER

CAS No.	Compound	Result	RL	MDL	Units	Q
309-00-2	Aldrin	ND	0.050	0.010	ug/l	
319-84-6	alpha-BHC	ND	0.050	0.010	ug/l	
319-85-7	beta-BHC	ND	0.050	0.011	ug/l	
319-86-8	delta-BHC	ND	0.050	0.010	ug/l	
58-89-9	gamma-BHC (Lindane)	ND	0.050	0.010	ug/l	
5103-71-9	alpha-Chlordane	ND	0.050	0.010	ug/l	
5103-74-2	gamma-Chlordane	ND	0.050	0.010	ug/l	
60-57-1	Dieldrin	ND	0.050	0.010	ug/l	
72-54-8	4,4'-DDD	ND	0.10	0.020	ug/l	
72-55-9	4,4'-DDE	ND	0.10	0.020	ug/l	
50-29-3	4,4'-DDT	ND	0.10	0.020	ug/l	
72-20-8	Endrin	ND	0.10	0.020	ug/l	
1031-07-8	Endosulfan sulfate	ND	0.10	0.020	ug/l	
7421-93-4	Endrin aldehyde	ND	0.10	0.030	ug/l	UL
53494-70-5	Endrin ketone	ND	0.10	0.020	ug/l	
959-98-8	Endosulfan-I	ND	0.050	0.010	ug/l	
33213-65-9	Endosulfan-II	ND	0.10	0.010	ug/l	
76-44-8	Heptachlor	ND	0.050	0.010	ug/l	
1024-57-3	Heptachlor epoxide	ND	0.050	0.010	ug/l	
72-43-5	Methoxychlor	ND	0.10	0.020	ug/l	
8001-35-2	Toxaphene	ND	2.5	1.3	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	84%		42-127%
2051-24-3	Decachlorobiphenyl	36%		27-127%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	50MW01		
Lab Sample ID:	F52208-2	Date Sampled:	08/30/07
Matrix:	AQ - Ground Water	Date Received:	08/31/07
Method:	SW846 8082 SW846 3510C	Percent Solids:	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	ST66572.D	1	09/14/07	JB	09/06/07	OP22238	GST1731
Run #2							

	Initial Volume	Final Volume
Run #1	1000 ml	10.0 ml
Run #2		

PCB List

CAS No.	Compound	Result	RL	MDL	Units	Q
12674-11-2	Aroclor 1016	ND	0.50	0.25	ug/l	
11104-28-2	Aroclor 1221	ND	0.50	0.40	ug/l	
11141-16-5	Aroclor 1232	ND	0.50	0.40	ug/l	
53469-21-9	Aroclor 1242	ND	0.50	0.25	ug/l	
12672-29-6	Aroclor 1248	ND	0.50	0.25	ug/l	
11097-69-1	Aroclor 1254	ND	0.50	0.25	ug/l	
11096-82-5	Aroclor 1260	ND	0.50	0.25	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	79%		38-127%
2051-24-3	Decachlorobiphenyl	37%		25-137%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	48MW07		
Lab Sample ID:	F52208-3	Date Sampled:	08/30/07
Matrix:	AQ - Ground Water	Date Received:	08/31/07
Method:	SW846 8081A SW846 3510C	Percent Solids:	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	KK21928.D	1	09/24/07	FS	09/06/07	OP22237	GKK792
Run #2							

	Initial Volume	Final Volume
Run #1	1020 ml	10.0 ml
Run #2		

Pesticide TCL List

DATA VAL QUALIFIER

CAS No.	Compound	Result	RL	MDL	Units	Q
309-00-2	Aldrin	ND	0.049	0.0098	ug/l	
319-84-6	alpha-BHC	ND	0.049	0.0098	ug/l	
319-85-7	beta-BHC	ND	0.049	0.011	ug/l	
319-86-8	delta-BHC	ND	0.049	0.0098	ug/l	
58-89-9	gamma-BHC (Lindane)	ND	0.049	0.0098	ug/l	
5103-71-9	alpha-Chlordane	ND	0.049	0.0098	ug/l	
5103-74-2	gamma-Chlordane	ND	0.049	0.0098	ug/l	
60-57-1	Dieldrin	ND	0.049	0.0098	ug/l	
72-54-8	4,4'-DDD	ND	0.098	0.020	ug/l	
72-55-9	4,4'-DDE	ND	0.098	0.020	ug/l	
50-29-3	4,4'-DDT	ND	0.098	0.020	ug/l	
72-20-8	Endrin	ND	0.098	0.020	ug/l	
1031-07-8	Endosulfan sulfate	ND	0.098	0.020	ug/l	
7421-93-4	Endrin aldehyde	ND	0.098	0.029	ug/l	UL
53494-70-5	Endrin ketone	ND	0.098	0.020	ug/l	
959-98-8	Endosulfan-I	ND	0.049	0.0098	ug/l	
33213-65-9	Endosulfan-II	ND	0.098	0.0098	ug/l	
76-44-8	Heptachlor	ND	0.049	0.0098	ug/l	
1024-57-3	Heptachlor epoxide	ND	0.049	0.0098	ug/l	
72-43-5	Methoxychlor	ND	0.098	0.020	ug/l	
8001-35-2	Toxaphene	ND	2.5	1.2	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	84%		42-127%
2051-24-3	Decachlorobiphenyl	74%		27-127%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	48MW07		
Lab Sample ID:	F52208-3	Date Sampled:	08/30/07
Matrix:	AQ - Ground Water	Date Received:	08/31/07
Method:	SW846 8082 SW846 3510C	Percent Solids:	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	ST66579.D	1	09/14/07	JB	09/06/07	OP22238	GST1731
Run #2							

	Initial Volume	Final Volume
Run #1	1020 ml	10.0 ml
Run #2		

PCB List

CAS No.	Compound	Result	RL	MDL	Units	Q
12674-11-2	Aroclor 1016	ND	0.49	0.25	ug/l	
11104-28-2	Aroclor 1221	ND	0.49	0.39	ug/l	
11141-16-5	Aroclor 1232	ND	0.49	0.39	ug/l	
53469-21-9	Aroclor 1242	ND	0.49	0.25	ug/l	
12672-29-6	Aroclor 1248	ND	0.49	0.25	ug/l	
11097-69-1	Aroclor 1254	ND	0.49	0.25	ug/l	
11096-82-5	Aroclor 1260	ND	0.49	0.25	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	80%		38-127%
2051-24-3	Decachlorobiphenyl	74%		25-137%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: KK21925.D

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Report of Analysis

Client Sample ID:	50MW02		
Lab Sample ID:	F52208-4	Date Sampled:	08/30/07
Matrix:	AQ - Ground Water	Date Received:	08/31/07
Method:	SW846 8081A SW846 3510C	Percent Solids:	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	KK21925.D	1	09/24/07	FS	09/06/07	OP22237	GKK792
Run #2							

	Initial Volume	Final Volume
Run #1	1020 ml	10.0 ml
Run #2		

Pesticide TCL List

DATA VAL QUALIFIER

CAS No.	Compound	Result	RL	MDL	Units	Q
309-00-2	Aldrin	ND	0.049	0.0098	ug/l	UJ
319-84-6	alpha-BHC	ND	0.049	0.0098	ug/l	
319-85-7	beta-BHC	ND	0.049	0.011	ug/l	
319-86-8	delta-BHC	ND	0.049	0.0098	ug/l	
58-89-9	gamma-BHC (Lindane)	ND	0.049	0.0098	ug/l	
5103-71-9	alpha-Chlordane	ND	0.049	0.0098	ug/l	
5103-74-2	gamma-Chlordane	ND	0.049	0.0098	ug/l	
60-57-1	Dieldrin	ND	0.049	0.0098	ug/l	
72-54-8	4,4'-DDD	ND	0.098	0.020	ug/l	
72-55-9	4,4'-DDE	ND	0.098	0.020	ug/l	
50-29-3	4,4'-DDT	ND	0.098	0.020	ug/l	
72-20-8	Endrin	ND	0.098	0.020	ug/l	
1031-07-8	Endosulfan sulfate	ND	0.098	0.020	ug/l	
7421-93-4	Endrin aldehyde	ND	0.098	0.029	ug/l	
53494-70-5	Endrin ketone	ND	0.098	0.020	ug/l	
959-98-8	Endosulfan-I	ND	0.049	0.0098	ug/l	
33213-65-9	Endosulfan-II	ND	0.098	0.0098	ug/l	
76-44-8	Heptachlor	ND	0.049	0.0098	ug/l	
1024-57-3	Heptachlor epoxide	ND	0.049	0.0098	ug/l	
72-43-5	Methoxychlor	ND	0.098	0.020	ug/l	
8001-35-2	Toxaphene	ND	2.5	1.2	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	89%		42-127%
2051-24-3	Decachlorobiphenyl	28%		27-127%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	50MW02		
Lab Sample ID:	F52208-4	Date Sampled:	08/30/07
Matrix:	AQ - Ground Water	Date Received:	08/31/07
Method:	SW846 8082 SW846 3510C	Percent Solids:	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	ST66573.D	1	09/14/07	JB	09/06/07	OP22238	GST1731
Run #2							

	Initial Volume	Final Volume
Run #1	1020 ml	10.0 ml
Run #2		

PCB List

DATA VAL QUALIFIER

CAS No.	Compound	Result	RL	MDL	Units	Q	
12674-11-2	Aroclor 1016	ND	0.49	0.25	ug/l		UJ
11104-28-2	Aroclor 1221	ND	0.49	0.39	ug/l		
11141-16-5	Aroclor 1232	ND	0.49	0.39	ug/l		
53469-21-9	Aroclor 1242	ND	0.49	0.25	ug/l		
12672-29-6	Aroclor 1248	ND	0.49	0.25	ug/l		
11097-69-1	Aroclor 1254	ND	0.49	0.25	ug/l		
11096-82-5	Aroclor 1260	ND	0.49	0.25	ug/l		

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	82%		38-127%
2051-24-3	Decachlorobiphenyl	26%		25-137%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: KK21931.D

Accutest LabLink@70184 17:26 25-Oct-2007

Report of Analysis

3.5

Client Sample ID:	48MW05		
Lab Sample ID:	F52208-5	Date Sampled:	08/30/07
Matrix:	AQ - Ground Water	Date Received:	08/31/07
Method:	SW846 8081A SW846 3510C	Percent Solids:	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	KK21931.D	1	09/24/07	FS	09/06/07	OP22237	GKK792
Run #2							

	Initial Volume	Final Volume
Run #1	1000 ml	10.0 ml
Run #2		

Pesticide TCL List

DATA VAL QUALIFIER

CAS No.	Compound	Result	RL	MDL	Units	Q
309-00-2	Aldrin	ND	0.050	0.010	ug/l	
319-84-6	alpha-BHC	ND	0.050	0.010	ug/l	
319-85-7	beta-BHC	ND	0.050	0.011	ug/l	
319-86-8	delta-BHC	ND	0.050	0.010	ug/l	
58-89-9	gamma-BHC (Lindane)	ND	0.050	0.010	ug/l	
5103-71-9	alpha-Chlordane	ND	0.050	0.010	ug/l	
5103-74-2	gamma-Chlordane	ND	0.050	0.010	ug/l	
60-57-1	Dieldrin	ND	0.050	0.010	ug/l	
72-54-8	4,4'-DDD	ND	0.10	0.020	ug/l	
72-55-9	4,4'-DDE	ND	0.10	0.020	ug/l	
50-29-3	4,4'-DDT	ND	0.10	0.020	ug/l	
72-20-8	Endrin	ND	0.10	0.020	ug/l	
1031-07-8	Endosulfan sulfate	ND	0.10	0.020	ug/l	
7421-93-4	Endrin aldehyde	ND	0.10	0.030	ug/l	UL
53494-70-5	Endrin ketone	ND	0.10	0.020	ug/l	
959-98-8	Endosulfan-I	ND	0.050	0.010	ug/l	
33213-65-9	Endosulfan-II	ND	0.10	0.010	ug/l	
76-44-8	Heptachlor	ND	0.050	0.010	ug/l	
1024-57-3	Heptachlor epoxide	ND	0.050	0.010	ug/l	
72-43-5	Methoxychlor	ND	0.10	0.020	ug/l	
8001-35-2	Toxaphene	ND	2.5	1.3	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	81%		42-127%
2051-24-3	Decachlorobiphenyl	35%		27-127%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest LabLink@70184 17:26 25-Oct-2007

Report of Analysis

3.5

Client Sample ID:	48MW05		
Lab Sample ID:	F52208-5	Date Sampled:	08/30/07
Matrix:	AQ - Ground Water	Date Received:	08/31/07
Method:	SW846 8082 SW846 3510C	Percent Solids:	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	ST66574.D	1	09/14/07	JB	09/06/07	OP22238	GST1731
Run #2							

	Initial Volume	Final Volume
Run #1	1000 ml	10.0 ml
Run #2		

PCB List

DATA VAL QUALIFIER

CAS No.	Compound	Result	RL	MDL	Units	Q	
12674-11-2	Aroclor 1016	ND	0.50	0.25	ug/l		UJ
11104-28-2	Aroclor 1221	ND	0.50	0.40	ug/l		
11141-16-5	Aroclor 1232	ND	0.50	0.40	ug/l		
53469-21-9	Aroclor 1242	ND	0.50	0.25	ug/l		
12672-29-6	Aroclor 1248	ND	0.50	0.25	ug/l		
11097-69-1	Aroclor 1254	ND	0.50	0.25	ug/l		
11096-82-5	Aroclor 1260	ND	0.50	0.25	ug/l		

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	80%		38-127%
2051-24-3	Decachlorobiphenyl	34%		25-137%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: KK21932.D

Accutest LabLink@70184 17:26 25-Oct-2007

Report of Analysis

3.6

Client Sample ID:	48MW06		
Lab Sample ID:	F52208-6	Date Sampled:	08/30/07
Matrix:	AQ - Ground Water	Date Received:	08/31/07
Method:	SW846 8081A SW846 3510C	Percent Solids:	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	KK21932.D	1	09/24/07	FS	09/06/07	OP22237	GKK792
Run #2							

	Initial Volume	Final Volume
Run #1	1000 ml	10.0 ml
Run #2		

Pesticide TCL List

DATA VAL QUALIFIER

CAS No.	Compound	Result	RL	MDL	Units	Q
309-00-2	Aldrin	ND	0.050	0.010	ug/l	
319-84-6	alpha-BHC	ND	0.050	0.010	ug/l	
319-85-7	beta-BHC	ND	0.050	0.011	ug/l	
319-86-8	delta-BHC	ND	0.050	0.010	ug/l	
58-89-9	gamma-BHC (Lindane)	ND	0.050	0.010	ug/l	
5103-71-9	alpha-Chlordane	ND	0.050	0.010	ug/l	
5103-74-2	gamma-Chlordane	ND	0.050	0.010	ug/l	
60-57-1	Dieldrin	ND	0.050	0.010	ug/l	
72-54-8	4,4'-DDD	ND	0.10	0.020	ug/l	
72-55-9	4,4'-DDE	ND	0.10	0.020	ug/l	
50-29-3	4,4'-DDT	ND	0.10	0.020	ug/l	
72-20-8	Endrin	ND	0.10	0.020	ug/l	
1031-07-8	Endosulfan sulfate	ND	0.10	0.020	ug/l	
7421-93-4	Endrin aldehyde	ND	0.10	0.030	ug/l	UL
53494-70-5	Endrin ketone	ND	0.10	0.020	ug/l	
959-98-8	Endosulfan-I	ND	0.050	0.010	ug/l	
33213-65-9	Endosulfan-II	ND	0.10	0.010	ug/l	
76-44-8	Heptachlor	ND	0.050	0.010	ug/l	
1024-57-3	Heptachlor epoxide	ND	0.050	0.010	ug/l	
72-43-5	Methoxychlor	ND	0.10	0.020	ug/l	
8001-35-2	Toxaphene	ND	2.5	1.3	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	72%		42-127%
2051-24-3	Decachlorobiphenyl	41%		27-127%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest LabLink@70184 17:26 25-Oct-2007

Report of Analysis

Client Sample ID:	48MW06		
Lab Sample ID:	F52208-6	Date Sampled:	08/30/07
Matrix:	AQ - Ground Water	Date Received:	08/31/07
Method:	SW846 8082 SW846 3510C	Percent Solids:	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	ST66575.D	1	09/14/07	JB	09/06/07	OP22238	GST1731
Run #2							

	Initial Volume	Final Volume
Run #1	1000 ml	10.0 ml
Run #2		

PCB List

CAS No.	Compound	Result	RL	MDL	Units	Q
12674-11-2	Aroclor 1016	ND	0.50	0.25	ug/l	
11104-28-2	Aroclor 1221	ND	0.50	0.40	ug/l	
11141-16-5	Aroclor 1232	ND	0.50	0.40	ug/l	
53469-21-9	Aroclor 1242	ND	0.50	0.25	ug/l	
12672-29-6	Aroclor 1248	ND	0.50	0.25	ug/l	
11097-69-1	Aroclor 1254	ND	0.50	0.25	ug/l	
11096-82-5	Aroclor 1260	ND	0.50	0.25	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	74%		38-127%
2051-24-3	Decachlorobiphenyl	41%		25-137%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Shaw® Shaw Environmental, Inc.

MEMORANDUM

TO: Jeff Parks, Shaw E&I Radford Army Ammunition Plant (RFAAP) Project Manager

FROM: Richard McCracken, Shaw E&I Project Chemist

SUBJECT: RFAAP Data Validation – Semi-Volatiles & Polynuclear Aromatic Hydrocarbons Accutest Laboratories, Inc., SDG F52208

DATE: October 29, 2007

The purpose of this memorandum is to present the data validation report for the samples collected at RFAAP on August 30, 2007. Samples were analyzed for semivolatile organic compounds (SVOCs) using USEPA SW846 Methods 3510C/8270C. The polynuclear aromatic hydrocarbons (PAHs) were analyzed using selective ion monitoring (SIM) techniques. A total of six aqueous samples were validated. The sample IDs are:

Field Sample ID	Lab Sample ID	Field Sample ID	Lab Sample ID
RB083007	F52208-1	50MW02	F52208-4
50MW01	F52208-2	48MW05	F52208-5
48MW07	F52208-3	48MW06	F52208-6

Data were reviewed by Richard McCracken and validated using a combination of project QAPP, *Quality Systems Manual for Environmental Laboratories, Final Version 3, January, 2006* (DoD, 2006) (DoD QSM), method-specific criteria, and laboratory SOP criteria. The data qualifier scheme was consistent with the *Region III Modifications to the National Functional Guidelines for Organic Data Review* (September 1994). Parameters evaluated are presented in **Table 1**. Data associated with parameters in compliance with quality control specifications have not been qualified. Data associated with parameters that did not comply with quality control specifications and directly impacted project data have been qualified in accordance with USEPA Region III specifications.

Table 1 Laboratory Performance Criteria

Qualified		Parameter
Yes	No	
	X	Holding Times and Preservation
	X	Instrument Performance Check
	X	Initial Calibration
	X	Continuing Calibration
	X	Blank Analysis
	X	Surrogate Spikes
	X	Internal Standards
X		Laboratory Control Sample
	X	Matrix Spike/Spike Duplicate
	X	Field Duplicate
	X	Quantitation Verification

The quality of data collected in support of this sampling activity is considered acceptable with noted qualifications.

Richard McCracken, Chemist

10/29/07
Date

RFAAP VALIDATION REPORT
SEMIVOLATILES AND PAH REVIEW
SDG F52208

I-Holding Times and Preservation
The objective is to ascertain the validity of results based on the holding time of the sample from time of collection to time of sample extraction and analysis. Holding time criteria: For semivolatile (SVOC) and polynuclear aromatic hydrocarbons (PAH) compounds, the samples are cooled @4°C ± 2°C for aqueous samples with a maximum holding time of 7 days from sample collection to preparative extraction and 40 days from preparative extraction to determinative analysis.

- Temperature Review: A temperature blank was sent with each cooler and recorded by the laboratory upon receipt. The samples collected on 8/30/07 were sent in 15 coolers, and were received by the laboratory on 8/31/07 at temperatures ranging from 0.6°C to 2.2°C, with 12 of the 15 coolers having temperatures below 2.0°C. The low sample temperatures are not expected to have an adverse impact on the analytical results. No qualifiers were applied.

- Holding Time Review: The aqueous samples were collected on 8/30/07, extracted for SVOCs on 9/6/07, extracted for PAHs by SIM on 9/6/07, analyzed for SVOCs on 9/15/07, and analyzed for PAHs by SIM on 9/20/07. All criteria were met. No qualifiers were applied.

II-Instrument Performance Check
GC/MS instrument performance checks are performed to ensure mass resolution, identification and, to some degree, sensitivity. The analysis of the instrument performance check solution must be performed at the beginning of each 12-hour period during which samples are analyzed.

- The instrument performance check, decafluorotriphenylphosphine (DFTPP), met the ion abundance criteria. No qualification was applied.

III-Initial Calibration
Compliance requirements for satisfactory instrument calibration are established to ensure that the instrument used is capable of producing acceptable qualitative and quantitative data for compounds on the semivolatile target compound list (TCL). Initial calibration demonstrates that the instrument is capable of acceptable performance in the beginning of the analytical run and of producing a linear calibration curve. For compounds analyzed using linear regression or second order, correlation coefficients must be >0.995 and coefficients of determination >0.99. The minimum relative response factor (RRF) criteria must be ≥0.05. The DoD QSM specifies that the initial calibration percent relative standard deviation (%RSD) must be ≤15% on the average for all compounds (<30% for CCCs). All detects are qualified as estimated "J" for where there were exceeding %RSDs, and all non-detects are qualified as estimated "UJ" for where there were grossly exceeding recoveries, unless determined to be unusable "R". Grossly exceeding is defined as twice the established criteria limits. For where there were low RRFs, all detects are qualified as estimated "J" and non-detects are rejected "R".

- Initial calibration for the SVOCs was performed on 9/14/07 using instrument GCMSR. Target compounds hexachlorocyclopentadiene (18.08%), 2,4-dinitrophenol (38.83%), and 4,6-dinitro-2-methylphenol (18.05%) had %RSDs outside criteria. All other target compounds were within criteria (%RSD≤15% or ≤30%; RRF≥0.05). The compounds with high %RSD were quantified using second order regression, and had correlation coefficients >0.995; therefore no qualifiers were applied. All samples were analyzed in conjunction with this initial calibration.

- Initial calibration for the PAHs-SIM was performed on 9/20/07 using instrument GCMSR, all target compounds were within criteria (%RSD≤15% or ≤30%; RRF≥0.05). No qualifiers were applied. Naphthalene (r=0.9986) and dibenzo(a,h)anthracene (r=0.9993) were quantified using second order regression with correlation coefficients >0.995. All samples were analyzed in conjunction with this initial calibration.

IV-Continuing Calibration

Compliance requirements for satisfactory instrument calibration are established to ensure that the instrument used was capable of producing acceptable qualitative and quantitative data for semivolatile target compounds. Continuing calibration standards containing both target and surrogates compounds are analyzed at the beginning of each 12-hour analysis period following the analysis of the instrument performance check and prior to the analysis of blanks and samples. The minimum relative response factors (RRF) for semivolatile target compounds and surrogates must be ≥0.05. The DoD QSM specifies that the percent difference (%D) between the initial calibration RRF and the continuing calibration RRF must be within ±20% for all target compounds. Grossly exceeding is defined where %D>40%. All detects are qualified as estimated "J" for where there were exceeding %Ds, and all non-detects are qualified as estimated "UJ" for where there were grossly exceeding recoveries, unless determined to be unusable "R". Grossly exceeding is defined as twice the established criteria limits. For where there were low RRFs, all detects are qualified as estimated "J" and non-detects are rejected "R".

- During the SVOC initial calibration verification performed on 9/14/07 @1502 using instrument GCMSR, bis(2-chloroethoxy)methane (24.6%), 4-chloroaniline (26.6%), and 3-nitroaniline (29.7%) had %D outside criteria. All other target compounds met criteria. No samples were analyzed following this initial calibration verification, no qualifiers were applied.

- During the SVOC continuing calibration performed on 9/15/07 @1225 using instrument GCMSR, all criteria were met for all target compounds. No qualifiers were applied. All samples were analyzed following this continuing calibration.

- During the PAH-SIM initial calibration verification performed on 9/20/07 @1436 using instrument GCMSR, all criteria were met for all target compounds. No qualifiers were applied. No samples were analyzed following this initial calibration verification.

- During the PAH-SIM continuing calibration performed on 9/20/07 @1520 using instrument GCMSR, all criteria were met for all target compounds. No qualifiers were applied. All samples were analyzed following this continuing calibration.

V-Blank Analysis

The purpose of blank analyses is to determine the presence and magnitude of contamination problems resulting from field and laboratory activities. A method blank analysis must be performed after the calibration standards and once every 12-hour time period beginning with the injection of DFTPP. No contaminants should be detected in any of the associated blanks > the MDL. DoD QSM criteria specifies all concentrations should be less than one-half MRL (<MRL for common laboratory contaminants phthalate esters). Positive sample results are reported and qualified "B", if the concentration of the compound in the sample is ≤10 times (10x) the maximum amount in any blank for the common laboratory contaminants phthalate esters, or 5 times (5X) the maximum amount for other semivolatile target compounds. **Table 2** summarizes the blank contamination analysis.

Table 2 Blank Contamination Analysis Summary

Analysis Date	QC Blank ID	Compound	Max Conc. µg/L	Action Level µg/L	B qualified samples
9/15/07	OP22221-MB	All SVOC target <½MRL	NA	NA	None
9/20/07	OP22222-MB	All PAH SIM target <½MRL	NA	NA	None
9/15/07	RB083007	All SVOC target <½MRL	NA	NA	None
9/20/07	RB083007	All PAH SIM target <½MRL	NA	NA	None

NA = Not applicable.
MRL = Method reporting limit.

VI-Surrogate Spikes
Laboratory performance on individual samples is evaluated through the review of surrogate spike samples. Surrogate spikes are added to all samples and blanks to measure their recovery in sample and blank matrices. The percent recoveries (%Rs) must be within the specified control limits. DoD surrogate recovery limits are specified in Table D-2 and Table D-3 of the DoD QSM (DoD, 2006). If the surrogate is not listed, then the laboratory criteria shall be used.

Aqueous Criteria:
2-Fluorophenol (14-62%) – (DoD QSM = 20-110%)
Phenol – d5 (10-40%) – (DoD QSM = 10-115%)
2,4,6-Tribromophenol (33-118%) – (DoD QSM = 40-125%)
Nitrobenzene-d5 (42-108%) – (DoD QSM = 40-110%)
2-Fluorobiphenyl (40-106%) – (DoD QSM = 50-110%)
p-Terphenyl – d14 (39-121%) – (DoD QSM = 50-135%)

- The MS had a high 2-fluorophenol (63.0%) recovery, while the MS and MSD had high phenol-d5 (56.0%, 56.0%) recoveries. The unspiked sample surrogate recoveries met criteria, no qualifiers were applied.

- All other field samples met surrogate recovery criteria. No qualifiers were applied.

VII-Internal Standards
Internal standards performance criteria ensure that GC/MS sensitivity and response are stable during every analytical run. Internal standard area counts for samples and blanks must not vary by more than a factor of two (-50% to +100%) from the associated calibration standard. The retention time of the internal standards in samples and blanks must not vary by more than ±30 seconds from the retention time of the associated calibration standard.

- All criteria were met. No qualifiers were applied.

VIII-Laboratory Control Sample
Laboratory control samples (LCS) are used to monitor laboratory accuracy by calculating the percent recoveries of the spiked compounds. All LCS percent recoveries must be within the specified control limits. DoD LCS aqueous recovery limits are specified in Table D-2 and Table D-6 of the DoD QSM (DoD, 2006). If the compound is not listed, then the laboratory criteria shall be used.

- Sample OP22221-BS was used as the aqueous LCS for the SVOC analysis on 9/15/07. 1,3-Dichlorobenzene (37%) and 1,4-dichlorobenzene (39%) had recoveries below criteria. The results for these two compounds in the associated samples have been qualified "L/UL" as estimated. All other compounds were within criteria. All samples were analyzed in conjunction with this LCS.

- Sample OP22222-BS was used as the aqueous LCS for the PAH-SIM analysis on 9/20/07. All criteria were met. No qualifiers were applied. All samples were analyzed in conjunction with this LCS.

IX-Matrix Spike/Matrix Spike Duplicate
Data for matrix spike/matrix spike duplicates (MS/MSD) are generated to determine long-term precision and accuracy of the analytical method on various matrices and to demonstrate acceptable compound recovery by the laboratory at the time of sample analysis. The percent recoveries (%Rs) and the relative percent difference (RPD) must be within the specified control limits. DoD aqueous MS/MSD recovery limits follow the LCS criteria and are specified in Table D-2 and Table D-6 of the DoD QSM (DoD, 2006). If the compound is not listed, then the laboratory criteria shall be used.

- Sample 50MW01 was used for the aqueous MS/MSD during SVOC analysis on 9/15/07. 4-Nitrophenol (60%, 60%) had high recoveries in the MS & MSD. All other compounds met criteria. The associated LCS met criteria for 4-nitrophenol, and it was not detected in any samples so no qualifiers were applied. All samples were analyzed in conjunction with this MS/MSD.

- Sample F52202-1 was used for the MS/MSD for the solid PAH SIM analysis on 9/20/07. The spiked sample was not a RFAAP site sample; therefore, it was not evaluated. All samples were analyzed in conjunction with this MS/MSD.

X-Field Duplicate Sample Analysis
Field duplicates were collected to identify the cumulative precision of the sampling and analytical process and sent to the laboratory blind. The RPD was calculated only for those analytes which were detected at levels exceeding the method reporting limits in both samples of the duplicate pair. Analytes that were rejected (R-qualified) in either sample of the duplicate pair were excluded from the duplicate assessment. Precision control criterion was established at 50% RPD for the aqueous and solid samples. Analytical results were qualified as estimated (J) for any RPDs exceeding criteria.

- No field duplicates were included in this data set.

XI-Quantitation Verification

The accuracy of analytical results was verified through the calculation of several parameters. Percent difference (%D) between the calculated and reported values must be ≤10%. Any sample value >MDL and <MRL or <3*MDL (whichever is greater) was qualified as estimated, "J."

Sample: 50MW02, bis(2-ethylhexyl)phthalate

Conc. (µg/L) = {(Ax)*(Is)*(Vt)*(DF)}/{(Ais)*(RRF)*(V_o)*(V_i)}

where:	$Conc_{sample}$	=	Sample concentration in µg/L
	A_x	=	Area of characteristic ion for compound being measured.
	I_s	=	Amount of internal standard injected (ng).
	V_t	=	Volume of total extract, taking into account dilutions (i.e., a 1-to-10 dilution of a 1-mL extract will mean V(t) = 10,000 µL.
	A_{is}	=	Area of characteristic ion for the internal standard.
	RRF_A	=	Average relative response factor for compound being measured
	V_o	=	Volume of water extracted (mL).
	V_i	=	Volume of extract injected (µL).
	DF	=	Dilution Factor

Conc. µg/L = (69077 * 40 * 1000 * 1) / (424945 * 0.797 * 1020 * 1) = 8 ng/mL
= 8 µg/L

Reported Value = 8 µg/L
% Difference = 0.0%
Values were within 10% difference.

Sample: OP22222-BS, bezno(a)pyrene

Conc. (µg/L) = {(Ax)*(Is)*(Vt)*(DF)}/{(Ais)*(RRF)*(V_o)*(V_i)}

where:	$Conc_{sample}$	=	Sample concentration in µg/L
	A_x	=	Area of characteristic ion for compound being measured.
	I_s	=	Amount of internal standard injected (ng).
	V_t	=	Volume of total extract, taking into account dilutions (i.e., a 1-to-10 dilution of a 1-mL extract will mean V(t) = 10,000 µL.
	A_{is}	=	Area of characteristic ion for the internal standard.
	RRF_A	=	Average relative response factor for compound being measured
	V_o	=	Volume of water extracted (mL).
	V_i	=	Volume of extract injected (µL).
	DF	=	Dilution Factor

Conc. µg/L = (80494 * 4 * 1000 * 1) / (116277 * 1.238 * 1000 * 1) = 2.2 ng/mL
= 2.2 µg/L

Reported Value = 2.2 µg/L
% Difference = 0.0%
Values were within 10% difference.

USEPA Region III Validation Qualifiers

(No Code) = Confirmed identification.

B = The analyte has been detected in the sample and the associated laboratory or field blank.

J = Indicates an estimated value for (1) estimated value due to QC non-conformance. Reported value may not be accurate or precise, (2) estimating a concentration as a tentatively identified compound as indicated by the mass spectral and retention time data, or (3) estimating a concentration ≥MDL and <MRL or <3*MDL, whichever is greater.

K = Analyte present. Reported value may be biased high (estimated) due to QC non-conformance.

L = Analyte present. Reported value may be biased low (estimated) due to QC non-conformance.

R = Unreliable result. Analyte may or may not be present in the sample due to QC non-conformance.

UL = Value is estimated bias low and not detected due to QC non-conformance. Reporting limit may be inaccurate or imprecise. Quantitation limit is probably higher.

UJ = Value is estimated and not detected due to QC non-conformance. Reporting limit may be inaccurate or imprecise.

Laboratory Qualifiers

(No Code) = Confirmed identification.

U = Not detected. The associated number indicates the compound reporting limit for the sample.

A (Dioxins) = B (Metals) = The reported value was obtained from a reading <MRL and ≥MDL and is considered estimated.

B (Organics) = The analyte or compound has been detected in the sample and laboratory method blank. It indicates probable blank contamination.

E (Metals) = Reported value is estimated because of the presence of interferences.

E (Organics) = Identifies compounds whose concentrations exceed the upper level of the calibration range.

EMPC (Dioxins) = The ion-abundance ratio between the two characteristic PCDD/PCDF ions was outside accepted ranges. The detected PCDD/PCDF was reported as an estimated maximum possible concentration (EMPC).

D = Indicates sample was analyzed at a dilution.

J = Indicates an estimated value for (1) estimating a concentration as a tentatively identified compound as indicated by the mass spectral and retention time data, or (2) estimating a concentration <MRL and ≥MDL.

N (Organics) = Indicates presumptive evidence of a compound for tentatively identified compounds using a library search.

N (Metals) = Laboratory spike sample recovery not within control limits.

P (Organics) = Target analyte confirmation >40% difference for detected compound between the primary and secondary columns. The lower of the two values was reported.

* (Metals) = Duplicate analysis not within control limits.

* (Organics) = Surrogate outside of QC limits on both original and re-analysis.

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Report of Analysis

Client Sample ID:	RB083007		
Lab Sample ID:	F52208-1	Date Sampled:	08/30/07
Matrix:	AQ - Ground Water	Date Received:	08/31/07
Method:	SW846 8270C SW846 3510C	Percent Solids:	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	R10641.D	1	09/15/07	NJ	09/06/07	OP22221	SR497
Run #2							

	Initial Volume	Final Volume
Run #1	1000 ml	1.0 ml
Run #2		

ABN TCL List w/o PAHs

CAS No.	Compound	Result	RL	MDL	Units	Q (DATA VAL QUALIFIER)
65-85-0	Benzoic Acid	ND	25	10	ug/l	
95-57-8	2-Chlorophenol	ND	5.0	1.0	ug/l	
59-50-7	4-Chloro-3-methyl phenol	ND	5.0	2.0	ug/l	
120-83-2	2,4-Dichlorophenol	ND	5.0	1.0	ug/l	
105-67-9	2,4-Dimethylphenol	ND	5.0	2.0	ug/l	
51-28-5	2,4-Dinitrophenol	ND	25	10	ug/l	
534-52-1	4,6-Dinitro-o-cresol	ND	10	2.0	ug/l	
95-48-7	2-Methylphenol	ND	5.0	1.0	ug/l	
	3&4-Methylphenol	ND	5.0	1.3	ug/l	
88-75-5	2-Nitrophenol	ND	5.0	1.0	ug/l	
100-02-7	4-Nitrophenol	ND	25	10	ug/l	
87-86-5	Pentachlorophenol	ND	25	10	ug/l	
108-95-2	Phenol	ND	5.0	2.0	ug/l	
95-95-4	2,4,5-Trichlorophenol	ND	5.0	1.0	ug/l	
88-06-2	2,4,6-Trichlorophenol	ND	5.0	1.0	ug/l	
101-55-3	4-Bromophenyl phenyl ether	ND	5.0	1.2	ug/l	
85-68-7	Butyl benzyl phthalate	ND	5.0	2.0	ug/l	
100-51-6	Benzyl Alcohol	ND	5.0	1.0	ug/l	
91-58-7	2-Chloronaphthalene	ND	5.0	1.3	ug/l	
106-47-8	4-Chloroaniline	ND	5.0	2.0	ug/l	
86-74-8	Carbazole	ND	5.0	1.0	ug/l	
111-91-1	bis(2-Chloroethoxy)methane	ND	5.0	1.0	ug/l	
111-44-4	bis(2-Chloroethyl)ether	ND	5.0	1.0	ug/l	
108-60-1	bis(2-Chloroisopropyl)ether	ND	5.0	1.0	ug/l	
7005-72-3	4-Chlorophenyl phenyl ether	ND	5.0	1.3	ug/l	
95-50-1	1,2-Dichlorobenzene	ND	5.0	1.5	ug/l	
541-73-1	1,3-Dichlorobenzene	ND	5.0	1.6	ug/l	UL
106-46-7	1,4-Dichlorobenzene	ND	5.0	1.5	ug/l	UL
121-14-2	2,4-Dinitrotoluene	ND	5.0	1.0	ug/l	
606-20-2	2,6-Dinitrotoluene	ND	5.0	1.0	ug/l	
91-94-1	3,3'-Dichlorobenzidine	ND	10	2.0	ug/l	
132-64-9	Dibenzofuran	ND	5.0	1.0	ug/l	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	RB083007		
Lab Sample ID:	F52208-1	Date Sampled:	08/30/07
Matrix:	AQ - Ground Water	Date Received:	08/31/07
Method:	SW846 8270C SW846 3510C	Percent Solids:	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

ABN TCL List w/o PAHs

CAS No.	Compound	Result	RL	MDL	Units	Q
84-74-2	Di-n-butyl phthalate	ND	5.0	2.0	ug/l	
117-84-0	Di-n-octyl phthalate	ND	5.0	2.0	ug/l	
84-66-2	Diethyl phthalate	ND	5.0	2.0	ug/l	
131-11-3	Dimethyl phthalate	ND	5.0	2.0	ug/l	
117-81-7	bis(2-Ethylhexyl)phthalate	ND	5.0	2.0	ug/l	
118-74-1	Hexachlorobenzene	ND	5.0	1.2	ug/l	
87-68-3	Hexachlorobutadiene	ND	5.0	1.7	ug/l	
77-47-4	Hexachlorocyclopentadiene	ND	5.0	1.5	ug/l	
67-72-1	Hexachloroethane	ND	5.0	1.9	ug/l	
78-59-1	Isophorone	ND	5.0	1.0	ug/l	
88-74-4	2-Nitroaniline	ND	10	2.0	ug/l	
99-09-2	3-Nitroaniline	ND	10	2.0	ug/l	
100-01-6	4-Nitroaniline	ND	10	2.0	ug/l	
98-95-3	Nitrobenzene	ND	5.0	1.0	ug/l	
621-64-7	N-Nitroso-di-n-propylamine	ND	5.0	1.0	ug/l	
86-30-6	N-Nitrosodiphenylamine	ND	5.0	1.0	ug/l	
120-82-1	1,2,4-Trichlorobenzene	ND	5.0	1.5	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol	36%		14-62%
4165-62-2	Phenol-d5	27%		10-40%
118-79-6	2,4,6-Tribromophenol	68%		33-118%
4165-60-0	Nitrobenzene-d5	61%		42-108%
321-60-8	2-Fluorobiphenyl	59%		40-106%
1718-51-0	Terphenyl-d14	92%		39-121%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	RB083007		
Lab Sample ID:	F52208-1	Date Sampled:	08/30/07
Matrix:	AQ - Ground Water	Date Received:	08/31/07
Method:	SW846 8270C BY SIM SW846 3510C	Percent Solids:	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	R10777.D	1	09/20/07	NJ	09/06/07	OP22222	SR502
Run #2							

	Initial Volume	Final Volume
Run #1	1000 ml	1.0 ml
Run #2		

BN PAH List

CAS No.	Compound	Result	RL	MDL	Units	Q
83-32-9	Acenaphthene	ND	1.0	0.50	ug/l	
208-96-8	Acenaphthylene	ND	1.0	0.50	ug/l	
120-12-7	Anthracene	ND	1.0	0.50	ug/l	
56-55-3	Benzo(a)anthracene	ND	0.20	0.050	ug/l	
50-32-8	Benzo(a)pyrene	ND	0.20	0.10	ug/l	
205-99-2	Benzo(b)fluoranthene	ND	0.20	0.050	ug/l	
191-24-2	Benzo(g,h,i)perylene	ND	0.20	0.10	ug/l	
207-08-9	Benzo(k)fluoranthene	ND	0.20	0.10	ug/l	
218-01-9	Chrysene	ND	0.20	0.10	ug/l	
53-70-3	Dibenzo(a,h)anthracene	ND	0.20	0.050	ug/l	
206-44-0	Fluoranthene	ND	1.0	0.25	ug/l	
86-73-7	Fluorene	ND	1.0	0.25	ug/l	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	0.20	0.050	ug/l	
90-12-0	1-Methylnaphthalene	ND	1.0	0.25	ug/l	
91-57-6	2-Methylnaphthalene	ND	1.0	0.25	ug/l	
91-20-3	Naphthalene	ND	1.0	0.25	ug/l	
85-01-8	Phenanthrene	ND	1.0	0.50	ug/l	
129-00-0	Pyrene	ND	1.0	0.25	ug/l	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	50MW01		
Lab Sample ID:	F52208-2	Date Sampled:	08/30/07
Matrix:	AQ - Ground Water	Date Received:	08/31/07
Method:	SW846 8270C SW846 3510C	Percent Solids:	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	R10642.D	1	09/15/07	NJ	09/06/07	OP22221	SR497
Run #2							

	Initial Volume	Final Volume
Run #1	980 ml	1.0 ml
Run #2		

ABN TCL List w/o PAHs

DATA VAL QUALIFIER

CAS No.	Compound	Result	RL	MDL	Units	Q
65-85-0	Benzoic Acid	ND	26	10	ug/l	
95-57-8	2-Chlorophenol	ND	5.1	1.0	ug/l	
59-50-7	4-Chloro-3-methyl phenol	ND	5.1	2.0	ug/l	
120-83-2	2,4-Dichlorophenol	ND	5.1	1.0	ug/l	
105-67-9	2,4-Dimethylphenol	ND	5.1	2.0	ug/l	
51-28-5	2,4-Dinitrophenol	ND	26	10	ug/l	
534-52-1	4,6-Dinitro-o-cresol	ND	10	2.0	ug/l	
95-48-7	2-Methylphenol	ND	5.1	1.0	ug/l	
	3&4-Methylphenol	ND	5.1	1.3	ug/l	
88-75-5	2-Nitrophenol	ND	5.1	1.0	ug/l	
100-02-7	4-Nitrophenol	ND	26	10	ug/l	
87-86-5	Pentachlorophenol	ND	26	10	ug/l	
108-95-2	Phenol	ND	5.1	2.0	ug/l	
95-95-4	2,4,5-Trichlorophenol	ND	5.1	1.0	ug/l	
88-06-2	2,4,6-Trichlorophenol	ND	5.1	1.0	ug/l	
101-55-3	4-Bromophenyl phenyl ether	ND	5.1	1.2	ug/l	
85-68-7	Butyl benzyl phthalate	ND	5.1	2.0	ug/l	
100-51-6	Benzyl Alcohol	ND	5.1	1.0	ug/l	
91-58-7	2-Chloronaphthalene	ND	5.1	1.3	ug/l	
106-47-8	4-Chloroaniline	ND	5.1	2.0	ug/l	
86-74-8	Carbazole	ND	5.1	1.0	ug/l	
111-91-1	bis(2-Chloroethoxy)methane	ND	5.1	1.0	ug/l	
111-44-4	bis(2-Chloroethyl)ether	ND	5.1	1.0	ug/l	
108-60-1	bis(2-Chloroisopropyl)ether	ND	5.1	1.0	ug/l	
7005-72-3	4-Chlorophenyl phenyl ether	ND	5.1	1.3	ug/l	
95-50-1	1,2-Dichlorobenzene	ND	5.1	1.5	ug/l	
541-73-1	1,3-Dichlorobenzene	ND	5.1	1.6	ug/l	UL
106-46-7	1,4-Dichlorobenzene	ND	5.1	1.5	ug/l	UL
121-14-2	2,4-Dinitrotoluene	ND	5.1	1.0	ug/l	
606-20-2	2,6-Dinitrotoluene	ND	5.1	1.0	ug/l	
91-94-1	3,3'-Dichlorobenzidine	ND	10	2.0	ug/l	
132-64-9	Dibenzofuran	ND	5.1	1.0	ug/l	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	50MW01		
Lab Sample ID:	F52208-2	Date Sampled:	08/30/07
Matrix:	AQ - Ground Water	Date Received:	08/31/07
Method:	SW846 8270C SW846 3510C	Percent Solids:	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

ABN TCL List w/o PAHs

CAS No.	Compound	Result	RL	MDL	Units	Q
84-74-2	Di-n-butyl phthalate	ND	5.1	2.0	ug/l	
117-84-0	Di-n-octyl phthalate	ND	5.1	2.0	ug/l	
84-66-2	Diethyl phthalate	ND	5.1	2.0	ug/l	
131-11-3	Dimethyl phthalate	ND	5.1	2.0	ug/l	
117-81-7	bis(2-Ethylhexyl)phthalate	ND	5.1	2.0	ug/l	
118-74-1	Hexachlorobenzene	ND	5.1	1.2	ug/l	
87-68-3	Hexachlorobutadiene	ND	5.1	1.7	ug/l	
77-47-4	Hexachlorocyclopentadiene	ND	5.1	1.5	ug/l	
67-72-1	Hexachloroethane	ND	5.1	1.9	ug/l	
78-59-1	Isophorone	ND	5.1	1.0	ug/l	
88-74-4	2-Nitroaniline	ND	10	2.0	ug/l	
99-09-2	3-Nitroaniline	ND	10	2.0	ug/l	
100-01-6	4-Nitroaniline	ND	10	2.0	ug/l	
98-95-3	Nitrobenzene	ND	5.1	1.0	ug/l	
621-64-7	N-Nitroso-di-n-propylamine	ND	5.1	1.0	ug/l	
86-30-6	N-Nitrosodiphenylamine	ND	5.1	1.0	ug/l	
120-82-1	1,2,4-Trichlorobenzene	ND	5.1	1.5	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol	37%		14-62%
4165-62-2	Phenol-d5	29%		10-40%
118-79-6	2,4,6-Tribromophenol	82%		33-118%
4165-60-0	Nitrobenzene-d5	60%		42-108%
321-60-8	2-Fluorobiphenyl	61%		40-106%
1718-51-0	Terphenyl-d14	84%		39-121%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	50MW01		
Lab Sample ID:	F52208-2	Date Sampled:	08/30/07
Matrix:	AQ - Ground Water	Date Received:	08/31/07
Method:	SW846 8270C BY SIM SW846 3510C	Percent Solids:	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	R10778.D	1	09/20/07	NJ	09/06/07	OP22222	SR502
Run #2							

	Initial Volume	Final Volume
Run #1	980 ml	1.0 ml
Run #2		

BN PAH List

CAS No.	Compound	Result	RL	MDL	Units	Q
83-32-9	Acenaphthene	ND	1.0	0.51	ug/l	
208-96-8	Acenaphthylene	ND	1.0	0.51	ug/l	
120-12-7	Anthracene	ND	1.0	0.51	ug/l	
56-55-3	Benzo(a)anthracene	ND	0.20	0.051	ug/l	
50-32-8	Benzo(a)pyrene	ND	0.20	0.10	ug/l	
205-99-2	Benzo(b)fluoranthene	ND	0.20	0.051	ug/l	
191-24-2	Benzo(g,h,i)perylene	ND	0.20	0.10	ug/l	
207-08-9	Benzo(k)fluoranthene	ND	0.20	0.10	ug/l	
218-01-9	Chrysene	ND	0.20	0.10	ug/l	
53-70-3	Dibenzo(a,h)anthracene	ND	0.20	0.051	ug/l	
206-44-0	Fluoranthene	ND	1.0	0.26	ug/l	
86-73-7	Fluorene	ND	1.0	0.26	ug/l	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	0.20	0.051	ug/l	
90-12-0	1-Methylnaphthalene	ND	1.0	0.26	ug/l	
91-57-6	2-Methylnaphthalene	ND	1.0	0.26	ug/l	
91-20-3	Naphthalene	ND	1.0	0.26	ug/l	
85-01-8	Phenanthrene	ND	1.0	0.51	ug/l	
129-00-0	Pyrene	ND	1.0	0.26	ug/l	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: R10645.D

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Report of Analysis

3.3

Client Sample ID:	48MW07		
Lab Sample ID:	F52208-3	Date Sampled:	08/30/07
Matrix:	AQ - Ground Water	Date Received:	08/31/07
Method:	SW846 8270C SW846 3510C	Percent Solids:	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	R10645.D	1	09/15/07	NJ	09/06/07	OP22221	SR497
Run #2							

	Initial Volume	Final Volume
Run #1	1020 ml	1.0 ml
Run #2		

ABN TCL List w/o PAHs

DATA VAL QUALIFIER

CAS No.	Compound	Result	RL	MDL	Units	Q
65-85-0	Benzoic Acid	ND	25	9.8	ug/l	
95-57-8	2-Chlorophenol	ND	4.9	0.98	ug/l	
59-50-7	4-Chloro-3-methyl phenol	ND	4.9	2.0	ug/l	
120-83-2	2,4-Dichlorophenol	ND	4.9	0.98	ug/l	
105-67-9	2,4-Dimethylphenol	ND	4.9	2.0	ug/l	
51-28-5	2,4-Dinitrophenol	ND	25	9.8	ug/l	
534-52-1	4,6-Dinitro-o-cresol	ND	9.8	2.0	ug/l	
95-48-7	2-Methylphenol	ND	4.9	0.98	ug/l	
	3&4-Methylphenol	ND	4.9	1.3	ug/l	
88-75-5	2-Nitrophenol	ND	4.9	0.98	ug/l	
100-02-7	4-Nitrophenol	ND	25	9.8	ug/l	
87-86-5	Pentachlorophenol	ND	25	9.8	ug/l	
108-95-2	Phenol	ND	4.9	2.0	ug/l	
95-95-4	2,4,5-Trichlorophenol	ND	4.9	0.98	ug/l	
88-06-2	2,4,6-Trichlorophenol	ND	4.9	0.98	ug/l	
101-55-3	4-Bromophenyl phenyl ether	ND	4.9	1.2	ug/l	
85-68-7	Butyl benzyl phthalate	ND	4.9	2.0	ug/l	
100-51-6	Benzyl Alcohol	ND	4.9	0.98	ug/l	
91-58-7	2-Chloronaphthalene	ND	4.9	1.3	ug/l	
106-47-8	4-Chloroaniline	ND	4.9	2.0	ug/l	
86-74-8	Carbazole	ND	4.9	0.98	ug/l	
111-91-1	bis(2-Chloroethoxy)methane	ND	4.9	0.98	ug/l	
111-44-4	bis(2-Chloroethyl)ether	ND	4.9	0.98	ug/l	
108-60-1	bis(2-Chloroisopropyl)ether	ND	4.9	0.98	ug/l	
7005-72-3	4-Chlorophenyl phenyl ether	ND	4.9	1.3	ug/l	
95-50-1	1,2-Dichlorobenzene	ND	4.9	1.5	ug/l	
541-73-1	1,3-Dichlorobenzene	ND	4.9	1.6	ug/l	UL
106-46-7	1,4-Dichlorobenzene	ND	4.9	1.5	ug/l	UL
121-14-2	2,4-Dinitrotoluene	ND	4.9	0.98	ug/l	
606-20-2	2,6-Dinitrotoluene	ND	4.9	0.98	ug/l	
91-94-1	3,3'-Dichlorobenzidine	ND	9.8	2.0	ug/l	
132-64-9	Dibenzofuran	ND	4.9	0.98	ug/l	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	48MW07		
Lab Sample ID:	F52208-3	Date Sampled:	08/30/07
Matrix:	AQ - Ground Water	Date Received:	08/31/07
Method:	SW846 8270C SW846 3510C	Percent Solids:	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

ABN TCL List w/o PAHs

CAS No.	Compound	Result	RL	MDL	Units	Q
84-74-2	Di-n-butyl phthalate	ND	4.9	2.0	ug/l	
117-84-0	Di-n-octyl phthalate	ND	4.9	2.0	ug/l	
84-66-2	Diethyl phthalate	ND	4.9	2.0	ug/l	
131-11-3	Dimethyl phthalate	ND	4.9	2.0	ug/l	
117-81-7	bis(2-Ethylhexyl)phthalate	ND	4.9	2.0	ug/l	
118-74-1	Hexachlorobenzene	ND	4.9	1.2	ug/l	
87-68-3	Hexachlorobutadiene	ND	4.9	1.7	ug/l	
77-47-4	Hexachlorocyclopentadiene	ND	4.9	1.5	ug/l	
67-72-1	Hexachloroethane	ND	4.9	1.9	ug/l	
78-59-1	Isophorone	ND	4.9	0.98	ug/l	
88-74-4	2-Nitroaniline	ND	9.8	2.0	ug/l	
99-09-2	3-Nitroaniline	ND	9.8	2.0	ug/l	
100-01-6	4-Nitroaniline	ND	9.8	2.0	ug/l	
98-95-3	Nitrobenzene	ND	4.9	0.98	ug/l	
621-64-7	N-Nitroso-di-n-propylamine	ND	4.9	0.98	ug/l	
86-30-6	N-Nitrosodiphenylamine	ND	4.9	0.98	ug/l	
120-82-1	1,2,4-Trichlorobenzene	ND	4.9	1.5	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol	35%		14-62%
4165-62-2	Phenol-d5	25%		10-40%
118-79-6	2,4,6-Tribromophenol	73%		33-118%
4165-60-0	Nitrobenzene-d5	60%		42-108%
321-60-8	2-Fluorobiphenyl	61%		40-106%
1718-51-0	Terphenyl-d14	86%		39-121%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	48MW07		
Lab Sample ID:	F52208-3	Date Sampled:	08/30/07
Matrix:	AQ - Ground Water	Date Received:	08/31/07
Method:	SW846 8270C BY SIM SW846 3510C	Percent Solids:	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	R10779.D	1	09/20/07	NJ	09/06/07	OP22222	SR502
Run #2							

	Initial Volume	Final Volume
Run #1	1020 ml	1.0 ml
Run #2		

BN PAH List

CAS No.	Compound	Result	RL	MDL	Units	Q
83-32-9	Acenaphthene	ND	0.98	0.49	ug/l	
208-96-8	Acenaphthylene	ND	0.98	0.49	ug/l	
120-12-7	Anthracene	ND	0.98	0.49	ug/l	
56-55-3	Benzo(a)anthracene	ND	0.20	0.049	ug/l	
50-32-8	Benzo(a)pyrene	ND	0.20	0.098	ug/l	
205-99-2	Benzo(b)fluoranthene	ND	0.20	0.049	ug/l	
191-24-2	Benzo(g,h,i)perylene	ND	0.20	0.098	ug/l	
207-08-9	Benzo(k)fluoranthene	ND	0.20	0.098	ug/l	
218-01-9	Chrysene	ND	0.20	0.098	ug/l	
53-70-3	Dibenzo(a,h)anthracene	ND	0.20	0.049	ug/l	
206-44-0	Fluoranthene	ND	0.98	0.25	ug/l	
86-73-7	Fluorene	ND	0.98	0.25	ug/l	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	0.20	0.049	ug/l	
90-12-0	1-Methylnaphthalene	ND	0.98	0.25	ug/l	
91-57-6	2-Methylnaphthalene	ND	0.98	0.25	ug/l	
91-20-3	Naphthalene	ND	0.98	0.25	ug/l	
85-01-8	Phenanthrene	ND	0.98	0.49	ug/l	
129-00-0	Pyrene	ND	0.98	0.25	ug/l	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: R10646.D

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Report of Analysis

3.4

Client Sample ID:	50MW02		
Lab Sample ID:	F52208-4	Date Sampled:	08/30/07
Matrix:	AQ - Ground Water	Date Received:	08/31/07
Method:	SW846 8270C SW846 3510C	Percent Solids:	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	R10646.D	1	09/15/07	NJ	09/06/07	OP22221	SR497
Run #2							

	Initial Volume	Final Volume
Run #1	1020 ml	1.0 ml
Run #2		

ABN TCL List w/o PAHs

DATA VAL QUALIFIER

CAS No.	Compound	Result	RL	MDL	Units	Q
65-85-0	Benzoic Acid	ND	25	9.8	ug/l	
95-57-8	2-Chlorophenol	ND	4.9	0.98	ug/l	
59-50-7	4-Chloro-3-methyl phenol	ND	4.9	2.0	ug/l	
120-83-2	2,4-Dichlorophenol	ND	4.9	0.98	ug/l	
105-67-9	2,4-Dimethylphenol	ND	4.9	2.0	ug/l	
51-28-5	2,4-Dinitrophenol	ND	25	9.8	ug/l	
534-52-1	4,6-Dinitro-o-cresol	ND	9.8	2.0	ug/l	
95-48-7	2-Methylphenol	ND	4.9	0.98	ug/l	
	3&4-Methylphenol	ND	4.9	1.3	ug/l	
88-75-5	2-Nitrophenol	ND	4.9	0.98	ug/l	
100-02-7	4-Nitrophenol	ND	25	9.8	ug/l	
87-86-5	Pentachlorophenol	ND	25	9.8	ug/l	
108-95-2	Phenol	ND	4.9	2.0	ug/l	
95-95-4	2,4,5-Trichlorophenol	ND	4.9	0.98	ug/l	
88-06-2	2,4,6-Trichlorophenol	ND	4.9	0.98	ug/l	
101-55-3	4-Bromophenyl phenyl ether	ND	4.9	1.2	ug/l	
85-68-7	Butyl benzyl phthalate	ND	4.9	2.0	ug/l	
100-51-6	Benzyl Alcohol	ND	4.9	0.98	ug/l	
91-58-7	2-Chloronaphthalene	ND	4.9	1.3	ug/l	
106-47-8	4-Chloroaniline	ND	4.9	2.0	ug/l	
86-74-8	Carbazole	ND	4.9	0.98	ug/l	
111-91-1	bis(2-Chloroethoxy)methane	ND	4.9	0.98	ug/l	
111-44-4	bis(2-Chloroethyl)ether	ND	4.9	0.98	ug/l	
108-60-1	bis(2-Chloroisopropyl)ether	ND	4.9	0.98	ug/l	
7005-72-3	4-Chlorophenyl phenyl ether	ND	4.9	1.3	ug/l	
95-50-1	1,2-Dichlorobenzene	ND	4.9	1.5	ug/l	
541-73-1	1,3-Dichlorobenzene	ND	4.9	1.6	ug/l	UL
106-46-7	1,4-Dichlorobenzene	ND	4.9	1.5	ug/l	UL
121-14-2	2,4-Dinitrotoluene	ND	4.9	0.98	ug/l	
606-20-2	2,6-Dinitrotoluene	ND	4.9	0.98	ug/l	
91-94-1	3,3'-Dichlorobenzidine	ND	9.8	2.0	ug/l	
132-64-9	Dibenzofuran	ND	4.9	0.98	ug/l	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	50MW02		
Lab Sample ID:	F52208-4	Date Sampled:	08/30/07
Matrix:	AQ - Ground Water	Date Received:	08/31/07
Method:	SW846 8270C SW846 3510C	Percent Solids:	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

ABN TCL List w/o PAHs

CAS No.	Compound	Result	RL	MDL	Units	Q
84-74-2	Di-n-butyl phthalate	ND	4.9	2.0	ug/l	
117-84-0	Di-n-octyl phthalate	ND	4.9	2.0	ug/l	
84-66-2	Diethyl phthalate	ND	4.9	2.0	ug/l	
131-11-3	Dimethyl phthalate	ND	4.9	2.0	ug/l	
117-81-7	bis(2-Ethylhexyl)phthalate	8.0	4.9	2.0	ug/l	
118-74-1	Hexachlorobenzene	ND	4.9	1.2	ug/l	
87-68-3	Hexachlorobutadiene	ND	4.9	1.7	ug/l	
77-47-4	Hexachlorocyclopentadiene	ND	4.9	1.5	ug/l	
67-72-1	Hexachloroethane	ND	4.9	1.9	ug/l	
78-59-1	Isophorone	ND	4.9	0.98	ug/l	
88-74-4	2-Nitroaniline	ND	9.8	2.0	ug/l	
99-09-2	3-Nitroaniline	ND	9.8	2.0	ug/l	
100-01-6	4-Nitroaniline	ND	9.8	2.0	ug/l	
98-95-3	Nitrobenzene	ND	4.9	0.98	ug/l	
621-64-7	N-Nitroso-di-n-propylamine	ND	4.9	0.98	ug/l	
86-30-6	N-Nitrosodiphenylamine	ND	4.9	0.98	ug/l	
120-82-1	1,2,4-Trichlorobenzene	ND	4.9	1.5	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol	27%		14-62%
4165-62-2	Phenol-d5	23%		10-40%
118-79-6	2,4,6-Tribromophenol	79%		33-118%
4165-60-0	Nitrobenzene-d5	46%		42-108%
321-60-8	2-Fluorobiphenyl	55%		40-106%
1718-51-0	Terphenyl-d14	58%		39-121%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	50MW02		
Lab Sample ID:	F52208-4	Date Sampled:	08/30/07
Matrix:	AQ - Ground Water	Date Received:	08/31/07
Method:	SW846 8270C BY SIM SW846 3510C	Percent Solids:	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	R10780.D	1	09/20/07	NJ	09/06/07	OP22222	SR502
Run #2							

	Initial Volume	Final Volume
Run #1	1020 ml	1.0 ml
Run #2		

BN PAH List

CAS No.	Compound	Result	RL	MDL	Units	Q
83-32-9	Acenaphthene	ND	0.98	0.49	ug/l	
208-96-8	Acenaphthylene	ND	0.98	0.49	ug/l	
120-12-7	Anthracene	ND	0.98	0.49	ug/l	
56-55-3	Benzo(a)anthracene	ND	0.20	0.049	ug/l	
50-32-8	Benzo(a)pyrene	ND	0.20	0.098	ug/l	
205-99-2	Benzo(b)fluoranthene	ND	0.20	0.049	ug/l	
191-24-2	Benzo(g,h,i)perylene	ND	0.20	0.098	ug/l	
207-08-9	Benzo(k)fluoranthene	ND	0.20	0.098	ug/l	
218-01-9	Chrysene	ND	0.20	0.098	ug/l	
53-70-3	Dibenzo(a,h)anthracene	ND	0.20	0.049	ug/l	
206-44-0	Fluoranthene	ND	0.98	0.25	ug/l	
86-73-7	Fluorene	ND	0.98	0.25	ug/l	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	0.20	0.049	ug/l	
90-12-0	1-Methylnaphthalene	ND	0.98	0.25	ug/l	
91-57-6	2-Methylnaphthalene	ND	0.98	0.25	ug/l	
91-20-3	Naphthalene	ND	0.98	0.25	ug/l	
85-01-8	Phenanthrene	ND	0.98	0.49	ug/l	
129-00-0	Pyrene	ND	0.98	0.25	ug/l	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: R10647.D

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Report of Analysis

3.5

Client Sample ID:	48MW05		
Lab Sample ID:	F52208-5	Date Sampled:	08/30/07
Matrix:	AQ - Ground Water	Date Received:	08/31/07
Method:	SW846 8270C SW846 3510C	Percent Solids:	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	R10647.D	1	09/15/07	NJ	09/06/07	OP22221	SR497
Run #2							

	Initial Volume	Final Volume
Run #1	980 ml	1.0 ml
Run #2		

ABN TCL List w/o PAHs

DATA VAL QUALIFIER

CAS No.	Compound	Result	RL	MDL	Units	Q
65-85-0	Benzoic Acid	ND	26	10	ug/l	
95-57-8	2-Chlorophenol	ND	5.1	1.0	ug/l	
59-50-7	4-Chloro-3-methyl phenol	ND	5.1	2.0	ug/l	
120-83-2	2,4-Dichlorophenol	ND	5.1	1.0	ug/l	
105-67-9	2,4-Dimethylphenol	ND	5.1	2.0	ug/l	
51-28-5	2,4-Dinitrophenol	ND	26	10	ug/l	
534-52-1	4,6-Dinitro-o-cresol	ND	10	2.0	ug/l	
95-48-7	2-Methylphenol	ND	5.1	1.0	ug/l	
	3&4-Methylphenol	ND	5.1	1.3	ug/l	
88-75-5	2-Nitrophenol	ND	5.1	1.0	ug/l	
100-02-7	4-Nitrophenol	ND	26	10	ug/l	
87-86-5	Pentachlorophenol	ND	26	10	ug/l	
108-95-2	Phenol	ND	5.1	2.0	ug/l	
95-95-4	2,4,5-Trichlorophenol	ND	5.1	1.0	ug/l	
88-06-2	2,4,6-Trichlorophenol	ND	5.1	1.0	ug/l	
101-55-3	4-Bromophenyl phenyl ether	ND	5.1	1.2	ug/l	
85-68-7	Butyl benzyl phthalate	ND	5.1	2.0	ug/l	
100-51-6	Benzyl Alcohol	ND	5.1	1.0	ug/l	
91-58-7	2-Chloronaphthalene	ND	5.1	1.3	ug/l	
106-47-8	4-Chloroaniline	ND	5.1	2.0	ug/l	
86-74-8	Carbazole	ND	5.1	1.0	ug/l	
111-91-1	bis(2-Chloroethoxy)methane	ND	5.1	1.0	ug/l	
111-44-4	bis(2-Chloroethyl)ether	ND	5.1	1.0	ug/l	
108-60-1	bis(2-Chloroisopropyl)ether	ND	5.1	1.0	ug/l	
7005-72-3	4-Chlorophenyl phenyl ether	ND	5.1	1.3	ug/l	
95-50-1	1,2-Dichlorobenzene	ND	5.1	1.5	ug/l	
541-73-1	1,3-Dichlorobenzene	ND	5.1	1.6	ug/l	UL
106-46-7	1,4-Dichlorobenzene	ND	5.1	1.5	ug/l	UL
121-14-2	2,4-Dinitrotoluene	ND	5.1	1.0	ug/l	
606-20-2	2,6-Dinitrotoluene	ND	5.1	1.0	ug/l	
91-94-1	3,3'-Dichlorobenzidine	ND	10	2.0	ug/l	
132-64-9	Dibenzofuran	ND	5.1	1.0	ug/l	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	48MW05		
Lab Sample ID:	F52208-5	Date Sampled:	08/30/07
Matrix:	AQ - Ground Water	Date Received:	08/31/07
Method:	SW846 8270C SW846 3510C	Percent Solids:	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

ABN TCL List w/o PAHs

CAS No.	Compound	Result	RL	MDL	Units	Q
84-74-2	Di-n-butyl phthalate	ND	5.1	2.0	ug/l	
117-84-0	Di-n-octyl phthalate	ND	5.1	2.0	ug/l	
84-66-2	Diethyl phthalate	ND	5.1	2.0	ug/l	
131-11-3	Dimethyl phthalate	ND	5.1	2.0	ug/l	
117-81-7	bis(2-Ethylhexyl)phthalate	ND	5.1	2.0	ug/l	
118-74-1	Hexachlorobenzene	ND	5.1	1.2	ug/l	
87-68-3	Hexachlorobutadiene	ND	5.1	1.7	ug/l	
77-47-4	Hexachlorocyclopentadiene	ND	5.1	1.5	ug/l	
67-72-1	Hexachloroethane	ND	5.1	1.9	ug/l	
78-59-1	Isophorone	ND	5.1	1.0	ug/l	
88-74-4	2-Nitroaniline	ND	10	2.0	ug/l	
99-09-2	3-Nitroaniline	ND	10	2.0	ug/l	
100-01-6	4-Nitroaniline	ND	10	2.0	ug/l	
98-95-3	Nitrobenzene	ND	5.1	1.0	ug/l	
621-64-7	N-Nitroso-di-n-propylamine	ND	5.1	1.0	ug/l	
86-30-6	N-Nitrosodiphenylamine	ND	5.1	1.0	ug/l	
120-82-1	1,2,4-Trichlorobenzene	ND	5.1	1.5	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol	42%		14-62%
4165-62-2	Phenol-d5	31%		10-40%
118-79-6	2,4,6-Tribromophenol	78%		33-118%
4165-60-0	Nitrobenzene-d5	67%		42-108%
321-60-8	2-Fluorobiphenyl	66%		40-106%
1718-51-0	Terphenyl-d14	77%		39-121%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	48MW05		
Lab Sample ID:	F52208-5	Date Sampled:	08/30/07
Matrix:	AQ - Ground Water	Date Received:	08/31/07
Method:	SW846 8270C BY SIM SW846 3510C	Percent Solids:	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	R10781.D	1	09/20/07	NJ	09/06/07	OP22222	SR502
Run #2							

	Initial Volume	Final Volume
Run #1	980 ml	1.0 ml
Run #2		

BN PAH List

CAS No.	Compound	Result	RL	MDL	Units	Q
83-32-9	Acenaphthene	ND	1.0	0.51	ug/l	
208-96-8	Acenaphthylene	ND	1.0	0.51	ug/l	
120-12-7	Anthracene	ND	1.0	0.51	ug/l	
56-55-3	Benzo(a)anthracene	ND	0.20	0.051	ug/l	
50-32-8	Benzo(a)pyrene	ND	0.20	0.10	ug/l	
205-99-2	Benzo(b)fluoranthene	ND	0.20	0.051	ug/l	
191-24-2	Benzo(g,h,i)perylene	ND	0.20	0.10	ug/l	
207-08-9	Benzo(k)fluoranthene	ND	0.20	0.10	ug/l	
218-01-9	Chrysene	ND	0.20	0.10	ug/l	
53-70-3	Dibenzo(a,h)anthracene	ND	0.20	0.051	ug/l	
206-44-0	Fluoranthene	ND	1.0	0.26	ug/l	
86-73-7	Fluorene	ND	1.0	0.26	ug/l	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	0.20	0.051	ug/l	
90-12-0	1-Methylnaphthalene	ND	1.0	0.26	ug/l	
91-57-6	2-Methylnaphthalene	ND	1.0	0.26	ug/l	
91-20-3	Naphthalene	ND	1.0	0.26	ug/l	
85-01-8	Phenanthrene	ND	1.0	0.51	ug/l	
129-00-0	Pyrene	ND	1.0	0.26	ug/l	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: R10648.D

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Report of Analysis

Client Sample ID:	48MW06		
Lab Sample ID:	F52208-6	Date Sampled:	08/30/07
Matrix:	AQ - Ground Water	Date Received:	08/31/07
Method:	SW846 8270C SW846 3510C	Percent Solids:	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	R10648.D	1	09/15/07	NJ	09/06/07	OP22221	SR497
Run #2							

	Initial Volume	Final Volume
Run #1	1020 ml	1.0 ml
Run #2		

ABN TCL List w/o PAHs

DATA VAL QUALIFIER

CAS No.	Compound	Result	RL	MDL	Units	Q
65-85-0	Benzoic Acid	ND	25	9.8	ug/l	
95-57-8	2-Chlorophenol	ND	4.9	0.98	ug/l	
59-50-7	4-Chloro-3-methyl phenol	ND	4.9	2.0	ug/l	
120-83-2	2,4-Dichlorophenol	ND	4.9	0.98	ug/l	
105-67-9	2,4-Dimethylphenol	ND	4.9	2.0	ug/l	
51-28-5	2,4-Dinitrophenol	ND	25	9.8	ug/l	
534-52-1	4,6-Dinitro-o-cresol	ND	9.8	2.0	ug/l	
95-48-7	2-Methylphenol	ND	4.9	0.98	ug/l	
	3&4-Methylphenol	ND	4.9	1.3	ug/l	
88-75-5	2-Nitrophenol	ND	4.9	0.98	ug/l	
100-02-7	4-Nitrophenol	ND	25	9.8	ug/l	
87-86-5	Pentachlorophenol	ND	25	9.8	ug/l	
108-95-2	Phenol	ND	4.9	2.0	ug/l	
95-95-4	2,4,5-Trichlorophenol	ND	4.9	0.98	ug/l	
88-06-2	2,4,6-Trichlorophenol	ND	4.9	0.98	ug/l	
101-55-3	4-Bromophenyl phenyl ether	ND	4.9	1.2	ug/l	
85-68-7	Butyl benzyl phthalate	ND	4.9	2.0	ug/l	
100-51-6	Benzyl Alcohol	ND	4.9	0.98	ug/l	
91-58-7	2-Chloronaphthalene	ND	4.9	1.3	ug/l	
106-47-8	4-Chloroaniline	ND	4.9	2.0	ug/l	
86-74-8	Carbazole	ND	4.9	0.98	ug/l	
111-91-1	bis(2-Chloroethoxy)methane	ND	4.9	0.98	ug/l	
111-44-4	bis(2-Chloroethyl)ether	ND	4.9	0.98	ug/l	
108-60-1	bis(2-Chloroisopropyl)ether	ND	4.9	0.98	ug/l	
7005-72-3	4-Chlorophenyl phenyl ether	ND	4.9	1.3	ug/l	
95-50-1	1,2-Dichlorobenzene	ND	4.9	1.5	ug/l	
541-73-1	1,3-Dichlorobenzene	ND	4.9	1.6	ug/l	UL
106-46-7	1,4-Dichlorobenzene	ND	4.9	1.5	ug/l	UL
121-14-2	2,4-Dinitrotoluene	ND	4.9	0.98	ug/l	
606-20-2	2,6-Dinitrotoluene	ND	4.9	0.98	ug/l	
91-94-1	3,3'-Dichlorobenzidine	ND	9.8	2.0	ug/l	
132-64-9	Dibenzofuran	ND	4.9	0.98	ug/l	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest LabLink@70184 17:26 25-Oct-2007

Report of Analysis

Client Sample ID:	48MW06		
Lab Sample ID:	F52208-6	Date Sampled:	08/30/07
Matrix:	AQ - Ground Water	Date Received:	08/31/07
Method:	SW846 8270C SW846 3510C	Percent Solids:	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	R10648.D	1	09/15/07	NJ	09/06/07	OP22221	SR497
Run #2							

	Initial Volume	Final Volume
Run #1	1020 ml	1.0 ml
Run #2		

ABN TCL List w/o PAHs

DATA VAL QUALIFIER

CAS No.	Compound	Result	RL	MDL	Units	Q
65-85-0	Benzoic Acid	ND	25	9.8	ug/l	
95-57-8	2-Chlorophenol	ND	4.9	0.98	ug/l	
59-50-7	4-Chloro-3-methyl phenol	ND	4.9	2.0	ug/l	
120-83-2	2,4-Dichlorophenol	ND	4.9	0.98	ug/l	
105-67-9	2,4-Dimethylphenol	ND	4.9	2.0	ug/l	
51-28-5	2,4-Dinitrophenol	ND	25	9.8	ug/l	
534-52-1	4,6-Dinitro-o-cresol	ND	9.8	2.0	ug/l	
95-48-7	2-Methylphenol	ND	4.9	0.98	ug/l	
	3&4-Methylphenol	ND	4.9	1.3	ug/l	
88-75-5	2-Nitrophenol	ND	4.9	0.98	ug/l	
100-02-7	4-Nitrophenol	ND	25	9.8	ug/l	
87-86-5	Pentachlorophenol	ND	25	9.8	ug/l	
108-95-2	Phenol	ND	4.9	2.0	ug/l	
95-95-4	2,4,5-Trichlorophenol	ND	4.9	0.98	ug/l	
88-06-2	2,4,6-Trichlorophenol	ND	4.9	0.98	ug/l	
101-55-3	4-Bromophenyl phenyl ether	ND	4.9	1.2	ug/l	
85-68-7	Butyl benzyl phthalate	ND	4.9	2.0	ug/l	
100-51-6	Benzyl Alcohol	ND	4.9	0.98	ug/l	
91-58-7	2-Chloronaphthalene	ND	4.9	1.3	ug/l	
106-47-8	4-Chloroaniline	ND	4.9	2.0	ug/l	
86-74-8	Carbazole	ND	4.9	0.98	ug/l	
111-91-1	bis(2-Chloroethoxy)methane	ND	4.9	0.98	ug/l	
111-44-4	bis(2-Chloroethyl)ether	ND	4.9	0.98	ug/l	
108-60-1	bis(2-Chloroisopropyl)ether	ND	4.9	0.98	ug/l	
7005-72-3	4-Chlorophenyl phenyl ether	ND	4.9	1.3	ug/l	
95-50-1	1,2-Dichlorobenzene	ND	4.9	1.5	ug/l	
541-73-1	1,3-Dichlorobenzene	ND	4.9	1.6	ug/l	J
106-46-7	1,4-Dichlorobenzene	ND	4.9	1.5	ug/l	J
121-14-2	2,4-Dinitrotoluene	ND	4.9	0.98	ug/l	
606-20-2	2,6-Dinitrotoluene	ND	4.9	0.98	ug/l	
91-94-1	3,3'-Dichlorobenzidine	ND	9.8	2.0	ug/l	
132-64-9	Dibenzofuran	ND	4.9	0.98	ug/l	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	48MW06		
Lab Sample ID:	F52208-6	Date Sampled:	08/30/07
Matrix:	AQ - Ground Water	Date Received:	08/31/07
Method:	SW846 8270C SW846 3510C	Percent Solids:	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

ABN TCL List w/o PAHs

CAS No.	Compound	Result	RL	MDL	Units	Q
84-74-2	Di-n-butyl phthalate	ND	4.9	2.0	ug/l	
117-84-0	Di-n-octyl phthalate	ND	4.9	2.0	ug/l	
84-66-2	Diethyl phthalate	ND	4.9	2.0	ug/l	
131-11-3	Dimethyl phthalate	ND	4.9	2.0	ug/l	
117-81-7	bis(2-Ethylhexyl)phthalate	ND	4.9	2.0	ug/l	
118-74-1	Hexachlorobenzene	ND	4.9	1.2	ug/l	
87-68-3	Hexachlorobutadiene	ND	4.9	1.7	ug/l	
77-47-4	Hexachlorocyclopentadiene	ND	4.9	1.5	ug/l	
67-72-1	Hexachloroethane	ND	4.9	1.9	ug/l	
78-59-1	Isophorone	ND	4.9	0.98	ug/l	
88-74-4	2-Nitroaniline	ND	9.8	2.0	ug/l	
99-09-2	3-Nitroaniline	ND	9.8	2.0	ug/l	
100-01-6	4-Nitroaniline	ND	9.8	2.0	ug/l	
98-95-3	Nitrobenzene	ND	4.9	0.98	ug/l	
621-64-7	N-Nitroso-di-n-propylamine	ND	4.9	0.98	ug/l	
86-30-6	N-Nitrosodiphenylamine	ND	4.9	0.98	ug/l	
120-82-1	1,2,4-Trichlorobenzene	ND	4.9	1.5	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol	38%		14-62%
4165-62-2	Phenol-d5	28%		10-40%
118-79-6	2,4,6-Tribromophenol	75%		33-118%
4165-60-0	Nitrobenzene-d5	66%		42-108%
321-60-8	2-Fluorobiphenyl	65%		40-106%
1718-51-0	Terphenyl-d14	80%		39-121%

ND = Not detected MDL - Method Detection Limit
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J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest LabLink@70184 17:26 25-Oct-2007

Report of Analysis

Client Sample ID:	48MW06		
Lab Sample ID:	F52208-6	Date Sampled:	08/30/07
Matrix:	AQ - Ground Water	Date Received:	08/31/07
Method:	SW846 8270C BY SIM SW846 3510C	Percent Solids:	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	R10782.D	1	09/20/07	NJ	09/06/07	OP22222	SR502
Run #2							

	Initial Volume	Final Volume
Run #1	1020 ml	1.0 ml
Run #2		

BN PAH List

CAS No.	Compound	Result	RL	MDL	Units	Q
83-32-9	Acenaphthene	ND	0.98	0.49	ug/l	
208-96-8	Acenaphthylene	ND	0.98	0.49	ug/l	
120-12-7	Anthracene	ND	0.98	0.49	ug/l	
56-55-3	Benzo(a)anthracene	ND	0.20	0.049	ug/l	
50-32-8	Benzo(a)pyrene	ND	0.20	0.098	ug/l	
205-99-2	Benzo(b)fluoranthene	ND	0.20	0.049	ug/l	
191-24-2	Benzo(g,h,i)perylene	ND	0.20	0.098	ug/l	
207-08-9	Benzo(k)fluoranthene	ND	0.20	0.098	ug/l	
218-01-9	Chrysene	ND	0.20	0.098	ug/l	
53-70-3	Dibenzo(a,h)anthracene	ND	0.20	0.049	ug/l	
206-44-0	Fluoranthene	ND	0.98	0.25	ug/l	
86-73-7	Fluorene	ND	0.98	0.25	ug/l	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	0.20	0.049	ug/l	
90-12-0	1-Methylnaphthalene	ND	0.98	0.25	ug/l	
91-57-6	2-Methylnaphthalene	ND	0.98	0.25	ug/l	
91-20-3	Naphthalene	ND	0.98	0.25	ug/l	
85-01-8	Phenanthrene	ND	0.98	0.49	ug/l	
129-00-0	Pyrene	ND	0.98	0.25	ug/l	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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412-858-3335
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Shaw® Shaw Environmental, Inc.

MEMORANDUM

TO: Jeff Parks, Shaw E&I Radford Army Ammunition Plant (RFAAP) Project Manager

FROM: Richard McCracken, Shaw E&I Project Chemist

SUBJECT: RFAAP Data Validation - Volatiles
Accutest Laboratories, Inc., SDG F52208

DATE: October 29, 2007

The purpose of this memorandum is to present the data validation report for the samples collected at RFAAP on August 30, 2007. The samples were analyzed for target compound list (TCL) volatile organic compounds (VOCs) using USEPA SW846 Method 5030B/8260B. A total of seven aqueous samples were validated. The sample IDs are:

Field Sample ID	Lab Sample ID	Field Sample ID	Lab Sample ID
RB083007	F52208-1	48MW05	F52208-5
50MW01	F52208-2	48MW06	F52208-6
48MW07	F52208-3	TB083007	F52208-8
50MW02	F52208-4		

Data were reviewed by Richard McCracken and validated using a combination of project QAPP, *Quality Systems Manual for Environmental Laboratories, Final Version 3, January, 2006* (DoD, 2006) (DoD QSM), method-specific criteria, and laboratory SOP criteria. The data qualifier scheme was consistent with the *Region III Modifications to the National Functional Guidelines for Organic Data Review* (September 1994). Parameters evaluated are presented in **Table 1**. Data associated with parameters in compliance with quality control specifications have not been qualified. Data associated with parameters that did not comply with quality control specifications and directly impacted project data have been qualified in accordance with USEPA Region III specifications.

Table 1 Laboratory Performance Criteria

Qualified		Parameter
Yes	No	
	X	Holding Times and Preservation
	X	Instrument Performance Results
	X	Initial Calibration
	X	Continuing Calibration
	X	Blank Analysis
	X	Laboratory Control Sample
	X	Matrix Spike / Spike Duplicate Sample
	X	System Monitoring Compounds
	X	Internal Standards
	X	Field Sample Duplicate
X		Quantitation Verification

The quality of data collected in support of this sampling activity is considered acceptable with noted qualifications.

Richard McCracken, Chemist

10/29/07
Date

RFAAP VALIDATION REPORT
VOLATILES REVIEW
SDG F52208

I-Holding Times and Preservation
The objective is to ascertain the validity of results based on the holding time of the sample from time of collection to time of analysis. Holding time criteria: For aqueous samples cooled @ 4°C±2°C; pH<2 HCl, the maximum holding time is 14 days (7 days if no HCl added) from sample collection to analysis. For soil samples cooled @ 4°C±2°C; the maximum holding time is 14 days from sample collection to analysis.

- Temperature Review: A temperature blank was sent with each cooler and recorded by the laboratory upon receipt. The samples collected on 8/30/07 were sent in 15 coolers, and were received by the laboratory on 8/31/07 at temperatures ranging from 0.6°C to 2.2°C, with 12 of the 15 coolers having temperatures below 2.0°C. The low sample temperatures are not expected to have an adverse impact on the analytical results. No qualifiers were applied.

- Holding Time Review: The aqueous samples were collected for VOCs on 08/30/07 and analyzed on 9/13/07. All criteria were met. No qualifiers were applied.

II-Instrument Performance Check
The analysis of the instrument performance check solution must be performed at the beginning of each 12-hour period during which samples are analyzed.

- The instrument performance check, bromofluorobenzene (BFB), met the ion abundance criteria. No qualification was applied.

III-Initial Calibration
Compliance requirements for satisfactory instrument calibration are established to ensure that the instrument used is capable of producing acceptable qualitative and quantitative data for volatile target compounds. Initial calibration demonstrates that the instrument is capable of acceptable performance in the beginning of the analytical run and of producing a linear calibration curve. The RRF must be greater than 0.1 for chloromethane, 1,1-dichloroethane, and bromoform and greater than 0.3 for 1,1,2,2-tetrachloroethane and chlorobenzene. The minimum relative response factor (RRF) must be ≥0.05 for all other compounds. The DoD QSM specifies that the percent relative standard deviation (%RSD) must be ≤15% for each target compound and must be ≤30% for each calibration check compound. For compounds analyzed using linear regression or second order, correlation coefficients must be >0.995 and coefficients of determination >0.99. All detects are qualified as estimated "J" for where there were exceeding %RSDs, and all non-detects are qualified as estimated "UJ" for where there were grossly exceeding recoveries, unless determined to be unusable "R". Grossly exceeding is defined as twice the established criteria limits. For where there were low RRFs, all detects are qualified as estimated "J" and non-detects are rejected "R".

- During the 9/7/07 initial calibration performed on instrument MSVOA4, target compounds acetone (15.12%), chloroethane (15.55%), 2-hexanone (20.41%), 4-methyl-2-pentanone (24.74%), methylene chloride (33.22%), and styrene (17.15%) were outside %RSD criteria. All other target compounds met %RSD criteria, and all compounds met RRF criteria. The compounds with high %RSD were quantified using second order regression, and had correlation coefficients >0.995; therefore, no qualifiers were applied. All samples were analyzed in conjunction with this initial calibration.

IV-Continuing Calibration

Compliance requirements for satisfactory instrument calibration are established to ensure that the instrument used is capable of producing acceptable qualitative and quantitative data for volatile target compounds. Continuing calibration establishes the 12-hour relative response factors on which the quantitations are based and checks satisfactory performance of the instrument on a day-to-day basis. The RRF must be greater than 0.1 for chloromethane, 1,1-dichloroethane, and bromoform and greater than 0.3 for 1,1,2,2-tetrachloroethane and chlorobenzene. The minimum relative response factor (RRF) must be ≥0.05 for all other compounds. The DoD QSM specifies that the percent difference (%D) between the initial calibration RRF and the continuing calibration RRF must be within 20% for all target compounds. All detects are qualified as estimated "J" for where there were exceeding %Ds, and all non-detects are qualified as estimated "UJ" for where there were grossly exceeding recoveries, unless determined to be unusable "R". Grossly exceeding is defined as twice the established criteria limits. For where there were low RRFs, all detects are qualified as estimated "J" and non-detects are rejected "R".

- During the initial calibration verification performed on 9/7/07 @1307 on instrument MSVOA4, acetone (31.6%) had a %drift outside criteria. All other target compounds were within criteria (%D≤20%; %Drift≤20%; RRF≥0.05). No samples were analyzed following this initial calibration verification, therefore no qualifiers were applied.

- During the continuing calibration performed on 9/13/07 @1030 on instrument MSVOA4, acetone (21.7%) had a %drift outside criteria. All other target compounds were within criteria (%D≤20%; %Drift≤20%; RRF≥0.05). No acetone was detected in any of the associated samples, so no data qualification was required. All samples were analyzed following this continuing calibration.

V-Blank Analysis

The purpose of blank analyses is to determine the presence and magnitude of contamination problems resulting from field and laboratory activities. A method blank analysis must be performed after the calibration standards and once every 12-hour time period beginning with the injection of BFB. No contaminants should be detected in any of the associated blanks > the MDL. The DoD QSM criteria specifies all concentrations should be less than one-half MRL (<MRL for common laboratory contaminants methylene chloride, acetone, and 2-butanone). Positive sample results are reported and qualified "B", if the concentration of the compound in the sample is ≤10 times (10x) the maximum amount in any blank for the common laboratory contaminants methylene chloride, acetone, and 2-butanone (MEK), or 5 times (5X) the maximum amount for other volatile target compounds. **Table 2** summarizes the blank contamination analysis.

Table 2 Blank Contamination Analysis Summary

Analysis Date	QC Blank ID	Compound	Max Conc. µg/L	Action Level µg/L	B qualified samples
9/13/07	VB2036-MB	All target <½MRL	NA	NA	None
9/13/07	RB083007	All target <½MRL	NA	NA	None
9/13/07	TB083007	All target <½MRL	NA	NA	None

NA = Not Applicable
MRL = Method Reporting Limit

VI-Laboratory Control Sample

Data for laboratory control samples (LCS) are evaluated to determine long-term accuracy of the analytical method on various matrices. Percent recoveries (%Rs) should be within the specified control limits. The DoD aqueous LCS recovery limits are specified in Table D-4 of the DoD QSM (DoD, 2006). If the compound is not listed, then the laboratory criteria shall be used.

- Sample VB2036-BS was used as the aqueous LCS for the VOC analysis on 9/13/07. Methyl chloride (143%) was above the DoD QSM criteria. No methyl chloride was detected in any samples, therefore no data qualifiers were applied. All other target compound recoveries were within criteria. All samples were analyzed in conjunction with this LCS.

VII-Matrix Spike/Matrix Spike Duplicate

Data for matrix spike/matrix spike duplicates (MS/MSD) are generated to determine long-term precision and accuracy of the analytical method on various matrices and to demonstrate acceptable compound recovery by the laboratory at the time of sample analysis. The percent recoveries (%Rs) and the relative percent difference (RPD) must be within the specified control limits. The DoD MS/MSD aqueous recovery limits follow the LCS criteria and are specified in Table D-4 of the DoD QSM (DoD, 2006). If the compound is not listed, then the laboratory criteria shall be used.

- Sample RB083007 was used for the aqueous MS/MSD analysis on 9/13/07. Methyl chloride (150%, 141%) was above the DoD QSM criteria. No methyl chloride was detected in any samples, therefore no data qualifiers were applied. All other target compound recoveries were within criteria. All samples were analyzed in conjunction with this MS/MSD.

VIII-System Monitoring Compounds (Surrogates)

Laboratory performance on individual samples is evaluated through the review of surrogate spike samples. Recoveries for system monitoring compounds in volatile samples and blanks must be within the specified control limits. DoD surrogate recovery limits are specified in Table D-3 of the DoD QSM (DoD, 2006). If the surrogate is not listed, then the laboratory criteria shall be used.

Aqueous Criteria: Dibromofluoromethane (87-116%) (DoD QSM = 85-115%)
1,2-Dichloroethane-d4 (76-127%) (DoD QSM = 70-120%)
Toluene-d8 (86-112%) (DoD QSM = 85-120%)
4-Bromofluorobenzene (84-120%) (DoD QSM = 75-120%)

- All samples met criteria. No qualifiers were applied.

IX-Internal Standards (IS)

Internal standards performance criteria ensure that GC/MS sensitivity and response are stable during every analytical run. Specific criteria include: area counts (-50% to +100%) of the associated calibration standard, and retention time (± 30 seconds) from that of the associated calibration standard.

- All samples met criteria. No qualifiers were applied.

X-Field Duplicate Sample Analysis

Field duplicates were collected to identify the cumulative precision of the sampling and analytical process and sent to the laboratory blind. The RPD was calculated only for those analytes which were detected at levels exceeding the method reporting limits in both samples of the duplicate pair. Analytes that were rejected (R-qualified) in either sample of the duplicate pair were excluded from the duplicate assessment. Precision control criterion was established at 50% RPD for the aqueous and solid samples. Analytical results were qualified as estimated (J) for any RPDs exceeding criteria.

- No field duplicates were included in this sample set.

XI-Quantitation Verification

The accuracy of analytical results is verified through the calculation of several parameters. The percent difference (%D) between the calculated and the reported values should be within 10%. Any sample value >MDL and <MRL or <3*MDL (whichever is greater) was qualified as estimated, "J."

Sample: 50MW02 (F52208-4), trichloroethylene

Conc. (μg/L) = (Ax * Is * DF)/(Ais * RRF * Vo)

where: Ax is the compound area
Is is the amount of internal standard added (ng)
DF is the dilution factor
Ais is the internal standard area
RRF is the relative response factor
Vo is the volume of water purged (ml)

Conc. μg/L = (33658 * 250 μg/L * 1) / (1645049 * 0.304 *5) = 3.4 μg/L

Reported Conc. = 3.4 μg/L
%D = 0.0%
Values were within 10% difference.

USEPA Region III Validation Qualifiers

(No Code) = Confirmed identification.

B = The analyte has been detected in the sample and the associated laboratory or field blank.

J = Indicates an estimated value for (1) estimated value due to QC non-conformance. Reported value may not be accurate or precise, (2) estimating a concentration as a tentatively identified compound as indicated by the mass spectral and retention time data, or (3) estimating a concentration ≥MDL and <MRL or <3*MDL, whichever is greater.

K = Analyte present. Reported value may be biased high (estimated) due to QC non-conformance.

L = Analyte present. Reported value may be biased low (estimated) due to QC non-conformance.

R = Unreliable result. Analyte may or may not be present in the sample due to QC non-conformance.

UL = Value is estimated bias low and not detected due to QC non-conformance. Reporting limit may be inaccurate or imprecise. Quantitation limit is probably higher.

UJ = Value is estimated and not detected due to QC non-conformance. Reporting limit may be inaccurate or imprecise.

Laboratory Qualifiers

(No Code) = Confirmed identification.

U = Not detected. The associated number indicates the compound reporting limit for the sample.

A (Dioxins) = B (Metals) = The reported value was obtained from a reading <MRL and ≥MDL and is considered estimated.

B (Organics) = The analyte or compound has been detected in the sample and laboratory method blank. It indicates probable blank contamination.

E (Metals) = Reported value is estimated because of the presence of interferences.

E (Organics) = Identifies compounds whose concentrations exceed the upper level of the calibration range.

EMPC (Dioxins) = The ion-abundance ratio between the two characteristic PCDD/PCDF ions was outside accepted ranges. The detected PCDD/PCDF was reported as an estimated maximum possible concentration (EMPC).

D = Indicates sample was analyzed at a dilution.

J = Indicates an estimated value for (1) estimating a concentration as a tentatively identified compound as indicated by the mass spectral and retention time data, or (2) estimating a concentration <MRL and ≥ MDL.

N (Organics) = Indicates presumptive evidence of a compound for tentatively identified compounds using a library search.

N (Metals) = Laboratory spike sample recovery not within control limits.

P (Organics) = Target analyte confirmation >40% difference for detected compound between the primary and secondary columns. The lower of the two values was reported.

* (Metals) = Duplicate analysis not within control limits.

* (Organics) = Surrogate outside of QC limits on both original and re-analysis.

Accutest LabLink@70184 17:26 25-Oct-2007

Report of Analysis

Client Sample ID:	RB083007		
Lab Sample ID:	F52208-1	Date Sampled:	08/30/07
Matrix:	AQ - Ground Water	Date Received:	08/31/07
Method:	SW846 8260B	Percent Solids:	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	B048431.D	1	09/13/07	LD	n/a	n/a	VB2036
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	25	10	ug/l	
71-43-2	Benzene	ND	1.0	0.20	ug/l	
75-27-4	Bromodichloromethane	ND	1.0	0.29	ug/l	
75-25-2	Bromoform	ND	1.0	0.28	ug/l	
108-90-7	Chlorobenzene	ND	1.0	0.20	ug/l	
75-00-3	Chloroethane	ND	2.0	0.46	ug/l	
67-66-3	Chloroform	ND	1.0	0.21	ug/l	
75-15-0	Carbon disulfide	ND	2.0	0.20	ug/l	
56-23-5	Carbon tetrachloride	ND	1.0	0.29	ug/l	
75-34-3	1,1-Dichloroethane	ND	1.0	0.25	ug/l	
75-35-4	1,1-Dichloroethylene	ND	1.0	0.23	ug/l	
107-06-2	1,2-Dichloroethane	ND	1.0	0.20	ug/l	
78-87-5	1,2-Dichloropropane	ND	1.0	0.25	ug/l	
124-48-1	Dibromochloromethane	ND	1.0	0.20	ug/l	
156-59-2	cis-1,2-Dichloroethylene	ND	1.0	0.28	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	1.0	0.24	ug/l	
156-60-5	trans-1,2-Dichloroethylene	ND	1.0	0.20	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	1.0	0.21	ug/l	
100-41-4	Ethylbenzene	ND	1.0	0.20	ug/l	
591-78-6	2-Hexanone	ND	10	2.9	ug/l	
108-10-1	4-Methyl-2-pentanone	ND	5.0	2.2	ug/l	
74-83-9	Methyl bromide	ND	2.0	0.54	ug/l	
74-87-3	Methyl chloride	ND	2.0	0.38	ug/l	
75-09-2	Methylene chloride	ND	5.0	1.0	ug/l	
78-93-3	Methyl ethyl ketone	ND	5.0	2.0	ug/l	
100-42-5	Styrene	ND	1.0	0.20	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	1.0	0.29	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.0	0.37	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	1.0	0.30	ug/l	
127-18-4	Tetrachloroethylene	ND	1.0	0.25	ug/l	
108-88-3	Toluene	ND	1.0	0.27	ug/l	
79-01-6	Trichloroethylene	ND	1.0	0.38	ug/l	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	RB083007		
Lab Sample ID:	F52208-1	Date Sampled:	08/30/07
Matrix:	AQ - Ground Water	Date Received:	08/31/07
Method:	SW846 8260B	Percent Solids:	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
75-01-4	Vinyl chloride	ND	1.0	0.34	ug/l	
	m,p-Xylene	ND	2.0	0.36	ug/l	
95-47-6	o-Xylene	ND	1.0	0.20	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	101%		87-116%
17060-07-0	1,2-Dichloroethane-D4	107%		76-127%
2037-26-5	Toluene-D8	103%		86-112%
460-00-4	4-Bromofluorobenzene	113%		84-120%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	50MW01		
Lab Sample ID:	F52208-2	Date Sampled:	08/30/07
Matrix:	AQ - Ground Water	Date Received:	08/31/07
Method:	SW846 8260B	Percent Solids:	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	B048438.D	1	09/13/07	LD	n/a	n/a	VB2036
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	25	10	ug/l	
71-43-2	Benzene	ND	1.0	0.20	ug/l	
75-27-4	Bromodichloromethane	ND	1.0	0.29	ug/l	
75-25-2	Bromoform	ND	1.0	0.28	ug/l	
108-90-7	Chlorobenzene	ND	1.0	0.20	ug/l	
75-00-3	Chloroethane	ND	2.0	0.46	ug/l	
67-66-3	Chloroform	ND	1.0	0.21	ug/l	
75-15-0	Carbon disulfide	ND	2.0	0.20	ug/l	
56-23-5	Carbon tetrachloride	ND	1.0	0.29	ug/l	
75-34-3	1,1-Dichloroethane	ND	1.0	0.25	ug/l	
75-35-4	1,1-Dichloroethylene	ND	1.0	0.23	ug/l	
107-06-2	1,2-Dichloroethane	ND	1.0	0.20	ug/l	
78-87-5	1,2-Dichloropropane	ND	1.0	0.25	ug/l	
124-48-1	Dibromochloromethane	ND	1.0	0.20	ug/l	
156-59-2	cis-1,2-Dichloroethylene	ND	1.0	0.28	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	1.0	0.24	ug/l	
156-60-5	trans-1,2-Dichloroethylene	ND	1.0	0.20	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	1.0	0.21	ug/l	
100-41-4	Ethylbenzene	ND	1.0	0.20	ug/l	
591-78-6	2-Hexanone	ND	10	2.9	ug/l	
108-10-1	4-Methyl-2-pentanone	ND	5.0	2.2	ug/l	
74-83-9	Methyl bromide	ND	2.0	0.54	ug/l	
74-87-3	Methyl chloride	ND	2.0	0.38	ug/l	
75-09-2	Methylene chloride	ND	5.0	1.0	ug/l	
78-93-3	Methyl ethyl ketone	ND	5.0	2.0	ug/l	
100-42-5	Styrene	ND	1.0	0.20	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	1.0	0.29	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.0	0.37	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	1.0	0.30	ug/l	
127-18-4	Tetrachloroethylene	ND	1.0	0.25	ug/l	
108-88-3	Toluene	ND	1.0	0.27	ug/l	
79-01-6	Trichloroethylene	ND	1.0	0.38	ug/l	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	50MW01		
Lab Sample ID:	F52208-2	Date Sampled:	08/30/07
Matrix:	AQ - Ground Water	Date Received:	08/31/07
Method:	SW846 8260B	Percent Solids:	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
75-01-4	Vinyl chloride	ND	1.0	0.34	ug/l	
	m,p-Xylene	ND	2.0	0.36	ug/l	
95-47-6	o-Xylene	ND	1.0	0.20	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	99%		87-116%
17060-07-0	1,2-Dichloroethane-D4	110%		76-127%
2037-26-5	Toluene-D8	102%		86-112%
460-00-4	4-Bromofluorobenzene	111%		84-120%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	48MW07		
Lab Sample ID:	F52208-3	Date Sampled:	08/30/07
Matrix:	AQ - Ground Water	Date Received:	08/31/07
Method:	SW846 8260B	Percent Solids:	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	B048439.D	1	09/13/07	LD	n/a	n/a	VB2036
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	25	10	ug/l	
71-43-2	Benzene	ND	1.0	0.20	ug/l	
75-27-4	Bromodichloromethane	ND	1.0	0.29	ug/l	
75-25-2	Bromoform	ND	1.0	0.28	ug/l	
108-90-7	Chlorobenzene	ND	1.0	0.20	ug/l	
75-00-3	Chloroethane	ND	2.0	0.46	ug/l	
67-66-3	Chloroform	ND	1.0	0.21	ug/l	
75-15-0	Carbon disulfide	ND	2.0	0.20	ug/l	
56-23-5	Carbon tetrachloride	ND	1.0	0.29	ug/l	
75-34-3	1,1-Dichloroethane	ND	1.0	0.25	ug/l	
75-35-4	1,1-Dichloroethylene	ND	1.0	0.23	ug/l	
107-06-2	1,2-Dichloroethane	ND	1.0	0.20	ug/l	
78-87-5	1,2-Dichloropropane	ND	1.0	0.25	ug/l	
124-48-1	Dibromochloromethane	ND	1.0	0.20	ug/l	
156-59-2	cis-1,2-Dichloroethylene	ND	1.0	0.28	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	1.0	0.24	ug/l	
156-60-5	trans-1,2-Dichloroethylene	ND	1.0	0.20	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	1.0	0.21	ug/l	
100-41-4	Ethylbenzene	ND	1.0	0.20	ug/l	
591-78-6	2-Hexanone	ND	10	2.9	ug/l	
108-10-1	4-Methyl-2-pentanone	ND	5.0	2.2	ug/l	
74-83-9	Methyl bromide	ND	2.0	0.54	ug/l	
74-87-3	Methyl chloride	ND	2.0	0.38	ug/l	
75-09-2	Methylene chloride	ND	5.0	1.0	ug/l	
78-93-3	Methyl ethyl ketone	ND	5.0	2.0	ug/l	
100-42-5	Styrene	ND	1.0	0.20	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	1.0	0.29	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.0	0.37	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	1.0	0.30	ug/l	
127-18-4	Tetrachloroethylene	ND	1.0	0.25	ug/l	
108-88-3	Toluene	ND	1.0	0.27	ug/l	
79-01-6	Trichloroethylene	ND	1.0	0.38	ug/l	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	48MW07		
Lab Sample ID:	F52208-3	Date Sampled:	08/30/07
Matrix:	AQ - Ground Water	Date Received:	08/31/07
Method:	SW846 8260B	Percent Solids:	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
75-01-4	Vinyl chloride	ND	1.0	0.34	ug/l	
	m,p-Xylene	ND	2.0	0.36	ug/l	
95-47-6	o-Xylene	ND	1.0	0.20	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	101%		87-116%
17060-07-0	1,2-Dichloroethane-D4	109%		76-127%
2037-26-5	Toluene-D8	101%		86-112%
460-00-4	4-Bromofluorobenzene	111%		84-120%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: [redacted]

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Report of Analysis

3.4

Client Sample ID:	50MW02		
Lab Sample ID:	F52208-4	Date Sampled:	08/30/07
Matrix:	AQ - Ground Water	Date Received:	08/31/07
Method:	SW846 8260B	Percent Solids:	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	B048440.D	1	09/13/07	LD	n/a	n/a	VB2036
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

VOA TCL List

DATA VAL QUALIFIER

CAS No.	Compound	Result	RL	MDL	Units	Q	
67-64-1	Acetone	ND	25	10	ug/l		
71-43-2	Benzene	ND	1.0	0.20	ug/l		
75-27-4	Bromodichloromethane	ND	1.0	0.29	ug/l		
75-25-2	Bromoform	ND	1.0	0.28	ug/l		
108-90-7	Chlorobenzene	ND	1.0	0.20	ug/l		
75-00-3	Chloroethane	ND	2.0	0.46	ug/l		
67-66-3	Chloroform	ND	1.0	0.21	ug/l		
75-15-0	Carbon disulfide	ND	2.0	0.20	ug/l		
56-23-5	Carbon tetrachloride	2.7	1.0	0.29	ug/l		
75-34-3	1,1-Dichloroethane	ND	1.0	0.25	ug/l		
75-35-4	1,1-Dichloroethylene	ND	1.0	0.23	ug/l		
107-06-2	1,2-Dichloroethane	ND	1.0	0.20	ug/l		
78-87-5	1,2-Dichloropropane	ND	1.0	0.25	ug/l		
124-48-1	Dibromochloromethane	ND	1.0	0.20	ug/l		
156-59-2	cis-1,2-Dichloroethylene	ND	1.0	0.28	ug/l		
10061-01-5	cis-1,3-Dichloropropene	ND	1.0	0.24	ug/l		
156-60-5	trans-1,2-Dichloroethylene	ND	1.0	0 20	ug/l		
10061-02-6	trans-1,3-Dichloropropene	ND	1.0	0.21	ug/l		
100-41-4	Ethylbenzene	ND	1.0	0.20	ug/l		
591-78-6	2-Hexanone	ND	10	2.9	ug/l		
108-10-1	4-Methyl-2-pentanone	ND	5.0	2.2	ug/l		
74-83-9	Methyl bromide	ND	2.0	0.54	ug/l		
74-87-3	Methyl chloride	ND	2.0	0.38	ug/l		
75-09-2	Methylene chloride	ND	5.0	1.0	ug/l		
78-93-3	Methyl ethyl ketone	ND	5.0	2.0	ug/l		
100-42-5	Styrene	ND	1.0	0.20	ug/l		
71-55-6	1,1,1-Trichloroethane	ND	1.0	0.29	ug/l		
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.0	0.37	ug/l		
79-00-5	1,1,2-Trichloroethane	ND	1.0	0.30	ug/l		
127-18-4	Tetrachloroethylene	0.84	1.0	0.25	ug/l	J	J
108-88-3	Toluene	ND	1.0	0.27	ug/l		
79-01-6	Trichloroethylene	3.4	1.0	0.38	ug/l		

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	50MW02		
Lab Sample ID:	F52208-4	Date Sampled:	08/30/07
Matrix:	AQ - Ground Water	Date Received:	08/31/07
Method:	SW846 8260B	Percent Solids:	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
75-01-4	Vinyl chloride	ND	1.0	0.34	ug/l	
	m,p-Xylene	ND	2.0	0.36	ug/l	
95-47-6	o-Xylene	ND	1.0	0.20	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	100%		87-116%
17060-07-0	1,2-Dichloroethane-D4	109%		76-127%
2037-26-5	Toluene-D8	102%		86-112%
460-00-4	4-Bromofluorobenzene	112%		84-120%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	48MW05		
Lab Sample ID:	F52208-5	Date Sampled:	08/30/07
Matrix:	AQ - Ground Water	Date Received:	08/31/07
Method:	SW846 8260B	Percent Solids:	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	B048441.D	1	09/13/07	LD	n/a	n/a	VB2036
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	25	10	ug/l	
71-43-2	Benzene	ND	1.0	0.20	ug/l	
75-27-4	Bromodichloromethane	ND	1.0	0.29	ug/l	
75-25-2	Bromoform	ND	1.0	0.28	ug/l	
108-90-7	Chlorobenzene	ND	1.0	0.20	ug/l	
75-00-3	Chloroethane	ND	2.0	0.46	ug/l	
67-66-3	Chloroform	ND	1.0	0.21	ug/l	
75-15-0	Carbon disulfide	ND	2.0	0.20	ug/l	
56-23-5	Carbon tetrachloride	ND	1.0	0.29	ug/l	
75-34-3	1,1-Dichloroethane	ND	1.0	0.25	ug/l	
75-35-4	1,1-Dichloroethylene	ND	1.0	0.23	ug/l	
107-06-2	1,2-Dichloroethane	ND	1.0	0.20	ug/l	
78-87-5	1,2-Dichloropropane	ND	1.0	0.25	ug/l	
124-48-1	Dibromochloromethane	ND	1.0	0.20	ug/l	
156-59-2	cis-1,2-Dichloroethylene	ND	1.0	0.28	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	1.0	0.24	ug/l	
156-60-5	trans-1,2-Dichloroethylene	ND	1.0	0.20	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	1.0	0.21	ug/l	
100-41-4	Ethylbenzene	ND	1.0	0.20	ug/l	
591-78-6	2-Hexanone	ND	10	2.9	ug/l	
108-10-1	4-Methyl-2-pentanone	ND	5.0	2.2	ug/l	
74-83-9	Methyl bromide	ND	2.0	0.54	ug/l	
74-87-3	Methyl chloride	ND	2.0	0.38	ug/l	
75-09-2	Methylene chloride	ND	5.0	1.0	ug/l	
78-93-3	Methyl ethyl ketone	ND	5.0	2.0	ug/l	
100-42-5	Styrene	ND	1.0	0.20	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	1.0	0.29	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.0	0.37	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	1.0	0.30	ug/l	
127-18-4	Tetrachloroethylene	2.3	1.0	0.25	ug/l	
108-88-3	Toluene	ND	1.0	0.27	ug/l	
79-01-6	Trichloroethylene	ND	1.0	0.38	ug/l	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	48MW05		
Lab Sample ID:	F52208-5	Date Sampled:	08/30/07
Matrix:	AQ - Ground Water	Date Received:	08/31/07
Method:	SW846 8260B	Percent Solids:	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
75-01-4	Vinyl chloride	ND	1.0	0.34	ug/l	
	m,p-Xylene	ND	2.0	0.36	ug/l	
95-47-6	o-Xylene	ND	1.0	0.20	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	100%		87-116%
17060-07-0	1,2-Dichloroethane-D4	110%		76-127%
2037-26-5	Toluene-D8	101%		86-112%
460-00-4	4-Bromofluorobenzene	111%		84-120%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: [redacted]

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Report of Analysis

Client Sample ID:	48MW06		
Lab Sample ID:	F52208-6	Date Sampled:	08/30/07
Matrix:	AQ - Ground Water	Date Received:	08/31/07
Method:	SW846 8260B	Percent Solids:	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	B048442.D	1	09/13/07	LD	n/a	n/a	VB2036
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	25	10	ug/l	
71-43-2	Benzene	ND	1.0	0.20	ug/l	
75-27-4	Bromodichloromethane	ND	1.0	0.29	ug/l	
75-25-2	Bromoform	ND	1.0	0.28	ug/l	
108-90-7	Chlorobenzene	ND	1.0	0.20	ug/l	
75-00-3	Chloroethane	ND	2.0	0.46	ug/l	
67-66-3	Chloroform	ND	1.0	0.21	ug/l	
75-15-0	Carbon disulfide	ND	2.0	0.20	ug/l	
56-23-5	Carbon tetrachloride	ND	1.0	0.29	ug/l	
75-34-3	1,1-Dichloroethane	3.4	1.0	0.25	ug/l	
75-35-4	1,1-Dichloroethylene	ND	1.0	0.23	ug/l	
107-06-2	1,2-Dichloroethane	ND	1.0	0.20	ug/l	
78-87-5	1,2-Dichloropropane	ND	1.0	0.25	ug/l	
124-48-1	Dibromochloromethane	ND	1.0	0.20	ug/l	
156-59-2	cis-1,2-Dichloroethylene	2.9	1.0	0.28	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	1.0	0.24	ug/l	
156-60-5	trans-1,2-Dichloroethylene	ND	1.0	0.20	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	1.0	0.21	ug/l	
100-41-4	Ethylbenzene	ND	1.0	0.20	ug/l	
591-78-6	2-Hexanone	ND	10	2.9	ug/l	
108-10-1	4-Methyl-2-pentanone	ND	5.0	2.2	ug/l	
74-83-9	Methyl bromide	ND	2.0	0.54	ug/l	
74-87-3	Methyl chloride	ND	2.0	0.38	ug/l	
75-09-2	Methylene chloride	ND	5.0	1.0	ug/l	
78-93-3	Methyl ethyl ketone	ND	5.0	2.0	ug/l	
100-42-5	Styrene	ND	1.0	0.20	ug/l	
71-55-6	1,1,1-Trichloroethane	1.8	1.0	0.29	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.0	0.37	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	1.0	0.30	ug/l	
127-18-4	Tetrachloroethylene	ND	1.0	0.25	ug/l	
108-88-3	Toluene	ND	1.0	0.27	ug/l	
79-01-6	Trichloroethylene	3.7	1.0	0.38	ug/l	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	48MW06		
Lab Sample ID:	F52208-6	Date Sampled:	08/30/07
Matrix:	AQ - Ground Water	Date Received:	08/31/07
Method:	SW846 8260B	Percent Solids:	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
75-01-4	Vinyl chloride	ND	1.0	0.34	ug/l	
	m,p-Xylene	ND	2.0	0.36	ug/l	
95-47-6	o-Xylene	ND	1.0	0.20	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	100%		87-116%
17060-07-0	1,2-Dichloroethane-D4	109%		76-127%
2037-26-5	Toluene-D8	103%		86-112%
460-00-4	4-Bromofluorobenzene	111%		84-120%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest LabLink@70184 17:26 25-Oct-2007

Report of Analysis

Client Sample ID:	TB083007		
Lab Sample ID:	F52208-8	Date Sampled:	08/30/07
Matrix:	AQ - Trip Blank Water	Date Received:	08/31/07
Method:	SW846 8260B	Percent Solids:	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	B048444.D	1	09/13/07	LD	n/a	n/a	VB2036
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	25	10	ug/l	
71-43-2	Benzene	ND	1.0	0.20	ug/l	
75-27-4	Bromodichloromethane	ND	1.0	0.29	ug/l	
75-25-2	Bromoform	ND	1.0	0.28	ug/l	
108-90-7	Chlorobenzene	ND	1.0	0.20	ug/l	
75-00-3	Chloroethane	ND	2.0	0.46	ug/l	
67-66-3	Chloroform	ND	1.0	0.21	ug/l	
75-15-0	Carbon disulfide	ND	2.0	0.20	ug/l	
56-23-5	Carbon tetrachloride	ND	1.0	0.29	ug/l	
75-34-3	1,1-Dichloroethane	ND	1.0	0.25	ug/l	
75-35-4	1,1-Dichloroethylene	ND	1.0	0.23	ug/l	
107-06-2	1,2-Dichloroethane	ND	1.0	0.20	ug/l	
78-87-5	1,2-Dichloropropane	ND	1.0	0.25	ug/l	
124-48-1	Dibromochloromethane	ND	1.0	0.20	ug/l	
156-59-2	cis-1,2-Dichloroethylene	ND	1.0	0.28	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	1.0	0.24	ug/l	
156-60-5	trans-1,2-Dichloroethylene	ND	1.0	0.20	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	1.0	0.21	ug/l	
100-41-4	Ethylbenzene	ND	1.0	0.20	ug/l	
591-78-6	2-Hexanone	ND	10	2.9	ug/l	
108-10-1	4-Methyl-2-pentanone	ND	5.0	2.2	ug/l	
74-83-9	Methyl bromide	ND	2.0	0.54	ug/l	
74-87-3	Methyl chloride	ND	2.0	0.38	ug/l	
75-09-2	Methylene chloride	ND	5.0	1.0	ug/l	
78-93-3	Methyl ethyl ketone	ND	5.0	2.0	ug/l	
100-42-5	Styrene	ND	1.0	0.20	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	1.0	0.29	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.0	0.37	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	1.0	0.30	ug/l	
127-18-4	Tetrachloroethylene	ND	1.0	0.25	ug/l	
108-88-3	Toluene	ND	1.0	0.27	ug/l	
79-01-6	Trichloroethylene	ND	1.0	0.38	ug/l	

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	TB083007		
Lab Sample ID:	F52208-8	Date Sampled:	08/30/07
Matrix:	AQ - Trip Blank Water	Date Received:	08/31/07
Method:	SW846 8260B	Percent Solids:	n/a
Project:	WPA 019 Field Investigation; Radford AAP, VA		

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
75-01-4	Vinyl chloride	ND	1.0	0.34	ug/l	
	m,p-Xylene	ND	2.0	0.36	ug/l	
95-47-6	o-Xylene	ND	1.0	0.20	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	99%		87-116%
17060-07-0	1,2-Dichloroethane-D4	109%		76-127%
2037-26-5	Toluene-D8	103%		86-112%
460-00-4	4-Bromofluorobenzene	111%		84-120%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Appendix B

Lithologic Boring Logs, Soil Gas Survey, and Well Purge Forms

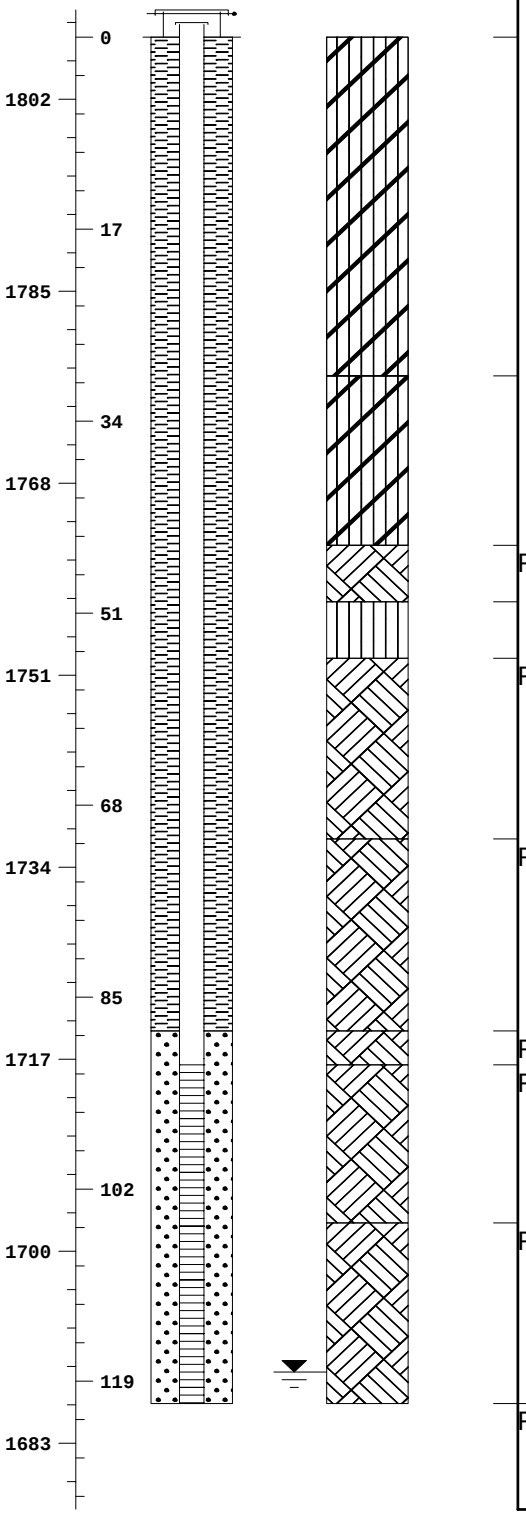
Appendix B-1

Lithologic Boring Logs

DRILL HOLE LOG
DRILL HOLE NO.: 50MW01

PROJECT: WPA 019 Groundwater Investigation
CLIENT/OWNER: RFAAP
HOLE LOCATION: RFAAP Radford, VA
DRILLER: Bedford Well Drilling
DRILL RIG: T3 Air Rotary
DEPTH TO WATER: 118.2
HOLE DIAMETER: 6 Inch

PROJECT NO.: 123461
DATE: 8/08/07
TOC ELEV.: 1809.9
GS ELEV.: 1807.5
LOGGED BY: J. Choynowski
HOLE NO.: 50MW01



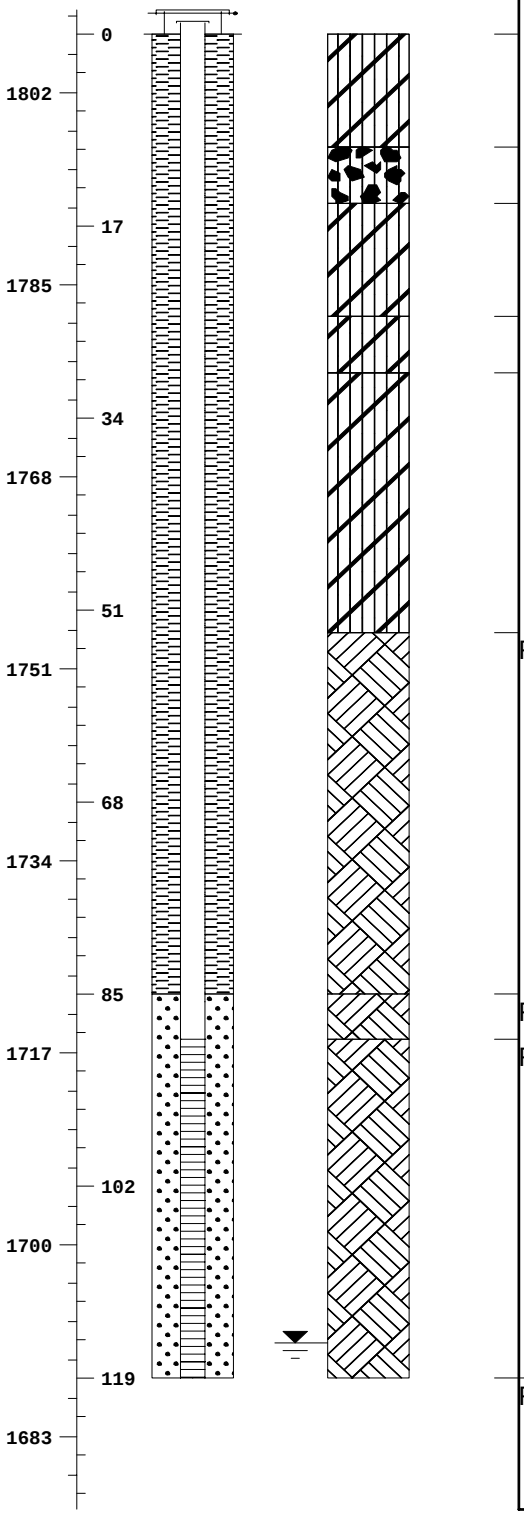
ELEVATION / DEPTH	WELL DETAILS	SOIL SYMBOLS, SAMPLER SYMBOLS AND FIELD TEST DATA	USCS	DESCRIPTION	Sample Number	Recovery	Water Content
				4" Protective case. 0			
			CL-ML	Red brown clay and silt, low plasticity. 2" PVC well pipe.			
				30			
			CL-ML	Yellowish brown clay and silt, low plasticity.			
				45			
			ROCK	Competent rock, bedrock.			
				50			
			ML	Dark gray to brown silt filling void (soft drilling).			
				55			
			ROCK	Into pale brown dolostone (hard drilling).			
				71			
			ROCK	Pale brown to olive brown.			
				88			
			ROCK	Top of sand filter layer. 91			
			ROCK	Top of well screen, 0.010" slot.			
				105			
			ROCK	Dark grayish brown.			
				121			
			ROCK	Bottom of screen and well.			

FIGURE NO.

DRILL HOLE LOG
DRILL HOLE NO.: 50MW02

PROJECT: WPA 019 Groundwater Investigation
CLIENT/OWNER: RFAAP
HOLE LOCATION: RFAAP Radford, VA
DRILLER: Bedford Well Drilling
DRILL RIG: T3 Air Rotary
DEPTH TO WATER: 115.9
HOLE DIAMETER: 6 Inch

PROJECT NO.: 123461
DATE: 8/09/07
TOC ELEV.: 1809.6
GS ELEV.: 1807.2
LOGGED BY: J. Choynowski
HOLE NO.: 50MW02



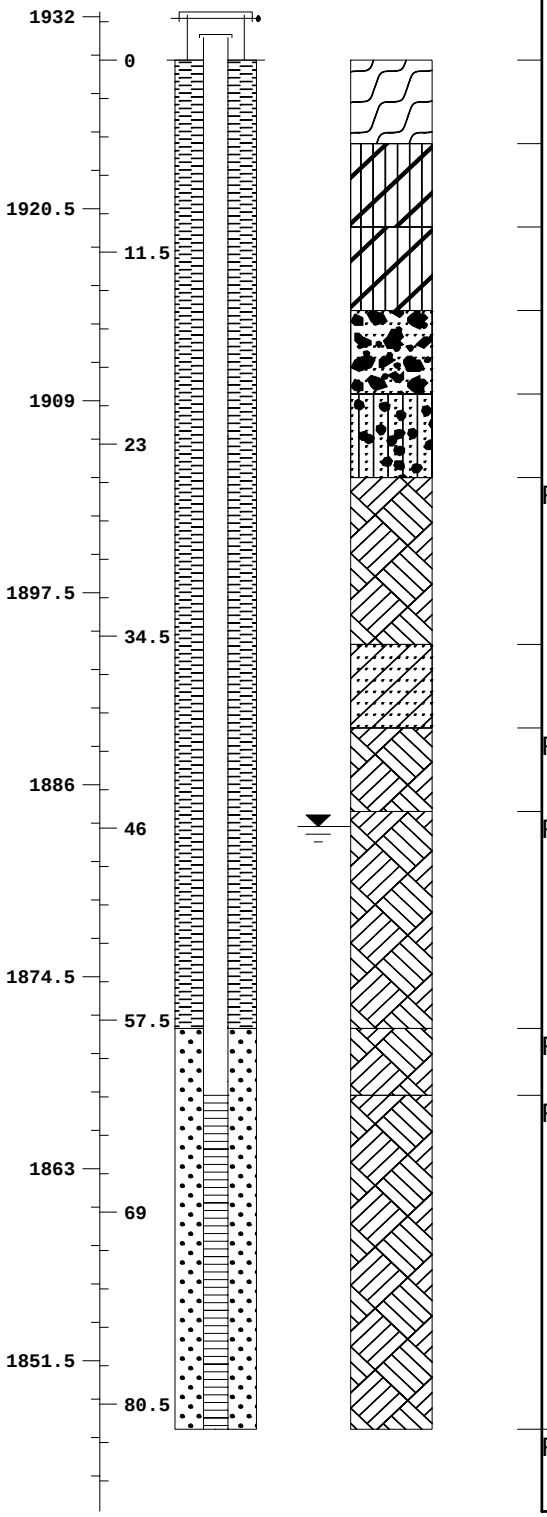
ELEVATION / DEPTH	USCS	DESCRIPTION	Sample Number	Recovery	Water Content
		4" Protective case.			
0	CL-ML	Red brown silt & clay.			
		2" PVC well pipe.			
10	ML	Red brown silt, trace coarse gravel.			
15	CL-ML	Red brown silt, little (-) clay.			
25	CL-ML	Brown silt, some (-) clay, low plasticity.			
30	CL-ML	Yellow brown silt & clay, low plasticity.			
53	ROCK	Pale brown to olive brown. Competent rock.			
85	ROCK	Top of sand filter layer.			
89	ROCK	Top of well screen, 0.010" slot.			
119	ROCK	Bottom of screen and well.			

FIGURE NO.

DRILL HOLE LOG
DRILL HOLE NO.: 59MW01

PROJECT: WPA 019 Groundwater Investigation
CLIENT/OWNER: RFAAP
HOLE LOCATION: RFAAP Radford, VA
DRILLER: Bedford Well Drilling
DRILL RIG: T3 Air Rotary
DEPTH TO WATER: 45.9
HOLE DIAMETER: 6 Inch

PROJECT NO.: 123461
DATE: 8/07/07
TOC ELEV.: 1831.2
GS ELEV.: 1929.4
LOGGED BY: J. Choynowski
HOLE NO.: 59MW01



ELEVATION / DEPTH	WELL DETAILS	SOIL SYMBOLS, SAMPLER SYMBOLS AND FIELD TEST DATA	USCS	DESCRIPTION	Sample Number	Recovery	Water Content
				4" Protective case.			
				0			
			OL	Black organic topsoil & roots turning to olive brown silty clay w/ little gravel.			
				2" PVC well pipe.			
			CL-ML	Olive brown silt & clay, little very fine sand.			
				5			
				10			
			CL-ML	Yellowish brown to olive brown clay w/ little silt, low plasticity.			
				15			
			GW-SW	Reddish brown gravel, coarse sands.			
				20			
			VG	Yellowish brown gravel, w/ little coarse sand, silt & clay.			
				25			
			ROCK	Olive weathered saprolite, gravel size.			
				35			
			SC	Pale brown sand & clay w/ some silt.			
				40			
			ROCK	Olive saprolite. Void.			
				45			
			ROCK	Olive saprolite.			
				58			
			ROCK	Top of sand filter layer.			
				62			
			ROCK	Top of well screen, 0.010" slot.			
				82			
			ROCK	Bottom of screen and well.			

FIGURE NO.

Appendix B-2

2007 RFI Well Purge Forms

Well Purging-Field Water Quality Measurements Form

Location (Site / Facility Name) RFAAP
Well Number 50MW01 Date 8-30-07
Field Personnel CS BS
Sample Organization Shaw Environmental
Identify MP

Depth to 91 / 121 of screen (below MP)
top bottom
Pump Intake at (ft. below MP) Bailer
Purging Device (e.g., Redi Flo2)
PID Reading (ppm)

Clock Time 24 HR	Water Depth ft. below MP	Pump Setting[1]	Purge Rate mL/min	Cum. Volume Purged liters	pH	Spec. Cond. mS/cm	Turbidity NTU	DO mg/L	Temp. deg. C	ORP/Eh[2] mv	Comments
0800	18.26	—	—	—	6.37	1.40	-5.0	11.99	17.03	205	

[1] Pump dial setting (e.g., hertz, cycles/min., etc.)
[2] Oxidation reduction potential (stand in for Eh)

Well Purging-Field Water Quality Measurements Form

Location (Site / Facility Name) RFAAP
Well Number 50mw02 Date 8-30-07
Field Personnel
Sample Organization Shaw Environmental
Identify MP

Depth to 89 (top) / 119 (bottom) of screen (below MP)
Pump Intake at (ft. below MP) Bailer
Purging Device (e.g., Redi Flo2)
PID Reading (ppm)

Clock Time 24 HR	Water Depth ft. below MP	Pump Setting[1]	Purge Rate mL/min	Cum. Volume Purged liters	pH	Spec. Cond. mS/cm	Turbidity NTU	DO mg/L	Temp. deg. C	ORP/Eh[2] mv	Comments
	115.91										
0900					7.04	6.921	547	12.43	17.80	212	

[1] Pump dial setting (e.g., hertz, cycles/min., etc.)
[2] Oxidation reduction potential (stand in for Eh)

Well Purging-Field Water Quality Measurements Form

Location (Site / Facility Name) RFAAP
Well Number 59MW01 Date 8-29-07
Field Personnel CJ / BS
Sample Organization Shaw Environmental
Identify MP

Depth to 68 (top) / 82 (bottom) of screen (below MP)
Pump Intake at (ft. below MP)
Purging Device (e.g., Redi Flo2)
PID Reading (ppm)

Clock Time 24 HR	Water Depth ft. below MP	Pump Setting[1]	Purge Rate mL/min	Cum. Volume Purged liters	pH	Spec. Cond. mS/cm	Turbidity NTU	DO mg/L	Temp. deg. C	ORP/Eh[2] mv	Comments
0540	45.9										
0555	49.95	167	350		6.10	.342	999	2.64	13.57	119	
0600	[illegible]	167	350		6.50	.345	999	2.20	14.62	97	
0605	50.00	167	350		6.93	.347	999	1.88	14.87	82	
0610		167	350		7.16	.345	999	1.71	14.95	71	
0615	50.35	167	350		7.33	.345	685	1.54	15.05	59	
0620		167	350		7.43	.347	410	1.36	15.11	48	
0625	50.40	167	350		7.47	.347	345	1.29	15.09	41	
0630		167	350		7.50	.347	300	1.23	15.19	36	
0635		167	350		7.52	.346	268	1.20	15.21	33	
0640		167	350		7.53	.347	265	1.16	15.27	32	
0645		167	350		7.55	.347	243	1.11	15.30	28	
0650		Sample Taken									

[1] Pump dial setting (e.g., hertz, cycles/min., etc.)
[2] Oxidation reduction potential (stand in for Eh)

Appendix C

Sample Location Coordinates and Elevations

Appendix C
2002 RFI/RI Sample Location Coordinates and Elevations

Site ID	Northing	Easting	Elevation
SWMU 50			
50SB06	3600538.82	10892339.91	1811.15
50SB07	3600591.26	10892471.24	1819.49
50SB08	3600432.21	10892378.16	1810.89
50SB09	3600492.25	10892477.85	1816.44
50SB10	3600528.12	10892531.64	1817.46
50SB11	3600561.23	10892551.05	1813.48
50SB12	3600387.84	10892407.00	1810.66
50SB13	3600391.82	10892480.73	1812.99
50SB14	3600390.24	10892565.33	1815.40
50SB15	3600483.94	10892573.27	1821.08
50MW01	3600334.20	10892291.52	1809.90
50MW02	3600295.66	10892519.27	1809.63
SWMU 59			
59SB03	3600720.99	10892704.14	1824.12
59SB04	3600654.06	10892659.45	1804.16

Appendix C
2002 RFI/RI Sample Location Coordinates and Elevations

Site ID	Northing	Easting	Elevation
59SB05	3600664.53	10892735.65	1822.35
59SB06	3600574.26	10892749.75	1809.70
59SS02	3600720.49	10892656.90	1824.63
59SS06	3600711.94	10892676.09	1822.72
59SS07	3600698.47	10892657.82	1823.10
59SS08	3600625.68	10892691.17	1818.72
59SS09	3600645.78	10892719.82	1820.36
59SS10	3600602.33	10892711.21	1814.86
59MW01	3600759.80	10892750.26	1831.27

Appendix C
2002 RFI/RI Sample Location Coordinates and Elevations

Site ID	Northing	Easting	Elevation

* Coordinates are in VA State Plane (NAD 1983)

**Elevations are feet above mean sea level (NAVD 88)

Appendix D

Contaminant Fate and Transport

CONTAMINANT FATE AND TRANSPORT

D.1 TRANSFORMATION AND FATE OF CONTAMINANTS

When contaminants are exposed to the environment, the potential for transformations of the chemical exists. The endpoint of the transformation process is referenced as the “fate” of the chemical. The ultimate "fate" refers to the expected final state that an element, compound, or group of compounds will achieve following release to the environment. The fate processes for organic contaminants may include sorption, volatilization, hydrolysis, and abiotic and biotic degradation, while the fate processes for inorganic contaminants may include ion exchange, chemical speciation, and oxidation/reduction. These fate processes dictate how contaminants will be transported in the environment. Contaminants can be transported with little attenuation or retardation due to these fate processes, or they can be delayed or transformed so that little migration occurs. Various fate processes, as well as the properties that may affect the fate of contaminants, are discussed below.

D.1.1 Contaminant Properties Affecting Fate

The physical and chemical properties of contaminants play a large role in determining their fate after release to the environment. The following section provides a discussion of several of these key properties.

D.1.1.1 Specific Gravity

Specific gravity is the ratio of the density of a compound to the density of water. It is a measure of the tendency of a compound to float (specific gravity <1) or sink (specific gravity >1) in water. Contaminants that are immiscible in water can exist as separate phase liquids and are referred to as Light Non-Aqueous Phase Liquids (LNAPLs) if their specific gravity is less than one, or Dense Non-Aqueous Phase Liquids (DNAPLs) if their specific gravity is greater than one.

D.1.1.2 Water Solubility

The solubility of a compound in water is the maximum or saturated concentration of the compound in pure water at a specific temperature. Compounds with high solubility in water tend to remain in the aqueous phase and not partition to soil or sediment, are less likely to volatilize from water, and are generally more likely to biodegrade. Conversely, compounds with a low water solubility tend to partition to soil or sediment, volatilize more readily from water, and are less likely to be biodegradable. The solubility of inorganic chemicals varies widely from insoluble to greater than 100,000 mg/L, depending on temperature, pH, ORP, and the concentrations of dissolved constituents such as humic and fulvic acids.

D.1.1.3 Vapor Pressure

Vapor pressure is a property of a chemical in its pure state, which indicates how readily it will volatilize to the atmosphere. Volatilization from water is dependent upon vapor pressure and Henry’s Law Constant. Vapor pressures for chemicals in their pure states range from 0.001 to 760 mm mercury (mm Hg) for liquids to less than 10^{-10} mm Hg for solids.

D.1.1.4 Henry's Law Constant

The Henry's Law Constant of a compound is essentially the air/water partition coefficient. In dimensional form, the Henry's Law Constant is the ratio of the vapor pressure to the water

solubility (in atm-m^3/mole). The Henry's Law Constant indicates how a chemical will partition between air and water at equilibrium, and can be used to calculate the rate of volatilization of a chemical from water.

D.1.1.5 Organic Carbon/Water Partition Coefficient

The organic carbon/water partition coefficient (K_{oc}) is a measure of the tendency for a chemical to be sorbed to the organic fraction of soil and sediment. Normal K_{oc} values range from 1 to 10^7 L/kg, with higher values indicating greater sorption potential by the soil and lower values indicating high leaching capabilities for the contaminants from the waste source into surface runoff and groundwater.

D.1.1.6 Octanol/Water Partition Coefficient

The octanol/water partition coefficient (K_{ow}) is a measure of the distribution of a compound at equilibrium between n-octanol and water. The octanol/water partition coefficient, K_{ow}, gives an indication of how a compound will preferentially distribute into a solvent or water, and is a measure of how hydrophobic a compound is. A chemical with a high K_{ow} is hydrophobic and may be relatively immobile in an aqueous system (e.g., contaminant sorbs to soil particles), but may be mobilized in the presence of an organic solvent.

D.1.2 Fate of Organic Contaminants

D.1.2.1 Sorption

Sorption and desorption are two major mechanisms affecting the fate of contaminants in the subsurface. Sorption includes both adsorption and absorption. Adsorption is defined as the accumulation occurring at an interface, while absorption is the partitioning between two phases (Knox et al., 1993).

Sorption is the process by which a compound is retained onto a solid particle rather than remaining dissolved in solution. The sorption of contaminants to the soil matrix is an important factor affecting their transport in terrestrial environments. The sorption of contaminants to suspended sediments and bottom sediment is an important factor affecting chemical transport in aquatic environments.

In general, sorption reactions may be classified as either sorbent or solvent-motivated. Sorbent-motivated sorption occurs when an attraction between the sorbent (subsurface material) and the solute (contaminant), and the contaminant accumulates at the surface due to the affinity of the surface for the contaminant. An example of sorbent-motivated sorption would be a highly polar or ionizable contaminant interaction with the cation exchange sites of clay minerals. This type of sorption typically occurs with inorganics and is more commonly referred to as ion exchange. Solvent-motivated sorption occurs when the contaminant is hydrophobic, such as nonpolar organics, which prefer nonpolar phases to the polar water phase. Hydrophobic contaminants will accumulate at an interface or partition into a nonpolar phase (e.g., associate with the organic content of the subsurface medium) rather than partition into the water phase. The sorption of most neutral organic constituents falls into the category of hydrophobic, or solvent-motivated sorption (Knox et al., 1993). The best indicators of the partitioning of a compound between soil and water are the organic carbon/water partition coefficient (K_{oc}), the soil/water distribution coefficient (K_d), the octanol/water partition coefficient (K_{ow}), and the retardation factor (R).

For nonionic organic chemicals and aquifer materials, sorption is largely controlled by the clay and organic carbon content of the soil. The distribution of an organic chemical between water

and a specific soil matrix is characterized by the organic carbon/water partition coefficient, K_{oc}. This coefficient, which is based on the specific organic carbon content of the soil, is typically measured empirically using a linear adsorption isotherm where the partitioning between the two phases is determined by the following equation (Olsen and Davis, 1990):

$$K_d = \frac{C_s}{C_w} \qquad \textit{Equation 1}$$

where:

K_d = Soil/water distribution coefficient (L/kg)
C_s = Mass of the solute on the solid phase per unit mass of the solid phase (mg/kg)
C_w = Mass of the solute per unit volume of solution (mg/L)

The soil/water distribution coefficient, K_d, obtained from the above equation is then normalized to correct for variations in the organic carbon content of differing soil matrices to calculate K_{oc}:

$$K_{oc} = \frac{K_d}{f_{oc}} \qquad \textit{Equation 2}$$

where:

K_{oc} = Organic carbon/water partition coefficient (L/kg)
K_d = Soil/water distribution coefficient (L/kg)
f_{oc} = Fraction of organic carbon in the soil

The normalization of the adsorption coefficient to ascertain K_{oc} correlates well with other adsorption coefficient estimation methods which use other properties of the chemical such as water solubility or octanol/water partitioning (Callahan et al., 1979).

If the empirical K_d or K_{oc} value for the chemical is not available, the most widely accepted method of estimating the organic carbon/water partition coefficient involves the octanol/water partition coefficient, K_{ow}. The octanol/water partition coefficient, K_{ow}, has been correlated to water solubility, the organic carbon/water partition coefficient, and bioconcentration factors for aquatic life and represents the extent of partitioning by a chemical between organic and aqueous phases (Lyman et al., 1990). The relationship between K_{oc} and K_{ow} is expressed as a regression equation:

$$\log K_{oc} = a \log K_{ow} + b \qquad \textit{Equation 3}$$

where a and b are constants derived from specific data sets which represent differing classes of chemicals such as pesticides, aromatic compounds, and chlorinated hydrocarbons. Chemicals with low K_{ow} (i.e., less than 10 L/kg) are considered relatively hydrophilic and tend to have high water solubilities and small K_{oc} values. Conversely, hydrophobic compounds typically have K_{ow} values greater than 10^4 L/kg (Lyman et al., 1990). In general, the more hydrophobic a contaminant is, the more likely the contaminant will be sorbed to soil.

From Equation 1, when C_s is equal to zero, K_d also equals zero. Under this condition, no adsorption or retardation of the chemical occurs. This implies that the contaminant moves at the same velocity as the groundwater and in this case, the contaminant is termed a conservative or nonreactive solute. However, the velocity of the contaminant front can be substantially different for solutes that are adsorbed within the soil matrix. The retardation factor is defined as the ratio of the groundwater flow velocity to the contaminant front velocity:

$$R = 1 + \rho_b \frac{K_d}{n_e} \qquad \textit{Equation 4}$$

where:

R	=	Retardation factor (dimensionless)
θ_b	=	Bulk density of the soil (g/mL)
K_d	=	Distribution coefficient (mL/g)
n_e	=	Effective porosity of the soil (dimensionless)

The retardation factor indicates the extent of retardation of contaminant migration in groundwater due to adsorption. A retardation factor of 1.0 indicates that the contaminant has little tendency to bind to soils and, hence, moves freely in the groundwater. By contrast, the larger the R, the greater the tendency for a contaminant to bind to the soil matrix and the slower it will move in the groundwater. The retardation factor cannot fall below 1.0.

Other factors which affect the adsorption of chemicals to the soil matrix include temperature, pH of the soil and water, particle size distribution, and surface area of solids. The value of the distribution coefficient K_d usually decreases with increasing temperature because adsorption is an exothermic process. Neutral and slightly polarized organic compounds are somewhat affected by pH. Chemicals that tend to ionize are significantly affected by pH (Lyman et al., 1990). When the pH of the groundwater is approximately 1.0 to 1.5 units above the negative log of the acid dissociation constant (pK_a), adsorption becomes significant. A comparison of the pK_a of an organic acid with the pH of the groundwater indicates the potential importance of the dissociation of the organic compound in determining the degree of partitioning. The size of affected soil particles also plays a role in a contaminant's sorption characteristics. Particles of small size, such as particles of fine silt or clay, will have a greater tendency to adsorb chemicals.

D.1.2.2 Volatilization

Volatilization is a process whereby a compound changes state from the aqueous phase to the vapor phase. Compounds that do not adsorb onto soil/sediment or dissolve in water have the greatest tendency to volatilize. The volatility of a compound can be evaluated from its K_{oc} and by assessing its Henry's Law Constant. The value of K_{oc} indicates the degree of sorption of a compound to soil/sediment. A compound with a high K_{oc} value will have a reduced volatility because the compound sorbs extensively to the soil/sediment surface. The Henry's Law Constant can be considered the partition coefficient of the contaminant between the aqueous phase and the gas phase. A Henry's Law Constant of greater than 10^{-3} atm-m^3/mol indicates a high volatility, and a Henry's Law Constant of less than 10^{-5} atm-m^3/mol indicates a low volatility. **Table D-1** provides a rough outline of relative volatility of a solute according to its Henry's Law Constant.

Table D-1
Volatility of Compounds Based on Henry's Law Constants

Volatility	Henry's Law Constant
Volatilization is very slow, at a rate controlled by slow diffusion through air	$< 10^{-5}$ atm-m^3/mol
Volatilization is not rapid but significant	10^{-5} atm-m^3/mol to 10^{-3} atm-m^3/mol
Volatilization is rapid	$> 10^{-3}$ atm-m^3/mol

The Henry's Law Constant is related to other physical properties of the compound, the most important of which are vapor pressure and water solubility. Compounds exhibiting a high vapor pressure and low water solubility tend to have high volatilization rates. In fact, in the absence of literature values, Henry's Law Constants can be estimated from the following equation (Olsen and Davis, 1990):

$$H = \frac{(V_p)(MW)(16.04)}{(WS)(T)} \qquad \textit{Equation 5}$$

where:

V_p = Vapor pressure of the chemical (mm Hg)
MW = Molecular weight of the chemical (g/mol)
WS = Solubility in water (mg/L)
T = Temperature (^oK)
H = Henry's Law Constant ([mg/L]/[mg/L])

From this equation, it is evident that the volatilization of a compound to air will depend on its vapor pressure, water solubility, and temperature. Other important factors affecting volatilization include wind speed, the depth of the aquifer, and the geology of the unsaturated zone.

D.1.2.3 Hydrolysis

Hydrolysis is the reaction of a compound with water. It usually involves the introduction of a hydroxyl (-OH) group into an organic compound, usually at a point of unbalanced charge distribution (Cherry et al., 1983). The hydrolysis reaction can displace halogens, and may be catalyzed by the presence of acids, bases, or metal ions. Therefore, the rate of hydrolysis is pH and metal-ion concentration dependent. Surface effects also may affect the rate of hydrolysis. Halogenated aliphatics are susceptible to hydrolysis, with reactions proceeding most rapidly for monohalogenated compounds, and much more slowly as the number of halogen ions increases (Fetter, 1993).

Hydrolysis applies to a limited number of chemicals. These contain hydrolyzable groups, such as esters, aliphatic halogens, amides, carbamates, and phosphate esters (Howard, 1991). Compounds that are not susceptible include: alkanes, alkenes, aldehydes, amines, and carboxy-containing compounds (Olsen and Davis, 1990).

D.1.2.4 Abiotic Degradation

Abiotic degradation is the chemical degradation of compounds without the assistance of biological activities. In the natural environment, the most common abiotic degradation processes are hydrolysis and hydroxyl radical reactions. Other abiotic degradation processes include direct photolysis, dehydrohalogenation, and oxidation.

Hydrolysis, as mentioned above, is a chemical reaction in which compounds react with water molecules in the environment, resulting in the introduction of a hydroxyl group (-OH) and the loss of a leaving group (-X), typically a halogen.

$$RX + H_2O \rightarrow ROH + HX \ (or\ H^+, X^-) \qquad Equation\ 6$$

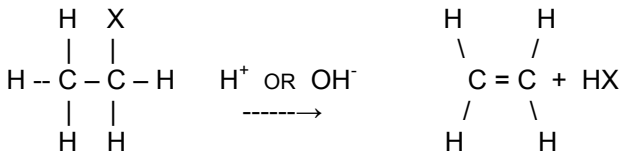
These reactions are catalyzed mainly by hydronium (H_3O^+) and/or hydroxyl ions (OH^-). Therefore, as mentioned above, hydrolysis reactions are pH dependent. Selected metals may also catalyze a hydrolysis reaction (Olsen and Davis, 1990).

Hydroxyl radical reactions are reactions with hydroxyl radicals photochemically generated from sunlight. These reactions may occur mostly in the atmosphere and to a lesser degree in surface water. Once the free radicals are formed, they will react with organic molecules to form an intermediate organic-free radical, which usually reacts further with other compounds. For most chemicals in the atmosphere, reaction with photochemically-generated hydroxyl radicals is the most common degradation process. For many chemicals, experimental reaction rate constants for reactions involving hydroxyl radicals are available in the scientific literature and are used to calculate an estimated half-life by assuming an average hydroxyl radical concentration of $5x10^5$ molecules/cm^3 in non-smog conditions (Howard, 1991).

Occasionally, other reactions besides hydroxyl radical reactions occur in the atmosphere such as ozone oxidation and direct photolysis. Direct photolysis is a photochemical alteration of the compound as a result of the compound absorbing direct sunlight. The possibility of direct photolysis in air or water can be partially assessed by examining the UV spectrum of the chemical. If the chemical does not absorb sunlight at wavelengths greater than 290 nm, the chemical cannot directly photolyze.

Dehydrohalogenation is an elimination reaction in which an alkyl derivative will eliminate HX to form an alkene, where X is commonly a halogen, hydroxyl radical, or ester group:

Equation 7



D.1.2.5 Biotic Degradation

Biodegradation is the process in which the chemical degradation of a compound is assisted by soil microorganisms (e.g., fungi, bacteria). Reactions include oxidation, reduction, hydrolysis, and sometimes rearrangement of the molecule. Though biodegradation may occur very slowly for some compounds, the eventual mineralization of almost every organic compound in the

terrestrial and aquatic environment can be attributed to biodegradation (Alexander, 1978). A typical range of half lives for different degradation rates are summarized in **Table D-2**.

Rates of biotic degradation depend on many factors. Microorganisms require a carbon source (e.g., organic matter), an electron acceptor (e.g., oxygen, nitrate), nutrients (e.g., nitrogen, phosphorus), and various trace elements in order to maintain existing cells and produce new cells. Many environmental factors can also serve to limit the occurrence of microbial metabolism in the subsurface. These factors include pH, temperature, toxics, substrate concentration, and the presence of microbes. Most bacteria find the optimum pH range to be 6.5 to 7.5 and are not able to survive at pH values greater than 9.5 or below 4.0 (Knox et al., 1993). Microbial activity generally increases with increasing temperature. The presence of certain compounds may also be toxic to microorganisms. Heavy metals, acids, bases, or high concentrations of the substrate can serve to limit microbial activity. Finally, for biotic degradation to occur in the subsurface, microbes capable of metabolizing (or cometabolizing) the substrate must be present.

Table D-2
Rate of Biodegradation Based on Half Lives

Biodegradation Rate	Approximate Biodegradation Half-Life
Fast	1 day to 7 days
Moderately Fast	7 days to 4 weeks
Slow	4 weeks to 6 months
Resistant	6 months to 1 year

Complete biotic degradation of organic chemicals by microorganisms, utilizing enzymes to facilitate degradation, ultimately produces microbial cells, water, and carbon dioxide, which eventually lead to mineralization of the compound. Whether or not a chemical is transformed by enzymes depends on the configuration alignment of the enzyme with the organic chemical during the reaction. If an ideal configuration of the enzyme with organic chemicals occurs, the reaction will occur. Persistent chemicals have less favorable alignments, and non-reacting or recalcitrant chemicals fail to bond or produce favorable alignments.

Biotic degradation can be either aerobic or anaerobic. An aerobic reaction occurs in the presence of oxygen. Aerobic reactions occur in oxygen-rich environments such as surface soil (i.e., 0 to 6 inches bgs) and upper layers of sediment. An aerobic reaction is usually an oxidation reaction. An anaerobic reaction occurs in the absence of oxygen. Anaerobic reactions occur in such places as the saturated zone in terrestrial environments and the bottom layer of sediment in aquatic environments. Because of the lack of oxygen in these environments, an anaerobic reaction usually favors dehydrohalogenation reactions or reductive reactions.

D.1.3 Fate of Inorganic Contaminants

D.1.3.1 Ion Exchange

Metals in soil are generally immobile, particularly under neutral or alkaline conditions, and tend to sorb to soil particles. As described in *Section D.1.2.1*, sorption can be considered as either

sorbent- or solvent-motivated. Solvent-motivated sorption (partitioning) typically occurs for nonpolar, hydrophobic organic chemicals in groundwater by accumulation occurring on the organic content of the media. Ion exchange is sorbent-motivated sorption and occurs for inorganic chemicals due to an affinity of the solid surface for the compound. Typically, the sorbent surface contains a charge deficiency and requires the accumulation of ions near the solid/liquid interface to neutralize the surface charge. In subsurface media, the mineral fraction most commonly involved in ion exchange is the clay fraction (Knox et al., 1993). Ion exchange occurs when the sorbent charge deficiency can be neutralized more efficiently by ions in solution than by those ions currently adsorbed. For example, if sodium ions (monovalent) have accumulated and calcium ions (divalent) suddenly appear, the excess surface charge can be more efficiently neutralized by the calcium ions than by sodium. Thus, the sodium ions will desorb, the calcium ions will adsorb, and an exchange of ions occurs. The cation exchange capacity of a given aquifer material indicates the probable type and amount of clay minerals present, and can be used as an indication of the ability of a soil to attenuate cations found in the groundwater (Makeig, 1982).

D.1.3.2 Chemical Speciation

Most inorganic chemicals occur in more than one ionic form, or species, in soils and groundwater. These species, which form as a result of hydrolysis, oxidation/reduction, and complexation reactions, may have different valences and mobilities in groundwater due to different affinities for adsorption and different solubility controls. Simple ionic species often combine with ligands to form ionic or neutral-charge aqueous complexes. The major inorganic ligands in groundwater are generally Cl^-, HCO_3^{-2}, CO_2, and SO_4^{-2}, and in some cases, NH_3, NO_3^- and F^- (Cherry et al., 1983). Environmental conditions which affect speciation of inorganic chemicals include pH, redox potential, and inorganic ligands.

D.1.3.3 Oxidation/Reduction

Oxidation and reduction ("redox") refers to the transfer of electrons and the resultant species change of ions or compounds. Oxidation is the loss of electrons, while reduction is the gain of electrons. Redox processes are important because they can cause changes in the mobility of many inorganic compounds. The ability of a redox reaction to occur is a function of the redox potential. The redox potential is defined in terms of the negative logarithm of the free-electron activity and is referred to as pE. The redox potential can also be expressed in terms of volts (E_h). Low values of pE indicate high electron activity and favor electron-rich species (reduced). High values of pE indicate low electron activity and favor electron-poor species (oxidized).

D.2 TRANSPORT OF CONTAMINANTS

Contaminant transport refers to the mechanisms and rates of migration of contaminants away from the source area. Migration pathways often include air, water, soil, and the interfaces between the phases of the contaminant (i.e., solid, liquid, or gas). Mechanisms controlling the movement of contaminants include advection, dispersion, diffusion, volatilization, and sorption. These mechanisms are dictated by the physical and chemical nature of the environmental media and their interaction with the potential COCs. Water pathways include surface water, storm water runoff, groundwater, infiltration/percolation, and precipitation. The air pathways include uptake into the atmosphere and deposition from it either in a dry or wet form. The soil pathways include sediment and soil transported by erosion or by site activities such as construction and movement through the vadose zone as soil gas. Transport across an interface is primarily due to

partitioning. The degree of partitioning will depend on the volatility, solubility, and sorptive capacity of the phases. The primary transport mechanisms across the water-air and soil-air interfaces are volatilization and sorption, while transport across the soil-water interface is controlled by sorption/desorption and dissolution (solubilization).

D.2.1 Advection

Contaminant transport by advection occurs when the contaminant is moved in and with the bulk flow of either water or the atmosphere. The primary advective transport pathway at Building 4343 is migration into surface water.

D.2.2 Diffusion

Transport by diffusion is the result of a concentration gradient in the contaminant plume or the soil gas within the vadose zone. The rate of diffusion is expressed by the diffusivity coefficient, which is affected by temperature, pressure, density, and soil porosity. Diffusion in soil is strongly dependent on the effective porosity of the soil. Residual clays have high porosity but low effective (interconnected) porosity. Transport due to diffusion in clays is usually minimal.

D.2.3 Volatilization

Volatilization occurs when a liquid changes its phase to a gas. This is primarily a mechanism for organic contaminants migrating from the soil or surface water to the air. Volatilization is a mass transfer process that is limited by a compound's solubility in water, molecular weight, vapor pressure, K_{oc} value, and by the local temperature.

D.2.4 Sorption

As discussed previously, sorption is a general term used in place of the specific terms absorption or adsorption. Adsorption describes the process whereby a contaminant is bound to the surface of a medium, whereas absorption occurs when the contaminant is bound within the medium. The distinction between the two is not always relevant, but the fact that a contaminant has been sorbed indicates that it has been bound to its new medium and will be transported with this new medium. This transport mechanism may be significant when a high concentration of suspended solids is found in water samples.

Desorption is the release (leaching) of a contaminant from the sorbent phase. Sorption/desorption is a primary mechanism of transport for water and soil pathways. In a water-soil environment, soil is the adsorbent and the contaminants are the adsorbates. Sorption/desorption of organic and inorganic compounds within soil-water systems is assessed by several physical and chemical properties of both the compound and the soil or sediment (*Section D.1.2.1*).

Appendix E

HHRA Tables and Statistical Comparison Results

Appendix E-1

RAGS Part D Tables – SWMU 50

Table E.1-1
Selection of Exposure Pathways - SWMU 50

Scenario Timeframe	Medium	Exposure Medium	Exposure Point	Receptor Population	Receptor Age	Exposure Route	On-Site/ Off-Site	Type of Analysis	Rationale for Selection or Exclusion of Exposure Pathway
Current	Surface Soil	Surface Soil	SWMU 50	Maintenance Worker	Adult	Ingestion	On-site	Quant	Maintenance workers could contact surface soil at SWMU 50 and be exposed to COPCs via incidental ingestion.
						Dermal	On-site	Quant	Maintenance workers could contact surface soil at SWMU 50 and be exposed to COPCs via dermal absorption.
				Industrial Worker	Adult	Ingestion	On-site	None	There are no workers currently exposed to surface soil at SWMU 50 on a daily basis.
						Dermal	On-site	None	There are no workers currently exposed to surface soil at SWMU 50 on a daily basis.
				Trespasser	Adolescent	Ingestion	On-site	None	Due to security at the installation, trespasser exposures are unlikely. However, the maintenance worker scenario would be protective of the limited exposures that would be experienced by a trespasser.
						Dermal	On-site	None	Due to security at the installation, trespasser exposures are unlikely. However, the maintenance worker scenario would be protective of the limited exposures that would be experienced by a trespasser.
		Air	SWMU 50	Maintenance Worker	Adult	Inhalation	On-site	Quant	Maintenance workers could be exposed to airborne volatiles or particulate matter released from surface soil at SWMU 50.
				Industrial Worker	Adult	Inhalation	On-site	None	There are no workers currently exposed to airborne volatiles or particulates from surface soil at SWMU 50 on a daily basis.
				Trespasser	Adolescent	Inhalation	On-site	None	Due to security at the installation, trespasser exposures are unlikely. However, the maintenance worker scenario would be protective of the limited exposures that would be experienced by a trespasser.
	Total Soil (Surface and Subsurface)	Total Soil (Surface and Subsurface)	SWMU 50	None	None	None	On-site	None	Currently excavation or construction activities are not occurring at SWMU 50.
	Groundwater	Groundwater	SWMU 50	None	None	None	On-site	None	Groundwater is not currently being used at SWMU 50. Therefore, there is currently no direct exposure to groundwater.
		Air	Volatile groundwater COPCs released to ambient air	Maintenance Worker	Adult	Inhalation	On-site	Quant	Volatiles could be released from groundwater into ambient air. Maintenance workers could be exposed via inhalation. The groundwater pathways for SWMUs 48, 49, 50 and 59 have been addressed in a separate RFI/CMS for SWMUs 48 and 49.

Table E.1-1
Selection of Exposure Pathways - SWMU 50

Scenario Timeframe	Medium	Exposure Medium	Exposure Point	Receptor Population	Receptor Age	Exposure Route	On-Site/ Off-Site	Type of Analysis	Rationale for Selection or Exclusion of Exposure Pathway
Future	Surface Soil	Surface Soil	SWMU 50	Maintenance Worker	Adult	Ingestion	On-site	Quant	Maintenance workers could contact surface soil at SWMU 50 and be exposed to COPCs via incidental ingestion.
						Dermal	On-site	Quant	Maintenance workers could contact surface soil at SWMU 50 and be exposed to COPCs via dermal absorption.
				Industrial Worker	Adult	Ingestion	On-site	Quant	Industrial workers could contact surface soil at SWMU 50 and be exposed to COPCs via incidental ingestion.
						Dermal	On-site	Quant	Industrial workers could contact surface soil at SWMU 50 and be exposed to COPCs via dermal absorption.
				Trespasser	Adolescent	Ingestion	On-site	None	Due to security at the installation, trespasser exposures are unlikely. However, the maintenance worker scenario would be protective of the limited exposures that would be experienced by a trespasser.
						Dermal	On-site	None	Due to security at the installation, trespasser exposures are unlikely. However, the maintenance worker scenario would be protective of the limited exposures that would be experienced by a trespasser.
		Air	SWMU 50	Maintenance Worker	Adult	Inhalation	On-site	Quant	Maintenance workers could be exposed to airborne volatiles or particulate matter released from surface soil at SWMU 50.
				Industrial Worker	Adult	Inhalation	On-site	Quant	Industrial workers could be exposed to airborne volatiles or particulate matter released from surface soil at SWMU 50.
				Trespasser	Adolescent	Inhalation	On-site	None	Due to security at the installation, trespasser exposures are unlikely. However, the maintenance worker scenario would be protective of the limited exposures that would be experienced by a trespasser.
	Total Soil (Surface and Subsurface)	Total Soil (Surface and Subsurface)	SWMU 50	Maintenance Worker	Adult	Ingestion	On-site	Quant	Maintenance workers could contact soil at SWMU 50 and be exposed to COPCs via incidental ingestion.
						Dermal	On-site	Quant	Maintenance workers could contact soil at SWMU 50 and be exposed to COPCs via dermal absorption.
				Industrial Worker	Adult	Ingestion	On-site	Quant	Industrial workers could contact soil at SWMU 50 and be exposed to COPCs via incidental ingestion.
						Dermal	On-site	Quant	Industrial workers could contact soil at SWMU 50 and be exposed to COPCs via dermal absorption.
				Excavation Worker	Adult	Ingestion	On-site	Quant	Excavation workers could contact soil at SWMU 50 and be exposed to COPCs via incidental ingestion.
						Dermal	On-site	Quant	Excavation workers could contact soil at SWMU 50 and be exposed to COPCs via dermal absorption.
				Resident	Adult	Ingestion	On-site	Quant	If SWMU 50 were to be further developed for residential purposes, residents could be exposed to COPCs in total soil via ingestion. The residential scenario is not considered to be a reasonably anticipated land use; however, it is being included in this e
						Dermal	On-site	Quant	If SWMU 50 were to be further developed for residential purposes, residents could be exposed to COPCs in total soil via dermal absorption.
					Child	Ingestion	On-site	Quant	If SWMU 50 were to be further developed for residential purposes, residents could be exposed to COPCs in total soil via ingestion. The residential scenario is not considered to be a reasonably anticipated land use; however, it is being included in this e
						Dermal	On-site	Quant	If SWMU 50 were to be further developed for residential purposes, residents could be exposed to COPCs in total soil via dermal absorption.

Table E.1-1
Selection of Exposure Pathways - SWMU 50

Scenario Timeframe	Medium	Exposure Medium	Exposure Point	Receptor Population	Receptor Age	Exposure Route	On-Site/ Off-Site	Type of Analysis	Rationale for Selection or Exclusion of Exposure Pathway
Future (cont.)	Total Soil (Surface and Subsurface)	Total Soil (Surface and Subsurface)		Trespasser	Adolescent	Ingestion	On-site	None	Given the industrial nature of the site, trespasser exposures are unlikely. However, the maintenance worker scenario would be protective of the limited exposures that would be experienced by a trespasser.
						Dermal	On-site	None	Given the industrial nature of the site, trespasser exposures are unlikely. However, the maintenance worker scenario would be protective of the limited exposures that would be experienced by a trespasser.
		Air	SWMU 50	Maintenance Worker	Adult	Inhalation	On-site	Quant	Maintenance workers could be exposed to airborne volatiles or particulate matter released from soils at SWMU 50.
				Industrial Worker	Adult	Inhalation	On-site	Quant	Industrial workers could be exposed to airborne volatiles or particulate matter released from soils at SWMU 50.
				Excavation Worker	Adult	Inhalation	On-site	Quant	Excavation workers could be exposed to airborne volatiles or particulate matter released from soils at SWMU 50.
				Resident	Adult	Inhalation	On-site	Quant	If SWMU 50 were to be further developed for residential purposes, residents could be exposed to airborne volatiles or particulate matter released from total soil.
					Child	Inhalation	On-site	Quant	If SWMU 50 were to be further developed for residential purposes, residents could be exposed to airborne volatiles or particulate matter released from total soil.
				Trespasser	Adolescent	Inhalation	On-site	None	Given the industrial nature of the site, trespasser exposures are unlikely. However, the maintenance worker scenario would be protective of the limited exposures that would be experienced by a trespasser.
	Groundwater	Groundwater	SWMU 50	Maintenance Worker	Adult	Ingestion	On-site	None	Maintenance workers would not contact groundwater at SWMU 50.
						Dermal	On-site	None	Maintenance workers would not contact groundwater at SWMU 50.
				Industrial Worker	Adult	Ingestion	On-site	Quant	If SWMU 50 were to be further developed for industrial purposes and groundwater wells were installed at the site, site workers could be exposed to COPCs in groundwater via ingestion. The groundwater pathways for SWMUs 48, 49, 50 and 59 have been addressed in a separate RFI/CMS for SWMUs 48 and 49.
						Dermal	On-site	None	Although site worker dermal exposures to groundwater could occur, the exposed body surface area of a worker (i.e., hands and arms) would be small and exposures would be infrequent.
				Excavation Worker	Adult	Ingestion	On-site	None	Based on the depth to groundwater, excavation workers would not contact groundwater at SWMU 50.
						Dermal	On-site	None	Based on the depth to groundwater, excavation workers would not contact groundwater at SWMU 50.
				Resident	Adult	Ingestion	On-site	Quant	If SWMU 50 were to be further developed for residential purposes, residents could be exposed to COPCs in groundwater via ingestion. The residential scenario is not considered to be a reasonably anticipated land use; however, it is being included in this evaluation to meet "clean closure" requirements under RCRA. The groundwater pathways for SWMUs 48, 49, 50 and 59 have been addressed in a separate RFI/CMS for SWMUs 48 and 49.
						Dermal	On-site	Quant	If SWMU 50 were to be further developed for residential purposes, residents could be exposed to COPCs in groundwater via dermal absorption. The groundwater pathways for SWMUs 48, 49, 50 and 59 have been addressed in a separate RFI/CMS for SWMUs 48 and 49.

Table E.1-1
Selection of Exposure Pathways - SWMU 50

Scenario Timeframe	Medium	Exposure Medium	Exposure Point	Receptor Population	Receptor Age	Exposure Route	On-Site/ Off-Site	Type of Analysis	Rationale for Selection or Exclusion of Exposure Pathway
Future (cont.)	Groundwater (cont.)	Groundwater	SWMU 50		Child	Ingestion	On-site	Quant	If SWMU 50 were to be further developed for residential purposes, residents could be exposed to COPCs in groundwater via ingestion. The residential scenario is not considered to be a reasonably anticipated land use; however, it is being included in this evaluation to meet "clean closure" requirements under RCRA. The groundwater pathways for SWMUs 48, 49, 50 and 59 have been addressed in a separate RFI/CMS for SWMUs 48 and 49.
						Dermal	On-site	Quant	If SWMU 50 were to be further developed for residential purposes, residents could be exposed to COPCs in groundwater via dermal absorption. The groundwater pathways for SWMUs 48, 49, 50 and 59 have been addressed in a separate RFI/CMS for SWMUs 48 and 49.
				Trespasser	Adolescent	Ingestion	On-site	None	Due to security at the installation, trespasser exposures are unlikely.
						Dermal	On-site	None	Due to security at the installation, trespasser exposures are unlikely.
		Homegrown fruits and vegetables	SWMU 50	Resident	Adult	Ingestion	On-site	Quant	Residents could ingest COPCs in groundwater that had been taken up by homegrown fruits and vegetables. The groundwater pathways for SWMUs 48, 49, 50 and 59 have been addressed in a separate RFI/CMS for SWMUs 48 and 49.
					Child	Ingestion	On-site	Quant	Residents could ingest COPCs in groundwater that had been taken up by homegrown fruits and vegetables. The groundwater pathways for SWMUs 48, 49, 50 and 59 have been addressed in a separate RFI/CMS for SWMUs 48 and 49.
		Air	Volatile groundwater COPCs released to ambient air	Maintenance Worker	Adult	Inhalation	On-site	Quant	Volatiles could be released from groundwater into ambient air. Maintenance workers could be exposed via inhalation. The groundwater pathways for SWMUs 48, 49, 50 and 59 have been addresses in a separate RFI/CMS for SWMUs 48 and 49.
			Indoor Vapors	Industrial Worker	Adult	Inhalation	On-site	Quant	Volatiles in groundwater could potentially migrate into buildings via vapor intrusion. The groundwater pathways for SWMUs 48, 49, 50 and 59 have been addressed in a separate RFI/CMS for SWMUs 48 and 49.
			Trench Vapors	Excavation Worker	Adult	Inhalation	On-site	Quant	Volatiles in groundwater could potentially migrate into a construction or utility trench via vapor intrusion. The groundwater pathways for SWMUs 48, 49, 50 and 59 have been addressed in a separate RFI/CMS for SWMUs 48 and 49.
			Volatiles at Showerhead	Resident	Adult	Inhalation	On-site	Quant	If groundwater wells were installed for residential purposes, adult residents could contact volatiles in groundwater via showering. The groundwater pathways for SWMUs 48, 49, 50 and 59 have been addressed in a separate RFI/CMS for SWMUs 48 and 49.
					Child	Inhalation	On-site	None	Children are assumed to bathe rather than shower. Therefore, inhalation exposure is assessed using only indoor air.
			Indoor Vapors	Resident	Adult	Inhalation	On-site	Quant	Volatiles in groundwater could potentially migrate into residences via vapor intrusion. The groundwater pathways for SWMUs 48, 49, 50 and 59 have been addressed in a separate RFI/CMS for SWMUs 48 and 49.
					Child	Inhalation	On-site	Quant	Volatiles in groundwater could potentially migrate into residences via vapor intrusion. The groundwater pathways for SWMUs 48, 49, 50 and 59 have been addressed in a separate RFI/CMS for SWMUs 48 and 49.
			Volatile groundwater COPCs released to ambient air	Trespasser	Adolescent	Inhalation	On-site	None	Due to security at the installation, trespasser exposures are unlikely. However, the maintenance worker scenario would be protective of the limited exposures that would be experienced by a trespasser.

Table E.1-1
Selection of Exposure Pathways - SWMU 50

Scenario Timeframe	Medium	Exposure Medium	Exposure Point	Receptor Population	Receptor Age	Exposure Route	On-Site/ Off-Site	Type of Analysis	Rationale for Selection or Exclusion of Exposure Pathway
Future (cont.)	Groundwater	Groundwater	Off-site	Resident	Adult	Ingestion	Off-site	Quant	If COPCs from SWMU 50 groundwater were to migrate off-site in the future, off-site residents could be exposed to COPCs in groundwater via ingestion. See RFI/CMS for SWMUs 48 and 49.
						Dermal	Off-site	Quant	If COPCs from SWMU 50 groundwater were to migrate off-site in the future, off-site residents could be exposed to COPCs in groundwater via dermal absorption. See RFI/CMS for SWMUs 48 and 49.
					Child	Ingestion	Off-site	Quant	If COPCs from SWMU 50 groundwater were to migrate off-site in the future, off-site residents could be exposed to COPCs in groundwater via ingestion. See RFI/CMS for SWMUs 48 and 49.
						Dermal	Off-site	Quant	If COPCs from SWMU 50 groundwater were to migrate off-site in the future, off-site residents could be exposed to COPCs in groundwater via dermal absorption. See RFI/CMS for SWMUs 48 and 49.
				Trespasser	Adolescent	Ingestion	Off-site	None	The residential scenario would be protective of the limited exposures that would be experienced by a trespasser.
						Dermal	Off-site	None	The residential scenario would be protective of the limited exposures that would be experienced by a trespasser.
		Homegrown fruits and vegetables	Off-site	Resident	Adult	Ingestion	Off-site	Quant	If COPCs from SWMU 50 groundwater were to migrate off-site in the future, off-site residents could ingest COPCs in groundwater that had been taken up by homegrown fruits and vegetables. See RFI/CMS for SWMUs 48 and 49.
					Child	Ingestion	Off-site	Quant	If COPCs from SWMU 50 groundwater were to migrate off-site in the future, off-site residents could ingest COPCs in groundwater that had been taken up by homegrown fruits and vegetables. See RFI/CMS for SWMUs 48 and 49.
		Air	Volatile groundwater COPCs released to ambient air	Maintenance Worker	Adult	Inhalation	Off-site	Quant	If COPCs from SWMU 50 groundwater were to migrate off-site in the future, volatiles could be released from groundwater into ambient air. Off-site maintenance workers could be exposed via inhalation. See RFI/CMS for SWMUs 48 and 49.
			Indoor Vapors	Industrial Worker	Adult	Inhalation	Off-site	Quant	If COPCs from SWMU 50 groundwater were to migrate off-site in the future, volatiles in groundwater could potentially migrate into off-site buildings via vapor intrusion. See RFI/CMS for SWMUs 48 and 49.
			Trench Vapors	Excavation Worker	Adult	Inhalation	Off-site	Quant	If COPCs from SWMU 50 groundwater were to migrate off-site in the future, volatiles in groundwater could potentially migrate into an off-site construction or utility trench via vapor intrusion. See RFI/CMS for SWMUs 48 and 49.
			Volatiles at Showerhead	Resident	Adult	Inhalation	Off-site	Quant	If COPCs from SWMU 50 groundwater were to migrate to off-site wells in the future, adult residents could contact volatiles in groundwater via showering. See RFI/CMS for SWMUs 48 and 49.
					Child	Inhalation	Off-site	None	Children are assumed to bathe rather than shower. Therefore, inhalation exposure is assessed using only indoor air.
			Indoor Vapors	Resident	Adult	Inhalation	Off-site	Quant	If COPCs from SWMU 50 groundwater were to migrate off-site in the future, volatiles in groundwater could potentially migrate into off-site residences via vapor intrusion. See RFI/CMS for SWMUs 48 and 49.
					Child	Inhalation	Off-site	Quant	If COPCs from SWMU 50 groundwater were to migrate off-site in the future, volatiles in groundwater could potentially migrate into off-site residences via vapor intrusion. See RFI/CMS for SWMUs 48 and 49.
			Volatile groundwater COPCs released to ambient air	Trespasser	Adolescent	Inhalation	Off-site	None	The maintenance worker scenario would be protective of the limited exposures that would be experienced by a trespasser.

Table E.1-2
Occurrence, Distribution and Selection of Chemicals of Potential Concern
Current/Future - Surface Soil - SWMU 50

Scenario Timeframe: Current/Future
Medium: Soil
Exposure Medium: Surface Soil

Exposure Point	CAS Number	Chemical	Minimum Concentration (Qualifier)	Maximum Concentration (Qualifier)	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value (2)	Screening Toxicity Value (3) (N/C)	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag (Y/N)	Rationale for Selection or Deletion (4)
	NA	2,3,7,8-TCDD-TE	2.35E-06	9.60E-05	mg/kg	50SB06A	10/10	N/A	9.60E-05	N/A	4.50E-06 (C)	N/A	N/A	Yes	ASL
Surface Soil	67562-39-4	1,2,3,4,6,7,8-Heptachlorodibenzofuran	1.01E-06 B	5.19E-04	mg/kg	50SB06A	10/10	N/A	5.19E-04	N/A	N/A	N/A	N/A	No	TEQ
	35822-46-9	1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	5.27E-05	4.61E-03 J	mg/kg	50SB06A	10/10	N/A	4.61E-03	N/A	N/A	N/A	N/A	No	TEQ
	55673-89-7	1,2,3,4,7,8,9-Heptachlorodibenzofuran	5.88E-07 J	2.97E-05	mg/kg	50SB06A	7/10	4.86E-07 - 5.54E-07	2.97E-05	N/A	N/A	N/A	N/A	No	TEQ
	70648-26-9	1,2,3,4,7,8-Hexachlorodibenzofuran	3.24E-07 J	3.70E-05	mg/kg	50SB07A	9/10	5.54E-07 - 5.54E-07	3.70E-05	N/A	N/A	N/A	N/A	No	TEQ
	39227-28-6	1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	2.02E-07 J	1.46E-05	mg/kg	50SB07A	10/10	N/A	1.46E-05	N/A	N/A	N/A	N/A	No	TEQ
	57117-44-9	1,2,3,6,7,8-Hexachlorodibenzofuran	1.20E-07 J	1.66E-05	mg/kg	50SB07A	9/10	5.54E-07 - 5.54E-07	1.66E-05	N/A	N/A	N/A	N/A	No	TEQ
	57653-85-7	1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	3.34E-07 J	1.22E-04	mg/kg	50SB06A	10/10	N/A	1.22E-04	N/A	N/A	N/A	N/A	No	TEQ
	72918-21-9	1,2,3,7,8,9-Hexachlorodibenzofuran	7.77E-07 J	4.27E-06 J	mg/kg	50SB07A	4/10	4.86E-07 - 6.82E-07	4.27E-06	N/A	N/A	N/A	N/A	No	TEQ
	19408-74-3	1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	3.57E-07 J	4.12E-05	mg/kg	50SB06A	10/10	N/A	4.12E-05	N/A	N/A	N/A	N/A	No	TEQ
	57117-41-6	1,2,3,7,8-Pentachlorodibenzofuran	9.99E-08 J	4.08E-06 J	mg/kg	50SB07A	8/10	5.54E-07 - 5.86E-07	4.08E-06	N/A	N/A	N/A	N/A	No	TEQ
	40321-76-4	1,2,3,7,8-Pentachlorodibenzo-p-dioxin	2.79E-07 J	6.68E-06	mg/kg	50SB07A	8/10	5.54E-07 - 5.75E-07	6.68E-06	N/A	N/A	N/A	N/A	No	TEQ
	51207-31-9	2,3,7,8-Tetrachlorodibenzofuran	2.16E-07 B	7.79E-06	mg/kg	50SB07A	9/10	3.93E-07 - 3.93E-07	7.79E-06	N/A	N/A	N/A	N/A	No	TEQ
	Shaw 05	Total Heptachlorodibenzofuran	1.55E-06 B	2.04E-03 J	mg/kg	50SB06A	10/10	N/A	2.04E-03	N/A	N/A	N/A	N/A	No	TEQ
	Shaw 04	Total Heptachlorodibenzo-p-dioxin	1.10E-04 J	7.35E-03	mg/kg	50SB06A	10/10	N/A	7.35E-03	N/A	N/A	N/A	N/A	No	TEQ
	Shaw 07	Total Hexachlorodibenzofuran	1.77E-06	5.18E-04	mg/kg	50SB06A	9/10	5.54E-07 - 5.54E-07	5.18E-04	N/A	N/A	N/A	N/A	No	TEQ
	Shaw 06	Total Hexachlorodibenzo-p-dioxin	3.11E-06 J	4.04E-04	mg/kg	50SB06A	10/10	N/A	4.04E-04	N/A	N/A	N/A	N/A	No	TEQ
	Shaw 09	Total Pentachlorodibenzofuran	8.82E-07 J	1.09E-04 J	mg/kg	50SB07A	9/10	5.54E-07 - 5.54E-07	1.09E-04	N/A	N/A	N/A	N/A	No	TEQ
	Shaw 08	Total Pentachlorodibenzo-p-dioxin	7.88E-07 J	1.78E-05 J	mg/kg	50SB07A	8/10	5.54E-07 - 5.75E-07	1.78E-05	N/A	N/A	N/A	N/A	No	TEQ
	Shaw 11	Total Tetrachlorodibenzofuran	5.16E-07	5.62E-05 J	mg/kg	50SB07A	9/10	3.93E-07 - 3.93E-07	5.62E-05	N/A	N/A	N/A	N/A	No	TEQ
	Shaw 10	Total Tetrachlorodibenzo-p-dioxin	3.71E-07 J	3.41E-06 J	mg/kg	50SB07A	6/10	1.59E-07 - 4.97E-07	3.41E-06	N/A	N/A	N/A	N/A	No	TEQ
	60851-34-5	2,3,4,6,7,8-Hexachlorodibenzofuran	1.81E-07 J	1.53E-05	mg/kg	50SB07A	9/10	5.54E-07 - 5.54E-07	1.53E-05	N/A	N/A	N/A	N/A	No	TEQ
	57117-31-4	2,3,4,7,8-Pentachlorodibenzofuran	1.46E-07 B	9.63E-06	mg/kg	50SB07A	9/10	5.54E-07 - 5.54E-07	9.63E-06	N/A	N/A	N/A	N/A	No	TEQ
	1746-01-6	2,3,7,8-Tetrachlorodibenzo-p-dioxin	1.30E-07 J	5.63E-07 J	mg/kg	50SB07A	3/10	1.39E-07 - 4.97E-07	5.63E-07	N/A	N/A	N/A	N/A	No	TEQ
	3268-87-9	Octachlorodibenzodioxin	3.81E-03	5.02E-02 J	mg/kg	50SB06A	10/10	N/A	5.02E-02	N/A	N/A	N/A	N/A	No	TEQ
	39001-02-0	Octachlorodibenzofuran	1.70E-06 B	2.09E-03	mg/kg	50SB06A	10/10	N/A	2.09E-03	N/A	N/A	N/A	N/A	No	TEQ
	95-50-1	1,2-Dichlorobenzene	1.10E-02 J	1.10E-02 J	mg/kg	50SS02	1/15	1.70E-01 - 3.70E+00	1.10E-02	N/A	2.00E+02 (N)	N/A	N/A	No	BSL
	541-73-1	1,3-Dichlorobenzene (5)	8.60E-03 J	8.60E-03 J	mg/kg	50SS02	1/15	1.70E-01 - 3.70E+00	8.60E-03	N/A	2.60E+00 (C)	N/A	N/A	No	BSL
	106-46-7	1,4-Dichlorobenzene	1.10E-02 J	1.10E-02 J	mg/kg	50SS02	1/15	1.70E-01 - 3.70E+00	1.10E-02	N/A	2.60E+00 (C)	N/A	N/A	No	BSL
	93-76-5	2,4,5-T	8.18E-03 J	8.18E-03 J	mg/kg	50SS01	1/12	7.10E-03 - 1.14E-01	8.18E-03	N/A	6.10E+01 (N)	N/A	N/A	No	BSL
	94-75-7	2,4-D	1.42E-01 J	1.42E-01 J	mg/kg	50SS03	1/12	2.23E-02 - 3.90E-02	1.42E-01	N/A	6.90E+01 (N)	N/A	N/A	No	BSL
	121-14-2	2,4-Dinitrotoluene (6)	1.01E-01 J	8.88E-01	mg/kg	50SB07A	5/14	2.00E-01 - 4.00E-01	8.88E-01	N/A	7.10E-01 (C)	N/A	N/A	Yes	ASL
	91-57-6	2-Methylnaphthalene	9.10E-03	4.00E-01	mg/kg	50SB05A	4/14	2.80E-01 - 1.50E+00	4.00E-01	N/A	3.10E+01 (N)	N/A	N/A	No	BSL
	72-54-8	4,4'-DDD	4.10E-04 J	4.47E-04 J	mg/kg	50SS03	2/12	3.60E-03 - 3.80E-02	4.47E-04	N/A	2.00E+00 (C)	N/A	N/A	No	BSL
	72-55-9	4,4'-DDE	3.37E-03	3.37E-03	mg/kg	50SS03	1/11	3.60E-03 - 3.80E-02	3.37E-03	N/A	1.40E+00 (C)	N/A	N/A	No	BSL
	50-29-3	4,4'-DDT	1.29E-02	1.29E-02	mg/kg	50SS03	1/12	7.43E-04 - 3.80E-02	1.29E-02	N/A	1.70E+00 (C)	N/A	N/A	No	BSL
	83-32-9	Acenaphthene	1.60E-02	1.60E-02	mg/kg	50SB05A	1/11	2.80E-01 - 1.50E+00	1.60E-02	N/A	3.40E+02 (N)	N/A	N/A	No	BSL
	208-96-8	Acenaphthylene (7)	2.20E-03	2.00E-02	mg/kg	50SB05A	4/14	2.80E-01 - 1.50E+00	2.00E-02	N/A	1.70E+02 (N)	N/A	N/A	No	BSL
	67-64-1	Acetone	7.45E-02 J	7.45E-02 J	mg/kg	50SB08A	1/13	5.70E-03 - 9.00E-02	7.45E-02	N/A	6.10E+03 (N)	N/A	N/A	No	BSL

Table E.1-2
Occurrence, Distribution and Selection of Chemicals of Potential Concern
Current/Future - Surface Soil - SWMU 50

Scenario Timeframe: Current/Future
Medium: Soil
Exposure Medium: Surface Soil

Exposure Point	CAS Number	Chemical	Minimum Concentration (Qualifier)	Maximum Concentration (Qualifier)	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value (2)	Screening Toxicity Value (3) (N/C)	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag (Y/N)	Rationale for Selection or Deletion (4)
	120-12-7	Anthracene	3.00E-03	1.10E-02	mg/kg	50SB05A	3/14	2.10E-03 - 1.50E+00	1.10E-02	N/A	1.70E+03 (N)	N/A	N/A	No	BSL
	11097-69-1	Aroclor 1254	1.04E-02 J	1.48E+00	mg/kg	50SB07A	7/14	1.80E-02 - 2.00E-02	1.48E+00	N/A	1.10E-01 (N)	N/A	N/A	Yes	ASL
	56-55-3	Benzo(a)anthracene	3.60E-03	1.37E-01 L	mg/kg	50SB07A	5/14	5.60E-02 - 6.30E-02	1.37E-01	N/A	1.50E-01 (C)	N/A	N/A	No	BSL
	50-32-8	Benzo(a)pyrene	3.30E-03	1.50E-01 L	mg/kg	50SB07A	6/14	5.60E-02 - 6.30E-02	1.50E-01	N/A	1.50E-02 (C)	N/A	N/A	No	BSL
	205-99-2	Benzo(b)fluoranthene	6.50E-03	1.52E-01 L	mg/kg	50SB07A	6/14	5.60E-02 - 6.30E-02	1.52E-01	N/A	1.50E-01 (C)	N/A	N/A	Yes	ASL
	191-24-2	Benzo(g,h,i)perylene (7)	3.40E-03 J	5.90E-02	mg/kg	50SS02	5/14	5.60E-02 - 3.00E-01	5.90E-02	N/A	1.70E+02 (N)	N/A	N/A	No	BSL
	207-08-9	Benzo(k)fluoranthene	2.00E-03 J	9.89E-02 L	mg/kg	50SB07A	6/14	5.60E-02 - 6.30E-02	9.89E-02	N/A	1.50E+00 (C)	N/A	N/A	No	BSL
	86-74-8	Carbazole	1.10E-02 J	2.80E-02 J	mg/kg	50SB05A	3/15	1.70E-01 - 3.70E+00	2.80E-02	N/A	N/A	N/A	N/A	Yes	NTX
	218-01-9	Chrysene	6.10E-03	1.19E-01 L	mg/kg	50SB07A	6/14	5.60E-02 - 6.30E-02	1.19E-01	N/A	1.50E+01 (C)	N/A	N/A	No	BSL
	53-70-3	Dibenz(a,h)anthracene	1.60E-03 J	1.40E-02	mg/kg	50SS02	4/14	5.60E-02 - 3.00E-01	1.40E-02	N/A	1.50E-02 (C)	N/A	N/A	No	BSL
	132-64-9	Dibenzofuran	2.00E-02 J	2.00E-01 J	mg/kg	50SB05A	3/15	1.70E-01 - 3.70E+00	2.00E-01	N/A	N/A	N/A	N/A	Yes	NTX
	131-11-3	Dimethylphthalate	7.16E-01	1.50E+00 J	mg/kg	50SB04A	2/15	1.90E-01 - 1.50E+00	1.50E+00	N/A	N/A	N/A	N/A	Yes	NTX
	84-74-2	Di-n-butyl phthalate	1.29E-01 J	7.77E-01	mg/kg	50SB08A	3/11	1.90E-01 - 1.50E+00	7.77E-01	N/A	6.10E+02 (N)	N/A	N/A	No	BSL
	33213-65-9	Endosulfan II (8)	6.36E-04 J	2.24E-03	mg/kg	50SS03	2/12	3.60E-03 - 3.80E-02	2.24E-03	N/A	3.70E+01 (N)	N/A	N/A	No	BSL
	72-20-8	Endrin	2.88E-04 J	2.88E-04 J	mg/kg	50SS01	1/12	7.59E-04 - 3.80E-02	2.88E-04	N/A	1.80E+00 (N)	N/A	N/A	No	BSL
	206-44-0	Fluoranthene	9.00E-03	7.30E-02	mg/kg	50SS02	4/14	2.80E-01 - 1.50E+00	7.30E-02	N/A	2.30E+02 (N)	N/A	N/A	No	BSL
	86-73-7	Fluorene	1.10E-03 J	1.80E-02 J	mg/kg	50SB05A	4/14	2.80E-01 - 1.50E+00	1.80E-02	N/A	2.30E+02 (N)	N/A	N/A	No	BSL
	193-39-5	Indeno(1,2,3-cd)pyrene	2.30E-03	8.41E-02 L	mg/kg	50SB07A	6/14	5.60E-02 - 6.30E-02	8.41E-02	N/A	1.50E-01 (C)	N/A	N/A	No	BSL
	72-43-5	Methoxychlor	1.29E-03	1.29E-03	mg/kg	50SS03	1/12	7.43E-04 - 3.80E-02	1.29E-03	N/A	3.10E+01 (N)	N/A	N/A	No	BSL
	91-20-3	Naphthalene	2.70E-02	2.70E-01	mg/kg	50SB05A	3/13	2.80E-01 - 1.50E+00	2.70E-01	N/A	3.90E+00 (C)	N/A	N/A	No	BSL
	86-30-6	n-Nitrosodiphenylamine	2.10E-02 J	2.10E+00 J	mg/kg	50SB04A	4/15	1.70E-01 - 7.70E-01	2.10E+00	N/A	9.90E+01 (C)	N/A	N/A	No	BSL
	85-01-8	Phenanthrene (7)	1.10E-02	2.60E-01	mg/kg	50SB05A	4/14	2.80E-01 - 1.50E+00	2.60E-01	N/A	1.70E+02 (N)	N/A	N/A	No	BSL
	129-00-0	Pyrene	7.50E-03	8.50E-02	mg/kg	50SS02	4/14	2.80E-01 - 1.50E+00	8.50E-02	N/A	1.70E+02 (N)	N/A	N/A	No	BSL
	7429-90-5	Aluminum	6.59E+03 J	2.43E+04	mg/kg	50SS03	14/14	N/A	2.43E+04	N/A	7.70E+03 (N)	N/A	N/A	Yes	ASL
	7440-36-0	Antimony	3.30E-01 L	1.40E+00 L	mg/kg	50SB07A	11/12	5.47E-01 - 5.47E-01	1.40E+00	N/A	3.10E+00 (N)	N/A	N/A	No	BSL
	7440-38-2	Arsenic	1.03E+00 J	7.40E+00 J	mg/kg	50SB09A	14/14	N/A	7.40E+00	N/A	3.90E-01 (C)	N/A	N/A	Yes	ASL
	7440-39-3	Barium	3.39E+01 J	1.41E+02	mg/kg	50SS01	14/14	N/A	1.41E+02	N/A	1.50E+03 (N)	N/A	N/A	No	BSL
	7440-41-7	Beryllium	3.50E-01	9.00E-01	mg/kg	50SB08A	10/10	N/A	9.00E-01	N/A	1.60E+01 (N)	N/A	N/A	No	BSL
	7440-43-9	Cadmium	1.27E-01	1.43E-01	mg/kg	50SS02	2/12	5.70E-02 - 1.20E+00	1.43E-01	N/A	7.00E+00 (N)	N/A	N/A	No	BSL
	7440-70-2	Calcium	4.84E+02 J	2.86E+04 J	mg/kg	50SS02	14/14	N/A	2.86E+04	N/A	N/A	1.00E+06	RDA	No	BSL
	7440-47-3	Chromium	1.22E+01 J	1.16E+02 J	mg/kg	50SB07A	14/14	N/A	1.16E+02	N/A	2.80E+02 (C)	N/A	N/A	No	BSL
	7440-48-4	Cobalt	3.40E+00 J	1.71E+01 J	mg/kg	50SB08A	14/14	N/A	1.71E+01	N/A	2.30E+00 (N)	N/A	N/A	Yes	ASL
	7440-50-8	Copper	4.00E+00	5.64E+01	mg/kg	50SB07A	14/14	N/A	5.64E+01	N/A	3.10E+02 (N)	N/A	N/A	No	BSL
	7439-89-6	Iron	7.51E+03 J	2.83E+04	mg/kg	50SS03	14/14	N/A	2.83E+04	N/A	5.50E+03 (N)	N/A	N/A	Yes	ASL
	7439-92-1	Lead	6.60E+00 J	1.78E+02 J	mg/kg	50SB07A	14/14	N/A	1.78E+02	N/A	4.00E+02 (N)	N/A	N/A	No	BSL
	7439-95-4	Magnesium	3.12E+02 J	2.02E+04	mg/kg	50SS02	14/14	N/A	2.02E+04	N/A	N/A	1.00E+06	RDA	No	BSL
	7439-96-5	Manganese	6.28E+01 J	1.32E+03	mg/kg	50SS01	14/14	N/A	1.32E+03	N/A	1.80E+02 (N)	N/A	N/A	Yes	ASL
	7439-97-6	Mercury (9)	4.10E-02 J	8.16E-01	mg/kg	50SB05A	14/14	N/A	8.16E-01	N/A	2.30E+00 (N)	N/A	N/A	No	BSL
	7440-02-0	Nickel	4.10E+00 J	5.01E+01 J	mg/kg	50SB07A	14/14	N/A	5.01E+01	N/A	1.60E+02 (N)	N/A	N/A	No	BSL

Table E.1-2
Occurrence, Distribution and Selection of Chemicals of Potential Concern
Current/Future - Surface Soil - SWMU 50

Scenario Timeframe: Current/Future
Medium: Soil
Exposure Medium: Surface Soil

Exposure Point	CAS Number	Chemical	Minimum Concentration (Qualifier)	Maximum Concentration (Qualifier)	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value (2)	Screening Toxicity Value (3) (N/C)	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag (Y/N)	Rationale for Selection or Deletion (4)
	7440-09-7	Potassium	4.65E+02	2.05E+03	mg/kg	50SS02	8/8	N/A	2.05E+03	N/A	N/A	1.00E+06	RDA	No	BSL
	7782-49-2	Selenium	4.80E+00 J	7.40E+00 J	mg/kg	50SB12A	9/13	1.09E+00 - 1.14E+00	7.40E+00	N/A	3.90E+01 (N)	N/A	N/A	No	BSL
	7440-22-4	Silver	1.70E-01 J	8.90E-01 J	mg/kg	50SB05A	4/14	4.70E-02 - 1.11E+00	8.90E-01	N/A	3.90E+01 (N)	N/A	N/A	No	BSL
	7440-23-5	Sodium	6.17E+01 J	7.25E+01 J	mg/kg	50SS03	3/14	4.20E+00 - 4.80E+01	7.25E+01	N/A	N/A	1.00E+06	RDA	No	BSL
	7440-62-2	Vanadium (10)	1.72E+01 J	4.91E+01 J	mg/kg	50SB12A	14/14	N/A	4.91E+01	N/A	3.90E+01 (N)	N/A	N/A	Yes	ASL
	7440-66-6	Zinc	1.70E+01 J	9.33E+01 J	mg/kg	50SS02	14/14	N/A	9.33E+01	N/A	2.30E+03 (N)	N/A	N/A	No	BSL

(1) Maximum concentration used for screening.

(2) N/A - Refer to supporting information for background discussion.
Background values derived from site-specific statistical analysis. See text for supporting information.

(3) Screening level values for residential soil from USEPA Regional Screening Level Table (September 2008) are based on a risk level of 1.0E-06 and a hazard index of 0.1. See text for derivation of Nutrient RDAs.

(4) Rationale Codes
Selection Reason:
Infrequent Detection but Associated Historically (HIST)
Toxicity Information Available (TX)
Above Screening Levels (ASL)
No Toxicity Information (NTX)
Deletion Reason:
Background Levels (BKG)
Below Screening and/or ARAR/TBC Level (BSL)

Definitions:
N/A = Not Applicable or Not Available
SQL = Sample Quantitation Limit
COPC = Chemical of Potential Concern
ARAR/TBC = Applicable or Relevant and Appropriate Requirement/To Be Considered
MCL = Federal Maximum Contaminant Level
SMCL = Secondary Maximum Contaminant Level
J = Estimated Value
C = Carcinogenic
N = Non-Carcinogenic
RDA = Recommended Daily Allowance

(5) The screening value for 1,3-dichlorobenzene is based on 1,4-dichlorobenzene.

(6) The screening value for dinitrotoluene mixture is based on carcinogenicity study for 2,4-DNT and 2,6-DNT. Therefore, the RBC for dinitrotoluene mixture is conservatively used as the screening value for the individual compounds.

(7) The screening value for pyrene was used as a surrogate.

(8) The screening value for endosulfan II is based on endosulfan.

(9) The screening value for mercury is based on mercury, inorganic salts.

(10) The screening value for vanadium is based on vanadium and compounds.

Table E.1-3
Summary of Screening for Non-Detected Chemicals
Current/Future - Surface Soil at SWMU 50

Scenario Timeframe: Current/Future
Medium: Soil
Exposure Medium: Surface Soil

Exposure Point	CAS Number	Chemical	Minimum Concentration (Qualifier)	Maximum Concentration (Qualifier)	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value (2)	Screening Toxicity Value (3) (N/C)	Max ND greater than Screening Value? (Y/N)
Surface Soil	99-35-4	1,3,5-Trinitrobenzene			mg/kg		0/14	1.00E-01 - 2.50E-01	2.50E-01	N/A	2.20E+02 (N)	No
	99-65-0	1,3-Dinitrobenzene			mg/kg		0/14	1.00E-01 - 2.50E-01	2.50E-01	N/A	6.10E-01 (N)	No
	90-12-0	1-Methylnaphthalene			mg/kg		0/10	2.80E-01 - 1.50E+00	1.50E+00	N/A	2.20E+01 (C)	No
	118-96-7	2,4,6-Trinitrotoluene			mg/kg		0/14	2.00E-01 - 4.00E-01	4.00E-01	N/A	3.60E+00 (N)	No
	35572-78-2	2-amino-4,6-Dinitrotoluene			mg/kg		0/14	2.00E-01 - 4.00E-01	4.00E-01	N/A	1.50E+01 (N)	No
	88-72-2	2-Nitrotoluene			mg/kg		0/14	2.20E-01 - 8.00E-01	8.00E-01	N/A	2.90E+00 (C)	No
	NA	3&4-Methylphenol (4)			mg/kg		0/10	1.70E-01 - 7.70E-01	7.70E-01	N/A	3.10E+01 (N)	No
	99-08-1	3-Nitrotoluene			mg/kg		0/14	2.20E-01 - 8.00E-01	8.00E-01	N/A	1.20E+02 (N)	No
	19406-51-0	4-amino-2,6-Dinitrotoluene			mg/kg		0/14	2.00E-01 - 4.00E-01	4.00E-01	N/A	1.50E+01 (N)	No
	99-99-0	4-Nitrotoluene			mg/kg		0/14	2.20E-01 - 8.00E-01	8.00E-01	N/A	2.40E+01 (N)	No
	100-51-6	Benzyl alcohol			mg/kg		0/15	1.70E-01 - 3.70E+00	3.70E+00	N/A	3.10E+03 (N)	No
	156-59-2	cis-1,2-Dichloroethene			mg/kg		0/14	4.90E-03 - 9.00E-03	9.00E-03	N/A	7.80E+01 (N)	No
	121-82-4	Cyclonite			mg/kg		0/14	2.00E-01 - 4.00E-01	4.00E-01	N/A	5.50E+00 (C)	No
	2691-41-0	HMX			mg/kg		0/14	2.00E-01 - 4.00E-01	4.00E-01	N/A	3.80E+02 (N)	No
	ICF87	m+p-Xylenes			mg/kg		0/14	9.80E-03 - 1.80E-02	1.80E-02	N/A	6.00E+01 (N)	No
	55-63-0	Nitroglycerin			mg/kg		0/14	3.28E-01 - 2.00E+00	2.00E+00	N/A	6.10E-01 (N)	Yes
	95-47-6	o-Xylene			mg/kg		0/14	4.90E-03 - 9.00E-03	9.00E-03	N/A	5.30E+02 (N)	No
	78-11-5	Pentaerythritol tetranitrate			mg/kg		0/14	3.28E-01 - 2.00E+00	2.00E+00	N/A	N/A	NTX
	110-86-1	Pyridine			mg/kg		0/5	1.90E-01 - 3.70E+00	3.70E+00	N/A	7.80E+00 (N)	No
	479-45-8	Tetryl			mg/kg		0/14	2.00E-01 - 5.00E-01	5.00E-01	N/A	2.40E+01 (N)	No
	156-60-5	trans-1,2-Dichloroethene			mg/kg		0/14	4.90E-03 - 9.00E-03	9.00E-03	N/A	1.10E+01 (N)	No
	7440-28-0	Thallium			mg/kg		0/10	2.40E+00 - 1.30E+01	1.30E+01	0.844	5.10E-01 (N)	Yes
	93-72-1	2,4,5-TP (Silvex)			mg/kg		0/12	1.11E-02 - 1.14E-01	1.14E-01	N/A	4.90E+01 (N)	No
	94-82-6	2,4-DB			mg/kg		0/12	7.10E-02 - 1.14E+00	1.14E+00	N/A	4.90E+01 (N)	No
	309-00-2	Aldrin			mg/kg		0/12	7.43E-04 - 1.90E-02	1.90E-02	N/A	2.90E-02 (C)	No
	319-84-6	alpha-BHC			mg/kg		0/12	7.43E-04 - 1.90E-02	1.90E-02	N/A	7.70E-02 (C)	No
	5103-71-9	alpha-Chlordane (5)			mg/kg		0/12	7.43E-04 - 1.90E-02	1.90E-02	N/A	1.60E+00 (C)	No
	319-85-7	beta-BHC			mg/kg		0/12	7.43E-04 - 1.90E-02	1.90E-02	N/A	2.70E-01 (C)	No
	75-99-0	Dalapon			mg/kg		0/12	3.60E-02 - 1.14E+00	1.14E+00	N/A	1.80E+02 (N)	No
	319-86-8	delta-BHC			mg/kg		0/12	7.43E-04 - 1.90E-02	1.90E-02	N/A	5.20E-01 (C)	No
	1918-00-9	Dicamba			mg/kg		0/11	7.10E-03 - 2.28E-01	2.28E-01	N/A	1.80E+02 (N)	No
	120-36-5	Dichloroprop			mg/kg		0/12	2.23E-02 - 2.28E-01	2.28E-01	N/A	N/A	NTX

Table E.1-3
Summary of Screening for Non-Detected Chemicals
Current/Future - Surface Soil at SWMU 50

Scenario Timeframe: Current/Future
Medium: Soil
Exposure Medium: Surface Soil

Exposure Point	CAS Number	Chemical	Minimum Concentration (Qualifier)	Maximum Concentration (Qualifier)	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value (2)	Screening Toxicity Value (3) (N/C)	Max ND greater than Screening Value? (Y/N)
	60-57-1	Dieldrin			mg/kg		0/12	7.43E-04 - 1.90E-02	1.90E-02	N/A	3.00E-02 (C)	No
	959-98-8	Endosulfan I (6)			mg/kg		0/12	7.43E-04 - 1.90E-02	1.90E-02	N/A	3.70E+01 (N)	No
	1031-07-8	Endosulfan sulfate (6)			mg/kg		0/12	7.43E-04 - 3.80E-02	3.80E-02	N/A	3.70E+01 (N)	No
	7421-93-4	Endrin aldehyde (7)			mg/kg		0/12	7.43E-04 - 3.80E-02	3.80E-02	N/A	1.80E+00 (N)	No
	53494-70-5	Endrin ketone (7)			mg/kg		0/12	7.43E-04 - 3.80E-02	3.80E-02	N/A	1.80E+00 (N)	No
	58-89-9	gamma-BHC (Lindane)			mg/kg		0/12	7.43E-04 - 1.90E-02	1.90E-02	N/A	5.20E-01 (C)	No
	5103-74-2	gamma-Chlordane (5)			mg/kg		0/12	7.43E-04 - 1.90E-02	1.90E-02	N/A	1.60E+00 (C)	No
	76-44-8	Heptachlor			mg/kg		0/12	7.43E-04 - 1.90E-02	1.90E-02	N/A	1.10E-01 (C)	No
	1024-57-3	Heptachlor epoxide			mg/kg		0/12	7.43E-04 - 1.90E-02	1.90E-02	N/A	5.30E-02 (C)	No
	94-74-6	MCPA			mg/kg		0/12	1.80E-01 - 1.14E+02	1.14E+02	N/A	3.10E+00 (N)	Yes
	93-65-2	MCPP			mg/kg		0/12	1.80E-01 - 1.14E+02	1.14E+02	N/A	6.10E+00 (N)	Yes
	8001-35-2	Toxaphene			mg/kg		0/12	3.71E-02 - 9.40E-01	9.40E-01	N/A	4.40E-01 (C)	Yes
	12674-11-2	Aroclor 1016			mg/kg		0/14	1.80E-02 - 3.80E-01	3.80E-01	N/A	3.90E-01 (N)	No
	11104-28-2	Aroclor 1221			mg/kg		0/14	1.80E-02 - 3.80E-01	3.80E-01	N/A	1.70E-01 (C)	Yes
	11141-16-5	Aroclor 1232			mg/kg		0/14	1.80E-02 - 3.80E-01	3.80E-01	N/A	1.70E-01 (C)	Yes
	53469-21-9	Aroclor 1242			mg/kg		0/14	1.80E-02 - 3.80E-01	3.80E-01	N/A	2.20E-01 (C)	Yes
	12672-29-6	Aroclor 1248			mg/kg		0/14	1.80E-02 - 3.80E-01	3.80E-01	N/A	2.20E-01 (C)	Yes
	11096-82-5	Aroclor 1260			mg/kg		0/14	1.80E-02 - 3.80E-01	3.80E-01	N/A	2.20E-01 (C)	Yes
	120-82-1	1,2,4-Trichlorobenzene			mg/kg		0/15	1.70E-01 - 3.70E+00	3.70E+00	N/A	8.70E+00 (N)	No
	95-95-4	2,4,5-Trichlorophenol			mg/kg		0/15	1.70E-01 - 3.70E+00	3.70E+00	N/A	6.10E+02 (N)	No
	88-06-2	2,4,6-Trichlorophenol			mg/kg		0/15	1.70E-01 - 3.70E+00	3.70E+00	N/A	6.10E+00 (N)	No
	120-83-2	2,4-Dichlorophenol			mg/kg		0/15	1.70E-01 - 3.70E+00	3.70E+00	N/A	1.80E+01 (N)	No
	105-67-9	2,4-Dimethylphenol			mg/kg		0/15	1.70E-01 - 3.70E+00	3.70E+00	N/A	1.20E+02 (N)	No
	51-28-5	2,4-Dinitrophenol			mg/kg		0/15	8.70E-01 - 1.80E+01	1.80E+01	N/A	1.20E+01 (N)	Yes
	606-20-2	2,6-Dinitrotoluene (8)			mg/kg		0/14	2.00E-01 - 4.00E-01	4.00E-01	N/A	7.10E-01 (C)	No
	91-58-7	2-Chloronaphthalene			mg/kg		0/15	1.70E-01 - 3.70E+00	3.70E+00	N/A	6.30E+02 (N)	No
	95-57-8	2-Chlorophenol			mg/kg		0/15	1.70E-01 - 3.70E+00	3.70E+00	N/A	3.90E+01 (N)	No
	88-74-4	2-Nitroaniline			mg/kg		0/15	1.90E-01 - 3.70E+00	3.70E+00	N/A	N/A	NTX
	88-75-5	2-Nitrophenol			mg/kg		0/15	1.70E-01 - 3.70E+00	3.70E+00	N/A	N/A	NTX
	88-85-7	2-sec-butyl-4,6-dinitrophenol			mg/kg		0/12	7.10E-03 - 2.28E-01	2.28E-01	N/A	6.10E+00 (N)	No
	91-94-1	3,3'-Dichlorobenzidine			mg/kg		0/15	1.90E-01 - 3.70E+00	3.70E+00	N/A	1.10E+00 (C)	Yes
	99-09-2	3-Nitroaniline			mg/kg		0/15	1.90E-01 - 3.70E+00	3.70E+00	N/A	1.80E+00 (N)	Yes

Table E.1-3
Summary of Screening for Non-Detected Chemicals
Current/Future - Surface Soil at SWMU 50

Scenario Timeframe: Current/Future
Medium: Soil
Exposure Medium: Surface Soil

Exposure Point	CAS Number	Chemical	Minimum Concentration (Qualifier)	Maximum Concentration (Qualifier)	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value (2)	Screening Toxicity Value (3) (N/C)	Max ND greater than Screening Value? (Y/N)
	534-52-1	4,6-Dinitro-o-cresol			mg/kg		0/15	3.50E-01 - 1.80E+01	1.80E+01	N/A	6.10E-01 (N)	Yes
	100-01-6	4-Nitroaniline			mg/kg		0/15	1.90E-01 - 3.70E+00	3.70E+00	N/A	1.80E+01 (N)	No
	100-02-7	4-Nitrophenol			mg/kg		0/15	8.70E-01 - 1.80E+01	1.80E+01	N/A	N/A	NTX
	65-85-0	Benzoic Acid			mg/kg		0/15	8.70E-01 - 1.80E+01	1.80E+01	N/A	2.40E+04 (N)	No
	111-91-1	bis(2-Chloroethoxy)methane			mg/kg		0/15	1.70E-01 - 3.70E+00	3.70E+00	N/A	1.80E+01 (N)	No
	111-44-4	bis(2-Chloroethyl)ether			mg/kg		0/15	1.70E-01 - 3.70E+00	3.70E+00	N/A	1.90E-01 (C)	Yes
	108-60-1	bis(2-Chloroisopropyl)ether			mg/kg		0/15	1.70E-01 - 3.70E+00	3.70E+00	N/A	3.50E+00 (C)	Yes
	117-81-7	bis(2-Ethylhexyl) phthalate			mg/kg		0/11	1.90E-01 - 1.50E+00	1.50E+00	N/A	3.50E+01 (C)	No
	84-66-2	Diethyl phthalate			mg/kg		0/12	1.90E-01 - 3.70E+00	3.70E+00	N/A	4.90E+03 (N)	No
	117-84-0	Di-n-octyl phthalate			mg/kg		0/15	1.90E-01 - 3.70E+00	3.70E+00	N/A	N/A	NTX
	118-74-1	Hexachlorobenzene			mg/kg		0/15	1.70E-01 - 3.70E+00	3.70E+00	N/A	3.00E-01 (C)	Yes
	87-68-3	Hexachlorobutadiene			mg/kg		0/15	1.70E-01 - 3.70E+00	3.70E+00	N/A	6.10E+00 (N)	No
	77-47-4	Hexachlorocyclopentadiene			mg/kg		0/15	1.70E-01 - 3.70E+00	3.70E+00	N/A	3.70E+01 (N)	No
	67-72-1	Hexachloroethane			mg/kg		0/15	1.70E-01 - 3.70E+00	3.70E+00	N/A	6.10E+00 (N)	No
	78-59-1	Isophorone			mg/kg		0/15	1.70E-01 - 3.70E+00	3.70E+00	N/A	5.10E+02 (C)	No
	98-95-3	Nitrobenzene			mg/kg		0/14	2.00E-01 - 4.00E-01	4.00E-01	N/A	3.10E+00 (N)	No
	621-64-7	n-Nitroso-di-n-propylamine			mg/kg		0/15	1.70E-01 - 3.70E+00	3.70E+00	N/A	6.90E-02 (C)	Yes
	95-48-7	o-Cresol			mg/kg		0/15	1.70E-01 - 3.70E+00	3.70E+00	N/A	3.10E+02 (N)	No
	106-47-8	p-Chloroaniline			mg/kg		0/15	1.70E-01 - 3.70E+00	3.70E+00	N/A	9.00E+00 (C)	No
	59-50-7	p-Chloro-m-cresol			mg/kg		0/15	1.70E-01 - 3.70E+00	3.70E+00	N/A	N/A	NTX
	106-44-5	p-Cresol			mg/kg		0/5	1.90E-01 - 3.70E+00	3.70E+00	N/A	3.10E+01 (N)	No
	87-86-5	Pentachlorophenol			mg/kg		0/15	8.70E-01 - 1.80E+01	1.80E+01	N/A	3.00E+00 (C)	Yes
	108-95-2	Phenol			mg/kg		0/15	1.70E-01 - 3.70E+00	3.70E+00	N/A	1.80E+03 (N)	No
	71-55-6	1,1,1-Trichloroethane			mg/kg		0/14	4.90E-03 - 9.00E-03	9.00E-03	N/A	9.00E+02 (N)	No
	79-34-5	1,1,2,2-Tetrachloroethane			mg/kg		0/14	4.90E-03 - 9.00E-03	9.00E-03	N/A	5.90E-01 (C)	No
	79-00-5	1,1,2-Trichloroethane			mg/kg		0/14	4.90E-03 - 9.00E-03	9.00E-03	N/A	1.10E+00 (C)	No
	75-34-3	1,1-Dichloroethane			mg/kg		0/14	4.90E-03 - 9.00E-03	9.00E-03	N/A	3.40E+00 (C)	No
	75-35-4	1,1-Dichloroethene			mg/kg		0/14	4.90E-03 - 9.00E-03	9.00E-03	N/A	2.50E+01 (N)	No
	107-06-2	1,2-Dichloroethane			mg/kg		0/14	4.90E-03 - 9.00E-03	9.00E-03	N/A	4.50E-01 (C)	No
	78-87-5	1,2-Dichloropropane			mg/kg		0/14	4.90E-03 - 9.00E-03	9.00E-03	N/A	9.30E-01 (C)	No
	78-93-3	2-Butanone			mg/kg		0/14	5.60E-03 - 4.50E-02	4.50E-02	N/A	2.80E+03 (N)	No
	591-78-6	2-Hexanone			mg/kg		0/14	5.60E-03 - 4.50E-02	4.50E-02	N/A	N/A	NTX

Table E.1-3
Summary of Screening for Non-Detected Chemicals
Current/Future - Surface Soil at SWMU 50

Scenario Timeframe: Current/Future
Medium: Soil
Exposure Medium: Surface Soil

Exposure Point	CAS Number	Chemical	Minimum Concentration (Qualifier)	Maximum Concentration (Qualifier)	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value (2)	Screening Toxicity Value (3) (N/C)	Max ND greater than Screening Value? (Y/N)
	101-55-3	4-Bromophenyl phenylether			mg/kg		0/15	1.70E-01 - 3.70E+00	3.70E+00	N/A	N/A	NTX
	7005-72-3	4-Chlorophenyl phenylether			mg/kg		0/15	1.70E-01 - 3.70E+00	3.70E+00	N/A	N/A	NTX
	108-10-1	4-Methyl-2-pentanone			mg/kg		0/14	5.60E-03 - 4.50E-02	4.50E-02	N/A	5.30E+02 (N)	No
	71-43-2	Benzene			mg/kg		0/14	4.90E-03 - 9.00E-03	9.00E-03	N/A	1.10E+00 (C)	No
	75-27-4	Bromodichloromethane			mg/kg		0/14	4.90E-03 - 9.00E-03	9.00E-03	N/A	1.00E+01 (C)	No
	74-83-9	Bromomethane			mg/kg		0/14	4.90E-03 - 9.00E-03	9.00E-03	N/A	7.90E-01 (N)	No
	75-15-0	Carbon disulfide			mg/kg		0/13	4.90E-03 - 9.00E-03	9.00E-03	N/A	6.70E+01 (N)	No
	56-23-5	Carbon tetrachloride			mg/kg		0/14	4.90E-03 - 9.00E-03	9.00E-03	N/A	2.50E-01 (C)	No
	108-90-7	Chlorobenzene			mg/kg		0/14	4.90E-03 - 9.00E-03	9.00E-03	N/A	3.10E+01 (N)	No
	75-00-3	Chloroethane			mg/kg		0/14	4.90E-03 - 9.00E-03	9.00E-03	N/A	1.50E+03 (N)	No
	67-66-3	Chloroform			mg/kg		0/14	4.90E-03 - 9.00E-03	9.00E-03	N/A	3.00E-01 (C)	No
	74-87-3	Chloromethane			mg/kg		0/14	4.90E-03 - 9.00E-03	9.00E-03	N/A	1.70E+00 (C)	No
	10061-01-5	cis-1,3-Dichloro-1-propene (9)			mg/kg		0/14	4.90E-03 - 9.00E-03	9.00E-03	N/A	1.70E+00 (C)	No
	124-48-1	Dibromochloromethane			mg/kg		0/14	4.90E-03 - 9.00E-03	9.00E-03	N/A	5.80E+00 (C)	No
	100-41-4	Ethylbenzene			mg/kg		0/14	4.90E-03 - 9.00E-03	9.00E-03	N/A	5.70E+00 (C)	No
	75-09-2	Methylene chloride			mg/kg		0/14	5.60E-03 - 1.80E-02	1.80E-02	N/A	1.10E+01 (C)	No
	100-42-5	Styrene			mg/kg		0/14	4.90E-03 - 9.00E-03	9.00E-03	N/A	6.50E+02 (N)	No
	127-18-4	Tetrachloroethene			mg/kg		0/14	4.90E-03 - 9.00E-03	9.00E-03	N/A	5.70E-01 (C)	No
	108-88-3	Toluene			mg/kg		0/14	4.90E-03 - 9.00E-03	9.00E-03	N/A	5.00E+02 (N)	No
	10061-02-6	trans-1,3-Dichloropropene (9)			mg/kg		0/14	4.90E-03 - 9.00E-03	9.00E-03	N/A	1.70E+00 (C)	No
	75-25-2	Tribromomethane			mg/kg		0/14	4.90E-03 - 9.00E-03	9.00E-03	N/A	6.10E+01 (C)	No
	79-01-6	Trichloroethene			mg/kg		0/14	4.90E-03 - 9.00E-03	9.00E-03	N/A	2.80E+00 (C)	No
	75-01-4	Vinyl Chloride			mg/kg		0/14	4.90E-03 - 9.00E-03	9.00E-03	N/A	6.00E-02 (C)	No

(1) Maximum concentration used for screening.

(2) N/A - Refer to supporting information for background discussion.
Background values derived from site-specific statistical analysis. See text for supporting information.

(3) Screening toxicity values for residential soil from USEPA Regional Screening Level Table (September 2008) and based on a risk level of 1.0E-06 and a hazard index of 0.1. See text for derivation of Nutrient RDAs.

(4) The screening value is based on p-cresol.

(5) The screening value is based on chlordane.

(6) The screening value is based on endosulfan.

Table E.1-3
Summary of Screening for Non-Detected Chemicals
Current/Future - Surface Soil at SWMU 50

Scenario Timeframe: Current/Future
Medium: Soil
Exposure Medium: Surface Soil

Exposure Point	CAS Number	Chemical	Minimum Concentration (Qualifier)	Maximum Concentration (Qualifier)	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value (2)	Screening Toxicity Value (3) (N/C)	Max ND greater than Screening Value? (Y/N)

(7) The screening value is based on endrin.

(8) The screening value is based on dinitrotoluene mixtures.

(9) The screening value is based on 1,3-dichloropropene.

Table E.1-4
Occurrence, Distribution and Selection of Chemicals of Potential Concern
Current/Future - Total Soil - SWMU 50

Scenario Timeframe: Current/Future
Medium: Soil
Exposure Medium: Total Soil

Exposure Point	CAS Number	Chemical	Minimum Concentration (Qualifier)	Maximum Concentration (Qualifier)	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value (2)	Screening Toxicity Value (3) (N/C)	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag (Y/N)	Rationale for Selection or Deletion (4)
	NA	2,3,7,8-TCDD-TE	3.27E-07	9.60E-05	mg/kg	50SB06A	20/20	N/A	9.60E-05	N/A	4.50E-06 (C)	N/A	N/A	Yes	ASL
Total Soil	67562-39-4	1,2,3,4,6,7,8-Heptachlorodibenzofuran	8.91E-07 B	5.59E-04	mg/kg	50SB13B	20/20	N/A	5.59E-04	N/A	N/A	N/A	N/A	No	TEQ
	35822-46-9	1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	1.25E-05	4.61E-03 J	mg/kg	50SB06A	20/20	N/A	4.61E-03	N/A	N/A	N/A	N/A	No	TEQ
	55673-89-7	1,2,3,4,7,8,9-Heptachlorodibenzofuran	5.88E-07 J	2.97E-05	mg/kg	50SB06A	12/20	4.86E-07 - 1.02E-06	2.97E-05	N/A	N/A	N/A	N/A	No	TEQ
	70648-26-9	1,2,3,4,7,8-Hexachlorodibenzofuran	3.24E-07 J	1.20E-04	mg/kg	50SB13B	17/20	5.39E-07 - 6.69E-07	1.20E-04	N/A	N/A	N/A	N/A	No	TEQ
	39227-28-6	1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	2.02E-07 J	1.46E-05	mg/kg	50SB07A	15/20	5.39E-07 - 8.16E-07	1.46E-05	N/A	N/A	N/A	N/A	No	TEQ
	57117-44-9	1,2,3,6,7,8-Hexachlorodibenzofuran	1.20E-07 J	1.82E-05	mg/kg	50SB13B	16/20	5.39E-07 - 7.98E-07	1.82E-05	N/A	N/A	N/A	N/A	No	TEQ
	57653-85-7	1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	3.00E-07 J	1.22E-04	mg/kg	50SB06A	16/20	5.39E-07 - 8.30E-07	1.22E-04	N/A	N/A	N/A	N/A	No	TEQ
	72918-21-9	1,2,3,7,8,9-Hexachlorodibenzofuran	7.77E-07 J	5.74E-06 J	mg/kg	50SB12B	9/20	4.86E-07 - 7.98E-07	5.74E-06	N/A	N/A	N/A	N/A	No	TEQ
	19408-74-3	1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	2.93E-07 J	4.12E-05	mg/kg	50SB06A	16/20	5.39E-07 - 8.42E-07	4.12E-05	N/A	N/A	N/A	N/A	No	TEQ
	57117-41-6	1,2,3,7,8-Pentachlorodibenzofuran	9.99E-08 J	4.08E-06 J	mg/kg	50SB07A	13/20	5.02E-07 - 7.98E-07	4.08E-06	N/A	N/A	N/A	N/A	No	TEQ
	40321-76-4	1,2,3,7,8-Pentachlorodibenzo-p-dioxin	2.79E-07 J	6.68E-06	mg/kg	50SB07A	13/20	5.02E-07 - 8.34E-07	6.68E-06	N/A	N/A	N/A	N/A	No	TEQ
	60851-34-5	2,3,4,6,7,8-Hexachlorodibenzofuran	1.81E-07 J	1.53E-05	mg/kg	50SB07A	14/20	5.02E-07 - 7.98E-07	1.53E-05	N/A	N/A	N/A	N/A	No	TEQ
	57117-31-4	2,3,4,7,8-Pentachlorodibenzofuran	1.07E-07 B	9.63E-06	mg/kg	50SB07A	15/20	5.02E-07 - 7.98E-07	9.63E-06	N/A	N/A	N/A	N/A	No	TEQ
	1746-01-6	2,3,7,8-Tetrachlorodibenzo-p-dioxin	1.30E-07 J	5.63E-07 J	mg/kg	50SB07A	7/20	1.39E-07 - 6.79E-07	5.63E-07	N/A	N/A	N/A	N/A	No	TEQ
	51207-31-9	2,3,7,8-Tetrachlorodibenzofuran	1.41E-07 B	7.79E-06	mg/kg	50SB07A	19/20	3.93E-07 - 3.93E-07	7.79E-06	N/A	N/A	N/A	N/A	No	TEQ
	Shaw 05	Total Heptachlorodibenzofuran	8.91E-07 B	2.04E-03 J	mg/kg	50SB06A	20/20	N/A	2.04E-03	N/A	N/A	N/A	N/A	No	TEQ
	Shaw 04	Total Heptachlorodibenzo-p-dioxin	2.87E-05	7.35E-03	mg/kg	50SB06A	20/20	N/A	7.35E-03	N/A	N/A	N/A	N/A	No	TEQ
	Shaw 07	Total Hexachlorodibenzofuran	3.45E-07	5.18E-04	mg/kg	50SB06A	18/20	5.54E-07 - 7.74E-07	5.18E-04	N/A	N/A	N/A	N/A	No	TEQ
	Shaw 06	Total Hexachlorodibenzo-p-dioxin	6.30E-07	4.04E-04	mg/kg	50SB06A	20/20	N/A	4.04E-04	N/A	N/A	N/A	N/A	No	TEQ
	Shaw 09	Total Pentachlorodibenzofuran	1.47E-07 B	1.09E-04 J	mg/kg	50SB07A	17/20	5.39E-07 - 5.99E-07	1.09E-04	N/A	N/A	N/A	N/A	No	TEQ
	Shaw 08	Total Pentachlorodibenzo-p-dioxin	7.88E-07 J	1.78E-05 J	mg/kg	50SB07A	13/20	5.02E-07 - 8.34E-07	1.78E-05	N/A	N/A	N/A	N/A	No	TEQ
	Shaw 11	Total Tetrachlorodibenzofuran	1.41E-07 B	5.62E-05 J	mg/kg	50SB07A	19/20	3.93E-07 - 3.93E-07	5.62E-05	N/A	N/A	N/A	N/A	No	TEQ
	Shaw 10	Total Tetrachlorodibenzo-p-dioxin	1.82E-07	1.00E-05 J	mg/kg	50SB12B	13/20	1.48E-07 - 4.97E-07	1.00E-05	N/A	N/A	N/A	N/A	No	TEQ
	3268-87-9	Octachlorodibenzodioxin	4.72E-04	5.02E-02 J	mg/kg	50SB06A	20/20	N/A	5.02E-02	N/A	N/A	N/A	N/A	No	TEQ
	39001-02-0	Octachlorodibenzofuran	1.28E-06 B	2.09E-03	mg/kg	50SB06A	20/20	N/A	2.09E-03	N/A	N/A	N/A	N/A	No	TEQ
	71-55-6	1,1,1-Trichloroethane	5.00E+00	5.00E+00	mg/kg	50SL1 (RVFS*9)	1/30	4.90E-03 - 2.00E+00	5.00E+00	N/A	9.00E+02 (N)	N/A	N/A	No	BSL
	95-50-1	1,2-Dichlorobenzene	1.10E-02 J	1.60E-02 J	mg/kg	50SB04C	2/31	1.10E-01 - 3.70E+00	1.60E-02	N/A	2.00E+02 (N)	N/A	N/A	No	BSL
	541-73-1	1,3-Dichlorobenzene (5)	8.60E-03 J	1.60E-02 J	mg/kg	50SB04C	2/31	1.30E-01 - 3.70E+00	1.60E-02	N/A	2.60E+00 (C)	N/A	N/A	No	BSL
	106-46-7	1,4-Dichlorobenzene	1.10E-02 J	1.60E-02 J	mg/kg	50SB04C	2/31	9.80E-02 - 3.70E+00	1.60E-02	N/A	2.60E+00 (C)	N/A	N/A	No	BSL
	93-76-5	2,4,5-T	8.18E-03 J	8.18E-03 J	mg/kg	50SS01	1/22	7.10E-03 - 1.14E-01	8.18E-03	N/A	6.10E+01 (N)	N/A	N/A	No	BSL
	118-96-7	2,4,6-Trinitrotoluene	9.23E-02 J	9.23E-02 J	mg/kg	50SB06B	1/28	2.00E-01 - 4.00E-01	9.23E-02	N/A	3.60E+00 (N)	N/A	N/A	No	BSL
	94-75-7	2,4-D	1.42E-01 J	1.42E-01 J	mg/kg	50SS03	1/22	2.23E-02 - 5.60E-02	1.42E-01	N/A	6.90E+01 (N)	N/A	N/A	No	BSL
	121-14-2	2,4-Dinitrotoluene (6)	7.79E-02 J	8.88E-01	mg/kg	50SB07A	8/30	1.40E-01 - 4.00E-01	8.88E-01	N/A	7.10E-01 (C)	N/A	N/A	Yes	ASL
	606-20-2	2,6-Dinitrotoluene (6)	1.79E-01 J	1.79E-01 J	mg/kg	50SB12B	1/30	8.50E-02 - 4.00E-01	1.79E-01	N/A	7.10E-01 (C)	N/A	N/A	No	BSL
	91-57-6	2-Methylnaphthalene	9.10E-03	4.70E-01	mg/kg	50SL1 (RVFS*9)	7/30	2.80E-03 - 2.10E+00	4.70E-01	N/A	3.10E+01 (N)	N/A	N/A	No	BSL
	72-54-8	4,4'-DDD	4.10E-04 J	4.47E-04 J	mg/kg	50SS03	2/24	3.60E-03 - 2.70E-01	4.47E-04	N/A	2.00E+00 (C)	N/A	N/A	No	BSL
	72-55-9	4,4'-DDE	3.37E-03	3.37E-03	mg/kg	50SS03	1/23	3.60E-03 - 3.10E-01	3.37E-03	N/A	1.40E+00 (C)	N/A	N/A	No	BSL

Table E.1-4
Occurrence, Distribution and Selection of Chemicals of Potential Concern
Current/Future - Total Soil - SWMU 50

Scenario Timeframe: Current/Future
Medium: Soil
Exposure Medium: Total Soil

Exposure Point	CAS Number	Chemical	Minimum Concentration (Qualifier)	Maximum Concentration (Qualifier)	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value (2)	Screening Toxicity Value (3) (N/C)	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag (Y/N)	Rationale for Selection or Deletion (4)
	50-29-3	4,4'-DDT	1.29E-02	1.29E-02	mg/kg	50SS03	1/24	7.43E-04 - 3.10E-01	1.29E-02	N/A	1.70E+00 (C)	N/A	N/A	No	BSL
	83-32-9	Acenaphthene	1.60E-02	1.60E-02	mg/kg	50SB05A	1/25	2.80E-03 - 2.10E+00	1.60E-02	N/A	3.40E+02 (N)	N/A	N/A	No	BSL
	208-96-8	Acenaphthylene (7)	2.20E-03	2.00E-02	mg/kg	50SB05A	7/30	2.80E-03 - 2.10E+00	2.00E-02	N/A	1.70E+02 (N)	N/A	N/A	No	BSL
	67-64-1	Acetone	7.45E-02 J	1.01E-01 J	mg/kg	50SB12B	2/29	5.70E-03 - 8.00E+00	1.01E-01	N/A	6.10E+03 (N)	N/A	N/A	No	BSL
	120-12-7	Anthracene	2.00E-03 J	1.10E-02	mg/kg	50SB05A	5/30	2.10E-03 - 2.10E+00	1.10E-02	N/A	1.70E+03 (N)	N/A	N/A	No	BSL
	11097-69-1	Aroclor 1254	1.04E-02 J	1.48E+00	mg/kg	50SB07A	14/30	1.80E-02 - 2.30E+00	1.48E+00	N/A	1.10E-01 (N)	N/A	N/A	Yes	ASL
	56-55-3	Benzo(a)anthracene	1.60E-03 J	1.37E-01 L	mg/kg	50SB07A	8/30	2.80E-03 - 4.10E-01	1.37E-01	N/A	1.50E-01 (C)	N/A	N/A	No	BSL
	50-32-8	Benzo(a)pyrene	3.30E-03	1.50E-01 L	mg/kg	50SB07A	8/30	2.80E-03 - 4.10E-01	1.50E-01	N/A	1.50E-02 (C)	N/A	N/A	Yes	ASL
	205-99-2	Benzo(b)fluoranthene	1.80E-03 J	1.52E-01 L	mg/kg	50SB07A	9/30	2.80E-03 - 4.10E-01	1.52E-01	N/A	1.50E-01 (C)	N/A	N/A	Yes	ASL
	191-24-2	Benzo(g,h,i)perylene (7)	1.10E-03 J	5.90E-02	mg/kg	50SS02	9/30	2.80E-03 - 4.10E-01	5.90E-02	N/A	1.70E+02 (N)	N/A	N/A	No	BSL
	207-08-9	Benzo(k)fluoranthene	5.50E-04 J	9.89E-02 L	mg/kg	50SB07A	9/30	2.80E-03 - 4.10E-01	9.89E-02	N/A	1.50E+00 (C)	N/A	N/A	No	BSL
	86-74-8	Carbazole	1.10E-02 J	2.80E-02 J	mg/kg	50SB05A	4/29	1.70E-01 - 3.70E+00	2.80E-02	N/A	N/A	N/A	N/A	Yes	NTX
	67-66-3	Chloroform	2.00E+00	2.00E+00	mg/kg	50SL1 (RVFS*9)	1/30	4.90E-03 - 4.00E-01	2.00E+00	N/A	3.00E-01 (C)	N/A	N/A	Yes	ASL
	218-01-9	Chrysene	2.60E-03 J	1.19E-01 L	mg/kg	50SB07A	9/30	2.80E-03 - 4.10E-01	1.19E-01	N/A	1.50E+01 (C)	N/A	N/A	No	BSL
	53-70-3	Dibenz(a,h)anthracene	1.60E-03 J	1.40E-02	mg/kg	50SS02	5/30	2.80E-03 - 4.10E-01	1.40E-02	N/A	1.50E-02 (C)	N/A	N/A	No	BSL
	132-64-9	Dibenzofuran	1.20E-02 J	2.00E-01 J	mg/kg	50SB05A	5/31	3.50E-02 - 3.70E+00	2.00E-01	N/A	N/A	N/A	N/A	Yes	NTX
	1918-00-9	Dicamba	1.39E-02 J	1.39E-02 J	mg/kg	50SB10B	1/21	7.10E-03 - 2.28E-01	1.39E-02	N/A	1.80E+02 (N)	N/A	N/A	No	BSL
	131-11-3	Dimethylphthalate	7.16E-01	1.50E+00 J	mg/kg	50SB04A	2/31	1.70E-01 - 2.80E+00	1.50E+00	N/A	N/A	N/A	N/A	Yes	NTX
	84-74-2	Di-n-butyl phthalate	1.29E-01	3.54E+00	mg/kg	50SB12B	7/26	6.10E-02 - 2.80E+00	3.54E+00	N/A	6.10E+02 (N)	N/A	N/A	No	BSL
	33213-65-9	Endosulfan II (8)	6.36E-04 J	2.24E-03	mg/kg	50SS03	2/24	3.60E-03 - 6.20E-01	2.24E-03	N/A	3.70E+01 (N)	N/A	N/A	No	BSL
	72-20-8	Endrin	2.88E-04 J	2.88E-04 J	mg/kg	50SS01	1/24	7.59E-04 - 4.50E-01	2.88E-04	N/A	1.80E+00 (N)	N/A	N/A	No	BSL
	206-44-0	Fluoranthene	1.60E-03 J	7.30E-02	mg/kg	50SS02	7/30	2.80E-03 - 2.10E+00	7.30E-02	N/A	2.30E+02 (N)	N/A	N/A	No	BSL
	86-73-7	Fluorene	1.00E-03 J	1.80E-02 J	mg/kg	50SB05A	7/30	2.80E-03 - 2.10E+00	1.80E-02	N/A	2.30E+02 (N)	N/A	N/A	No	BSL
	193-39-5	Indeno(1,2,3-cd)pyrene	2.30E-03	8.41E-02 L	mg/kg	50SB07A	9/30	2.80E-03 - 4.10E-01	8.41E-02	N/A	1.50E-01 (C)	N/A	N/A	No	BSL
	ICF87	m+p-Xylenes	5.80E-03 K	5.80E-03 K	mg/kg	50SB12B	1/28	9.80E-03 - 2.40E-02	5.80E-03	N/A	6.00E+01 (N)	N/A	N/A	No	BSL
	72-43-5	Methoxychlor	1.29E-03	1.29E-03	mg/kg	50SS03	1/24	7.43E-04 - 3.30E-01	1.29E-03	N/A	3.10E+01 (N)	N/A	N/A	No	BSL
	91-20-3	Naphthalene	1.60E-02	4.30E-01	mg/kg	50SL1 (RVFS*9)	6/28	2.80E-03 - 2.10E+00	4.30E-01	N/A	3.90E+00 (C)	N/A	N/A	No	BSL
	86-30-6	n-Nitrosodiphenylamine	2.10E-02 J	2.10E+00 J	mg/kg	50SB04A	5/31	1.70E-01 - 1.40E+00	2.10E+00	N/A	9.90E+01 (C)	N/A	N/A	No	BSL
	85-01-8	Phenanthrene (7)	1.10E-02	2.60E-01	mg/kg	50SB05A	8/30	2.80E-03 - 2.10E+00	2.60E-01	N/A	1.70E+02 (N)	N/A	N/A	No	BSL
	129-00-0	Pyrene	2.30E-03 J	8.50E-02	mg/kg	50SS02	7/30	2.80E-03 - 2.10E+00	8.50E-02	N/A	1.70E+02 (N)	N/A	N/A	No	BSL
	7429-90-5	Aluminum	3.10E+03 J	3.84E+04	mg/kg	50SB05C	28/28	N/A	3.84E+04	N/A	7.70E+03 (N)	N/A	N/A	Yes	ASL
	7440-36-0	Antimony	3.30E-01 L	2.50E+00 L	mg/kg	50SB10B	18/24	3.80E-01 - 6.36E-01	2.50E+00	N/A	3.10E+00 (N)	N/A	N/A	No	BSL
	7440-38-2	Arsenic	1.03E+00 J	1.37E+01 J	mg/kg	50SB04B	28/28	N/A	1.37E+01	N/A	3.90E-01 (C)	N/A	N/A	Yes	ASL
	7440-39-3	Barium	1.20E+01 J	1.41E+02	mg/kg	50SS01	28/28	N/A	1.41E+02	N/A	1.50E+03 (N)	N/A	N/A	No	BSL
	7440-41-7	Beryllium	1.30E-01 J	9.00E-01	mg/kg	50SB08A	20/20	N/A	9.00E-01	N/A	1.60E+01 (N)	N/A	N/A	No	BSL
	7440-43-9	Cadmium	1.20E-01 J	1.50E-01 J	mg/kg	50SB04C	4/26	5.70E-02 - 1.60E+00	1.50E-01	N/A	7.00E+00 (N)	N/A	N/A	No	BSL
	7440-70-2	Calcium	2.54E+01 J	2.37E+05 J	mg/kg	50SB09B	27/27	N/A	2.37E+05	N/A	N/A	1.00E+06	RDA	No	BSL
	7440-47-3	Chromium	1.22E+01 J	5.13E+02 J	mg/kg	50SB13B	28/28	N/A	5.13E+02	N/A	2.80E+02 (C)	N/A	N/A	Yes	ASL

Table E.1-4
Occurrence, Distribution and Selection of Chemicals of Potential Concern
Current/Future - Total Soil - SWMU 50

Scenario Timeframe: Current/Future
Medium: Soil
Exposure Medium: Total Soil

Exposure Point	CAS Number	Chemical	Minimum Concentration (Qualifier)	Maximum Concentration (Qualifier)	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value (2)	Screening Toxicity Value (3) (N/C)	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag (Y/N)	Rationale for Selection or Deletion (4)
	7440-48-4	Cobalt	1.30E+00 J	4.49E+01 J	mg/kg	50SB15B	28/28	N/A	4.49E+01	N/A	2.30E+00 (N)	N/A	N/A	Yes	ASL
	7440-50-8	Copper	4.00E+00	4.38E+02	mg/kg	50SB13B	28/28	N/A	4.38E+02	N/A	3.10E+02 (N)	N/A	N/A	Yes	ASL
	7439-89-6	Iron	3.06E+03 J	4.72E+04 J	mg/kg	50SB10B	28/28	N/A	4.72E+04	N/A	5.50E+03 (N)	N/A	N/A	Yes	ASL
	7439-92-1	Lead	6.60E+00 J	5.85E+02	mg/kg	50SB04C	28/28	N/A	5.85E+02	N/A	4.00E+02 (N)	N/A	N/A	Yes	ASL
	7439-95-4	Magnesium	3.12E+02 J	2.02E+04	mg/kg	50SS02	28/28	N/A	2.02E+04	N/A	N/A	1.00E+06	RDA	No	BSL
	7439-96-5	Manganese	2.51E+01 J	1.44E+03 J	mg/kg	50SB15B	28/28	N/A	1.44E+03	N/A	1.80E+02 (N)	N/A	N/A	Yes	ASL
	7439-97-6	Mercury (9)	1.20E-02 J	8.16E-01	mg/kg	50SB05A	28/28	N/A	8.16E-01	N/A	2.30E+00 (N)	N/A	N/A	No	BSL
	7440-02-0	Nickel	4.10E+00 J	1.81E+02	mg/kg	50SB04C	28/28	N/A	1.81E+02	N/A	1.60E+02 (N)	N/A	N/A	Yes	ASL
	7440-09-7	Potassium	4.65E+02	2.05E+03	mg/kg	50SS02	14/14	N/A	2.05E+03	N/A	N/A	1.00E+06	RDA	No	BSL
	7782-49-2	Selenium	5.70E-01 L	1.35E+01 J	mg/kg	50SB10B	14/27	1.50E-01 - 3.20E+01	1.35E+01	N/A	3.90E+01 (N)	N/A	N/A	No	BSL
	7440-22-4	Silver	6.90E-02 J	1.10E+00 J	mg/kg	50SB04C	8/28	4.70E-02 - 1.65E+00	1.10E+00	N/A	3.90E+01 (N)	N/A	N/A	No	BSL
	7440-23-5	Sodium	3.52E+01 J	7.87E+01 J	mg/kg	50SB04C	6/28	4.20E+00 - 6.70E+01	7.87E+01	N/A	N/A	1.00E+06	RDA	No	BSL
	7440-62-2	Vanadium (10)	6.40E+00 J	8.42E+01 J	mg/kg	50SB10B	28/28	N/A	8.42E+01	N/A	3.90E+01 (N)	N/A	N/A	Yes	ASL
	7440-66-6	Zinc	5.00E+00 J	9.33E+01 J	mg/kg	50SS02	28/28	N/A	9.33E+01	N/A	2.30E+03 (N)	N/A	N/A	No	BSL

(1) Maximum concentration used for screening.

(2) N/A - Refer to supporting information for background discussion.
Background values derived from site-specific statistical analysis. See text for supporting information.

(3) Screening level values for residential soil from USEPA Regional Screening Level Table (September 2008) are based on a risk level of 1.0E-06 and a hazard index of 0.1. See text for derivation of Nutrient RDAs.

(4) Rationale Codes
Selection Reason:
Infrequent Detection but Associated Historically (HIST)
Toxicity Information Available (TX)
Above Screening Levels (ASL)
No Toxicity Information (NTX)
Deletion Reason:
Background Levels (BKG)
Below Screening and/or ARAR/TBC Level (BSL)

Definitions:
N/A = Not Applicable or Not Available
SQL = Sample Quantitation Limit
COPC = Chemical of Potential Concern
ARAR/TBC = Applicable or Relevant and Appropriate Requirement/To Be Considered
MCL = Federal Maximum Contaminant Level
SMCL = Secondary Maximum Contaminant Level
J = Estimated Value
C = Carcinogenic
N = Non-Carcinogenic
RDA = Recommended Daily Allowance

(5) The screening value for 1,3-dichlorobenzene is based on 1,4-dichlorobenzene.

(6) The screening value for dinitrotoluene mixture is based on carcinogenicity study for 2,4-DNT and 2,6-DNT. Therefore, the RBC for dinitrotoluene mixture is conservatively used as the screening value for the individual compounds.

(7) The screening value for pyrene was used as a surrogate.

(8) The screening value for endosulfan II is based on endosulfan.

(9) The screening value for mercury is based on mercury, inorganic salts.

(10) The screening value for vanadium is based on vanadium and compounds.

Table E.1-5
Summary of Screening for Non-Detected Chemicals
Current/Future - Total Soil at SWMU 50

Scenario Timeframe: Current/Future
Medium: Soil
Exposure Medium: Total Soil

Exposure Point	CAS Number	Chemical	Minimum Concentration (Qualifier)	Maximum Concentration (Qualifier)	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value (2)	Screening Toxicity Value (3) (N/C)	Max ND greater than Screening Value? (Y/N)
Total Soil	122-66-7	1,2-Diphenylhydrazine			mg/kg		0/2	1.40E-01 - 1.40E-01	1.40E-01	N/A	N/A	NTX
	99-35-4	1,3,5-Trinitrobenzene			mg/kg		0/28	1.00E-01 - 2.50E-01	2.50E-01	N/A	2.20E+02 (N)	No
	99-65-0	1,3-Dinitrobenzene			mg/kg		0/28	1.00E-01 - 2.50E-01	2.50E-01	N/A	6.10E-01 (N)	No
	90-12-0	1-Methylnaphthalene			mg/kg		0/20	2.80E-01 - 2.10E+00	2.10E+00	N/A	2.20E+01 (C)	No
	35572-78-2	2-amino-4,6-Dinitrotoluene			mg/kg		0/28	2.00E-01 - 4.00E-01	4.00E-01	N/A	1.50E+01 (N)	No
	110-75-8	2-Chloroethyl vinyl ether			mg/kg		0/2	5.00E+00 - 5.00E+00	5.00E+00	N/A	N/A	NTX
	88-72-2	2-Nitrotoluene			mg/kg		0/28	2.20E-01 - 8.00E-01	8.00E-01	N/A	2.90E+00 (C)	No
	NA	3&4-Methylphenol (4)			mg/kg		0/20	1.70E-01 - 1.40E+00	1.40E+00	N/A	3.10E+01 (N)	No
	99-08-1	3-Nitrotoluene			mg/kg		0/28	2.20E-01 - 8.00E-01	8.00E-01	N/A	1.20E+02 (N)	No
	19406-51-0	4-amino-2,6-Dinitrotoluene			mg/kg		0/28	2.00E-01 - 4.00E-01	4.00E-01	N/A	1.50E+01 (N)	No
	99-99-0	4-Nitrotoluene			mg/kg		0/28	2.20E-01 - 8.00E-01	8.00E-01	N/A	2.40E+01 (N)	No
	107-02-8	Acraldehyde			mg/kg		0/2	5.00E+01 - 5.00E+01	5.00E+01	N/A	N/A	NTX
	107-13-1	Acrylonitrile			mg/kg		0/2	5.00E+01 - 5.00E+01	5.00E+01	N/A	2.40E-01 (C)	Yes
	92-87-5	Benzidine			mg/kg		0/2	8.50E-01 - 8.50E-01	8.50E-01	N/A	5.00E-04 (C)	Yes
	100-51-6	Benzyl alcohol			mg/kg		0/31	1.70E-01 - 3.70E+00	3.70E+00	N/A	3.10E+03 (N)	No
	156-59-2	cis-1,2-Dichloroethene			mg/kg		0/28	4.90E-03 - 1.20E-02	1.20E-02	N/A	7.80E+01 (N)	No
	121-82-4	Cyclonite			mg/kg		0/28	2.00E-01 - 4.00E-01	4.00E-01	N/A	5.50E+00 (C)	No
	2691-41-0	HMX			mg/kg		0/28	2.00E-01 - 4.00E-01	4.00E-01	N/A	3.80E+02 (N)	No
	55-63-0	Nitroglycerin			mg/kg		0/28	3.28E-01 - 2.00E+00	2.00E+00	N/A	6.10E-01 (N)	Yes
	62-75-9	N-Nitrosodimethylamine			mg/kg		0/2	1.40E-01 - 1.40E-01	1.40E-01	N/A	2.30E-03 (C)	Yes
	95-47-6	o-Xylene			mg/kg		0/28	4.90E-03 - 1.20E-02	1.20E-02	N/A	5.30E+02 (N)	No
	78-11-5	Pentaerythritol tetranitrate			mg/kg		0/28	3.28E-01 - 2.00E+00	2.00E+00	N/A	N/A	NTX
	110-86-1	Pyridine			mg/kg		0/9	1.90E-01 - 3.70E+00	3.70E+00	N/A	7.80E+00 (N)	No
	479-45-8	Tetryl			mg/kg		0/28	2.00E-01 - 5.00E-01	5.00E-01	N/A	2.40E+01 (N)	No
	156-60-5	trans-1,2-Dichloroethene			mg/kg		0/28	4.90E-03 - 1.20E-02	1.20E-02	N/A	1.10E+01 (N)	No
	75-69-4	Trichlorofluoromethane			mg/kg		0/2	3.00E+00 - 3.00E+00	3.00E+00	N/A	8.00E+01 (N)	No
	108-05-4	Vinyl acetate			mg/kg		0/2	2.00E+00 - 2.00E+00	2.00E+00	N/A	9.90E+01 (N)	No
	7440-28-0	Thallium			mg/kg		0/21	5.95E-01 - 1.30E+01	1.30E+01	N/A	5.10E-01 (N)	Yes
	93-72-1	2,4,5-TP (Silvex)			mg/kg		0/22	1.11E-02 - 1.14E-01	1.14E-01	N/A	4.90E+01 (N)	No
	94-82-6	2,4-DB			mg/kg		0/22	7.10E-02 - 1.14E+00	1.14E+00	N/A	4.90E+01 (N)	No
	309-00-2	Aldrin			mg/kg		0/24	7.43E-04 - 3.30E-01	3.30E-01	N/A	2.90E-02 (C)	Yes
	319-84-6	alpha-BHC			mg/kg		0/24	7.43E-04 - 2.70E-01	2.70E-01	N/A	7.70E-02 (C)	Yes
	5103-71-9	alpha-Chlordane (5)			mg/kg		0/24	7.43E-04 - 3.30E-01	3.30E-01	N/A	1.60E+00 (C)	No

Table E.1-5
Summary of Screening for Non-Detected Chemicals
Current/Future - Total Soil at SWMU 50

Scenario Timeframe: Current/Future
Medium: Soil
Exposure Medium: Total Soil

Exposure Point	CAS Number	Chemical	Minimum Concentration (Qualifier)	Maximum Concentration (Qualifier)	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value (2)	Screening Toxicity Value (3) (N/C)	Max ND greater than Screening Value? (Y/N)
	319-85-7	beta-BHC			mg/kg		0/24	7.43E-04 - 2.70E-01	2.70E-01	N/A	2.70E-01 (C)	No
	75-99-0	Dalapon			mg/kg		0/22	3.60E-02 - 1.14E+00	1.14E+00	N/A	1.80E+02 (N)	No
	319-86-8	delta-BHC			mg/kg		0/24	7.43E-04 - 2.70E-01	2.70E-01	N/A	5.20E-01 (C)	No
	120-36-5	Dichloroprop			mg/kg		0/22	2.23E-02 - 2.28E-01	2.28E-01	N/A	N/A	NTX
	60-57-1	Dieldrin			mg/kg		0/24	7.43E-04 - 3.10E-01	3.10E-01	N/A	3.00E-02 (C)	Yes
	959-98-8	Endosulfan I (6)			mg/kg		0/24	7.43E-04 - 6.20E-01	6.20E-01	N/A	3.70E+01 (N)	No
	1031-07-8	Endosulfan sulfate (6)			mg/kg		0/24	7.43E-04 - 6.20E-01	6.20E-01	N/A	3.70E+01 (N)	No
	7421-93-4	Endrin aldehyde (7)			mg/kg		0/24	7.43E-04 - 5.30E-01	5.30E-01	N/A	1.80E+00 (N)	No
	53494-70-5	Endrin ketone (7)			mg/kg		0/24	7.43E-04 - 5.30E-01	5.30E-01	N/A	1.80E+00 (N)	No
	58-89-9	gamma-BHC (Lindane)			mg/kg		0/24	7.43E-04 - 2.70E-01	2.70E-01	N/A	5.20E-01 (C)	No
	5103-74-2	gamma-Chlordane (5)			mg/kg		0/24	7.43E-04 - 3.30E-01	3.30E-01	N/A	1.60E+00 (C)	No
	76-44-8	Heptachlor			mg/kg		0/24	7.43E-04 - 1.30E-01	1.30E-01	N/A	1.10E-01 (C)	Yes
	1024-57-3	Heptachlor epoxide			mg/kg		0/24	7.43E-04 - 3.30E-01	3.30E-01	N/A	5.30E-02 (C)	Yes
	94-74-6	MCPA			mg/kg		0/22	1.80E-01 - 1.14E+02	1.14E+02	N/A	3.10E+00 (N)	Yes
	93-65-2	MCPP			mg/kg		0/22	1.80E-01 - 1.14E+02	1.14E+02	N/A	6.10E+00 (N)	Yes
	8001-35-2	Toxaphene			mg/kg		0/24	3.71E-02 - 2.60E+00	2.60E+00	N/A	4.40E-01 (C)	Yes
	12674-11-2	Aroclor 1016			mg/kg		0/30	1.80E-02 - 1.40E+00	1.40E+00	N/A	3.90E-01 (N)	Yes
	11104-28-2	Aroclor 1221			mg/kg		0/30	1.80E-02 - 1.40E+00	1.40E+00	N/A	1.70E-01 (C)	Yes
	11141-16-5	Aroclor 1232			mg/kg		0/30	1.80E-02 - 1.40E+00	1.40E+00	N/A	1.70E-01 (C)	Yes
	53469-21-9	Aroclor 1242			mg/kg		0/30	1.80E-02 - 1.40E+00	1.40E+00	N/A	2.20E-01 (C)	Yes
	12672-29-6	Aroclor 1248			mg/kg		0/30	1.80E-02 - 2.00E+00	2.00E+00	N/A	2.20E-01 (C)	Yes
	11096-82-5	Aroclor 1260			mg/kg		0/30	1.80E-02 - 2.60E+00	2.60E+00	N/A	2.20E-01 (C)	Yes
	120-82-1	1,2,4-Trichlorobenzene			mg/kg		0/31	4.00E-02 - 3.70E+00	3.70E+00	N/A	8.70E+00 (N)	No
	95-95-4	2,4,5-Trichlorophenol			mg/kg		0/31	1.00E-01 - 3.70E+00	3.70E+00	N/A	6.10E+02 (N)	No
	88-06-2	2,4,6-Trichlorophenol			mg/kg		0/31	1.70E-01 - 3.70E+00	3.70E+00	N/A	6.10E+00 (N)	No
	120-83-2	2,4-Dichlorophenol			mg/kg		0/31	1.70E-01 - 3.70E+00	3.70E+00	N/A	1.80E+01 (N)	No
	105-67-9	2,4-Dimethylphenol			mg/kg		0/31	1.70E-01 - 3.70E+00	3.70E+00	N/A	1.20E+02 (N)	No
	51-28-5	2,4-Dinitrophenol			mg/kg		0/31	8.70E-01 - 1.80E+01	1.80E+01	N/A	1.20E+01 (N)	Yes
	91-58-7	2-Chloronaphthalene			mg/kg		0/31	3.60E-02 - 3.70E+00	3.70E+00	N/A	6.30E+02 (N)	No
	95-57-8	2-Chlorophenol			mg/kg		0/31	6.00E-02 - 3.70E+00	3.70E+00	N/A	3.90E+01 (N)	No
	88-74-4	2-Nitroaniline			mg/kg		0/31	6.20E-02 - 3.70E+00	3.70E+00	N/A	N/A	NTX
	88-75-5	2-Nitrophenol			mg/kg		0/31	1.40E-01 - 3.70E+00	3.70E+00	N/A	N/A	NTX
	88-85-7	2-sec-butyl-4,6-dinitrophenol			mg/kg		0/22	7.10E-03 - 2.28E-01	2.28E-01	N/A	6.10E+00 (N)	No

Table E.1-5
Summary of Screening for Non-Detected Chemicals
Current/Future - Total Soil at SWMU 50

Scenario Timeframe: Current/Future
Medium: Soil
Exposure Medium: Total Soil

Exposure Point	CAS Number	Chemical	Minimum Concentration (Qualifier)	Maximum Concentration (Qualifier)	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value (2)	Screening Toxicity Value (3) (N/C)	Max ND greater than Screening Value? (Y/N)
	91-94-1	3,3'-Dichlorobenzidine			mg/kg		0/31	1.90E-01 - 6.30E+00	6.30E+00	N/A	1.10E+00 (C)	Yes
	99-09-2	3-Nitroaniline			mg/kg		0/31	1.90E-01 - 3.70E+00	3.70E+00	N/A	1.80E+00 (N)	Yes
	534-52-1	4,6-Dinitro-o-cresol			mg/kg		0/31	3.50E-01 - 1.80E+01	1.80E+01	N/A	6.10E-01 (N)	Yes
	100-01-6	4-Nitroaniline			mg/kg		0/31	1.90E-01 - 3.70E+00	3.70E+00	N/A	1.80E+01 (N)	No
	100-02-7	4-Nitrophenol			mg/kg		0/31	8.70E-01 - 1.80E+01	1.80E+01	N/A	N/A	NTX
	65-85-0	Benzoic Acid			mg/kg		0/31	8.70E-01 - 1.80E+01	1.80E+01	N/A	2.40E+04 (N)	No
	111-91-1	bis(2-Chloroethoxy)methane			mg/kg		0/31	5.90E-02 - 3.70E+00	3.70E+00	N/A	1.80E+01 (N)	No
	111-44-4	bis(2-Chloroethyl)ether			mg/kg		0/31	3.30E-02 - 3.70E+00	3.70E+00	N/A	1.90E-01 (C)	Yes
	108-60-1	bis(2-Chloroisopropyl)ether			mg/kg		0/31	1.70E-01 - 3.70E+00	3.70E+00	N/A	3.50E+00 (C)	Yes
	117-81-7	bis(2-Ethylhexyl) phthalate			mg/kg		0/26	1.90E-01 - 2.80E+00	2.80E+00	N/A	3.50E+01 (C)	No
	85-68-7	Butyl benzyl phthalate			mg/kg		0/31	1.70E-01 - 3.70E+00	3.70E+00	N/A	2.60E+02 (C)	No
	84-66-2	Diethyl phthalate			mg/kg		0/28	1.90E-01 - 3.70E+00	3.70E+00	N/A	4.90E+03 (N)	No
	117-84-0	Di-n-octyl phthalate			mg/kg		0/31	1.90E-01 - 3.70E+00	3.70E+00	N/A	N/A	NTX
	118-74-1	Hexachlorobenzene			mg/kg		0/31	3.30E-02 - 3.70E+00	3.70E+00	N/A	3.00E-01 (C)	Yes
	87-68-3	Hexachlorobutadiene			mg/kg		0/31	1.70E-01 - 3.70E+00	3.70E+00	N/A	6.10E+00 (N)	No
	77-47-4	Hexachlorocyclopentadiene			mg/kg		0/31	1.70E-01 - 6.20E+00	6.20E+00	N/A	3.70E+01 (N)	No
	67-72-1	Hexachloroethane			mg/kg		0/31	1.50E-01 - 3.70E+00	3.70E+00	N/A	6.10E+00 (N)	No
	78-59-1	Isophorone			mg/kg		0/31	3.30E-02 - 3.70E+00	3.70E+00	N/A	5.10E+02 (C)	No
	98-95-3	Nitrobenzene			mg/kg		0/30	4.50E-02 - 4.00E-01	4.00E-01	N/A	3.10E+00 (N)	No
	621-64-7	n-Nitroso-di-n-propylamine			mg/kg		0/31	1.70E-01 - 3.70E+00	3.70E+00	N/A	6.90E-02 (C)	Yes
	95-48-7	o-Cresol			mg/kg		0/31	2.90E-02 - 3.70E+00	3.70E+00	N/A	3.10E+02 (N)	No
	106-47-8	p-Chloroaniline			mg/kg		0/31	1.70E-01 - 3.70E+00	3.70E+00	N/A	9.00E+00 (C)	No
	59-50-7	p-Chloro-m-cresol			mg/kg		0/31	9.50E-02 - 3.70E+00	3.70E+00	N/A	N/A	NTX
	106-44-5	p-Cresol			mg/kg		0/11	1.90E-01 - 3.70E+00	3.70E+00	N/A	3.10E+01 (N)	No
	87-86-5	Pentachlorophenol			mg/kg		0/31	8.70E-01 - 1.80E+01	1.80E+01	N/A	3.00E+00 (C)	Yes
	108-95-2	Phenol			mg/kg		0/31	1.10E-01 - 3.70E+00	3.70E+00	N/A	1.80E+03 (N)	No
	79-34-5	1,1,2,2-Tetrachloroethane			mg/kg		0/30	4.90E-03 - 1.00E+00	1.00E+00	N/A	5.90E-01 (C)	Yes
	79-00-5	1,1,2-Trichloroethane			mg/kg		0/30	4.90E-03 - 3.00E+00	3.00E+00	N/A	1.10E+00 (C)	Yes
	75-34-3	1,1-Dichloroethane			mg/kg		0/30	4.90E-03 - 1.00E+00	1.00E+00	N/A	3.40E+00 (C)	No
	75-35-4	1,1-Dichloroethene			mg/kg		0/30	4.90E-03 - 2.00E+00	2.00E+00	N/A	2.50E+01 (N)	No
	107-06-2	1,2-Dichloroethane			mg/kg		0/30	4.90E-03 - 8.00E-01	8.00E-01	N/A	4.50E-01 (C)	Yes
	540-59-0	1,2-Dichloroethene (total)			mg/kg		0/2	2.00E+00 - 2.00E+00	2.00E+00	N/A	7.00E+01 (N)	No
	78-87-5	1,2-Dichloropropane			mg/kg		0/30	4.90E-03 - 1.00E+00	1.00E+00	N/A	9.30E-01 (C)	Yes

Table E.1-5
Summary of Screening for Non-Detected Chemicals
Current/Future - Total Soil at SWMU 50

Scenario Timeframe: Current/Future
Medium: Soil
Exposure Medium: Total Soil

Exposure Point	CAS Number	Chemical	Minimum Concentration (Qualifier)	Maximum Concentration (Qualifier)	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value (2)	Screening Toxicity Value (3) (N/C)	Max ND greater than Screening Value? (Y/N)
	78-93-3	2-Butanone			mg/kg		0/30	5.60E-03 - 4.00E+01	4.00E+01	N/A	2.80E+03 (N)	No
	591-78-6	2-Hexanone			mg/kg		0/30	5.60E-03 - 2.00E+01	2.00E+01	N/A	N/A	NTX
	101-55-3	4-Bromophenyl phenylether			mg/kg		0/31	3.30E-02 - 3.70E+00	3.70E+00	N/A	N/A	NTX
	7005-72-3	4-Chlorophenyl phenylether			mg/kg		0/31	3.30E-02 - 3.70E+00	3.70E+00	N/A	N/A	NTX
	108-10-1	4-Methyl-2-pentanone			mg/kg		0/30	5.60E-03 - 1.00E+01	1.00E+01	N/A	5.30E+02 (N)	No
	71-43-2	Benzene			mg/kg		0/30	4.90E-03 - 8.00E-01	8.00E-01	N/A	1.10E+00 (C)	No
	75-27-4	Bromodichloromethane			mg/kg		0/30	4.90E-03 - 1.00E+00	1.00E+00	N/A	1.00E+01 (C)	No
	74-83-9	Bromomethane			mg/kg		0/30	4.90E-03 - 3.00E+00	3.00E+00	N/A	7.90E-01 (N)	Yes
	75-15-0	Carbon disulfide			mg/kg		0/27	4.90E-03 - 2.00E+00	2.00E+00	N/A	6.70E+01 (N)	No
	56-23-5	Carbon tetrachloride			mg/kg		0/30	4.90E-03 - 4.00E+00	4.00E+00	N/A	2.50E-01 (C)	Yes
	108-90-7	Chlorobenzene			mg/kg		0/30	4.90E-03 - 4.00E-01	4.00E-01	N/A	3.10E+01 (N)	No
	75-00-3	Chloroethane			mg/kg		0/30	4.90E-03 - 6.00E+00	6.00E+00	N/A	1.50E+03 (N)	No
	74-87-3	Chloromethane			mg/kg		0/30	4.90E-03 - 4.00E+00	4.00E+00	N/A	1.70E+00 (C)	Yes
	10061-01-5	cis-1,3-Dichloro-1-propene (8)			mg/kg		0/30	4.90E-03 - 2.00E+00	2.00E+00	N/A	1.70E+00 (C)	Yes
	124-48-1	Dibromochloromethane			mg/kg		0/30	4.90E-03 - 2.00E+00	2.00E+00	N/A	5.80E+00 (C)	No
	100-41-4	Ethylbenzene			mg/kg		0/30	4.90E-03 - 8.00E-01	8.00E-01	N/A	5.70E+00 (C)	No
	75-09-2	Methylene chloride			mg/kg		0/30	5.60E-03 - 6.00E+00	6.00E+00	N/A	1.10E+01 (C)	No
	100-42-5	Styrene			mg/kg		0/30	4.90E-03 - 1.00E+00	1.00E+00	N/A	6.50E+02 (N)	No
	127-18-4	Tetrachloroethene			mg/kg		0/30	4.90E-03 - 4.00E-01	4.00E-01	N/A	5.70E-01 (C)	No
	108-88-3	Toluene			mg/kg		0/30	4.90E-03 - 4.00E-01	4.00E-01	N/A	5.00E+02 (N)	No
	10061-02-6	trans-1,3-Dichloropropene (8)			mg/kg		0/30	4.90E-03 - 1.00E+00	1.00E+00	N/A	1.70E+00 (C)	No
	75-25-2	Tribromomethane			mg/kg		0/30	4.90E-03 - 3.00E+00	3.00E+00	N/A	6.10E+01 (C)	No
	79-01-6	Trichloroethene			mg/kg		0/30	4.90E-03 - 1.00E+00	1.00E+00	N/A	2.80E+00 (C)	No
	75-01-4	Vinyl Chloride			mg/kg		0/30	4.90E-03 - 3.00E+00	3.00E+00	N/A	6.00E-02 (C)	Yes
	1330-20-7	Xylenes (total)			mg/kg		0/2	8.00E-01 - 8.00E-01	8.00E-01	N/A	6.00E+01 (N)	No

(1) Maximum concentration used for screening.

(2) N/A - Refer to supporting information for background discussion.
Background values derived from site-specific statistical analysis. See text for supporting information.

(3) Screening toxicity values for residential soil from USEPA Regional Screening Level Table (September 2008) and based on a risk level of 1.0E-06 and a hazard index of 0.1. See text for derivation of Nutrient RDAs.

(4) The screening value is based on p-cresol.

(5) The screening value is based on chlordane.

Table E.1-5
Summary of Screening for Non-Detected Chemicals
Current/Future - Total Soil at SWMU 50

Scenario Timeframe: Current/Future
Medium: Soil
Exposure Medium: Total Soil

Exposure Point	CAS Number	Chemical	Minimum Concentration (Qualifier)	Maximum Concentration (Qualifier)	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value (2)	Screening Toxicity Value (3) (N/C)	Max ND greater than Screening Value? (Y/N)

(6) The screening value is based on endosulfan.

(7) The screening value is based on endrin.

(8) The screening value is based on 1,3-dichloropropene.

Table E.1-6
Medium-Specific Exposure Point Concentration Summary for SWMU 50 Surface Soil

Scenario Timeframe: Current/Future
Medium: Soil
Exposure Medium: Surface Soil

Exposure Point	Chemical of Potential Concern	Units	Arithmetic Mean of Detects	Multiple Detection Limits? (Yes/No) [1]	95% UCL (Distribution) [2]	Maximum Concentration	Exposure Point Concentration			
							Value	Units	Statistic [3]	Rationale [4]
Surface Soil	2,3,7,8-TCDD-TE	mg/kg	2.67E-05	No	6.17E-05 (G)	9.60E-05	6.17E-05	mg/kg	95% Approx. Gamma	Test (6)
	2,4-Dinitrotoluene	mg/kg	3.93E-01	Yes	4.44E-01 (N)	8.88E-01	4.44E-01	mg/kg	95% KM-% Btstrp	Test (1)
	Aroclor 1254	mg/kg	3.44E-01	Yes	3.76E-01 (G)	1.48E+00	3.76E-01	mg/kg	95% KM-t	Test (1)
	Benzo(b)fluoranthene	mg/kg	5.25E-02	Yes	5.46E-02 (N)	1.52E-01	5.46E-02	mg/kg	95% KM-t	Test (1)
	Carbazole	mg/kg	1.87E-02	Yes	2.80E-02 (N)	2.80E-02	2.80E-02	mg/kg	95% KM-% Btstrp	Test (1)
	Dibenzofuran	mg/kg	8.33E-02	Yes	2.00E-01 (N)	2.00E-01	2.00E-01	mg/kg	95% KM-% Btstrp	Test (1)
	Dimethylphthalate[5]	mg/kg	1.11E+00	N/A	5.47E-01 (NP)	1.50E+00	5.47E-01	mg/kg	95% UCL-Bst	Test (8)
	Aluminum	mg/kg	1.54E+04	No	1.75E+04 (N)	2.43E+04	1.75E+04	mg/kg	95% Student's-t	Test (4)
	Arsenic	mg/kg	3.96E+00	No	4.90E+00 (N)	7.40E+00	4.90E+00	mg/kg	95% Student's-t	Test (4)
	Cobalt	mg/kg	9.06E+00	No	1.09E+01 (N)	1.71E+01	1.09E+01	mg/kg	95% Student's-t	Test (4)
	Iron	mg/kg	1.95E+04	No	2.21E+04 (N)	2.83E+04	2.21E+04	mg/kg	95% Student's-t	Test (4)
	Manganese	mg/kg	6.96E+02	No	8.73E+02 (N)	1.32E+03	8.73E+02	mg/kg	95% Student's-t	Test (4)
	Vanadium	mg/kg	3.81E+01	No	4.25E+01 (N)	4.91E+01	4.25E+01	mg/kg	95% Student's-t	Test (4)

Notes: N/A = Not applicable

[1] ProUCL software (version 4.0, USEPA, 2007) recommends use of Kaplan-Meier method if there are multiple detection limits.

[2] Statistical Distribution and 95% UCL as determined by ProUCL (unless otherwise noted): (G) the data were determined to follow gamma distribution; (L) the data were determined to follow lognormal distribution; (NP) the data were determined to be non-parametric; (N) the data were determined to be normally distributed.

[3] Statistic: Maximum Detected Value (Max); 95% KM Chebyshev (95% KM-Cheby); 97.5% KM Chebyshev (97.5% KM-Cheby); 99% KM Chebyshev (99% KM-Cheby); 95% KM Percentile Bootstrap (95% KM-% Btstrp); 95% KM-t (95% KM-t); 95% KM-BCA (95% KM-BCA); 95% H-UCL (95% H-UCL); 95% Chebyshev -Mean, SD- UCL (95% Cheby, Mean, SD); 97.5% Chebyshev -Mean, SD- UCL (97.5% Cheby, Mean, SD); 99% Chebyshev -Mean, SD- UCL (99% Cheby, Mean, SD); 95% UCL of Log-transformed Data (95% UCL-T) 95% Student's-t (95% Student's-t); 95% Modified-t (95% Modified-t); 95% UCL based on bootstrap statistic (95% UCL-Bst); 95% Approximate Gamma UCL (95% Approx. Gamma); 95% KM Chebyshev-MVUE (95% KM-Cheby-MVUE).

[4] Unless otherwise noted (see footnote 5), ProUCL EPC selection rationale based on, detection limit values, distribution, standard deviation, and sample size (see ProUCL output in appendix for further details):

Test (1): Kaplan-Meier method recommended by ProUCL due to multiple detection limits.

Test (2): The 95% UCL exceeds the maximum detected concentration, therefore, maximum concentration used for EPC.

Test (3): Shapiro-Wilk W test, Kolmogorov-Smirnov (K-S), and Anderson-Darling (A-D) tests, indicate data follow nonparametric distribution.

Test (4): Shapiro-Wilk W test indicates data are normally distributed.

Test (5): Shapiro-Wilk W test indicates data are log-normally distributed.

Test (6): Kolmogorov-Smirnov (K-S) and/or Anderson-Darling (A-D) tests indicate data follow gamma distribution.

Table E.1-6
Medium-Specific Exposure Point Concentration Summary for SWMU 50 Surface Soil

Exposure Point	Chemical of Potential Concern	Units	Arithmetic Mean of Detects	Multiple Detection Limits? (Yes/No) [1]	95% UCL (Distribution) [2]	Maximum Concentration	Exposure Point Concentration			
							Value	Units	Statistic [3]	Rationale [4]

Test (7): Sample size is less than or equal to 5, therefore, maximum concentration used for EPC.

Test (8): 95% UCL estimated by a non-Pro-UCL bootstrap method.

[5] Infrequent detection resulted in ProUCL modeling error for this constituent, therefore the distribution was assumed to be non-parametric and the UCL was determined using a non-ProUCL bootstrap method with random numbers for NDs (see text for details).

Table E.1-7
Medium-Specific Exposure Point Concentration Summary for SWMU 50 Total Soil

Scenario Timeframe: Current/Future
Medium: Soil
Exposure Medium: Surface Soil

Exposure Point	Chemical of Potential Concern	Units	Arithmetic Mean of Detects	95% UCL (Distribution) [2]	Maximum Concentration	Exposure Point Concentration			
						Value	Units	Statistic [3]	Rationale [4]
Total Soil	2,3,7,8-TCDD-TE	mg/kg	1.92E-05	3.30E-05 (G)	9.60E-05	3.30E-05	mg/kg	95% Approx. Gamma	Test (6)
	2,4-Dinitrotoluene	mg/kg	3.48E-01	2.37E-01 (N)	8.88E-01	2.37E-01	mg/kg	95% KM-% Btstrp	Test (1)
	Aroclor 1254	mg/kg	4.84E-01	3.83E-01 (N)	1.48E+00	3.83E-01	mg/kg	95% KM-t	Test (1)
	Benzo(a)pyrene	mg/kg	3.50E-02	3.31E-02 (G)	1.50E-01	3.31E-02	mg/kg	95% KM-t	Test (1)
	Benzo(b)fluoranthene	mg/kg	3.92E-02	3.55E-02 (G)	1.52E-01	3.55E-02	mg/kg	95% KM-t	Test (1)
	Carbazole	mg/kg	1.98E-02	2.63E-02 (N)	2.80E-02	2.63E-02	mg/kg	95% KM-% Btstrp	Test (1)
	Chloroform[5]	mg/kg	2.00E+00	1.43E-01 (NP)	2.00E+00	1.43E-01	mg/kg	95% UCL-Bst	Test (8)
	Dibenzofuran	mg/kg	7.08E-02	7.51E-02 (N)	2.00E-01	7.51E-02	mg/kg	95% KM-% Btstrp	Test (1)
	Dimethylphthalate[5]	mg/kg	1.11E+00	4.96E-01 (NP)	1.50E+00	4.96E-01	mg/kg	95% UCL-Bst	Test (8)
	Aluminum	mg/kg	1.69E+04	2.01E+04 (G)	3.84E+04	2.01E+04	mg/kg	95% Approx. Gamma	Test (6)
	Arsenic	mg/kg	4.46E+00	5.62E+00 (G)	1.37E+01	5.62E+00	mg/kg	95% Approx. Gamma	Test (6)
	Chromium	mg/kg	6.23E+01	1.47E+02 (NP)	5.13E+02	1.47E+02	mg/kg	95% Cheby, Mean, Sd	Test (3)
	Cobalt	mg/kg	8.91E+00	1.14E+01 (G)	4.49E+01	1.14E+01	mg/kg	95% Approx. Gamma	Test (6)
	Copper	mg/kg	5.05E+01	2.22E+02 (NP)	4.38E+02	2.22E+02	mg/kg	99% Cheby, Mean, Sd	Test (3)
	Iron	mg/kg	2.02E+04	2.34E+04 (N)	4.72E+04	2.34E+04	mg/kg	95% Student's-t	Test (4)
	Lead	mg/kg	7.28E+01	2.94E+02 (NP)	5.85E+02	2.94E+02	mg/kg	99% Cheby, Mean, Sd	Test (3)
	Manganese	mg/kg	4.90E+02	6.78E+02 (G)	1.44E+03	6.78E+02	mg/kg	95% Approx. Gamma	Test (6)
	Nickel	mg/kg	2.51E+01	5.99E+01 (NP)	1.81E+02	5.99E+01	mg/kg	95% Cheby, Mean, Sd	Test (3)
	Vanadium	mg/kg	3.64E+01	4.30E+01 (N)	8.42E+01	4.30E+01	mg/kg	95% Student's-t	Test (4)

Notes: N/A = Not applicable

[1] ProUCL software (version 4.0, USEPA, 2007) recommends use of Kaplan-Meier method if there are multiple detection limits.

[2] Statistical Distribution and 95% UCL as determined by ProUCL (unless otherwise noted): (G) the data were determined to follow gamma distribution; (L) the data were determined to follow lognormal distribution; (NP) the data were determined to be non-parametric; (N) the data were determined to be normally distributed.

[3] Statistic: Maximum Detected Value (Max); 95% KM Chebyshev (95% KM-Cheby); 97.5% KM Chebyshev (97.5% KM-Cheby); 99% KM Chebyshev (99% KM-Cheby); 95% KM Percentile Bootstrap (95% KM-% Btstrp); 95% KM-t (95% KM-t); 95% KM-BCA (95% KM-BCA); 95% H-UCL (95% H-UCL); 95% Chebyshev -Mean, SD- UCL (95% Cheby, Mean, SD); 97.5% Chebyshev -Mean, SD- UCL (97.5% Cheby, Mean, SD); 99% Chebyshev -Mean, SD- UCL (99% Cheby, Mean, SD); 95% UCL of Log-transformed Data (95% UCL-T) 95% Student's-t (95% Student's-t); 95% Modified-t (95% Modified-t); 95% UCL based on bootstrap statistic (95% UCL-Bst); 95% Approximate Gamma UCL (95% Approx. Gamma); 95% KM Chebyshev-MVUE (95% KM-Cheby-MVUE).

[4] Unless otherwise noted (see footnote 5), ProUCL EPC selection rationale based on, detection limit values, distribution, standard deviation, and sample size (see ProUCL output in appendix for further details)

Test (1): Kaplan-Meier method recommended by ProUCL due to multiple detection limits.
Test (2): The 95% UCL exceeds the maximum detected concentration, therefore, maximum concentration used for EPC.
Test (3): Shapiro-Wilk W test, Kolmogorov-Smirnov (K-S), and Anderson-Darling (A-D) tests, indicate data follow nonparametric distribution.
Test (4): Shapiro-Wilk W test indicates data are normally distributed.
Test (5): Shapiro-Wilk W test indicates data are log-normally distributed.
Test (6): Kolmogorov-Smirnov (K-S) and/or Anderson-Darling (A-D) tests indicate data follow gamma distribution.
Test (7): Sample size is less than or equal to 5, therefore, maximum concentration used for EPC.
Test (8): 95% UCL estimated by a non-Pro-UCL bootstrap method.

[5] Infrequent detection resulted in ProUCL modeling error for this constituent, therefore the distribution was assumed to be non-parametric and the UCL was determined using a non-ProUCL bootstrap method with random numbers for NDs (see text for details).

Table E.1-8
Values Used for Daily Intake Calculations- Current/Future Exposures to Surface Soil
SWMU 50

Scenario Timeframe:	Current/Future
Medium:	Surface Soil
Exposure Medium:	Surface 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	SWMU 50	CS	Chemical Concentration in Soil	See site-specific EPC tables	mg/kg	See site-specific EPC tables	
				IR-S	Ingestion Rate of Soil	100	mg/day	USEPA, 2002	Potential (Lifetime) Average Daily Dose
				EF	Exposure Frequency	50	days/year	(1)	$[(L)ADD_{pot}]$ (mg/kg-day) =
				ED	Exposure Duration	25	years	USEPA, 2002	
				CF1	Conversion Factor 1	$1/10^6$	kg/mg	---	$\frac{CS \times IR\text{-}S \times EF \times ED \times CF1}{BW \times AT \times CF2}$
				BW	Body Weight	70	kg	USEPA, 2002	
				AT-C	Averaging Time (Cancer)	70	years	USEPA, 2002	
				AT-N	Averaging Time (Non-Cancer)	25	years	USEPA, 2002	
				CF2	Conversion Factor 2	365	days/year	---	
Dermal Absorption	Maintenance Worker	Adult	SWMU 50	CS	Chemical Concentration in Soil	See site-specific EPC tables	mg/kg	See site-specific EPC tables	
				SSAF	Soil to Skin Adherence Factor	0.2	mg/cm^2-day	USEPA, 1997, 2002	Internal (Lifetime) Average Daily Dose
				DABS	Dermal Absorption Factor (Solid)	(2)	--	USEPA, 1995, 2003	$[(L)ADD_{int}]$ (mg/kg-day) =
				SA	Skin Surface Area Available for Contact	3,300 (3)	cm^2	USEPA, 1997	
				EF	Exposure Frequency	50	days/year	(1)	$\frac{CS \times SSAF \times DABS \times SA \times EF \times ED \times CF1}{BW \times AT \times CF2}$
				ED	Exposure Duration	25	years	USEPA, 2002	
				CF1	Conversion Factor 1	$1/10^6$	kg/mg	---	
				BW	Body Weight	70	kg	USEPA, 2002	
				AT-C	Averaging Time (Cancer)	70	years	USEPA, 2002	
				AT-N	Averaging Time (Non-Cancer)	25	years	USEPA, 2002	
				CF2	Conversion Factor 2	365	days/year	---	

(1) Best professional judgement. Based on site maintenance/inspection activities conducted 1day/week and assuming 2 weeks on vacation.
(2) Dermal absorption factors are presented in **Table E.1-14**.
(3) Value derived from data presented in USEPA (1997), averaging across gender and age. It is assumed that head, hands, and forearms are exposed to surface soil.

USEPA, 1995: Assessing Dermal Exposure from Soil Hazardous Waste Management Division. Office of Superfund Programs, Region III, Philadelphia, PA.
USEPA, 1997: Exposure Factors Handbook, Volume I. EPA/600/P-95/002Fa.
USEPA, 2002: Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites. OSWER 9355.4-24.
USEPA, 2003: Updated Dermal Exposure Assessment Guidance. Office of Superfund Programs, Region III, Philadelphia, PA.

Table E.1-9
Values Used for Daily Intake Calculations- Future Exposures to Total Soil
SWMU 50

Scenario Timeframe:	Future
Medium:	Total Soil
Exposure Medium:	Total 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	SWMU 50	CS	Chemical Concentration in Soil	See site-specific EPC tables	mg/kg	See site-specific EPC tables	
				IR-S	Ingestion Rate of Soil	100	mg/day	USEPA, 2002	Potential (Lifetime) Average Daily Dose
				EF	Exposure Frequency	50	days/year	(1)	$[(L)ADD_{pot}]$ (mg/kg-day) =
				ED	Exposure Duration	25	years	USEPA, 2002	
				CF1	Conversion Factor 1	$1/10^6$	kg/mg	---	$\frac{CS \times IR\text{-}S \times EF \times ED \times CF1}{BW \times AT \times CF2}$
				BW	Body Weight	70	kg	USEPA, 2002	
				AT-C	Averaging Time (Cancer)	70	years	USEPA, 2002	
				AT-N	Averaging Time (Non-Cancer)	25	years	USEPA, 2002	
				CF2	Conversion Factor 2	365	days/year	---	
	Excavation Worker	Adult	SWMU 50	CS	Chemical Concentration in Soil	See site-specific EPC tables	mg/kg	See site-specific EPC tables	
				IR-S	Ingestion Rate of Soil	330	mg/day	USEPA, 2002	Potential (Lifetime) Average Daily Dose
				EF	Exposure Frequency	125	days/year	USEPA, 2002	$[(L)ADD_{pot}]$ (mg/kg-day) =
				ED	Exposure Duration	1	years	USEPA, 2002	
				CF1	Conversion Factor 1	$1/10^6$	kg/mg	---	$\frac{CS \times IR\text{-}S \times EF \times ED \times CF1}{BW \times AT \times CF2}$
				BW	Body Weight	70	kg	USEPA, 2002	
				AT-C	Averaging Time (Cancer)	70	years	USEPA, 2002	
				AT-N	Averaging Time (Non-Cancer)	1	years	USEPA, 2002	
				CF2	Conversion Factor 2	365	days/year	---	
	Resident	Adult	SWMU 50	CS	Chemical Concentration in Soil	See site-specific EPC tables	mg/kg	See site-specific EPC tables	
				IR-S	Ingestion Rate of Soil	100	mg/day	USEPA, 1991a	Potential (Lifetime) Average Daily Dose
				EF	Exposure Frequency	350	days/year	USEPA, 1991a	$[(L)ADD_{pot}]$ (mg/kg-day) =
				ED	Exposure Duration	30	years	USEPA, 1991a	
				ED_c	Exposure Duration	24	years	USEPA, 1991b	
				CF1	Conversion Factor 1	$1/10^6$	kg/mg	---	$\frac{CS \times IR\text{-}S \times EF \times ED \times CF1}{BW \times AT \times CF2}$
				BW	Body Weight	70	kg	USEPA, 1991a	
				AT-C	Averaging Time (Cancer)	70	years	USEPA, 1991a	
				AT-N	Averaging Time (Non-Cancer)	30	years	USEPA, 1991a	
				CF2	Conversion Factor 2	365	days/year	---	
		Child	SWMU 50	CS	Chemical Concentration in Soil	See site-specific EPC tables	mg/kg	See site-specific EPC tables	
				IR-S	Ingestion Rate of Soil	200	mg/day	USEPA, 1991a	Potential (Lifetime) Average Daily Dose
				EF	Exposure Frequency	350	days/year	USEPA, 1991a	$[(L)ADD_{pot}]$ (mg/kg-day) =
				ED	Exposure Duration	6	years	USEPA, 1991a	
				CF1	Conversion Factor 1	$1/10^6$	kg/mg	---	$\frac{CS \times IR\text{-}S \times EF \times ED \times CF1}{BW \times AT \times CF2}$
				BW	Body Weight	15	kg	USEPA, 1991a	
				AT-C	Averaging Time (Cancer)	70	years	USEPA, 1991a	
				AT-N	Averaging Time (Non-Cancer)	6	years	USEPA, 1991a	
				CF2	Conversion Factor 2	365	days/year	---	
Dermal Absorption	Maintenance Worker	Adult	SWMU 50	CS	Chemical Concentration in Soil	See site-specific EPC tables	mg/kg	See site-specific EPC tables	
				SSAF	Soil to Skin Adherence Factor	0.2	mg/cm^2-day	USEPA, 1997, 2001	Internal (Lifetime) Average Daily Dose
				DABS	Dermal Absorption Factor (Solid)	(2)	--	USEPA, 1995, 2003	$[(L)ADD_{int}]$ (mg/kg-day) =
				SA	Skin Surface Area Available for Contact	3,300 (3)	cm^2	USEPA, 1997	
				EF	Exposure Frequency	50	days/year	(1)	$\frac{CS \times SSAF \times DABS \times SA \times EF \times ED \times CF1}{BW \times AT \times CF2}$
				ED	Exposure Duration	25	years	USEPA, 2002	
				CF1	Conversion Factor 1	$1/10^6$	kg/mg	---	
				BW	Body Weight	70	kg	USEPA, 2002	
				AT-C	Averaging Time (Cancer)	70	years	USEPA, 2002	
				AT-N	Averaging Time (Non-Cancer)	25	years	USEPA, 2002	
				CF2	Conversion Factor 2	365	days/year	---	

Table E.1-9
Values Used for Daily Intake Calculations- Future Exposures to Total Soil
SWMU 50

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Dermal Absorption (con't)	Excavation Worker	Adult	SWMU 50	CS	Chemical Concentration in Soil	See site-specific EPC tables	mg/kg	See site-specific EPC tables	
				SSAF	Soil to Skin Adherence Factor	0.3	mg/cm^2-day	USEPA, 2002	Internal (Lifetime) Average Daily Dose
				DABS	Dermal Absorption Factor (Solid)	(2)	--	USEPA, 1995, 2003	$[(L)ADD_{int}]$ (mg/kg-day) =
				SA	Skin Surface Area Available for Contact	3,300 (3)	cm^2	USEPA, 1997	
				EF	Exposure Frequency	125	days/year	USEPA, 2002	$\frac{CS \times SSAF \times DABS \times SA \times EF \times ED \times CF1}{BW \times AT \times CF2}$
				ED	Exposure Duration	1	years	USEPA, 2002	
				CF1	Conversion Factor 1	$1/10^6$	kg/mg	---	
				BW	Body Weight	70	kg	USEPA, 2002	
				AT-C	Averaging Time (Cancer)	70	years	USEPA, 2002	
				AT-N	Averaging Time (Non-Cancer)	1	years	USEPA, 2002	
				CF2	Conversion Factor 2	365	days/year	---	
	Resident	Adult	SWMU 50	CS	Chemical Concentration in Soil	See site-specific EPC tables	mg/kg	See site-specific EPC tables	
				SSAF	Soil to Skin Adherence Factor	0.07	mg/cm^2-day	USEPA, 1997, 2004	Internal (Lifetime) Average Daily Dose
				DABS	Dermal Absorption Factor (Solid)	(2)	--	USEPA, 1995, 2003	$[(L)ADD_{int}]$ (mg/kg-day) =
				SA	Skin Surface Area Available for Contact	5,700 (4)	cm^2	USEPA, 1997	
				EF	Exposure Frequency	350	days/year	USEPA, 1991a	$\frac{CS \times SSAF \times DABS \times SA \times EF \times ED \times CF1}{BW \times AT \times CF2}$
				ED	Exposure Duration	30	years	USEPA, 1991a	
				ED_c	Exposure Duration	24	years	USEPA, 1991b	
				CF1	Conversion Factor 1	$1/10^6$	kg/mg	---	
				BW	Body Weight	70	kg	USEPA, 1991a	
				AT-C	Averaging Time (Cancer)	70	years	USEPA, 1991a	
				AT-N	Averaging Time (Non-Cancer)	30	years	USEPA, 1991a	
				CF2	Conversion Factor 2	365	days/year	---	
		Child	SWMU 50	CS	Chemical Concentration in Soil	See site-specific EPC tables	mg/kg	See site-specific EPC tables	
				SSAF	Soil to Skin Adherence Factor	0.2	mg/cm^2-day	USEPA, 1997, 2004	Internal (Lifetime) Average Daily Dose
				DABS	Dermal Absorption Factor (Solid)	(2)	--	USEPA, 1995, 2003	$[(L)ADD_{int}]$ (mg/kg-day) =
				SA	Skin Surface Area Available for Contact	2,800 (5)	cm^2	USEPA, 1997	
				EF	Exposure Frequency	350	days/year	USEPA, 1991a	$\frac{CS \times SSAF \times DABS \times SA \times EF \times ED \times CF1}{BW \times AT \times CF2}$
				ED	Exposure Duration	6	years	USEPA, 1991a	
				CF1	Conversion Factor 1	$1/10^6$	kg/mg	---	
				BW	Body Weight	15	kg	USEPA, 1991a	
				AT-C	Averaging Time (Cancer)	70	years	USEPA, 1991a	
				AT-N	Averaging Time (Non-Cancer)	6	years	USEPA, 1991a	
				CF2	Conversion Factor 2	365	days/year	---	

(1) Best professional judgement. Based on site maintenance/inspection activities conducted 1day/week and assuming 2 weeks on vacation.
(2) Dermal absorption factors are presented in**Table E.1-14**.
(3) Value derived from data presented in USEPA (1997), averaging across gender and age. It is assumed that head, hands, and forearms are exposed to soil.
(4) Value derived from data presented in USEPA (1997), averaging across gender and age. It is assumed that head, hands, forearms, and lower legs are exposed to soil.
(5) Value derived from data presented in USEPA (1997), averaging across gender and age. It is assumed that head, hands, forearms, lower legs, and feet are exposed to soil.

USEPA, 1991a: Risk Assessment Guidance for Superfund, Volume I: Human Health Evaluation Manual - Supplemental Guidance, Standard Default Exposure Factors. Interim Final. OSWER 9285.6-03.
USEPA, 1991b: Risk Assessment Guidance for Superfund, Volume I: Human Health Evaluation Manual (Part B, Development of Risk-Based Preliminary Remediation Goals). OSWER 9285.7-01B.
USEPA, 1995: Assessing Dermal Exposure from Soil. Hazardous Waste Management Division. Office of Superfund Programs, Region III, Philadelphia, PA.
USEPA, 1997: Exposure Factors Handbook, Volume I. EPA/600/P-95/002Fa.
USEPA, 2003: Updated Dermal Exposure Assessment Guidance. Office of Superfund Programs, Region III, Philadelphia, PA.
USEPA, 2002: Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites. OSWER 9355.4-24.
USEPA, 2004: Risk Assessment Guidance for Superfund. Volume I: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment). Final.

Table E.1-10
Values Used for Daily Intake Calculations- Current/Future Exposures to Surface Soil- Air
SWMU 50

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 (Particulates)	Maintenance Worker	Adult	SWMU 50	CA	Chemical Concentration in Air	Chemical Specific	mg/m^3	(1)	
				FI	Fraction Inhaled	1.00	unitless	--	
				EF	Exposure Frequency	50	days/year	USEPA, 2002	Intake concentration (mg/m^3) =
				ED	Exposure Duration	25	years	USEPA, 2002	CA*FI*EF*ED
				AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 2002	AT
				AT-N	Averaging Time (Non-Cancer)	9,125	days	Based on ED	
Inhalation (Volatiles)	Maintenance Worker	Adult	SWMU 50	CA	Chemical Concentration in Air	Chemical Specific	mg/m^3	(1)	
				FI	Fraction Inhaled	1.00	unitless	--	
				EF	Exposure Frequency	50	days/year	USEPA, 2002	Intake concentration (mg/m^3) =
				ED	Exposure Duration	25	years	USEPA, 2002	CA*FI*EF*ED
				AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 2002	AT
				AT-N	Averaging Time (Non-Cancer)	9,125	days	Based on ED	

(1) Chemical concentration for particulates in air (mg/m^3) = Concentration in soil (mg/kg) x 1/PEF (kg/m^3).
Chemical concentration of volatiles in air (mg/m^3) = Concentration in soil (mg/kg) x 1/VF (kg/m^3).

USEPA, 2002: Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites. OSWER 9355.4-24.

Table E.1-11
Values Used for Daily Intake Calculations- Future Exposures to Total Soil - Air
SWMU 50

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 (Particulates and Volatiles)	Maintenance Worker	Adult	SWMU 50	CA	Chemical Concentration in Air	Chemical Specific	mg/m^3	(1)	Intake concentration (mg/m^3) = $\frac{CA*FI*EF*ED}{AT}$
				FI	Fraction Inhaled	1	unitless	--	
				EF	Exposure Frequency	50	days/year	USEPA, 2002	
				ED	Exposure Duration	25	years	USEPA, 2002	
				AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 2002	
				AT-N	Averaging Time (Non-Cancer)	9,125	days	Based on ED	
	Excavation Worker	Adult	SWMU 50	CA	Chemical Concentration in Air	Chemical Specific	mg/m^3	(1)	Intake concentration (mg/m^3) = $\frac{CA*FI*EF*ED}{AT}$
				FI	Fraction Inhaled	1	unitless	--	
				EF	Exposure Frequency	125	days/year	USEPA, 2002	
				ED	Exposure Duration	1	years	USEPA, 2002	
				AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 2002	
				AT-N	Averaging Time (Non-Cancer)	365	days	Based on ED	
	Resident	Adult	SWMU 50	CA	Chemical Concentration in Air	Chemical Specific	mg/m^3	(1)	Intake concentration (mg/m^3) = $\frac{CA*FI*EF*ED}{AT}$
				FI	Fraction Inhaled	1	unitless	--	
				EF	Exposure Frequency	350	days/year	USEPA, 2002	
				ED_c	Exposure Duration (Cancer)	24	years	USEPA, 2002 (2)	
				ED	Exposure Duration (Noncancer)	30	years	USEPA, 2002	
				AT-C	Averaging Time (Cancer)	25,550	days	Reference	
				AT-N	Averaging Time (Non-Cancer)	10,950	days	Based on ED (3)	
		Child	SWMU 50	CA	Chemical Concentration in Air	Chemical Specific	mg/m^3	(1)	Intake concentration (mg/m^3) = $\frac{CA*FI*EF*ED}{AT}$
				FI	Fraction Inhaled	1	unitless	--	
				EF	Exposure Frequency	350	days/year	USEPA, 2002	
				ED	Exposure Duration	6	years	USEPA, 2002	
				AT-C	Averaging Time (Cancer)	25,550	days	--	
				AT-N	Averaging Time (Non-Cancer)	2,190	days	Based on ED	

(1) Chemical concentration for particulates in air (mg/m^3) = Concentration in soil (mg/kg) x 1/PEF (kg/m^3).
Chemical concentration of volatiles in air (mg/m^3) = Concentration in soil (mg/kg) x 1/VF (kg/m^3).
(2) For carcinogens, risks for adults and children are averaged over a lifetime of 70 years (USEPA, 2002)
(3) AT for chronic exposures = 30 years x 365 days/year.

USEPA, 2002: Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites. OSWER 9355.4-24.

Table E.1-12
Values Used for Daily Intake Calculations - Future Exposures to Surface and Total Soil
SWMU 50

Scenario Timeframe:	Future
Medium:	Surface and Total Soil
Exposure Medium:	Surface and Total Soil

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Ingestion	Industrial Worker (outdoor)	Adult	SWMU 50	CS	Chemical Concentration in Soil	See site-specific EPC tables	mg/kg	See site-specific EPC tables	
				IR-S	Ingestion Rate of Soil	100	mg/day	USEPA, 2002	Potential (Lifetime) Average Daily Dose
				EF	Exposure Frequency	225	days/year	USEPA, 2002	$[(L)ADD_{pot}]$ (mg/kg-day) =
				ED	Exposure Duration	25	years	USEPA, 2002	
				CF1	Conversion Factor 1	$1/10^6$	kg/mg	---	$\frac{CS \times IR\text{-}S \times EF \times ED \times CF1}{BW \times AT \times CF2}$
				BW	Body Weight	70	kg	USEPA, 2002	
				AT-C	Averaging Time (Cancer)	70	years	USEPA, 2002	
				AT-N	Averaging Time (Non-Cancer)	25	years	USEPA, 2002	
				CF2	Conversion Factor 2	365	days/year	---	
Dermal Absorption	Industrial Worker (outdoor)	Adult	SWMU 50	CS	Chemical Concentration in Soil	See site-specific EPC tables	mg/kg	See site-specific EPC tables	
				SSAF	Soil to Skin Adherence Factor	0.2	mg/cm^2-day	USEPA, 1997, 2002	Internal (Lifetime) Average Daily Dose
				DABS	Dermal Absorption Factor (Solid)	(1)	--	USEPA, 1995, 2003	$[(L)ADD_{int}]$ (mg/kg-day) =
				SA	Skin Surface Area Available for Contact	3,300 (2)	cm^2	USEPA, 1997, 2004	
				EF	Exposure Frequency	225	days/year	USEPA, 2002	$\frac{CS \times SSAF \times DABS \times SA \times EF \times ED \times CF1}{BW \times AT \times CF2}$
				ED	Exposure Duration	25	years	USEPA, 2002	
				CF1	Conversion Factor 1	$1/10^6$	kg/mg	---	
				BW	Body Weight	70	kg	USEPA, 2002	
				AT-C	Averaging Time (Cancer)	70	years	USEPA, 2002	
				AT-N	Averaging Time (Non-Cancer)	25	years	USEPA, 2002	
				CF2	Conversion Factor 2	365	days/year	---	

(1) Dermal absorption factors are presented in **Table E.1-14.**
(2) Value derived from data presented in USEPA (1997), averaging across gender and age. It is assumed that head, hands, and forearms are exposed to surface soil.

USEPA, 1995: Assessing Dermal Exposure from Soil Hazardous Waste Management Division. Office of Superfund Programs, Region III, Philadelphia, PA.
USEPA, 1997: Exposure Factors Handbook, Volume I. EPA/600/P-95/002Fa.
USEPA, 2002: Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites. OSWER 9355.4-24.
USEPA, 2003: Updated Dermal Exposure Assessment Guidance. Office of Superfund Programs, Region III, Philadelphia, PA.
USEPA, 2004: Risk Assessment Guidance for Superfund. Volume I: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment). Final.

Table E.1-13
Values Used for Daily Intake Calculations - Future Exposures to Surface and Total Soil - Air
SWMU 50

Scenario Timeframe:	Future
Medium:	Surface and 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 (Particulates and Volatiles)	Industrial Worker (Outdoor)	Adult	SWMU 50	CA	Chemical Concentration in Air	Chemical Specific	mg/m^3	(1)	Intake concentration (mg/m3) =
				FI	Fraction Inhaled	1	unitless	--	CA*FI*EF*ED
				EF	Exposure Frequency	225	days/year	USEPA, 2002	AT
				ED	Exposure Duration	25	years	USEPA, 2002	
				AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 2002	
				AT-N	Averaging Time (Non-Cancer)	9,125	days	Based on ED	

(1) Chemical concentration for particulates in air (mg/m^3) = Concentration in soil (mg/kg) x 1/PEF (kg/m^3).
Chemical concentration of volatiles in air (mg/m^3) = Concentration in soil (mg/kg) x 1/VF (kg/m^3).

USEPA, 2002: Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites. OSWER 9355.4-24.

Table E.1-14
Dermal Absorption Fractions and Physical/Chemical Properties for Soil - SWMU 50
Radford Army Ammunition Plant, Radford, Virginia

Analyte	CAS NO.	ABS_d [a] (m^3/kg)	D_i [b] (cm^2/s)	D_w [b] (cm^2/s)	K_{oc} [b] (cm^3/g)	K_d [c] (cm^3/g)	H [b] (unitless)	D_A (cm^2/s)
Aluminum	7429-90-5	1.0E-02						
Arsenic	7440-38-2	3.0E-02						
Chromium III	7440-47-3	1.0E-02						
Cobalt	7440-48-4	1.0E-02						
Copper	7440-50-8	1.0E-02						
Iron	7439-89-6	1.0E-02						
Lead	7439-92-1	1.0E-02						
Manganese	7439-96-5	1.0E-02						
Nickel	7440-02-0	1.0E-02						
Vanadium	7440-62-2	1.0E-02						
Aroclor 1254	11097-69-1	1.4E-01			7.56E+04			
Benzo(a)pyrene	50-32-8	1.3E-01			7.87E+05			
Benzo(b)fluoranthene	205-99-2	1.3E-01			8.03E+05			
Carbazole	86-74-8	1.3E-01						
Chloroform	108-10-1	3.0E-02	7.70E-02	1.10E-05	3.50E+01	2.10E-01	1.50E-01	
Dibenzofuran	132-64-9	1.3E-01						
Dimethylphthalate	131-11-3	1.0E-01						
2,4-Dinitrotoluene	121-14-2	1.02E-01			3.64E+02	2.18E+00	2.00E-06	
2,6-Dinitrotoluene	606-20-2	9.9E-02	3.70E-02	7.80E-06	3.71E+02	2.23E+00	3.10E-05	
TCDD TE	N/A	3.0E-02			1.46E+05			

CAS No. = Chemical Abstract Service No.
ABS_d = Dermal Absorption Factor
VF = Volatilization Factor
D_A = Apparent Diffusivity
m^3/kg = cubic meters per kilogram
cm^2/s = centimeter squared per second

[a] ABS_d values are taken from Exhibit 3-4, Risk Assessment Guidance for Superfund (RAGS), Volume 1, 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, unless otherwise noted.

[b] Values for derivation of VF are taken from the USEPA Regional Screening Levels Table, Physical-Chemical Parameters (dated September 12, 2008).

[c] Calculated value: $K_d = K_{oc} \times f_{oc}$

Table E.1-15
PEF Calculation - Construction Worker
Radford Army Ammunition Plant - SWMU 50

Site Name: **Radford SWMU 50**

Calculation of Site-Specific Construction Worker PEF:

$$PEF_{sc} = Q / C_{sr} \; x \; \frac{1}{F_D} \; x \left[\frac{T \; x \; A_R}{556 \; x \; (W/3)^{0.4} \; x \; \frac{365 \; day/yr - p)}{365 \; day/yr} \; x \; \sum VKT} \right]$$

Variable	Value	Units	Description
Q/C_{sr} =	**18.36**	g/m^2-s per kg/m^3	**calculated below**
Duration of construction =	**6**	months	
	25	weeks	
	125	days	assuming 5 days per week
t_c =	1,000	hours	assuming 8 hour days
	60,000	min	
T =	3,600,000	sec	
F_D =	0.185		dispersion correction factor
Surface area of site =	**2.061**	acres	**Site-specific**
Surface area of site =	8,340.9	m^2	
Length of side of area configured as a square =	91.3	m	equal to the square root of the area of the site
L_R =	300	ft	side of area configured as a square
W_R =	20	ft	width of roadway segment - default
A_R =	557.4	m^2	surface area of contaminated roadway segment
W =	**6**	tons	mean vehicle weight - default, assuming 2, 2-ton cars and 2, 10-ton trucks
p =	**119**	days/yr	Number of days/yr with at least 0.01 inches of precipitation - value for Radford Area from Exhibit 5-1
Number of vehicles on site	**2**	cars	value based on assumptions for W
	2	truck	
VKT =	22.8	km	sum of vehicle km traveled during exposure duration - assuming each vehicles travels road once per day and 5 days/week for total time

Variables in **BOLD** are site-specific and should be entered for each site

PEF_{sc} = 1.76E+07 m^3/kg

$$Q / C_{sr} = A \; x \; \exp \left[\frac{(\ln A_s - B)^2}{C} \right]$$

Variable	Value	Units	Description
A_s =	**2.061**	acres	Site specific area
A =	12.9351		default constant
B =	5.7383		default constant
C =	71.7711		default constant

Q/C_{sr} = 18.36 g/m^2-s per kg/m^3

A_s is site-specific and a value should be entered for each site

Table E.1-16
PEF Calculation - Commercial/Industrial Worker
Radford Army Ammunition Plant - SWMU 50

Site name: Radford SWMU 50

Calculation of Site-Specific Commercial/Industrial Worker PEF:
This value can be applied to workers as well as residents unless site area is greater than 0.5 acres.
Equation 4-5 from USEPA, 2002

$$PEF = \frac{Q}{C_{wind}} \; x \; \frac{3{,}600 \text{ sec/hr}}{0.036 \; x \; (1-V) \; x \; (U_m/U_t)^3 \; x \; F(x)}$$

Variable	Value	Units	Description
Q/C_{wind} =	45.34	g/m^2-s per kg/m^3	Calculated below
V =	**0.5**	unitless	fraction of vegetative cover
U_m =	**3.5**	m/s	mean annual windspeed
U_t =	**11.32**	m/s	equivalent threshold value of windspeed at 7 m
F(x) =	**0.194**	unitless	function dependent on U_m/U_t derived using Cowherd et al., 1985

Q/C_{wind} can be used for any source size from 0.5 acres to 500 acres using the equation and look up tables in Appendix D, Exhibit D-2. Source of 0.5 acres is the size of a typical exposure unit.

PEF = 1.58E+09 m^3/kg

From Exhibit D-2 from USEPA 2002:

$$Q/C_{wind} = A \; x \; \exp\left[\frac{(\ln A_s - B)^2}{C}\right]$$

Variable	Value	Units	Description
A =	9.9253		Site-specific value
B =	18.6636		Site-specific value
C =	211.8862		Site-specific value
A_s =	**2.061**	acres	**Contaminated site area**

Q/C_{wind} = 45.34 g/m^2-s/kg/m^3

Table E.1-17
PEF Calculation - Residents
Radford Army Ammunition Plant - SWMU 50

Site name: Radford SWMU 50

Calculation of Site-Specific Residential PEF:
A separate PEF for residents must be calculated if the site in question is greater than 0.5 acres in size. This residential PEF is based on a 0.5 acre residential site.
Equation 4-5 from USEPA, 2002

$$PEF = \frac{Q}{C_{wind}} \; x \; \frac{3{,}600 \; sec/hr}{0.036 \; x \; (1-V) \; x \; (U_m/U_t)^3 \; x \; F(x)}$$

Variable	Value	Units	Description
Q/C_{wind} =	58.17	g/m^2-s per kg/m^3	Calculated below
V =	**0.5**	unitless	fraction of vegetative cover
U_m =	**3.5**	m/s	mean annual windspeed
U_t =	**11.32**	m/s	equivalent threshold value of windspeed at 7 m
F(x) =	**0.194**	unitless	function dependent on U_m/U_t derived using Cowherd et al., 1985

Q/C_{wind} can be used for any source size from 0.5 acres to 500 acres using the equation and look up tables in Appendix D, Exhibit D-2. Source of 0.5 acres is the size of a typical exposure unit.

PEF_R = 2.03E+09 m^3/kg

From Exhibit D-2 from USEPA 2002:

$$Q/C_{wind} = A \; x \; \exp\left[\frac{(\ln A_s - B)^2}{C}\right]$$

Variable	Value	Units	Description
A =	9.9253		Site-specific value
B =	18.6636		Site-specific value
C =	211.8862		Site-specific value
A_s =	0.5	acres	**Residential exposure**

Q/C_{wind} = 58.17 g/m^2-s/kg/m^3

Table E.1-18
VF Calculation - Construction Worker
Radford Army Ammunition Plant - SWMU 50

Site Name: Radford SWMU 50

D_A values calculated using the following equation and values from the Supplemental Guidance for Developing Soil Screening Levels at Superfund Sites. OSWER 9355.4-24. USEPA, 2002.

Equation 4-8 from USEPA, 2002.

This equation is chemical-specific.

$$D_A = \frac{[((\theta_a^{10/3} x D_i x H) + (\theta_w^{10/3} x D_w))/n^2]}{((\rho_b x K_d) + \theta_w + (\theta_a x H))}$$

Chemical name: **Chloroform**

Variable	Value	Units	Description
θ_a =	0.28	L_{air}/L_{soil}	default
θ_w =	0.15	L_{water}/L_{soil}	default
D_i =	**7.70E-02**	cm^2/s	**chemical-specific from VF table**
D_w =	**1.10E-05**	cm^2/s	**chemical-specific from VF table**
H =	**1.50E-01**	unitless	**chemical-specific from VF table**
n =	0.43	L_{pore}/L_{soil}	default
ρ_b =	1.5	g/cm^3	default
K_d =	**0.21**	cm^3/g	**chemical-specific from VF table**
K_{oc} =	**35.0**	cm^3/g	**chemical-specific from VF table**
f_{oc} =	0.006	g/g	

D_A = 1.8E-03 cm^2/s

This equation is chemical-specific. Bold variables - information is required for each chemical
Copy this worksheet for each volatile COPC to calculate VF.

VF (soil only) values for construction worker were calculated using the following equations from the Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites. OSWER 9355.4-24. USEPA, 2002. Equation 5-14 from USEPA, 2002

$$VF_{sc} = \frac{(3.14 x D_A x T)^{1/2} x CF}{2 x \rho_b x D_A} \; x \; \frac{Q}{C_{sa}} \; x \; \frac{1}{F_D}$$

Variable	Value	Units	Description
Q/C_{sa} =	11.00	g/m^2-s/kg/m^3	calculated below
F_D =	0.185	unitless	default
D_A =	1.8E-03	cm^2/s	**chemical specific - calculated above**
T =	**3,600,000**	**seconds**	Receptor-specific exposure interval (example: T= 1 yr*125 days/yr*8 hr/day*60 min/hr*60 sec/min)
CF =	1.00E-04	m^2/cm^2	default conversion factor
ρ_b =	1.5	g/cm^3	default

VF_{sc} = 1.6E+02 m^3/kg

Equation 5-15 from USEPA, 2002:

$$Q/C_{sa} = A \; x \exp\left[\frac{(\ln A_c - B)^2}{C}\right]$$

Variable	Value	Units	Description
A =	2.4538		default constant
B =	17.566		default constant
C =	189.0426		default constant
A_c =	**2.061**	acres	**site-specific**

A_c is site specific - area should change for each site

Q/C_{sa} = 11.00 g/m^2-s/kg/m^3

Table E.1-19
VF Calculation - Maintenance Worker
Radford Army Ammunition Plant - SWMU 50

Site Name: Radford SWMU 50

D_A values calculated using the following equation and values from the Supplemental Guidance for Developing Soil Screening Levels at Superfund Sites. OSWER 9355.4-24. USEPA, 2002.
Equation 4-8 from USEPA, 2002.
This equation is chemical-specific.

$$D_A = \frac{[((\theta_a^{10/3} x D_i x H) + (\theta_w^{10/3} x D_w))/n^2]}{((\rho_b x K_d) + \theta_w + (\theta_a x H))}$$

Chemical name: **Chloroform**

Variable	Value	Units	Description
θ_a =	0.28	L_{air}/L_{soil}	default
θ_w =	0.15	L_{water}/L_{soil}	default
D_i =	**7.70E-02**	cm^2/s	**chemical-specific from VF table**
D_w =	**1.10E-05**	cm^2/s	**chemical-specific from VF table**
H	**1.50E-01**	unitless	**chemical-specific from VF table**
n =	0.43	L_{pore}/L_{soil}	default
ρ_b =	1.5	g/cm^3	default
K_d =	**0.21**	cm^3/g	**chemical-specific from VF table**
K_{oc} =	**35.0**	cm^3/g	**chemical-specific from VF table**
f_{oc} =	0.006	g/g	

D_A = 1.8E-03 cm^2/s

VF (soil only) values for commercial/industrial worker, adult resident and child resident were calculated using the following equations from the Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites. OSWER 9355.4-24. USEPA, 2002. Equation 4-8 from USEPA, 2002

$$VF = \frac{Q}{C_{vol}} \; x \; \frac{(3.14 x D_A x T)^{1/2} x CF}{2 x \rho_b x D_A}$$

Variable	Value	Units	Description
Q/C_{vol} =	45.34	$(g/m^2\text{-}s)/kg/m^3$	calculated below
D_A =	1.8E-03	cm^2/s	chemical specific - calculated above
T =	**788,400,000**	seconds	**Receptor-specific exposure interval (T= 25 yrs*365 days/yr*24hr/day*60 min/hr*60 sec/min)**
CF =	1.00E-04	m^2/cm^2	default
ρ_b =	1.5	g/cm^3	default

VF = 1.79E+03 m^3/kg

From Exhibit D-3 from USEPA 2002:

$$Q/C_{vol} = A \; x \; \exp\left[\frac{(\ln A_s - B)^2}{C}\right]$$

Variable	Value	Units	Description
A =	9.9253		Site-specific value - see tab D-3 for values
B =	18.6636		Site-specific value - see tab D-3 for values
C =	211.8862		Site-specific value - see tab D-3 for values
A_s =	**2.061**	acres	Contaminated site area

Q/C_{vol} = 45.34 $g/m^2\text{-}s/kg/m^3$

Table E.1-20
VF Calculation - Industrial Worker
Radford Army Ammunition Plant - SWMU 50

Site Name: Radford SWMU 50

D_A values calculated using the following equation and values from the Supplemental Guidance for Developing Soil Screening Levels at Superfund Sites. OSWER 9355.4-24. USEPA, 2002.
Equation 4-8 from USEPA, 2002.
This equation is chemical-specific.

$$D_A = \frac{[((\theta_a^{10/3} x D_i x H) + (\theta_w^{10/3} x D_w))/n^2]}{((\rho_b x K_d) + \theta_w + (\theta_a x H))}$$

Chemical name: **Chloroform**

Variable	Value	Units	Description
θ_a =	0.28	L_{air}/L_{soil}	default
θ_w =	0.15	L_{water}/L_{soil}	default
D_i =	**7.70E-02**	cm^2/s	**chemical-specific from VF table**
D_w =	**1.10E-05**	cm^2/s	**chemical-specific from VF table**
H	**1.50E-01**	unitless	**chemical-specific from VF table**
n =	0.43	L_{pore}/L_{soil}	default
ρ_b =	1.5	g/cm^3	default
K_d =	**0.21**	cm^3/g	**chemical-specific from VF table**
K_{oc} =	**35.0**	cm^3/g	**chemical-specific from VF table**
f_{oc} =	0.006	g/g	

D_A = 1.8E-03 cm^2/s

VF (soil only) values for commercial/industrial worker, adult resident and child resident were calculated using the following equations from the Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites. OSWER 9355.4-24. USEPA, 2002. Equation 4-8 from USEPA, 2002

$$VF = \frac{Q}{C_{vol}} \; x \; \frac{(3.14 x D_A x T)^{1/2} x CF}{2 x \rho_b x D_A}$$

Variable	Value	Units	Description
Q/C_{vol} =	45.34	$(g/m^2\text{-s})/kg/m^3$	calculated below
D_A =	1.8E-03	cm^2/s	chemical specific - calculated above
T =	##########	seconds	**Receptor-specific exposure interval (T= 25 yrs*365 days/yr*24hr/day*60 min/hr*60 sec/min)**
CF =	1.00E-04	m^2/cm^2	default
ρ_b =	1.5	g/cm^3	default

VF = **1.79E+03** m^3/kg

From Exhibit D-3 from USEPA 2002:

$$Q/C_{vol} = A \; x \; \exp\left[\frac{(\ln A_s - B)^2}{C}\right]$$

Variable	Value	Units	Description
A =	9.9253		Site-specific value - see tab D-3 for values
B =	18.6636		Site-specific value - see tab D-3 for values
C =	211.8862		Site-specific value - see tab D-3 for values
A_s =	**2.061**	acres	Contaminated site area

Q/C_{vol} = 45.34 $g/m^2\text{-s/kg/m}^3$

Table E.1-21
VF Calculation - Adult Resident
Radford Army Ammunition Plant - SWMU 50

Site Name: Radford SWMU 50

D_A values calculated using the following equation and values from the Supplemental Guidance for Developing Soil Screening Levels at Superfund Sites. OSWER 9355.4-24. USEPA, 2002.
Equation 4-8 from USEPA, 2002.
This equation is chemical-specific.

$$D_A = \frac{[((\theta_a^{10/3} x D_i x H) + (\theta_w^{10/3} x D_w))/n^2]}{((\rho_b x K_d) + \theta_w + (\theta_a x H))}$$

Chemical name: **Chloroform**

Variable	Value	Units	Description
θ_a =	0.28	L_{air}/L_{soil}	default
θ_w =	0.15	L_{water}/L_{soil}	default
D_i =	**7.70E-02**	cm^2/s	**chemical-specific from VF table**
D_w =	**1.10E-05**	cm^2/s	**chemical-specific from VF table**
H	**1.50E-01**	unitless	**chemical-specific from VF table**
n =	0.43	L_{pore}/L_{soil}	default
ρ_b =	1.5	g/cm^3	default
K_d =	**0.21**	cm^3/g	**chemical-specific from VF table**
K_{oc} =	**35.0**	cm^3/g	**chemical-specific from VF table**
f_{oc} =	0.006	g/g	

D_A = 1.8E-03 cm^2/s

VF (soil only) values for commercial/industrial worker, adult resident and child resident were calculated using the following equations from the Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites. OSWER 9355.4-24. USEPA, 2002. Equation 4-8 from USEPA, 2002

$$VF = \frac{Q}{C_{vol}} \; x \; \frac{(3.14 x D_A x T)^{1/2} x CF}{2 x \rho_b x D_A}$$

Variable	Value	Units	Description
Q/C_{vol} =	58.17	g/m^2-s)/kg/m^3	calculated below
D_A =	1.8E-03	cm^2/s	chemical specific - calculated above
T =	##########	seconds	**Receptor-specific exposure interval (T= 24 yrs*365 days/yr*24hr/day*60 min/hr*60 sec/min)**
CF =	1.00E-04	m^2/cm^2	default
ρ_b =	1.5	g/cm^3	default

VF = 2.25E+03 m^3/kg

From Exhibit D-3 from USEPA 2002:

$$Q/C_{vol} = A \; x \; \exp\left[\frac{(\ln A_s - B)^2}{C}\right]$$

Variable	Value	Units	Description
A =	9.9253		Site-specific value - see tab D-3 for values
B =	18.6636		Site-specific value - see tab D-3 for values
C =	211.8862		Site-specific value - see tab D-3 for values
A_s =	0.5	acres	Residential exposure

Q/C_{vol} = 58.17 g/m^2-s/kg/m^3

Table E.1-22
VF Calculation - Child Resident
Radford Army Ammunition Plant - SWMU 50

Site Name: Radford SWMU 50

D_A values calculated using the following equation and values from the Supplemental Guidance for Developing Soil Screening Levels at Superfund Sites. OSWER 9355.4-24. USEPA, 2002.
Equation 4-8 from USEPA, 2002.
This equation is chemical-specific.

$$D_A = \frac{[((\theta_a^{10/3} x D_i x H) + (\theta_w^{10/3} x D_w))/n^2]}{((\rho_b x K_d) + \theta_w + (\theta_a x H))}$$

Chemical name: **Chloroform**

Variable	Value	Units	Description
θ_a =	0.28	L_{air}/L_{soil}	default
θ_w =	0.15	L_{water}/L_{soil}	default
D_i =	**7.70E-02**	cm^2/s	**chemical-specific from VF table**
D_w =	**1.10E-05**	cm^2/s	**chemical-specific from VF table**
H	**1.50E-01**	unitless	**chemical-specific from VF table**
n =	0.43	L_{pore}/L_{soil}	default
ρ_b =	1.5	g/cm^3	default
K_d =	**0.21**	cm^3/g	**chemical-specific from VF table**
K_{oc} =	**35.0**	cm^3/g	**chemical-specific from VF table**
f_{oc} =	0.006	g/g	

D_A = 1.8E-03 cm^2/s

VF (soil only) values for commercial/industrial worker, adult resident and child resident were calculated using the following equations from the Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites. OSWER 9355.4-24. USEPA, 2002.

$$VF = \frac{Q}{C_{vol}} \; x \; \frac{(3.14 x D_A x T)^{1/2} x CF}{2 x \rho_b x D_A}$$

Variable	Value	Units	Description
Q/C_{vol} =	58.17	g/m^2-s)/kg/m^3	calculated below
D_A =	1.8E-03	cm^2/s	chemical specific - calculated above
T =	##########	seconds	**Receptor-specific exposure interval (T= 6 yrs*365 days/yr*24hr/day*60 min/hr*60 sec/min)**
CF =	1.00E-04	m^2/cm^2	default
ρ_b =	1.5	g/cm^3	default

VF = 1.12E+03 m^3/kg

From Exhibit D-3 from USEPA 2002:

$$Q/C_{vol} = A \; x \; \exp\left[\frac{(\ln A_s - B)^2}{C}\right]$$

Variable	Value	Units	Description
A =	9.9253		Site-specific value - see tab D-3 for values
B =	18.6636		Site-specific value - see tab D-3 for values
C =	211.8862		Site-specific value - see tab D-3 for values
A_s =	0.5	acres	Residential exposure

Q/C_{vol} = 58.17 g/m^2-s/kg/m^3

Table E.1-23
Cancer Toxicity Data - Oral/Dermal

Chemical of Potential Concern	Oral Cancer Slope Factor		Oral Absorption Efficiency for Dermal (1)	Absorbed Cancer Slope Factor for Dermal (2)		Weight of Evidence/ Cancer Guideline Description	Oral CSF	
	Value	Units		Value	Units		Source	Date (3) (MM/DD/YY)
Organics								
Aroclor 1254	2.0E+00	$(mg/kg\text{-}day)^{-1}$	100%	2.0E+00	$(mg/kg\text{-}day)^{-1}$	B2	IRIS; EPA, 2008	2/19/09:9/12/08
Benzo(a)pyrene	7.3E+00	$(mg/kg\text{-}day)^{-1}$	100%	7.3E+00	$(mg/kg\text{-}day)^{-1}$	B2	IRIS	2/19/09:11/1/94
Benzo(b)fluoranthene	7.3E-01	$(mg/kg\text{-}day)^{-1}$	100%	7.3E-01	$(mg/kg\text{-}day)^{-1}$	B2	EPA, 2008	2/19/09:3/1/94
Carbazole	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chloroform	3.1E-02	$(mg/kg\text{-}day)^{-1}$	100%	3.1E-02	$(mg/kg\text{-}day)^{-1}$	B2	EPA, 2008; Cal EPA	2/19/09:10/19/01
Dibenzofuran	N/A	N/A	N/A	N/A	N/A	D	N/A	10/01/90
Dimethylphthalate	N/A	N/A	N/A	N/A	N/A	D	N/A	02/01/93
2,4-Dinitrotoluene (4)	6.8E-01	$(mg/kg\text{-}day)^{-1}$	100%	6.8E-01	$(mg/kg\text{-}day)^{-1}$	B2	IRIS	2/19/09:9/1/90
TCDD TE	1.3E+05	$(mg/kg\text{-}day)^{-1}$	100%	1.3E+05	$(mg/kg\text{-}day)^{-1}$	B2	EPA, 2008; Cal EPA	2/19/09:9/12/08
Inorganics								
Aluminum	N/A	N/A	N/A	N/A	N/A	N/A	EPA, 2008	2/19/09:9/12/08
Arsenic	1.5E+00	$(mg/kg\text{-}day)^{-1}$	100%	1.5E+00	$(mg/kg\text{-}day)^{-1}$	A	IRIS	2/19/09:4/10/98
Chromium (III)	N/A	N/A	N/A	N/A	N/A	D	IRIS	2/19/09:9/3/98
Cobalt	N/A	N/A	N/A	N/A	N/A	N/A	N/A	2/19/09:9/12/08
Copper	N/A	N/A	N/A	N/A	N/A	D	IRIS	2/19/09:8/1/91
Iron	N/A	N/A	N/A	N/A	N/A	N/A	EPA, 2008	2/19/09:9/12/08
Lead	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Manganese	N/A	N/A	N/A	N/A	N/A	D	IRIS	2/19/09:12/1/96
Nickel	N/A	N/A	N/A	N/A	N/A	N/A	IRIS	2/19/09:8/1/94
Vanadium	N/A	N/A	N/A	N/A	N/A	N/A	N/A	2/19/09:9/12/08

(1) Source: Risk Assessment Guidance for Fuperfund Volume 1: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment) Final. Section 4.2 and Exhibit 4-1.

(2) The equation for deriving the adjusted dermal cancer slope factors are presented in the text.

(3) For IRIS values, the date IRIS was searched and the date of the most recent review are provided. For HEAST values, the date of HEAST is provided.

(4) Value is based on dinitrotoluene mixture.

Definitions:

N/A = Not Available
Cal EPA = California Environmental Protection Agency
IRIS = Integrated Risk Information System
HEAST= Health Effects Assessment Summary Tables
NCEA = National Center for Environmental Assessment
PPRTV = Provisional Peer-Reviewed Toxicity Values
EPA, 2008 = Regional Screening Values, ORNL Sept 12, 2008
VDEQ, 2008 = Virginia Department of Environmental Quality, Voluntary Remediation Program, Table 4.1, Non-Cancer Toxicity Data, August 1, 2008.

EPA Group:

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
E - Evidence of noncarcinogenicity

Table E.1-24
Non-Cancer Toxicity Data - Oral/Dermal

Chemical of Potential Concern	Chronic/ Subchronic	Oral RfD		Oral to Dermal Efficiency for Dermal (1)	Absorbed RfD for Dermal (2)		Primary Target Organ(s)	Combined Uncertainty/ Modifying Factors	RfD:Target Organ(s)	
		Value	Units		Value	Units			Source(s)	Dates of RfD (3): (MM/DD/YY)
Organics										
Aroclor 1254	Chronic	2.0E-05	mg/kg-day	100%	2.0E-05	mg/kg-day	Immune system, eyes	300	IRIS	2/19/09:11/1/96
Benzo(a)pyrene	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Benzo(b)fluoranthene	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Carbazole	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chloroform	Chronic	1.0E-02	mg/kg-day	100%	1.0E-02	mg/kg-day	Liver	1,000	IRIS	2/19/09:10/19/01
Dibenzofuran	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dimethylphthalate	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	3/1/1994
2,4-Dinitrotoluene	Chronic	2.0E-03	mg/kg-day	100%	2.0E-03	mg/kg-day	CNS, Blood, Liver	100	IRIS	2/19/09:2/1/93
TCDD TE	Chronic	1.0E-09	mg/kg-day	100%	1.0E-09	mg/kg-day	Developmental nervous system	N/A	EPA, 2008; ATSDR	2/19/09:9/12/08
Inorganics										
Aluminum	Chronic	1.0E+00	mg/kg-day	100%	1.0E+00	mg/kg-day	Developmental nervous system	N/A	PPRTV; EPA, 2008; VDEQ, 2008	2/19/09:9/12/08
Arsenic	Chronic	3.0E-04	mg/kg-day	100%	3.0E-04	mg/kg-day	Skin, Vascular System	3	IRIS	2/19/09:2/1/93
Chromium (III)	Chronic	1.5E+00	mg/kg-day	1.3%	1.95E-02	mg/kg-day	NOAEL	1,000	IRIS	2/19/09:9/3/98
Cobalt	Chronic	3.0E-04	mg/kg-day	100%	3.0E-04	mg/kg-day	N/A	N/A	PPRTV; EPA, 2008	2/19/09:9/12/08
Copper	Chronic	4.0E-02	mg/kg-day	100%	4.0E-02	mg/kg-day	GI Tract	N/A	EPA, 2008; HEAST	2/19/09:7/97
Iron	Chronic	7.0E-01	mg/kg-day	100%	7.0E-01	mg/kg-day	Blood, Liver, GI Tract	N/A	PPRTV; EPA, 2008; VDEQ, 2008	2/19/09:9/12/08
Lead	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Manganese (water)	Chronic	2.4E-02	mg/kg-day	4%	9.6E-04	mg/kg-day	CNS	1	EPA, 2008; IRIS	2/19/09:5/1/96
Nickel	Chronic	2.0E-02	mg/kg-day	4%	8.0E-04	mg/kg-day	Kidney, Liver, Spleen	300	IRIS, VDEQ, 2008	2/19/09:12/1/96
Vanadium (4)	Chronic	5.0E-03	mg/kg-day	2.6%	1.3E-04	mg/kg-day	Kidney	N/A	EPA, 2008; VDEQ, 2008; NCEA	2/19/09:9/12/08

(1) Source: Risk Assessment Guidance for Superfund Volume 1: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment) Final. Section 4.2 and Exhibit 4-1.
(2) The equation used to derive the adjusted dermal RfD is presented in the text.
(3) For IRIS values, the date IRIS was searched and the date of the most recent review are provided. For HEAST values, the date of HEAST is provided.
(4) The toxicity value for Vanadium was based on Vanadium and Compounds.

Definitions: N/A = Not Available
ATSDR = Agency for Toxic Substances Disease Registry
IRIS = Integrated Risk Information System
HEAST= Health Effects Assessment Summary Tables
NCEA = National Center for Environmental Assessment
PPRTV = Provisional Peer-Reviewed Toxicity Values
EPA, 2008 = Regional Screening Values, ORNL, September 12, 2008
VDEQ, 2008 = Virginia Department of Environmental Quality, Voluntary Remediation Program, Table 4.1, Non-Cancer Toxicity Data, August 1, 2008.

Table E.1-25
Cancer Toxicity Data - Inhalation

Chemical of Potential Concern	Unit Risk		Weight of Evidence/ Cancer Guideline Description	Unit Risk: Inhalation CSF	
	Value	Units		Source	Date (1) (MM/DD/YY)
Organics					
Aroclor 1254	5.70E-04	$(ug/m^3)^{-1}$	B2	EPA, 2008	2/19/09:9/12/08
Benzo(a)pyrene	1.10E-03	$(ug/m^3)^{-1}$	B2	EPA, 2008	2/19/09:9/12/08
Benzo(b)fluoranthene	1.10E-04	$(ug/m^3)^{-1}$	B2	EPA, 2008; Cal EPA	2/19/09:9/12/08
Carbazole	N/A	N/A	N/A	N/A	N/A
Chloroform	2.30E-05	$(ug/m^3)^{-1}$	B2	IRIS	2/19/09:10/19/01
Dibenzofuran	N/A	N/A	D	N/A	10/1/1990
Dimethlyphthalate	N/A	N/A	D	N/A	2/1/1993
2,4-Dinitrotoluene	N/A	N/A	N/A	N/A	2/19/09:9/1/90
TCDD TE	3.80E+01	$(ug/m^3)^{-1}$	B2	EPA, 2008; Cal EPA	2/19/09:9/12/08
Inorganics					
Aluminum	N/A	N/A	N/A	N/A	2/19/09:9/12/08
Arsenic	4.3E-03	$(ug/m^3)^{-1}$	A	IRIS	2/19/098:4/10/98
Chromium (total) (2)	1.2E-02	$(ug/m^3)^{-1}$	N/A	IRIS; EPA, 2008	2/19/09:9/12/08
Cobalt	9.0E-03	$(ug/m^3)^{-1}$	N/A	PPRTV; EPA, 2008	2/19/09:9/12/08
Copper	N/A	N/A	D	IRIS	2/19/09:8/1/91
Iron	N/A	N/A	N/A	EPA, 2008	2/19/09:9/12/08
Lead	N/A	N/A	N/A	N/A	N/A
Manganese	N/A	N/A	D	IRIS	2/19/09:12/1/96
Nickel	N/A	N/A	N/A	IRIS	2/19/09:8/1/94
Vanadium	N/A	N/A	N/A	EPA, 2008	2/19/09:9/12/08

(1) For IRIS values, the date IRIS was searched and the date of the most recent review are provided.
For HEAST values, the date of HEAST is provided.
(2) The IUR Is based on a 1:6 ratio of Chromium VI to Chromium III.

EPA Group:
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
E - Evidence of noncarcinogenicity

Definition:
N/A = Not Available
Cal EPA = California Environmental Protection Agency
IRIS = Integrated Risk Information System
HEAST= Health Effects Assessment Summary Tables
NCEA = National Center for Environmental Assessment
PPRTV = Provisional Peer-Reviewed Toxicity Values
EPA, 2008 = Regional Screening Values, ORNL, September 12, 2008
VDEQ, 2008 = Virginia Department of Environmental Quality, Voluntary Remediation Program, Table 4.2, Cancer Toxicity Data, August 1, 2008.

Table E.1-26
Non-Cancer Toxicity Data - Inhalation

Chemical of Potential Concern	Chronic/ Subchronic	Inhalation RfC		Primary Target Organ (s)	Combined Uncertainty/ Modifying Factors	RfC:Target Organ(s)	
		Value	Units			Source(s) (2)	Dates of RfD: (MM/DD/YY)
Organics							
Aroclor 1254	N/A	N/A	N/A	N/A	N/A	N/A	2/19/09:11/1/96
Benzo(a)pyrene	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Benzo(b)fluoranthene	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Carbazole	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chloroform	Chronic	9.8E-02	mg/m^3	Liver	N/A	EPA, 2008; ATSDR	2/19/09:9/12/08
Dibenzofuran	N/A	N/A	N/A	N/A	N/A	N/A	5/1/92
Dimethylphthalate	N/A	N/A	N/A	N/A	N/A	N/A	10/1/90
2,4-Dinitrotoluene	N/A	N/A	N/A	N/A	N/A	EPA, 2008	2/19/09:3/1/91
TCDD TE	N/A	N/A	N/A	N/A	N/A	N/A	2/19/2009
Inorganics							
Aluminum	Chronic	5.0E-03	mg/m^3	N/A	N/A	EPA, 2008; VDEQ, 2008; PPRTV	2/19/09:9/12/08
Arsenic	Chronic	3.0E-05	mg/m^3	Development, Cardiovascular, Nervous System	N/A	EPA, 2008; Cal EPA	2/19/09:9/12/08
Chromium (total)	N/A	N/A	N/A	N/A	N/A	IRIS	2/19/09:9/3/98
Cobalt	Chronic	6.0E-06	mg/m^3	N/A	N/A	PPRTV; EPA, 2008	2/19/09:9/12/08
Copper	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Iron	N/A	N/A	N/A	N/A	N/A	EPA, 2008	2/19/09:9/12/08
Lead	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Manganese	Chronic	5.0E-05	mg/m^3	CNS	1,000	IRIS	2/19/09:12/1/93
Nickel	N/A	N/A	N/A	N/A	N/A	N/A	2/19/09:9/12/08
Vanadium	N/A	N/A	N/A	N/A	N/A	EPA, 2008	2/19/09:9/12/08

(1) The adjusted inhalation RfD was derived from the RfC value assuming a 70 kg adult inhales 20 m^3/day as follows: RfD = RfC * (20 m^3/day / 70 kg).

(2) For NCEA values, the date of the article provided by NCEA is provided.
For IRIS values, the date IRIS was searched and the date of the most recent review are provided.
For HEAST values, the date of HEAST is provided.

Definitions: N/A = Not Available
ATSDR = Agency for Toxic Substances Disease Registry
Cal EPA = California Environmental Protection Agency
IRIS = Integrated Risk Information System
NCEA = National Center for Environmental Assessment
HEAST = Health Effects Assessment Tables
PPRTV = Provisional Peer-Reviewed Toxicity Values
EPA, 2008 - Regional Screening Valules, ORNL, September 12, 2008
VDEQ, 2008 = Virginia Department of Environmental Quality, Voluntary Remediation Program, Table 4.1, Non-Cancer Toxicity Data,

Table E.1-27
Calculation of Cancer Risks
Reasonable Maximum Exposure
Current/Future - Maintenance Worker

Scenario Timeframe: Current
Receptor Population: Maintenance Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations				
							Intake/Exposure Concentration		CSF/Unit Risk		
					Value	Units	Value	Units	Value	Units	Cancer Risk
Surface Soil	Surface Soil	SWMU 50	**Ingestion**	**Organics**							
				TCDD TE	6.17E-05	mg/kg	4.3E-12	mg/kg-day	1.3E+05	$(mg/kg\text{-}day)^{-1}$	5.6E-07
				2,4-Dinitrotoluene	4.44E-01	mg/kg	3.1E-08	mg/kg-day	6.8E-01	$(mg/kg\text{-}day)^{-1}$	2.1E-08
				Aroclor 1254	3.76E-01	mg/kg	2.6E-08	mg/kg-day	2.0E+00	$(mg/kg\text{-}day)^{-1}$	5.3E-08
				Benzo(b)fluoranthene	5.46E-02	mg/kg	3.8E-09	mg/kg-day	7.3E-01	$(mg/kg\text{-}day)^{-1}$	2.8E-09
				Carbazole	2.80E-02	mg/kg	2.0E-09	mg/kg-day	N/A	$(mg/kg\text{-}day)^{-1}$	---
				Dibenzofuran	2.00E-01	mg/kg	1.4E-08	mg/kg-day	N/A	$(mg/kg\text{-}day)^{-1}$	---
				Dimethylphthalate	5.47E-01	mg/kg	3.8E-08	mg/kg-day	N/A	$(mg/kg\text{-}day)^{-1}$	---
				Inorganics							
				Aluminum	1.75E+04	mg/kg	1.2E-03	mg/kg-day	N/A	$(mg/kg\text{-}day)^{-1}$	---
				Arsenic	4.90E+00	mg/kg	3.4E-07	mg/kg-day	1.5E+00	$(mg/kg\text{-}day)^{-1}$	5.1E-07
				Cobalt	1.09E+01	mg/kg	7.6E-07	mg/kg-day	N/A	$(mg/kg\text{-}day)^{-1}$	---
				Iron	2.21E+04	mg/kg	1.5E-03	mg/kg-day	N/A	$(mg/kg\text{-}day)^{-1}$	---
				Manganese	8.73E+02	mg/kg	6.1E-05	mg/kg-day	N/A	$(mg/kg\text{-}day)^{-1}$	---
				Vanadium	4.25E+01	mg/kg	3.0E-06	mg/kg-day	N/A	$(mg/kg\text{-}day)^{-}$	---
			Exp. Route Total								1.2E-06
			Dermal Absorption	**Organics**							
				TCDD TE	6.17E-05	mg/kg	8.5E-13	mg/kg-day	1.3E+05	$(mg/kg\text{-}day)^{-1}$	1.1E-07
				2,4-Dinitrotoluene	4.44E-01	mg/kg	2.1E-08	mg/kg-day	6.8E-01	$(mg/kg\text{-}day)^{-1}$	1.4E-08
				Aroclor 1254	3.76E-01	mg/kg	1.0E-08	mg/kg-day	2.0E+00	$(mg/kg\text{-}day)^{-1}$	2.1E-08
				Benzo(b)fluoranthene	5.46E-02	mg/kg	2.5E-09	mg/kg-day	7.3E-01	$(mg/kg\text{-}day)^{-1}$	1.8E-09
				Carbazole	2.80E-02	mg/kg	1.3E-09	mg/kg-day	N/A	$(mg/kg\text{-}day)^{-1}$	---
				Dibenzofuran	2.00E-01	mg/kg	9.2E-09	mg/kg-day	N/A	$(mg/kg\text{-}day)^{-1}$	---
				Dimethylphthalate	5.47E-01	mg/kg	2.5E-08	mg/kg-day	N/A	$(mg/kg\text{-}day)^{-1}$	---
				Inorganics							
				Aluminum	1.75E+04	mg/kg	8.1E-05	mg/kg-day	N/A	$(mg/kg\text{-}day)^{-1}$	---
				Arsenic	4.90E+00	mg/kg	7.2E-08	mg/kg-day	1.5E+00	$(mg/kg\text{-}day)^{-1}$	1.1E-07
				Cobalt	1.09E+01	mg/kg	5.0E-08	mg/kg-day	N/A	$(mg/kg\text{-}day)^{-1}$	---
				Iron	2.21E+04	mg/kg	1.0E-04	mg/kg-day	N/A	$(mg/kg\text{-}day)^{-1}$	---
				Manganese	8.73E+02	mg/kg	4.0E-06	mg/kg-day	N/A	$(mg/kg\text{-}day)^{-1}$	---
				Vanadium	4.25E+01	mg/kg	2.0E-07	mg/kg-day	N/A	$(mg/kg\text{-}day)^{-}$	---
			Exp. Route Total								2.6E-07
		Exposure Point Total									1.4E-06
Exposure Media Total											1.4E-06

Table E.1-27
Calculation of Cancer Risks
Reasonable Maximum Exposure
Current/Future - Maintenance Worker

Scenario Timeframe: Current
Receptor Population: Maintenance Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations				
							Intake/Exposure Concentration		CSF/Unit Risk		
					Value	Units	Value	Units	Value	Units	Cancer Risk
Surface Soil	Air (Particulates)	SWMU 50	**Inhalation**	**Organics**							
				TCDD TE	9.01E-11	ug/m^3	4.4E-12	ug/m^3	3.8E+01	$(ug/m^3)^{-1}$	1.7E-10
				2,4-Dinitrotoluene	6.48E-07	ug/m^3	3.2E-08	ug/m^3	N/A	$(ug/m^3)^{-1}$	---
				Aroclor 1254	5.49E-07	ug/m^3	2.7E-08	ug/m^3	5.7E-04	$(ug/m^3)^{-1}$	1.5E-11
				Benzo(b)fluoranthene	7.97E-08	ug/m^3	3.9E-09	ug/m^3	1.1E-04	$(ug/m^3)^{-1}$	4.3E-13
				Carbazole	4.09E-08	ug/m^3	2.0E-09	ug/m^3	N/A	$(ug/m^3)^{-1}$	---
				Dibenzofuran	2.92E-07	ug/m^3	1.4E-08	ug/m^3	N/A	$(ug/m^3)^{-1}$	---
				Dimethylphthalate	7.99E-07	ug/m^3	3.9E-08	ug/m^3	N/A	$(ug/m^3)^{-1}$	---
				Inorganics							
				Aluminum	2.56E-02	ug/m^3	1.3E-03	ug/m^3	N/A	$(ug/m^3)^{-1}$	---
				Arsenic	7.16E-06	ug/m^3	3.5E-07	ug/m^3	4.3E-03	$(ug/m^3)^{-1}$	1.5E-09
				Cobalt	1.59E-05	ug/m^3	7.8E-07	ug/m^3	9.0E-03	$(ug/m^3)^{-1}$	7.0E-09
				Iron	3.23E-02	ug/m^3	1.6E-03	ug/m^3	N/A	$(ug/m^3)^{-1}$	---
				Manganese	1.27E-03	ug/m^3	6.2E-05	ug/m^3	N/A	$(ug/m^3)^{-1}$	---
				Vanadium	6.21E-05	ug/m^3	3.0E-06	ug/m^3	N/A	$(ug/m^3)^{-1}$	---
			Exp. Route Total								8.7E-09
		Exposure Point Total									8.7E-09
	Exposure Media Total										8.7E-09
	Air (Volatiles)	SWMU 50	**Inhalation**	**Organics** No COPC							
			Exp. Route Total								0.0E+00
		Exposure Point Total									0.0E+00
	Exposure Media Total										0.0E+00
Surface Soil Total											1.4E-06
										Total of Receptor Risks Across All Media	1.4E-06

N/A = Not Applicable.

Table E.1-28
Calculation of Non-cancer Hazards
Reasonable Maximum Exposure
Current/Future - Maintenance Worker

Scenario Timeframe: Current
Receptor Population: Maintenance Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Non-Cancer Hazard Calculations				
							Intake/Exposure Concentration		RfD/RfC		Hazard
					Value	Units	Value	Units	Value	Units	Quotient
Surface Soil	Surface Soil	SWMU 50	**Ingestion**	**Organics**							
				TCDD TE	6.17E-05	mg/kg	1.2E-11	mg/kg-day	1.0E-09	mg/kg-day	1.2E-02
				2,4-Dinitrotoluene	4.44E-01	mg/kg	8.7E-08	mg/kg-day	2.0E-03	mg/kg-day	4.3E-05
				Aroclor 1254	3.76E-01	mg/kg	7.4E-08	mg/kg-day	2.0E-05	mg/kg-day	3.7E-03
				Benzo(b)fluoranthene	5.46E-02	mg/kg	1.1E-08	mg/kg-day	N/A	mg/kg-day	---
				Carbazole	2.80E-02	mg/kg	5.5E-09	mg/kg-day	N/A	mg/kg-day	---
				Dibenzofuran	2.00E-01	mg/kg	3.9E-08	mg/kg-day	N/A	mg/kg-day	---
				Dimethylphthalate	5.47E-01	mg/kg	1.1E-07	mg/kg-day	N/A	mg/kg-day	---
				Inorganics							
				Aluminum	1.75E+04	mg/kg	3.4E-03	mg/kg-day	1.0E+00	mg/kg-day	3.4E-03
				Arsenic	4.90E+00	mg/kg	9.6E-07	mg/kg-day	3.0E-04	mg/kg-day	3.2E-03
				Cobalt	1.09E+01	mg/kg	2.1E-06	mg/kg-day	3.0E-04	mg/kg-day	7.1E-03
				Iron	2.21E+04	mg/kg	4.3E-03	mg/kg-day	7.0E-01	mg/kg-day	6.2E-03
				Manganese	8.73E+02	mg/kg	1.7E-04	mg/kg-day	2.4E-02	mg/kg-day	7.1E-03
				Vanadium	4.25E+01	mg/kg	8.3E-06	mg/kg-day	5.0E-03	mg/kg-day	1.7E-03
			Exp. Route Total								4.4E-02
			Dermal Absorption	**Organics**							
				TCDD TE	6.17E-05	mg/kg	2.4E-12	mg/kg-day	1.0E-09	mg/kg-day	2.4E-03
				2,4-Dinitrotoluene	4.44E-01	mg/kg	5.8E-08	mg/kg-day	2.0E-03	mg/kg-day	2.9E-05
				Aroclor 1254	3.76E-01	mg/kg	2.9E-08	mg/kg-day	2.0E-05	mg/kg-day	1.5E-03
				Benzo(b)fluoranthene	5.46E-02	mg/kg	7.1E-09	mg/kg-day	N/A	mg/kg-day	---
				Carbazole	2.80E-02	mg/kg	3.6E-09	mg/kg-day	N/A	mg/kg-day	---
				Dibenzofuran	2.00E-01	mg/kg	2.6E-08	mg/kg-day	N/A	mg/kg-day	---
				Dimethylphthalate	5.47E-01	mg/kg	7.1E-08	mg/kg-day	N/A	mg/kg-day	---
				Inorganics							
				Aluminum	1.75E+04	mg/kg	2.3E-04	mg/kg-day	1.0E+00	mg/kg-day	2.3E-04
				Arsenic	4.90E+00	mg/kg	2.0E-07	mg/kg-day	3.0E-04	mg/kg-day	6.8E-04
				Cobalt	1.09E+01	mg/kg	1.4E-07	mg/kg-day	3.0E-04	mg/kg-day	4.7E-04
				Iron	2.21E+04	mg/kg	2.9E-04	mg/kg-day	7.0E-01	mg/kg-day	4.1E-04
				Manganese	8.73E+02	mg/kg	1.1E-05	mg/kg-day	9.6E-04	mg/kg-day	1.2E-02
				Vanadium	4.25E+01	mg/kg	5.5E-07	mg/kg-day	1.3E-04	mg/kg-day	4.2E-03
			Exp. Route Total								2.2E-02
		Exposure Point Total									6.6E-02
	Exposure Media Total										6.6E-02

Table E.1-28
Calculation of Non-cancer Hazards
Reasonable Maximum Exposure
Current/Future - Maintenance Worker

Scenario Timeframe: Current
Receptor Population: Maintenance Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Non-Cancer Hazard Calculations				
							Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
					Value	Units	Value	Units	Value	Units	
Surface Soil	Air (Particulates)	SWMU 50	**Inhalation**	**Organics**							
				TCDD TE	9.01E-14	mg/m^3	1.2E-14	mg/m^3	N/A	(mg/m^3)	---
				2,4-Dinitrotoluene	6.48E-10	mg/m^3	8.9E-11	mg/m^3	N/A	(mg/m^3)	---
				Aroclor 1254	5.49E-10	mg/m^3	7.5E-11	mg/m^3	N/A	(mg/m^3)	---
				Benzo(b)fluoranthene	7.97E-11	mg/m^3	1.1E-11	mg/m^3	N/A	(mg/m^3)	---
				Carbazole	4.09E-11	mg/m^3	5.6E-12	mg/m^3	N/A	(mg/m^3)	---
				Dibenzofuran	2.92E-10	mg/m^3	4.0E-11	mg/m^3	N/A	(mg/m^3)	---
				Dimethylphthalate	7.99E-10	mg/m^3	1.1E-10	mg/m^3	N/A	(mg/m^3)	---
				Inorganics							
				Aluminum	2.56E-05	mg/m^3	3.5E-06	mg/m^3	5.0E-03	(mg/m^3)	7.0E-04
				Arsenic	7.16E-09	mg/m^3	9.8E-10	mg/m^3	3.0E-05	(mg/m^3)	3.3E-05
				Cobalt	1.59E-08	mg/m^3	2.2E-09	mg/m^3	6.0E-06	(mg/m^3)	3.6E-04
				Iron	3.23E-05	mg/m^3	4.4E-06	mg/m^3	N/A	(mg/m^3)	---
				Manganese	1.27E-06	mg/m^3	1.7E-07	mg/m^3	5.0E-05	(mg/m^3)	3.5E-03
				Vanadium	6.21E-08	mg/m^3	8.5E-09	mg/m^3	N/A	(mg/m^3)	---
			Exp. Route Total								4.6E-03
		Exposure Point Total									4.6E-03
	Exposure Media Total										4.6E-03
	Air (Volatiles)	SWMU 50	**Inhalation**	**Organics** No COPCs							
			Exp. Route Total								0.0E+00
		Exposure Point Total									0.0E+00
	Exposure Media Total										0.0E+00
Surface Soil Total											7.1E-02
										Total of Receptor Hazards Across All Media	7.1E-02

N/A = Not Applicable.

Table E.1-29
Calculation of Cancer Risks
Reasonable Maximum Exposure
Future - Maintenance Worker

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				
							Intake/Exposure Concentration		CSF/Unit Risk		
					Value	Units	Value	Units	Value	Units	Cancer Risk
Total Soil	Total Soil	SWMU 50	**Ingestion**	**Organics**							
				TCDD TE	3.30E-05	mg/kg	2.3E-12	mg/kg-day	1.3E+05	$(mg/kg\text{-}day)^{-1}$	3.0E-07
				2,4-Dinitrotoluene	2.37E-01	mg/kg	1.7E-08	mg/kg-day	6.8E-01	$(mg/kg\text{-}day)^{-1}$	1.1E-08
				Aroclor 1254	3.83E-01	mg/kg	2.7E-08	mg/kg-day	2.0E+00	$(mg/kg\text{-}day)^{-1}$	5.4E-08
				Benzo(a)pyrene	3.31E-02	mg/kg	2.3E-09	mg/kg-day	7.3E+00	$(mg/kg\text{-}day)^{-1}$	1.7E-08
				Benzo(b)fluoranthene	3.55E-02	mg/kg	2.5E-09	mg/kg-day	7.3E-01	$(mg/kg\text{-}day)^{-1}$	1.8E-09
				Carbazole	2.63E-02	mg/kg	1.8E-09	mg/kg-day	N/A	$(mg/kg\text{-}day)^{-1}$	---
				Chloroform	1.43E-01	mg/kg	1.0E-08	mg/kg-day	3.1E-02	$(mg/kg\text{-}day)^{-1}$	3.1E-10
				Dibenzofuran	7.51E-02	mg/kg	5.2E-09	mg/kg-day	N/A	$(mg/kg\text{-}day)^{-1}$	---
				Dimethylphthalate	4.96E-01	mg/kg	3.5E-08	mg/kg-day	N/A	$(mg/kg\text{-}day)^{-1}$	---
				Inorganics							
				Aluminum	2.01E+04	mg/kg	1.4E-03	mg/kg-day	N/A	$(mg/kg\text{-}day)^{-1}$	---
				Arsenic	5.62E+00	mg/kg	3.9E-07	mg/kg-day	1.5E+00	$(mg/kg\text{-}day)^{-1}$	5.9E-07
				Chromium III	1.47E+02	mg/kg	1.0E-05	mg/kg-day	N/A	$(mg/kg\text{-}day)^{-1}$	---
				Cobalt	1.14E+01	mg/kg	8.0E-07	mg/kg-day	N/A	$(mg/kg\text{-}day)^{-1}$	---
				Copper	2.22E+02	mg/kg	1.6E-05	mg/kg-day	N/A	$(mg/kg\text{-}day)^{-1}$	---
				Iron	2.34E+04	mg/kg	1.6E-03	mg/kg-day	N/A	$(mg/kg\text{-}day)^{-1}$	---
				Lead	2.94E+02	mg/kg	2.1E-05	mg/kg-day	N/A	$(mg/kg\text{-}day)^{-1}$	---
				Manganese	6.78E+02	mg/kg	4.7E-05	mg/kg-day	N/A	$(mg/kg\text{-}day)^{-1}$	---
				Nickel	5.99E+01	mg/kg	4.2E-06	mg/kg-day	N/A	$(mg/kg\text{-}day)^{-1}$	---
				Vanadium	4.30E+01	mg/kg	3.0E-06	mg/kg-day	N/A	$(mg/kg\text{-}day)^{-1}$	---
			Exp. Route Total								9.7E-07
			Dermal Absorption	**Organics**							
				TCDD TE	3.30E-05	mg/kg	4.6E-13	mg/kg-day	1.3E+05	$(mg/kg\text{-}day)^{-1}$	5.9E-08
				2,4-Dinitrotoluene	2.37E-01	mg/kg	1.1E-08	mg/kg-day	6.8E-01	$(mg/kg\text{-}day)^{-1}$	7.6E-09
				Aroclor 1254	3.83E-01	mg/kg	1.1E-08	mg/kg-day	2.0E+00	$(mg/kg\text{-}day)^{-1}$	2.1E-08
				Benzo(a)pyrene	3.31E-02	mg/kg	1.5E-09	mg/kg-day	7.3E+00	$(mg/kg\text{-}day)^{-1}$	1.1E-08
				Benzo(b)fluoranthene	3.55E-02	mg/kg	1.6E-09	mg/kg-day	7.3E-01	$(mg/kg\text{-}day)^{-1}$	1.2E-09
				Carbazole	2.63E-02	mg/kg	1.2E-09	mg/kg-day	N/A	$(mg/kg\text{-}day)^{-1}$	---
				Chloroform	1.43E-01	mg/kg	2.0E-09	mg/kg-day	3.1E-02	$(mg/kg\text{-}day)^{-1}$	6.1E-11
				Dibenzofuran	7.51E-02	mg/kg	3.5E-09	mg/kg-day	N/A	$(mg/kg\text{-}day)^{-1}$	---
				Dimethylphthalate	4.96E-01	mg/kg	2.3E-08	mg/kg-day	N/A	$(mg/kg\text{-}day)^{-1}$	---
				Inorganics							
				Aluminum	2.01E+04	mg/kg	9.3E-05	mg/kg-day	N/A	$(mg/kg\text{-}day)^{-1}$	---
				Arsenic	5.62E+00	mg/kg	8.3E-08	mg/kg-day	1.5E+00	$(mg/kg\text{-}day)^{-1}$	1.2E-07
				Chromium III	1.47E+02	mg/kg	6.8E-07	mg/kg-day	N/A	$(mg/kg\text{-}day)^{-1}$	---
				Cobalt	1.14E+01	mg/kg	5.3E-08	mg/kg-day	N/A	$(mg/kg\text{-}day)^{-1}$	---
				Copper	2.22E+02	mg/kg	1.0E-06	mg/kg-day	N/A	$(mg/kg\text{-}day)^{-1}$	---
				Iron	2.34E+04	mg/kg	1.1E-04	mg/kg-day	N/A	$(mg/kg\text{-}day)^{-1}$	---
				Lead	2.94E+02	mg/kg	1.4E-06	mg/kg-day	N/A	$(mg/kg\text{-}day)^{-1}$	---
				Manganese	6.78E+02	mg/kg	3.1E-06	mg/kg-day	N/A	$(mg/kg\text{-}day)^{-1}$	---
				Nickel	5.99E+01	mg/kg	2.8E-07	mg/kg-day	N/A	$(mg/kg\text{-}day)^{-1}$	---
				Vanadium	4.30E+01	mg/kg	2.0E-07	mg/kg-day	N/A	$(mg/kg\text{-}day)^{-1}$	---
			Exp. Route Total								2.2E-07
		Exposure Point Total									1.2E-06
	Exposure Media Total										1.2E-06

Table E.1-29
Calculation of Cancer Risks
Reasonable Maximum Exposure
Future - Maintenance Worker

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				
							Intake/Exposure Concentration		CSF/Unit Risk		
					Value	Units	Value	Units	Value	Units	Cancer Risk
Total Soil	Air (Particulates)	SWMU 50	**Inhalation**	**Organics**							
				TCDD TE	4.82E-11	ug/m^3	2.4E-12	ug/m^3	3.8E+01	$(ug/m^3)^{-1}$	9.0E-11
				2,4-Dinitrotoluene	3.46E-07	ug/m^3	1.7E-08	ug/m^3	N/A	$(ug/m^3)^{-1}$	---
				Aroclor 1254	5.59E-07	ug/m^3	2.7E-08	ug/m^3	5.7E-04	$(ug/m^3)^{-1}$	1.6E-11
				Benzo(a)pyrene	4.83E-08	ug/m^3	2.4E-09	ug/m^3	1.1E-03	$(ug/m^3)^{-1}$	2.6E-12
				Benzo(b)fluoranthene	5.18E-08	ug/m^3	2.5E-09	ug/m^3	1.1E-04	$(ug/m^3)^{-1}$	2.8E-13
				Carbazole	3.84E-08	ug/m^3	1.9E-09	ug/m^3	N/A	$(ug/m^3)^{-1}$	---
				Dibenzofuran	1.10E-07	ug/m^3	5.4E-09	ug/m^3	N/A	$(ug/m^3)^{-1}$	---
				Dimethylphthalate	7.24E-07	ug/m^3	3.5E-08	ug/m^3	N/A	$(ug/m^3)^{-1}$	---
				Inorganics							
				Aluminum	2.94E-02	ug/m^3	1.4E-03	ug/m^3	N/A	$(ug/m^3)^{-1}$	---
				Arsenic	8.21E-06	ug/m^3	4.0E-07	ug/m^3	4.3E-03	$(ug/m^3)^{-1}$	1.7E-09
				Chromium (total)	2.15E-04	ug/m^3	1.1E-05	ug/m^3	1.2E-02	$(ug/m^3)^{-1}$	1.3E-07
				Cobalt	1.66E-05	ug/m^3	8.1E-07	ug/m^3	9.0E-03	$(ug/m^3)^{-1}$	7.3E-09
				Copper	3.24E-04	ug/m^3	1.6E-05	ug/m^3	N/A	$(ug/m^3)^{-1}$	---
				Iron	3.42E-02	ug/m^3	1.7E-03	ug/m^3	N/A	$(ug/m^3)^{-1}$	---
				Lead	4.29E-04	ug/m^3	2.1E-05	ug/m^3	N/A	$(ug/m^3)^{-1}$	---
				Manganese	9.90E-04	ug/m^3	4.8E-05	ug/m^3	N/A	$(ug/m^3)^{-1}$	---
				Nickel	8.75E-05	ug/m^3	4.3E-06	ug/m^3	N/A	$(ug/m^3)^{-1}$	---
				Vanadium	6.28E-05	ug/m^3	3.1E-06	ug/m^3	N/A	$(ug/m^3)^{-1}$	---
			Exp. Route Total								1.4E-07
		Exposure Point Total									1.4E-07
	Exposure Media Total										1.4E-07
	Air (Volatiles)	SWMU 50	**Inhalation**	**Organics**							
				Chloroform	7.99E-02	ug/m^3	3.9E-03	mg/m^3	2.3E-05	$(mg/m^3)^{-1}$	9.0E-08
			Exp. Route Total								9.0E-08
		Exposure Point Total									9.0E-08
	Exposure Media Total										9.0E-08
Total Soil Total											1.4E-06

Table E.1-29
Calculation of Cancer Risks
Reasonable Maximum Exposure
Future - Maintenance Worker

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				
							Intake/Exposure Concentration		CSF/Unit Risk		
					Value	Units	Value	Units	Value	Units	Cancer Risk
Surface Soil	Surface Soil	SWMU 50	**Ingestion**	**Organics**							
				TCDD TE	6.17E-05	mg/kg	4.3E-12	mg/kg-day	1.3E+05	$(mg/kg\text{-}day)^{-1}$	5.6E-07
				2,4-Dinitrotoluene	4.44E-01	mg/kg	3.1E-08	mg/kg-day	6.8E-01	$(mg/kg\text{-}day)^{-1}$	2.1E-08
				Aroclor 1254	3.76E-01	mg/kg	2.6E-08	mg/kg-day	2.0E+00	$(mg/kg\text{-}day)^{-1}$	5.3E-08
				Benzo(b)fluoranthene	5.46E-02	mg/kg	3.8E-09	mg/kg-day	7.3E-01	$(mg/kg\text{-}day)^{-1}$	2.8E-09
				Carbazole	2.80E-02	mg/kg	2.0E-09	mg/kg-day	N/A	$(mg/kg\text{-}day)^{-1}$	---
				Dibenzofuran	2.00E-01	mg/kg	1.4E-08	mg/kg-day	N/A	$(mg/kg\text{-}day)^{-1}$	---
				Dimethylphthalate	5.47E-01	mg/kg	3.8E-08	mg/kg-day	N/A	$(mg/kg\text{-}day)^{-1}$	---
				Inorganics							
				Aluminum	1.75E+04	mg/kg	1.2E-03	mg/kg-day	N/A	$(mg/kg\text{-}day)^{-1}$	---
				Arsenic	4.90E+00	mg/kg	3.4E-07	mg/kg-day	1.5E+00	$(mg/kg\text{-}day)^{-1}$	5.1E-07
				Cobalt	1.09E+01	mg/kg	7.6E-07	mg/kg-day	N/A	$(mg/kg\text{-}day)^{-1}$	---
				Iron	2.21E+04	mg/kg	1.5E-03	mg/kg-day	N/A	$(mg/kg\text{-}day)^{-1}$	---
				Manganese	8.73E+02	mg/kg	6.1E-05	mg/kg-day	N/A	$(mg/kg\text{-}day)^{-1}$	---
				Vanadium	4.25E+01	mg/kg	3.0E-06	mg/kg-day	N/A	$(mg/kg\text{-}day)^{-}$	---
			Exp. Route Total								1.2E-06
			Dermal Absorption	**Organics**							
				TCDD TE	6.17E-05	mg/kg	8.5E-13	mg/kg-day	1.3E+05	$(mg/kg\text{-}day)^{-1}$	1.1E-07
				2,4-Dinitrotoluene	4.44E-01	mg/kg	2.1E-08	mg/kg-day	6.8E-01	$(mg/kg\text{-}day)^{-1}$	1.4E-08
				Aroclor 1254	3.76E-01	mg/kg	1.0E-08	mg/kg-day	2.0E+00	$(mg/kg\text{-}day)^{-1}$	2.1E-08
				Benzo(b)fluoranthene	5.46E-02	mg/kg	2.5E-09	mg/kg-day	7.3E-01	$(mg/kg\text{-}day)^{-1}$	1.8E-09
				Carbazole	2.80E-02	mg/kg	1.3E-09	mg/kg-day	N/A	$(mg/kg\text{-}day)^{-1}$	---
				Dibenzofuran	2.00E-01	mg/kg	9.2E-09	mg/kg-day	N/A	$(mg/kg\text{-}day)^{-1}$	---
				Dimethylphthalate	5.47E-01	mg/kg	2.5E-08	mg/kg-day	N/A	$(mg/kg\text{-}day)^{-1}$	---
				Inorganics							
				Aluminum	1.75E+04	mg/kg	8.1E-05	mg/kg-day	N/A	$(mg/kg\text{-}day)^{-1}$	---
				Arsenic	4.90E+00	mg/kg	7.2E-08	mg/kg-day	1.5E+00	$(mg/kg\text{-}day)^{-1}$	1.1E-07
				Cobalt	1.09E+01	mg/kg	5.0E-08	mg/kg-day	N/A	$(mg/kg\text{-}day)^{-1}$	---
				Iron	2.21E+04	mg/kg	1.0E-04	mg/kg-day	N/A	$(mg/kg\text{-}day)^{-1}$	---
				Manganese	8.73E+02	mg/kg	4.0E-06	mg/kg-day	N/A	$(mg/kg\text{-}day)^{-1}$	---
				Vanadium	4.25E+01	mg/kg	2.0E-07	mg/kg-day	N/A	$(mg/kg\text{-}day)^{-}$	---
			Exp. Route Total								2.6E-07
		Exposure Point Total									1.4E-06
	Exposure Media Total										1.4E-06

Table E.1-29
Calculation of Cancer Risks
Reasonable Maximum Exposure
Future - Maintenance Worker

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				
							Intake/Exposure Concentration		CSF/Unit Risk		
					Value	Units	Value	Units	Value	Units	Cancer Risk
Surface Soil	Air (Particulates)	SWMU 50	**Inhalation**	**Organics**							
				TCDD TE	9.01E-11	ug/m^3	4.4E-12	ug/m^3	3.8E+01	$(ug/m^3)^{-1}$	1.7E-10
				2,4-Dinitrotoluene	6.48E-07	ug/m^3	3.2E-08	ug/m^3	N/A	$(ug/m^3)^{-1}$	---
				Aroclor 1254	5.49E-07	ug/m^3	2.7E-08	ug/m^3	5.7E-04	$(ug/m^3)^{-1}$	1.5E-11
				Benzo(b)fluoranthene	7.97E-08	ug/m^3	3.9E-09	ug/m^3	1.1E-04	$(ug/m^3)^{-1}$	4.3E-13
				Carbazole	4.09E-08	ug/m^3	2.0E-09	ug/m^3	N/A	$(ug/m^3)^{-1}$	---
				Dibenzofuran	2.92E-07	ug/m^3	1.4E-08	ug/m^3	N/A	$(ug/m^3)^{-1}$	---
				Dimethylphthalate	7.99E-07	ug/m^3	3.9E-08	ug/m^3	N/A	$(ug/m^3)^{-1}$	---
				Inorganics							
				Aluminum	2.56E-02	ug/m^3	1.3E-03	ug/m^3	N/A	$(ug/m^3)^{-1}$	---
				Arsenic	7.16E-06	ug/m^3	3.5E-07	ug/m^3	4.3E-03	$(ug/m^3)^{-1}$	1.5E-09
				Cobalt	1.59E-05	ug/m^3	7.8E-07	ug/m^3	9.0E-03	$(ug/m^3)^{-1}$	7.0E-09
				Iron	3.23E-02	ug/m^3	1.6E-03	ug/m^3	N/A	$(ug/m^3)^{-1}$	---
				Manganese	1.27E-03	ug/m^3	6.2E-05	ug/m^3	N/A	$(ug/m^3)^{-1}$	---
				Vanadium	6.21E-05	ug/m^3	3.0E-06	ug/m^3	N/A	$(ug/m^3)^{-1}$	---
			Exp. Route Total								8.7E-09
		Exposure Point Total									8.7E-09
	Exposure Media Total										8.7E-09
	Air (Volatiles)	SWMU 50	**Inhalation**	**Organics** No COPC							
			Exp. Route Total								0.0E+00
		Exposure Point Total									0.0E+00
	Exposure Media Total										0.0E+00
Surface Soil Total											1.4E-06
										Total of Receptor Risks Across All Media	1.4E-06

N/A = Not Applicable.

Since surface soil represents the more highly contaminated portion of soil, total risk and hazard estimates are conservatively based on this data grouping.

Table E.1-30
Calculation of Non-cancer Hazards
Reasonable Maximum Exposure
Future - Maintenance Worker

Scenario Timeframe: Future
Receptor Population: Maintenance Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Non-Cancer Hazard Calculations				
							Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
					Value	Units	Value	Units	Value	Units	
Total Soil	Total Soil	SWMU 50	**Ingestion**	**Organics**							
				TCDD TE	3.30E-05	mg/kg	6.5E-12	mg/kg-day	1.0E-09	mg/kg-day	6.5E-03
				2,4-Dinitrotoluene	2.37E-01	mg/kg	4.6E-08	mg/kg-day	2.0E-03	mg/kg-day	2.3E-05
				Aroclor 1254	3.83E-01	mg/kg	7.5E-08	mg/kg-day	2.0E-05	mg/kg-day	3.7E-03
				Benzo(a)pyrene	3.31E-02	mg/kg	6.5E-09	mg/kg-day	N/A	mg/kg-day	---
				Benzo(b)fluoranthene	3.55E-02	mg/kg	6.9E-09	mg/kg-day	N/A	mg/kg-day	---
				Carbazole	2.63E-02	mg/kg	5.1E-09	mg/kg-day	N/A	mg/kg-day	---
				Chloroform	1.43E-01	mg/kg	2.8E-08	mg/kg-day	1.0E-02	mg/kg-day	2.8E-06
				Dibenzofuran	7.51E-02	mg/kg	1.5E-08	mg/kg-day	N/A	mg/kg-day	---
				Dimethylphthalate	4.96E-01	mg/kg	9.7E-08	mg/kg-day	N/A	mg/kg-day	---
				Inorganics							
				Aluminum	2.01E+04	mg/kg	3.9E-03	mg/kg-day	1.0E+00	mg/kg-day	3.9E-03
				Arsenic	5.62E+00	mg/kg	1.1E-06	mg/kg-day	3.0E-04	mg/kg-day	3.7E-03
				Chromium III	1.47E+02	mg/kg	2.9E-05	mg/kg-day	1.5E+00	mg/kg-day	1.9E-05
				Cobalt	1.14E+01	mg/kg	2.2E-06	mg/kg-day	3.0E-04	mg/kg-day	7.4E-03
				Copper	2.22E+02	mg/kg	4.3E-05	mg/kg-day	4.0E-02	mg/kg-day	1.1E-03
				Iron	2.34E+04	mg/kg	4.6E-03	mg/kg-day	7.0E-01	mg/kg-day	6.5E-03
				Lead	2.94E+02	mg/kg	5.8E-05	mg/kg-day	N/A	mg/kg-day	---
				Manganese	6.78E+02	mg/kg	1.3E-04	mg/kg-day	2.4E-02	mg/kg-day	5.5E-03
				Nickel	5.99E+01	mg/kg	1.2E-05	mg/kg-day	2.0E-02	mg/kg-day	5.9E-04
				Vanadium	4.30E+01	mg/kg	8.4E-06	mg/kg-day	5.0E-03	mg/kg-day	1.7E-03
			Exp. Route Total								4.1E-02
			Dermal Absorption	**Organics**							
				TCDD TE	3.30E-05	mg/kg	1.3E-12	mg/kg-day	1.0E-09	mg/kg-day	1.3E-03
				2,4-Dinitrotoluene	2.37E-01	mg/kg	3.1E-08	mg/kg-day	2.0E-03	mg/kg-day	1.6E-05
				Aroclor 1254	3.83E-01	mg/kg	3.0E-08	mg/kg-day	2.0E-05	mg/kg-day	1.5E-03
				Benzo(a)pyrene	3.31E-02	mg/kg	4.3E-09	mg/kg-day	N/A	mg/kg-day	---
				Benzo(b)fluoranthene	3.55E-02	mg/kg	4.6E-09	mg/kg-day	N/A	mg/kg-day	---
				Carbazole	2.63E-02	mg/kg	3.4E-09	mg/kg-day	N/A	mg/kg-day	---
				Chloroform	1.43E-01	mg/kg	5.5E-09	mg/kg-day	1.0E-02	mg/kg-day	5.5E-07
				Dibenzofuran	7.51E-02	mg/kg	9.7E-09	mg/kg-day	N/A	mg/kg-day	---
				Dimethylphthalate	4.96E-01	mg/kg	6.4E-08	mg/kg-day	N/A	mg/kg-day	---
				Inorganics							
				Aluminum	2.01E+04	mg/kg	2.6E-04	mg/kg-day	1.0E+00	mg/kg-day	2.6E-04
				Arsenic	5.62E+00	mg/kg	2.3E-07	mg/kg-day	3.0E-04	mg/kg-day	7.7E-04
				Chromium III	1.47E+02	mg/kg	1.9E-06	mg/kg-day	2.0E-02	mg/kg-day	9.7E-05
				Cobalt	1.14E+01	mg/kg	1.5E-07	mg/kg-day	3.0E-04	mg/kg-day	4.9E-04
				Copper	2.22E+02	mg/kg	2.9E-06	mg/kg-day	4.0E-02	mg/kg-day	7.2E-05
				Iron	2.34E+04	mg/kg	3.0E-04	mg/kg-day	7.0E-01	mg/kg-day	4.3E-04
				Lead	2.94E+02	mg/kg	3.8E-06	mg/kg-day	N/A	mg/kg-day	---
				Manganese	6.78E+02	mg/kg	8.8E-06	mg/kg-day	9.6E-04	mg/kg-day	9.1E-03
				Nickel	5.99E+01	mg/kg	7.7E-07	mg/kg-day	8.0E-04	mg/kg-day	9.7E-04
				Vanadium	4.30E+01	mg/kg	5.6E-07	mg/kg-day	1.3E-04	mg/kg-day	4.3E-03
			Exp. Route Total								1.9E-02
		Exposure Point Total									6.0E-02
	Exposure Media Total										6.0E-02

Table E.1-30
Calculation of Non-cancer Hazards
Reasonable Maximum Exposure
Future - Maintenance Worker

Scenario Timeframe: Future
Receptor Population: Maintenance Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Non-Cancer Hazard Calculations				
							Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
					Value	Units	Value	Units	Value	Units	
Total Soil	Air (Particulates)	SWMU 50	**Inhalation**	**Organics**							
				TCDD TE	4.82E-14	mg/m³	6.6E-15	mg/m³	N/A	(mg/m³)	---
				2,4-Dinitrotoluene	3.46E-10	mg/m³	4.7E-11	mg/m³	N/A	(mg/m³)	---
				Aroclor 1254	5.59E-10	mg/m³	7.7E-11	mg/m³	N/A	(mg/m³)	---
				Benzo(a)pyrene	4.83E-11	mg/m³	6.6E-12	mg/m³	N/A	(mg/m³)	---
				Benzo(b)fluoranthene	5.18E-11	mg/m³	7.1E-12	mg/m³	N/A	(mg/m³)	---
				Carbazole	3.84E-11	mg/m³	5.3E-12	mg/m³	N/A	(mg/m³)	---
				Dibenzofuran	1.10E-10	mg/m³	1.5E-11	mg/m³	N/A	(mg/m³)	---
				Dimethylphthalate	7.24E-10	mg/m³	9.9E-11	mg/m³	N/A	(mg/m³)	---
				Inorganics							
				Aluminum	2.94E-05	mg/m³	4.0E-06	mg/m³	5.0E-03	(mg/m³)	8.0E-04
				Arsenic	8.21E-09	mg/m³	1.1E-09	mg/m³	3.0E-05	(mg/m³)	3.7E-05
				Chromium (total)	2.15E-07	mg/m³	2.9E-08	mg/m³	N/A	(mg/m³)	---
				Cobalt	1.66E-08	mg/m³	2.3E-09	mg/m³	6.0E-06	(mg/m³)	3.8E-04
				Copper	3.24E-07	mg/m³	4.4E-08	mg/m³	N/A	(mg/m³)	---
				Iron	3.42E-05	mg/m³	4.7E-06	mg/m³	N/A	(mg/m³)	---
				Lead	4.29E-07	mg/m³	5.9E-08	mg/m³	N/A	(mg/m³)	---
				Manganese	9.90E-07	mg/m³	1.4E-07	mg/m³	5.0E-05	(mg/m³)	2.7E-03
				Nickel	8.75E-08	mg/m³	1.2E-08	mg/m³	N/A	(mg/m³)	---
				Vanadium	6.28E-08	mg/m³	8.6E-09	mg/m³	N/A	(mg/m³)	---
			Exp. Route Total								3.9E-03
		Exposure Point Total									3.9E-03
	Exposure Media Total										3.9E-03
	Air (Volatiles)	SWMU 50	**Inhalation**	**Organics**							
				Chloroform	7.99E-05	mg/m³	1.1E-05	mg/m³	9.8E-02	(mg/m³)	1.1E-04
			Exp. Route Total								1.1E-04
		Exposure Point Total									1.1E-04
	Exposure Media Total										1.1E-04
Total Soil Total											6.4E-02

Table E.1-30
Calculation of Non-cancer Hazards
Reasonable Maximum Exposure
Future - Maintenance Worker

Scenario Timeframe: Future
Receptor Population: Maintenance Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Non-Cancer Hazard Calculations				
							Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
					Value	Units	Value	Units	Value	Units	
Surface Soil	Surface Soil	SWMU 50	**Ingestion**	**Organics**							
				TCDD TE	6.17E-05	mg/kg	1.2E-11	mg/kg-day	1.0E-09	mg/kg-day	1.2E-02
				2,4-Dinitrotoluene	4.44E-01	mg/kg	8.7E-08	mg/kg-day	2.0E-03	mg/kg-day	4.3E-05
				Aroclor 1254	3.76E-01	mg/kg	7.4E-08	mg/kg-day	2.0E-05	mg/kg-day	3.7E-03
				Benzo(b)fluoranthene	5.46E-02	mg/kg	1.1E-08	mg/kg-day	N/A	mg/kg-day	---
				Carbazole	2.80E-02	mg/kg	5.5E-09	mg/kg-day	N/A	mg/kg-day	---
				Dibenzofuran	2.00E-01	mg/kg	3.9E-08	mg/kg-day	N/A	mg/kg-day	---
				Dimethylphthalate	5.47E-01	mg/kg	1.1E-07	mg/kg-day	N/A	mg/kg-day	---
				Inorganics							
				Aluminum	1.75E+04	mg/kg	3.4E-03	mg/kg-day	1.0E+00	mg/kg-day	3.4E-03
				Arsenic	4.90E+00	mg/kg	9.6E-07	mg/kg-day	3.0E-04	mg/kg-day	3.2E-03
				Cobalt	1.09E+01	mg/kg	2.1E-06	mg/kg-day	3.0E-04	mg/kg-day	7.1E-03
				Iron	2.21E+04	mg/kg	4.3E-03	mg/kg-day	7.0E-01	mg/kg-day	6.2E-03
				Manganese	8.73E+02	mg/kg	1.7E-04	mg/kg-day	2.4E-02	mg/kg-day	7.1E-03
				Vanadium	4.25E+01	mg/kg	8.3E-06	mg/kg-day	5.0E-03	mg/kg-day	1.7E-03
			Exp. Route Total								4.4E-02
			Dermal Absorption	**Organics**							
				TCDD TE	6.17E-05	mg/kg	2.4E-12	mg/kg-day	1.0E-09	mg/kg-day	2.4E-03
				2,4-Dinitrotoluene	4.44E-01	mg/kg	5.8E-08	mg/kg-day	2.0E-03	mg/kg-day	2.9E-05
				Aroclor 1254	3.76E-01	mg/kg	2.9E-08	mg/kg-day	2.0E-05	mg/kg-day	1.5E-03
				Benzo(b)fluoranthene	5.46E-02	mg/kg	7.1E-09	mg/kg-day	N/A	mg/kg-day	---
				Carbazole	2.80E-02	mg/kg	3.6E-09	mg/kg-day	N/A	mg/kg-day	---
				Dibenzofuran	2.00E-01	mg/kg	2.6E-08	mg/kg-day	N/A	mg/kg-day	---
				Dimethylphthalate	5.47E-01	mg/kg	7.1E-08	mg/kg-day	N/A	mg/kg-day	---
				Inorganics							
				Aluminum	1.75E+04	mg/kg	2.3E-04	mg/kg-day	1.0E+00	mg/kg-day	2.3E-04
				Arsenic	4.90E+00	mg/kg	2.0E-07	mg/kg-day	3.0E-04	mg/kg-day	6.8E-04
				Cobalt	1.09E+01	mg/kg	1.4E-07	mg/kg-day	3.0E-04	mg/kg-day	4.7E-04
				Iron	2.21E+04	mg/kg	2.9E-04	mg/kg-day	7.0E-01	mg/kg-day	4.1E-04
				Manganese	8.73E+02	mg/kg	1.1E-05	mg/kg-day	9.6E-04	mg/kg-day	1.2E-02
				Vanadium	4.25E+01	mg/kg	5.5E-07	mg/kg-day	1.3E-04	mg/kg-day	4.2E-03
			Exp. Route Total								2.2E-02
		Exposure Point Total									6.6E-02
	Exposure Media Total										6.6E-02

Table E.1-30
Calculation of Non-cancer Hazards
Reasonable Maximum Exposure
Future - Maintenance Worker

Scenario Timeframe: Future
Receptor Population: Maintenance Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Non-Cancer Hazard Calculations				
							Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
					Value	Units	Value	Units	Value	Units	
Surface Soil	Air (Particulates)	SWMU 50	**Inhalation**	**Organics**							
				TCDD TE	9.01E-14	mg/m^3	1.2E-14	mg/m^3	N/A	(mg/m^3)	---
				2,4-Dinitrotoluene	6.48E-10	mg/m^3	8.9E-11	mg/m^3	N/A	(mg/m^3)	---
				Aroclor 1254	5.49E-10	mg/m^3	7.5E-11	mg/m^3	N/A	(mg/m^3)	---
				Benzo(b)fluoranthene	7.97E-11	mg/m^3	1.1E-11	mg/m^3	N/A	(mg/m^3)	---
				Carbazole	4.09E-11	mg/m^3	5.6E-12	mg/m^3	N/A	(mg/m^3)	---
				Dibenzofuran	2.92E-10	mg/m^3	4.0E-11	mg/m^3	N/A	(mg/m^3)	---
				Dimethylphthalate	7.99E-10	mg/m^3	1.1E-10	mg/m^3	N/A	(mg/m^3)	---
				Inorganics							
				Aluminum	2.56E-05	mg/m^3	3.5E-06	mg/m^3	5.0E-03	(mg/m^3)	7.0E-04
				Arsenic	7.16E-09	mg/m^3	9.8E-10	mg/m^3	3.0E-05	(mg/m^3)	3.3E-05
				Cobalt	1.59E-08	mg/m^3	2.2E-09	mg/m^3	6.0E-06	(mg/m^3)	3.6E-04
				Iron	3.23E-05	mg/m^3	4.4E-06	mg/m^3	N/A	(mg/m^3)	---
				Manganese	1.27E-06	mg/m^3	1.7E-07	mg/m^3	5.0E-05	(mg/m^3)	3.5E-03
				Vanadium	6.21E-08	mg/m^3	8.5E-09	mg/m^3	N/A	(mg/m^3)	---
			Exp. Route Total								4.6E-03
		Exposure Point Total									4.6E-03
	Exposure Media Total										4.6E-03
	Air (Volatiles)	SWMU 50	**Inhalation**	**Organics** No COPCs							
			Exp. Route Total								0.0E+00
		Exposure Point Total									0.0E+00
	Exposure Media Total										0.0E+00
Surface Soil Total											7.1E-02
										Total of Receptor Hazards Across All Media	6.4E-02

N/A = Not Applicable.

Since total soil represents the more highly contaminated portion of soil, total risk and hazard estimates are conservatively based on this data grouping.

Table E.1-31
Calculation of Cancer Risks
Reasonable Maximum Exposure
Future - Industrial Worker

Scenario Timeframe: Future
Receptor Population: Industrial Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations				
							Intake/Exposure Concentration		CSF/Unit Risk		
					Value	Units	Value	Units	Value	Units	Cancer Risk
Total Soil	Total Soil	SWMU 50	**Ingestion**	**Organics**							
				TCDD TE	3.30E-05	mg/kg	1.0E-11	mg/kg-day	1.3E+05	$(mg/kg\text{-}day)^{-1}$	1.3E-06
				2,4-Dinitrotoluene	2.37E-01	mg/kg	7.5E-08	mg/kg-day	6.8E-01	$(mg/kg\text{-}day)^{-1}$	5.1E-08
				Aroclor 1254	3.83E-01	mg/kg	1.2E-07	mg/kg-day	2.0E+00	$(mg/kg\text{-}day)^{-1}$	2.4E-07
				Benzo(a)pyrene	3.31E-02	mg/kg	1.0E-08	mg/kg-day	7.3E+00	$(mg/kg\text{-}day)^{-1}$	7.6E-08
				Benzo(b)fluoranthene	3.55E-02	mg/kg	1.1E-08	mg/kg-day	7.3E-01	$(mg/kg\text{-}day)^{-1}$	8.2E-09
				Carbazole	2.63E-02	mg/kg	8.3E-09	mg/kg-day	N/A	$(mg/kg\text{-}day)^{-1}$	---
				Chloroform	1.43E-01	mg/kg	4.5E-08	mg/kg-day	3.1E-02	$(mg/kg\text{-}day)^{-1}$	1.4E-09
				Dibenzofuran	7.51E-02	mg/kg	2.4E-08	mg/kg-day	N/A	$(mg/kg\text{-}day)^{-1}$	---
				Dimethylphthalate	4.96E-01	mg/kg	1.6E-07	mg/kg-day	N/A	$(mg/kg\text{-}day)^{-1}$	---
				Inorganics							
				Aluminum	2.01E+04	mg/kg	6.3E-03	mg/kg-day	N/A	$(mg/kg\text{-}day)^{-1}$	---
				Arsenic	5.62E+00	mg/kg	1.8E-06	mg/kg-day	1.5E+00	$(mg/kg\text{-}day)^{-1}$	2.7E-06
				Chromium III	1.47E+02	mg/kg	4.6E-05	mg/kg-day	N/A	$(mg/kg\text{-}day)^{-1}$	---
				Cobalt	1.14E+01	mg/kg	3.6E-06	mg/kg-day	N/A	$(mg/kg\text{-}day)^{-1}$	---
				Copper	2.22E+02	mg/kg	7.0E-05	mg/kg-day	N/A	$(mg/kg\text{-}day)^{-1}$	---
				Iron	2.34E+04	mg/kg	7.4E-03	mg/kg-day	N/A	$(mg/kg\text{-}day)^{-1}$	---
				Lead	2.94E+02	mg/kg	9.2E-05	mg/kg-day	N/A	$(mg/kg\text{-}day)^{-1}$	---
				Manganese	6.78E+02	mg/kg	2.1E-04	mg/kg-day	N/A	$(mg/kg\text{-}day)^{-1}$	---
				Nickel	5.99E+01	mg/kg	1.9E-05	mg/kg-day	N/A	$(mg/kg\text{-}day)^{-1}$	---
				Vanadium	4.30E+01	mg/kg	1.4E-05	mg/kg-day	N/A	$(mg/kg\text{-}day)^{-1}$	---
			Exp. Route Total								4.4E-06
			Dermal Absorption	**Organics**							
				TCDD TE	3.30E-05	mg/kg	2.1E-12	mg/kg-day	1.3E+05	$(mg/kg\text{-}day)^{-1}$	2.7E-07
				2,4-Dinitrotoluene	2.37E-01	mg/kg	5.0E-08	mg/kg-day	6.8E-01	$(mg/kg\text{-}day)^{-1}$	3.4E-08
				Aroclor 1254	3.83E-01	mg/kg	4.8E-08	mg/kg-day	2.0E+00	$(mg/kg\text{-}day)^{-1}$	9.5E-08
				Benzo(a)pyrene	3.31E-02	mg/kg	6.9E-09	mg/kg-day	7.3E+00	$(mg/kg\text{-}day)^{-1}$	5.0E-08
				Benzo(b)fluoranthene	3.55E-02	mg/kg	7.4E-09	mg/kg-day	7.3E-01	$(mg/kg\text{-}day)^{-1}$	5.4E-09
				Carbazole	2.63E-02	mg/kg	5.5E-09	mg/kg-day	N/A	$(mg/kg\text{-}day)^{-1}$	---
				Chloroform	1.43E-01	mg/kg	8.9E-09	mg/kg-day	3.1E-02	$(mg/kg\text{-}day)^{-1}$	2.8E-10
				Dibenzofuran	7.51E-02	mg/kg	1.6E-08	mg/kg-day	N/A	$(mg/kg\text{-}day)^{-1}$	---
				Dimethylphthalate	4.96E-01	mg/kg	1.0E-07	mg/kg-day	N/A	$(mg/kg\text{-}day)^{-1}$	---
				Inorganics							
				Aluminum	2.01E+04	mg/kg	4.2E-04	mg/kg-day	N/A	$(mg/kg\text{-}day)^{-1}$	---
				Arsenic	5.62E+00	mg/kg	3.7E-07	mg/kg-day	1.5E+00	$(mg/kg\text{-}day)^{-1}$	5.6E-07
				Chromium III	1.47E+02	mg/kg	3.1E-06	mg/kg-day	N/A	$(mg/kg\text{-}day)^{-1}$	---
				Cobalt	1.14E+01	mg/kg	2.4E-07	mg/kg-day	N/A	$(mg/kg\text{-}day)^{-1}$	---
				Copper	2.22E+02	mg/kg	4.6E-06	mg/kg-day	N/A	$(mg/kg\text{-}day)^{-1}$	---
				Iron	2.34E+04	mg/kg	4.9E-04	mg/kg-day	N/A	$(mg/kg\text{-}day)^{-1}$	---
				Lead	2.94E+02	mg/kg	6.1E-06	mg/kg-day	N/A	$(mg/kg\text{-}day)^{-1}$	---
				Manganese	6.78E+02	mg/kg	1.4E-05	mg/kg-day	N/A	$(mg/kg\text{-}day)^{-1}$	---
				Nickel	5.99E+01	mg/kg	1.2E-06	mg/kg-day	N/A	$(mg/kg\text{-}day)^{-1}$	---
				Vanadium	4.30E+01	mg/kg	8.9E-07	mg/kg-day	N/A	$(mg/kg\text{-}day)^{-1}$	---
			Exp. Route Total								1.0E-06
		Exposure Point Total									5.4E-06
	Exposure Media Total										5.4E-06

Table E.1-31
Calculation of Cancer Risks
Reasonable Maximum Exposure
Future - Industrial Worker

Scenario Timeframe: Future
Receptor Population: Industrial Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations				
							Intake/Exposure Concentration		CSF/Unit Risk		
					Value	Units	Value	Units	Value	Units	Cancer Risk
Total Soil	Air (Particulates)	SWMU 50	**Inhalation**	**Organics**							
				TCDD TE	4.82E-11	ug/m^3	1.1E-11	ug/m^3	3.8E+01	(ug/m^3)$^{-1}$	4.0E-10
				2,4-Dinitrotoluene	3.46E-07	ug/m^3	7.6E-08	ug/m^3	N/A	(ug/m^3)$^{-1}$	---
				Aroclor 1254	5.59E-07	ug/m^3	1.2E-07	ug/m^3	5.7E-04	(ug/m^3)$^{-1}$	7.0E-11
				Benzo(a)pyrene	4.83E-08	ug/m^3	1.1E-08	ug/m^3	1.1E-03	(ug/m^3)$^{-1}$	1.2E-11
				Benzo(b)fluoranthene	5.18E-08	ug/m^3	1.1E-08	ug/m^3	1.1E-04	(ug/m^3)$^{-1}$	1.3E-12
				Carbazole	3.84E-08	ug/m^3	8.5E-09	ug/m^3	N/A	(ug/m^3)$^{-1}$	---
				Dibenzofuran	1.10E-07	ug/m^3	2.4E-08	ug/m^3	N/A	(ug/m^3)$^{-1}$	---
				Dimethylphthalate	7.24E-07	ug/m^3	1.6E-07	ug/m^3	N/A	(ug/m^3)$^{-1}$	---
				Inorganics							
				Aluminum	2.94E-02	ug/m^3	6.5E-03	ug/m^3	N/A	(ug/m^3)$^{-1}$	---
				Arsenic	8.21E-06	ug/m^3	1.8E-06	ug/m^3	4.3E-03	(ug/m^3)$^{-1}$	7.8E-09
				Chromium (total)	2.15E-04	ug/m^3	4.7E-05	ug/m^3	1.2E-02	(ug/m^3)$^{-1}$	5.7E-07
				Cobalt	1.66E-05	ug/m^3	3.7E-06	ug/m^3	9.0E-03	(ug/m^3)$^{-1}$	3.3E-08
				Copper	3.24E-04	ug/m^3	7.1E-05	ug/m^3	N/A	(ug/m^3)$^{-1}$	---
				Iron	3.42E-02	ug/m^3	7.5E-03	ug/m^3	N/A	(ug/m^3)$^{-1}$	---
				Lead	4.29E-04	ug/m^3	9.5E-05	ug/m^3	N/A	(ug/m^3)$^{-1}$	---
				Manganese	9.90E-04	ug/m^3	2.2E-04	ug/m^3	N/A	(ug/m^3)$^{-1}$	---
				Nickel	8.75E-05	ug/m^3	1.9E-05	ug/m^3	N/A	(ug/m^3)$^{-1}$	---
				Vanadium	6.28E-05	ug/m^3	1.4E-05	ug/m^3	N/A	(ug/m^3)$^{-1}$	---
			Exp. Route Total								6.1E-07
		Exposure Point Total									6.1E-07
	Exposure Media Total										6.1E-07
	Air (Volatiles)	SWMU 50	**Inhalation**	**Organics**							
				Chloroform	7.99E-02	ug/m^3	1.8E-02	ug/m^3	2.3E-05	(ug/m^3)$^{-1}$	4.0E-07
			Exp. Route Total								4.0E-07
		Exposure Point Total									4.0E-07
	Exposure Media Total										4.0E-07
Total Soil Total											6.4E-06

Table E.1-31
Calculation of Cancer Risks
Reasonable Maximum Exposure
Future - Industrial Worker

Scenario Timeframe: Future
Receptor Population: Industrial Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations				
							Intake/Exposure Concentration		CSF/Unit Risk		
					Value	Units	Value	Units	Value	Units	Cancer Risk
Surface Soil	Surface Soil	SWMU 50	**Ingestion**	**Organics**							
				TCDD TE	6.17E-05	mg/kg	1.9E-11	mg/kg-day	1.3E+05	$(mg/kg\text{-}day)^{-1}$	2.5E-06
				2,4-Dinitrotoluene	4.44E-01	mg/kg	1.4E-07	mg/kg-day	6.8E-01	$(mg/kg\text{-}day)^{-1}$	9.5E-08
				Aroclor 1254	3.76E-01	mg/kg	1.2E-07	mg/kg-day	2.0E+00	$(mg/kg\text{-}day)^{-1}$	2.4E-07
				Benzo(b)fluoranthene	5.46E-02	mg/kg	1.7E-08	mg/kg-day	7.3E-01	$(mg/kg\text{-}day)^{-1}$	1.3E-08
				Carbazole	2.80E-02	mg/kg	8.8E-09	mg/kg-day	N/A	$(mg/kg\text{-}day)^{-1}$	---
				Dibenzofuran	2.00E-01	mg/kg	6.3E-08	mg/kg-day	N/A	$(mg/kg\text{-}day)^{-1}$	---
				Dimethylphthalate	5.47E-01	mg/kg	1.7E-07	mg/kg-day	N/A	$(mg/kg\text{-}day)^{-1}$	---
				Inorganics							
				Aluminum	1.75E+04	mg/kg	5.5E-03	mg/kg-day	N/A	$(mg/kg\text{-}day)^{-1}$	---
				Arsenic	4.90E+00	mg/kg	1.5E-06	mg/kg-day	1.5E+00	$(mg/kg\text{-}day)^{-1}$	2.3E-06
				Cobalt	1.09E+01	mg/kg	3.4E-06	mg/kg-day	N/A	$(mg/kg\text{-}day)^{-1}$	---
				Iron	2.21E+04	mg/kg	7.0E-03	mg/kg-day	N/A	$(mg/kg\text{-}day)^{-1}$	---
				Manganese	8.73E+02	mg/kg	2.7E-04	mg/kg-day	N/A	$(mg/kg\text{-}day)^{-1}$	---
				Vanadium	4.25E+01	mg/kg	1.3E-05	mg/kg-day	N/A	$(mg/kg\text{-}day)^{-}$	---
			Exp. Route Total								5.2E-06
			Dermal Absorption	**Organics**							
				TCDD TE	6.17E-05	mg/kg	3.8E-12	mg/kg-day	1.3E+05	$(mg/kg\text{-}day)^{-1}$	5.0E-07
				2,4-Dinitrotoluene	4.44E-01	mg/kg	9.4E-08	mg/kg-day	6.8E-01	$(mg/kg\text{-}day)^{-1}$	6.4E-08
				Aroclor 1254	3.76E-01	mg/kg	4.7E-08	mg/kg-day	2.0E+00	$(mg/kg\text{-}day)^{-1}$	9.4E-08
				Benzo(b)fluoranthene	5.46E-02	mg/kg	1.1E-08	mg/kg-day	7.3E-01	$(mg/kg\text{-}day)^{-1}$	8.3E-09
				Carbazole	2.80E-02	mg/kg	5.8E-09	mg/kg-day	N/A	$(mg/kg\text{-}day)^{-1}$	---
				Dibenzofuran	2.00E-01	mg/kg	4.2E-08	mg/kg-day	N/A	$(mg/kg\text{-}day)^{-1}$	---
				Dimethylphthalate	5.47E-01	mg/kg	1.1E-07	mg/kg-day	N/A	$(mg/kg\text{-}day)^{-1}$	---
				Inorganics							
				Aluminum	1.75E+04	mg/kg	3.6E-04	mg/kg-day	N/A	$(mg/kg\text{-}day)^{-1}$	---
				Arsenic	4.90E+00	mg/kg	3.3E-07	mg/kg-day	1.5E+00	$(mg/kg\text{-}day)^{-1}$	4.9E-07
				Cobalt	1.09E+01	mg/kg	2.3E-07	mg/kg-day	N/A	$(mg/kg\text{-}day)^{-1}$	---
				Iron	2.21E+04	mg/kg	4.6E-04	mg/kg-day	N/A	$(mg/kg\text{-}day)^{-1}$	---
				Manganese	8.73E+02	mg/kg	1.8E-05	mg/kg-day	N/A	$(mg/kg\text{-}day)^{-1}$	---
				Vanadium	4.25E+01	mg/kg	8.8E-07	mg/kg-day	N/A	$(mg/kg\text{-}day)^{-}$	---
			Exp. Route Total								1.2E-06
		Exposure Point Total									6.3E-06
	Exposure Media Total										6.3E-06

Table E.1-31
Calculation of Cancer Risks
Reasonable Maximum Exposure
Future - Industrial Worker

Scenario Timeframe: Future
Receptor Population: Industrial Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations				
							Intake/Exposure Concentration		CSF/Unit Risk		
					Value	Units	Value	Units	Value	Units	Cancer Risk
Surface Soil	Air (Particulates)	SWMU 50	**Inhalation**	**Organics**							
				TCDD TE	9.01E-11	ug/m^3	2.0E-11	ug/m^3	3.8E+01	$(ug/m^3)^{-1}$	7.5E-10
				2,4-Dinitrotoluene	6.48E-07	ug/m^3	1.4E-07	ug/m^3	N/A	$(ug/m^3)^{-1}$	---
				Aroclor 1254	5.49E-07	ug/m^3	1.2E-07	ug/m^3	5.7E-04	$(ug/m^3)^{-1}$	6.9E-11
				Benzo(b)fluoranthene	7.97E-08	ug/m^3	1.8E-08	ug/m^3	1.1E-04	$(ug/m^3)^{-1}$	1.9E-12
				Carbazole	4.09E-08	ug/m^3	9.0E-09	ug/m^3	N/A	$(ug/m^3)^{-1}$	---
				Dibenzofuran	2.92E-07	ug/m^3	6.4E-08	ug/m^3	N/A	$(ug/m^3)^{-1}$	---
				Dimethylphthalate	7.99E-07	ug/m^3	1.8E-07	ug/m^3	N/A	$(ug/m^3)^{-1}$	---
				Inorganics							
				Aluminum	2.56E-02	ug/m^3	5.6E-03	ug/m^3	N/A	$(ug/m^3)^{-1}$	---
				Arsenic	7.16E-06	ug/m^3	1.6E-06	ug/m^3	4.3E-03	$(ug/m^3)^{-1}$	6.8E-09
				Cobalt	1.59E-05	ug/m^3	3.5E-06	ug/m^3	9.0E-03	$(ug/m^3)^{-1}$	3.2E-08
				Iron	3.23E-02	ug/m^3	7.1E-03	ug/m^3	N/A	$(ug/m^3)^{-1}$	---
				Manganese	1.27E-03	ug/m^3	2.8E-04	ug/m^3	N/A	$(ug/m^3)^{-1}$	---
				Vanadium	6.21E-05	ug/m^3	1.4E-05	ug/m^3	N/A	$(ug/m^3)^{-1}$	---
			Exp. Route Total								3.9E-08
		Exposure Point Total									3.9E-08
	Exposure Media Total										3.9E-08
	Air (Volatiles)	SWMU 50	**Inhalation**	**Organics** No COPCs							
			Exp. Route Total								0.0E+00
		Exposure Point Total									0.0E+00
	Exposure Media Total										0.0E+00
Surface Soil Total											6.4E-06
										Total of Receptor Risks Across All Media	6.4E-06

N/A = Not Applicable.

Since surface soil represents the more highly contaminated portion of soil, total risk and hazard estimates are conservatively based on this data grouping.

Table E.1-32
Calculation of Non-cancer Hazards
Reasonable Maximum Exposure
Future - Industrial Worker

Scenario Timeframe: Future
Receptor Population: Industrial Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Non-Cancer Hazard Calculations				
							Intake/Exposure Concentration		RfD/RfC		Hazard
					Value	Units	Value	Units	Value	Units	Quotient
Total Soil	Total Soil	SWMU 50	**Ingestion**	**Organics**							
				TCDD TE	3.30E-05	mg/kg	2.9E-11	mg/kg-day	1.0E-09	mg/kg-day	2.9E-02
				2,4-Dinitrotoluene	2.37E-01	mg/kg	2.1E-07	mg/kg-day	2.0E-03	mg/kg-day	1.0E-04
				Aroclor 1254	3.83E-01	mg/kg	3.4E-07	mg/kg-day	2.0E-05	mg/kg-day	1.7E-02
				Benzo(a)pyrene	3.31E-02	mg/kg	2.9E-08	mg/kg-day	N/A	mg/kg-day	---
				Benzo(b)fluoranthene	3.55E-02	mg/kg	3.1E-08	mg/kg-day	N/A	mg/kg-day	---
				Carbazole	2.63E-02	mg/kg	2.3E-08	mg/kg-day	N/A	mg/kg-day	---
				Chloroform	1.43E-01	mg/kg	1.3E-07	mg/kg-day	1.0E-02	mg/kg-day	1.3E-05
				Dibenzofuran	7.51E-02	mg/kg	6.6E-08	mg/kg-day	N/A	mg/kg-day	---
				Dimethylphthalate	4.96E-01	mg/kg	4.4E-07	mg/kg-day	N/A	mg/kg-day	---
				Inorganics							
				Aluminum	2.01E+04	mg/kg	1.8E-02	mg/kg-day	1.0E+00	mg/kg-day	1.8E-02
				Arsenic	5.62E+00	mg/kg	4.9E-06	mg/kg-day	3.0E-04	mg/kg-day	1.6E-02
				Chromium III	1.47E+02	mg/kg	1.3E-04	mg/kg-day	1.5E+00	mg/kg-day	8.6E-05
				Cobalt	1.14E+01	mg/kg	1.0E-05	mg/kg-day	3.0E-04	mg/kg-day	3.3E-02
				Copper	2.22E+02	mg/kg	2.0E-04	mg/kg-day	4.0E-02	mg/kg-day	4.9E-03
				Iron	2.34E+04	mg/kg	2.1E-02	mg/kg-day	7.0E-01	mg/kg-day	2.9E-02
				Lead	2.94E+02	mg/kg	2.6E-04	mg/kg-day	N/A	mg/kg-day	---
				Manganese	6.78E+02	mg/kg	6.0E-04	mg/kg-day	2.4E-02	mg/kg-day	2.5E-02
				Nickel	5.99E+01	mg/kg	5.3E-05	mg/kg-day	2.0E-02	mg/kg-day	2.6E-03
				Vanadium	4.30E+01	mg/kg	3.8E-05	mg/kg-day	5.0E-03	mg/kg-day	7.6E-03
			Exp. Route Total								1.8E-01
			Dermal Absorption	**Organics**							
				TCDD TE	3.30E-05	mg/kg	5.8E-12	mg/kg-day	1.0E-09	mg/kg-day	5.8E-03
				2,4-Dinitrotoluene	2.37E-01	mg/kg	1.4E-07	mg/kg-day	2.0E-03	mg/kg-day	7.0E-05
				Aroclor 1254	3.83E-01	mg/kg	1.3E-07	mg/kg-day	2.0E-05	mg/kg-day	6.7E-03
				Benzo(a)pyrene	3.31E-02	mg/kg	1.9E-08	mg/kg-day	N/A	mg/kg-day	---
				Benzo(b)fluoranthene	3.55E-02	mg/kg	2.1E-08	mg/kg-day	N/A	mg/kg-day	---
				Carbazole	2.63E-02	mg/kg	1.5E-08	mg/kg-day	N/A	mg/kg-day	---
				Chloroform	1.43E-01	mg/kg	2.5E-08	mg/kg-day	1.0E-02	mg/kg-day	2.5E-06
				Dibenzofuran	7.51E-02	mg/kg	4.4E-08	mg/kg-day	N/A	mg/kg-day	---
				Dimethylphthalate	4.96E-01	mg/kg	2.9E-07	mg/kg-day	N/A	mg/kg-day	---
				Inorganics							
				Aluminum	2.01E+04	mg/kg	1.2E-03	mg/kg-day	1.0E+00	mg/kg-day	1.2E-03
				Arsenic	5.62E+00	mg/kg	1.0E-06	mg/kg-day	3.0E-04	mg/kg-day	3.5E-03
				Chromium III	1.47E+02	mg/kg	8.5E-06	mg/kg-day	2.0E-02	mg/kg-day	4.4E-04
				Cobalt	1.14E+01	mg/kg	6.6E-07	mg/kg-day	3.0E-04	mg/kg-day	2.2E-03
				Copper	2.22E+02	mg/kg	1.3E-05	mg/kg-day	4.0E-02	mg/kg-day	3.2E-04
				Iron	2.34E+04	mg/kg	1.4E-03	mg/kg-day	7.0E-01	mg/kg-day	1.9E-03
				Lead	2.94E+02	mg/kg	1.7E-05	mg/kg-day	N/A	mg/kg-day	---
				Manganese	6.78E+02	mg/kg	3.9E-05	mg/kg-day	9.6E-04	mg/kg-day	4.1E-02
				Nickel	5.99E+01	mg/kg	3.5E-06	mg/kg-day	8.0E-04	mg/kg-day	4.4E-03
				Vanadium	4.30E+01	mg/kg	2.5E-06	mg/kg-day	1.3E-04	mg/kg-day	1.9E-02
			Exp. Route Total								8.7E-02
		Exposure Point Total									2.7E-01
	Exposure Media Total										2.7E-01

Table E.1-32
Calculation of Non-cancer Hazards
Reasonable Maximum Exposure
Future - Industrial Worker

Scenario Timeframe: Future
Receptor Population: Industrial Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Non-Cancer Hazard Calculations				
							Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
					Value	Units	Value	Units	Value	Units	
Total Soil	Air (Particulates)	SWMU 50	**Inhalation**	**Organics**							
				TCDD TE	4.82E-14	mg/m^3	3.0E-14	mg/m^3	N/A	(mg/m^3)	---
				2,4-Dinitrotoluene	3.46E-10	mg/m^3	2.1E-10	mg/m^3	N/A	(mg/m^3)	---
				Aroclor 1254	5.59E-10	mg/m^3	3.4E-10	mg/m^3	N/A	(mg/m^3)	---
				Benzo(a)pyrene	4.83E-11	mg/m^3	3.0E-11	mg/m^3	N/A	(mg/m^3)	---
				Benzo(b)fluoranthene	5.18E-11	mg/m^3	3.2E-11	mg/m^3	N/A	(mg/m^3)	---
				Carbazole	3.84E-11	mg/m^3	2.4E-11	mg/m^3	N/A	(mg/m^3)	---
				Dibenzofuran	1.10E-10	mg/m^3	6.8E-11	mg/m^3	N/A	(mg/m^3)	---
				Dimethylphthalate	7.24E-10	mg/m^3	4.5E-10	mg/m^3	N/A	(mg/m^3)	---
				Inorganics							
				Aluminum	2.94E-05	mg/m^3	1.8E-05	mg/m^3	5.0E-03	(mg/m^3)	3.6E-03
				Arsenic	8.21E-09	mg/m^3	5.1E-09	mg/m^3	3.0E-05	(mg/m^3)	1.7E-04
				Chromium (total)	2.15E-07	mg/m^3	1.3E-07	mg/m^3	N/A	(mg/m^3)	---
				Cobalt	1.66E-08	mg/m^3	1.0E-08	mg/m^3	6.0E-06	(mg/m^3)	1.7E-03
				Copper	3.24E-07	mg/m^3	2.0E-07	mg/m^3	N/A	(mg/m^3)	---
				Iron	3.42E-05	mg/m^3	2.1E-05	mg/m^3	N/A	(mg/m^3)	---
				Lead	4.29E-07	mg/m^3	2.6E-07	mg/m^3	N/A	(mg/m^3)	---
				Manganese	9.90E-07	mg/m^3	6.1E-07	mg/m^3	5.0E-05	(mg/m^3)	1.2E-02
				Nickel	8.75E-08	mg/m^3	5.4E-08	mg/m^3	N/A	(mg/m^3)	---
				Vanadium	6.28E-08	mg/m^3	3.9E-08	mg/m^3	N/A	(mg/m^3)	---
			Exp. Route Total								1.8E-02
		Exposure Point Total									1.8E-02
	Exposure Media Total										1.8E-02
	Air (Volatiles)	SWMU 50	**Inhalation**	**Organics**							
				Chloroform	7.99E-05	mg/m^3	4.9E-05	mg/m^3	9.8E-02	(mg/m^3)	5.0E-04
			Exp. Route Total								5.0E-04
		Exposure Point Total									5.0E-04
	Exposure Media Total										5.0E-04
Total Soil Total											2.9E-01

Table E.1-32
Calculation of Non-cancer Hazards
Reasonable Maximum Exposure
Future - Industrial Worker

Scenario Timeframe: Future
Receptor Population: Industrial Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Non-Cancer Hazard Calculations				
							Intake/Exposure Concentration		RfD/RfC		Hazard
					Value	Units	Value	Units	Value	Units	Quotient
Surface Soil	Surface Soil	SWMU 50	**Ingestion**	**Organics**							
				TCDD TE	6.17E-05	mg/kg	5.4E-11	mg/kg-day	1.0E-09	mg/kg-day	5.4E-02
				2,4-Dinitrotoluene	4.44E-01	mg/kg	3.9E-07	mg/kg-day	2.0E-03	mg/kg-day	2.0E-04
				Aroclor 1254	3.76E-01	mg/kg	3.3E-07	mg/kg-day	2.0E-05	mg/kg-day	1.7E-02
				Benzo(b)fluoranthene	5.46E-02	mg/kg	4.8E-08	mg/kg-day	N/A	mg/kg-day	---
				Carbazole	2.80E-02	mg/kg	2.5E-08	mg/kg-day	N/A	mg/kg-day	---
				Dibenzofuran	2.00E-01	mg/kg	1.8E-07	mg/kg-day	N/A	mg/kg-day	---
				Dimethylphthalate	5.47E-01	mg/kg	4.8E-07	mg/kg-day	N/A	mg/kg-day	---
				Inorganics							
				Aluminum	1.75E+04	mg/kg	1.5E-02	mg/kg-day	1.0E+00	mg/kg-day	1.5E-02
				Arsenic	4.90E+00	mg/kg	4.3E-06	mg/kg-day	3.0E-04	mg/kg-day	1.4E-02
				Cobalt	1.09E+01	mg/kg	9.6E-06	mg/kg-day	3.0E-04	mg/kg-day	3.2E-02
				Iron	2.21E+04	mg/kg	1.9E-02	mg/kg-day	7.0E-01	mg/kg-day	2.8E-02
				Manganese	8.73E+02	mg/kg	7.7E-04	mg/kg-day	2.4E-02	mg/kg-day	3.2E-02
				Vanadium	4.25E+01	mg/kg	3.7E-05	mg/kg-day	5.0E-03	mg/kg-day	7.5E-03
			Exp. Route Total								2.0E-01
			Dermal Absorption	**Organics**							
				TCDD TE	6.17E-05	mg/kg	1.1E-11	mg/kg-day	1.0E-09	mg/kg-day	1.1E-02
				2,4-Dinitrotoluene	4.44E-01	mg/kg	2.6E-07	mg/kg-day	2.0E-03	mg/kg-day	1.3E-04
				Aroclor 1254	3.76E-01	mg/kg	1.3E-07	mg/kg-day	2.0E-05	mg/kg-day	6.6E-03
				Benzo(b)fluoranthene	5.46E-02	mg/kg	3.2E-08	mg/kg-day	N/A	mg/kg-day	---
				Carbazole	2.80E-02	mg/kg	1.6E-08	mg/kg-day	N/A	mg/kg-day	---
				Dibenzofuran	2.00E-01	mg/kg	1.2E-07	mg/kg-day	N/A	mg/kg-day	---
				Dimethylphthalate	5.47E-01	mg/kg	3.2E-07	mg/kg-day	N/A	mg/kg-day	---
				Inorganics							
				Aluminum	1.75E+04	mg/kg	1.0E-03	mg/kg-day	1.0E+00	mg/kg-day	1.0E-03
				Arsenic	4.90E+00	mg/kg	9.1E-07	mg/kg-day	3.0E-04	mg/kg-day	3.0E-03
				Cobalt	1.09E+01	mg/kg	6.3E-07	mg/kg-day	3.0E-04	mg/kg-day	2.1E-03
				Iron	2.21E+04	mg/kg	1.3E-03	mg/kg-day	7.0E-01	mg/kg-day	1.8E-03
				Manganese	8.73E+02	mg/kg	5.1E-05	mg/kg-day	9.6E-04	mg/kg-day	5.3E-02
				Vanadium	4.25E+01	mg/kg	2.5E-06	mg/kg-day	1.3E-04	mg/kg-day	1.9E-02
			Exp. Route Total								9.7E-02
		Exposure Point Total									3.0E-01
	Exposure Media Total										3.0E-01

Table E.1-32
Calculation of Non-cancer Hazards
Reasonable Maximum Exposure
Future - Industrial Worker

Scenario Timeframe: Future
Receptor Population: Industrial Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Non-Cancer Hazard Calculations				
							Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
					Value	Units	Value	Units	Value	Units	
Surface Soil	Air (Particulates)	SWMU 50	**Inhalation**	**Organics**							
				TCDD TE	9.01E-14	mg/m^3	5.6E-14	mg/m^3	N/A	(mg/m^3)	---
				2,4-Dinitrotoluene	6.48E-10	mg/m^3	4.0E-10	mg/m^3	N/A	(mg/m^3)	---
				Aroclor 1254	5.49E-10	mg/m^3	3.4E-10	mg/m^3	N/A	(mg/m^3)	---
				Benzo(b)fluoranthene	7.97E-11	mg/m^3	4.9E-11	mg/m^3	N/A	(mg/m^3)	---
				Carbazole	4.09E-11	mg/m^3	2.5E-11	mg/m^3	N/A	(mg/m^3)	---
				Dibenzofuran	2.92E-10	mg/m^3	1.8E-10	mg/m^3	N/A	(mg/m^3)	---
				Dimethylphthalate	7.99E-10	mg/m^3	4.9E-10	mg/m^3	N/A	(mg/m^3)	---
				Inorganics							
				Aluminum	2.56E-05	mg/m^3	1.6E-05	mg/m^3	5.0E-03	(mg/m^3)	3.2E-03
				Arsenic	7.16E-09	mg/m^3	4.4E-09	mg/m^3	3.0E-05	(mg/m^3)	1.5E-04
				Cobalt	1.59E-08	mg/m^3	9.8E-09	mg/m^3	6.0E-06	(mg/m^3)	1.6E-03
				Iron	3.23E-05	mg/m^3	2.0E-05	mg/m^3	N/A	(mg/m^3)	---
				Manganese	1.27E-06	mg/m^3	7.9E-07	mg/m^3	5.0E-05	(mg/m^3)	1.6E-02
				Vanadium	6.21E-08	mg/m^3	3.8E-08	mg/m^3	N/A	(mg/m^3)	---
			Exp. Route Total								2.1E-02
		Exposure Point Total									2.1E-02
	Exposure Media Total										2.1E-02
	Air (Volatiles)	SWMU 50	**Inhalation**	**Organics** No COPCs							
			Exp. Route Total								0.0E+00
		Exposure Point Total									0.0E+00
	Exposure Media Total										0.0E+00
Surface Soil Total											3.2E-01
										Total of Receptor Hazards Across All Media	2.9E-01

N/A = Not Applicable.

Since total soil represents the more highly contaminated portion of soil, total risk and hazard estimates are conservatively based on this data grouping.

Table E.1-33
Calculation of Cancer Risks
Reasonable Maximum Exposure
Future - Excavation Worker

Scenario Timeframe: Future
Receptor Population: Excavation Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations				
							Intake/Exposure Concentration		CSF/Unit Risk		
					Value	Units	Value	Units	Value	Units	Cancer Risk
Total Soil	Total Soil	SWMU 50	**Ingestion**	**Organics**							
				TCDD TE	3.30E-05	mg/kg	1.5E-12	mg/kg-day	1.3E+05	$(mg/kg\text{-}day)^{-1}$	2.0E-07
				2,4-Dinitrotoluene	2.37E-01	mg/kg	1.1E-08	mg/kg-day	6.8E-01	$(mg/kg\text{-}day)^{-1}$	7.4E-09
				Aroclor 1254	3.83E-01	mg/kg	1.8E-08	mg/kg-day	2.0E+00	$(mg/kg\text{-}day)^{-1}$	3.5E-08
				Benzo(a)pyrene	3.31E-02	mg/kg	1.5E-09	mg/kg-day	7.3E+00	$(mg/kg\text{-}day)^{-1}$	1.1E-08
				Benzo(b)fluoranthene	3.55E-02	mg/kg	1.6E-09	mg/kg-day	7.3E-01	$(mg/kg\text{-}day)^{-1}$	1.2E-09
				Carbazole	2.63E-02	mg/kg	1.2E-09	mg/kg-day	N/A	$(mg/kg\text{-}day)^{-1}$	---
				Chloroform	1.43E-01	mg/kg	6.6E-09	mg/kg-day	3.1E-02	$(mg/kg\text{-}day)^{-1}$	2.0E-10
				Dibenzofuran	7.51E-02	mg/kg	3.5E-09	mg/kg-day	N/A	$(mg/kg\text{-}day)^{-1}$	---
				Dimethylphthalate	4.96E-01	mg/kg	2.3E-08	mg/kg-day	N/A	$(mg/kg\text{-}day)^{-1}$	---
				Inorganics							
				Aluminum	2.01E+04	mg/kg	9.3E-04	mg/kg-day	N/A	$(mg/kg\text{-}day)^{-1}$	---
				Arsenic	5.62E+00	mg/kg	2.6E-07	mg/kg-day	1.5E+00	$(mg/kg\text{-}day)^{-1}$	3.9E-07
				Chromium III	1.47E+02	mg/kg	6.8E-06	mg/kg-day	N/A	$(mg/kg\text{-}day)^{-1}$	---
				Cobalt	1.14E+01	mg/kg	5.3E-07	mg/kg-day	N/A	$(mg/kg\text{-}day)^{-1}$	---
				Copper	2.22E+02	mg/kg	1.0E-05	mg/kg-day	N/A	$(mg/kg\text{-}day)^{-1}$	---
				Iron	2.34E+04	mg/kg	1.1E-03	mg/kg-day	N/A	$(mg/kg\text{-}day)^{-1}$	---
				Lead	2.94E+02	mg/kg	1.4E-05	mg/kg-day	N/A	$(mg/kg\text{-}day)^{-1}$	---
				Manganese	6.78E+02	mg/kg	3.1E-05	mg/kg-day	N/A	$(mg/kg\text{-}day)^{-1}$	---
				Nickel	5.99E+01	mg/kg	2.8E-06	mg/kg-day	N/A	$(mg/kg\text{-}day)^{-1}$	---
				Vanadium	4.30E+01	mg/kg	2.0E-06	mg/kg-day	N/A	$(mg/kg\text{-}day)^{-1}$	---
			Exp. Route Total								6.4E-07
			Dermal Absorption	**Organics**							
				TCDD TE	3.30E-05	mg/kg	1.4E-13	mg/kg-day	1.3E+05	$(mg/kg\text{-}day)^{-1}$	1.8E-08
				2,4-Dinitrotoluene	2.37E-01	mg/kg	3.3E-09	mg/kg-day	6.8E-01	$(mg/kg\text{-}day)^{-1}$	2.3E-09
				Aroclor 1254	3.83E-01	mg/kg	3.2E-09	mg/kg-day	2.0E+00	$(mg/kg\text{-}day)^{-1}$	6.4E-09
				Benzo(a)pyrene	3.31E-02	mg/kg	4.6E-10	mg/kg-day	7.3E+00	$(mg/kg\text{-}day)^{-1}$	3.3E-09
				Benzo(b)fluoranthene	3.55E-02	mg/kg	4.9E-10	mg/kg-day	7.3E-01	$(mg/kg\text{-}day)^{-1}$	3.6E-10
				Carbazole	2.63E-02	mg/kg	3.6E-10	mg/kg-day	N/A	$(mg/kg\text{-}day)^{-1}$	---
				Chloroform	1.43E-01	mg/kg	5.9E-10	mg/kg-day	3.1E-02	$(mg/kg\text{-}day)^{-1}$	1.8E-11
				Dibenzofuran	7.51E-02	mg/kg	1.0E-09	mg/kg-day	N/A	$(mg/kg\text{-}day)^{-1}$	---
				Dimethylphthalate	4.96E-01	mg/kg	6.9E-09	mg/kg-day	N/A	$(mg/kg\text{-}day)^{-1}$	---
				Inorganics							
				Aluminum	2.01E+04	mg/kg	2.8E-05	mg/kg-day	N/A	$(mg/kg\text{-}day)^{-1}$	---
				Arsenic	5.62E+00	mg/kg	2.5E-08	mg/kg-day	1.5E+00	$(mg/kg\text{-}day)^{-1}$	3.7E-08
				Chromium III	1.47E+02	mg/kg	2.0E-07	mg/kg-day	N/A	$(mg/kg\text{-}day)^{-1}$	---
				Cobalt	1.14E+01	mg/kg	1.6E-08	mg/kg-day	N/A	$(mg/kg\text{-}day)^{-1}$	---
				Copper	2.22E+02	mg/kg	3.1E-07	mg/kg-day	N/A	$(mg/kg\text{-}day)^{-1}$	---
				Iron	2.34E+04	mg/kg	3.2E-05	mg/kg-day	N/A	$(mg/kg\text{-}day)^{-1}$	---
				Lead	2.94E+02	mg/kg	4.1E-07	mg/kg-day	N/A	$(mg/kg\text{-}day)^{-1}$	---
				Manganese	6.78E+02	mg/kg	9.4E-07	mg/kg-day	N/A	$(mg/kg\text{-}day)^{-1}$	---
				Nickel	5.99E+01	mg/kg	8.3E-08	mg/kg-day	N/A	$(mg/kg\text{-}day)^{-1}$	---
				Vanadium	4.30E+01	mg/kg	6.0E-08	mg/kg-day	N/A	$(mg/kg\text{-}day)^{-1}$	---
			Exp. Route Total								6.7E-08
		Exposure Point Total									7.1E-07
	Exposure Media Total										7.1E-07

Table E.1-33
Calculation of Cancer Risks
Reasonable Maximum Exposure
Future - Excavation Worker

Scenario Timeframe: Future
Receptor Population: Excavation Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations				
							Intake/Exposure Concentration		CSF/Unit Risk		
					Value	Units	Value	Units	Value	Units	Cancer Risk
Total Soil	Air (Particulates)	SWMU 50	**Inhalation**	**Organics**							
				TCDD TE	1.88E-09	ug/m^3	1.8E-11	ug/m^3	3.8E+01	$(ug/m^3)^{-1}$	7.0E-10
				2,4-Dinitrotoluene	1.35E-05	ug/m^3	1.3E-07	ug/m^3	N/A	$(ug/m^3)^{-1}$	---
				Aroclor 1254	2.18E-05	ug/m^3	2.1E-07	ug/m^3	5.7E-04	$(ug/m^3)^{-1}$	1.2E-10
				Benzo(a)pyrene	1.88E-06	ug/m^3	1.8E-08	ug/m^3	1.1E-03	$(ug/m^3)^{-1}$	2.0E-11
				Benzo(b)fluoranthene	2.02E-06	ug/m^3	2.0E-08	ug/m^3	1.1E-04	$(ug/m^3)^{-1}$	2.2E-12
				Carbazole	1.49E-06	ug/m^3	1.5E-08	ug/m^3	N/A	$(ug/m^3)^{-1}$	---
				Dibenzofuran	4.27E-06	ug/m^3	4.2E-08	ug/m^3	N/A	$(ug/m^3)^{-1}$	---
				Dimethylphthalate	2.82E-05	ug/m^3	2.8E-07	ug/m^3	N/A	$(ug/m^3)^{-1}$	---
				Inorganics							
				Aluminum	1.14E+00	ug/m^3	1.1E-02	ug/m^3	N/A	$(ug/m^3)^{-1}$	---
				Arsenic	3.19E-04	ug/m^3	3.1E-06	ug/m^3	4.3E-03	$(ug/m^3)^{-1}$	1.3E-08
				Chromium (total)	8.35E-03	ug/m^3	8.2E-05	ug/m^3	1.2E-02	$(ug/m^3)^{-1}$	9.8E-07
				Cobalt	6.48E-04	ug/m^3	6.3E-06	ug/m^3	9.0E-03	$(ug/m^3)^{-1}$	5.7E-08
				Copper	1.26E-02	ug/m^3	1.2E-04	ug/m^3	N/A	$(ug/m^3)^{-1}$	---
				Iron	1.33E+00	ug/m^3	1.3E-02	ug/m^3	N/A	$(ug/m^3)^{-1}$	---
				Lead	1.67E-02	ug/m^3	1.6E-04	ug/m^3	N/A	$(ug/m^3)^{-1}$	---
				Manganese	3.85E-02	ug/m^3	3.8E-04	ug/m^3	N/A	$(ug/m^3)^{-1}$	---
				Nickel	3.40E-03	ug/m^3	3.3E-05	ug/m^3	N/A	$(ug/m^3)^{-1}$	---
				Vanadium	2.44E-03	ug/m^3	2.4E-05	ug/m^3	N/A	$(ug/m^3)^{-1}$	---
			Exp. Route Total								1.1E-06
		Exposure Point Total									1.1E-06
	Exposure Media Total										1.1E-06
	Air (Volatiles)	SWMU 50	**Inhalation**	**Organics**							
				Chloroform	8.94E-01	ug/m^3	8.7E-03	ug/m^3	2.3E-05	$(ug/m^3)^{-1}$	2.0E-07
			Exp. Route Total								2.0E-07
		Exposure Point Total									2.0E-07
	Exposure Media Total										2.0E-07
Total Soil Total											2.0E-06
										Total of Receptor Risks Across All Media	2.0E-06

N/A = Not Applicable.

Table E.1-34
Calculation of Non-cancer Hazards
Reasonable Maximum Exposure
Future - Excavation Worker

Scenario Timeframe: Future
Receptor Population: Excavation Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Non-Cancer Hazard Calculations				
							Intake/Exposure Concentration		RfD/RfC		Hazard
					Value	Units	Value	Units	Value	Units	Quotient
Total Soil	Total Soil	SWMU 50	**Ingestion**	**Organics**							
				TCDD TE	3.30E-05	mg/kg	1.1E-10	mg/kg-day	1.0E-09	mg/kg-day	1.1E-01
				2,4-Dinitrotoluene	2.37E-01	mg/kg	7.7E-07	mg/kg-day	2.0E-03	mg/kg-day	3.8E-04
				Aroclor 1254	3.83E-01	mg/kg	1.2E-06	mg/kg-day	2.0E-05	mg/kg-day	6.2E-02
				Benzo(a)pyrene	3.31E-02	mg/kg	1.1E-07	mg/kg-day	N/A	mg/kg-day	---
				Benzo(b)fluoranthene	3.55E-02	mg/kg	1.1E-07	mg/kg-day	N/A	mg/kg-day	---
				Carbazole	2.63E-02	mg/kg	8.5E-08	mg/kg-day	N/A	mg/kg-day	---
				Chloroform	1.43E-01	mg/kg	4.6E-07	mg/kg-day	1.0E-02	mg/kg-day	4.6E-05
				Dibenzofuran	7.51E-02	mg/kg	2.4E-07	mg/kg-day	N/A	mg/kg-day	---
				Dimethylphthalate	4.96E-01	mg/kg	1.6E-06	mg/kg-day	N/A	mg/kg-day	---
				Inorganics							
				Aluminum	2.01E+04	mg/kg	6.5E-02	mg/kg-day	1.0E+00	mg/kg-day	6.5E-02
				Arsenic	5.62E+00	mg/kg	1.8E-05	mg/kg-day	3.0E-04	mg/kg-day	6.0E-02
				Chromium III	1.47E+02	mg/kg	4.7E-04	mg/kg-day	1.5E+00	mg/kg-day	3.2E-04
				Cobalt	1.14E+01	mg/kg	3.7E-05	mg/kg-day	3.0E-04	mg/kg-day	1.2E-01
				Copper	2.22E+02	mg/kg	7.2E-04	mg/kg-day	4.0E-02	mg/kg-day	1.8E-02
				Iron	2.34E+04	mg/kg	7.6E-02	mg/kg-day	7.0E-01	mg/kg-day	1.1E-01
				Lead	2.94E+02	mg/kg	9.5E-04	mg/kg-day	N/A	mg/kg-day	---
				Manganese	6.78E+02	mg/kg	2.2E-03	mg/kg-day	2.4E-02	mg/kg-day	9.1E-02
				Nickel	5.99E+01	mg/kg	1.9E-04	mg/kg-day	2.0E-02	mg/kg-day	9.7E-03
				Vanadium	4.30E+01	mg/kg	1.4E-04	mg/kg-day	5.0E-03	mg/kg-day	2.8E-02
			Exp. Route Total								6.7E-01
			Dermal Absorption	**Organics**							
				TCDD TE	3.30E-05	mg/kg	9.6E-12	mg/kg-day	1.0E-09	mg/kg-day	9.6E-03
				2,4-Dinitrotoluene	2.37E-01	mg/kg	2.3E-07	mg/kg-day	2.0E-03	mg/kg-day	1.2E-04
				Aroclor 1254	3.83E-01	mg/kg	2.2E-07	mg/kg-day	2.0E-05	mg/kg-day	1.1E-02
				Benzo(a)pyrene	3.31E-02	mg/kg	3.2E-08	mg/kg-day	N/A	mg/kg-day	---
				Benzo(b)fluoranthene	3.55E-02	mg/kg	3.4E-08	mg/kg-day	N/A	mg/kg-day	---
				Carbazole	2.63E-02	mg/kg	2.5E-08	mg/kg-day	N/A	mg/kg-day	---
				Chloroform	1.43E-01	mg/kg	4.2E-08	mg/kg-day	1.0E-02	mg/kg-day	4.2E-06
				Dibenzofuran	7.51E-02	mg/kg	7.3E-08	mg/kg-day	N/A	mg/kg-day	---
				Dimethylphthalate	4.96E-01	mg/kg	4.8E-07	mg/kg-day	N/A	mg/kg-day	---
				Inorganics							
				Aluminum	2.01E+04	mg/kg	1.9E-03	mg/kg-day	1.0E+00	mg/kg-day	1.9E-03
				Arsenic	5.62E+00	mg/kg	1.7E-06	mg/kg-day	3.0E-04	mg/kg-day	5.8E-03
				Chromium III	1.47E+02	mg/kg	1.4E-05	mg/kg-day	2.0E-02	mg/kg-day	7.3E-04
				Cobalt	1.14E+01	mg/kg	1.1E-06	mg/kg-day	3.0E-04	mg/kg-day	3.7E-03
				Copper	2.22E+02	mg/kg	2.2E-05	mg/kg-day	4.0E-02	mg/kg-day	5.4E-04
				Iron	2.34E+04	mg/kg	2.3E-03	mg/kg-day	7.0E-01	mg/kg-day	3.2E-03
				Lead	2.94E+02	mg/kg	2.8E-05	mg/kg-day	N/A	mg/kg-day	---
				Manganese	6.78E+02	mg/kg	6.6E-05	mg/kg-day	9.6E-04	mg/kg-day	6.8E-02
				Nickel	5.99E+01	mg/kg	5.8E-06	mg/kg-day	8.0E-04	mg/kg-day	7.3E-03
				Vanadium	4.30E+01	mg/kg	4.2E-06	mg/kg-day	1.3E-04	mg/kg-day	3.2E-02
			Exp. Route Total								1.4E-01
		Exposure Point Total									8.2E-01
	Exposure Media Total										8.2E-01

Table E.1-34
Calculation of Non-cancer Hazards
Reasonable Maximum Exposure
Future - Excavation Worker

Scenario Timeframe: Future
Receptor Population: Excavation Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Non-Cancer Hazard Calculations				
							Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
					Value	Units	Value	Units	Value	Units	
Total Soil	Air (Particulates)	SWMU 50	**Inhalation**	**Organics**							
				TCDD TE	1.88E-12	mg/m^3	1.3E-12	mg/m^3	N/A	(mg/m^3)	---
				2,4-Dinitrotoluene	1.35E-08	mg/m^3	9.2E-09	mg/m^3	N/A	(mg/m^3)	---
				Aroclor 1254	2.18E-08	mg/m^3	1.5E-08	mg/m^3	N/A	(mg/m^3)	---
				Benzo(a)pyrene	1.88E-09	mg/m^3	1.3E-09	mg/m^3	N/A	(mg/m^3)	---
				Benzo(b)fluoranthene	2.02E-09	mg/m^3	1.4E-09	mg/m^3	N/A	(mg/m^3)	---
				Carbazole	1.49E-09	mg/m^3	1.0E-09	mg/m^3	N/A	(mg/m^3)	---
				Dibenzofuran	4.27E-09	mg/m^3	2.9E-09	mg/m^3	N/A	(mg/m^3)	---
				Dimethylphthalate	2.82E-08	mg/m^3	1.9E-08	mg/m^3	N/A	(mg/m^3)	---
				Inorganics							
				Aluminum	1.14E-03	mg/m^3	7.8E-04	mg/m^3	5.0E-03	(mg/m^3)	1.6E-01
				Arsenic	3.19E-07	mg/m^3	2.2E-07	mg/m^3	3.0E-05	(mg/m^3)	7.3E-03
				Chromium (total)	8.35E-06	mg/m^3	5.7E-06	mg/m^3	N/A	(mg/m^3)	---
				Cobalt	6.48E-07	mg/m^3	4.4E-07	mg/m^3	6.0E-06	(mg/m^3)	7.4E-02
				Copper	1.26E-05	mg/m^3	8.6E-06	mg/m^3	N/A	(mg/m^3)	---
				Iron	1.33E-03	mg/m^3	9.1E-04	mg/m^3	N/A	(mg/m^3)	---
				Lead	1.67E-05	mg/m^3	1.1E-05	mg/m^3	N/A	(mg/m^3)	---
				Manganese	3.85E-05	mg/m^3	2.6E-05	mg/m^3	5.0E-05	(mg/m^3)	5.3E-01
				Nickel	3.40E-06	mg/m^3	2.3E-06	mg/m^3	N/A	(mg/m^3)	---
				Vanadium	2.44E-06	mg/m^3	1.7E-06	mg/m^3	N/A	(mg/m^3)	---
			Exp. Route Total								7.7E-01
		Exposure Point Total									7.7E-01
	Exposure Media Total										7.7E-01
	Air (Volatiles)	SWMU 50	**Inhalation**	**Organics**							
				Chloroform	8.94E-04	mg/m^3	6.1E-04	mg/m^3	9.8E-02	(mg/m^3)	6.2E-03
			Exp. Route Total								6.2E-03
		Exposure Point Total									6.2E-03
	Exposure Media Total										6.2E-03
Total Soil Total											1.6E+00
										Total of Receptor Hazards Across All Media	1.6E+00

N/A = Not Applicable.

Table E.1-35
Calculation of Cancer Risks
Reasonable Maximum Exposure
Future - Lifetime Resident

Scenario Timeframe: Future
Receptor Population: Lifetime Resident
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations				
							Intake/Exposure Concentration		CSF/Unit Risk		
					Value	Units	Value	Units	Value	Units	Cancer Risk
Total Soil	Total Soil	SWMU 50	**Ingestion**	**Organics**							
				TCDD TE	3.30E-05	mg/kg	5.6E-11	mg/kg-day	1.3E+05	$(mg/kg-day)^{-1}$	7.2E-06
				2,4-Dinitrotoluene	2.37E-01	mg/kg	4.0E-07	mg/kg-day	6.8E-01	$(mg/kg-day)^{-1}$	2.7E-07
				Aroclor 1254	3.83E-01	mg/kg	6.4E-07	mg/kg-day	2.0E+00	$(mg/kg-day)^{-1}$	1.3E-06
				Benzo(a)pyrene	3.31E-02	mg/kg	ADAF	mg/kg-day	7.3E+00	$(mg/kg-day)^{-1}$	1.6E-06
				Benzo(b)fluoranthene	3.55E-02	mg/kg	ADAF	mg/kg-day	7.3E-01	$(mg/kg-day)^{-1}$	1.7E-07
				Carbazole	2.63E-02	mg/kg	4.4E-08	mg/kg-day	N/A	$(mg/kg-day)^{-1}$	---
				Chloroform	1.43E-01	mg/kg	2.4E-07	mg/kg-day	3.1E-02	$(mg/kg-day)^{-1}$	7.5E-09
				Dibenzofuran	7.51E-02	mg/kg	1.3E-07	mg/kg-day	N/A	$(mg/kg-day)^{-1}$	---
				Dimethylphthalate	4.96E-01	mg/kg	8.3E-07	mg/kg-day	N/A	$(mg/kg-day)^{-1}$	---
				Inorganics							
				Aluminum	2.01E+04	mg/kg	3.4E-02	mg/kg-day	N/A	$(mg/kg-day)^{-1}$	---
				Arsenic	5.62E+00	mg/kg	9.5E-06	mg/kg-day	1.5E+00	$(mg/kg-day)^{-1}$	1.4E-05
				Chromium III	1.47E+02	mg/kg	2.5E-04	mg/kg-day	N/A	$(mg/kg-day)^{-1}$	---
				Cobalt	1.14E+01	mg/kg	1.9E-05	mg/kg-day	N/A	$(mg/kg-day)^{-1}$	---
				Copper	2.22E+02	mg/kg	3.7E-04	mg/kg-day	N/A	$(mg/kg-day)^{-1}$	---
				Iron	2.34E+04	mg/kg	3.9E-02	mg/kg-day	N/A	$(mg/kg-day)^{-1}$	---
				Lead	2.94E+02	mg/kg	4.9E-04	mg/kg-day	N/A	$(mg/kg-day)^{-1}$	---
				Manganese	6.78E+02	mg/kg	1.1E-03	mg/kg-day	N/A	$(mg/kg-day)^{-1}$	---
				Nickel	5.99E+01	mg/kg	1.0E-04	mg/kg-day	N/A	$(mg/kg-day)^{-1}$	---
				Vanadium	4.30E+01	mg/kg	7.2E-05	mg/kg-day	N/A	$(mg/kg-day)^{-}$	---
			Exp. Route Total								2.5E-05
			Dermal Absorption	**Organics**							
				TCDD TE	3.30E-05	mg/kg	5.4E-12	mg/kg-day	1.3E+05	$(mg/kg-day)^{-1}$	7.0E-07
				2,4-Dinitrotoluene	2.37E-01	mg/kg	1.3E-07	mg/kg-day	6.8E-01	$(mg/kg-day)^{-1}$	8.9E-08
				Aroclor 1254	3.83E-01	mg/kg	1.2E-07	mg/kg-day	2.0E+00	$(mg/kg-day)^{-1}$	2.5E-07
				Benzo(a)pyrene	3.31E-02	mg/kg	ADAF	mg/kg-day	7.3E+00	$(mg/kg-day)^{-1}$	4.8E-07
				Benzo(b)fluoranthene	3.55E-02	mg/kg	ADAF	mg/kg-day	7.3E-01	$(mg/kg-day)^{-1}$	5.1E-08
				Carbazole	2.63E-02	mg/kg	1.4E-08	mg/kg-day	N/A	$(mg/kg-day)^{-1}$	---
				Chloroform	1.43E-01	mg/kg	2.3E-08	mg/kg-day	3.1E-02	$(mg/kg-day)^{-1}$	7.2E-10
				Dibenzofuran	7.51E-02	mg/kg	4.1E-08	mg/kg-day	N/A	$(mg/kg-day)^{-1}$	---
				Dimethylphthalate	4.96E-01	mg/kg	2.7E-07	mg/kg-day	N/A	$(mg/kg-day)^{-1}$	---
				Inorganics							
				Aluminum	2.01E+04	mg/kg	1.1E-03	mg/kg-day	N/A	$(mg/kg-day)^{-1}$	---
				Arsenic	5.62E+00	mg/kg	9.7E-07	mg/kg-day	1.5E+00	$(mg/kg-day)^{-1}$	1.5E-06
				Chromium III	1.47E+02	mg/kg	8.0E-06	mg/kg-day	N/A	$(mg/kg-day)^{-1}$	---
				Cobalt	1.14E+01	mg/kg	6.2E-07	mg/kg-day	N/A	$(mg/kg-day)^{-1}$	---
				Copper	2.22E+02	mg/kg	1.2E-05	mg/kg-day	N/A	$(mg/kg-day)^{-1}$	---
				Iron	2.34E+04	mg/kg	1.3E-03	mg/kg-day	N/A	$(mg/kg-day)^{-1}$	---
				Lead	2.94E+02	mg/kg	1.6E-05	mg/kg-day	N/A	$(mg/kg-day)^{-1}$	---
				Manganese	6.78E+02	mg/kg	3.7E-05	mg/kg-day	N/A	$(mg/kg-day)^{-1}$	---
				Nickel	5.99E+01	mg/kg	3.2E-06	mg/kg-day	N/A	$(mg/kg-day)^{-1}$	---
				Vanadium	4.30E+01	mg/kg	2.3E-06	mg/kg-day	N/A	$(mg/kg-day)^{-}$	---
			Exp. Route Total								3.0E-06
		Exposure Point Total									2.8E-05
	Exposure Media Total										2.8E-05

Table E.1-35
Calculation of Cancer Risks
Reasonable Maximum Exposure
Future - Lifetime Resident

Scenario Timeframe: Future
Receptor Population: Lifetime Resident
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations				
							Intake/Exposure Concentration		CSF/Unit Risk		
					Value	Units	Value	Units	Value	Units	Cancer Risk
Total Soil	Air (Particulates)	SWMU 50	**Inhalation**	**Organics**							
				TCDD TE	1.63E-11	ug/m^3	8.0E-12	ug/m^3	3.8E+01	$(ug/m^3)^{-1}$	3.0E-10
				2,4-Dinitrotoluene	1.17E-07	ug/m^3	5.8E-08	ug/m^3	N/A	$(ug/m^3)^{-1}$	---
				Aroclor 1254	1.89E-07	ug/m^3	9.3E-08	ug/m^3	5.7E-04	$(ug/m^3)^{-1}$	5.3E-11
				Benzo(a)pyrene	1.63E-08	ug/m^3	ADAF	ug/m^3	1.1E-03	$(ug/m^3)^{-1}$	1.9E-11
				Benzo(b)fluoranthene	1.75E-08	ug/m^3	ADAF	ug/m^3	1.1E-04	$(ug/m^3)^{-1}$	2.0E-12
				Carbazole	1.30E-08	ug/m^3	6.4E-09	ug/m^3	N/A	$(ug/m^3)^{-1}$	---
				Dibenzofuran	3.70E-08	ug/m^3	1.8E-08	ug/m^3	N/A	$(ug/m^3)^{-1}$	---
				Dimethylphthalate	2.44E-07	ug/m^3	1.2E-07	ug/m^3	N/A	$(ug/m^3)^{-1}$	---
				Inorganics							
				Aluminum	9.91E-03	ug/m^3	4.9E-03	ug/m^3	N/A	$(ug/m^3)^{-1}$	---
				Arsenic	2.77E-06	ug/m^3	1.4E-06	ug/m^3	4.3E-03	$(ug/m^3)^{-1}$	5.9E-09
				Chromium (total)	7.24E-05	ug/m^3	3.6E-05	ug/m^3	1.2E-02	$(ug/m^3)^{-1}$	4.3E-07
				Cobalt	5.62E-06	ug/m^3	2.8E-06	ug/m^3	9.0E-03	$(ug/m^3)^{-1}$	2.5E-08
				Copper	1.09E-04	ug/m^3	5.4E-05	ug/m^3	N/A	$(ug/m^3)^{-1}$	---
				Iron	1.15E-02	ug/m^3	5.7E-03	ug/m^3	N/A	$(ug/m^3)^{-1}$	---
				Lead	1.45E-04	ug/m^3	7.1E-05	ug/m^3	N/A	$(ug/m^3)^{-1}$	---
				Manganese	3.34E-04	ug/m^3	1.6E-04	ug/m^3	N/A	$(ug/m^3)^{-1}$	---
				Nickel	2.95E-05	ug/m^3	1.5E-05	ug/m^3	N/A	$(ug/m^3)^{-1}$	---
				Vanadium	2.12E-05	ug/m^3	1.0E-05	ug/m^3	N/A	$(ug/m^3)^{-1}$	---
			Exp. Route Total								4.6E-07
		Exposure Point Total									4.6E-07
	Exposure Media Total										4.6E-07
	Air (Volatiles)	SWMU 50	**Inhalation**	**Organics**							
				Chloroform	NC	ug/m^3	3.7E-02	ug/m^3	2.3E-05	$(ug/m^3)^{-1}$	8.4E-07
			Exp. Route Total								8.4E-07
		Exposure Point Total									8.4E-07
	Exposure Media Total										8.4E-07
Total Soil Total											2.9E-05
										Total of Receptor Risks Across All Media	2.9E-05

N/A = Not Applicable.
NC = Not calculated. Intake for Lifetime Resident based on age-adjusted calculation.
ADAF = Age-Dependent Adjustment Factors were applied in estimating risks associated with early life exposures

Table E.1-36
Calculation of Non-cancer Hazards
Reasonable Maximum Exposure
Future - Adult Resident

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Non-Cancer Hazard Calculations				
							Intake/Exposure Concentration		RfD/RfC		Hazard
					Value	Units	Value	Units	Value	Units	Quotient
Total Soil	Total Soil	SWMU 50	**Ingestion**	**Organics**							
				TCDD TE	3.30E-05	mg/kg	4.5E-11	mg/kg-day	1.0E-09	mg/kg-day	4.5E-02
				2,4-Dinitrotoluene	2.37E-01	mg/kg	3.2E-07	mg/kg-day	2.0E-03	mg/kg-day	1.6E-04
				Aroclor 1254	3.83E-01	mg/kg	5.2E-07	mg/kg-day	2.0E-05	mg/kg-day	2.6E-02
				Benzo(a)pyrene	3.31E-02	mg/kg	4.5E-08	mg/kg-day	N/A	mg/kg-day	---
				Benzo(b)fluoranthene	3.55E-02	mg/kg	4.9E-08	mg/kg-day	N/A	mg/kg-day	---
				Carbazole	2.63E-02	mg/kg	3.6E-08	mg/kg-day	N/A	mg/kg-day	---
				Chloroform	1.43E-01	mg/kg	2.0E-07	mg/kg-day	1.0E-02	mg/kg-day	2.0E-05
				Dibenzofuran	7.51E-02	mg/kg	1.0E-07	mg/kg-day	N/A	mg/kg-day	---
				Dimethylphthalate	4.96E-01	mg/kg	6.8E-07	mg/kg-day	N/A	mg/kg-day	---
				Inorganics							
				Aluminum	2.01E+04	mg/kg	2.8E-02	mg/kg-day	1.0E+00	mg/kg-day	2.8E-02
				Arsenic	5.62E+00	mg/kg	7.7E-06	mg/kg-day	3.0E-04	mg/kg-day	2.6E-02
				Chromium III	1.47E+02	mg/kg	2.0E-04	mg/kg-day	1.5E+00	mg/kg-day	1.3E-04
				Cobalt	1.14E+01	mg/kg	1.6E-05	mg/kg-day	3.0E-04	mg/kg-day	5.2E-02
				Copper	2.22E+02	mg/kg	3.0E-04	mg/kg-day	4.0E-02	mg/kg-day	7.6E-03
				Iron	2.34E+04	mg/kg	3.2E-02	mg/kg-day	7.0E-01	mg/kg-day	4.6E-02
				Lead	2.94E+02	mg/kg	4.0E-04	mg/kg-day	N/A	mg/kg-day	---
				Manganese	6.78E+02	mg/kg	9.3E-04	mg/kg-day	2.4E-02	mg/kg-day	3.9E-02
				Nickel	5.99E+01	mg/kg	8.2E-05	mg/kg-day	2.0E-02	mg/kg-day	4.1E-03
				Vanadium	4.30E+01	mg/kg	5.9E-05	mg/kg-day	5.0E-03	mg/kg-day	1.2E-02
			Exp. Route Total								2.8E-01
			Dermal Absorption	**Organics**							
				TCDD TE	3.30E-05	mg/kg	5.4E-12	mg/kg-day	1.0E-09	mg/kg-day	5.4E-03
				2,4-Dinitrotoluene	2.37E-01	mg/kg	1.3E-07	mg/kg-day	2.0E-03	mg/kg-day	6.6E-05
				Aroclor 1254	3.83E-01	mg/kg	1.3E-07	mg/kg-day	2.0E-05	mg/kg-day	6.3E-03
				Benzo(a)pyrene	3.31E-02	mg/kg	1.8E-08	mg/kg-day	N/A	mg/kg-day	---
				Benzo(b)fluoranthene	3.55E-02	mg/kg	1.9E-08	mg/kg-day	N/A	mg/kg-day	---
				Carbazole	2.63E-02	mg/kg	1.4E-08	mg/kg-day	N/A	mg/kg-day	---
				Chloroform	1.43E-01	mg/kg	2.3E-08	mg/kg-day	1.0E-02	mg/kg-day	2.3E-06
				Dibenzofuran	7.51E-02	mg/kg	4.1E-08	mg/kg-day	N/A	mg/kg-day	---
				Dimethylphthalate	4.96E-01	mg/kg	2.7E-07	mg/kg-day	N/A	mg/kg-day	---
				Inorganics							
				Aluminum	2.01E+04	mg/kg	1.1E-03	mg/kg-day	1.0E+00	mg/kg-day	1.1E-03
				Arsenic	5.62E+00	mg/kg	9.8E-07	mg/kg-day	3.0E-04	mg/kg-day	3.3E-03
				Chromium III	1.47E+02	mg/kg	8.0E-06	mg/kg-day	2.0E-02	mg/kg-day	4.1E-04
				Cobalt	1.14E+01	mg/kg	6.2E-07	mg/kg-day	3.0E-04	mg/kg-day	2.1E-03
				Copper	2.22E+02	mg/kg	1.2E-05	mg/kg-day	4.0E-02	mg/kg-day	3.0E-04
				Iron	2.34E+04	mg/kg	1.3E-03	mg/kg-day	7.0E-01	mg/kg-day	1.8E-03
				Lead	2.94E+02	mg/kg	1.6E-05	mg/kg-day	N/A	mg/kg-day	---
				Manganese	6.78E+02	mg/kg	3.7E-05	mg/kg-day	9.6E-04	mg/kg-day	3.9E-02
				Nickel	5.99E+01	mg/kg	3.3E-06	mg/kg-day	8.0E-04	mg/kg-day	4.1E-03
				Vanadium	4.30E+01	mg/kg	2.4E-06	mg/kg-day	1.3E-04	mg/kg-day	1.8E-02
			Exp. Route Total								8.2E-02
		Exposure Point Total									3.7E-01
	Exposure Media Total										3.7E-01

Table E.1-36
Calculation of Non-cancer Hazards
Reasonable Maximum Exposure
Future - Adult Resident

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Non-Cancer Hazard Calculations				
							Intake/Exposure Concentration		RfD/RfC		Hazard
					Value	Units	Value	Units	Value	Units	Quotient
Total Soil	Air (Particulates)	SWMU 50	**Inhalation**	**Organics**							
				TCDD TE	1.63E-14	mg/m^3	1.6E-14	mg/m^3	N/A	(mg/m^3)	---
				2,4-Dinitrotoluene	1.17E-10	mg/m^3	1.1E-10	mg/m^3	N/A	(mg/m^3)	---
				Aroclor 1254	1.89E-10	mg/m^3	1.8E-10	mg/m^3	N/A	(mg/m^3)	---
				Benzo(a)pyrene	1.63E-11	mg/m^3	1.6E-11	mg/m^3	N/A	(mg/m^3)	---
				Benzo(b)fluoranthene	1.75E-11	mg/m^3	1.7E-11	mg/m^3	N/A	(mg/m^3)	---
				Carbazole	1.30E-11	mg/m^3	1.2E-11	mg/m^3	N/A	(mg/m^3)	---
				Dibenzofuran	3.70E-11	mg/m^3	3.5E-11	mg/m^3	N/A	(mg/m^3)	---
				Dimethylphthalate	2.44E-10	mg/m^3	2.3E-10	mg/m^3	N/A	(mg/m^3)	---
				Inorganics							
				Aluminum	9.91E-06	mg/m^3	9.5E-06	mg/m^3	5.0E-03	(mg/m^3)	1.9E-03
				Arsenic	2.77E-09	mg/m^3	2.7E-09	mg/m^3	3.0E-05	(mg/m^3)	8.9E-05
				Chromium (total)	7.24E-08	mg/m^3	6.9E-08	mg/m^3	N/A	(mg/m^3)	---
				Cobalt	5.62E-09	mg/m^3	5.4E-09	mg/m^3	6.0E-06	(mg/m^3)	9.0E-04
				Copper	1.09E-07	mg/m^3	1.0E-07	mg/m^3	N/A	(mg/m^3)	---
				Iron	1.15E-05	mg/m^3	1.1E-05	mg/m^3	N/A	(mg/m^3)	---
				Lead	1.45E-07	mg/m^3	1.4E-07	mg/m^3	N/A	(mg/m^3)	---
				Manganese	3.34E-07	mg/m^3	3.2E-07	mg/m^3	5.0E-05	(mg/m^3)	6.4E-03
				Nickel	2.95E-08	mg/m^3	2.8E-08	mg/m^3	N/A	(mg/m^3)	---
				Vanadium	2.12E-08	mg/m^3	2.0E-08	mg/m^3	N/A	(mg/m^3)	---
			Exp. Route Total								9.3E-03
		Exposure Point Total									9.3E-03
	Exposure Media Total										9.3E-03
	Air (Volatiles)	SWMU 50	**Inhalation**	**Organics**							
				Chloroform	6.36E-05	mg/m^3	6.1E-05	mg/m^3	9.8E-02	(mg/m^3)	6.2E-04
			Exp. Route Total								6.2E-04
		Exposure Point Total									6.2E-04
	Exposure Media Total										6.2E-04
Total Soil Total											3.8E-01
										Total of Receptor Hazards Across All Media	3.8E-01

N/A = Not Applicable.

Table E.1-37
Calculation of Cancer Risks
Reasonable Maximum Exposure
Future - Child Resident

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations				
							Intake/Exposure Concentration		CSF/Unit Risk		
					Value	Units	Value	Units	Value	Units	Cancer Risk
Total Soil	Total Soil	SWMU 50	**Ingestion**	**Organics**							
				TCDD TE	3.30E-05	mg/kg	3.6E-11	mg/kg-day	1.3E+05	$(mg/kg\text{-}day)^{-1}$	4.7E-06
				2,4-Dinitrotoluene	2.37E-01	mg/kg	2.6E-07	mg/kg-day	6.8E-01	$(mg/kg\text{-}day)^{-1}$	1.8E-07
				Aroclor 1254	3.83E-01	mg/kg	4.2E-07	mg/kg-day	2.0E+00	$(mg/kg\text{-}day)^{-1}$	8.4E-07
				Benzo(a)pyrene	3.31E-02	mg/kg	3.6E-08	mg/kg-day	7.3E+00	$(mg/kg\text{-}day)^{-1}$	2.6E-07
				Benzo(b)fluoranthene	3.55E-02	mg/kg	3.9E-08	mg/kg-day	7.3E-01	$(mg/kg\text{-}day)^{-1}$	2.8E-08
				Carbazole	2.63E-02	mg/kg	2.9E-08	mg/kg-day	N/A	$(mg/kg\text{-}day)^{-1}$	---
				Chloroform	1.43E-01	mg/kg	1.6E-07	mg/kg-day	3.1E-02	$(mg/kg\text{-}day)^{-1}$	4.9E-09
				Dibenzofuran	7.51E-02	mg/kg	8.2E-08	mg/kg-day	N/A	$(mg/kg\text{-}day)^{-1}$	---
				Dimethylphthalate	4.96E-01	mg/kg	5.4E-07	mg/kg-day	N/A	$(mg/kg\text{-}day)^{-1}$	---
				Inorganics							
				Aluminum	2.01E+04	mg/kg	2.2E-02	mg/kg-day	N/A	$(mg/kg\text{-}day)^{-1}$	---
				Arsenic	5.62E+00	mg/kg	6.2E-06	mg/kg-day	1.5E+00	$(mg/kg\text{-}day)^{-1}$	9.2E-06
				Chromium III	1.47E+02	mg/kg	1.6E-04	mg/kg-day	N/A	$(mg/kg\text{-}day)^{-1}$	---
				Cobalt	1.14E+01	mg/kg	1.2E-05	mg/kg-day	N/A	$(mg/kg\text{-}day)^{-1}$	---
				Copper	2.22E+02	mg/kg	2.4E-04	mg/kg-day	N/A	$(mg/kg\text{-}day)^{-1}$	---
				Iron	2.34E+04	mg/kg	2.6E-02	mg/kg-day	N/A	$(mg/kg\text{-}day)^{-1}$	---
				Lead	2.94E+02	mg/kg	3.2E-04	mg/kg-day	N/A	$(mg/kg\text{-}day)^{-1}$	---
				Manganese	6.78E+02	mg/kg	7.4E-04	mg/kg-day	N/A	$(mg/kg\text{-}day)^{-1}$	---
				Nickel	5.99E+01	mg/kg	6.6E-05	mg/kg-day	N/A	$(mg/kg\text{-}day)^{-1}$	---
				Vanadium	4.30E+01	mg/kg	4.7E-05	mg/kg-day	N/A	$(mg/kg\text{-}day)^{-1}$	---
			Exp. Route Total								1.5E-05
			Dermal Absorption	**Organics**							
				TCDD TE	3.30E-05	mg/kg	3.0E-12	mg/kg-day	1.3E+05	$(mg/kg\text{-}day)^{-1}$	3.9E-07
				2,4-Dinitrotoluene	2.37E-01	mg/kg	7.4E-08	mg/kg-day	6.8E-01	$(mg/kg\text{-}day)^{-1}$	5.0E-08
				Aroclor 1254	3.83E-01	mg/kg	7.1E-08	mg/kg-day	2.0E+00	$(mg/kg\text{-}day)^{-1}$	1.4E-07
				Benzo(a)pyrene	3.31E-02	mg/kg	1.0E-08	mg/kg-day	7.3E+00	$(mg/kg\text{-}day)^{-1}$	7.4E-08
				Benzo(b)fluoranthene	3.55E-02	mg/kg	1.1E-08	mg/kg-day	7.3E-01	$(mg/kg\text{-}day)^{-1}$	8.0E-09
				Carbazole	2.63E-02	mg/kg	8.1E-09	mg/kg-day	N/A	$(mg/kg\text{-}day)^{-1}$	---
				Chloroform	1.43E-01	mg/kg	1.3E-08	mg/kg-day	3.1E-02	$(mg/kg\text{-}day)^{-1}$	4.1E-10
				Dibenzofuran	7.51E-02	mg/kg	2.3E-08	mg/kg-day	N/A	$(mg/kg\text{-}day)^{-1}$	---
				Dimethylphthalate	4.96E-01	mg/kg	1.5E-07	mg/kg-day	N/A	$(mg/kg\text{-}day)^{-1}$	---
				Inorganics							
				Aluminum	2.01E+04	mg/kg	6.2E-04	mg/kg-day	N/A	$(mg/kg\text{-}day)^{-1}$	---
				Arsenic	5.62E+00	mg/kg	5.5E-07	mg/kg-day	1.5E+00	$(mg/kg\text{-}day)^{-1}$	8.3E-07
				Chromium III	1.47E+02	mg/kg	4.5E-06	mg/kg-day	N/A	$(mg/kg\text{-}day)^{-1}$	---
				Cobalt	1.14E+01	mg/kg	3.5E-07	mg/kg-day	N/A	$(mg/kg\text{-}day)^{-1}$	---
				Copper	2.22E+02	mg/kg	6.8E-06	mg/kg-day	N/A	$(mg/kg\text{-}day)^{-1}$	---
				Iron	2.34E+04	mg/kg	7.2E-04	mg/kg-day	N/A	$(mg/kg\text{-}day)^{-1}$	---
				Lead	2.94E+02	mg/kg	9.0E-06	mg/kg-day	N/A	$(mg/kg\text{-}day)^{-1}$	---
				Manganese	6.78E+02	mg/kg	2.1E-05	mg/kg-day	N/A	$(mg/kg\text{-}day)^{-1}$	---
				Nickel	5.99E+01	mg/kg	1.8E-06	mg/kg-day	N/A	$(mg/kg\text{-}day)^{-1}$	---
				Vanadium	4.30E+01	mg/kg	1.3E-06	mg/kg-day	N/A	$(mg/kg\text{-}day)^{-1}$	---
			Exp. Route Total								1.5E-06
		Exposure Point Total									1.7E-05
	Exposure Media Total										1.7E-05

Table E.1-37
Calculation of Cancer Risks
Reasonable Maximum Exposure
Future - Child Resident

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations				
							Intake/Exposure Concentration		CSF/Unit Risk		
					Value	Units	Value	Units	Value	Units	Cancer Risk
Total Soil	Air (Particulates)	SWMU 50	**Inhalation**	**Organics**							
				TCDD TE	1.63E-11	ug/m^3	1.3E-12	ug/m^3	3.8E+01	$(ug/m^3)^{-1}$	5.1E-11
				2,4-Dinitrotoluene	1.17E-07	ug/m^3	9.6E-09	ug/m^3	N/A	$(ug/m^3)^{-1}$	---
				Aroclor 1254	1.89E-07	ug/m^3	1.6E-08	ug/m^3	5.7E-04	$(ug/m^3)^{-1}$	8.8E-12
				Benzo(a)pyrene	1.63E-08	ug/m^3	1.3E-09	ug/m^3	1.1E-03	$(ug/m^3)^{-1}$	1.5E-12
				Benzo(b)fluoranthene	1.75E-08	ug/m^3	1.4E-09	ug/m^3	1.1E-04	$(ug/m^3)^{-1}$	1.6E-13
				Carbazole	1.30E-08	ug/m^3	1.1E-09	ug/m^3	N/A	$(ug/m^3)^{-1}$	---
				Dibenzofuran	3.70E-08	ug/m^3	3.0E-09	ug/m^3	N/A	$(ug/m^3)^{-1}$	---
				Dimethylphthalate	2.44E-07	ug/m^3	2.0E-08	ug/m^3	N/A	$(ug/m^3)^{-1}$	---
				Inorganics							
				Aluminum	9.91E-03	ug/m^3	8.1E-04	ug/m^3	N/A	$(ug/m^3)^{-1}$	---
				Arsenic	2.77E-06	ug/m^3	2.3E-07	ug/m^3	4.3E-03	$(ug/m^3)^{-1}$	9.8E-10
				Chromium (total)	7.24E-05	ug/m^3	6.0E-06	ug/m^3	1.2E-02	$(ug/m^3)^{-1}$	7.1E-08
				Cobalt	5.62E-06	ug/m^3	4.6E-07	ug/m^3	9.0E-03	$(ug/m^3)^{-1}$	4.2E-09
				Copper	1.09E-04	ug/m^3	9.0E-06	ug/m^3	N/A	$(ug/m^3)^{-1}$	---
				Iron	1.15E-02	ug/m^3	9.5E-04	ug/m^3	N/A	$(ug/m^3)^{-1}$	---
				Lead	1.45E-04	ug/m^3	1.2E-05	ug/m^3	N/A	$(ug/m^3)^{-1}$	---
				Manganese	3.34E-04	ug/m^3	2.7E-05	ug/m^3	N/A	$(ug/m^3)^{-1}$	---
				Nickel	2.95E-05	ug/m^3	2.4E-06	ug/m^3	N/A	$(ug/m^3)^{-1}$	---
				Vanadium	2.12E-05	ug/m^3	1.7E-06	ug/m^3	N/A	$(ug/m^3)^{-1}$	---
			Exp. Route Total								7.7E-08
		Exposure Point Total									7.7E-08
	Exposure Media Total										7.7E-08
	Air (Volatiles)	SWMU 50	**Inhalation**	**Organics**							
				Chloroform	1.28E-01	ug/m^3	1.0E-02	ug/m^3	2.3E-05	$(ug/m^3)^{-1}$	2.4E-07
			Exp. Route Total								2.4E-07
		Exposure Point Total									2.4E-07
	Exposure Media Total										2.4E-07
Total Soil Total											1.7E-05
										Total of Receptor Risks Across All Media	1.7E-05

N/A = Not Applicable.

Table E.1-38
Calculation of Non-cancer Hazards
Reasonable Maximum Exposure
Future - Child Resident

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Non-Cancer Hazard Calculations				
							Intake/Exposure Concentration		RfD/RfC		Hazard
					Value	Units	Value	Units	Value	Units	Quotient
Total Soil	Total Soil	SWMU 50	**Ingestion**	**Organics**							
				TCDD TE	3.30E-05	mg/kg	4.2E-10	mg/kg-day	1.0E-09	mg/kg-day	4.2E-01
				2,4-Dinitrotoluene	2.37E-01	mg/kg	3.0E-06	mg/kg-day	2.0E-03	mg/kg-day	1.5E-03
				Aroclor 1254	3.83E-01	mg/kg	4.9E-06	mg/kg-day	2.0E-05	mg/kg-day	2.4E-01
				Benzo(a)pyrene	3.31E-02	mg/kg	4.2E-07	mg/kg-day	N/A	mg/kg-day	---
				Benzo(b)fluoranthene	3.55E-02	mg/kg	4.5E-07	mg/kg-day	N/A	mg/kg-day	---
				Carbazole	2.63E-02	mg/kg	3.4E-07	mg/kg-day	N/A	mg/kg-day	---
				Chloroform	1.43E-01	mg/kg	1.8E-06	mg/kg-day	1.0E-02	mg/kg-day	1.8E-04
				Dibenzofuran	7.51E-02	mg/kg	9.6E-07	mg/kg-day	N/A	mg/kg-day	---
				Dimethylphthalate	4.96E-01	mg/kg	6.3E-06	mg/kg-day	N/A	mg/kg-day	---
				Inorganics							
				Aluminum	2.01E+04	mg/kg	2.6E-01	mg/kg-day	1.0E+00	mg/kg-day	2.6E-01
				Arsenic	5.62E+00	mg/kg	7.2E-05	mg/kg-day	3.0E-04	mg/kg-day	2.4E-01
				Chromium III	1.47E+02	mg/kg	1.9E-03	mg/kg-day	1.5E+00	mg/kg-day	1.3E-03
				Cobalt	1.14E+01	mg/kg	1.5E-04	mg/kg-day	3.0E-04	mg/kg-day	4.9E-01
				Copper	2.22E+02	mg/kg	2.8E-03	mg/kg-day	4.0E-02	mg/kg-day	7.1E-02
				Iron	2.34E+04	mg/kg	3.0E-01	mg/kg-day	7.0E-01	mg/kg-day	4.3E-01
				Lead	2.94E+02	mg/kg	3.8E-03	mg/kg-day	N/A	mg/kg-day	---
				Manganese	6.78E+02	mg/kg	8.7E-03	mg/kg-day	2.4E-02	mg/kg-day	3.6E-01
				Nickel	5.99E+01	mg/kg	7.7E-04	mg/kg-day	2.0E-02	mg/kg-day	3.8E-02
				Vanadium	4.30E+01	mg/kg	5.5E-04	mg/kg-day	5.0E-03	mg/kg-day	1.1E-01
			Exp. Route Total								2.7E+00
			Dermal	**Organics**							
			Absorption	TCDD TE	3.30E-05	mg/kg	3.5E-11	mg/kg-day	1.0E-09	mg/kg-day	3.5E-02
				2,4-Dinitrotoluene	2.37E-01	mg/kg	8.7E-07	mg/kg-day	2.0E-03	mg/kg-day	4.3E-04
				Aroclor 1254	3.83E-01	mg/kg	8.2E-07	mg/kg-day	2.0E-05	mg/kg-day	4.1E-02
				Benzo(a)pyrene	3.31E-02	mg/kg	1.2E-07	mg/kg-day	N/A	mg/kg-day	---
				Benzo(b)fluoranthene	3.55E-02	mg/kg	1.3E-07	mg/kg-day	N/A	mg/kg-day	---
				Carbazole	2.63E-02	mg/kg	9.4E-08	mg/kg-day	N/A	mg/kg-day	---
				Chloroform	1.43E-01	mg/kg	1.5E-07	mg/kg-day	1.0E-02	mg/kg-day	1.5E-05
				Dibenzofuran	7.51E-02	mg/kg	2.7E-07	mg/kg-day	N/A	mg/kg-day	---
				Dimethylphthalate	4.96E-01	mg/kg	1.8E-06	mg/kg-day	N/A	mg/kg-day	---
				Inorganics							
				Aluminum	2.01E+04	mg/kg	7.2E-03	mg/kg-day	1.0E+00	mg/kg-day	7.2E-03
				Arsenic	5.62E+00	mg/kg	6.4E-06	mg/kg-day	3.0E-04	mg/kg-day	2.1E-02
				Chromium III	1.47E+02	mg/kg	5.3E-05	mg/kg-day	2.0E-02	mg/kg-day	2.7E-03
				Cobalt	1.14E+01	mg/kg	4.1E-06	mg/kg-day	3.0E-04	mg/kg-day	1.4E-02
				Copper	2.22E+02	mg/kg	7.9E-05	mg/kg-day	4.0E-02	mg/kg-day	2.0E-03
				Iron	2.34E+04	mg/kg	8.4E-03	mg/kg-day	7.0E-01	mg/kg-day	1.2E-02
				Lead	2.94E+02	mg/kg	1.1E-04	mg/kg-day	N/A	mg/kg-day	---
				Manganese	6.78E+02	mg/kg	2.4E-04	mg/kg-day	9.6E-04	mg/kg-day	2.5E-01
				Nickel	5.99E+01	mg/kg	2.1E-05	mg/kg-day	8.0E-04	mg/kg-day	2.7E-02
				Vanadium	4.30E+01	mg/kg	1.5E-05	mg/kg-day	1.3E-04	mg/kg-day	1.2E-01
			Exp. Route Total								5.3E-01
		Exposure Point Total									3.2E+00
	Exposure Media Total										3.2E+00

Table E.1-38
Calculation of Non-cancer Hazards
Reasonable Maximum Exposure
Future - Child Resident

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Non-Cancer Hazard Calculations				
							Intake/Exposure Concentration		RfD/RfC		Hazard
					Value	Units	Value	Units	Value	Units	Quotient
Total Soil	Air (Particulates)	SWMU 50	**Inhalation**	**Organics**							
				TCDD TE	1.63E-14	mg/m^3	1.6E-14	mg/m^3	N/A	(mg/m^3)	---
				2,4-Dinitrotoluene	1.17E-10	mg/m^3	1.1E-10	mg/m^3	N/A	(mg/m^3)	---
				Aroclor 1254	1.89E-10	mg/m^3	1.8E-10	mg/m^3	N/A	(mg/m^3)	---
				Benzo(a)pyrene	1.63E-11	mg/m^3	1.6E-11	mg/m^3	N/A	(mg/m^3)	---
				Benzo(b)fluoranthene	1.75E-11	mg/m^3	1.7E-11	mg/m^3	N/A	(mg/m^3)	---
				Carbazole	1.30E-11	mg/m^3	1.2E-11	mg/m^3	N/A	(mg/m^3)	---
				Dibenzofuran	3.70E-11	mg/m^3	3.5E-11	mg/m^3	N/A	(mg/m^3)	---
				Dimethylphthalate	2.44E-10	mg/m^3	2.3E-10	mg/m^3	N/A	(mg/m^3)	---
				Inorganics							
				Aluminum	9.91E-06	mg/m^3	9.5E-06	mg/m^3	5.0E-03	(mg/m^3)	1.9E-03
				Arsenic	2.77E-09	mg/m^3	2.7E-09	mg/m^3	3.0E-05	(mg/m^3)	8.9E-05
				Chromium (total)	7.24E-08	mg/m^3	6.9E-08	mg/m^3	N/A	(mg/m^3)	---
				Cobalt	5.62E-09	mg/m^3	5.4E-09	mg/m^3	6.0E-06	(mg/m^3)	9.0E-04
				Copper	1.09E-07	mg/m^3	1.0E-07	mg/m^3	N/A	(mg/m^3)	---
				Iron	1.15E-05	mg/m^3	1.1E-05	mg/m^3	N/A	(mg/m^3)	---
				Lead	1.45E-07	mg/m^3	1.4E-07	mg/m^3	N/A	(mg/m^3)	---
				Manganese	3.34E-07	mg/m^3	3.2E-07	mg/m^3	5.0E-05	(mg/m^3)	6.4E-03
				Nickel	2.95E-08	mg/m^3	2.8E-08	mg/m^3	N/A	(mg/m^3)	---
				Vanadium	2.12E-08	mg/m^3	2.0E-08	mg/m^3	N/A	(mg/m^3)	---
			Exp. Route Total								9.3E-03
		Exposure Point Total									9.3E-03
	Exposure Media Total										9.3E-03
	Air (Volatiles)	SWMU 50	**Inhalation**	**Organics**							
				Chloroform	1.28E-04	mg/m^3	1.2E-04	mg/m^3	9.8E-02	(mg/m^3)	1.2E-03
			Exp. Route Total								1.2E-03
		Exposure Point Total									1.2E-03
	Exposure Media Total										1.2E-03
Total Soil Total											3.2E+00
										Total of Receptor Hazards Across All Media	3.2E+00

N/A = Not Applicable.

Table E.1-39
Summary of Receptor Risks and Hazards for COPCs
Reasonable Maximum Exposure
Current - Maintenance Worker

Scenario Timeframe: Current
Receptor Population: Maintenance Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	SWMU 50										
			TCDD TE	5.6E-07		1.1E-07	6.7E-07	Developmental nervous system	1.2E-02		2.4E-03	1.4E-02
			2,4-Dinitrotoluene	2.1E-08		1.4E-08	3.5E-08	CNS, Blood, Liver	4.3E-05		2.9E-05	7.3E-05
			Aroclor 1254	5.3E-08		4.9E-08	1.0E-07	Immune System, Eyes	3.7E-03		3.4E-03	7.1E-03
			Benzo(b)fluoranthene	2.8E-09		2.4E-09	5.2E-09	N/A	---		---	---
			Carbazole	---		---	---	N/A	---		---	---
			Dibenzofuran	---		---	---	N/A	---		---	---
			Dimethylphthalate	---		---	---	N/A	---		---	---
			Aluminum	---		---	---	Developmental nervous system	3.4E-03		2.3E-04	3.7E-03
			Arsenic	5.1E-07		1.0E-07	6.2E-07	Skin, Vascular Effects	3.2E-03		6.3E-04	3.8E-03
			Cobalt	---		---	---	N/A	7.1E-03		4.7E-04	7.6E-03
			Iron	---		---	---	Blood, Liver, GI Irritation	6.2E-03		4.1E-04	6.6E-03
			Manganese	---		---	---	CNS	7.1E-03		1.2E-02	1.9E-02
			Vanadium	---		---	---	Kidney	1.7E-03		4.2E-03	5.9E-03
			Chemical Total	1.2E-06		2.8E-07	1.4E-06		0.044		0.024	0.068
		Exposure Point Total					1.4E-06					0.068
	Exposure Media Total						1.4E-06					0.068
	Air (Particulates and Volatiles)	SWMU 50										
			TCDD TE		7.3E-11		7.3E-11	N/A		---		---
			2,4-Dinitrotoluene		---		---	N/A		---		---
			Aroclor 1254		6.6E-12		6.6E-12	N/A		---		---
			Benzo(b)fluoranthene		1.9E-13		1.9E-13	N/A		---		---
			Carbazole		---		---	N/A		---		---
			Dibenzofuran		---		---	N/A		---		---
			Dimethylphthalate		---		---	N/A		---		---
			Aluminum		---		---	N/A		3.0E-04		3.0E-04
			Arsenic		6.5E-10		6.5E-10	Development, Cardiovascular, Nervous System		1.4E-05		1.4E-05
			Cobalt		3.0E-09		3.0E-09	N/A		1.6E-04		1.6E-04
			Iron		---		---	N/A		---		---
			Manganese		---		---	CNS		1.5E-03		1.5E-03
			Vanadium		---		---	N/A		---		---
			Chemical Total		3.8E-09		3.8E-09			0.0020		0.0020
		Exposure Point Total					3.8E-09					0.0020
	Exposure Media Total						3.8E-09					0.0020
Surface Soil Total							1.4E-06					0.070
Receptor Total							1.4E-06					0.070

1.4E-06	Total Hazard Across All Media = 0.070

(a) Chromium RfD is based on NOAEL; no target organ is identified.

CNS = Central Nervous System.
GI = Gastrointestinal
NOAEL = No Observable Adverse Effects Level.
N/A = Not Available.

Total CNS HI Across All Media =	0.039
Total Blood HI Across All Media =	0.0067
Total Liver HI Across All Media =	0.0067
Total Immune System HI Across All Media =	0.0071
Total Eyes HI Across All Media =	0.0071
Total Skin HI Across All Media =	0.0038
Total Vascular Effects HI Across All Media =	0.0038
Total GI Irritation HI Across All Media =	0.0066
Total Kidney HI Across All Media =	0.0059
Total Development HI Across All Media =	0.000014

Table E.1-40
Summary of Receptor Risks and Hazards for COPCs
Reasonable Maximum Exposure
Future - Maintenance Worker

Scenario Timeframe: Future
Receptor Population: Maintenance Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Total Soil	Total Soil	SWMU 50										
			TCDD TE	3.0E-07		5.9E-08	3.6E-07	Developmental nervous system	6.5E-03		1.3E-03	7.7E-03
			2,4-Dinitrotoluene	1.1E-08		7.6E-09	1.9E-08	CNS, Blood, Liver	2.3E-05		1.6E-05	3.9E-05
			Aroclor 1254	5.4E-08		4.9E-08	1.0E-07	Immune System, Eyes	3.7E-03		3.5E-03	7.2E-03
			Benzo(a)pyrene	1.7E-08		1.4E-08	3.1E-08	N/A	---		---	--
			Benzo(b)fluoranthene	1.8E-09		1.6E-09	3.4E-09	N/A	---		---	---
			Carbazole	---		---	---	N/A	---		---	---
			Chloroform	3.1E-10		6.1E-11	3.7E-10	Liver	2.8E-06		5.5E-07	3.4E-06
			Dibenzofuran	---		---	---	N/A	---		---	---
			Dimethylphthalate	---		---	---	N/A	---		---	---
			Aluminum	---		---	---	Developmental nervous system	3.9E-03		2.6E-04	4.2E-03
			Arsenic	5.9E-07		1.2E-07	7.1E-07	Skin, Vascular Effects	3.7E-03		7.3E-04	4.4E-03
			Chromium III	---		---	---	NOAEL	1.9E-05		9.7E-05	1.2E-04
			Cobalt	---		---	---	N/A	7.4E-03		4.9E-04	7.9E-03
			Copper	---		---	---	GI Tract	1.1E-03		7.2E-05	1.2E-03
			Iron	---		---	---	Blood, Liver, GI Irritation	6.5E-03		4.3E-04	7.0E-03
			Lead	---		---	---	N/A	---		---	---
			Manganese	---		---	---	CNS	5.5E-03		9.1E-03	1.5E-02
			Nickel	---		---	---	Kidney, Liver, Spleen	5.9E-04		9.7E-04	1.6E-03
			Vanadium	---		---	---	Kidney	1.7E-03		4.3E-03	6.0E-03
			Chemical Total	9.7E-07		2.5E-07	1.2E-06		0.041		0.021	0.062
		Exposure Point Total					1.2E-06					0.062
	Exposure Media Total						1.2E-06					0.062
	Air (Particulates and Volatiles)	SWMU 50										
			TCDD TE		3.9E-11		3.9E-11	N/A		---		---
			2,4-Dinitrotoluene		---		---	N/A		---		---
			Aroclor 1254		6.8E-12		6.8E-12	N/A		---		---
			Benzo(a)pyrene		1.1E-12		1.1E-12	N/A		---		---
			Benzo(b)fluoranthene		1.2E-13		1.2E-13	N/A		---		---
			Carbazole		---		---	N/A		---		---
			Chloroform		9.0E-08		9.0E-08	N/A		1.1E-04		1.1E-04
			Dibenzofuran		---		---	N/A		---		---
			Dimethylphthalate		---		---	N/A		---		---
			Aluminum		---		---	N/A		3.5E-04		3.5E-04
			Arsenic		7.5E-10		7.5E-10	Development, Cardiovascular, Nervous System		1.6E-05		1.6E-05
			Chromium (total)		5.5E-08		5.5E-08	N/A		---		---
			Cobalt		3.2E-09		3.2E-09	N/A		1.6E-04		1.6E-04
			Copper		---		---	N/A		---		---
			Iron		---		---	N/A		---		---
			Lead		---		---	N/A		---		---
			Manganese		---		---	CNS		1.2E-03		1.2E-03
			Nickel		---		---	N/A		---		---
			Vanadium		---		---	N/A		---		---
			Chemical Total		1.5E-07		1.5E-07			0.0018		0.0018
		Exposure Point Total					1.5E-07					0.0018
	Exposure Media Total						1.5E-07					0.0018
Total Soil Total							1.4E-06					0.064

Table E.1-40
Summary of Receptor Risks and Hazards for COPCs
Reasonable Maximum Exposure
Future - Maintenance Worker

Scenario Timeframe: Future
Receptor Population: Maintenance Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	SWMU 50										
			TCDD TE	5.6E-07		1.1E-07	6.7E-07	Developmental nervous system	1.2E-02		2.4E-03	1.4E-02
			2,4-Dinitrotoluene	2.1E-08		1.4E-08	3.5E-08	CNS, Blood, Liver	4.3E-05		2.9E-05	7.3E-05
			Aroclor 1254	5.3E-08		4.9E-08	1.0E-07	Immune System, Eyes	3.7E-03		3.4E-03	7.1E-03
			Benzo(b)fluoranthene	2.8E-09		2.4E-09	5.2E-09	N/A	---		---	---
			Carbazole	---		---	---	N/A	---		---	---
			Dibenzofuran	---		---	---	N/A	---		---	---
			Dimethylphthalate	---		---	---	N/A	---		---	---
			Aluminum	---		---	---	Developmental nervous system	3.4E-03		2.3E-04	3.7E-03
			Arsenic	5.1E-07		1.0E-07	6.2E-07	Skin, Vascular Effects	3.2E-03		6.3E-04	3.8E-03
			Cobalt	---		---	---	N/A	7.1E-03		4.7E-04	7.6E-03
			Iron	---		---	---	Blood, Liver, GI Irritation	6.2E-03		4.1E-04	6.6E-03
			Manganese	---		---	---	CNS	7.1E-03		1.2E-02	1.9E-02
			Vanadium	---		---	---	Kidney	1.7E-03		4.2E-03	5.9E-03
			Chemical Total	1.2E-06		2.8E-07	1.4E-06		0.044		0.024	0.068
		Exposure Point Total					1.4E-06					0.068
	Exposure Media Total						1.4E-06					0.068
	Air (Particulates and Volatiles)	SWMU 50										
			TCDD TE		7.3E-11		7.3E-11	N/A		---		---
			2,4-Dinitrotoluene		---		---	N/A		---		---
			Aroclor 1254		6.6E-12		6.6E-12	N/A		---		---
			Benzo(b)fluoranthene		1.9E-13		1.9E-13	N/A		---		---
			Carbazole		---		---	N/A		---		---
			Dibenzofuran		---		---	N/A		---		---
			Dimethylphthalate		---		---	N/A		---		---
			Aluminum		---		---	N/A		3.0E-04		3.0E-04
			Arsenic		6.5E-10		6.5E-10	Development, Cardiovascular, Nervous System		1.4E-05		1.4E-05
			Cobalt		3.0E-09		3.0E-09	N/A		1.6E-04		1.6E-04
			Iron		---		---	N/A		---		---
			Manganese		---		---	CNS		1.5E-03		1.5E-03
			Vanadium		---		---	N/A		---		---
			Chemical Total		3.8E-09		3.8E-09			0.0020		0.0020
		Exposure Point Total					3.8E-09					0.0020
	Exposure Media Total						3.8E-09					0.0020
Surface Soil Total							1.4E-06					0.070
Receptor Total[b]							1.4E-06					0.070

Total Risk Across All Media[b] = 1.4E-06

Total Hazard Across All Media[c] = 0.070

(a) Chromium RfD is based on NOAEL; no target organ is identified.
(b) Since total soil represents the more highly contaminated portion of soil, total risk estimates are conservatively based on this soil data grouping.
(c) Since surface soil represents the more highly contaminated portion of soil, hazard estimates are conservatively based on this soil data grouping.

CNS = Central nervous system.
GI = Gastrointestinal.
NOAEL = No Observable Adverse Effects Level.
N/A = Not Available.

Total CNS HI Across All Media =	0.039
Total Blood HI Across All Media =	0.0067
Total Liver HI Across All Media =	0.0067
Total Immune System HI Across All Media =	0.0071
Total Eyes HI Across All Media =	0.0071
Total Skin HI Across All Media =	0.0038
Total Vascular Effects HI Across All Media =	0.0038
Total GI Irritation HI Across All Media =	0.0066
Total Kidney HI Across All Media =	0.0059
Total Development HI Across All Media =	0.000014

Table E.1-41
Summary of Receptor Risks and Hazards for COPCs
Reasonable Maximum Exposure
Future - Industrial Worker

Scenario Timeframe: Future
Receptor Population: Industrial Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Total Soil	Total Soil	SWMU 50										
			TCDD TE	1.3E-06		2.7E-07	1.6E-06	Developmental nervous system	2.9E-02		5.8E-03	3.5E-02
			2,4-Dinitrotoluene	5.1E-08		3.4E-08	8.5E-08	CNS, Blood, Liver	1.0E-04		7.0E-05	1.7E-04
			Aroclor 1254	2.4E-07		2.2E-07	4.6E-07	Immune System, Eyes	1.7E-02		1.6E-02	3.2E-02
			Benzo(a)pyrene	7.6E-08		6.5E-08	1.4E-07	N/A	---		---	---
			Benzo(b)fluoranthene	8.2E-09		7.0E-09	1.5E-08	N/A	---		---	---
			Carbazole	---		---	---	N/A	---		---	---
			Chloroform	1.4E-09		2.8E-10	1.7E-09	Liver	1.3E-05		2.5E-06	1.5E-05
			Dibenzofuran	---		---	---	N/A	---		---	---
			Dimethylphthalate	---		---	---	N/A	---		---	---
			Aluminum	---		---	---	Developmental nervous system	1.8E-02		1.2E-03	1.9E-02
			Arsenic	2.7E-06		5.2E-07	3.2E-06	Skin, Vascular Effects	1.6E-02		3.3E-03	2.0E-02
			Chromium III	---		---	---	NOAEL	8.6E-05		4.4E-04	5.2E-04
			Cobalt	---		---	---	N/A	3.3E-02		2.2E-03	3.6E-02
			Copper	---		---	---	GI Tract	4.9E-03		3.2E-04	5.2E-03
			Iron	---		---	---	Blood, Liver, GI Irritation	2.9E-02		1.9E-03	3.1E-02
			Lead	---		---	---	N/A	---		---	---
			Manganese	---		---	---	CNS	2.5E-02		4.1E-02	6.6E-02
			Nickel	---		---	---	Kidney, Liver, Spleen	2.6E-03		4.4E-03	7.0E-03
			Vanadium	---		---	---	Kidney	7.6E-03		1.9E-02	2.7E-02
			Chemical Total	4.4E-06		1.1E-06	5.5E-06		0.18		0.095	0.28
		Exposure Point Total					5.5E-06					0.28
	Exposure Media Total						5.5E-06					0.28
	Air (Particulates and Volatiles)	SWMU 50										
			TCDD TE		1.7E-10		1.7E-10	N/A		---		---
			2,4-Dinitrotoluene		---		---	N/A		---		---
			Aroclor 1254		3.0E-11		3.0E-11	N/A		---		---
			Benzo(a)pyrene		5.1E-12		5.1E-12	N/A		---		---
			Benzo(b)fluoranthene		5.4E-13		5.4E-13	N/A		---		---
			Carbazole		---		---	N/A		---		---
			Chloroform		4.0E-07		4.0E-07	N/A		5.0E-04		5.0E-04
			Dibenzofuran		---		---	N/A		---		---
			Dimethylphthalate		---		---	N/A		---		---
			Aluminum		---		---	N/A		1.6E-03		1.6E-03
			Arsenic		3.4E-09		3.4E-09	Development, Cardiovascular, Nervous System		7.3E-05		7.3E-05
			Chromium (total)		2.5E-07		2.5E-07	N/A		---		---
			Cobalt		1.4E-08		1.4E-08	N/A		7.4E-04		7.4E-04
			Copper		---		---	N/A		---		---
			Iron		---		---	N/A		---		---
			Lead		---		---	N/A		---		---
			Manganese		---		---	CNS		5.3E-03		5.3E-03
			Nickel		---		---	N/A		---		---
			Vanadium		---		---	N/A		---		---
			Chemical Total		6.7E-07		6.7E-07			0.0082		0.0082
		Exposure Point Total					6.7E-07					0.0082
	Exposure Media Total						6.7E-07					0.0082
Total Soil Total							6.2E-06					0.29

Table E.1-41
Summary of Receptor Risks and Hazards for COPCs
Reasonable Maximum Exposure
Future - Industrial Worker

Scenario Timeframe: Future
Receptor Population: Industrial Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	SWMU 50										
			TCDD TE	2.5E-06		5.0E-07	3.0E-06	Developmental nervous system	5.4E-02		1.1E-02	6.5E-02
			2,4-Dinitrotoluene	9.5E-08		6.4E-08	1.6E-07	CNS, Blood, Liver	2.0E-04		1.3E-04	3.3E-04
			Aroclor 1254	2.4E-07		2.2E-07	4.6E-07	Immune System, Eyes	1.7E-02		1.5E-02	3.2E-02
			Benzo(b)fluoranthene	1.3E-08		1.1E-08	2.3E-08	N/A	---		---	---
			Carbazole	---		---	---	N/A	---		---	---
			Dibenzofuran	---		---	---	N/A	---		---	---
			Dimethylphthalate	---		---	---	N/A	---		---	---
			Aluminum	---		---	---	Developmental nervous system	1.5E-02		1.0E-03	1.6E-02
			Arsenic	2.3E-06		4.6E-07	2.8E-06	Skin, Vascular Effects	1.4E-02		2.8E-03	1.7E-02
			Cobalt	---		---	---	N/A	3.2E-02		2.1E-03	3.4E-02
			Iron	---		---	---	Blood, Liver, GI Irritation	2.8E-02		1.8E-03	3.0E-02
			Manganese	---		---	---	CNS	3.2E-02		5.3E-02	8.5E-02
			Vanadium	---		---	---	Kidney	7.5E-03		1.9E-02	2.6E-02
			Chemical Total	5.2E-06		1.3E-06	6.4E-06		0.20		0.11	0.31
		Exposure Point Total					6.4E-06					0.31
	Exposure Media Total						6.4E-06					0.31
	Air (Particulates and Volatiles)	SWMU 50										
			TCDD TE		3.3E-10		3.3E-10	N/A		---		---
			2,4-Dinitrotoluene		---		---	N/A		---		---
			Aroclor 1254		3.0E-11		3.0E-11	N/A		---		---
			Benzo(b)fluoranthene		8.4E-13		8.4E-13	N/A		---		---
			Carbazole		---		---	N/A		---		---
			Dibenzofuran		---		---	N/A		---		---
			Dimethylphthalate		---			N/A		---		
			Aluminum		---		---	N/A		1.4E-03		1.4E-03
			Arsenic		2.9E-09		2.9E-09	Development, Cardiovascular, Nervous System		6.4E-05		6.4E-05
			Cobalt		1.4E-08		1.4E-08	N/A		7.1E-04		7.1E-04
			Iron		---		---	N/A		---		---
			Manganese		---		---	CNS		6.8E-03		6.8E-03
			Vanadium		---		---	N/A		---		---
			Chemical Total		1.7E-08		1.7E-08			0.0090		0.0090
		Exposure Point Total					1.7E-08					0.0090
	Exposure Media Total						1.7E-08					0.0090
Surface Soil Total							6.4E-06					0.32
Receptor Total[b]							6.4E-06					0.32

Total Risk Across All Media[b] = 6.4E-06

Total Hazard Across All Media[b] = 0.32

(a) Chromium RfD is based on NOAEL; no target organ is identified.
(b) Since surface soil represents the more highly contaminated portion of soil, total risk and hazard estimates are conservatively based on this soil data grouping.

Total CNS HI Across All Media =	0.17
Total Blood HI Across All Media =	0.030
Total Liver HI Across All Media =	0.030
Total Immune System HI Across All Media =	0.032
Total Eyes HI Across All Media =	0.032
Total Skin HI Across All Media =	0.017
Total Vascular Effects HI Across All Media =	0.017
Total GI Irritation HI Across All Media =	0.030
Total Kidney HI Across All Media =	0.026
Total Development HI Across All Media =	0.000064

CNS = Central nervous system.
GI = Gastrointestinal.
NOAEL = No Observable Adverse Effects Level.
N/A = Not Available.

Table E.1-42
Summary of Receptor Risks and Hazards for COPCs
Reasonable Maximum Exposure
Future - Excavation Worker

Scenario Timeframe: Future
Receptor Population: Excavation Worke
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Total Soil	Total Soil	SWMU 50										
			TCDD TE	9.9E-08		8.9E-09	1.1E-07	Developmental nervous system	5.3E-02		4.8E-03	5.8E-02
			2,4-Dinitrotoluene	3.7E-09		1.1E-09	4.9E-09	CNS, Blood, Liver	1.9E-04		5.9E-05	2.5E-04
			Aroclor 1254	1.8E-08		7.4E-09	2.5E-08	Immune System, Eyes	3.1E-02		1.3E-02	4.4E-02
			Benzo(a)pyrene	5.6E-09		2.2E-09	7.7E-09	N/A	---		---	---
			Benzo(b)fluoranthene	6.0E-10		2.3E-10	8.3E-10	N/A	---		---	---
			Carbazole	---		---	---	N/A	---		---	---
			Chloroform	1.0E-10		9.2E-12	1.1E-10	Liver	2.3E-05		2.1E-06	2.5E-05
			Dibenzofuran	---		---	---	N/A	---		---	---
			Dimethylphthalate	---		---	---	N/A	---		---	---
			Aluminum	---		---	---	Developmental nervous system	3.2E-02		9.7E-04	3.3E-02
			Arsenic	1.9E-07		1.7E-08	2.1E-07	Skin, Vascular Effects	3.0E-02		2.7E-03	3.3E-02
			Chromium III	---		---	---	NOAEL	1.6E-04		3.7E-04	5.2E-04
			Cobalt	---		---	---	N/A	6.1E-02		1.8E-03	6.3E-02
			Copper	---		---	---	GI Tract	9.0E-03		2.7E-04	9.2E-03
			Iron	---		---	---	Blood, Liver, GI Irritation	5.4E-02		1.6E-03	5.6E-02
			Lead	---		---	---	N/A	---		---	---
			Manganese	---		---	---	CNS	4.6E-02		3.4E-02	8.0E-02
			Nickel	---		---	---	Kidney, Liver, Spleen	4.8E-03		3.6E-03	8.5E-03
			Vanadium	---		---	---	Kidney	1.4E-02		1.6E-02	3.0E-02
			Chemical Total	3.2E-07		3.7E-08	3.6E-07		0.34		0.079	0.42
		Exposure Point Total					3.6E-07					0.42
	Exposure Media Total						3.6E-07					0.42
	Air (Particulates and Volatiles)	SWMU 50										
			TCDD TE		3.5E-10		3.5E-10	N/A		---		---
			2,4-Dinitrotoluene		---		---	N/A		---		---
			Aroclor 1254		6.1E-11		6.1E-11	N/A		---		---
			Benzo(a)pyrene		1.0E-11		1.0E-11	N/A		---		---
			Benzo(b)fluoranthene		1.1E-12		1.1E-12	N/A		---		---
			Carbazole		---		---	N/A		---		---
			Chloroform		1.0E-07		1.0E-07	N/A		3.1E-03		3.1E-03
			Dibenzofuran		---		---	N/A		---		---
			Dimethylphthalate		---		---	N/A		---		---
			Aluminum		---		---	N/A		7.8E-02		7.8E-02
			Arsenic		6.7E-09		6.7E-09	Development, Cardiovascular, Nervous System		3.6E-03		3.6E-03
			Chromium (total)		4.9E-07		4.9E-07	N/A		---		---
			Cobalt		2.9E-08		2.9E-08	N/A		3.7E-02		3.7E-02
			Copper		---		---	N/A		---		---
			Iron		---		---	N/A		---		---
			Lead		---		---	N/A		---		---
			Manganese		---		---	CNS		2.6E-01		2.6E-01
			Nickel		---		---	N/A		---		---
			Vanadium		---		---	N/A		---		---
			Chemical Total		6.3E-07		6.3E-07			0.39		0.39
		Exposure Point Total					6.3E-07					0.39
	Exposure Media Total						6.3E-07					0.39
Total Soil Total							9.8E-07					0.80
Receptor Total							9.8E-07					0.80

Total Risk Across All Media = 9.8E-07

Total Hazard Across All Media = 0.80

(a) Chromium RfD is based on NOAEL; no target organ is identified

CNS = Central nervous system
GI = Gastrointestinal.
NOAEL = No Observable Adverse Effects Level
N/A = Not Available.

Total CNS HI Across All Media =	0.44
Total Blood HI Across All Media =	0.056
Total Liver HI Across All Media =	0.064
Total Immune System HI Across All Media =	0.044
Total Eyes HI Across All Media =	0.044
Total Skin HI Across All Media =	0.033
Total Vascular Effects HI Across All Media =	0.037
Total NOAEL HI Across All Media =	0.00052
Total GI Irritation HI Across All Media =	0.065
Total Kidney HI Across All Media =	0.038
Total Spleen HI Across All Media =	0.0085
Total Development HI Across All Media =	0.0036

Table E.1-43
Summary of Receptor Risks and Hazards for COPCs
Reasonable Maximum Exposure
Future - Adult/ Lifetime Resident

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult/ Lifetime

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Total Soil	Total Soil	SWMU 50										
			TCDD TE	6.7E-06		6.4E-07	7.4E-06	Developmental nervous system	4.5E-02		5.4E-03	5.1E-02
			2,4-Dinitrotoluene	2.5E-07		8.1E-08	3.3E-07	CNS, Blood, Liver	1.6E-04		6.6E-05	2.3E-04
			Aroclor 1254	1.2E-06		5.3E-07	1.7E-06	Immune System, Eyes	2.6E-02		1.5E-02	4.1E-02
			Benzo(a)pyrene	1.6E-06		6.2E-07	2.2E-06	N/A	---		---	---
			Benzo(b)fluoranthene	1.7E-07		6.7E-08	2.4E-07	N/A	---		---	---
			Carbazole	---		---	---	N/A	---		---	---
			Chloroform	6.9E-09		6.6E-10	7.6E-09	Liver	2.0E-05		2.3E-06	2.2E-05
			Dibenzofuran	---		---	---	N/A	---		---	---
			Dimethylphthalate	---		---	---	N/A	---		---	---
			Aluminum	---		---	---	Developmental nervous system	2.8E-02		1.1E-03	2.9E-02
			Arsenic	1.3E-05		1.2E-06	1.4E-05	Skin, Vascular Effects	2.6E-02		3.1E-03	2.9E-02
			Chromium III	---		---	---	NOAEL	1.3E-04		4.1E-04	5.5E-04
			Cobalt	---		---	---	N/A	5.2E-02		2.1E-03	5.4E-02
			Copper	---		---	---	GI Tract	7.6E-03		3.0E-04	7.9E-03
			Iron	---		---	---	Blood, Liver, GI Irritation	4.6E-02		1.8E-03	4.8E-02
			Lead	---		---	---	N/A	---		---	---
			Manganese	---		---	---	CNS	3.9E-02		3.9E-02	7.7E-02
			Nickel	---		---	---	Kidney, Liver, Spleen	4.1E-03		4.1E-03	8.2E-03
			Vanadium	---		---	---	Kidney	1.2E-02		1.8E-02	3.0E-02
			Chemical Total	2.3E-05		3.2E-06	2.6E-05		0.28		0.090	0.37
		Exposure Point Total					2.6E-05					0.37
	Exposure Media Total						2.6E-05					0.37
	Air (Particulates and Volatiles)	SWMU 50										
			TCDD TE		2.5E-10		2.5E-10	N/A		---		---
			2,4-Dinitrotoluene		---		---	N/A		---		---
			Aroclor 1254		4.4E-11		4.4E-11	N/A		---		---
			Benzo(a)pyrene		1.9E-11		1.9E-11	N/A		---		---
			Benzo(b)fluoranthene		2.0E-12		2.0E-12	N/A		---		---
			Carbazole		---		---	N/A		---		---
			Chloroform		7.2E-07		7.2E-07	N/A		6.2E-04		6.2E-04
			Dibenzofuran		---		---	N/A		---		---
			Dimethylphthalate		---		---	N/A		---		---
			Aluminum		---		---	N/A		1.9E-03		1.9E-03
			Arsenic		4.9E-09		4.9E-09	Development, Cardiovascular, Nervous System		8.9E-05		8.9E-05
			Chromium (total)		3.6E-07		3.6E-07	N/A		---		---
			Cobalt		2.1E-08		2.1E-08	N/A		9.0E-04		9.0E-04
			Copper		---		---	N/A		---		---
			Iron		---		---	N/A		---		---
			Lead		---		---	N/A		---		---
			Manganese		---		---	CNS		6.4E-03		6.4E-03
			Nickel		---		---	N/A		---		---
			Vanadium		---		---	N/A		---		---
			Chemical Total		1.1E-06		1.1E-06			0.010		0.010
		Exposure Point Total					1.1E-06					0.010
	Exposure Media Total						1.1E-06					0.010
Total Soil Total							2.7E-05					0.38
Receptor Total							2.7E-05					0.38

Total Risk Across All Media = 2.7E-05

Total Hazard Across All Media = 0.38

(a) Chromium RfD is based on NOAEL; no target organ is identified

Total CNS HI Across All Media =	0.16
Total Blood HI Across All Media =	0.048
Total Liver HI Across All Media =	0.056
Total Immune System HI Across All Media =	0.041
Total Eyes HI Across All Media =	0.041
Total Skin HI Across All Media =	0.029
Total Vascular Effects HI Across All Media =	0.029
Total NOAEL HI Across All Media =	0.00055
Total GI Irritation HI Across All Media =	0.056
Total Kidney HI Across All Media =	0.038
Total Spleen HI Across All Media =	0.0082
Total Development HI Across All Media =	0.000089

CNS = Central nervous system
GI = Gastrointestinal.
NOAEL = No Observable Adverse Effects Level
N/A = Not Available.
NV = No dermal exposure value calculated. As per USEPA Dermal Exposure spreadsheet, this chemical is not assesse

Table E.1-44
Summary of Receptor Risks and Hazards for COPCs
Reasonable Maximum Exposure
Future - Child Resident

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Total Soil	Total Soil	SWMU 50										
			TCDD TE	4.7E-06		3.9E-07	5.1E-06	Developmental nervous system	4.2E-01		3.5E-02	4.6E-01
			2,4-Dinitrotoluene	1.8E-07		5.0E-08	2.3E-07	CNS, Blood, Liver	1.5E-03		4.3E-04	1.9E-03
			Aroclor 1254	8.4E-07		3.3E-07	1.2E-06	Immune System, Eyes	2.4E-01		9.6E-02	3.4E-01
			Benzo(a)pyrene	2.6E-07		9.6E-08	3.6E-07	N/A	---		---	---
			Benzo(b)fluoranthene	2.8E-08		1.0E-08	3.9E-08	N/A	---		---	---
			Carbazole	---		---	---	N/A	---		---	---
			Chloroform	4.9E-09		4.1E-10	5.3E-09	Liver	1.8E-04		1.5E-05	2.0E-04
			Dibenzofuran	---		---	---	N/A	---		---	---
			Dimethylphthalate	---		---	---	N/A	---		---	---
			Aluminum	---		---	---	Developmental nervous system	2.6E-01		7.2E-03	2.6E-01
			Arsenic	9.2E-06		7.8E-07	1.0E-05	Skin, Vascular Effects	2.4E-01		2.0E-02	2.6E-01
			Chromium III	---		---	---	NOAEL	1.3E-03		2.7E-03	4.0E-03
			Cobalt	---		---	---	N/A	4.9E-01		1.4E-02	5.0E-01
			Copper	---		---	---	GI Tract	7.1E-02		2.0E-03	7.3E-02
			Iron	---		---	---	Blood, Liver, GI Irritation	4.3E-01		1.2E-02	4.4E-01
			Lead	---		---	---	N/A	---		---	---
			Manganese	---		---	---	CNS	3.6E-01		2.5E-01	6.1E-01
			Nickel	---		---	---	Kidney, Liver, Spleen	3.8E-02		2.7E-02	6.5E-02
			Vanadium	---		---	---	Kidney	1.1E-01		1.2E-01	2.3E-01
			Chemical Total	1.5E-05		1.7E-06	1.7E-05		2.7		0.59	3.2
		Exposure Point Total					1.7E-05					3.2
	Exposure Media Total						1.7E-05					3.2
	Air (Particulates and Volatiles)	SWMU 50										
			TCDD TE		5.1E-11		5.1E-11	N/A		---		---
			2,4-Dinitrotoluene		---		---	N/A		---		---
			Aroclor 1254		8.8E-12		8.8E-12	N/A		---		---
			Benzo(a)pyrene		1.5E-12		1.5E-12	N/A		---		---
			Benzo(b)fluoranthene		1.6E-13		1.6E-13	N/A		---		---
			Carbazole		---		---	N/A		---		---
			Chloroform		2.4E-07		2.4E-07	N/A		1.2E-03		1.2E-03
			Dibenzofuran		---		---	N/A		---		---
			Dimethylphthalate		---		---	N/A		---		---
			Aluminum		---		---	N/A		1.9E-03		1.9E-03
			Arsenic		9.8E-10		9.8E-10	Development, Cardiovascular, Nervous System		8.9E-05		8.9E-05
			Chromium (total)		7.1E-08		7.1E-08	N/A		---		---
			Cobalt		4.2E-09		4.2E-09	N/A		9.0E-04		9.0E-04
			Copper		---		---	N/A		---		---
			Iron		---		---	N/A		---		---
			Lead		---		---	N/A		---		---
			Manganese		---		---	CNS		6.4E-03		6.4E-03
			Nickel		---		---	N/A		---		---
			Vanadium		---		---	N/A		---		---
			Chemical Total		3.2E-07		3.2E-07			0.011		0.011
		Exposure Point Total					3.2E-07					0.011
	Exposure Media Total						3.2E-07					0.011
Total Soil Total							1.7E-05					3.3
Receptor Total							1.7E-05					3.3

Total Risk Across All Media = 1.7E-05

Total Hazard Across All Media = 3.3

(a) Chromium RfD is based on NOAEL; no target organ is identified

CNS = Central nervous system
GI = Gastrointestinal.
NOAEL = No Observable Adverse Effects Level
N/A = Not Available.
NV = No dermal exposure value calculated. As per USEPA Dermal Exposure spreadsheet, this chemical is not assesse

Total CNS HI Across All Media =	1.3
Total Blood HI Across All Media =	0.44
Total Liver HI Across All Media =	0.51
Total Immune System HI Across All Media =	0.34
Total Eyes HI Across All Media =	0.34
Total Skin HI Across All Media =	0.26
Total Vascular Effects HI Across All Media =	0.26
Total NOAEL HI Across All Media =	0.0040
Total GI Irritation HI Across All Media =	0.51
Total Kidney HI Across All Media =	0.29
Total Spleen HI Across All Media =	0.065
Total Development HI Across All Media =	0.000089

Table E.1-45
Risk Assessment Summary
Reasonable Maximum Exposure
Current - Maintenance Worker

Scenario Timeframe: Current
Receptor Population: Maintenance Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	SWMU 50										
			Chemical Total				1.4E-06 (a)					<1
		Exposure Point Total					1.4E-06 (a)					<1
	Exposure Media Total						1.4E-06 (a)					<1
	Air (Particulates and Volatiles)	SWMU 50										
			Chemical Total				<1.0E-06					<1
		Exposure Point Total					<1.0E-06					<1
	Exposure Media Total						<1.0E-06					<1
Surface Soil Total							1.4E-06 (a)					<1
Receptor Total							1.4E-06 (a)					<1

Total Risk Across All Media = 1.4E-06 (a)

Total Hazard Across All Media = <1

(a) Although no individual chemical or media type exposure exceeds 1.0E-06, the total risk is equal to 1.4E-06.

Table E.1-46
Risk Assessment Summary
Reasonable Maximum Exposure
Future - Maintenance Worker

Scenario Timeframe: Future
Receptor Population: Maintenance Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Total Soil	Total Soil	SWMU 50										
			Chemical Total				1.2E-06 (a)					<1
		Exposure Point Total					1.2E-06 (a)					<1
	Exposure Media Total						1.2E-06 (a)					<1
	Air (Particulates and Volatiles)	SWMU 50										
			Chemical Total				<1.0E-06					<1
		Exposure Point Total					<1.0E-06					<1
	Exposure Media Total						<1.0E-06					<1
Total Soil Total							1.2E-06 (a)					<1
Surface Soil	Surface Soil	SWMU 50										
			Chemical Total				1.4E-06 (a)					<1
		Exposure Point Total					1.4E-06 (a)					<1
	Exposure Media Total						1.4E-06 (a)					<1
	Air (Particulates and Volatiles)	SWMU 50										
			Chemical Total				<1.0E-06					<1
		Exposure Point Total					<1.0E-06					<1
	Exposure Media Total						<1.0E-06					<1
Surface Soil Total							1.4E-06 (a)					<1
Receptor Total[a]							1.4E-06 (a)					<1

Total Risk Across All Media[b] = 1.4E-06 (a)

Total Hazard Across All Media = <1

(a) Although no individual chemical or media type exposure exceeds 1.0E-06, the total risk is greater than 1.0E-06.
(b) Since total soil represents the more highly contaminated portion of soil, total risk estimates are conservatively based on this soil data grouping.

Table E.1-47
Risk Assessment Summary
Reasonable Maximum Exposure
Future - Industrial Worker

Scenario Timeframe: Future
Receptor Population: Industrial Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Total Soil	Total Soil	SWMU 50	TCDD TE	1.3E-06		2.7E-07	1.6E-06					
			Arsenic	2.7E-06		5.2E-07	3.2E-06					
			Chemical Total	4.0E-06		7.9E-07	4.8E-06					<1
		Exposure Point Total					4.8E-06					<1
	Exposure Media Total						4.8E-06					<1
	Air (Particulates and Volatiles)	SWMU 50										
			Chemical Total				<1.0E-06					<1
		Exposure Point Total					<1.0E-06					<1
	Exposure Media Total						<1.0E-06					<1
Total Soil Total							4.8E-06					<1
Surface Soil	Surface Soil	SWMU 50	TCDD TE	2.5E-06		5.0E-07	3.0E-06					
			Arsenic	2.3E-06		4.6E-07	2.8E-06					
			Chemical Total	4.8E-06		9.6E-07	5.8E-06					<1
		Exposure Point Total					5.8E-06					<1
	Exposure Media Total						5.8E-06					<1
	Air (Particulates and Volatiles)	SWMU 50										
			Chemical Total				<1.0E-06					<1
		Exposure Point Total					<1.0E-06					<1
	Exposure Media Total						<1.0E-06					<1
Surface Soil Total							5.8E-06					<1
Receptor Total[a]							5.8E-06					<1

Total Risk Across All Media [a] = 5.8E-06

Total Hazard Across All Media = <1

(a) Since surface soil represents the more highly contaminated portion of soil, total risk estimates are conservatively based on this soil data grouping.

Table E.1-48
Risk Assessment Summary
Reasonable Maximum Exposure
Future - Excavation Worker

Scenario Timeframe: Future
Receptor Population: Excavation Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Total Soil	Total Soil	SWMU 50										
			Chemical Total				<1.0E-06					<1
		Exposure Point Total					<1.0E-06					<1
	Exposure Media Total						<1.0E-06					<1
	Air (Particulates and Volatiles)	SWMU 50										
			Chemical Total				<1.0E-06					<1
		Exposure Point Total					<1.0E-06					<1
	Exposure Media Total						<1.0E-06					<1
Total Soil Total							<1.0E-06					<1
Receptor Total							<1.0E-06					<1

Total Risk Across All Media = <1.0E-06

Total Hazard Across All Media = <1

Table E.1-49
Risk Assessment Summary
Reasonable Maximum Exposure
Future - Adult/ Lifetime Resident

Scenario Timeframe: Future
Receptor Population: Lifetime Resident
Receptor Age: Adult/ Lifetime

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Total Soil	Total Soil	SWMU 50										
			TCDD TE	6.7E-06		6.4E-07	7.4E-06					
			Aroclor 1254	1.2E-06		5.3E-07	1.7E-06					
			Benzo(a)pyrene	1.6E-06		6.2E-07	2.2E-06					
			Arsenic	1.3E-05		1.2E-06	1.4E-05					
			Chemical Total	2.3E-05		3.0E-06	2.6E-05					<1
		Exposure Point Total					2.6E-05					<1
	Exposure Media Total						2.6E-05					<1
	Air (Particulates and Volatiles)	SWMU 50										
			Chemical Total				1.1E-06 (a)					<1
		Exposure Point Total					1.1E-06 (a)					<1
	Exposure Media Total						1.1E-06 (a)					<1
Total Soil Total							2.6E-05					<1
Receptor Total							2.6E-05					<1

Total Risk Across All Media = 2.6E-05

Total Hazard Across All Media = <1

(a) Although no individual chemical or media type exposure exceeds 1.0E-06, the total risk is greater than 1.0E-06.

Table E.1-50
Risk Assessment Summary
Reasonable Maximum Exposure
Future - Child Resident

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Total Soil	Total Soil	SWMU 50	TCDD TE	4.7E-06		3.9E-07	5.1E-06					
			Aroclor 1254	8.4E-07		3.3E-07	1.2E-06					
			Arsenic	9.2E-06		7.8E-07	1.0E-05					
			Chemical Total	1.5E-05		1.5E-06	1.6E-05					3.2 (a)
		Exposure Point Total					1.6E-05					3.2 (a)
	Exposure Media Total						1.6E-05					3.2 (a)
	Air (Particulates and Volatiles)	SWMU 50										
			Chemical Total				<1.0E-06					<1
		Exposure Point Total					<1.0E-06					<1
	Exposure Media Total						<1.0E-06					<1
Total Soil Total							1.6E-05					3.2 (a)
Receptor Total							1.6E-05					3.2 (a)

Total Risk Across All Media = 1.6E-05

Total Hazard Across All Media = 3.2 (a)

(a) Although no individual chemical or media type exposure exceeds 1.0, the total hazard is greater than 1.0.

Appendix E-2

RAGS Part D Tables – SWMU 59

Table E.2-45
Risk Assessment Summary
Reasonable Maximum Exposure
Future - Child Resident

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Total Soil	Total Soil	SWMU 59	Arsenic	2.2E-05		1.9E-06	2.4E-05					
			Chemical Total	2.2E-05		1.9E-06	2.4E-05					2.5 (a)
		Exposure Point Total					2.4E-05					2.5 (a)
	Exposure Media Total						2.4E-05					2.5 (a)
	Air (Particulates and Volatiles)	SWMU 59										
			Chemical Total				<1.0E-06					<1
		Exposure Point Total					<1.0E-06					<1
	Exposure Media Total						<1.0E-06					<1
Total Soil Total							2.4E-05					2.5 (a)
Receptor Total							2.4E-05					2.5 (a)

Total Risk Across All Media = 2.4E-05

Total Hazard Across All Media = 2.5 (a)

(a) Although no individual chemical or media type exposure exceeds 1.0, the total hazard is greater than 1.0.

Appendix E-3

Calculations for 2,3,7,8-TCDD Equivalents –

SWMUs 50 and 59

Sample		HHRA Values	Units	SLERA Values	Units	Matrix	HHRA - Unit Adjusted Values		SLERA - Unit Adjusted Values	
50SB06A	TCDD-TE	9.60E+01	pg/g	9.80E+01	pg/g	SS	9.60E-05	mg/kg	9.80E-05	mg/kg
50SB07A	TCDD-TE	5.36E+01	pg/g	6.77E+01	pg/g	SS	5.36E-05	mg/kg	6.77E-05	mg/kg
50SB08A	TCDD-TE	4.17E+01	pg/g	4.30E+01	pg/g	SS	4.17E-05	mg/kg	4.30E-05	mg/kg
50SB09A	TCDD-TE	3.56E+00	pg/g	3.56E+00	pg/g	SS	3.56E-06	mg/kg	3.56E-06	mg/kg
50SB10A	TCDD-TE	2.35E+00	pg/g	2.37E+00	pg/g	SS	2.35E-06	mg/kg	2.37E-06	mg/kg
50SB11A	TCDD-TE	9.38E+00	pg/g	9.39E+00	pg/g	SS	9.38E-06	mg/kg	9.39E-06	mg/kg
50SB12A	TCDD-TE	4.75E+01	pg/g	4.80E+01	pg/g	SS	4.75E-05	mg/kg	4.80E-05	mg/kg
50SB13A	TCDD-TE	3.63E+00	pg/g	3.63E+00	pg/g	SS	3.63E-06	mg/kg	3.63E-06	mg/kg
50SB14A	TCDD-TE	5.54E+00	pg/g	5.81E+00	pg/g	SS	5.54E-06	mg/kg	5.81E-06	mg/kg
50SB15A	TCDD-TE	4.11E+00	pg/g	4.33E+00	pg/g	SS	4.11E-06	mg/kg	4.33E-06	mg/kg
50SB06B	TCDD-TE	2.49E+01	pg/g			SB	2.49E-05	mg/kg		
50SB07B	TCDD-TE	3.27E-01	pg/g			SB	3.27E-07	mg/kg		
50SB08B	TCDD-TE	6.80E+00	pg/g			SB	6.80E-06	mg/kg		
50SB09B	TCDD-TE	1.67E+01	pg/g			SB	1.67E-05	mg/kg		
50SB10B	TCDD-TE	4.11E+00	pg/g			SB	4.11E-06	mg/kg		
50SB11B	TCDD-TE	2.35E+00	pg/g			SB	2.35E-06	mg/kg		
50SB12B	TCDD-TE	3.21E+01	pg/g			SB	3.21E-05	mg/kg		
50SB13B	TCDD-TE	2.58E+01	pg/g			SB	2.58E-05	mg/kg		
50SB14B	TCDD-TE	9.64E-01	pg/g			SB	9.64E-07	mg/kg		
50SB15B	TCDD-TE	1.75E+00	pg/g			SB	1.75E-06	mg/kg		

Sample		HHRA Values	Units	SLERA Values	Units	Matrix	HHRA - Unit Adjusted Values		SLERA - Unit Adjusted Values	
59SB02A	TCDD-TE	9.05E-01	pg/g	1.26E+00	pg/g	SS	9.05E-07	mg/kg	1.26E-06	mg/kg
59SB03A	TCDD-TE	3.36E+00	pg/g	4.08E+00	pg/g	SS	3.36E-06	mg/kg	4.08E-06	mg/kg
59SB04A	TCDD-TE	2.42E+00	pg/g	2.76E+00	pg/g	SS	2.42E-06	mg/kg	2.76E-06	mg/kg
59SB05A	TCDD-TE	2.21E+00	pg/g	2.21E+00	pg/g	SS	2.21E-06	mg/kg	2.21E-06	mg/kg
59SB06A	TCDD-TE	2.61E-01	pg/g	5.67E-01	pg/g	SS	2.61E-07	mg/kg	5.67E-07	mg/kg
59SS06	TCDD-TE	1.18E+01	pg/g	1.21E+01	pg/g	SS	1.18E-05	mg/kg	1.21E-05	mg/kg
59SS07	TCDD-TE	7.65E+00	pg/g	7.97E+00	pg/g	SS	7.65E-06	mg/kg	7.97E-06	mg/kg
59SS08	TCDD-TE	1.13E+01	pg/g	1.17E+01	pg/g	SS	1.13E-05	mg/kg	1.17E-05	mg/kg
59SS09	TCDD-TE	3.45E+00	pg/g	3.47E+00	pg/g	SS	3.45E-06	mg/kg	3.47E-06	mg/kg
59SS10	TCDD-TE	1.84E+00	pg/g	1.85E+00	pg/g	SS	1.84E-06	mg/kg	1.85E-06	mg/kg
59SB02B	TCDD-TE	1.61E+00	pg/g			SB	1.61E-06	mg/kg		
59SB02C	TCDD-TE	3.85E-01	pg/g			SB	3.85E-07	mg/kg		
59SB03B	TCDD-TE	1.22E+00	pg/g			SB	1.22E-06	mg/kg		
59SB03C	TCDD-TE	9.02E-01	pg/g			SB	9.02E-07	mg/kg		
59SB04B	TCDD-TE	1.17E+00	pg/g			SB	1.17E-06	mg/kg		
59SB04C	TCDD-TE	1.51E-01	pg/g			SB	1.51E-07	mg/kg		
59SB05B	TCDD-TE	6.99E-01	pg/g			SB	6.99E-07	mg/kg		
59SB05C	TCDD-TE	3.63E-01	pg/g			SB	3.63E-07	mg/kg		
59SB06B	TCDD-TE	1.76E+00	pg/g			SB	1.76E-06	mg/kg		
59SB06C	TCDD-TE	7.46E-01	pg/g			SB	7.46E-07	mg/kg		

Appendix E-4

Exposure PointConcentrations

– ProUCL 4.0 Output –

SWMU 50

1				General UCL Statistics for Data Sets with Non-Detects								
2		User Selected Options										
3		From File		C:\Documents and Settings\debbi.freer\My Documents\Radford\50_ProUCL_input_SS.wst								
4		Full Precision		OFF								
5		Confidence Coefficient		95%								
6		Number of Bootstrap Operations		2000								
7												
8												
9	2,4-DNT (mg/kg)											
10												
11				General Statistics								
12			Number of Valid Samples	14			Number of Detected Data	5				
13			Number of Unique Samples	5			Number of Non-Detect Data	9				
14			Number of Missing Values	1			Percent Non-Detects	64.29%				
15												
16			Raw Statistics				Log-transformed Statistics					
17			Minimum Detected	0.101			Minimum Detected	-2.293				
18			Maximum Detected	0.888			Maximum Detected	-0.119				
19			Mean of Detected	0.393			Mean of Detected	-1.23				
20			SD of Detected	0.316			SD of Detected	0.9				
21			Minimum Non-Detect	0.2			Minimum Non-Detect	-1.609				
22			Maximum Non-Detect	0.4			Maximum Non-Detect	-0.916				
23												
24		Note: Data have multiple DLs - Use of KM Method is recommended					Number treated as Non-Detect	11				
25		For all methods (except KM, DL/2, and ROS Methods),					Number treated as Detected	3				
26		Observations < Largest ND are treated as NDs					Single DL Non-Detect Percentage	78.57%				
27												
28				UCL Statistics								
29			Normal Distribution Test with Detected Values Only				Lognormal Distribution Test with Detected Values Only					
30			Shapiro Wilk Test Statistic	0.893			Shapiro Wilk Test Statistic	0.926				
31			5% Shapiro Wilk Critical Value	0.762			5% Shapiro Wilk Critical Value	0.762				
32			Data appear Normal at 5% Significance Level				Data appear Lognormal at 5% Significance Level					
33												
34			Assuming Normal Distribution				Assuming Lognormal Distribution					
35			DL/2 Substitution Method				DL/2 Substitution Method					
36			Mean	0.221			Mean	-1.785				
37			SD	0.221			SD	0.676				
38			95% DL/2 (t) UCL	0.326			95% H-Stat (DL/2) UCL	0.335				
39												
40			Maximum Likelihood Estimate(MLE) Method				Log ROS Method					
41			Mean	0.099			Mean in Log Scale	-1.812				
42			SD	0.365			SD in Log Scale	0.733				
43			95% MLE (t) UCL	0.272			Mean in Original Scale	0.221				
44			95% MLE (Tiku) UCL	0.497			SD in Original Scale	0.223				
45							95% Percentile Bootstrap UCL	0.327				
46							95% BCA Bootstrap UCL	0.361				
47												
48			Gamma Distribution Test with Detected Values Only				Data Distribution Test with Detected Values Only					
49			k star (bias corrected)	0.867			Data appear Normal at 5% Significance Level					
50			Theta Star	0.454								
51			nu star	8.665								
52												
53			A-D Test Statistic	0.312			Nonparametric Statistics					

54				5% A-D Critical Value	0.685					Kaplan-Meier (KM) Method		
55				K-S Test Statistic	0.685					Mean		0.216
56				5% K-S Critical Value	0.361					SD		0.215
57				**Data appear Gamma Distributed at 5% Significance Level**						SE of Mean		0.0649
58										95% KM (t) UCL		0.331
59				**Assuming Gamma Distribution**						95% KM (z) UCL		0.323
60				Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL		0.326
61				Minimum	0.101					95% KM (bootstrap t) UCL		0.388
62				Maximum	0.888					95% KM (BCA) UCL		0.475
63				Mean	0.367					95% KM (Percentile Bootstrap) UCL		0.444
64				Median	0.355					95% KM (Chebyshev) UCL		0.499
65				SD	0.19					97.5% KM (Chebyshev) UCL		0.621
66				k star	3.229					99% KM (Chebyshev) UCL		0.862
67				Theta star	0.114							
68				Nu star	90.42					**Potential UCLs to Use**		
69				AppChi2	69.49					95% KM (t) UCL		0.331
70				95% Gamma Approximate UCL	0.478					95% KM (Percentile Bootstrap) UCL		0.444
71				95% Adjusted Gamma UCL	0.495							
72	**Note: DL/2 is not a recommended method.**											
73												
74												
75	**2-Methylnaphthalene (mg/kg)**											
76												
77										**General Statistics**		
78				Number of Valid Samples	14					Number of Detected Data		4
79				Number of Unique Samples	4					Number of Non-Detect Data		10
80				Number of Missing Values	1					Percent Non-Detects		71.43%
81												
82				**Raw Statistics**						**Log-transformed Statistics**		
83				Minimum Detected	0.0091					Minimum Detected		-4.699
84				Maximum Detected	0.4					Maximum Detected		-0.916
85				Mean of Detected	0.126					Mean of Detected		-2.938
86				SD of Detected	0.184					SD of Detected		1.552
87				Minimum Non-Detect	0.28					Minimum Non-Detect		-1.273
88				Maximum Non-Detect	1.5					Maximum Non-Detect		0.405
89												
90	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect		14
91	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected		0
92	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage		100.00%
93												
94										**UCL Statistics**		
95				**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**		
96				Shapiro Wilk Test Statistic	0.714					Shapiro Wilk Test Statistic		0.943
97				5% Shapiro Wilk Critical Value	0.748					5% Shapiro Wilk Critical Value		0.748
98				**Data not Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**		
99												
100				**Assuming Normal Distribution**						**Assuming Lognormal Distribution**		
101				DL/2 Substitution Method						DL/2 Substitution Method		
102				Mean	0.185					Mean		-2.085
103				SD	0.185					SD		1.026
104				95% DL/2 (t) UCL	0.273					95% H-Stat (DL/2) UCL		1.352
105												
106				Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method		

107	MLE method failed to converge properly									Mean in Log Scale		-3.4
108										SD in Log Scale		0.967
109										Mean in Original Scale		0.0595
110										SD in Original Scale		0.0998
111										95% Percentile Bootstrap UCL		0.111
112										95% BCA Bootstrap UCL		0.14
113												
114	Gamma Distribution Test with Detected Values Only									Data Distribution Test with Detected Values Only		
115				k star (bias corrected)		0.342				Data appear Gamma Distributed at 5% Significance Level		
116				Theta Star		0.367						
117				nu star		2.734						
118												
119				A-D Test Statistic		0.433				Nonparametric Statistics		
120				5% A-D Critical Value		0.672				Kaplan-Meier (KM) Method		
121				K-S Test Statistic		0.672				Mean		0.0622
122				5% K-S Critical Value		0.406				SD		0.099
123	Data appear Gamma Distributed at 5% Significance Level									SE of Mean		0.0331
124										95% KM (t) UCL		0.121
125	Assuming Gamma Distribution									95% KM (z) UCL		0.117
126				Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL		0.118
127				Minimum		0.0091				95% KM (bootstrap t) UCL		0.225
128				Maximum		0.4				95% KM (BCA) UCL		0.134
129				Mean		0.12				95% KM (Percentile Bootstrap) UCL		0.139
130				Median		0.127				95% KM (Chebyshev) UCL		0.206
131				SD		0.0978				97.5% KM (Chebyshev) UCL		0.269
132				k star		1.328				99% KM (Chebyshev) UCL		0.391
133				Theta star		0.0902						
134				Nu star		37.18				Potential UCLs to Use		
135				AppChi2		24.22				95% KM (t) UCL		0.121
136				95% Gamma Approximate UCL		0.184						
137				95% Adjusted Gamma UCL		N/A						
138	Note: DL/2 is not a recommended method.											
139												
140												
141	Acenaphthylene (mg/kg)											
142												
143	General Statistics											
144				Number of Valid Samples		14				Number of Detected Data		4
145				Number of Unique Samples		4				Number of Non-Detect Data		10
146				Number of Missing Values		1				Percent Non-Detects		71.43%
147												
148	Raw Statistics									Log-transformed Statistics		
149				Minimum Detected		0.0022				Minimum Detected		-6.119
150				Maximum Detected		0.02				Maximum Detected		-3.912
151				Mean of Detected		0.00883				Mean of Detected		-5.103
152				SD of Detected		0.00822				SD of Detected		1.025
153				Minimum Non-Detect		0.28				Minimum Non-Detect		-1.273
154				Maximum Non-Detect		1.5				Maximum Non-Detect		0.405
155												
156	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect		14
157	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected		0
158	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage		100.00%
159												

	A	B	C	D	E	F	G	H	I	J	K	L
160	**UCL Statistics**											
161	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
162					Shapiro Wilk Test Statistic	0.883					Shapiro Wilk Test Statistic	0.931
163					5% Shapiro Wilk Critical Value	0.748					5% Shapiro Wilk Critical Value	0.748
164	**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
165												
166	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
167					DL/2 Substitution Method						DL/2 Substitution Method	
168					Mean	0.152					Mean	-2.703
169					SD	0.184					SD	1.705
170					95% DL/2 (t) UCL	0.239					95% H-Stat (DL/2) UCL	15.25
171												
172					Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method	
173	**MLE method failed to converge properly**										Mean in Log Scale	-5.103
174											SD in Log Scale	0.755
175											Mean in Original Scale	0.00785
176											SD in Original Scale	0.00575
177											95% Percentile Bootstrap UCL	0.0103
178											95% BCA Bootstrap UCL	0.0108
179												
180	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
181					k star (bias corrected)	0.538	**Data appear Normal at 5% Significance Level**					
182					Theta Star	0.0164						
183					nu star	4.303						
184												
185					A-D Test Statistic	0.322	**Nonparametric Statistics**					
186					5% A-D Critical Value	0.662					Kaplan-Meier (KM) Method	
187					K-S Test Statistic	0.662					Mean	0.00883
188					5% K-S Critical Value	0.4					SD	0.00712
189	**Data appear Gamma Distributed at 5% Significance Level**										SE of Mean	0.00411
190											95% KM (t) UCL	0.0161
191	**Assuming Gamma Distribution**										95% KM (z) UCL	0.0156
192					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.0169
193					Minimum	0.0014					95% KM (bootstrap t) UCL	0.0219
194					Maximum	0.02					95% KM (BCA) UCL	0.015
195					Mean	0.00845					95% KM (Percentile Bootstrap) UCL	0.0158
196					Median	0.00747					95% KM (Chebyshev) UCL	0.0267
197					SD	0.00623					97.5% KM (Chebyshev) UCL	0.0345
198					k star	1.366					99% KM (Chebyshev) UCL	0.0497
199					Theta star	0.00619						
200					Nu star	38.25	**Potential UCLs to Use**					
201					AppChi2	25.08					95% KM (t) UCL	0.0161
202					95% Gamma Approximate UCL	0.0129					95% KM (Percentile Bootstrap) UCL	0.0158
203					95% Adjusted Gamma UCL	N/A						
204	**Note: DL/2 is not a recommended method.**											
205												
206												
207	**Anthracene (mg/kg)**											
208												
209	**General Statistics**											
210					Number of Valid Samples	14					Number of Detected Data	3
211					Number of Unique Samples	3					Number of Non-Detect Data	11
212					Number of Missing Values	1					Percent Non-Detects	78.57%

Raw Statistics		
Minimum Detected	0.003	
Maximum Detected	0.011	
Mean of Detected	0.00673	
SD of Detected	0.00403	
Minimum Non-Detect	0.0021	
Maximum Non-Detect	1.5	
Note: Data have multiple DLs - Use of KM Method is recommended		
For all methods (except KM, DL/2, and ROS Methods),		
Observations < Largest ND are treated as NDs		

Log-transformed Statistics		
Minimum Detected	-5.809	
Maximum Detected	-4.51	
Mean of Detected	-5.134	
SD of Detected	0.651	
Minimum Non-Detect	-6.166	
Maximum Non-Detect	0.405	
Number treated as Non-Detect	14	
Number treated as Detected	0	
Single DL Non-Detect Percentage	100.00%	

UCL Statistics

Normal Distribution Test with Detected Values Only		
Shapiro Wilk Test Statistic	0.987	
5% Shapiro Wilk Critical Value	0.767	
Data appear Normal at 5% Significance Level		
Assuming Normal Distribution		
DL/2 Substitution Method		
Mean	0.151	
SD	0.185	
95% DL/2 (t) UCL	0.238	
Maximum Likelihood Estimate(MLE) Method	N/A	
MLE method failed to converge properly		

Lognormal Distribution Test with Detected Values Only		
Shapiro Wilk Test Statistic	0.995	
5% Shapiro Wilk Critical Value	0.767	
Data appear Lognormal at 5% Significance Level		
Assuming Lognormal Distribution		
DL/2 Substitution Method		
Mean	-2.835	
SD	1.905	
95% H-Stat (DL/2) UCL	19.07	
Log ROS Method		
Mean in Log Scale	-5.575	
SD in Log Scale	0.722	
Mean in Original Scale	0.00472	
SD in Original Scale	0.00308	
95% Percentile Bootstrap UCL	0.00608	
95% BCA Bootstrap UCL	0.0062	

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	0.245	
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	

Data Distribution Test with Detected Values Only		
Data appear Normal at 5% Significance Level		
Nonparametric Statistics		
Kaplan-Meier (KM) Method		
Mean	0.0058	
SD	0.00327	
SE of Mean	0.002	
95% KM (t) UCL	0.00935	
95% KM (z) UCL	0.0091	
95% KM (jackknife) UCL	0.00958	
95% KM (bootstrap t) UCL	0.0108	
95% KM (BCA) UCL	0.011	
95% KM (Percentile Bootstrap) UCL	0.011	
95% KM (Chebyshev) UCL	0.0145	
97.5% KM (Chebyshev) UCL	0.0183	
99% KM (Chebyshev) UCL	0.0257	

266					Nu star	N/A	**Potential UCLs to Use**					
267					AppChi2	N/A					95% KM (t) UCL	0.00935
268					95% Gamma Approximate UCL	N/A					95% KM (Percentile Bootstrap) UCL	0.011
269					95% Adjusted Gamma UCL	N/A						
270	**Note: DL/2 is not a recommended method.**											
271												
272												
273	**Aroclor 1254 (mg/kg)**											
274												
275					**General Statistics**							
276					Number of Valid Samples	14					Number of Detected Data	7
277					Number of Unique Samples	7					Number of Non-Detect Data	7
278					Number of Missing Values	1					Percent Non-Detects	50.00%
279												
280					**Raw Statistics**		**Log-transformed Statistics**					
281					Minimum Detected	0.0104					Minimum Detected	-4.566
282					Maximum Detected	1.48					Maximum Detected	0.392
283					Mean of Detected	0.344					Mean of Detected	-2.459
284					SD of Detected	0.536					SD of Detected	1.975
285					Minimum Non-Detect	0.018					Minimum Non-Detect	-4.017
286					Maximum Non-Detect	0.02					Maximum Non-Detect	-3.912
287												
288	Note: Data have multiple DLs - Use of KM Method is recommended										Number treated as Non-Detect	9
289	For all methods (except KM, DL/2, and ROS Methods),										Number treated as Detected	5
290	Observations < Largest ND are treated as NDs										Single DL Non-Detect Percentage	64.29%
291												
292					**UCL Statistics**							
293					**Normal Distribution Test with Detected Values Only**		**Lognormal Distribution Test with Detected Values Only**					
294					Shapiro Wilk Test Statistic	0.706					Shapiro Wilk Test Statistic	0.889
295					5% Shapiro Wilk Critical Value	0.803					5% Shapiro Wilk Critical Value	0.803
296					**Data not Normal at 5% Significance Level**		**Data appear Lognormal at 5% Significance Level**					
297												
298					**Assuming Normal Distribution**		**Assuming Lognormal Distribution**					
299					DL/2 Substitution Method						DL/2 Substitution Method	
300					Mean	0.177					Mean	-3.566
301					SD	0.403					SD	1.767
302					95% DL/2 (t) UCL	0.368					95% H-Stat (DL/2) UCL	1.101
303												
304					Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method	
305					**MLE yields a negative mean**						Mean in Log Scale	-3.622
306											SD in Log Scale	1.896
307											Mean in Original Scale	0.178
308											SD in Original Scale	0.403
309											95% Percentile Bootstrap UCL	0.358
310											95% BCA Bootstrap UCL	0.484
311												
312					**Gamma Distribution Test with Detected Values Only**		**Data Distribution Test with Detected Values Only**					
313					k star (bias corrected)	0.359	**Data appear Gamma Distributed at 5% Significance Level**					
314					Theta Star	0.959						
315					nu star	5.028						
316												
317					A-D Test Statistic	0.507	**Nonparametric Statistics**					
318					5% A-D Critical Value	0.758	Kaplan-Meier (KM) Method					

319				K-S Test Statistic	0.758					Mean	0.178
320				5% K-S Critical Value	0.329					SD	0.388
321	**Data appear Gamma Distributed at 5% Significance Level**									SE of Mean	0.112
322										95% KM (t) UCL	0.376
323	**Assuming Gamma Distribution**									95% KM (z) UCL	0.362
324				Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.369
325				Minimum	0.0104					95% KM (bootstrap t) UCL	0.741
326				Maximum	1.48					95% KM (BCA) UCL	0.393
327				Mean	0.345					95% KM (Percentile Bootstrap) UCL	0.388
328				Median	0.343					95% KM (Chebyshev) UCL	0.666
329				SD	0.364					97.5% KM (Chebyshev) UCL	0.878
330				k star	0.712					99% KM (Chebyshev) UCL	1.293
331				Theta star	0.484						
332				Nu star	19.94					**Potential UCLs to Use**	
333				AppChi2	10.81					95% KM (t) UCL	0.376
334				95% Gamma Approximate UCL	0.637						
335				95% Adjusted Gamma UCL	0.693						
336	**Note: DL/2 is not a recommended method.**										
337											
338											
339	**B(a)A (mg/kg)**										
340											
341					**General Statistics**						
342				Number of Valid Samples	14					Number of Detected Data	5
343				Number of Unique Samples	5					Number of Non-Detect Data	9
344				Number of Missing Values	1					Percent Non-Detects	64.29%
345											
346				**Raw Statistics**						**Log-transformed Statistics**	
347				Minimum Detected	0.0036					Minimum Detected	-5.627
348				Maximum Detected	0.137					Maximum Detected	-1.988
349				Mean of Detected	0.0465					Mean of Detected	-3.676
350				SD of Detected	0.053					SD of Detected	1.359
351				Minimum Non-Detect	0.056					Minimum Non-Detect	-2.882
352				Maximum Non-Detect	0.063					Maximum Non-Detect	-2.765
353											
354	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect	13
355	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected	1
356	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage	92.86%
357											
358					**UCL Statistics**						
359	**Normal Distribution Test with Detected Values Only**									**Lognormal Distribution Test with Detected Values Only**	
360				Shapiro Wilk Test Statistic	0.812					Shapiro Wilk Test Statistic	0.975
361				5% Shapiro Wilk Critical Value	0.762					5% Shapiro Wilk Critical Value	0.762
362	**Data appear Normal at 5% Significance Level**									**Data appear Lognormal at 5% Significance Level**	
363											
364	**Assuming Normal Distribution**									**Assuming Lognormal Distribution**	
365				DL/2 Substitution Method						DL/2 Substitution Method	
366				Mean	0.0357					Mean	-3.573
367				SD	0.0306					SD	0.758
368				95% DL/2 (t) UCL	0.0502					95% H-Stat (DL/2) UCL	0.0974
369											
370				Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method	
371	**MLE method failed to converge properly**									Mean in Log Scale	-3.976

372											SD in Log Scale	0.838
373											Mean in Original Scale	0.0274
374											SD in Original Scale	0.0332
375											95% Percentile Bootstrap UCL	0.0433
376											95% BCA Bootstrap UCL	0.0525
377												
378	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
379					k star (bias corrected)	0.515	**Data appear Normal at 5% Significance Level**					
380					Theta Star	0.0903						
381					nu star	5.154						
382												
383					A-D Test Statistic	0.223	**Nonparametric Statistics**					
384					5% A-D Critical Value	0.693	Kaplan-Meier (KM) Method					
385					K-S Test Statistic	0.693	Mean	0.032				
386					5% K-S Critical Value	0.365	SD	0.0328				
387	**Data appear Gamma Distributed at 5% Significance Level**						SE of Mean	0.0119				
388							95% KM (t) UCL	0.0531				
389	**Assuming Gamma Distribution**						95% KM (z) UCL	0.0516				
390	Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.0538				
391					Minimum	0.0036	95% KM (bootstrap t) UCL	0.0583				
392					Maximum	0.137	95% KM (BCA) UCL	0.0504				
393					Mean	0.0458	95% KM (Percentile Bootstrap) UCL	0.0519				
394					Median	0.0448	95% KM (Chebyshev) UCL	0.0839				
395					SD	0.0297	97.5% KM (Chebyshev) UCL	0.106				
396					k star	1.946	99% KM (Chebyshev) UCL	0.151				
397					Theta star	0.0235						
398					Nu star	54.5	**Potential UCLs to Use**					
399					AppChi2	38.53	95% KM (t) UCL	0.0531				
400					95% Gamma Approximate UCL	0.0647	95% KM (Percentile Bootstrap) UCL	0.0519				
401					95% Adjusted Gamma UCL	0.0679						
402	**Note: DL/2 is not a recommended method.**											
403												
404												
405	**B(a)P (mg/kg)**											
406												
407	**General Statistics**											
408					Number of Valid Samples	14	Number of Detected Data	6				
409					Number of Unique Samples	6	Number of Non-Detect Data	8				
410					Number of Missing Values	1	Percent Non-Detects	57.14%				
411												
412	**Raw Statistics**						**Log-transformed Statistics**					
413					Minimum Detected	0.0033	Minimum Detected	-5.714				
414					Maximum Detected	0.15	Maximum Detected	-1.897				
415					Mean of Detected	0.0428	Mean of Detected	-3.816				
416					SD of Detected	0.0553	SD of Detected	1.304				
417					Minimum Non-Detect	0.056	Minimum Non-Detect	-2.882				
418					Maximum Non-Detect	0.063	Maximum Non-Detect	-2.765				
419												
420	Note: Data have multiple DLs - Use of KM Method is recommended						Number treated as Non-Detect	13				
421	For all methods (except KM, DL/2, and ROS Methods),						Number treated as Detected	1				
422	Observations < Largest ND are treated as NDs						Single DL Non-Detect Percentage	92.86%				
423												
424	**UCL Statistics**											

425	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
426					Shapiro Wilk Test Statistic	0.738					Shapiro Wilk Test Statistic	0.974
427					5% Shapiro Wilk Critical Value	0.788					5% Shapiro Wilk Critical Value	0.788
428	**Data not Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
429												
430	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
431					DL/2 Substitution Method						DL/2 Substitution Method	
432					Mean	0.0353					Mean	-3.645
433					SD	0.0349					SD	0.824
434					95% DL/2 (t) UCL	0.0519					95% H-Stat (DL/2) UCL	0.108
435												
436					Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method	
437	**MLE method failed to converge properly**										Mean in Log Scale	-4.036
438											SD in Log Scale	0.857
439											Mean in Original Scale	0.0272
440											SD in Original Scale	0.0372
441											95% Percentile Bootstrap UCL	0.045
442											95% BCA Bootstrap UCL	0.0547
443												
444	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
445					k star (bias corrected)	0.552	**Data appear Gamma Distributed at 5% Significance Level**					
446					Theta Star	0.0777						
447					nu star	6.619						
448												
449					A-D Test Statistic	0.34	**Nonparametric Statistics**					
450					5% A-D Critical Value	0.718					Kaplan-Meier (KM) Method	
451					K-S Test Statistic	0.718					Mean	0.0306
452					5% K-S Critical Value	0.342					SD	0.0371
453	**Data appear Gamma Distributed at 5% Significance Level**										SE of Mean	0.0125
454											95% KM (t) UCL	0.0527
455	**Assuming Gamma Distribution**										95% KM (z) UCL	0.0511
456					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.0529
457					Minimum	0.0033					95% KM (bootstrap t) UCL	0.108
458					Maximum	0.15					95% KM (BCA) UCL	0.0527
459					Mean	0.0419					95% KM (Percentile Bootstrap) UCL	0.0512
460					Median	0.0409					95% KM (Chebyshev) UCL	0.085
461					SD	0.0344					97.5% KM (Chebyshev) UCL	0.109
462					k star	1.528					99% KM (Chebyshev) UCL	0.155
463					Theta star	0.0274						
464					Nu star	42.79	**Potential UCLs to Use**					
465					AppChi2	28.79					95% KM (t) UCL	0.0527
466					95% Gamma Approximate UCL	0.0623						
467					95% Adjusted Gamma UCL	0.0658						
468	**Note: DL/2 is not a recommended method.**											
469												
470												
471	**B(b)F (mg/kg)**											
472												
473	**General Statistics**											
474					Number of Valid Samples	14					Number of Detected Data	6
475					Number of Unique Samples	6					Number of Non-Detect Data	8
476					Number of Missing Values	1					Percent Non-Detects	57.14%
477												

	A	B	C	D	E	F	G	H	I	J	K	L
478	**Raw Statistics**						**Log-transformed Statistics**					
479					Minimum Detected	0.0065					Minimum Detected	-5.036
480					Maximum Detected	0.152					Maximum Detected	-1.884
481					Mean of Detected	0.0525					Mean of Detected	-3.43
482					SD of Detected	0.0551					SD of Detected	1.116
483					Minimum Non-Detect	0.056					Minimum Non-Detect	-2.882
484					Maximum Non-Detect	0.063					Maximum Non-Detect	-2.765
485												
486	Note: Data have multiple DLs - Use of KM Method is recommended										Number treated as Non-Detect	12
487	For all methods (except KM, DL/2, and ROS Methods),										Number treated as Detected	2
488	Observations < Largest ND are treated as NDs										Single DL Non-Detect Percentage	85.71%
489												
490	**UCL Statistics**											
491	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
492					Shapiro Wilk Test Statistic	0.822					Shapiro Wilk Test Statistic	0.972
493					5% Shapiro Wilk Critical Value	0.788					5% Shapiro Wilk Critical Value	0.788
494	**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
495												
496	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
497					DL/2 Substitution Method						DL/2 Substitution Method	
498					Mean	0.0394					Mean	-3.48
499					SD	0.0362					SD	0.694
500					95% DL/2 (t) UCL	0.0566					95% H-Stat (DL/2) UCL	0.0915
501												
502					Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method	
503	**MLE method failed to converge properly**										Mean in Log Scale	-3.768
504											SD in Log Scale	0.772
505											Mean in Original Scale	0.0329
506											SD in Original Scale	0.0385
507											95% Percentile Bootstrap UCL	0.0506
508											95% BCA Bootstrap UCL	0.0594
509												
510	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
511					k star (bias corrected)	0.699	**Data appear Normal at 5% Significance Level**					
512					Theta Star	0.075						
513					nu star	8.388						
514												
515					A-D Test Statistic	0.288	**Nonparametric Statistics**					
516					5% A-D Critical Value	0.713					Kaplan-Meier (KM) Method	
517					K-S Test Statistic	0.713					Mean	0.0342
518					5% K-S Critical Value	0.34					SD	0.0373
519	**Data appear Gamma Distributed at 5% Significance Level**										SE of Mean	0.0115
520											95% KM (t) UCL	0.0546
521	**Assuming Gamma Distribution**										95% KM (z) UCL	0.0531
522					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.0542
523					Minimum	0.0065					95% KM (bootstrap t) UCL	0.0694
524					Maximum	0.152					95% KM (BCA) UCL	0.0552
525					Mean	0.0523					95% KM (Percentile Bootstrap) UCL	0.0543
526					Median	0.052					95% KM (Chebyshev) UCL	0.0845
527					SD	0.0342					97.5% KM (Chebyshev) UCL	0.106
528					k star	2.066					99% KM (Chebyshev) UCL	0.149
529					Theta star	0.0253						
530					Nu star	57.84	**Potential UCLs to Use**					

531					AppChi2	41.35					95% KM (t) UCL	0.0546
532					95% Gamma Approximate UCL	0.0731					95% KM (Percentile Bootstrap) UCL	0.0543
533					95% Adjusted Gamma UCL	0.0765						
534	**Note: DL/2 is not a recommended method.**											
535												
536												
537	**B(ghi)P (mg/kg)**											
538												
539	**General Statistics**											
540					Number of Valid Samples	14					Number of Detected Data	5
541					Number of Unique Samples	5					Number of Non-Detect Data	9
542					Number of Missing Values	1					Percent Non-Detects	64.29%
543												
544	**Raw Statistics**						**Log-transformed Statistics**					
545					Minimum Detected	0.0034					Minimum Detected	-5.684
546					Maximum Detected	0.059					Maximum Detected	-2.83
547					Mean of Detected	0.0223					Mean of Detected	-4.174
548					SD of Detected	0.0213					SD of Detected	1.013
549					Minimum Non-Detect	0.056					Minimum Non-Detect	-2.882
550					Maximum Non-Detect	0.3					Maximum Non-Detect	-1.204
551												
552	Note: Data have multiple DLs - Use of KM Method is recommended										Number treated as Non-Detect	14
553	For all methods (except KM, DL/2, and ROS Methods),										Number treated as Detected	0
554	Observations < Largest ND are treated as NDs										Single DL Non-Detect Percentage	100.00%
555												
556	**UCL Statistics**											
557	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
558					Shapiro Wilk Test Statistic	0.772					Shapiro Wilk Test Statistic	0.904
559					5% Shapiro Wilk Critical Value	0.762					5% Shapiro Wilk Critical Value	0.762
560	**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
561												
562	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
563					DL/2 Substitution Method						DL/2 Substitution Method	
564					Mean	0.0356					Mean	-3.636
565					SD	0.0352					SD	0.818
566					95% DL/2 (t) UCL	0.0523					95% H-Stat (DL/2) UCL	0.153
567												
568					Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method	
569	**MLE method failed to converge properly**										Mean in Log Scale	-4.332
570											SD in Log Scale	0.601
571											Mean in Original Scale	0.0159
572											SD in Original Scale	0.013
573											95% Percentile Bootstrap UCL	0.0224
574											95% BCA Bootstrap UCL	0.026
575												
576	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
577					k star (bias corrected)	0.734	**Data appear Normal at 5% Significance Level**					
578					Theta Star	0.0303						
579					nu star	7.336						
580												
581					A-D Test Statistic	0.452	**Nonparametric Statistics**					
582					5% A-D Critical Value	0.686	Kaplan-Meier (KM) Method					
583					K-S Test Statistic	0.686					Mean	0.0182

584				5% K-S Critical Value	0.362					SD	0.0154
585	**Data appear Gamma Distributed at 5% Significance Level**									SE of Mean	0.00607
586										95% KM (t) UCL	0.0289
587	**Assuming Gamma Distribution**									95% KM (z) UCL	0.0282
588	Gamma ROS Statistics using Extrapolated Data									95% KM (jackknife) UCL	0.029
589				Minimum	0.0034					95% KM (bootstrap t) UCL	0.043
590				Maximum	0.059					95% KM (BCA) UCL	0.0274
591				Mean	0.0225					95% KM (Percentile Bootstrap) UCL	0.0283
592				Median	0.022					95% KM (Chebyshev) UCL	0.0446
593				SD	0.0119					97.5% KM (Chebyshev) UCL	0.0561
594				k star	3.117					99% KM (Chebyshev) UCL	0.0785
595				Theta star	0.00722						
596				Nu star	87.27					**Potential UCLs to Use**	
597				AppChi2	66.74					95% KM (t) UCL	0.0289
598				95% Gamma Approximate UCL	0.0294					95% KM (Percentile Bootstrap) UCL	0.0283
599				95% Adjusted Gamma UCL	0.0305						
600	**Note: DL/2 is not a recommended method.**										
601											
602											
603	**B(k)F (mg/kg)**										
604											
605					**General Statistics**						
606				Number of Valid Samples	14					Number of Detected Data	6
607				Number of Unique Samples	6					Number of Non-Detect Data	8
608				Number of Missing Values	1					Percent Non-Detects	57.14%
609											
610				**Raw Statistics**						**Log-transformed Statistics**	
611				Minimum Detected	0.002					Minimum Detected	-6.215
612				Maximum Detected	0.0989					Maximum Detected	-2.314
613				Mean of Detected	0.0266					Mean of Detected	-4.36
614				SD of Detected	0.0367					SD of Detected	1.35
615				Minimum Non-Detect	0.056					Minimum Non-Detect	-2.882
616				Maximum Non-Detect	0.063					Maximum Non-Detect	-2.765
617											
618	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect	13
619	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected	1
620	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage	92.86%
621											
622					**UCL Statistics**						
623	**Normal Distribution Test with Detected Values Only**									**Lognormal Distribution Test with Detected Values Only**	
624				Shapiro Wilk Test Statistic	0.715					Shapiro Wilk Test Statistic	0.982
625				5% Shapiro Wilk Critical Value	0.788					5% Shapiro Wilk Critical Value	0.788
626	**Data not Normal at 5% Significance Level**									**Data appear Lognormal at 5% Significance Level**	
627											
628	**Assuming Normal Distribution**									**Assuming Lognormal Distribution**	
629				DL/2 Substitution Method						DL/2 Substitution Method	
630				Mean	0.0284					Mean	-3.878
631				SD	0.0228					SD	0.943
632				95% DL/2 (t) UCL	0.0392					95% H-Stat (DL/2) UCL	0.138
633											
634				Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method	
635	**MLE method failed to converge properly**									Mean in Log Scale	-4.59
636										SD in Log Scale	0.888

637											Mean in Original Scale	0.0165
638											SD in Original Scale	0.0246
639											95% Percentile Bootstrap UCL	0.0286
640											95% BCA Bootstrap UCL	0.0352
641												
642				**Gamma Distribution Test with Detected Values Only**							**Data Distribution Test with Detected Values Only**	
643						k star (bias corrected)	0.515				**Data appear Gamma Distributed at 5% Significance Level**	
644						Theta Star	0.0517					
645						nu star	6.183					
646												
647						A-D Test Statistic	0.327				**Nonparametric Statistics**	
648						5% A-D Critical Value	0.72				Kaplan-Meier (KM) Method	
649						K-S Test Statistic	0.72				Mean	0.0184
650						5% K-S Critical Value	0.343				SD	0.0242
651				**Data appear Gamma Distributed at 5% Significance Level**							SE of Mean	0.00785
652											95% KM (t) UCL	0.0323
653				**Assuming Gamma Distribution**							95% KM (z) UCL	0.0313
654						Gamma ROS Statistics using Extrapolated Data					95% KM (jackknife) UCL	0.0322
655						Minimum	0.002				95% KM (bootstrap t) UCL	0.0502
656						Maximum	0.0989				95% KM (BCA) UCL	0.0314
657						Mean	0.0261				95% KM (Percentile Bootstrap) UCL	0.032
658						Median	0.0255				95% KM (Chebyshev) UCL	0.0526
659						SD	0.0228				97.5% KM (Chebyshev) UCL	0.0674
660						k star	1.405				99% KM (Chebyshev) UCL	0.0965
661						Theta star	0.0185					
662						Nu star	39.35				**Potential UCLs to Use**	
663						AppChi2	25.98				95% KM (t) UCL	0.0323
664						95% Gamma Approximate UCL	0.0395					
665						95% Adjusted Gamma UCL	0.0418					
666	**Note: DL/2 is not a recommended method.**											
667												
668												
669	**Carbazole (mg/kg)**											
670												
671							**General Statistics**					
672						Number of Valid Samples	15				Number of Detected Data	3
673						Number of Unique Samples	3				Number of Non-Detect Data	12
674											Percent Non-Detects	80.00%
675												
676				**Raw Statistics**							**Log-transformed Statistics**	
677						Minimum Detected	0.011				Minimum Detected	-4.51
678						Maximum Detected	0.028				Maximum Detected	-3.576
679						Mean of Detected	0.0187				Mean of Detected	-4.053
680						SD of Detected	0.00862				SD of Detected	0.468
681						Minimum Non-Detect	0.17				Minimum Non-Detect	-1.772
682						Maximum Non-Detect	3.7				Maximum Non-Detect	1.308
683												
684	Note: Data have multiple DLs - Use of KM Method is recommended										Number treated as Non-Detect	15
685	For all methods (except KM, DL/2, and ROS Methods),										Number treated as Detected	0
686	Observations < Largest ND are treated as NDs										Single DL Non-Detect Percentage	100.00%
687												
688							**UCL Statistics**					
689				**Normal Distribution Test with Detected Values Only**							**Lognormal Distribution Test with Detected Values Only**	

690					Shapiro Wilk Test Statistic	0.972					Shapiro Wilk Test Statistic	0.998
691					5% Shapiro Wilk Critical Value	0.767					5% Shapiro Wilk Critical Value	0.767
692					**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**	
693												
694					**Assuming Normal Distribution**						**Assuming Lognormal Distribution**	
695					DL/2 Substitution Method						DL/2 Substitution Method	
696					Mean	0.234					Mean	-2.322
697					SD	0.461					SD	1.247
698					95% DL/2 (t) UCL	0.443					95% H-Stat (DL/2) UCL	2.396
699												
700					Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method	
701					**MLE method failed to converge properly**						Mean in Log Scale	-4.053
702											SD in Log Scale	0.348
703											Mean in Original Scale	0.0184
704											SD in Original Scale	0.00654
705											95% Percentile Bootstrap UCL	0.0212
706											95% BCA Bootstrap UCL	0.0214
707												
708					**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**	
709					k star (bias corrected)	N/A					**Data appear Normal at 5% Significance Level**	
710					Theta Star	N/A						
711					nu star	N/A						
712												
713					A-D Test Statistic	0.255					**Nonparametric Statistics**	
714					5% A-D Critical Value	N/A					Kaplan-Meier (KM) Method	
715					K-S Test Statistic	N/A					Mean	0.0187
716					5% K-S Critical Value	N/A					SD	0.00704
717					**Data not Gamma Distributed at 5% Significance Level**						SE of Mean	0.00498
718											95% KM (t) UCL	0.0274
719					**Assuming Gamma Distribution**						95% KM (z) UCL	0.0269
720					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.029
721					Minimum	N/A					95% KM (bootstrap t) UCL	0.0391
722					Maximum	N/A					95% KM (BCA) UCL	0.0258
723					Mean	N/A					95% KM (Percentile Bootstrap) UCL	0.028
724					Median	N/A					95% KM (Chebyshev) UCL	0.0404
725					SD	N/A					97.5% KM (Chebyshev) UCL	0.0498
726					k star	N/A					99% KM (Chebyshev) UCL	0.0682
727					Theta star	N/A						
728					Nu star	N/A					**Potential UCLs to Use**	
729					AppChi2	N/A					95% KM (t) UCL	0.0274
730					95% Gamma Approximate UCL	N/A					95% KM (Percentile Bootstrap) UCL	0.028
731					95% Adjusted Gamma UCL	N/A						
732	**Note: DL/2 is not a recommended method.**											
733												
734												
735	**Chrysene (mg/kg)**											
736												
737					**General Statistics**							
738					Number of Valid Samples	14					Number of Detected Data	6
739					Number of Unique Samples	6					Number of Non-Detect Data	8
740					Number of Missing Values	1					Percent Non-Detects	57.14%
741												
742					**Raw Statistics**						**Log-transformed Statistics**	

743				Minimum Detected	0.0061					Minimum Detected	-5.099	
744				Maximum Detected	0.119					Maximum Detected	-2.129	
745				Mean of Detected	0.045					Mean of Detected	-3.525	
746				SD of Detected	0.0419					SD of Detected	1.077	
747				Minimum Non-Detect	0.056					Minimum Non-Detect	-2.882	
748				Maximum Non-Detect	0.063					Maximum Non-Detect	-2.765	
749												
750	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect	13	
751	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected	1	
752	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage	92.86%	
753												
754	**UCL Statistics**											
755	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
756				Shapiro Wilk Test Statistic	0.879					Shapiro Wilk Test Statistic	0.971	
757				5% Shapiro Wilk Critical Value	0.788					5% Shapiro Wilk Critical Value	0.788	
758	**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
759												
760	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
761				DL/2 Substitution Method						DL/2 Substitution Method		
762				Mean	0.0362					Mean	-3.521	
763				SD	0.0272					SD	0.668	
764				95% DL/2 (t) UCL	0.0491					95% H-Stat (DL/2) UCL	0.0861	
765												
766				Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method		
767	**MLE method failed to converge properly**									Mean in Log Scale	-3.84	
768										SD in Log Scale	0.741	
769										Mean in Original Scale	0.0292	
770										SD in Original Scale	0.0298	
771										95% Percentile Bootstrap UCL	0.044	
772										95% BCA Bootstrap UCL	0.0498	
773												
774	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
775				k star (bias corrected)	0.772		**Data appear Normal at 5% Significance Level**					
776				Theta Star	0.0583							
777				nu star	9.262							
778												
779				A-D Test Statistic	0.224		**Nonparametric Statistics**					
780				5% A-D Critical Value	0.71					Kaplan-Meier (KM) Method		
781				K-S Test Statistic	0.71					Mean	0.0324	
782				5% K-S Critical Value	0.339					SD	0.03	
783	**Data appear Gamma Distributed at 5% Significance Level**									SE of Mean	0.0107	
784										95% KM (t) UCL	0.0514	
785	**Assuming Gamma Distribution**									95% KM (z) UCL	0.05	
786				Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.0524	
787				Minimum	0.0061					95% KM (bootstrap t) UCL	0.0627	
788				Maximum	0.119					95% KM (BCA) UCL	0.0511	
789				Mean	0.0449					95% KM (Percentile Bootstrap) UCL	0.053	
790				Median	0.0443					95% KM (Chebyshev) UCL	0.0791	
791				SD	0.0263					97.5% KM (Chebyshev) UCL	0.0994	
792				k star	2.289					99% KM (Chebyshev) UCL	0.139	
793				Theta star	0.0196							
794				Nu star	64.08		**Potential UCLs to Use**					
795				AppChi2	46.67					95% KM (t) UCL	0.0514	

796					95% Gamma Approximate UCL	0.0616				95% KM (Percentile Bootstrap) UCL		0.053
797					95% Adjusted Gamma UCL	0.0644						
798	**Note: DL/2 is not a recommended method.**											
799												
800												
801	**DB(ah)A (mg/kg)**											
802												
803	**General Statistics**											
804					Number of Valid Samples	14				Number of Detected Data		4
805					Number of Unique Samples	4				Number of Non-Detect Data		10
806					Number of Missing Values	1				Percent Non-Detects		71.43%
807												
808	**Raw Statistics**						**Log-transformed Statistics**					
809					Minimum Detected	0.0016				Minimum Detected		-6.438
810					Maximum Detected	0.014				Maximum Detected		-4.269
811					Mean of Detected	0.0056				Mean of Detected		-5.519
812					SD of Detected	0.00566				SD of Detected		0.906
813					Minimum Non-Detect	0.056				Minimum Non-Detect		-2.882
814					Maximum Non-Detect	0.3				Maximum Non-Detect		-1.204
815												
816	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect		14
817	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected		0
818	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage		100.00%
819												
820	**UCL Statistics**											
821	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
822					Shapiro Wilk Test Statistic	0.76				Shapiro Wilk Test Statistic		0.914
823					5% Shapiro Wilk Critical Value	0.748				5% Shapiro Wilk Critical Value		0.748
824	**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
825												
826	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
827					DL/2 Substitution Method					DL/2 Substitution Method		
828					Mean	0.0314				Mean		-3.973
829					SD	0.036				SD		1.184
830					95% DL/2 (t) UCL	0.0485				95% H-Stat (DL/2) UCL		0.461
831												
832					Maximum Likelihood Estimate(MLE) Method	N/A				Log ROS Method		
833	**MLE method failed to converge properly**									Mean in Log Scale		-5.519
834										SD in Log Scale		0.52
835										Mean in Original Scale		0.00462
836										SD in Original Scale		0.00305
837										95% Percentile Bootstrap UCL		0.00609
838										95% BCA Bootstrap UCL		0.00683
839												
840	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
841					k star (bias corrected)	0.578	**Data appear Normal at 5% Significance Level**					
842					Theta Star	0.00969						
843					nu star	4.623						
844												
845					A-D Test Statistic	0.468	**Nonparametric Statistics**					
846					5% A-D Critical Value	0.662				Kaplan-Meier (KM) Method		
847					K-S Test Statistic	0.662				Mean		0.0056
848					5% K-S Critical Value	0.399				SD		0.00491

849	Data appear Gamma Distributed at 5% Significance Level										SE of Mean	0.00283
850											95% KM (t) UCL	0.0106
851	Assuming Gamma Distribution										95% KM (z) UCL	0.0103
852	Gamma ROS Statistics using Extrapolated Data										95% KM (jackknife) UCL	0.0112
853	Minimum	0.0016									95% KM (bootstrap t) UCL	0.0294
854	Maximum	0.014									95% KM (BCA) UCL	0.0105
855	Mean	0.00519									95% KM (Percentile Bootstrap) UCL	0.0105
856	Median	0.00486									95% KM (Chebyshev) UCL	0.0179
857	SD	0.00329									97.5% KM (Chebyshev) UCL	0.0233
858	k star	2.506									99% KM (Chebyshev) UCL	0.0338
859	Theta star	0.00207										
860	Nu star	70.16									Potential UCLs to Use	
861	AppChi2	51.88									95% KM (t) UCL	0.0106
862	95% Gamma Approximate UCL	0.00702									95% KM (Percentile Bootstrap) UCL	0.0105
863	95% Adjusted Gamma UCL	N/A										
864	Note: DL/2 is not a recommended method.											
865												
866												
867	Dibenzofuran (mg/kg)											
868												
869	General Statistics											
870	Number of Valid Samples	15									Number of Detected Data	3
871	Number of Unique Samples	3									Number of Non-Detect Data	12
872											Percent Non-Detects	80.00%
873												
874	Raw Statistics										Log-transformed Statistics	
875	Minimum Detected	0.02									Minimum Detected	-3.912
876	Maximum Detected	0.2									Maximum Detected	-1.609
877	Mean of Detected	0.0833									Mean of Detected	-3.009
878	SD of Detected	0.101									SD of Detected	1.229
879	Minimum Non-Detect	0.17									Minimum Non-Detect	-1.772
880	Maximum Non-Detect	3.7									Maximum Non-Detect	1.308
881												
882	Note: Data have multiple DLs - Use of KM Method is recommended										Number treated as Non-Detect	15
883	For all methods (except KM, DL/2, and ROS Methods),										Number treated as Detected	0
884	Observations < Largest ND are treated as NDs										Single DL Non-Detect Percentage	100.00%
885												
886	UCL Statistics											
887	Normal Distribution Test with Detected Values Only										Lognormal Distribution Test with Detected Values Only	
888	Shapiro Wilk Test Statistic	0.792									Shapiro Wilk Test Statistic	0.877
889	5% Shapiro Wilk Critical Value	0.767									5% Shapiro Wilk Critical Value	0.767
890	Data appear Normal at 5% Significance Level										Data appear Lognormal at 5% Significance Level	
891												
892	Assuming Normal Distribution										Assuming Lognormal Distribution	
893	DL/2 Substitution Method										DL/2 Substitution Method	
894	Mean	0.247									Mean	-2.113
895	SD	0.457									SD	1.073
896	95% DL/2 (t) UCL	0.454									95% H-Stat (DL/2) UCL	1.379
897												
898	Maximum Likelihood Estimate(MLE) Method	N/A									Log ROS Method	
899	MLE method failed to converge properly										Mean in Log Scale	-3.512
900											SD in Log Scale	0.678
901											Mean in Original Scale	0.0399

902											SD in Original Scale	0.0459
903											95% Percentile Bootstrap UCL	0.0629
904											95% BCA Bootstrap UCL	0.075
905												
906	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
907					k star (bias corrected)	N/A	**Data appear Normal at 5% Significance Level**					
908					Theta Star	N/A						
909					nu star	N/A						
910												
911					A-D Test Statistic	0.467	**Nonparametric Statistics**					
912					5% A-D Critical Value	N/A					Kaplan-Meier (KM) Method	
913					K-S Test Statistic	N/A					Mean	0.0396
914					5% K-S Critical Value	N/A					SD	0.0486
915	**Data not Gamma Distributed at 5% Significance Level**										SE of Mean	0.0176
916											95% KM (t) UCL	0.0705
917	**Assuming Gamma Distribution**										95% KM (z) UCL	0.0685
918					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.0677
919					Minimum	N/A					95% KM (bootstrap t) UCL	0.16
920					Maximum	N/A					95% KM (BCA) UCL	N/A
921					Mean	N/A					95% KM (Percentile Bootstrap) UCL	0.2
922					Median	N/A					95% KM (Chebyshev) UCL	0.116
923					SD	N/A					97.5% KM (Chebyshev) UCL	0.149
924					k star	N/A					99% KM (Chebyshev) UCL	0.214
925					Theta star	N/A						
926					Nu star	N/A	**Potential UCLs to Use**					
927					AppChi2	N/A					95% KM (t) UCL	0.0705
928					95% Gamma Approximate UCL	N/A					95% KM (Percentile Bootstrap) UCL	0.2
929					95% Adjusted Gamma UCL	N/A						
930	**Note: DL/2 is not a recommended method.**											
931												
932												
933	**D-n-BP (mg/kg)**											
934												
935	**General Statistics**											
936					Number of Valid Samples	11					Number of Detected Data	3
937					Number of Unique Samples	3					Number of Non-Detect Data	8
938					Number of Missing Values	4					Percent Non-Detects	72.73%
939												
940	**Raw Statistics**						**Log-transformed Statistics**					
941					Minimum Detected	0.129					Minimum Detected	-2.048
942					Maximum Detected	0.777					Maximum Detected	-0.252
943					Mean of Detected	0.378					Mean of Detected	-1.258
944					SD of Detected	0.349					SD of Detected	0.917
945					Minimum Non-Detect	0.19					Minimum Non-Detect	-1.661
946					Maximum Non-Detect	1.5					Maximum Non-Detect	0.405
947												
948	Note: Data have multiple DLs - Use of KM Method is recommended										Number treated as Non-Detect	11
949	For all methods (except KM, DL/2, and ROS Methods),										Number treated as Detected	0
950	Observations < Largest ND are treated as NDs										Single DL Non-Detect Percentage	100.00%
951												
952	**UCL Statistics**											
953	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
954					Shapiro Wilk Test Statistic	0.863					Shapiro Wilk Test Statistic	0.958

955				5% Shapiro Wilk Critical Value	0.767					5% Shapiro Wilk Critical Value	0.767
956	**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
957												
958	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
959				DL/2 Substitution Method						DL/2 Substitution Method		
960				Mean	0.332					Mean	-1.379	
961				SD	0.277					SD	0.746	
962				95% DL/2 (t) UCL	0.483					95% H-Stat (DL/2) UCL	0.898	
963												
964				Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method		
965	**MLE method failed to converge properly**									Mean in Log Scale	-1.695	
966										SD in Log Scale	0.553	
967										Mean in Original Scale	0.221	
968										SD in Original Scale	0.191	
969										95% Percentile Bootstrap UCL	0.327	
970										95% BCA Bootstrap UCL	0.389	
971												
972	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
973				k star (bias corrected)	N/A		**Data appear Normal at 5% Significance Level**					
974				Theta Star	N/A							
975				nu star	N/A							
976												
977				A-D Test Statistic	0.346		**Nonparametric Statistics**					
978				5% A-D Critical Value	N/A					Kaplan-Meier (KM) Method		
979				K-S Test Statistic	N/A					Mean	0.231	
980				5% K-S Critical Value	N/A					SD	0.198	
981	**Data not Gamma Distributed at 5% Significance Level**									SE of Mean	0.0842	
982										95% KM (t) UCL	0.383	
983	**Assuming Gamma Distribution**									95% KM (z) UCL	0.369	
984				Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.366	
985				Minimum	N/A					95% KM (bootstrap t) UCL	0.49	
986				Maximum	N/A					95% KM (BCA) UCL	N/A	
987				Mean	N/A					95% KM (Percentile Bootstrap) UCL	0.777	
988				Median	N/A					95% KM (Chebyshev) UCL	0.598	
989				SD	N/A					97.5% KM (Chebyshev) UCL	0.757	
990				k star	N/A					99% KM (Chebyshev) UCL	1.069	
991				Theta star	N/A							
992				Nu star	N/A		**Potential UCLs to Use**					
993				AppChi2	N/A					95% KM (t) UCL	0.383	
994				95% Gamma Approximate UCL	N/A					95% KM (Percentile Bootstrap) UCL	0.777	
995				95% Adjusted Gamma UCL	N/A							
996	**Note: DL/2 is not a recommended method.**											
997												
998												
999	**Fluoranthene (mg/kg)**											
1000												
1001	**General Statistics**											
1002				Number of Valid Samples	14					Number of Detected Data	4	
1003				Number of Unique Samples	4					Number of Non-Detect Data	10	
1004				Number of Missing Values	1					Percent Non-Detects	71.43%	
1005												
1006	**Raw Statistics**						**Log-transformed Statistics**					
1007				Minimum Detected	0.009					Minimum Detected	-4.711	

1008					Maximum Detected	0.073					Maximum Detected	-2.617
1009					Mean of Detected	0.0373					Mean of Detected	-3.543
1010					SD of Detected	0.0272					SD of Detected	0.886
1011					Minimum Non-Detect	0.28					Minimum Non-Detect	-1.273
1012					Maximum Non-Detect	1.5					Maximum Non-Detect	0.405
1013												
1014	Note: Data have multiple DLs - Use of KM Method is recommended										Number treated as Non-Detect	14
1015	For all methods (except KM, DL/2, and ROS Methods),										Number treated as Detected	0
1016	Observations < Largest ND are treated as NDs										Single DL Non-Detect Percentage	100.00%
1017												
1018	**UCL Statistics**											
1019	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
1020					Shapiro Wilk Test Statistic	0.975					Shapiro Wilk Test Statistic	0.975
1021					5% Shapiro Wilk Critical Value	0.748					5% Shapiro Wilk Critical Value	0.748
1022	**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
1023												
1024	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
1025					DL/2 Substitution Method						DL/2 Substitution Method	
1026					Mean	0.16					Mean	-2.258
1027					SD	0.178					SD	1.037
1028					95% DL/2 (t) UCL	0.244					95% H-Stat (DL/2) UCL	1.502
1029												
1030					Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method	
1031	**MLE method failed to converge properly**										Mean in Log Scale	-3.543
1032											SD in Log Scale	0.656
1033											Mean in Original Scale	0.0348
1034											SD in Original Scale	0.0211
1035											95% Percentile Bootstrap UCL	0.0445
1036											95% BCA Bootstrap UCL	0.0448
1037												
1038	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
1039					k star (bias corrected)	0.699	**Data appear Normal at 5% Significance Level**					
1040					Theta Star	0.0533						
1041					nu star	5.592						
1042												
1043					A-D Test Statistic	0.197	**Nonparametric Statistics**					
1044					5% A-D Critical Value	0.66					Kaplan-Meier (KM) Method	
1045					K-S Test Statistic	0.66					Mean	0.0373
1046					5% K-S Critical Value	0.398					SD	0.0235
1047	**Data appear Gamma Distributed at 5% Significance Level**										SE of Mean	0.0136
1048											95% KM (t) UCL	0.0613
1049	**Assuming Gamma Distribution**										95% KM (z) UCL	0.0596
1050					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.064
1051					Minimum	0.009					95% KM (bootstrap t) UCL	0.0761
1052					Maximum	0.073					95% KM (BCA) UCL	0.0623
1053					Mean	0.0366					95% KM (Percentile Bootstrap) UCL	0.0623
1054					Median	0.0348					95% KM (Chebyshev) UCL	0.0965
1055					SD	0.0207					97.5% KM (Chebyshev) UCL	0.122
1056					k star	2.3					99% KM (Chebyshev) UCL	0.172
1057					Theta star	0.0159						
1058					Nu star	64.39	**Potential UCLs to Use**					
1059					AppChi2	46.93					95% KM (t) UCL	0.0613
1060					95% Gamma Approximate UCL	0.0502					95% KM (Percentile Bootstrap) UCL	0.0623

1061					95% Adjusted Gamma UCL	N/A						
1062	**Note: DL/2 is not a recommended method.**											
1063												
1064												
1065	**Fluorene (mg/kg)**											
1066												
1067	**General Statistics**											
1068					Number of Valid Samples	14				Number of Detected Data	4	
1069					Number of Unique Samples	4				Number of Non-Detect Data	10	
1070					Number of Missing Values	1				Percent Non-Detects	71.43%	
1071												
1072	**Raw Statistics**						**Log-transformed Statistics**					
1073					Minimum Detected	0.0011				Minimum Detected	-6.812	
1074					Maximum Detected	0.018				Maximum Detected	-4.017	
1075					Mean of Detected	0.00688				Mean of Detected	-5.465	
1076					SD of Detected	0.00762				SD of Detected	1.167	
1077					Minimum Non-Detect	0.28				Minimum Non-Detect	-1.273	
1078					Maximum Non-Detect	1.5				Maximum Non-Detect	0.405	
1079												
1080	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect	14	
1081	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected	0	
1082	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage	100.00%	
1083												
1084	**UCL Statistics**											
1085	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
1086					Shapiro Wilk Test Statistic	0.828				Shapiro Wilk Test Statistic	0.997	
1087					5% Shapiro Wilk Critical Value	0.748				5% Shapiro Wilk Critical Value	0.748	
1088	**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
1089												
1090	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
1091					DL/2 Substitution Method					DL/2 Substitution Method		
1092					Mean	0.151				Mean	-2.807	
1093					SD	0.184				SD	1.882	
1094					95% DL/2 (t) UCL	0.239				95% H-Stat (DL/2) UCL	32.96	
1095												
1096					Maximum Likelihood Estimate(MLE) Method	N/A				Log ROS Method		
1097	**MLE method failed to converge properly**									Mean in Log Scale	-5.465	
1098										SD in Log Scale	0.87	
1099										Mean in Original Scale	0.00594	
1100										SD in Original Scale	0.00512	
1101										95% Percentile Bootstrap UCL	0.00834	
1102										95% BCA Bootstrap UCL	0.0088	
1103												
1104	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
1105					k star (bias corrected)	0.459	**Data appear Normal at 5% Significance Level**					
1106					Theta Star	0.015						
1107					nu star	3.671						
1108												
1109					A-D Test Statistic	0.256	**Nonparametric Statistics**					
1110					5% A-D Critical Value	0.665				Kaplan-Meier (KM) Method		
1111					K-S Test Statistic	0.665				Mean	0.00688	
1112					5% K-S Critical Value	0.401				SD	0.0066	
1113	**Data appear Gamma Distributed at 5% Significance Level**									SE of Mean	0.00381	

1114											95% KM (t) UCL	0.0136
1115	**Assuming Gamma Distribution**										95% KM (z) UCL	0.0131
1116	Gamma ROS Statistics using Extrapolated Data										95% KM (jackknife) UCL	0.0144
1117					Minimum	0.0003396					95% KM (bootstrap t) UCL	0.031
1118					Maximum	0.018					95% KM (BCA) UCL	0.013
1119					Mean	0.00643					95% KM (Percentile Bootstrap) UCL	0.0138
1120					Median	0.00526					95% KM (Chebyshev) UCL	0.0235
1121					SD	0.00568					97.5% KM (Chebyshev) UCL	0.0307
1122					k star	0.871					99% KM (Chebyshev) UCL	0.0448
1123					Theta star	0.00738						
1124					Nu star	24.39					**Potential UCLs to Use**	
1125					AppChi2	14.14					95% KM (t) UCL	0.0136
1126					95% Gamma Approximate UCL	0.0111					95% KM (Percentile Bootstrap) UCL	0.0138
1127					95% Adjusted Gamma UCL	N/A						
1128	**Note: DL/2 is not a recommended method.**											
1129												
1130												
1131	**I(123cd)P (mg/kg)**											
1132												
1133						**General Statistics**						
1134					Number of Valid Samples	14					Number of Detected Data	6
1135					Number of Unique Samples	6					Number of Non-Detect Data	8
1136					Number of Missing Values	1					Percent Non-Detects	57.14%
1137												
1138					**Raw Statistics**						**Log-transformed Statistics**	
1139					Minimum Detected	0.0023					Minimum Detected	-6.075
1140					Maximum Detected	0.0841					Maximum Detected	-2.476
1141					Mean of Detected	0.027					Mean of Detected	-4.223
1142					SD of Detected	0.031					SD of Detected	1.288
1143					Minimum Non-Detect	0.056					Minimum Non-Detect	-2.882
1144					Maximum Non-Detect	0.063					Maximum Non-Detect	-2.765
1145												
1146	Note: Data have multiple DLs - Use of KM Method is recommended										Number treated as Non-Detect	13
1147	For all methods (except KM, DL/2, and ROS Methods),										Number treated as Detected	1
1148	Observations < Largest ND are treated as NDs										Single DL Non-Detect Percentage	92.86%
1149												
1150						**UCL Statistics**						
1151					**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**	
1152					Shapiro Wilk Test Statistic	0.819					Shapiro Wilk Test Statistic	0.991
1153					5% Shapiro Wilk Critical Value	0.788					5% Shapiro Wilk Critical Value	0.788
1154					**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**	
1155												
1156					**Assuming Normal Distribution**						**Assuming Lognormal Distribution**	
1157					DL/2 Substitution Method						DL/2 Substitution Method	
1158					Mean	0.0285					Mean	-3.82
1159					SD	0.0193					SD	0.878
1160					95% DL/2 (t) UCL	0.0377					95% H-Stat (DL/2) UCL	0.117
1161												
1162					Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method	
1163					**MLE method failed to converge properly**						Mean in Log Scale	-4.442
1164											SD in Log Scale	0.847
1165											Mean in Original Scale	0.0175
1166											SD in Original Scale	0.0212

1167											95% Percentile Bootstrap UCL	0.0273
1168											95% BCA Bootstrap UCL	0.0316
1169												
1170	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
1171					k star (bias corrected)	0.586	**Data appear Normal at 5% Significance Level**					
1172					Theta Star	0.0461						
1173					nu star	7.028						
1174												
1175					A-D Test Statistic	0.209	**Nonparametric Statistics**					
1176					5% A-D Critical Value	0.716	Kaplan-Meier (KM) Method					
1177					K-S Test Statistic	0.716	Mean	0.0205				
1178					5% K-S Critical Value	0.341	SD	0.0219				
1179	**Data appear Gamma Distributed at 5% Significance Level**						SE of Mean	0.00798				
1180							95% KM (t) UCL	0.0346				
1181	**Assuming Gamma Distribution**						95% KM (z) UCL	0.0336				
1182					Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	0.0351				
1183					Minimum	0.0023	95% KM (bootstrap t) UCL	0.0488				
1184					Maximum	0.0841	95% KM (BCA) UCL	0.0334				
1185					Mean	0.0263	95% KM (Percentile Bootstrap) UCL	0.0339				
1186					Median	0.0255	95% KM (Chebyshev) UCL	0.0553				
1187					SD	0.0195	97.5% KM (Chebyshev) UCL	0.0703				
1188					k star	1.626	99% KM (Chebyshev) UCL	0.0999				
1189					Theta star	0.0161						
1190					Nu star	45.54	**Potential UCLs to Use**					
1191					AppChi2	31.06	95% KM (t) UCL	0.0346				
1192					95% Gamma Approximate UCL	0.0385	95% KM (Percentile Bootstrap) UCL	0.0339				
1193					95% Adjusted Gamma UCL	0.0406						
1194	**Note: DL/2 is not a recommended method.**											
1195												
1196												
1197	**Naphthalene (mg/kg)**											
1198												
1199	**General Statistics**											
1200					Number of Valid Samples	13	Number of Detected Data	3				
1201					Number of Unique Samples	2	Number of Non-Detect Data	10				
1202					Number of Missing Values	2	Percent Non-Detects	76.92%				
1203												
1204	**Raw Statistics**						**Log-transformed Statistics**					
1205					Minimum Detected	0.027	Minimum Detected	-3.612				
1206					Maximum Detected	0.27	Maximum Detected	-1.309				
1207					Mean of Detected	0.108	Mean of Detected	-2.844				
1208					SD of Detected	0.14	SD of Detected	1.329				
1209					Minimum Non-Detect	0.28	Minimum Non-Detect	-1.273				
1210					Maximum Non-Detect	1.5	Maximum Non-Detect	0.405				
1211												
1212	Note: Data have multiple DLs - Use of KM Method is recommended						Number treated as Non-Detect	13				
1213	For all methods (except KM, DL/2, and ROS Methods),						Number treated as Detected	0				
1214	Observations < Largest ND are treated as NDs						Single DL Non-Detect Percentage	100.00%				
1215												
1216	**UCL Statistics**											
1217	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
1218					Shapiro Wilk Test Statistic	0.75	Shapiro Wilk Test Statistic	0.75				
1219					5% Shapiro Wilk Critical Value	0.767	5% Shapiro Wilk Critical Value	0.767				

1220	**Data not Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**					
1221												
1222	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
1223				DL/2 Substitution Method						DL/2 Substitution Method		
1224				Mean		0.186				Mean		-1.998
1225				SD		0.18				SD		0.851
1226				95% DL/2 (t) UCL		0.275				95% H-Stat (DL/2) UCL		0.898
1227												
1228				Maximum Likelihood Estimate(MLE) Method		N/A				Log ROS Method		
1229	**MLE method failed to converge properly**									Mean in Log Scale		-2.844
1230										SD in Log Scale		0.909
1231										Mean in Original Scale		0.0854
1232										SD in Original Scale		0.08
1233										95% Percentile Bootstrap UCL		0.123
1234										95% BCA Bootstrap UCL		0.126
1235												
1236	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
1237				k star (bias corrected)		N/A	**Data do not follow a Discernable Distribution (0.05)**					
1238				Theta Star		N/A						
1239				nu star		N/A						
1240												
1241				A-D Test Statistic		0.614	**Nonparametric Statistics**					
1242				5% A-D Critical Value		N/A				Kaplan-Meier (KM) Method		
1243				K-S Test Statistic		N/A				Mean		0.108
1244				5% K-S Critical Value		N/A				SD		0.115
1245	**Data not Gamma Distributed at 5% Significance Level**									SE of Mean		0.081
1246										95% KM (t) UCL		0.252
1247	**Assuming Gamma Distribution**									95% KM (z) UCL		0.241
1248				Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL		0.278
1249				Minimum		N/A				95% KM (bootstrap t) UCL		1.8E+308
1250				Maximum		N/A				95% KM (BCA) UCL		0.27
1251				Mean		N/A				95% KM (Percentile Bootstrap) UCL		N/A
1252				Median		N/A				95% KM (Chebyshev) UCL		0.461
1253				SD		N/A				97.5% KM (Chebyshev) UCL		0.614
1254				k star		N/A				99% KM (Chebyshev) UCL		0.914
1255				Theta star		N/A						
1256				Nu star		N/A	**Potential UCLs to Use**					
1257				AppChi2		N/A				95% KM (BCA) UCL		0.27
1258				95% Gamma Approximate UCL		N/A						
1259				95% Adjusted Gamma UCL		N/A						
1260	**Note: DL/2 is not a recommended method.**											
1261												
1262												
1263	**n-Nitrosodiphenylamine (mg/kg)**											
1264												
1265	**General Statistics**											
1266				Number of Valid Samples		15				Number of Detected Data		4
1267				Number of Unique Samples		4				Number of Non-Detect Data		11
1268										Percent Non-Detects		73.33%
1269												
1270	**Raw Statistics**						**Log-transformed Statistics**					
1271				Minimum Detected		0.021				Minimum Detected		-3.863
1272				Maximum Detected		2.1				Maximum Detected		0.742

	A	B	C	D	E	F	G	H	I	J	K	L
1273					Mean of Detected	0.62					Mean of Detected	-1.638
1274					SD of Detected	0.989					SD of Detected	1.883
1275					Minimum Non-Detect	0.17					Minimum Non-Detect	-1.772
1276					Maximum Non-Detect	0.77					Maximum Non-Detect	-0.261
1277												
1278	Note: Data have multiple DLs - Use of KM Method is recommended										Number treated as Non-Detect	14
1279	For all methods (except KM, DL/2, and ROS Methods),										Number treated as Detected	1
1280	Observations < Largest ND are treated as NDs										Single DL Non-Detect Percentage	93.33%
1281												
1282	**UCL Statistics**											
1283	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
1284					Shapiro Wilk Test Statistic	0.698					Shapiro Wilk Test Statistic	0.953
1285					5% Shapiro Wilk Critical Value	0.748					5% Shapiro Wilk Critical Value	0.748
1286	**Data not Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
1287												
1288	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
1289					DL/2 Substitution Method						DL/2 Substitution Method	
1290					Mean	0.272					Mean	-1.989
1291					SD	0.516					SD	1.02
1292					95% DL/2 (t) UCL	0.507					95% H-Stat (DL/2) UCL	0.666
1293												
1294					Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method	
1295	**MLE method failed to converge properly**										Mean in Log Scale	-2.875
1296											SD in Log Scale	1.339
1297											Mean in Original Scale	0.2
1298											SD in Original Scale	0.529
1299											95% Percentile Bootstrap UCL	0.468
1300											95% BCA Bootstrap UCL	0.612
1301												
1302	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
1303					k star (bias corrected)	0.302	**Data appear Gamma Distributed at 5% Significance Level**					
1304					Theta Star	2.055						
1305					nu star	2.415						
1306												
1307					A-D Test Statistic	0.407	**Nonparametric Statistics**					
1308					5% A-D Critical Value	0.679					Kaplan-Meier (KM) Method	
1309					K-S Test Statistic	0.679					Mean	0.216
1310					5% K-S Critical Value	0.409					SD	0.509
1311	**Data appear Gamma Distributed at 5% Significance Level**										SE of Mean	0.156
1312											95% KM (t) UCL	0.49
1313	**Assuming Gamma Distribution**										95% KM (z) UCL	0.472
1314					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.451
1315					Minimum	0.021					95% KM (bootstrap t) UCL	1.521
1316					Maximum	2.1					95% KM (BCA) UCL	0.622
1317					Mean	0.624					95% KM (Percentile Bootstrap) UCL	0.572
1318					Median	0.641					95% KM (Chebyshev) UCL	0.895
1319					SD	0.481					97.5% KM (Chebyshev) UCL	1.188
1320					k star	1.298					99% KM (Chebyshev) UCL	1.765
1321					Theta star	0.481						
1322					Nu star	38.93	**Potential UCLs to Use**					
1323					AppChi2	25.64					95% KM (t) UCL	0.49
1324					95% Gamma Approximate UCL	0.948						
1325					95% Adjusted Gamma UCL	N/A						

1326	**Note: DL/2 is not a recommended method.**											
1327												
1328												
1329	**Phenanthrene (mg/kg)**											
1330												
1331	**General Statistics**											
1332					Number of Valid Samples	14			Number of Detected Data			4
1333					Number of Unique Samples	4			Number of Non-Detect Data			10
1334					Number of Missing Values	1			Percent Non-Detects			71.43%
1335												
1336	**Raw Statistics**						**Log-transformed Statistics**					
1337					Minimum Detected	0.011			Minimum Detected			-4.51
1338					Maximum Detected	0.26			Maximum Detected			-1.347
1339					Mean of Detected	0.0935			Mean of Detected			-2.965
1340					SD of Detected	0.113			SD of Detected			1.31
1341					Minimum Non-Detect	0.28			Minimum Non-Detect			-1.273
1342					Maximum Non-Detect	1.5			Maximum Non-Detect			0.405
1343												
1344	Note: Data have multiple DLs - Use of KM Method is recommended								Number treated as Non-Detect			14
1345	For all methods (except KM, DL/2, and ROS Methods),								Number treated as Detected			0
1346	Observations < Largest ND are treated as NDs								Single DL Non-Detect Percentage			100.00%
1347												
1348	**UCL Statistics**											
1349	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
1350					Shapiro Wilk Test Statistic	0.803			Shapiro Wilk Test Statistic			0.995
1351					5% Shapiro Wilk Critical Value	0.748			5% Shapiro Wilk Critical Value			0.748
1352	**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
1353												
1354	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
1355					DL/2 Substitution Method				DL/2 Substitution Method			
1356					Mean	0.176			Mean			-2.093
1357					SD	0.176			SD			0.952
1358					95% DL/2 (t) UCL	0.259			95% H-Stat (DL/2) UCL			1.118
1359												
1360					Maximum Likelihood Estimate(MLE) Method	N/A			Log ROS Method			
1361	**MLE method failed to converge properly**								Mean in Log Scale			-2.965
1362									SD in Log Scale			0.974
1363									Mean in Original Scale			0.0783
1364									SD in Original Scale			0.0749
1365									95% Percentile Bootstrap UCL			0.114
1366									95% BCA Bootstrap UCL			0.119
1367												
1368	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
1369					k star (bias corrected)	0.41	**Data appear Normal at 5% Significance Level**					
1370					Theta Star	0.228						
1371					nu star	3.279						
1372												
1373					A-D Test Statistic	0.268	**Nonparametric Statistics**					
1374					5% A-D Critical Value	0.667			Kaplan-Meier (KM) Method			
1375					K-S Test Statistic	0.667			Mean			0.0935
1376					5% K-S Critical Value	0.403			SD			0.098
1377	**Data appear Gamma Distributed at 5% Significance Level**								SE of Mean			0.0566
1378									95% KM (t) UCL			0.194

1379	**Assuming Gamma Distribution**									95% KM (z) UCL		0.187
1380	Gamma ROS Statistics using Extrapolated Data									95% KM (jackknife) UCL		0.205
1381	Minimum				0					95% KM (bootstrap t) UCL		0.512
1382	Maximum				0.26					95% KM (BCA) UCL		0.2
1383	Mean				0.0858					95% KM (Percentile Bootstrap) UCL		0.195
1384	Median				0.0652					95% KM (Chebyshev) UCL		0.34
1385	SD				0.0837					97.5% KM (Chebyshev) UCL		0.447
1386	k star				0.247					99% KM (Chebyshev) UCL		0.657
1387	Theta star				0.348							
1388	Nu star				6.903					**Potential UCLs to Use**		
1389	AppChi2				2.117					95% KM (t) UCL		0.194
1390	95% Gamma Approximate UCL				0.28					95% KM (Percentile Bootstrap) UCL		0.195
1391	95% Adjusted Gamma UCL				N/A							
1392	**Note: DL/2 is not a recommended method.**											
1393												
1394												
1395	**Pyrene (mg/kg)**											
1396												
1397	**General Statistics**											
1398	Number of Valid Samples				14					Number of Detected Data		4
1399	Number of Unique Samples				4					Number of Non-Detect Data		10
1400	Number of Missing Values				1					Percent Non-Detects		71.43%
1401												
1402	**Raw Statistics**									**Log-transformed Statistics**		
1403	Minimum Detected				0.0075					Minimum Detected		-4.893
1404	Maximum Detected				0.085					Maximum Detected		-2.465
1405	Mean of Detected				0.0416					Mean of Detected		-3.507
1406	SD of Detected				0.0331					SD of Detected		1.036
1407	Minimum Non-Detect				0.28					Minimum Non-Detect		-1.273
1408	Maximum Non-Detect				1.5					Maximum Non-Detect		0.405
1409												
1410	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect		14
1411	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected		0
1412	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage		100.00%
1413												
1414	**UCL Statistics**											
1415	**Normal Distribution Test with Detected Values Only**									**Lognormal Distribution Test with Detected Values Only**		
1416	Shapiro Wilk Test Statistic				0.975					Shapiro Wilk Test Statistic		0.964
1417	5% Shapiro Wilk Critical Value				0.748					5% Shapiro Wilk Critical Value		0.748
1418	**Data appear Normal at 5% Significance Level**									**Data appear Lognormal at 5% Significance Level**		
1419												
1420	**Assuming Normal Distribution**									**Assuming Lognormal Distribution**		
1421	DL/2 Substitution Method									DL/2 Substitution Method		
1422	Mean				0.161					Mean		-2.247
1423	SD				0.177					SD		1.055
1424	95% DL/2 (t) UCL				0.245					95% H-Stat (DL/2) UCL		1.556
1425												
1426	Maximum Likelihood Estimate(MLE) Method				N/A					Log ROS Method		
1427	**MLE method failed to converge properly**									Mean in Log Scale		-3.507
1428										SD in Log Scale		0.764
1429										Mean in Original Scale		0.0383
1430										SD in Original Scale		0.0262
1431										95% Percentile Bootstrap UCL		0.0499

1432											95% BCA Bootstrap UCL	0.0509
1433												
1434	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
1435					k star (bias corrected)	0.585	**Data appear Normal at 5% Significance Level**					
1436					Theta Star	0.0712						
1437					nu star	4.678						
1438												
1439					A-D Test Statistic	0.202	**Nonparametric Statistics**					
1440					5% A-D Critical Value	0.662	Kaplan-Meier (KM) Method					
1441					K-S Test Statistic	0.662	Mean	0.0416				
1442					5% K-S Critical Value	0.399	SD	0.0287				
1443	**Data appear Gamma Distributed at 5% Significance Level**						SE of Mean	0.0166				
1444							95% KM (t) UCL	0.0709				
1445	**Assuming Gamma Distribution**						95% KM (z) UCL	0.0689				
1446	Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.0742				
1447					Minimum	0.0075	95% KM (bootstrap t) UCL	0.0903				
1448					Maximum	0.085	95% KM (BCA) UCL	0.0723				
1449					Mean	0.0403	95% KM (Percentile Bootstrap) UCL	0.0721				
1450					Median	0.037	95% KM (Chebyshev) UCL	0.114				
1451					SD	0.0253	97.5% KM (Chebyshev) UCL	0.145				
1452					k star	1.842	99% KM (Chebyshev) UCL	0.206				
1453					Theta star	0.0219						
1454					Nu star	51.59	**Potential UCLs to Use**					
1455					AppChi2	36.09	95% KM (t) UCL	0.0709				
1456					95% Gamma Approximate UCL	0.0576	95% KM (Percentile Bootstrap) UCL	0.0721				
1457					95% Adjusted Gamma UCL	N/A						
1458	**Note: DL/2 is not a recommended method.**											
1459												
1460												
1461	**Aluminum (mg/kg)**											
1462												
1463	**General Statistics**											
1464					Number of Valid Samples	14	Number of Unique Samples	13				
1465					Number of Missing Values	1						
1466												
1467	**Raw Statistics**						**Log-transformed Statistics**					
1468					Minimum	6590	Minimum of Log Data	8.793				
1469					Maximum	24300	Maximum of Log Data	10.1				
1470					Mean	15371	Mean of log Data	9.595				
1471					Median	14950	SD of log Data	0.327				
1472					SD	4542						
1473					Coefficient of Variation	0.296						
1474					Skewness	0.0494						
1475												
1476	**Relevant UCL Statistics**											
1477	**Normal Distribution Test**						**Lognormal Distribution Test**					
1478					Shapiro Wilk Test Statistic	0.975	Shapiro Wilk Test Statistic	0.935				
1479					Shapiro Wilk Critical Value	0.874	Shapiro Wilk Critical Value	0.874				
1480	**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
1481												
1482	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
1483					95% Student's-t UCL	17521	95% H-UCL	18439				
1484	**95% UCLs (Adjusted for Skewness)**						95% Chebyshev (MVUE) UCL	21384				

1485				95% Adjusted-CLT UCL	17385					97.5% Chebyshev (MVUE) UCL	23960
1486				95% Modified-t UCL	17523					99% Chebyshev (MVUE) UCL	29021
1487											
1488				**Gamma Distribution Test**						**Data Distribution**	
1489				k star (bias corrected)	8.772					**Data appear Normal at 5% Significance Level**	
1490				Theta Star	1752						
1491				nu star	245.6						
1492				Approximate Chi Square Value (.05)	210.3					**Nonparametric Statistics**	
1493				Adjusted Level of Significance	0.0312					95% CLT UCL	17368
1494				Adjusted Chi Square Value	206					95% Jackknife UCL	17521
1495										95% Standard Bootstrap UCL	17341
1496				Anderson-Darling Test Statistic	0.295					95% Bootstrap-t UCL	17612
1497				Anderson-Darling 5% Critical Value	0.734					95% Hall's Bootstrap UCL	17579
1498				Kolmogorov-Smirnov Test Statistic	0.161					95% Percentile Bootstrap UCL	17292
1499				Kolmogorov-Smirnov 5% Critical Value	0.229					95% BCA Bootstrap UCL	17336
1500				**Data appear Gamma Distributed at 5% Significance Level**						95% Chebyshev(Mean, Sd) UCL	20663
1501										97.5% Chebyshev(Mean, Sd) UCL	22952
1502				**Assuming Gamma Distribution**						99% Chebyshev(Mean, Sd) UCL	27450
1503				95% Approximate Gamma UCL	17949						
1504				95% Adjusted Gamma UCL	18327						
1505											
1506				**Potential UCL to Use**						Use 95% Student's-t UCL	17521
1507											
1508											
1509	**Antimony (mg/kg)**										
1510											
1511				**General Statistics**							
1512				Number of Valid Samples	12					Number of Detected Data	11
1513				Number of Unique Samples	7					Number of Non-Detect Data	1
1514				Number of Missing Values	3					Percent Non-Detects	8.33%
1515											
1516				**Raw Statistics**						**Log-transformed Statistics**	
1517				Minimum Detected	0.33					Minimum Detected	-1.109
1518				Maximum Detected	1.4					Maximum Detected	0.336
1519				Mean of Detected	1.075					Mean of Detected	0.00839
1520				SD of Detected	0.323					SD of Detected	0.422
1521				Minimum Non-Detect	0.547					Minimum Non-Detect	-0.603
1522				Maximum Non-Detect	0.547					Maximum Non-Detect	-0.603
1523											
1524											
1525				**UCL Statistics**							
1526				**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**	
1527				Shapiro Wilk Test Statistic	0.869					Shapiro Wilk Test Statistic	0.738
1528				5% Shapiro Wilk Critical Value	0.85					5% Shapiro Wilk Critical Value	0.85
1529				**Data appear Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**	
1530											
1531				**Assuming Normal Distribution**						**Assuming Lognormal Distribution**	
1532				DL/2 Substitution Method						DL/2 Substitution Method	
1533				Mean	1.008					Mean	-0.1
1534				SD	0.385					SD	0.551
1535				95% DL/2 (t) UCL	1.208					95% H-Stat (DL/2) UCL	1.296
1536											
1537				Maximum Likelihood Estimate(MLE) Method						Log ROS Method	

1538				Mean	1.022					Mean in Log Scale		-0.0482
1539				SD	0.346					SD in Log Scale		0.448
1540				95% MLE (t) UCL	1.202					Mean in Original Scale		1.028
1541				95% MLE (Tiku) UCL	1.212					SD in Original Scale		0.348
1542										95% Percentile Bootstrap UCL		1.183
1543										95% BCA Bootstrap UCL		1.166
1544												
1545	**Gamma Distribution Test with Detected Values Only**									**Data Distribution Test with Detected Values Only**		
1546				k star (bias corrected)	5.898					**Data appear Normal at 5% Significance Level**		
1547				Theta Star	0.182							
1548				nu star	129.8							
1549												
1550				A-D Test Statistic	0.926					**Nonparametric Statistics**		
1551				5% A-D Critical Value	0.73					Kaplan-Meier (KM) Method		
1552				K-S Test Statistic	0.73					Mean		1.013
1553				5% K-S Critical Value	0.256					SD		0.36
1554	**Data not Gamma Distributed at 5% Significance Level**									SE of Mean		0.109
1555										95% KM (t) UCL		1.208
1556	**Assuming Gamma Distribution**									95% KM (z) UCL		1.192
1557				Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL		1.212
1558				Minimum	0.33					95% KM (bootstrap t) UCL		1.174
1559				Maximum	1.4					95% KM (BCA) UCL		1.217
1560				Mean	1.031					95% KM (Percentile Bootstrap) UCL		1.199
1561				Median	1.1					95% KM (Chebyshev) UCL		1.487
1562				SD	0.343					97.5% KM (Chebyshev) UCL		1.692
1563				k star	5.363					99% KM (Chebyshev) UCL		2.096
1564				Theta star	0.192							
1565				Nu star	128.7					**Potential UCLs to Use**		
1566				AppChi2	103.5					95% KM (t) UCL		1.208
1567				95% Gamma Approximate UCL	1.282					95% KM (Percentile Bootstrap) UCL		1.199
1568				95% Adjusted Gamma UCL	1.327							
1569	**Note: DL/2 is not a recommended method.**											
1570												
1571												
1572	**Arsenic (mg/kg)**											
1573												
1574	**General Statistics**											
1575				Number of Valid Samples	14					Number of Unique Samples		14
1576				Number of Missing Values	1							
1577												
1578	**Raw Statistics**									**Log-transformed Statistics**		
1579				Minimum	1.03					Minimum of Log Data		0.0296
1580				Maximum	7.4					Maximum of Log Data		2.001
1581				Mean	3.957					Mean of log Data		1.237
1582				Median	3.8					SD of log Data		0.577
1583				SD	2.002							
1584				Coefficient of Variation	0.506							
1585				Skewness	0.349							
1586												
1587	**Relevant UCL Statistics**											
1588	**Normal Distribution Test**									**Lognormal Distribution Test**		
1589				Shapiro Wilk Test Statistic	0.954					Shapiro Wilk Test Statistic		0.957
1590				Shapiro Wilk Critical Value	0.874					Shapiro Wilk Critical Value		0.874

1591	**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
1592												
1593	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
1594				95% Student's-t UCL	4.904					95% H-UCL	5.767	
1595	**95% UCLs (Adjusted for Skewness)**									95% Chebyshev (MVUE) UCL	6.807	
1596				95% Adjusted-CLT UCL	4.89					97.5% Chebyshev (MVUE) UCL	8.016	
1597				95% Modified-t UCL	4.913					99% Chebyshev (MVUE) UCL	10.39	
1598												
1599	**Gamma Distribution Test**						**Data Distribution**					
1600				k star (bias corrected)	3.004		**Data appear Normal at 5% Significance Level**					
1601				Theta Star	1.317							
1602				nu star	84.12							
1603				Approximate Chi Square Value (.05)	63.98		**Nonparametric Statistics**					
1604				Adjusted Level of Significance	0.0312					95% CLT UCL	4.837	
1605				Adjusted Chi Square Value	61.66					95% Jackknife UCL	4.904	
1606										95% Standard Bootstrap UCL	4.827	
1607				Anderson-Darling Test Statistic	0.194					95% Bootstrap-t UCL	5.047	
1608				Anderson-Darling 5% Critical Value	0.741					95% Hall's Bootstrap UCL	4.92	
1609				Kolmogorov-Smirnov Test Statistic	0.107					95% Percentile Bootstrap UCL	4.874	
1610				Kolmogorov-Smirnov 5% Critical Value	0.23					95% BCA Bootstrap UCL	4.919	
1611	**Data appear Gamma Distributed at 5% Significance Level**									95% Chebyshev(Mean, Sd) UCL	6.289	
1612										97.5% Chebyshev(Mean, Sd) UCL	7.298	
1613	**Assuming Gamma Distribution**									99% Chebyshev(Mean, Sd) UCL	9.28	
1614				95% Approximate Gamma UCL	5.203							
1615				95% Adjusted Gamma UCL	5.399							
1616												
1617	**Potential UCL to Use**									Use 95% Student's-t UCL	4.904	
1618												
1619												
1620	**Barium (mg/kg)**											
1621												
1622	**General Statistics**											
1623				Number of Valid Samples	14					Number of Unique Samples	14	
1624				Number of Missing Values	1							
1625												
1626	**Raw Statistics**						**Log-transformed Statistics**					
1627				Minimum	33.9					Minimum of Log Data	3.523	
1628				Maximum	141					Maximum of Log Data	4.949	
1629				Mean	89.17					Mean of log Data	4.444	
1630				Median	92.6					SD of log Data	0.336	
1631				SD	25.83							
1632				Coefficient of Variation	0.29							
1633				Skewness	-0.0176							
1634												
1635	**Relevant UCL Statistics**											
1636	**Normal Distribution Test**						**Lognormal Distribution Test**					
1637				Shapiro Wilk Test Statistic	0.96					Shapiro Wilk Test Statistic	0.879	
1638				Shapiro Wilk Critical Value	0.874					Shapiro Wilk Critical Value	0.874	
1639	**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
1640												
1641	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
1642				95% Student's-t UCL	101.4					95% H-UCL	107.8	
1643	**95% UCLs (Adjusted for Skewness)**									95% Chebyshev (MVUE) UCL	125.3	

1644					95% Adjusted-CLT UCL	100.5				97.5% Chebyshev (MVUE) UCL		140.7
1645					95% Modified-t UCL	101.4				99% Chebyshev (MVUE) UCL		171
1646												
1647					**Gamma Distribution Test**					**Data Distribution**		
1648					k star (bias corrected)	8.655				**Data appear Normal at 5% Significance Level**		
1649					Theta Star	10.3						
1650					nu star	242.3						
1651					Approximate Chi Square Value (.05)	207.3				**Nonparametric Statistics**		
1652					Adjusted Level of Significance	0.0312				95% CLT UCL		100.5
1653					Adjusted Chi Square Value	203				95% Jackknife UCL		101.4
1654										95% Standard Bootstrap UCL		100
1655					Anderson-Darling Test Statistic	0.461				95% Bootstrap-t UCL		101.9
1656					Anderson-Darling 5% Critical Value	0.734				95% Hall's Bootstrap UCL		103.3
1657					Kolmogorov-Smirnov Test Statistic	0.163				95% Percentile Bootstrap UCL		99.95
1658					Kolmogorov-Smirnov 5% Critical Value	0.229				95% BCA Bootstrap UCL		100.5
1659					**Data appear Gamma Distributed at 5% Significance Level**					95% Chebyshev(Mean, Sd) UCL		119.3
1660										97.5% Chebyshev(Mean, Sd) UCL		132.3
1661					**Assuming Gamma Distribution**					99% Chebyshev(Mean, Sd) UCL		157.9
1662					95% Approximate Gamma UCL	104.2						
1663					95% Adjusted Gamma UCL	106.5						
1664												
1665					**Potential UCL to Use**					Use 95% Student's-t UCL		101.4
1666												
1667												
1668	**Beryllium (mg/kg)**											
1669												
1670					**General Statistics**							
1671					Number of Valid Samples	10				Number of Unique Samples		10
1672					Number of Missing Values	5						
1673												
1674					**Raw Statistics**					**Log-transformed Statistics**		
1675					Minimum	0.35				Minimum of Log Data		-1.05
1676					Maximum	0.9				Maximum of Log Data		-0.105
1677					Mean	0.649				Mean of log Data		-0.466
1678					Median	0.65				SD of log Data		0.284
1679					SD	0.169						
1680					Coefficient of Variation	0.26						
1681					Skewness	-0.23						
1682												
1683					**Relevant UCL Statistics**							
1684					**Normal Distribution Test**					**Lognormal Distribution Test**		
1685					Shapiro Wilk Test Statistic	0.978				Shapiro Wilk Test Statistic		0.944
1686					Shapiro Wilk Critical Value	0.842				Shapiro Wilk Critical Value		0.842
1687					**Data appear Normal at 5% Significance Level**					**Data appear Lognormal at 5% Significance Level**		
1688												
1689					**Assuming Normal Distribution**					**Assuming Lognormal Distribution**		
1690					95% Student's-t UCL	0.747				95% H-UCL		0.786
1691					**95% UCLs (Adjusted for Skewness)**					95% Chebyshev (MVUE) UCL		0.907
1692					95% Adjusted-CLT UCL	0.733				97.5% Chebyshev (MVUE) UCL		1.018
1693					95% Modified-t UCL	0.746				99% Chebyshev (MVUE) UCL		1.236
1694												
1695					**Gamma Distribution Test**					**Data Distribution**		
1696					k star (bias corrected)	10.48				**Data appear Normal at 5% Significance Level**		

1697					Theta Star	0.062						
1698					nu star	209.5						
1699					Approximate Chi Square Value (.05)	177		**Nonparametric Statistics**				
1700					Adjusted Level of Significance	0.0267					95% CLT UCL	0.737
1701					Adjusted Chi Square Value	171.8					95% Jackknife UCL	0.747
1702											95% Standard Bootstrap UCL	0.731
1703					Anderson-Darling Test Statistic	0.228					95% Bootstrap-t UCL	0.738
1704					Anderson-Darling 5% Critical Value	0.725					95% Hall's Bootstrap UCL	0.733
1705					Kolmogorov-Smirnov Test Statistic	0.149					95% Percentile Bootstrap UCL	0.73
1706					Kolmogorov-Smirnov 5% Critical Value	0.266					95% BCA Bootstrap UCL	0.725
1707					**Data appear Gamma Distributed at 5% Significance Level**						95% Chebyshev(Mean, Sd) UCL	0.882
1708											97.5% Chebyshev(Mean, Sd) UCL	0.982
1709					**Assuming Gamma Distribution**						99% Chebyshev(Mean, Sd) UCL	1.18
1710					95% Approximate Gamma UCL	0.768						
1711					95% Adjusted Gamma UCL	0.791						
1712												
1713					**Potential UCL to Use**						Use 95% Student's-t UCL	0.747
1714												
1715												
1716	**Calcium (mg/kg)**											
1717												
1718					**General Statistics**							
1719					Number of Valid Samples	14					Number of Unique Samples	14
1720					Number of Missing Values	1						
1721												
1722					**Raw Statistics**			**Log-transformed Statistics**				
1723					Minimum	484					Minimum of Log Data	6.182
1724					Maximum	28600					Maximum of Log Data	10.26
1725					Mean	5822					Mean of log Data	7.727
1726					Median	1365					SD of log Data	1.413
1727					SD	8338						
1728					Coefficient of Variation	1.432						
1729					Skewness	1.865						
1730												
1731					**Relevant UCL Statistics**							
1732					**Normal Distribution Test**			**Lognormal Distribution Test**				
1733					Shapiro Wilk Test Statistic	0.687					Shapiro Wilk Test Statistic	0.87
1734					Shapiro Wilk Critical Value	0.874					Shapiro Wilk Critical Value	0.874
1735					**Data not Normal at 5% Significance Level**			**Data not Lognormal at 5% Significance Level**				
1736												
1737					**Assuming Normal Distribution**			**Assuming Lognormal Distribution**				
1738					95% Student's-t UCL	9769					95% H-UCL	24614
1739					**95% UCLs (Adjusted for Skewness)**						95% Chebyshev (MVUE) UCL	15512
1740					95% Adjusted-CLT UCL	10675					97.5% Chebyshev (MVUE) UCL	19866
1741					95% Modified-t UCL	9954					99% Chebyshev (MVUE) UCL	28420
1742												
1743					**Gamma Distribution Test**			**Data Distribution**				
1744					k star (bias corrected)	0.557		**Data do not follow a Discernable Distribution (0.05)**				
1745					Theta Star	10455						
1746					nu star	15.59						
1747					Approximate Chi Square Value (.05)	7.676		**Nonparametric Statistics**				
1748					Adjusted Level of Significance	0.0312					95% CLT UCL	9488
1749					Adjusted Chi Square Value	6.95					95% Jackknife UCL	9769

1750											95% Standard Bootstrap UCL	9367
1751				Anderson-Darling Test Statistic	1.143						95% Bootstrap-t UCL	11813
1752				Anderson-Darling 5% Critical Value	0.78						95% Hall's Bootstrap UCL	10437
1753				Kolmogorov-Smirnov Test Statistic	0.289						95% Percentile Bootstrap UCL	9394
1754				Kolmogorov-Smirnov 5% Critical Value	0.239						95% BCA Bootstrap UCL	10560
1755				**Data not Gamma Distributed at 5% Significance Level**							95% Chebyshev(Mean, Sd) UCL	15536
1756											97.5% Chebyshev(Mean, Sd) UCL	19739
1757				**Assuming Gamma Distribution**							99% Chebyshev(Mean, Sd) UCL	27995
1758				95% Approximate Gamma UCL	11827							
1759				95% Adjusted Gamma UCL	13062							
1760												
1761				**Potential UCL to Use**							Use 99% Chebyshev (Mean, Sd) UCL	27995
1762												
1763												
1764	**Chromium (mg/kg)**											
1765												
1766					**General Statistics**							
1767				Number of Valid Samples	14						Number of Unique Samples	14
1768				Number of Missing Values	1							
1769												
1770				**Raw Statistics**							**Log-transformed Statistics**	
1771				Minimum	12.2						Minimum of Log Data	2.501
1772				Maximum	116						Maximum of Log Data	4.754
1773				Mean	32.64						Mean of log Data	3.311
1774				Median	27.55						SD of log Data	0.559
1775				SD	25.67							
1776				Coefficient of Variation	0.787							
1777				Skewness	2.953							
1778												
1779					**Relevant UCL Statistics**							
1780				**Normal Distribution Test**							**Lognormal Distribution Test**	
1781				Shapiro Wilk Test Statistic	0.642						Shapiro Wilk Test Statistic	0.923
1782				Shapiro Wilk Critical Value	0.874						Shapiro Wilk Critical Value	0.874
1783				**Data not Normal at 5% Significance Level**							**Data appear Lognormal at 5% Significance Level**	
1784												
1785				**Assuming Normal Distribution**							**Assuming Lognormal Distribution**	
1786				95% Student's-t UCL	44.79						95% H-UCL	44.82
1787				**95% UCLs (Adjusted for Skewness)**							95% Chebyshev (MVUE) UCL	52.99
1788				95% Adjusted-CLT UCL	49.71						97.5% Chebyshev (MVUE) UCL	62.22
1789				95% Modified-t UCL	45.69						99% Chebyshev (MVUE) UCL	80.35
1790												
1791				**Gamma Distribution Test**							**Data Distribution**	
1792				k star (bias corrected)	2.427						**Data appear Gamma Distributed at 5% Significance Level**	
1793				Theta Star	13.45							
1794				nu star	67.95							
1795				Approximate Chi Square Value (.05)	49.97						**Nonparametric Statistics**	
1796				Adjusted Level of Significance	0.0312						95% CLT UCL	43.92
1797				Adjusted Chi Square Value	47.93						95% Jackknife UCL	44.79
1798											95% Standard Bootstrap UCL	43.15
1799				Anderson-Darling Test Statistic	0.692						95% Bootstrap-t UCL	61.3
1800				Anderson-Darling 5% Critical Value	0.742						95% Hall's Bootstrap UCL	91.74
1801				Kolmogorov-Smirnov Test Statistic	0.197						95% Percentile Bootstrap UCL	45.86
1802				Kolmogorov-Smirnov 5% Critical Value	0.23						95% BCA Bootstrap UCL	51.67

1803	Data appear Gamma Distributed at 5% Significance Level									95% Chebyshev(Mean, Sd) UCL		62.54
1804										97.5% Chebyshev(Mean, Sd) UCL		75.48
1805	Assuming Gamma Distribution									99% Chebyshev(Mean, Sd) UCL		100.9
1806				95% Approximate Gamma UCL	44.37							
1807				95% Adjusted Gamma UCL	46.26							
1808												
1809	Potential UCL to Use									Use 95% Approximate Gamma UCL		44.37
1810												
1811												
1812	Cobalt (mg/kg)											
1813												
1814	General Statistics											
1815				Number of Valid Samples	14					Number of Unique Samples		14
1816				Number of Missing Values	1							
1817												
1818	Raw Statistics									Log-transformed Statistics		
1819				Minimum	3.4					Minimum of Log Data		1.224
1820				Maximum	17.1					Maximum of Log Data		2.839
1821				Mean	9.059					Mean of log Data		2.112
1822				Median	9.015					SD of log Data		0.463
1823				SD	3.831							
1824				Coefficient of Variation	0.423							
1825				Skewness	0.473							
1826												
1827	Relevant UCL Statistics											
1828	Normal Distribution Test									Lognormal Distribution Test		
1829				Shapiro Wilk Test Statistic	0.959					Shapiro Wilk Test Statistic		0.952
1830				Shapiro Wilk Critical Value	0.874					Shapiro Wilk Critical Value		0.874
1831	Data appear Normal at 5% Significance Level									Data appear Lognormal at 5% Significance Level		
1832												
1833	Assuming Normal Distribution									Assuming Lognormal Distribution		
1834				95% Student's-t UCL	10.87					95% H-UCL		11.97
1835	95% UCLs (Adjusted for Skewness)									95% Chebyshev (MVUE) UCL		14.16
1836				95% Adjusted-CLT UCL	10.88					97.5% Chebyshev (MVUE) UCL		16.34
1837				95% Modified-t UCL	10.89					99% Chebyshev (MVUE) UCL		20.62
1838												
1839	Gamma Distribution Test									Data Distribution		
1840				k star (bias corrected)	4.45					Data appear Normal at 5% Significance Level		
1841				Theta Star	2.036							
1842				nu star	124.6							
1843				Approximate Chi Square Value (.05)	99.83					Nonparametric Statistics		
1844				Adjusted Level of Significance	0.0312					95% CLT UCL		10.74
1845				Adjusted Chi Square Value	96.89					95% Jackknife UCL		10.87
1846										95% Standard Bootstrap UCL		10.65
1847				Anderson-Darling Test Statistic	0.272					95% Bootstrap-t UCL		10.95
1848				Anderson-Darling 5% Critical Value	0.738					95% Hall's Bootstrap UCL		11.11
1849				Kolmogorov-Smirnov Test Statistic	0.127					95% Percentile Bootstrap UCL		10.73
1850				Kolmogorov-Smirnov 5% Critical Value	0.229					95% BCA Bootstrap UCL		10.82
1851	Data appear Gamma Distributed at 5% Significance Level									95% Chebyshev(Mean, Sd) UCL		13.52
1852										97.5% Chebyshev(Mean, Sd) UCL		15.45
1853	Assuming Gamma Distribution									99% Chebyshev(Mean, Sd) UCL		19.25
1854				95% Approximate Gamma UCL	11.31							
1855				95% Adjusted Gamma UCL	11.65							

1856												
1857	**Potential UCL to Use**									Use 95% Student's-t UCL		10.87
1858												
1859												
1860	**Copper (mg/kg)**											
1861												
1862	**General Statistics**											
1863					Number of Valid Samples	14				Number of Unique Samples		14
1864					Number of Missing Values	1						
1865												
1866	**Raw Statistics**									**Log-transformed Statistics**		
1867					Minimum	4				Minimum of Log Data		1.386
1868					Maximum	56.4				Maximum of Log Data		4.032
1869					Mean	16.93				Mean of log Data		2.585
1870					Median	11.85				SD of log Data		0.704
1871					SD	13.78						
1872					Coefficient of Variation	0.814						
1873					Skewness	2.026						
1874												
1875	**Relevant UCL Statistics**											
1876	**Normal Distribution Test**									**Lognormal Distribution Test**		
1877					Shapiro Wilk Test Statistic	0.782				Shapiro Wilk Test Statistic		0.975
1878					Shapiro Wilk Critical Value	0.874				Shapiro Wilk Critical Value		0.874
1879	**Data not Normal at 5% Significance Level**									**Data appear Lognormal at 5% Significance Level**		
1880												
1881	**Assuming Normal Distribution**									**Assuming Lognormal Distribution**		
1882					95% Student's-t UCL	23.45				95% H-UCL		26.9
1883	**95% UCLs (Adjusted for Skewness)**									95% Chebyshev (MVUE) UCL		31
1884					95% Adjusted-CLT UCL	25.11				97.5% Chebyshev (MVUE) UCL		37.22
1885					95% Modified-t UCL	23.78				99% Chebyshev (MVUE) UCL		49.42
1886												
1887	**Gamma Distribution Test**									**Data Distribution**		
1888					k star (bias corrected)	1.782				**Data appear Gamma Distributed at 5% Significance Level**		
1889					Theta Star	9.499						
1890					nu star	49.89						
1891					Approximate Chi Square Value (.05)	34.67				**Nonparametric Statistics**		
1892					Adjusted Level of Significance	0.0312				95% CLT UCL		22.98
1893					Adjusted Chi Square Value	32.99				95% Jackknife UCL		23.45
1894										95% Standard Bootstrap UCL		22.81
1895					Anderson-Darling Test Statistic	0.419				95% Bootstrap-t UCL		27.69
1896					Anderson-Darling 5% Critical Value	0.745				95% Hall's Bootstrap UCL		49.24
1897					Kolmogorov-Smirnov Test Statistic	0.205				95% Percentile Bootstrap UCL		23.38
1898					Kolmogorov-Smirnov 5% Critical Value	0.231				95% BCA Bootstrap UCL		25.23
1899	**Data appear Gamma Distributed at 5% Significance Level**									95% Chebyshev(Mean, Sd) UCL		32.98
1900										97.5% Chebyshev(Mean, Sd) UCL		39.93
1901	**Assuming Gamma Distribution**									99% Chebyshev(Mean, Sd) UCL		53.57
1902					95% Approximate Gamma UCL	24.35						
1903					95% Adjusted Gamma UCL	25.59						
1904												
1905	**Potential UCL to Use**									Use 95% Approximate Gamma UCL		24.35
1906												
1907												
1908	**Iron (mg/kg)**											

1909												
1910	**General Statistics**											
1911					Number of Valid Samples	14				Number of Unique Samples	14	
1912					Number of Missing Values	1						
1913												
1914	**Raw Statistics**						**Log-transformed Statistics**					
1915					Minimum	7510				Minimum of Log Data	8.924	
1916					Maximum	28300				Maximum of Log Data	10.25	
1917					Mean	19506				Mean of log Data	9.828	
1918					Median	20450				SD of log Data	0.36	
1919					SD	5496						
1920					Coefficient of Variation	0.282						
1921					Skewness	-0.954						
1922												
1923	**Relevant UCL Statistics**											
1924	**Normal Distribution Test**						**Lognormal Distribution Test**					
1925					Shapiro Wilk Test Statistic	0.91				Shapiro Wilk Test Statistic	0.796	
1926					Shapiro Wilk Critical Value	0.874				Shapiro Wilk Critical Value	0.874	
1927	**Data appear Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**					
1928												
1929	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
1930					95% Student's-t UCL	22108				95% H-UCL	24036	
1931	**95% UCLs (Adjusted for Skewness)**									95% Chebyshev (MVUE) UCL	28070	
1932					95% Adjusted-CLT UCL	21522				97.5% Chebyshev (MVUE) UCL	31696	
1933					95% Modified-t UCL	22045				99% Chebyshev (MVUE) UCL	38818	
1934												
1935	**Gamma Distribution Test**						**Data Distribution**					
1936					k star (bias corrected)	7.962	**Data appear Normal at 5% Significance Level**					
1937					Theta Star	2450						
1938					nu star	222.9						
1939					Approximate Chi Square Value (.05)	189.4	**Nonparametric Statistics**					
1940					Adjusted Level of Significance	0.0312				95% CLT UCL	21923	
1941					Adjusted Chi Square Value	185.3				95% Jackknife UCL	22108	
1942										95% Standard Bootstrap UCL	21805	
1943					Anderson-Darling Test Statistic	1.01				95% Bootstrap-t UCL	21735	
1944					Anderson-Darling 5% Critical Value	0.735				95% Hall's Bootstrap UCL	21647	
1945					Kolmogorov-Smirnov Test Statistic	0.265				95% Percentile Bootstrap UCL	21764	
1946					Kolmogorov-Smirnov 5% Critical Value	0.229				95% BCA Bootstrap UCL	21491	
1947	**Data not Gamma Distributed at 5% Significance Level**									95% Chebyshev(Mean, Sd) UCL	25909	
1948										97.5% Chebyshev(Mean, Sd) UCL	28680	
1949	**Assuming Gamma Distribution**									99% Chebyshev(Mean, Sd) UCL	34122	
1950					95% Approximate Gamma UCL	22963						
1951					95% Adjusted Gamma UCL	23471						
1952												
1953	**Potential UCL to Use**									Use 95% Student's-t UCL	22108	
1954												
1955												
1956	**Lead (mg/kg)**											
1957												
1958	**General Statistics**											
1959					Number of Valid Samples	14				Number of Unique Samples	14	
1960					Number of Missing Values	1						
1961												

1962	**Raw Statistics**						**Log-transformed Statistics**					
1963					Minimum	6.6					Minimum of Log Data	1.887
1964					Maximum	178					Maximum of Log Data	5.182
1965					Mean	43.81					Mean of log Data	3.232
1966					Median	18.35					SD of log Data	0.996
1967					SD	55.5						
1968					Coefficient of Variation	1.267						
1969					Skewness	1.82						
1970												
1971	**Relevant UCL Statistics**											
1972	**Normal Distribution Test**						**Lognormal Distribution Test**					
1973					Shapiro Wilk Test Statistic	0.645					Shapiro Wilk Test Statistic	0.853
1974					Shapiro Wilk Critical Value	0.874					Shapiro Wilk Critical Value	0.874
1975	**Data not Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**					
1976												
1977	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
1978					95% Student's-t UCL	70.08					95% H-UCL	89.89
1979	**95% UCLs (Adjusted for Skewness)**										95% Chebyshev (MVUE) UCL	89.42
1980					95% Adjusted-CLT UCL	75.92					97.5% Chebyshev (MVUE) UCL	111
1981					95% Modified-t UCL	71.28					99% Chebyshev (MVUE) UCL	153.3
1982												
1983	**Gamma Distribution Test**						**Data Distribution**					
1984					k star (bias corrected)	0.87	**Data do not follow a Discernable Distribution (0.05)**					
1985					Theta Star	50.34						
1986					nu star	24.37						
1987					Approximate Chi Square Value (.05)	14.13	**Nonparametric Statistics**					
1988					Adjusted Level of Significance	0.0312					95% CLT UCL	68.21
1989					Adjusted Chi Square Value	13.1					95% Jackknife UCL	70.08
1990											95% Standard Bootstrap UCL	67.38
1991					Anderson-Darling Test Statistic	1.549					95% Bootstrap-t UCL	95.64
1992					Anderson-Darling 5% Critical Value	0.759					95% Hall's Bootstrap UCL	67.81
1993					Kolmogorov-Smirnov Test Statistic	0.332					95% Percentile Bootstrap UCL	68.46
1994					Kolmogorov-Smirnov 5% Critical Value	0.235					95% BCA Bootstrap UCL	75.54
1995	**Data not Gamma Distributed at 5% Significance Level**										95% Chebyshev(Mean, Sd) UCL	108.5
1996											97.5% Chebyshev(Mean, Sd) UCL	136.4
1997	**Assuming Gamma Distribution**										99% Chebyshev(Mean, Sd) UCL	191.4
1998					95% Approximate Gamma UCL	75.57						
1999					95% Adjusted Gamma UCL	81.48						
2000												
2001	**Potential UCL to Use**						Use 95% Chebyshev (Mean, Sd) UCL					108.5
2002												
2003												
2004	**Magnesium (mg/kg)**											
2005												
2006	**General Statistics**											
2007					Number of Valid Samples	14					Number of Unique Samples	14
2008					Number of Missing Values	1						
2009												
2010	**Raw Statistics**						**Log-transformed Statistics**					
2011					Minimum	312					Minimum of Log Data	5.743
2012					Maximum	20200					Maximum of Log Data	9.913
2013					Mean	3816					Mean of log Data	7.513
2014					Median	1670					SD of log Data	1.206

2015					SD	5539						
2016					Coefficient of Variation	1.452						
2017					Skewness	2.369						
2018												
2019	**Relevant UCL Statistics**											
2020	**Normal Distribution Test**						**Lognormal Distribution Test**					
2021					Shapiro Wilk Test Statistic	0.649					Shapiro Wilk Test Statistic	0.951
2022					Shapiro Wilk Critical Value	0.874					Shapiro Wilk Critical Value	0.874
2023	**Data not Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
2024												
2025	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
2026					95% Student's-t UCL	6437					95% H-UCL	10910
2027	**95% UCLs (Adjusted for Skewness)**										95% Chebyshev (MVUE) UCL	8951
2028					95% Adjusted-CLT UCL	7252					97.5% Chebyshev (MVUE) UCL	11308
2029					95% Modified-t UCL	6593					99% Chebyshev (MVUE) UCL	15938
2030												
2031	**Gamma Distribution Test**						**Data Distribution**					
2032					k star (bias corrected)	0.683	**Data Follow Appr. Gamma Distribution at 5% Significance Level**					
2033					Theta Star	5590						
2034					nu star	19.11						
2035					Approximate Chi Square Value (.05)	10.2	**Nonparametric Statistics**					
2036					Adjusted Level of Significance	0.0312					95% CLT UCL	6250
2037					Adjusted Chi Square Value	9.346					95% Jackknife UCL	6437
2038											95% Standard Bootstrap UCL	6158
2039					Anderson-Darling Test Statistic	0.79					95% Bootstrap-t UCL	9143
2040					Anderson-Darling 5% Critical Value	0.768					95% Hall's Bootstrap UCL	7336
2041					Kolmogorov-Smirnov Test Statistic	0.218					95% Percentile Bootstrap UCL	6314
2042					Kolmogorov-Smirnov 5% Critical Value	0.237					95% BCA Bootstrap UCL	7234
2043	**Data follow Appr. Gamma Distribution at 5% Significance Level**										95% Chebyshev(Mean, Sd) UCL	10268
2044											97.5% Chebyshev(Mean, Sd) UCL	13060
2045	**Assuming Gamma Distribution**										99% Chebyshev(Mean, Sd) UCL	18544
2046					95% Approximate Gamma UCL	7150						
2047					95% Adjusted Gamma UCL	7803						
2048												
2049	**Potential UCL to Use**										Use 95% Approximate Gamma UCL	7150
2050												
2051												
2052	**Manganese (mg/kg)**											
2053												
2054	**General Statistics**											
2055					Number of Valid Samples	14					Number of Unique Samples	14
2056					Number of Missing Values	1						
2057												
2058	**Raw Statistics**						**Log-transformed Statistics**					
2059					Minimum	62.8					Minimum of Log Data	4.14
2060					Maximum	1320					Maximum of Log Data	7.185
2061					Mean	696.2					Mean of log Data	6.325
2062					Median	667					SD of log Data	0.823
2063					SD	372.9						
2064					Coefficient of Variation	0.536						
2065					Skewness	0.0175						
2066												
2067	**Relevant UCL Statistics**											

2068	**Normal Distribution Test**						**Lognormal Distribution Test**					
2069				Shapiro Wilk Test Statistic	0.974						Shapiro Wilk Test Statistic	0.84
2070				Shapiro Wilk Critical Value	0.874						Shapiro Wilk Critical Value	0.874
2071	**Data appear Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**					
2072												
2073	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
2074				95% Student's-t UCL	872.7						95% H-UCL	1393
2075	**95% UCLs (Adjusted for Skewness)**										95% Chebyshev (MVUE) UCL	1537
2076				95% Adjusted-CLT UCL	860.6						97.5% Chebyshev (MVUE) UCL	1872
2077				95% Modified-t UCL	872.8						99% Chebyshev (MVUE) UCL	2532
2078												
2079	**Gamma Distribution Test**						**Data Distribution**					
2080				k star (bias corrected)	1.952		**Data appear Normal at 5% Significance Level**					
2081				Theta Star	356.6							
2082				nu star	54.66							
2083				Approximate Chi Square Value (.05)	38.67		**Nonparametric Statistics**					
2084				Adjusted Level of Significance	0.0312						95% CLT UCL	860.1
2085				Adjusted Chi Square Value	36.89						95% Jackknife UCL	872.7
2086											95% Standard Bootstrap UCL	849.9
2087				Anderson-Darling Test Statistic	0.455						95% Bootstrap-t UCL	872.2
2088				Anderson-Darling 5% Critical Value	0.744						95% Hall's Bootstrap UCL	860.4
2089				Kolmogorov-Smirnov Test Statistic	0.176						95% Percentile Bootstrap UCL	853
2090				Kolmogorov-Smirnov 5% Critical Value	0.231						95% BCA Bootstrap UCL	856.8
2091	**Data appear Gamma Distributed at 5% Significance Level**										95% Chebyshev(Mean, Sd) UCL	1131
2092											97.5% Chebyshev(Mean, Sd) UCL	1319
2093	**Assuming Gamma Distribution**										99% Chebyshev(Mean, Sd) UCL	1688
2094				95% Approximate Gamma UCL	984							
2095				95% Adjusted Gamma UCL	1031							
2096												
2097	**Potential UCL to Use**										Use 95% Student's-t UCL	872.7
2098												
2099												
2100	**Mercury (mg/kg)**											
2101												
2102	**General Statistics**											
2103				Number of Valid Samples	14						Number of Unique Samples	13
2104				Number of Missing Values	1							
2105												
2106	**Raw Statistics**						**Log-transformed Statistics**					
2107				Minimum	0.041						Minimum of Log Data	-3.194
2108				Maximum	0.816						Maximum of Log Data	-0.203
2109				Mean	0.145						Mean of log Data	-2.356
2110				Median	0.0769						SD of log Data	0.809
2111				SD	0.201							
2112				Coefficient of Variation	1.388							
2113				Skewness	3.299							
2114												
2115	**Relevant UCL Statistics**											
2116	**Normal Distribution Test**						**Lognormal Distribution Test**					
2117				Shapiro Wilk Test Statistic	0.52						Shapiro Wilk Test Statistic	0.851
2118				Shapiro Wilk Critical Value	0.874						Shapiro Wilk Critical Value	0.874
2119	**Data not Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**					
2120												

2121	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
2122				95% Student's-t UCL	0.24					95% H-UCL	0.23	
2123	**95% UCLs (Adjusted for Skewness)**									95% Chebyshev (MVUE) UCL	0.256	
2124				95% Adjusted-CLT UCL	0.283					97.5% Chebyshev (MVUE) UCL	0.311	
2125				95% Modified-t UCL	0.247					99% Chebyshev (MVUE) UCL	0.42	
2126												
2127	**Gamma Distribution Test**						**Data Distribution**					
2128				k star (bias corrected)	1.09		**Data do not follow a Discernable Distribution (0.05)**					
2129				Theta Star	0.133							
2130				nu star	30.52							
2131				Approximate Chi Square Value (.05)	18.9		**Nonparametric Statistics**					
2132				Adjusted Level of Significance	0.0312					95% CLT UCL	0.233	
2133				Adjusted Chi Square Value	17.7					95% Jackknife UCL	0.24	
2134										95% Standard Bootstrap UCL	0.229	
2135				Anderson-Darling Test Statistic	1.299					95% Bootstrap-t UCL	0.45	
2136				Anderson-Darling 5% Critical Value	0.754					95% Hall's Bootstrap UCL	0.539	
2137				Kolmogorov-Smirnov Test Statistic	0.254					95% Percentile Bootstrap UCL	0.24	
2138				Kolmogorov-Smirnov 5% Critical Value	0.234					95% BCA Bootstrap UCL	0.292	
2139	**Data not Gamma Distributed at 5% Significance Level**									95% Chebyshev(Mean, Sd) UCL	0.378	
2140										97.5% Chebyshev(Mean, Sd) UCL	0.48	
2141	**Assuming Gamma Distribution**									99% Chebyshev(Mean, Sd) UCL	0.678	
2142				95% Approximate Gamma UCL	0.233							
2143				95% Adjusted Gamma UCL	0.249							
2144												
2145	**Potential UCL to Use**									Use 95% Chebyshev (Mean, Sd) UCL	0.378	
2146												
2147												
2148	**Nickel (mg/kg)**											
2149												
2150	**General Statistics**											
2151				Number of Valid Samples	14					Number of Unique Samples	14	
2152				Number of Missing Values	1							
2153												
2154	**Raw Statistics**						**Log-transformed Statistics**					
2155				Minimum	4.1					Minimum of Log Data	1.411	
2156				Maximum	50.1					Maximum of Log Data	3.914	
2157				Mean	12.93					Mean of log Data	2.35	
2158				Median	10.45					SD of log Data	0.615	
2159				SD	11.33							
2160				Coefficient of Variation	0.876							
2161				Skewness	3.058							
2162												
2163	**Relevant UCL Statistics**											
2164	**Normal Distribution Test**						**Lognormal Distribution Test**					
2165				Shapiro Wilk Test Statistic	0.617					Shapiro Wilk Test Statistic	0.925	
2166				Shapiro Wilk Critical Value	0.874					Shapiro Wilk Critical Value	0.874	
2167	**Data not Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
2168												
2169	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
2170				95% Student's-t UCL	18.29					95% H-UCL	18.53	
2171	**95% UCLs (Adjusted for Skewness)**									95% Chebyshev (MVUE) UCL	21.77	
2172				95% Adjusted-CLT UCL	20.55					97.5% Chebyshev (MVUE) UCL	25.8	
2173				95% Modified-t UCL	18.7					99% Chebyshev (MVUE) UCL	33.7	

2174												
2175	**Gamma Distribution Test**						**Data Distribution**					
2176					k star (bias corrected)	2.043	**Data appear Gamma Distributed at 5% Significance Level**					
2177					Theta Star	6.329						
2178					nu star	57.19						
2179					Approximate Chi Square Value (.05)	40.81	**Nonparametric Statistics**					
2180					Adjusted Level of Significance	0.0312				95% CLT UCL	17.91	
2181					Adjusted Chi Square Value	38.98				95% Jackknife UCL	18.29	
2182										95% Standard Bootstrap UCL	17.7	
2183					Anderson-Darling Test Statistic	0.727				95% Bootstrap-t UCL	25.94	
2184					Anderson-Darling 5% Critical Value	0.744				95% Hall's Bootstrap UCL	38.93	
2185					Kolmogorov-Smirnov Test Statistic	0.206				95% Percentile Bootstrap UCL	18.44	
2186					Kolmogorov-Smirnov 5% Critical Value	0.231				95% BCA Bootstrap UCL	21.99	
2187	**Data appear Gamma Distributed at 5% Significance Level**									95% Chebyshev(Mean, Sd) UCL	26.12	
2188										97.5% Chebyshev(Mean, Sd) UCL	31.83	
2189	**Assuming Gamma Distribution**									99% Chebyshev(Mean, Sd) UCL	43.04	
2190					95% Approximate Gamma UCL	18.12						
2191					95% Adjusted Gamma UCL	18.97						
2192												
2193	**Potential UCL to Use**									Use 95% Approximate Gamma UCL	18.12	
2194												
2195												
2196	**Potassium (mg/kg)**											
2197												
2198	**General Statistics**											
2199					Number of Valid Samples	8				Number of Unique Samples	8	
2200					Number of Missing Values	7						
2201												
2202	**Raw Statistics**						**Log-transformed Statistics**					
2203					Minimum	465				Minimum of Log Data	6.142	
2204					Maximum	2050				Maximum of Log Data	7.626	
2205					Mean	1275				Mean of log Data	7.074	
2206					Median	1225				SD of log Data	0.45	
2207					SD	478.8						
2208					Coefficient of Variation	0.376						
2209					Skewness	-0.087						
2210												
2211	**Relevant UCL Statistics**											
2212	**Normal Distribution Test**						**Lognormal Distribution Test**					
2213					Shapiro Wilk Test Statistic	0.985				Shapiro Wilk Test Statistic	0.909	
2214					Shapiro Wilk Critical Value	0.818				Shapiro Wilk Critical Value	0.818	
2215	**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
2216												
2217	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
2218					95% Student's-t UCL	1595				95% H-UCL	1930	
2219	**95% UCLs (Adjusted for Skewness)**									95% Chebyshev (MVUE) UCL	2189	
2220					95% Adjusted-CLT UCL	1548				97.5% Chebyshev (MVUE) UCL	2579	
2221					95% Modified-t UCL	1595				99% Chebyshev (MVUE) UCL	3344	
2222												
2223	**Gamma Distribution Test**						**Data Distribution**					
2224					k star (bias corrected)	4.254	**Data appear Normal at 5% Significance Level**					
2225					Theta Star	299.7						
2226					nu star	68.06						

2227					Approximate Chi Square Value (.05)	50.07		**Nonparametric Statistics**				
2228					Adjusted Level of Significance	0.0195					95% CLT UCL	1553
2229					Adjusted Chi Square Value	46.19					95% Jackknife UCL	1595
2230											95% Standard Bootstrap UCL	1534
2231					Anderson-Darling Test Statistic	0.278					95% Bootstrap-t UCL	1587
2232					Anderson-Darling 5% Critical Value	0.718					95% Hall's Bootstrap UCL	1592
2233					Kolmogorov-Smirnov Test Statistic	0.189					95% Percentile Bootstrap UCL	1529
2234					Kolmogorov-Smirnov 5% Critical Value	0.295					95% BCA Bootstrap UCL	1517
2235					**Data appear Gamma Distributed at 5% Significance Level**						95% Chebyshev(Mean, Sd) UCL	2013
2236											97.5% Chebyshev(Mean, Sd) UCL	2332
2237					**Assuming Gamma Distribution**						99% Chebyshev(Mean, Sd) UCL	2959
2238					95% Approximate Gamma UCL	1733						
2239					95% Adjusted Gamma UCL	1878						
2240												
2241					**Potential UCL to Use**						Use 95% Student's-t UCL	1595
2242												
2243												
2244	**Selenium (mg.kg)**											
2245												
2246					**General Statistics**							
2247					Number of Valid Samples	13					Number of Detected Data	9
2248					Number of Unique Samples	8					Number of Non-Detect Data	4
2249					Number of Missing Values	2					Percent Non-Detects	30.77%
2250												
2251					**Raw Statistics**			**Log-transformed Statistics**				
2252					Minimum Detected	4.8					Minimum Detected	1.569
2253					Maximum Detected	7.4					Maximum Detected	2.001
2254					Mean of Detected	6.089					Mean of Detected	1.799
2255					SD of Detected	0.793					SD of Detected	0.131
2256					Minimum Non-Detect	1.09					Minimum Non-Detect	0.0862
2257					Maximum Non-Detect	1.14					Maximum Non-Detect	0.131
2258												
2259	Note: Data have multiple DLs - Use of KM Method is recommended										Number treated as Non-Detect	4
2260	For all methods (except KM, DL/2, and ROS Methods),										Number treated as Detected	9
2261	Observations < Largest ND are treated as NDs										Single DL Non-Detect Percentage	30.77%
2262												
2263					**UCL Statistics**							
2264					**Normal Distribution Test with Detected Values Only**			**Lognormal Distribution Test with Detected Values Only**				
2265					Shapiro Wilk Test Statistic	0.957					Shapiro Wilk Test Statistic	0.955
2266					5% Shapiro Wilk Critical Value	0.829					5% Shapiro Wilk Critical Value	0.829
2267					**Data appear Normal at 5% Significance Level**			**Data appear Lognormal at 5% Significance Level**				
2268												
2269					**Assuming Normal Distribution**			**Assuming Lognormal Distribution**				
2270					DL/2 Substitution Method						DL/2 Substitution Method	
2271					Mean	4.388					Mean	1.067
2272					SD	2.734					SD	1.148
2273					95% DL/2 (t) UCL	5.739					95% H-Stat (DL/2) UCL	6.077
2274												
2275					Maximum Likelihood Estimate(MLE) Method						Log ROS Method	
2276					Mean	4.006					Mean in Log Scale	1.7
2277					SD	3.296					SD in Log Scale	0.189
2278					95% MLE (t) UCL	5.636					Mean in Original Scale	5.566
2279					95% MLE (Tiku) UCL	5.817					SD in Original Scale	1.046

2280											95% Percentile Bootstrap UCL	6.029
2281											95% BCA Bootstrap UCL	6.029
2282												
2283	**Gamma Distribution Test with Detected Values Only**										**Data Distribution Test with Detected Values Only**	
2284					k star (bias corrected)	44.02					**Data appear Normal at 5% Significance Level**	
2285					Theta Star	0.138						
2286					nu star	792.3						
2287												
2288					A-D Test Statistic	0.316					**Nonparametric Statistics**	
2289					5% A-D Critical Value	0.72					Kaplan-Meier (KM) Method	
2290					K-S Test Statistic	0.72					Mean	5.692
2291					5% K-S Critical Value	0.279					SD	0.861
2292	**Data appear Gamma Distributed at 5% Significance Level**										SE of Mean	0.253
2293											95% KM (t) UCL	6.144
2294	**Assuming Gamma Distribution**										95% KM (z) UCL	6.109
2295					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	6.157
2296					Minimum	4.8					95% KM (bootstrap t) UCL	6.131
2297					Maximum	7.4					95% KM (BCA) UCL	6.369
2298					Mean	5.877					95% KM (Percentile Bootstrap) UCL	6.246
2299					Median	5.69					95% KM (Chebyshev) UCL	6.796
2300					SD	0.738					97.5% KM (Chebyshev) UCL	7.273
2301					k star	54.87					99% KM (Chebyshev) UCL	8.211
2302					Theta star	0.107						
2303					Nu star	1427					**Potential UCLs to Use**	
2304					AppChi2	1340					95% KM (t) UCL	6.144
2305					95% Gamma Approximate UCL	6.257					95% KM (Percentile Bootstrap) UCL	6.246
2306					95% Adjusted Gamma UCL	6.314						
2307	**Note: DL/2 is not a recommended method.**											
2308												
2309												
2310	**Silver (mg/kg)**											
2311												
2312	**General Statistics**											
2313					Number of Valid Samples	14					Number of Detected Data	4
2314					Number of Unique Samples	4					Number of Non-Detect Data	10
2315					Number of Missing Values	1					Percent Non-Detects	71.43%
2316												
2317	**Raw Statistics**										**Log-transformed Statistics**	
2318					Minimum Detected	0.17					Minimum Detected	-1.772
2319					Maximum Detected	0.89					Maximum Detected	-0.117
2320					Mean of Detected	0.563					Mean of Detected	-0.732
2321					SD of Detected	0.297					SD of Detected	0.719
2322					Minimum Non-Detect	0.047					Minimum Non-Detect	-3.058
2323					Maximum Non-Detect	1.11					Maximum Non-Detect	0.104
2324												
2325	Note: Data have multiple DLs - Use of KM Method is recommended										Number treated as Non-Detect	14
2326	For all methods (except KM, DL/2, and ROS Methods),										Number treated as Detected	0
2327	Observations < Largest ND are treated as NDs										Single DL Non-Detect Percentage	100.00%
2328												
2329	**UCL Statistics**											
2330	**Normal Distribution Test with Detected Values Only**										**Lognormal Distribution Test with Detected Values Only**	
2331					Shapiro Wilk Test Statistic	0.947					Shapiro Wilk Test Statistic	0.846
2332					5% Shapiro Wilk Critical Value	0.748					5% Shapiro Wilk Critical Value	0.748

2333	**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
2334												
2335	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
2336	DL/2 Substitution Method						DL/2 Substitution Method					
2337	Mean				0.216		Mean					-2.629
2338	SD				0.302		SD					1.53
2339	95% DL/2 (t) UCL				0.359		95% H-Stat (DL/2) UCL					1.065
2340												
2341	Maximum Likelihood Estimate(MLE) Method				N/A		Log ROS Method					
2342	**MLE method failed to converge properly**						Mean in Log Scale					-2.447
2343							SD in Log Scale					1.252
2344							Mean in Original Scale					0.195
2345							SD in Original Scale					0.281
2346							95% Percentile Bootstrap UCL					0.326
2347							95% BCA Bootstrap UCL					0.357
2348												
2349	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
2350	k star (bias corrected)				1.005		**Data appear Normal at 5% Significance Level**					
2351	Theta Star				0.56							
2352	nu star				8.037							
2353												
2354	A-D Test Statistic				0.431		**Nonparametric Statistics**					
2355	5% A-D Critical Value				0.659		Kaplan-Meier (KM) Method					
2356	K-S Test Statistic				0.659		Mean					0.291
2357	5% K-S Critical Value				0.396		SD					0.23
2358	**Data appear Gamma Distributed at 5% Significance Level**						SE of Mean					0.0738
2359							95% KM (t) UCL					0.421
2360	**Assuming Gamma Distribution**						95% KM (z) UCL					0.412
2361	Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL					0.542
2362	Minimum				0.17		95% KM (bootstrap t) UCL					0.369
2363	Maximum				0.89		95% KM (BCA) UCL					0.89
2364	Mean				0.582		95% KM (Percentile Bootstrap) UCL					0.657
2365	Median				0.562		95% KM (Chebyshev) UCL					0.612
2366	SD				0.216		97.5% KM (Chebyshev) UCL					0.752
2367	k star				4.76		99% KM (Chebyshev) UCL					1.025
2368	Theta star				0.122							
2369	Nu star				133.3		**Potential UCLs to Use**					
2370	AppChi2				107.6		95% KM (t) UCL					0.421
2371	95% Gamma Approximate UCL				0.721		95% KM (Percentile Bootstrap) UCL					0.657
2372	95% Adjusted Gamma UCL				N/A							
2373	**Note: DL/2 is not a recommended method.**											
2374												
2375												
2376	**Sodium (mg/kg)**											
2377												
2378	**General Statistics**											
2379	Number of Valid Samples				14		Number of Detected Data					3
2380	Number of Unique Samples				3		Number of Non-Detect Data					11
2381	Number of Missing Values				1		Percent Non-Detects					78.57%
2382												
2383	**Raw Statistics**						**Log-transformed Statistics**					
2384	Minimum Detected				61.7		Minimum Detected					4.122
2385	Maximum Detected				72.5		Maximum Detected					4.284

2386				Mean of Detected	66.37					Mean of Detected	4.193	
2387				SD of Detected	5.547					SD of Detected	0.0825	
2388				Minimum Non-Detect	4.2					Minimum Non-Detect	1.435	
2389				Maximum Non-Detect	48					Maximum Non-Detect	3.871	
2390												
2391	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect	11	
2392	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected	3	
2393	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage	78.57%	
2394												
2395	**UCL Statistics**											
2396	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
2397				Shapiro Wilk Test Statistic	0.948					Shapiro Wilk Test Statistic	0.956	
2398				5% Shapiro Wilk Critical Value	0.767					5% Shapiro Wilk Critical Value	0.767	
2399	**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
2400												
2401	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
2402				DL/2 Substitution Method						DL/2 Substitution Method		
2403				Mean	30.62					Mean	3.183	
2404				SD	20.26					SD	0.836	
2405				95% DL/2 (t) UCL	40.21					95% H-Stat (DL/2) UCL	61.6	
2406												
2407				Maximum Likelihood Estimate(MLE) Method						Log ROS Method		
2408				Mean	46.2					Mean in Log Scale	3.869	
2409				SD	19.77					SD in Log Scale	0.194	
2410				95% MLE (t) UCL	55.56					Mean in Original Scale	48.77	
2411				95% MLE (Tiku) UCL	63.9					SD in Original Scale	10.32	
2412										95% Percentile Bootstrap UCL	53.45	
2413										95% BCA Bootstrap UCL	53.59	
2414												
2415	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
2416				k star (bias corrected)	N/A		**Data appear Normal at 5% Significance Level**					
2417				Theta Star	N/A							
2418				nu star	N/A							
2419												
2420				A-D Test Statistic	0.312		**Nonparametric Statistics**					
2421				5% A-D Critical Value	N/A					Kaplan-Meier (KM) Method		
2422				K-S Test Statistic	N/A					Mean	62.7	
2423				5% K-S Critical Value	N/A					SD	2.84	
2424	**Data not Gamma Distributed at 5% Significance Level**									SE of Mean	0.929	
2425										95% KM (t) UCL	64.35	
2426	**Assuming Gamma Distribution**									95% KM (z) UCL	64.23	
2427				Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	64.98	
2428				Minimum	N/A					95% KM (bootstrap t) UCL	64.21	
2429				Maximum	N/A					95% KM (BCA) UCL	72.5	
2430				Mean	N/A					95% KM (Percentile Bootstrap) UCL	72.5	
2431				Median	N/A					95% KM (Chebyshev) UCL	66.75	
2432				SD	N/A					97.5% KM (Chebyshev) UCL	68.5	
2433				k star	N/A					99% KM (Chebyshev) UCL	71.95	
2434				Theta star	N/A							
2435				Nu star	N/A		**Potential UCLs to Use**					
2436				AppChi2	N/A					95% KM (t) UCL	64.35	
2437				95% Gamma Approximate UCL	N/A					95% KM (Percentile Bootstrap) UCL	72.5	
2438				95% Adjusted Gamma UCL	N/A							

2439	Note: DL/2 is not a recommended method.											
2440												
2441												
2442	Vanadium (mg/kg)											
2443												
2444	General Statistics											
2445					Number of Valid Samples	14			Number of Unique Samples	14		
2446					Number of Missing Values	1						
2447												
2448	Raw Statistics						Log-transformed Statistics					
2449					Minimum	17.2			Minimum of Log Data	2.845		
2450					Maximum	49.1			Maximum of Log Data	3.894		
2451					Mean	38.06			Mean of log Data	3.603		
2452					Median	39.75			SD of log Data	0.297		
2453					SD	9.41						
2454					Coefficient of Variation	0.247						
2455					Skewness	-0.939						
2456												
2457	Relevant UCL Statistics											
2458	Normal Distribution Test						Lognormal Distribution Test					
2459					Shapiro Wilk Test Statistic	0.921			Shapiro Wilk Test Statistic	0.847		
2460					Shapiro Wilk Critical Value	0.874			Shapiro Wilk Critical Value	0.874		
2461	Data appear Normal at 5% Significance Level						Data not Lognormal at 5% Significance Level					
2462												
2463	Assuming Normal Distribution						Assuming Lognormal Distribution					
2464					95% Student's-t UCL	42.52			95% H-UCL	44.85		
2465	95% UCLs (Adjusted for Skewness)								95% Chebyshev (MVUE) UCL	51.61		
2466					95% Adjusted-CLT UCL	41.53			97.5% Chebyshev (MVUE) UCL	57.39		
2467					95% Modified-t UCL	42.41			99% Chebyshev (MVUE) UCL	68.74		
2468												
2469	Gamma Distribution Test						Data Distribution					
2470					k star (bias corrected)	11.12	Data appear Normal at 5% Significance Level					
2471					Theta Star	3.423						
2472					nu star	311.3						
2473					Approximate Chi Square Value (.05)	271.5	Nonparametric Statistics					
2474					Adjusted Level of Significance	0.0312			95% CLT UCL	42.2		
2475					Adjusted Chi Square Value	266.5			95% Jackknife UCL	42.52		
2476									95% Standard Bootstrap UCL	42.11		
2477					Anderson-Darling Test Statistic	0.653			95% Bootstrap-t UCL	41.98		
2478					Anderson-Darling 5% Critical Value	0.734			95% Hall's Bootstrap UCL	41.64		
2479					Kolmogorov-Smirnov Test Statistic	0.22			95% Percentile Bootstrap UCL	41.91		
2480					Kolmogorov-Smirnov 5% Critical Value	0.229			95% BCA Bootstrap UCL	41.44		
2481	Data appear Gamma Distributed at 5% Significance Level								95% Chebyshev(Mean, Sd) UCL	49.03		
2482									97.5% Chebyshev(Mean, Sd) UCL	53.77		
2483	Assuming Gamma Distribution								99% Chebyshev(Mean, Sd) UCL	63.09		
2484					95% Approximate Gamma UCL	43.66						
2485					95% Adjusted Gamma UCL	44.46						
2486												
2487	Potential UCL to Use								Use 95% Student's-t UCL	42.52		
2488												
2489												
2490	Zinc (mg/kg)											
2491												

General Statistics		
Number of Valid Samples	14	
Number of Missing Values	1	
Number of Unique Samples	14	
Raw Statistics		**Log-transformed Statistics**
Minimum	17	Minimum of Log Data 2.833
Maximum	93.3	Maximum of Log Data 4.536
Mean	47.65	Mean of log Data 3.702
Median	41.4	SD of log Data 0.607
SD	26.63	
Coefficient of Variation	0.559	
Skewness	0.405	
Relevant UCL Statistics		
Normal Distribution Test		**Lognormal Distribution Test**
Shapiro Wilk Test Statistic	0.903	Shapiro Wilk Test Statistic 0.918
Shapiro Wilk Critical Value	0.874	Shapiro Wilk Critical Value 0.874
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	60.25	95% H-UCL 70.87
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL 83.35
95% Adjusted-CLT UCL	60.18	97.5% Chebyshev (MVUE) UCL 98.64
95% Modified-t UCL	60.38	99% Chebyshev (MVUE) UCL 128.7
Gamma Distribution Test		**Data Distribution**
k star (bias corrected)	2.604	**Data appear Normal at 5% Significance Level**
Theta Star	18.3	
nu star	72.9	
Approximate Chi Square Value (.05)	54.24	**Nonparametric Statistics**
Adjusted Level of Significance	0.0312	95% CLT UCL 59.36
Adjusted Chi Square Value	52.11	95% Jackknife UCL 60.25
		95% Standard Bootstrap UCL 58.78
Anderson-Darling Test Statistic	0.437	95% Bootstrap-t UCL 61.62
Anderson-Darling 5% Critical Value	0.742	95% Hall's Bootstrap UCL 59.02
Kolmogorov-Smirnov Test Statistic	0.155	95% Percentile Bootstrap UCL 58.81
Kolmogorov-Smirnov 5% Critical Value	0.23	95% BCA Bootstrap UCL 59.38
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL 78.67
		97.5% Chebyshev(Mean, Sd) UCL 92.09
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL 118.5
95% Approximate Gamma UCL	64.04	
95% Adjusted Gamma UCL	66.66	
Potential UCL to Use		Use 95% Student's-t UCL 60.25

1				General UCL Statistics for Data Sets with Non-Detects								
2			User Selected Options									
3			From File	WorkSheet.wst								
4			Full Precision	OFF								
5			Confidence Coefficient	95%								
6			Number of Bootstrap Operations	2000								
7												
8												
9	2,4-DNT (mg/kg)											
10												
11						General Statistics						
12					Number of Valid Samples	30			Number of Detected Data	8		
13					Number of Unique Samples	8			Number of Non-Detect Data	22		
14					Number of Missing Values	1			Percent Non-Detects	73.33%		
15												
16				Raw Statistics					Log-transformed Statistics			
17					Minimum Detected	0.0779			Minimum Detected	-2.552		
18					Maximum Detected	0.888			Maximum Detected	-0.119		
19					Mean of Detected	0.348			Mean of Detected	-1.438		
20					SD of Detected	0.301			SD of Detected	0.968		
21					Minimum Non-Detect	0.14			Minimum Non-Detect	-1.966		
22					Maximum Non-Detect	0.4			Maximum Non-Detect	-0.916		
23												
24	Note: Data have multiple DLs - Use of KM Method is recommended								Number treated as Non-Detect	26		
25	For all methods (except KM, DL/2, and ROS Methods),								Number treated as Detected	4		
26	Observations < Largest ND are treated as NDs								Single DL Non-Detect Percentage	86.67%		
27												
28						UCL Statistics						
29				Normal Distribution Test with Detected Values Only					Lognormal Distribution Test with Detected Values Only			
30					Shapiro Wilk Test Statistic	0.859			Shapiro Wilk Test Statistic	0.879		
31					5% Shapiro Wilk Critical Value	0.818			5% Shapiro Wilk Critical Value	0.818		
32				Data appear Normal at 5% Significance Level					Data appear Lognormal at 5% Significance Level			
33												
34				Assuming Normal Distribution					Assuming Lognormal Distribution			
35					DL/2 Substitution Method				DL/2 Substitution Method			
36					Mean	0.177			Mean	-1.986		
37					SD	0.183			SD	0.608		
38					95% DL/2 (t) UCL	0.234			95% H-Stat (DL/2) UCL	0.197		
39												
40					Maximum Likelihood Estimate(MLE) Method	N/A			Log ROS Method			
41				MLE yields a negative mean					Mean in Log Scale	-2.017		
42									SD in Log Scale	0.731		
43									Mean in Original Scale	0.181		
44									SD in Original Scale	0.186		
45									95% Percentile Bootstrap UCL	0.239		
46									95% BCA Bootstrap UCL	0.26		
47												
48				Gamma Distribution Test with Detected Values Only					Data Distribution Test with Detected Values Only			
49					k star (bias corrected)	0.991			Data appear Normal at 5% Significance Level			
50					Theta Star	0.351						
51					nu star	15.85						
52												
53					A-D Test Statistic	0.513			Nonparametric Statistics			

54				5% A-D Critical Value	0.729					Kaplan-Meier (KM) Method		
55				K-S Test Statistic	0.729					Mean		0.167
56				5% K-S Critical Value	0.299					SD		0.183
57	**Data appear Gamma Distributed at 5% Significance Level**									SE of Mean		0.0367
58										95% KM (t) UCL		0.23
59	**Assuming Gamma Distribution**									95% KM (z) UCL		0.228
60				Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL		0.228
61				Minimum	0.0779					95% KM (bootstrap t) UCL		0.266
62				Maximum	0.888					95% KM (BCA) UCL		0.247
63				Mean	0.335					95% KM (Percentile Bootstrap) UCL		0.237
64				Median	0.331					95% KM (Chebyshev) UCL		0.327
65				SD	0.163					97.5% KM (Chebyshev) UCL		0.396
66				k star	3.779					99% KM (Chebyshev) UCL		0.532
67				Theta star	0.0886							
68				Nu star	226.7					**Potential UCLs to Use**		
69				AppChi2	192.9					95% KM (t) UCL		0.23
70				95% Gamma Approximate UCL	0.394					95% KM (Percentile Bootstrap) UCL		0.237
71				95% Adjusted Gamma UCL	0.397							
72	**Note: DL/2 is not a recommended method.**											
73												
74												
75	**2-Methylnaphthalene (mg/kg)**											
76												
77						**General Statistics**						
78				Number of Valid Samples	30					Number of Detected Data		7
79				Number of Unique Samples	7					Number of Non-Detect Data		23
80				Number of Missing Values	1					Percent Non-Detects		76.67%
81												
82				**Raw Statistics**						**Log-transformed Statistics**		
83				Minimum Detected	0.0091					Minimum Detected		-4.699
84				Maximum Detected	0.47					Maximum Detected		-0.755
85				Mean of Detected	0.17					Mean of Detected		-2.53
86				SD of Detected	0.191					SD of Detected		1.462
87				Minimum Non-Detect	0.0028					Minimum Non-Detect		-5.878
88				Maximum Non-Detect	2.1					Maximum Non-Detect		0.742
89												
90	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect		30
91	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected		0
92	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage		100.00%
93												
94						**UCL Statistics**							
95	**Normal Distribution Test with Detected Values Only**									**Lognormal Distribution Test with Detected Values Only**		
96				Shapiro Wilk Test Statistic	0.804					Shapiro Wilk Test Statistic		0.931
97				5% Shapiro Wilk Critical Value	0.803					5% Shapiro Wilk Critical Value		0.803
98	**Data appear Normal at 5% Significance Level**									**Data appear Lognormal at 5% Significance Level**		
99												
100	**Assuming Normal Distribution**									**Assuming Lognormal Distribution**		
101				DL/2 Substitution Method						DL/2 Substitution Method		
102				Mean	0.209					Mean		-2.197
103				SD	0.224					SD		1.48
104				95% DL/2 (t) UCL	0.278					95% H-Stat (DL/2) UCL		1.216
105												
106				Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method		

107	MLE method failed to converge properly									Mean in Log Scale		-3.668
108										SD in Log Scale		1.133
109										Mean in Original Scale		0.0574
110										SD in Original Scale		0.109
111										95% Percentile Bootstrap UCL		0.0924
112										95% BCA Bootstrap UCL		0.104
113												
114	Gamma Distribution Test with Detected Values Only									Data Distribution Test with Detected Values Only		
115				k star (bias corrected)		0.543				Data appear Normal at 5% Significance Level		
116				Theta Star		0.313						
117				nu star		7.606						
118												
119				A-D Test Statistic		0.403				Nonparametric Statistics		
120				5% A-D Critical Value		0.735				Kaplan-Meier (KM) Method		
121				K-S Test Statistic		0.735				Mean		0.0755
122				5% K-S Critical Value		0.322				SD		0.117
123	Data appear Gamma Distributed at 5% Significance Level									SE of Mean		0.0299
124										95% KM (t) UCL		0.126
125	Assuming Gamma Distribution									95% KM (z) UCL		0.125
126				Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL		0.123
127				Minimum		0.0091				95% KM (bootstrap t) UCL		0.145
128				Maximum		0.47				95% KM (BCA) UCL		0.14
129				Mean		0.178				95% KM (Percentile Bootstrap) UCL		0.132
130				Median		0.181				95% KM (Chebyshev) UCL		0.206
131				SD		0.118				97.5% KM (Chebyshev) UCL		0.262
132				k star		1.704				99% KM (Chebyshev) UCL		0.373
133				Theta star		0.105						
134				Nu star		102.2				Potential UCLs to Use		
135				AppChi2		79.91				95% KM (t) UCL		0.126
136				95% Gamma Approximate UCL		0.228				95% KM (Percentile Bootstrap) UCL		0.132
137				95% Adjusted Gamma UCL		0.232						
138	Note: DL/2 is not a recommended method.											
139												
140												
141	Acenaphthylene (mg/kg)											
142												
143	General Statistics											
144				Number of Valid Samples		30				Number of Detected Data		7
145				Number of Unique Samples		7				Number of Non-Detect Data		23
146				Number of Missing Values		1				Percent Non-Detects		76.67%
147												
148	Raw Statistics									Log-transformed Statistics		
149				Minimum Detected		0.0022				Minimum Detected		-6.119
150				Maximum Detected		0.02				Maximum Detected		-3.912
151				Mean of Detected		0.00669				Mean of Detected		-5.314
152				SD of Detected		0.00643				SD of Detected		0.79
153				Minimum Non-Detect		0.0028				Minimum Non-Detect		-5.878
154				Maximum Non-Detect		2.1				Maximum Non-Detect		0.742
155												
156	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect		30
157	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected		0
158	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage		100.00%
159												

	A	B	C	D	E	F	G	H	I	J	K	L
160	**UCL Statistics**											
161	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
162	Shapiro Wilk Test Statistic					0.74	Shapiro Wilk Test Statistic					0.895
163	5% Shapiro Wilk Critical Value					0.803	5% Shapiro Wilk Critical Value					0.803
164	**Data not Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
165												
166	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
167	DL/2 Substitution Method						DL/2 Substitution Method					
168	Mean					0.171	Mean					-2.794
169	SD					0.224	SD					1.866
170	95% DL/2 (t) UCL					0.241	95% H-Stat (DL/2) UCL					3.387
171												
172	Maximum Likelihood Estimate(MLE) Method					N/A	Log ROS Method					
173	**MLE method failed to converge properly**						Mean in Log Scale					-5.458
174							SD in Log Scale					0.535
175							Mean in Original Scale					0.00499
176							SD in Original Scale					0.00352
177							95% Percentile Bootstrap UCL					0.00613
178							95% BCA Bootstrap UCL					0.00656
179												
180	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
181	k star (bias corrected)					1.114	**Data appear Gamma Distributed at 5% Significance Level**					
182	Theta Star					0.006						
183	nu star					15.59						
184												
185	A-D Test Statistic					0.573	**Nonparametric Statistics**					
186	5% A-D Critical Value					0.718	Kaplan-Meier (KM) Method					
187	K-S Test Statistic					0.718	Mean					0.00613
188	5% K-S Critical Value					0.316	SD					0.00577
189	**Data appear Gamma Distributed at 5% Significance Level**						SE of Mean					0.0022
190							95% KM (t) UCL					0.00987
191	**Assuming Gamma Distribution**						95% KM (z) UCL					0.00975
192	Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL					0.00997
193	Minimum					0.0002711	95% KM (bootstrap t) UCL					0.0239
194	Maximum					0.02	95% KM (BCA) UCL					0.0107
195	Mean					0.00734	95% KM (Percentile Bootstrap) UCL					0.00984
196	Median					0.0079	95% KM (Chebyshev) UCL					0.0157
197	SD					0.00416	97.5% KM (Chebyshev) UCL					0.0199
198	k star					2.156	99% KM (Chebyshev) UCL					0.028
199	Theta star					0.0034						
200	Nu star					129.4	**Potential UCLs to Use**					
201	AppChi2					104.1	95% KM (t) UCL					0.00987
202	95% Gamma Approximate UCL					0.00912						
203	95% Adjusted Gamma UCL					0.00923						
204	**Note: DL/2 is not a recommended method.**											
205												
206												
207	**Anthracene (mg/kg)**											
208												
209	**General Statistics**											
210	Number of Valid Samples					30	Number of Detected Data					5
211	Number of Unique Samples					5	Number of Non-Detect Data					25
212	Number of Missing Values					1	Percent Non-Detects					83.33%

Raw Statistics		
Minimum Detected	0.002	
Maximum Detected	0.011	
Mean of Detected	0.0057	
SD of Detected	0.00352	
Minimum Non-Detect	0.0021	
Maximum Non-Detect	2.1	
Note: Data have multiple DLs - Use of KM Method is recommended		
For all methods (except KM, DL/2, and ROS Methods),		
Observations < Largest ND are treated as NDs		

Log-transformed Statistics	
Minimum Detected	-6.215
Maximum Detected	-4.51
Mean of Detected	-5.337
SD of Detected	0.674
Minimum Non-Detect	-6.166
Maximum Non-Detect	0.742
Number treated as Non-Detect	30
Number treated as Detected	0
Single DL Non-Detect Percentage	100.00%

UCL Statistics

Normal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.925
5% Shapiro Wilk Critical Value	0.762
Data appear Normal at 5% Significance Level	
Assuming Normal Distribution	
DL/2 Substitution Method	
Mean	0.171
SD	0.225
95% DL/2 (t) UCL	0.24
Maximum Likelihood Estimate(MLE) Method	N/A
MLE method failed to converge properly	

Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.949
5% Shapiro Wilk Critical Value	0.762
Data appear Lognormal at 5% Significance Level	
Assuming Lognormal Distribution	
DL/2 Substitution Method	
Mean	-2.891
SD	2.012
95% H-Stat (DL/2) UCL	4.062
Log ROS Method	
Mean in Log Scale	-5.724
SD in Log Scale	0.483
Mean in Original Scale	0.00368
SD in Original Scale	0.00204
95% Percentile Bootstrap UCL	0.00427
95% BCA Bootstrap UCL	0.0045

Gamma Distribution Test with Detected Values Only	
k star (bias corrected)	1.376
Theta Star	0.00414
nu star	13.76
A-D Test Statistic	0.283
5% A-D Critical Value	0.682
K-S Test Statistic	0.682
5% K-S Critical Value	0.359
Data appear Gamma Distributed at 5% Significance Level	
Assuming Gamma Distribution	
Gamma ROS Statistics using Extrapolated Data	
Minimum	0.002
Maximum	0.013
Mean	0.00772
Median	0.00869
SD	0.0029
k star	5.271
Theta star	0.00146

Data Distribution Test with Detected Values Only	
Data appear Normal at 5% Significance Level	
Nonparametric Statistics	
Kaplan-Meier (KM) Method	
Mean	0.00431
SD	0.00307
SE of Mean	0.00121
95% KM (t) UCL	0.00637
95% KM (z) UCL	0.00631
95% KM (jackknife) UCL	0.00626
95% KM (bootstrap t) UCL	0.00701
95% KM (BCA) UCL	0.00814
95% KM (Percentile Bootstrap) UCL	0.00737
95% KM (Chebyshev) UCL	0.0096
97.5% KM (Chebyshev) UCL	0.0119
99% KM (Chebyshev) UCL	0.0164

266					Nu star	316.3	**Potential UCLs to Use**					
267					AppChi2	276.1					95% KM (t) UCL	0.00637
268					95% Gamma Approximate UCL	0.00884					95% KM (Percentile Bootstrap) UCL	0.00737
269					95% Adjusted Gamma UCL	0.00891						
270	**Note: DL/2 is not a recommended method.**											
271												
272												
273	**Aroclor 1254 (mg/kg)**											
274												
275					**General Statistics**							
276					Number of Valid Samples	30					Number of Detected Data	14
277					Number of Unique Samples	14					Number of Non-Detect Data	16
278					Number of Missing Values	1					Percent Non-Detects	53.33%
279												
280					**Raw Statistics**		**Log-transformed Statistics**					
281					Minimum Detected	0.0104					Minimum Detected	-4.566
282					Maximum Detected	1.48					Maximum Detected	0.392
283					Mean of Detected	0.484					Mean of Detected	-1.674
284					SD of Detected	0.485					SD of Detected	1.795
285					Minimum Non-Detect	0.018					Minimum Non-Detect	-4.017
286					Maximum Non-Detect	2.3					Maximum Non-Detect	0.833
287												
288	Note: Data have multiple DLs - Use of KM Method is recommended										Number treated as Non-Detect	30
289	For all methods (except KM, DL/2, and ROS Methods),										Number treated as Detected	0
290	Observations < Largest ND are treated as NDs										Single DL Non-Detect Percentage	100.00%
291												
292					**UCL Statistics**							
293					**Normal Distribution Test with Detected Values Only**		**Lognormal Distribution Test with Detected Values Only**					
294					Shapiro Wilk Test Statistic	0.877					Shapiro Wilk Test Statistic	0.86
295					5% Shapiro Wilk Critical Value	0.874					5% Shapiro Wilk Critical Value	0.874
296					**Data appear Normal at 5% Significance Level**		**Data not Lognormal at 5% Significance Level**					
297												
298					**Assuming Normal Distribution**		**Assuming Lognormal Distribution**					
299					DL/2 Substitution Method						DL/2 Substitution Method	
300					Mean	0.308					Mean	-2.877
301					SD	0.46					SD	2.024
302					95% DL/2 (t) UCL	0.45					95% H-Stat (DL/2) UCL	0.865
303												
304					Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method	
305					**MLE method failed to converge properly**						Mean in Log Scale	-3.127
306											SD in Log Scale	1.955
307											Mean in Original Scale	0.236
308											SD in Original Scale	0.402
309											95% Percentile Bootstrap UCL	0.355
310											95% BCA Bootstrap UCL	0.382
311												
312					**Gamma Distribution Test with Detected Values Only**		**Data Distribution Test with Detected Values Only**					
313					k star (bias corrected)	0.555	**Data appear Normal at 5% Significance Level**					
314					Theta Star	0.872						
315					nu star	15.53						
316												
317					A-D Test Statistic	0.608	**Nonparametric Statistics**					
318					5% A-D Critical Value	0.78	Kaplan-Meier (KM) Method					

319					K-S Test Statistic	0.78					Mean	0.248
320					5% K-S Critical Value	0.239					SD	0.406
321					**Data appear Gamma Distributed at 5% Significance Level**						SE of Mean	0.0796
322											95% KM (t) UCL	0.383
323					**Assuming Gamma Distribution**						95% KM (z) UCL	0.379
324					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.381
325					Minimum	0.0104					95% KM (bootstrap t) UCL	0.435
326					Maximum	1.48					95% KM (BCA) UCL	0.4
327					Mean	0.498					95% KM (Percentile Bootstrap) UCL	0.383
328					Median	0.427					95% KM (Chebyshev) UCL	0.595
329					SD	0.38					97.5% KM (Chebyshev) UCL	0.745
330					k star	1.043					99% KM (Chebyshev) UCL	1.04
331					Theta star	0.477						
332					Nu star	62.6					**Potential UCLs to Use**	
333					AppChi2	45.4					95% KM (t) UCL	0.383
334					95% Gamma Approximate UCL	0.686					95% KM (Percentile Bootstrap) UCL	0.383
335					95% Adjusted Gamma UCL	0.699						
336	**Note: DL/2 is not a recommended method.**											
337												
338												
339	**B(a)A (mg/kg)**											
340												
341					**General Statistics**							
342					Number of Valid Samples	30					Number of Detected Data	8
343					Number of Unique Samples	8					Number of Non-Detect Data	22
344					Number of Missing Values	1					Percent Non-Detects	73.33%
345												
346					**Raw Statistics**						**Log-transformed Statistics**	
347					Minimum Detected	0.0016					Minimum Detected	-6.438
348					Maximum Detected	0.137					Maximum Detected	-1.988
349					Mean of Detected	0.0332					Mean of Detected	-4.174
350					SD of Detected	0.0445					SD of Detected	1.43
351					Minimum Non-Detect	0.0028					Minimum Non-Detect	-5.878
352					Maximum Non-Detect	0.41					Maximum Non-Detect	-0.892
353												
354	Note: Data have multiple DLs - Use of KM Method is recommended										Number treated as Non-Detect	30
355	For all methods (except KM, DL/2, and ROS Methods),										Number treated as Detected	0
356	Observations < Largest ND are treated as NDs										Single DL Non-Detect Percentage	100.00%
357												
358					**UCL Statistics**							
359					**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**	
360					Shapiro Wilk Test Statistic	0.715					Shapiro Wilk Test Statistic	0.986
361					5% Shapiro Wilk Critical Value	0.818					5% Shapiro Wilk Critical Value	0.818
362					**Data not Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**	
363												
364					**Assuming Normal Distribution**						**Assuming Lognormal Distribution**	
365					DL/2 Substitution Method						DL/2 Substitution Method	
366					Mean	0.0431					Mean	-3.568
367					SD	0.0417					SD	1.094
368					95% DL/2 (t) UCL	0.0561					95% H-Stat (DL/2) UCL	0.13
369												
370					Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method	
371					**MLE method failed to converge properly**						Mean in Log Scale	-4.616

372											SD in Log Scale	0.873
373											Mean in Original Scale	0.0158
374											SD in Original Scale	0.0246
375											95% Percentile Bootstrap UCL	0.0239
376											95% BCA Bootstrap UCL	0.0304
377												
378	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
379					k star (bias corrected)	0.568	**Data appear Gamma Distributed at 5% Significance Level**					
380					Theta Star	0.0584						
381					nu star	9.093						
382												
383					A-D Test Statistic	0.208	**Nonparametric Statistics**					
384					5% A-D Critical Value	0.744					Kaplan-Meier (KM) Method	
385					K-S Test Statistic	0.744					Mean	0.0209
386					5% K-S Critical Value	0.304					SD	0.0274
387	**Data appear Gamma Distributed at 5% Significance Level**										SE of Mean	0.00726
388											95% KM (t) UCL	0.0332
389	**Assuming Gamma Distribution**										95% KM (z) UCL	0.0328
390					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.0332
391					Minimum	0					95% KM (bootstrap t) UCL	0.0388
392					Maximum	0.137					95% KM (BCA) UCL	0.0348
393					Mean	0.028					95% KM (Percentile Bootstrap) UCL	0.0343
394					Median	0.0255					95% KM (Chebyshev) UCL	0.0525
395					SD	0.0259					97.5% KM (Chebyshev) UCL	0.0662
396					k star	0.444					99% KM (Chebyshev) UCL	0.0931
397					Theta star	0.063						
398					Nu star	26.64	**Potential UCLs to Use**					
399					AppChi2	15.87					95% KM (t) UCL	0.0332
400					95% Gamma Approximate UCL	0.047						
401					95% Adjusted Gamma UCL	0.0484						
402	**Note: DL/2 is not a recommended method.**											
403												
404												
405	**B(a)P (mg/kg)**											
406												
407	**General Statistics**											
408					Number of Valid Samples	30					Number of Detected Data	8
409					Number of Unique Samples	8					Number of Non-Detect Data	22
410					Number of Missing Values	1					Percent Non-Detects	73.33%
411												
412	**Raw Statistics**						**Log-transformed Statistics**					
413					Minimum Detected	0.0033					Minimum Detected	-5.714
414					Maximum Detected	0.15					Maximum Detected	-1.897
415					Mean of Detected	0.035					Mean of Detected	-4.017
416					SD of Detected	0.049					SD of Detected	1.2
417					Minimum Non-Detect	0.0028					Minimum Non-Detect	-5.878
418					Maximum Non-Detect	0.41					Maximum Non-Detect	-0.892
419												
420	Note: Data have multiple DLs - Use of KM Method is recommended										Number treated as Non-Detect	30
421	For all methods (except KM, DL/2, and ROS Methods),										Number treated as Detected	0
422	Observations < Largest ND are treated as NDs										Single DL Non-Detect Percentage	100.00%
423												
424	**UCL Statistics**											

	A	B	C	D	E	F	G	H	I	J	K	L
425	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
426					Shapiro Wilk Test Statistic	0.66					Shapiro Wilk Test Statistic	0.958
427					5% Shapiro Wilk Critical Value	0.818					5% Shapiro Wilk Critical Value	0.818
428	**Data not Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
429												
430	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
431					DL/2 Substitution Method						DL/2 Substitution Method	
432					Mean	0.0453					Mean	-3.602
433					SD	0.0472					SD	1.176
434					95% DL/2 (t) UCL	0.0599					95% H-Stat (DL/2) UCL	0.115
435												
436					Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method	
437	**MLE method failed to converge properly**										Mean in Log Scale	-4.674
438											SD in Log Scale	0.887
439											Mean in Original Scale	0.0155
440											SD in Original Scale	0.0271
441											95% Percentile Bootstrap UCL	0.0247
442											95% BCA Bootstrap UCL	0.0308
443												
444	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
445					k star (bias corrected)	0.635	**Data Follow Appr. Gamma Distribution at 5% Significance Level**					
446					Theta Star	0.055						
447					nu star	10.16						
448												
449					A-D Test Statistic	0.512	**Nonparametric Statistics**					
450					5% A-D Critical Value	0.74					Kaplan-Meier (KM) Method	
451					K-S Test Statistic	0.74					Mean	0.0203
452					5% K-S Critical Value	0.303					SD	0.0299
453	**Data follow Appr. Gamma Distribution at 5% Significance Level**										SE of Mean	0.00751
454											95% KM (t) UCL	0.0331
455	**Assuming Gamma Distribution**										95% KM (z) UCL	0.0327
456					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.0327
457					Minimum	0					95% KM (bootstrap t) UCL	0.0565
458					Maximum	0.15					95% KM (BCA) UCL	0.0359
459					Mean	0.035					95% KM (Percentile Bootstrap) UCL	0.0339
460					Median	0.0369					95% KM (Chebyshev) UCL	0.0531
461					SD	0.0293					97.5% KM (Chebyshev) UCL	0.0672
462					k star	0.439					99% KM (Chebyshev) UCL	0.0951
463					Theta star	0.0797						
464					Nu star	26.34	**Potential UCLs to Use**					
465					AppChi2	15.64					95% KM (t) UCL	0.0331
466					95% Gamma Approximate UCL	0.0589						
467					95% Adjusted Gamma UCL	0.0608						
468	**Note: DL/2 is not a recommended method.**											
469												
470												
471	**B(b)F (mg/kg)**											
472												
473	**General Statistics**											
474					Number of Valid Samples	30					Number of Detected Data	9
475					Number of Unique Samples	9					Number of Non-Detect Data	21
476					Number of Missing Values	1					Percent Non-Detects	70.00%
477												

	A	B	C	D	E	F	G	H	I	J	K	L
478	**Raw Statistics**						**Log-transformed Statistics**					
479					Minimum Detected	0.0018					Minimum Detected	-6.32
480					Maximum Detected	0.152					Maximum Detected	-1.884
481					Mean of Detected	0.0392					Mean of Detected	-3.909
482					SD of Detected	0.0483					SD of Detected	1.326
483					Minimum Non-Detect	0.0028					Minimum Non-Detect	-5.878
484					Maximum Non-Detect	0.41					Maximum Non-Detect	-0.892
485												
486	Note: Data have multiple DLs - Use of KM Method is recommended										Number treated as Non-Detect	30
487	For all methods (except KM, DL/2, and ROS Methods),										Number treated as Detected	0
488	Observations < Largest ND are treated as NDs										Single DL Non-Detect Percentage	100.00%
489												
490	**UCL Statistics**											
491	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
492					Shapiro Wilk Test Statistic	0.746					Shapiro Wilk Test Statistic	0.979
493					5% Shapiro Wilk Critical Value	0.829					5% Shapiro Wilk Critical Value	0.829
494	**Data not Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
495												
496	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
497					DL/2 Substitution Method						DL/2 Substitution Method	
498					Mean	0.0464					Mean	-3.496
499					SD	0.0448					SD	1.074
500					95% DL/2 (t) UCL	0.0603					95% H-Stat (DL/2) UCL	0.119
501												
502					Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method	
503	**MLE method failed to converge properly**										Mean in Log Scale	-4.399
504											SD in Log Scale	0.854
505											Mean in Original Scale	0.0193
506											SD in Original Scale	0.0289
507											95% Percentile Bootstrap UCL	0.0285
508											95% BCA Bootstrap UCL	0.0326
509												
510	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
511					k star (bias corrected)	0.658	**Data appear Gamma Distributed at 5% Significance Level**					
512					Theta Star	0.0596						
513					nu star	11.84						
514												
515					A-D Test Statistic	0.259	**Nonparametric Statistics**					
516					5% A-D Critical Value	0.747					Kaplan-Meier (KM) Method	
517					K-S Test Statistic	0.747					Mean	0.0232
518					5% K-S Critical Value	0.288					SD	0.0309
519	**Data appear Gamma Distributed at 5% Significance Level**										SE of Mean	0.00721
520											95% KM (t) UCL	0.0355
521	**Assuming Gamma Distribution**										95% KM (z) UCL	0.0351
522					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.0351
523					Minimum	0.0018					95% KM (bootstrap t) UCL	0.0413
524					Maximum	0.152					95% KM (BCA) UCL	0.0371
525					Mean	0.0375					95% KM (Percentile Bootstrap) UCL	0.0354
526					Median	0.0367					95% KM (Chebyshev) UCL	0.0547
527					SD	0.0264					97.5% KM (Chebyshev) UCL	0.0683
528					k star	2.18					99% KM (Chebyshev) UCL	0.095
529					Theta star	0.0172						
530					Nu star	130.8	**Potential UCLs to Use**					

531					AppChi2	105.4					95% KM (t) UCL	0.0355
532					95% Gamma Approximate UCL	0.0466						
533					95% Adjusted Gamma UCL	0.0472						
534	**Note: DL/2 is not a recommended method.**											
535												
536												
537	**B(ghi)P (mg/kg)**											
538												
539	**General Statistics**											
540					Number of Valid Samples	30					Number of Detected Data	9
541					Number of Unique Samples	9					Number of Non-Detect Data	21
542					Number of Missing Values	1					Percent Non-Detects	70.00%
543												
544	**Raw Statistics**						**Log-transformed Statistics**					
545					Minimum Detected	0.0011					Minimum Detected	-6.812
546					Maximum Detected	0.059					Maximum Detected	-2.83
547					Mean of Detected	0.0174					Mean of Detected	-4.558
548					SD of Detected	0.0174					SD of Detected	1.21
549					Minimum Non-Detect	0.0028					Minimum Non-Detect	-5.878
550					Maximum Non-Detect	0.41					Maximum Non-Detect	-0.892
551												
552	Note: Data have multiple DLs - Use of KM Method is recommended										Number treated as Non-Detect	30
553	For all methods (except KM, DL/2, and ROS Methods),										Number treated as Detected	0
554	Observations < Largest ND are treated as NDs										Single DL Non-Detect Percentage	100.00%
555												
556	**UCL Statistics**											
557	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
558					Shapiro Wilk Test Statistic	0.785					Shapiro Wilk Test Statistic	0.918
559					5% Shapiro Wilk Critical Value	0.829					5% Shapiro Wilk Critical Value	0.829
560	**Data not Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
561												
562	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
563					DL/2 Substitution Method						DL/2 Substitution Method	
564					Mean	0.0448					Mean	-3.636
565					SD	0.0474					SD	1.211
566					95% DL/2 (t) UCL	0.0595					95% H-Stat (DL/2) UCL	0.183
567												
568					Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method	
569	**MLE method failed to converge properly**										Mean in Log Scale	-4.816
570											SD in Log Scale	0.769
571											Mean in Original Scale	0.0108
572											SD in Original Scale	0.0105
573											95% Percentile Bootstrap UCL	0.0142
574											95% BCA Bootstrap UCL	0.0162
575												
576	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
577					k star (bias corrected)	0.82	**Data appear Gamma Distributed at 5% Significance Level**					
578					Theta Star	0.0213						
579					nu star	14.76						
580												
581					A-D Test Statistic	0.404	**Nonparametric Statistics**					
582					5% A-D Critical Value	0.741					Kaplan-Meier (KM) Method	
583					K-S Test Statistic	0.741					Mean	0.0144

584				5% K-S Critical Value	0.286					SD	0.0146
585	**Data appear Gamma Distributed at 5% Significance Level**									SE of Mean	0.00441
586										95% KM (t) UCL	0.0219
587	**Assuming Gamma Distribution**									95% KM (z) UCL	0.0217
588	Gamma ROS Statistics using Extrapolated Data									95% KM (jackknife) UCL	0.0219
589				Minimum	0					95% KM (bootstrap t) UCL	0.0251
590				Maximum	0.059					95% KM (BCA) UCL	0.0224
591				Mean	0.0174					95% KM (Percentile Bootstrap) UCL	0.0222
592				Median	0.0185					95% KM (Chebyshev) UCL	0.0336
593				SD	0.0108					97.5% KM (Chebyshev) UCL	0.0419
594				k star	0.767					99% KM (Chebyshev) UCL	0.0583
595				Theta star	0.0227						
596				Nu star	46.04					**Potential UCLs to Use**	
597				AppChi2	31.47					95% KM (t) UCL	0.0219
598				95% Gamma Approximate UCL	0.0255						
599				95% Adjusted Gamma UCL	0.026						
600	**Note: DL/2 is not a recommended method.**										
601											
602											
603	**B(k)F (mg/kg)**										
604											
605					**General Statistics**						
606				Number of Valid Samples	30					Number of Detected Data	9
607				Number of Unique Samples	9					Number of Non-Detect Data	21
608				Number of Missing Values	1					Percent Non-Detects	70.00%
609											
610				**Raw Statistics**						**Log-transformed Statistics**	
611				Minimum Detected	0.00055					Minimum Detected	-7.506
612				Maximum Detected	0.0989					Maximum Detected	-2.314
613				Mean of Detected	0.019					Mean of Detected	-4.909
614				SD of Detected	0.0312					SD of Detected	1.508
615				Minimum Non-Detect	0.0028					Minimum Non-Detect	-5.878
616				Maximum Non-Detect	0.41					Maximum Non-Detect	-0.892
617											
618	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect	30
619	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected	0
620	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage	100.00%
621											
622					**UCL Statistics**						
623	**Normal Distribution Test with Detected Values Only**									**Lognormal Distribution Test with Detected Values Only**	
624				Shapiro Wilk Test Statistic	0.615					Shapiro Wilk Test Statistic	0.984
625				5% Shapiro Wilk Critical Value	0.829					5% Shapiro Wilk Critical Value	0.829
626	**Data not Normal at 5% Significance Level**									**Data appear Lognormal at 5% Significance Level**	
627											
628	**Assuming Normal Distribution**									**Assuming Lognormal Distribution**	
629				DL/2 Substitution Method						DL/2 Substitution Method	
630				Mean	0.0355					Mean	-3.874
631				SD	0.0388					SD	1.268
632				95% DL/2 (t) UCL	0.0476					95% H-Stat (DL/2) UCL	0.149
633											
634				Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method	
635	**MLE method failed to converge properly**									Mean in Log Scale	-5.288
636										SD in Log Scale	0.919

637											Mean in Original Scale	0.00902
638											SD in Original Scale	0.0178
639											95% Percentile Bootstrap UCL	0.0148
640											95% BCA Bootstrap UCL	0.0188
641												
642	**Gamma Distribution Test with Detected Values Only**										**Data Distribution Test with Detected Values Only**	
643					k star (bias corrected)	0.504					**Data appear Gamma Distributed at 5% Significance Level**	
644					Theta Star	0.0378						
645					nu star	9.073						
646												
647					A-D Test Statistic	0.424					**Nonparametric Statistics**	
648					5% A-D Critical Value	0.76					Kaplan-Meier (KM) Method	
649					K-S Test Statistic	0.76					Mean	0.0114
650					5% K-S Critical Value	0.291					SD	0.0188
651	**Data appear Gamma Distributed at 5% Significance Level**										SE of Mean	0.00447
652											95% KM (t) UCL	0.019
653	**Assuming Gamma Distribution**										95% KM (z) UCL	0.0188
654					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.019
655					Minimum	0					95% KM (bootstrap t) UCL	0.0349
656					Maximum	0.0989					95% KM (BCA) UCL	0.0197
657					Mean	0.0149					95% KM (Percentile Bootstrap) UCL	0.019
658					Median	0.0127					95% KM (Chebyshev) UCL	0.0309
659					SD	0.0181					97.5% KM (Chebyshev) UCL	0.0393
660					k star	0.425					99% KM (Chebyshev) UCL	0.0559
661					Theta star	0.0351						
662					Nu star	25.47					**Potential UCLs to Use**	
663					AppChi2	14.97					95% KM (t) UCL	0.019
664					95% Gamma Approximate UCL	0.0254						
665					95% Adjusted Gamma UCL	0.0262						
666	**Note: DL/2 is not a recommended method.**											
667												
668												
669	**Carbazole (mg/kg)**											
670												
671	**General Statistics**											
672					Number of Valid Samples	29					Number of Detected Data	4
673					Number of Unique Samples	4					Number of Non-Detect Data	25
674					Number of Missing Values	2					Percent Non-Detects	86.21%
675												
676	**Raw Statistics**										**Log-transformed Statistics**	
677					Minimum Detected	0.011					Minimum Detected	-4.51
678					Maximum Detected	0.028					Maximum Detected	-3.576
679					Mean of Detected	0.0198					Mean of Detected	-3.983
680					SD of Detected	0.00737					SD of Detected	0.407
681					Minimum Non-Detect	0.17					Minimum Non-Detect	-1.772
682					Maximum Non-Detect	3.7					Maximum Non-Detect	1.308
683												
684	Note: Data have multiple DLs - Use of KM Method is recommended										Number treated as Non-Detect	29
685	For all methods (except KM, DL/2, and ROS Methods),										Number treated as Detected	0
686	Observations < Largest ND are treated as NDs										Single DL Non-Detect Percentage	100.00%
687												
688	**UCL Statistics**											
689	**Normal Distribution Test with Detected Values Only**										**Lognormal Distribution Test with Detected Values Only**	

690					Shapiro Wilk Test Statistic	0.989					Shapiro Wilk Test Statistic	0.967
691					5% Shapiro Wilk Critical Value	0.748					5% Shapiro Wilk Critical Value	0.748
692					**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**	
693												
694					**Assuming Normal Distribution**						**Assuming Lognormal Distribution**	
695					DL/2 Substitution Method						DL/2 Substitution Method	
696					Mean	0.224					Mean	-2.131
697					SD	0.357					SD	1.087
698					95% DL/2 (t) UCL	0.337					95% H-Stat (DL/2) UCL	0.58
699												
700					Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method	
701					**MLE method failed to converge properly**						Mean in Log Scale	-3.983
702											SD in Log Scale	0.287
703											Mean in Original Scale	0.0194
704											SD in Original Scale	0.00558
705											95% Percentile Bootstrap UCL	0.0211
706											95% BCA Bootstrap UCL	0.0212
707												
708					**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**	
709					k star (bias corrected)	2.346					**Data appear Normal at 5% Significance Level**	
710					Theta Star	0.00842						
711					nu star	18.77						
712												
713					A-D Test Statistic	0.228					**Nonparametric Statistics**	
714					5% A-D Critical Value	0.658					Kaplan-Meier (KM) Method	
715					K-S Test Statistic	0.658					Mean	0.0198
716					5% K-S Critical Value	0.395					SD	0.00638
717					**Data appear Gamma Distributed at 5% Significance Level**						SE of Mean	0.00368
718											95% KM (t) UCL	0.026
719					**Assuming Gamma Distribution**						95% KM (z) UCL	0.0258
720					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.0269
721					Minimum	0.00699					95% KM (bootstrap t) UCL	0.0274
722					Maximum	0.0293					95% KM (BCA) UCL	0.0263
723					Mean	0.02					95% KM (Percentile Bootstrap) UCL	0.0263
724					Median	0.0205					95% KM (Chebyshev) UCL	0.0358
725					SD	0.00523					97.5% KM (Chebyshev) UCL	0.0427
726					k star	11.18					99% KM (Chebyshev) UCL	0.0564
727					Theta star	0.00179						
728					Nu star	648.7					**Potential UCLs to Use**	
729					AppChi2	590.6					95% KM (t) UCL	0.026
730					95% Gamma Approximate UCL	0.022					95% KM (Percentile Bootstrap) UCL	0.0263
731					95% Adjusted Gamma UCL	N/A						
732	**Note: DL/2 is not a recommended method.**											
733												
734												
735	**Chrysene (mg/kg)**											
736												
737						**General Statistics**							
738					Number of Valid Samples	30					Number of Detected Data	9
739					Number of Unique Samples	9					Number of Non-Detect Data	21
740					Number of Missing Values	1					Percent Non-Detects	70.00%
741												
742					**Raw Statistics**						**Log-transformed Statistics**	

743				Minimum Detected	0.0026					Minimum Detected	-5.952	
744				Maximum Detected	0.119					Maximum Detected	-2.129	
745				Mean of Detected	0.0344					Mean of Detected	-3.935	
746				SD of Detected	0.0374					SD of Detected	1.211	
747				Minimum Non-Detect	0.0028					Minimum Non-Detect	-5.878	
748				Maximum Non-Detect	0.41					Maximum Non-Detect	-0.892	
749												
750	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect	30	
751	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected	0	
752	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage	100.00%	
753												
754	**UCL Statistics**											
755	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
756				Shapiro Wilk Test Statistic	0.818					Shapiro Wilk Test Statistic	0.987	
757				5% Shapiro Wilk Critical Value	0.829					5% Shapiro Wilk Critical Value	0.829	
758	**Data not Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
759												
760	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
761				DL/2 Substitution Method						DL/2 Substitution Method		
762				Mean	0.0419					Mean	-3.541	
763				SD	0.0392					SD	1.001	
764				95% DL/2 (t) UCL	0.0541					95% H-Stat (DL/2) UCL	0.0994	
765												
766				Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method		
767	**MLE method failed to converge properly**									Mean in Log Scale	-4.357	
768										SD in Log Scale	0.775	
769										Mean in Original Scale	0.0183	
770										SD in Original Scale	0.0226	
771										95% Percentile Bootstrap UCL	0.026	
772										95% BCA Bootstrap UCL	0.0295	
773												
774	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
775				k star (bias corrected)	0.752		**Data appear Gamma Distributed at 5% Significance Level**					
776				Theta Star	0.0458							
777				nu star	13.54							
778												
779				A-D Test Statistic	0.169		**Nonparametric Statistics**					
780				5% A-D Critical Value	0.743					Kaplan-Meier (KM) Method		
781				K-S Test Statistic	0.743					Mean	0.023	
782				5% K-S Critical Value	0.287					SD	0.026	
783	**Data appear Gamma Distributed at 5% Significance Level**									SE of Mean	0.00694	
784										95% KM (t) UCL	0.0348	
785	**Assuming Gamma Distribution**									95% KM (z) UCL	0.0344	
786				Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.0348	
787				Minimum	0.0026					95% KM (bootstrap t) UCL	0.0401	
788				Maximum	0.119					95% KM (BCA) UCL	0.0359	
789				Mean	0.0338					95% KM (Percentile Bootstrap) UCL	0.0354	
790				Median	0.034					95% KM (Chebyshev) UCL	0.0533	
791				SD	0.0209					97.5% KM (Chebyshev) UCL	0.0664	
792				k star	2.426					99% KM (Chebyshev) UCL	0.0921	
793				Theta star	0.0139							
794				Nu star	145.5		**Potential UCLs to Use**					
795				AppChi2	118.7					95% KM (t) UCL	0.0348	

796				95% Gamma Approximate UCL		0.0415						
797				95% Adjusted Gamma UCL		0.042						
798	**Note: DL/2 is not a recommended method.**											
799												
800												
801	**DB(ah)A (mg/kg)**											
802												
803	**General Statistics**											
804				Number of Valid Samples		30				Number of Detected Data		5
805				Number of Unique Samples		5				Number of Non-Detect Data		25
806				Number of Missing Values		1				Percent Non-Detects		83.33%
807												
808	**Raw Statistics**									**Log-transformed Statistics**		
809				Minimum Detected		0.0016				Minimum Detected		-6.438
810				Maximum Detected		0.014				Maximum Detected		-4.269
811				Mean of Detected		0.00516				Mean of Detected		-5.552
812				SD of Detected		0.005				SD of Detected		0.788
813				Minimum Non-Detect		0.0028				Minimum Non-Detect		-5.878
814				Maximum Non-Detect		0.41				Maximum Non-Detect		-0.892
815												
816	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect		30
817	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected		0
818	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage		100.00%
819												
820	**UCL Statistics**											
821	**Normal Distribution Test with Detected Values Only**									**Lognormal Distribution Test with Detected Values Only**		
822				Shapiro Wilk Test Statistic		0.686				Shapiro Wilk Test Statistic		0.853
823				5% Shapiro Wilk Critical Value		0.762				5% Shapiro Wilk Critical Value		0.762
824	**Data not Normal at 5% Significance Level**									**Data appear Lognormal at 5% Significance Level**		
825												
826	**Assuming Normal Distribution**									**Assuming Lognormal Distribution**		
827				DL/2 Substitution Method						DL/2 Substitution Method		
828				Mean		0.0416				Mean		-3.851
829				SD		0.0463				SD		1.394
830				95% DL/2 (t) UCL		0.0559				95% H-Stat (DL/2) UCL		0.196
831												
832				Maximum Likelihood Estimate(MLE) Method		N/A				Log ROS Method		
833	**MLE method failed to converge properly**									Mean in Log Scale		-5.897
834										SD in Log Scale		0.435
835										Mean in Original Scale		0.00309
836										SD in Original Scale		0.0022
837										95% Percentile Bootstrap UCL		0.00379
838										95% BCA Bootstrap UCL		0.00423
839												
840	**Gamma Distribution Test with Detected Values Only**									**Data Distribution Test with Detected Values Only**		
841				k star (bias corrected)		0.895				**Data appear Lognormal at 5% Significance Level**		
842				Theta Star		0.00577						
843				nu star		8.949						
844												
845				A-D Test Statistic		0.689				**Nonparametric Statistics**		
846				5% A-D Critical Value		0.685				Kaplan-Meier (KM) Method		
847				K-S Test Statistic		0.685				Mean		0.00394
848				5% K-S Critical Value		0.361				SD		0.0039

849	**Data not Gamma Distributed at 5% Significance Level**										SE of Mean	0.00155
850											95% KM (t) UCL	0.00656
851	**Assuming Gamma Distribution**										95% KM (z) UCL	0.00648
852	Gamma ROS Statistics using Extrapolated Data										95% KM (jackknife) UCL	0.00639
853	Minimum	0.00129									95% KM (bootstrap t) UCL	0.0262
854	Maximum	0.014									95% KM (BCA) UCL	0.007
855	Mean	0.00662									95% KM (Percentile Bootstrap) UCL	0.00713
856	Median	0.00732									95% KM (Chebyshev) UCL	0.0107
857	SD	0.00286									97.5% KM (Chebyshev) UCL	0.0136
858	k star	4.044									99% KM (Chebyshev) UCL	0.0193
859	Theta star	0.00164										
860	Nu star	242.6									**Potential UCLs to Use**	
861	AppChi2	207.6									95% KM (t) UCL	0.00656
862	95% Gamma Approximate UCL	0.00774									95% KM (% Bootstrap) UCL	0.00713
863	95% Adjusted Gamma UCL	0.00781										
864	**Note: DL/2 is not a recommended method.**											
865												
866												
867	**Dibenzofuran (mg/kg)**											
868												
869	**General Statistics**											
870	Number of Valid Samples	31									Number of Detected Data	5
871	Number of Unique Samples	5									Number of Non-Detect Data	26
872											Percent Non-Detects	83.87%
873												
874	**Raw Statistics**										**Log-transformed Statistics**	
875	Minimum Detected	0.012									Minimum Detected	-4.423
876	Maximum Detected	0.2									Maximum Detected	-1.609
877	Mean of Detected	0.0708									Mean of Detected	-3.167
878	SD of Detected	0.0788									SD of Detected	1.149
879	Minimum Non-Detect	0.035									Minimum Non-Detect	-3.352
880	Maximum Non-Detect	3.7									Maximum Non-Detect	1.308
881												
882	Note: Data have multiple DLs - Use of KM Method is recommended										Number treated as Non-Detect	31
883	For all methods (except KM, DL/2, and ROS Methods),										Number treated as Detected	0
884	Observations < Largest ND are treated as NDs										Single DL Non-Detect Percentage	100.00%
885												
886	**UCL Statistics**											
887	**Normal Distribution Test with Detected Values Only**										**Lognormal Distribution Test with Detected Values Only**	
888	Shapiro Wilk Test Statistic	0.815									Shapiro Wilk Test Statistic	0.948
889	5% Shapiro Wilk Critical Value	0.762									5% Shapiro Wilk Critical Value	0.762
890	**Data appear Normal at 5% Significance Level**										**Data appear Lognormal at 5% Significance Level**	
891												
892	**Assuming Normal Distribution**										**Assuming Lognormal Distribution**	
893	DL/2 Substitution Method										DL/2 Substitution Method	
894	Mean	0.216									Mean	-2.181
895	SD	0.347									SD	1.107
896	95% DL/2 (t) UCL	0.322									95% H-Stat (DL/2) UCL	0.554
897												
898	Maximum Likelihood Estimate(MLE) Method	N/A									Log ROS Method	
899	**MLE method failed to converge properly**										Mean in Log Scale	-3.595
900											SD in Log Scale	0.627
901											Mean in Original Scale	0.0349

902											SD in Original Scale	0.0351
903											95% Percentile Bootstrap UCL	0.0463
904											95% BCA Bootstrap UCL	0.0514
905												
906	**Gamma Distribution Test with Detected Values Only**										**Data Distribution Test with Detected Values Only**	
907					k star (bias corrected)	0.573					**Data appear Normal at 5% Significance Level**	
908					Theta Star	0.124						
909					nu star	5.73						
910												
911					A-D Test Statistic	0.338					**Nonparametric Statistics**	
912					5% A-D Critical Value	0.69					Kaplan-Meier (KM) Method	
913					K-S Test Statistic	0.69					Mean	0.0414
914					5% K-S Critical Value	0.364					SD	0.0459
915	**Data appear Gamma Distributed at 5% Significance Level**										SE of Mean	0.0154
916											95% KM (t) UCL	0.0676
917	**Assuming Gamma Distribution**										95% KM (z) UCL	0.0668
918					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.0681
919					Minimum	0.012					95% KM (bootstrap t) UCL	0.124
920					Maximum	0.2					95% KM (BCA) UCL	0.0788
921					Mean	0.0823					95% KM (Percentile Bootstrap) UCL	0.0751
922					Median	0.0846					95% KM (Chebyshev) UCL	0.109
923					SD	0.0384					97.5% KM (Chebyshev) UCL	0.138
924					k star	3.677					99% KM (Chebyshev) UCL	0.195
925					Theta star	0.0224						
926					Nu star	228					**Potential UCLs to Use**	
927					AppChi2	194					95% KM (t) UCL	0.0676
928					95% Gamma Approximate UCL	0.0967					95% KM (Percentile Bootstrap) UCL	0.0751
929					95% Adjusted Gamma UCL	0.0976						
930	**Note: DL/2 is not a recommended method.**											
931												
932												
933	**D-n-BP (mg/kg)**											
934												
935	**General Statistics**											
936					Number of Valid Samples	26					Number of Detected Data	7
937					Number of Unique Samples	7					Number of Non-Detect Data	19
938					Number of Missing Values	5					Percent Non-Detects	73.08%
939												
940	**Raw Statistics**										**Log-transformed Statistics**	
941					Minimum Detected	0.129					Minimum Detected	-2.048
942					Maximum Detected	3.54					Maximum Detected	1.264
943					Mean of Detected	0.952					Mean of Detected	-0.616
944					SD of Detected	1.206					SD of Detected	1.119
945					Minimum Non-Detect	0.061					Minimum Non-Detect	-2.797
946					Maximum Non-Detect	2.8					Maximum Non-Detect	1.03
947												
948	Note: Data have multiple DLs - Use of KM Method is recommended										Number treated as Non-Detect	25
949	For all methods (except KM, DL/2, and ROS Methods),										Number treated as Detected	1
950	Observations < Largest ND are treated as NDs										Single DL Non-Detect Percentage	96.15%
951												
952	**UCL Statistics**											
953	**Normal Distribution Test with Detected Values Only**										**Lognormal Distribution Test with Detected Values Only**	
954					Shapiro Wilk Test Statistic	0.716					Shapiro Wilk Test Statistic	0.966

955				5% Shapiro Wilk Critical Value	0.803					5% Shapiro Wilk Critical Value	0.803
956	**Data not Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
957												
958	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
959				DL/2 Substitution Method						DL/2 Substitution Method		
960				Mean	0.465					Mean	-1.402	
961				SD	0.721					SD	1.081	
962				95% DL/2 (t) UCL	0.706					95% H-Stat (DL/2) UCL	0.658	
963												
964				Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method		
965	**MLE method failed to converge properly**									Mean in Log Scale	-2.192	
966										SD in Log Scale	1.233	
967										Mean in Original Scale	0.311	
968										SD in Original Scale	0.713	
969										95% Percentile Bootstrap UCL	0.568	
970										95% BCA Bootstrap UCL	0.721	
971												
972	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
973				k star (bias corrected)	0.676		**Data appear Gamma Distributed at 5% Significance Level**					
974				Theta Star	1.409							
975				nu star	9.461							
976												
977				A-D Test Statistic	0.396		**Nonparametric Statistics**					
978				5% A-D Critical Value	0.727					Kaplan-Meier (KM) Method		
979				K-S Test Statistic	0.727					Mean	0.383	
980				5% K-S Critical Value	0.32					SD	0.684	
981	**Data appear Gamma Distributed at 5% Significance Level**									SE of Mean	0.147	
982										95% KM (t) UCL	0.634	
983	**Assuming Gamma Distribution**									95% KM (z) UCL	0.625	
984				Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.591	
985				Minimum	0					95% KM (bootstrap t) UCL	1.051	
986				Maximum	3.54					95% KM (BCA) UCL	0.845	
987				Mean	1.014					95% KM (Percentile Bootstrap) UCL	0.712	
988				Median	0.816					95% KM (Chebyshev) UCL	1.024	
989				SD	0.829					97.5% KM (Chebyshev) UCL	1.301	
990				k star	0.544					99% KM (Chebyshev) UCL	1.846	
991				Theta star	1.863							
992				Nu star	28.3		**Potential UCLs to Use**					
993				AppChi2	17.16					95% KM (t) UCL	0.634	
994				95% Gamma Approximate UCL	1.672							
995				95% Adjusted Gamma UCL	1.73							
996	**Note: DL/2 is not a recommended method.**											
997												
998												
999	**Fluoranthene (mg/kg)**											
1000												
1001	**General Statistics**											
1002				Number of Valid Samples	30					Number of Detected Data	7	
1003				Number of Unique Samples	7					Number of Non-Detect Data	23	
1004				Number of Missing Values	1					Percent Non-Detects	76.67%	
1005												
1006	**Raw Statistics**						**Log-transformed Statistics**					
1007				Minimum Detected	0.0016					Minimum Detected	-6.438	

	A	B	C	D	E	F	G	H	I	J	K	L
1008					Maximum Detected	0.073					Maximum Detected	-2.617
1009					Mean of Detected	0.0292					Mean of Detected	-3.993
1010					SD of Detected	0.0238					SD of Detected	1.264
1011					Minimum Non-Detect	0.0028					Minimum Non-Detect	-5.878
1012					Maximum Non-Detect	2.1					Maximum Non-Detect	0.742
1013												
1014	Note: Data have multiple DLs - Use of KM Method is recommended										Number treated as Non-Detect	30
1015	For all methods (except KM, DL/2, and ROS Methods),										Number treated as Detected	0
1016	Observations < Largest ND are treated as NDs										Single DL Non-Detect Percentage	100.00%
1017												
1018	**UCL Statistics**											
1019	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
1020					Shapiro Wilk Test Statistic	0.944					Shapiro Wilk Test Statistic	0.9
1021					5% Shapiro Wilk Critical Value	0.803					5% Shapiro Wilk Critical Value	0.803
1022	**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
1023												
1024	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
1025					DL/2 Substitution Method						DL/2 Substitution Method	
1026					Mean	0.178					Mean	-2.437
1027					SD	0.22					SD	1.507
1028					95% DL/2 (t) UCL	0.246					95% H-Stat (DL/2) UCL	1.417
1029												
1030					Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method	
1031	**MLE method failed to converge properly**										Mean in Log Scale	-4.291
1032											SD in Log Scale	0.82
1033											Mean in Original Scale	0.0184
1034											SD in Original Scale	0.0152
1035											95% Percentile Bootstrap UCL	0.023
1036											95% BCA Bootstrap UCL	0.0239
1037												
1038	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
1039					k star (bias corrected)	0.796	**Data appear Normal at 5% Significance Level**					
1040					Theta Star	0.0367						
1041					nu star	11.14						
1042												
1043					A-D Test Statistic	0.204	**Nonparametric Statistics**					
1044					5% A-D Critical Value	0.725	Kaplan-Meier (KM) Method					
1045					K-S Test Statistic	0.725					Mean	0.0244
1046					5% K-S Critical Value	0.318					SD	0.0214
1047	**Data appear Gamma Distributed at 5% Significance Level**										SE of Mean	0.00775
1048											95% KM (t) UCL	0.0376
1049	**Assuming Gamma Distribution**										95% KM (z) UCL	0.0372
1050					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.0377
1051					Minimum	0.0016					95% KM (bootstrap t) UCL	0.0413
1052					Maximum	0.073					95% KM (BCA) UCL	0.0395
1053					Mean	0.0306					95% KM (Percentile Bootstrap) UCL	0.0381
1054					Median	0.0321					95% KM (Chebyshev) UCL	0.0582
1055					SD	0.0171					97.5% KM (Chebyshev) UCL	0.0728
1056					k star	1.913					99% KM (Chebyshev) UCL	0.102
1057					Theta star	0.016						
1058					Nu star	114.8	**Potential UCLs to Use**					
1059					AppChi2	91.04					95% KM (t) UCL	0.0376
1060					95% Gamma Approximate UCL	0.0386					95% KM (Percentile Bootstrap) UCL	0.0381

1061					95% Adjusted Gamma UCL	0.0391						
1062	**Note: DL/2 is not a recommended method.**											
1063												
1064												
1065	**Fluorene (mg/kg)**											
1066												
1067	**General Statistics**											
1068					Number of Valid Samples	30				Number of Detected Data		7
1069					Number of Unique Samples	7				Number of Non-Detect Data		23
1070					Number of Missing Values	1				Percent Non-Detects		76.67%
1071												
1072	**Raw Statistics**						**Log-transformed Statistics**					
1073					Minimum Detected	0.001				Minimum Detected		-6.908
1074					Maximum Detected	0.018				Maximum Detected		-4.017
1075					Mean of Detected	0.00569				Mean of Detected		-5.717
1076					SD of Detected	0.00632				SD of Detected		1.144
1077					Minimum Non-Detect	0.0028				Minimum Non-Detect		-5.878
1078					Maximum Non-Detect	2.1				Maximum Non-Detect		0.742
1079												
1080	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect		30
1081	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected		0
1082	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage		100.00%
1083												
1084	**UCL Statistics**											
1085	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
1086					Shapiro Wilk Test Statistic	0.802				Shapiro Wilk Test Statistic		0.907
1087					5% Shapiro Wilk Critical Value	0.803				5% Shapiro Wilk Critical Value		0.803
1088	**Data not Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
1089												
1090	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
1091					DL/2 Substitution Method					DL/2 Substitution Method		
1092					Mean	0.171				Mean		-2.888
1093					SD	0.225				SD		2.036
1094					95% DL/2 (t) UCL	0.241				95% H-Stat (DL/2) UCL		6.386
1095												
1096					Maximum Likelihood Estimate(MLE) Method	N/A				Log ROS Method		
1097	**MLE method failed to converge properly**									Mean in Log Scale		-5.852
1098										SD in Log Scale		0.72
1099										Mean in Original Scale		0.00379
1100										SD in Original Scale		0.00351
1101										95% Percentile Bootstrap UCL		0.00492
1102										95% BCA Bootstrap UCL		0.00535
1103												
1104	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
1105					k star (bias corrected)	0.695	**Data appear Gamma Distributed at 5% Significance Level**					
1106					Theta Star	0.00818						
1107					nu star	9.726						
1108												
1109					A-D Test Statistic	0.4	**Nonparametric Statistics**					
1110					5% A-D Critical Value	0.727				Kaplan-Meier (KM) Method		
1111					K-S Test Statistic	0.727				Mean		0.00512
1112					5% K-S Critical Value	0.319				SD		0.00568
1113	**Data appear Gamma Distributed at 5% Significance Level**									SE of Mean		0.00217

1114											95% KM (t) UCL	0.0088
1115	**Assuming Gamma Distribution**										95% KM (z) UCL	0.00868
1116				Gamma ROS Statistics using Extrapolated Data							95% KM (jackknife) UCL	0.00895
1117					Minimum	0.0003888					95% KM (bootstrap t) UCL	0.0159
1118					Maximum	0.018					95% KM (BCA) UCL	0.00928
1119					Mean	0.00621					95% KM (Percentile Bootstrap) UCL	0.00922
1120					Median	0.00635					95% KM (Chebyshev) UCL	0.0146
1121					SD	0.00434					97.5% KM (Chebyshev) UCL	0.0187
1122					k star	1.45					99% KM (Chebyshev) UCL	0.0267
1123					Theta star	0.00428						
1124					Nu star	86.99					**Potential UCLs to Use**	
1125					AppChi2	66.49					95% KM (t) UCL	0.0088
1126				95% Gamma Approximate UCL		0.00812						
1127				95% Adjusted Gamma UCL		0.00825						
1128	**Note: DL/2 is not a recommended method.**											
1129												
1130												
1131	**I(123cd)P (mg/kg)**											
1132												
1133						**General Statistics**						
1134					Number of Valid Samples	30					Number of Detected Data	9
1135					Number of Unique Samples	9					Number of Non-Detect Data	21
1136					Number of Missing Values	1					Percent Non-Detects	70.00%
1137												
1138					**Raw Statistics**						**Log-transformed Statistics**	
1139					Minimum Detected	0.0023					Minimum Detected	-6.075
1140					Maximum Detected	0.0841					Maximum Detected	-2.476
1141					Mean of Detected	0.022					Mean of Detected	-4.374
1142					SD of Detected	0.026					SD of Detected	1.138
1143					Minimum Non-Detect	0.0028					Minimum Non-Detect	-5.878
1144					Maximum Non-Detect	0.41					Maximum Non-Detect	-0.892
1145												
1146	Note: Data have multiple DLs - Use of KM Method is recommended										Number treated as Non-Detect	30
1147	For all methods (except KM, DL/2, and ROS Methods),										Number treated as Detected	0
1148	Observations < Largest ND are treated as NDs										Single DL Non-Detect Percentage	100.00%
1149												
1150						**UCL Statistics**						
1151					**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**	
1152					Shapiro Wilk Test Statistic	0.748					Shapiro Wilk Test Statistic	0.985
1153					5% Shapiro Wilk Critical Value	0.829					5% Shapiro Wilk Critical Value	0.829
1154					**Data not Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**	
1155												
1156					**Assuming Normal Distribution**						**Assuming Lognormal Distribution**	
1157					DL/2 Substitution Method						DL/2 Substitution Method	
1158					Mean	0.0426					Mean	-3.727
1159					SD	0.047					SD	1.242
1160					95% DL/2 (t) UCL	0.0571					95% H-Stat (DL/2) UCL	0.132
1161												
1162					Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method	
1163					**MLE method failed to converge properly**						Mean in Log Scale	-4.828
1164											SD in Log Scale	0.791
1165											Mean in Original Scale	0.0117
1166											SD in Original Scale	0.0155

1167											95% Percentile Bootstrap UCL	0.0172
1168											95% BCA Bootstrap UCL	0.0191
1169												
1170	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
1171					k star (bias corrected)	0.764	**Data appear Gamma Distributed at 5% Significance Level**					
1172					Theta Star	0.0287						
1173					nu star	13.75						
1174												
1175					A-D Test Statistic	0.267	**Nonparametric Statistics**					
1176					5% A-D Critical Value	0.743					Kaplan-Meier (KM) Method	
1177					K-S Test Statistic	0.743					Mean	0.0148
1178					5% K-S Critical Value	0.287					SD	0.0183
1179	**Data appear Gamma Distributed at 5% Significance Level**										SE of Mean	0.00482
1180											95% KM (t) UCL	0.023
1181	**Assuming Gamma Distribution**										95% KM (z) UCL	0.0228
1182					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.0229
1183					Minimum	0					95% KM (bootstrap t) UCL	0.0292
1184					Maximum	0.0841					95% KM (BCA) UCL	0.0236
1185					Mean	0.0224					95% KM (Percentile Bootstrap) UCL	0.0229
1186					Median	0.024					95% KM (Chebyshev) UCL	0.0358
1187					SD	0.0166					97.5% KM (Chebyshev) UCL	0.0449
1188					k star	0.663					99% KM (Chebyshev) UCL	0.0628
1189					Theta star	0.0337						
1190					Nu star	39.79	**Potential UCLs to Use**					
1191					AppChi2	26.34					95% KM (t) UCL	0.023
1192					95% Gamma Approximate UCL	0.0338						
1193					95% Adjusted Gamma UCL	0.0346						
1194	**Note: DL/2 is not a recommended method.**											
1195												
1196												
1197	**Naphthalene (mg/kg)**											
1198												
1199	**General Statistics**											
1200					Number of Valid Samples	28					Number of Detected Data	6
1201					Number of Unique Samples	5					Number of Non-Detect Data	22
1202					Number of Missing Values	3					Percent Non-Detects	78.57%
1203												
1204	**Raw Statistics**						**Log-transformed Statistics**					
1205					Minimum Detected	0.016					Minimum Detected	-4.135
1206					Maximum Detected	0.43					Maximum Detected	-0.844
1207					Mean of Detected	0.148					Mean of Detected	-2.605
1208					SD of Detected	0.168					SD of Detected	1.37
1209					Minimum Non-Detect	0.0028					Minimum Non-Detect	-5.878
1210					Maximum Non-Detect	2.1					Maximum Non-Detect	0.742
1211												
1212	Note: Data have multiple DLs - Use of KM Method is recommended										Number treated as Non-Detect	28
1213	For all methods (except KM, DL/2, and ROS Methods),										Number treated as Detected	0
1214	Observations < Largest ND are treated as NDs										Single DL Non-Detect Percentage	100.00%
1215												
1216	**UCL Statistics**											
1217	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
1218					Shapiro Wilk Test Statistic	0.827					Shapiro Wilk Test Statistic	0.892
1219					5% Shapiro Wilk Critical Value	0.788					5% Shapiro Wilk Critical Value	0.788

	A	B	C	D	E	F	G	H	I	J	K	L
1220	**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
1221												
1222	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
1223	DL/2 Substitution Method						DL/2 Substitution Method					
1224	Mean					0.213	Mean					-2.072
1225	SD					0.223	SD					1.302
1226	95% DL/2 (t) UCL					0.285	95% H-Stat (DL/2) UCL					1.03
1227												
1228	Maximum Likelihood Estimate(MLE) Method					N/A	Log ROS Method					
1229	**MLE method failed to converge properly**						Mean in Log Scale					-3.358
1230							SD in Log Scale					0.932
1231							Mean in Original Scale					0.0589
1232							SD in Original Scale					0.089
1233							95% Percentile Bootstrap UCL					0.0879
1234							95% BCA Bootstrap UCL					0.102
1235												
1236	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
1237	k star (bias corrected)					0.534	**Data appear Normal at 5% Significance Level**					
1238	Theta Star					0.278						
1239	nu star					6.405						
1240												
1241	A-D Test Statistic					0.435	**Nonparametric Statistics**					
1242	5% A-D Critical Value					0.719	Kaplan-Meier (KM) Method					
1243	K-S Test Statistic					0.719	Mean					0.086
1244	5% K-S Critical Value					0.342	SD					0.112
1245	**Data appear Gamma Distributed at 5% Significance Level**						SE of Mean					0.0385
1246							95% KM (t) UCL					0.152
1247	**Assuming Gamma Distribution**						95% KM (z) UCL					0.149
1248	Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL					0.152
1249	Minimum					0.0132	95% KM (bootstrap t) UCL					0.213
1250	Maximum					0.43	95% KM (BCA) UCL					0.167
1251	Mean					0.159	95% KM (Percentile Bootstrap) UCL					0.156
1252	Median					0.159	95% KM (Chebyshev) UCL					0.254
1253	SD					0.109	97.5% KM (Chebyshev) UCL					0.326
1254	k star					1.539	99% KM (Chebyshev) UCL					0.469
1255	Theta star					0.103						
1256	Nu star					86.21	**Potential UCLs to Use**					
1257	AppChi2					65.8	95% KM (t) UCL					0.152
1258	95% Gamma Approximate UCL					0.208	95% KM (Percentile Bootstrap) UCL					0.156
1259	95% Adjusted Gamma UCL					0.212						
1260	**Note: DL/2 is not a recommended method.**											
1261												
1262												
1263	**n-Nitrosodiphenylamine (mg/kg)**											
1264												
1265	**General Statistics**											
1266	Number of Valid Samples					31	Number of Detected Data					5
1267	Number of Unique Samples					5	Number of Non-Detect Data					26
1268							Percent Non-Detects					83.87%
1269												
1270	**Raw Statistics**						**Log-transformed Statistics**					
1271	Minimum Detected					0.021	Minimum Detected					-3.863
1272	Maximum Detected					2.1	Maximum Detected					0.742

	A	B	C	D	E	F	G	H	I	J	K	L
1273					Mean of Detected	0.526					Mean of Detected	-1.69
1274					SD of Detected	0.882					SD of Detected	1.635
1275					Minimum Non-Detect	0.17					Minimum Non-Detect	-1.772
1276					Maximum Non-Detect	1.4					Maximum Non-Detect	0.336
1277												
1278	Note: Data have multiple DLs - Use of KM Method is recommended										Number treated as Non-Detect	30
1279	For all methods (except KM, DL/2, and ROS Methods),										Number treated as Detected	1
1280	Observations < Largest ND are treated as NDs										Single DL Non-Detect Percentage	96.77%
1281												
1282	**UCL Statistics**											
1283	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
1284					Shapiro Wilk Test Statistic	0.622					Shapiro Wilk Test Statistic	0.909
1285					5% Shapiro Wilk Critical Value	0.762					5% Shapiro Wilk Critical Value	0.762
1286	**Data not Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
1287												
1288	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
1289					DL/2 Substitution Method						DL/2 Substitution Method	
1290					Mean	0.238					Mean	-1.924
1291					SD	0.381					SD	0.851
1292					95% DL/2 (t) UCL	0.354					95% H-Stat (DL/2) UCL	0.293
1293												
1294					Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method	
1295	**MLE method failed to converge properly**										Mean in Log Scale	-2.544
1296											SD in Log Scale	0.904
1297											Mean in Original Scale	0.151
1298											SD in Original Scale	0.366
1299											95% Percentile Bootstrap UCL	0.277
1300											95% BCA Bootstrap UCL	0.352
1301												
1302	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
1303					k star (bias corrected)	0.37	**Data Follow Appr. Gamma Distribution at 5% Significance Level**					
1304					Theta Star	1.423						
1305					nu star	3.697						
1306												
1307					A-D Test Statistic	0.601	**Nonparametric Statistics**					
1308					5% A-D Critical Value	0.706					Kaplan-Meier (KM) Method	
1309					K-S Test Statistic	0.706					Mean	0.176
1310					5% K-S Critical Value	0.37					SD	0.358
1311	**Data follow Appr. Gamma Distribution at 5% Significance Level**										SE of Mean	0.081
1312											95% KM (t) UCL	0.313
1313	**Assuming Gamma Distribution**										95% KM (z) UCL	0.309
1314					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.323
1315					Minimum	0.021					95% KM (bootstrap t) UCL	0.476
1316					Maximum	2.1					95% KM (BCA) UCL	0.296
1317					Mean	0.515					95% KM (Percentile Bootstrap) UCL	0.319
1318					Median	0.539					95% KM (Chebyshev) UCL	0.529
1319					SD	0.349					97.5% KM (Chebyshev) UCL	0.682
1320					k star	2.182					99% KM (Chebyshev) UCL	0.981
1321					Theta star	0.236						
1322					Nu star	135.3	**Potential UCLs to Use**					
1323					AppChi2	109.4					95% KM (t) UCL	0.313
1324					95% Gamma Approximate UCL	0.637						
1325					95% Adjusted Gamma UCL	0.644						

	A	B	C	D	E	F	G	H	I	J	K	L
1326	**Note: DL/2 is not a recommended method.**											
1327												
1328												
1329	**Phenanthrene (mg/kg)**											
1330												
1331	**General Statistics**											
1332	Number of Valid Samples					30	Number of Detected Data					8
1333	Number of Unique Samples					7	Number of Non-Detect Data					22
1334	Number of Missing Values					1	Percent Non-Detects					73.33%
1335												
1336	**Raw Statistics**						**Log-transformed Statistics**					
1337	Minimum Detected					0.011	Minimum Detected					-4.51
1338	Maximum Detected					0.26	Maximum Detected					-1.347
1339	Mean of Detected					0.0835	Mean of Detected					-3.091
1340	SD of Detected					0.0885	SD of Detected					1.263
1341	Minimum Non-Detect					0.0028	Minimum Non-Detect					-5.878
1342	Maximum Non-Detect					2.1	Maximum Non-Detect					0.742
1343												
1344	Note: Data have multiple DLs - Use of KM Method is recommended						Number treated as Non-Detect					30
1345	For all methods (except KM, DL/2, and ROS Methods),						Number treated as Detected					0
1346	Observations < Largest ND are treated as NDs						Single DL Non-Detect Percentage					100.00%
1347												
1348	**UCL Statistics**											
1349	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
1350	Shapiro Wilk Test Statistic					0.842	Shapiro Wilk Test Statistic					0.894
1351	5% Shapiro Wilk Critical Value					0.818	5% Shapiro Wilk Critical Value					0.818
1352	**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
1353												
1354	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
1355	DL/2 Substitution Method						DL/2 Substitution Method					
1356	Mean					0.191	Mean					-2.241
1357	SD					0.216	SD					1.362
1358	95% DL/2 (t) UCL					0.258	95% H-Stat (DL/2) UCL					1.115
1359												
1360	Maximum Likelihood Estimate(MLE) Method					N/A	Log ROS Method					
1361	**MLE method failed to converge properly**						Mean in Log Scale					-3.546
1362							SD in Log Scale					1.023
1363							Mean in Original Scale					0.0473
1364							SD in Original Scale					0.0552
1365							95% Percentile Bootstrap UCL					0.0653
1366							95% BCA Bootstrap UCL					0.0696
1367												
1368	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
1369	k star (bias corrected)					0.68	**Data appear Normal at 5% Significance Level**					
1370	Theta Star					0.123						
1371	nu star					10.87						
1372												
1373	A-D Test Statistic					0.378	**Nonparametric Statistics**					
1374	5% A-D Critical Value					0.737	Kaplan-Meier (KM) Method					
1375	K-S Test Statistic					0.737	Mean					0.0691
1376	5% K-S Critical Value					0.302	SD					0.0795
1377	**Data appear Gamma Distributed at 5% Significance Level**						SE of Mean					0.0269
1378							95% KM (t) UCL					0.115

1379	**Assuming Gamma Distribution**										95% KM (z) UCL	0.113
1380	Gamma ROS Statistics using Extrapolated Data										95% KM (jackknife) UCL	0.116
1381					Minimum	0					95% KM (bootstrap t) UCL	0.159
1382					Maximum	0.26					95% KM (BCA) UCL	0.115
1383					Mean	0.0971					95% KM (Percentile Bootstrap) UCL	0.115
1384					Median	0.107					95% KM (Chebyshev) UCL	0.186
1385					SD	0.0691					97.5% KM (Chebyshev) UCL	0.237
1386					k star	0.627					99% KM (Chebyshev) UCL	0.336
1387					Theta star	0.155						
1388					Nu star	37.6					**Potential UCLs to Use**	
1389					AppChi2	24.56					95% KM (t) UCL	0.115
1390					95% Gamma Approximate UCL	0.149					95% KM (Percentile Bootstrap) UCL	0.115
1391					95% Adjusted Gamma UCL	0.152						
1392	**Note: DL/2 is not a recommended method.**											
1393												
1394												
1395	**Pyrene (mg/kg)**											
1396												
1397	**General Statistics**											
1398					Number of Valid Samples	30					Number of Detected Data	7
1399					Number of Unique Samples	7					Number of Non-Detect Data	23
1400					Number of Missing Values	1					Percent Non-Detects	76.67%
1401												
1402	**Raw Statistics**										**Log-transformed Statistics**	
1403					Minimum Detected	0.0023					Minimum Detected	-6.075
1404					Maximum Detected	0.085					Maximum Detected	-2.465
1405					Mean of Detected	0.032					Mean of Detected	-3.938
1406					SD of Detected	0.0287					SD of Detected	1.238
1407					Minimum Non-Detect	0.0028					Minimum Non-Detect	-5.878
1408					Maximum Non-Detect	2.1					Maximum Non-Detect	0.742
1409												
1410	Note: Data have multiple DLs - Use of KM Method is recommended										Number treated as Non-Detect	30
1411	For all methods (except KM, DL/2, and ROS Methods),										Number treated as Detected	0
1412	Observations < Largest ND are treated as NDs										Single DL Non-Detect Percentage	100.00%
1413												
1414	**UCL Statistics**											
1415	**Normal Distribution Test with Detected Values Only**										**Lognormal Distribution Test with Detected Values Only**	
1416					Shapiro Wilk Test Statistic	0.916					Shapiro Wilk Test Statistic	0.951
1417					5% Shapiro Wilk Critical Value	0.803					5% Shapiro Wilk Critical Value	0.803
1418	**Data appear Normal at 5% Significance Level**										**Data appear Lognormal at 5% Significance Level**	
1419												
1420	**Assuming Normal Distribution**										**Assuming Lognormal Distribution**	
1421					DL/2 Substitution Method						DL/2 Substitution Method	
1422					Mean	0.177					Mean	-2.473
1423					SD	0.221					SD	1.532
1424					95% DL/2 (t) UCL	0.246					95% H-Stat (DL/2) UCL	1.42
1425												
1426					Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method	
1427	**MLE method failed to converge properly**										Mean in Log Scale	-4.35
1428											SD in Log Scale	0.848
1429											Mean in Original Scale	0.0183
1430											SD in Original Scale	0.0176
1431											95% Percentile Bootstrap UCL	0.0237

1432											95% BCA Bootstrap UCL	0.0248
1433												
1434	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
1435					k star (bias corrected)	0.751	**Data appear Normal at 5% Significance Level**					
1436					Theta Star	0.0426						
1437					nu star	10.52						
1438												
1439					A-D Test Statistic	0.165	**Nonparametric Statistics**					
1440					5% A-D Critical Value	0.726					Kaplan-Meier (KM) Method	
1441					K-S Test Statistic	0.726					Mean	0.0247
1442					5% K-S Critical Value	0.319					SD	0.0253
1443	**Data appear Gamma Distributed at 5% Significance Level**										SE of Mean	0.00879
1444											95% KM (t) UCL	0.0397
1445	**Assuming Gamma Distribution**										95% KM (z) UCL	0.0392
1446					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.0397
1447					Minimum	0.0023					95% KM (bootstrap t) UCL	0.0479
1448					Maximum	0.085					95% KM (BCA) UCL	0.0437
1449					Mean	0.04					95% KM (Percentile Bootstrap) UCL	0.0417
1450					Median	0.0442					95% KM (Chebyshev) UCL	0.0631
1451					SD	0.0193					97.5% KM (Chebyshev) UCL	0.0796
1452					k star	2.685					99% KM (Chebyshev) UCL	0.112
1453					Theta star	0.0149						
1454					Nu star	161.1	**Potential UCLs to Use**					
1455					AppChi2	132.7					95% KM (t) UCL	0.0397
1456					95% Gamma Approximate UCL	0.0486					95% KM (Percentile Bootstrap) UCL	0.0417
1457					95% Adjusted Gamma UCL	0.0491						
1458	**Note: DL/2 is not a recommended method.**											
1459												
1460												
1461	**Aluminum (mg/kg)**											
1462												
1463	**General Statistics**											
1464					Number of Valid Samples	28					Number of Unique Samples	26
1465					Number of Missing Values	3						
1466												
1467	**Raw Statistics**						**Log-transformed Statistics**					
1468					Minimum	3100					Minimum of Log Data	8.039
1469					Maximum	38400					Maximum of Log Data	10.56
1470					Mean	16914					Mean of log Data	9.606
1471					Median	15150					SD of log Data	0.545
1472					SD	8646						
1473					Coefficient of Variation	0.511						
1474					Skewness	1.049						
1475												
1476	**Relevant UCL Statistics**											
1477	**Normal Distribution Test**						**Lognormal Distribution Test**					
1478					Shapiro Wilk Test Statistic	0.915					Shapiro Wilk Test Statistic	0.959
1479					Shapiro Wilk Critical Value	0.924					Shapiro Wilk Critical Value	0.924
1480	**Data not Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
1481												
1482	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
1483					95% Student's-t UCL	19697					95% H-UCL	21210
1484	**95% UCLs (Adjusted for Skewness)**										95% Chebyshev (MVUE) UCL	25198

1485				95% Adjusted-CLT UCL	19948					97.5% Chebyshev (MVUE) UCL	28693
1486				95% Modified-t UCL	19751					99% Chebyshev (MVUE) UCL	35557
1487											
1488				**Gamma Distribution Test**						**Data Distribution**	
1489				k star (bias corrected)	3.59					**Data appear Gamma Distributed at 5% Significance Level**	
1490				Theta Star	4711						
1491				nu star	201.1						
1492				Approximate Chi Square Value (.05)	169.3					**Nonparametric Statistics**	
1493				Adjusted Level of Significance	0.0404					95% CLT UCL	19602
1494				Adjusted Chi Square Value	167.5					95% Jackknife UCL	19697
1495										95% Standard Bootstrap UCL	19509
1496				Anderson-Darling Test Statistic	0.281					95% Bootstrap-t UCL	20105
1497				Anderson-Darling 5% Critical Value	0.75					95% Hall's Bootstrap UCL	20153
1498				Kolmogorov-Smirnov Test Statistic	0.102					95% Percentile Bootstrap UCL	19675
1499				Kolmogorov-Smirnov 5% Critical Value	0.166					95% BCA Bootstrap UCL	19961
1500				**Data appear Gamma Distributed at 5% Significance Level**						95% Chebyshev(Mean, Sd) UCL	24036
1501										97.5% Chebyshev(Mean, Sd) UCL	27118
1502				**Assuming Gamma Distribution**						99% Chebyshev(Mean, Sd) UCL	33172
1503				95% Approximate Gamma UCL	20093						
1504				95% Adjusted Gamma UCL	20309						
1505											
1506				**Potential UCL to Use**						Use 95% Approximate Gamma UCL	20093
1507											
1508											
1509	**Antimony (mg/kg)**										
1510											
1511					**General Statistics**						
1512				Number of Valid Samples	24					Number of Detected Data	18
1513				Number of Unique Samples	12					Number of Non-Detect Data	6
1514				Number of Missing Values	7					Percent Non-Detects	25.00%
1515											
1516				**Raw Statistics**						**Log-transformed Statistics**	
1517				Minimum Detected	0.33					Minimum Detected	-1.109
1518				Maximum Detected	2.5					Maximum Detected	0.916
1519				Mean of Detected	1.218					Mean of Detected	0.122
1520				SD of Detected	0.465					SD of Detected	0.427
1521				Minimum Non-Detect	0.38					Minimum Non-Detect	-0.968
1522				Maximum Non-Detect	0.636					Maximum Non-Detect	-0.453
1523											
1524	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect	7
1525	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected	17
1526	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage	29.17%
1527											
1528					**UCL Statistics**						
1529				**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**	
1530				Shapiro Wilk Test Statistic	0.928					Shapiro Wilk Test Statistic	0.902
1531				5% Shapiro Wilk Critical Value	0.897					5% Shapiro Wilk Critical Value	0.897
1532				**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**	
1533											
1534				**Assuming Normal Distribution**						**Assuming Lognormal Distribution**	
1535				DL/2 Substitution Method						DL/2 Substitution Method	
1536				Mean	0.973					Mean	-0.274
1537				SD	0.591					SD	0.795

1538				95% DL/2 (t) UCL	1.179				95% H-Stat (DL/2) UCL	1.108		
1539												
1540				Maximum Likelihood Estimate(MLE) Method					Log ROS Method			
1541				Mean	0.978				Mean in Log Scale	-0.0809		
1542				SD	0.594				SD in Log Scale	0.514		
1543				95% MLE (t) UCL	1.186				Mean in Original Scale	1.04		
1544				95% MLE (Tiku) UCL	1.199				SD in Original Scale	0.51		
1545									95% Percentile Bootstrap UCL	1.217		
1546									95% BCA Bootstrap UCL	1.237		
1547												
1548				**Gamma Distribution Test with Detected Values Only**					**Data Distribution Test with Detected Values Only**			
1549				k star (bias corrected)	5.656				**Data appear Normal at 5% Significance Level**			
1550				Theta Star	0.215							
1551				nu star	203.6							
1552												
1553				A-D Test Statistic	0.499				**Nonparametric Statistics**			
1554				5% A-D Critical Value	0.742				Kaplan-Meier (KM) Method			
1555				K-S Test Statistic	0.742				Mean	0.996		
1556				5% K-S Critical Value	0.204				SD	0.549		
1557				**Data appear Gamma Distributed at 5% Significance Level**					SE of Mean	0.115		
1558									95% KM (t) UCL	1.194		
1559				**Assuming Gamma Distribution**					95% KM (z) UCL	1.186		
1560				Gamma ROS Statistics using Extrapolated Data					95% KM (jackknife) UCL	1.185		
1561				Minimum	0.33				95% KM (bootstrap t) UCL	1.188		
1562				Maximum	2.5				95% KM (BCA) UCL	1.309		
1563				Mean	1.112				95% KM (Percentile Bootstrap) UCL	1.25		
1564				Median	1.05				95% KM (Chebyshev) UCL	1.499		
1565				SD	0.444				97.5% KM (Chebyshev) UCL	1.716		
1566				k star	6.041				99% KM (Chebyshev) UCL	2.143		
1567				Theta star	0.184							
1568				Nu star	290				**Potential UCLs to Use**			
1569				AppChi2	251.5				95% KM (t) UCL	1.194		
1570				95% Gamma Approximate UCL	1.282				95% KM (Percentile Bootstrap) UCL	1.25		
1571				95% Adjusted Gamma UCL	1.295							
1572	**Note: DL/2 is not a recommended method.**											
1573												
1574												
1575	**Arsenic (mg/kg)**											
1576												
1577						**General Statistics**							
1578				Number of Valid Samples	28				Number of Unique Samples	25		
1579				Number of Missing Values	3							
1580												
1581				**Raw Statistics**					**Log-transformed Statistics**			
1582				Minimum	1.03				Minimum of Log Data	0.0296		
1583				Maximum	13.7				Maximum of Log Data	2.617		
1584				Mean	4.463				Mean of log Data	1.261		
1585				Median	3.4				SD of log Data	0.684		
1586				SD	3.397							
1587				Coefficient of Variation	0.761							
1588				Skewness	1.596							
1589												
1590						**Relevant UCL Statistics**							

1591	**Normal Distribution Test**						**Lognormal Distribution Test**					
1592				Shapiro Wilk Test Statistic	0.808					Shapiro Wilk Test Statistic	0.965	
1593				Shapiro Wilk Critical Value	0.924					Shapiro Wilk Critical Value	0.924	
1594	**Data not Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
1595												
1596	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
1597				95% Student's-t UCL	5.557					95% H-UCL	5.887	
1598	**95% UCLs (Adjusted for Skewness)**									95% Chebyshev (MVUE) UCL	7.09	
1599				95% Adjusted-CLT UCL	5.726					97.5% Chebyshev (MVUE) UCL	8.248	
1600				95% Modified-t UCL	5.589					99% Chebyshev (MVUE) UCL	10.52	
1601												
1602	**Gamma Distribution Test**						**Data Distribution**					
1603				k star (bias corrected)	2.059		**Data appear Gamma Distributed at 5% Significance Level**					
1604				Theta Star	2.167							
1605				nu star	115.3							
1606				Approximate Chi Square Value (.05)	91.52		**Nonparametric Statistics**					
1607				Adjusted Level of Significance	0.0404					95% CLT UCL	5.519	
1608				Adjusted Chi Square Value	90.21					95% Jackknife UCL	5.557	
1609										95% Standard Bootstrap UCL	5.485	
1610				Anderson-Darling Test Statistic	0.598					95% Bootstrap-t UCL	5.991	
1611				Anderson-Darling 5% Critical Value	0.757					95% Hall's Bootstrap UCL	5.966	
1612				Kolmogorov-Smirnov Test Statistic	0.107					95% Percentile Bootstrap UCL	5.561	
1613				Kolmogorov-Smirnov 5% Critical Value	0.167					95% BCA Bootstrap UCL	5.771	
1614	**Data appear Gamma Distributed at 5% Significance Level**									95% Chebyshev(Mean, Sd) UCL	7.261	
1615										97.5% Chebyshev(Mean, Sd) UCL	8.472	
1616	**Assuming Gamma Distribution**									99% Chebyshev(Mean, Sd) UCL	10.85	
1617				95% Approximate Gamma UCL	5.623							
1618				95% Adjusted Gamma UCL	5.705							
1619												
1620	**Potential UCL to Use**									Use 95% Approximate Gamma UCL	5.623	
1621												
1622												
1623	**Barium (mg/kg)**											
1624												
1625	**General Statistics**											
1626				Number of Valid Samples	28					Number of Unique Samples	28	
1627				Number of Missing Values	3							
1628												
1629	**Raw Statistics**						**Log-transformed Statistics**					
1630				Minimum	12					Minimum of Log Data	2.485	
1631				Maximum	141					Maximum of Log Data	4.949	
1632				Mean	71.48					Mean of log Data	4.166	
1633				Median	68.55					SD of log Data	0.509	
1634				SD	29.37							
1635				Coefficient of Variation	0.411							
1636				Skewness	0.261							
1637												
1638	**Relevant UCL Statistics**											
1639	**Normal Distribution Test**						**Lognormal Distribution Test**					
1640				Shapiro Wilk Test Statistic	0.987					Shapiro Wilk Test Statistic	0.91	
1641				Shapiro Wilk Critical Value	0.924					Shapiro Wilk Critical Value	0.924	
1642	**Data appear Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**					
1643												

1644	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
1645				95% Student's-t UCL	80.93					95% H-UCL	88.86	
1646	**95% UCLs (Adjusted for Skewness)**									95% Chebyshev (MVUE) UCL	105	
1647				95% Adjusted-CLT UCL	80.9					97.5% Chebyshev (MVUE) UCL	118.8	
1648				95% Modified-t UCL	80.98					99% Chebyshev (MVUE) UCL	146	
1649												
1650	**Gamma Distribution Test**						**Data Distribution**					
1651				k star (bias corrected)	4.501		**Data appear Normal at 5% Significance Level**					
1652				Theta Star	15.88							
1653				nu star	252.1							
1654				Approximate Chi Square Value (.05)	216.3		**Nonparametric Statistics**					
1655				Adjusted Level of Significance	0.0404					95% CLT UCL	80.61	
1656				Adjusted Chi Square Value	214.3					95% Jackknife UCL	80.93	
1657										95% Standard Bootstrap UCL	80.51	
1658				Anderson-Darling Test Statistic	0.341					95% Bootstrap-t UCL	81.36	
1659				Anderson-Darling 5% Critical Value	0.749					95% Hall's Bootstrap UCL	81.37	
1660				Kolmogorov-Smirnov Test Statistic	0.129					95% Percentile Bootstrap UCL	80.34	
1661				Kolmogorov-Smirnov 5% Critical Value	0.166					95% BCA Bootstrap UCL	80.56	
1662	**Data appear Gamma Distributed at 5% Significance Level**									95% Chebyshev(Mean, Sd) UCL	95.67	
1663										97.5% Chebyshev(Mean, Sd) UCL	106.1	
1664	**Assuming Gamma Distribution**									99% Chebyshev(Mean, Sd) UCL	126.7	
1665				95% Approximate Gamma UCL	83.3							
1666				95% Adjusted Gamma UCL	84.09							
1667												
1668	**Potential UCL to Use**									Use 95% Student's-t UCL	80.93	
1669												
1670												
1671	**Beryllium (mg/kg)**											
1672												
1673	**General Statistics**											
1674				Number of Valid Samples	20					Number of Unique Samples	19	
1675				Number of Missing Values	11							
1676												
1677	**Raw Statistics**						**Log-transformed Statistics**					
1678				Minimum	0.13					Minimum of Log Data	-2.04	
1679				Maximum	0.9					Maximum of Log Data	-0.105	
1680				Mean	0.549					Mean of log Data	-0.698	
1681				Median	0.585					SD of log Data	0.506	
1682				SD	0.209							
1683				Coefficient of Variation	0.381							
1684				Skewness	-0.433							
1685												
1686	**Relevant UCL Statistics**											
1687	**Normal Distribution Test**						**Lognormal Distribution Test**					
1688				Shapiro Wilk Test Statistic	0.962					Shapiro Wilk Test Statistic	0.854	
1689				Shapiro Wilk Critical Value	0.905					Shapiro Wilk Critical Value	0.905	
1690	**Data appear Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**					
1691												
1692	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
1693				95% Student's-t UCL	0.63					95% H-UCL	0.714	
1694	**95% UCLs (Adjusted for Skewness)**									95% Chebyshev (MVUE) UCL	0.849	
1695				95% Adjusted-CLT UCL	0.621					97.5% Chebyshev (MVUE) UCL	0.973	
1696				95% Modified-t UCL	0.629					99% Chebyshev (MVUE) UCL	1.217	

1697												
1698	**Gamma Distribution Test**						**Data Distribution**					
1699					k star (bias corrected)	4.498	**Data appear Normal at 5% Significance Level**					
1700					Theta Star	0.122						
1701					nu star	179.9						
1702					Approximate Chi Square Value (.05)	149.9	**Nonparametric Statistics**					
1703					Adjusted Level of Significance	0.038				95% CLT UCL	0.626	
1704					Adjusted Chi Square Value	147.7				95% Jackknife UCL	0.63	
1705										95% Standard Bootstrap UCL	0.624	
1706					Anderson-Darling Test Statistic	0.802				95% Bootstrap-t UCL	0.624	
1707					Anderson-Darling 5% Critical Value	0.745				95% Hall's Bootstrap UCL	0.621	
1708					Kolmogorov-Smirnov Test Statistic	0.192				95% Percentile Bootstrap UCL	0.627	
1709					Kolmogorov-Smirnov 5% Critical Value	0.194				95% BCA Bootstrap UCL	0.622	
1710	**Data follow Appr. Gamma Distribution at 5% Significance Level**									95% Chebyshev(Mean, Sd) UCL	0.753	
1711										97.5% Chebyshev(Mean, Sd) UCL	0.841	
1712	**Assuming Gamma Distribution**									99% Chebyshev(Mean, Sd) UCL	1.014	
1713					95% Approximate Gamma UCL	0.659						
1714					95% Adjusted Gamma UCL	0.669						
1715												
1716	**Potential UCL to Use**									Use 95% Student's-t UCL	0.63	
1717												
1718												
1719	**Cadmium (mg/kg)**											
1720												
1721	**General Statistics**											
1722					Number of Valid Samples	26				Number of Detected Data	4	
1723					Number of Unique Samples	4				Number of Non-Detect Data	22	
1724					Number of Missing Values	5				Percent Non-Detects	84.62%	
1725												
1726	**Raw Statistics**						**Log-transformed Statistics**					
1727					Minimum Detected	0.12				Minimum Detected	-2.12	
1728					Maximum Detected	0.15				Maximum Detected	-1.897	
1729					Mean of Detected	0.135				Mean of Detected	-2.006	
1730					SD of Detected	0.0139				SD of Detected	0.103	
1731					Minimum Non-Detect	0.057				Minimum Non-Detect	-2.865	
1732					Maximum Non-Detect	1.6				Maximum Non-Detect	0.47	
1733												
1734	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect	26	
1735	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected	0	
1736	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage	100.00%	
1737												
1738	**UCL Statistics**											
1739	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
1740					Shapiro Wilk Test Statistic	0.939				Shapiro Wilk Test Statistic	0.939	
1741					5% Shapiro Wilk Critical Value	0.748				5% Shapiro Wilk Critical Value	0.748	
1742	**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
1743												
1744	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
1745					DL/2 Substitution Method					DL/2 Substitution Method		
1746					Mean	0.289				Mean	-1.793	
1747					SD	0.255				SD	1.177	
1748					95% DL/2 (t) UCL	0.374				95% H-Stat (DL/2) UCL	0.753	
1749												

1750					Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method	
1751					**MLE method failed to converge properly**						Mean in Log Scale	-2.236
1752											SD in Log Scale	0.143
1753											Mean in Original Scale	0.108
1754											SD in Original Scale	0.0163
1755											95% Percentile Bootstrap UCL	0.113
1756											95% BCA Bootstrap UCL	0.114
1757												
1758					**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**	
1759					k star (bias corrected)	31.58					**Data appear Normal at 5% Significance Level**	
1760					Theta Star	0.00428						
1761					nu star	252.6						
1762												
1763					A-D Test Statistic	0.305					**Nonparametric Statistics**	
1764					5% A-D Critical Value	0.657					Kaplan-Meier (KM) Method	
1765					K-S Test Statistic	0.657					Mean	0.125
1766					5% K-S Critical Value	0.394					SD	0.00961
1767					**Data appear Gamma Distributed at 5% Significance Level**						SE of Mean	0.00308
1768											95% KM (t) UCL	0.13
1769					**Assuming Gamma Distribution**						95% KM (z) UCL	0.13
1770					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.13
1771					Minimum	0					95% KM (bootstrap t) UCL	0.129
1772					Maximum	0.15					95% KM (BCA) UCL	0.15
1773					Mean	0.0208					95% KM (Percentile Bootstrap) UCL	0.145
1774					Median	0					95% KM (Chebyshev) UCL	0.138
1775					SD	0.0499					97.5% KM (Chebyshev) UCL	0.144
1776					k star	0.08					99% KM (Chebyshev) UCL	0.155
1777					Theta star	0.26						
1778					Nu star	4.159					**Potential UCLs to Use**	
1779					AppChi2	0.786					95% KM (t) UCL	0.13
1780					95% Gamma Approximate UCL	0.11					95% KM (Percentile Bootstrap) UCL	0.145
1781					95% Adjusted Gamma UCL	N/A						
1782	**Note: DL/2 is not a recommended method.**											
1783												
1784												
1785	**Calcium (mg/kg)**											
1786												
1787						**General Statistics**							
1788					Number of Valid Samples	27					Number of Unique Samples	27
1789					Number of Missing Values	4						
1790												
1791					**Raw Statistics**						**Log-transformed Statistics**	
1792					Minimum	25.4					Minimum of Log Data	3.235
1793					Maximum	237000					Maximum of Log Data	12.38
1794					Mean	57270					Mean of log Data	8.558
1795					Median	1720					SD of log Data	2.778
1796					SD	85746						
1797					Coefficient of Variation	1.497						
1798					Skewness	1.118						
1799												
1800						**Relevant UCL Statistics**							
1801					**Normal Distribution Test**						**Lognormal Distribution Test**	
1802					Shapiro Wilk Test Statistic	0.675					Shapiro Wilk Test Statistic	0.902

1803				Shapiro Wilk Critical Value	0.923				Shapiro Wilk Critical Value	0.923		
1804	**Data not Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**					
1805												
1806	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
1807				95% Student's-t UCL	85416					95% H-UCL	4233912	
1808	**95% UCLs (Adjusted for Skewness)**									95% Chebyshev (MVUE) UCL	599967	
1809				95% Adjusted-CLT UCL	88205					97.5% Chebyshev (MVUE) UCL	796224	
1810				95% Modified-t UCL	86007					99% Chebyshev (MVUE) UCL	1181731	
1811												
1812	**Gamma Distribution Test**						**Data Distribution**					
1813				k star (bias corrected)	0.282		**Data do not follow a Discernable Distribution (0.05)**					
1814				Theta Star	203190							
1815				nu star	15.22							
1816				Approximate Chi Square Value (.05)	7.415		**Nonparametric Statistics**					
1817				Adjusted Level of Significance	0.0401					95% CLT UCL	84413	
1818				Adjusted Chi Square Value	7.068					95% Jackknife UCL	85416	
1819										95% Standard Bootstrap UCL	83768	
1820				Anderson-Darling Test Statistic	1.717					95% Bootstrap-t UCL	89688	
1821				Anderson-Darling 5% Critical Value	0.858					95% Hall's Bootstrap UCL	83779	
1822				Kolmogorov-Smirnov Test Statistic	0.237					95% Percentile Bootstrap UCL	85065	
1823				Kolmogorov-Smirnov 5% Critical Value	0.183					95% BCA Bootstrap UCL	86372	
1824	**Data not Gamma Distributed at 5% Significance Level**									95% Chebyshev(Mean, Sd) UCL	129200	
1825										97.5% Chebyshev(Mean, Sd) UCL	160324	
1826	**Assuming Gamma Distribution**									99% Chebyshev(Mean, Sd) UCL	221460	
1827				95% Approximate Gamma UCL	117554							
1828				95% Adjusted Gamma UCL	123334							
1829												
1830	**Potential UCL to Use**									Use 99% Chebyshev (Mean, Sd) UCL	221460	
1831												
1832												
1833	**Chromium (mg/kg)**											
1834												
1835	**General Statistics**											
1836				Number of Valid Samples	28					Number of Unique Samples	28	
1837				Number of Missing Values	3							
1838												
1839	**Raw Statistics**						**Log-transformed Statistics**					
1840				Minimum	12.2					Minimum of Log Data	2.501	
1841				Maximum	513					Maximum of Log Data	6.24	
1842				Mean	62.28					Mean of log Data	3.612	
1843				Median	29.85					SD of log Data	0.84	
1844				SD	102.3							
1845				Coefficient of Variation	1.642							
1846				Skewness	3.688							
1847												
1848	**Relevant UCL Statistics**											
1849	**Normal Distribution Test**						**Lognormal Distribution Test**					
1850				Shapiro Wilk Test Statistic	0.463					Shapiro Wilk Test Statistic	0.8	
1851				Shapiro Wilk Critical Value	0.924					Shapiro Wilk Critical Value	0.924	
1852	**Data not Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**					
1853												
1854	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
1855				95% Student's-t UCL	95.19					95% H-UCL	76.15	

1856	**95% UCLs (Adjusted for Skewness)**									95% Chebyshev (MVUE) UCL	91.6
1857	95% Adjusted-CLT UCL	108.5								97.5% Chebyshev (MVUE) UCL	108.8
1858	95% Modified-t UCL	97.44								99% Chebyshev (MVUE) UCL	142.6
1859											
1860	**Gamma Distribution Test**									**Data Distribution**	
1861	k star (bias corrected)	1.005								**Data do not follow a Discernable Distribution (0.05)**	
1862	Theta Star	61.94									
1863	nu star	56.31									
1864	Approximate Chi Square Value (.05)	40.06								**Nonparametric Statistics**	
1865	Adjusted Level of Significance	0.0404								95% CLT UCL	94.06
1866	Adjusted Chi Square Value	39.21								95% Jackknife UCL	95.19
1867										95% Standard Bootstrap UCL	94.54
1868	Anderson-Darling Test Statistic	3.778								95% Bootstrap-t UCL	164.3
1869	Anderson-Darling 5% Critical Value	0.772								95% Hall's Bootstrap UCL	201.9
1870	Kolmogorov-Smirnov Test Statistic	0.33								95% Percentile Bootstrap UCL	97.46
1871	Kolmogorov-Smirnov 5% Critical Value	0.17								95% BCA Bootstrap UCL	113.6
1872	**Data not Gamma Distributed at 5% Significance Level**									95% Chebyshev(Mean, Sd) UCL	146.5
1873										97.5% Chebyshev(Mean, Sd) UCL	183
1874	**Assuming Gamma Distribution**									99% Chebyshev(Mean, Sd) UCL	254.6
1875	95% Approximate Gamma UCL	87.53									
1876	95% Adjusted Gamma UCL	89.42									
1877											
1878	**Potential UCL to Use**									Use 95% Chebyshev (Mean, Sd) UCL	146.5
1879											
1880											
1881	**Cobalt (mg/kg)**										
1882											
1883	**General Statistics**										
1884	Number of Valid Samples	28								Number of Unique Samples	25
1885	Number of Missing Values	3									
1886											
1887	**Raw Statistics**									**Log-transformed Statistics**	
1888	Minimum	1.3								Minimum of Log Data	0.262
1889	Maximum	44.9								Maximum of Log Data	3.804
1890	Mean	8.912								Mean of log Data	1.912
1891	Median	7.65								SD of log Data	0.754
1892	SD	8.175									
1893	Coefficient of Variation	0.917									
1894	Skewness	3.325									
1895											
1896	**Relevant UCL Statistics**										
1897	**Normal Distribution Test**									**Lognormal Distribution Test**	
1898	Shapiro Wilk Test Statistic	0.67								Shapiro Wilk Test Statistic	0.965
1899	Shapiro Wilk Critical Value	0.924								Shapiro Wilk Critical Value	0.924
1900	**Data not Normal at 5% Significance Level**									**Data appear Lognormal at 5% Significance Level**	
1901											
1902	**Assuming Normal Distribution**									**Assuming Lognormal Distribution**	
1903	95% Student's-t UCL	11.54								95% H-UCL	12.34
1904	**95% UCLs (Adjusted for Skewness)**									95% Chebyshev (MVUE) UCL	14.89
1905	95% Adjusted-CLT UCL	12.49								97.5% Chebyshev (MVUE) UCL	17.49
1906	95% Modified-t UCL	11.71								99% Chebyshev (MVUE) UCL	22.6
1907											
1908	**Gamma Distribution Test**									**Data Distribution**	

1909					k star (bias corrected)	1.78		**Data appear Gamma Distributed at 5% Significance Level**				
1910					Theta Star	5.007						
1911					nu star	99.67						
1912					Approximate Chi Square Value (.05)	77.64		**Nonparametric Statistics**				
1913					Adjusted Level of Significance	0.0404					95% CLT UCL	11.45
1914					Adjusted Chi Square Value	76.44					95% Jackknife UCL	11.54
1915											95% Standard Bootstrap UCL	11.5
1916					Anderson-Darling Test Statistic	0.469					95% Bootstrap-t UCL	13.64
1917					Anderson-Darling 5% Critical Value	0.758					95% Hall's Bootstrap UCL	22.99
1918					Kolmogorov-Smirnov Test Statistic	0.115					95% Percentile Bootstrap UCL	11.75
1919					Kolmogorov-Smirnov 5% Critical Value	0.168					95% BCA Bootstrap UCL	12.79
1920					**Data appear Gamma Distributed at 5% Significance Level**						95% Chebyshev(Mean, Sd) UCL	15.65
1921											97.5% Chebyshev(Mean, Sd) UCL	18.56
1922					**Assuming Gamma Distribution**						99% Chebyshev(Mean, Sd) UCL	24.28
1923					95% Approximate Gamma UCL	11.44						
1924					95% Adjusted Gamma UCL	11.62						
1925												
1926					**Potential UCL to Use**						Use 95% Approximate Gamma UCL	11.44
1927												
1928												
1929	**Copper (mg/kg)**											
1930												
1931					**General Statistics**							
1932					Number of Valid Samples	28					Number of Unique Samples	27
1933					Number of Missing Values	3						
1934												
1935					**Raw Statistics**						**Log-transformed Statistics**	
1936					Minimum	4					Minimum of Log Data	1.386
1937					Maximum	438					Maximum of Log Data	6.082
1938					Mean	50.51					Mean of log Data	3.077
1939					Median	14.15					SD of log Data	1.172
1940					SD	91.39						
1941					Coefficient of Variation	1.809						
1942					Skewness	3.312						
1943												
1944					**Relevant UCL Statistics**							
1945					**Normal Distribution Test**						**Lognormal Distribution Test**	
1946					Shapiro Wilk Test Statistic	0.533					Shapiro Wilk Test Statistic	0.905
1947					Shapiro Wilk Critical Value	0.924					Shapiro Wilk Critical Value	0.924
1948					**Data not Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**	
1949												
1950					**Assuming Normal Distribution**						**Assuming Lognormal Distribution**	
1951					95% Student's-t UCL	79.93					95% H-UCL	78.98
1952					**95% UCLs (Adjusted for Skewness)**						95% Chebyshev (MVUE) UCL	88.8
1953					95% Adjusted-CLT UCL	90.47					97.5% Chebyshev (MVUE) UCL	109.3
1954					95% Modified-t UCL	81.73					99% Chebyshev (MVUE) UCL	149.5
1955												
1956					**Gamma Distribution Test**						**Data Distribution**	
1957					k star (bias corrected)	0.66					**Data do not follow a Discernable Distribution (0.05)**	
1958					Theta Star	76.47						
1959					nu star	36.99						
1960					Approximate Chi Square Value (.05)	24.06					**Nonparametric Statistics**	
1961					Adjusted Level of Significance	0.0404					95% CLT UCL	78.92

1962					Adjusted Chi Square Value	23.42					95% Jackknife UCL	79.93
1963											95% Standard Bootstrap UCL	78.73
1964					Anderson-Darling Test Statistic	2.337					95% Bootstrap-t UCL	114
1965					Anderson-Darling 5% Critical Value	0.788					95% Hall's Bootstrap UCL	173.1
1966					Kolmogorov-Smirnov Test Statistic	0.25					95% Percentile Bootstrap UCL	80.44
1967					Kolmogorov-Smirnov 5% Critical Value	0.172					95% BCA Bootstrap UCL	93.82
1968					**Data not Gamma Distributed at 5% Significance Level**						95% Chebyshev(Mean, Sd) UCL	125.8
1969											97.5% Chebyshev(Mean, Sd) UCL	158.4
1970					**Assuming Gamma Distribution**						99% Chebyshev(Mean, Sd) UCL	222.4
1971					95% Approximate Gamma UCL	77.63						
1972					95% Adjusted Gamma UCL	79.77						
1973												
1974					**Potential UCL to Use**						Use 99% Chebyshev (Mean, Sd) UCL	222.4
1975												
1976												
1977	**Iron (mg/kg)**											
1978												
1979					**General Statistics**							
1980					Number of Valid Samples	28					Number of Unique Samples	27
1981					Number of Missing Values	3						
1982												
1983					**Raw Statistics**						**Log-transformed Statistics**	
1984					Minimum	3060					Minimum of Log Data	8.026
1985					Maximum	47200					Maximum of Log Data	10.76
1986					Mean	20151					Mean of log Data	9.749
1987					Median	20450					SD of log Data	0.655
1988					SD	10151						
1989					Coefficient of Variation	0.504						
1990					Skewness	0.609						
1991												
1992					**Relevant UCL Statistics**							
1993					**Normal Distribution Test**						**Lognormal Distribution Test**	
1994					Shapiro Wilk Test Statistic	0.952					Shapiro Wilk Test Statistic	0.874
1995					Shapiro Wilk Critical Value	0.924					Shapiro Wilk Critical Value	0.924
1996					**Data appear Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**	
1997												
1998					**Assuming Normal Distribution**						**Assuming Lognormal Distribution**	
1999					95% Student's-t UCL	23419					95% H-UCL	27598
2000					**95% UCLs (Adjusted for Skewness)**						95% Chebyshev (MVUE) UCL	33176
2001					95% Adjusted-CLT UCL	23543					97.5% Chebyshev (MVUE) UCL	38430
2002					95% Modified-t UCL	23456					99% Chebyshev (MVUE) UCL	48751
2003												
2004					**Gamma Distribution Test**						**Data Distribution**	
2005					k star (bias corrected)	2.913					**Data appear Normal at 5% Significance Level**	
2006					Theta Star	6919						
2007					nu star	163.1						
2008					Approximate Chi Square Value (.05)	134.6					**Nonparametric Statistics**	
2009					Adjusted Level of Significance	0.0404					95% CLT UCL	23307
2010					Adjusted Chi Square Value	133					95% Jackknife UCL	23419
2011											95% Standard Bootstrap UCL	23270
2012					Anderson-Darling Test Statistic	0.778					95% Bootstrap-t UCL	23748
2013					Anderson-Darling 5% Critical Value	0.753					95% Hall's Bootstrap UCL	24030
2014					Kolmogorov-Smirnov Test Statistic	0.175					95% Percentile Bootstrap UCL	23458

2015					Kolmogorov-Smirnov 5% Critical Value	0.166					95% BCA Bootstrap UCL	23455
2016					**Data not Gamma Distributed at 5% Significance Level**						95% Chebyshev(Mean, Sd) UCL	28514
2017											97.5% Chebyshev(Mean, Sd) UCL	32132
2018					**Assuming Gamma Distribution**						99% Chebyshev(Mean, Sd) UCL	39239
2019					95% Approximate Gamma UCL	24423						
2020					95% Adjusted Gamma UCL	24717						
2021												
2022					**Potential UCL to Use**						Use 95% Student's-t UCL	23419
2023												
2024												
2025	**Lead (mg/kg)**											
2026												
2027					**General Statistics**							
2028					Number of Valid Samples	28					Number of Unique Samples	28
2029					Number of Missing Values	3						
2030												
2031					**Raw Statistics**						**Log-transformed Statistics**	
2032					Minimum	6.6					Minimum of Log Data	1.887
2033					Maximum	585					Maximum of Log Data	6.372
2034					Mean	72.8					Mean of log Data	3.502
2035					Median	19.4					SD of log Data	1.197
2036					SD	117.6						
2037					Coefficient of Variation	1.616						
2038					Skewness	3.363						
2039												
2040					**Relevant UCL Statistics**							
2041					**Normal Distribution Test**						**Lognormal Distribution Test**	
2042					Shapiro Wilk Test Statistic	0.578					Shapiro Wilk Test Statistic	0.899
2043					Shapiro Wilk Critical Value	0.924					Shapiro Wilk Critical Value	0.924
2044					**Data not Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**	
2045												
2046					**Assuming Normal Distribution**						**Assuming Lognormal Distribution**	
2047					95% Student's-t UCL	110.7					95% H-UCL	127
2048					**95% UCLs (Adjusted for Skewness)**						95% Chebyshev (MVUE) UCL	141.5
2049					95% Adjusted-CLT UCL	124.5					97.5% Chebyshev (MVUE) UCL	174.5
2050					95% Modified-t UCL	113					99% Chebyshev (MVUE) UCL	239.4
2051												
2052					**Gamma Distribution Test**						**Data Distribution**	
2053					k star (bias corrected)	0.703					**Data do not follow a Discernable Distribution (0.05)**	
2054					Theta Star	103.6						
2055					nu star	39.36						
2056					Approximate Chi Square Value (.05)	25.99					**Nonparametric Statistics**	
2057					Adjusted Level of Significance	0.0404					95% CLT UCL	109.4
2058					Adjusted Chi Square Value	25.32					95% Jackknife UCL	110.7
2059											95% Standard Bootstrap UCL	108.7
2060					Anderson-Darling Test Statistic	1.923					95% Bootstrap-t UCL	145
2061					Anderson-Darling 5% Critical Value	0.784					95% Hall's Bootstrap UCL	255.4
2062					Kolmogorov-Smirnov Test Statistic	0.279					95% Percentile Bootstrap UCL	110.6
2063					Kolmogorov-Smirnov 5% Critical Value	0.172					95% BCA Bootstrap UCL	126.2
2064					**Data not Gamma Distributed at 5% Significance Level**						95% Chebyshev(Mean, Sd) UCL	169.7
2065											97.5% Chebyshev(Mean, Sd) UCL	211.6
2066					**Assuming Gamma Distribution**						99% Chebyshev(Mean, Sd) UCL	294
2067					95% Approximate Gamma UCL	110.3						

95% Adjusted Gamma UCL	113.2	
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL 294

Magnesium (mg/kg)

General Statistics

Number of Valid Samples	28	Number of Unique Samples	27
Number of Missing Values	3		

Raw Statistics		**Log-transformed Statistics**	
Minimum	312	Minimum of Log Data	5.743
Maximum	20200	Maximum of Log Data	9.913
Mean	2740	Mean of log Data	7.38
Median	1590	SD of log Data	0.946
SD	4061		
Coefficient of Variation	1.482		
Skewness	3.42		

Relevant UCL Statistics

Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.55	Shapiro Wilk Test Statistic	0.95
Shapiro Wilk Critical Value	0.924	Shapiro Wilk Critical Value	0.924
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	4047	95% H-UCL	3880
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	4615
95% Adjusted-CLT UCL	4532	97.5% Chebyshev (MVUE) UCL	5551
95% Modified-t UCL	4129	99% Chebyshev (MVUE) UCL	7389
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	0.979	**Data appear Lognormal at 5% Significance Level**	
Theta Star	2799		
nu star	54.81		
Approximate Chi Square Value (.05)	38.79	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0404	95% CLT UCL	4002
Adjusted Chi Square Value	37.96	95% Jackknife UCL	4047
		95% Standard Bootstrap UCL	3950
Anderson-Darling Test Statistic	1.559	95% Bootstrap-t UCL	5303
Anderson-Darling 5% Critical Value	0.772	95% Hall's Bootstrap UCL	7392
Kolmogorov-Smirnov Test Statistic	0.182	95% Percentile Bootstrap UCL	4084
Kolmogorov-Smirnov 5% Critical Value	0.17	95% BCA Bootstrap UCL	4487
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	6085
		97.5% Chebyshev(Mean, Sd) UCL	7532
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	10376
95% Approximate Gamma UCL	3870		
95% Adjusted Gamma UCL	3955		
Potential UCL to Use		Use 95% H-UCL	3880

	A	B	C	D	E	F	G	H	I	J	K	L
2121	**Manganese (mg/kg)**											
2122												
2123					**General Statistics**							
2124					Number of Valid Samples	28				Number of Unique Samples	26	
2125					Number of Missing Values	3						
2126												
2127					**Raw Statistics**					**Log-transformed Statistics**		
2128					Minimum	25.1				Minimum of Log Data	3.223	
2129					Maximum	1440				Maximum of Log Data	7.272	
2130					Mean	489.5				Mean of log Data	5.719	
2131					Median	373.5				SD of log Data	1.104	
2132					SD	422.5						
2133					Coefficient of Variation	0.863						
2134					Skewness	0.83						
2135												
2136					**Relevant UCL Statistics**							
2137					**Normal Distribution Test**					**Lognormal Distribution Test**		
2138					Shapiro Wilk Test Statistic	0.882				Shapiro Wilk Test Statistic	0.948	
2139					Shapiro Wilk Critical Value	0.924				Shapiro Wilk Critical Value	0.924	
2140					**Data not Normal at 5% Significance Level**					**Data appear Lognormal at 5% Significance Level**		
2141												
2142					**Assuming Normal Distribution**					**Assuming Lognormal Distribution**		
2143					95% Student's-t UCL	625.5				95% H-UCL	972.2	
2144					**95% UCLs (Adjusted for Skewness)**					95% Chebyshev (MVUE) UCL	1117	
2145					95% Adjusted-CLT UCL	634.2				97.5% Chebyshev (MVUE) UCL	1366	
2146					95% Modified-t UCL	627.5				99% Chebyshev (MVUE) UCL	1855	
2147												
2148					**Gamma Distribution Test**					**Data Distribution**		
2149					k star (bias corrected)	1.088				**Data appear Gamma Distributed at 5% Significance Level**		
2150					Theta Star	449.7						
2151					nu star	60.95						
2152					Approximate Chi Square Value (.05)	43.99				**Nonparametric Statistics**		
2153					Adjusted Level of Significance	0.0404				95% CLT UCL	620.8	
2154					Adjusted Chi Square Value	43.1				95% Jackknife UCL	625.5	
2155										95% Standard Bootstrap UCL	620.3	
2156					Anderson-Darling Test Statistic	0.419				95% Bootstrap-t UCL	642.7	
2157					Anderson-Darling 5% Critical Value	0.77				95% Hall's Bootstrap UCL	632	
2158					Kolmogorov-Smirnov Test Statistic	0.133				95% Percentile Bootstrap UCL	618.4	
2159					Kolmogorov-Smirnov 5% Critical Value	0.169				95% BCA Bootstrap UCL	637.2	
2160					**Data appear Gamma Distributed at 5% Significance Level**					95% Chebyshev(Mean, Sd) UCL	837.5	
2161										97.5% Chebyshev(Mean, Sd) UCL	988.1	
2162					**Assuming Gamma Distribution**					99% Chebyshev(Mean, Sd) UCL	1284	
2163					95% Approximate Gamma UCL	678.1						
2164					95% Adjusted Gamma UCL	692.1						
2165												
2166					**Potential UCL to Use**					Use 95% Approximate Gamma UCL	678.1	
2167												
2168												
2169	**Mercury (mg/kg)**											
2170												
2171					**General Statistics**							
2172					Number of Valid Samples	28				Number of Unique Samples	22	
2173					Number of Missing Values	3						

2174												
2175	**Raw Statistics**						**Log-transformed Statistics**					
2176					Minimum	0.012					Minimum of Log Data	-4.423
2177					Maximum	0.816					Maximum of Log Data	-0.203
2178					Mean	0.149					Mean of log Data	-2.28
2179					Median	0.105					SD of log Data	0.862
2180					SD	0.164						
2181					Coefficient of Variation	1.105						
2182					Skewness	3.04						
2183												
2184	**Relevant UCL Statistics**											
2185	**Normal Distribution Test**						**Lognormal Distribution Test**					
2186					Shapiro Wilk Test Statistic	0.642					Shapiro Wilk Test Statistic	0.973
2187					Shapiro Wilk Critical Value	0.924					Shapiro Wilk Critical Value	0.924
2188	**Data not Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
2189												
2190	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
2191					95% Student's-t UCL	0.202					95% H-UCL	0.217
2192	**95% UCLs (Adjusted for Skewness)**										95% Chebyshev (MVUE) UCL	0.261
2193					95% Adjusted-CLT UCL	0.219					97.5% Chebyshev (MVUE) UCL	0.311
2194					95% Modified-t UCL	0.205					99% Chebyshev (MVUE) UCL	0.409
2195												
2196	**Gamma Distribution Test**						**Data Distribution**					
2197					k star (bias corrected)	1.344	**Data Follow Appr. Gamma Distribution at 5% Significance Level**					
2198					Theta Star	0.111						
2199					nu star	75.26						
2200					Approximate Chi Square Value (.05)	56.28	**Nonparametric Statistics**					
2201					Adjusted Level of Significance	0.0404					95% CLT UCL	0.2
2202					Adjusted Chi Square Value	55.27					95% Jackknife UCL	0.202
2203											95% Standard Bootstrap UCL	0.198
2204					Anderson-Darling Test Statistic	0.764					95% Bootstrap-t UCL	0.263
2205					Anderson-Darling 5% Critical Value	0.763					95% Hall's Bootstrap UCL	0.464
2206					Kolmogorov-Smirnov Test Statistic	0.147					95% Percentile Bootstrap UCL	0.204
2207					Kolmogorov-Smirnov 5% Critical Value	0.168					95% BCA Bootstrap UCL	0.224
2208	**Data follow Appr. Gamma Distribution at 5% Significance Level**										95% Chebyshev(Mean, Sd) UCL	0.284
2209											97.5% Chebyshev(Mean, Sd) UCL	0.343
2210	**Assuming Gamma Distribution**										99% Chebyshev(Mean, Sd) UCL	0.458
2211					95% Approximate Gamma UCL	0.199						
2212					95% Adjusted Gamma UCL	0.203						
2213												
2214	**Potential UCL to Use**										Use 95% Approximate Gamma UCL	0.199
2215												
2216												
2217	**Nickel (mg/kg)**											
2218												
2219	**General Statistics**											
2220					Number of Valid Samples	28					Number of Unique Samples	28
2221					Number of Missing Values	3						
2222												
2223	**Raw Statistics**						**Log-transformed Statistics**					
2224					Minimum	4.1					Minimum of Log Data	1.411
2225					Maximum	181					Maximum of Log Data	5.198
2226					Mean	25.12					Mean of log Data	2.66

2227					Median	12.1					SD of log Data	0.885
2228					SD	42.18						
2229					Coefficient of Variation	1.679						
2230					Skewness	3.283						
2231												
2232					**Relevant UCL Statistics**							
2233					**Normal Distribution Test**						**Lognormal Distribution Test**	
2234					Shapiro Wilk Test Statistic	0.457					Shapiro Wilk Test Statistic	0.849
2235					Shapiro Wilk Critical Value	0.924					Shapiro Wilk Critical Value	0.924
2236					**Data not Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**	
2237												
2238					**Assuming Normal Distribution**						**Assuming Lognormal Distribution**	
2239					95% Student's-t UCL	38.7					95% H-UCL	31.44
2240					**95% UCLs (Adjusted for Skewness)**						95% Chebyshev (MVUE) UCL	37.68
2241					95% Adjusted-CLT UCL	43.51					97.5% Chebyshev (MVUE) UCL	45
2242					95% Modified-t UCL	39.52					99% Chebyshev (MVUE) UCL	59.38
2243												
2244					**Gamma Distribution Test**						**Data Distribution**	
2245					k star (bias corrected)	0.936					**Data do not follow a Discernable Distribution (0.05)**	
2246					Theta Star	26.83						
2247					nu star	52.42						
2248					Approximate Chi Square Value (.05)	36.79					**Nonparametric Statistics**	
2249					Adjusted Level of Significance	0.0404					95% CLT UCL	38.23
2250					Adjusted Chi Square Value	35.98					95% Jackknife UCL	38.7
2251											95% Standard Bootstrap UCL	37.95
2252					Anderson-Darling Test Statistic	3.191					95% Bootstrap-t UCL	80.63
2253					Anderson-Darling 5% Critical Value	0.773					95% Hall's Bootstrap UCL	96.35
2254					Kolmogorov-Smirnov Test Statistic	0.299					95% Percentile Bootstrap UCL	38.15
2255					Kolmogorov-Smirnov 5% Critical Value	0.17					95% BCA Bootstrap UCL	43.33
2256					**Data not Gamma Distributed at 5% Significance Level**						95% Chebyshev(Mean, Sd) UCL	59.87
2257											97.5% Chebyshev(Mean, Sd) UCL	74.9
2258					**Assuming Gamma Distribution**						99% Chebyshev(Mean, Sd) UCL	104.4
2259					95% Approximate Gamma UCL	35.79						
2260					95% Adjusted Gamma UCL	36.6						
2261												
2262					**Potential UCL to Use**						Use 95% Chebyshev (Mean, Sd) UCL	59.87
2263												
2264												
2265	**Potassium (mg/kg)**											
2266												
2267					**General Statistics**							
2268					Number of Valid Samples	14					Number of Unique Samples	14
2269					Number of Missing Values	17						
2270												
2271					**Raw Statistics**						**Log-transformed Statistics**	
2272					Minimum	465					Minimum of Log Data	6.142
2273					Maximum	2050					Maximum of Log Data	7.626
2274					Mean	1279					Mean of log Data	7.089
2275					Median	1320					SD of log Data	0.401
2276					SD	430.3						
2277					Coefficient of Variation	0.336						
2278					Skewness	-0.212						
2279												

2280	**Relevant UCL Statistics**											
2281	**Normal Distribution Test**						**Lognormal Distribution Test**					
2282	Shapiro Wilk Test Statistic				0.986		Shapiro Wilk Test Statistic					0.911
2283	Shapiro Wilk Critical Value				0.874		Shapiro Wilk Critical Value					0.874
2284	**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
2285												
2286	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
2287	95% Student's-t UCL				1483		95% H-UCL					1620
2288	**95% UCLs (Adjusted for Skewness)**						95% Chebyshev (MVUE) UCL					1905
2289	95% Adjusted-CLT UCL				1461		97.5% Chebyshev (MVUE) UCL					2170
2290	95% Modified-t UCL				1482		99% Chebyshev (MVUE) UCL					2692
2291												
2292	**Gamma Distribution Test**						**Data Distribution**					
2293	k star (bias corrected)				6.202		**Data appear Normal at 5% Significance Level**					
2294	Theta Star				206.3							
2295	nu star				173.6							
2296	Approximate Chi Square Value (.05)				144.2		**Nonparametric Statistics**					
2297	Adjusted Level of Significance				0.0312		95% CLT UCL					1468
2298	Adjusted Chi Square Value				140.6		95% Jackknife UCL					1483
2299							95% Standard Bootstrap UCL					1459
2300	Anderson-Darling Test Statistic				0.35		95% Bootstrap-t UCL					1474
2301	Anderson-Darling 5% Critical Value				0.736		95% Hall's Bootstrap UCL					1473
2302	Kolmogorov-Smirnov Test Statistic				0.144		95% Percentile Bootstrap UCL					1459
2303	Kolmogorov-Smirnov 5% Critical Value				0.229		95% BCA Bootstrap UCL					1454
2304	**Data appear Gamma Distributed at 5% Significance Level**						95% Chebyshev(Mean, Sd) UCL					1780
2305							97.5% Chebyshev(Mean, Sd) UCL					1997
2306	**Assuming Gamma Distribution**						99% Chebyshev(Mean, Sd) UCL					2423
2307	95% Approximate Gamma UCL				1541							
2308	95% Adjusted Gamma UCL				1580							
2309												
2310	**Potential UCL to Use**						Use 95% Student's-t UCL					1483
2311												
2312												
2313	**Selenium (mg.kg)**											
2314												
2315	**General Statistics**											
2316	Number of Valid Samples				27		Number of Detected Data					14
2317	Number of Unique Samples				13		Number of Non-Detect Data					13
2318	Number of Missing Values				4		Percent Non-Detects					48.15%
2319												
2320	**Raw Statistics**						**Log-transformed Statistics**					
2321	Minimum Detected				0.57		Minimum Detected					-0.562
2322	Maximum Detected				13.5		Maximum Detected					2.603
2323	Mean of Detected				6.519		Mean of Detected					1.725
2324	SD of Detected				2.847		SD of Detected					0.712
2325	Minimum Non-Detect				0.15		Minimum Non-Detect					-1.897
2326	Maximum Non-Detect				32		Maximum Non-Detect					3.466
2327												
2328	Note: Data have multiple DLs - Use of KM Method is recommended						Number treated as Non-Detect					27
2329	For all methods (except KM, DL/2, and ROS Methods),						Number treated as Detected					0
2330	Observations < Largest ND are treated as NDs						Single DL Non-Detect Percentage					100.00%
2331												
2332	**UCL Statistics**											

	A	B	C	D	E	F	G	H	I	J	K	L
2333	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
2334					Shapiro Wilk Test Statistic	0.865					Shapiro Wilk Test Statistic	0.65
2335					5% Shapiro Wilk Critical Value	0.874					5% Shapiro Wilk Critical Value	0.874
2336	**Data not Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**					
2337												
2338	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
2339					DL/2 Substitution Method						DL/2 Substitution Method	
2340					Mean	5.531					Mean	1.106
2341					SD	4.504					SD	1.399
2342					95% DL/2 (t) UCL	7.01					95% H-Stat (DL/2) UCL	11.13
2343												
2344					Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method	
2345	**MLE method failed to converge properly**										Mean in Log Scale	1.263
2346											SD in Log Scale	0.758
2347											Mean in Original Scale	4.502
2348											SD in Original Scale	3.006
2349											95% Percentile Bootstrap UCL	5.458
2350											95% BCA Bootstrap UCL	5.611
2351												
2352	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
2353					k star (bias corrected)	2.803	**Data do not follow a Discernable Distribution (0.05)**					
2354					Theta Star	2.326						
2355					nu star	78.48						
2356												
2357					A-D Test Statistic	1.393	**Nonparametric Statistics**					
2358					5% A-D Critical Value	0.741					Kaplan-Meier (KM) Method	
2359					K-S Test Statistic	0.741					Mean	4.356
2360					5% K-S Critical Value	0.23					SD	3.603
2361	**Data not Gamma Distributed at 5% Significance Level**										SE of Mean	0.797
2362											95% KM (t) UCL	5.715
2363	**Assuming Gamma Distribution**										95% KM (z) UCL	5.667
2364					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	6.036
2365					Minimum	0.57					95% KM (bootstrap t) UCL	5.708
2366					Maximum	13.5					95% KM (BCA) UCL	7.05
2367					Mean	6.453					95% KM (Percentile Bootstrap) UCL	6.694
2368					Median	5.8					95% KM (Chebyshev) UCL	7.83
2369					SD	2.491					97.5% KM (Chebyshev) UCL	9.334
2370					k star	4.413					99% KM (Chebyshev) UCL	12.29
2371					Theta star	1.462						
2372					Nu star	238.3	**Potential UCLs to Use**					
2373					AppChi2	203.6					95% KM (t) UCL	5.715
2374					95% Gamma Approximate UCL	7.554					95% KM (% Bootstrap) UCL	6.694
2375					95% Adjusted Gamma UCL	7.63						
2376	**Note: DL/2 is not a recommended method.**											
2377												
2378												
2379	**Silver (mg/kg)**											
2380												
2381	**General Statistics**											
2382					Number of Valid Samples	28					Number of Detected Data	8
2383					Number of Unique Samples	8					Number of Non-Detect Data	20
2384					Number of Missing Values	3					Percent Non-Detects	71.43%
2385												

	A	B	C	D	E	F	G	H	I	J	K	L
2386	**Raw Statistics**						**Log-transformed Statistics**					
2387					Minimum Detected	0.069					Minimum Detected	-2.674
2388					Maximum Detected	1.1					Maximum Detected	0.0953
2389					Mean of Detected	0.529					Mean of Detected	-1.048
2390					SD of Detected	0.388					SD of Detected	1.121
2391					Minimum Non-Detect	0.047					Minimum Non-Detect	-3.058
2392					Maximum Non-Detect	1.65					Maximum Non-Detect	0.501
2393												
2394	Note: Data have multiple DLs - Use of KM Method is recommended										Number treated as Non-Detect	28
2395	For all methods (except KM, DL/2, and ROS Methods),										Number treated as Detected	0
2396	Observations < Largest ND are treated as NDs										Single DL Non-Detect Percentage	100.00%
2397												
2398	**UCL Statistics**											
2399	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
2400					Shapiro Wilk Test Statistic	0.914					Shapiro Wilk Test Statistic	0.837
2401					5% Shapiro Wilk Critical Value	0.818					5% Shapiro Wilk Critical Value	0.818
2402	**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
2403												
2404	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
2405					DL/2 Substitution Method						DL/2 Substitution Method	
2406					Mean	0.24					Mean	-2.53
2407					SD	0.338					SD	1.487
2408					95% DL/2 (t) UCL	0.349					95% H-Stat (DL/2) UCL	0.421
2409												
2410					Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method	
2411	**MLE method failed to converge properly**										Mean in Log Scale	-3.416
2412											SD in Log Scale	1.72
2413											Mean in Original Scale	0.162
2414											SD in Original Scale	0.308
2415											95% Percentile Bootstrap UCL	0.265
2416											95% BCA Bootstrap UCL	0.293
2417												
2418	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
2419					k star (bias corrected)	0.931	**Data appear Normal at 5% Significance Level**					
2420					Theta Star	0.569						
2421					nu star	14.9						
2422												
2423					A-D Test Statistic	0.565	**Nonparametric Statistics**					
2424					5% A-D Critical Value	0.73	Kaplan-Meier (KM) Method					
2425					K-S Test Statistic	0.73					Mean	0.216
2426					5% K-S Critical Value	0.3					SD	0.297
2427	**Data appear Gamma Distributed at 5% Significance Level**										SE of Mean	0.0636
2428											95% KM (t) UCL	0.325
2429	**Assuming Gamma Distribution**										95% KM (z) UCL	0.321
2430					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.316
2431					Minimum	0.069					95% KM (bootstrap t) UCL	0.35
2432					Maximum	1.1					95% KM (BCA) UCL	0.62
2433					Mean	0.525					95% KM (Percentile Bootstrap) UCL	0.411
2434					Median	0.527					95% KM (Chebyshev) UCL	0.493
2435					SD	0.198					97.5% KM (Chebyshev) UCL	0.613
2436					k star	3.948					99% KM (Chebyshev) UCL	0.849
2437					Theta star	0.133						
2438					Nu star	221.1	**Potential UCLs to Use**					

2439					AppChi2	187.7					95% KM (t) UCL	0.325
2440					95% Gamma Approximate UCL	0.618					95% KM (Percentile Bootstrap) UCL	0.411
2441					95% Adjusted Gamma UCL	0.625						
2442	**Note: DL/2 is not a recommended method.**											
2443												
2444												
2445	**Sodium (mg/kg)**											
2446												
2447					**General Statistics**							
2448					Number of Valid Samples	28					Number of Detected Data	6
2449					Number of Unique Samples	6					Number of Non-Detect Data	22
2450					Number of Missing Values	3					Percent Non-Detects	78.57%
2451												
2452					**Raw Statistics**						**Log-transformed Statistics**	
2453					Minimum Detected	35.2					Minimum Detected	3.561
2454					Maximum Detected	78.7					Maximum Detected	4.366
2455					Mean of Detected	64.8					Mean of Detected	4.139
2456					SD of Detected	15.87					SD of Detected	0.298
2457					Minimum Non-Detect	4.2					Minimum Non-Detect	1.435
2458					Maximum Non-Detect	67					Maximum Non-Detect	4.205
2459												
2460	Note: Data have multiple DLs - Use of KM Method is recommended										Number treated as Non-Detect	25
2461	For all methods (except KM, DL/2, and ROS Methods),										Number treated as Detected	3
2462	Observations < Largest ND are treated as NDs										Single DL Non-Detect Percentage	89.29%
2463												
2464					**UCL Statistics**							
2465					**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**	
2466					Shapiro Wilk Test Statistic	0.844					Shapiro Wilk Test Statistic	0.771
2467					5% Shapiro Wilk Critical Value	0.788					5% Shapiro Wilk Critical Value	0.788
2468					**Data appear Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**	
2469												
2470					**Assuming Normal Distribution**						**Assuming Lognormal Distribution**	
2471					DL/2 Substitution Method						DL/2 Substitution Method	
2472					Mean	32.49					Mean	3.259
2473					SD	19.78					SD	0.806
2474					95% DL/2 (t) UCL	38.86					95% H-Stat (DL/2) UCL	49.43
2475												
2476					Maximum Likelihood Estimate(MLE) Method						Log ROS Method	
2477					Mean	47.74					Mean in Log Scale	3.513
2478					SD	15.76					SD in Log Scale	0.388
2479					95% MLE (t) UCL	52.81					Mean in Original Scale	36.44
2480					95% MLE (Tiku) UCL	67.79					SD in Original Scale	17.12
2481											95% Percentile Bootstrap UCL	41.82
2482											95% BCA Bootstrap UCL	42.89
2483												
2484					**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**	
2485					k star (bias corrected)	7.912					**Data appear Normal at 5% Significance Level**	
2486					Theta Star	8.19						
2487					nu star	94.95						
2488												
2489					A-D Test Statistic	0.641					**Nonparametric Statistics**	
2490					5% A-D Critical Value	0.698					Kaplan-Meier (KM) Method	
2491					K-S Test Statistic	0.698					Mean	41.88

2492				5% K-S Critical Value	0.332						SD	14.05
2493	**Data appear Gamma Distributed at 5% Significance Level**										SE of Mean	2.983
2494											95% KM (t) UCL	46.96
2495	**Assuming Gamma Distribution**										95% KM (z) UCL	46.79
2496				Gamma ROS Statistics using Extrapolated Data							95% KM (jackknife) UCL	57.05
2497				Minimum	35.2						95% KM (bootstrap t) UCL	45.65
2498				Maximum	78.7						95% KM (BCA) UCL	72.84
2499				Mean	64.83						95% KM (Percentile Bootstrap) UCL	66.82
2500				Median	65.6						95% KM (Chebyshev) UCL	54.88
2501				SD	8.159						97.5% KM (Chebyshev) UCL	60.51
2502				k star	48.3						99% KM (Chebyshev) UCL	71.56
2503				Theta star	1.342							
2504				Nu star	2705						**Potential UCLs to Use**	
2505				AppChi2	2585						95% KM (t) UCL	46.96
2506				95% Gamma Approximate UCL	67.83						95% KM (Percentile Bootstrap) UCL	66.82
2507				95% Adjusted Gamma UCL	68.02							
2508	**Note: DL/2 is not a recommended method.**											
2509												
2510												
2511	**Vanadium (mg/kg)**											
2512												
2513					**General Statistics**							
2514				Number of Valid Samples	28						Number of Unique Samples	28
2515				Number of Missing Values	3							
2516												
2517				**Raw Statistics**							**Log-transformed Statistics**	
2518				Minimum	6.4						Minimum of Log Data	1.856
2519				Maximum	84.2						Maximum of Log Data	4.433
2520				Mean	36.42						Mean of log Data	3.418
2521				Median	36.85						SD of log Data	0.656
2522				SD	20.29							
2523				Coefficient of Variation	0.557							
2524				Skewness	0.751							
2525												
2526					**Relevant UCL Statistics**							
2527				**Normal Distribution Test**							**Lognormal Distribution Test**	
2528				Shapiro Wilk Test Statistic	0.936						Shapiro Wilk Test Statistic	0.938
2529				Shapiro Wilk Critical Value	0.924						Shapiro Wilk Critical Value	0.924
2530				**Data appear Normal at 5% Significance Level**							**Data appear Lognormal at 5% Significance Level**	
2531												
2532				**Assuming Normal Distribution**							**Assuming Lognormal Distribution**	
2533				95% Student's-t UCL	42.95						95% H-UCL	49.23
2534				**95% UCLs (Adjusted for Skewness)**							95% Chebyshev (MVUE) UCL	59.18
2535				95% Adjusted-CLT UCL	43.31						97.5% Chebyshev (MVUE) UCL	68.56
2536				95% Modified-t UCL	43.04						99% Chebyshev (MVUE) UCL	87
2537												
2538				**Gamma Distribution Test**							**Data Distribution**	
2539				k star (bias corrected)	2.686						**Data appear Normal at 5% Significance Level**	
2540				Theta Star	13.56							
2541				nu star	150.4							
2542				Approximate Chi Square Value (.05)	123.1						**Nonparametric Statistics**	
2543				Adjusted Level of Significance	0.0404						95% CLT UCL	42.73
2544				Adjusted Chi Square Value	121.5						95% Jackknife UCL	42.95

2545											95% Standard Bootstrap UCL	42.58
2546					Anderson-Darling Test Statistic	0.306					95% Bootstrap-t UCL	43.54
2547					Anderson-Darling 5% Critical Value	0.754					95% Hall's Bootstrap UCL	43.76
2548					Kolmogorov-Smirnov Test Statistic	0.112					95% Percentile Bootstrap UCL	42.65
2549					Kolmogorov-Smirnov 5% Critical Value	0.167					95% BCA Bootstrap UCL	43.61
2550					**Data appear Gamma Distributed at 5% Significance Level**						95% Chebyshev(Mean, Sd) UCL	53.13
2551											97.5% Chebyshev(Mean, Sd) UCL	60.37
2552					**Assuming Gamma Distribution**						99% Chebyshev(Mean, Sd) UCL	74.57
2553					95% Approximate Gamma UCL	44.51						
2554					95% Adjusted Gamma UCL	45.07						
2555												
2556					**Potential UCL to Use**						Use 95% Student's-t UCL	42.95
2557												
2558												
2559	**Zinc (mg/kg)**											
2560												
2561					**General Statistics**							
2562					Number of Valid Samples	28					Number of Unique Samples	28
2563					Number of Missing Values	3						
2564												
2565					**Raw Statistics**						**Log-transformed Statistics**	
2566					Minimum	5					Minimum of Log Data	1.609
2567					Maximum	93.3					Maximum of Log Data	4.536
2568					Mean	41.28					Mean of log Data	3.549
2569					Median	33.55					SD of log Data	0.638
2570					SD	23.29						
2571					Coefficient of Variation	0.564						
2572					Skewness	0.751						
2573												
2574					**Relevant UCL Statistics**							
2575					**Normal Distribution Test**						**Lognormal Distribution Test**	
2576					Shapiro Wilk Test Statistic	0.918					Shapiro Wilk Test Statistic	0.94
2577					Shapiro Wilk Critical Value	0.924					Shapiro Wilk Critical Value	0.924
2578					**Data not Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**	
2579												
2580					**Assuming Normal Distribution**						**Assuming Lognormal Distribution**	
2581					95% Student's-t UCL	48.77					95% H-UCL	54.96
2582					**95% UCLs (Adjusted for Skewness)**						95% Chebyshev (MVUE) UCL	65.98
2583					95% Adjusted-CLT UCL	49.18					97.5% Chebyshev (MVUE) UCL	76.24
2584					95% Modified-t UCL	48.88					99% Chebyshev (MVUE) UCL	96.38
2585												
2586					**Gamma Distribution Test**						**Data Distribution**	
2587					k star (bias corrected)	2.772					**Data appear Gamma Distributed at 5% Significance Level**	
2588					Theta Star	14.89						
2589					nu star	155.2						
2590					Approximate Chi Square Value (.05)	127.4					**Nonparametric Statistics**	
2591					Adjusted Level of Significance	0.0404					95% CLT UCL	48.52
2592					Adjusted Chi Square Value	125.9					95% Jackknife UCL	48.77
2593											95% Standard Bootstrap UCL	48.5
2594					Anderson-Darling Test Statistic	0.332					95% Bootstrap-t UCL	49.52
2595					Anderson-Darling 5% Critical Value	0.753					95% Hall's Bootstrap UCL	48.88
2596					Kolmogorov-Smirnov Test Statistic	0.0984					95% Percentile Bootstrap UCL	48.69
2597					Kolmogorov-Smirnov 5% Critical Value	0.167					95% BCA Bootstrap UCL	48.96

	A	B	C	D	E	F	G	H	I	J	K	L
2598	**Data appear Gamma Distributed at 5% Significance Level**									95% Chebyshev(Mean, Sd) UCL		60.46
2599										97.5% Chebyshev(Mean, Sd) UCL		68.76
2600	**Assuming Gamma Distribution**									99% Chebyshev(Mean, Sd) UCL		85.07
2601					95% Approximate Gamma UCL	50.28						
2602					95% Adjusted Gamma UCL	50.91						
2603												
2604	**Potential UCL to Use**									Use 95% Approximate Gamma UCL		50.28
2605												

Appendix E-5

Exposure PointConcentrations

– ProUCL 4.0 Output –

SWMU 59

1				General UCL Statistics for Data Sets with Non-Detects								
2		User Selected Options										
3			From File	H:\Risk DB\Radford\SWMUs 50-59\ProUCL\59_ProUCL_input_SS.wst								
4			Full Precision	OFF								
5			Confidence Coefficient	95%								
6			Number of Bootstrap Operations	2000								
7												
8												
9	2-Methylnaphthalene (mg/kg)											
10												
11					General Statistics							
12				Number of Valid Samples	14			Number of Detected Data	4			
13				Number of Unique Samples	4			Number of Non-Detect Data	10			
14				Number of Missing Values	2			Percent Non-Detects	71.43%			
15												
16				Raw Statistics				Log-transformed Statistics				
17				Minimum Detected	0.0564			Minimum Detected	-2.875			
18				Maximum Detected	0.21			Maximum Detected	-1.561			
19				Mean of Detected	0.123			Mean of Detected	-2.202			
20				SD of Detected	0.0639			SD of Detected	0.537			
21				Minimum Non-Detect	0.049			Minimum Non-Detect	-3.016			
22				Maximum Non-Detect	0.3			Maximum Non-Detect	-1.204			
23												
24	Note: Data have multiple DLs - Use of KM Method is recommended							Number treated as Non-Detect	14			
25	For all methods (except KM, DL/2, and ROS Methods),							Number treated as Detected	0			
26	Observations < Largest ND are treated as NDs							Single DL Non-Detect Percentage	100.00%			
27												
28					UCL Statistics							
29				Normal Distribution Test with Detected Values Only				Lognormal Distribution Test with Detected Values Only				
30				Shapiro Wilk Test Statistic	0.925			Shapiro Wilk Test Statistic	0.958			
31				5% Shapiro Wilk Critical Value	0.748			5% Shapiro Wilk Critical Value	0.748			
32				Data appear Normal at 5% Significance Level				Data appear Lognormal at 5% Significance Level				
33												
34				Assuming Normal Distribution				Assuming Lognormal Distribution				
35				DL/2 Substitution Method				DL/2 Substitution Method				
36				Mean	0.127			Mean	-2.16			
37				SD	0.0451			SD	0.536			
38				95% DL/2 (t) UCL	0.149			95% H-Stat (DL/2) UCL	0.15			
39												
40				Maximum Likelihood Estimate(MLE) Method	N/A			Log ROS Method				
41				MLE method failed to converge properly				Mean in Log Scale	-2.465			
42								SD in Log Scale	0.494			
43								Mean in Original Scale	0.0951			
44								SD in Original Scale	0.048			
45								95% Percentile Bootstrap UCL	0.117			
46								95% BCA Bootstrap UCL	0.12			
47												
48				Gamma Distribution Test with Detected Values Only				Data Distribution Test with Detected Values Only				
49				k star (bias corrected)	1.401			Data appear Normal at 5% Significance Level				
50				Theta Star	0.0877							
51				nu star	11.2							
52												
53				A-D Test Statistic	0.298			Nonparametric Statistics				

54				5% A-D Critical Value	0.659					Kaplan-Meier (KM) Method		
55				K-S Test Statistic	0.659					Mean		0.105
56				5% K-S Critical Value	0.396					SD		0.0534
57				**Data appear Gamma Distributed at 5% Significance Level**						SE of Mean		0.0259
58										95% KM (t) UCL		0.151
59				**Assuming Gamma Distribution**						95% KM (z) UCL		0.148
60				Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL		0.153
61				Minimum	0.046					95% KM (bootstrap t) UCL		0.16
62				Maximum	0.213					95% KM (BCA) UCL		0.21
63				Mean	0.129					95% KM (Percentile Bootstrap) UCL		0.165
64				Median	0.121					95% KM (Chebyshev) UCL		0.218
65				SD	0.0534					97.5% KM (Chebyshev) UCL		0.267
66				k star	4.333					99% KM (Chebyshev) UCL		0.363
67				Theta star	0.0297							
68				Nu star	121.3					**Potential UCLs to Use**		
69				AppChi2	96.89					95% KM (t) UCL		0.151
70				95% Gamma Approximate UCL	0.161					95% KM (Percentile Bootstrap) UCL		0.165
71				95% Adjusted Gamma UCL	N/A							
72	**Note: DL/2 is not a recommended method.**											
73												
74												
75	**Anthracene (mg/kg)**											
76												
77							**General Statistics**					
78				Number of Valid Samples	15					Number of Detected Data		3
79				Number of Unique Samples	3					Number of Non-Detect Data		12
80				Number of Missing Values	1					Percent Non-Detects		80.00%
81												
82				**Raw Statistics**						**Log-transformed Statistics**		
83				Minimum Detected	0.0035					Minimum Detected		-5.655
84				Maximum Detected	0.02					Maximum Detected		-3.912
85				Mean of Detected	0.0093					Mean of Detected		-4.998
86				SD of Detected	0.00928					SD of Detected		0.947
87				Minimum Non-Detect	0.033					Minimum Non-Detect		-3.411
88				Maximum Non-Detect	0.3					Maximum Non-Detect		-1.204
89												
90	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect		15
91	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected		0
92	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage		100.00%
93												
94							**UCL Statistics**					
95				**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**		
96				Shapiro Wilk Test Statistic	0.791					Shapiro Wilk Test Statistic		0.847
97				5% Shapiro Wilk Critical Value	0.767					5% Shapiro Wilk Critical Value		0.767
98				**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**		
99												
100				**Assuming Normal Distribution**						**Assuming Lognormal Distribution**		
101				DL/2 Substitution Method						DL/2 Substitution Method		
102				Mean	0.106					Mean		-2.717
103				SD	0.0605					SD		1.353
104				95% DL/2 (t) UCL	0.133					95% H-Stat (DL/2) UCL		0.734
105												
106				Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method		

107	MLE method failed to converge properly									Mean in Log Scale		-4.998
108										SD in Log Scale		0.741
109										Mean in Original Scale		0.00871
110										SD in Original Scale		0.00661
111										95% Percentile Bootstrap UCL		0.0115
112										95% BCA Bootstrap UCL		0.0121
113												
114	Gamma Distribution Test with Detected Values Only									Data Distribution Test with Detected Values Only		
115				k star (bias corrected)		N/A				Data appear Normal at 5% Significance Level		
116				Theta Star		N/A						
117				nu star		N/A						
118												
119				A-D Test Statistic		0.5				Nonparametric Statistics		
120				5% A-D Critical Value		N/A				Kaplan-Meier (KM) Method		
121				K-S Test Statistic		N/A				Mean		0.0093
122				5% K-S Critical Value		N/A				SD		0.00757
123	Data not Gamma Distributed at 5% Significance Level									SE of Mean		0.00536
124										95% KM (t) UCL		0.0187
125	Assuming Gamma Distribution									95% KM (z) UCL		0.0181
126				Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL		0.0205
127				Minimum		N/A				95% KM (bootstrap t) UCL		0.142
128				Maximum		N/A				95% KM (BCA) UCL		0.02
129				Mean		N/A				95% KM (Percentile Bootstrap) UCL		0.02
130				Median		N/A				95% KM (Chebyshev) UCL		0.0326
131				SD		N/A				97.5% KM (Chebyshev) UCL		0.0428
132				k star		N/A				99% KM (Chebyshev) UCL		0.0626
133				Theta star		N/A						
134				Nu star		N/A				Potential UCLs to Use		
135				AppChi2		N/A				95% KM (t) UCL		0.0187
136				95% Gamma Approximate UCL		N/A				95% KM (Percentile Bootstrap) UCL		0.02
137				95% Adjusted Gamma UCL		N/A						
138	Note: DL/2 is not a recommended method.											
139												
140												
141	Aroclor 1254 (mg/kg)											
142												
143	General Statistics											
144				Number of Valid Samples		15				Number of Detected Data		5
145				Number of Unique Samples		5				Number of Non-Detect Data		10
146				Number of Missing Values		1				Percent Non-Detects		66.67%
147												
148	Raw Statistics									Log-transformed Statistics		
149				Minimum Detected		0.0111				Minimum Detected		-4.501
150				Maximum Detected		0.061				Maximum Detected		-2.797
151				Mean of Detected		0.0268				Mean of Detected		-3.798
152				SD of Detected		0.0198				SD of Detected		0.636
153				Minimum Non-Detect		0.017				Minimum Non-Detect		-4.075
154				Maximum Non-Detect		10				Maximum Non-Detect		2.303
155												
156	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect		15
157	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected		0
158	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage		100.00%
159												

	A	B	C	D	E	F	G	H	I	J	K	L
160	**UCL Statistics**											
161	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
162					Shapiro Wilk Test Statistic	0.792					Shapiro Wilk Test Statistic	0.943
163					5% Shapiro Wilk Critical Value	0.762					5% Shapiro Wilk Critical Value	0.762
164	**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
165												
166	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
167					DL/2 Substitution Method						DL/2 Substitution Method	
168					Mean	0.425					Mean	-3.561
169					SD	1.299					SD	1.901
170					95% DL/2 (t) UCL	1.016					95% H-Stat (DL/2) UCL	2.891
171												
172					Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method	
173	**MLE method failed to converge properly**										Mean in Log Scale	-4.143
174											SD in Log Scale	0.452
175											Mean in Original Scale	0.018
176											SD in Original Scale	0.0125
177											95% Percentile Bootstrap UCL	0.0238
178											95% BCA Bootstrap UCL	0.028
179												
180	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
181					k star (bias corrected)	1.319	**Data appear Normal at 5% Significance Level**					
182					Theta Star	0.0203						
183					nu star	13.19						
184												
185					A-D Test Statistic	0.387	**Nonparametric Statistics**					
186					5% A-D Critical Value	0.683					Kaplan-Meier (KM) Method	
187					K-S Test Statistic	0.683					Mean	0.019
188					5% K-S Critical Value	0.359					SD	0.0129
189	**Data appear Gamma Distributed at 5% Significance Level**										SE of Mean	0.00422
190											95% KM (t) UCL	0.0264
191	**Assuming Gamma Distribution**										95% KM (z) UCL	0.0259
192					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.0268
193					Minimum	0.0111					95% KM (bootstrap t) UCL	0.0319
194					Maximum	0.061					95% KM (BCA) UCL	0.0303
195					Mean	0.0248					95% KM (Percentile Bootstrap) UCL	0.028
196					Median	0.021					95% KM (Chebyshev) UCL	0.0374
197					SD	0.0114					97.5% KM (Chebyshev) UCL	0.0453
198					k star	5.632					99% KM (Chebyshev) UCL	0.061
199					Theta star	0.0044						
200					Nu star	168.9	**Potential UCLs to Use**					
201					AppChi2	139.9					95% KM (t) UCL	0.0264
202					95% Gamma Approximate UCL	0.0299					95% KM (Percentile Bootstrap) UCL	0.028
203					95% Adjusted Gamma UCL	0.0306						
204	**Note: DL/2 is not a recommended method.**											
205												
206												
207	**B(a)A (mg/kg)**											
208												
209	**General Statistics**											
210					Number of Valid Samples	15					Number of Detected Data	7
211					Number of Unique Samples	7					Number of Non-Detect Data	8
212					Number of Missing Values	1					Percent Non-Detects	53.33%

213												
214	**Raw Statistics**						**Log-transformed Statistics**					
215					Minimum Detected	0.012					Minimum Detected	-4.423
216					Maximum Detected	0.06					Maximum Detected	-2.813
217					Mean of Detected	0.0298					Mean of Detected	-3.659
218					SD of Detected	0.0172					SD of Detected	0.597
219					Minimum Non-Detect	0.056					Minimum Non-Detect	-2.882
220					Maximum Non-Detect	0.8					Maximum Non-Detect	-0.223
221												
222	Note: Data have multiple DLs - Use of KM Method is recommended										Number treated as Non-Detect	15
223	For all methods (except KM, DL/2, and ROS Methods),										Number treated as Detected	0
224	Observations < Largest ND are treated as NDs										Single DL Non-Detect Percentage	100.00%
225												
226	**UCL Statistics**											
227	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
228					Shapiro Wilk Test Statistic	0.918					Shapiro Wilk Test Statistic	0.944
229					5% Shapiro Wilk Critical Value	0.803					5% Shapiro Wilk Critical Value	0.803
230	**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
231												
232	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
233					DL/2 Substitution Method						DL/2 Substitution Method	
234					Mean	0.0578					Mean	-3.352
235					SD	0.0964					SD	0.835
236					95% DL/2 (t) UCL	0.102					95% H-Stat (DL/2) UCL	0.129
237												
238					Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method	
239	**MLE method failed to converge properly**										Mean in Log Scale	-3.731
240											SD in Log Scale	0.408
241											Mean in Original Scale	0.026
242											SD in Original Scale	0.012
243											95% Percentile Bootstrap UCL	0.0315
244											95% BCA Bootstrap UCL	0.0322
245												
246	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
247					k star (bias corrected)	2.122	**Data appear Normal at 5% Significance Level**					
248					Theta Star	0.0141						
249					nu star	29.71						
250												
251					A-D Test Statistic	0.259	**Nonparametric Statistics**					
252					5% A-D Critical Value	0.711	Kaplan-Meier (KM) Method					
253					K-S Test Statistic	0.711					Mean	0.0275
254					5% K-S Critical Value	0.313					SD	0.014
255	**Data appear Gamma Distributed at 5% Significance Level**										SE of Mean	0.00523
256											95% KM (t) UCL	0.0367
257	**Assuming Gamma Distribution**										95% KM (z) UCL	0.0361
258					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.0371
259					Minimum	0.012					95% KM (bootstrap t) UCL	0.0395
260					Maximum	0.06					95% KM (BCA) UCL	0.0362
261					Mean	0.0307					95% KM (Percentile Bootstrap) UCL	0.0363
262					Median	0.0312					95% KM (Chebyshev) UCL	0.0503
263					SD	0.0114					97.5% KM (Chebyshev) UCL	0.0602
264					k star	5.827					99% KM (Chebyshev) UCL	0.0796
265					Theta star	0.00527						

266					Nu star	174.8	**Potential UCLs to Use**					
267					AppChi2	145.2					95% KM (t) UCL	0.0367
268					95% Gamma Approximate UCL	0.0369					95% KM (Percentile Bootstrap) UCL	0.0363
269					95% Adjusted Gamma UCL	0.0378						
270	**Note: DL/2 is not a recommended method.**											
271												
272												
273	**B(a)P (mg/kg)**											
274												
275					**General Statistics**							
276					Number of Valid Samples	15					Number of Detected Data	7
277					Number of Unique Samples	7					Number of Non-Detect Data	8
278					Number of Missing Values	1					Percent Non-Detects	53.33%
279												
280					**Raw Statistics**		**Log-transformed Statistics**					
281					Minimum Detected	0.0066					Minimum Detected	-5.021
282					Maximum Detected	0.046					Maximum Detected	-3.079
283					Mean of Detected	0.0256					Mean of Detected	-3.891
284					SD of Detected	0.0156					SD of Detected	0.794
285					Minimum Non-Detect	0.056					Minimum Non-Detect	-2.882
286					Maximum Non-Detect	1					Maximum Non-Detect	0
287												
288	Note: Data have multiple DLs - Use of KM Method is recommended										Number treated as Non-Detect	15
289	For all methods (except KM, DL/2, and ROS Methods),										Number treated as Detected	0
290	Observations < Largest ND are treated as NDs										Single DL Non-Detect Percentage	100.00%
291												
292					**UCL Statistics**							
293					**Normal Distribution Test with Detected Values Only**		**Lognormal Distribution Test with Detected Values Only**					
294					Shapiro Wilk Test Statistic	0.924					Shapiro Wilk Test Statistic	0.866
295					5% Shapiro Wilk Critical Value	0.803					5% Shapiro Wilk Critical Value	0.803
296					**Data appear Normal at 5% Significance Level**		**Data appear Lognormal at 5% Significance Level**					
297												
298					**Assuming Normal Distribution**		**Assuming Lognormal Distribution**					
299					DL/2 Substitution Method						DL/2 Substitution Method	
300					Mean	0.0651					Mean	-3.419
301					SD	0.123					SD	1.024
302					95% DL/2 (t) UCL	0.121					95% H-Stat (DL/2) UCL	0.191
303												
304					Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method	
305					**MLE method failed to converge properly**						Mean in Log Scale	-3.891
306											SD in Log Scale	0.542
307											Mean in Original Scale	0.0231
308											SD in Original Scale	0.011
309											95% Percentile Bootstrap UCL	0.0278
310											95% BCA Bootstrap UCL	0.028
311												
312					**Gamma Distribution Test with Detected Values Only**		**Data Distribution Test with Detected Values Only**					
313					k star (bias corrected)	1.452	**Data appear Normal at 5% Significance Level**					
314					Theta Star	0.0176						
315					nu star	20.33						
316												
317					A-D Test Statistic	0.408	**Nonparametric Statistics**					
318					5% A-D Critical Value	0.714	Kaplan-Meier (KM) Method					

319				K-S Test Statistic	0.714					Mean	0.0256	
320				5% K-S Critical Value	0.315					SD	0.0144	
321				**Data appear Gamma Distributed at 5% Significance Level**						SE of Mean	0.00589	
322										95% KM (t) UCL	0.0359	
323				**Assuming Gamma Distribution**						95% KM (z) UCL	0.0353	
324				Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.0364	
325				Minimum	0.0066					95% KM (bootstrap t) UCL	0.0379	
326				Maximum	0.046					95% KM (BCA) UCL	0.0349	
327				Mean	0.026					95% KM (Percentile Bootstrap) UCL	0.0352	
328				Median	0.0265					95% KM (Chebyshev) UCL	0.0513	
329				SD	0.0108					97.5% KM (Chebyshev) UCL	0.0624	
330				k star	3.68					99% KM (Chebyshev) UCL	0.0842	
331				Theta star	0.00707							
332				Nu star	110.4					**Potential UCLs to Use**		
333				AppChi2	87.15					95% KM (t) UCL	0.0359	
334				95% Gamma Approximate UCL	0.033					95% KM (Percentile Bootstrap) UCL	0.0352	
335				95% Adjusted Gamma UCL	0.034							
336	**Note: DL/2 is not a recommended method.**											
337												
338												
339	**B(b)F (mg/kg)**											
340												
341				**General Statistics**								
342				Number of Valid Samples	15					Number of Detected Data	8	
343				Number of Unique Samples	8					Number of Non-Detect Data	7	
344				Number of Missing Values	1					Percent Non-Detects	46.67%	
345												
346				**Raw Statistics**						**Log-transformed Statistics**		
347				Minimum Detected	0.012					Minimum Detected	-4.423	
348				Maximum Detected	0.063					Maximum Detected	-2.765	
349				Mean of Detected	0.0307					Mean of Detected	-3.645	
350				SD of Detected	0.0182					SD of Detected	0.616	
351				Minimum Non-Detect	0.056					Minimum Non-Detect	-2.882	
352				Maximum Non-Detect	1					Maximum Non-Detect	0	
353												
354	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect	15	
355	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected	0	
356	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage	100.00%	
357												
358				**UCL Statistics**								
359				**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**		
360				Shapiro Wilk Test Statistic	0.913					Shapiro Wilk Test Statistic	0.938	
361				5% Shapiro Wilk Critical Value	0.818					5% Shapiro Wilk Critical Value	0.818	
362				**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**		
363												
364				**Assuming Normal Distribution**						**Assuming Lognormal Distribution**		
365				DL/2 Substitution Method						DL/2 Substitution Method		
366				Mean	0.0663					Mean	-3.323	
367				SD	0.122					SD	0.918	
368				95% DL/2 (t) UCL	0.122					95% H-Stat (DL/2) UCL	0.166	
369												
370				Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method		
371				**MLE method failed to converge properly**						Mean in Log Scale	-3.699	

372											SD in Log Scale	0.45
373											Mean in Original Scale	0.0273
374											SD in Original Scale	0.0136
375											95% Percentile Bootstrap UCL	0.0335
376											95% BCA Bootstrap UCL	0.0346
377												
378	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
379					k star (bias corrected)	2.126	**Data appear Normal at 5% Significance Level**					
380					Theta Star	0.0144						
381					nu star	34.01						
382												
383					A-D Test Statistic	0.285	**Nonparametric Statistics**					
384					5% A-D Critical Value	0.721	Kaplan-Meier (KM) Method					
385					K-S Test Statistic	0.721	Mean	0.0289				
386					5% K-S Critical Value	0.296	SD	0.0156				
387	**Data appear Gamma Distributed at 5% Significance Level**						SE of Mean	0.00555				
388							95% KM (t) UCL	0.0387				
389	**Assuming Gamma Distribution**						95% KM (z) UCL	0.038				
390	Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.039				
391					Minimum	0.012	95% KM (bootstrap t) UCL	0.0406				
392					Maximum	0.063	95% KM (BCA) UCL	0.0377				
393					Mean	0.0316	95% KM (Percentile Bootstrap) UCL	0.038				
394					Median	0.0324	95% KM (Chebyshev) UCL	0.0531				
395					SD	0.0131	97.5% KM (Chebyshev) UCL	0.0635				
396					k star	4.695	99% KM (Chebyshev) UCL	0.0841				
397					Theta star	0.00673						
398					Nu star	140.9	**Potential UCLs to Use**					
399					AppChi2	114.4	95% KM (t) UCL	0.0387				
400					95% Gamma Approximate UCL	0.0389	95% KM (Percentile Bootstrap) UCL	0.038				
401					95% Adjusted Gamma UCL	0.0399						
402	**Note: DL/2 is not a recommended method.**											
403												
404												
405	**B(ghi)P (mg/kg)**											
406												
407	**General Statistics**											
408					Number of Valid Samples	15	Number of Detected Data	6				
409					Number of Unique Samples	6	Number of Non-Detect Data	9				
410					Number of Missing Values	1	Percent Non-Detects	60.00%				
411												
412	**Raw Statistics**						**Log-transformed Statistics**					
413					Minimum Detected	0.0082	Minimum Detected	-4.804				
414					Maximum Detected	0.025	Maximum Detected	-3.689				
415					Mean of Detected	0.0176	Mean of Detected	-4.101				
416					SD of Detected	0.00621	SD of Detected	0.405				
417					Minimum Non-Detect	0.056	Minimum Non-Detect	-2.882				
418					Maximum Non-Detect	1	Maximum Non-Detect	0				
419												
420	Note: Data have multiple DLs - Use of KM Method is recommended						Number treated as Non-Detect	15				
421	For all methods (except KM, DL/2, and ROS Methods),						Number treated as Detected	0				
422	Observations < Largest ND are treated as NDs						Single DL Non-Detect Percentage	100.00%				
423												
424	**UCL Statistics**											

	A	B	C	D	E	F	G	H	I	J	K	L
425	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
426					Shapiro Wilk Test Statistic	0.949					Shapiro Wilk Test Statistic	0.905
427					5% Shapiro Wilk Critical Value	0.788					5% Shapiro Wilk Critical Value	0.788
428	**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
429												
430	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
431					DL/2 Substitution Method						DL/2 Substitution Method	
432					Mean	0.0621					Mean	-3.481
433					SD	0.124					SD	0.96
434					95% DL/2 (t) UCL	0.119					95% H-Stat (DL/2) UCL	0.177
435												
436					Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method	
437	**MLE method failed to converge properly**										Mean in Log Scale	-4.101
438											SD in Log Scale	0.268
439											Mean in Original Scale	0.0171
440											SD in Original Scale	0.0042
441											95% Percentile Bootstrap UCL	0.0188
442											95% BCA Bootstrap UCL	0.0188
443												
444	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
445					k star (bias corrected)	4.234	**Data appear Normal at 5% Significance Level**					
446					Theta Star	0.00416						
447					nu star	50.81						
448												
449					A-D Test Statistic	0.309	**Nonparametric Statistics**					
450					5% A-D Critical Value	0.698					Kaplan-Meier (KM) Method	
451					K-S Test Statistic	0.698					Mean	0.0176
452					5% K-S Critical Value	0.333					SD	0.00567
453	**Data appear Gamma Distributed at 5% Significance Level**										SE of Mean	0.00253
454											95% KM (t) UCL	0.0221
455	**Assuming Gamma Distribution**										95% KM (z) UCL	0.0218
456					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.0223
457					Minimum	0.0082					95% KM (bootstrap t) UCL	0.0223
458					Maximum	0.025					95% KM (BCA) UCL	0.0215
459					Mean	0.0181					95% KM (Percentile Bootstrap) UCL	0.0218
460					Median	0.0185					95% KM (Chebyshev) UCL	0.0287
461					SD	0.00417					97.5% KM (Chebyshev) UCL	0.0334
462					k star	13.52					99% KM (Chebyshev) UCL	0.0428
463					Theta star	0.00134						
464					Nu star	405.7	**Potential UCLs to Use**					
465					AppChi2	360					95% KM (t) UCL	0.0221
466					95% Gamma Approximate UCL	0.0203					95% KM (Percentile Bootstrap) UCL	0.0218
467					95% Adjusted Gamma UCL	0.0207						
468	**Note: DL/2 is not a recommended method.**											
469												
470												
471	**B(k)F (mg/kg)**											
472												
473	**General Statistics**											
474					Number of Valid Samples	15					Number of Detected Data	7
475					Number of Unique Samples	7					Number of Non-Detect Data	8
476					Number of Missing Values	1					Percent Non-Detects	53.33%
477												

	A	B	C	D	E	F	G	H	I	J	K	L
478	**Raw Statistics**						**Log-transformed Statistics**					
479					Minimum Detected	0.0023					Minimum Detected	-6.075
480					Maximum Detected	0.033					Maximum Detected	-3.411
481					Mean of Detected	0.0202					Mean of Detected	-4.292
482					SD of Detected	0.0132					SD of Detected	1.152
483					Minimum Non-Detect	0.056					Minimum Non-Detect	-2.882
484					Maximum Non-Detect	0.3					Maximum Non-Detect	-1.204
485												
486	Note: Data have multiple DLs - Use of KM Method is recommended										Number treated as Non-Detect	15
487	For all methods (except KM, DL/2, and ROS Methods),										Number treated as Detected	0
488	Observations < Largest ND are treated as NDs										Single DL Non-Detect Percentage	100.00%
489												
490	**UCL Statistics**											
491	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
492					Shapiro Wilk Test Statistic	0.846					Shapiro Wilk Test Statistic	0.758
493					5% Shapiro Wilk Critical Value	0.803					5% Shapiro Wilk Critical Value	0.803
494	**Data appear Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**					
495												
496	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
497					DL/2 Substitution Method						DL/2 Substitution Method	
498					Mean	0.0332					Mean	-3.775
499					SD	0.0338					SD	0.993
500					95% DL/2 (t) UCL	0.0485					95% H-Stat (DL/2) UCL	0.119
501												
502					Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method	
503	**MLE method failed to converge properly**										Mean in Log Scale	-4.292
504											SD in Log Scale	0.783
505											Mean in Original Scale	0.017
506											SD in Original Scale	0.00971
507											95% Percentile Bootstrap UCL	0.0212
508											95% BCA Bootstrap UCL	0.0217
509												
510	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
511					k star (bias corrected)	0.909	**Data appear Normal at 5% Significance Level**					
512					Theta Star	0.0222						
513					nu star	12.73						
514												
515					A-D Test Statistic	0.777	**Nonparametric Statistics**					
516					5% A-D Critical Value	0.722					Kaplan-Meier (KM) Method	
517					K-S Test Statistic	0.722					Mean	0.0202
518					5% K-S Critical Value	0.317					SD	0.0123
519	**Data follow Appr. Gamma Distribution at 5% Significance Level**										SE of Mean	0.00501
520											95% KM (t) UCL	0.029
521	**Assuming Gamma Distribution**										95% KM (z) UCL	0.0284
522					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.0294
523					Minimum	0.0023					95% KM (bootstrap t) UCL	0.0285
524					Maximum	0.033					95% KM (BCA) UCL	0.0282
525					Mean	0.02					95% KM (Percentile Bootstrap) UCL	0.0279
526					Median	0.0198					95% KM (Chebyshev) UCL	0.042
527					SD	0.00916					97.5% KM (Chebyshev) UCL	0.0515
528					k star	2.239					99% KM (Chebyshev) UCL	0.07
529					Theta star	0.00894						
530					Nu star	67.18	**Potential UCLs to Use**					

531				AppChi2	49.32					95% KM (t) UCL	0.029	
532				95% Gamma Approximate UCL	0.0273					95% KM (Percentile Bootstrap) UCL	0.0279	
533				95% Adjusted Gamma UCL	0.0284							
534	**Note: DL/2 is not a recommended method.**											
535												
536												
537	**Chrysene (mg/kg)**											
538												
539	**General Statistics**											
540				Number of Valid Samples	15					Number of Detected Data	8	
541				Number of Unique Samples	8					Number of Non-Detect Data	7	
542				Number of Missing Values	1					Percent Non-Detects	46.67%	
543												
544	**Raw Statistics**						**Log-transformed Statistics**					
545				Minimum Detected	0.016					Minimum Detected	-4.135	
546				Maximum Detected	0.057					Maximum Detected	-2.865	
547				Mean of Detected	0.0315					Mean of Detected	-3.554	
548				SD of Detected	0.0147					SD of Detected	0.471	
549				Minimum Non-Detect	0.056					Minimum Non-Detect	-2.882	
550				Maximum Non-Detect	0.6					Maximum Non-Detect	-0.511	
551												
552	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect	15	
553	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected	0	
554	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage	100.00%	
555												
556	**UCL Statistics**											
557	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
558				Shapiro Wilk Test Statistic	0.896					Shapiro Wilk Test Statistic	0.909	
559				5% Shapiro Wilk Critical Value	0.818					5% Shapiro Wilk Critical Value	0.818	
560	**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
561												
562	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
563				DL/2 Substitution Method						DL/2 Substitution Method		
564				Mean	0.0504					Mean	-3.346	
565				SD	0.0703					SD	0.706	
566				95% DL/2 (t) UCL	0.0823					95% H-Stat (DL/2) UCL	0.103	
567												
568				Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method		
569	**MLE method failed to converge properly**									Mean in Log Scale	-3.586	
570										SD in Log Scale	0.343	
571										Mean in Original Scale	0.0293	
572										SD in Original Scale	0.0108	
573										95% Percentile Bootstrap UCL	0.0338	
574										95% BCA Bootstrap UCL	0.0347	
575												
576	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
577				k star (bias corrected)	3.43		**Data appear Normal at 5% Significance Level**					
578				Theta Star	0.00918							
579				nu star	54.87							
580												
581				A-D Test Statistic	0.441		**Nonparametric Statistics**					
582				5% A-D Critical Value	0.719					Kaplan-Meier (KM) Method		
583				K-S Test Statistic	0.719					Mean	0.0305	

584				5% K-S Critical Value	0.295					SD	0.013
585	**Data appear Gamma Distributed at 5% Significance Level**									SE of Mean	0.00469
586										95% KM (t) UCL	0.0387
587	**Assuming Gamma Distribution**									95% KM (z) UCL	0.0382
588	Gamma ROS Statistics using Extrapolated Data									95% KM (jackknife) UCL	0.039
589				Minimum	0.016					95% KM (bootstrap t) UCL	0.0397
590				Maximum	0.057					95% KM (BCA) UCL	0.0386
591				Mean	0.0325					95% KM (Percentile Bootstrap) UCL	0.0384
592				Median	0.0344					95% KM (Chebyshev) UCL	0.0509
593				SD	0.0106					97.5% KM (Chebyshev) UCL	0.0598
594				k star	7.667					99% KM (Chebyshev) UCL	0.0771
595				Theta star	0.00425						
596				Nu star	230					**Potential UCLs to Use**	
597				AppChi2	195.9					95% KM (t) UCL	0.0387
598				95% Gamma Approximate UCL	0.0382					95% KM (Percentile Bootstrap) UCL	0.0384
599				95% Adjusted Gamma UCL	0.039						
600	**Note: DL/2 is not a recommended method.**										
601											
602											
603	**DB(ah)A (mg/kg)**										
604											
605					**General Statistics**						
606				Number of Valid Samples	15					Number of Detected Data	3
607				Number of Unique Samples	3					Number of Non-Detect Data	12
608				Number of Missing Values	1					Percent Non-Detects	80.00%
609											
610				**Raw Statistics**						**Log-transformed Statistics**	
611				Minimum Detected	0.0018					Minimum Detected	-6.32
612				Maximum Detected	0.0064					Maximum Detected	-5.051
613				Mean of Detected	0.00337					Mean of Detected	-5.879
614				SD of Detected	0.00263					SD of Detected	0.717
615				Minimum Non-Detect	0.056					Minimum Non-Detect	-2.882
616				Maximum Non-Detect	1					Maximum Non-Detect	0
617											
618	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect	15
619	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected	0
620	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage	100.00%
621											
622					**UCL Statistics**						
623	**Normal Distribution Test with Detected Values Only**									**Lognormal Distribution Test with Detected Values Only**	
624				Shapiro Wilk Test Statistic	0.766					Shapiro Wilk Test Statistic	0.782
625				5% Shapiro Wilk Critical Value	0.767					5% Shapiro Wilk Critical Value	0.767
626	**Data not Normal at 5% Significance Level**									**Data appear Lognormal at 5% Significance Level**	
627											
628	**Assuming Normal Distribution**									**Assuming Lognormal Distribution**	
629				DL/2 Substitution Method						DL/2 Substitution Method	
630				Mean	0.0602					Mean	-3.736
631				SD	0.124					SD	1.379
632				95% DL/2 (t) UCL	0.117					95% H-Stat (DL/2) UCL	0.273
633											
634				Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method	
635	**MLE method failed to converge properly**									Mean in Log Scale	-5.879
636										SD in Log Scale	0.449

637											Mean in Original Scale	0.00308
638											SD in Original Scale	0.00146
639											95% Percentile Bootstrap UCL	0.0037
640											95% BCA Bootstrap UCL	0.00377
641												
642				**Gamma Distribution Test with Detected Values Only**							**Data Distribution Test with Detected Values Only**	
643						k star (bias corrected)	N/A				**Data appear Lognormal at 5% Significance Level**	
644						Theta Star	N/A					
645						nu star	N/A					
646												
647						A-D Test Statistic	0.578				**Nonparametric Statistics**	
648						5% A-D Critical Value	N/A				Kaplan-Meier (KM) Method	
649						K-S Test Statistic	N/A				Mean	0.00337
650						5% K-S Critical Value	N/A				SD	0.00215
651				**Data not Gamma Distributed at 5% Significance Level**							SE of Mean	0.00152
652											95% KM (t) UCL	0.00604
653				**Assuming Gamma Distribution**							95% KM (z) UCL	0.00586
654						Gamma ROS Statistics using Extrapolated Data					95% KM (jackknife) UCL	0.00653
655						Minimum	N/A				95% KM (bootstrap t) UCL	0.0969
656						Maximum	N/A				95% KM (BCA) UCL	0.0064
657						Mean	N/A				95% KM (Percentile Bootstrap) UCL	0.0064
658						Median	N/A				95% KM (Chebyshev) UCL	0.00998
659						SD	N/A				97.5% KM (Chebyshev) UCL	0.0128
660						k star	N/A				99% KM (Chebyshev) UCL	0.0185
661						Theta star	N/A					
662						Nu star	N/A				**Potential UCLs to Use**	
663						AppChi2	N/A				95% KM (t) UCL	0.00604
664						95% Gamma Approximate UCL	N/A				95% KM (% Bootstrap) UCL	0.0064
665						95% Adjusted Gamma UCL	N/A					
666	**Note: DL/2 is not a recommended method.**											
667												
668												
669	**Dibenzofuran (mg/kg)**											
670												
671							**General Statistics**					
672						Number of Valid Samples	15				Number of Detected Data	3
673						Number of Unique Samples	3				Number of Non-Detect Data	12
674						Number of Missing Values	1				Percent Non-Detects	80.00%
675												
676				**Raw Statistics**							**Log-transformed Statistics**	
677						Minimum Detected	0.016				Minimum Detected	-4.135
678						Maximum Detected	0.032				Maximum Detected	-3.442
679						Mean of Detected	0.0237				Mean of Detected	-3.783
680						SD of Detected	0.00802				SD of Detected	0.347
681						Minimum Non-Detect	0.035				Minimum Non-Detect	-3.352
682						Maximum Non-Detect	0.2				Maximum Non-Detect	-1.609
683												
684	Note: Data have multiple DLs - Use of KM Method is recommended										Number treated as Non-Detect	15
685	For all methods (except KM, DL/2, and ROS Methods),										Number treated as Detected	0
686	Observations < Largest ND are treated as NDs										Single DL Non-Detect Percentage	100.00%
687												
688							**UCL Statistics**					
689				**Normal Distribution Test with Detected Values Only**							**Lognormal Distribution Test with Detected Values Only**	

690					Shapiro Wilk Test Statistic	0.995					Shapiro Wilk Test Statistic	0.999
691					5% Shapiro Wilk Critical Value	0.767					5% Shapiro Wilk Critical Value	0.767
692					**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**	
693												
694					**Assuming Normal Distribution**						**Assuming Lognormal Distribution**	
695					DL/2 Substitution Method						DL/2 Substitution Method	
696					Mean	0.0729					Mean	-2.782
697					SD	0.032					SD	0.682
698					95% DL/2 (t) UCL	0.0875					95% H-Stat (DL/2) UCL	0.143
699												
700					Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method	
701					**MLE method failed to converge properly**						Mean in Log Scale	-3.783
702											SD in Log Scale	0.308
703											Mean in Original Scale	0.0238
704											SD in Original Scale	0.00741
705											95% Percentile Bootstrap UCL	0.0269
706											95% BCA Bootstrap UCL	0.0273
707												
708					**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**	
709					k star (bias corrected)	N/A					**Data appear Normal at 5% Significance Level**	
710					Theta Star	N/A						
711					nu star	N/A						
712												
713					A-D Test Statistic	0.246					**Nonparametric Statistics**	
714					5% A-D Critical Value	N/A					Kaplan-Meier (KM) Method	
715					K-S Test Statistic	N/A					Mean	0.0237
716					5% K-S Critical Value	N/A					SD	0.00655
717					**Data not Gamma Distributed at 5% Significance Level**						SE of Mean	0.00463
718											95% KM (t) UCL	0.0318
719					**Assuming Gamma Distribution**						95% KM (z) UCL	0.0313
720					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.0333
721					Minimum	N/A					95% KM (bootstrap t) UCL	0.0368
722					Maximum	N/A					95% KM (BCA) UCL	0.032
723					Mean	N/A					95% KM (Percentile Bootstrap) UCL	0.032
724					Median	N/A					95% KM (Chebyshev) UCL	0.0439
725					SD	N/A					97.5% KM (Chebyshev) UCL	0.0526
726					k star	N/A					99% KM (Chebyshev) UCL	0.0697
727					Theta star	N/A						
728					Nu star	N/A					**Potential UCLs to Use**	
729					AppChi2	N/A					95% KM (t) UCL	0.0318
730					95% Gamma Approximate UCL	N/A					95% KM (Percentile Bootstrap) UCL	0.032
731					95% Adjusted Gamma UCL	N/A						
732	**Note: DL/2 is not a recommended method.**											
733												
734												
735	**Dieldrin (mg/kg)**											
736												
737					**General Statistics**							
738					Number of Valid Samples	15					Number of Detected Data	3
739					Number of Unique Samples	3					Number of Non-Detect Data	12
740					Number of Missing Values	1					Percent Non-Detects	80.00%
741												
742					**Raw Statistics**						**Log-transformed Statistics**	

743				Minimum Detected	0.00044					Minimum Detected	-7.729	
744				Maximum Detected	0.00452					Maximum Detected	-5.399	
745				Mean of Detected	0.0019					Mean of Detected	-6.774	
746				SD of Detected	0.00227					SD of Detected	1.22	
747				Minimum Non-Detect	0.00076					Minimum Non-Detect	-7.182	
748				Maximum Non-Detect	2					Maximum Non-Detect	0.693	
749												
750	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect	15	
751	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected	0	
752	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage	100.00%	
753												
754	**UCL Statistics**											
755	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
756				Shapiro Wilk Test Statistic	0.807					Shapiro Wilk Test Statistic	0.911	
757				5% Shapiro Wilk Critical Value	0.767					5% Shapiro Wilk Critical Value	0.767	
758	**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
759												
760	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
761				DL/2 Substitution Method						DL/2 Substitution Method		
762				Mean	0.0779					Mean	-6.267	
763				SD	0.258					SD	2.266	
764				95% DL/2 (t) UCL	0.195					95% H-Stat (DL/2) UCL	0.979	
765												
766				Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method		
767	**MLE method failed to converge properly**									Mean in Log Scale	-7.286	
768										SD in Log Scale	0.66	
769										Mean in Original Scale	0.0009063	
770										SD in Original Scale	0.00103	
771										95% Percentile Bootstrap UCL	0.00141	
772										95% BCA Bootstrap UCL	0.00172	
773												
774	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
775				k star (bias corrected)	N/A		**Data appear Normal at 5% Significance Level**					
776				Theta Star	N/A							
777				nu star	N/A							
778												
779				A-D Test Statistic	0.425		**Nonparametric Statistics**					
780				5% A-D Critical Value	N/A					Kaplan-Meier (KM) Method		
781				K-S Test Statistic	N/A					Mean	0.0008969	
782				5% K-S Critical Value	N/A					SD	0.00106	
783	**Data not Gamma Distributed at 5% Significance Level**									SE of Mean	0.0003763	
784										95% KM (t) UCL	0.00156	
785	**Assuming Gamma Distribution**									95% KM (z) UCL	0.00152	
786				Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.00153	
787				Minimum	N/A					95% KM (bootstrap t) UCL	0.00274	
788				Maximum	N/A					95% KM (BCA) UCL	0.00452	
789				Mean	N/A					95% KM (Percentile Bootstrap) UCL	0.00452	
790				Median	N/A					95% KM (Chebyshev) UCL	0.00254	
791				SD	N/A					97.5% KM (Chebyshev) UCL	0.00325	
792				k star	N/A					99% KM (Chebyshev) UCL	0.00464	
793				Theta star	N/A							
794				Nu star	N/A					**Potential UCLs to Use**		
795				AppChi2	N/A					95% KM (t) UCL	0.00156	

	A	B	C	D	E	F	G	H	I	J	K	L
796				95% Gamma Approximate UCL		N/A				95% KM (Percentile Bootstrap) UCL		0.00452
797				95% Adjusted Gamma UCL		N/A						
798	**Note: DL/2 is not a recommended method.**											
799												
800												
801	**Endrin ketone (mg/kg)**											
802												
803	**General Statistics**											
804				Number of Valid Samples		15				Number of Detected Data		3
805				Number of Unique Samples		3				Number of Non-Detect Data		12
806				Number of Missing Values		1				Percent Non-Detects		80.00%
807												
808	**Raw Statistics**						**Log-transformed Statistics**					
809				Minimum Detected		0.00166				Minimum Detected		-6.401
810				Maximum Detected		0.0029				Maximum Detected		-5.843
811				Mean of Detected		0.00233				Mean of Detected		-6.088
812				SD of Detected		0.000626				SD of Detected		0.285
813				Minimum Non-Detect		0.0034				Minimum Non-Detect		-5.684
814				Maximum Non-Detect		2				Maximum Non-Detect		0.693
815												
816	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect		15
817	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected		0
818	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage		100.00%
819												
820	**UCL Statistics**											
821	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
822				Shapiro Wilk Test Statistic		0.981				Shapiro Wilk Test Statistic		0.957
823				5% Shapiro Wilk Critical Value		0.767				5% Shapiro Wilk Critical Value		0.767
824	**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
825												
826	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
827				DL/2 Substitution Method						DL/2 Substitution Method		
828				Mean		0.086				Mean		-5.525
829				SD		0.262				SD		1.995
830				95% DL/2 (t) UCL		0.205				95% H-Stat (DL/2) UCL		0.339
831												
832				Maximum Likelihood Estimate(MLE) Method		N/A				Log ROS Method		
833	**MLE method failed to converge properly**									Mean in Log Scale		-6.088
834										SD in Log Scale		0.215
835										Mean in Original Scale		0.00232
836										SD in Original Scale		0.0004916
837										95% Percentile Bootstrap UCL		0.00252
838										95% BCA Bootstrap UCL		0.00253
839												
840	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
841				k star (bias corrected)		N/A	**Data appear Normal at 5% Significance Level**					
842				Theta Star		N/A						
843				nu star		N/A						
844												
845				A-D Test Statistic		0.294	**Nonparametric Statistics**					
846				5% A-D Critical Value		N/A				Kaplan-Meier (KM) Method		
847				K-S Test Statistic		N/A				Mean		0.00233
848				5% K-S Critical Value		N/A				SD		0.0005111

849	Data not Gamma Distributed at 5% Significance Level										SE of Mean	0.0003614
850											95% KM (t) UCL	0.00297
851	Assuming Gamma Distribution										95% KM (z) UCL	0.00292
852	Gamma ROS Statistics using Extrapolated Data										95% KM (jackknife) UCL	0.00308
853	Minimum	N/A									95% KM (bootstrap t) UCL	0.00302
854	Maximum	N/A									95% KM (BCA) UCL	N/A
855	Mean	N/A									95% KM (Percentile Bootstrap) UCL	0.0029
856	Median	N/A									95% KM (Chebyshev) UCL	0.00391
857	SD	N/A									97.5% KM (Chebyshev) UCL	0.00459
858	k star	N/A									99% KM (Chebyshev) UCL	0.00593
859	Theta star	N/A										
860	Nu star	N/A									Potential UCLs to Use	
861	AppChi2	N/A									95% KM (t) UCL	0.00297
862	95% Gamma Approximate UCL	N/A									95% KM (Percentile Bootstrap) UCL	0.0029
863	95% Adjusted Gamma UCL	N/A										
864	Warning: Recommended UCL exceeds the maximum observation											
865	Note: DL/2 is not a recommended method.											
866												
867												
868	Fluoranthene (mg/kg)											
869												
870	General Statistics											
871	Number of Valid Samples	15									Number of Detected Data	6
872	Number of Unique Samples	6									Number of Non-Detect Data	9
873	Number of Missing Values	1									Percent Non-Detects	60.00%
874												
875	Raw Statistics										Log-transformed Statistics	
876	Minimum Detected	0.013									Minimum Detected	-4.343
877	Maximum Detected	0.11									Maximum Detected	-2.207
878	Mean of Detected	0.0602									Mean of Detected	-3.105
879	SD of Detected	0.0405									SD of Detected	0.939
880	Minimum Non-Detect	0.068									Minimum Non-Detect	-2.688
881	Maximum Non-Detect	0.3									Maximum Non-Detect	-1.204
882												
883	Note: Data have multiple DLs - Use of KM Method is recommended										Number treated as Non-Detect	15
884	For all methods (except KM, DL/2, and ROS Methods),										Number treated as Detected	0
885	Observations < Largest ND are treated as NDs										Single DL Non-Detect Percentage	100.00%
886												
887	UCL Statistics											
888	Normal Distribution Test with Detected Values Only										Lognormal Distribution Test with Detected Values Only	
889	Shapiro Wilk Test Statistic	0.905									Shapiro Wilk Test Statistic	0.835
890	5% Shapiro Wilk Critical Value	0.788									5% Shapiro Wilk Critical Value	0.788
891	Data appear Normal at 5% Significance Level										Data appear Lognormal at 5% Significance Level	
892												
893	Assuming Normal Distribution										Assuming Lognormal Distribution	
894	DL/2 Substitution Method										DL/2 Substitution Method	
895	Mean	0.103									Mean	-2.5
896	SD	0.0519									SD	0.842
897	95% DL/2 (t) UCL	0.127									95% H-Stat (DL/2) UCL	0.356
898												
899	Maximum Likelihood Estimate(MLE) Method	N/A									Log ROS Method	
900	MLE method failed to converge properly										Mean in Log Scale	-3.213
901											SD in Log Scale	0.712

902											Mean in Original Scale	0.05
903											SD in Original Scale	0.0317
904											95% Percentile Bootstrap UCL	0.0633
905											95% BCA Bootstrap UCL	0.0643
906												
907	**Gamma Distribution Test with Detected Values Only**										**Data Distribution Test with Detected Values Only**	
908					k star (bias corrected)	1.032					**Data appear Normal at 5% Significance Level**	
909					Theta Star	0.0584						
910					nu star	12.38						
911												
912					A-D Test Statistic	0.494					**Nonparametric Statistics**	
913					5% A-D Critical Value	0.705					Kaplan-Meier (KM) Method	
914					K-S Test Statistic	0.705					Mean	0.0554
915					5% K-S Critical Value	0.336					SD	0.0369
916	**Data appear Gamma Distributed at 5% Significance Level**										SE of Mean	0.0156
917											95% KM (t) UCL	0.0828
918	**Assuming Gamma Distribution**										95% KM (z) UCL	0.081
919					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.0843
920					Minimum	0.013					95% KM (bootstrap t) UCL	0.0868
921					Maximum	0.11					95% KM (BCA) UCL	0.0834
922					Mean	0.0636					95% KM (Percentile Bootstrap) UCL	0.0826
923					Median	0.0691					95% KM (Chebyshev) UCL	0.123
924					SD	0.0324					97.5% KM (Chebyshev) UCL	0.153
925					k star	2.513					99% KM (Chebyshev) UCL	0.21
926					Theta star	0.0253						
927					Nu star	75.38					**Potential UCLs to Use**	
928					AppChi2	56.39					95% KM (t) UCL	0.0828
929					95% Gamma Approximate UCL	0.0851					95% KM (Percentile Bootstrap) UCL	0.0826
930					95% Adjusted Gamma UCL	0.0882						
931	**Note: DL/2 is not a recommended method.**											
932												
933												
934	**Fluorene (mg/kg)**											
935												
936	**General Statistics**											
937					Number of Valid Samples	15					Number of Detected Data	3
938					Number of Unique Samples	3					Number of Non-Detect Data	12
939					Number of Missing Values	1					Percent Non-Detects	80.00%
940												
941	**Raw Statistics**										**Log-transformed Statistics**	
942					Minimum Detected	0.0043					Minimum Detected	-5.449
943					Maximum Detected	0.0091					Maximum Detected	-4.699
944					Mean of Detected	0.0064					Mean of Detected	-5.1
945					SD of Detected	0.00246					SD of Detected	0.377
946					Minimum Non-Detect	0.033					Minimum Non-Detect	-3.411
947					Maximum Non-Detect	0.3					Maximum Non-Detect	-1.204
948												
949	Note: Data have multiple DLs - Use of KM Method is recommended										Number treated as Non-Detect	15
950	For all methods (except KM, DL/2, and ROS Methods),										Number treated as Detected	0
951	Observations < Largest ND are treated as NDs										Single DL Non-Detect Percentage	100.00%
952												
953	**UCL Statistics**											
954	**Normal Distribution Test with Detected Values Only**										**Lognormal Distribution Test with Detected Values Only**	

955					Shapiro Wilk Test Statistic	0.955					Shapiro Wilk Test Statistic	0.987
956					5% Shapiro Wilk Critical Value	0.767					5% Shapiro Wilk Critical Value	0.767
957					**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**	
958												
959					**Assuming Normal Distribution**						**Assuming Lognormal Distribution**	
960					DL/2 Substitution Method						DL/2 Substitution Method	
961					Mean	0.105					Mean	-2.737
962					SD	0.0614					SD	1.35
963					95% DL/2 (t) UCL	0.133					95% H-Stat (DL/2) UCL	0.776
964												
965					Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method	
966					**MLE method failed to converge properly**						Mean in Log Scale	-5.1
967											SD in Log Scale	0.313
968											Mean in Original Scale	0.00638
969											SD in Original Scale	0.00201
970											95% Percentile Bootstrap UCL	0.00722
971											95% BCA Bootstrap UCL	0.00725
972												
973					**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**	
974					k star (bias corrected)	N/A					**Data appear Normal at 5% Significance Level**	
975					Theta Star	N/A						
976					nu star	N/A						
977												
978					A-D Test Statistic	0.277					**Nonparametric Statistics**	
979					5% A-D Critical Value	N/A					Kaplan-Meier (KM) Method	
980					K-S Test Statistic	N/A					Mean	0.0064
981					5% K-S Critical Value	N/A					SD	0.002
982					**Data not Gamma Distributed at 5% Significance Level**						SE of Mean	0.00142
983											95% KM (t) UCL	0.0089
984					**Assuming Gamma Distribution**						95% KM (z) UCL	0.00873
985					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.00935
986					Minimum	N/A					95% KM (bootstrap t) UCL	0.0129
987					Maximum	N/A					95% KM (BCA) UCL	0.0091
988					Mean	N/A					95% KM (Percentile Bootstrap) UCL	0.0091
989					Median	N/A					95% KM (Chebyshev) UCL	0.0126
990					SD	N/A					97.5% KM (Chebyshev) UCL	0.0153
991					k star	N/A					99% KM (Chebyshev) UCL	0.0205
992					Theta star	N/A						
993					Nu star	N/A					**Potential UCLs to Use**	
994					AppChi2	N/A					95% KM (t) UCL	0.0089
995					95% Gamma Approximate UCL	N/A					95% KM (Percentile Bootstrap) UCL	0.0091
996					95% Adjusted Gamma UCL	N/A						
997	**Note: DL/2 is not a recommended method.**											
998												
999												
1000	**Heptachlor epoxide (mg/kg)**											
1001												
1002						**General Statistics**							
1003					Number of Valid Samples	15					Number of Detected Data	3
1004					Number of Unique Samples	3					Number of Non-Detect Data	12
1005					Number of Missing Values	1					Percent Non-Detects	80.00%
1006												
1007					**Raw Statistics**						**Log-transformed Statistics**	

1008					Minimum Detected	0.00046					Minimum Detected	-7.684
1009					Maximum Detected	0.00106					Maximum Detected	-6.849
1010					Mean of Detected	0.0006667					Mean of Detected	-7.392
1011					SD of Detected	0.0003408					SD of Detected	0.47
1012					Minimum Non-Detect	0.000777					Minimum Non-Detect	-7.16
1013					Maximum Non-Detect	2					Maximum Non-Detect	0.693
1014												
1015	Note: Data have multiple DLs - Use of KM Method is recommended										Number treated as Non-Detect	15
1016	For all methods (except KM, DL/2, and ROS Methods),										Number treated as Detected	0
1017	Observations < Largest ND are treated as NDs										Single DL Non-Detect Percentage	100.00%
1018												
1019	**UCL Statistics**											
1020	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
1021					Shapiro Wilk Test Statistic	0.775					Shapiro Wilk Test Statistic	0.788
1022					5% Shapiro Wilk Critical Value	0.767					5% Shapiro Wilk Critical Value	0.767
1023	**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
1024												
1025	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
1026					DL/2 Substitution Method						DL/2 Substitution Method	
1027					Mean	0.0783					Mean	-6.381
1028					SD	0.258					SD	2.277
1029					95% DL/2 (t) UCL	0.196					95% H-Stat (DL/2) UCL	0.621
1030												
1031					Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method	
1032	**MLE method failed to converge properly**										Mean in Log Scale	-7.499
1033											SD in Log Scale	0.264
1034											Mean in Original Scale	0.0005736
1035											SD in Original Scale	0.0001733
1036											95% Percentile Bootstrap UCL	0.0006534
1037											95% BCA Bootstrap UCL	0.0006685
1038												
1039	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
1040					k star (bias corrected)	N/A	**Data appear Normal at 5% Significance Level**					
1041					Theta Star	N/A						
1042					nu star	N/A						
1043												
1044					A-D Test Statistic	0.567	**Nonparametric Statistics**					
1045					5% A-D Critical Value	N/A					Kaplan-Meier (KM) Method	
1046					K-S Test Statistic	N/A					Mean	0.000588
1047					5% K-S Critical Value	N/A					SD	0.0002362
1048	**Data not Gamma Distributed at 5% Significance Level**										SE of Mean	0.0001295
1049											95% KM (t) UCL	0.000816
1050	**Assuming Gamma Distribution**										95% KM (z) UCL	0.0008009
1051					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.0008132
1052					Minimum	N/A					95% KM (bootstrap t) UCL	0.00377
1053					Maximum	N/A					95% KM (BCA) UCL	N/A
1054					Mean	N/A					95% KM (Percentile Bootstrap) UCL	0.00106
1055					Median	N/A					95% KM (Chebyshev) UCL	0.00115
1056					SD	N/A					97.5% KM (Chebyshev) UCL	0.0014
1057					k star	N/A					99% KM (Chebyshev) UCL	0.00188
1058					Theta star	N/A						
1059					Nu star	N/A	**Potential UCLs to Use**					
1060					AppChi2	N/A					95% KM (t) UCL	0.000816

1061				95% Gamma Approximate UCL		N/A				95% KM (Percentile Bootstrap) UCL		0.00106
1062				95% Adjusted Gamma UCL		N/A						
1063	**Note: DL/2 is not a recommended method.**											
1064												
1065												
1066	**I(123cd)P (mg/kg)**											
1067												
1068	**General Statistics**											
1069				Number of Valid Samples		15				Number of Detected Data		6
1070				Number of Unique Samples		6				Number of Non-Detect Data		9
1071				Number of Missing Values		1				Percent Non-Detects		60.00%
1072												
1073	**Raw Statistics**						**Log-transformed Statistics**					
1074				Minimum Detected		0.0036				Minimum Detected		-5.627
1075				Maximum Detected		0.0263				Maximum Detected		-3.638
1076				Mean of Detected		0.0156				Mean of Detected		-4.438
1077				SD of Detected		0.00987				SD of Detected		0.925
1078				Minimum Non-Detect		0.056				Minimum Non-Detect		-2.882
1079				Maximum Non-Detect		1				Maximum Non-Detect		0
1080												
1081	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect		15
1082	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected		0
1083	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage		100.00%
1084												
1085	**UCL Statistics**											
1086	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
1087				Shapiro Wilk Test Statistic		0.861				Shapiro Wilk Test Statistic		0.772
1088				5% Shapiro Wilk Critical Value		0.788				5% Shapiro Wilk Critical Value		0.788
1089	**Data appear Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**					
1090												
1091	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
1092				DL/2 Substitution Method						DL/2 Substitution Method		
1093				Mean		0.0627				Mean		-3.606
1094				SD		0.125				SD		1.188
1095				95% DL/2 (t) UCL		0.12				95% H-Stat (DL/2) UCL		0.263
1096												
1097				Maximum Likelihood Estimate(MLE) Method		N/A				Log ROS Method		
1098	**MLE method failed to converge properly**									Mean in Log Scale		-4.438
1099										SD in Log Scale		0.606
1100										Mean in Original Scale		0.0137
1101										SD in Original Scale		0.00685
1102										95% Percentile Bootstrap UCL		0.0166
1103										95% BCA Bootstrap UCL		0.0166
1104												
1105	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
1106				k star (bias corrected)		1.081	**Data appear Normal at 5% Significance Level**					
1107				Theta Star		0.0145						
1108				nu star		12.97						
1109												
1110				A-D Test Statistic		0.685	**Nonparametric Statistics**					
1111				5% A-D Critical Value		0.705				Kaplan-Meier (KM) Method		
1112				K-S Test Statistic		0.705				Mean		0.0156
1113				5% K-S Critical Value		0.336				SD		0.00901

1114	Data appear Gamma Distributed at 5% Significance Level										SE of Mean	0.00403
1115											95% KM (t) UCL	0.0227
1116	Assuming Gamma Distribution										95% KM (z) UCL	0.0223
1117	Gamma ROS Statistics using Extrapolated Data										95% KM (jackknife) UCL	0.0231
1118	Minimum	0.0036									95% KM (bootstrap t) UCL	0.0226
1119	Maximum	0.0263									95% KM (BCA) UCL	0.0216
1120	Mean	0.0157									95% KM (Percentile Bootstrap) UCL	0.0222
1121	Median	0.0157									95% KM (Chebyshev) UCL	0.0332
1122	SD	0.00668									97.5% KM (Chebyshev) UCL	0.0408
1123	k star	3.204									99% KM (Chebyshev) UCL	0.0557
1124	Theta star	0.00489										
1125	Nu star	96.11									Potential UCLs to Use	
1126	AppChi2	74.5									95% KM (t) UCL	0.0227
1127	95% Gamma Approximate UCL	0.0202									95% KM (Percentile Bootstrap) UCL	0.0222
1128	95% Adjusted Gamma UCL	0.0209										
1129	Note: DL/2 is not a recommended method.											
1130												
1131												
1132	Methoxychlor (mg/kg)											
1133												
1134	General Statistics											
1135	Number of Valid Samples	15									Number of Detected Data	3
1136	Number of Unique Samples	3									Number of Non-Detect Data	12
1137	Number of Missing Values	1									Percent Non-Detects	80.00%
1138												
1139	Raw Statistics										Log-transformed Statistics	
1140	Minimum Detected	0.00282									Minimum Detected	-5.871
1141	Maximum Detected	0.0102									Maximum Detected	-4.585
1142	Mean of Detected	0.00767									Mean of Detected	-5.021
1143	SD of Detected	0.0042									SD of Detected	0.736
1144	Minimum Non-Detect	0.0035									Minimum Non-Detect	-5.655
1145	Maximum Non-Detect	2									Maximum Non-Detect	0.693
1146												
1147	Note: Data have multiple DLs - Use of KM Method is recommended										Number treated as Non-Detect	15
1148	For all methods (except KM, DL/2, and ROS Methods),										Number treated as Detected	0
1149	Observations < Largest ND are treated as NDs										Single DL Non-Detect Percentage	100.00%
1150												
1151	UCL Statistics											
1152	Normal Distribution Test with Detected Values Only										Lognormal Distribution Test with Detected Values Only	
1153	Shapiro Wilk Test Statistic	0.771									Shapiro Wilk Test Statistic	0.762
1154	5% Shapiro Wilk Critical Value	0.767									5% Shapiro Wilk Critical Value	0.767
1155	Data appear Normal at 5% Significance Level										Data not Lognormal at 5% Significance Level	
1156												
1157	Assuming Normal Distribution										Assuming Lognormal Distribution	
1158	DL/2 Substitution Method										DL/2 Substitution Method	
1159	Mean	0.0861									Mean	-4.469
1160	SD	0.256									SD	1.761
1161	95% DL/2 (t) UCL	0.203									95% H-Stat (DL/2) UCL	0.38
1162												
1163	Maximum Likelihood Estimate(MLE) Method	N/A									Log ROS Method	
1164	MLE method failed to converge properly										Mean in Log Scale	-5.503
1165											SD in Log Scale	0.431
1166											Mean in Original Scale	0.0045

1167											SD in Original Scale	0.00241
1168											95% Percentile Bootstrap UCL	0.00559
1169											95% BCA Bootstrap UCL	0.00596
1170												
1171	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
1172				k star (bias corrected)	N/A		**Data appear Normal at 5% Significance Level**					
1173				Theta Star	N/A							
1174				nu star	N/A							
1175												
1176				A-D Test Statistic	0.598		**Nonparametric Statistics**					
1177				5% A-D Critical Value	N/A						Kaplan-Meier (KM) Method	
1178				K-S Test Statistic	N/A						Mean	0.0049
1179				5% K-S Critical Value	N/A						SD	0.00329
1180	**Data not Gamma Distributed at 5% Significance Level**										SE of Mean	0.00152
1181											95% KM (t) UCL	0.00758
1182	**Assuming Gamma Distribution**										95% KM (z) UCL	0.0074
1183				Gamma ROS Statistics using Extrapolated Data							95% KM (jackknife) UCL	0.00924
1184				Minimum	N/A						95% KM (bootstrap t) UCL	0.00666
1185				Maximum	N/A						95% KM (BCA) UCL	0.0102
1186				Mean	N/A						95% KM (Percentile Bootstrap) UCL	0.0102
1187				Median	N/A						95% KM (Chebyshev) UCL	0.0115
1188				SD	N/A						97.5% KM (Chebyshev) UCL	0.0144
1189				k star	N/A						99% KM (Chebyshev) UCL	0.02
1190				Theta star	N/A							
1191				Nu star	N/A		**Potential UCLs to Use**					
1192				AppChi2	N/A						95% KM (t) UCL	0.00758
1193				95% Gamma Approximate UCL	N/A						95% KM (Percentile Bootstrap) UCL	0.0102
1194				95% Adjusted Gamma UCL	N/A							
1195	**Note: DL/2 is not a recommended method.**											
1196												
1197												
1198	**Naphthalene (mg/kg)**											
1199												
1200	**General Statistics**											
1201				Number of Valid Samples	14						Number of Detected Data	3
1202				Number of Unique Samples	3						Number of Non-Detect Data	11
1203				Number of Missing Values	2						Percent Non-Detects	78.57%
1204												
1205	**Raw Statistics**						**Log-transformed Statistics**					
1206				Minimum Detected	0.06						Minimum Detected	-2.813
1207				Maximum Detected	0.13						Maximum Detected	-2.04
1208				Mean of Detected	0.0907						Mean of Detected	-2.451
1209				SD of Detected	0.0358						SD of Detected	0.389
1210				Minimum Non-Detect	0.037						Minimum Non-Detect	-3.297
1211				Maximum Non-Detect	0.3						Maximum Non-Detect	-1.204
1212												
1213	Note: Data have multiple DLs - Use of KM Method is recommended										Number treated as Non-Detect	14
1214	For all methods (except KM, DL/2, and ROS Methods),										Number treated as Detected	0
1215	Observations < Largest ND are treated as NDs										Single DL Non-Detect Percentage	100.00%
1216												
1217	**UCL Statistics**											
1218	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
1219				Shapiro Wilk Test Statistic	0.957						Shapiro Wilk Test Statistic	0.989

1220				5% Shapiro Wilk Critical Value	0.767					5% Shapiro Wilk Critical Value	0.767
1221	**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
1222												
1223	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
1224				DL/2 Substitution Method						DL/2 Substitution Method		
1225				Mean	0.121					Mean	-2.216	
1226				SD	0.0407					SD	0.579	
1227				95% DL/2 (t) UCL	0.14					95% H-Stat (DL/2) UCL	0.155	
1228												
1229				Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method		
1230	**MLE method failed to converge properly**									Mean in Log Scale	-2.716	
1231										SD in Log Scale	0.471	
1232										Mean in Original Scale	0.073	
1233										SD in Original Scale	0.033	
1234										95% Percentile Bootstrap UCL	0.0871	
1235										95% BCA Bootstrap UCL	0.0879	
1236												
1237	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
1238				k star (bias corrected)	N/A		**Data appear Normal at 5% Significance Level**					
1239				Theta Star	N/A							
1240				nu star	N/A							
1241												
1242				A-D Test Statistic	0.273		**Nonparametric Statistics**					
1243				5% A-D Critical Value	N/A					Kaplan-Meier (KM) Method		
1244				K-S Test Statistic	N/A					Mean	0.0831	
1245				5% K-S Critical Value	N/A					SD	0.0286	
1246	**Data not Gamma Distributed at 5% Significance Level**									SE of Mean	0.0175	
1247										95% KM (t) UCL	0.114	
1248	**Assuming Gamma Distribution**									95% KM (z) UCL	0.112	
1249				Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.115	
1250				Minimum	N/A					95% KM (bootstrap t) UCL	0.145	
1251				Maximum	N/A					95% KM (BCA) UCL	N/A	
1252				Mean	N/A					95% KM (Percentile Bootstrap) UCL	0.13	
1253				Median	N/A					95% KM (Chebyshev) UCL	0.159	
1254				SD	N/A					97.5% KM (Chebyshev) UCL	0.192	
1255				k star	N/A					99% KM (Chebyshev) UCL	0.257	
1256				Theta star	N/A							
1257				Nu star	N/A		**Potential UCLs to Use**					
1258				AppChi2	N/A					95% KM (t) UCL	0.114	
1259				95% Gamma Approximate UCL	N/A					95% KM (Percentile Bootstrap) UCL	0.13	
1260				95% Adjusted Gamma UCL	N/A							
1261	**Note: DL/2 is not a recommended method.**											
1262												
1263												
1264	**Phenanthrene (mg/kg)**											
1265												
1266	**General Statistics**											
1267				Number of Valid Samples	15					Number of Detected Data	9	
1268				Number of Unique Samples	9					Number of Non-Detect Data	6	
1269				Number of Missing Values	1					Percent Non-Detects	40.00%	
1270												
1271	**Raw Statistics**						**Log-transformed Statistics**					
1272				Minimum Detected	0.0453					Minimum Detected	-3.094	

1273				Maximum Detected	0.3					Maximum Detected	-1.204	
1274				Mean of Detected	0.0923					Mean of Detected	-2.573	
1275				SD of Detected	0.0796					SD of Detected	0.569	
1276				Minimum Non-Detect	0.033					Minimum Non-Detect	-3.411	
1277				Maximum Non-Detect	0.3					Maximum Non-Detect	-1.204	
1278												
1279	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect	14	
1280	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected	1	
1281	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage	93.33%	
1282												
1283	**UCL Statistics**											
1284	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
1285				Shapiro Wilk Test Statistic	0.584					Shapiro Wilk Test Statistic	0.792	
1286				5% Shapiro Wilk Critical Value	0.829					5% Shapiro Wilk Critical Value	0.829	
1287	**Data not Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**					
1288												
1289	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
1290				DL/2 Substitution Method						DL/2 Substitution Method		
1291				Mean	0.105					Mean	-2.461	
1292				SD	0.0697					SD	0.697	
1293				95% DL/2 (t) UCL	0.137					95% H-Stat (DL/2) UCL	0.203	
1294												
1295				Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method		
1296	**MLE method failed to converge properly**									Mean in Log Scale	-2.727	
1297										SD in Log Scale	0.551	
1298										Mean in Original Scale	0.078	
1299										SD in Original Scale	0.0643	
1300										95% Percentile Bootstrap UCL	0.108	
1301										95% BCA Bootstrap UCL	0.124	
1302												
1303	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
1304				k star (bias corrected)	1.936		**Data Follow Appr. Gamma Distribution at 5% Significance Level**					
1305				Theta Star	0.0477							
1306				nu star	34.84							
1307												
1308				A-D Test Statistic	1.089		**Nonparametric Statistics**					
1309				5% A-D Critical Value	0.727					Kaplan-Meier (KM) Method		
1310				K-S Test Statistic	0.727					Mean	0.0797	
1311				5% K-S Critical Value	0.282					SD	0.0611	
1312	**Data follow Appr. Gamma Distribution at 5% Significance Level**									SE of Mean	0.0171	
1313										95% KM (t) UCL	0.11	
1314	**Assuming Gamma Distribution**									95% KM (z) UCL	0.108	
1315				Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.109	
1316				Minimum	0					95% KM (bootstrap t) UCL	0.162	
1317				Maximum	0.3					95% KM (BCA) UCL	0.116	
1318				Mean	0.0875					95% KM (Percentile Bootstrap) UCL	0.111	
1319				Median	0.071					95% KM (Chebyshev) UCL	0.154	
1320				SD	0.0668					97.5% KM (Chebyshev) UCL	0.186	
1321				k star	0.441					99% KM (Chebyshev) UCL	0.249	
1322				Theta star	0.198							
1323				Nu star	13.23		**Potential UCLs to Use**					
1324				AppChi2	6.048					95% KM (t) UCL	0.11	
1325				95% Gamma Approximate UCL	0.191							

1326					95% Adjusted Gamma UCL	0.212						
1327	**Note: DL/2 is not a recommended method.**											
1328												
1329												
1330	**Pyrene (mg/kg)**											
1331												
1332	**General Statistics**											
1333					Number of Valid Samples	15				Number of Detected Data		5
1334					Number of Unique Samples	5				Number of Non-Detect Data		10
1335					Number of Missing Values	1				Percent Non-Detects		66.67%
1336												
1337	**Raw Statistics**						**Log-transformed Statistics**					
1338					Minimum Detected	0.016				Minimum Detected		-4.135
1339					Maximum Detected	0.092				Maximum Detected		-2.386
1340					Mean of Detected	0.0573				Mean of Detected		-3.101
1341					SD of Detected	0.0364				SD of Detected		0.849
1342					Minimum Non-Detect	0.033				Minimum Non-Detect		-3.411
1343					Maximum Non-Detect	0.3				Maximum Non-Detect		-1.204
1344												
1345	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect		15
1346	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected		0
1347	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage		100.00%
1348												
1349	**UCL Statistics**											
1350	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
1351					Shapiro Wilk Test Statistic	0.819				Shapiro Wilk Test Statistic		0.789
1352					5% Shapiro Wilk Critical Value	0.762				5% Shapiro Wilk Critical Value		0.762
1353	**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
1354												
1355	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
1356					DL/2 Substitution Method					DL/2 Substitution Method		
1357					Mean	0.104				Mean		-2.496
1358					SD	0.0511				SD		0.837
1359					95% DL/2 (t) UCL	0.127				95% H-Stat (DL/2) UCL		0.306
1360												
1361					Maximum Likelihood Estimate(MLE) Method	N/A				Log ROS Method		
1362	**MLE method failed to converge properly**									Mean in Log Scale		-3.239
1363										SD in Log Scale		0.634
1364										Mean in Original Scale		0.0469
1365										SD in Original Scale		0.0279
1366										95% Percentile Bootstrap UCL		0.0588
1367										95% BCA Bootstrap UCL		0.0596
1368												
1369	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
1370					k star (bias corrected)	1.021	**Data appear Normal at 5% Significance Level**					
1371					Theta Star	0.0561						
1372					nu star	10.21						
1373												
1374					A-D Test Statistic	0.646	**Nonparametric Statistics**					
1375					5% A-D Critical Value	0.684				Kaplan-Meier (KM) Method		
1376					K-S Test Statistic	0.684				Mean		0.0508
1377					5% K-S Critical Value	0.36				SD		0.0332
1378	**Data appear Gamma Distributed at 5% Significance Level**									SE of Mean		0.0151

1379											95% KM (t) UCL	0.0774
1380	**Assuming Gamma Distribution**										95% KM (z) UCL	0.0757
1381	Gamma ROS Statistics using Extrapolated Data										95% KM (jackknife) UCL	0.0784
1382	Minimum	0.016									95% KM (bootstrap t) UCL	0.0787
1383	Maximum	0.0986									95% KM (BCA) UCL	0.0838
1384	Mean	0.061									95% KM (Percentile Bootstrap) UCL	0.0834
1385	Median	0.0655									95% KM (Chebyshev) UCL	0.117
1386	SD	0.0267									97.5% KM (Chebyshev) UCL	0.145
1387	k star	3.412									99% KM (Chebyshev) UCL	0.201
1388	Theta star	0.0179										
1389	Nu star	102.4									**Potential UCLs to Use**	
1390	AppChi2	80.01									95% KM (t) UCL	0.0774
1391	95% Gamma Approximate UCL	0.078									95% KM (Percentile Bootstrap) UCL	0.0834
1392	95% Adjusted Gamma UCL	0.0804										
1393	**Note: DL/2 is not a recommended method.**											
1394												
1395												
1396	**Aluminum (mg/kg)**											
1397												
1398	**General Statistics**											
1399	Number of Valid Samples	16									Number of Unique Samples	15
1400												
1401	**Raw Statistics**										**Log-transformed Statistics**	
1402	Minimum	3120									Minimum of Log Data	8.046
1403	Maximum	17800									Maximum of Log Data	9.787
1404	Mean	10060									Mean of log Data	9.081
1405	Median	10900									SD of log Data	0.574
1406	SD	4807										
1407	Coefficient of Variation	0.478										
1408	Skewness	-0.0197										
1409												
1410	**Relevant UCL Statistics**											
1411	**Normal Distribution Test**										**Lognormal Distribution Test**	
1412	Shapiro Wilk Test Statistic	0.941									Shapiro Wilk Test Statistic	0.904
1413	Shapiro Wilk Critical Value	0.887									Shapiro Wilk Critical Value	0.887
1414	**Data appear Normal at 5% Significance Level**										**Data appear Lognormal at 5% Significance Level**	
1415												
1416	**Assuming Normal Distribution**										**Assuming Lognormal Distribution**	
1417	95% Student's-t UCL	12167									95% H-UCL	14217
1418	**95% UCLs (Adjusted for Skewness)**										95% Chebyshev (MVUE) UCL	16905
1419	95% Adjusted-CLT UCL	12030									97.5% Chebyshev (MVUE) UCL	19789
1420	95% Modified-t UCL	12166									99% Chebyshev (MVUE) UCL	25453
1421												
1422	**Gamma Distribution Test**										**Data Distribution**	
1423	k star (bias corrected)	3.173									**Data appear Normal at 5% Significance Level**	
1424	Theta Star	3170										
1425	nu star	101.5										
1426	Approximate Chi Square Value (.05)	79.29									**Nonparametric Statistics**	
1427	Adjusted Level of Significance	0.0335									95% CLT UCL	12037
1428	Adjusted Chi Square Value	77.05									95% Jackknife UCL	12167
1429											95% Standard Bootstrap UCL	11957
1430	Anderson-Darling Test Statistic	0.492									95% Bootstrap-t UCL	12090
1431	Anderson-Darling 5% Critical Value	0.742									95% Hall's Bootstrap UCL	11912

1432				Kolmogorov-Smirnov Test Statistic	0.163					95% Percentile Bootstrap UCL	12031
1433				Kolmogorov-Smirnov 5% Critical Value	0.216					95% BCA Bootstrap UCL	12011
1434				**Data appear Gamma Distributed at 5% Significance Level**						95% Chebyshev(Mean, Sd) UCL	15298
1435										97.5% Chebyshev(Mean, Sd) UCL	17564
1436				**Assuming Gamma Distribution**						99% Chebyshev(Mean, Sd) UCL	22016
1437				95% Approximate Gamma UCL	12883						
1438				95% Adjusted Gamma UCL	13257						
1439											
1440				**Potential UCL to Use**						Use 95% Student's-t UCL	12167
1441											
1442											
1443	**Arsenic (mg/kg)**										
1444											
1445				**General Statistics**							
1446				Number of Valid Samples	16					Number of Unique Samples	16
1447											
1448				**Raw Statistics**						**Log-transformed Statistics**	
1449				Minimum	1.6					Minimum of Log Data	0.47
1450				Maximum	37					Maximum of Log Data	3.611
1451				Mean	8.506					Mean of log Data	1.576
1452				Median	3.72					SD of log Data	0.983
1453				SD	11.22						
1454				Coefficient of Variation	1.319						
1455				Skewness	1.901						
1456											
1457				**Relevant UCL Statistics**							
1458				**Normal Distribution Test**						**Lognormal Distribution Test**	
1459				Shapiro Wilk Test Statistic	0.618					Shapiro Wilk Test Statistic	0.83
1460				Shapiro Wilk Critical Value	0.887					Shapiro Wilk Critical Value	0.887
1461				**Data not Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**	
1462											
1463				**Assuming Normal Distribution**						**Assuming Lognormal Distribution**	
1464				95% Student's-t UCL	13.42					95% H-UCL	15.52
1465				**95% UCLs (Adjusted for Skewness)**						95% Chebyshev (MVUE) UCL	16.37
1466				95% Adjusted-CLT UCL	14.54					97.5% Chebyshev (MVUE) UCL	20.19
1467				95% Modified-t UCL	13.65					99% Chebyshev (MVUE) UCL	27.71
1468											
1469				**Gamma Distribution Test**						**Data Distribution**	
1470				k star (bias corrected)	0.87					**Data do not follow a Discernable Distribution (0.05)**	
1471				Theta Star	9.772						
1472				nu star	27.85						
1473				Approximate Chi Square Value (.05)	16.82					**Nonparametric Statistics**	
1474				Adjusted Level of Significance	0.0335					95% CLT UCL	13.12
1475				Adjusted Chi Square Value	15.84					95% Jackknife UCL	13.42
1476										95% Standard Bootstrap UCL	13.07
1477				Anderson-Darling Test Statistic	1.827					95% Bootstrap-t UCL	17.03
1478				Anderson-Darling 5% Critical Value	0.763					95% Hall's Bootstrap UCL	12.17
1479				Kolmogorov-Smirnov Test Statistic	0.333					95% Percentile Bootstrap UCL	13.28
1480				Kolmogorov-Smirnov 5% Critical Value	0.221					95% BCA Bootstrap UCL	14.69
1481				**Data not Gamma Distributed at 5% Significance Level**						95% Chebyshev(Mean, Sd) UCL	20.73
1482										97.5% Chebyshev(Mean, Sd) UCL	26.02
1483				**Assuming Gamma Distribution**						99% Chebyshev(Mean, Sd) UCL	36.41
1484				95% Approximate Gamma UCL	14.09						

1485					95% Adjusted Gamma UCL	14.96						
1486												
1487					**Potential UCL to Use**						Use 95% Chebyshev (Mean, Sd) UCL	20.73
1488												
1489												
1490	**Barium (mg/kg)**											
1491												
1492					**General Statistics**							
1493					Number of Valid Samples	16					Number of Unique Samples	16
1494												
1495					**Raw Statistics**						**Log-transformed Statistics**	
1496					Minimum	57.1					Minimum of Log Data	4.045
1497					Maximum	190					Maximum of Log Data	5.247
1498					Mean	116.3					Mean of log Data	4.673
1499					Median	97.2					SD of log Data	0.425
1500					SD	48.3						
1501					Coefficient of Variation	0.415						
1502					Skewness	0.352						
1503												
1504					**Relevant UCL Statistics**							
1505					**Normal Distribution Test**						**Lognormal Distribution Test**	
1506					Shapiro Wilk Test Statistic	0.878					Shapiro Wilk Test Statistic	0.904
1507					Shapiro Wilk Critical Value	0.887					Shapiro Wilk Critical Value	0.887
1508					**Data not Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**	
1509												
1510					**Assuming Normal Distribution**						**Assuming Lognormal Distribution**	
1511					95% Student's-t UCL	137.5					95% H-UCL	145.6
1512					**95% UCLs (Adjusted for Skewness)**						95% Chebyshev (MVUE) UCL	171.6
1513					95% Adjusted-CLT UCL	137.3					97.5% Chebyshev (MVUE) UCL	195.5
1514					95% Modified-t UCL	137.7					99% Chebyshev (MVUE) UCL	242.4
1515												
1516					**Gamma Distribution Test**						**Data Distribution**	
1517					k star (bias corrected)	5.04					**Data appear Gamma Distributed at 5% Significance Level**	
1518					Theta Star	23.08						
1519					nu star	161.3						
1520					Approximate Chi Square Value (.05)	132.9					**Nonparametric Statistics**	
1521					Adjusted Level of Significance	0.0335					95% CLT UCL	136.2
1522					Adjusted Chi Square Value	130					95% Jackknife UCL	137.5
1523											95% Standard Bootstrap UCL	135.3
1524					Anderson-Darling Test Statistic	0.672					95% Bootstrap-t UCL	139.6
1525					Anderson-Darling 5% Critical Value	0.741					95% Hall's Bootstrap UCL	135.8
1526					Kolmogorov-Smirnov Test Statistic	0.156					95% Percentile Bootstrap UCL	135.5
1527					Kolmogorov-Smirnov 5% Critical Value	0.216					95% BCA Bootstrap UCL	136
1528					**Data appear Gamma Distributed at 5% Significance Level**						95% Chebyshev(Mean, Sd) UCL	168.9
1529											97.5% Chebyshev(Mean, Sd) UCL	191.7
1530					**Assuming Gamma Distribution**						99% Chebyshev(Mean, Sd) UCL	236.5
1531					95% Approximate Gamma UCL	141.1						
1532					95% Adjusted Gamma UCL	144.3						
1533												
1534					**Potential UCL to Use**						Use 95% Approximate Gamma UCL	141.1
1535												
1536												
1537	**Beryllium (mg/kg)**											

1538												
1539	**General Statistics**											
1540					Number of Valid Samples	15				Number of Unique Samples	13	
1541					Number of Missing Values	1						
1542												
1543	**Raw Statistics**						**Log-transformed Statistics**					
1544					Minimum	0.493				Minimum of Log Data	-0.707	
1545					Maximum	1.3				Maximum of Log Data	0.262	
1546					Mean	0.778				Mean of log Data	-0.302	
1547					Median	0.63				SD of log Data	0.323	
1548					SD	0.266						
1549					Coefficient of Variation	0.342						
1550					Skewness	0.868						
1551												
1552	**Relevant UCL Statistics**											
1553	**Normal Distribution Test**						**Lognormal Distribution Test**					
1554					Shapiro Wilk Test Statistic	0.874				Shapiro Wilk Test Statistic	0.913	
1555					Shapiro Wilk Critical Value	0.881				Shapiro Wilk Critical Value	0.881	
1556	**Data not Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
1557												
1558	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
1559					95% Student's-t UCL	0.899				95% H-UCL	0.918	
1560	**95% UCLs (Adjusted for Skewness)**									95% Chebyshev (MVUE) UCL	1.062	
1561					95% Adjusted-CLT UCL	0.908				97.5% Chebyshev (MVUE) UCL	1.186	
1562					95% Modified-t UCL	0.902				99% Chebyshev (MVUE) UCL	1.428	
1563												
1564	**Gamma Distribution Test**						**Data Distribution**					
1565					k star (bias corrected)	8.098	**Data Follow Appr. Gamma Distribution at 5% Significance Level**					
1566					Theta Star	0.0961						
1567					nu star	242.9						
1568					Approximate Chi Square Value (.05)	207.8	**Nonparametric Statistics**					
1569					Adjusted Level of Significance	0.0324				95% CLT UCL	0.891	
1570					Adjusted Chi Square Value	203.8				95% Jackknife UCL	0.899	
1571										95% Standard Bootstrap UCL	0.888	
1572					Anderson-Darling Test Statistic	0.629				95% Bootstrap-t UCL	0.927	
1573					Anderson-Darling 5% Critical Value	0.737				95% Hall's Bootstrap UCL	0.899	
1574					Kolmogorov-Smirnov Test Statistic	0.239				95% Percentile Bootstrap UCL	0.893	
1575					Kolmogorov-Smirnov 5% Critical Value	0.222				95% BCA Bootstrap UCL	0.901	
1576	**Data follow Appr. Gamma Distribution at 5% Significance Level**									95% Chebyshev(Mean, Sd) UCL	1.078	
1577										97.5% Chebyshev(Mean, Sd) UCL	1.208	
1578	**Assuming Gamma Distribution**									99% Chebyshev(Mean, Sd) UCL	1.462	
1579					95% Approximate Gamma UCL	0.909						
1580					95% Adjusted Gamma UCL	0.927						
1581												
1582	**Potential UCL to Use**									Use 95% Approximate Gamma UCL	0.909	
1583												
1584												
1585	**Calcium (mg/kg)**											
1586												
1587	**General Statistics**											
1588					Number of Valid Samples	16				Number of Unique Samples	16	
1589												
1590	**Raw Statistics**						**Log-transformed Statistics**					

1591					Minimum	192					Minimum of Log Data	5.257
1592					Maximum	2680					Maximum of Log Data	7.894
1593					Mean	1107					Mean of log Data	6.76
1594					Median	833.5					SD of log Data	0.751
1595					SD	795.8						
1596					Coefficient of Variation	0.719						
1597					Skewness	0.979						
1598												
1599					**Relevant UCL Statistics**							
1600	**Normal Distribution Test**									**Lognormal Distribution Test**		
1601					Shapiro Wilk Test Statistic	0.869					Shapiro Wilk Test Statistic	0.964
1602					Shapiro Wilk Critical Value	0.887					Shapiro Wilk Critical Value	0.887
1603	**Data not Normal at 5% Significance Level**									**Data appear Lognormal at 5% Significance Level**		
1604												
1605	**Assuming Normal Distribution**									**Assuming Lognormal Distribution**		
1606					95% Student's-t UCL	1456					95% H-UCL	1804
1607	**95% UCLs (Adjusted for Skewness)**										95% Chebyshev (MVUE) UCL	2093
1608					95% Adjusted-CLT UCL	1486					97.5% Chebyshev (MVUE) UCL	2514
1609					95% Modified-t UCL	1464					99% Chebyshev (MVUE) UCL	3342
1610												
1611	**Gamma Distribution Test**									**Data Distribution**		
1612					k star (bias corrected)	1.794				**Data appear Gamma Distributed at 5% Significance Level**		
1613					Theta Star	617.2						
1614					nu star	57.4						
1615					Approximate Chi Square Value (.05)	40.99				**Nonparametric Statistics**		
1616					Adjusted Level of Significance	0.0335					95% CLT UCL	1434
1617					Adjusted Chi Square Value	39.41					95% Jackknife UCL	1456
1618											95% Standard Bootstrap UCL	1428
1619					Anderson-Darling Test Statistic	0.331					95% Bootstrap-t UCL	1529
1620					Anderson-Darling 5% Critical Value	0.749					95% Hall's Bootstrap UCL	1454
1621					Kolmogorov-Smirnov Test Statistic	0.132					95% Percentile Bootstrap UCL	1450
1622					Kolmogorov-Smirnov 5% Critical Value	0.218					95% BCA Bootstrap UCL	1492
1623	**Data appear Gamma Distributed at 5% Significance Level**										95% Chebyshev(Mean, Sd) UCL	1974
1624											97.5% Chebyshev(Mean, Sd) UCL	2350
1625	**Assuming Gamma Distribution**										99% Chebyshev(Mean, Sd) UCL	3087
1626					95% Approximate Gamma UCL	1551						
1627					95% Adjusted Gamma UCL	1613						
1628												
1629	**Potential UCL to Use**										Use 95% Approximate Gamma UCL	1551
1630												
1631												
1632	**Chromium (mg/kg)**											
1633												
1634					**General Statistics**							
1635					Number of Valid Samples	16					Number of Unique Samples	15
1636												
1637	**Raw Statistics**									**Log-transformed Statistics**		
1638					Minimum	7.5					Minimum of Log Data	2.015
1639					Maximum	28.8					Maximum of Log Data	3.36
1640					Mean	16.26					Mean of log Data	2.707
1641					Median	16.95					SD of log Data	0.43
1642					SD	6.487						
1643					Coefficient of Variation	0.399						

1644					Skewness	0.176						
1645												
1646	**Relevant UCL Statistics**											
1647	**Normal Distribution Test**						**Lognormal Distribution Test**					
1648					Shapiro Wilk Test Statistic	0.923					Shapiro Wilk Test Statistic	0.909
1649					Shapiro Wilk Critical Value	0.887					Shapiro Wilk Critical Value	0.887
1650	**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
1651												
1652	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
1653					95% Student's-t UCL	19.11					95% H-UCL	20.48
1654	**95% UCLs (Adjusted for Skewness)**										95% Chebyshev (MVUE) UCL	24.16
1655					95% Adjusted-CLT UCL	19.01					97.5% Chebyshev (MVUE) UCL	27.54
1656					95% Modified-t UCL	19.12					99% Chebyshev (MVUE) UCL	34.19
1657												
1658	**Gamma Distribution Test**						**Data Distribution**					
1659					k star (bias corrected)	5.121	**Data appear Normal at 5% Significance Level**					
1660					Theta Star	3.175						
1661					nu star	163.9						
1662					Approximate Chi Square Value (.05)	135.3	**Nonparametric Statistics**					
1663					Adjusted Level of Significance	0.0335					95% CLT UCL	18.93
1664					Adjusted Chi Square Value	132.3					95% Jackknife UCL	19.11
1665											95% Standard Bootstrap UCL	18.84
1666					Anderson-Darling Test Statistic	0.637					95% Bootstrap-t UCL	19.12
1667					Anderson-Darling 5% Critical Value	0.741					95% Hall's Bootstrap UCL	18.9
1668					Kolmogorov-Smirnov Test Statistic	0.176					95% Percentile Bootstrap UCL	18.91
1669					Kolmogorov-Smirnov 5% Critical Value	0.216					95% BCA Bootstrap UCL	18.9
1670	**Data appear Gamma Distributed at 5% Significance Level**										95% Chebyshev(Mean, Sd) UCL	23.33
1671											97.5% Chebyshev(Mean, Sd) UCL	26.39
1672	**Assuming Gamma Distribution**										99% Chebyshev(Mean, Sd) UCL	32.4
1673					95% Approximate Gamma UCL	19.7						
1674					95% Adjusted Gamma UCL	20.14						
1675												
1676	**Potential UCL to Use**										Use 95% Student's-t UCL	19.11
1677												
1678												
1679	**Cobalt (mg/kg)**											
1680												
1681	**General Statistics**											
1682					Number of Valid Samples	16					Number of Unique Samples	16
1683												
1684	**Raw Statistics**						**Log-transformed Statistics**					
1685					Minimum	2.9					Minimum of Log Data	1.065
1686					Maximum	10.1					Maximum of Log Data	2.313
1687					Mean	6.107					Mean of log Data	1.745
1688					Median	5.86					SD of log Data	0.379
1689					SD	2.188						
1690					Coefficient of Variation	0.358						
1691					Skewness	0.38						
1692												
1693	**Relevant UCL Statistics**											
1694	**Normal Distribution Test**						**Lognormal Distribution Test**					
1695					Shapiro Wilk Test Statistic	0.948					Shapiro Wilk Test Statistic	0.947
1696					Shapiro Wilk Critical Value	0.887					Shapiro Wilk Critical Value	0.887

1697	**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
1698												
1699	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
1700				95% Student's-t UCL	7.066					95% H-UCL	7.438	
1701	**95% UCLs (Adjusted for Skewness)**									95% Chebyshev (MVUE) UCL	8.699	
1702				95% Adjusted-CLT UCL	7.062					97.5% Chebyshev (MVUE) UCL	9.813	
1703				95% Modified-t UCL	7.075					99% Chebyshev (MVUE) UCL	12	
1704												
1705	**Gamma Distribution Test**						**Data Distribution**					
1706				k star (bias corrected)	6.525		**Data appear Normal at 5% Significance Level**					
1707				Theta Star	0.936							
1708				nu star	208.8							
1709				Approximate Chi Square Value (.05)	176.4		**Nonparametric Statistics**					
1710				Adjusted Level of Significance	0.0335					95% CLT UCL	7.007	
1711				Adjusted Chi Square Value	173					95% Jackknife UCL	7.066	
1712										95% Standard Bootstrap UCL	6.973	
1713				Anderson-Darling Test Statistic	0.265					95% Bootstrap-t UCL	7.065	
1714				Anderson-Darling 5% Critical Value	0.74					95% Hall's Bootstrap UCL	7.049	
1715				Kolmogorov-Smirnov Test Statistic	0.109					95% Percentile Bootstrap UCL	6.972	
1716				Kolmogorov-Smirnov 5% Critical Value	0.215					95% BCA Bootstrap UCL	7.08	
1717	**Data appear Gamma Distributed at 5% Significance Level**									95% Chebyshev(Mean, Sd) UCL	8.491	
1718										97.5% Chebyshev(Mean, Sd) UCL	9.523	
1719	**Assuming Gamma Distribution**									99% Chebyshev(Mean, Sd) UCL	11.55	
1720				95% Approximate Gamma UCL	7.231							
1721				95% Adjusted Gamma UCL	7.372							
1722												
1723	**Potential UCL to Use**									Use 95% Student's-t UCL	7.066	
1724												
1725												
1726	**Copper (mg/kg)**											
1727												
1728	**General Statistics**											
1729				Number of Valid Samples	16					Number of Unique Samples	15	
1730												
1731	**Raw Statistics**						**Log-transformed Statistics**					
1732				Minimum	3.3					Minimum of Log Data	1.194	
1733				Maximum	15.3					Maximum of Log Data	2.728	
1734				Mean	10.53					Mean of log Data	2.295	
1735				Median	10.75					SD of log Data	0.384	
1736				SD	3.281							
1737				Coefficient of Variation	0.312							
1738				Skewness	-0.397							
1739												
1740	**Relevant UCL Statistics**											
1741	**Normal Distribution Test**						**Lognormal Distribution Test**					
1742				Shapiro Wilk Test Statistic	0.964					Shapiro Wilk Test Statistic	0.868	
1743				Shapiro Wilk Critical Value	0.887					Shapiro Wilk Critical Value	0.887	
1744	**Data appear Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**					
1745												
1746	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
1747				95% Student's-t UCL	11.97					95% H-UCL	12.96	
1748	**95% UCLs (Adjusted for Skewness)**									95% Chebyshev (MVUE) UCL	15.17	
1749				95% Adjusted-CLT UCL	11.79					97.5% Chebyshev (MVUE) UCL	17.14	

1750				95% Modified-t UCL	11.95					99% Chebyshev (MVUE) UCL	20.99	
1751												
1752				**Gamma Distribution Test**						**Data Distribution**		
1753				k star (bias corrected)	7.095					**Data appear Normal at 5% Significance Level**		
1754				Theta Star	1.484							
1755				nu star	227.1							
1756				Approximate Chi Square Value (.05)	193.2					**Nonparametric Statistics**		
1757				Adjusted Level of Significance	0.0335					95% CLT UCL	11.88	
1758				Adjusted Chi Square Value	189.6					95% Jackknife UCL	11.97	
1759										95% Standard Bootstrap UCL	11.81	
1760				Anderson-Darling Test Statistic	0.398					95% Bootstrap-t UCL	11.84	
1761				Anderson-Darling 5% Critical Value	0.74					95% Hall's Bootstrap UCL	11.79	
1762				Kolmogorov-Smirnov Test Statistic	0.167					95% Percentile Bootstrap UCL	11.89	
1763				Kolmogorov-Smirnov 5% Critical Value	0.215					95% BCA Bootstrap UCL	11.77	
1764				**Data appear Gamma Distributed at 5% Significance Level**						95% Chebyshev(Mean, Sd) UCL	14.1	
1765										97.5% Chebyshev(Mean, Sd) UCL	15.65	
1766				**Assuming Gamma Distribution**						99% Chebyshev(Mean, Sd) UCL	18.69	
1767				95% Approximate Gamma UCL	12.37							
1768				95% Adjusted Gamma UCL	12.61							
1769												
1770				**Potential UCL to Use**						Use 95% Student's-t UCL	11.97	
1771												
1772												
1773	**Iron (mg/kg)**											
1774												
1775				**General Statistics**								
1776				Number of Valid Samples	16					Number of Unique Samples	16	
1777												
1778				**Raw Statistics**						**Log-transformed Statistics**		
1779				Minimum	4200					Minimum of Log Data	8.343	
1780				Maximum	24400					Maximum of Log Data	10.1	
1781				Mean	14234					Mean of log Data	9.442	
1782				Median	15300					SD of log Data	0.545	
1783				SD	6348							
1784				Coefficient of Variation	0.446							
1785				Skewness	-0.207							
1786												
1787				**Relevant UCL Statistics**								
1788				**Normal Distribution Test**						**Lognormal Distribution Test**		
1789				Shapiro Wilk Test Statistic	0.932					Shapiro Wilk Test Statistic	0.891	
1790				Shapiro Wilk Critical Value	0.887					Shapiro Wilk Critical Value	0.887	
1791				**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**		
1792												
1793				**Assuming Normal Distribution**						**Assuming Lognormal Distribution**		
1794				95% Student's-t UCL	17017					95% H-UCL	19680	
1795				**95% UCLs (Adjusted for Skewness)**						95% Chebyshev (MVUE) UCL	23409	
1796				95% Adjusted-CLT UCL	16757					97.5% Chebyshev (MVUE) UCL	27272	
1797				95% Modified-t UCL	17003					99% Chebyshev (MVUE) UCL	34859	
1798												
1799				**Gamma Distribution Test**						**Data Distribution**		
1800				k star (bias corrected)	3.528					**Data appear Normal at 5% Significance Level**		
1801				Theta Star	4035							
1802				nu star	112.9							

1803				Approximate Chi Square Value (.05)	89.36		**Nonparametric Statistics**					
1804				Adjusted Level of Significance	0.0335					95% CLT UCL	16845	
1805				Adjusted Chi Square Value	86.98					95% Jackknife UCL	17017	
1806										95% Standard Bootstrap UCL	16781	
1807				Anderson-Darling Test Statistic	0.666					95% Bootstrap-t UCL	16822	
1808				Anderson-Darling 5% Critical Value	0.742					95% Hall's Bootstrap UCL	16616	
1809				Kolmogorov-Smirnov Test Statistic	0.204					95% Percentile Bootstrap UCL	16595	
1810				Kolmogorov-Smirnov 5% Critical Value	0.216					95% BCA Bootstrap UCL	16543	
1811				**Data appear Gamma Distributed at 5% Significance Level**						95% Chebyshev(Mean, Sd) UCL	21152	
1812										97.5% Chebyshev(Mean, Sd) UCL	24146	
1813				**Assuming Gamma Distribution**						99% Chebyshev(Mean, Sd) UCL	30026	
1814				95% Approximate Gamma UCL	17982							
1815				95% Adjusted Gamma UCL	18474							
1816												
1817				**Potential UCL to Use**						Use 95% Student's-t UCL	17017	
1818												
1819												
1820	**Lead (mg/kg)**											
1821												
1822				**General Statistics**								
1823				Number of Valid Samples	16					Number of Unique Samples	16	
1824												
1825				**Raw Statistics**			**Log-transformed Statistics**					
1826				Minimum	5.37					Minimum of Log Data	1.681	
1827				Maximum	30.9					Maximum of Log Data	3.431	
1828				Mean	14.84					Mean of log Data	2.568	
1829				Median	15.2					SD of log Data	0.538	
1830				SD	7.583							
1831				Coefficient of Variation	0.511							
1832				Skewness	0.64							
1833												
1834				**Relevant UCL Statistics**								
1835				**Normal Distribution Test**			**Lognormal Distribution Test**					
1836				Shapiro Wilk Test Statistic	0.933					Shapiro Wilk Test Statistic	0.954	
1837				Shapiro Wilk Critical Value	0.887					Shapiro Wilk Critical Value	0.887	
1838				**Data appear Normal at 5% Significance Level**			**Data appear Lognormal at 5% Significance Level**					
1839												
1840				**Assuming Normal Distribution**			**Assuming Lognormal Distribution**					
1841				95% Student's-t UCL	18.16					95% H-UCL	20.17	
1842				**95% UCLs (Adjusted for Skewness)**						95% Chebyshev (MVUE) UCL	23.99	
1843				95% Adjusted-CLT UCL	18.28					97.5% Chebyshev (MVUE) UCL	27.91	
1844				95% Modified-t UCL	18.22					99% Chebyshev (MVUE) UCL	35.62	
1845												
1846				**Gamma Distribution Test**			**Data Distribution**					
1847				k star (bias corrected)	3.308		**Data appear Normal at 5% Significance Level**					
1848				Theta Star	4.487							
1849				nu star	105.8							
1850				Approximate Chi Square Value (.05)	83.1		**Nonparametric Statistics**					
1851				Adjusted Level of Significance	0.0335					95% CLT UCL	17.96	
1852				Adjusted Chi Square Value	80.81					95% Jackknife UCL	18.16	
1853										95% Standard Bootstrap UCL	17.88	
1854				Anderson-Darling Test Statistic	0.316					95% Bootstrap-t UCL	18.57	
1855				Anderson-Darling 5% Critical Value	0.742					95% Hall's Bootstrap UCL	18.38	

1856				Kolmogorov-Smirnov Test Statistic	0.159					95% Percentile Bootstrap UCL	18.01	
1857				Kolmogorov-Smirnov 5% Critical Value	0.216					95% BCA Bootstrap UCL	18.36	
1858				**Data appear Gamma Distributed at 5% Significance Level**						95% Chebyshev(Mean, Sd) UCL	23.1	
1859										97.5% Chebyshev(Mean, Sd) UCL	26.68	
1860				**Assuming Gamma Distribution**						99% Chebyshev(Mean, Sd) UCL	33.7	
1861				95% Approximate Gamma UCL	18.9							
1862				95% Adjusted Gamma UCL	19.44							
1863												
1864				**Potential UCL to Use**						Use 95% Student's-t UCL	18.16	
1865												
1866												
1867	**Magnesium (mg/kg)**											
1868												
1869				**General Statistics**								
1870				Number of Valid Samples	16					Number of Unique Samples	16	
1871												
1872				**Raw Statistics**						**Log-transformed Statistics**		
1873				Minimum	227					Minimum of Log Data	5.425	
1874				Maximum	2270					Maximum of Log Data	7.728	
1875				Mean	954.3					Mean of log Data	6.574	
1876				Median	566					SD of log Data	0.804	
1877				SD	700.7							
1878				Coefficient of Variation	0.734							
1879				Skewness	0.576							
1880												
1881				**Relevant UCL Statistics**								
1882				**Normal Distribution Test**						**Lognormal Distribution Test**		
1883				Shapiro Wilk Test Statistic	0.858					Shapiro Wilk Test Statistic	0.898	
1884				Shapiro Wilk Critical Value	0.887					Shapiro Wilk Critical Value	0.887	
1885				**Data not Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**		
1886												
1887				**Assuming Normal Distribution**						**Assuming Lognormal Distribution**		
1888				95% Student's-t UCL	1261					95% H-UCL	1637	
1889				**95% UCLs (Adjusted for Skewness)**						95% Chebyshev (MVUE) UCL	1870	
1890				95% Adjusted-CLT UCL	1269					97.5% Chebyshev (MVUE) UCL	2262	
1891				95% Modified-t UCL	1266					99% Chebyshev (MVUE) UCL	3031	
1892												
1893				**Gamma Distribution Test**						**Data Distribution**		
1894				k star (bias corrected)	1.582					**Data Follow Appr. Gamma Distribution at 5% Significance Level**		
1895				Theta Star	603.3							
1896				nu star	50.61							
1897				Approximate Chi Square Value (.05)	35.28					**Nonparametric Statistics**		
1898				Adjusted Level of Significance	0.0335					95% CLT UCL	1242	
1899				Adjusted Chi Square Value	33.82					95% Jackknife UCL	1261	
1900										95% Standard Bootstrap UCL	1245	
1901				Anderson-Darling Test Statistic	0.803					95% Bootstrap-t UCL	1323	
1902				Anderson-Darling 5% Critical Value	0.751					95% Hall's Bootstrap UCL	1245	
1903				Kolmogorov-Smirnov Test Statistic	0.191					95% Percentile Bootstrap UCL	1241	
1904				Kolmogorov-Smirnov 5% Critical Value	0.218					95% BCA Bootstrap UCL	1252	
1905				**Data follow Appr. Gamma Distribution at 5% Significance Level**						95% Chebyshev(Mean, Sd) UCL	1718	
1906										97.5% Chebyshev(Mean, Sd) UCL	2048	
1907				**Assuming Gamma Distribution**						99% Chebyshev(Mean, Sd) UCL	2697	
1908				95% Approximate Gamma UCL	1369							

1909				95% Adjusted Gamma UCL	1428							
1910												
1911				**Potential UCL to Use**						Use 95% Approximate Gamma UCL		1369
1912												
1913												
1914	**Manganese (mg/kg)**											
1915												
1916					**General Statistics**							
1917				Number of Valid Samples	16					Number of Unique Samples		16
1918												
1919				**Raw Statistics**						**Log-transformed Statistics**		
1920				Minimum	67.95					Minimum of Log Data		4.219
1921				Maximum	3630					Maximum of Log Data		8.197
1922				Mean	614.7					Mean of log Data		5.744
1923				Median	282.5					SD of log Data		1.048
1924				SD	995.3							
1925				Coefficient of Variation	1.619							
1926				Skewness	2.621							
1927												
1928					**Relevant UCL Statistics**							
1929				**Normal Distribution Test**						**Lognormal Distribution Test**		
1930				Shapiro Wilk Test Statistic	0.532					Shapiro Wilk Test Statistic		0.889
1931				Shapiro Wilk Critical Value	0.887					Shapiro Wilk Critical Value		0.887
1932				**Data not Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**		
1933												
1934				**Assuming Normal Distribution**						**Assuming Lognormal Distribution**		
1935				95% Student's-t UCL	1051					95% H-UCL		1150
1936				**95% UCLs (Adjusted for Skewness)**						95% Chebyshev (MVUE) UCL		1165
1937				95% Adjusted-CLT UCL	1198					97.5% Chebyshev (MVUE) UCL		1446
1938				95% Modified-t UCL	1078					99% Chebyshev (MVUE) UCL		1998
1939												
1940				**Gamma Distribution Test**						**Data Distribution**		
1941				k star (bias corrected)	0.746					**Data appear Lognormal at 5% Significance Level**		
1942				Theta Star	823.9							
1943				nu star	23.88							
1944				Approximate Chi Square Value (.05)	13.75					**Nonparametric Statistics**		
1945				Adjusted Level of Significance	0.0335					95% CLT UCL		1024
1946				Adjusted Chi Square Value	12.89					95% Jackknife UCL		1051
1947										95% Standard Bootstrap UCL		1011
1948				Anderson-Darling Test Statistic	1.658					95% Bootstrap-t UCL		3547
1949				Anderson-Darling 5% Critical Value	0.769					95% Hall's Bootstrap UCL		3728
1950				Kolmogorov-Smirnov Test Statistic	0.321					95% Percentile Bootstrap UCL		1050
1951				Kolmogorov-Smirnov 5% Critical Value	0.222					95% BCA Bootstrap UCL		1171
1952				**Data not Gamma Distributed at 5% Significance Level**						95% Chebyshev(Mean, Sd) UCL		1699
1953										97.5% Chebyshev(Mean, Sd) UCL		2169
1954				**Assuming Gamma Distribution**						99% Chebyshev(Mean, Sd) UCL		3091
1955				95% Approximate Gamma UCL	1067							
1956				95% Adjusted Gamma UCL	1139							
1957												
1958				**Potential UCL to Use**						Use 95% Chebyshev (MVUE) UCL		1165
1959												
1960												
1961	**Mercury (mg/kg)**											

General Statistics		
Number of Valid Samples	14	Number of Detected Data	13
Number of Unique Samples	13	Number of Non-Detect Data	1
Number of Missing Values	2	Percent Non-Detects	7.14%
Raw Statistics		**Log-transformed Statistics**	
Minimum Detected	0.041	Minimum Detected	-3.194
Maximum Detected	0.561	Maximum Detected	-0.579
Mean of Detected	0.236	Mean of Detected	-1.706
SD of Detected	0.163	SD of Detected	0.801
Minimum Non-Detect	0.05	Minimum Non-Detect	-2.996
Maximum Non-Detect	0.05	Maximum Non-Detect	-2.996
UCL Statistics			
Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Shapiro Wilk Test Statistic	0.932	Shapiro Wilk Test Statistic	0.965
5% Shapiro Wilk Critical Value	0.866	5% Shapiro Wilk Critical Value	0.866
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	0.221	Mean	-1.848
SD	0.166	SD	0.934
95% DL/2 (t) UCL	0.299	95% H-Stat (DL/2) UCL	0.406
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	0.209	Mean in Log Scale	-1.813
SD	0.178	SD in Log Scale	0.868
95% MLE (t) UCL	0.294	Mean in Original Scale	0.222
95% MLE (Tiku) UCL	0.294	SD in Original Scale	0.165
		95% Percentile Bootstrap UCL	0.293
		95% BCA Bootstrap UCL	0.295
Gamma Distribution Test with Detected Values Only		**Data Distribution Test with Detected Values Only**	
k star (bias corrected)	1.64	**Data appear Normal at 5% Significance Level**	
Theta Star	0.144		
nu star	42.64		
A-D Test Statistic	0.187	**Nonparametric Statistics**	
5% A-D Critical Value	0.743	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.743	Mean	0.222
5% K-S Critical Value	0.239	SD	0.159
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	0.0442
		95% KM (t) UCL	0.3
Assuming Gamma Distribution		95% KM (z) UCL	0.295
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	0.299
Minimum	0	95% KM (bootstrap t) UCL	0.31
Maximum	0.561	95% KM (BCA) UCL	0.302
Mean	0.219	95% KM (Percentile Bootstrap) UCL	0.297
Median	0.187	95% KM (Chebyshev) UCL	0.414
SD	0.169	97.5% KM (Chebyshev) UCL	0.498

2015					k star	0.379				99% KM (Chebyshev) UCL		0.661
2016					Theta star	0.577						
2017					Nu star	10.62				**Potential UCLs to Use**		
2018					AppChi2	4.333				95% KM (t) UCL		0.3
2019					95% Gamma Approximate UCL	0.537				95% KM (Percentile Bootstrap) UCL		0.297
2020					95% Adjusted Gamma UCL	0.61						
2021	**Note: DL/2 is not a recommended method.**											
2022												
2023												
2024	**Nickel (mg/kg)**											
2025												
2026					**General Statistics**							
2027					Number of Valid Samples	16				Number of Unique Samples		16
2028												
2029					**Raw Statistics**					**Log-transformed Statistics**		
2030					Minimum	5.2				Minimum of Log Data		1.649
2031					Maximum	12.8				Maximum of Log Data		2.549
2032					Mean	7.809				Mean of log Data		2.019
2033					Median	7.25				SD of log Data		0.275
2034					SD	2.255						
2035					Coefficient of Variation	0.289						
2036					Skewness	0.878						
2037												
2038					**Relevant UCL Statistics**							
2039					**Normal Distribution Test**					**Lognormal Distribution Test**		
2040					Shapiro Wilk Test Statistic	0.912				Shapiro Wilk Test Statistic		0.947
2041					Shapiro Wilk Critical Value	0.887				Shapiro Wilk Critical Value		0.887
2042					**Data appear Normal at 5% Significance Level**					**Data appear Lognormal at 5% Significance Level**		
2043												
2044					**Assuming Normal Distribution**					**Assuming Lognormal Distribution**		
2045					95% Student's-t UCL	8.798				95% H-UCL		8.92
2046					**95% UCLs (Adjusted for Skewness)**					95% Chebyshev (MVUE) UCL		10.16
2047					95% Adjusted-CLT UCL	8.869				97.5% Chebyshev (MVUE) UCL		11.18
2048					95% Modified-t UCL	8.818				99% Chebyshev (MVUE) UCL		13.19
2049												
2050					**Gamma Distribution Test**					**Data Distribution**		
2051					k star (bias corrected)	11.31				**Data appear Normal at 5% Significance Level**		
2052					Theta Star	0.691						
2053					nu star	361.8						
2054					Approximate Chi Square Value (.05)	318.7				**Nonparametric Statistics**		
2055					Adjusted Level of Significance	0.0335				95% CLT UCL		8.737
2056					Adjusted Chi Square Value	314.1				95% Jackknife UCL		8.798
2057										95% Standard Bootstrap UCL		8.72
2058					Anderson-Darling Test Statistic	0.39				95% Bootstrap-t UCL		9.029
2059					Anderson-Darling 5% Critical Value	0.738				95% Hall's Bootstrap UCL		9.023
2060					Kolmogorov-Smirnov Test Statistic	0.16				95% Percentile Bootstrap UCL		8.781
2061					Kolmogorov-Smirnov 5% Critical Value	0.215				95% BCA Bootstrap UCL		8.912
2062					**Data appear Gamma Distributed at 5% Significance Level**					95% Chebyshev(Mean, Sd) UCL		10.27
2063										97.5% Chebyshev(Mean, Sd) UCL		11.33
2064					**Assuming Gamma Distribution**					99% Chebyshev(Mean, Sd) UCL		13.42
2065					95% Approximate Gamma UCL	8.865						
2066					95% Adjusted Gamma UCL	8.995						
2067												

2068	**Potential UCL to Use**									Use 95% Student's-t UCL	8.798	
2069												
2070												
2071	**Potassium (mg/kg)**											
2072												
2073	**General Statistics**											
2074	Number of Valid Samples	12					Number of Unique Samples	12				
2075	Number of Missing Values	4										
2076												
2077	**Raw Statistics**						**Log-transformed Statistics**					
2078	Minimum	300					Minimum of Log Data	5.704				
2079	Maximum	1070					Maximum of Log Data	6.975				
2080	Mean	598.9					Mean of log Data	6.292				
2081	Median	561					SD of log Data	0.479				
2082	SD	279.9										
2083	Coefficient of Variation	0.467										
2084	Skewness	0.449										
2085												
2086	**Relevant UCL Statistics**											
2087	**Normal Distribution Test**						**Lognormal Distribution Test**					
2088	Shapiro Wilk Test Statistic	0.886					Shapiro Wilk Test Statistic	0.894				
2089	Shapiro Wilk Critical Value	0.859					Shapiro Wilk Critical Value	0.859				
2090	**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
2091												
2092	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
2093	95% Student's-t UCL	744					95% H-UCL	821.8				
2094	**95% UCLs (Adjusted for Skewness)**						95% Chebyshev (MVUE) UCL	968.2				
2095	95% Adjusted-CLT UCL	743					97.5% Chebyshev (MVUE) UCL	1128				
2096	95% Modified-t UCL	745.8					99% Chebyshev (MVUE) UCL	1441				
2097												
2098	**Gamma Distribution Test**						**Data Distribution**					
2099	k star (bias corrected)	3.802					**Data appear Normal at 5% Significance Level**					
2100	Theta Star	157.5										
2101	nu star	91.24										
2102	Approximate Chi Square Value (.05)	70.21					**Nonparametric Statistics**					
2103	Adjusted Level of Significance	0.029					95% CLT UCL	731.8				
2104	Adjusted Chi Square Value	67.4					95% Jackknife UCL	744				
2105							95% Standard Bootstrap UCL	725.6				
2106	Anderson-Darling Test Statistic	0.553					95% Bootstrap-t UCL	760.9				
2107	Anderson-Darling 5% Critical Value	0.732					95% Hall's Bootstrap UCL	723.4				
2108	Kolmogorov-Smirnov Test Statistic	0.206					95% Percentile Bootstrap UCL	727.9				
2109	Kolmogorov-Smirnov 5% Critical Value	0.246					95% BCA Bootstrap UCL	730.3				
2110	**Data appear Gamma Distributed at 5% Significance Level**						95% Chebyshev(Mean, Sd) UCL	951.1				
2111							97.5% Chebyshev(Mean, Sd) UCL	1103				
2112	**Assuming Gamma Distribution**						99% Chebyshev(Mean, Sd) UCL	1403				
2113	95% Approximate Gamma UCL	778.3										
2114	95% Adjusted Gamma UCL	810.7										
2115												
2116	**Potential UCL to Use**									Use 95% Student's-t UCL	744	
2117												
2118												
2119	**Selenium (mg.kg)**											
2120												

2121	**General Statistics**											
2122					Number of Valid Samples	15				Number of Detected Data		11
2123					Number of Unique Samples	11				Number of Non-Detect Data		4
2124					Number of Missing Values	1				Percent Non-Detects		26.67%
2125												
2126	**Raw Statistics**									**Log-transformed Statistics**		
2127					Minimum Detected	0.26				Minimum Detected		-1.347
2128					Maximum Detected	7				Maximum Detected		1.946
2129					Mean of Detected	2.991				Mean of Detected		0.457
2130					SD of Detected	2.853				SD of Detected		1.29
2131					Minimum Non-Detect	0.11				Minimum Non-Detect		-2.207
2132					Maximum Non-Detect	1.2				Maximum Non-Detect		0.182
2133												
2134	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect		10
2135	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected		5
2136	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage		66.67%
2137												
2138	**UCL Statistics**											
2139	**Normal Distribution Test with Detected Values Only**									**Lognormal Distribution Test with Detected Values Only**		
2140					Shapiro Wilk Test Statistic	0.776				Shapiro Wilk Test Statistic		0.825
2141					5% Shapiro Wilk Critical Value	0.85				5% Shapiro Wilk Critical Value		0.85
2142	**Data not Normal at 5% Significance Level**									**Data not Lognormal at 5% Significance Level**		
2143												
2144	**Assuming Normal Distribution**									**Assuming Lognormal Distribution**		
2145					DL/2 Substitution Method					DL/2 Substitution Method		
2146					Mean	2.283				Mean		-0.0684
2147					SD	2.703				SD		1.516
2148					95% DL/2 (t) UCL	3.513				95% H-Stat (DL/2) UCL		8.185
2149												
2150					Maximum Likelihood Estimate(MLE) Method					Log ROS Method		
2151					Mean	5.9				Mean in Log Scale		-0.0938
2152					SD	0.853				SD in Log Scale		1.503
2153					95% MLE (t) UCL	6.288				Mean in Original Scale		2.264
2154					95% MLE (Tiku) UCL	6.572				SD in Original Scale		2.717
2155										95% Percentile Bootstrap UCL		3.423
2156										95% BCA Bootstrap UCL		3.498
2157												
2158	**Gamma Distribution Test with Detected Values Only**									**Data Distribution Test with Detected Values Only**		
2159					k star (bias corrected)	0.725				**Data do not follow a Discernable Distribution (0.05)**		
2160					Theta Star	4.124						
2161					nu star	15.95						
2162												
2163					A-D Test Statistic	1.081				**Nonparametric Statistics**		
2164					5% A-D Critical Value	0.755				Kaplan-Meier (KM) Method		
2165					K-S Test Statistic	0.755				Mean		2.293
2166					5% K-S Critical Value	0.263				SD		2.603
2167	**Data not Gamma Distributed at 5% Significance Level**									SE of Mean		0.705
2168										95% KM (t) UCL		3.535
2169	**Assuming Gamma Distribution**									95% KM (z) UCL		3.453
2170					Gamma ROS Statistics using Extrapolated Data					95% KM (jackknife) UCL		3.506
2171					Minimum	0.26				95% KM (bootstrap t) UCL		3.791
2172					Maximum	7				95% KM (BCA) UCL		3.582
2173					Mean	2.61				95% KM (Percentile Bootstrap) UCL		3.475

2174					Median	0.72				95% KM (Chebyshev) UCL		5.367
2175					SD	2.547				97.5% KM (Chebyshev) UCL		6.697
2176					k star	0.864				99% KM (Chebyshev) UCL		9.31
2177					Theta star	3.022						
2178					Nu star	25.91				**Potential UCLs to Use**		
2179					AppChi2	15.31				97.5% KM (Chebyshev) UCL		6.697
2180					95% Gamma Approximate UCL	4.417						
2181					95% Adjusted Gamma UCL	4.725						
2182	**Note: DL/2 is not a recommended method.**											
2183												
2184												
2185	**Sodium (mg/kg)**											
2186												
2187						**General Statistics**						
2188					Number of Valid Samples	8				Number of Detected Data		6
2189					Number of Unique Samples	6				Number of Non-Detect Data		2
2190					Number of Missing Values	8				Percent Non-Detects		25.00%
2191												
2192					**Raw Statistics**					**Log-transformed Statistics**		
2193					Minimum Detected	35.4				Minimum Detected		3.567
2194					Maximum Detected	370				Maximum Detected		5.914
2195					Mean of Detected	154.2				Mean of Detected		4.73
2196					SD of Detected	126.9				SD of Detected		0.886
2197					Minimum Non-Detect	42				Minimum Non-Detect		3.738
2198					Maximum Non-Detect	43				Maximum Non-Detect		3.761
2199												
2200	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect		3
2201	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected		5
2202	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage		37.50%
2203												
2204						**UCL Statistics**						
2205					**Normal Distribution Test with Detected Values Only**					**Lognormal Distribution Test with Detected Values Only**		
2206					Shapiro Wilk Test Statistic	0.892				Shapiro Wilk Test Statistic		0.961
2207					5% Shapiro Wilk Critical Value	0.788				5% Shapiro Wilk Critical Value		0.788
2208					**Data appear Normal at 5% Significance Level**					**Data appear Lognormal at 5% Significance Level**		
2209												
2210					**Assuming Normal Distribution**					**Assuming Lognormal Distribution**		
2211					DL/2 Substitution Method					DL/2 Substitution Method		
2212					Mean	121				Mean		4.312
2213					SD	123.6				SD		1.078
2214					95% DL/2 (t) UCL	203.8				95% H-Stat (DL/2) UCL		503.4
2215												
2216					Maximum Likelihood Estimate(MLE) Method					Log ROS Method		
2217					Mean	85.13				Mean in Log Scale		4.386
2218					SD	158.9				SD in Log Scale		0.984
2219					95% MLE (t) UCL	191.6				Mean in Original Scale		122.8
2220					95% MLE (Tiku) UCL	202.8				SD in Original Scale		122
2221										95% Percentile Bootstrap UCL		197.8
2222										95% BCA Bootstrap UCL		205.2
2223												
2224					**Gamma Distribution Test with Detected Values Only**					**Data Distribution Test with Detected Values Only**		
2225					k star (bias corrected)	0.997				**Data appear Normal at 5% Significance Level**		
2226					Theta Star	154.7						

2227					nu star	11.96						
2228												
2229					A-D Test Statistic	0.26	**Nonparametric Statistics**					
2230					5% A-D Critical Value	0.706					Kaplan-Meier (KM) Method	
2231					K-S Test Statistic	0.706					Mean	124.5
2232					5% K-S Critical Value	0.337					SD	112.7
2233	**Data appear Gamma Distributed at 5% Significance Level**										SE of Mean	43.66
2234											95% KM (t) UCL	207.2
2235	**Assuming Gamma Distribution**										95% KM (z) UCL	196.3
2236	Gamma ROS Statistics using Extrapolated Data										95% KM (jackknife) UCL	203.3
2237					Minimum	35.4					95% KM (bootstrap t) UCL	280.3
2238					Maximum	370					95% KM (BCA) UCL	215.3
2239					Mean	127.7					95% KM (Percentile Bootstrap) UCL	204.3
2240					Median	66.7					95% KM (Chebyshev) UCL	314.8
2241					SD	117.9					97.5% KM (Chebyshev) UCL	397.2
2242					k star	1.114					99% KM (Chebyshev) UCL	558.9
2243					Theta star	114.7						
2244					Nu star	17.82	**Potential UCLs to Use**					
2245					AppChi2	9.259					95% KM (t) UCL	207.2
2246					95% Gamma Approximate UCL	245.8					95% KM (Percentile Bootstrap) UCL	204.3
2247					95% Adjusted Gamma UCL	293.7						
2248	**Note: DL/2 is not a recommended method.**											
2249												
2250												
2251	**Thallium (mg/kg)**											
2252												
2253	**General Statistics**											
2254					Number of Valid Samples	16					Number of Detected Data	4
2255					Number of Unique Samples	4					Number of Non-Detect Data	12
2256											Percent Non-Detects	75.00%
2257												
2258	**Raw Statistics**						**Log-transformed Statistics**					
2259					Minimum Detected	0.073					Minimum Detected	-2.617
2260					Maximum Detected	0.21					Maximum Detected	-1.561
2261					Mean of Detected	0.134					Mean of Detected	-2.099
2262					SD of Detected	0.0631					SD of Detected	0.487
2263					Minimum Non-Detect	0.26					Minimum Non-Detect	-1.347
2264					Maximum Non-Detect	12					Maximum Non-Detect	2.485
2265												
2266	Note: Data have multiple DLs - Use of KM Method is recommended										Number treated as Non-Detect	16
2267	For all methods (except KM, DL/2, and ROS Methods),										Number treated as Detected	0
2268	Observations < Largest ND are treated as NDs										Single DL Non-Detect Percentage	100.00%
2269												
2270	**UCL Statistics**											
2271	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
2272					Shapiro Wilk Test Statistic	0.933					Shapiro Wilk Test Statistic	0.942
2273					5% Shapiro Wilk Critical Value	0.748					5% Shapiro Wilk Critical Value	0.748
2274	**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
2275												
2276	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
2277					DL/2 Substitution Method						DL/2 Substitution Method	
2278					Mean	1.684					Mean	-0.356
2279					SD	1.711					SD	1.61

2280				95% DL/2 (t) UCL	2.434					95% H-Stat (DL/2) UCL		23.07
2281												
2282				Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method		
2283				**MLE method failed to converge properly**						Mean in Log Scale		-2.099
2284										SD in Log Scale		0.362
2285										Mean in Original Scale		0.13
2286										SD in Original Scale		0.0469
2287										95% Percentile Bootstrap UCL		0.149
2288										95% BCA Bootstrap UCL		0.151
2289												
2290				**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**		
2291				k star (bias corrected)	1.638					**Data appear Normal at 5% Significance Level**		
2292				Theta Star	0.0816							
2293				nu star	13.11							
2294												
2295				A-D Test Statistic	0.3					**Nonparametric Statistics**		
2296				5% A-D Critical Value	0.659					Kaplan-Meier (KM) Method		
2297				K-S Test Statistic	0.659					Mean		0.134
2298				5% K-S Critical Value	0.396					SD		0.0546
2299				**Data appear Gamma Distributed at 5% Significance Level**						SE of Mean		0.0315
2300										95% KM (t) UCL		0.189
2301				**Assuming Gamma Distribution**						95% KM (z) UCL		0.186
2302				Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL		0.196
2303				Minimum	0.0594					95% KM (bootstrap t) UCL		0.214
2304				Maximum	0.21					95% KM (BCA) UCL		0.185
2305				Mean	0.135					95% KM (Percentile Bootstrap) UCL		0.19
2306				Median	0.138					95% KM (Chebyshev) UCL		0.271
2307				SD	0.0469					97.5% KM (Chebyshev) UCL		0.331
2308				k star	6.471					99% KM (Chebyshev) UCL		0.448
2309				Theta star	0.0208							
2310				Nu star	207.1					**Potential UCLs to Use**		
2311				AppChi2	174.8					95% KM (t) UCL		0.189
2312				95% Gamma Approximate UCL	0.16					95% KM (Percentile Bootstrap) UCL		0.19
2313				95% Adjusted Gamma UCL	N/A							
2314	**Note: DL/2 is not a recommended method.**											
2315												
2316												
2317	**Vanadium (mg/kg)**											
2318												
2319						**General Statistics**							
2320				Number of Valid Samples	16					Number of Unique Samples		16
2321												
2322				**Raw Statistics**						**Log-transformed Statistics**		
2323				Minimum	12.1					Minimum of Log Data		2.493
2324				Maximum	50.6					Maximum of Log Data		3.924
2325				Mean	28.5					Mean of log Data		3.264
2326				Median	29.55					SD of log Data		0.438
2327				SD	11.7							
2328				Coefficient of Variation	0.411							
2329				Skewness	0.338							
2330												
2331						**Relevant UCL Statistics**							
2332				**Normal Distribution Test**						**Lognormal Distribution Test**		

2333					Shapiro Wilk Test Statistic	0.952					Shapiro Wilk Test Statistic	0.952
2334					Shapiro Wilk Critical Value	0.887					Shapiro Wilk Critical Value	0.887
2335					**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**	
2336												
2337					**Assuming Normal Distribution**						**Assuming Lognormal Distribution**	
2338					95% Student's-t UCL	33.63					95% H-UCL	36.08
2339					**95% UCLs (Adjusted for Skewness)**						95% Chebyshev (MVUE) UCL	42.61
2340					95% Adjusted-CLT UCL	33.58					97.5% Chebyshev (MVUE) UCL	48.67
2341					95% Modified-t UCL	33.67					99% Chebyshev (MVUE) UCL	60.57
2342												
2343					**Gamma Distribution Test**						**Data Distribution**	
2344					k star (bias corrected)	4.926					**Data appear Normal at 5% Significance Level**	
2345					Theta Star	5.785						
2346					nu star	157.6						
2347					Approximate Chi Square Value (.05)	129.6					**Nonparametric Statistics**	
2348					Adjusted Level of Significance	0.0335					95% CLT UCL	33.31
2349					Adjusted Chi Square Value	126.7					95% Jackknife UCL	33.63
2350											95% Standard Bootstrap UCL	33.27
2351					Anderson-Darling Test Statistic	0.302					95% Bootstrap-t UCL	34.14
2352					Anderson-Darling 5% Critical Value	0.741					95% Hall's Bootstrap UCL	33.8
2353					Kolmogorov-Smirnov Test Statistic	0.143					95% Percentile Bootstrap UCL	33.21
2354					Kolmogorov-Smirnov 5% Critical Value	0.216					95% BCA Bootstrap UCL	33.34
2355					**Data appear Gamma Distributed at 5% Significance Level**						95% Chebyshev(Mean, Sd) UCL	41.25
2356											97.5% Chebyshev(Mean, Sd) UCL	46.77
2357					**Assuming Gamma Distribution**						99% Chebyshev(Mean, Sd) UCL	57.6
2358					95% Approximate Gamma UCL	34.66						
2359					95% Adjusted Gamma UCL	35.45						
2360												
2361					**Potential UCL to Use**						Use 95% Student's-t UCL	33.63
2362												
2363												
2364	**Zinc (mg/kg)**											
2365												
2366					**General Statistics**							
2367					Number of Valid Samples	16					Number of Unique Samples	16
2368												
2369					**Raw Statistics**						**Log-transformed Statistics**	
2370					Minimum	7.23					Minimum of Log Data	1.978
2371					Maximum	76.3					Maximum of Log Data	4.335
2372					Mean	30.05					Mean of log Data	3.213
2373					Median	28.8					SD of log Data	0.673
2374					SD	18.04						
2375					Coefficient of Variation	0.6						
2376					Skewness	0.943						
2377												
2378					**Relevant UCL Statistics**							
2379					**Normal Distribution Test**						**Lognormal Distribution Test**	
2380					Shapiro Wilk Test Statistic	0.919					Shapiro Wilk Test Statistic	0.944
2381					Shapiro Wilk Critical Value	0.887					Shapiro Wilk Critical Value	0.887
2382					**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**	
2383												
2384					**Assuming Normal Distribution**						**Assuming Lognormal Distribution**	
2385					95% Student's-t UCL	37.96					95% H-UCL	46.12

2386	**95% UCLs (Adjusted for Skewness)**									95% Chebyshev (MVUE) UCL	54.35	
2387	95% Adjusted-CLT UCL	38.6								97.5% Chebyshev (MVUE) UCL	64.6	
2388	95% Modified-t UCL	38.13								99% Chebyshev (MVUE) UCL	84.74	
2389												
2390	**Gamma Distribution Test**									**Data Distribution**		
2391	k star (bias corrected)	2.31								**Data appear Normal at 5% Significance Level**		
2392	Theta Star	13.01										
2393	nu star	73.93										
2394	Approximate Chi Square Value (.05)	55.13								**Nonparametric Statistics**		
2395	Adjusted Level of Significance	0.0335								95% CLT UCL	37.47	
2396	Adjusted Chi Square Value	53.28								95% Jackknife UCL	37.96	
2397										95% Standard Bootstrap UCL	37.21	
2398	Anderson-Darling Test Statistic	0.312								95% Bootstrap-t UCL	38.93	
2399	Anderson-Darling 5% Critical Value	0.746								95% Hall's Bootstrap UCL	40.33	
2400	Kolmogorov-Smirnov Test Statistic	0.144								95% Percentile Bootstrap UCL	37.96	
2401	Kolmogorov-Smirnov 5% Critical Value	0.217								95% BCA Bootstrap UCL	38.53	
2402	**Data appear Gamma Distributed at 5% Significance Level**									95% Chebyshev(Mean, Sd) UCL	49.7	
2403										97.5% Chebyshev(Mean, Sd) UCL	58.21	
2404	**Assuming Gamma Distribution**									99% Chebyshev(Mean, Sd) UCL	74.91	
2405	95% Approximate Gamma UCL	40.3										
2406	95% Adjusted Gamma UCL	41.7										
2407												
2408	**Potential UCL to Use**									Use 95% Student's-t UCL	37.96	
2409												

1				General UCL Statistics for Data Sets with Non-Detects								
2		User Selected Options										
3		From File		WorkSheet.wst								
4		Full Precision		OFF								
5		Confidence Coefficient		95%								
6		Number of Bootstrap Operations		2000								
7												
8												
9	2-Methylnaphthalene (mg/kg)											
10												
11					General Statistics							
12				Number of Valid Samples	26			Number of Detected Data	5			
13				Number of Unique Samples	5			Number of Non-Detect Data	21			
14				Number of Missing Values	2			Percent Non-Detects	80.77%			
15												
16				Raw Statistics				Log-transformed Statistics				
17				Minimum Detected	0.006			Minimum Detected	-5.116			
18				Maximum Detected	0.21			Maximum Detected	-1.561			
19				Mean of Detected	0.0995			Mean of Detected	-2.784			
20				SD of Detected	0.0761			SD of Detected	1.384			
21				Minimum Non-Detect	0.0021			Minimum Non-Detect	-6.166			
22				Maximum Non-Detect	0.33			Maximum Non-Detect	-1.109			
23												
24	Note: Data have multiple DLs - Use of KM Method is recommended							Number treated as Non-Detect	26			
25	For all methods (except KM, DL/2, and ROS Methods),							Number treated as Detected	0			
26	Observations < Largest ND are treated as NDs							Single DL Non-Detect Percentage	100.00%			
27												
28					UCL Statistics							
29				Normal Distribution Test with Detected Values Only				Lognormal Distribution Test with Detected Values Only				
30				Shapiro Wilk Test Statistic	0.968			Shapiro Wilk Test Statistic	0.839			
31				5% Shapiro Wilk Critical Value	0.762			5% Shapiro Wilk Critical Value	0.762			
32				Data appear Normal at 5% Significance Level				Data appear Lognormal at 5% Significance Level				
33												
34				Assuming Normal Distribution				Assuming Lognormal Distribution				
35				DL/2 Substitution Method				DL/2 Substitution Method				
36				Mean	0.129			Mean	-2.338			
37				SD	0.0512			SD	1.177			
38				95% DL/2 (t) UCL	0.146			95% H-Stat (DL/2) UCL	0.297			
39												
40				Maximum Likelihood Estimate(MLE) Method	N/A			Log ROS Method				
41				MLE method failed to converge properly				Mean in Log Scale	-3.547			
42								SD in Log Scale	1.104			
43								Mean in Original Scale	0.049			
44								SD in Original Scale	0.0514			
45								95% Percentile Bootstrap UCL	0.0659			
46								95% BCA Bootstrap UCL	0.0685			
47												
48				Gamma Distribution Test with Detected Values Only				Data Distribution Test with Detected Values Only				
49				k star (bias corrected)	0.609			Data appear Normal at 5% Significance Level				
50				Theta Star	0.163							
51				nu star	6.086							
52												
53				A-D Test Statistic	0.363			Nonparametric Statistics				

54				5% A-D Critical Value	0.689					Kaplan-Meier (KM) Method		
55				K-S Test Statistic	0.689					Mean		0.0699
56				5% K-S Critical Value	0.363					SD		0.0693
57				**Data appear Gamma Distributed at 5% Significance Level**						SE of Mean		0.0283
58										95% KM (t) UCL		0.118
59				**Assuming Gamma Distribution**						95% KM (z) UCL		0.116
60				Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL		0.118
61				Minimum	0.006					95% KM (bootstrap t) UCL		0.12
62				Maximum	0.267					95% KM (BCA) UCL		0.147
63				Mean	0.122					95% KM (Percentile Bootstrap) UCL		0.135
64				Median	0.122					95% KM (Chebyshev) UCL		0.193
65				SD	0.0693					97.5% KM (Chebyshev) UCL		0.247
66				k star	2.158					99% KM (Chebyshev) UCL		0.352
67				Theta star	0.0565							
68				Nu star	112.2					**Potential UCLs to Use**		
69				AppChi2	88.77					95% KM (t) UCL		0.118
70				95% Gamma Approximate UCL	0.154					95% KM (Percentile Bootstrap) UCL		0.135
71				95% Adjusted Gamma UCL	0.157							
72	**Note: DL/2 is not a recommended method.**											
73												
74												
75	**Acetone (mg/kg)**											
76												
77							**General Statistics**					
78				Number of Valid Samples	24					Number of Detected Data		4
79				Number of Unique Samples	4					Number of Non-Detect Data		20
80				Number of Missing Values	4					Percent Non-Detects		83.33%
81												
82				**Raw Statistics**						**Log-transformed Statistics**		
83				Minimum Detected	0.0406					Minimum Detected		-3.205
84				Maximum Detected	0.0658					Maximum Detected		-2.721
85				Mean of Detected	0.051					Mean of Detected		-2.992
86				SD of Detected	0.0108					SD of Detected		0.205
87				Minimum Non-Detect	0.0054					Minimum Non-Detect		-5.221
88				Maximum Non-Detect	0.12					Maximum Non-Detect		-2.12
89												
90	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect		24
91	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected		0
92	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage		100.00%
93												
94							**UCL Statistics**					
95				**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**		
96				Shapiro Wilk Test Statistic	0.944					Shapiro Wilk Test Statistic		0.973
97				5% Shapiro Wilk Critical Value	0.748					5% Shapiro Wilk Critical Value		0.748
98				**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**		
99												
100				**Assuming Normal Distribution**						**Assuming Lognormal Distribution**		
101				DL/2 Substitution Method						DL/2 Substitution Method		
102				Mean	0.0302					Mean		-3.768
103				SD	0.0166					SD		0.927
104				95% DL/2 (t) UCL	0.0361					95% H-Stat (DL/2) UCL		0.0472
105												
106				Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method		

107	MLE method failed to converge properly									Mean in Log Scale		-3.297
108										SD in Log Scale		0.184
109										Mean in Original Scale		0.0377
110										SD in Original Scale		0.00797
111										95% Percentile Bootstrap UCL		0.0404
112										95% BCA Bootstrap UCL		0.0414
113												
114	Gamma Distribution Test with Detected Values Only									Data Distribution Test with Detected Values Only		
115				k star (bias corrected)		7.98				Data appear Normal at 5% Significance Level		
116				Theta Star		0.00639						
117				nu star		63.84						
118												
119				A-D Test Statistic		0.255				Nonparametric Statistics		
120				5% A-D Critical Value		0.657				Kaplan-Meier (KM) Method		
121				K-S Test Statistic		0.657				Mean		0.0437
122				5% K-S Critical Value		0.394				SD		0.00611
123	Data appear Gamma Distributed at 5% Significance Level									SE of Mean		0.00189
124										95% KM (t) UCL		0.0469
125	Assuming Gamma Distribution									95% KM (z) UCL		0.0468
126				Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL		0.0475
127				Minimum		0				95% KM (bootstrap t) UCL		0.0459
128				Maximum		0.0658				95% KM (BCA) UCL		0.0658
129				Mean		0.0085				95% KM (Percentile Bootstrap) UCL		0.0536
130				Median		0				95% KM (Chebyshev) UCL		0.0519
131				SD		0.0198				97.5% KM (Chebyshev) UCL		0.0555
132				k star		0.0852				99% KM (Chebyshev) UCL		0.0625
133				Theta star		0.0998						
134				Nu star		4.087				Potential UCLs to Use		
135				AppChi2		0.757				95% KM (t) UCL		0.0469
136				95% Gamma Approximate UCL		0.0459				95% KM (Percentile Bootstrap) UCL		0.0536
137				95% Adjusted Gamma UCL		N/A						
138	Note: DL/2 is not a recommended method.											
139												
140												
141	Anthracene (mg/kg)											
142												
143						General Statistics						
144				Number of Valid Samples		27				Number of Detected Data		3
145				Number of Unique Samples		3				Number of Non-Detect Data		24
146				Number of Missing Values		1				Percent Non-Detects		88.89%
147												
148				Raw Statistics						Log-transformed Statistics		
149				Minimum Detected		0.0035				Minimum Detected		-5.655
150				Maximum Detected		0.02				Maximum Detected		-3.912
151				Mean of Detected		0.0093				Mean of Detected		-4.998
152				SD of Detected		0.00928				SD of Detected		0.947
153				Minimum Non-Detect		0.0021				Minimum Non-Detect		-6.166
154				Maximum Non-Detect		0.33				Maximum Non-Detect		-1.109
155												
156	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect		27
157	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected		0
158	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage		100.00%
159												

160	**UCL Statistics**											
161	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
162	Shapiro Wilk Test Statistic				0.791		Shapiro Wilk Test Statistic					0.847
163	5% Shapiro Wilk Critical Value				0.767		5% Shapiro Wilk Critical Value					0.767
164	**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
165												
166	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
167	DL/2 Substitution Method						DL/2 Substitution Method					
168	Mean				0.117		Mean					-2.703
169	SD				0.0606		SD					1.602
170	95% DL/2 (t) UCL				0.137		95% H-Stat (DL/2) UCL					0.735
171												
172	Maximum Likelihood Estimate(MLE) Method				N/A		Log ROS Method					
173	**MLE method failed to converge properly**						Mean in Log Scale					-6.101
174							SD in Log Scale					1.142
175							Mean in Original Scale					0.00406
176							SD in Original Scale					0.00481
177							95% Percentile Bootstrap UCL					0.00562
178							95% BCA Bootstrap UCL					0.00592
179												
180	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
181	k star (bias corrected)				N/A		**Data appear Normal at 5% Significance Level**					
182	Theta Star				N/A							
183	nu star				N/A							
184												
185	A-D Test Statistic				0.5		**Nonparametric Statistics**					
186	5% A-D Critical Value				N/A		Kaplan-Meier (KM) Method					
187	K-S Test Statistic				N/A		Mean					0.00698
188	5% K-S Critical Value				N/A		SD					0.00652
189	**Data not Gamma Distributed at 5% Significance Level**						SE of Mean					0.00357
190							95% KM (t) UCL					0.0131
191	**Assuming Gamma Distribution**						95% KM (z) UCL					0.0129
192	Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL					0.0129
193	Minimum				N/A		95% KM (bootstrap t) UCL					0.0781
194	Maximum				N/A		95% KM (BCA) UCL					N/A
195	Mean				N/A		95% KM (Percentile Bootstrap) UCL					N/A
196	Median				N/A		95% KM (Chebyshev) UCL					0.0225
197	SD				N/A		97.5% KM (Chebyshev) UCL					0.0293
198	k star				N/A		99% KM (Chebyshev) UCL					0.0425
199	Theta star				N/A							
200	Nu star				N/A		**Potential UCLs to Use**					
201	AppChi2				N/A		95% KM (t) UCL					0.0131
202	95% Gamma Approximate UCL				N/A		95% KM (Percentile Bootstrap) UCL					N/A
203	95% Adjusted Gamma UCL				N/A							
204	**Note: DL/2 is not a recommended method.**											
205												
206												
207	**Aroclor 1254 (mg/kg)**											
208												
209	**General Statistics**											
210	Number of Valid Samples				27		Number of Detected Data					5
211	Number of Unique Samples				5		Number of Non-Detect Data					22
212	Number of Missing Values				1		Percent Non-Detects					81.48%

Raw Statistics		
Minimum Detected	0.0111	
Maximum Detected	0.061	
Mean of Detected	0.0268	
SD of Detected	0.0198	
Minimum Non-Detect	0.017	
Maximum Non-Detect	10	
Note: Data have multiple DLs - Use of KM Method is recommended		
For all methods (except KM, DL/2, and ROS Methods),		
Observations < Largest ND are treated as NDs		

Log-transformed Statistics	
Minimum Detected	-4.501
Maximum Detected	-2.797
Mean of Detected	-3.798
SD of Detected	0.636
Minimum Non-Detect	-4.075
Maximum Non-Detect	2.303
Number treated as Non-Detect	27
Number treated as Detected	0
Single DL Non-Detect Percentage	100.00%

UCL Statistics

Normal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.792
5% Shapiro Wilk Critical Value	0.762
Data appear Normal at 5% Significance Level	
Assuming Normal Distribution	
DL/2 Substitution Method	
Mean	0.241
SD	0.976
95% DL/2 (t) UCL	0.562
Maximum Likelihood Estimate(MLE) Method	N/A
MLE method failed to converge properly	

Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.943
5% Shapiro Wilk Critical Value	0.762
Data appear Lognormal at 5% Significance Level	
Assuming Lognormal Distribution	
DL/2 Substitution Method	
Mean	-3.977
SD	1.486
95% H-Stat (DL/2) UCL	0.137
Log ROS Method	
Mean in Log Scale	-4.265
SD in Log Scale	0.399
Mean in Original Scale	0.0155
SD in Original Scale	0.00986
95% Percentile Bootstrap UCL	0.0189
95% BCA Bootstrap UCL	0.0207

Gamma Distribution Test with Detected Values Only	
k star (bias corrected)	1.319
Theta Star	0.0203
nu star	13.19
A-D Test Statistic	0.387
5% A-D Critical Value	0.683
K-S Test Statistic	0.683
5% K-S Critical Value	0.359
Data appear Gamma Distributed at 5% Significance Level	
Assuming Gamma Distribution	
Gamma ROS Statistics using Extrapolated Data	
Minimum	0.0111
Maximum	0.061
Mean	0.0255
Median	0.0238
SD	0.00936
k star	8.47
Theta star	0.00301

Data Distribution Test with Detected Values Only	
Data appear Normal at 5% Significance Level	
Nonparametric Statistics	
Kaplan-Meier (KM) Method	
Mean	0.0164
SD	0.0098
SE of Mean	0.00274
95% KM (t) UCL	0.0211
95% KM (z) UCL	0.0209
95% KM (jackknife) UCL	0.0225
95% KM (bootstrap t) UCL	0.0237
95% KM (BCA) UCL	0.0274
95% KM (Percentile Bootstrap) UCL	0.0243
95% KM (Chebyshev) UCL	0.0283
97.5% KM (Chebyshev) UCL	0.0335
99% KM (Chebyshev) UCL	0.0437

266					Nu star	457.4	**Potential UCLs to Use**					
267					AppChi2	408.8					95% KM (t) UCL	0.0211
268					95% Gamma Approximate UCL	0.0285					95% KM (Percentile Bootstrap) UCL	0.0243
269					95% Adjusted Gamma UCL	0.0287						
270	**Note: DL/2 is not a recommended method.**											
271												
272												
273	**B(a)A (mg/kg)**											
274												
275	**General Statistics**											
276					Number of Valid Samples	27					Number of Detected Data	7
277					Number of Unique Samples	7					Number of Non-Detect Data	20
278					Number of Missing Values	1					Percent Non-Detects	74.07%
279												
280	**Raw Statistics**						**Log-transformed Statistics**					
281					Minimum Detected	0.012					Minimum Detected	-4.423
282					Maximum Detected	0.06					Maximum Detected	-2.813
283					Mean of Detected	0.0298					Mean of Detected	-3.659
284					SD of Detected	0.0172					SD of Detected	0.597
285					Minimum Non-Detect	0.0021					Minimum Non-Detect	-6.166
286					Maximum Non-Detect	0.8					Maximum Non-Detect	-0.223
287												
288	Note: Data have multiple DLs - Use of KM Method is recommended										Number treated as Non-Detect	27
289	For all methods (except KM, DL/2, and ROS Methods),										Number treated as Detected	0
290	Observations < Largest ND are treated as NDs										Single DL Non-Detect Percentage	100.00%
291												
292	**UCL Statistics**											
293	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
294					Shapiro Wilk Test Statistic	0.918					Shapiro Wilk Test Statistic	0.944
295					5% Shapiro Wilk Critical Value	0.803					5% Shapiro Wilk Critical Value	0.803
296	**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
297												
298	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
299					DL/2 Substitution Method						DL/2 Substitution Method	
300					Mean	0.0437					Mean	-3.653
301					SD	0.0729					SD	1.102
302					95% DL/2 (t) UCL	0.0677					95% H-Stat (DL/2) UCL	0.0791
303												
304					Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method	
305	**MLE method failed to converge properly**										Mean in Log Scale	-4
306											SD in Log Scale	0.477
307											Mean in Original Scale	0.0206
308											SD in Original Scale	0.0112
309											95% Percentile Bootstrap UCL	0.0241
310											95% BCA Bootstrap UCL	0.0249
311												
312	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
313					k star (bias corrected)	2.122	**Data appear Normal at 5% Significance Level**					
314					Theta Star	0.0141						
315					nu star	29.71						
316												
317					A-D Test Statistic	0.259	**Nonparametric Statistics**					
318					5% A-D Critical Value	0.711	Kaplan-Meier (KM) Method					

319				K-S Test Statistic	0.711					Mean	0.024	
320				5% K-S Critical Value	0.313					SD	0.0141	
321				**Data appear Gamma Distributed at 5% Significance Level**						SE of Mean	0.00464	
322										95% KM (t) UCL	0.0319	
323				**Assuming Gamma Distribution**						95% KM (z) UCL	0.0316	
324				Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.0319	
325				Minimum	0.00909					95% KM (bootstrap t) UCL	0.0338	
326				Maximum	0.06					95% KM (BCA) UCL	0.0338	
327				Mean	0.0321					95% KM (Percentile Bootstrap) UCL	0.033	
328				Median	0.0367					95% KM (Chebyshev) UCL	0.0442	
329				SD	0.0127					97.5% KM (Chebyshev) UCL	0.053	
330				k star	4.553					99% KM (Chebyshev) UCL	0.0702	
331				Theta star	0.00704							
332				Nu star	245.9					**Potential UCLs to Use**		
333				AppChi2	210.6					95% KM (t) UCL	0.0319	
334				95% Gamma Approximate UCL	0.0374					95% KM (Percentile Bootstrap) UCL	0.033	
335				95% Adjusted Gamma UCL	0.0378							
336	**Note: DL/2 is not a recommended method.**											
337												
338												
339	**B(a)P (mg/kg)**											
340												
341					**General Statistics**							
342				Number of Valid Samples	27					Number of Detected Data	7	
343				Number of Unique Samples	7					Number of Non-Detect Data	20	
344				Number of Missing Values	1					Percent Non-Detects	74.07%	
345												
346				**Raw Statistics**						**Log-transformed Statistics**		
347				Minimum Detected	0.0066					Minimum Detected	-5.021	
348				Maximum Detected	0.046					Maximum Detected	-3.079	
349				Mean of Detected	0.0256					Mean of Detected	-3.891	
350				SD of Detected	0.0156					SD of Detected	0.794	
351				Minimum Non-Detect	0.0021					Minimum Non-Detect	-6.166	
352				Maximum Non-Detect	1					Maximum Non-Detect	0	
353												
354	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect	27	
355	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected	0	
356	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage	100.00%	
357												
358					**UCL Statistics**							
359				**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**		
360				Shapiro Wilk Test Statistic	0.924					Shapiro Wilk Test Statistic	0.866	
361				5% Shapiro Wilk Critical Value	0.803					5% Shapiro Wilk Critical Value	0.803	
362				**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**		
363												
364				**Assuming Normal Distribution**						**Assuming Lognormal Distribution**		
365				DL/2 Substitution Method						DL/2 Substitution Method		
366				Mean	0.0478					Mean	-3.69	
367				SD	0.093					SD	1.175	
368				95% DL/2 (t) UCL	0.0783					95% H-Stat (DL/2) UCL	0.0946	
369												
370				Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method		
371				**MLE method failed to converge properly**						Mean in Log Scale	-4.295	

372											SD in Log Scale	0.701
373											Mean in Original Scale	0.017
374											SD in Original Scale	0.0113
375											95% Percentile Bootstrap UCL	0.0204
376											95% BCA Bootstrap UCL	0.0209
377												
378	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
379					k star (bias corrected)	1.452	**Data appear Normal at 5% Significance Level**					
380					Theta Star	0.0176						
381					nu star	20.33						
382												
383					A-D Test Statistic	0.408	**Nonparametric Statistics**					
384					5% A-D Critical Value	0.714	Kaplan-Meier (KM) Method					
385					K-S Test Statistic	0.714	Mean	0.0214				
386					5% K-S Critical Value	0.315	SD	0.015				
387	**Data appear Gamma Distributed at 5% Significance Level**						SE of Mean	0.00539				
388							95% KM (t) UCL	0.0306				
389	**Assuming Gamma Distribution**						95% KM (z) UCL	0.0302				
390					Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	0.0307				
391					Minimum	0.00578	95% KM (bootstrap t) UCL	0.0319				
392					Maximum	0.047	95% KM (BCA) UCL	0.0335				
393					Mean	0.0288	95% KM (Percentile Bootstrap) UCL	0.0321				
394					Median	0.033	95% KM (Chebyshev) UCL	0.0449				
395					SD	0.0127	97.5% KM (Chebyshev) UCL	0.055				
396					k star	3.101	99% KM (Chebyshev) UCL	0.075				
397					Theta star	0.00929						
398					Nu star	167.5	**Potential UCLs to Use**					
399					AppChi2	138.5	95% KM (t) UCL	0.0306				
400					95% Gamma Approximate UCL	0.0348	95% KM (Percentile Bootstrap) UCL	0.0321				
401					95% Adjusted Gamma UCL	0.0353						
402	**Note: DL/2 is not a recommended method.**											
403												
404												
405	**B(b)F (mg/kg)**											
406												
407	**General Statistics**											
408					Number of Valid Samples	27	Number of Detected Data	8				
409					Number of Unique Samples	8	Number of Non-Detect Data	19				
410					Number of Missing Values	1	Percent Non-Detects	70.37%				
411												
412	**Raw Statistics**						**Log-transformed Statistics**					
413					Minimum Detected	0.012	Minimum Detected	-4.423				
414					Maximum Detected	0.063	Maximum Detected	-2.765				
415					Mean of Detected	0.0307	Mean of Detected	-3.645				
416					SD of Detected	0.0182	SD of Detected	0.616				
417					Minimum Non-Detect	0.0021	Minimum Non-Detect	-6.166				
418					Maximum Non-Detect	1	Maximum Non-Detect	0				
419												
420	Note: Data have multiple DLs - Use of KM Method is recommended						Number treated as Non-Detect	27				
421	For all methods (except KM, DL/2, and ROS Methods),						Number treated as Detected	0				
422	Observations < Largest ND are treated as NDs						Single DL Non-Detect Percentage	100.00%				
423												
424	**UCL Statistics**											

	A	B	C	D	E	F	G	H	I	J	K	L
425	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
426					Shapiro Wilk Test Statistic	0.913					Shapiro Wilk Test Statistic	0.938
427					5% Shapiro Wilk Critical Value	0.818					5% Shapiro Wilk Critical Value	0.818
428	**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
429												
430	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
431					DL/2 Substitution Method						DL/2 Substitution Method	
432					Mean	0.0485					Mean	-3.637
433					SD	0.0923					SD	1.142
434					95% DL/2 (t) UCL	0.0787					95% H-Stat (DL/2) UCL	0.0873
435												
436					Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method	
437	**MLE method failed to converge properly**										Mean in Log Scale	-3.97
438											SD in Log Scale	0.497
439											Mean in Original Scale	0.0214
440											SD in Original Scale	0.0123
441											95% Percentile Bootstrap UCL	0.0253
442											95% BCA Bootstrap UCL	0.0263
443												
444	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
445					k star (bias corrected)	2.126	**Data appear Normal at 5% Significance Level**					
446					Theta Star	0.0144						
447					nu star	34.01						
448												
449					A-D Test Statistic	0.285	**Nonparametric Statistics**					
450					5% A-D Critical Value	0.721					Kaplan-Meier (KM) Method	
451					K-S Test Statistic	0.721					Mean	0.0247
452					5% K-S Critical Value	0.296					SD	0.0148
453	**Data appear Gamma Distributed at 5% Significance Level**										SE of Mean	0.00466
454											95% KM (t) UCL	0.0326
455	**Assuming Gamma Distribution**										95% KM (z) UCL	0.0324
456					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.0327
457					Minimum	0.00724					95% KM (bootstrap t) UCL	0.0347
458					Maximum	0.063					95% KM (BCA) UCL	0.0346
459					Mean	0.032					95% KM (Percentile Bootstrap) UCL	0.0331
460					Median	0.0358					95% KM (Chebyshev) UCL	0.045
461					SD	0.0138					97.5% KM (Chebyshev) UCL	0.0538
462					k star	3.751					99% KM (Chebyshev) UCL	0.0711
463					Theta star	0.00852						
464					Nu star	202.6	**Potential UCLs to Use**					
465					AppChi2	170.6					95% KM (t) UCL	0.0326
466					95% Gamma Approximate UCL	0.0379					95% KM (Percentile Bootstrap) UCL	0.0331
467					95% Adjusted Gamma UCL	0.0384						
468	**Note: DL/2 is not a recommended method.**											
469												
470												
471	**B(ghi)P (mg/kg)**											
472												
473	**General Statistics**											
474					Number of Valid Samples	27					Number of Detected Data	6
475					Number of Unique Samples	6					Number of Non-Detect Data	21
476					Number of Missing Values	1					Percent Non-Detects	77.78%
477												

	A	B	C	D	E	F	G	H	I	J	K	L
478	**Raw Statistics**						**Log-transformed Statistics**					
479					Minimum Detected	0.0082					Minimum Detected	-4.804
480					Maximum Detected	0.025					Maximum Detected	-3.689
481					Mean of Detected	0.0176					Mean of Detected	-4.101
482					SD of Detected	0.00621					SD of Detected	0.405
483					Minimum Non-Detect	0.0021					Minimum Non-Detect	-6.166
484					Maximum Non-Detect	1					Maximum Non-Detect	0
485												
486	Note: Data have multiple DLs - Use of KM Method is recommended										Number treated as Non-Detect	27
487	For all methods (except KM, DL/2, and ROS Methods),										Number treated as Detected	0
488	Observations < Largest ND are treated as NDs										Single DL Non-Detect Percentage	100.00%
489												
490	**UCL Statistics**											
491	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
492					Shapiro Wilk Test Statistic	0.949					Shapiro Wilk Test Statistic	0.905
493					5% Shapiro Wilk Critical Value	0.788					5% Shapiro Wilk Critical Value	0.788
494	**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
495												
496	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
497					DL/2 Substitution Method						DL/2 Substitution Method	
498					Mean	0.0461					Mean	-3.724
499					SD	0.0932					SD	1.138
500					95% DL/2 (t) UCL	0.0767					95% H-Stat (DL/2) UCL	0.084
501												
502					Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method	
503	**MLE method failed to converge properly**										Mean in Log Scale	-4.337
504											SD in Log Scale	0.361
505											Mean in Original Scale	0.0139
506											SD in Original Scale	0.00484
507											95% Percentile Bootstrap UCL	0.0153
508											95% BCA Bootstrap UCL	0.0154
509												
510	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
511					k star (bias corrected)	4.234	**Data appear Normal at 5% Significance Level**					
512					Theta Star	0.00416						
513					nu star	50.81						
514												
515					A-D Test Statistic	0.309	**Nonparametric Statistics**					
516					5% A-D Critical Value	0.698	Kaplan-Meier (KM) Method					
517					K-S Test Statistic	0.698					Mean	0.0153
518					5% K-S Critical Value	0.333					SD	0.00638
519	**Data appear Gamma Distributed at 5% Significance Level**										SE of Mean	0.00247
520											95% KM (t) UCL	0.0195
521	**Assuming Gamma Distribution**										95% KM (z) UCL	0.0193
522					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.0197
523					Minimum	0.0082					95% KM (bootstrap t) UCL	0.0197
524					Maximum	0.025					95% KM (BCA) UCL	0.0213
525					Mean	0.0192					95% KM (Percentile Bootstrap) UCL	0.0203
526					Median	0.0208					95% KM (Chebyshev) UCL	0.026
527					SD	0.00452					97.5% KM (Chebyshev) UCL	0.0307
528					k star	13.58					99% KM (Chebyshev) UCL	0.0398
529					Theta star	0.00141						
530					Nu star	733.2	**Potential UCLs to Use**					

531					AppChi2	671.4					95% KM (t) UCL	0.0195
532					95% Gamma Approximate UCL	0.021					95% KM (Percentile Bootstrap) UCL	0.0203
533					95% Adjusted Gamma UCL	0.0211						
534	**Note: DL/2 is not a recommended method.**											
535												
536												
537	**B(k)F (mg/kg)**											
538												
539	**General Statistics**											
540					Number of Valid Samples	27					Number of Detected Data	7
541					Number of Unique Samples	7					Number of Non-Detect Data	20
542					Number of Missing Values	1					Percent Non-Detects	74.07%
543												
544	**Raw Statistics**						**Log-transformed Statistics**					
545					Minimum Detected	0.0023					Minimum Detected	-6.075
546					Maximum Detected	0.033					Maximum Detected	-3.411
547					Mean of Detected	0.0202					Mean of Detected	-4.292
548					SD of Detected	0.0132					SD of Detected	1.152
549					Minimum Non-Detect	0.0021					Minimum Non-Detect	-6.166
550					Maximum Non-Detect	0.3					Maximum Non-Detect	-1.204
551												
552	Note: Data have multiple DLs - Use of KM Method is recommended										Number treated as Non-Detect	27
553	For all methods (except KM, DL/2, and ROS Methods),										Number treated as Detected	0
554	Observations < Largest ND are treated as NDs										Single DL Non-Detect Percentage	100.00%
555												
556	**UCL Statistics**											
557	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
558					Shapiro Wilk Test Statistic	0.846					Shapiro Wilk Test Statistic	0.758
559					5% Shapiro Wilk Critical Value	0.803					5% Shapiro Wilk Critical Value	0.803
560	**Data appear Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**					
561												
562	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
563					DL/2 Substitution Method						DL/2 Substitution Method	
564					Mean	0.03					Mean	-3.888
565					SD	0.0262					SD	1.127
566					95% DL/2 (t) UCL	0.0386					95% H-Stat (DL/2) UCL	0.0794
567												
568					Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method	
569	**MLE method failed to converge properly**										Mean in Log Scale	-4.829
570											SD in Log Scale	0.977
571											Mean in Original Scale	0.0119
572											SD in Original Scale	0.00991
573											95% Percentile Bootstrap UCL	0.0148
574											95% BCA Bootstrap UCL	0.0151
575												
576	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
577					k star (bias corrected)	0.909	**Data appear Normal at 5% Significance Level**					
578					Theta Star	0.0222						
579					nu star	12.73						
580												
581					A-D Test Statistic	0.777	**Nonparametric Statistics**					
582					5% A-D Critical Value	0.722					Kaplan-Meier (KM) Method	
583					K-S Test Statistic	0.722					Mean	0.0162

584				5% K-S Critical Value	0.317					SD	0.0131
585	**Data follow Appr. Gamma Distribution at 5% Significance Level**									SE of Mean	0.00473
586										95% KM (t) UCL	0.0243
587	**Assuming Gamma Distribution**									95% KM (z) UCL	0.024
588	Gamma ROS Statistics using Extrapolated Data									95% KM (jackknife) UCL	0.0244
589				Minimum	0.0023					95% KM (bootstrap t) UCL	0.025
590				Maximum	0.0402					95% KM (BCA) UCL	0.0265
591				Mean	0.0227					95% KM (Percentile Bootstrap) UCL	0.0259
592				Median	0.0255					95% KM (Chebyshev) UCL	0.0368
593				SD	0.0112					97.5% KM (Chebyshev) UCL	0.0458
594				k star	2.276					99% KM (Chebyshev) UCL	0.0633
595				Theta star	0.00998						
596				Nu star	122.9	**Potential UCLs to Use**					
597				AppChi2	98.3					95% KM (t) UCL	0.0243
598				95% Gamma Approximate UCL	0.0284					95% KM (Percentile Bootstrap) UCL	0.0259
599				95% Adjusted Gamma UCL	0.0288						
600	**Note: DL/2 is not a recommended method.**										
601											
602											
603	**Chrysene (mg/kg)**										
604											
605	**General Statistics**										
606				Number of Valid Samples	27					Number of Detected Data	8
607				Number of Unique Samples	8					Number of Non-Detect Data	19
608				Number of Missing Values	1					Percent Non-Detects	70.37%
609											
610	**Raw Statistics**					**Log-transformed Statistics**					
611				Minimum Detected	0.016					Minimum Detected	-4.135
612				Maximum Detected	0.057					Maximum Detected	-2.865
613				Mean of Detected	0.0315					Mean of Detected	-3.554
614				SD of Detected	0.0147					SD of Detected	0.471
615				Minimum Non-Detect	0.0021					Minimum Non-Detect	-6.166
616				Maximum Non-Detect	0.6					Maximum Non-Detect	-0.511
617											
618	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect	27
619	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected	0
620	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage	100.00%
621											
622	**UCL Statistics**										
623	**Normal Distribution Test with Detected Values Only**					**Lognormal Distribution Test with Detected Values Only**					
624				Shapiro Wilk Test Statistic	0.896					Shapiro Wilk Test Statistic	0.909
625				5% Shapiro Wilk Critical Value	0.818					5% Shapiro Wilk Critical Value	0.818
626	**Data appear Normal at 5% Significance Level**					**Data appear Lognormal at 5% Significance Level**					
627											
628	**Assuming Normal Distribution**					**Assuming Lognormal Distribution**					
629				DL/2 Substitution Method						DL/2 Substitution Method	
630				Mean	0.0396					Mean	-3.649
631				SD	0.0535					SD	1.054
632				95% DL/2 (t) UCL	0.0572					95% H-Stat (DL/2) UCL	0.0708
633											
634				Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method	
635	**MLE method failed to converge properly**									Mean in Log Scale	-3.779
636										SD in Log Scale	0.395

637											Mean in Original Scale	0.0247
638											SD in Original Scale	0.0104
639											95% Percentile Bootstrap UCL	0.028
640											95% BCA Bootstrap UCL	0.0282
641												
642				**Gamma Distribution Test with Detected Values Only**							**Data Distribution Test with Detected Values Only**	
643						k star (bias corrected)	3.43				**Data appear Normal at 5% Significance Level**	
644						Theta Star	0.00918					
645						nu star	54.87					
646												
647						A-D Test Statistic	0.441				**Nonparametric Statistics**	
648						5% A-D Critical Value	0.719				Kaplan-Meier (KM) Method	
649						K-S Test Statistic	0.719				Mean	0.0277
650						5% K-S Critical Value	0.295				SD	0.0131
651				**Data appear Gamma Distributed at 5% Significance Level**							SE of Mean	0.00425
652											95% KM (t) UCL	0.0349
653				**Assuming Gamma Distribution**							95% KM (z) UCL	0.0347
654						Gamma ROS Statistics using Extrapolated Data					95% KM (jackknife) UCL	0.0348
655						Minimum	0.0127				95% KM (bootstrap t) UCL	0.0363
656						Maximum	0.057				95% KM (BCA) UCL	0.0367
657						Mean	0.0334				95% KM (Percentile Bootstrap) UCL	0.035
658						Median	0.0375				95% KM (Chebyshev) UCL	0.0462
659						SD	0.0112				97.5% KM (Chebyshev) UCL	0.0542
660						k star	6.699				99% KM (Chebyshev) UCL	0.07
661						Theta star	0.00498					
662						Nu star	361.7				**Potential UCLs to Use**	
663						AppChi2	318.7				95% KM (t) UCL	0.0349
664						95% Gamma Approximate UCL	0.0379				95% KM (Percentile Bootstrap) UCL	0.035
665						95% Adjusted Gamma UCL	0.0382					
666	**Note: DL/2 is not a recommended method.**											
667												
668												
669	**DB(ah)A (mg/kg)**											
670												
671							**General Statistics**					
672						Number of Valid Samples	27				Number of Detected Data	3
673						Number of Unique Samples	3				Number of Non-Detect Data	24
674						Number of Missing Values	1				Percent Non-Detects	88.89%
675												
676				**Raw Statistics**							**Log-transformed Statistics**	
677						Minimum Detected	0.0018				Minimum Detected	-6.32
678						Maximum Detected	0.0064				Maximum Detected	-5.051
679						Mean of Detected	0.00337				Mean of Detected	-5.879
680						SD of Detected	0.00263				SD of Detected	0.717
681						Minimum Non-Detect	0.0021				Minimum Non-Detect	-6.166
682						Maximum Non-Detect	1				Maximum Non-Detect	0
683												
684	Note: Data have multiple DLs - Use of KM Method is recommended										Number treated as Non-Detect	27
685	For all methods (except KM, DL/2, and ROS Methods),										Number treated as Detected	0
686	Observations < Largest ND are treated as NDs										Single DL Non-Detect Percentage	100.00%
687												
688							**UCL Statistics**					
689				**Normal Distribution Test with Detected Values Only**							**Lognormal Distribution Test with Detected Values Only**	

690					Shapiro Wilk Test Statistic	0.766					Shapiro Wilk Test Statistic	0.782
691					5% Shapiro Wilk Critical Value	0.767					5% Shapiro Wilk Critical Value	0.767
692					**Data not Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**	
693												
694					**Assuming Normal Distribution**						**Assuming Lognormal Distribution**	
695					DL/2 Substitution Method						DL/2 Substitution Method	
696					Mean	0.0451					Mean	-3.866
697					SD	0.0929					SD	1.33
698					95% DL/2 (t) UCL	0.0756					95% H-Stat (DL/2) UCL	0.12
699												
700					Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method	
701					**MLE method failed to converge properly**						Mean in Log Scale	-6.047
702											SD in Log Scale	0.359
703											Mean in Original Scale	0.00253
704											SD in Original Scale	0.00107
705											95% Percentile Bootstrap UCL	0.00288
706											95% BCA Bootstrap UCL	0.00294
707												
708					**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**	
709					k star (bias corrected)	N/A					**Data appear Lognormal at 5% Significance Level**	
710					Theta Star	N/A						
711					nu star	N/A						
712												
713					A-D Test Statistic	0.578					**Nonparametric Statistics**	
714					5% A-D Critical Value	N/A					Kaplan-Meier (KM) Method	
715					K-S Test Statistic	N/A					Mean	0.00276
716					5% K-S Critical Value	N/A					SD	0.00182
717					**Data not Gamma Distributed at 5% Significance Level**						SE of Mean	0.0009975
718											95% KM (t) UCL	0.00446
719					**Assuming Gamma Distribution**						95% KM (z) UCL	0.0044
720					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.00447
721					Minimum	N/A					95% KM (bootstrap t) UCL	0.0402
722					Maximum	N/A					95% KM (BCA) UCL	0.0064
723					Mean	N/A					95% KM (Percentile Bootstrap) UCL	N/A
724					Median	N/A					95% KM (Chebyshev) UCL	0.00711
725					SD	N/A					97.5% KM (Chebyshev) UCL	0.00899
726					k star	N/A					99% KM (Chebyshev) UCL	0.0127
727					Theta star	N/A						
728					Nu star	N/A					**Potential UCLs to Use**	
729					AppChi2	N/A					95% KM (t) UCL	0.00446
730					95% Gamma Approximate UCL	N/A					95% KM (% Bootstrap) UCL	N/A
731					95% Adjusted Gamma UCL	N/A						
732	**Note: DL/2 is not a recommended method.**											
733												
734												
735	**Dibenzofuran (mg/kg)**											
736												
737						**General Statistics**							
738					Number of Valid Samples	27					Number of Detected Data	3
739					Number of Unique Samples	3					Number of Non-Detect Data	24
740					Number of Missing Values	1					Percent Non-Detects	88.89%
741												
742					**Raw Statistics**						**Log-transformed Statistics**	

743				Minimum Detected	0.016					Minimum Detected	-4.135	
744				Maximum Detected	0.032					Maximum Detected	-3.442	
745				Mean of Detected	0.0237					Mean of Detected	-3.783	
746				SD of Detected	0.00802					SD of Detected	0.347	
747				Minimum Non-Detect	0.035					Minimum Non-Detect	-3.352	
748				Maximum Non-Detect	0.225					Maximum Non-Detect	-1.492	
749												
750	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect	27	
751	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected	0	
752	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage	100.00%	
753												
754	**UCL Statistics**											
755	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
756				Shapiro Wilk Test Statistic	0.995					Shapiro Wilk Test Statistic	0.999	
757				5% Shapiro Wilk Critical Value	0.767					5% Shapiro Wilk Critical Value	0.767	
758	**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
759												
760	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
761				DL/2 Substitution Method						DL/2 Substitution Method		
762				Mean	0.0849					Mean	-2.57	
763				SD	0.0274					SD	0.557	
764				95% DL/2 (t) UCL	0.0938					95% H-Stat (DL/2) UCL	0.121	
765												
766				Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method		
767	**MLE method failed to converge properly**									Mean in Log Scale	-3.783	
768										SD in Log Scale	0.318	
769										Mean in Original Scale	0.0239	
770										SD in Original Scale	0.00761	
771										95% Percentile Bootstrap UCL	0.0263	
772										95% BCA Bootstrap UCL	0.0265	
773												
774	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
775				k star (bias corrected)	N/A		**Data appear Normal at 5% Significance Level**					
776				Theta Star	N/A							
777				nu star	N/A							
778												
779				A-D Test Statistic	0.246		**Nonparametric Statistics**					
780				5% A-D Critical Value	N/A					Kaplan-Meier (KM) Method		
781				K-S Test Statistic	N/A					Mean	0.0237	
782				5% K-S Critical Value	N/A					SD	0.00655	
783	**Data not Gamma Distributed at 5% Significance Level**									SE of Mean	0.00463	
784										95% KM (t) UCL	0.0316	
785	**Assuming Gamma Distribution**									95% KM (z) UCL	0.0313	
786				Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.0332	
787				Minimum	N/A					95% KM (bootstrap t) UCL	0.0393	
788				Maximum	N/A					95% KM (BCA) UCL	0.032	
789				Mean	N/A					95% KM (Percentile Bootstrap) UCL	N/A	
790				Median	N/A					95% KM (Chebyshev) UCL	0.0439	
791				SD	N/A					97.5% KM (Chebyshev) UCL	0.0526	
792				k star	N/A					99% KM (Chebyshev) UCL	0.0697	
793				Theta star	N/A							
794				Nu star	N/A		**Potential UCLs to Use**					
795				AppChi2	N/A					95% KM (t) UCL	0.0316	

796				95% Gamma Approximate UCL		N/A				95% KM (Percentile Bootstrap) UCL		N/A
797				95% Adjusted Gamma UCL		N/A						
798	**Note: DL/2 is not a recommended method.**											
799												
800												
801	**Dieldrin (mg/kg)**											
802												
803	**General Statistics**											
804				Number of Valid Samples		25				Number of Detected Data		3
805				Number of Unique Samples		3				Number of Non-Detect Data		22
806				Number of Missing Values		3				Percent Non-Detects		88.00%
807												
808	**Raw Statistics**						**Log-transformed Statistics**					
809				Minimum Detected		0.00044				Minimum Detected		-7.729
810				Maximum Detected		0.00452				Maximum Detected		-5.399
811				Mean of Detected		0.0019				Mean of Detected		-6.774
812				SD of Detected		0.00227				SD of Detected		1.22
813				Minimum Non-Detect		0.00076				Minimum Non-Detect		-7.182
814				Maximum Non-Detect		2				Maximum Non-Detect		0.693
815												
816	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect		25
817	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected		0
818	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage		100.00%
819												
820	**UCL Statistics**											
821	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
822				Shapiro Wilk Test Statistic		0.807				Shapiro Wilk Test Statistic		0.911
823				5% Shapiro Wilk Critical Value		0.767				5% Shapiro Wilk Critical Value		0.767
824	**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
825												
826	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
827				DL/2 Substitution Method						DL/2 Substitution Method		
828				Mean		0.0471				Mean		-6.529
829				SD		0.201				SD		1.762
830				95% DL/2 (t) UCL		0.116				95% H-Stat (DL/2) UCL		0.0262
831												
832				Maximum Likelihood Estimate(MLE) Method		N/A				Log ROS Method		
833	**MLE method failed to converge properly**									Mean in Log Scale		-7.356
834										SD in Log Scale		0.617
835										Mean in Original Scale		0.0008086
836										SD in Original Scale		0.0008301
837										95% Percentile Bootstrap UCL		0.0011
838										95% BCA Bootstrap UCL		0.00132
839												
840	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
841				k star (bias corrected)		N/A	**Data appear Normal at 5% Significance Level**					
842				Theta Star		N/A						
843				nu star		N/A						
844												
845				A-D Test Statistic		0.425	**Nonparametric Statistics**					
846				5% A-D Critical Value		N/A				Kaplan-Meier (KM) Method		
847				K-S Test Statistic		N/A				Mean		0.0007657
848				5% K-S Critical Value		N/A				SD		0.0008147

849	Data not Gamma Distributed at 5% Significance Level										SE of Mean	0.0002414
850											95% KM (t) UCL	0.00118
851	Assuming Gamma Distribution										95% KM (z) UCL	0.00116
852	Gamma ROS Statistics using Extrapolated Data										95% KM (jackknife) UCL	0.00122
853	Minimum				N/A						95% KM (bootstrap t) UCL	0.00154
854	Maximum				N/A						95% KM (BCA) UCL	0.00452
855	Mean				N/A						95% KM (Percentile Bootstrap) UCL	0.00452
856	Median				N/A						95% KM (Chebyshev) UCL	0.00182
857	SD				N/A						97.5% KM (Chebyshev) UCL	0.00227
858	k star				N/A						99% KM (Chebyshev) UCL	0.00317
859	Theta star				N/A							
860	Nu star				N/A						Potential UCLs to Use	
861	AppChi2				N/A						95% KM (t) UCL	0.00118
862	95% Gamma Approximate UCL				N/A						95% KM (Percentile Bootstrap) UCL	0.00452
863	95% Adjusted Gamma UCL				N/A							
864	Note: DL/2 is not a recommended method.											
865												
866												
867	Endrin ketone (mg/kg)											
868												
869	General Statistics											
870	Number of Valid Samples				25						Number of Detected Data	3
871	Number of Unique Samples				3						Number of Non-Detect Data	22
872	Number of Missing Values				3						Percent Non-Detects	88.00%
873												
874	Raw Statistics										Log-transformed Statistics	
875	Minimum Detected				0.00166						Minimum Detected	-6.401
876	Maximum Detected				0.0029						Maximum Detected	-5.843
877	Mean of Detected				0.00233						Mean of Detected	-6.088
878	SD of Detected				0.000626						SD of Detected	0.285
879	Minimum Non-Detect				0.0034						Minimum Non-Detect	-5.684
880	Maximum Non-Detect				2						Maximum Non-Detect	0.693
881												
882	Note: Data have multiple DLs - Use of KM Method is recommended										Number treated as Non-Detect	25
883	For all methods (except KM, DL/2, and ROS Methods),										Number treated as Detected	0
884	Observations < Largest ND are treated as NDs										Single DL Non-Detect Percentage	100.00%
885												
886	UCL Statistics											
887	Normal Distribution Test with Detected Values Only										Lognormal Distribution Test with Detected Values Only	
888	Shapiro Wilk Test Statistic				0.981						Shapiro Wilk Test Statistic	0.957
889	5% Shapiro Wilk Critical Value				0.767						5% Shapiro Wilk Critical Value	0.767
890	Data appear Normal at 5% Significance Level										Data appear Lognormal at 5% Significance Level	
891												
892	Assuming Normal Distribution										Assuming Lognormal Distribution	
893	DL/2 Substitution Method										DL/2 Substitution Method	
894	Mean				0.0524						Mean	-5.808
895	SD				0.204						SD	1.564
896	95% DL/2 (t) UCL				0.122						95% H-Stat (DL/2) UCL	0.0298
897												
898	Maximum Likelihood Estimate(MLE) Method				N/A						Log ROS Method	
899	MLE method failed to converge properly										Mean in Log Scale	-6.088
900											SD in Log Scale	0.217
901											Mean in Original Scale	0.00232

902											SD in Original Scale	0.000499
903											95% Percentile Bootstrap UCL	0.00247
904											95% BCA Bootstrap UCL	0.00248
905												
906	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
907					k star (bias corrected)	N/A	**Data appear Normal at 5% Significance Level**					
908					Theta Star	N/A						
909					nu star	N/A						
910												
911					A-D Test Statistic	0.294	**Nonparametric Statistics**					
912					5% A-D Critical Value	N/A					Kaplan-Meier (KM) Method	
913					K-S Test Statistic	N/A					Mean	0.00233
914					5% K-S Critical Value	N/A					SD	0.0005111
915	**Data not Gamma Distributed at 5% Significance Level**										SE of Mean	0.0003614
916											95% KM (t) UCL	0.00295
917	**Assuming Gamma Distribution**										95% KM (z) UCL	0.00292
918					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.00307
919					Minimum	N/A					95% KM (bootstrap t) UCL	0.00302
920					Maximum	N/A					95% KM (BCA) UCL	0.0029
921					Mean	N/A					95% KM (Percentile Bootstrap) UCL	N/A
922					Median	N/A					95% KM (Chebyshev) UCL	0.00391
923					SD	N/A					97.5% KM (Chebyshev) UCL	0.00459
924					k star	N/A					99% KM (Chebyshev) UCL	0.00593
925					Theta star	N/A						
926					Nu star	N/A	**Potential UCLs to Use**					
927					AppChi2	N/A					95% KM (t) UCL	0.00295
928					95% Gamma Approximate UCL	N/A					95% KM (Percentile Bootstrap) UCL	N/A
929					95% Adjusted Gamma UCL	N/A						
930	**Warning: Recommended UCL exceeds the maximum observation**											
931	**Note: DL/2 is not a recommended method.**											
932												
933												
934	**Fluoranthene (mg/kg)**											
935												
936	**General Statistics**											
937					Number of Valid Samples	27					Number of Detected Data	6
938					Number of Unique Samples	6					Number of Non-Detect Data	21
939					Number of Missing Values	1					Percent Non-Detects	77.78%
940												
941	**Raw Statistics**						**Log-transformed Statistics**					
942					Minimum Detected	0.013					Minimum Detected	-4.343
943					Maximum Detected	0.11					Maximum Detected	-2.207
944					Mean of Detected	0.0602					Mean of Detected	-3.105
945					SD of Detected	0.0405					SD of Detected	0.939
946					Minimum Non-Detect	0.0021					Minimum Non-Detect	-6.166
947					Maximum Non-Detect	0.33					Maximum Non-Detect	-1.109
948												
949	Note: Data have multiple DLs - Use of KM Method is recommended										Number treated as Non-Detect	27
950	For all methods (except KM, DL/2, and ROS Methods),										Number treated as Detected	0
951	Observations < Largest ND are treated as NDs										Single DL Non-Detect Percentage	100.00%
952												
953	**UCL Statistics**											
954	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					

955					Shapiro Wilk Test Statistic	0.905					Shapiro Wilk Test Statistic	0.835
956					5% Shapiro Wilk Critical Value	0.788					5% Shapiro Wilk Critical Value	0.788
957					**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**	
958												
959					**Assuming Normal Distribution**						**Assuming Lognormal Distribution**	
960					DL/2 Substitution Method						DL/2 Substitution Method	
961					Mean	0.115					Mean	-2.583
962					SD	0.0564					SD	1.404
963					95% DL/2 (t) UCL	0.134					95% H-Stat (DL/2) UCL	0.473
964												
965					Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method	
966					**MLE method failed to converge properly**						Mean in Log Scale	-3.706
967											SD in Log Scale	0.86
968											Mean in Original Scale	0.0345
969											SD in Original Scale	0.0288
970											95% Percentile Bootstrap UCL	0.0438
971											95% BCA Bootstrap UCL	0.0445
972												
973					**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**	
974					k star (bias corrected)	1.032					**Data appear Normal at 5% Significance Level**	
975					Theta Star	0.0584						
976					nu star	12.38						
977												
978					A-D Test Statistic	0.494					**Nonparametric Statistics**	
979					5% A-D Critical Value	0.705					Kaplan-Meier (KM) Method	
980					K-S Test Statistic	0.705					Mean	0.0454
981					5% K-S Critical Value	0.336					SD	0.0372
982					**Data appear Gamma Distributed at 5% Significance Level**						SE of Mean	0.0137
983											95% KM (t) UCL	0.0688
984					**Assuming Gamma Distribution**						95% KM (z) UCL	0.068
985					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.0689
986					Minimum	0.013					95% KM (bootstrap t) UCL	0.0712
987					Maximum	0.145					95% KM (BCA) UCL	0.0866
988					Mean	0.0779					95% KM (Percentile Bootstrap) UCL	0.0767
989					Median	0.0906					95% KM (Chebyshev) UCL	0.105
990					SD	0.0394					97.5% KM (Chebyshev) UCL	0.131
991					k star	2.715					99% KM (Chebyshev) UCL	0.182
992					Theta star	0.0287						
993					Nu star	146.6					**Potential UCLs to Use**	
994					AppChi2	119.6					95% KM (t) UCL	0.0688
995					95% Gamma Approximate UCL	0.0954					95% KM (Percentile Bootstrap) UCL	0.0767
996					95% Adjusted Gamma UCL	0.0967						
997	**Note: DL/2 is not a recommended method.**											
998												
999												
1000	**Fluorene (mg/kg)**											
1001												
1002						**General Statistics**							
1003					Number of Valid Samples	27					Number of Detected Data	3
1004					Number of Unique Samples	3					Number of Non-Detect Data	24
1005					Number of Missing Values	1					Percent Non-Detects	88.89%
1006												
1007					**Raw Statistics**						**Log-transformed Statistics**	

1008				Minimum Detected	0.0043					Minimum Detected	-5.449	
1009				Maximum Detected	0.0091					Maximum Detected	-4.699	
1010				Mean of Detected	0.0064					Mean of Detected	-5.1	
1011				SD of Detected	0.00246					SD of Detected	0.377	
1012				Minimum Non-Detect	0.0021					Minimum Non-Detect	-6.166	
1013				Maximum Non-Detect	0.33					Maximum Non-Detect	-1.109	
1014												
1015	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect	27	
1016	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected	0	
1017	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage	100.00%	
1018												
1019	**UCL Statistics**											
1020	**Normal Distribution Test with Detected Values Only**									**Lognormal Distribution Test with Detected Values Only**		
1021				Shapiro Wilk Test Statistic	0.955					Shapiro Wilk Test Statistic	0.987	
1022				5% Shapiro Wilk Critical Value	0.767					5% Shapiro Wilk Critical Value	0.767	
1023	**Data appear Normal at 5% Significance Level**									**Data appear Lognormal at 5% Significance Level**		
1024												
1025	**Assuming Normal Distribution**									**Assuming Lognormal Distribution**		
1026				DL/2 Substitution Method						DL/2 Substitution Method		
1027				Mean	0.116					Mean	-2.714	
1028				SD	0.0611					SD	1.601	
1029				95% DL/2 (t) UCL	0.136					95% H-Stat (DL/2) UCL	0.735	
1030												
1031				Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method		
1032	**MLE method failed to converge properly**									Mean in Log Scale	-5.564	
1033										SD in Log Scale	0.479	
1034										Mean in Original Scale	0.00428	
1035										SD in Original Scale	0.00206	
1036										95% Percentile Bootstrap UCL	0.00493	
1037										95% BCA Bootstrap UCL	0.00499	
1038												
1039	**Gamma Distribution Test with Detected Values Only**									**Data Distribution Test with Detected Values Only**		
1040				k star (bias corrected)	N/A					**Data appear Normal at 5% Significance Level**		
1041				Theta Star	N/A							
1042				nu star	N/A							
1043												
1044				A-D Test Statistic	0.277					**Nonparametric Statistics**		
1045				5% A-D Critical Value	N/A					Kaplan-Meier (KM) Method		
1046				K-S Test Statistic	N/A					Mean	0.00556	
1047				5% K-S Critical Value	N/A					SD	0.00186	
1048	**Data not Gamma Distributed at 5% Significance Level**									SE of Mean	0.00102	
1049										95% KM (t) UCL	0.0073	
1050	**Assuming Gamma Distribution**									95% KM (z) UCL	0.00724	
1051				Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.00726	
1052				Minimum	N/A					95% KM (bootstrap t) UCL	0.00843	
1053				Maximum	N/A					95% KM (BCA) UCL	N/A	
1054				Mean	N/A					95% KM (Percentile Bootstrap) UCL	0.0091	
1055				Median	N/A					95% KM (Chebyshev) UCL	0.01	
1056				SD	N/A					97.5% KM (Chebyshev) UCL	0.0119	
1057				k star	N/A					99% KM (Chebyshev) UCL	0.0157	
1058				Theta star	N/A							
1059				Nu star	N/A					**Potential UCLs to Use**		
1060				AppChi2	N/A					95% KM (t) UCL	0.0073	

1061				95% Gamma Approximate UCL		N/A				95% KM (Percentile Bootstrap) UCL		0.0091
1062				95% Adjusted Gamma UCL		N/A						
1063	**Note: DL/2 is not a recommended method.**											
1064												
1065												
1066	**Heptachlor epoxide (mg/kg)**											
1067												
1068					**General Statistics**							
1069				Number of Valid Samples		25				Number of Detected Data		3
1070				Number of Unique Samples		3				Number of Non-Detect Data		22
1071				Number of Missing Values		3				Percent Non-Detects		88.00%
1072												
1073				**Raw Statistics**						**Log-transformed Statistics**		
1074				Minimum Detected		0.00046				Minimum Detected		-7.684
1075				Maximum Detected		0.00106				Maximum Detected		-6.849
1076				Mean of Detected		0.0006667				Mean of Detected		-7.392
1077				SD of Detected		0.0003408				SD of Detected		0.47
1078				Minimum Non-Detect		0.000777				Minimum Non-Detect		-7.16
1079				Maximum Non-Detect		2				Maximum Non-Detect		0.693
1080												
1081	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect		25
1082	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected		0
1083	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage		100.00%
1084												
1085					**UCL Statistics**							
1086				**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**		
1087				Shapiro Wilk Test Statistic		0.775				Shapiro Wilk Test Statistic		0.788
1088				5% Shapiro Wilk Critical Value		0.767				5% Shapiro Wilk Critical Value		0.767
1089				**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**		
1090												
1091				**Assuming Normal Distribution**						**Assuming Lognormal Distribution**		
1092				DL/2 Substitution Method						DL/2 Substitution Method		
1093				Mean		0.0474				Mean		-6.598
1094				SD		0.201				SD		1.76
1095				95% DL/2 (t) UCL		0.116				95% H-Stat (DL/2) UCL		0.026
1096												
1097				Maximum Likelihood Estimate(MLE) Method		N/A				Log ROS Method		
1098				**MLE method failed to converge properly**						Mean in Log Scale		-7.502
1099										SD in Log Scale		0.276
1100										Mean in Original Scale		0.0005736
1101										SD in Original Scale		0.0001709
1102										95% Percentile Bootstrap UCL		0.0006308
1103										95% BCA Bootstrap UCL		0.0006389
1104												
1105				**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**		
1106				k star (bias corrected)		N/A				**Data appear Normal at 5% Significance Level**		
1107				Theta Star		N/A						
1108				nu star		N/A						
1109												
1110				A-D Test Statistic		0.567				**Nonparametric Statistics**		
1111				5% A-D Critical Value		N/A				Kaplan-Meier (KM) Method		
1112				K-S Test Statistic		N/A				Mean		0.000588
1113				5% K-S Critical Value		N/A				SD		0.0002362

1114	**Data not Gamma Distributed at 5% Significance Level**										SE of Mean	0.0001295
1115											95% KM (t) UCL	0.0008095
1116	**Assuming Gamma Distribution**										95% KM (z) UCL	0.0008009
1117	Gamma ROS Statistics using Extrapolated Data										95% KM (jackknife) UCL	0.0008099
1118	Minimum	N/A									95% KM (bootstrap t) UCL	0.00377
1119	Maximum	N/A									95% KM (BCA) UCL	0.00106
1120	Mean	N/A									95% KM (Percentile Bootstrap) UCL	N/A
1121	Median	N/A									95% KM (Chebyshev) UCL	0.00115
1122	SD	N/A									97.5% KM (Chebyshev) UCL	0.0014
1123	k star	N/A									99% KM (Chebyshev) UCL	0.00188
1124	Theta star	N/A										
1125	Nu star	N/A									**Potential UCLs to Use**	
1126	AppChi2	N/A									95% KM (t) UCL	0.0008095
1127	95% Gamma Approximate UCL	N/A									95% KM (Percentile Bootstrap) UCL	N/A
1128	95% Adjusted Gamma UCL	N/A										
1129	**Note: DL/2 is not a recommended method.**											
1130												
1131												
1132	**I(123cd)P (mg/kg)**											
1133												
1134	**General Statistics**											
1135	Number of Valid Samples	27									Number of Detected Data	6
1136	Number of Unique Samples	6									Number of Non-Detect Data	21
1137	Number of Missing Values	1									Percent Non-Detects	77.78%
1138												
1139	**Raw Statistics**										**Log-transformed Statistics**	
1140	Minimum Detected	0.0036									Minimum Detected	-5.627
1141	Maximum Detected	0.0263									Maximum Detected	-3.638
1142	Mean of Detected	0.0156									Mean of Detected	-4.438
1143	SD of Detected	0.00987									SD of Detected	0.925
1144	Minimum Non-Detect	0.0021									Minimum Non-Detect	-6.166
1145	Maximum Non-Detect	1									Maximum Non-Detect	0
1146												
1147	Note: Data have multiple DLs - Use of KM Method is recommended										Number treated as Non-Detect	27
1148	For all methods (except KM, DL/2, and ROS Methods),										Number treated as Detected	0
1149	Observations < Largest ND are treated as NDs										Single DL Non-Detect Percentage	100.00%
1150												
1151	**UCL Statistics**											
1152	**Normal Distribution Test with Detected Values Only**										**Lognormal Distribution Test with Detected Values Only**	
1153	Shapiro Wilk Test Statistic	0.861									Shapiro Wilk Test Statistic	0.772
1154	5% Shapiro Wilk Critical Value	0.788									5% Shapiro Wilk Critical Value	0.788
1155	**Data appear Normal at 5% Significance Level**										**Data not Lognormal at 5% Significance Level**	
1156												
1157	**Assuming Normal Distribution**										**Assuming Lognormal Distribution**	
1158	DL/2 Substitution Method										DL/2 Substitution Method	
1159	Mean	0.0464									Mean	-3.794
1160	SD	0.0941									SD	1.236
1161	95% DL/2 (t) UCL	0.0773									95% H-Stat (DL/2) UCL	0.105
1162												
1163	Maximum Likelihood Estimate(MLE) Method	N/A									Log ROS Method	
1164	**MLE method failed to converge properly**										Mean in Log Scale	-4.951
1165											SD in Log Scale	0.794
1166											Mean in Original Scale	0.00935

1167											SD in Original Scale	0.00694
1168											95% Percentile Bootstrap UCL	0.0114
1169											95% BCA Bootstrap UCL	0.0117
1170												
1171	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
1172					k star (bias corrected)	1.081	**Data appear Normal at 5% Significance Level**					
1173					Theta Star	0.0145						
1174					nu star	12.97						
1175												
1176					A-D Test Statistic	0.685	**Nonparametric Statistics**					
1177					5% A-D Critical Value	0.705					Kaplan-Meier (KM) Method	
1178					K-S Test Statistic	0.705					Mean	0.0126
1179					5% K-S Critical Value	0.336					SD	0.00939
1180	**Data appear Gamma Distributed at 5% Significance Level**										SE of Mean	0.00363
1181											95% KM (t) UCL	0.0188
1182	**Assuming Gamma Distribution**										95% KM (z) UCL	0.0186
1183					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.019
1184					Minimum	0.0036					95% KM (bootstrap t) UCL	0.019
1185					Maximum	0.0308					95% KM (BCA) UCL	0.022
1186					Mean	0.0182					95% KM (Percentile Bootstrap) UCL	0.0215
1187					Median	0.0205					95% KM (Chebyshev) UCL	0.0285
1188					SD	0.00816					97.5% KM (Chebyshev) UCL	0.0353
1189					k star	3.041					99% KM (Chebyshev) UCL	0.0488
1190					Theta star	0.00599						
1191					Nu star	164.2	**Potential UCLs to Use**					
1192					AppChi2	135.6					95% KM (t) UCL	0.0188
1193					95% Gamma Approximate UCL	0.0221					95% KM (Percentile Bootstrap) UCL	0.0215
1194					95% Adjusted Gamma UCL	0.0223						
1195	**Note: DL/2 is not a recommended method.**											
1196												
1197												
1198	**Methoxychlor (mg/kg)**											
1199												
1200	**General Statistics**											
1201					Number of Valid Samples	25					Number of Detected Data	3
1202					Number of Unique Samples	3					Number of Non-Detect Data	22
1203					Number of Missing Values	3					Percent Non-Detects	88.00%
1204												
1205	**Raw Statistics**						**Log-transformed Statistics**					
1206					Minimum Detected	0.00282					Minimum Detected	-5.871
1207					Maximum Detected	0.0102					Maximum Detected	-4.585
1208					Mean of Detected	0.00767					Mean of Detected	-5.021
1209					SD of Detected	0.0042					SD of Detected	0.736
1210					Minimum Non-Detect	0.0035					Minimum Non-Detect	-5.655
1211					Maximum Non-Detect	2					Maximum Non-Detect	0.693
1212												
1213	Note: Data have multiple DLs - Use of KM Method is recommended										Number treated as Non-Detect	25
1214	For all methods (except KM, DL/2, and ROS Methods),										Number treated as Detected	0
1215	Observations < Largest ND are treated as NDs										Single DL Non-Detect Percentage	100.00%
1216												
1217	**UCL Statistics**											
1218	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
1219					Shapiro Wilk Test Statistic	0.771					Shapiro Wilk Test Statistic	0.762

1220				5% Shapiro Wilk Critical Value	0.767					5% Shapiro Wilk Critical Value	0.767
1221	**Data appear Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**					
1222												
1223	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
1224				DL/2 Substitution Method						DL/2 Substitution Method		
1225				Mean	0.0534					Mean	-4.983	
1226				SD	0.2					SD	1.568	
1227				95% DL/2 (t) UCL	0.122					95% H-Stat (DL/2) UCL	0.0643	
1228												
1229				Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method		
1230	**MLE method failed to converge properly**									Mean in Log Scale	-5.692	
1231										SD in Log Scale	0.401	
1232										Mean in Original Scale	0.0037	
1233										SD in Original Scale	0.00204	
1234										95% Percentile Bootstrap UCL	0.0044	
1235										95% BCA Bootstrap UCL	0.00471	
1236												
1237	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
1238				k star (bias corrected)	N/A		**Data appear Normal at 5% Significance Level**					
1239				Theta Star	N/A							
1240				nu star	N/A							
1241												
1242				A-D Test Statistic	0.598		**Nonparametric Statistics**					
1243				5% A-D Critical Value	N/A					Kaplan-Meier (KM) Method		
1244				K-S Test Statistic	N/A					Mean	0.00386	
1245				5% K-S Critical Value	N/A					SD	0.00255	
1246	**Data not Gamma Distributed at 5% Significance Level**									SE of Mean	0.0008334	
1247										95% KM (t) UCL	0.00529	
1248	**Assuming Gamma Distribution**									95% KM (z) UCL	0.00523	
1249				Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.00821	
1250				Minimum	N/A					95% KM (bootstrap t) UCL	0.00459	
1251				Maximum	N/A					95% KM (BCA) UCL	N/A	
1252				Mean	N/A					95% KM (Percentile Bootstrap) UCL	0.0102	
1253				Median	N/A					95% KM (Chebyshev) UCL	0.00749	
1254				SD	N/A					97.5% KM (Chebyshev) UCL	0.00906	
1255				k star	N/A					99% KM (Chebyshev) UCL	0.0122	
1256				Theta star	N/A							
1257				Nu star	N/A		**Potential UCLs to Use**					
1258				AppChi2	N/A					95% KM (t) UCL	0.00529	
1259				95% Gamma Approximate UCL	N/A					95% KM (Percentile Bootstrap) UCL	0.0102	
1260				95% Adjusted Gamma UCL	N/A							
1261	**Note: DL/2 is not a recommended method.**											
1262												
1263												
1264	**Naphthalene (mg/kg)**											
1265												
1266	**General Statistics**											
1267				Number of Valid Samples	25					Number of Detected Data	3	
1268				Number of Unique Samples	3					Number of Non-Detect Data	22	
1269				Number of Missing Values	3					Percent Non-Detects	88.00%	
1270												
1271	**Raw Statistics**						**Log-transformed Statistics**					
1272				Minimum Detected	0.06					Minimum Detected	-2.813	

1273				Maximum Detected	0.13					Maximum Detected	-2.04	
1274				Mean of Detected	0.0907					Mean of Detected	-2.451	
1275				SD of Detected	0.0358					SD of Detected	0.389	
1276				Minimum Non-Detect	0.0021					Minimum Non-Detect	-6.166	
1277				Maximum Non-Detect	0.33					Maximum Non-Detect	-1.109	
1278												
1279	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect	25	
1280	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected	0	
1281	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage	100.00%	
1282												
1283	**UCL Statistics**											
1284	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
1285				Shapiro Wilk Test Statistic	0.957					Shapiro Wilk Test Statistic	0.989	
1286				5% Shapiro Wilk Critical Value	0.767					5% Shapiro Wilk Critical Value	0.767	
1287	**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
1288												
1289	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
1290				DL/2 Substitution Method						DL/2 Substitution Method		
1291				Mean	0.13					Mean	-2.259	
1292				SD	0.0439					SD	1.064	
1293				95% DL/2 (t) UCL	0.145					95% H-Stat (DL/2) UCL	0.251	
1294												
1295				Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method		
1296	**MLE method failed to converge properly**									Mean in Log Scale	-2.929	
1297										SD in Log Scale	0.498	
1298										Mean in Original Scale	0.0601	
1299										SD in Original Scale	0.03	
1300										95% Percentile Bootstrap UCL	0.0704	
1301										95% BCA Bootstrap UCL	0.0709	
1302												
1303	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
1304				k star (bias corrected)	N/A		**Data appear Normal at 5% Significance Level**					
1305				Theta Star	N/A							
1306				nu star	N/A							
1307												
1308				A-D Test Statistic	0.273		**Nonparametric Statistics**					
1309				5% A-D Critical Value	N/A					Kaplan-Meier (KM) Method		
1310				K-S Test Statistic	N/A					Mean	0.0784	
1311				5% K-S Critical Value	N/A					SD	0.0272	
1312	**Data not Gamma Distributed at 5% Significance Level**									SE of Mean	0.0149	
1313										95% KM (t) UCL	0.104	
1314	**Assuming Gamma Distribution**									95% KM (z) UCL	0.103	
1315				Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.103	
1316				Minimum	N/A					95% KM (bootstrap t) UCL	0.121	
1317				Maximum	N/A					95% KM (BCA) UCL	0.13	
1318				Mean	N/A					95% KM (Percentile Bootstrap) UCL	0.13	
1319				Median	N/A					95% KM (Chebyshev) UCL	0.143	
1320				SD	N/A					97.5% KM (Chebyshev) UCL	0.171	
1321				k star	N/A					99% KM (Chebyshev) UCL	0.227	
1322				Theta star	N/A							
1323				Nu star	N/A		**Potential UCLs to Use**					
1324				AppChi2	N/A					95% KM (t) UCL	0.104	
1325				95% Gamma Approximate UCL	N/A					95% KM (Percentile Bootstrap) UCL	0.13	

1326					95% Adjusted Gamma UCL	N/A						
1327	**Note: DL/2 is not a recommended method.**											
1328												
1329												
1330	**Phenanthrene (mg/kg)**											
1331												
1332	**General Statistics**											
1333					Number of Valid Samples	27				Number of Detected Data	10	
1334					Number of Unique Samples	10				Number of Non-Detect Data	17	
1335					Number of Missing Values	1				Percent Non-Detects	62.96%	
1336												
1337	**Raw Statistics**						**Log-transformed Statistics**					
1338					Minimum Detected	0.0021				Minimum Detected	-6.166	
1339					Maximum Detected	0.3				Maximum Detected	-1.204	
1340					Mean of Detected	0.0833				Mean of Detected	-2.932	
1341					SD of Detected	0.0803				SD of Detected	1.257	
1342					Minimum Non-Detect	0.0021				Minimum Non-Detect	-6.166	
1343					Maximum Non-Detect	0.33				Maximum Non-Detect	-1.109	
1344												
1345	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect	27	
1346	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected	0	
1347	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage	100.00%	
1348												
1349	**UCL Statistics**											
1350	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
1351					Shapiro Wilk Test Statistic	0.673				Shapiro Wilk Test Statistic	0.743	
1352					5% Shapiro Wilk Critical Value	0.842				5% Shapiro Wilk Critical Value	0.842	
1353	**Data not Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**					
1354												
1355	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
1356					DL/2 Substitution Method					DL/2 Substitution Method		
1357					Mean	0.116				Mean	-2.538	
1358					SD	0.0657				SD	1.291	
1359					95% DL/2 (t) UCL	0.138				95% H-Stat (DL/2) UCL	0.376	
1360												
1361					Maximum Likelihood Estimate(MLE) Method	N/A				Log ROS Method		
1362	**MLE method failed to converge properly**									Mean in Log Scale	-3.354	
1363										SD in Log Scale	1.009	
1364										Mean in Original Scale	0.0526	
1365										SD in Original Scale	0.0559	
1366										95% Percentile Bootstrap UCL	0.0714	
1367										95% BCA Bootstrap UCL	0.0796	
1368												
1369	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
1370					k star (bias corrected)	0.95	**Data do not follow a Discernable Distribution (0.05)**					
1371					Theta Star	0.0877						
1372					nu star	18.99						
1373												
1374					A-D Test Statistic	0.869	**Nonparametric Statistics**					
1375					5% A-D Critical Value	0.744				Kaplan-Meier (KM) Method		
1376					K-S Test Statistic	0.744				Mean	0.062	
1377					5% K-S Critical Value	0.272				SD	0.0641	
1378	**Data not Gamma Distributed at 5% Significance Level**									SE of Mean	0.0166	

1379											95% KM (t) UCL	0.0904
1380	**Assuming Gamma Distribution**										95% KM (z) UCL	0.0893
1381				Gamma ROS Statistics using Extrapolated Data							95% KM (jackknife) UCL	0.089
1382					Minimum	0					95% KM (bootstrap t) UCL	0.102
1383					Maximum	0.3					95% KM (BCA) UCL	0.0986
1384					Mean	0.0842					95% KM (Percentile Bootstrap) UCL	0.0938
1385					Median	0.083					95% KM (Chebyshev) UCL	0.134
1386					SD	0.0605					97.5% KM (Chebyshev) UCL	0.166
1387					k star	0.622					99% KM (Chebyshev) UCL	0.227
1388					Theta star	0.136						
1389					Nu star	33.57					**Potential UCLs to Use**	
1390					AppChi2	21.32					95% KM (BCA) UCL	0.0986
1391				95% Gamma Approximate UCL		0.133						
1392				95% Adjusted Gamma UCL		0.137						
1393	**Note: DL/2 is not a recommended method.**											
1394												
1395												
1396	**Pyrene (mg/kg)**											
1397												
1398						**General Statistics**						
1399					Number of Valid Samples	27					Number of Detected Data	5
1400					Number of Unique Samples	5					Number of Non-Detect Data	22
1401					Number of Missing Values	1					Percent Non-Detects	81.48%
1402												
1403				**Raw Statistics**							**Log-transformed Statistics**	
1404					Minimum Detected	0.016					Minimum Detected	-4.135
1405					Maximum Detected	0.092					Maximum Detected	-2.386
1406					Mean of Detected	0.0573					Mean of Detected	-3.101
1407					SD of Detected	0.0364					SD of Detected	0.849
1408					Minimum Non-Detect	0.0021					Minimum Non-Detect	-6.166
1409					Maximum Non-Detect	0.33					Maximum Non-Detect	-1.109
1410												
1411	Note: Data have multiple DLs - Use of KM Method is recommended										Number treated as Non-Detect	27
1412	For all methods (except KM, DL/2, and ROS Methods),										Number treated as Detected	0
1413	Observations < Largest ND are treated as NDs										Single DL Non-Detect Percentage	100.00%
1414												
1415						**UCL Statistics**						
1416	**Normal Distribution Test with Detected Values Only**										**Lognormal Distribution Test with Detected Values Only**	
1417					Shapiro Wilk Test Statistic	0.819					Shapiro Wilk Test Statistic	0.789
1418					5% Shapiro Wilk Critical Value	0.762					5% Shapiro Wilk Critical Value	0.762
1419	**Data appear Normal at 5% Significance Level**										**Data appear Lognormal at 5% Significance Level**	
1420												
1421	**Assuming Normal Distribution**										**Assuming Lognormal Distribution**	
1422					DL/2 Substitution Method						DL/2 Substitution Method	
1423					Mean	0.115					Mean	-2.58
1424					SD	0.056					SD	1.403
1425					95% DL/2 (t) UCL	0.134					95% H-Stat (DL/2) UCL	0.456
1426												
1427					Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method	
1428	**MLE method failed to converge properly**										Mean in Log Scale	-3.771
1429											SD in Log Scale	0.799
1430											Mean in Original Scale	0.0311
1431											SD in Original Scale	0.025

1432											95% Percentile Bootstrap UCL	0.0394
1433											95% BCA Bootstrap UCL	0.0401
1434												
1435	**Gamma Distribution Test with Detected Values Only**										**Data Distribution Test with Detected Values Only**	
1436					k star (bias corrected)	1.021					**Data appear Normal at 5% Significance Level**	
1437					Theta Star	0.0561						
1438					nu star	10.21						
1439												
1440					A-D Test Statistic	0.646					**Nonparametric Statistics**	
1441					5% A-D Critical Value	0.684					Kaplan-Meier (KM) Method	
1442					K-S Test Statistic	0.684					Mean	0.0419
1443					5% K-S Critical Value	0.36					SD	0.0325
1444	**Data appear Gamma Distributed at 5% Significance Level**										SE of Mean	0.0129
1445											95% KM (t) UCL	0.0639
1446	**Assuming Gamma Distribution**										95% KM (z) UCL	0.0631
1447					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.0633
1448					Minimum	0.016					95% KM (bootstrap t) UCL	0.0635
1449					Maximum	0.15					95% KM (BCA) UCL	0.0838
1450					Mean	0.0802					95% KM (Percentile Bootstrap) UCL	0.0821
1451					Median	0.092					95% KM (Chebyshev) UCL	0.098
1452					SD	0.0392					97.5% KM (Chebyshev) UCL	0.122
1453					k star	3.09					99% KM (Chebyshev) UCL	0.17
1454					Theta star	0.026						
1455					Nu star	166.8					**Potential UCLs to Use**	
1456					AppChi2	138					95% KM (t) UCL	0.0639
1457					95% Gamma Approximate UCL	0.097					95% KM (Percentile Bootstrap) UCL	0.0821
1458					95% Adjusted Gamma UCL	0.0982						
1459	**Note: DL/2 is not a recommended method.**											
1460												
1461												
1462	**Aluminum (mg/kg)**											
1463												
1464	**General Statistics**											
1465					Number of Valid Samples	28					Number of Unique Samples	26
1466												
1467	**Raw Statistics**						**Log-transformed Statistics**					
1468					Minimum	3120					Minimum of Log Data	8.046
1469					Maximum	39450					Maximum of Log Data	10.58
1470					Mean	15188					Mean of log Data	9.454
1471					Median	13900					SD of log Data	0.647
1472					SD	8410						
1473					Coefficient of Variation	0.554						
1474					Skewness	0.799						
1475												
1476	**Relevant UCL Statistics**											
1477	**Normal Distribution Test**						**Lognormal Distribution Test**					
1478					Shapiro Wilk Test Statistic	0.95					Shapiro Wilk Test Statistic	0.941
1479					Shapiro Wilk Critical Value	0.924					Shapiro Wilk Critical Value	0.924
1480	**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
1481												
1482	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
1483					95% Student's-t UCL	17895					95% H-UCL	20371
1484	**95% UCLs (Adjusted for Skewness)**										95% Chebyshev (MVUE) UCL	24474

1485					95% Adjusted-CLT UCL	18058				97.5% Chebyshev (MVUE) UCL		28317
1486					95% Modified-t UCL	17935				99% Chebyshev (MVUE) UCL		35864
1487												
1488					**Gamma Distribution Test**					**Data Distribution**		
1489					k star (bias corrected)	2.731				**Data appear Normal at 5% Significance Level**		
1490					Theta Star	5562						
1491					nu star	152.9						
1492					Approximate Chi Square Value (.05)	125.3				**Nonparametric Statistics**		
1493					Adjusted Level of Significance	0.0404				95% CLT UCL		17802
1494					Adjusted Chi Square Value	123.8				95% Jackknife UCL		17895
1495										95% Standard Bootstrap UCL		17802
1496					Anderson-Darling Test Statistic	0.312				95% Bootstrap-t UCL		18252
1497					Anderson-Darling 5% Critical Value	0.754				95% Hall's Bootstrap UCL		18376
1498					Kolmogorov-Smirnov Test Statistic	0.11				95% Percentile Bootstrap UCL		17738
1499					Kolmogorov-Smirnov 5% Critical Value	0.167				95% BCA Bootstrap UCL		18059
1500					**Data appear Gamma Distributed at 5% Significance Level**					95% Chebyshev(Mean, Sd) UCL		22115
1501										97.5% Chebyshev(Mean, Sd) UCL		25113
1502					**Assuming Gamma Distribution**					99% Chebyshev(Mean, Sd) UCL		31001
1503					95% Approximate Gamma UCL	18530						
1504					95% Adjusted Gamma UCL	18761						
1505												
1506					**Potential UCL to Use**					Use 95% Student's-t UCL		17895
1507												
1508												
1509	**Antimony (mg/kg)**											
1510												
1511					**General Statistics**							
1512					Number of Valid Samples	28				Number of Detected Data		3
1513					Number of Unique Samples	3				Number of Non-Detect Data		25
1514										Percent Non-Detects		89.29%
1515												
1516					**Raw Statistics**					**Log-transformed Statistics**		
1517					Minimum Detected	0.74				Minimum Detected		-0.301
1518					Maximum Detected	1.8				Maximum Detected		0.588
1519					Mean of Detected	1.347				Mean of Detected		0.231
1520					SD of Detected	0.546				SD of Detected		0.47
1521					Minimum Non-Detect	0.2				Minimum Non-Detect		-1.609
1522					Maximum Non-Detect	7.14				Maximum Non-Detect		1.966
1523												
1524	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect		28
1525	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected		0
1526	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage		100.00%
1527												
1528					**UCL Statistics**							
1529					**Normal Distribution Test with Detected Values Only**					**Lognormal Distribution Test with Detected Values Only**		
1530					Shapiro Wilk Test Statistic	0.941				Shapiro Wilk Test Statistic		0.896
1531					5% Shapiro Wilk Critical Value	0.767				5% Shapiro Wilk Critical Value		0.767
1532					**Data appear Normal at 5% Significance Level**					**Data appear Lognormal at 5% Significance Level**		
1533												
1534					**Assuming Normal Distribution**					**Assuming Lognormal Distribution**		
1535					DL/2 Substitution Method					DL/2 Substitution Method		
1536					Mean	0.546				Mean		-1.345
1537					SD	0.943				SD		1.023

1538				95% DL/2 (t) UCL	0.85					95% H-Stat (DL/2) UCL	0.71	
1539												
1540				Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method		
1541				**MLE method failed to converge properly**						Mean in Log Scale	-2.231	
1542										SD in Log Scale	1.072	
1543										Mean in Original Scale	0.231	
1544										SD in Original Scale	0.425	
1545										95% Percentile Bootstrap UCL	0.375	
1546										95% BCA Bootstrap UCL	0.42	
1547												
1548				**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**		
1549				k star (bias corrected)	N/A					**Data appear Normal at 5% Significance Level**		
1550				Theta Star	N/A							
1551				nu star	N/A							
1552												
1553				A-D Test Statistic	0.373					**Nonparametric Statistics**		
1554				5% A-D Critical Value	N/A					Kaplan-Meier (KM) Method		
1555				K-S Test Statistic	N/A					Mean	0.81	
1556				5% K-S Critical Value	N/A					SD	0.246	
1557				**Data not Gamma Distributed at 5% Significance Level**						SE of Mean	0.0591	
1558										95% KM (t) UCL	0.911	
1559				**Assuming Gamma Distribution**						95% KM (z) UCL	0.907	
1560				Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	1.292	
1561				Minimum	N/A					95% KM (bootstrap t) UCL	0.851	
1562				Maximum	N/A					95% KM (BCA) UCL	1.8	
1563				Mean	N/A					95% KM (Percentile Bootstrap) UCL	1.8	
1564				Median	N/A					95% KM (Chebyshev) UCL	1.068	
1565				SD	N/A					97.5% KM (Chebyshev) UCL	1.179	
1566				k star	N/A					99% KM (Chebyshev) UCL	1.398	
1567				Theta star	N/A							
1568				Nu star	N/A					**Potential UCLs to Use**		
1569				AppChi2	N/A					95% KM (t) UCL	0.911	
1570				95% Gamma Approximate UCL	N/A					95% KM (Percentile Bootstrap) UCL	1.8	
1571				95% Adjusted Gamma UCL	N/A							
1572	**Note: DL/2 is not a recommended method.**											
1573												
1574												
1575	**Arsenic (mg/kg)**											
1576												
1577						**General Statistics**							
1578				Number of Valid Samples	28					Number of Unique Samples	27	
1579												
1580				**Raw Statistics**						**Log-transformed Statistics**		
1581				Minimum	0.97					Minimum of Log Data	-0.0305	
1582				Maximum	37					Maximum of Log Data	3.611	
1583				Mean	5.979					Mean of log Data	1.187	
1584				Median	2.64					SD of log Data	0.972	
1585				SD	9.053							
1586				Coefficient of Variation	1.514							
1587				Skewness	2.637							
1588												
1589						**Relevant UCL Statistics**							
1590				**Normal Distribution Test**						**Lognormal Distribution Test**		

1591					Shapiro Wilk Test Statistic	0.552					Shapiro Wilk Test Statistic	0.877
1592					Shapiro Wilk Critical Value	0.924					Shapiro Wilk Critical Value	0.924
1593					**Data not Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**	
1594												
1595					**Assuming Normal Distribution**						**Assuming Lognormal Distribution**	
1596					95% Student's-t UCL	8.893					95% H-UCL	8.275
1597					**95% UCLs (Adjusted for Skewness)**						95% Chebyshev (MVUE) UCL	9.801
1598					95% Adjusted-CLT UCL	9.704					97.5% Chebyshev (MVUE) UCL	11.82
1599					95% Modified-t UCL	9.035					99% Chebyshev (MVUE) UCL	15.79
1600												
1601					**Gamma Distribution Test**						**Data Distribution**	
1602					k star (bias corrected)	0.884					**Data do not follow a Discernable Distribution (0.05)**	
1603					Theta Star	6.76						
1604					nu star	49.53						
1605					Approximate Chi Square Value (.05)	34.37					**Nonparametric Statistics**	
1606					Adjusted Level of Significance	0.0404					95% CLT UCL	8.793
1607					Adjusted Chi Square Value	33.59					95% Jackknife UCL	8.893
1608											95% Standard Bootstrap UCL	8.643
1609					Anderson-Darling Test Statistic	2.522					95% Bootstrap-t UCL	11.22
1610					Anderson-Darling 5% Critical Value	0.775					95% Hall's Bootstrap UCL	8.977
1611					Kolmogorov-Smirnov Test Statistic	0.246					95% Percentile Bootstrap UCL	8.962
1612					Kolmogorov-Smirnov 5% Critical Value	0.17					95% BCA Bootstrap UCL	10.16
1613					**Data not Gamma Distributed at 5% Significance Level**						95% Chebyshev(Mean, Sd) UCL	13.44
1614											97.5% Chebyshev(Mean, Sd) UCL	16.66
1615					**Assuming Gamma Distribution**						99% Chebyshev(Mean, Sd) UCL	23
1616					95% Approximate Gamma UCL	8.616						
1617					95% Adjusted Gamma UCL	8.816						
1618												
1619					**Potential UCL to Use**						Use 95% Chebyshev (Mean, Sd) UCL	13.44
1620												
1621												
1622	**Barium (mg/kg)**											
1623												
1624					**General Statistics**							
1625					Number of Valid Samples	28					Number of Unique Samples	28
1626												
1627					**Raw Statistics**						**Log-transformed Statistics**	
1628					Minimum	31.6					Minimum of Log Data	3.453
1629					Maximum	190					Maximum of Log Data	5.247
1630					Mean	85.85					Mean of log Data	4.293
1631					Median	69.3					SD of log Data	0.567
1632					SD	51.31						
1633					Coefficient of Variation	0.598						
1634					Skewness	0.948						
1635												
1636					**Relevant UCL Statistics**							
1637					**Normal Distribution Test**						**Lognormal Distribution Test**	
1638					Shapiro Wilk Test Statistic	0.838					Shapiro Wilk Test Statistic	0.92
1639					Shapiro Wilk Critical Value	0.924					Shapiro Wilk Critical Value	0.924
1640					**Data not Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**	
1641												
1642					**Assuming Normal Distribution**						**Assuming Lognormal Distribution**	
1643					95% Student's-t UCL	102.4					95% H-UCL	106.9

1644	**95% UCLs (Adjusted for Skewness)**									95% Chebyshev (MVUE) UCL	127.4
1645	95% Adjusted-CLT UCL	103.7								97.5% Chebyshev (MVUE) UCL	145.6
1646	95% Modified-t UCL	102.7								99% Chebyshev (MVUE) UCL	181.4
1647											
1648	**Gamma Distribution Test**									**Data Distribution**	
1649	k star (bias corrected)	2.958								**Data Follow Appr. Gamma Distribution at 5% Significance Level**	
1650	Theta Star	29.02									
1651	nu star	165.6									
1652	Approximate Chi Square Value (.05)	136.9								**Nonparametric Statistics**	
1653	Adjusted Level of Significance	0.0404								95% CLT UCL	101.8
1654	Adjusted Chi Square Value	135.3								95% Jackknife UCL	102.4
1655										95% Standard Bootstrap UCL	101.2
1656	Anderson-Darling Test Statistic	0.958								95% Bootstrap-t UCL	105
1657	Anderson-Darling 5% Critical Value	0.753								95% Hall's Bootstrap UCL	103
1658	Kolmogorov-Smirnov Test Statistic	0.146								95% Percentile Bootstrap UCL	101.9
1659	Kolmogorov-Smirnov 5% Critical Value	0.166								95% BCA Bootstrap UCL	103.2
1660	**Data follow Appr. Gamma Distribution at 5% Significance Level**									95% Chebyshev(Mean, Sd) UCL	128.1
1661										97.5% Chebyshev(Mean, Sd) UCL	146.4
1662	**Assuming Gamma Distribution**									99% Chebyshev(Mean, Sd) UCL	182.3
1663	95% Approximate Gamma UCL	103.9									
1664	95% Adjusted Gamma UCL	105.1									
1665											
1666	**Potential UCL to Use**									Use 95% Approximate Gamma UCL	103.9
1667											
1668											
1669	**Beryllium (mg/kg)**										
1670											
1671	**General Statistics**										
1672	Number of Valid Samples	20								Number of Unique Samples	17
1673	Number of Missing Values	8									
1674											
1675	**Raw Statistics**									**Log-transformed Statistics**	
1676	Minimum	0.43								Minimum of Log Data	-0.844
1677	Maximum	1.3								Maximum of Log Data	0.262
1678	Mean	0.726								Mean of log Data	-0.371
1679	Median	0.63								SD of log Data	0.32
1680	SD	0.253									
1681	Coefficient of Variation	0.349									
1682	Skewness	1.109									
1683											
1684	**Relevant UCL Statistics**										
1685	**Normal Distribution Test**									**Lognormal Distribution Test**	
1686	Shapiro Wilk Test Statistic	0.875								Shapiro Wilk Test Statistic	0.939
1687	Shapiro Wilk Critical Value	0.905								Shapiro Wilk Critical Value	0.905
1688	**Data not Normal at 5% Significance Level**									**Data appear Lognormal at 5% Significance Level**	
1689											
1690	**Assuming Normal Distribution**									**Assuming Lognormal Distribution**	
1691	95% Student's-t UCL	0.824								95% H-UCL	0.832
1692	**95% UCLs (Adjusted for Skewness)**									95% Chebyshev (MVUE) UCL	0.954
1693	95% Adjusted-CLT UCL	0.834								97.5% Chebyshev (MVUE) UCL	1.053
1694	95% Modified-t UCL	0.827								99% Chebyshev (MVUE) UCL	1.248
1695											
1696	**Gamma Distribution Test**									**Data Distribution**	

1697				k star (bias corrected)	8.457		**Data appear Gamma Distributed at 5% Significance Level**					
1698				Theta Star	0.0859							
1699				nu star	338.3							
1700				Approximate Chi Square Value (.05)	296.7		**Nonparametric Statistics**					
1701				Adjusted Level of Significance	0.038					95% CLT UCL	0.819	
1702				Adjusted Chi Square Value	293.6					95% Jackknife UCL	0.824	
1703										95% Standard Bootstrap UCL	0.818	
1704				Anderson-Darling Test Statistic	0.625					95% Bootstrap-t UCL	0.851	
1705				Anderson-Darling 5% Critical Value	0.742					95% Hall's Bootstrap UCL	0.833	
1706				Kolmogorov-Smirnov Test Statistic	0.179					95% Percentile Bootstrap UCL	0.826	
1707				Kolmogorov-Smirnov 5% Critical Value	0.194					95% BCA Bootstrap UCL	0.846	
1708				**Data appear Gamma Distributed at 5% Significance Level**						95% Chebyshev(Mean, Sd) UCL	0.973	
1709										97.5% Chebyshev(Mean, Sd) UCL	1.08	
1710				**Assuming Gamma Distribution**						99% Chebyshev(Mean, Sd) UCL	1.29	
1711				95% Approximate Gamma UCL	0.828							
1712				95% Adjusted Gamma UCL	0.837							
1713												
1714				**Potential UCL to Use**						Use 95% Approximate Gamma UCL	0.828	
1715												
1716												
1717	**Calcium (mg/kg)**											
1718												
1719				**General Statistics**								
1720				Number of Valid Samples	28					Number of Unique Samples	28	
1721												
1722				**Raw Statistics**						**Log-transformed Statistics**		
1723				Minimum	40.7					Minimum of Log Data	3.706	
1724				Maximum	2680					Maximum of Log Data	7.894	
1725				Mean	782.8					Mean of log Data	6.26	
1726				Median	535.5					SD of log Data	0.974	
1727				SD	720.6							
1728				Coefficient of Variation	0.921							
1729				Skewness	1.555							
1730												
1731				**Relevant UCL Statistics**								
1732				**Normal Distribution Test**						**Lognormal Distribution Test**		
1733				Shapiro Wilk Test Statistic	0.805					Shapiro Wilk Test Statistic	0.97	
1734				Shapiro Wilk Critical Value	0.924					Shapiro Wilk Critical Value	0.924	
1735				**Data not Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**		
1736												
1737				**Assuming Normal Distribution**						**Assuming Lognormal Distribution**		
1738				95% Student's-t UCL	1015					95% H-UCL	1327	
1739				**95% UCLs (Adjusted for Skewness)**						95% Chebyshev (MVUE) UCL	1571	
1740				95% Adjusted-CLT UCL	1049					97.5% Chebyshev (MVUE) UCL	1895	
1741				95% Modified-t UCL	1021					99% Chebyshev (MVUE) UCL	2533	
1742												
1743				**Gamma Distribution Test**						**Data Distribution**		
1744				k star (bias corrected)	1.261					**Data appear Gamma Distributed at 5% Significance Level**		
1745				Theta Star	620.8							
1746				nu star	70.6							
1747				Approximate Chi Square Value (.05)	52.26					**Nonparametric Statistics**		
1748				Adjusted Level of Significance	0.0404					95% CLT UCL	1007	
1749				Adjusted Chi Square Value	51.28					95% Jackknife UCL	1015	

1750											95% Standard Bootstrap UCL	1005
1751					Anderson-Darling Test Statistic	0.369					95% Bootstrap-t UCL	1082
1752					Anderson-Darling 5% Critical Value	0.765					95% Hall's Bootstrap UCL	1049
1753					Kolmogorov-Smirnov Test Statistic	0.115					95% Percentile Bootstrap UCL	995
1754					Kolmogorov-Smirnov 5% Critical Value	0.169					95% BCA Bootstrap UCL	1040
1755					**Data appear Gamma Distributed at 5% Significance Level**						95% Chebyshev(Mean, Sd) UCL	1376
1756											97.5% Chebyshev(Mean, Sd) UCL	1633
1757					**Assuming Gamma Distribution**						99% Chebyshev(Mean, Sd) UCL	2138
1758					95% Approximate Gamma UCL	1058						
1759					95% Adjusted Gamma UCL	1078						
1760												
1761					**Potential UCL to Use**						Use 95% Approximate Gamma UCL	1058
1762												
1763												
1764	**Chromium (mg/kg)**											
1765												
1766					**General Statistics**							
1767					Number of Valid Samples	28					Number of Unique Samples	26
1768												
1769					**Raw Statistics**						**Log-transformed Statistics**	
1770					Minimum	7.5					Minimum of Log Data	2.015
1771					Maximum	33.6					Maximum of Log Data	3.515
1772					Mean	19.19					Mean of log Data	2.877
1773					Median	19.2					SD of log Data	0.416
1774					SD	7.285						
1775					Coefficient of Variation	0.38						
1776					Skewness	0.325						
1777												
1778					**Relevant UCL Statistics**							
1779					**Normal Distribution Test**						**Lognormal Distribution Test**	
1780					Shapiro Wilk Test Statistic	0.945					Shapiro Wilk Test Statistic	0.93
1781					Shapiro Wilk Critical Value	0.924					Shapiro Wilk Critical Value	0.924
1782					**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**	
1783												
1784					**Assuming Normal Distribution**						**Assuming Lognormal Distribution**	
1785					95% Student's-t UCL	21.54					95% H-UCL	22.52
1786					**95% UCLs (Adjusted for Skewness)**						95% Chebyshev (MVUE) UCL	26.12
1787					95% Adjusted-CLT UCL	21.55					97.5% Chebyshev (MVUE) UCL	29.06
1788					95% Modified-t UCL	21.55					99% Chebyshev (MVUE) UCL	34.85
1789												
1790					**Gamma Distribution Test**						**Data Distribution**	
1791					k star (bias corrected)	5.952					**Data appear Normal at 5% Significance Level**	
1792					Theta Star	3.224						
1793					nu star	333.3						
1794					Approximate Chi Square Value (.05)	292					**Nonparametric Statistics**	
1795					Adjusted Level of Significance	0.0404					95% CLT UCL	21.46
1796					Adjusted Chi Square Value	289.6					95% Jackknife UCL	21.54
1797											95% Standard Bootstrap UCL	21.5
1798					Anderson-Darling Test Statistic	0.546					95% Bootstrap-t UCL	21.7
1799					Anderson-Darling 5% Critical Value	0.747					95% Hall's Bootstrap UCL	21.7
1800					Kolmogorov-Smirnov Test Statistic	0.126					95% Percentile Bootstrap UCL	21.42
1801					Kolmogorov-Smirnov 5% Critical Value	0.166					95% BCA Bootstrap UCL	21.41
1802					**Data appear Gamma Distributed at 5% Significance Level**						95% Chebyshev(Mean, Sd) UCL	25.19

1803											97.5% Chebyshev(Mean, Sd) UCL	27.79
1804			**Assuming Gamma Distribution**								99% Chebyshev(Mean, Sd) UCL	32.89
1805					95% Approximate Gamma UCL	21.91						
1806					95% Adjusted Gamma UCL	22.09						
1807												
1808			**Potential UCL to Use**								Use 95% Student's-t UCL	21.54
1809												
1810												
1811	**Cobalt (mg/kg)**											
1812												
1813						**General Statistics**						
1814					Number of Valid Samples	28					Number of Unique Samples	26
1815												
1816			**Raw Statistics**						**Log-transformed Statistics**			
1817					Minimum	2.9					Minimum of Log Data	1.065
1818					Maximum	10.1					Maximum of Log Data	2.313
1819					Mean	5.736					Mean of log Data	1.675
1820					Median	5.7					SD of log Data	0.394
1821					SD	2.137						
1822					Coefficient of Variation	0.372						
1823					Skewness	0.306						
1824												
1825						**Relevant UCL Statistics**						
1826			**Normal Distribution Test**						**Lognormal Distribution Test**			
1827					Shapiro Wilk Test Statistic	0.943					Shapiro Wilk Test Statistic	0.93
1828					Shapiro Wilk Critical Value	0.924					Shapiro Wilk Critical Value	0.924
1829			**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**			
1830												
1831			**Assuming Normal Distribution**						**Assuming Lognormal Distribution**			
1832					95% Student's-t UCL	6.424					95% H-UCL	6.647
1833			**95% UCLs (Adjusted for Skewness)**								95% Chebyshev (MVUE) UCL	7.67
1834					95% Adjusted-CLT UCL	6.425					97.5% Chebyshev (MVUE) UCL	8.499
1835					95% Modified-t UCL	6.428					99% Chebyshev (MVUE) UCL	10.13
1836												
1837			**Gamma Distribution Test**						**Data Distribution**			
1838					k star (bias corrected)	6.412			**Data appear Normal at 5% Significance Level**			
1839					Theta Star	0.895						
1840					nu star	359.1						
1841					Approximate Chi Square Value (.05)	316.2			**Nonparametric Statistics**			
1842					Adjusted Level of Significance	0.0404					95% CLT UCL	6.4
1843					Adjusted Chi Square Value	313.7					95% Jackknife UCL	6.424
1844											95% Standard Bootstrap UCL	6.384
1845					Anderson-Darling Test Statistic	0.477					95% Bootstrap-t UCL	6.451
1846					Anderson-Darling 5% Critical Value	0.747					95% Hall's Bootstrap UCL	6.392
1847					Kolmogorov-Smirnov Test Statistic	0.126					95% Percentile Bootstrap UCL	6.385
1848					Kolmogorov-Smirnov 5% Critical Value	0.166					95% BCA Bootstrap UCL	6.396
1849			**Data appear Gamma Distributed at 5% Significance Level**								95% Chebyshev(Mean, Sd) UCL	7.496
1850											97.5% Chebyshev(Mean, Sd) UCL	8.258
1851			**Assuming Gamma Distribution**								99% Chebyshev(Mean, Sd) UCL	9.754
1852					95% Approximate Gamma UCL	6.515						
1853					95% Adjusted Gamma UCL	6.566						
1854												
1855			**Potential UCL to Use**								Use 95% Student's-t UCL	6.424

	A	B	C	D	E	F	G	H	I	J	K	L
1856												
1857												
1858	**Copper (mg/kg)**											
1859												
1860						**General Statistics**						
1861					Number of Valid Samples	28			Number of Unique Samples	26		
1862												
1863				**Raw Statistics**					**Log-transformed Statistics**			
1864					Minimum	3.3			Minimum of Log Data	1.194		
1865					Maximum	19.1			Maximum of Log Data	2.95		
1866					Mean	11.04			Mean of log Data	2.338		
1867					Median	10.75			SD of log Data	0.379		
1868					SD	3.748						
1869					Coefficient of Variation	0.34						
1870					Skewness	0.23						
1871												
1872						**Relevant UCL Statistics**						
1873				**Normal Distribution Test**					**Lognormal Distribution Test**			
1874					Shapiro Wilk Test Statistic	0.984			Shapiro Wilk Test Statistic	0.952		
1875					Shapiro Wilk Critical Value	0.924			Shapiro Wilk Critical Value	0.924		
1876				**Data appear Normal at 5% Significance Level**					**Data appear Lognormal at 5% Significance Level**			
1877												
1878				**Assuming Normal Distribution**					**Assuming Lognormal Distribution**			
1879					95% Student's-t UCL	12.24			95% H-UCL	12.74		
1880				**95% UCLs (Adjusted for Skewness)**					95% Chebyshev (MVUE) UCL	14.65		
1881					95% Adjusted-CLT UCL	12.23			97.5% Chebyshev (MVUE) UCL	16.19		
1882					95% Modified-t UCL	12.25			99% Chebyshev (MVUE) UCL	19.21		
1883												
1884				**Gamma Distribution Test**					**Data Distribution**			
1885					k star (bias corrected)	7.282			**Data appear Normal at 5% Significance Level**			
1886					Theta Star	1.515						
1887					nu star	407.8						
1888					Approximate Chi Square Value (.05)	362			**Nonparametric Statistics**			
1889					Adjusted Level of Significance	0.0404			95% CLT UCL	12.2		
1890					Adjusted Chi Square Value	359.3			95% Jackknife UCL	12.24		
1891									95% Standard Bootstrap UCL	12.15		
1892					Anderson-Darling Test Statistic	0.18			95% Bootstrap-t UCL	12.27		
1893					Anderson-Darling 5% Critical Value	0.746			95% Hall's Bootstrap UCL	12.22		
1894					Kolmogorov-Smirnov Test Statistic	0.0767			95% Percentile Bootstrap UCL	12.16		
1895					Kolmogorov-Smirnov 5% Critical Value	0.165			95% BCA Bootstrap UCL	12.24		
1896				**Data appear Gamma Distributed at 5% Significance Level**					95% Chebyshev(Mean, Sd) UCL	14.12		
1897									97.5% Chebyshev(Mean, Sd) UCL	15.46		
1898				**Assuming Gamma Distribution**					99% Chebyshev(Mean, Sd) UCL	18.08		
1899					95% Approximate Gamma UCL	12.43						
1900					95% Adjusted Gamma UCL	12.52						
1901												
1902				**Potential UCL to Use**					Use 95% Student's-t UCL	12.24		
1903												
1904												
1905	**Iron (mg/kg)**											
1906												
1907						**General Statistics**						
1908					Number of Valid Samples	28			Number of Unique Samples	28		

1909												
1910	**Raw Statistics**						**Log-transformed Statistics**					
1911					Minimum	4200					Minimum of Log Data	8.343
1912					Maximum	38800					Maximum of Log Data	10.57
1913					Mean	18925					Mean of log Data	9.706
1914					Median	18600					SD of log Data	0.576
1915					SD	9664						
1916					Coefficient of Variation	0.511						
1917					Skewness	0.636						
1918												
1919	**Relevant UCL Statistics**											
1920	**Normal Distribution Test**						**Lognormal Distribution Test**					
1921					Shapiro Wilk Test Statistic	0.93					Shapiro Wilk Test Statistic	0.945
1922					Shapiro Wilk Critical Value	0.924					Shapiro Wilk Critical Value	0.924
1923	**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
1924												
1925	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
1926					95% Student's-t UCL	22036					95% H-UCL	24207
1927	**95% UCLs (Adjusted for Skewness)**										95% Chebyshev (MVUE) UCL	28877
1928					95% Adjusted-CLT UCL	22164					97.5% Chebyshev (MVUE) UCL	33046
1929					95% Modified-t UCL	22073					99% Chebyshev (MVUE) UCL	41237
1930												
1931	**Gamma Distribution Test**						**Data Distribution**					
1932					k star (bias corrected)	3.299	**Data appear Normal at 5% Significance Level**					
1933					Theta Star	5737						
1934					nu star	184.7						
1935					Approximate Chi Square Value (.05)	154.3	**Nonparametric Statistics**					
1936					Adjusted Level of Significance	0.0404					95% CLT UCL	21929
1937					Adjusted Chi Square Value	152.6					95% Jackknife UCL	22036
1938											95% Standard Bootstrap UCL	21871
1939					Anderson-Darling Test Statistic	0.335					95% Bootstrap-t UCL	22521
1940					Anderson-Darling 5% Critical Value	0.751					95% Hall's Bootstrap UCL	22156
1941					Kolmogorov-Smirnov Test Statistic	0.0917					95% Percentile Bootstrap UCL	21890
1942					Kolmogorov-Smirnov 5% Critical Value	0.166					95% BCA Bootstrap UCL	21959
1943	**Data appear Gamma Distributed at 5% Significance Level**										95% Chebyshev(Mean, Sd) UCL	26886
1944											97.5% Chebyshev(Mean, Sd) UCL	30331
1945	**Assuming Gamma Distribution**										99% Chebyshev(Mean, Sd) UCL	37098
1946					95% Approximate Gamma UCL	22658						
1947					95% Adjusted Gamma UCL	22914						
1948												
1949	**Potential UCL to Use**										Use 95% Student's-t UCL	22036
1950												
1951												
1952	**Lead (mg/kg)**											
1953												
1954	**General Statistics**											
1955					Number of Valid Samples	28					Number of Unique Samples	27
1956												
1957	**Raw Statistics**						**Log-transformed Statistics**					
1958					Minimum	3.8					Minimum of Log Data	1.335
1959					Maximum	30.9					Maximum of Log Data	3.431
1960					Mean	12.23					Mean of log Data	2.374
1961					Median	9.8					SD of log Data	0.515

1962					SD	6.662						
1963					Coefficient of Variation	0.545						
1964					Skewness	1.256						
1965												
1966					**Relevant UCL Statistics**							
1967					**Normal Distribution Test**					**Lognormal Distribution Test**		
1968					Shapiro Wilk Test Statistic	0.886				Shapiro Wilk Test Statistic	0.983	
1969					Shapiro Wilk Critical Value	0.924				Shapiro Wilk Critical Value	0.924	
1970					**Data not Normal at 5% Significance Level**					**Data appear Lognormal at 5% Significance Level**		
1971												
1972					**Assuming Normal Distribution**					**Assuming Lognormal Distribution**		
1973					95% Student's-t UCL	14.37				95% H-UCL	14.88	
1974					**95% UCLs (Adjusted for Skewness)**					95% Chebyshev (MVUE) UCL	17.6	
1975					95% Adjusted-CLT UCL	14.62				97.5% Chebyshev (MVUE) UCL	19.94	
1976					95% Modified-t UCL	14.42				99% Chebyshev (MVUE) UCL	24.53	
1977												
1978					**Gamma Distribution Test**					**Data Distribution**		
1979					k star (bias corrected)	3.61				**Data appear Gamma Distributed at 5% Significance Level**		
1980					Theta Star	3.387						
1981					nu star	202.1						
1982					Approximate Chi Square Value (.05)	170.2				**Nonparametric Statistics**		
1983					Adjusted Level of Significance	0.0404				95% CLT UCL	14.3	
1984					Adjusted Chi Square Value	168.4				95% Jackknife UCL	14.37	
1985										95% Standard Bootstrap UCL	14.25	
1986					Anderson-Darling Test Statistic	0.411				95% Bootstrap-t UCL	14.79	
1987					Anderson-Darling 5% Critical Value	0.75				95% Hall's Bootstrap UCL	14.71	
1988					Kolmogorov-Smirnov Test Statistic	0.151				95% Percentile Bootstrap UCL	14.36	
1989					Kolmogorov-Smirnov 5% Critical Value	0.166				95% BCA Bootstrap UCL	14.52	
1990					**Data appear Gamma Distributed at 5% Significance Level**					95% Chebyshev(Mean, Sd) UCL	17.71	
1991										97.5% Chebyshev(Mean, Sd) UCL	20.09	
1992					**Assuming Gamma Distribution**					99% Chebyshev(Mean, Sd) UCL	24.75	
1993					95% Approximate Gamma UCL	14.52						
1994					95% Adjusted Gamma UCL	14.67						
1995												
1996					**Potential UCL to Use**					Use 95% Approximate Gamma UCL	14.52	
1997												
1998												
1999	**Magnesium (mg/kg)**											
2000												
2001					**General Statistics**							
2002					Number of Valid Samples	28				Number of Unique Samples	28	
2003												
2004					**Raw Statistics**					**Log-transformed Statistics**		
2005					Minimum	227				Minimum of Log Data	5.425	
2006					Maximum	2270				Maximum of Log Data	7.728	
2007					Mean	914.1				Mean of log Data	6.639	
2008					Median	877.5				SD of log Data	0.628	
2009					SD	541.7						
2010					Coefficient of Variation	0.593						
2011					Skewness	0.844						
2012												
2013					**Relevant UCL Statistics**							
2014					**Normal Distribution Test**					**Lognormal Distribution Test**		

2015				Shapiro Wilk Test Statistic	0.924					Shapiro Wilk Test Statistic	0.97	
2016				Shapiro Wilk Critical Value	0.924					Shapiro Wilk Critical Value	0.924	
2017				**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**		
2018												
2019				**Assuming Normal Distribution**						**Assuming Lognormal Distribution**		
2020				95% Student's-t UCL	1088					95% H-UCL	1195	
2021				**95% UCLs (Adjusted for Skewness)**						95% Chebyshev (MVUE) UCL	1433	
2022				95% Adjusted-CLT UCL	1100					97.5% Chebyshev (MVUE) UCL	1653	
2023				95% Modified-t UCL	1091					99% Chebyshev (MVUE) UCL	2086	
2024												
2025				**Gamma Distribution Test**						**Data Distribution**		
2026				k star (bias corrected)	2.663					**Data appear Normal at 5% Significance Level**		
2027				Theta Star	343.3							
2028				nu star	149.1							
2029				Approximate Chi Square Value (.05)	121.9					**Nonparametric Statistics**		
2030				Adjusted Level of Significance	0.0404					95% CLT UCL	1082	
2031				Adjusted Chi Square Value	120.4					95% Jackknife UCL	1088	
2032										95% Standard Bootstrap UCL	1083	
2033				Anderson-Darling Test Statistic	0.238					95% Bootstrap-t UCL	1108	
2034				Anderson-Darling 5% Critical Value	0.754					95% Hall's Bootstrap UCL	1106	
2035				Kolmogorov-Smirnov Test Statistic	0.102					95% Percentile Bootstrap UCL	1082	
2036				Kolmogorov-Smirnov 5% Critical Value	0.167					95% BCA Bootstrap UCL	1098	
2037				**Data appear Gamma Distributed at 5% Significance Level**						95% Chebyshev(Mean, Sd) UCL	1360	
2038										97.5% Chebyshev(Mean, Sd) UCL	1553	
2039				**Assuming Gamma Distribution**						99% Chebyshev(Mean, Sd) UCL	1933	
2040				95% Approximate Gamma UCL	1118							
2041				95% Adjusted Gamma UCL	1132							
2042												
2043				**Potential UCL to Use**						Use 95% Student's-t UCL	1088	
2044												
2045												
2046	**Manganese (mg/kg)**											
2047												
2048				**General Statistics**								
2049				Number of Valid Samples	28					Number of Unique Samples	28	
2050												
2051				**Raw Statistics**						**Log-transformed Statistics**		
2052				Minimum	67.95					Minimum of Log Data	4.219	
2053				Maximum	3630					Maximum of Log Data	8.197	
2054				Mean	508.3					Mean of log Data	5.631	
2055				Median	282.5					SD of log Data	0.991	
2056				SD	791.7							
2057				Coefficient of Variation	1.557							
2058				Skewness	3.128							
2059												
2060				**Relevant UCL Statistics**								
2061				**Normal Distribution Test**						**Lognormal Distribution Test**		
2062				Shapiro Wilk Test Statistic	0.541					Shapiro Wilk Test Statistic	0.925	
2063				Shapiro Wilk Critical Value	0.924					Shapiro Wilk Critical Value	0.924	
2064				**Data not Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**		
2065												
2066				**Assuming Normal Distribution**						**Assuming Lognormal Distribution**		
2067				95% Student's-t UCL	763.2					95% H-UCL	728.3	

2068	**95% UCLs (Adjusted for Skewness)**									95% Chebyshev (MVUE) UCL	859.5
2069	95% Adjusted-CLT UCL	848.9								97.5% Chebyshev (MVUE) UCL	1039
2070	95% Modified-t UCL	777.9								99% Chebyshev (MVUE) UCL	1392
2071											
2072	**Gamma Distribution Test**									**Data Distribution**	
2073	k star (bias corrected)	0.886								**Data appear Lognormal at 5% Significance Level**	
2074	Theta Star	573.5									
2075	nu star	49.63									
2076	Approximate Chi Square Value (.05)	34.46								**Nonparametric Statistics**	
2077	Adjusted Level of Significance	0.0404								95% CLT UCL	754.4
2078	Adjusted Chi Square Value	33.68								95% Jackknife UCL	763.2
2079										95% Standard Bootstrap UCL	748.9
2080	Anderson-Darling Test Statistic	1.85								95% Bootstrap-t UCL	1199
2081	Anderson-Darling 5% Critical Value	0.775								95% Hall's Bootstrap UCL	1718
2082	Kolmogorov-Smirnov Test Statistic	0.249								95% Percentile Bootstrap UCL	776.8
2083	Kolmogorov-Smirnov 5% Critical Value	0.17								95% BCA Bootstrap UCL	893.5
2084	**Data not Gamma Distributed at 5% Significance Level**									95% Chebyshev(Mean, Sd) UCL	1160
2085										97.5% Chebyshev(Mean, Sd) UCL	1443
2086	**Assuming Gamma Distribution**									99% Chebyshev(Mean, Sd) UCL	1997
2087	95% Approximate Gamma UCL	732.2									
2088	95% Adjusted Gamma UCL	749.2									
2089											
2090	**Potential UCL to Use**									Use 95% H-UCL	728.3
2091											
2092											
2093	**Mercury (mg/kg)**										
2094											
2095	**General Statistics**										
2096	Number of Valid Samples	26								Number of Detected Data	24
2097	Number of Unique Samples	21								Number of Non-Detect Data	2
2098	Number of Missing Values	2								Percent Non-Detects	7.69%
2099											
2100	**Raw Statistics**									**Log-transformed Statistics**	
2101	Minimum Detected	0.029								Minimum Detected	-3.54
2102	Maximum Detected	0.561								Maximum Detected	-0.579
2103	Mean of Detected	0.162								Mean of Detected	-2.147
2104	SD of Detected	0.144								SD of Detected	0.818
2105	Minimum Non-Detect	0.05								Minimum Non-Detect	-2.996
2106	Maximum Non-Detect	0.0611								Maximum Non-Detect	-2.795
2107											
2108	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect	6
2109	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected	20
2110	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage	23.08%
2111											
2112	**UCL Statistics**										
2113	**Normal Distribution Test with Detected Values Only**									**Lognormal Distribution Test with Detected Values Only**	
2114	Shapiro Wilk Test Statistic	0.797								Shapiro Wilk Test Statistic	0.956
2115	5% Shapiro Wilk Critical Value	0.916								5% Shapiro Wilk Critical Value	0.916
2116	**Data not Normal at 5% Significance Level**									**Data appear Lognormal at 5% Significance Level**	
2117											
2118	**Assuming Normal Distribution**									**Assuming Lognormal Distribution**	
2119	DL/2 Substitution Method									DL/2 Substitution Method	
2120	Mean	0.152								Mean	-2.258

2121					SD	0.143					SD	0.877
2122					95% DL/2 (t) UCL	0.2					95% H-Stat (DL/2) UCL	0.218
2123												
2124					Maximum Likelihood Estimate(MLE) Method						Log ROS Method	
2125					Mean	0.133					Mean in Log Scale	-2.239
2126					SD	0.164					SD in Log Scale	0.848
2127					95% MLE (t) UCL	0.188					Mean in Original Scale	0.153
2128					95% MLE (Tiku) UCL	0.189					SD in Original Scale	0.143
2129											95% Percentile Bootstrap UCL	0.197
2130											95% BCA Bootstrap UCL	0.207
2131												
2132				**Gamma Distribution Test with Detected Values Only**							**Data Distribution Test with Detected Values Only**	
2133					k star (bias corrected)	1.484					**Data appear Lognormal at 5% Significance Level**	
2134					Theta Star	0.109						
2135					nu star	71.22						
2136												
2137					A-D Test Statistic	0.802					**Nonparametric Statistics**	
2138					5% A-D Critical Value	0.759					Kaplan-Meier (KM) Method	
2139					K-S Test Statistic	0.759					Mean	0.153
2140					5% K-S Critical Value	0.181					SD	0.14
2141				**Data not Gamma Distributed at 5% Significance Level**							SE of Mean	0.028
2142											95% KM (t) UCL	0.201
2143				**Assuming Gamma Distribution**							95% KM (z) UCL	0.199
2144					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.201
2145					Minimum	0					95% KM (bootstrap t) UCL	0.215
2146					Maximum	0.561					95% KM (BCA) UCL	0.206
2147					Mean	0.15					95% KM (Percentile Bootstrap) UCL	0.199
2148					Median	0.0965					95% KM (Chebyshev) UCL	0.275
2149					SD	0.145					97.5% KM (Chebyshev) UCL	0.328
2150					k star	0.373					99% KM (Chebyshev) UCL	0.431
2151					Theta star	0.401						
2152					Nu star	19.42					**Potential UCLs to Use**	
2153					AppChi2	10.42					95% KM (Chebyshev) UCL	0.275
2154					95% Gamma Approximate UCL	0.279						
2155					95% Adjusted Gamma UCL	0.291						
2156	**Note: DL/2 is not a recommended method.**											
2157												
2158												
2159	**Nickel (mg/kg)**											
2160												
2161						**General Statistics**							
2162					Number of Valid Samples	28					Number of Unique Samples	27
2163												
2164				**Raw Statistics**							**Log-transformed Statistics**	
2165					Minimum	5.2					Minimum of Log Data	1.649
2166					Maximum	13.85					Maximum of Log Data	2.628
2167					Mean	8.274					Mean of log Data	2.079
2168					Median	8.3					SD of log Data	0.264
2169					SD	2.233						
2170					Coefficient of Variation	0.27						
2171					Skewness	0.703						
2172												
2173						**Relevant UCL Statistics**							

2174	**Normal Distribution Test**						**Lognormal Distribution Test**					
2175				Shapiro Wilk Test Statistic	0.944						Shapiro Wilk Test Statistic	0.967
2176				Shapiro Wilk Critical Value	0.924						Shapiro Wilk Critical Value	0.924
2177	**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
2178												
2179	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
2180				95% Student's-t UCL	8.992						95% H-UCL	9.066
2181	**95% UCLs (Adjusted for Skewness)**										95% Chebyshev (MVUE) UCL	10.09
2182				95% Adjusted-CLT UCL	9.027						97.5% Chebyshev (MVUE) UCL	10.88
2183				95% Modified-t UCL	9.002						99% Chebyshev (MVUE) UCL	12.43
2184												
2185	**Gamma Distribution Test**						**Data Distribution**					
2186				k star (bias corrected)	13.35		**Data appear Normal at 5% Significance Level**					
2187				Theta Star	0.62							
2188				nu star	747.4							
2189				Approximate Chi Square Value (.05)	685		**Nonparametric Statistics**					
2190				Adjusted Level of Significance	0.0404						95% CLT UCL	8.968
2191				Adjusted Chi Square Value	681.3						95% Jackknife UCL	8.992
2192											95% Standard Bootstrap UCL	8.97
2193				Anderson-Darling Test Statistic	0.313						95% Bootstrap-t UCL	9.107
2194				Anderson-Darling 5% Critical Value	0.745						95% Hall's Bootstrap UCL	9.077
2195				Kolmogorov-Smirnov Test Statistic	0.098						95% Percentile Bootstrap UCL	8.949
2196				Kolmogorov-Smirnov 5% Critical Value	0.165						95% BCA Bootstrap UCL	8.963
2197	**Data appear Gamma Distributed at 5% Significance Level**										95% Chebyshev(Mean, Sd) UCL	10.11
2198											97.5% Chebyshev(Mean, Sd) UCL	10.91
2199	**Assuming Gamma Distribution**										99% Chebyshev(Mean, Sd) UCL	12.47
2200				95% Approximate Gamma UCL	9.028							
2201				95% Adjusted Gamma UCL	9.077							
2202												
2203	**Potential UCL to Use**										Use 95% Student's-t UCL	8.992
2204												
2205												
2206	**Potassium (mg/kg)**											
2207												
2208	**General Statistics**											
2209				Number of Valid Samples	24						Number of Unique Samples	24
2210				Number of Missing Values	4							
2211												
2212	**Raw Statistics**						**Log-transformed Statistics**					
2213				Minimum	300						Minimum of Log Data	5.704
2214				Maximum	1330						Maximum of Log Data	7.193
2215				Mean	769.2						Mean of log Data	6.552
2216				Median	765						SD of log Data	0.464
2217				SD	310							
2218				Coefficient of Variation	0.403							
2219				Skewness	-0.025							
2220												
2221	**Relevant UCL Statistics**											
2222	**Normal Distribution Test**						**Lognormal Distribution Test**					
2223				Shapiro Wilk Test Statistic	0.953						Shapiro Wilk Test Statistic	0.912
2224				Shapiro Wilk Critical Value	0.916						Shapiro Wilk Critical Value	0.916
2225	**Data appear Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**					
2226												

2227	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
2228				95% Student's-t UCL	877.6					95% H-UCL	941.9	
2229	**95% UCLs (Adjusted for Skewness)**									95% Chebyshev (MVUE) UCL	1109	
2230				95% Adjusted-CLT UCL	872.9					97.5% Chebyshev (MVUE) UCL	1253	
2231				95% Modified-t UCL	877.6					99% Chebyshev (MVUE) UCL	1535	
2232												
2233	**Gamma Distribution Test**						**Data Distribution**					
2234				k star (bias corrected)	4.865		**Data appear Normal at 5% Significance Level**					
2235				Theta Star	158.1							
2236				nu star	233.5							
2237				Approximate Chi Square Value (.05)	199.1		**Nonparametric Statistics**					
2238				Adjusted Level of Significance	0.0392					95% CLT UCL	873.3	
2239				Adjusted Chi Square Value	196.9					95% Jackknife UCL	877.6	
2240										95% Standard Bootstrap UCL	870	
2241				Anderson-Darling Test Statistic	0.573					95% Bootstrap-t UCL	878.4	
2242				Anderson-Darling 5% Critical Value	0.746					95% Hall's Bootstrap UCL	872.9	
2243				Kolmogorov-Smirnov Test Statistic	0.147					95% Percentile Bootstrap UCL	870	
2244				Kolmogorov-Smirnov 5% Critical Value	0.178					95% BCA Bootstrap UCL	869	
2245	**Data appear Gamma Distributed at 5% Significance Level**									95% Chebyshev(Mean, Sd) UCL	1045	
2246										97.5% Chebyshev(Mean, Sd) UCL	1164	
2247	**Assuming Gamma Distribution**									99% Chebyshev(Mean, Sd) UCL	1399	
2248				95% Approximate Gamma UCL	902							
2249				95% Adjusted Gamma UCL	912.2							
2250												
2251	**Potential UCL to Use**									Use 95% Student's-t UCL	877.6	
2252												
2253												
2254	**Selenium (mg.kg)**											
2255												
2256	**General Statistics**											
2257				Number of Valid Samples	27					Number of Detected Data	18	
2258				Number of Unique Samples	17					Number of Non-Detect Data	9	
2259				Number of Missing Values	1					Percent Non-Detects	33.33%	
2260												
2261	**Raw Statistics**						**Log-transformed Statistics**					
2262				Minimum Detected	0.165					Minimum Detected	-1.802	
2263				Maximum Detected	11.7					Maximum Detected	2.46	
2264				Mean of Detected	3.151					Mean of Detected	0.18	
2265				SD of Detected	3.857					SD of Detected	1.522	
2266				Minimum Non-Detect	0.11					Minimum Non-Detect	-2.207	
2267				Maximum Non-Detect	1.315					Maximum Non-Detect	0.274	
2268												
2269	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect	20	
2270	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected	7	
2271	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage	74.07%	
2272												
2273	**UCL Statistics**											
2274	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
2275				Shapiro Wilk Test Statistic	0.762					Shapiro Wilk Test Statistic	0.863	
2276				5% Shapiro Wilk Critical Value	0.897					5% Shapiro Wilk Critical Value	0.897	
2277	**Data not Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**					
2278												
2279	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					

2280				DL/2 Substitution Method						DL/2 Substitution Method		
2281				Mean	2.204					Mean		-0.45
2282				SD	3.408					SD		1.664
2283				95% DL/2 (t) UCL	3.323					95% H-Stat (DL/2) UCL		4.196
2284												
2285				Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method		
2286				**MLE yields a negative mean**						Mean in Log Scale		-0.669
2287										SD in Log Scale		1.824
2288										Mean in Original Scale		2.146
2289										SD in Original Scale		3.439
2290										95% Percentile Bootstrap UCL		3.247
2291										95% BCA Bootstrap UCL		3.531
2292												
2293				**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**		
2294				k star (bias corrected)	0.565					**Data do not follow a Discernable Distribution (0.05)**		
2295				Theta Star	5.575							
2296				nu star	20.34							
2297												
2298				A-D Test Statistic	1.358					**Nonparametric Statistics**		
2299				5% A-D Critical Value	0.788					Kaplan-Meier (KM) Method		
2300				K-S Test Statistic	0.788					Mean		2.183
2301				5% K-S Critical Value	0.213					SD		3.354
2302				**Data not Gamma Distributed at 5% Significance Level**						SE of Mean		0.664
2303										95% KM (t) UCL		3.317
2304				**Assuming Gamma Distribution**						95% KM (z) UCL		3.276
2305				Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL		3.301
2306				Minimum	0.165					95% KM (bootstrap t) UCL		3.755
2307				Maximum	11.7					95% KM (BCA) UCL		3.37
2308				Mean	2.674					95% KM (Percentile Bootstrap) UCL		3.347
2309				Median	0.838					95% KM (Chebyshev) UCL		5.08
2310				SD	3.239					97.5% KM (Chebyshev) UCL		6.333
2311				k star	0.741					99% KM (Chebyshev) UCL		8.794
2312				Theta star	3.608							
2313				Nu star	40.02					**Potential UCLs to Use**		
2314				AppChi2	26.53					99% KM (Chebyshev) UCL		8.794
2315				95% Gamma Approximate UCL	4.034							
2316				95% Adjusted Gamma UCL	4.144							
2317	**Note: DL/2 is not a recommended method.**											
2318												
2319												
2320	**Sodium (mg/kg)**											
2321												
2322										**General Statistics**		
2323				Number of Valid Samples	15					Number of Detected Data		11
2324				Number of Unique Samples	11					Number of Non-Detect Data		4
2325				Number of Missing Values	13					Percent Non-Detects		26.67%
2326												
2327				**Raw Statistics**						**Log-transformed Statistics**		
2328				Minimum Detected	35.4					Minimum Detected		3.567
2329				Maximum Detected	396					Maximum Detected		5.981
2330				Mean of Detected	220.5					Mean of Detected		5.07
2331				SD of Detected	149.5					SD of Detected		0.946
2332				Minimum Non-Detect	42					Minimum Non-Detect		3.738

2333				Maximum Non-Detect	51					Maximum Non-Detect	3.932	
2334												
2335	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect	6	
2336	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected	9	
2337	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage	40.00%	
2338												
2339	**UCL Statistics**											
2340	**Normal Distribution Test with Detected Values Only**									**Lognormal Distribution Test with Detected Values Only**		
2341				Shapiro Wilk Test Statistic	0.848					Shapiro Wilk Test Statistic	0.841	
2342				5% Shapiro Wilk Critical Value	0.85					5% Shapiro Wilk Critical Value	0.85	
2343	**Data not Normal at 5% Significance Level**									**Data not Lognormal at 5% Significance Level**		
2344												
2345	**Assuming Normal Distribution**									**Assuming Lognormal Distribution**		
2346				DL/2 Substitution Method						DL/2 Substitution Method		
2347				Mean	167.9					Mean	4.556	
2348				SD	155.3					SD	1.191	
2349				95% DL/2 (t) UCL	238.6					95% H-Stat (DL/2) UCL	333.8	
2350												
2351				Maximum Likelihood Estimate(MLE) Method						Log ROS Method		
2352				Mean	117					Mean in Log Scale	4.659	
2353				SD	214.8					SD in Log Scale	1.068	
2354				95% MLE (t) UCL	214.6					Mean in Original Scale	170.9	
2355				95% MLE (Tiku) UCL	227.5					SD in Original Scale	152.5	
2356										95% Percentile Bootstrap UCL	236.5	
2357										95% BCA Bootstrap UCL	243.5	
2358												
2359	**Gamma Distribution Test with Detected Values Only**									**Data Distribution Test with Detected Values Only**		
2360				k star (bias corrected)	1.281					**Data Follow Appr. Gamma Distribution at 5% Significance Level**		
2361				Theta Star	172.1							
2362				nu star	28.19							
2363												
2364				A-D Test Statistic	0.75					**Nonparametric Statistics**		
2365				5% A-D Critical Value	0.741					Kaplan-Meier (KM) Method		
2366				K-S Test Statistic	0.741					Mean	171.5	
2367				5% K-S Critical Value	0.259					SD	146.7	
2368	**Data follow Appr. Gamma Distribution at 5% Significance Level**									SE of Mean	39.73	
2369										95% KM (t) UCL	241.5	
2370	**Assuming Gamma Distribution**									95% KM (z) UCL	236.9	
2371				Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	239.5	
2372				Minimum	35.4					95% KM (bootstrap t) UCL	248.8	
2373				Maximum	396					95% KM (BCA) UCL	243.2	
2374				Mean	187.1					95% KM (Percentile Bootstrap) UCL	237.7	
2375				Median	113.1					95% KM (Chebyshev) UCL	344.7	
2376				SD	139.2					97.5% KM (Chebyshev) UCL	419.6	
2377				k star	1.478					99% KM (Chebyshev) UCL	566.8	
2378				Theta star	126.6							
2379				Nu star	44.34					**Potential UCLs to Use**		
2380				AppChi2	30.07					95% KM (Percentile Bootstrap) UCL	237.7	
2381				95% Gamma Approximate UCL	275.9							
2382				95% Adjusted Gamma UCL	289.8							
2383	**Note: DL/2 is not a recommended method.**											
2384												
2385												

2386	**Thallium (mg/kg)**											
2387												
2388	**General Statistics**											
2389					Number of Valid Samples	28			Number of Detected Data			6
2390					Number of Unique Samples	6			Number of Non-Detect Data			22
2391									Percent Non-Detects			78.57%
2392												
2393	**Raw Statistics**						**Log-transformed Statistics**					
2394					Minimum Detected	0.073			Minimum Detected			-2.617
2395					Maximum Detected	0.21			Maximum Detected			-1.561
2396					Mean of Detected	0.128			Mean of Detected			-2.114
2397					SD of Detected	0.0498			SD of Detected			0.38
2398					Minimum Non-Detect	0.26			Minimum Non-Detect			-1.347
2399					Maximum Non-Detect	12			Maximum Non-Detect			2.485
2400												
2401	Note: Data have multiple DLs - Use of KM Method is recommended								Number treated as Non-Detect			28
2402	For all methods (except KM, DL/2, and ROS Methods),								Number treated as Detected			0
2403	Observations < Largest ND are treated as NDs								Single DL Non-Detect Percentage			100.00%
2404												
2405	**UCL Statistics**											
2406	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
2407					Shapiro Wilk Test Statistic	0.949			Shapiro Wilk Test Statistic			0.991
2408					5% Shapiro Wilk Critical Value	0.788			5% Shapiro Wilk Critical Value			0.788
2409	**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
2410												
2411	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
2412					DL/2 Substitution Method				DL/2 Substitution Method			
2413					Mean	1.319			Mean			-0.701
2414					SD	1.579			SD			1.536
2415					95% DL/2 (t) UCL	1.828			95% H-Stat (DL/2) UCL			6.159
2416												
2417					Maximum Likelihood Estimate(MLE) Method	N/A			Log ROS Method			
2418	**MLE method failed to converge properly**								Mean in Log Scale			-2.114
2419									SD in Log Scale			0.274
2420									Mean in Original Scale			0.125
2421									SD in Original Scale			0.035
2422									95% Percentile Bootstrap UCL			0.136
2423									95% BCA Bootstrap UCL			0.137
2424												
2425	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
2426					k star (bias corrected)	4.308	**Data appear Normal at 5% Significance Level**					
2427					Theta Star	0.0298						
2428					nu star	51.7						
2429												
2430					A-D Test Statistic	0.175	**Nonparametric Statistics**					
2431					5% A-D Critical Value	0.698			Kaplan-Meier (KM) Method			
2432					K-S Test Statistic	0.698			Mean			0.128
2433					5% K-S Critical Value	0.333			SD			0.0455
2434	**Data appear Gamma Distributed at 5% Significance Level**								SE of Mean			0.0203
2435									95% KM (t) UCL			0.163
2436	**Assuming Gamma Distribution**								95% KM (z) UCL			0.162
2437					Gamma ROS Statistics using Extrapolated Data				95% KM (jackknife) UCL			0.166
2438					Minimum	0.0649			95% KM (bootstrap t) UCL			0.194

	A	B	C	D	E	F	G	H	I	J	K	L
2439					Maximum	0.21				95% KM (BCA) UCL		0.159
2440					Mean	0.131				95% KM (Percentile Bootstrap) UCL		0.164
2441					Median	0.136				95% KM (Chebyshev) UCL		0.217
2442					SD	0.0346				97.5% KM (Chebyshev) UCL		0.255
2443					k star	12.18				99% KM (Chebyshev) UCL		0.331
2444					Theta star	0.0108						
2445					Nu star	682	**Potential UCLs to Use**					
2446					AppChi2	622.5				95% KM (t) UCL		0.163
2447				95% Gamma Approximate UCL		0.144				95% KM (Percentile Bootstrap) UCL		0.164
2448				95% Adjusted Gamma UCL		0.144						
2449	**Note: DL/2 is not a recommended method.**											
2450												
2451												
2452	**Vanadium (mg/kg)**											
2453												
2454	**General Statistics**											
2455				Number of Valid Samples		28				Number of Unique Samples		28
2456												
2457	**Raw Statistics**						**Log-transformed Statistics**					
2458					Minimum	12.1				Minimum of Log Data		2.493
2459					Maximum	74.5				Maximum of Log Data		4.311
2460					Mean	36.49				Mean of log Data		3.486
2461					Median	34.3				SD of log Data		0.491
2462					SD	17.22						
2463					Coefficient of Variation	0.472						
2464					Skewness	0.666						
2465												
2466	**Relevant UCL Statistics**											
2467	**Normal Distribution Test**						**Lognormal Distribution Test**					
2468					Shapiro Wilk Test Statistic	0.938				Shapiro Wilk Test Statistic		0.973
2469					Shapiro Wilk Critical Value	0.924				Shapiro Wilk Critical Value		0.924
2470	**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
2471												
2472	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
2473					95% Student's-t UCL	42.04				95% H-UCL		44.25
2474	**95% UCLs (Adjusted for Skewness)**									95% Chebyshev (MVUE) UCL		52.12
2475					95% Adjusted-CLT UCL	42.28				97.5% Chebyshev (MVUE) UCL		58.8
2476					95% Modified-t UCL	42.1				99% Chebyshev (MVUE) UCL		71.94
2477												
2478	**Gamma Distribution Test**						**Data Distribution**					
2479					k star (bias corrected)	4.176	**Data appear Normal at 5% Significance Level**					
2480					Theta Star	8.739						
2481					nu star	233.9						
2482					Approximate Chi Square Value (.05)	199.5	**Nonparametric Statistics**					
2483					Adjusted Level of Significance	0.0404				95% CLT UCL		41.85
2484					Adjusted Chi Square Value	197.5				95% Jackknife UCL		42.04
2485										95% Standard Bootstrap UCL		41.57
2486					Anderson-Darling Test Statistic	0.203				95% Bootstrap-t UCL		42.36
2487					Anderson-Darling 5% Critical Value	0.749				95% Hall's Bootstrap UCL		42.17
2488					Kolmogorov-Smirnov Test Statistic	0.0903				95% Percentile Bootstrap UCL		41.92
2489					Kolmogorov-Smirnov 5% Critical Value	0.166				95% BCA Bootstrap UCL		42.24
2490	**Data appear Gamma Distributed at 5% Significance Level**									95% Chebyshev(Mean, Sd) UCL		50.68
2491										97.5% Chebyshev(Mean, Sd) UCL		56.82

2492	**Assuming Gamma Distribution**										99% Chebyshev(Mean, Sd) UCL	68.88
2493				95% Approximate Gamma UCL	42.79							
2494				95% Adjusted Gamma UCL	43.21							
2495												
2496	**Potential UCL to Use**										Use 95% Student's-t UCL	42.04
2497												
2498												
2499	**Zinc (mg/kg)**											
2500												
2501	**General Statistics**											
2502				Number of Valid Samples	28						Number of Unique Samples	25
2503												
2504	**Raw Statistics**						**Log-transformed Statistics**					
2505				Minimum	7.23						Minimum of Log Data	1.978
2506				Maximum	76.3						Maximum of Log Data	4.335
2507				Mean	29.33						Mean of log Data	3.248
2508				Median	26.95						SD of log Data	0.542
2509				SD	15.08							
2510				Coefficient of Variation	0.514							
2511				Skewness	1.19							
2512												
2513	**Relevant UCL Statistics**											
2514	**Normal Distribution Test**						**Lognormal Distribution Test**					
2515				Shapiro Wilk Test Statistic	0.924						Shapiro Wilk Test Statistic	0.966
2516				Shapiro Wilk Critical Value	0.924						Shapiro Wilk Critical Value	0.924
2517	**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
2518												
2519	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
2520				95% Student's-t UCL	34.19						95% H-UCL	36.67
2521	**95% UCLs (Adjusted for Skewness)**										95% Chebyshev (MVUE) UCL	43.55
2522				95% Adjusted-CLT UCL	34.7						97.5% Chebyshev (MVUE) UCL	49.56
2523				95% Modified-t UCL	34.29						99% Chebyshev (MVUE) UCL	61.38
2524												
2525	**Gamma Distribution Test**						**Data Distribution**					
2526				k star (bias corrected)	3.588		**Data appear Normal at 5% Significance Level**					
2527				Theta Star	8.175							
2528				nu star	200.9							
2529				Approximate Chi Square Value (.05)	169.1		**Nonparametric Statistics**					
2530				Adjusted Level of Significance	0.0404						95% CLT UCL	34.02
2531				Adjusted Chi Square Value	167.3						95% Jackknife UCL	34.19
2532											95% Standard Bootstrap UCL	34.05
2533				Anderson-Darling Test Statistic	0.22						95% Bootstrap-t UCL	34.9
2534				Anderson-Darling 5% Critical Value	0.75						95% Hall's Bootstrap UCL	35.52
2535				Kolmogorov-Smirnov Test Statistic	0.102						95% Percentile Bootstrap UCL	33.99
2536				Kolmogorov-Smirnov 5% Critical Value	0.166						95% BCA Bootstrap UCL	34.87
2537	**Data appear Gamma Distributed at 5% Significance Level**										95% Chebyshev(Mean, Sd) UCL	41.75
2538											97.5% Chebyshev(Mean, Sd) UCL	47.13
2539	**Assuming Gamma Distribution**										99% Chebyshev(Mean, Sd) UCL	57.68
2540				95% Approximate Gamma UCL	34.85							
2541				95% Adjusted Gamma UCL	35.22							
2542												
2543	**Potential UCL to Use**										Use 95% Student's-t UCL	34.19
2544												

Appendix E-6

Exposure Point Concentrations – ProUCL 4.0 Output – TCDD Toxicity Equivalents – SWMUs 50 and 59

	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	

50_HHRA_TS (pg/g)

General Statistics

Number of Valid Samples	20	Number of Unique Samples	20

Raw Statistics		**Log-transformed Statistics**	
Minimum	0.327	Minimum of Log Data	-1.119
Maximum	96.01	Maximum of Log Data	4.564
Mean	19.16	Mean of log Data	2.063
Median	6.167	SD of log Data	1.508
SD	24.69		
Coefficient of Variation	1.288		
Skewness	1.882		

Relevant UCL Statistics

Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.754	Shapiro Wilk Test Statistic	0.968
Shapiro Wilk Critical Value	0.905	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**	
95% Student's-t UCL	28.71	95% H-UCL	78.78
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	60.82
95% Adjusted-CLT UCL	30.73	97.5% Chebyshev (MVUE) UCL	77.59
95% Modified-t UCL	29.1	99% Chebyshev (MVUE) UCL	110.5
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	0.613	**Data appear Gamma Distributed at 5% Significance Level**	
Theta Star	31.28		
nu star	24.51		
Approximate Chi Square Value (.05)	14.23	**Nonparametric Statistics**	
Adjusted Level of Significance	0.038	95% CLT UCL	28.24
Adjusted Chi Square Value	13.62	95% Jackknife UCL	28.71
		95% Standard Bootstrap UCL	27.86
Anderson-Darling Test Statistic	0.524	95% Bootstrap-t UCL	34.18
Anderson-Darling 5% Critical Value	0.786	95% Hall's Bootstrap UCL	33.66
Kolmogorov-Smirnov Test Statistic	0.169	95% Percentile Bootstrap UCL	28.58
Kolmogorov-Smirnov 5% Critical Value	0.202	95% BCA Bootstrap UCL	29.93
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	43.23
		97.5% Chebyshev(Mean, Sd) UCL	53.64
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	74.09
95% Approximate Gamma UCL	32.99		
95% Adjusted Gamma UCL	34.49		
Potential UCL to Use		Use 95% Approximate Gamma UCL	32.99

	A	B	C	D	E	F	G	H	I	J	K	L
54												
55												
56	**50_HHRA_SS (pg/g)**											
57												
58	**General Statistics**											
59	Number of Valid Samples					10	Number of Unique Samples					10
60												
61	**Raw Statistics**						**Log-transformed Statistics**					
62	Minimum					2.353	Minimum of Log Data					0.856
63	Maximum					96.01	Maximum of Log Data					4.564
64	Mean					26.74	Mean of log Data					2.492
65	Median					7.457	SD of log Data					1.39
66	SD					31.81						
67	Coefficient of Variation					1.189						
68	Skewness					1.288						
69												
70	**Relevant UCL Statistics**											
71	**Normal Distribution Test**						**Lognormal Distribution Test**					
72	Shapiro Wilk Test Statistic					0.782	Shapiro Wilk Test Statistic					0.865
73	Shapiro Wilk Critical Value					0.842	Shapiro Wilk Critical Value					0.842
74	**Data not Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
75												
76	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
77	95% Student's-t UCL					45.18	95% H-UCL					197.8
78	**95% UCLs (Adjusted for Skewness)**						95% Chebyshev (MVUE) UCL					82.17
79	95% Adjusted-CLT UCL					47.66	97.5% Chebyshev (MVUE) UCL					106
80	95% Modified-t UCL					45.86	99% Chebyshev (MVUE) UCL					152.7
81												
82	**Gamma Distribution Test**						**Data Distribution**					
83	k star (bias corrected)					0.594	**Data Follow Appr. Gamma Distribution at 5% Significance Level**					
84	Theta Star					45.03						
85	nu star					11.88						
86	Approximate Chi Square Value (.05)					5.145	**Nonparametric Statistics**					
87	Adjusted Level of Significance					0.0267	95% CLT UCL					43.28
88	Adjusted Chi Square Value					4.4	95% Jackknife UCL					45.18
89							95% Standard Bootstrap UCL					42.3
90	Anderson-Darling Test Statistic					0.776	95% Bootstrap-t UCL					52.35
91	Anderson-Darling 5% Critical Value					0.757	95% Hall's Bootstrap UCL					45.09
92	Kolmogorov-Smirnov Test Statistic					0.249	95% Percentile Bootstrap UCL					44.11
93	Kolmogorov-Smirnov 5% Critical Value					0.276	95% BCA Bootstrap UCL					45.76
94	**Data follow Appr. Gamma Distribution at 5% Significance Level**						95% Chebyshev(Mean, Sd) UCL					70.58
95							97.5% Chebyshev(Mean, Sd) UCL					89.55
96	**Assuming Gamma Distribution**						99% Chebyshev(Mean, Sd) UCL					126.8
97	95% Approximate Gamma UCL					61.72						
98	95% Adjusted Gamma UCL					72.16						
99												
100	**Potential UCL to Use**						Use 95% Approximate Gamma UCL					61.72
101												
102												
103	**50_SLERA_SS (pg/g)**											
104												
105	**General Statistics**											
106	Number of Valid Samples					10	Number of Unique Samples					10

107												
108	**Raw Statistics**						**Log-transformed Statistics**					
109					Minimum	2.365					Minimum of Log Data	0.861
110					Maximum	98.04					Maximum of Log Data	4.585
111					Mean	28.58					Mean of log Data	2.532
112					Median	7.6					SD of log Data	1.418
113					SD	33.91						
114					Coefficient of Variation	1.187						
115					Skewness	1.15						
116												
117	**Relevant UCL Statistics**											
118	**Normal Distribution Test**						**Lognormal Distribution Test**					
119					Shapiro Wilk Test Statistic	0.789					Shapiro Wilk Test Statistic	0.866
120					Shapiro Wilk Critical Value	0.842					Shapiro Wilk Critical Value	0.842
121	**Data not Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
122												
123	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
124					95% Student's-t UCL	48.23					95% H-UCL	229.5
125	**95% UCLs (Adjusted for Skewness)**										95% Chebyshev (MVUE) UCL	89.48
126					95% Adjusted-CLT UCL	50.38					97.5% Chebyshev (MVUE) UCL	115.6
127					95% Modified-t UCL	48.88					99% Chebyshev (MVUE) UCL	166.8
128												
129	**Gamma Distribution Test**						**Data Distribution**					
130					k star (bias corrected)	0.579	**Data Follow Appr. Gamma Distribution at 5% Significance Level**					
131					Theta Star	49.37						
132					nu star	11.58						
133					Approximate Chi Square Value (.05)	4.95	**Nonparametric Statistics**					
134					Adjusted Level of Significance	0.0267					95% CLT UCL	46.21
135					Adjusted Chi Square Value	4.222					95% Jackknife UCL	48.23
136											95% Standard Bootstrap UCL	45.49
137					Anderson-Darling Test Statistic	0.76					95% Bootstrap-t UCL	58.75
138					Anderson-Darling 5% Critical Value	0.758					95% Hall's Bootstrap UCL	49.43
139					Kolmogorov-Smirnov Test Statistic	0.251					95% Percentile Bootstrap UCL	46.7
140					Kolmogorov-Smirnov 5% Critical Value	0.276					95% BCA Bootstrap UCL	50.46
141	**Data follow Appr. Gamma Distribution at 5% Significance Level**										95% Chebyshev(Mean, Sd) UCL	75.32
142											97.5% Chebyshev(Mean, Sd) UCL	95.54
143	**Assuming Gamma Distribution**										99% Chebyshev(Mean, Sd) UCL	135.3
144					95% Approximate Gamma UCL	66.84						
145					95% Adjusted Gamma UCL	78.36						
146												
147	**Potential UCL to Use**										Use 95% Approximate Gamma UCL	66.84
148												
149												
150	**59_HHRA_TS (pg/g)**											
151												
152	**General Statistics**											
153					Number of Valid Samples	20					Number of Unique Samples	20
154												
155	**Raw Statistics**						**Log-transformed Statistics**					
156					Minimum	0.151					Minimum of Log Data	-1.889
157					Maximum	11.79					Maximum of Log Data	2.467
158					Mean	2.711					Mean of log Data	0.35
159					Median	1.417					SD of log Data	1.183

160					SD	3.462						
161					Coefficient of Variation	1.277						
162					Skewness	1.993						
163												
164	**Relevant UCL Statistics**											
165	**Normal Distribution Test**						**Lognormal Distribution Test**					
166					Shapiro Wilk Test Statistic	0.683					Shapiro Wilk Test Statistic	0.976
167					Shapiro Wilk Critical Value	0.905					Shapiro Wilk Critical Value	0.905
168	**Data not Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
169												
170	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
171					95% Student's-t UCL	4.049					95% H-UCL	6.214
172	**95% UCLs (Adjusted for Skewness)**										95% Chebyshev (MVUE) UCL	6.297
173					95% Adjusted-CLT UCL	4.353					97.5% Chebyshev (MVUE) UCL	7.851
174					95% Modified-t UCL	4.107					99% Chebyshev (MVUE) UCL	10.9
175												
176	**Gamma Distribution Test**						**Data Distribution**					
177					k star (bias corrected)	0.801	**Data appear Gamma Distributed at 5% Significance Level**					
178					Theta Star	3.383						
179					nu star	32.05						
180					Approximate Chi Square Value (.05)	20.11	**Nonparametric Statistics**					
181					Adjusted Level of Significance	0.038					95% CLT UCL	3.984
182					Adjusted Chi Square Value	19.37					95% Jackknife UCL	4.049
183											95% Standard Bootstrap UCL	3.97
184					Anderson-Darling Test Statistic	0.623					95% Bootstrap-t UCL	5.445
185					Anderson-Darling 5% Critical Value	0.772					95% Hall's Bootstrap UCL	4.571
186					Kolmogorov-Smirnov Test Statistic	0.151					95% Percentile Bootstrap UCL	4.097
187					Kolmogorov-Smirnov 5% Critical Value	0.2					95% BCA Bootstrap UCL	4.428
188	**Data appear Gamma Distributed at 5% Significance Level**										95% Chebyshev(Mean, Sd) UCL	6.085
189											97.5% Chebyshev(Mean, Sd) UCL	7.545
190	**Assuming Gamma Distribution**										99% Chebyshev(Mean, Sd) UCL	10.41
191					95% Approximate Gamma UCL	4.32						
192					95% Adjusted Gamma UCL	4.487						
193												
194	**Potential UCL to Use**										Use 95% Approximate Gamma UCL	4.32
195												
196												
197	**59_HHRA_SS (pg/g)**											
198												
199	**General Statistics**											
200					Number of Valid Samples	10					Number of Unique Samples	10
201												
202	**Raw Statistics**						**Log-transformed Statistics**					
203					Minimum	0.261					Minimum of Log Data	-1.343
204					Maximum	11.79					Maximum of Log Data	2.467
205					Mean	4.521					Mean of log Data	1.022
206					Median	2.887					SD of log Data	1.167
207					SD	4.211						
208					Coefficient of Variation	0.932						
209					Skewness	1.045						
210												
211	**Relevant UCL Statistics**											
212	**Normal Distribution Test**						**Lognormal Distribution Test**					

213					Shapiro Wilk Test Statistic	0.826					Shapiro Wilk Test Statistic	0.938
214					Shapiro Wilk Critical Value	0.842					Shapiro Wilk Critical Value	0.842
215	**Data not Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
216												
217	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
218					95% Student's-t UCL	6.962					95% H-UCL	21.08
219	**95% UCLs (Adjusted for Skewness)**										95% Chebyshev (MVUE) UCL	13.43
220					95% Adjusted-CLT UCL	7.181					97.5% Chebyshev (MVUE) UCL	17.08
221					95% Modified-t UCL	7.035					99% Chebyshev (MVUE) UCL	24.26
222												
223	**Gamma Distribution Test**						**Data Distribution**					
224					k star (bias corrected)	0.883	**Data appear Gamma Distributed at 5% Significance Level**					
225					Theta Star	5.12						
226					nu star	17.66						
227					Approximate Chi Square Value (.05)	9.145	**Nonparametric Statistics**					
228					Adjusted Level of Significance	0.0267					95% CLT UCL	6.711
229					Adjusted Chi Square Value	8.101					95% Jackknife UCL	6.962
230											95% Standard Bootstrap UCL	6.641
231					Anderson-Darling Test Statistic	0.297					95% Bootstrap-t UCL	8.616
232					Anderson-Darling 5% Critical Value	0.745					95% Hall's Bootstrap UCL	7.276
233					Kolmogorov-Smirnov Test Statistic	0.184					95% Percentile Bootstrap UCL	6.732
234					Kolmogorov-Smirnov 5% Critical Value	0.273					95% BCA Bootstrap UCL	7.155
235	**Data appear Gamma Distributed at 5% Significance Level**										95% Chebyshev(Mean, Sd) UCL	10.33
236											97.5% Chebyshev(Mean, Sd) UCL	12.84
237	**Assuming Gamma Distribution**										99% Chebyshev(Mean, Sd) UCL	17.77
238					95% Approximate Gamma UCL	8.73						
239					95% Adjusted Gamma UCL	9.854						
240												
241	**Potential UCL to Use**										Use 95% Approximate Gamma UCL	8.73
242												
243												
244	**59_SLERA_SS (pg/g)**											
245												
246	**General Statistics**											
247					Number of Valid Samples	10					Number of Unique Samples	10
248												
249	**Raw Statistics**						**Log-transformed Statistics**					
250					Minimum	0.567					Minimum of Log Data	-0.567
251					Maximum	12.14					Maximum of Log Data	2.496
252					Mean	4.804					Mean of log Data	1.178
253					Median	3.116					SD of log Data	0.982
254					SD	4.271						
255					Coefficient of Variation	0.889						
256					Skewness	1.04						
257												
258	**Relevant UCL Statistics**											
259	**Normal Distribution Test**						**Lognormal Distribution Test**					
260					Shapiro Wilk Test Statistic	0.827					Shapiro Wilk Test Statistic	0.961
261					Shapiro Wilk Critical Value	0.842					Shapiro Wilk Critical Value	0.842
262	**Data not Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
263												
264	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
265					95% Student's-t UCL	7.28					95% H-UCL	14.34

266	**95% UCLs (Adjusted for Skewness)**									95% Chebyshev (MVUE) UCL	11.93	
267	95% Adjusted-CLT UCL	7.5								97.5% Chebyshev (MVUE) UCL	14.95	
268	95% Modified-t UCL	7.354								99% Chebyshev (MVUE) UCL	20.9	
269												
270	**Gamma Distribution Test**									**Data Distribution**		
271	k star (bias corrected)	1.06								**Data appear Gamma Distributed at 5% Significance Level**		
272	Theta Star	4.53										
273	nu star	21.21										
274	Approximate Chi Square Value (.05)	11.75								**Nonparametric Statistics**		
275	Adjusted Level of Significance	0.0267								95% CLT UCL	7.026	
276	Adjusted Chi Square Value	10.54								95% Jackknife UCL	7.28	
277										95% Standard Bootstrap UCL	6.973	
278	Anderson-Darling Test Statistic	0.311								95% Bootstrap-t UCL	8.701	
279	Anderson-Darling 5% Critical Value	0.741								95% Hall's Bootstrap UCL	7.406	
280	Kolmogorov-Smirnov Test Statistic	0.161								95% Percentile Bootstrap UCL	6.925	
281	Kolmogorov-Smirnov 5% Critical Value	0.272								95% BCA Bootstrap UCL	7.366	
282	**Data appear Gamma Distributed at 5% Significance Level**									95% Chebyshev(Mean, Sd) UCL	10.69	
283										97.5% Chebyshev(Mean, Sd) UCL	13.24	
284	**Assuming Gamma Distribution**									99% Chebyshev(Mean, Sd) UCL	18.24	
285	95% Approximate Gamma UCL	8.674										
286	95% Adjusted Gamma UCL	9.665										
287												
288	**Potential UCL to Use**									Use 95% Approximate Gamma UCL	8.674	
289												

Appendix E-7

Background Comparisons – ProUCL 4.0 Output – SWMU 50

APPENDIX E.7A

Goodness-of-Fit Test Statistics for Data Sets with Non-Detects

User Selected Options

From File	H:\Risk DB\Radford\SWMUs 50-59\Background Stats\50_ProUCL_input_SS_for BKG.wst
Full Precision	OFF
Confidence Coefficient	0.95

Aluminum (mg/kg) (rfaap bkgrd-ss)

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	28	0	28	28	0	0.00%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Full: no NDs)	28	3620	20100	8300	6705	4279

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Full: no NDs)	4.541	4.078	1828	8.91	0.477	0.0535

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.935	0.935	0.935	0.935

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Full: no NDs)	0.871	0.924	Data Not Normal
Lilliefors (Full: no NDs)	0.208	0.167	Data Not Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.982	0.982	0.982	0.982

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Full: no NDs)	0.741	0.749	
Kolmogorov-Smirnov (Full: no NDs)	0.171	0.166	Data appear Approximate Gamma Distribution

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.98	0.98	0.98	0.98

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Full: no NDs)	0.948	0.924	Data Appear Lognormal
Lilliefors (Full: no NDs)	0.142	0.167	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Aluminum (mg/kg) (swmu 50 ss)

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	15	1	14	14	0	0.00%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Full: no NDs)	14	6590	24300	15371	14950	4542

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Full: no NDs)	11.1	8.772	1384	9.595	0.327	0.0341

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.984	0.984	0.984	0.984

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Full: no NDs)	0.975	0.874	Data Appear Normal
Lilliefors (Full: no NDs)	0.14	0.237	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.979	0.979	0.979	0.979

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Full: no NDs)	0.295	0.734	
Kolmogorov-Smirnov (Full: no NDs)	0.161	0.229	Data Appear Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.96	0.96	0.96	0.96

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Full: no NDs)	0.935	0.874	Data Appear Lognormal
Lilliefors (Full: no NDs)	0.156	0.237	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Antimony (mg/kg) (rfaap bkgrd-ss)

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	28	14	14	0	14	100.00%

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable Antimony (mg/kg) (rfaap bkgrd-ss) was not processed!

Antimony (mg/kg) (swmu 50 ss)

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	15	3	12	11	1	8.33%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Detects Only)	11	0.33	1.4	1.075	1.1	0.323
Statistics (All: NDs treated as DL value)	12	0.33	1.4	1.031	1.1	0.344
Statistics (All: NDs treated as DL/2 value)	12	0.274	1.4	1.008	1.1	0.385
Statistics (Normal ROS Estimated Data)	12	0.33	1.4	1.028	1.1	0.348
Statistics (Gamma ROS Estimated Data)	12	0.33	1.4	1.031	1.1	0.343
Statistics (Lognormal ROS Estimated Data)	12	0.33	1.4	1.028	1.1	0.348

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	8.026	6.075	0.134	0.00839	0.422	50.27
Statistics (NDs = DL)	7.032	5.329	0.147	-0.0426	0.439	-10.32
Statistics (NDs = DL/2)	4.782	3.642	0.211	-0.1	0.551	-5.492
Statistics (Gamma ROS Estimates)	7.076	5.363	0.146	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-0.0482	0.448	-9.28

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.93	0.951	0.932	0.949

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.869	0.85	Data Appear Normal
Lilliefors (Detects Only)	0.227	0.267	Data Appear Normal
Shapiro-Wilks (NDs = DL)	0.896	0.859	Data Appear Normal
Lilliefors (NDs = DL)	0.214	0.256	Data Appear Normal
Shapiro-Wilks (NDs = DL/2)	0.856	0.859	Data Not Normal
Lilliefors (NDs = DL/2)	0.242	0.256	Data Appear Normal
Shapiro-Wilks (Normal ROS Estimates)	0.891	0.859	Data Appear Normal
Lilliefors (Normal ROS Estimates)	0.218	0.256	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.872	0.896	0.858	0.896

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.926	0.73	
Kolmogorov-Smirnov (Detects Only)	0.285	0.256	Data Not Gamma Distributed
Anderson-Darling (NDs = DL)	0.798	0.731	
Kolmogorov-Smirnov (NDs = DL)	0.269	0.246	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	1.136	0.733	
Kolmogorov-Smirnov (NDs = DL/2)	0.304	0.246	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	0.793	0.731	

Kolmogorov-Smirnov (Gamma ROS Est.)	0.268	0.246	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.849	0.897	0.867	0.897

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.738	0.85	Data Not Lognormal
Lilliefors (Detects Only)	0.31	0.267	Data Not Lognormal
Shapiro-Wilks (NDs = DL)	0.809	0.859	Data Not Lognormal
Lilliefors (NDs = DL)	0.289	0.256	Data Not Lognormal
Shapiro-Wilks (NDs = DL/2)	0.748	0.859	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.322	0.256	Data Not Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.806	0.859	Data Not Lognormal
Lilliefors (Lognormal ROS Estimates)	0.293	0.256	Data Not Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Arsenic (mg/kg) (rfaap bkgrd-ss)

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	28	0	28	28	0	0.00%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Full: no NDs)	28	1.5	10.2	3.732	2.75	2.33

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Full: no NDs)	3.494	3.143	1.068	1.167	0.532	0.456

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.898	0.898	0.898	0.898

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Full: no NDs)	0.803	0.924	Data Not Normal
Lilliefors (Full: no NDs)	0.203	0.167	Data Not Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.969	0.969	0.969	0.969

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Full: no NDs)	1.02	0.752	
Kolmogorov-Smirnov (Full: no NDs)	0.165	0.166	Data appear Approximate Gamma Distribution

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.972	0.972	0.972	0.972

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Full: no NDs)	0.932	0.924	Data Appear Lognormal
Lilliefors (Full: no NDs)	0.138	0.167	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Arsenic (mg/kg) (swmu 50 ss)

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	15	1	14	14	0	0.00%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Full: no NDs)	14	1.03	7.4	3.957	3.8	2.002

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Full: no NDs)	3.763	3.004	1.052	1.237	0.577	0.466

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.984	0.984	0.984	0.984

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Full: no NDs)	0.954	0.874	Data Appear Normal
Lilliefors (Full: no NDs)	0.124	0.237	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.979	0.979	0.979	0.979

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Full: no NDs)	0.194	0.741	
Kolmogorov-Smirnov (Full: no NDs)	0.107	0.23	Data Appear Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.981	0.981	0.981	0.981

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Full: no NDs)	0.957	0.874	Data Appear Lognormal
Lilliefors (Full: no NDs)	0.119	0.237	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Barium (mg/kg) (rfaap bkgrd-ss)

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	28	0	28	24	4	14.29%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	4	0.36	1	0.683	0.685	0.367
Statistics (Detects Only)	24	23.4	174	75.55	61.85	43.2
Statistics (All: NDs treated as DL value)	28	0.36	174	64.85	58.65	47.97
Statistics (All: NDs treated as DL/2 value)	28	0.18	174	64.8	58.65	48.04
Statistics (Normal ROS Estimated Data)	28	-33.62	174	61.51	58.65	53.13
Statistics (Gamma ROS Estimated Data)	28	1E-09	174	66.05	58.65	46.43
Statistics (Lognormal ROS Estimated Data)	28	14.2	174	67.13	58.65	45.07

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	3.215	2.894	23.5	4.161	0.597	0.144
Statistics (NDs = DL)	0.867	0.798	74.79	3.495	1.762	0.504
Statistics (NDs = DL/2)	0.769	0.711	84.25	3.396	1.997	0.588
Statistics (Gamma ROS Estimates)	0.566	0.529	116.7	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	3.967	0.734	0.185

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.963	0.976	0.976	0.989

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.917	0.916	Data Appear Normal
Lilliefors (Detects Only)	0.192	0.181	Data Not Normal
Shapiro-Wilks (NDs = DL)	0.941	0.924	Data Appear Normal
Lilliefors (NDs = DL)	0.153	0.167	Data Appear Normal
Shapiro-Wilks (NDs = DL/2)	0.941	0.924	Data Appear Normal
Lilliefors (NDs = DL/2)	0.153	0.167	Data Appear Normal
Shapiro-Wilks (Normal ROS Estimates)	0.971	0.924	Data Appear Normal
Lilliefors (Normal ROS Estimates)	0.127	0.167	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.986	0.947	0.939	0.927

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.354	0.751	
Kolmogorov-Smirnov (Detects Only)	0.127	0.179	Data Appear Gamma Distributed
Anderson-Darling (NDs = DL)	1.516	0.78	
Kolmogorov-Smirnov (NDs = DL)	0.191	0.171	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	1.873	0.784	
Kolmogorov-Smirnov (NDs = DL/2)	0.217	0.172	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	3.326	0.804	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.279	0.174	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.987	0.853	0.833	0.985

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.959	0.916	Data Appear Lognormal
Lilliefors (Detects Only)	0.104	0.181	Data Appear Lognormal
Shapiro-Wilks (NDs = DL)	0.725	0.924	Data Not Lognormal
Lilliefors (NDs = DL)	0.28	0.167	Data Not Lognormal
Shapiro-Wilks (NDs = DL/2)	0.691	0.924	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.309	0.167	Data Not Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.955	0.924	Data Appear Lognormal
Lilliefors (Lognormal ROS Estimates)	0.11	0.167	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Barium (mg/kg) (swmu 50 ss)

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	15	1	14	14	0	0.00%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Full: no NDs)	14	33.9	141	89.17	92.6	25.83

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Full: no NDs)	10.95	8.655	8.14	4.444	0.336	0.0757

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.971	0.971	0.971	0.971

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Full: no NDs)	0.96	0.874	Data Appear Normal
Lilliefors (Full: no NDs)	0.161	0.237	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.968	0.968	0.968	0.968

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Full: no NDs)	0.461	0.734	
Kolmogorov-Smirnov (Full: no NDs)	0.163	0.229	Data Appear Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.924	0.924	0.924	0.924

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Full: no NDs)	0.879	0.874	Data Appear Lognormal
Lilliefors (Full: no NDs)	0.19	0.237	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Beryllium (mg/kg) (rfaap bkgrd-ss)

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	28	0	28	15	13	46.43%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	13	0.022	0.03	0.0278	0.03	0.00339
Statistics (Detects Only)	15	0.61	1.5	0.887	0.87	0.246
Statistics (All: NDs treated as DL value)	28	0.022	1.5	0.488	0.615	0.471
Statistics (All: NDs treated as DL/2 value)	28	0.011	1.5	0.481	0.615	0.477
Statistics (Normal ROS Estimated Data)	28	-0.178	1.5	0.577	0.615	0.402
Statistics (Gamma ROS Estimated Data)	28	0.498	1.5	0.87	0.879	0.206
Statistics (Lognormal ROS Estimated Data)	28	0.276	1.5	0.674	0.615	0.297

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	15.44	13.81	0.0574	-0.153	0.26	-1.698
Statistics (NDs = DL)	0.6	0.559	0.814	-1.748	1.757	-1.005
Statistics (NDs = DL/2)	0.478	0.45	1.008	-2.07	2.107	-1.018
Statistics (Gamma ROS Estimates)	19.32	17.28	0.045	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-0.483	0.427	-0.884

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.952	0.917	0.916	0.993

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.908	0.881	Data Appear Normal
Lilliefors (Detects Only)	0.151	0.229	Data Appear Normal
Shapiro-Wilks (NDs = DL)	0.826	0.924	Data Not Normal
Lilliefors (NDs = DL)	0.299	0.167	Data Not Normal
Shapiro-Wilks (NDs = DL/2)	0.823	0.924	Data Not Normal
Lilliefors (NDs = DL/2)	0.3	0.167	Data Not Normal
Shapiro-Wilks (Normal ROS Estimates)	0.984	0.924	Data Appear Normal
Lilliefors (Normal ROS Estimates)	0.0906	0.167	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.978	0.872	0.849	0.982

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.307	0.736	

Kolmogorov-Smirnov (Detects Only)	0.159	0.221	Data Appear Gamma Distributed
Anderson-Darling (NDs = DL)	3.179	0.8	
Kolmogorov-Smirnov (NDs = DL)	0.312	0.174	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	3.391	0.815	
Kolmogorov-Smirnov (NDs = DL/2)	0.314	0.175	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	0.229	0.745	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.102	0.165	Data Appear Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.98	0.868	0.86	0.994

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.953	0.881	Data Appear Lognormal
Lilliefors (Detects Only)	0.15	0.229	Data Appear Lognormal
Shapiro-Wilks (NDs = DL)	0.731	0.924	Data Not Lognormal
Lilliefors (NDs = DL)	0.306	0.167	Data Not Lognormal
Shapiro-Wilks (NDs = DL/2)	0.715	0.924	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.308	0.167	Data Not Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.981	0.924	Data Appear Lognormal
Lilliefors (Lognormal ROS Estimates)	0.0909	0.167	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Beryllium (mg/kg) (swmu 50 ss)

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	15	5	10	10	0	0.00%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Full: no NDs)	10	0.35	0.9	0.649	0.65	0.169

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Full: no NDs)	14.87	10.48	0.0436	-0.466	0.284	-0.609

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.99	0.99	0.99	0.99

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Full: no NDs)	0.978	0.842	Data Appear Normal
Lilliefors (Full: no NDs)	0.12	0.28	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.978	0.978	0.978	0.978

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Full: no NDs)	0.228	0.725	
Kolmogorov-Smirnov (Full: no NDs)	0.149	0.266	Data Appear Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.97	0.97	0.97	0.97

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Full: no NDs)	0.944	0.842	Data Appear Lognormal
Lilliefors (Full: no NDs)	0.168	0.28	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Calcium (mg/kg) (rfaap bkgrd-ss)

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	28	0	28	23	5	17.86%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	5	4.6	6.6	5.12	4.8	0.844
Statistics (Detects Only)	23	116	7340	1197	885	1440
Statistics (All: NDs treated as DL value)	28	4.6	7340	983.9	761.5	1380
Statistics (All: NDs treated as DL/2 value)	28	2.3	7340	983.5	761.5	1380
Statistics (Normal ROS Estimated Data)	28	-1605	7340	751.5	761.5	1625
Statistics (Gamma ROS Estimated Data)	28	1E-09	7340	984.5	761.5	1380
Statistics (Lognormal ROS Estimated Data)	28	104.3	7340	1007	761.5	1364

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	1.506	1.368	794.6	6.72	0.84	0.125
Statistics (NDs = DL)	0.575	0.537	1712	5.81	2.128	0.366
Statistics (NDs = DL/2)	0.523	0.491	1879	5.686	2.383	0.419
Statistics (Gamma ROS Estimates)	0.178	0.183	5519	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	6.391	1.047	0.164

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.724	0.745	0.746	0.855

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.553	0.914	Data Not Normal
Lilliefors (Detects Only)	0.275	0.185	Data Not Normal
Shapiro-Wilks (NDs = DL)	0.587	0.924	Data Not Normal
Lilliefors (NDs = DL)	0.244	0.167	Data Not Normal
Shapiro-Wilks (NDs = DL/2)	0.587	0.924	Data Not Normal
Lilliefors (NDs = DL/2)	0.244	0.167	Data Not Normal
Shapiro-Wilks (Normal ROS Estimates)	0.761	0.924	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.207	0.167	Data Not Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.866	0.916	0.919	0.944

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.694	0.76	
Kolmogorov-Smirnov (Detects Only)	0.152	0.185	Data Appear Gamma Distributed
Anderson-Darling (NDs = DL)	1.232	0.803	
Kolmogorov-Smirnov (NDs = DL)	0.192	0.174	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	1.47	0.808	
Kolmogorov-Smirnov (NDs = DL/2)	0.211	0.175	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	6.572	0.907	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.417	0.184	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.974	0.886	0.869	0.976

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.967	0.914	Data Appear Lognormal
Lilliefors (Detects Only)	0.0979	0.185	Data Appear Lognormal
Shapiro-Wilks (NDs = DL)	0.779	0.924	Data Not Lognormal
Lilliefors (NDs = DL)	0.279	0.167	Data Not Lognormal
Shapiro-Wilks (NDs = DL/2)	0.75	0.924	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.296	0.167	Data Not Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.949	0.924	Data Appear Lognormal
Lilliefors (Lognormal ROS Estimates)	0.114	0.167	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Calcium (mg/kg) (swmu 50 ss)

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	15	1	14	14	0	0.00%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Full: no NDs)	14	484	28600	5822	1365	8338

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Full: no NDs)	0.648	0.557	8983	7.727	1.413	0.183

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.824	0.824	0.824	0.824

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)

Shapiro-Wilks (Full: no NDs)	0.687	0.874	Data Not Normal
Lilliefors (Full: no NDs)	0.331	0.237	Data Not Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.971	0.971	0.971	0.971

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Full: no NDs)	1.143	0.78	
Kolmogorov-Smirnov (Full: no NDs)	0.289	0.239	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.942	0.942	0.942	0.942

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Full: no NDs)	0.87	0.874	Data Not Lognormal
Lilliefors (Full: no NDs)	0.221	0.237	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Cadmium (mg/kg) (rfaap bkgrd-ss)

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	28	0	28	2	26	92.86%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	26	N/A	N/A	N/A	N/A	N/A
Statistics (Detects Only)	2	N/A	N/A	N/A	N/A	N/A
Statistics (All: NDs treated as DL value)	28	N/A	N/A	N/A	N/A	N/A
Statistics (All: NDs treated as DL/2 value)	28	N/A	N/A	N/A	N/A	N/A
Statistics (Normal ROS Estimated Data)	28	N/A	N/A	N/A	N/A	N/A

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	N/A	N/A	N/A	N/A

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	N/A	N/A	
Lilliefors (Detects Only)	N/A	N/A	
Shapiro-Wilks (NDs = DL)	N/A	N/A	
Lilliefors (NDs = DL)	N/A	N/A	
Shapiro-Wilks (NDs = DL/2)	N/A	N/A	
Lilliefors (NDs = DL/2)	N/A	N/A	
Shapiro-Wilks (Normal ROS Estimates)	N/A	N/A	
Lilliefors (Normal ROS Estimates)	N/A	N/A	

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	N/A	N/A	N/A	N/A

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	N/A	N/A	
Kolmogorov-Smirnov (Detects Only)	N/A	N/A	
Anderson-Darling (NDs = DL)	N/A	N/A	
Kolmogorov-Smirnov (NDs = DL)	N/A	N/A	
Anderson-Darling (NDs = DL/2)	N/A	N/A	
Kolmogorov-Smirnov (NDs = DL/2)	N/A	N/A	
Anderson-Darling (Gamma ROS Estimates)	N/A	N/A	
Kolmogorov-Smirnov (Gamma ROS Est.)	N/A	N/A	

Note: Substitution methods such as DL or DL/2 are not recommended.

Cadmium (mg/kg) (swmu 50 ss)

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	15	3	12	2	10	83.33%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	10	N/A	N/A	N/A	N/A	N/A
Statistics (Detects Only)	2	N/A	N/A	N/A	N/A	N/A
Statistics (All: NDs treated as DL value)	12	N/A	N/A	N/A	N/A	N/A
Statistics (All: NDs treated as DL/2 value)	12	N/A	N/A	N/A	N/A	N/A
Statistics (Normal ROS Estimated Data)	12	N/A	N/A	N/A	N/A	N/A

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	N/A	N/A	N/A	N/A

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	N/A	N/A	
Lilliefors (Detects Only)	N/A	N/A	
Shapiro-Wilks (NDs = DL)	N/A	N/A	
Lilliefors (NDs = DL)	N/A	N/A	
Shapiro-Wilks (NDs = DL/2)	N/A	N/A	
Lilliefors (NDs = DL/2)	N/A	N/A	
Shapiro-Wilks (Normal ROS Estimates)	N/A	N/A	
Lilliefors (Normal ROS Estimates)	N/A	N/A	

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	N/A	N/A	N/A	N/A

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)

Anderson-Darling (Detects Only)	N/A	N/A
Kolmogorov-Smirnov (Detects Only)	N/A	N/A
Anderson-Darling (NDs = DL)	N/A	N/A
Kolmogorov-Smirnov (NDs = DL)	N/A	N/A
Anderson-Darling (NDs = DL/2)	N/A	N/A
Kolmogorov-Smirnov (NDs = DL/2)	N/A	N/A
Anderson-Darling (Gamma ROS Estimates)	N/A	N/A
Kolmogorov-Smirnov (Gamma ROS Est.)	N/A	N/A

Note: Substitution methods such as DL or DL/2 are not recommended.

Chromium (mg/kg) (rfaap bkgrd-ss)

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	28	0	28	28	0	0.00%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Full: no NDs)	28	6.3	53.3	21.09	22.4	10.5

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Full: no NDs)	4.111	3.695	5.13	2.922	0.529	0.181

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.956	0.956	0.956	0.956

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Full: no NDs)	0.92	0.924	Data Not Normal
Lilliefors (Full: no NDs)	0.11	0.167	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.974	0.974	0.974	0.974

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Full: no NDs)	0.612	0.75	
Kolmogorov-Smirnov (Full: no NDs)	0.145	0.166	Data Appear Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.974	0.974	0.974	0.974

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Full: no NDs)	0.946	0.924	Data Appear Lognormal
Lilliefors (Full: no NDs)	0.17	0.167	Data Not Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Chromium (mg/kg) (swmu 50 ss)

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	15	1	14	14	0	0.00%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Full: no NDs)	14	12.2	116	32.64	27.55	25.67

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Full: no NDs)	3.028	2.427	10.78	3.311	0.559	0.169

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.783	0.783	0.783	0.783

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Full: no NDs)	0.642	0.874	Data Not Normal
Lilliefors (Full: no NDs)	0.29	0.237	Data Not Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.881	0.881	0.881	0.881

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Full: no NDs)	0.692	0.742	
Kolmogorov-Smirnov (Full: no NDs)	0.197	0.23	Data Appear Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.953	0.953	0.953	0.953

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Full: no NDs)	0.923	0.874	Data Appear Lognormal
Lilliefors (Full: no NDs)	0.153	0.237	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Cobalt (mg/kg) (rfaap bkgrd-ss)

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	28	0	28	20	8	28.57%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	8	0.11	0.75	0.501	0.72	0.319
Statistics (Detects Only)	20	5.9	45.4	15.95	12.1	10.07
Statistics (All: NDs treated as DL value)	28	0.11	45.4	11.53	10.15	11.04
Statistics (All: NDs treated as DL/2 value)	28	0.055	45.4	11.46	10.15	11.11

Statistics (Normal ROS Estimated Data)	28	-10.02	45.4	9.494	10.15	13.45
Statistics (Gamma ROS Estimated Data)	28	3.774	45.4	13.39	10.15	9.473
Statistics (Lognormal ROS Estimated Data)	28	3.134	45.4	12.48	10.15	10.13

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	3.439	3.095	4.636	2.617	0.545	0.208
Statistics (NDs = DL)	0.701	0.65	16.45	1.583	1.793	1.132
Statistics (NDs = DL/2)	0.588	0.549	19.49	1.385	2.092	1.51
Statistics (Gamma ROS Estimates)	2.851	2.569	4.697	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	2.25	0.749	0.333

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.901	0.93	0.93	0.968

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.819	0.905	Data Not Normal
Lilliefors (Detects Only)	0.236	0.198	Data Not Normal
Shapiro-Wilks (NDs = DL)	0.867	0.924	Data Not Normal
Lilliefors (NDs = DL)	0.158	0.167	Data Appear Normal
Shapiro-Wilks (NDs = DL/2)	0.867	0.924	Data Not Normal
Lilliefors (NDs = DL/2)	0.156	0.167	Data Appear Normal
Shapiro-Wilks (Normal ROS Estimates)	0.936	0.924	Data Appear Normal
Lilliefors (Normal ROS Estimates)	0.128	0.167	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.973	0.98	0.973	0.967

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.596	0.747	
Kolmogorov-Smirnov (Detects Only)	0.167	0.195	Data Appear Gamma Distributed
Anderson-Darling (NDs = DL)	1.122	0.79	
Kolmogorov-Smirnov (NDs = DL)	0.195	0.172	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	1.507	0.801	
Kolmogorov-Smirnov (NDs = DL/2)	0.221	0.174	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	0.785	0.754	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.155	0.167	Data appear Approximate Gamma Distribution

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.982	0.918	0.903	0.983

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.96	0.905	Data Appear Lognormal
Lilliefors (Detects Only)	0.132	0.198	Data Appear Lognormal

Shapiro-Wilks (NDs = DL)	0.831	0.924	Data Not Lognormal
Lilliefors (NDs = DL)	0.257	0.167	Data Not Lognormal
Shapiro-Wilks (NDs = DL/2)	0.802	0.924	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.288	0.167	Data Not Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.954	0.924	Data Appear Lognormal
Lilliefors (Lognormal ROS Estimates)	0.126	0.167	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Cobalt (mg/kg) (swmu 50 ss)

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	15	1	14	14	0	0.00%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Full: no NDs)	14	3.4	17.1	9.059	9.015	3.831

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Full: no NDs)	5.604	4.45	1.617	2.112	0.463	0.219

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.98	0.98	0.98	0.98

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Full: no NDs)	0.959	0.874	Data Appear Normal
Lilliefors (Full: no NDs)	0.163	0.237	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.984	0.984	0.984	0.984

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Full: no NDs)	0.272	0.738	
Kolmogorov-Smirnov (Full: no NDs)	0.127	0.229	Data Appear Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.977	0.977	0.977	0.977

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Full: no NDs)	0.952	0.874	Data Appear Lognormal
Lilliefors (Full: no NDs)	0.142	0.237	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Copper (mg/kg) (rfaap bkgrd-ss)

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	28	0	28	26	2	7.14%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	2	0.17	0.17	0.17	0.17	0
Statistics (Detects Only)	26	2.2	13.6	6.919	5.35	3.696
Statistics (All: NDs treated as DL value)	28	0.17	13.6	6.437	5.2	3.973
Statistics (All: NDs treated as DL/2 value)	28	0.085	13.6	6.431	5.2	3.983
Statistics (Normal ROS Estimated Data)	28	-2.356	13.6	6.306	5.2	4.214
Statistics (Gamma ROS Estimated Data)	28	1E-09	13.6	6.44	5.2	3.969
Statistics (Lognormal ROS Estimated Data)	28	1.502	13.6	6.545	5.2	3.814

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	3.738	3.361	1.851	1.795	0.544	0.303
Statistics (NDs = DL)	1.699	1.541	3.788	1.54	1.072	0.696
Statistics (NDs = DL/2)	1.493	1.357	4.307	1.49	1.234	0.828
Statistics (Gamma ROS Estimates)	0.633	0.589	10.17	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	1.703	0.623	0.366

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.947	0.966	0.967	0.973

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.88	0.92	Data Not Normal
Lilliefors (Detects Only)	0.206	0.174	Data Not Normal
Shapiro-Wilks (NDs = DL)	0.919	0.924	Data Not Normal
Lilliefors (NDs = DL)	0.181	0.167	Data Not Normal
Shapiro-Wilks (NDs = DL/2)	0.92	0.924	Data Not Normal
Lilliefors (NDs = DL/2)	0.18	0.167	Data Not Normal
Shapiro-Wilks (Normal ROS Estimates)	0.939	0.924	Data Appear Normal
Lilliefors (Normal ROS Estimates)	0.164	0.167	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.96	0.946	0.941	0.888

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.717	0.749	
Kolmogorov-Smirnov (Detects Only)	0.151	0.172	Data Appear Gamma Distributed
Anderson-Darling (NDs = DL)	0.918	0.761	
Kolmogorov-Smirnov (NDs = DL)	0.152	0.168	Data appear Approximate Gamma Distribution
Anderson-Darling (NDs = DL/2)	1.191	0.763	
Kolmogorov-Smirnov (NDs = DL/2)	0.177	0.168	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	3.942	0.797	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.345	0.173	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.977	0.861	0.825	0.983

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.939	0.92	Data Appear Lognormal
Lilliefors (Detects Only)	0.135	0.174	Data Appear Lognormal
Shapiro-Wilks (NDs = DL)	0.748	0.924	Data Not Lognormal
Lilliefors (NDs = DL)	0.222	0.167	Data Not Lognormal
Shapiro-Wilks (NDs = DL/2)	0.69	0.924	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.258	0.167	Data Not Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.952	0.924	Data Appear Lognormal
Lilliefors (Lognormal ROS Estimates)	0.118	0.167	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Copper (mg/kg) (swmu 50 ss)

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	15	1	14	14	0	0.00%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Full: no NDs)	14	4	56.4	16.93	11.85	13.78

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Full: no NDs)	2.207	1.782	7.669	2.585	0.704	0.272

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.875	0.875	0.875	0.875

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Full: no NDs)	0.782	0.874	Data Not Normal
Lilliefors (Full: no NDs)	0.258	0.237	Data Not Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.966	0.966	0.966	0.966

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Full: no NDs)	0.419	0.745	
Kolmogorov-Smirnov (Full: no NDs)	0.205	0.231	Data Appear Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.986	0.986	0.986	0.986

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Full: no NDs)	0.975	0.874	Data Appear Lognormal
Lilliefors (Full: no NDs)	0.159	0.237	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Iron (mg/kg) (rfaap bkgrd-ss)

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	28	0	28	28	0	0.00%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Full: no NDs)	28	7250	63000	20108	19750	11869

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Full: no NDs)	3.411	3.069	5895	9.755	0.57	0.0584

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.912	0.912	0.912	0.912

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Full: no NDs)	0.846	0.924	Data Not Normal
Lilliefors (Full: no NDs)	0.139	0.167	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.961	0.961	0.961	0.961

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Full: no NDs)	0.612	0.752	
Kolmogorov-Smirnov (Full: no NDs)	0.151	0.166	Data Appear Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.97	0.97	0.97	0.97

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Full: no NDs)	0.932	0.924	Data Appear Lognormal
Lilliefors (Full: no NDs)	0.153	0.167	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Iron (mg/kg) (swmu 50 ss)

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	15	1	14	14	0	0.00%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Full: no NDs)	14	7510	28300	19506	20450	5496

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Full: no NDs)	10.07	7.962	1937	9.828	0.36	0.0366

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.949	0.949	0.949	0.949

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Full: no NDs)	0.91	0.874	Data Appear Normal
Lilliefors (Full: no NDs)	0.215	0.237	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.919	0.919	0.919	0.919

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Full: no NDs)	1.01	0.735	
Kolmogorov-Smirnov (Full: no NDs)	0.265	0.229	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.885	0.885	0.885	0.885

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Full: no NDs)	0.796	0.874	Data Not Lognormal
Lilliefors (Full: no NDs)	0.293	0.237	Data Not Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Lead (mg/kg) (rfaap bkgrd-ss)

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	28	0	28	28	0	0.00%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Full: no NDs)	28	8.9	225	26.96	15.15	41.34

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Full: no NDs)	1.456	1.324	18.52	2.913	0.702	0.241

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS

Correlation Coefficient R	0.619	0.619	0.619	0.619

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Full: no NDs)	0.416	0.924	Data Not Normal
Lilliefors (Full: no NDs)	0.375	0.167	Data Not Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.807	0.807	0.807	0.807

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Full: no NDs)	3.163	0.764	
Kolmogorov-Smirnov (Full: no NDs)	0.253	0.169	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.886	0.886	0.886	0.886

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Full: no NDs)	0.798	0.924	Data Not Lognormal
Lilliefors (Full: no NDs)	0.192	0.167	Data Not Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Lead (mg/kg) (swmu 50 ss)

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	15	1	14	14	0	0.00%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Full: no NDs)	14	6.6	178	43.81	18.35	55.5

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Full: no NDs)	1.047	0.87	41.84	3.232	0.996	0.308

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.8	0.8	0.8	0.8

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Full: no NDs)	0.645	0.874	Data Not Normal
Lilliefors (Full: no NDs)	0.371	0.237	Data Not Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.942	0.942	0.942	0.942

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Full: no NDs)	1.549	0.759	
Kolmogorov-Smirnov (Full: no NDs)	0.332	0.235	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.925	0.925	0.925	0.925

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Full: no NDs)	0.853	0.874	Data Not Lognormal
Lilliefors (Full: no NDs)	0.276	0.237	Data Not Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Magnesium (mg/kg) (rfaap bkgrd-ss)

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	28	0	28	25	3	10.71%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	3	4.7	5	4.833	4.8	0.153
Statistics (Detects Only)	25	158	20400	2498	913	4334
Statistics (All: NDs treated as DL value)	28	4.7	20400	2231	741	4161
Statistics (All: NDs treated as DL/2 value)	28	2.35	20400	2230	741	4161
Statistics (Normal ROS Estimated Data)	28	-5148	20400	1678	741	4743
Statistics (Gamma ROS Estimated Data)	28	1E-09	20400	2230	741	4161
Statistics (Lognormal ROS Estimated Data)	28	56.13	20400	2236	741	4158

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	0.694	0.643	3600	6.951	1.272	0.183
Statistics (NDs = DL)	0.479	0.451	4657	6.375	2.075	0.325
Statistics (NDs = DL/2)	0.457	0.432	4879	6.301	2.257	0.358
Statistics (Gamma ROS Estimates)	0.198	0.201	11267	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	6.638	1.512	0.228

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.731	0.721	0.721	0.836

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.558	0.918	Data Not Normal
Lilliefors (Detects Only)	0.303	0.177	Data Not Normal
Shapiro-Wilks (NDs = DL)	0.546	0.924	Data Not Normal
Lilliefors (NDs = DL)	0.299	0.167	Data Not Normal
Shapiro-Wilks (NDs = DL/2)	0.546	0.924	Data Not Normal
Lilliefors (NDs = DL/2)	0.299	0.167	Data Not Normal
Shapiro-Wilks (Normal ROS Estimates)	0.729	0.924	Data Not Normal

Lilliefors (Normal ROS Estimates)	0.267	0.167	Data Not Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.946	0.959	0.961	0.987

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	1.247	0.789	
Kolmogorov-Smirnov (Detects Only)	0.183	0.182	Data Not Gamma Distributed
Anderson-Darling (NDs = DL)	0.674	0.815	
Kolmogorov-Smirnov (NDs = DL)	0.131	0.175	Data Appear Gamma Distributed
Anderson-Darling (NDs = DL/2)	0.681	0.82	
Kolmogorov-Smirnov (NDs = DL/2)	0.141	0.176	Data Appear Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	3.847	0.898	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.366	0.183	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.978	0.943	0.925	0.99

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.95	0.918	Data Appear Lognormal
Lilliefors (Detects Only)	0.107	0.177	Data Appear Lognormal
Shapiro-Wilks (NDs = DL)	0.889	0.924	Data Not Lognormal
Lilliefors (NDs = DL)	0.195	0.167	Data Not Lognormal
Shapiro-Wilks (NDs = DL/2)	0.856	0.924	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.22	0.167	Data Not Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.973	0.924	Data Appear Lognormal
Lilliefors (Lognormal ROS Estimates)	0.0849	0.167	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Magnesium (mg/kg) (swmu 50 ss)

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	15	1	14	14	0	0.00%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Full: no NDs)	14	312	20200	3816	1670	5539

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Full: no NDs)	0.808	0.683	4721	7.513	1.206	0.161

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.795	0.795	0.795	0.795

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Full: no NDs)	0.649	0.874	Data Not Normal
Lilliefors (Full: no NDs)	0.345	0.237	Data Not Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.967	0.967	0.967	0.967

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Full: no NDs)	0.79	0.768	
Kolmogorov-Smirnov (Full: no NDs)	0.218	0.237	Data appear Approximate Gamma Distribution

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.978	0.978	0.978	0.978

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Full: no NDs)	0.951	0.874	Data Appear Lognormal
Lilliefors (Full: no NDs)	0.128	0.237	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Manganese (mg/kg) (rfaap bkgrd-ss)

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	28	0	28	28	0	0.00%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Full: no NDs)	28	43	2040	695.9	490	591.5

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Full: no NDs)	1.442	1.311	482.6	6.16	0.971	0.158

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.923	0.923	0.923	0.923

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Full: no NDs)	0.84	0.924	Data Not Normal
Lilliefors (Full: no NDs)	0.197	0.167	Data Not Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.971	0.971	0.971	0.971

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)

Anderson-Darling (Full: no NDs)	0.306	0.764	
Kolmogorov-Smirnov (Full: no NDs)	0.102	0.169	Data Appear Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.983	0.983	0.983	0.983

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Full: no NDs)	0.962	0.924	Data Appear Lognormal
Lilliefors (Full: no NDs)	0.106	0.167	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Manganese (mg/kg) (swmu 50 ss)

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	15	1	14	14	0	0.00%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Full: no NDs)	14	62.8	1320	696.2	667	372.9

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Full: no NDs)	2.424	1.952	287.2	6.325	0.823	0.13

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.991	0.991	0.991	0.991

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Full: no NDs)	0.974	0.874	Data Appear Normal
Lilliefors (Full: no NDs)	0.145	0.237	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.954	0.954	0.954	0.954

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Full: no NDs)	0.455	0.744	
Kolmogorov-Smirnov (Full: no NDs)	0.176	0.231	Data Appear Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.911	0.911	0.911	0.911

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Full: no NDs)	0.84	0.874	Data Not Lognormal

Lilliefors (Full: no NDs)	0.228	0.237	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Mercury (mg/kg) (rfaap bkgrd-ss)

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	28	0	28	3	25	89.29%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	25	0.019	0.06	0.0466	0.05	0.017
Statistics (Detects Only)	3	0.07	1.2	0.467	0.13	0.636
Statistics (All: NDs treated as DL value)	28	0.019	1.2	0.0916	0.06	0.218
Statistics (All: NDs treated as DL/2 value)	28	0.0095	1.2	0.0708	0.03	0.223
Statistics (Normal ROS Estimated Data)	28	-6.561	1.2	-3.164	-3.255	1.837
Statistics (Gamma ROS Estimated Data)	28	1E-09	1.2	0.05	1E-09	0.227
Statistics (Lognormal ROS Estimated Data)	28	6.8748E-09	1.2	0.0503	2.3931E-05	0.227

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	0.798	0.737	0.585	-1.506	1.494	-0.992
Statistics (NDs = DL)	0.982	0.901	0.0933	-2.979	0.795	-0.267
Statistics (NDs = DL/2)	0.644	0.598	0.11	-3.598	0.952	-0.265
Statistics (Gamma ROS Estimates)	0.0553	0.0732	0.904	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-10.44	4.519	-0.433

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.889	0.485	0.471	0.987

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.79	0.767	Data Appear Normal
Lilliefors (Detects Only)	0.368	0.512	Data Appear Normal
Shapiro-Wilks (NDs = DL)	0.268	0.924	Data Not Normal
Lilliefors (NDs = DL)	0.468	0.167	Data Not Normal
Shapiro-Wilks (NDs = DL/2)	0.253	0.924	Data Not Normal
Lilliefors (NDs = DL/2)	0.466	0.167	Data Not Normal
Shapiro-Wilks (Normal ROS Estimates)	0.974	0.924	Data Appear Normal
Lilliefors (Normal ROS Estimates)	0.0965	0.167	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	N/A	0.694	0.731	0.95

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.439	N/A	
Kolmogorov-Smirnov (Detects Only)	0.373	N/A	
Anderson-Darling (NDs = DL)	4.794	0.775	
Kolmogorov-Smirnov (NDs = DL)	0.41	0.17	Data Not Gamma Distributed

Anderson-Darling (NDs = DL/2)	5.507	0.796	
Kolmogorov-Smirnov (NDs = DL/2)	0.458	0.173	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	9.082	1.229	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.564	0.206	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.951	0.826	0.826	0.988

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.904	0.767	Data Appear Lognormal
Lilliefors (Detects Only)	0.306	0.512	Data Appear Lognormal
Shapiro-Wilks (NDs = DL)	0.71	0.924	Data Not Lognormal
Lilliefors (NDs = DL)	0.31	0.167	Data Not Lognormal
Shapiro-Wilks (NDs = DL/2)	0.708	0.924	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.355	0.167	Data Not Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.974	0.924	Data Appear Lognormal
Lilliefors (Lognormal ROS Estimates)	0.0964	0.167	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Mercury (mg/kg) (swmu 50 ss)

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	15	1	14	14	0	0.00%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Full: no NDs)	14	0.041	0.816	0.145	0.0769	0.201

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Full: no NDs)	1.327	1.09	0.109	-2.356	0.809	-0.343

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.701	0.701	0.701	0.701

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Full: no NDs)	0.52	0.874	Data Not Normal
Lilliefors (Full: no NDs)	0.303	0.237	Data Not Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.877	0.877	0.877	0.877

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Full: no NDs)	1.299	0.754	
Kolmogorov-Smirnov (Full: no NDs)	0.254	0.234	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.918	0.918	0.918	0.918

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Full: no NDs)	0.851	0.874	Data Not Lognormal
Lilliefors (Full: no NDs)	0.188	0.237	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Nickel (mg/kg) (rfaap bkgrd-ss)

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	28	0	28	17	11	39.29%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	11	0.21	1.3	1.005	1.3	0.504
Statistics (Detects Only)	17	4.6	18.1	9.935	9.4	4.294
Statistics (All: NDs treated as DL value)	28	0.21	18.1	6.427	5.55	5.545
Statistics (All: NDs treated as DL/2 value)	28	0.105	18.1	6.23	5.55	5.741
Statistics (Normal ROS Estimated Data)	28	-7.045	18.1	5.574	5.55	6.652
Statistics (Gamma ROS Estimated Data)	28	1.974	18.1	9.082	8.465	3.849
Statistics (Lognormal ROS Estimated Data)	28	1.602	18.1	7.218	5.55	4.794

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	5.612	5.034	1.77	2.204	0.448	0.203
Statistics (NDs = DL)	0.953	0.874	6.748	1.251	1.353	1.082
Statistics (NDs = DL/2)	0.709	0.657	8.784	0.979	1.668	1.704
Statistics (Gamma ROS Estimates)	5.329	4.782	1.704	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	1.759	0.683	0.388

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.977	0.953	0.948	0.993

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.938	0.892	Data Appear Normal
Lilliefors (Detects Only)	0.12	0.215	Data Appear Normal
Shapiro-Wilks (NDs = DL)	0.891	0.924	Data Not Normal
Lilliefors (NDs = DL)	0.215	0.167	Data Not Normal
Shapiro-Wilks (NDs = DL/2)	0.88	0.924	Data Not Normal
Lilliefors (NDs = DL/2)	0.227	0.167	Data Not Normal
Shapiro-Wilks (Normal ROS Estimates)	0.977	0.924	Data Appear Normal
Lilliefors (Normal ROS Estimates)	0.0932	0.167	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.986	0.947	0.923	0.993

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.276	0.741	
Kolmogorov-Smirnov (Detects Only)	0.133	0.21	Data Appear Gamma Distributed
Anderson-Darling (NDs = DL)	0.909	0.776	
Kolmogorov-Smirnov (NDs = DL)	0.199	0.171	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	1.342	0.789	
Kolmogorov-Smirnov (NDs = DL/2)	0.225	0.172	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	0.176	0.748	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.0785	0.166	Data Appear Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.984	0.942	0.929	0.986

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.949	0.892	Data Appear Lognormal
Lilliefors (Detects Only)	0.125	0.215	Data Appear Lognormal
Shapiro-Wilks (NDs = DL)	0.872	0.924	Data Not Lognormal
Lilliefors (NDs = DL)	0.188	0.167	Data Not Lognormal
Shapiro-Wilks (NDs = DL/2)	0.847	0.924	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.236	0.167	Data Not Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.959	0.924	Data Appear Lognormal
Lilliefors (Lognormal ROS Estimates)	0.107	0.167	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Nickel (mg/kg) (swmu 50 ss)

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	15	1	14	14	0	0.00%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Full: no NDs)	14	4.1	50.1	12.93	10.45	11.33

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Full: no NDs)	2.539	2.043	5.092	2.35	0.615	0.262

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.766	0.766	0.766	0.766

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Full: no NDs)	0.617	0.874	Data Not Normal
Lilliefors (Full: no NDs)	0.312	0.237	Data Not Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.872	0.872	0.872	0.872

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Full: no NDs)	0.727	0.744	
Kolmogorov-Smirnov (Full: no NDs)	0.206	0.231	Data Appear Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.953	0.953	0.953	0.953

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Full: no NDs)	0.925	0.874	Data Appear Lognormal
Lilliefors (Full: no NDs)	0.165	0.237	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Potassium (mg/kg) (rfaap bkgrd-ss)

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	28	0	28	22	6	21.43%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	6	201	271	220	213	25.92
Statistics (Detects Only)	22	166	2350	735.4	509.5	632.6
Statistics (All: NDs treated as DL value)	28	166	2350	625	317.5	598.1
Statistics (All: NDs treated as DL/2 value)	28	100.5	2350	601.4	317.5	616.1
Statistics (Normal ROS Estimated Data)	28	-180.2	2350	544.7	317.5	671
Statistics (Gamma ROS Estimated Data)	28	135.6	2350	613.1	326.6	607.5
Statistics (Lognormal ROS Estimated Data)	28	142.4	2350	609.6	317.5	609.5

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	1.634	1.482	450.2	6.264	0.838	0.134
Statistics (NDs = DL)	1.53	1.39	408.6	6.076	0.826	0.136
Statistics (NDs = DL/2)	1.2	1.095	501.1	5.928	0.989	0.167
Statistics (Gamma ROS Estimates)	1.347	1.226	455.3	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	5.992	0.91	0.152

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.914	0.87	0.889	0.938

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.83	0.911	Data Not Normal
Lilliefors (Detects Only)	0.222	0.189	Data Not Normal
Shapiro-Wilks (NDs = DL)	0.756	0.924	Data Not Normal

Lilliefors (NDs = DL)	0.239	0.167	Data Not Normal
Shapiro-Wilks (NDs = DL/2)	0.787	0.924	Data Not Normal
Lilliefors (NDs = DL/2)	0.22	0.167	Data Not Normal
Shapiro-Wilks (Normal ROS Estimates)	0.874	0.924	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.176	0.167	Data Not Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.987	0.977	0.987	0.984

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.667	0.758	
Kolmogorov-Smirnov (Detects Only)	0.154	0.188	Data Appear Gamma Distributed
Anderson-Darling (NDs = DL)	1.637	0.762	
Kolmogorov-Smirnov (NDs = DL)	0.21	0.168	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	0.858	0.769	
Kolmogorov-Smirnov (NDs = DL/2)	0.151	0.169	Data appear Approximate Gamma Distribution
Anderson-Darling (Gamma ROS Estimates)	1.093	0.766	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.171	0.169	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.977	0.948	0.977	0.959

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.939	0.911	Data Appear Lognormal
Lilliefors (Detects Only)	0.123	0.189	Data Appear Lognormal
Shapiro-Wilks (NDs = DL)	0.882	0.924	Data Not Lognormal
Lilliefors (NDs = DL)	0.187	0.167	Data Not Lognormal
Shapiro-Wilks (NDs = DL/2)	0.934	0.924	Data Appear Lognormal
Lilliefors (NDs = DL/2)	0.102	0.167	Data Appear Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.9	0.924	Data Not Lognormal
Lilliefors (Lognormal ROS Estimates)	0.138	0.167	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Potassium (mg/kg) (swmu 50 ss)

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	15	7	8	8	0	0.00%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Full: no NDs)	8	465	2050	1275	1225	478.8

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Full: no NDs)	6.672	4.254	191.1	7.074	0.45	0.0636

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.987	0.987	0.987	0.987

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Full: no NDs)	0.985	0.818	Data Appear Normal
Lilliefors (Full: no NDs)	0.139	0.313	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.974	0.974	0.974	0.974

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Full: no NDs)	0.278	0.718	
Kolmogorov-Smirnov (Full: no NDs)	0.189	0.295	Data Appear Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.944	0.944	0.944	0.944

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Full: no NDs)	0.909	0.818	Data Appear Lognormal
Lilliefors (Full: no NDs)	0.219	0.313	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Selenium (mg.kg) (rfaap bkgrd-ss)

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	28	0	28	2	26	92.86%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	26	N/A	N/A	N/A	N/A	N/A
Statistics (Detects Only)	2	N/A	N/A	N/A	N/A	N/A
Statistics (All: NDs treated as DL value)	28	N/A	N/A	N/A	N/A	N/A
Statistics (All: NDs treated as DL/2 value)	28	N/A	N/A	N/A	N/A	N/A
Statistics (Normal ROS Estimated Data)	28	N/A	N/A	N/A	N/A	N/A

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	N/A	N/A	N/A	N/A

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	N/A	N/A	
Lilliefors (Detects Only)	N/A	N/A	
Shapiro-Wilks (NDs = DL)	N/A	N/A	
Lilliefors (NDs = DL)	N/A	N/A	

Shapiro-Wilks (NDs = DL/2)	N/A	N/A
Lilliefors (NDs = DL/2)	N/A	N/A
Shapiro-Wilks (Normal ROS Estimates)	N/A	N/A
Lilliefors (Normal ROS Estimates)	N/A	N/A

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	N/A	N/A	N/A	N/A

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	N/A	N/A	
Kolmogorov-Smirnov (Detects Only)	N/A	N/A	
Anderson-Darling (NDs = DL)	N/A	N/A	
Kolmogorov-Smirnov (NDs = DL)	N/A	N/A	
Anderson-Darling (NDs = DL/2)	N/A	N/A	
Kolmogorov-Smirnov (NDs = DL/2)	N/A	N/A	
Anderson-Darling (Gamma ROS Estimates)	N/A	N/A	
Kolmogorov-Smirnov (Gamma ROS Est.)	N/A	N/A	

Note: Substitution methods such as DL or DL/2 are not recommended.

Selenium (mg.kg) (swmu 50 ss)

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	15	2	13	9	4	30.77%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	4	1.09	1.14	1.12	1.125	0.0245
Statistics (Detects Only)	9	4.8	7.4	6.089	5.8	0.793
Statistics (All: NDs treated as DL value)	13	1.09	7.4	4.56	5.6	2.473
Statistics (All: NDs treated as DL/2 value)	13	0.545	7.4	4.388	5.6	2.734
Statistics (Normal ROS Estimated Data)	13	3.825	7.4	5.487	5.6	1.148
Statistics (Gamma ROS Estimated Data)	13	4.8	7.4	5.877	5.69	0.738
Statistics (Lognormal ROS Estimated Data)	13	4.171	7.4	5.566	5.6	1.046

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	65.91	50.75	0.0924	1.799	0.131	0.073
Statistics (NDs = DL)	2.261	1.791	2.017	1.28	0.817	0.638
Statistics (NDs = DL/2)	1.356	1.095	3.235	1.067	1.148	1.076
Statistics (Gamma ROS Estimates)	71.26	54.87	0.0825	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	1.7	0.189	0.111

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.976	0.902	0.892	0.979

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.957	0.829	Data Appear Normal

Lilliefors (Detects Only)	0.198	0.295	Data Appear Normal
Shapiro-Wilks (NDs = DL)	0.791	0.866	Data Not Normal
Lilliefors (NDs = DL)	0.278	0.246	Data Not Normal
Shapiro-Wilks (NDs = DL/2)	0.774	0.866	Data Not Normal
Lilliefors (NDs = DL/2)	0.287	0.246	Data Not Normal
Shapiro-Wilks (Normal ROS Estimates)	0.944	0.866	Data Appear Normal
Lilliefors (Normal ROS Estimates)	0.155	0.246	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.978	0.817	0.766	0.972

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.316	0.72	
Kolmogorov-Smirnov (Detects Only)	0.192	0.279	Data Appear Gamma Distributed
Anderson-Darling (NDs = DL)	1.76	0.742	
Kolmogorov-Smirnov (NDs = DL)	0.321	0.239	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	1.992	0.752	
Kolmogorov-Smirnov (NDs = DL/2)	0.345	0.242	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	0.467	0.732	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.221	0.236	Data Appear Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.975	0.851	0.832	0.975

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.955	0.829	Data Appear Lognormal
Lilliefors (Detects Only)	0.178	0.295	Data Appear Lognormal
Shapiro-Wilks (NDs = DL)	0.702	0.866	Data Not Lognormal
Lilliefors (NDs = DL)	0.33	0.246	Data Not Lognormal
Shapiro-Wilks (NDs = DL/2)	0.672	0.866	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.361	0.246	Data Not Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.934	0.866	Data Appear Lognormal
Lilliefors (Lognormal ROS Estimates)	0.163	0.246	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Silver (mg/kg) (rfaap bkgrd-ss)

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	28	0	28	1	27	96.43%

Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set!

It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable Silver (mg/kg) (rfaap bkgrd-ss) was not processed!

Silver (mg/kg) (swmu 50 ss)

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	15	1	14	4	10	71.43%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	10	0.047	1.11	0.156	0.05	0.335
Statistics (Detects Only)	4	0.17	0.89	0.563	0.595	0.297
Statistics (All: NDs treated as DL value)	14	0.047	1.11	0.272	0.051	0.367
Statistics (All: NDs treated as DL/2 value)	14	0.0235	0.89	0.216	0.0255	0.302
Statistics (Normal ROS Estimated Data)	14	-0.951	0.89	-0.212	-0.428	0.562
Statistics (Gamma ROS Estimated Data)	14	0.17	0.89	0.582	0.562	0.216
Statistics (Lognormal ROS Estimated Data)	14	0.0168	0.89	0.195	0.0553	0.281

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	3.352	2.681	0.168	-0.732	0.719	-0.983
Statistics (NDs = DL)	0.724	0.616	0.376	-2.134	1.279	-0.6
Statistics (NDs = DL/2)	0.568	0.494	0.381	-2.629	1.53	-0.582
Statistics (Gamma ROS Estimates)	5.997	4.76	0.0971	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-2.447	1.252	-0.512

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.964	0.824	0.829	0.944

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.947	0.748	Data Appear Normal
Lilliefors (Detects Only)	0.274	0.443	Data Appear Normal
Shapiro-Wilks (NDs = DL)	0.676	0.874	Data Not Normal
Lilliefors (NDs = DL)	0.367	0.237	Data Not Normal
Shapiro-Wilks (NDs = DL/2)	0.682	0.874	Data Not Normal
Lilliefors (NDs = DL/2)	0.378	0.237	Data Not Normal
Shapiro-Wilks (Normal ROS Estimates)	0.885	0.874	Data Appear Normal
Lilliefors (Normal ROS Estimates)	0.221	0.237	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.904	0.956	0.937	0.928

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.431	0.659	
Kolmogorov-Smirnov (Detects Only)	0.344	0.396	Data Appear Gamma Distributed
Anderson-Darling (NDs = DL)	2.094	0.773	
Kolmogorov-Smirnov (NDs = DL)	0.393	0.238	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	2.149	0.787	

Kolmogorov-Smirnov (NDs = DL/2)	0.402	0.241	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	0.83	0.737	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.306	0.229	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.911	0.848	0.842	0.937

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.846	0.748	Data Appear Lognormal
Lilliefors (Detects Only)	0.353	0.443	Data Appear Lognormal
Shapiro-Wilks (NDs = DL)	0.702	0.874	Data Not Lognormal
Lilliefors (NDs = DL)	0.378	0.237	Data Not Lognormal
Shapiro-Wilks (NDs = DL/2)	0.689	0.874	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.387	0.237	Data Not Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.871	0.874	Data Not Lognormal
Lilliefors (Lognormal ROS Estimates)	0.219	0.237	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Sodium (mg/kg) (rfaap bkgrd-ss)

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	28	0	28	1	27	96.43%

Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set!
It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable Sodium (mg/kg) (rfaap bkgrd-ss) was not processed!

Sodium (mg/kg) (swmu 50 ss)

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	15	1	14	3	11	78.57%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	11	4.2	48	41.75	46	12.56
Statistics (Detects Only)	3	61.7	72.5	66.37	64.9	5.547
Statistics (All: NDs treated as DL value)	14	4.2	72.5	47.02	46	15.36
Statistics (All: NDs treated as DL/2 value)	14	2.1	72.5	30.62	23	20.26
Statistics (Normal ROS Estimated Data)	14	28.63	72.5	44.61	38.92	13.02
Statistics (Gamma ROS Estimated Data)	14	1E-09	72.5	14.22	1E-09	28.34
Statistics (Lognormal ROS Estimated Data)	14	37.73	72.5	48.77	43.99	10.32

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	218.6	171.8	0.304	4.193	0.0825	0.0197
Statistics (NDs = DL)	4.22	3.363	11.14	3.727	0.68	0.182

Statistics (NDs = DL/2)	2.246	1.812	13.63	3.183	0.836	0.263
Statistics (Gamma ROS Estimates)	0.0486	0.0858	292.4	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	3.869	0.194	0.0502

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.973	0.86	0.839	0.932

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.948	0.767	Data Appear Normal
Lilliefors (Detects Only)	0.271	0.512	Data Appear Normal
Shapiro-Wilks (NDs = DL)	0.775	0.874	Data Not Normal
Lilliefors (NDs = DL)	0.325	0.237	Data Not Normal
Shapiro-Wilks (NDs = DL/2)	0.715	0.874	Data Not Normal
Lilliefors (NDs = DL/2)	0.414	0.237	Data Not Normal
Shapiro-Wilks (Normal ROS Estimates)	0.868	0.874	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.24	0.237	Data Not Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	N/A	0.826	0.897	0.769

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.312	N/A	
Kolmogorov-Smirnov (Detects Only)	0.287	N/A	
Anderson-Darling (NDs = DL)	2.387	0.74	
Kolmogorov-Smirnov (NDs = DL)	0.422	0.23	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	1.798	0.745	
Kolmogorov-Smirnov (NDs = DL/2)	0.334	0.231	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	3.493	1.039	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.501	0.273	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.978	0.685	0.813	0.932

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.956	0.767	Data Appear Lognormal
Lilliefors (Detects Only)	0.263	0.512	Data Appear Lognormal
Shapiro-Wilks (NDs = DL)	0.506	0.874	Data Not Lognormal
Lilliefors (NDs = DL)	0.448	0.237	Data Not Lognormal
Shapiro-Wilks (NDs = DL/2)	0.693	0.874	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.374	0.237	Data Not Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.868	0.874	Data Not Lognormal
Lilliefors (Lognormal ROS Estimates)	0.24	0.237	Data Not Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Thallium (mg/kg) (rfaap bkgrd-ss)

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	28	0	28	4	24	85.71%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	24	0.13	0.41	0.195	0.14	0.102
Statistics (Detects Only)	4	1.3	2.1	1.85	2	0.37
Statistics (All: NDs treated as DL value)	28	0.13	2.1	0.431	0.14	0.61
Statistics (All: NDs treated as DL/2 value)	28	0.065	2.1	0.348	0.07	0.638
Statistics (Normal ROS Estimated Data)	28	-1.016	2.1	0.463	0.263	0.766
Statistics (Gamma ROS Estimated Data)	28	1.3	2.1	1.854	1.856	0.123
Statistics (Lognormal ROS Estimated Data)	28	0.329	2.1	0.886	0.706	0.466

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	28.68	25.63	0.0645	0.598	0.225	0.376
Statistics (NDs = DL)	1.025	0.939	0.421	-1.403	0.921	-0.657
Statistics (NDs = DL/2)	0.649	0.604	0.535	-1.997	1.149	-0.575
Statistics (Gamma ROS Estimates)	199.2	177.9	0.00931	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-0.229	0.457	-1.992

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.85	0.729	0.691	0.977

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.737	0.748	Data Not Normal
Lilliefors (Detects Only)	0.408	0.443	Data Appear Normal
Shapiro-Wilks (NDs = DL)	0.532	0.924	Data Not Normal
Lilliefors (NDs = DL)	0.371	0.167	Data Not Normal
Shapiro-Wilks (NDs = DL/2)	0.481	0.924	Data Not Normal
Lilliefors (NDs = DL/2)	0.446	0.167	Data Not Normal
Shapiro-Wilks (Normal ROS Estimates)	0.952	0.924	Data Appear Normal
Lilliefors (Normal ROS Estimates)	0.138	0.167	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.806	0.898	0.892	0.668

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.755	0.657	
Kolmogorov-Smirnov (Detects Only)	0.436	0.394	Data Not Gamma Distributed
Anderson-Darling (NDs = DL)	4.636	0.773	
Kolmogorov-Smirnov (NDs = DL)	0.342	0.17	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	5.51	0.795	
Kolmogorov-Smirnov (NDs = DL/2)	0.351	0.173	Data Not Gamma Distributed

Anderson-Darling (Gamma ROS Estimates)	6.198	0.743	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.415	0.165	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.838	0.829	0.804	0.977

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.717	0.748	Data Not Lognormal
Lilliefors (Detects Only)	0.415	0.443	Data Appear Lognormal
Shapiro-Wilks (NDs = DL)	0.678	0.924	Data Not Lognormal
Lilliefors (NDs = DL)	0.311	0.167	Data Not Lognormal
Shapiro-Wilks (NDs = DL/2)	0.639	0.924	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.318	0.167	Data Not Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.951	0.924	Data Appear Lognormal
Lilliefors (Lognormal ROS Estimates)	0.138	0.167	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Thallium (mg/kg) (swmu 50 ss)

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	15	5	10	0	10	100.00%

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable Thallium (mg/kg) (swmu 50 ss) was not processed!

Vanadium (mg/kg) (rfaap bkgrd-ss)

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	28	0	28	28	0	0.00%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Full: no NDs)	28	12.2	101	33.89	33.8	17.78

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Full: no NDs)	4.392	3.946	7.716	3.405	0.497	0.146

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.902	0.902	0.902	0.902

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)

Shapiro-Wilks (Full: no NDs)	0.832	0.924	Data Not Normal
Lilliefors (Full: no NDs)	0.141	0.167	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.943	0.943	0.943	0.943

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Full: no NDs)	0.622	0.749	
Kolmogorov-Smirnov (Full: no NDs)	0.111	0.166	Data Appear Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.969	0.969	0.969	0.969

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Full: no NDs)	0.939	0.924	Data Appear Lognormal
Lilliefors (Full: no NDs)	0.138	0.167	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Vanadium (mg/kg) (swmu 50 ss)

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	15	1	14	14	0	0.00%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Full: no NDs)	14	17.2	49.1	38.06	39.75	9.41

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Full: no NDs)	14.09	11.12	2.701	3.603	0.297	0.0823

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.962	0.962	0.962	0.962

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Full: no NDs)	0.921	0.874	Data Appear Normal
Lilliefors (Full: no NDs)	0.182	0.237	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.927	0.927	0.927	0.927

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Full: no NDs)	0.653	0.734	

Kolmogorov-Smirnov (Full: no NDs)	0.22	0.229	Data Appear Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.918	0.918	0.918	0.918

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Full: no NDs)	0.847	0.874	Data Not Lognormal
Lilliefors (Full: no NDs)	0.235	0.237	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Zinc (mg/kg) (rfaap bkgrd-ss)

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	28	0	28	28	0	0.00%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Full: no NDs)	28	7.1	216	41.21	29.7	40.24

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Full: no NDs)	1.826	1.654	22.56	3.421	0.761	0.223

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.798	0.798	0.798	0.798

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Full: no NDs)	0.665	0.924	Data Not Normal
Lilliefors (Full: no NDs)	0.203	0.167	Data Not Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.913	0.913	0.913	0.913

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Full: no NDs)	0.54	0.76	
Kolmogorov-Smirnov (Full: no NDs)	0.105	0.168	Data Appear Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.985	0.985	0.985	0.985

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Full: no NDs)	0.975	0.924	Data Appear Lognormal
Lilliefors (Full: no NDs)	0.1	0.167	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Zinc (mg/kg) (swmu 50 ss)

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	15	1	14	14	0	0.00%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Full: no NDs)	14	17	93.3	47.65	41.4	26.63

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Full: no NDs)	3.253	2.604	14.65	3.702	0.607	0.164

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.961	0.961	0.961	0.961

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Full: no NDs)	0.903	0.874	Data Appear Normal
Lilliefors (Full: no NDs)	0.151	0.237	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.963	0.963	0.963	0.963

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Full: no NDs)	0.437	0.742	
Kolmogorov-Smirnov (Full: no NDs)	0.155	0.23	Data Appear Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.971	0.971	0.971	0.971

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Full: no NDs)	0.918	0.874	Data Appear Lognormal
Lilliefors (Full: no NDs)	0.141	0.237	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Appendix E.7A
RFAAP SWMU 50 Surface Soil vs Background Statistical Comparisons

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Full Data Sets without NDs

User Selected Options	
From File	H:\Risk DB\Radford\SWMUs 50-59\Background Stats\50_ProUCL_input_SS_for BKG.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 (mg/kg)(swmu 50 ss)
Background Data: Aluminum (mg/kg)(rfaap bkgrd-ss)

Raw Statistics

	Site	Background
Number of Valid Observations	14	28
Number of Missing Values	1	0
Number of Distinct Observations	13	28
Minimum	6590	3620
Maximum	24300	20100
Mean	15371	8300
Median	14950	6705
SD	4542	4279
SE of Mean	1214	808.6

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Site or AOC <= Mean/Median of Background

Site Rank Sum W-Stat	448
WMW Test U-Stat	343
WMW Critical Value (0.050)	299
Approximate P-Value	4.64E-05

Conclusion with Alpha = 0.05
Reject H0, Conclude Site > Background

Appendix E.7A
RFAAP SWMU 50 Surface Soil vs Background Statistical Comparisons

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	H:\Risk DB\Radford\SWMUs 50-59\Background Stats\50_ProUCL_input_SS_for BKG.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 (mg/kg)(swmu 50 ss)
Background Data: Aluminum (mg/kg)(rfaap bkgrd-ss)

Raw Statistics

	Site	Background
Number of Valid Data	14	28
Number of Missing Values	1	0
Number of Non-Detect Data	0	0
Number of Detect Data	14	28
Minimum Non-Detect	N/A	N/A
Maximum Non-Detect	N/A	N/A
Percent Non detects	0.00%	0.00%
Minimum Detected	6590	3620
Maximum Detected	24300	20100
Mean of Detected Data	15371	8300
Median of Detected Data	14950	6705
SD of Detected Data	4542	4279

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	3.949
Critical z (0.95)	1.645
P-Value	3.93E-05

Conclusion with Alpha = 0.05
Reject H0, Conclude Site > Background
P-Value < alpha (0.05)

Appendix E.7A
RFAAP SWMU 50 Surface Soil vs Background Statistical Comparisons

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	H:\Risk DB\Radford\SWMUs 50-59\Background Stats\50_ProUCL_input_SS_for BKG.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: Antimony (mg/kg)(swmu 50 ss)
Background Data: Antimony (mg/kg)(rfaap bkgrd-ss)

Raw Statistics

	Site	Background
Number of Valid Data	12	14
Number of Missing Values	3	14
Number of Non-Detect Data	1	14
Number of Detect Data	11	0
Minimum Non-Detect	0.547	0.24
Maximum Non-Detect	0.547	0.36
Percent Non detects	8.33%	100.00%
Minimum Detected	0.33	N/A
Maximum Detected	1.4	N/A
Mean of Detected Data	1.075	N/A
Median of Detected Data	1.1	N/A
SD of Detected Data	0.323	N/A

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	4.403
Critical z (0.95)	1.645
P-Value	5.34E-06

Conclusion with Alpha = 0.05
Reject H0, Conclude Site > Background
P-Value < alpha (0.05)

Appendix E.7A
RFAAP SWMU 50 Surface Soil vs Background Statistical Comparisons

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Full Data Sets without NDs

User Selected Options	
From File	H:\Risk DB\Radford\SWMUs 50-59\Background Stats\50_ProUCL_input_SS_for BKG.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 (mg/kg)(swmu 50 ss)
Background Data: Arsenic (mg/kg)(rfaap bkgrd-ss)

Raw Statistics

	Site	Background
Number of Valid Observations	14	28
Number of Missing Values	1	0
Number of Distinct Observations	14	24
Minimum	1.03	1.5
Maximum	7.4	10.2
Mean	3.957	3.732
Median	3.8	2.75
SD	2.002	2.33
SE of Mean	0.535	0.44

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Site or AOC <= Mean/Median of Background

Site Rank Sum W-Stat	322
WMW Test U-Stat	217
WMW Critical Value (0.050)	299
Approximate P-Value	0.292

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site <= Background

Appendix E.7A
RFAAP SWMU 50 Surface Soil vs Background Statistical Comparisons

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	H:\Risk DB\Radford\SWMUs 50-59\Background Stats\50_ProUCL_input_SS_for BKG.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 (mg/kg)(swmu 50 ss)
Background Data: Arsenic (mg/kg)(rfaap bkgrd-ss)

Raw Statistics

	Site	Background
Number of Valid Data	14	28
Number of Missing Values	1	0
Number of Non-Detect Data	0	0
Number of Detect Data	14	28
Minimum Non-Detect	N/A	N/A
Maximum Non-Detect	N/A	N/A
Percent Non detects	0.00%	0.00%
Minimum Detected	1.03	1.5
Maximum Detected	7.4	10.2
Mean of Detected Data	3.957	3.732
Median of Detected Data	3.8	2.75
SD of Detected Data	2.002	2.33

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	0.667
Critical z (0.95)	1.645
P-Value	0.252

Conclusion with Alpha = 0.05
Do Not Reject H0, Conclude Site <= Background
P-Value >= alpha (0.05)

Appendix E.7A
RFAAP SWMU 50 Surface Soil vs Background Statistical Comparisons

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	H:\Risk DB\Radford\SWMUs 50-59\Background Stats\50_ProUCL_input_SS_for BKG.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: Barium (mg/kg)(swmu 50 ss)
Background Data: Barium (mg/kg)(rfaap bkgrd-ss)

Raw Statistics

	Site	Background
Number of Valid Data	14	28
Number of Missing Values	1	0
Number of Non-Detect Data	0	4
Number of Detect Data	14	24
Minimum Non-Detect	N/A	0.36
Maximum Non-Detect	N/A	1
Percent Non detects	0.00%	14.29%
Minimum Detected	33.9	23.4
Maximum Detected	141	174
Mean of Detected Data	89.17	75.55
Median of Detected Data	92.6	61.85
SD of Detected Data	25.83	43.2

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	2.055
Critical z (0.95)	1.645
P-Value	0.0199

Conclusion with Alpha = 0.05
Reject H0, Conclude Site > Background
P-Value < alpha (0.05)

Appendix E.7A
RFAAP SWMU 50 Surface Soil vs Background Statistical Comparisons

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	H:\Risk DB\Radford\SWMUs 50-59\Background Stats\50_ProUCL_input_SS_for BKG.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: Beryllium (mg/kg)(swmu 50 ss)
Background Data: Beryllium (mg/kg)(rfaap bkgrd-ss)

Raw Statistics

	Site	Background
Number of Valid Data	10	28
Number of Missing Values	5	0
Number of Non-Detect Data	0	13
Number of Detect Data	10	15
Minimum Non-Detect	N/A	0.022
Maximum Non-Detect	N/A	0.03
Percent Non detects	0.00%	46.43%
Minimum Detected	0.35	0.61
Maximum Detected	0.9	1.5
Mean of Detected Data	0.649	0.887
Median of Detected Data	0.65	0.87
SD of Detected Data	0.169	0.246

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	0.71
Critical z (0.95)	1.645
P-Value	0.239

Conclusion with Alpha = 0.05
Do Not Reject H0, Conclude Site <= Background
P-Value >= alpha (0.05)

Appendix E.7A
RFAAP SWMU 50 Surface Soil vs Background Statistical Comparisons

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	H:\Risk DB\Radford\SWMUs 50-59\Background Stats\50_ProUCL_input_SS_for BKG.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: Calcium (mg/kg)(swmu 50 ss)
Background Data: Calcium (mg/kg)(rfaap bkgrd-ss)

Raw Statistics

	Site	Background
Number of Valid Data	14	28
Number of Missing Values	1	0
Number of Non-Detect Data	0	5
Number of Detect Data	14	23
Minimum Non-Detect	N/A	4.6
Maximum Non-Detect	N/A	6.6
Percent Non detects	0.00%	17.86%
Minimum Detected	484	116
Maximum Detected	28600	7340
Mean of Detected Data	5822	1197
Median of Detected Data	1365	885
SD of Detected Data	8338	1440

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	2.644
Critical z (0.95)	1.645
P-Value	0.0041

Conclusion with Alpha = 0.05
Reject H0, Conclude Site > Background
P-Value < alpha (0.05)

Appendix E.7A
RFAAP SWMU 50 Surface Soil vs Background Statistical Comparisons

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	H:\Risk DB\Radford\SWMUs 50-59\Background Stats\50_ProUCL_input_SS_for BKG.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: Cadmium (mg/kg)(swmu 50 ss)
Background Data: Cadmium (mg/kg)(rfaap bkgrd-ss)

Raw Statistics

	Site	Background
Number of Valid Data	12	28
Number of Missing Values	3	0
Number of Non-Detect Data	10	26
Number of Detect Data	2	2
Minimum Non-Detect	0.057	0.02
Maximum Non-Detect	1.2	0.05
Percent Non detects	83.33%	92.86%
Minimum Detected	0.127	0.67
Maximum Detected	0.143	0.82
Mean of Detected Data	0.135	0.745
Median of Detected Data	0.135	0.745
SD of Detected Data	0.0113	0.106

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	1.408
Critical z (0.95)	1.645
P-Value	0.0795

Conclusion with Alpha = 0.05
Do Not Reject H0, Conclude Site <= Background
P-Value >= alpha (0.05)

Appendix E.7A
RFAAP SWMU 50 Surface Soil vs Background Statistical Comparisons

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Full Data Sets without NDs

User Selected Options	
From File	H:\Risk DB\Radford\SWMUs 50-59\Background Stats\50_ProUCL_input_SS_for BKG.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 (mg/kg)(swmu 50 ss)
Background Data: Chromium (mg/kg)(rfaap bkgrd-ss)

Raw Statistics

	Site	Background
Number of Valid Observations	14	28
Number of Missing Values	1	0
Number of Distinct Observations	14	27
Minimum	12.2	6.3
Maximum	116	53.3
Mean	32.64	21.09
Median	27.55	22.4
SD	25.67	10.5
SE of Mean	6.861	1.985

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Site or AOC <= Mean/Median of Background

Site Rank Sum W-Stat	377.5
WMW Test U-Stat	272.5
WMW Critical Value (0.050)	299
Approximate P-Value	0.0213

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site <= Background **Error - P<0.05, should be reject H0 (see alternative run below):**

Appendix E.7A
RFAAP SWMU 50 Surface Soil vs Background Statistical Comparisons

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	H:\Risk DB\Radford\SWMUs 50-59\Background Stats\50_ProUCL_input_SS_for BKG.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 (mg/kg)(swmu 50 ss)
Background Data: Chromium (mg/kg)(rfaap bkgrd-ss)

Raw Statistics

	Site	Background
Number of Valid Data	14	28
Number of Missing Values	1	0
Number of Non-Detect Data	0	0
Number of Detect Data	14	28
Minimum Non-Detect	N/A	N/A
Maximum Non-Detect	N/A	N/A
Percent Non detects	0.00%	0.00%
Minimum Detected	12.2	6.3
Maximum Detected	116	53.3
Mean of Detected Data	32.64	21.09
Median of Detected Data	27.55	22.4
SD of Detected Data	25.67	10.5

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	2.054
Critical z (0.95)	1.645
P-Value	0.02

Conclusion with Alpha = 0.05
Reject H0, Conclude Site > Background
P-Value < alpha (0.05)

Appendix E.7A
RFAAP SWMU 50 Surface Soil vs Background Statistical Comparisons

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	H:\Risk DB\Radford\SWMUs 50-59\Background Stats\50_ProUCL_input_SS_for BKG.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: Cobalt (mg/kg)(swmu 50 ss)
Background Data: Cobalt (mg/kg)(rfaap bkgrd-ss)

Raw Statistics

	Site	Background
Number of Valid Data	14	28
Number of Missing Values	1	0
Number of Non-Detect Data	0	8
Number of Detect Data	14	20
Minimum Non-Detect	N/A	0.11
Maximum Non-Detect	N/A	0.75
Percent Non detects	0.00%	28.57%
Minimum Detected	3.4	5.9
Maximum Detected	17.1	45.4
Mean of Detected Data	9.059	15.95
Median of Detected Data	9.015	12.1
SD of Detected Data	3.831	10.07

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	-0.375
Critical z (0.95)	1.645
P-Value	0.646

Conclusion with Alpha = 0.05
Do Not Reject H0, Conclude Site <= Background
P-Value >= alpha (0.05)

Appendix E.7A
RFAAP SWMU 50 Surface Soil vs Background Statistical Comparisons

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	H:\Risk DB\Radford\SWMUs 50-59\Background Stats\50_ProUCL_input_SS_for BKG.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: Copper (mg/kg)(swmu 50 ss)
Background Data: Copper (mg/kg)(rfaap bkgrd-ss)

Raw Statistics

	Site	Background
Number of Valid Data	14	28
Number of Missing Values	1	0
Number of Non-Detect Data	0	2
Number of Detect Data	14	26
Minimum Non-Detect	N/A	0.17
Maximum Non-Detect	N/A	0.17
Percent Non detects	0.00%	7.14%
Minimum Detected	4	2.2
Maximum Detected	56.4	13.6
Mean of Detected Data	16.93	6.919
Median of Detected Data	11.85	5.35
SD of Detected Data	13.78	3.696

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	3.282
Critical z (0.95)	1.645
P-Value	5.15E-04

Conclusion with Alpha = 0.05
Reject H0, Conclude Site > Background
P-Value < alpha (0.05)

Appendix E.7A
RFAAP SWMU 50 Surface Soil vs Background Statistical Comparisons

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Full Data Sets without NDs

User Selected Options	
From File	H:\Risk DB\Radford\SWMUs 50-59\Background Stats\50_ProUCL_input_SS_for BKG.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 (mg/kg)(swmu 50 ss)
Background Data: Iron (mg/kg)(rfaap bkgrd-ss)

Raw Statistics

	Site	Background
Number of Valid Observations	14	28
Number of Missing Values	1	0
Number of Distinct Observations	14	26
Minimum	7510	7250
Maximum	28300	63000
Mean	19506	20108
Median	20450	19750
SD	5496	11869
SE of Mean	1469	2243

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Site or AOC <= Mean/Median of Background

Site Rank Sum W-Stat	310.5
WMW Test U-Stat	205.5
WMW Critical Value (0.050)	299
Approximate P-Value	0.405

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site <= Background

Appendix E.7A
RFAAP SWMU 50 Surface Soil vs Background Statistical Comparisons

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Full Data Sets without NDs

User Selected Options	
From File	H:\Risk DB\Radford\SWMUs 50-59\Background Stats\50_ProUCL_input_SS_for BKG.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 (mg/kg)(swmu 50 ss)
Background Data: Lead (mg/kg)(rfaap bkgrd-ss)

Raw Statistics

	Site	Background
Number of Valid Observations	14	28
Number of Missing Values	1	0
Number of Distinct Observations	14	26
Minimum	6.6	8.9
Maximum	178	225
Mean	43.81	26.96
Median	18.35	15.15
SD	55.5	41.34
SE of Mean	14.83	7.813

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Site or AOC <= Mean/Median of Background

Site Rank Sum W-Stat	347
WMW Test U-Stat	242
WMW Critical Value (0.050)	299
Approximate P-Value	0.112

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site <= Background

Appendix E.7A
RFAAP SWMU 50 Surface Soil vs Background Statistical Comparisons

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	H:\Risk DB\Radford\SWMUs 50-59\Background Stats\50_ProUCL_input_SS_for BKG.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: Magnesium (mg/kg)(swmu 50 ss)
Background Data: Magnesium (mg/kg)(rfaap bkgrd-ss)

Raw Statistics

	Site	Background
Number of Valid Data	14	28
Number of Missing Values	1	0
Number of Non-Detect Data	0	3
Number of Detect Data	14	25
Minimum Non-Detect	N/A	4.7
Maximum Non-Detect	N/A	5
Percent Non detects	0.00%	10.71%
Minimum Detected	312	158
Maximum Detected	20200	20400
Mean of Detected Data	3816	2498
Median of Detected Data	1670	913
SD of Detected Data	5539	4334

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	1.868
Critical z (0.95)	1.645
P-Value	0.0309

Conclusion with Alpha = 0.05
Reject H0, Conclude Site > Background
P-Value < alpha (0.05)

Appendix E.7A
RFAAP SWMU 50 Surface Soil vs Background Statistical Comparisons

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Full Data Sets without NDs

User Selected Options	
From File	H:\Risk DB\Radford\SWMUs 50-59\Background Stats\50_ProUCL_input_SS_for BKG.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 (mg/kg)(swmu 50 ss)
Background Data: Manganese (mg/kg)(rfaap bkgrd-ss)

Raw Statistics

	Site	Background
Number of Valid Observations	14	28
Number of Missing Values	1	0
Number of Distinct Observations	14	28
Minimum	62.8	43
Maximum	1320	2040
Mean	696.2	695.9
Median	667	490
SD	372.9	591.5
SE of Mean	99.67	111.8

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Site or AOC <= Mean/Median of Background

Site Rank Sum W-Stat	332.5
WMW Test U-Stat	227.5
WMW Critical Value (0.050)	299
Approximate P-Value	0.204

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site <= Background

Appendix E.7A
RFAAP SWMU 50 Surface Soil vs Background Statistical Comparisons

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	H:\Risk DB\Radford\SWMUs 50-59\Background Stats\50_ProUCL_input_SS_for BKG.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: Mercury (mg/kg)(swmu 50 ss)
Background Data: Mercury (mg/kg)(rfaap bkgrd-ss)

Raw Statistics

	Site	Background
Number of Valid Data	14	28
Number of Missing Values	1	0
Number of Non-Detect Data	0	25
Number of Detect Data	14	3
Minimum Non-Detect	N/A	0.019
Maximum Non-Detect	N/A	0.06
Percent Non detects	0.00%	89.29%
Minimum Detected	0.041	0.07
Maximum Detected	0.816	1.2
Mean of Detected Data	0.145	0.467
Median of Detected Data	0.0769	0.13
SD of Detected Data	0.201	0.636

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	4.103
Critical z (0.95)	1.645
P-Value	2.04E-05

Conclusion with Alpha = 0.05
Reject H0, Conclude Site > Background
P-Value < alpha (0.05)

Appendix E.7A
RFAAP SWMU 50 Surface Soil vs Background Statistical Comparisons

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	H:\Risk DB\Radford\SWMUs 50-59\Background Stats\50_ProUCL_input_SS_for BKG.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: Nickel (mg/kg)(swmu 50 ss)
Background Data: Nickel (mg/kg)(rfaap bkgrd-ss)

Raw Statistics

	Site	Background
Number of Valid Data	14	28
Number of Missing Values	1	0
Number of Non-Detect Data	0	11
Number of Detect Data	14	17
Minimum Non-Detect	N/A	0.21
Maximum Non-Detect	N/A	1.3
Percent Non detects	0.00%	39.29%
Minimum Detected	4.1	4.6
Maximum Detected	50.1	18.1
Mean of Detected Data	12.93	9.935
Median of Detected Data	10.45	9.4
SD of Detected Data	11.33	4.294

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	2.423
Critical z (0.95)	1.645
P-Value	0.0077

Conclusion with Alpha = 0.05
Reject H0, Conclude Site > Background
P-Value < alpha (0.05)

Appendix E.7A
RFAAP SWMU 50 Surface Soil vs Background Statistical Comparisons

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	H:\Risk DB\Radford\SWMUs 50-59\Background Stats\50_ProUCL_input_SS_for BKG.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: Potassium (mg/kg)(swmu 50 ss)
Background Data: Potassium (mg/kg)(rfaap bkgrd-ss)

Raw Statistics

	Site	Background
Number of Valid Data	8	28
Number of Missing Values	7	0
Number of Non-Detect Data	0	6
Number of Detect Data	8	22
Minimum Non-Detect	N/A	201
Maximum Non-Detect	N/A	271
Percent Non detects	0.00%	21.43%
Minimum Detected	465	166
Maximum Detected	2050	2350
Mean of Detected Data	1275	735.4
Median of Detected Data	1225	509.5
SD of Detected Data	478.8	632.6

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	2.843
Critical z (0.95)	1.645
P-Value	0.00224

Conclusion with Alpha = 0.05
Reject H0, Conclude Site > Background
P-Value < alpha (0.05)

Appendix E.7A
RFAAP SWMU 50 Surface Soil vs Background Statistical Comparisons

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	H:\Risk DB\Radford\SWMUs 50-59\Background Stats\50_ProUCL_input_SS_for BKG.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: Selenium (mg.kg)(swmu 50 ss)
Background Data: Selenium (mg.kg)(rfaap bkgrd-ss)

Raw Statistics

	Site	Background
Number of Valid Data	13	28
Number of Missing Values	2	0
Number of Non-Detect Data	4	26
Number of Detect Data	9	2
Minimum Non-Detect	1.09	0.14
Maximum Non-Detect	1.14	0.36
Percent Non detects	30.77%	92.86%
Minimum Detected	4.8	0.64
Maximum Detected	7.4	0.77
Mean of Detected Data	6.089	0.705
Median of Detected Data	5.8	0.705
SD of Detected Data	0.793	0.0919

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	4.603
Critical z (0.95)	1.645
P-Value	2.09E-06

Conclusion with Alpha = 0.05
Reject H0, Conclude Site > Background
P-Value < alpha (0.05)

Appendix E.7A
RFAAP SWMU 50 Surface Soil vs Background Statistical Comparisons

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	H:\Risk DB\Radford\SWMUs 50-59\Background Stats\50_ProUCL_input_SS_for BKG.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: Silver (mg/kg)(swmu 50 ss)
Background Data: Silver (mg/kg)(rfaap bkgrd-ss)

Raw Statistics

	Site	Background
Number of Valid Data	14	28
Number of Missing Values	1	0
Number of Non-Detect Data	10	27
Number of Detect Data	4	1
Minimum Non-Detect	0.047	0.16
Maximum Non-Detect	1.11	0.38
Percent Non detects	71.43%	96.43%
Minimum Detected	0.17	4.3
Maximum Detected	0.89	4.3
Mean of Detected Data	0.563	4.3
Median of Detected Data	0.595	4.3
SD of Detected Data	0.297	N/A

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	1.932
Critical z (0.95)	1.645
P-Value	0.0267

Conclusion with Alpha = 0.05
Reject H0, Conclude Site > Background
P-Value < alpha (0.05)

Appendix E.7A
RFAAP SWMU 50 Surface Soil vs Background Statistical Comparisons

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	H:\Risk DB\Radford\SWMUs 50-59\Background Stats\50_ProUCL_input_SS_for BKG.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: Sodium (mg/kg)(swmu 50 ss)
Background Data: Sodium (mg/kg)(rfaap bkgrd-ss)

Raw Statistics

	Site	Background
Number of Valid Data	14	28
Number of Missing Values	1	0
Number of Non-Detect Data	11	27
Number of Detect Data	3	1
Minimum Non-Detect	4.2	10.8
Maximum Non-Detect	48	25.9
Percent Non detects	78.57%	96.43%
Minimum Detected	61.7	124
Maximum Detected	72.5	124
Mean of Detected Data	66.37	124
Median of Detected Data	64.9	124
SD of Detected Data	5.547	N/A

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	1.755
Critical z (0.95)	1.645
P-Value	0.0396

Conclusion with Alpha = 0.05
Reject H0, Conclude Site > Background
P-Value < alpha (0.05)

Appendix E.7A
RFAAP SWMU 50 Surface Soil vs Background Statistical Comparisons

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	H:\Risk DB\Radford\SWMUs 50-59\Background Stats\50_ProUCL_input_SS_for BKG.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: Thallium (mg/kg)(swmu 50 ss)
Background Data: Thallium (mg/kg)(rfaap bkgrd-ss)

Raw Statistics

	Site	Background
Number of Valid Data	10	28
Number of Missing Values	5	0
Number of Non-Detect Data	10	24
Number of Detect Data	0	4
Minimum Non-Detect	2.4	0.13
Maximum Non-Detect	13	0.41
Percent Non detects	100.00%	85.71%
Minimum Detected	N/A	1.3
Maximum Detected	N/A	2.1
Mean of Detected Data	N/A	1.85
Median of Detected Data	N/A	2
SD of Detected Data	N/A	0.37

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	0
Critical z (0.95)	1.645
P-Value	0.5

Conclusion with Alpha = 0.05
Do Not Reject H0, Conclude Site <= Background
P-Value >= alpha (0.05)

Appendix E.7A
RFAAP SWMU 50 Surface Soil vs Background Statistical Comparisons

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Full Data Sets without NDs

User Selected Options	
From File	H:\Risk DB\Radford\SWMUs 50-59\Background Stats\50_ProUCL_input_SS_for BKG.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 (mg/kg)(swmu 50 ss)
Background Data: Vanadium (mg/kg)(rfaap bkgrd-ss)

Raw Statistics

	Site	Background
Number of Valid Observations	14	28
Number of Missing Values	1	0
Number of Distinct Observations	14	27
Minimum	17.2	12.2
Maximum	49.1	101
Mean	38.06	33.89
Median	39.75	33.8
SD	9.41	17.78
SE of Mean	2.515	3.36

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Site or AOC <= Mean/Median of Background

Site Rank Sum W-Stat	357
WMW Test U-Stat	252
WMW Critical Value (0.050)	299
Approximate P-Value	0.0693

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site <= Background

Appendix E.7A
RFAAP SWMU 50 Surface Soil vs Background Statistical Comparisons

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Full Data Sets without NDs

User Selected Options	
From File	H:\Risk DB\Radford\SWMUs 50-59\Background Stats\50_ProUCL_input_SS_for BKG.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 (mg/kg)(swmu 50 ss)
Background Data: Zinc (mg/kg)(rfaap bkgrd-ss)

Raw Statistics

	Site	Background
Number of Valid Observations	14	28
Number of Missing Values	1	0
Number of Distinct Observations	14	28
Minimum	17	7.1
Maximum	93.3	216
Mean	47.65	41.21
Median	41.4	29.7
SD	26.63	40.24
SE of Mean	7.117	7.605

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Site or AOC <= Mean/Median of Background

Site Rank Sum W-Stat	351
WMW Test U-Stat	246
WMW Critical Value (0.050)	299
Approximate P-Value	0.0933

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site <= Background

APPENDIX E.7B

Goodness-of-Fit Test Statistics for Data Sets with Non-Detects

User Selected Options

From File	H:\Risk DB\Radford\SWMUs 50-59\Background Stats\50_ProUCL_input_TS_for BKG.wst
Full Precision	OFF
Confidence Coefficient	0.95

Aluminum (mg/kg) (rfaap bkgrd ts)

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	79	0	79	79	0	0.00%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Full: no NDs)	79	3620	47900	14204	12100	9433

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Full: no NDs)	2.787	2.689	5097	9.371	0.618	0.0659

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.923	0.923	0.923	0.923

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Lilliefors (Full: no NDs)	0.15	0.0997	Data Not Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.988	0.988	0.988	0.988

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Full: no NDs)	0.604	0.76	
Kolmogorov-Smirnov (Full: no NDs)	0.0772	0.101	Data Appear Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.995	0.995	0.995	0.995

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Lilliefors (Full: no NDs)	0.0626	0.0997	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Aluminum (mg/kg) (swmu 50 ts)

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	31	3	28	28	0	0.00%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Full: no NDs)	28	3100	38400	16914	15150	8646

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Full: no NDs)	3.995	3.59	4234	9.606	0.545	0.0567

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.957	0.957	0.957	0.957

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Full: no NDs)	0.915	0.924	Data Not Normal
Lilliefors (Full: no NDs)	0.164	0.167	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.986	0.986	0.986	0.986

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Full: no NDs)	0.281	0.75	
Kolmogorov-Smirnov (Full: no NDs)	0.102	0.166	Data Appear Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.976	0.976	0.976	0.976

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Full: no NDs)	0.959	0.924	Data Appear Lognormal
Lilliefors (Full: no NDs)	0.13	0.167	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Antimony (mg/kg) (rfaap bkgrd ts)

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	79	41	38	0	38	100.00%

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable Antimony (mg/kg) (rfaap bkgrd ts) was not processed!

Antimony (mg/kg) (swmu 50 ts)

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	31	7	24	18	6	25.00%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	6	0.38	0.636	0.472	0.43	0.0983
Statistics (Detects Only)	18	0.33	2.5	1.218	1.15	0.465
Statistics (All: NDs treated as DL value)	24	0.33	2.5	1.032	1.05	0.52
Statistics (All: NDs treated as DL/2 value)	24	0.19	2.5	0.973	1.05	0.591
Statistics (Normal ROS Estimated Data)	24	0.175	2.5	0.994	1.05	0.564
Statistics (Gamma ROS Estimated Data)	24	0.33	2.5	1.112	1.05	0.444
Statistics (Lognormal ROS Estimated Data)	24	0.33	2.5	1.04	1.05	0.51

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	6.743	5.928	0.181	0.122	0.427	3.513
Statistics (NDs = DL)	3.948	3.482	0.261	-0.101	0.546	-5.422
Statistics (NDs = DL/2)	2.182	1.937	0.446	-0.274	0.795	-2.904
Statistics (Gamma ROS Estimates)	6.872	6.041	0.162	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-0.0809	0.514	-6.356

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.951	0.963	0.961	0.964

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.928	0.897	Data Appear Normal
Lilliefors (Detects Only)	0.161	0.209	Data Appear Normal
Shapiro-Wilks (NDs = DL)	0.93	0.916	Data Appear Normal
Lilliefors (NDs = DL)	0.101	0.181	Data Appear Normal
Shapiro-Wilks (NDs = DL/2)	0.922	0.916	Data Appear Normal
Lilliefors (NDs = DL/2)	0.153	0.181	Data Appear Normal
Shapiro-Wilks (Normal ROS Estimates)	0.93	0.916	Data Appear Normal
Lilliefors (Normal ROS Estimates)	0.13	0.181	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.967	0.981	0.956	0.976

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.499	0.742	
Kolmogorov-Smirnov (Detects Only)	0.191	0.204	Data Appear Gamma Distributed
Anderson-Darling (NDs = DL)	0.499	0.749	
Kolmogorov-Smirnov (NDs = DL)	0.168	0.179	Data Appear Gamma Distributed
Anderson-Darling (NDs = DL/2)	1.17	0.754	
Kolmogorov-Smirnov (NDs = DL/2)	0.231	0.18	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	0.304	0.745	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.088	0.178	Data Appear Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.936	0.973	0.933	0.976

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.902	0.897	Data Appear Lognormal
Lilliefors (Detects Only)	0.221	0.209	Data Not Lognormal
Shapiro-Wilks (NDs = DL)	0.94	0.916	Data Appear Lognormal
Lilliefors (NDs = DL)	0.198	0.181	Data Not Lognormal
Shapiro-Wilks (NDs = DL/2)	0.859	0.916	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.26	0.181	Data Not Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.949	0.916	Data Appear Lognormal
Lilliefors (Lognormal ROS Estimates)	0.188	0.181	Data Not Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Arsenic (mg/kg) (rfaap bkgrd ts)

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	79	0	79	76	3	3.80%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	3	0.09	0.12	0.103	0.1	0.0153
Statistics (Detects Only)	76	1.2	35.9	4.989	3.2	5.36
Statistics (All: NDs treated as DL value)	79	0.09	35.9	4.804	3.1	5.339
Statistics (All: NDs treated as DL/2 value)	79	0.045	35.9	4.802	3.1	5.341
Statistics (Normal ROS Estimated Data)	79	-5.169	35.9	4.604	3.1	5.608
Statistics (Gamma ROS Estimated Data)	79	1E-09	35.9	4.8	3.1	5.343
Statistics (Lognormal ROS Estimated Data)	79	0.728	35.9	4.828	3.1	5.32

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	1.819	1.759	2.742	1.308	0.692	0.529

Statistics (NDs = DL)	1.401	1.356	3.429	1.172	0.968	0.826
Statistics (NDs = DL/2)	1.323	1.281	3.631	1.146	1.067	0.932
Statistics (Gamma ROS Estimates)	0.568	0.555	8.454	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	1.246	0.748	0.6

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.765	0.778	0.778	0.817

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Lilliefors (Detects Only)	0.282	0.102	Data Not Normal
Lilliefors (NDs = DL)	0.279	0.0997	Data Not Normal
Lilliefors (NDs = DL/2)	0.279	0.0997	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.263	0.0997	Data Not Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.916	0.932	0.935	0.972

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	4.409	0.766	
Kolmogorov-Smirnov (Detects Only)	0.213	0.104	Data Not Gamma Distributed
Anderson-Darling (NDs = DL)	3.469	0.772	
Kolmogorov-Smirnov (NDs = DL)	0.182	0.102	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	3.587	0.774	
Kolmogorov-Smirnov (NDs = DL/2)	0.176	0.103	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	10.23	0.812	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.332	0.106	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.958	0.919	0.886	0.974

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Lilliefors (Detects Only)	0.151	0.102	Data Not Lognormal
Lilliefors (NDs = DL)	0.159	0.0997	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.187	0.0997	Data Not Lognormal
Lilliefors (Lognormal ROS Estimates)	0.134	0.0997	Data Not Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Arsenic (mg/kg) (swmu 50 ts)

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	31	3	28	28	0	0.00%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Full: no NDs)	28	1.03	13.7	4.463	3.4	3.397

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Full: no NDs)	2.28	2.059	1.958	1.261	0.684	0.543

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.9	0.9	0.9	0.9

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)

Shapiro-Wilks (Full: no NDs)	0.808	0.924	Data Not Normal
Lilliefors (Full: no NDs)	0.174	0.167	Data Not Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.976	0.976	0.976	0.976

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Full: no NDs)	0.598	0.757	
Kolmogorov-Smirnov (Full: no NDs)	0.107	0.167	Data Appear Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.987	0.987	0.987	0.987

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Full: no NDs)	0.965	0.924	Data Appear Lognormal
Lilliefors (Full: no NDs)	0.103	0.167	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Barium (mg/kg) (rfaap bkgrd ts)

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	79	0	79	63	16	20.25%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	16	0.36	1.1	0.821	1	0.3
Statistics (Detects Only)	63	23.4	174	68.4	56.7	40.39
Statistics (All: NDs treated as DL value)	79	0.36	174	54.71	45.5	45.21
Statistics (All: NDs treated as DL/2 value)	79	0.18	174	54.63	45.5	45.31
Statistics (Normal ROS Estimated Data)	79	-54.83	174	50.41	45.5	51.24
Statistics (Gamma ROS Estimated Data)	79	1E-09	174	58.64	45.5	41.27
Statistics (Lognormal ROS Estimated Data)	79	10.45	174	58.03	45.5	41.56

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	3.354	3.236	20.39	4.069	0.555	0.136
Statistics (NDs = DL)	0.737	0.717	74.26	3.188	1.839	0.577
Statistics (NDs = DL/2)	0.642	0.626	85.13	3.047	2.109	0.692
Statistics (Gamma ROS Estimates)	1.061	1.029	55.28	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	3.817	0.71	0.186

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.932	0.955	0.955	0.984

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Lilliefors (Detects Only)	0.211	0.112	Data Not Normal
Lilliefors (NDs = DL)	0.154	0.0997	Data Not Normal
Lilliefors (NDs = DL/2)	0.153	0.0997	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.13	0.0997	Data Not Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.977	0.947	0.938	0.974

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)

Anderson-Darling (Detects Only)	1.567	0.757	
Kolmogorov-Smirnov (Detects Only)	0.142	0.113	Data Not Gamma Distributed
Anderson-Darling (NDs = DL)	4.488	0.794	
Kolmogorov-Smirnov (NDs = DL)	0.207	0.105	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	5.552	0.804	
Kolmogorov-Smirnov (NDs = DL/2)	0.235	0.105	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	3.925	0.78	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.215	0.103	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.98	0.875	0.857	0.99

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Lilliefors (Detects Only)	0.114	0.112	Data Not Lognormal
Lilliefors (NDs = DL)	0.29	0.0997	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.317	0.0997	Data Not Lognormal
Lilliefors (Lognormal ROS Estimates)	0.0679	0.0997	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Barium (mg/kg) (swmu 50 ts)

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	31	3	28	28	0	0.00%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Full: no NDs)	28	12	141	71.48	68.55	29.37

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Full: no NDs)	5.014	4.501	14.25	4.166	0.509	0.122

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.993	0.993	0.993	0.993

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Full: no NDs)	0.987	0.924	Data Appear Normal
Lilliefors (Full: no NDs)	0.0844	0.167	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.986	0.986	0.986	0.986

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Full: no NDs)	0.341	0.749	
Kolmogorov-Smirnov (Full: no NDs)	0.129	0.166	Data Appear Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.947	0.947	0.947	0.947

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Full: no NDs)	0.91	0.924	Data Not Lognormal
Lilliefors (Full: no NDs)	0.163	0.167	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Beryllium (mg/kg) (rfaap bkgrd ts)

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	79	0	79	40	39	49.37%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	39	0.022	0.03	0.0286	0.03	0.00265
Statistics (Detects Only)	40	0.61	5.4	1.449	1.1	1.086
Statistics (All: NDs treated as DL value)	79	0.022	5.4	0.748	0.61	1.049
Statistics (All: NDs treated as DL/2 value)	79	0.011	5.4	0.74	0.61	1.054
Statistics (Normal ROS Estimated Data)	79	-3.53	5.4	0.149	0.61	1.644
Statistics (Gamma ROS Estimated Data)	79	1E-09	5.4	1.439	1.3	0.88
Statistics (Lognormal ROS Estimated Data)	79	0.0819	5.4	0.892	0.61	0.959

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	3.116	3.006	0.465	0.202	0.533	2.643
Statistics (NDs = DL)	0.47	0.461	1.589	-1.654	1.93	-1.167
Statistics (NDs = DL/2)	0.39	0.383	1.9	-1.996	2.273	-1.138
Statistics (Gamma ROS Estimates)	1.38	1.336	1.043	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-0.504	0.875	-1.735

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.81	0.829	0.83	0.978

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.666	0.94	Data Not Normal
Lilliefors (Detects Only)	0.256	0.14	Data Not Normal
Lilliefors (NDs = DL)	0.247	0.0997	Data Not Normal
Lilliefors (NDs = DL/2)	0.248	0.0997	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.117	0.0997	Data Not Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.915	0.976	0.973	0.959

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	2.172	0.754	
Kolmogorov-Smirnov (Detects Only)	0.198	0.14	Data Not Gamma Distributed
Anderson-Darling (NDs = DL)	6.807	0.826	
Kolmogorov-Smirnov (NDs = DL)	0.32	0.107	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	7.311	0.844	
Kolmogorov-Smirnov (NDs = DL/2)	0.323	0.108	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	5.881	0.773	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.232	0.103	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.947	0.883	0.873	0.996

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.891	0.94	Data Not Lognormal
Lilliefors (Detects Only)	0.155	0.14	Data Not Lognormal
Lilliefors (NDs = DL)	0.325	0.0997	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.328	0.0997	Data Not Lognormal
Lilliefors (Lognormal ROS Estimates)	0.0541	0.0997	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Beryllium (mg/kg) (swmu 50 ts)

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	31	11	20	20	0	0.00%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Full: no NDs)	20	0.13	0.9	0.549	0.585	0.209

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Full: no NDs)	5.253	4.498	0.105	-0.698	0.506	-0.724

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.984	0.984	0.984	0.984

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Full: no NDs)	0.962	0.905	Data Appear Normal
Lilliefors (Full: no NDs)	0.14	0.198	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.947	0.947	0.947	0.947

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Full: no NDs)	0.802	0.745	
Kolmogorov-Smirnov (Full: no NDs)	0.192	0.194	Data appear Approximate Gamma Distribution

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.922	0.922	0.922	0.922

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Full: no NDs)	0.854	0.905	Data Not Lognormal
Lilliefors (Full: no NDs)	0.206	0.198	Data Not Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Cadmium (mg/kg) (rfaap bkgrd ts)

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	79	0	79	13	66	83.54%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	66	0.02	0.05	0.0256	0.02	0.00861
Statistics (Detects Only)	13	0.57	2.5	1.152	1.1	0.585
Statistics (All: NDs treated as DL value)	79	0.02	2.5	0.211	0.02	0.479
Statistics (All: NDs treated as DL/2 value)	79	0.01	2.5	0.2	0.01	0.483
Statistics (Normal ROS Estimated Data)	79	-4.148	2.5	-1.016	-1.143	1.342
Statistics (Gamma ROS Estimated Data)	79	0.197	2.987	1.943	2.175	0.717
Statistics (Lognormal ROS Estimated Data)	79	0.0167	2.5	0.338	0.174	0.444

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	5.194	5.005	0.222	0.0424	0.448	10.55
Statistics (NDs = DL)	0.424	0.416	0.498	-3.093	1.437	-0.465
Statistics (NDs = DL/2)	0.329	0.325	0.609	-3.672	1.69	-0.46
Statistics (Gamma ROS Estimates)	5.206	5.016	0.373	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-1.649	1.046	-0.634

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.905	0.675	0.671	0.995

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.82	0.866	Data Not Normal
Lilliefors (Detects Only)	0.246	0.246	Data Not Normal
Lilliefors (NDs = DL)	0.467	0.0997	Data Not Normal
Lilliefors (NDs = DL/2)	0.477	0.0997	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.0689	0.0997	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.955	0.948	0.957	0.92

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.512	0.736	
Kolmogorov-Smirnov (Detects Only)	0.181	0.237	Data Appear Gamma Distributed
Anderson-Darling (NDs = DL)	17.17	0.836	
Kolmogorov-Smirnov (NDs = DL)	0.422	0.107	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	18.08	0.858	
Kolmogorov-Smirnov (NDs = DL/2)	0.448	0.109	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	2.804	0.754	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.164	0.101	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.969	0.778	0.764	0.995

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.934	0.866	Data Appear Lognormal
Lilliefors (Detects Only)	0.158	0.246	Data Appear Lognormal
Lilliefors (NDs = DL)	0.327	0.0997	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.348	0.0997	Data Not Lognormal
Lilliefors (Lognormal ROS Estimates)	0.0689	0.0997	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Cadmium (mg/kg) (swmu 50 ts)

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	31	5	26	4	22	84.62%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	22	0.057	1.6	0.633	0.55	0.537
Statistics (Detects Only)	4	0.12	0.15	0.135	0.135	0.0139
Statistics (All: NDs treated as DL value)	26	0.057	1.6	0.557	0.205	0.525
Statistics (All: NDs treated as DL/2 value)	26	0.0285	0.8	0.289	0.147	0.255
Statistics (Normal ROS Estimated Data)	26	0.0718	0.15	0.104	0.101	0.0192
Statistics (Gamma ROS Estimated Data)	26	1E-09	0.15	0.0208	1E-09	0.0499
Statistics (Lognormal ROS Estimated Data)	26	0.0841	0.15	0.108	0.104	0.0163

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	125.6	111.2	0.00107	-2.006	0.103	-0.0514
Statistics (NDs = DL)	0.937	0.855	0.594	-1.206	1.224	-1.014
Statistics (NDs = DL/2)	1.043	0.949	0.277	-1.793	1.177	-0.656
Statistics (Gamma ROS Estimates)	0.0614	0.08	0.338	--	--	--

Statistics (Lognormal ROS Estimates)	--	--	--	-2.236	0.143	-0.0638

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.978	0.892	0.911	0.955

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.939	0.748	Data Appear Normal
Lilliefors (Detects Only)	0.218	0.443	Data Appear Normal
Shapiro-Wilks (NDs = DL)	0.781	0.92	Data Not Normal
Lilliefors (NDs = DL)	0.281	0.174	Data Not Normal
Shapiro-Wilks (NDs = DL/2)	0.815	0.92	Data Not Normal
Lilliefors (NDs = DL/2)	0.245	0.174	Data Not Normal
Shapiro-Wilks (Normal ROS Estimates)	0.912	0.92	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.211	0.174	Data Not Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.975	0.88	0.893	0.8

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.305	0.657	
Kolmogorov-Smirnov (Detects Only)	0.252	0.394	Data Appear Gamma Distributed
Anderson-Darling (NDs = DL)	2.152	0.776	
Kolmogorov-Smirnov (NDs = DL)	0.249	0.177	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	1.527	0.772	
Kolmogorov-Smirnov (NDs = DL/2)	0.238	0.176	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	7.467	1.165	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.537	0.21	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.978	0.919	0.937	0.955

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.939	0.748	Data Appear Lognormal
Lilliefors (Detects Only)	0.225	0.443	Data Appear Lognormal
Shapiro-Wilks (NDs = DL)	0.823	0.92	Data Not Lognormal
Lilliefors (NDs = DL)	0.241	0.174	Data Not Lognormal
Shapiro-Wilks (NDs = DL/2)	0.857	0.92	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.23	0.174	Data Not Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.911	0.92	Data Not Lognormal
Lilliefors (Lognormal ROS Estimates)	0.211	0.174	Data Not Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Chromium (mg/kg) (rfaap bkgrd ts)

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	79	0	79	79	0	0.00%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Full: no NDs)	79	6.3	75.8	26.86	26	12.51

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Full: no NDs)	4.546	4.382	5.91	3.177	0.501	0.158

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.971	0.971	0.971	0.971

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Lilliefors (Full: no NDs)	0.0734	0.0997	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.99	0.99	0.99	0.99

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Full: no NDs)	0.591	0.755	
Kolmogorov-Smirnov (Full: no NDs)	0.0909	0.101	Data Appear Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.984	0.984	0.984	0.984

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Lilliefors (Full: no NDs)	0.122	0.0997	Data Not Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Chromium (mg/kg) (swmu 50 ts)

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	31	3	28	28	0	0.00%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Full: no NDs)	28	12.2	513	62.28	29.85	102.3

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Full: no NDs)	1.099	1.005	56.64	3.612	0.84	0.232

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.66	0.66	0.66	0.66

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Full: no NDs)	0.463	0.924	Data Not Normal
Lilliefors (Full: no NDs)	0.402	0.167	Data Not Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.87	0.87	0.87	0.87

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Full: no NDs)	3.778	0.772	
Kolmogorov-Smirnov (Full: no NDs)	0.33	0.17	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.888	0.888	0.888	0.888

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)

Shapiro-Wilks (Full: no NDs)	0.8	0.924	Data Not Lognormal
Lilliefors (Full: no NDs)	0.251	0.167	Data Not Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Cobalt (mg/kg) (rfaap bkgrd ts)

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	79	0	79	56	23	29.11%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	23	0.11	0.84	0.587	0.73	0.286
Statistics (Detects Only)	56	5.9	130	22.23	13.3	23.94
Statistics (All: NDs treated as DL value)	79	0.11	130	15.93	11.4	22.41
Statistics (All: NDs treated as DL/2 value)	79	0.055	130	15.84	11.4	22.47
Statistics (Normal ROS Estimated Data)	79	-40.83	130	8.784	11.4	29.44
Statistics (Gamma ROS Estimated Data)	79	1E-09	130	17.57	11.9	21.54
Statistics (Lognormal ROS Estimated Data)	79	1.86	130	16.76	11.4	21.87

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	1.78	1.721	12.49	2.795	0.701	0.251
Statistics (NDs = DL)	0.61	0.595	26.11	1.758	1.787	1.017
Statistics (NDs = DL/2)	0.523	0.511	30.31	1.556	2.08	1.337
Statistics (Gamma ROS Estimates)	0.504	0.494	34.83	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	2.331	0.947	0.406

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.767	0.788	0.789	0.923

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Lilliefors (Detects Only)	0.263	0.118	Data Not Normal
Lilliefors (NDs = DL)	0.24	0.0997	Data Not Normal
Lilliefors (NDs = DL/2)	0.241	0.0997	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.17	0.0997	Data Not Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.914	0.965	0.969	0.961

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	3.203	0.765	
Kolmogorov-Smirnov (Detects Only)	0.162	0.121	Data Not Gamma Distributed
Anderson-Darling (NDs = DL)	2.127	0.807	
Kolmogorov-Smirnov (NDs = DL)	0.155	0.105	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	2.851	0.816	
Kolmogorov-Smirnov (NDs = DL/2)	0.171	0.106	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	9.036	0.818	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.36	0.106	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.956	0.941	0.924	0.986

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Lilliefors (Detects Only)	0.13	0.118	Data Not Lognormal
Lilliefors (NDs = DL)	0.213	0.0997	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.251	0.0997	Data Not Lognormal

Lilliefors (Lognormal ROS Estimates)	0.0915	0.0997	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Cobalt (mg/kg) (swmu 50 ts)

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	31	3	28	28	0	0.00%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Full: no NDs)	28	1.3	44.9	8.912	7.65	8.175

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Full: no NDs)	1.967	1.78	4.531	1.912	0.754	0.394

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.8	0.8	0.8	0.8

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Full: no NDs)	0.67	0.924	Data Not Normal
Lilliefors (Full: no NDs)	0.221	0.167	Data Not Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.904	0.904	0.904	0.904

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Full: no NDs)	0.469	0.758	
Kolmogorov-Smirnov (Full: no NDs)	0.115	0.168	Data Appear Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.978	0.978	0.978	0.978

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Full: no NDs)	0.965	0.924	Data Appear Lognormal
Lilliefors (Full: no NDs)	0.0989	0.167	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Copper (mg/kg) (rfaap bkgrd ts)

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	79	0	79	77	2	2.53%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	2	0.17	0.17	0.17	0.17	0
Statistics (Detects Only)	77	1.6	38.7	12.25	9.1	9.397
Statistics (All: NDs treated as DL value)	79	0.17	38.7	11.95	9	9.47
Statistics (All: NDs treated as DL/2 value)	79	0.085	38.7	11.94	9	9.473
Statistics (Normal ROS Estimated Data)	79	-11.93	38.7	11.67	9	9.957
Statistics (Gamma ROS Estimated Data)	79	1E-09	38.7	11.94	9	9.475
Statistics (Lognormal ROS Estimated Data)	79	0.988	38.7	11.97	9	9.441

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	1.754	1.696	6.985	2.194	0.828	0.378
Statistics (NDs = DL)	1.438	1.391	8.31	2.094	1.03	0.492
Statistics (NDs = DL/2)	1.381	1.337	8.649	2.076	1.101	0.53

Statistics (Gamma ROS Estimates)	0.698	0.68	17.1	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	2.141	0.882	0.412

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.941	0.944	0.944	0.961

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Lilliefors (Detects Only)	0.152	0.101	Data Not Normal
Lilliefors (NDs = DL)	0.155	0.0997	Data Not Normal
Lilliefors (NDs = DL/2)	0.155	0.0997	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.136	0.0997	Data Not Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.982	0.98	0.979	0.955

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.936	0.767	
Kolmogorov-Smirnov (Detects Only)	0.117	0.103	Data Not Gamma Distributed
Anderson-Darling (NDs = DL)	0.591	0.772	
Kolmogorov-Smirnov (NDs = DL)	0.0861	0.102	Data Appear Gamma Distributed
Anderson-Darling (NDs = DL/2)	0.619	0.773	
Kolmogorov-Smirnov (NDs = DL/2)	0.0788	0.103	Data Appear Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	4.964	0.798	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.209	0.105	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.988	0.951	0.927	0.988

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Lilliefors (Detects Only)	0.082	0.101	Data Appear Lognormal
Lilliefors (NDs = DL)	0.0741	0.0997	Data Appear Lognormal
Lilliefors (NDs = DL/2)	0.0933	0.0997	Data Appear Lognormal
Lilliefors (Lognormal ROS Estimates)	0.0707	0.0997	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Copper (mg/kg) (swmu 50 ts)

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	31	3	28	28	0	0.00%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Full: no NDs)	28	4	438	50.51	14.15	91.39

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Full: no NDs)	0.713	0.66	70.83	3.077	1.172	0.381

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.714	0.714	0.714	0.714

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Full: no NDs)	0.533	0.924	Data Not Normal
Lilliefors (Full: no NDs)	0.332	0.167	Data Not Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.942	0.942	0.942	0.942

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Full: no NDs)	2.337	0.788	
Kolmogorov-Smirnov (Full: no NDs)	0.25	0.172	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.952	0.952	0.952	0.952

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Full: no NDs)	0.905	0.924	Data Not Lognormal
Lilliefors (Full: no NDs)	0.17	0.167	Data Not Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Iron (mg/kg) (rfaap bkgrd ts)

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	79	0	79	79	0	0.00%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Full: no NDs)	79	7250	67700	26963	25200	11990

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Full: no NDs)	4.607	4.441	5852	10.09	0.508	0.0503

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.979	0.979	0.979	0.979

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Lilliefors (Full: no NDs)	0.0648	0.0997	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.984	0.984	0.984	0.984

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Full: no NDs)	0.831	0.755	
Kolmogorov-Smirnov (Full: no NDs)	0.082	0.101	Data appear Approximate Gamma Distribution

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.97	0.97	0.97	0.97

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Lilliefors (Full: no NDs)	0.115	0.0997	Data Not Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Iron (mg/kg) (swmu 50 ts)

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs

Raw Statistics	31	3	28	28	0	0.00%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Full: no NDs)	28	3060	47200	20151	20450	10151

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Full: no NDs)	3.235	2.913	6228	9.749	0.655	0.0672

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.974	0.974	0.974	0.974

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Full: no NDs)	0.952	0.924	Data Appear Normal
Lilliefors (Full: no NDs)	0.142	0.167	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.978	0.978	0.978	0.978

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Full: no NDs)	0.778	0.753	
Kolmogorov-Smirnov (Full: no NDs)	0.175	0.166	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.933	0.933	0.933	0.933

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Full: no NDs)	0.874	0.924	Data Not Lognormal
Lilliefors (Full: no NDs)	0.216	0.167	Data Not Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Lead (mg/kg) (rfaap bkgrd ts)

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	79	0	79	79	0	0.00%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Full: no NDs)	79	2.1	256	22.04	12	39.85

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Full: no NDs)	1.186	1.149	18.59	2.615	0.783	0.299

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.597	0.597	0.597	0.597

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Lilliefors (Full: no NDs)	0.344	0.0997	Data Not Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.803	0.803	0.803	0.803

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Full: no NDs)	7.671	0.777	
Kolmogorov-Smirnov (Full: no NDs)	0.245	0.103	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.929	0.929	0.929	0.929

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Lilliefors (Full: no NDs)	0.147	0.0997	Data Not Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Lead (mg/kg) (swmu 50 ts)

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	31	3	28	28	0	0.00%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Full: no NDs)	28	6.6	585	72.8	19.4	117.6

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Full: no NDs)	0.761	0.703	95.71	3.502	1.197	0.342

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.743	0.743	0.743	0.743

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Full: no NDs)	0.578	0.924	Data Not Normal
Lilliefors (Full: no NDs)	0.287	0.167	Data Not Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.944	0.944	0.944	0.944

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Full: no NDs)	1.923	0.784	
Kolmogorov-Smirnov (Full: no NDs)	0.279	0.172	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.952	0.952	0.952	0.952

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Full: no NDs)	0.899	0.924	Data Not Lognormal
Lilliefors (Full: no NDs)	0.233	0.167	Data Not Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Magnesium (mg/kg) (rfaap bkgrd ts)

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	79	0	79	72	7	8.86%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	7	3.8	5	4.686	4.8	0.402
Statistics (Detects Only)	72	139	58100	6394	1270	12925

Statistics (All: NDs treated as DL value)	79	3.8	58100	5828	1080	12466
Statistics (All: NDs treated as DL/2 value)	79	1.9	58100	5827	1080	12466
Statistics (Normal ROS Estimated Data)	79	-19110	58100	4438	1080	13862
Statistics (Gamma ROS Estimated Data)	79	1E-09	58100	5827	1080	12466
Statistics (Lognormal ROS Estimated Data)	79	28.2	58100	5832	1080	12464

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	0.484	0.474	13216	7.443	1.571	0.211
Statistics (NDs = DL)	0.379	0.373	15366	6.92	2.257	0.326
Statistics (NDs = DL/2)	0.368	0.363	15828	6.859	2.409	0.351
Statistics (Gamma ROS Estimates)	0.198	0.199	29431	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	7.129	1.812	0.254

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.71	0.697	0.697	0.812

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Lilliefors (Detects Only)	0.323	0.104	Data Not Normal
Lilliefors (NDs = DL)	0.321	0.0997	Data Not Normal
Lilliefors (NDs = DL/2)	0.321	0.0997	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.29	0.0997	Data Not Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.943	0.948	0.949	0.956

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	4.255	0.821	
Kolmogorov-Smirnov (Detects Only)	0.17	0.111	Data Not Gamma Distributed
Anderson-Darling (NDs = DL)	2.668	0.847	
Kolmogorov-Smirnov (NDs = DL)	0.136	0.108	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	2.542	0.849	
Kolmogorov-Smirnov (NDs = DL/2)	0.129	0.108	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	7.068	0.912	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.298	0.111	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.977	0.962	0.948	0.992

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Lilliefors (Detects Only)	0.0868	0.104	Data Appear Lognormal
Lilliefors (NDs = DL)	0.135	0.0997	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.157	0.0997	Data Not Lognormal
Lilliefors (Lognormal ROS Estimates)	0.0546	0.0997	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Magnesium (mg/kg) (swmu 50 ts)

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	31	3	28	28	0	0.00%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Full: no NDs)	28	312	20200	2740	1590	4061

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV

Statistics (Full: no NDs)	1.069	0.979	2562	7.38	0.946	0.128

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.724	0.724	0.724	0.724

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Full: no NDs)	0.55	0.924	Data Not Normal
Lilliefors (Full: no NDs)	0.322	0.167	Data Not Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.912	0.912	0.912	0.912

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Full: no NDs)	1.559	0.772	
Kolmogorov-Smirnov (Full: no NDs)	0.182	0.17	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.973	0.973	0.973	0.973

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Full: no NDs)	0.95	0.924	Data Appear Lognormal
Lilliefors (Full: no NDs)	0.1	0.167	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Manganese (mg/kg) (rfaap bkgrd ts)

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	79	0	79	79	0	0.00%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Full: no NDs)	79	16.7	2040	471.4	359	467.1

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Full: no NDs)	1.121	1.087	420.6	5.647	1.118	0.198

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.894	0.894	0.894	0.894

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Lilliefors (Full: no NDs)	0.165	0.0997	Data Not Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.982	0.982	0.982	0.982

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Full: no NDs)	0.359	0.779	
Kolmogorov-Smirnov (Full: no NDs)	0.0515	0.103	Data Appear Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.985	0.985	0.985	0.985

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Lilliefors (Full: no NDs)	0.093	0.0997	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Manganese (mg/kg) (swmu 50 ts)

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	31	3	28	28	0	0.00%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Full: no NDs)	28	25.1	1440	489.5	373.5	422.5

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Full: no NDs)	1.192	1.088	410.5	5.719	1.104	0.193

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.947	0.947	0.947	0.947

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Full: no NDs)	0.882	0.924	Data Not Normal
Lilliefors (Full: no NDs)	0.2	0.167	Data Not Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.972	0.972	0.972	0.972

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Full: no NDs)	0.419	0.77	
Kolmogorov-Smirnov (Full: no NDs)	0.133	0.169	Data Appear Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.979	0.979	0.979	0.979

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Full: no NDs)	0.948	0.924	Data Appear Lognormal
Lilliefors (Full: no NDs)	0.135	0.167	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Mercury (mg/kg) (rfaap bkgrd ts)

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	79	0	79	18	61	77.22%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	61	0.019	0.06	0.0484	0.06	0.0158
Statistics (Detects Only)	18	0.038	1.2	0.187	0.125	0.259
Statistics (All: NDs treated as DL value)	79	0.019	1.2	0.0799	0.06	0.135
Statistics (All: NDs treated as DL/2 value)	79	0.0095	1.2	0.0612	0.03	0.139
Statistics (Normal ROS Estimated Data)	79	-1.214	1.2	-0.361	-0.372	0.403
Statistics (Gamma ROS Estimated Data)	79	0.038	1.2	0.173	0.156	0.138
Statistics (Lognormal ROS Estimated Data)	79	0.0007952	1.2	0.0541	0.0171	0.141

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	1.552	1.501	0.12	-2.035	0.727	-0.358
Statistics (NDs = DL)	1.645	1.591	0.0485	-2.861	0.681	-0.238
Statistics (NDs = DL/2)	0.962	0.934	0.0636	-3.396	0.902	-0.266
Statistics (Gamma ROS Estimates)	3.073	2.965	0.0563	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-4.029	1.44	-0.357

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.64	0.523	0.527	0.977

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.442	0.897	Data Not Normal
Lilliefors (Detects Only)	0.384	0.209	Data Not Normal
Lilliefors (NDs = DL)	0.356	0.0997	Data Not Normal
Lilliefors (NDs = DL/2)	0.361	0.0997	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.067	0.0997	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.801	0.683	0.741	0.816

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	1.702	0.756	
Kolmogorov-Smirnov (Detects Only)	0.274	0.207	Data Not Gamma Distributed
Anderson-Darling (NDs = DL)	6.715	0.768	
Kolmogorov-Smirnov (NDs = DL)	0.33	0.102	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	8.44	0.784	
Kolmogorov-Smirnov (NDs = DL/2)	0.377	0.104	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	0.725	0.759	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.0728	0.101	Data Appear Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.919	0.916	0.914	0.994

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.871	0.897	Data Not Lognormal
Lilliefors (Detects Only)	0.193	0.209	Data Appear Lognormal
Lilliefors (NDs = DL)	0.269	0.0997	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.321	0.0997	Data Not Lognormal
Lilliefors (Lognormal ROS Estimates)	0.062	0.0997	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Mercury (mg/kg) (swmu 50 ts)

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	31	3	28	28	0	0.00%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Full: no NDs)	28	0.012	0.816	0.149	0.105	0.164

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Full: no NDs)	1.479	1.344	0.101	-2.28	0.862	-0.378

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.787	0.787	0.787	0.787

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Full: no NDs)	0.642	0.924	Data Not Normal
Lilliefors (Full: no NDs)	0.261	0.167	Data Not Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.924	0.924	0.924	0.924

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Full: no NDs)	0.764	0.763	
Kolmogorov-Smirnov (Full: no NDs)	0.147	0.168	Data appear Approximate Gamma Distribution

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.98	0.98	0.98	0.98

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Full: no NDs)	0.973	0.924	Data Appear Lognormal
Lilliefors (Full: no NDs)	0.116	0.167	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Nickel (mg/kg) (rfaap bkgrd ts)

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	79	0	79	61	18	22.78%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	18	0.21	1.4	1.066	1.3	0.466
Statistics (Detects Only)	61	4.6	94.2	17.95	13.2	15.68
Statistics (All: NDs treated as DL value)	79	0.21	94.2	14.1	9.4	15.49
Statistics (All: NDs treated as DL/2 value)	79	0.105	94.2	13.98	9.4	15.59
Statistics (Normal ROS Estimated Data)	79	-32.3	94.2	10.45	9.4	19.82
Statistics (Gamma ROS Estimated Data)	79	1E-09	94.2	14.69	9.8	15.1
Statistics (Lognormal ROS Estimated Data)	79	1.082	94.2	14.48	9.4	15.18

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	1.974	1.908	9.092	2.614	0.722	0.276
Statistics (NDs = DL)	0.89	0.865	15.85	1.989	1.367	0.687
Statistics (NDs = DL/2)	0.743	0.723	18.82	1.831	1.622	0.886
Statistics (Gamma ROS Estimates)	0.377	0.371	38.92	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	2.235	0.959	0.429

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.86	0.87	0.874	0.961

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Lilliefors (Detects Only)	0.197	0.113	Data Not Normal
Lilliefors (NDs = DL)	0.185	0.0997	Data Not Normal
Lilliefors (NDs = DL/2)	0.187	0.0997	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.156	0.0997	Data Not Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.969	0.99	0.992	0.988

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.996	0.763	
Kolmogorov-Smirnov (Detects Only)	0.096	0.115	Data appear Approximate Gamma Distribution
Anderson-Darling (NDs = DL)	0.633	0.787	
Kolmogorov-Smirnov (NDs = DL)	0.112	0.104	Data appear Approximate Gamma Distribution
Anderson-Darling (NDs = DL/2)	1.261	0.794	
Kolmogorov-Smirnov (NDs = DL/2)	0.135	0.104	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	11.39	0.847	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.343	0.108	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.986	0.963	0.942	0.997

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Lilliefors (Detects Only)	0.087	0.113	Data Appear Lognormal
Lilliefors (NDs = DL)	0.14	0.0997	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.198	0.0997	Data Not Lognormal
Lilliefors (Lognormal ROS Estimates)	0.0586	0.0997	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Nickel (mg/kg) (swmu 50 ts)

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	31	3	28	28	0	0.00%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Full: no NDs)	28	4.1	181	25.12	12.1	42.18

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Full: no NDs)	1.022	0.936	24.59	2.66	0.885	0.333

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.663	0.663	0.663	0.663

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Full: no NDs)	0.457	0.924	Data Not Normal
Lilliefors (Full: no NDs)	0.363	0.167	Data Not Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.862	0.862	0.862	0.862

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Full: no NDs)	3.191	0.773	
Kolmogorov-Smirnov (Full: no NDs)	0.299	0.17	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.918	0.918	0.918	0.918

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)

Shapiro-Wilks (Full: no NDs)	0.849	0.924	Data Not Lognormal
Lilliefors (Full: no NDs)	0.211	0.167	Data Not Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Potassium (mg/kg) (rfaap bkgrd ts)

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	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	1E-09	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 CV
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

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.813	0.789	0.795	0.88

	Test value	Crit. (0.05)	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

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.972	0.968	0.974	0.962

	Test value	Crit. (0.05)	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

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.989	0.973	0.983	0.98

	Test value	Crit. (0.05)	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: Substitution methods such as DL or DL/2 are not recommended.

Potassium (mg/kg) (swmu 50 ts)

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	31	17	14	14	0	0.00%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Full: no NDs)	14	465	2050	1279	1320	430.3

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Full: no NDs)	7.833	6.202	163.3	7.089	0.401	0.0565

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.992	0.992	0.992	0.992

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Full: no NDs)	0.986	0.874	Data Appear Normal
Lilliefors (Full: no NDs)	0.0991	0.237	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.975	0.975	0.975	0.975

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Full: no NDs)	0.35	0.736	
Kolmogorov-Smirnov (Full: no NDs)	0.144	0.229	Data Appear Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.951	0.951	0.951	0.951

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Full: no NDs)	0.911	0.874	Data Appear Lognormal
Lilliefors (Full: no NDs)	0.174	0.237	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Selenium (mg.kg) (rfaap bkgrd ts)

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	79	0	79	2	77	97.47%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	77	N/A	N/A	N/A	N/A	N/A
Statistics (Detects Only)	2	N/A	N/A	N/A	N/A	N/A
Statistics (All: NDs treated as DL value)	79	N/A	N/A	N/A	N/A	N/A
Statistics (All: NDs treated as DL/2 value)	79	N/A	N/A	N/A	N/A	N/A
Statistics (Normal ROS Estimated Data)	79	N/A	N/A	N/A	N/A	N/A

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	N/A	N/A	N/A	N/A

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)

Shapiro-Wilks (Detects Only)	N/A	N/A
Lilliefors (Detects Only)	N/A	N/A
Lilliefors (NDs = DL)	N/A	N/A
Lilliefors (NDs = DL/2)	N/A	N/A
Lilliefors (Normal ROS Estimates)	N/A	N/A

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	N/A	N/A	N/A	N/A

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	N/A	N/A	
Kolmogorov-Smirnov (Detects Only)	N/A	N/A	
Anderson-Darling (NDs = DL)	N/A	N/A	
Kolmogorov-Smirnov (NDs = DL)	N/A	N/A	
Anderson-Darling (NDs = DL/2)	N/A	N/A	
Kolmogorov-Smirnov (NDs = DL/2)	N/A	N/A	
Anderson-Darling (Gamma ROS Estimates)	N/A	N/A	
Kolmogorov-Smirnov (Gamma ROS Est.)	N/A	N/A	

Note: Substitution methods such as DL or DL/2 are not recommended.

Selenium (mg.kg) (swmu 50 ts)

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	31	4	27	14	13	48.15%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	13	0.15	32	8.935	1.28	11.46
Statistics (Detects Only)	14	0.57	13.5	6.519	6.15	2.847
Statistics (All: NDs treated as DL value)	27	0.15	32	7.683	5.7	8.133
Statistics (All: NDs treated as DL/2 value)	27	0.075	16	5.531	5.7	4.504
Statistics (Normal ROS Estimated Data)	27	-1.193	13.5	4.289	4.213	3.393
Statistics (Gamma ROS Estimated Data)	27	0.57	13.5	6.453	5.8	2.491
Statistics (Lognormal ROS Estimated Data)	27	0.57	13.5	4.502	3.481	3.006

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	3.507	3.142	1.859	1.725	0.712	0.412
Statistics (NDs = DL)	0.967	0.884	7.946	1.44	1.273	0.884
Statistics (NDs = DL/2)	0.959	0.877	5.766	1.106	1.399	1.265
Statistics (Gamma ROS Estimates)	4.937	4.413	1.307	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	1.263	0.758	0.6

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.911	0.878	0.943	0.964

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.865	0.874	Data Not Normal
Lilliefors (Detects Only)	0.236	0.237	Data Appear Normal
Shapiro-Wilks (NDs = DL)	0.773	0.923	Data Not Normal
Lilliefors (NDs = DL)	0.255	0.171	Data Not Normal
Shapiro-Wilks (NDs = DL/2)	0.879	0.923	Data Not Normal
Lilliefors (NDs = DL/2)	0.177	0.171	Data Not Normal
Shapiro-Wilks (Normal ROS Estimates)	0.932	0.923	Data Appear Normal
Lilliefors (Normal ROS Estimates)	0.158	0.171	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.928	0.976	0.94	0.965

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	1.393	0.741	
Kolmogorov-Smirnov (Detects Only)	0.287	0.23	Data Not Gamma Distributed
Anderson-Darling (NDs = DL)	0.577	0.775	
Kolmogorov-Smirnov (NDs = DL)	0.137	0.173	Data Appear Gamma Distributed
Anderson-Darling (NDs = DL/2)	1.728	0.775	
Kolmogorov-Smirnov (NDs = DL/2)	0.251	0.173	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	1.118	0.748	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.218	0.169	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.781	0.965	0.91	0.973

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.65	0.874	Data Not Lognormal
Lilliefors (Detects Only)	0.341	0.237	Data Not Lognormal
Shapiro-Wilks (NDs = DL)	0.933	0.923	Data Appear Lognormal
Lilliefors (NDs = DL)	0.207	0.171	Data Not Lognormal
Shapiro-Wilks (NDs = DL/2)	0.826	0.923	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.296	0.171	Data Not Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.946	0.923	Data Appear Lognormal
Lilliefors (Lognormal ROS Estimates)	0.158	0.171	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Silver (mg/kg) (rfaap bkgrd ts)

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	79	0	79	1	78	98.73%

Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set!

It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable Silver (mg/kg) (rfaap bkgrd ts) was not processed!

Silver (mg/kg) (swmu 50 ts)

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	31	3	28	8	20	71.43%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	20	0.047	1.65	0.248	0.053	0.48
Statistics (Detects Only)	8	0.069	1.1	0.529	0.595	0.388
Statistics (All: NDs treated as DL value)	28	0.047	1.65	0.329	0.0665	0.467
Statistics (All: NDs treated as DL/2 value)	28	0.0235	1.1	0.24	0.0333	0.338
Statistics (Normal ROS Estimated Data)	28	-1.245	1.1	-0.367	-0.514	0.645
Statistics (Gamma ROS Estimated Data)	28	0.069	1.1	0.525	0.527	0.198
Statistics (Lognormal ROS Estimated Data)	28	0.00322	1.1	0.162	0.0222	0.308

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	1.356	1.235	0.39	-1.048	1.121	-1.07
Statistics (NDs = DL)	0.661	0.614	0.497	-2.035	1.306	-0.642
Statistics (NDs = DL/2)	0.565	0.529	0.424	-2.53	1.487	-0.588

Statistics (Gamma ROS Estimates)	4.395	3.948	0.119	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-3.416	1.72	-0.503

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.967	0.813	0.826	0.941

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.914	0.818	Data Appear Normal
Lilliefors (Detects Only)	0.198	0.313	Data Appear Normal
Shapiro-Wilks (NDs = DL)	0.66	0.924	Data Not Normal
Lilliefors (NDs = DL)	0.384	0.167	Data Not Normal
Shapiro-Wilks (NDs = DL/2)	0.676	0.924	Data Not Normal
Lilliefors (NDs = DL/2)	0.365	0.167	Data Not Normal
Shapiro-Wilks (Normal ROS Estimates)	0.877	0.924	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.229	0.167	Data Not Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.92	0.957	0.936	0.851

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.565	0.73	
Kolmogorov-Smirnov (Detects Only)	0.279	0.3	Data Appear Gamma Distributed
Anderson-Darling (NDs = DL)	3.97	0.794	
Kolmogorov-Smirnov (NDs = DL)	0.377	0.173	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	3.704	0.804	
Kolmogorov-Smirnov (NDs = DL/2)	0.337	0.174	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	4.493	0.749	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.415	0.166	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.927	0.857	0.867	0.931

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.837	0.818	Data Appear Lognormal
Lilliefors (Detects Only)	0.298	0.313	Data Appear Lognormal
Shapiro-Wilks (NDs = DL)	0.718	0.924	Data Not Lognormal
Lilliefors (NDs = DL)	0.34	0.167	Data Not Lognormal
Shapiro-Wilks (NDs = DL/2)	0.731	0.924	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.31	0.167	Data Not Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.855	0.924	Data Not Lognormal
Lilliefors (Lognormal ROS Estimates)	0.229	0.167	Data Not Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Sodium (mg/kg) (rfaap bkgrd ts)

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	79	0	79	6	73	92.41%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	73	10.8	25.9	15.02	12	4.717
Statistics (Detects Only)	6	114	151	131.7	127	14.76
Statistics (All: NDs treated as DL value)	79	10.8	151	23.88	12.1	31.65
Statistics (All: NDs treated as DL/2 value)	79	5.4	151	16.94	6.05	33.39
Statistics (Normal ROS Estimated Data)	79	-8.416	151	43.69	36.98	33.18

Statistics (Gamma ROS Estimated Data)	79	114	151	131.6	131.6	3.738
Statistics (Lognormal ROS Estimated Data)	79	45.83	151	70.08	64.41	20.82

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	97.1	93.42	1.356	4.875	0.111	0.0227
Statistics (NDs = DL)	1.618	1.565	14.76	2.833	0.653	0.23
Statistics (NDs = DL/2)	0.916	0.889	18.5	2.193	0.823	0.376
Statistics (Gamma ROS Estimates)	1276	1227	0.103	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	4.216	0.249	0.059

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.957	0.639	0.59	0.936

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.901	0.788	Data Appear Normal
Lilliefors (Detects Only)	0.212	0.362	Data Appear Normal
Lilliefors (NDs = DL)	0.404	0.0997	Data Not Normal
Lilliefors (NDs = DL/2)	0.472	0.0997	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.2	0.0997	Data Not Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.959	0.811	0.809	0.571

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.389	0.696	
Kolmogorov-Smirnov (Detects Only)	0.22	0.332	Data Appear Gamma Distributed
Anderson-Darling (NDs = DL)	13.6	0.769	
Kolmogorov-Smirnov (NDs = DL)	0.302	0.102	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	17.64	0.786	
Kolmogorov-Smirnov (NDs = DL/2)	0.386	0.104	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	22.97	0.749	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.448	0.1	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.963	0.798	0.753	0.936

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.913	0.788	Data Appear Lognormal
Lilliefors (Detects Only)	0.198	0.362	Data Appear Lognormal
Lilliefors (NDs = DL)	0.246	0.0997	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.27	0.0997	Data Not Lognormal
Lilliefors (Lognormal ROS Estimates)	0.2	0.0997	Data Not Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Sodium (mg/kg) (swmu 50 ts)

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	31	3	28	6	22	78.57%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	22	4.2	67	47.36	47	15.95
Statistics (Detects Only)	6	35.2	78.7	64.8	68.7	15.87
Statistics (All: NDs treated as DL value)	28	4.2	78.7	51.1	48	17.25
Statistics (All: NDs treated as DL/2 value)	28	2.1	78.7	32.49	24.5	19.78

Statistics (Normal ROS Estimated Data)	28	4.392	78.7	30.19	22.39	21.38
Statistics (Gamma ROS Estimated Data)	28	35.2	78.7	64.83	65.6	8.159
Statistics (Lognormal ROS Estimated Data)	28	21.05	78.7	36.44	29.15	17.12

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	15.6	13.95	4.153	4.139	0.298	0.072
Statistics (NDs = DL)	3.996	3.592	12.79	3.803	0.681	0.179
Statistics (NDs = DL/2)	2.404	2.17	13.51	3.259	0.806	0.247
Statistics (Gamma ROS Estimates)	54.07	48.3	1.199	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	3.513	0.388	0.11

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.913	0.932	0.889	0.922

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.844	0.788	Data Appear Normal
Lilliefors (Detects Only)	0.256	0.362	Data Appear Normal
Shapiro-Wilks (NDs = DL)	0.875	0.924	Data Not Normal
Lilliefors (NDs = DL)	0.212	0.167	Data Not Normal
Shapiro-Wilks (NDs = DL/2)	0.792	0.924	Data Not Normal
Lilliefors (NDs = DL/2)	0.267	0.167	Data Not Normal
Shapiro-Wilks (Normal ROS Estimates)	0.842	0.924	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.209	0.167	Data Not Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.87	0.876	0.935	0.908

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.641	0.698	
Kolmogorov-Smirnov (Detects Only)	0.291	0.332	Data Appear Gamma Distributed
Anderson-Darling (NDs = DL)	3.157	0.75	
Kolmogorov-Smirnov (NDs = DL)	0.327	0.166	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	2.138	0.756	
Kolmogorov-Smirnov (NDs = DL/2)	0.282	0.167	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	1.328	0.743	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.2	0.165	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.87	0.743	0.847	0.918

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.771	0.788	Data Not Lognormal
Lilliefors (Detects Only)	0.311	0.362	Data Appear Lognormal
Shapiro-Wilks (NDs = DL)	0.569	0.924	Data Not Lognormal
Lilliefors (NDs = DL)	0.368	0.167	Data Not Lognormal
Shapiro-Wilks (NDs = DL/2)	0.731	0.924	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.335	0.167	Data Not Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.833	0.924	Data Not Lognormal
Lilliefors (Lognormal ROS Estimates)	0.209	0.167	Data Not Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Thallium (mg/kg) (rfaap bkgrd ts)

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs

Raw Statistics	79	0	79	15	64	81.01%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	64	0.13	0.45	0.189	0.15	0.0931
Statistics (Detects Only)	15	1.3	5	2.527	2.2	0.932
Statistics (All: NDs treated as DL value)	79	0.13	5	0.633	0.16	1.007
Statistics (All: NDs treated as DL/2 value)	79	0.065	5	0.556	0.08	1.039
Statistics (Normal ROS Estimated Data)	79	-4.787	5	-0.573	-0.722	1.972
Statistics (Gamma ROS Estimated Data)	79	1.3	5	2.489	2.468	0.399
Statistics (Lognormal ROS Estimated Data)	79	0.155	5	0.998	0.707	0.884

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	8.698	8.377	0.29	0.868	0.352	0.405
Statistics (NDs = DL)	0.753	0.733	0.841	-1.253	1.097	-0.876
Statistics (NDs = DL/2)	0.515	0.504	1.08	-1.814	1.358	-0.748
Statistics (Gamma ROS Estimates)	44.1	42.44	0.0564	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-0.291	0.738	-2.538

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.938	0.746	0.729	0.991

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.893	0.881	Data Appear Normal
Lilliefors (Detects Only)	0.17	0.229	Data Appear Normal
Lilliefors (NDs = DL)	0.382	0.0997	Data Not Normal
Lilliefors (NDs = DL/2)	0.435	0.0997	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.0779	0.0997	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.964	0.943	0.944	0.777

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.367	0.738	
Kolmogorov-Smirnov (Detects Only)	0.145	0.222	Data Appear Gamma Distributed
Anderson-Darling (NDs = DL)	12.86	0.793	
Kolmogorov-Smirnov (NDs = DL)	0.361	0.104	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	14.62	0.817	
Kolmogorov-Smirnov (NDs = DL/2)	0.371	0.106	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	10.13	0.749	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.319	0.1	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.977	0.835	0.815	0.99

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.959	0.881	Data Appear Lognormal
Lilliefors (Detects Only)	0.134	0.229	Data Appear Lognormal
Lilliefors (NDs = DL)	0.334	0.0997	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.34	0.0997	Data Not Lognormal
Lilliefors (Lognormal ROS Estimates)	0.0779	0.0997	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Thallium (mg/kg) (swmu 50 ts)

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	31	10	21	0	21	100.00%

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable Thallium (mg/kg) (swmu 50 ts) was not processed!

Vanadium (mg/kg) (rfaap bkgrd ts)

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	79	0	79	79	0	0.00%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Full: no NDs)	79	12.2	114	45.84	41.4	20.38

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Full: no NDs)	4.973	4.792	9.218	3.721	0.477	0.128

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.98	0.98	0.98	0.98

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Lilliefors (Full: no NDs)	0.0967	0.0997	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.997	0.997	0.997	0.997

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Full: no NDs)	0.228	0.754	
Kolmogorov-Smirnov (Full: no NDs)	0.054	0.101	Data Appear Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.988	0.988	0.988	0.988

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Lilliefors (Full: no NDs)	0.0843	0.0997	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Vanadium (mg/kg) (swmu 50 ts)

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	31	3	28	28	0	0.00%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Full: no NDs)	28	6.4	84.2	36.42	36.85	20.29

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Full: no NDs)	2.982	2.686	12.21	3.418	0.656	0.192

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.971	0.971	0.971	0.971

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Full: no NDs)	0.936	0.924	Data Appear Normal
Lilliefors (Full: no NDs)	0.123	0.167	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.983	0.983	0.983	0.983

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Full: no NDs)	0.306	0.754	
Kolmogorov-Smirnov (Full: no NDs)	0.112	0.167	Data Appear Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.971	0.971	0.971	0.971

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Full: no NDs)	0.938	0.924	Data Appear Lognormal
Lilliefors (Full: no NDs)	0.142	0.167	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Zinc (mg/kg) (rfaap bkgrd ts)

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	79	0	79	79	0	0.00%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Full: no NDs)	79	4.7	598	54.94	30.2	87.15

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Full: no NDs)	1.083	1.05	50.74	3.478	0.93	0.267

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.683	0.683	0.683	0.683

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Lilliefors (Full: no NDs)	0.291	0.0997	Data Not Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.88	0.88	0.88	0.88

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Full: no NDs)	3.363	0.78	
Kolmogorov-Smirnov (Full: no NDs)	0.145	0.103	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.982	0.982	0.982	0.982

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Lilliefors (Full: no NDs)	0.0696	0.0997	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Zinc (mg/kg) (swmu 50 ts)

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	31	3	28	28	0	0.00%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Full: no NDs)	28	5	93.3	41.28	33.55	23.29

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Full: no NDs)	3.078	2.772	13.41	3.549	0.638	0.18

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.962	0.962	0.962	0.962

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Full: no NDs)	0.918	0.924	Data Not Normal
Lilliefors (Full: no NDs)	0.165	0.167	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.98	0.98	0.98	0.98

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Full: no NDs)	0.332	0.753	
Kolmogorov-Smirnov (Full: no NDs)	0.0984	0.167	Data Appear Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.966	0.966	0.966	0.966

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Full: no NDs)	0.94	0.924	Data Appear Lognormal
Lilliefors (Full: no NDs)	0.0951	0.167	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Appendix E.7B
RFAAP SWMU 50 Total Soil vs Background Statistical Comparisons

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Full Data Sets without NDs

User Selected Options	
From File	H:\Risk DB\Radford\SWMUs 50-59\Background Stats\50_ProUCL_input_TS_for BKG.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 (mg/kg)(swmu 50 ts)
Background Data: Aluminum (mg/kg)(rfaap bkgrd ts)

Raw Statistics

	Site	Background
Number of Valid Observations	28	79
Number of Missing Values	3	0
Number of Distinct Observations	26	75
Minimum	3100	3620
Maximum	38400	47900
Mean	16914	14204
Median	15150	12100
SD	8646	9433
SE of Mean	1634	1061

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Site or AOC <= Mean/Median of Background

Site Rank Sum W-Stat	1784
WMW Test U-Stat	1.924
WMW Critical Value (0.050)	1.645
P-Value	0.0272

Conclusion with Alpha = 0.05
Reject H0, Conclude Site > Background
P-Value < alpha (0.05)

Appendix E.7B
RFAAP SWMU 50 Total Soil vs Background Statistical Comparisons

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	H:\Risk DB\Radford\SWMUs 50-59\Background Stats\50_ProUCL_input_TS_for BKG.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: Antimony (mg/kg)(swmu 50 ts)
Background Data: Antimony (mg/kg)(rfaap bkgrd ts)

Raw Statistics

	Site	Background
Number of Valid Data	24	38
Number of Missing Values	7	41
Number of Non-Detect Data	6	38
Number of Detect Data	18	0
Minimum Non-Detect	0.38	0.23
Maximum Non-Detect	0.636	0.36
Percent Non detects	25.00%	100.00%
Minimum Detected	0.33	N/A
Maximum Detected	2.5	N/A
Mean of Detected Data	1.218	N/A
Median of Detected Data	1.15	N/A
SD of Detected Data	0.465	N/A

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	6.187
Critical z (0.95)	1.645
P-Value	3.07E-10

Conclusion with Alpha = 0.05
Reject H0, Conclude Site > Background
P-Value < alpha (0.05)

Appendix E.7B
RFAAP SWMU 50 Total Soil vs Background Statistical Comparisons

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	H:\Risk DB\Radford\SWMUs 50-59\Background Stats\50_ProUCL_input_TS_for BKG.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 (mg/kg)(swmu 50 ts)
Background Data: Arsenic (mg/kg)(rfaap bkgrd ts)

Raw Statistics

	Site	Background
Number of Valid Data	28	79
Number of Missing Values	3	0
Number of Non-Detect Data	0	3
Number of Detect Data	28	76
Minimum Non-Detect	N/A	0.09
Maximum Non-Detect	N/A	0.12
Percent Non detects	0.00%	3.80%
Minimum Detected	1.03	1.2
Maximum Detected	13.7	35.9
Mean of Detected Data	4.463	4.989
Median of Detected Data	3.4	3.2
SD of Detected Data	3.397	5.36

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	0.234
Critical z (0.95)	1.645
P-Value	0.408

Conclusion with Alpha = 0.05
Do Not Reject H0, Conclude Site <= Background
P-Value >= alpha (0.05)

Appendix E.7B
RFAAP SWMU 50 Total Soil vs Background Statistical Comparisons

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	H:\Risk DB\Radford\SWMUs 50-59\Background Stats\50_ProUCL_input_TS_for BKG.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: Barium (mg/kg)(swmu 50 ts)
Background Data: Barium (mg/kg)(rfaap bkgrd ts)

Raw Statistics

	Site	Background
Number of Valid Data	28	79
Number of Missing Values	3	0
Number of Non-Detect Data	0	16
Number of Detect Data	28	63
Minimum Non-Detect	N/A	0.36
Maximum Non-Detect	N/A	1.1
Percent Non detects	0.00%	20.25%
Minimum Detected	12	23.4
Maximum Detected	141	174
Mean of Detected Data	71.48	68.4
Median of Detected Data	68.55	56.7
SD of Detected Data	29.37	40.39

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	2.669
Critical z (0.95)	1.645
P-Value	0.0038

Conclusion with Alpha = 0.05
Reject H0, Conclude Site > Background
P-Value < alpha (0.05)

Appendix E.7B
RFAAP SWMU 50 Total Soil vs Background Statistical Comparisons

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	H:\Risk DB\Radford\SWMUs 50-59\Background Stats\50_ProUCL_input_TS_for BKG.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: Beryllium (mg/kg)(swmu 50 ts)
Background Data: Beryllium (mg/kg)(rfaap bkgrd ts)

Raw Statistics

	Site	Background
Number of Valid Data	20	79
Number of Missing Values	11	0
Number of Non-Detect Data	0	39
Number of Detect Data	20	40
Minimum Non-Detect	N/A	0.022
Maximum Non-Detect	N/A	0.03
Percent Non detects	0.00%	49.37%
Minimum Detected	0.13	0.61
Maximum Detected	0.9	5.4
Mean of Detected Data	0.549	1.449
Median of Detected Data	0.585	1.1
SD of Detected Data	0.209	1.086

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	0.306
Critical z (0.95)	1.645
P-Value	0.38

Conclusion with Alpha = 0.05
Do Not Reject H0, Conclude Site <= Background
P-Value >= alpha (0.05)

Appendix E.7B
RFAAP SWMU 50 Total Soil vs Background Statistical Comparisons

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	H:\Risk DB\Radford\SWMUs 50-59\Background Stats\50_ProUCL_input_TS_for BKG.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: Cadmium (mg/kg)(swmu 50 ts)
Background Data: Cadmium (mg/kg)(rfaap bkgrd ts)

Raw Statistics

	Site	Background
Number of Valid Data	26	79
Number of Missing Values	5	0
Number of Non-Detect Data	22	66
Number of Detect Data	4	13
Minimum Non-Detect	0.057	0.02
Maximum Non-Detect	1.6	0.05
Percent Non detects	84.62%	83.54%
Minimum Detected	0.12	0.57
Maximum Detected	0.15	2.5
Mean of Detected Data	0.135	1.152
Median of Detected Data	0.135	1.1
SD of Detected Data	0.0139	0.585

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	-0.0187
Critical z (0.95)	1.645
P-Value	0.507

Conclusion with Alpha = 0.05
Do Not Reject H0, Conclude Site <= Background
P-Value >= alpha (0.05)

Appendix E.7B
RFAAP SWMU 50 Total Soil vs Background Statistical Comparisons

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Full Data Sets without NDs

User Selected Options	
From File	H:\Risk DB\Radford\SWMUs 50-59\Background Stats\50_ProUCL_input_TS_for BKG.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 (mg/kg)(swmu 50 ts)
Background Data: Chromium (mg/kg)(rfaap bkgrd ts)

Raw Statistics

	Site	Background
Number of Valid Observations	28	79
Number of Missing Values	3	0
Number of Distinct Observations	28	70
Minimum	12.2	6.3
Maximum	513	75.8
Mean	62.28	26.86
Median	29.85	26
SD	102.3	12.51
SE of Mean	19.33	1.408

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Site or AOC <= Mean/Median of Background

Site Rank Sum W-Stat	1811
WMW Test U-Stat	2.112
WMW Critical Value (0.050)	1.645
P-Value	0.0173

Conclusion with Alpha = 0.05
Reject H0, Conclude Site > Background
P-Value < alpha (0.05)

Appendix E.7B
RFAAP SWMU 50 Total Soil vs Background Statistical Comparisons

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	H:\Risk DB\Radford\SWMUs 50-59\Background Stats\50_ProUCL_input_TS_for BKG.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: Cobalt (mg/kg)(swmu 50 ts)
Background Data: Cobalt (mg/kg)(rfaap bkgrd ts)

Raw Statistics

	Site	Background
Number of Valid Data	28	79
Number of Missing Values	3	0
Number of Non-Detect Data	0	23
Number of Detect Data	28	56
Minimum Non-Detect	N/A	0.11
Maximum Non-Detect	N/A	0.84
Percent Non detects	0.00%	29.11%
Minimum Detected	1.3	5.9
Maximum Detected	44.9	130
Mean of Detected Data	8.912	22.23
Median of Detected Data	7.65	13.3
SD of Detected Data	8.175	23.94

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	-1.232
Critical z (0.95)	1.645
P-Value	0.891

Conclusion with Alpha = 0.05
Do Not Reject H0, Conclude Site <= Background
P-Value >= alpha (0.05)

Appendix E.7B
RFAAP SWMU 50 Total Soil vs Background Statistical Comparisons

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	H:\Risk DB\Radford\SWMUs 50-59\Background Stats\50_ProUCL_input_TS_for BKG.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: Copper (mg/kg)(swmu 50 ts)
Background Data: Copper (mg/kg)(rfaap bkgrd ts)

Raw Statistics

	Site	Background
Number of Valid Data	28	79
Number of Missing Values	3	0
Number of Non-Detect Data	0	2
Number of Detect Data	28	77
Minimum Non-Detect	N/A	0.17
Maximum Non-Detect	N/A	0.17
Percent Non detects	0.00%	2.53%
Minimum Detected	4	1.6
Maximum Detected	438	38.7
Mean of Detected Data	50.51	12.25
Median of Detected Data	14.15	9.1
SD of Detected Data	91.39	9.397

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	3.367
Critical z (0.95)	1.645
P-Value	3.81E-04

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

P-Value < alpha (0.05)

Appendix E.7B
RFAAP SWMU 50 Total Soil vs Background Statistical Comparisons

t-Test Site vs Background Comparison for Full Data Sets without NDs

User Selected Options
From File H:\Risk DB\Radford\SWMUs 50-59\Background Stats\50_ProUCL_input_TS_for BKG.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 (mg/kg)(swmu 50 ts)
Background Data: Iron (mg/kg)(rfaap bkgrd ts)

Raw Statistics

	Site	Background
Number of Valid Observations	28	79
Number of Missing Values	3	0
Number of Distinct Observations	27	72
Minimum	3060	7250
Maximum	47200	67700
Mean	20151	26963
Median	20450	25200
SD	10151	11990
SE of Mean	1918	1349

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)	105	-2.683	1.659	0.996
Satterthwaite (Unequal Variance)	55.6	-2.905	1.673	0.997

Pooled SD 11544.973
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
78	27	1.395	0.333

Conclusion with Alpha = 0.05
* Two variances appear to be equal

Appendix E.7B
RFAAP SWMU 50 Total Soil vs Background Statistical Comparisons

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Full Data Sets without NDs

User Selected Options	
From File	H:\Risk DB\Radford\SWMUs 50-59\Background Stats\50_ProUCL_input_TS_for BKG.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 (mg/kg)(swmu 50 ts)
Background Data: Lead (mg/kg)(rfaap bkgrd ts)

Raw Statistics

	Site	Background
Number of Valid Observations	28	79
Number of Missing Values	3	0
Number of Distinct Observations	28	70
Minimum	6.6	2.1
Maximum	585	256
Mean	72.8	22.04
Median	19.4	12
SD	117.6	39.85
SE of Mean	22.23	4.483

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Site or AOC <= Mean/Median of Background

Site Rank Sum W-Stat	2049
WMW Test U-Stat	3.802
WMW Critical Value (0.050)	1.645
P-Value	7.17E-05

Conclusion with Alpha = 0.05
Reject H0, Conclude Site > Background
P-Value < alpha (0.05)

Appendix E.7B
RFAAP SWMU 50 Total Soil vs Background Statistical Comparisons

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	H:\Risk DB\Radford\SWMUs 50-59\Background Stats\50_ProUCL_input_TS_for BKG.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: Magnesium (mg/kg)(swmu 50 ts)
Background Data: Magnesium (mg/kg)(rfaap bkgrd ts)

Raw Statistics

	Site	Background
Number of Valid Data	28	79
Number of Missing Values	3	0
Number of Non-Detect Data	0	7
Number of Detect Data	28	72
Minimum Non-Detect	N/A	3.8
Maximum Non-Detect	N/A	5
Percent Non detects	0.00%	8.86%
Minimum Detected	312	139
Maximum Detected	20200	58100
Mean of Detected Data	2740	6394
Median of Detected Data	1590	1270
SD of Detected Data	4061	12925

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	0.971
Critical z (0.95)	1.645
P-Value	0.166

Conclusion with Alpha = 0.05
Do Not Reject H0, Conclude Site <= Background
P-Value >= alpha (0.05)

Appendix E.7B
RFAAP SWMU 50 Total Soil vs Background Statistical Comparisons

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Full Data Sets without NDs

User Selected Options	
From File	H:\Risk DB\Radford\SWMUs 50-59\Background Stats\50_ProUCL_input_TS_for BKG.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 (mg/kg)(swmu 50 ts)
Background Data: Manganese (mg/kg)(rfaap bkgrd ts)

Raw Statistics

	Site	Background
Number of Valid Observations	28	79
Number of Missing Values	3	0
Number of Distinct Observations	26	78
Minimum	25.1	16.7
Maximum	1440	2040
Mean	489.5	471.4
Median	373.5	359
SD	422.5	467.1
SE of Mean	79.85	52.55

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Site or AOC <= Mean/Median of Background

Site Rank Sum W-Stat	1570
WMW Test U-Stat	0.404
WMW Critical Value (0.050)	1.645
P-Value	0.343

Conclusion with Alpha = 0.05
Do Not Reject H0, Conclude Site <= Background
P-Value >= alpha (0.05)

Appendix E.7B
RFAAP SWMU 50 Total Soil vs Background Statistical Comparisons

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	H:\Risk DB\Radford\SWMUs 50-59\Background Stats\50_ProUCL_input_TS_for BKG.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: Mercury (mg/kg)(swmu 50 ts)
Background Data: Mercury (mg/kg)(rfaap bkgrd ts)

Raw Statistics

	Site	Background
Number of Valid Data	28	79
Number of Missing Values	3	0
Number of Non-Detect Data	0	61
Number of Detect Data	28	18
Minimum Non-Detect	N/A	0.019
Maximum Non-Detect	N/A	0.06
Percent Non detects	0.00%	77.22%
Minimum Detected	0.012	0.038
Maximum Detected	0.816	1.2
Mean of Detected Data	0.149	0.187
Median of Detected Data	0.105	0.125
SD of Detected Data	0.164	0.259

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	5.36
Critical z (0.95)	1.645
P-Value	4.16E-08

Conclusion with Alpha = 0.05
Reject H0, Conclude Site > Background
P-Value < alpha (0.05)

Appendix E.7B
RFAAP SWMU 50 Total Soil vs Background Statistical Comparisons

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	H:\Risk DB\Radford\SWMUs 50-59\Background Stats\50_ProUCL_input_TS_for BKG.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: Nickel (mg/kg)(swmu 50 ts)
Background Data: Nickel (mg/kg)(rfaap bkgrd ts)

Raw Statistics

	Site	Background
Number of Valid Data	28	79
Number of Missing Values	3	0
Number of Non-Detect Data	0	18
Number of Detect Data	28	61
Minimum Non-Detect	N/A	0.21
Maximum Non-Detect	N/A	1.4
Percent Non detects	0.00%	22.78%
Minimum Detected	4.1	4.6
Maximum Detected	181	94.2
Mean of Detected Data	25.12	17.95
Median of Detected Data	12.1	13.2
SD of Detected Data	42.18	15.68

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	1.584
Critical z (0.95)	1.645
P-Value	0.0566

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site <= Background

P-Value >= alpha (0.05)

Appendix E.7B
RFAAP SWMU 50 Total Soil vs Background Statistical Comparisons

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	H:\Risk DB\Radford\SWMUs 50-59\Background Stats\50_ProUCL_input_TS_for BKG.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: Potassium (mg/kg)(swmu 50 ts)
Background Data: Potassium (mg/kg)(rfaap bkgrd ts)

Raw Statistics

	Site	Background
Number of Valid Data	14	79
Number of Missing Values	17	0
Number of Non-Detect Data	0	12
Number of Detect Data	14	67
Minimum Non-Detect	N/A	201
Maximum Non-Detect	N/A	271
Percent Non detects	0.00%	15.19%
Minimum Detected	465	123
Maximum Detected	2050	10900
Mean of Detected Data	1279	1690
Median of Detected Data	1320	694
SD of Detected Data	430.3	2232

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	2.063
Critical z (0.95)	1.645
P-Value	0.0196

Conclusion with Alpha = 0.05
Reject H0, Conclude Site > Background
P-Value < alpha (0.05)

Appendix E.7B
RFAAP SWMU 50 Total Soil vs Background Statistical Comparisons

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	H:\Risk DB\Radford\SWMUs 50-59\Background Stats\50_ProUCL_input_TS_for BKG.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: Selenium (mg.kg)(swmu 50 ts)
Background Data: Selenium (mg.kg)(rfaap bkgrd ts)

Raw Statistics

	Site	Background
Number of Valid Data	27	79
Number of Missing Values	4	0
Number of Non-Detect Data	13	77
Number of Detect Data	14	2
Minimum Non-Detect	0.15	0.14
Maximum Non-Detect	32	0.93
Percent Non detects	48.15%	97.47%
Minimum Detected	0.57	0.64
Maximum Detected	13.5	0.77
Mean of Detected Data	6.519	0.705
Median of Detected Data	6.15	0.705
SD of Detected Data	2.847	0.0919

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	6.857
Critical z (0.95)	1.645
P-Value	3.52E-12

Conclusion with Alpha = 0.05
Reject H0, Conclude Site > Background
P-Value < alpha (0.05)

Appendix E.7B
RFAAP SWMU 50 Total Soil vs Background Statistical Comparisons

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	H:\Risk DB\Radford\SWMUs 50-59\Background Stats\50_ProUCL_input_TS_for BKG.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: Silver (mg/kg)(swmu 50 ts)
Background Data: Silver (mg/kg)(rfaap bkgrd ts)

Raw Statistics

	Site	Background
Number of Valid Data	28	79
Number of Missing Values	3	0
Number of Non-Detect Data	20	78
Number of Detect Data	8	1
Minimum Non-Detect	0.047	0.16
Maximum Non-Detect	1.65	0.42
Percent Non detects	71.43%	98.73%
Minimum Detected	0.069	4.3
Maximum Detected	1.1	4.3
Mean of Detected Data	0.529	4.3
Median of Detected Data	0.595	4.3
SD of Detected Data	0.388	N/A

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	3.405
Critical z (0.95)	1.645
P-Value	3.31E-04

Conclusion with Alpha = 0.05
Reject H0, Conclude Site > Background
P-Value < alpha (0.05)

Appendix E.7B
RFAAP SWMU 50 Total Soil vs Background Statistical Comparisons

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	H:\Risk DB\Radford\SWMUs 50-59\Background Stats\50_ProUCL_input_TS_for BKG.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: Sodium (mg/kg)(swmu 50 ts)
Background Data: Sodium (mg/kg)(rfaap bkgrd ts)

Raw Statistics

	Site	Background
Number of Valid Data	28	79
Number of Missing Values	3	0
Number of Non-Detect Data	22	73
Number of Detect Data	6	6
Minimum Non-Detect	4.2	10.8
Maximum Non-Detect	67	25.9
Percent Non detects	78.57%	92.41%
Minimum Detected	35.2	114
Maximum Detected	78.7	151
Mean of Detected Data	64.8	131.7
Median of Detected Data	68.7	127
SD of Detected Data	15.87	14.76

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	1.781
Critical z (0.95)	1.645
P-Value	0.0374

Conclusion with Alpha = 0.05
Reject H0, Conclude Site > Background
P-Value < alpha (0.05)

Appendix E.7B
RFAAP SWMU 50 Total Soil vs Background Statistical Comparisons

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	H:\Risk DB\Radford\SWMUs 50-59\Background Stats\50_ProUCL_input_TS_for BKG.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: Thallium (mg/kg)(swmu 50 ts)
Background Data: Thallium (mg/kg)(rfaap bkgrd ts)

Raw Statistics

	Site	Background
Number of Valid Data	21	79
Number of Missing Values	10	0
Number of Non-Detect Data	21	64
Number of Detect Data	0	15
Minimum Non-Detect	0.595	0.13
Maximum Non-Detect	13	0.45
Percent Non detects	100.00%	81.01%
Minimum Detected	N/A	1.3
Maximum Detected	N/A	5
Mean of Detected Data	N/A	2.527
Median of Detected Data	N/A	2.2
SD of Detected Data	N/A	0.932

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	-0.404
Critical z (0.95)	1.645
P-Value	0.657

Conclusion with Alpha = 0.05
Do Not Reject H0, Conclude Site <= Background
P-Value >= alpha (0.05)

Appendix E.7B
RFAAP SWMU 50 Total Soil vs Background Statistical Comparisons

t-Test Site vs Background Comparison for Full Data Sets without NDs

User Selected Options
From File H:\Risk DB\Radford\SWMUs 50-59\Background Stats\50_ProUCL_input_TS_for BKG.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 (mg/kg)(swmu 50 ts)
Background Data: Vanadium (mg/kg)(rfaap bkgrd ts)

Raw Statistics

	Site	Background
Number of Valid Observations	28	79
Number of Missing Values	3	0
Number of Distinct Observations	28	76
Minimum	6.4	12.2
Maximum	84.2	114
Mean	36.42	45.84
Median	36.85	41.4
SD	20.29	20.38
SE of Mean	3.835	2.293

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)	105	-2.104	1.659	0.981
Satterthwaite (Unequal Variance)	47.7	-2.109	1.677	0.98

Pooled SD 20.359
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
78	27	1.009	1.019

Conclusion with Alpha = 0.05
* Two variances appear to be equal

Appendix E.7B
RFAAP SWMU 50 Total Soil vs Background Statistical Comparisons

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Full Data Sets without NDs

User Selected Options	
From File	H:\Risk DB\Radford\SWMUs 50-59\Background Stats\50_ProUCL_input_TS_for BKG.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 (mg/kg)(swmu 50 ts)
Background Data: Zinc (mg/kg)(rfaap bkgrd ts)

Raw Statistics

	Site	Background
Number of Valid Observations	28	79
Number of Missing Values	3	0
Number of Distinct Observations	28	76
Minimum	5	4.7
Maximum	93.3	598
Mean	41.28	54.94
Median	33.55	30.2
SD	23.29	87.15
SE of Mean	4.401	9.805

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Site or AOC <= Mean/Median of Background

Site Rank Sum W-Stat	1632
WMW Test U-Stat	0.843
WMW Critical Value (0.050)	1.645
P-Value	0.2

Conclusion with Alpha = 0.05
Do Not Reject H0, Conclude Site <= Background
P-Value >= alpha (0.05)

Appendix E-8

Background Comparisons

– ProUCL 4.0 Output –

SWMU 59

APPENDIX E.8A

Goodness-of-Fit Test Statistics for Data Sets with Non-Detects

User Selected Options

From File	H:\Risk DB\Radford\SWMUs 50-59\Background Stats\59_ProUCL_input_SS_for BKG.wst
Full Precision	OFF
Confidence Coefficient	0.95

Aluminum (mg/kg) (rfaap bkgrd-ss)

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	28	0	28	28	0	0.00%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Full: no NDs)	28	3620	20100	8300	6705	4279

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Full: no NDs)	4.541	4.078	1828	8.91	0.477	0.0535

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.935	0.935	0.935	0.935

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Full: no NDs)	0.871	0.924	Data Not Normal
Lilliefors (Full: no NDs)	0.208	0.167	Data Not Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.982	0.982	0.982	0.982

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Full: no NDs)	0.741	0.749	
Kolmogorov-Smirnov (Full: no NDs)	0.171	0.166	Data appear Approximate Gamma Distribution

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.98	0.98	0.98	0.98

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Full: no NDs)	0.948	0.924	Data Appear Lognormal
Lilliefors (Full: no NDs)	0.142	0.167	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Aluminum (mg/kg) (rfaap swmu 59 ss)

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	16	0	16	16	0	0.00%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Full: no NDs)	16	3120	17800	10060	10900	4807

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Full: no NDs)	3.854	3.173	2610	9.081	0.574	0.0632

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.98	0.98	0.98	0.98

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)

Shapiro-Wilks (Full: no NDs)	0.941	0.887	Data Appear Normal
Lilliefors (Full: no NDs)	0.161	0.222	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.955	0.955	0.955	0.955

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Full: no NDs)	0.492	0.742	
Kolmogorov-Smirnov (Full: no NDs)	0.163	0.216	Data Appear Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.959	0.959	0.959	0.959

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Full: no NDs)	0.904	0.887	Data Appear Lognormal
Lilliefors (Full: no NDs)	0.178	0.222	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Antimony (mg/kg) (rfaap bkgrd-ss)

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	28	14	14	0	14	100.00%

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable Antimony (mg/kg) (rfaap bkgrd-ss) was not processed!

Antimony (mg/kg) (rfaap swmu 59 ss)

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	16	0	16	1	15	93.75%

Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set!
It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable Antimony (mg/kg) (rfaap swmu 59 ss) was not processed!

Arsenic (mg/kg) (rfaap bkgrd-ss)

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	28	0	28	28	0	0.00%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Full: no NDs)	28	1.5	10.2	3.732	2.75	2.33

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Full: no NDs)	3.494	3.143	1.068	1.167	0.532	0.456

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.898	0.898	0.898	0.898

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)

Shapiro-Wilks (Full: no NDs)	0.803	0.924	Data Not Normal
Lilliefors (Full: no NDs)	0.203	0.167	Data Not Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.969	0.969	0.969	0.969

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Full: no NDs)	1.02	0.752	
Kolmogorov-Smirnov (Full: no NDs)	0.165	0.166	Data appear Approximate Gamma Distribution

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.972	0.972	0.972	0.972

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Full: no NDs)	0.932	0.924	Data Appear Lognormal
Lilliefors (Full: no NDs)	0.138	0.167	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Arsenic (mg/kg) (rfaap swmu 59 ss)

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	16	0	16	16	0	0.00%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Full: no NDs)	16	1.6	37	8.506	3.72	11.22

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Full: no NDs)	1.02	0.87	8.339	1.576	0.983	0.624

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.783	0.783	0.783	0.783

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Full: no NDs)	0.618	0.887	Data Not Normal
Lilliefors (Full: no NDs)	0.415	0.222	Data Not Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.933	0.933	0.933	0.933

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Full: no NDs)	1.827	0.763	
Kolmogorov-Smirnov (Full: no NDs)	0.333	0.221	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.915	0.915	0.915	0.915

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Full: no NDs)	0.83	0.887	Data Not Lognormal
Lilliefors (Full: no NDs)	0.253	0.222	Data Not Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Barium (mg/kg) (rfaap bkgrd-ss)

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs

Raw Statistics	28	0	28	24	4	14.29%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	4	0.36	1	0.683	0.685	0.367
Statistics (Detects Only)	24	23.4	174	75.55	61.85	43.2
Statistics (All: NDs treated as DL value)	28	0.36	174	64.85	58.65	47.97
Statistics (All: NDs treated as DL/2 value)	28	0.18	174	64.8	58.65	48.04
Statistics (Normal ROS Estimated Data)	28	-33.62	174	61.51	58.65	53.13
Statistics (Gamma ROS Estimated Data)	28	1E-09	174	66.05	58.65	46.43
Statistics (Lognormal ROS Estimated Data)	28	14.2	174	67.13	58.65	45.07

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	3.215	2.894	23.5	4.161	0.597	0.144
Statistics (NDs = DL)	0.867	0.798	74.79	3.495	1.762	0.504
Statistics (NDs = DL/2)	0.769	0.711	84.25	3.396	1.997	0.588
Statistics (Gamma ROS Estimates)	0.566	0.529	116.7	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	3.967	0.734	0.185

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.963	0.976	0.976	0.989

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.917	0.916	Data Appear Normal
Lilliefors (Detects Only)	0.192	0.181	Data Not Normal
Shapiro-Wilks (NDs = DL)	0.941	0.924	Data Appear Normal
Lilliefors (NDs = DL)	0.153	0.167	Data Appear Normal
Shapiro-Wilks (NDs = DL/2)	0.941	0.924	Data Appear Normal
Lilliefors (NDs = DL/2)	0.153	0.167	Data Appear Normal
Shapiro-Wilks (Normal ROS Estimates)	0.971	0.924	Data Appear Normal
Lilliefors (Normal ROS Estimates)	0.127	0.167	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.986	0.947	0.939	0.927

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.354	0.751	
Kolmogorov-Smirnov (Detects Only)	0.127	0.179	Data Appear Gamma Distributed
Anderson-Darling (NDs = DL)	1.516	0.78	
Kolmogorov-Smirnov (NDs = DL)	0.191	0.171	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	1.873	0.784	
Kolmogorov-Smirnov (NDs = DL/2)	0.217	0.172	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	3.326	0.804	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.279	0.174	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.987	0.853	0.833	0.985

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.959	0.916	Data Appear Lognormal
Lilliefors (Detects Only)	0.104	0.181	Data Appear Lognormal
Shapiro-Wilks (NDs = DL)	0.725	0.924	Data Not Lognormal
Lilliefors (NDs = DL)	0.28	0.167	Data Not Lognormal
Shapiro-Wilks (NDs = DL/2)	0.691	0.924	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.309	0.167	Data Not Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.955	0.924	Data Appear Lognormal
Lilliefors (Lognormal ROS Estimates)	0.11	0.167	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Barium (mg/kg) (rfaap swmu 59 ss)

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	16	0	16	16	0	0.00%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Full: no NDs)	16	57.1	190	116.3	97.2	48.3

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Full: no NDs)	6.152	5.04	18.91	4.673	0.425	0.091

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.949	0.949	0.949	0.949

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Full: no NDs)	0.878	0.887	Data Not Normal
Lilliefors (Full: no NDs)	0.197	0.222	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.949	0.949	0.949	0.949

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Full: no NDs)	0.672	0.741	
Kolmogorov-Smirnov (Full: no NDs)	0.156	0.216	Data Appear Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.963	0.963	0.963	0.963

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Full: no NDs)	0.904	0.887	Data Appear Lognormal
Lilliefors (Full: no NDs)	0.141	0.222	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Beryllium (mg/kg) (rfaap bkgrd-ss)

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	28	0	28	15	13	46.43%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	13	0.022	0.03	0.0278	0.03	0.00339
Statistics (Detects Only)	15	0.61	1.5	0.887	0.87	0.246
Statistics (All: NDs treated as DL value)	28	0.022	1.5	0.488	0.615	0.471
Statistics (All: NDs treated as DL/2 value)	28	0.011	1.5	0.481	0.615	0.477
Statistics (Normal ROS Estimated Data)	28	-0.178	1.5	0.577	0.615	0.402
Statistics (Gamma ROS Estimated Data)	28	0.498	1.5	0.87	0.879	0.206
Statistics (Lognormal ROS Estimated Data)	28	0.276	1.5	0.674	0.615	0.297

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	15.44	13.81	0.0574	-0.153	0.26	-1.698
Statistics (NDs = DL)	0.6	0.559	0.814	-1.748	1.757	-1.005
Statistics (NDs = DL/2)	0.478	0.45	1.008	-2.07	2.107	-1.018
Statistics (Gamma ROS Estimates)	19.32	17.28	0.045	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-0.483	0.427	-0.884

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.952	0.917	0.916	0.993

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.908	0.881	Data Appear Normal
Lilliefors (Detects Only)	0.151	0.229	Data Appear Normal
Shapiro-Wilks (NDs = DL)	0.826	0.924	Data Not Normal
Lilliefors (NDs = DL)	0.299	0.167	Data Not Normal
Shapiro-Wilks (NDs = DL/2)	0.823	0.924	Data Not Normal
Lilliefors (NDs = DL/2)	0.3	0.167	Data Not Normal
Shapiro-Wilks (Normal ROS Estimates)	0.984	0.924	Data Appear Normal
Lilliefors (Normal ROS Estimates)	0.0906	0.167	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.978	0.872	0.849	0.982

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.307	0.736	
Kolmogorov-Smirnov (Detects Only)	0.159	0.221	Data Appear Gamma Distributed
Anderson-Darling (NDs = DL)	3.179	0.8	
Kolmogorov-Smirnov (NDs = DL)	0.312	0.174	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	3.391	0.815	
Kolmogorov-Smirnov (NDs = DL/2)	0.314	0.175	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	0.229	0.745	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.102	0.165	Data Appear Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.98	0.868	0.86	0.994

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.953	0.881	Data Appear Lognormal
Lilliefors (Detects Only)	0.15	0.229	Data Appear Lognormal
Shapiro-Wilks (NDs = DL)	0.731	0.924	Data Not Lognormal
Lilliefors (NDs = DL)	0.306	0.167	Data Not Lognormal
Shapiro-Wilks (NDs = DL/2)	0.715	0.924	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.308	0.167	Data Not Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.981	0.924	Data Appear Lognormal
Lilliefors (Lognormal ROS Estimates)	0.0909	0.167	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Beryllium (mg/kg) (rfaap swmu 59 ss)

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	16	1	15	15	0	0.00%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Full: no NDs)	15	0.493	1.3	0.778	0.63	0.266

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Full: no NDs)	10.07	8.098	0.0773	-0.302	0.323	-1.07

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.942	0.942	0.942	0.942

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Full: no NDs)	0.874	0.881	Data Not Normal
Lilliefors (Full: no NDs)	0.244	0.229	Data Not Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.968	0.968	0.968	0.968

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Full: no NDs)	0.629	0.737	
Kolmogorov-Smirnov (Full: no NDs)	0.239	0.222	Data appear Approximate Gamma Distribution

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.965	0.965	0.965	0.965

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Full: no NDs)	0.913	0.881	Data Appear Lognormal
Lilliefors (Full: no NDs)	0.224	0.229	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Calcium (mg/kg) (rfaap bkgrd-ss)

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	28	0	28	23	5	17.86%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	5	4.6	6.6	5.12	4.8	0.844
Statistics (Detects Only)	23	116	7340	1197	885	1440
Statistics (All: NDs treated as DL value)	28	4.6	7340	983.9	761.5	1380
Statistics (All: NDs treated as DL/2 value)	28	2.3	7340	983.5	761.5	1380
Statistics (Normal ROS Estimated Data)	28	-1605	7340	751.5	761.5	1625
Statistics (Gamma ROS Estimated Data)	28	1E-09	7340	984.5	761.5	1380
Statistics (Lognormal ROS Estimated Data)	28	104.3	7340	1007	761.5	1364

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	1.506	1.368	794.6	6.72	0.84	0.125
Statistics (NDs = DL)	0.575	0.537	1712	5.81	2.128	0.366
Statistics (NDs = DL/2)	0.523	0.491	1879	5.686	2.383	0.419
Statistics (Gamma ROS Estimates)	0.178	0.183	5519	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	6.391	1.047	0.164

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.724	0.745	0.746	0.855

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.553	0.914	Data Not Normal
Lilliefors (Detects Only)	0.275	0.185	Data Not Normal
Shapiro-Wilks (NDs = DL)	0.587	0.924	Data Not Normal
Lilliefors (NDs = DL)	0.244	0.167	Data Not Normal
Shapiro-Wilks (NDs = DL/2)	0.587	0.924	Data Not Normal
Lilliefors (NDs = DL/2)	0.244	0.167	Data Not Normal
Shapiro-Wilks (Normal ROS Estimates)	0.761	0.924	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.207	0.167	Data Not Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.866	0.916	0.919	0.944

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.694	0.76	
Kolmogorov-Smirnov (Detects Only)	0.152	0.185	Data Appear Gamma Distributed
Anderson-Darling (NDs = DL)	1.232	0.803	
Kolmogorov-Smirnov (NDs = DL)	0.192	0.174	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	1.47	0.808	

Kolmogorov-Smirnov (NDs = DL/2)	0.211	0.175	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	6.572	0.907	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.417	0.184	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.974	0.886	0.869	0.976

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.967	0.914	Data Appear Lognormal
Lilliefors (Detects Only)	0.0979	0.185	Data Appear Lognormal
Shapiro-Wilks (NDs = DL)	0.779	0.924	Data Not Lognormal
Lilliefors (NDs = DL)	0.279	0.167	Data Not Lognormal
Shapiro-Wilks (NDs = DL/2)	0.75	0.924	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.296	0.167	Data Not Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.949	0.924	Data Appear Lognormal
Lilliefors (Lognormal ROS Estimates)	0.114	0.167	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Calcium (mg/kg) (rfaap swmu 59 ss)

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	16	0	16	16	0	0.00%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Full: no NDs)	16	192	2680	1107	833.5	795.8

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Full: no NDs)	2.157	1.794	513.4	6.76	0.751	0.111

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.938	0.938	0.938	0.938

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Full: no NDs)	0.869	0.887	Data Not Normal
Lilliefors (Full: no NDs)	0.191	0.222	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.976	0.976	0.976	0.976

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Full: no NDs)	0.331	0.749	
Kolmogorov-Smirnov (Full: no NDs)	0.132	0.218	Data Appear Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.986	0.986	0.986	0.986

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Full: no NDs)	0.964	0.887	Data Appear Lognormal
Lilliefors (Full: no NDs)	0.0991	0.222	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Cadmium (mg/kg) (rfaap bkgrd-ss)

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	28	0	28	2	26	92.86%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	26	N/A	N/A	N/A	N/A	N/A
Statistics (Detects Only)	2	N/A	N/A	N/A	N/A	N/A
Statistics (All: NDs treated as DL value)	28	N/A	N/A	N/A	N/A	N/A
Statistics (All: NDs treated as DL/2 value)	28	N/A	N/A	N/A	N/A	N/A
Statistics (Normal ROS Estimated Data)	28	N/A	N/A	N/A	N/A	N/A

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	N/A	N/A	N/A	N/A

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	N/A	N/A	
Lilliefors (Detects Only)	N/A	N/A	
Shapiro-Wilks (NDs = DL)	N/A	N/A	
Lilliefors (NDs = DL)	N/A	N/A	
Shapiro-Wilks (NDs = DL/2)	N/A	N/A	
Lilliefors (NDs = DL/2)	N/A	N/A	
Shapiro-Wilks (Normal ROS Estimates)	N/A	N/A	
Lilliefors (Normal ROS Estimates)	N/A	N/A	

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	N/A	N/A	N/A	N/A

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	N/A	N/A	
Kolmogorov-Smirnov (Detects Only)	N/A	N/A	
Anderson-Darling (NDs = DL)	N/A	N/A	
Kolmogorov-Smirnov (NDs = DL)	N/A	N/A	
Anderson-Darling (NDs = DL/2)	N/A	N/A	
Kolmogorov-Smirnov (NDs = DL/2)	N/A	N/A	
Anderson-Darling (Gamma ROS Estimates)	N/A	N/A	
Kolmogorov-Smirnov (Gamma ROS Est.)	N/A	N/A	

Note: Substitution methods such as DL or DL/2 are not recommended.

Cadmium (mg/kg) (rfaap swmu 59 ss)

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	16	0	16	2	14	87.50%

Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set!
It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable Cadmium (mg/kg) (rfaap swmu 59 ss) was not processed!

Chromium (mg/kg) (rfaap bkgrd-ss)

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	28	0	28	28	0	0.00%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Full: no NDs)	28	6.3	53.3	21.09	22.4	10.5

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Full: no NDs)	4.111	3.695	5.13	2.922	0.529	0.181

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS

Correlation Coefficient R	0.956	0.956	0.956	0.956

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Full: no NDs)	0.92	0.924	Data Not Normal
Lilliefors (Full: no NDs)	0.11	0.167	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.974	0.974	0.974	0.974

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Full: no NDs)	0.612	0.75	
Kolmogorov-Smirnov (Full: no NDs)	0.145	0.166	Data Appear Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.974	0.974	0.974	0.974

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Full: no NDs)	0.946	0.924	Data Appear Lognormal
Lilliefors (Full: no NDs)	0.17	0.167	Data Not Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Chromium (mg/kg) (rfaap swmu 59 ss)

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	16	0	16	16	0	0.00%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Full: no NDs)	16	7.5	28.8	16.26	16.95	6.487

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Full: no NDs)	6.252	5.121	2.601	2.707	0.43	0.159

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.967	0.967	0.967	0.967

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Full: no NDs)	0.923	0.887	Data Appear Normal
Lilliefors (Full: no NDs)	0.164	0.222	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.964	0.964	0.964	0.964

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Full: no NDs)	0.637	0.741	
Kolmogorov-Smirnov (Full: no NDs)	0.176	0.216	Data Appear Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.961	0.961	0.961	0.961

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Full: no NDs)	0.909	0.887	Data Appear Lognormal
Lilliefors (Full: no NDs)	0.179	0.222	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Cobalt (mg/kg) (rfaap bkgrd-ss)

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	28	0	28	20	8	28.57%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	8	0.11	0.75	0.501	0.72	0.319
Statistics (Detects Only)	20	5.9	45.4	15.95	12.1	10.07
Statistics (All: NDs treated as DL value)	28	0.11	45.4	11.53	10.15	11.04
Statistics (All: NDs treated as DL/2 value)	28	0.055	45.4	11.46	10.15	11.11
Statistics (Normal ROS Estimated Data)	28	-10.02	45.4	9.494	10.15	13.45
Statistics (Gamma ROS Estimated Data)	28	3.774	45.4	13.39	10.15	9.473
Statistics (Lognormal ROS Estimated Data)	28	3.134	45.4	12.48	10.15	10.13

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	3.439	3.095	4.636	2.617	0.545	0.208
Statistics (NDs = DL)	0.701	0.65	16.45	1.583	1.793	1.132
Statistics (NDs = DL/2)	0.588	0.549	19.49	1.385	2.092	1.51
Statistics (Gamma ROS Estimates)	2.851	2.569	4.697	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	2.25	0.749	0.333

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.901	0.93	0.93	0.968

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.819	0.905	Data Not Normal
Lilliefors (Detects Only)	0.236	0.198	Data Not Normal
Shapiro-Wilks (NDs = DL)	0.867	0.924	Data Not Normal
Lilliefors (NDs = DL)	0.158	0.167	Data Appear Normal
Shapiro-Wilks (NDs = DL/2)	0.867	0.924	Data Not Normal
Lilliefors (NDs = DL/2)	0.156	0.167	Data Appear Normal
Shapiro-Wilks (Normal ROS Estimates)	0.936	0.924	Data Appear Normal
Lilliefors (Normal ROS Estimates)	0.128	0.167	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.973	0.98	0.973	0.967

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.596	0.747	
Kolmogorov-Smirnov (Detects Only)	0.167	0.195	Data Appear Gamma Distributed
Anderson-Darling (NDs = DL)	1.122	0.79	
Kolmogorov-Smirnov (NDs = DL)	0.195	0.172	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	1.507	0.801	
Kolmogorov-Smirnov (NDs = DL/2)	0.221	0.174	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	0.785	0.754	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.155	0.167	Data appear Approximate Gamma Distribution

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.982	0.918	0.903	0.983

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.96	0.905	Data Appear Lognormal
Lilliefors (Detects Only)	0.132	0.198	Data Appear Lognormal
Shapiro-Wilks (NDs = DL)	0.831	0.924	Data Not Lognormal
Lilliefors (NDs = DL)	0.257	0.167	Data Not Lognormal
Shapiro-Wilks (NDs = DL/2)	0.802	0.924	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.288	0.167	Data Not Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.954	0.924	Data Appear Lognormal

Lilliefors (Lognormal ROS Estimates)	0.126	0.167	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Cobalt (mg/kg) (rfaap swmu 59 ss)

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	16	0	16	16	0	0.00%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Full: no NDs)	16	2.9	10.1	6.107	5.86	2.188

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Full: no NDs)	7.979	6.525	0.765	1.745	0.379	0.217

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.979	0.979	0.979	0.979

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Full: no NDs)	0.948	0.887	Data Appear Normal
Lilliefors (Full: no NDs)	0.118	0.222	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.982	0.982	0.982	0.982

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Full: no NDs)	0.265	0.74	
Kolmogorov-Smirnov (Full: no NDs)	0.109	0.215	Data Appear Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.979	0.979	0.979	0.979

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Full: no NDs)	0.947	0.887	Data Appear Lognormal
Lilliefors (Full: no NDs)	0.133	0.222	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Copper (mg/kg) (rfaap bkgrd-ss)

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	28	0	28	26	2	7.14%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	2	0.17	0.17	0.17	0.17	0
Statistics (Detects Only)	26	2.2	13.6	6.919	5.35	3.696
Statistics (All: NDs treated as DL value)	28	0.17	13.6	6.437	5.2	3.973
Statistics (All: NDs treated as DL/2 value)	28	0.085	13.6	6.431	5.2	3.983
Statistics (Normal ROS Estimated Data)	28	-2.356	13.6	6.306	5.2	4.214
Statistics (Gamma ROS Estimated Data)	28	1E-09	13.6	6.44	5.2	3.969
Statistics (Lognormal ROS Estimated Data)	28	1.502	13.6	6.545	5.2	3.814

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	3.738	3.361	1.851	1.795	0.544	0.303
Statistics (NDs = DL)	1.699	1.541	3.788	1.54	1.072	0.696
Statistics (NDs = DL/2)	1.493	1.357	4.307	1.49	1.234	0.828
Statistics (Gamma ROS Estimates)	0.633	0.589	10.17	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	1.703	0.623	0.366

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.947	0.966	0.967	0.973

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.88	0.92	Data Not Normal
Lilliefors (Detects Only)	0.206	0.174	Data Not Normal
Shapiro-Wilks (NDs = DL)	0.919	0.924	Data Not Normal
Lilliefors (NDs = DL)	0.181	0.167	Data Not Normal
Shapiro-Wilks (NDs = DL/2)	0.92	0.924	Data Not Normal
Lilliefors (NDs = DL/2)	0.18	0.167	Data Not Normal
Shapiro-Wilks (Normal ROS Estimates)	0.939	0.924	Data Appear Normal
Lilliefors (Normal ROS Estimates)	0.164	0.167	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.96	0.946	0.941	0.888

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.717	0.749	
Kolmogorov-Smirnov (Detects Only)	0.151	0.172	Data Appear Gamma Distributed
Anderson-Darling (NDs = DL)	0.918	0.761	
Kolmogorov-Smirnov (NDs = DL)	0.152	0.168	Data appear Approximate Gamma Distribution
Anderson-Darling (NDs = DL/2)	1.191	0.763	
Kolmogorov-Smirnov (NDs = DL/2)	0.177	0.168	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	3.942	0.797	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.345	0.173	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.977	0.861	0.825	0.983

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.939	0.92	Data Appear Lognormal
Lilliefors (Detects Only)	0.135	0.174	Data Appear Lognormal
Shapiro-Wilks (NDs = DL)	0.748	0.924	Data Not Lognormal
Lilliefors (NDs = DL)	0.222	0.167	Data Not Lognormal
Shapiro-Wilks (NDs = DL/2)	0.69	0.924	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.258	0.167	Data Not Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.952	0.924	Data Appear Lognormal
Lilliefors (Lognormal ROS Estimates)	0.118	0.167	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Copper (mg/kg) (rfaap swmu 59 ss)

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	16	0	16	16	0	0.00%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Full: no NDs)	16	3.3	15.3	10.53	10.75	3.281

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Full: no NDs)	8.681	7.095	1.213	2.295	0.384	0.167

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.983	0.983	0.983	0.983

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Full: no NDs)	0.964	0.887	Data Appear Normal
Lilliefors (Full: no NDs)	0.122	0.222	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.958	0.958	0.958	0.958

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Full: no NDs)	0.398	0.74	
Kolmogorov-Smirnov (Full: no NDs)	0.167	0.215	Data Appear Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.926	0.926	0.926	0.926

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Full: no NDs)	0.868	0.887	Data Not Lognormal
Lilliefors (Full: no NDs)	0.183	0.222	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Iron (mg/kg) (rfaap bkgrd-ss)

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	28	0	28	28	0	0.00%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Full: no NDs)	28	7250	63000	20108	19750	11869

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Full: no NDs)	3.411	3.069	5895	9.755	0.57	0.0584

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.912	0.912	0.912	0.912

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Full: no NDs)	0.846	0.924	Data Not Normal
Lilliefors (Full: no NDs)	0.139	0.167	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.961	0.961	0.961	0.961

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Full: no NDs)	0.612	0.752	
Kolmogorov-Smirnov (Full: no NDs)	0.151	0.166	Data Appear Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.97	0.97	0.97	0.97

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Full: no NDs)	0.932	0.924	Data Appear Lognormal
Lilliefors (Full: no NDs)	0.153	0.167	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Iron (mg/kg) (rfaap swmu 59 ss)

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	16	0	16	16	0	0.00%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Full: no NDs)	16	4200	24400	14234	15300	6348

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Full: no NDs)	4.291	3.528	3318	9.442	0.545	0.0578

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.973	0.973	0.973	0.973

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Full: no NDs)	0.932	0.887	Data Appear Normal
Lilliefors (Full: no NDs)	0.187	0.222	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.939	0.939	0.939	0.939

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Full: no NDs)	0.666	0.742	
Kolmogorov-Smirnov (Full: no NDs)	0.204	0.216	Data Appear Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.95	0.95	0.95	0.95

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Full: no NDs)	0.891	0.887	Data Appear Lognormal
Lilliefors (Full: no NDs)	0.196	0.222	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Lead (mg/kg) (rfaap bkgrd-ss)

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	28	0	28	28	0	0.00%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Full: no NDs)	28	8.9	225	26.96	15.15	41.34

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Full: no NDs)	1.456	1.324	18.52	2.913	0.702	0.241

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.619	0.619	0.619	0.619

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Full: no NDs)	0.416	0.924	Data Not Normal
Lilliefors (Full: no NDs)	0.375	0.167	Data Not Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.807	0.807	0.807	0.807

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Full: no NDs)	3.163	0.764	
Kolmogorov-Smirnov (Full: no NDs)	0.253	0.169	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.886	0.886	0.886	0.886

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Full: no NDs)	0.798	0.924	Data Not Lognormal
Lilliefors (Full: no NDs)	0.192	0.167	Data Not Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Lead (mg/kg) (rfaap swmu 59 ss)

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	16	0	16	16	0	0.00%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Full: no NDs)	16	5.37	30.9	14.84	15.2	7.583

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Full: no NDs)	4.02	3.308	3.692	2.568	0.538	0.21

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.971	0.971	0.971	0.971

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Full: no NDs)	0.933	0.887	Data Appear Normal
Lilliefors (Full: no NDs)	0.18	0.222	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.988	0.988	0.988	0.988

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Full: no NDs)	0.316	0.742	
Kolmogorov-Smirnov (Full: no NDs)	0.159	0.216	Data Appear Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.984	0.984	0.984	0.984

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Full: no NDs)	0.954	0.887	Data Appear Lognormal
Lilliefors (Full: no NDs)	0.17	0.222	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Magnesium (mg/kg) (rfaap bkgrd-ss)

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	28	0	28	25	3	10.71%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	3	4.7	5	4.833	4.8	0.153
Statistics (Detects Only)	25	158	20400	2498	913	4334
Statistics (All: NDs treated as DL value)	28	4.7	20400	2231	741	4161
Statistics (All: NDs treated as DL/2 value)	28	2.35	20400	2230	741	4161
Statistics (Normal ROS Estimated Data)	28	-5148	20400	1678	741	4743
Statistics (Gamma ROS Estimated Data)	28	1E-09	20400	2230	741	4161
Statistics (Lognormal ROS Estimated Data)	28	56.13	20400	2236	741	4158

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	0.694	0.643	3600	6.951	1.272	0.183

Statistics (NDs = DL)	0.479	0.451	4657	6.375	2.075	0.325
Statistics (NDs = DL/2)	0.457	0.432	4879	6.301	2.257	0.358
Statistics (Gamma ROS Estimates)	0.198	0.201	11267	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	6.638	1.512	0.228

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.731	0.721	0.721	0.836

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.558	0.918	Data Not Normal
Lilliefors (Detects Only)	0.303	0.177	Data Not Normal
Shapiro-Wilks (NDs = DL)	0.546	0.924	Data Not Normal
Lilliefors (NDs = DL)	0.299	0.167	Data Not Normal
Shapiro-Wilks (NDs = DL/2)	0.546	0.924	Data Not Normal
Lilliefors (NDs = DL/2)	0.299	0.167	Data Not Normal
Shapiro-Wilks (Normal ROS Estimates)	0.729	0.924	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.267	0.167	Data Not Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.946	0.959	0.961	0.987

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	1.247	0.789	
Kolmogorov-Smirnov (Detects Only)	0.183	0.182	Data Not Gamma Distributed
Anderson-Darling (NDs = DL)	0.674	0.815	
Kolmogorov-Smirnov (NDs = DL)	0.131	0.175	Data Appear Gamma Distributed
Anderson-Darling (NDs = DL/2)	0.681	0.82	
Kolmogorov-Smirnov (NDs = DL/2)	0.141	0.176	Data Appear Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	3.847	0.898	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.366	0.183	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.978	0.943	0.925	0.99

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.95	0.918	Data Appear Lognormal
Lilliefors (Detects Only)	0.107	0.177	Data Appear Lognormal
Shapiro-Wilks (NDs = DL)	0.889	0.924	Data Not Lognormal
Lilliefors (NDs = DL)	0.195	0.167	Data Not Lognormal
Shapiro-Wilks (NDs = DL/2)	0.856	0.924	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.22	0.167	Data Not Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.973	0.924	Data Appear Lognormal
Lilliefors (Lognormal ROS Estimates)	0.0849	0.167	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Magnesium (mg/kg) (rfaap swmu 59 ss)

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	16	0	16	16	0	0.00%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Full: no NDs)	16	227	2270	954.3	566	700.7

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Full: no NDs)	1.895	1.582	503.5	6.574	0.804	0.122

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.936	0.936	0.936	0.936

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Full: no NDs)	0.858	0.887	Data Not Normal
Lilliefors (Full: no NDs)	0.251	0.222	Data Not Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.953	0.953	0.953	0.953

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Full: no NDs)	0.803	0.751	
Kolmogorov-Smirnov (Full: no NDs)	0.191	0.218	Data appear Approximate Gamma Distribution

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.959	0.959	0.959	0.959

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Full: no NDs)	0.898	0.887	Data Appear Lognormal
Lilliefors (Full: no NDs)	0.187	0.222	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Manganese (mg/kg) (rfaap bkgrd-ss)

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	28	0	28	28	0	0.00%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Full: no NDs)	28	43	2040	695.9	490	591.5

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Full: no NDs)	1.442	1.311	482.6	6.16	0.971	0.158

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.923	0.923	0.923	0.923

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Full: no NDs)	0.84	0.924	Data Not Normal
Lilliefors (Full: no NDs)	0.197	0.167	Data Not Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.971	0.971	0.971	0.971

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Full: no NDs)	0.306	0.764	
Kolmogorov-Smirnov (Full: no NDs)	0.102	0.169	Data Appear Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.983	0.983	0.983	0.983

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Full: no NDs)	0.962	0.924	Data Appear Lognormal
Lilliefors (Full: no NDs)	0.106	0.167	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Manganese (mg/kg) (rfaap swmu 59 ss)

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	16	0	16	16	0	0.00%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Full: no NDs)	16	67.95	3630	614.7	282.5	995.3

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Full: no NDs)	0.867	0.746	709	5.744	1.048	0.182

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.717	0.717	0.717	0.717

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Full: no NDs)	0.532	0.887	Data Not Normal
Lilliefors (Full: no NDs)	0.432	0.222	Data Not Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.909	0.909	0.909	0.909

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Full: no NDs)	1.658	0.769	
Kolmogorov-Smirnov (Full: no NDs)	0.321	0.222	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.939	0.939	0.939	0.939

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Full: no NDs)	0.889	0.887	Data Appear Lognormal
Lilliefors (Full: no NDs)	0.221	0.222	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Mercury (mg/kg) (rfaap bkgrd-ss)

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	28	0	28	3	25	89.29%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	25	0.019	0.06	0.0466	0.05	0.017
Statistics (Detects Only)	3	0.07	1.2	0.467	0.13	0.636
Statistics (All: NDs treated as DL value)	28	0.019	1.2	0.0916	0.06	0.218
Statistics (All: NDs treated as DL/2 value)	28	0.0095	1.2	0.0708	0.03	0.223
Statistics (Normal ROS Estimated Data)	28	-6.561	1.2	-3.164	-3.255	1.837
Statistics (Gamma ROS Estimated Data)	28	1E-09	1.2	0.05	1E-09	0.227
Statistics (Lognormal ROS Estimated Data)	28	6.8748E-09	1.2	0.0503	2.3931E-05	0.227

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	0.798	0.737	0.585	-1.506	1.494	-0.992
Statistics (NDs = DL)	0.982	0.901	0.0933	-2.979	0.795	-0.267
Statistics (NDs = DL/2)	0.644	0.598	0.11	-3.598	0.952	-0.265
Statistics (Gamma ROS Estimates)	0.0553	0.0732	0.904	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-10.44	4.519	-0.433

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS

Correlation Coefficient R	0.889	0.485	0.471	0.987

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.79	0.767	Data Appear Normal
Lilliefors (Detects Only)	0.368	0.512	Data Appear Normal
Shapiro-Wilks (NDs = DL)	0.268	0.924	Data Not Normal
Lilliefors (NDs = DL)	0.468	0.167	Data Not Normal
Shapiro-Wilks (NDs = DL/2)	0.253	0.924	Data Not Normal
Lilliefors (NDs = DL/2)	0.466	0.167	Data Not Normal
Shapiro-Wilks (Normal ROS Estimates)	0.974	0.924	Data Appear Normal
Lilliefors (Normal ROS Estimates)	0.0965	0.167	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	N/A	0.694	0.731	0.95

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.439	N/A	
Kolmogorov-Smirnov (Detects Only)	0.373	N/A	
Anderson-Darling (NDs = DL)	4.794	0.775	
Kolmogorov-Smirnov (NDs = DL)	0.41	0.17	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	5.507	0.796	
Kolmogorov-Smirnov (NDs = DL/2)	0.458	0.173	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	9.082	1.229	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.564	0.206	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.951	0.826	0.826	0.988

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.904	0.767	Data Appear Lognormal
Lilliefors (Detects Only)	0.306	0.512	Data Appear Lognormal
Shapiro-Wilks (NDs = DL)	0.71	0.924	Data Not Lognormal
Lilliefors (NDs = DL)	0.31	0.167	Data Not Lognormal
Shapiro-Wilks (NDs = DL/2)	0.708	0.924	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.355	0.167	Data Not Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.974	0.924	Data Appear Lognormal
Lilliefors (Lognormal ROS Estimates)	0.0964	0.167	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Mercury (mg/kg) (rfaap swmu 59 ss)

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	16	2	14	13	1	7.14%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Detects Only)	13	0.041	0.561	0.236	0.22	0.163
Statistics (All: NDs treated as DL value)	14	0.041	0.561	0.223	0.187	0.164
Statistics (All: NDs treated as DL/2 value)	14	0.025	0.561	0.221	0.187	0.166
Statistics (Normal ROS Estimated Data)	14	-0.0618	0.561	0.215	0.187	0.175
Statistics (Gamma ROS Estimated Data)	14	1E-09	0.561	0.219	0.187	0.169
Statistics (Lognormal ROS Estimated Data)	14	0.0404	0.561	0.222	0.187	0.165

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	2.065	1.671	0.114	-1.706	0.801	-0.469
Statistics (NDs = DL)	1.842	1.495	0.121	-1.798	0.843	-0.469
Statistics (NDs = DL/2)	1.631	1.329	0.135	-1.848	0.934	-0.506
Statistics (Gamma ROS Estimates)	0.422	0.379	0.519	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-1.813	0.868	-0.479

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.971	0.962	0.968	0.986

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.932	0.866	Data Appear Normal
Lilliefors (Detects Only)	0.156	0.246	Data Appear Normal
Shapiro-Wilks (NDs = DL)	0.914	0.874	Data Appear Normal
Lilliefors (NDs = DL)	0.164	0.237	Data Appear Normal
Shapiro-Wilks (NDs = DL/2)	0.927	0.874	Data Appear Normal
Lilliefors (NDs = DL/2)	0.158	0.237	Data Appear Normal
Shapiro-Wilks (Normal ROS Estimates)	0.969	0.874	Data Appear Normal
Lilliefors (Normal ROS Estimates)	0.137	0.237	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.988	0.987	0.985	0.913

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.187	0.743	
Kolmogorov-Smirnov (Detects Only)	0.12	0.239	Data Appear Gamma Distributed
Anderson-Darling (NDs = DL)	0.236	0.747	
Kolmogorov-Smirnov (NDs = DL)	0.121	0.232	Data Appear Gamma Distributed
Anderson-Darling (NDs = DL/2)	0.168	0.749	
Kolmogorov-Smirnov (NDs = DL/2)	0.102	0.232	Data Appear Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	2.068	0.808	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.318	0.244	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.988	0.986	0.984	0.983

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.965	0.866	Data Appear Lognormal
Lilliefors (Detects Only)	0.133	0.246	Data Appear Lognormal
Shapiro-Wilks (NDs = DL)	0.956	0.874	Data Appear Lognormal
Lilliefors (NDs = DL)	0.132	0.237	Data Appear Lognormal
Shapiro-Wilks (NDs = DL/2)	0.958	0.874	Data Appear Lognormal
Lilliefors (NDs = DL/2)	0.139	0.237	Data Appear Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.947	0.874	Data Appear Lognormal
Lilliefors (Lognormal ROS Estimates)	0.135	0.237	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Nickel (mg/kg) (rfaap bkgrd-ss)

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	28	0	28	17	11	39.29%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	11	0.21	1.3	1.005	1.3	0.504
Statistics (Detects Only)	17	4.6	18.1	9.935	9.4	4.294
Statistics (All: NDs treated as DL value)	28	0.21	18.1	6.427	5.55	5.545
Statistics (All: NDs treated as DL/2 value)	28	0.105	18.1	6.23	5.55	5.741
Statistics (Normal ROS Estimated Data)	28	-7.045	18.1	5.574	5.55	6.652
Statistics (Gamma ROS Estimated Data)	28	1.974	18.1	9.082	8.465	3.849
Statistics (Lognormal ROS Estimated Data)	28	1.602	18.1	7.218	5.55	4.794

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	5.612	5.034	1.77	2.204	0.448	0.203
Statistics (NDs = DL)	0.953	0.874	6.748	1.251	1.353	1.082
Statistics (NDs = DL/2)	0.709	0.657	8.784	0.979	1.668	1.704
Statistics (Gamma ROS Estimates)	5.329	4.782	1.704	--	--	--

Statistics (Lognormal ROS Estimates)	--	--	--	1.759	0.683	0.388

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.977	0.953	0.948	0.993

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.938	0.892	Data Appear Normal
Lilliefors (Detects Only)	0.12	0.215	Data Appear Normal
Shapiro-Wilks (NDs = DL)	0.891	0.924	Data Not Normal
Lilliefors (NDs = DL)	0.215	0.167	Data Not Normal
Shapiro-Wilks (NDs = DL/2)	0.88	0.924	Data Not Normal
Lilliefors (NDs = DL/2)	0.227	0.167	Data Not Normal
Shapiro-Wilks (Normal ROS Estimates)	0.977	0.924	Data Appear Normal
Lilliefors (Normal ROS Estimates)	0.0932	0.167	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.986	0.947	0.923	0.993

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.276	0.741	
Kolmogorov-Smirnov (Detects Only)	0.133	0.21	Data Appear Gamma Distributed
Anderson-Darling (NDs = DL)	0.909	0.776	
Kolmogorov-Smirnov (NDs = DL)	0.199	0.171	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	1.342	0.789	
Kolmogorov-Smirnov (NDs = DL/2)	0.225	0.172	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	0.176	0.748	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.0785	0.166	Data Appear Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.984	0.942	0.929	0.986

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.949	0.892	Data Appear Lognormal
Lilliefors (Detects Only)	0.125	0.215	Data Appear Lognormal
Shapiro-Wilks (NDs = DL)	0.872	0.924	Data Not Lognormal
Lilliefors (NDs = DL)	0.188	0.167	Data Not Lognormal
Shapiro-Wilks (NDs = DL/2)	0.847	0.924	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.236	0.167	Data Not Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.959	0.924	Data Appear Lognormal
Lilliefors (Lognormal ROS Estimates)	0.107	0.167	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Nickel (mg/kg) (rfaap swmu 59 ss)

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	16	0	16	16	0	0.00%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Full: no NDs)	16	5.2	12.8	7.809	7.25	2.255

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Full: no NDs)	13.86	11.31	0.563	2.019	0.275	0.136

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.959	0.959	0.959	0.959

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Full: no NDs)	0.912	0.887	Data Appear Normal
Lilliefors (Full: no NDs)	0.173	0.222	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.981	0.981	0.981	0.981

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Full: no NDs)	0.39	0.738	
Kolmogorov-Smirnov (Full: no NDs)	0.16	0.215	Data Appear Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.979	0.979	0.979	0.979

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Full: no NDs)	0.947	0.887	Data Appear Lognormal
Lilliefors (Full: no NDs)	0.145	0.222	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Potassium (mg/kg) (rfaap bkgrd-ss)

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	28	0	28	22	6	21.43%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	6	201	271	220	213	25.92
Statistics (Detects Only)	22	166	2350	735.4	509.5	632.6
Statistics (All: NDs treated as DL value)	28	166	2350	625	317.5	598.1
Statistics (All: NDs treated as DL/2 value)	28	100.5	2350	601.4	317.5	616.1
Statistics (Normal ROS Estimated Data)	28	-180.2	2350	544.7	317.5	671
Statistics (Gamma ROS Estimated Data)	28	135.6	2350	613.1	326.6	607.5
Statistics (Lognormal ROS Estimated Data)	28	142.4	2350	609.6	317.5	609.5

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	1.634	1.482	450.2	6.264	0.838	0.134
Statistics (NDs = DL)	1.53	1.39	408.6	6.076	0.826	0.136
Statistics (NDs = DL/2)	1.2	1.095	501.1	5.928	0.989	0.167
Statistics (Gamma ROS Estimates)	1.347	1.226	455.3	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	5.992	0.91	0.152

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.914	0.87	0.889	0.938

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.83	0.911	Data Not Normal
Lilliefors (Detects Only)	0.222	0.189	Data Not Normal
Shapiro-Wilks (NDs = DL)	0.756	0.924	Data Not Normal
Lilliefors (NDs = DL)	0.239	0.167	Data Not Normal
Shapiro-Wilks (NDs = DL/2)	0.787	0.924	Data Not Normal
Lilliefors (NDs = DL/2)	0.22	0.167	Data Not Normal
Shapiro-Wilks (Normal ROS Estimates)	0.874	0.924	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.176	0.167	Data Not Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.987	0.977	0.987	0.984

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.667	0.758	
Kolmogorov-Smirnov (Detects Only)	0.154	0.188	Data Appear Gamma Distributed
Anderson-Darling (NDs = DL)	1.637	0.762	
Kolmogorov-Smirnov (NDs = DL)	0.21	0.168	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	0.858	0.769	
Kolmogorov-Smirnov (NDs = DL/2)	0.151	0.169	Data appear Approximate Gamma Distribution
Anderson-Darling (Gamma ROS Estimates)	1.093	0.766	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.171	0.169	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.977	0.948	0.977	0.959

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.939	0.911	Data Appear Lognormal
Lilliefors (Detects Only)	0.123	0.189	Data Appear Lognormal
Shapiro-Wilks (NDs = DL)	0.882	0.924	Data Not Lognormal
Lilliefors (NDs = DL)	0.187	0.167	Data Not Lognormal
Shapiro-Wilks (NDs = DL/2)	0.934	0.924	Data Appear Lognormal
Lilliefors (NDs = DL/2)	0.102	0.167	Data Appear Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.9	0.924	Data Not Lognormal
Lilliefors (Lognormal ROS Estimates)	0.138	0.167	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Potassium (mg/kg) (rfaap swmu 59 ss)

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	16	4	12	12	0	0.00%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Full: no NDs)	12	300	1070	598.9	561	279.9

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Full: no NDs)	4.995	3.802	119.9	6.292	0.479	0.0761

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.953	0.953	0.953	0.953

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Full: no NDs)	0.886	0.859	Data Appear Normal
Lilliefors (Full: no NDs)	0.203	0.256	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.965	0.965	0.965	0.965

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Full: no NDs)	0.553	0.732	
Kolmogorov-Smirnov (Full: no NDs)	0.206	0.246	Data Appear Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.96	0.96	0.96	0.96

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Full: no NDs)	0.894	0.859	Data Appear Lognormal
Lilliefors (Full: no NDs)	0.19	0.256	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Selenium (mg.kg) (rfaap bkgrd-ss)

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	28	0	28	2	26	92.86%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	26	N/A	N/A	N/A	N/A	N/A
Statistics (Detects Only)	2	N/A	N/A	N/A	N/A	N/A
Statistics (All: NDs treated as DL value)	28	N/A	N/A	N/A	N/A	N/A
Statistics (All: NDs treated as DL/2 value)	28	N/A	N/A	N/A	N/A	N/A
Statistics (Normal ROS Estimated Data)	28	N/A	N/A	N/A	N/A	N/A

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	N/A	N/A	N/A	N/A

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	N/A	N/A	
Lilliefors (Detects Only)	N/A	N/A	
Shapiro-Wilks (NDs = DL)	N/A	N/A	
Lilliefors (NDs = DL)	N/A	N/A	
Shapiro-Wilks (NDs = DL/2)	N/A	N/A	
Lilliefors (NDs = DL/2)	N/A	N/A	
Shapiro-Wilks (Normal ROS Estimates)	N/A	N/A	
Lilliefors (Normal ROS Estimates)	N/A	N/A	

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	N/A	N/A	N/A	N/A

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	N/A	N/A	
Kolmogorov-Smirnov (Detects Only)	N/A	N/A	
Anderson-Darling (NDs = DL)	N/A	N/A	
Kolmogorov-Smirnov (NDs = DL)	N/A	N/A	
Anderson-Darling (NDs = DL/2)	N/A	N/A	
Kolmogorov-Smirnov (NDs = DL/2)	N/A	N/A	
Anderson-Darling (Gamma ROS Estimates)	N/A	N/A	
Kolmogorov-Smirnov (Gamma ROS Est.)	N/A	N/A	

Note: Substitution methods such as DL or DL/2 are not recommended.

Selenium (mg.kg) (rfaap swmu 59 ss)

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	16	1	15	11	4	26.67%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	4	0.11	1.2	0.675	0.695	0.575
Statistics (Detects Only)	11	0.26	7	2.991	0.72	2.853
Statistics (All: NDs treated as DL value)	15	0.11	7	2.373	0.72	2.648
Statistics (All: NDs treated as DL/2 value)	15	0.055	7	2.283	0.699	2.703
Statistics (Normal ROS Estimated Data)	15	-3.259	7	1.783	0.699	3.31
Statistics (Gamma ROS Estimated Data)	15	0.26	7	2.61	0.72	2.547
Statistics (Lognormal ROS Estimated Data)	15	0.0913	7	2.264	0.699	2.717

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	0.914	0.775	3.273	0.457	1.29	2.824
Statistics (NDs = DL)	0.794	0.68	2.988	0.116	1.352	11.61
Statistics (NDs = DL/2)	0.679	0.588	3.363	-0.0684	1.516	-22.17
Statistics (Gamma ROS Estimates)	1.024	0.864	2.549	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-0.0938	1.503	-16.03

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.896	0.877	0.861	0.939

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.776	0.85	Data Not Normal
Lilliefors (Detects Only)	0.332	0.267	Data Not Normal
Shapiro-Wilks (NDs = DL)	0.75	0.881	Data Not Normal
Lilliefors (NDs = DL)	0.338	0.229	Data Not Normal
Shapiro-Wilks (NDs = DL/2)	0.725	0.881	Data Not Normal
Lilliefors (NDs = DL/2)	0.385	0.229	Data Not Normal
Shapiro-Wilks (Normal ROS Estimates)	0.87	0.881	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.293	0.229	Data Not Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.866	0.908	0.894	0.923

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	1.081	0.755	
Kolmogorov-Smirnov (Detects Only)	0.311	0.263	Data Not Gamma Distributed
Anderson-Darling (NDs = DL)	0.921	0.773	
Kolmogorov-Smirnov (NDs = DL)	0.227	0.23	Data appear Approximate Gamma Distribution
Anderson-Darling (NDs = DL/2)	1.092	0.78	
Kolmogorov-Smirnov (NDs = DL/2)	0.31	0.231	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	1.075	0.763	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.297	0.228	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.922	0.963	0.954	0.95

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.825	0.85	Data Not Lognormal
Lilliefors (Detects Only)	0.274	0.267	Data Not Lognormal
Shapiro-Wilks (NDs = DL)	0.911	0.881	Data Appear Lognormal
Lilliefors (NDs = DL)	0.192	0.229	Data Appear Lognormal
Shapiro-Wilks (NDs = DL/2)	0.899	0.881	Data Appear Lognormal
Lilliefors (NDs = DL/2)	0.235	0.229	Data Not Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.883	0.881	Data Appear Lognormal
Lilliefors (Lognormal ROS Estimates)	0.229	0.229	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Silver (mg/kg) (rfaap bkgrd-ss)

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	28	0	28	1	27	96.43%

Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set!
It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable Silver (mg/kg) (rfaap bkgrd-ss) was not processed!

Silver (mg/kg) (rfaap swmu 59 ss)

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	16	0	16	1	15	93.75%

Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set!
It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable Silver (mg/kg) (rfaap swmu 59 ss) was not processed!

Sodium (mg/kg) (rfaap bkgrd-ss)

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	28	0	28	1	27	96.43%

Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set!
It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable Sodium (mg/kg) (rfaap bkgrd-ss) was not processed!

Sodium (mg/kg) (rfaap swmu 59 ss)

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	16	8	8	6	2	25.00%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	2	42	43	42.5	42.5	0.707
Statistics (Detects Only)	6	35.4	370	154.2	119.9	126.9
Statistics (All: NDs treated as DL value)	8	35.4	370	126.3	66.7	119.1
Statistics (All: NDs treated as DL/2 value)	8	21	370	121	66.7	123.6
Statistics (Normal ROS Estimated Data)	8	-29.08	370	108.4	66.7	136.7
Statistics (Gamma ROS Estimated Data)	8	35.4	370	127.7	66.7	117.9
Statistics (Lognormal ROS Estimated Data)	8	28.57	370	122.8	66.7	122

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	1.771	1.19	87.07	4.73	0.886	0.187
Statistics (NDs = DL)	1.56	1.058	80.94	4.485	0.876	0.195
Statistics (NDs = DL/2)	1.172	0.816	103.2	4.312	1.078	0.25
Statistics (Gamma ROS Estimates)	1.648	1.114	77.49	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	4.386	0.984	0.224

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.947	0.892	0.911	0.952

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.892	0.788	Data Appear Normal
Lilliefors (Detects Only)	0.239	0.362	Data Appear Normal
Shapiro-Wilks (NDs = DL)	0.796	0.818	Data Not Normal
Lilliefors (NDs = DL)	0.298	0.313	Data Appear Normal
Shapiro-Wilks (NDs = DL/2)	0.827	0.818	Data Appear Normal
Lilliefors (NDs = DL/2)	0.277	0.313	Data Appear Normal
Shapiro-Wilks (Normal ROS Estimates)	0.903	0.818	Data Appear Normal
Lilliefors (Normal ROS Estimates)	0.228	0.313	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.993	0.985	0.993	0.983

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.26	0.706	
Kolmogorov-Smirnov (Detects Only)	0.233	0.337	Data Appear Gamma Distributed
Anderson-Darling (NDs = DL)	0.545	0.728	

Kolmogorov-Smirnov (NDs = DL)	0.262	0.299	Data Appear Gamma Distributed
Anderson-Darling (NDs = DL/2)	0.345	0.733	
Kolmogorov-Smirnov (NDs = DL/2)	0.198	0.301	Data Appear Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	0.557	0.727	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.276	0.298	Data Appear Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.986	0.954	0.977	0.963

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.961	0.788	Data Appear Lognormal
Lilliefors (Detects Only)	0.191	0.362	Data Appear Lognormal
Shapiro-Wilks (NDs = DL)	0.893	0.818	Data Appear Lognormal
Lilliefors (NDs = DL)	0.214	0.313	Data Appear Lognormal
Shapiro-Wilks (NDs = DL/2)	0.931	0.818	Data Appear Lognormal
Lilliefors (NDs = DL/2)	0.148	0.313	Data Appear Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.905	0.818	Data Appear Lognormal
Lilliefors (Lognormal ROS Estimates)	0.172	0.313	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Thallium (mg/kg) (rfaap bkgrd-ss)

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	28	0	28	4	24	85.71%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	24	0.13	0.41	0.195	0.14	0.102
Statistics (Detects Only)	4	1.3	2.1	1.85	2	0.37
Statistics (All: NDs treated as DL value)	28	0.13	2.1	0.431	0.14	0.61
Statistics (All: NDs treated as DL/2 value)	28	0.065	2.1	0.348	0.07	0.638
Statistics (Normal ROS Estimated Data)	28	-1.016	2.1	0.463	0.263	0.766
Statistics (Gamma ROS Estimated Data)	28	1.3	2.1	1.854	1.856	0.123
Statistics (Lognormal ROS Estimated Data)	28	0.329	2.1	0.886	0.706	0.466

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	28.68	25.63	0.0645	0.598	0.225	0.376
Statistics (NDs = DL)	1.025	0.939	0.421	-1.403	0.921	-0.657
Statistics (NDs = DL/2)	0.649	0.604	0.535	-1.997	1.149	-0.575
Statistics (Gamma ROS Estimates)	199.2	177.9	0.00931	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-0.229	0.457	-1.992

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.85	0.729	0.691	0.977

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.737	0.748	Data Not Normal
Lilliefors (Detects Only)	0.408	0.443	Data Appear Normal
Shapiro-Wilks (NDs = DL)	0.532	0.924	Data Not Normal
Lilliefors (NDs = DL)	0.371	0.167	Data Not Normal
Shapiro-Wilks (NDs = DL/2)	0.481	0.924	Data Not Normal
Lilliefors (NDs = DL/2)	0.446	0.167	Data Not Normal
Shapiro-Wilks (Normal ROS Estimates)	0.952	0.924	Data Appear Normal
Lilliefors (Normal ROS Estimates)	0.138	0.167	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.806	0.898	0.892	0.668

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)

Anderson-Darling (Detects Only)	0.755	0.657	
Kolmogorov-Smirnov (Detects Only)	0.436	0.394	Data Not Gamma Distributed
Anderson-Darling (NDs = DL)	4.636	0.773	
Kolmogorov-Smirnov (NDs = DL)	0.342	0.17	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	5.51	0.795	
Kolmogorov-Smirnov (NDs = DL/2)	0.351	0.173	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	6.198	0.743	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.415	0.165	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.838	0.829	0.804	0.977

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.717	0.748	Data Not Lognormal
Lilliefors (Detects Only)	0.415	0.443	Data Appear Lognormal
Shapiro-Wilks (NDs = DL)	0.678	0.924	Data Not Lognormal
Lilliefors (NDs = DL)	0.311	0.167	Data Not Lognormal
Shapiro-Wilks (NDs = DL/2)	0.639	0.924	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.318	0.167	Data Not Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.951	0.924	Data Appear Lognormal
Lilliefors (Lognormal ROS Estimates)	0.138	0.167	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Thallium (mg/kg) (rfaap swmu 59 ss)

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	16	0	16	4	12	75.00%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	12	0.26	12	4.402	4.8	3.362
Statistics (Detects Only)	4	0.073	0.21	0.134	0.126	0.0631
Statistics (All: NDs treated as DL value)	16	0.073	12	3.335	3.6	3.454
Statistics (All: NDs treated as DL/2 value)	16	0.073	6	1.684	1.8	1.711
Statistics (Normal ROS Estimated Data)	16	0.0616	0.21	0.134	0.134	0.0467
Statistics (Gamma ROS Estimated Data)	16	0.0594	0.21	0.135	0.138	0.0469
Statistics (Lognormal ROS Estimated Data)	16	0.07	0.215	0.13	0.123	0.0469

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	5.886	4.824	0.0227	-2.099	0.487	-0.232
Statistics (NDs = DL)	0.595	0.525	5.607	0.164	1.826	11.12
Statistics (NDs = DL/2)	0.69	0.603	2.439	-0.356	1.61	-4.526
Statistics (Gamma ROS Estimates)	7.913	6.471	0.017	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-2.099	0.362	-0.172

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.973	0.913	0.913	0.985

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.933	0.748	Data Appear Normal
Lilliefors (Detects Only)	0.246	0.443	Data Appear Normal
Shapiro-Wilks (NDs = DL)	0.832	0.887	Data Not Normal
Lilliefors (NDs = DL)	0.251	0.222	Data Not Normal
Shapiro-Wilks (NDs = DL/2)	0.832	0.887	Data Not Normal
Lilliefors (NDs = DL/2)	0.243	0.222	Data Not Normal
Shapiro-Wilks (Normal ROS Estimates)	0.954	0.887	Data Appear Normal
Lilliefors (Normal ROS Estimates)	0.125	0.222	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS

Correlation Coefficient R	0.98	0.93	0.938	0.971

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.3	0.659	
Kolmogorov-Smirnov (Detects Only)	0.262	0.396	Data Appear Gamma Distributed
Anderson-Darling (NDs = DL)	1.215	0.788	
Kolmogorov-Smirnov (NDs = DL)	0.266	0.226	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	1.236	0.78	
Kolmogorov-Smirnov (NDs = DL/2)	0.261	0.224	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	0.376	0.74	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.195	0.215	Data Appear Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.979	0.922	0.918	0.984

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.942	0.748	Data Appear Lognormal
Lilliefors (Detects Only)	0.222	0.443	Data Appear Lognormal
Shapiro-Wilks (NDs = DL)	0.832	0.887	Data Not Lognormal
Lilliefors (NDs = DL)	0.279	0.222	Data Not Lognormal
Shapiro-Wilks (NDs = DL/2)	0.823	0.887	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.278	0.222	Data Not Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.95	0.887	Data Appear Lognormal
Lilliefors (Lognormal ROS Estimates)	0.125	0.222	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Vanadium (mg/kg) (rfaap bkgrd-ss)

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	28	0	28	28	0	0.00%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Full: no NDs)	28	12.2	101	33.89	33.8	17.78

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Full: no NDs)	4.392	3.946	7.716	3.405	0.497	0.146

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.902	0.902	0.902	0.902

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Full: no NDs)	0.832	0.924	Data Not Normal
Lilliefors (Full: no NDs)	0.141	0.167	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.943	0.943	0.943	0.943

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Full: no NDs)	0.622	0.749	
Kolmogorov-Smirnov (Full: no NDs)	0.111	0.166	Data Appear Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.969	0.969	0.969	0.969

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Full: no NDs)	0.939	0.924	Data Appear Lognormal

Lilliefors (Full: no NDs)	0.138	0.167	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Vanadium (mg/kg) (rfaap swmu 59 ss)

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	16	0	16	16	0	0.00%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Full: no NDs)	16	12.1	50.6	28.5	29.55	11.7

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Full: no NDs)	6.012	4.926	4.741	3.264	0.438	0.134

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.982	0.982	0.982	0.982

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Full: no NDs)	0.952	0.887	Data Appear Normal
Lilliefors (Full: no NDs)	0.128	0.222	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.984	0.984	0.984	0.984

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Full: no NDs)	0.302	0.741	
Kolmogorov-Smirnov (Full: no NDs)	0.143	0.216	Data Appear Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.983	0.983	0.983	0.983

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Full: no NDs)	0.952	0.887	Data Appear Lognormal
Lilliefors (Full: no NDs)	0.164	0.222	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Zinc (mg/kg) (rfaap bkgrd-ss)

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	28	0	28	28	0	0.00%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Full: no NDs)	28	7.1	216	41.21	29.7	40.24

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Full: no NDs)	1.826	1.654	22.56	3.421	0.761	0.223

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.798	0.798	0.798	0.798

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Full: no NDs)	0.665	0.924	Data Not Normal
Lilliefors (Full: no NDs)	0.203	0.167	Data Not Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.913	0.913	0.913	0.913

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Full: no NDs)	0.54	0.76	
Kolmogorov-Smirnov (Full: no NDs)	0.105	0.168	Data Appear Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.985	0.985	0.985	0.985

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Full: no NDs)	0.975	0.924	Data Appear Lognormal
Lilliefors (Full: no NDs)	0.1	0.167	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Zinc (mg/kg) (rfaap swmu 59 ss)

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	16	0	16	16	0	0.00%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Full: no NDs)	16	7.23	76.3	30.05	28.8	18.04

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Full: no NDs)	2.792	2.31	10.76	3.213	0.673	0.209

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.957	0.957	0.957	0.957

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Full: no NDs)	0.919	0.887	Data Appear Normal
Lilliefors (Full: no NDs)	0.13	0.222	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.978	0.978	0.978	0.978

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Full: no NDs)	0.312	0.746	
Kolmogorov-Smirnov (Full: no NDs)	0.144	0.217	Data Appear Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.975	0.975	0.975	0.975

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Full: no NDs)	0.944	0.887	Data Appear Lognormal
Lilliefors (Full: no NDs)	0.166	0.222	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Appendix E.8A
RFAAP SWMU 59 Surface Soil vs Background Statistical Comparisons

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Full Data Sets without NDs

User Selected Options	
From File	H:\Risk DB\Radford\SWMUs 50-59\Background Stats\59_ProUCL_input_SS_for BKG.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 (mg/kg)(rfaap swmu 59 ss)
Background Data: Aluminum (mg/kg)(rfaap bkgrd-ss)

Raw Statistics

	Site	Background
Number of Valid Observations	16	28
Number of Distinct Observations	15	28
Minimum	3120	3620
Maximum	17800	20100
Mean	10060	8300
Median	10900	6705
SD	4807	4279
SE of Mean	1202	808.6

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Site or AOC <= Mean/Median of Background

Site Rank Sum W-Stat	411
WMW Test U-Stat	275
WMW Critical Value (0.050)	340
Approximate P-Value	0.109

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site <= Background

Appendix E.8A
RFAAP SWMU 59 Surface Soil vs Background Statistical Comparisons

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	H:\Risk DB\Radford\SWMUs 50-59\Background Stats\59_ProUCL_input_SS_for BKG.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: Antimony (mg/kg)(rfaap swmu 59 ss)
Background Data: Antimony (mg/kg)(rfaap bkgrd-ss)

Raw Statistics

	Site	Background
Number of Valid Data	16	14
Number of Missing Values	0	14
Number of Non-Detect Data	15	14
Number of Detect Data	1	0
Minimum Non-Detect	0.2	0.24
Maximum Non-Detect	7.14	0.36
Percent Non detects	93.75%	100.00%
Minimum Detected	0.74	N/A
Maximum Detected	0.74	N/A
Mean of Detected Data	0.74	N/A
Median of Detected Data	0.74	N/A
SD of Detected Data	N/A	N/A

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	1.003
Critical z (0.95)	1.645
P-Value	0.158

Conclusion with Alpha = 0.05
Do Not Reject H0, Conclude Site <= Background
P-Value >= alpha (0.05)

Appendix E.8A
RFAAP SWMU 59 Surface Soil vs Background Statistical Comparisons

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Full Data Sets without NDs

User Selected Options	
From File	H:\Risk DB\Radford\SWMUs 50-59\Background Stats\59_ProUCL_input_SS_for BKG.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 (mg/kg)(rfaap swmu 59 ss)
Background Data: Arsenic (mg/kg)(rfaap bkgrd-ss)

Raw Statistics

	Site	Background
Number of Valid Observations	16	28
Number of Distinct Observations	16	24
Minimum	1.6	1.5
Maximum	37	10.2
Mean	8.506	3.732
Median	3.72	2.75
SD	11.22	2.33
SE of Mean	2.805	0.44

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Site or AOC <= Mean/Median of Background

Site Rank Sum W-Stat	410.5
WMW Test U-Stat	274.5
WMW Critical Value (0.050)	340
Approximate P-Value	0.111

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site <= Background

Appendix E.8A
RFAAP SWMU 59 Surface Soil vs Background Statistical Comparisons

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	H:\Risk DB\Radford\SWMUs 50-59\Background Stats\59_ProUCL_input_SS_for BKG.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: Barium (mg/kg)(rfaap swmu 59 ss)
Background Data: Barium (mg/kg)(rfaap bkgrd-ss)

Raw Statistics

	Site	Background
Number of Valid Data	16	28
Number of Non-Detect Data	0	4
Number of Detect Data	16	24
Minimum Non-Detect	N/A	0.36
Maximum Non-Detect	N/A	1
Percent Non detects	0.00%	14.29%
Minimum Detected	57.1	23.4
Maximum Detected	190	174
Mean of Detected Data	116.3	75.55
Median of Detected Data	97.2	61.85
SD of Detected Data	48.3	43.2

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	3.173
Critical z (0.95)	1.645
P-Value	7.55E-04

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

P-Value < alpha (0.05)

Appendix E.8A
RFAAP SWMU 59 Surface Soil vs Background Statistical Comparisons

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	H:\Risk DB\Radford\SWMUs 50-59\Background Stats\59_ProUCL_input_SS_for BKG.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: Beryllium (mg/kg)(rfaap swmu 59 ss)
Background Data: Beryllium (mg/kg)(rfaap bkgrd-ss)

Raw Statistics

	Site	Background
Number of Valid Data	15	28
Number of Missing Values	1	0
Number of Non-Detect Data	0	13
Number of Detect Data	15	15
Minimum Non-Detect	N/A	0.022
Maximum Non-Detect	N/A	0.03
Percent Non detects	0.00%	46.43%
Minimum Detected	0.493	0.61
Maximum Detected	1.3	1.5
Mean of Detected Data	0.778	0.887
Median of Detected Data	0.63	0.87
SD of Detected Data	0.266	0.246

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	1.628
Critical z (0.95)	1.645
P-Value	0.0518

Conclusion with Alpha = 0.05
Do Not Reject H0, Conclude Site <= Background
P-Value >= alpha (0.05)

Appendix E.8A
RFAAP SWMU 59 Surface Soil vs Background Statistical Comparisons

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	H:\Risk DB\Radford\SWMUs 50-59\Background Stats\59_ProUCL_input_SS_for BKG.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: Calcium (mg/kg)(rfaap swmu 59 ss)
Background Data: Calcium (mg/kg)(rfaap bkgrd-ss)

Raw Statistics

	Site	Background
Number of Valid Data	16	28
Number of Non-Detect Data	0	5
Number of Detect Data	16	23
Minimum Non-Detect	N/A	4.6
Maximum Non-Detect	N/A	6.6
Percent Non detects	0.00%	17.86%
Minimum Detected	192	116
Maximum Detected	2680	7340
Mean of Detected Data	1107	1197
Median of Detected Data	833.5	885
SD of Detected Data	795.8	1440

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	1.221
Critical z (0.95)	1.645
P-Value	0.111

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site <= Background

P-Value >= alpha (0.05)

Appendix E.8A
RFAAP SWMU 59 Surface Soil vs Background Statistical Comparisons

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	H:\Risk DB\Radford\SWMUs 50-59\Background Stats\59_ProUCL_input_SS_for BKG.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: Cadmium (mg/kg)(rfaap swmu 59 ss)
Background Data: Cadmium (mg/kg)(rfaap bkgrd-ss)

Raw Statistics

	Site	Background
Number of Valid Data	16	28
Number of Non-Detect Data	14	26
Number of Detect Data	2	2
Minimum Non-Detect	0.051	0.02
Maximum Non-Detect	0.7	0.05
Percent Non detects	87.50%	92.86%
Minimum Detected	0.11	0.67
Maximum Detected	0.11	0.82
Mean of Detected Data	0.11	0.745
Median of Detected Data	0.11	0.745
SD of Detected Data	0	0.106

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	0.612
Critical z (0.95)	1.645
P-Value	0.27

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site <= Background

P-Value >= alpha (0.05)

Appendix E.8A
RFAAP SWMU 59 Surface Soil vs Background Statistical Comparisons

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Full Data Sets without NDs

User Selected Options	
From File	H:\Risk DB\Radford\SWMUs 50-59\Background Stats\59_ProUCL_input_SS_for BKG.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 (mg/kg)(rfaap swmu 59 ss)
Background Data: Chromium (mg/kg)(rfaap bkgrd-ss)

Raw Statistics

	Site	Background
Number of Valid Observations	16	28
Number of Distinct Observations	15	27
Minimum	7.5	6.3
Maximum	28.8	53.3
Mean	16.26	21.09
Median	16.95	22.4
SD	6.487	10.5
SE of Mean	1.622	1.985

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Site or AOC <= Mean/Median of Background

Site Rank Sum W-Stat	292
WMW Test U-Stat	156
WMW Critical Value (0.050)	340
Approximate P-Value	0.953

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site <= Background

Appendix E.8A
RFAAP SWMU 59 Surface Soil vs Background Statistical Comparisons

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	H:\Risk DB\Radford\SWMUs 50-59\Background Stats\59_ProUCL_input_SS_for BKG.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: Cobalt (mg/kg)(rfaap swmu 59 ss)
Background Data: Cobalt (mg/kg)(rfaap bkgrd-ss)

Raw Statistics

	Site	Background
Number of Valid Data	16	28
Number of Non-Detect Data	0	8
Number of Detect Data	16	20
Minimum Non-Detect	N/A	0.11
Maximum Non-Detect	N/A	0.75
Percent Non detects	0.00%	28.57%
Minimum Detected	2.9	5.9
Maximum Detected	10.1	45.4
Mean of Detected Data	6.107	15.95
Median of Detected Data	5.86	12.1
SD of Detected Data	2.188	10.07

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	-1.762
Critical z (0.95)	1.645
P-Value	0.961

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site <= Background

P-Value >= alpha (0.05)

Appendix E.8A
RFAAP SWMU 59 Surface Soil vs Background Statistical Comparisons

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	H:\Risk DB\Radford\SWMUs 50-59\Background Stats\59_ProUCL_input_SS_for BKG.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: Copper (mg/kg)(rfaap swmu 59 ss)
Background Data: Copper (mg/kg)(rfaap bkgrd-ss)

Raw Statistics

	Site	Background
Number of Valid Data	16	28
Number of Non-Detect Data	0	2
Number of Detect Data	16	26
Minimum Non-Detect	N/A	0.17
Maximum Non-Detect	N/A	0.17
Percent Non detects	0.00%	7.14%
Minimum Detected	3.3	2.2
Maximum Detected	15.3	13.6
Mean of Detected Data	10.53	6.919
Median of Detected Data	10.75	5.35
SD of Detected Data	3.281	3.696

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	3.025
Critical z (0.95)	1.645
P-Value	0.00124

Conclusion with Alpha = 0.05
Reject H0, Conclude Site > Background
P-Value < alpha (0.05)

Appendix E.8A
RFAAP SWMU 59 Surface Soil vs Background Statistical Comparisons

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Full Data Sets without NDs

User Selected Options	
From File	H:\Risk DB\Radford\SWMUs 50-59\Background Stats\59_ProUCL_input_SS_for BKG.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 (mg/kg)(rfaap swmu 59 ss)
Background Data: Iron (mg/kg)(rfaap bkgrd-ss)

Raw Statistics

	Site	Background
Number of Valid Observations	16	28
Number of Distinct Observations	16	26
Minimum	4200	7250
Maximum	24400	63000
Mean	14234	20108
Median	15300	19750
SD	6348	11869
SE of Mean	1587	2243

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Site or AOC <= Mean/Median of Background

Site Rank Sum W-Stat	280.5
WMW Test U-Stat	144.5
WMW Critical Value (0.050)	340
Approximate P-Value	0.975

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site <= Background

Appendix E.8A
RFAAP SWMU 59 Surface Soil vs Background Statistical Comparisons

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Full Data Sets without NDs

User Selected Options	
From File	H:\Risk DB\Radford\SWMUs 50-59\Background Stats\59_ProUCL_input_SS_for BKG.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 (mg/kg)(rfaap swmu 59 ss)
Background Data: Lead (mg/kg)(rfaap bkgrd-ss)

Raw Statistics

	Site	Background
Number of Valid Observations	16	28
Number of Distinct Observations	16	26
Minimum	5.37	8.9
Maximum	30.9	225
Mean	14.84	26.96
Median	15.2	15.15
SD	7.583	41.34
SE of Mean	1.896	7.813

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Site or AOC <= Mean/Median of Background

Site Rank Sum W-Stat	306.5
WMW Test U-Stat	170.5
WMW Critical Value (0.050)	340
Approximate P-Value	0.906

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site <= Background

Appendix E.8A
RFAAP SWMU 59 Surface Soil vs Background Statistical Comparisons

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	H:\Risk DB\Radford\SWMUs 50-59\Background Stats\59_ProUCL_input_SS_for BKG.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: Magnesium (mg/kg)(rfaap swmu 59 ss)
Background Data: Magnesium (mg/kg)(rfaap bkgrd-ss)

Raw Statistics

	Site	Background
Number of Valid Data	16	28
Number of Non-Detect Data	0	3
Number of Detect Data	16	25
Minimum Non-Detect	N/A	4.7
Maximum Non-Detect	N/A	5
Percent Non detects	0.00%	10.71%
Minimum Detected	227	158
Maximum Detected	2270	20400
Mean of Detected Data	954.3	2498
Median of Detected Data	566	913
SD of Detected Data	700.7	4334

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	-0.0244
Critical z (0.95)	1.645
P-Value	0.51

Conclusion with Alpha = 0.05
Do Not Reject H0, Conclude Site <= Background
P-Value >= alpha (0.05)

Appendix E.8A
RFAAP SWMU 59 Surface Soil vs Background Statistical Comparisons

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Full Data Sets without NDs

User Selected Options	
From File	H:\Risk DB\Radford\SWMUs 50-59\Background Stats\59_ProUCL_input_SS_for BKG.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 (mg/kg)(rfaap swmu 59 ss)
Background Data: Manganese (mg/kg)(rfaap bkgrd-ss)

Raw Statistics

	Site	Background
Number of Valid Observations	16	28
Number of Distinct Observations	16	28
Minimum	67.95	43
Maximum	3630	2040
Mean	614.7	695.9
Median	282.5	490
SD	995.3	591.5
SE of Mean	248.8	111.8

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Site or AOC <= Mean/Median of Background

Site Rank Sum W-Stat	283
WMW Test U-Stat	147
WMW Critical Value (0.050)	340
Approximate P-Value	0.971

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site <= Background

Appendix E.8A
RFAAP SWMU 59 Surface Soil vs Background Statistical Comparisons

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	H:\Risk DB\Radford\SWMUs 50-59\Background Stats\59_ProUCL_input_SS_for BKG.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: Mercury (mg/kg)(rfaap swmu 59 ss)
Background Data: Mercury (mg/kg)(rfaap bkgrd-ss)

Raw Statistics

	Site	Background
Number of Valid Data	14	28
Number of Missing Values	2	0
Number of Non-Detect Data	1	25
Number of Detect Data	13	3
Minimum Non-Detect	0.05	0.019
Maximum Non-Detect	0.05	0.06
Percent Non detects	7.14%	89.29%
Minimum Detected	0.041	0.07
Maximum Detected	0.561	1.2
Mean of Detected Data	0.236	0.467
Median of Detected Data	0.22	0.13
SD of Detected Data	0.163	0.636

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	4.709
Critical z (0.95)	1.645
P-Value	1.24E-06

Conclusion with Alpha = 0.05
Reject H0, Conclude Site > Background
P-Value < alpha (0.05)

Appendix E.8A
RFAAP SWMU 59 Surface Soil vs Background Statistical Comparisons

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	H:\Risk DB\Radford\SWMUs 50-59\Background Stats\59_ProUCL_input_SS_for BKG.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: Nickel (mg/kg)(rfaap swmu 59 ss)
Background Data: Nickel (mg/kg)(rfaap bkgrd-ss)

Raw Statistics

	Site	Background
Number of Valid Data	16	28
Number of Non-Detect Data	0	11
Number of Detect Data	16	17
Minimum Non-Detect	N/A	0.21
Maximum Non-Detect	N/A	1.3
Percent Non detects	0.00%	39.29%
Minimum Detected	5.2	4.6
Maximum Detected	12.8	18.1
Mean of Detected Data	7.809	9.935
Median of Detected Data	7.25	9.4
SD of Detected Data	2.255	4.294

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	1.279
Critical z (0.95)	1.645
P-Value	0.101

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site <= Background

P-Value >= alpha (0.05)

Appendix E.8A
RFAAP SWMU 59 Surface Soil vs Background Statistical Comparisons

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	H:\Risk DB\Radford\SWMUs 50-59\Background Stats\59_ProUCL_input_SS_for BKG.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: Potassium (mg/kg)(rfaap swmu 59 ss)
Background Data: Potassium (mg/kg)(rfaap bkgrd-ss)

Raw Statistics

	Site	Background
Number of Valid Data	12	28
Number of Missing Values	4	0
Number of Non-Detect Data	0	6
Number of Detect Data	12	22
Minimum Non-Detect	N/A	201
Maximum Non-Detect	N/A	271
Percent Non detects	0.00%	21.43%
Minimum Detected	300	166
Maximum Detected	1070	2350
Mean of Detected Data	598.9	735.4
Median of Detected Data	561	509.5
SD of Detected Data	279.9	632.6

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	1.426
Critical z (0.95)	1.645
P-Value	0.0769

Conclusion with Alpha = 0.05
Do Not Reject H0, Conclude Site <= Background
P-Value >= alpha (0.05)

Appendix E.8A
RFAAP SWMU 59 Surface Soil vs Background Statistical Comparisons

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	H:\Risk DB\Radford\SWMUs 50-59\Background Stats\59_ProUCL_input_SS_for BKG.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: Selenium (mg.kg)(rfaap swmu 59 ss)
Background Data: Selenium (mg.kg)(rfaap bkgrd-ss)

Raw Statistics

	Site	Background
Number of Valid Data	15	28
Number of Missing Values	1	0
Number of Non-Detect Data	4	26
Number of Detect Data	11	2
Minimum Non-Detect	0.11	0.14
Maximum Non-Detect	1.2	0.36
Percent Non detects	26.67%	92.86%
Minimum Detected	0.26	0.64
Maximum Detected	7	0.77
Mean of Detected Data	2.991	0.705
Median of Detected Data	0.72	0.705
SD of Detected Data	2.853	0.0919

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	4.517
Critical z (0.95)	1.645
P-Value	3.13E-06

Conclusion with Alpha = 0.05
Reject H0, Conclude Site > Background
P-Value < alpha (0.05)

Appendix E.8A
RFAAP SWMU 59 Surface Soil vs Background Statistical Comparisons

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	H:\Risk DB\Radford\SWMUs 50-59\Background Stats\59_ProUCL_input_SS_for BKG.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: Silver (mg/kg)(rfaap swmu 59 ss)
Background Data: Silver (mg/kg)(rfaap bkgrd-ss)

Raw Statistics

	Site	Background
Number of Valid Data	16	28
Number of Non-Detect Data	15	27
Number of Detect Data	1	1
Minimum Non-Detect	0.046	0.16
Maximum Non-Detect	1.2	0.38
Percent Non detects	93.75%	96.43%
Minimum Detected	0.498	4.3
Maximum Detected	0.498	4.3
Mean of Detected Data	0.498	4.3
Median of Detected Data	0.498	4.3
SD of Detected Data	N/A	N/A

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	0.394
Critical z (0.95)	1.645
P-Value	0.347

Conclusion with Alpha = 0.05
Do Not Reject H0, Conclude Site <= Background
P-Value >= alpha (0.05)

Appendix E.8A
RFAAP SWMU 59 Surface Soil vs Background Statistical Comparisons

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	H:\Risk DB\Radford\SWMUs 50-59\Background Stats\59_ProUCL_input_SS_for BKG.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: Sodium (mg/kg)(rfaap swmu 59 ss)
Background Data: Sodium (mg/kg)(rfaap bkgrd-ss)

Raw Statistics

	Site	Background
Number of Valid Data	8	28
Number of Missing Values	8	0
Number of Non-Detect Data	2	27
Number of Detect Data	6	1
Minimum Non-Detect	42	10.8
Maximum Non-Detect	43	25.9
Percent Non detects	25.00%	96.43%
Minimum Detected	35.4	124
Maximum Detected	370	124
Mean of Detected Data	154.2	124
Median of Detected Data	119.9	124
SD of Detected Data	126.9	N/A

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	4.44
Critical z (0.95)	1.645
P-Value	4.51E-06

Conclusion with Alpha = 0.05
Reject H0, Conclude Site > Background
P-Value < alpha (0.05)

Appendix E.8A
RFAAP SWMU 59 Surface Soil vs Background Statistical Comparisons

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	H:\Risk DB\Radford\SWMUs 50-59\Background Stats\59_ProUCL_input_SS_for BKG.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: Thallium (mg/kg)(rfaap swmu 59 ss)
Background Data: Thallium (mg/kg)(rfaap bkgrd-ss)

Raw Statistics

	Site	Background
Number of Valid Data	16	28
Number of Non-Detect Data	12	24
Number of Detect Data	4	4
Minimum Non-Detect	0.26	0.13
Maximum Non-Detect	12	0.41
Percent Non detects	75.00%	85.71%
Minimum Detected	0.073	1.3
Maximum Detected	0.21	2.1
Mean of Detected Data	0.134	1.85
Median of Detected Data	0.126	2
SD of Detected Data	0.0631	0.37

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	0.199
Critical z (0.95)	1.645
P-Value	0.421

Conclusion with Alpha = 0.05
Do Not Reject H0, Conclude Site <= Background
P-Value >= alpha (0.05)

Appendix E.8A
RFAAP SWMU 59 Surface Soil vs Background Statistical Comparisons

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Full Data Sets without NDs

User Selected Options	
From File	H:\Risk DB\Radford\SWMUs 50-59\Background Stats\59_ProUCL_input_SS_for BKG.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 (mg/kg)(rfaap swmu 59 ss)
Background Data: Vanadium (mg/kg)(rfaap bkgrd-ss)

Raw Statistics

	Site	Background
Number of Valid Observations	16	28
Number of Distinct Observations	16	27
Minimum	12.1	12.2
Maximum	50.6	101
Mean	28.5	33.89
Median	29.55	33.8
SD	11.7	17.78
SE of Mean	2.925	3.36

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Site or AOC <= Mean/Median of Background

Site Rank Sum W-Stat	318
WMW Test U-Stat	182
WMW Critical Value (0.050)	340
Approximate P-Value	0.85

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site <= Background

Appendix E.8A
RFAAP SWMU 59 Surface Soil vs Background Statistical Comparisons

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Full Data Sets without NDs

User Selected Options	
From File	H:\Risk DB\Radford\SWMUs 50-59\Background Stats\59_ProUCL_input_SS_for BKG.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 (mg/kg)(rfaap swmu 59 ss)
Background Data: Zinc (mg/kg)(rfaap bkgrd-ss)

Raw Statistics

	Site	Background
Number of Valid Observations	16	28
Number of Distinct Observations	16	28
Minimum	7.23	7.1
Maximum	76.3	216
Mean	30.05	41.21
Median	28.8	29.7
SD	18.04	40.24
SE of Mean	4.509	7.605

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Site or AOC <= Mean/Median of Background

Site Rank Sum W-Stat	326.5
WMW Test U-Stat	190.5
WMW Critical Value (0.050)	340
Approximate P-Value	0.797

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site <= Background

APPENDIX E.8B

Goodness-of-Fit Test Statistics for Data Sets with Non-Detects

User Selected Options

From File	H:\Risk DB\Radford\SWMUs 50-59\Background Stats\59_ProUCL_input_TS_for BKG.wst
Full Precision	OFF
Confidence Coefficient	0.95

Aluminum (mg/kg) (rfaap bkgrd ts)

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	79	0	79	79	0	0.00%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Full: no NDs)	79	3620	47900	14204	12100	9433

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Full: no NDs)	2.787	2.689	5097	9.371	0.618	0.0659

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.923	0.923	0.923	0.923

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Lilliefors (Full: no NDs)	0.15	0.0997	Data Not Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.988	0.988	0.988	0.988

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Full: no NDs)	0.604	0.76	
Kolmogorov-Smirnov (Full: no NDs)	0.0772	0.101	Data Appear Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.995	0.995	0.995	0.995

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Lilliefors (Full: no NDs)	0.0626	0.0997	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Aluminum (mg/kg) (swmu 59 ts)

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	28	0	28	28	0	0.00%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Full: no NDs)	28	3120	39450	15188	13900	8410

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Full: no NDs)	3.032	2.731	5009	9.454	0.647	0.0684

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.974	0.974	0.974	0.974

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Full: no NDs)	0.95	0.924	Data Appear Normal
Lilliefors (Full: no NDs)	0.098	0.167	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.989	0.989	0.989	0.989

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Full: no NDs)	0.312	0.754	
Kolmogorov-Smirnov (Full: no NDs)	0.11	0.167	Data Appear Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.973	0.973	0.973	0.973

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Full: no NDs)	0.941	0.924	Data Appear Lognormal
Lilliefors (Full: no NDs)	0.151	0.167	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Antimony (mg/kg) (rfaap bkgrd ts)

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	79	41	38	0	38	100.00%

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable Antimony (mg/kg) (rfaap bkgrd ts) was not processed!

Antimony (mg/kg) (swmu 59 ts)

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	28	0	28	3	25	89.29%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	25	0.2	7.14	0.9	0.3	1.882
Statistics (Detects Only)	3	0.74	1.8	1.347	1.5	0.546
Statistics (All: NDs treated as DL value)	28	0.2	7.14	0.948	0.308	1.787
Statistics (All: NDs treated as DL/2 value)	28	0.1	3.57	0.546	0.154	0.943
Statistics (Normal ROS Estimated Data)	28	-3.866	1.8	-1.622	-1.977	1.292
Statistics (Gamma ROS Estimated Data)	28	1E-09	1.8	0.144	1E-09	0.449
Statistics (Lognormal ROS Estimated Data)	28	0.0167	1.8	0.231	0.08	0.425

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	7.635	6.841	0.176	0.231	0.47	2.035
Statistics (NDs = DL)	0.873	0.803	1.086	-0.726	0.922	-1.271
Statistics (NDs = DL/2)	0.802	0.74	0.681	-1.345	1.023	-0.761
Statistics (Gamma ROS Estimates)	0.0527	0.0708	2.74	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-2.231	1.072	-0.48

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.97	0.633	0.697	0.938

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.941	0.767	Data Appear Normal
Lilliefors (Detects Only)	0.277	0.512	Data Appear Normal
Shapiro-Wilks (NDs = DL)	0.415	0.924	Data Not Normal
Lilliefors (NDs = DL)	0.403	0.167	Data Not Normal
Shapiro-Wilks (NDs = DL/2)	0.495	0.924	Data Not Normal
Lilliefors (NDs = DL/2)	0.412	0.167	Data Not Normal
Shapiro-Wilks (Normal ROS Estimates)	0.886	0.924	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.18	0.167	Data Not Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	N/A	0.85	0.908	0.933

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.373	N/A	
Kolmogorov-Smirnov (Detects Only)	0.331	N/A	
Anderson-Darling (NDs = DL)	4.829	0.779	
Kolmogorov-Smirnov (NDs = DL)	0.327	0.171	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	4.732	0.782	
Kolmogorov-Smirnov (NDs = DL/2)	0.34	0.172	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	9.139	1.246	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.565	0.208	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.947	0.83	0.837	0.937

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.896	0.767	Data Appear Lognormal
Lilliefors (Detects Only)	0.312	0.512	Data Appear Lognormal
Shapiro-Wilks (NDs = DL)	0.694	0.924	Data Not Lognormal
Lilliefors (NDs = DL)	0.316	0.167	Data Not Lognormal
Shapiro-Wilks (NDs = DL/2)	0.699	0.924	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.326	0.167	Data Not Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.885	0.924	Data Not Lognormal
Lilliefors (Lognormal ROS Estimates)	0.18	0.167	Data Not Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Arsenic (mg/kg) (rfaap bkgrd ts)

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	79	0	79	76	3	3.80%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	3	0.09	0.12	0.103	0.1	0.0153
Statistics (Detects Only)	76	1.2	35.9	4.989	3.2	5.36
Statistics (All: NDs treated as DL value)	79	0.09	35.9	4.804	3.1	5.339
Statistics (All: NDs treated as DL/2 value)	79	0.045	35.9	4.802	3.1	5.341
Statistics (Normal ROS Estimated Data)	79	-5.169	35.9	4.604	3.1	5.608
Statistics (Gamma ROS Estimated Data)	79	1E-09	35.9	4.8	3.1	5.343
Statistics (Lognormal ROS Estimated Data)	79	0.728	35.9	4.828	3.1	5.32

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	1.819	1.759	2.742	1.308	0.692	0.529

Statistics (NDs = DL)	1.401	1.356	3.429	1.172	0.968	0.826
Statistics (NDs = DL/2)	1.323	1.281	3.631	1.146	1.067	0.932
Statistics (Gamma ROS Estimates)	0.568	0.555	8.454	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	1.246	0.748	0.6

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.765	0.778	0.778	0.817

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Lilliefors (Detects Only)	0.282	0.102	Data Not Normal
Lilliefors (NDs = DL)	0.279	0.0997	Data Not Normal
Lilliefors (NDs = DL/2)	0.279	0.0997	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.263	0.0997	Data Not Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.916	0.932	0.935	0.972

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	4.409	0.766	
Kolmogorov-Smirnov (Detects Only)	0.213	0.104	Data Not Gamma Distributed
Anderson-Darling (NDs = DL)	3.469	0.772	
Kolmogorov-Smirnov (NDs = DL)	0.182	0.102	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	3.587	0.774	
Kolmogorov-Smirnov (NDs = DL/2)	0.176	0.103	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	10.23	0.812	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.332	0.106	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.958	0.919	0.886	0.974

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Lilliefors (Detects Only)	0.151	0.102	Data Not Lognormal
Lilliefors (NDs = DL)	0.159	0.0997	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.187	0.0997	Data Not Lognormal
Lilliefors (Lognormal ROS Estimates)	0.134	0.0997	Data Not Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Arsenic (mg/kg) (swmu 59 ts)

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	28	0	28	28	0	0.00%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Full: no NDs)	28	0.97	37	5.979	2.64	9.053

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Full: no NDs)	0.964	0.884	6.203	1.187	0.972	0.819

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.735	0.735	0.735	0.735

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)

Shapiro-Wilks (Full: no NDs)	0.552	0.924	Data Not Normal
Lilliefors (Full: no NDs)	0.374	0.167	Data Not Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.922	0.922	0.922	0.922

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Full: no NDs)	2.522	0.775	
Kolmogorov-Smirnov (Full: no NDs)	0.246	0.17	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.939	0.939	0.939	0.939

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Full: no NDs)	0.877	0.924	Data Not Lognormal
Lilliefors (Full: no NDs)	0.174	0.167	Data Not Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Barium (mg/kg) (rfaap bkgrd ts)

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	79	0	79	63	16	20.25%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	16	0.36	1.1	0.821	1	0.3
Statistics (Detects Only)	63	23.4	174	68.4	56.7	40.39
Statistics (All: NDs treated as DL value)	79	0.36	174	54.71	45.5	45.21
Statistics (All: NDs treated as DL/2 value)	79	0.18	174	54.63	45.5	45.31
Statistics (Normal ROS Estimated Data)	79	-54.83	174	50.41	45.5	51.24
Statistics (Gamma ROS Estimated Data)	79	1E-09	174	58.64	45.5	41.27
Statistics (Lognormal ROS Estimated Data)	79	10.45	174	58.03	45.5	41.56

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	3.354	3.236	20.39	4.069	0.555	0.136
Statistics (NDs = DL)	0.737	0.717	74.26	3.188	1.839	0.577
Statistics (NDs = DL/2)	0.642	0.626	85.13	3.047	2.109	0.692
Statistics (Gamma ROS Estimates)	1.061	1.029	55.28	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	3.817	0.71	0.186

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.932	0.955	0.955	0.984

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Lilliefors (Detects Only)	0.211	0.112	Data Not Normal
Lilliefors (NDs = DL)	0.154	0.0997	Data Not Normal
Lilliefors (NDs = DL/2)	0.153	0.0997	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.13	0.0997	Data Not Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.977	0.947	0.938	0.974

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)

Anderson-Darling (Detects Only)	1.567	0.757	
Kolmogorov-Smirnov (Detects Only)	0.142	0.113	Data Not Gamma Distributed
Anderson-Darling (NDs = DL)	4.488	0.794	
Kolmogorov-Smirnov (NDs = DL)	0.207	0.105	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	5.552	0.804	
Kolmogorov-Smirnov (NDs = DL/2)	0.235	0.105	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	3.925	0.78	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.215	0.103	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.98	0.875	0.857	0.99

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Lilliefors (Detects Only)	0.114	0.112	Data Not Lognormal
Lilliefors (NDs = DL)	0.29	0.0997	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.317	0.0997	Data Not Lognormal
Lilliefors (Lognormal ROS Estimates)	0.0679	0.0997	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Barium (mg/kg) (swmu 59 ts)

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	28	0	28	28	0	0.00%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Full: no NDs)	28	31.6	190	85.85	69.3	51.31

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Full: no NDs)	3.286	2.958	26.12	4.293	0.567	0.132

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.924	0.924	0.924	0.924

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Full: no NDs)	0.838	0.924	Data Not Normal
Lilliefors (Full: no NDs)	0.206	0.167	Data Not Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.961	0.961	0.961	0.961

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Full: no NDs)	0.958	0.753	
Kolmogorov-Smirnov (Full: no NDs)	0.146	0.166	Data appear Approximate Gamma Distribution

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.969	0.969	0.969	0.969

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Full: no NDs)	0.92	0.924	Data Not Lognormal
Lilliefors (Full: no NDs)	0.135	0.167	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Beryllium (mg/kg) (rfaap bkgrd ts)

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	79	0	79	40	39	49.37%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	39	0.022	0.03	0.0286	0.03	0.00265
Statistics (Detects Only)	40	0.61	5.4	1.449	1.1	1.086
Statistics (All: NDs treated as DL value)	79	0.022	5.4	0.748	0.61	1.049
Statistics (All: NDs treated as DL/2 value)	79	0.011	5.4	0.74	0.61	1.054
Statistics (Normal ROS Estimated Data)	79	-3.53	5.4	0.149	0.61	1.644
Statistics (Gamma ROS Estimated Data)	79	1E-09	5.4	1.439	1.3	0.88
Statistics (Lognormal ROS Estimated Data)	79	0.0819	5.4	0.892	0.61	0.959

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	3.116	3.006	0.465	0.202	0.533	2.643
Statistics (NDs = DL)	0.47	0.461	1.589	-1.654	1.93	-1.167
Statistics (NDs = DL/2)	0.39	0.383	1.9	-1.996	2.273	-1.138
Statistics (Gamma ROS Estimates)	1.38	1.336	1.043	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-0.504	0.875	-1.735

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.81	0.829	0.83	0.978

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.666	0.94	Data Not Normal
Lilliefors (Detects Only)	0.256	0.14	Data Not Normal
Lilliefors (NDs = DL)	0.247	0.0997	Data Not Normal
Lilliefors (NDs = DL/2)	0.248	0.0997	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.117	0.0997	Data Not Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.915	0.976	0.973	0.959

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	2.172	0.754	
Kolmogorov-Smirnov (Detects Only)	0.198	0.14	Data Not Gamma Distributed
Anderson-Darling (NDs = DL)	6.807	0.826	
Kolmogorov-Smirnov (NDs = DL)	0.32	0.107	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	7.311	0.844	
Kolmogorov-Smirnov (NDs = DL/2)	0.323	0.108	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	5.881	0.773	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.232	0.103	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.947	0.883	0.873	0.996

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.891	0.94	Data Not Lognormal
Lilliefors (Detects Only)	0.155	0.14	Data Not Lognormal
Lilliefors (NDs = DL)	0.325	0.0997	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.328	0.0997	Data Not Lognormal
Lilliefors (Lognormal ROS Estimates)	0.0541	0.0997	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Beryllium (mg/kg) (swmu 59 ts)

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	28	8	20	20	0	0.00%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Full: no NDs)	20	0.43	1.3	0.726	0.63	0.253

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Full: no NDs)	9.91	8.457	0.0733	-0.371	0.32	-0.862

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.939	0.939	0.939	0.939

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Full: no NDs)	0.875	0.905	Data Not Normal
Lilliefors (Full: no NDs)	0.198	0.198	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.971	0.971	0.971	0.971

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Full: no NDs)	0.625	0.742	
Kolmogorov-Smirnov (Full: no NDs)	0.179	0.194	Data Appear Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.974	0.974	0.974	0.974

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Full: no NDs)	0.939	0.905	Data Appear Lognormal
Lilliefors (Full: no NDs)	0.162	0.198	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Cadmium (mg/kg) (rfaap bkgrd ts)

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	79	0	79	13	66	83.54%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	66	0.02	0.05	0.0256	0.02	0.00861
Statistics (Detects Only)	13	0.57	2.5	1.152	1.1	0.585
Statistics (All: NDs treated as DL value)	79	0.02	2.5	0.211	0.02	0.479
Statistics (All: NDs treated as DL/2 value)	79	0.01	2.5	0.2	0.01	0.483
Statistics (Normal ROS Estimated Data)	79	-4.148	2.5	-1.016	-1.143	1.342
Statistics (Gamma ROS Estimated Data)	79	0.197	2.987	1.943	2.175	0.717
Statistics (Lognormal ROS Estimated Data)	79	0.0167	2.5	0.338	0.174	0.444

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	5.194	5.005	0.222	0.0424	0.448	10.55
Statistics (NDs = DL)	0.424	0.416	0.498	-3.093	1.437	-0.465
Statistics (NDs = DL/2)	0.329	0.325	0.609	-3.672	1.69	-0.46
Statistics (Gamma ROS Estimates)	5.206	5.016	0.373	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-1.649	1.046	-0.634

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.905	0.675	0.671	0.995

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.82	0.866	Data Not Normal
Lilliefors (Detects Only)	0.246	0.246	Data Not Normal
Lilliefors (NDs = DL)	0.467	0.0997	Data Not Normal
Lilliefors (NDs = DL/2)	0.477	0.0997	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.0689	0.0997	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.955	0.948	0.957	0.92

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.512	0.736	
Kolmogorov-Smirnov (Detects Only)	0.181	0.237	Data Appear Gamma Distributed
Anderson-Darling (NDs = DL)	17.17	0.836	
Kolmogorov-Smirnov (NDs = DL)	0.422	0.107	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	18.08	0.858	
Kolmogorov-Smirnov (NDs = DL/2)	0.448	0.109	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	2.804	0.754	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.164	0.101	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.969	0.778	0.764	0.995

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.934	0.866	Data Appear Lognormal
Lilliefors (Detects Only)	0.158	0.246	Data Appear Lognormal
Lilliefors (NDs = DL)	0.327	0.0997	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.348	0.0997	Data Not Lognormal
Lilliefors (Lognormal ROS Estimates)	0.0689	0.0997	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Cadmium (mg/kg) (swmu 59 ts)

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	28	0	28	2	26	92.86%

Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set!

It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable Cadmium (mg/kg) (swmu 59 ts) was not processed!

Chromium (mg/kg) (rfaap bkgrd ts)

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	79	0	79	79	0	0.00%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Full: no NDs)	79	6.3	75.8	26.86	26	12.51

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Full: no NDs)	4.546	4.382	5.91	3.177	0.501	0.158

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.971	0.971	0.971	0.971

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Lilliefors (Full: no NDs)	0.0734	0.0997	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.99	0.99	0.99	0.99

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Full: no NDs)	0.591	0.755	
Kolmogorov-Smirnov (Full: no NDs)	0.0909	0.101	Data Appear Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.984	0.984	0.984	0.984

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Lilliefors (Full: no NDs)	0.122	0.0997	Data Not Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Chromium (mg/kg) (swmu 59 ts)

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	28	0	28	28	0	0.00%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Full: no NDs)	28	7.5	33.6	19.19	19.2	7.285

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Full: no NDs)	6.64	5.952	2.89	2.877	0.416	0.144

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.978	0.978	0.978	0.978

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Full: no NDs)	0.945	0.924	Data Appear Normal
Lilliefors (Full: no NDs)	0.113	0.167	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.977	0.977	0.977	0.977

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Full: no NDs)	0.546	0.747	
Kolmogorov-Smirnov (Full: no NDs)	0.126	0.166	Data Appear Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.97	0.97	0.97	0.97

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Full: no NDs)	0.93	0.924	Data Appear Lognormal
Lilliefors (Full: no NDs)	0.153	0.167	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Cobalt (mg/kg) (rfaap bkgrd ts)

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	79	0	79	56	23	29.11%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	23	0.11	0.84	0.587	0.73	0.286
Statistics (Detects Only)	56	5.9	130	22.23	13.3	23.94
Statistics (All: NDs treated as DL value)	79	0.11	130	15.93	11.4	22.41
Statistics (All: NDs treated as DL/2 value)	79	0.055	130	15.84	11.4	22.47
Statistics (Normal ROS Estimated Data)	79	-40.83	130	8.784	11.4	29.44
Statistics (Gamma ROS Estimated Data)	79	1E-09	130	17.57	11.9	21.54
Statistics (Lognormal ROS Estimated Data)	79	1.86	130	16.76	11.4	21.87

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	1.78	1.721	12.49	2.795	0.701	0.251
Statistics (NDs = DL)	0.61	0.595	26.11	1.758	1.787	1.017
Statistics (NDs = DL/2)	0.523	0.511	30.31	1.556	2.08	1.337
Statistics (Gamma ROS Estimates)	0.504	0.494	34.83	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	2.331	0.947	0.406

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.767	0.788	0.789	0.923

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Lilliefors (Detects Only)	0.263	0.118	Data Not Normal
Lilliefors (NDs = DL)	0.24	0.0997	Data Not Normal
Lilliefors (NDs = DL/2)	0.241	0.0997	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.17	0.0997	Data Not Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.914	0.965	0.969	0.961

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	3.203	0.765	
Kolmogorov-Smirnov (Detects Only)	0.162	0.121	Data Not Gamma Distributed
Anderson-Darling (NDs = DL)	2.127	0.807	
Kolmogorov-Smirnov (NDs = DL)	0.155	0.105	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	2.851	0.816	
Kolmogorov-Smirnov (NDs = DL/2)	0.171	0.106	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	9.036	0.818	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.36	0.106	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.956	0.941	0.924	0.986

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Lilliefors (Detects Only)	0.13	0.118	Data Not Lognormal
Lilliefors (NDs = DL)	0.213	0.0997	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.251	0.0997	Data Not Lognormal
Lilliefors (Lognormal ROS Estimates)	0.0915	0.0997	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Cobalt (mg/kg) (swmu 59 ts)

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	28	0	28	28	0	0.00%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Full: no NDs)	28	2.9	10.1	5.736	5.7	2.137

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Full: no NDs)	7.155	6.412	0.802	1.675	0.394	0.235

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.98	0.98	0.98	0.98

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Full: no NDs)	0.943	0.924	Data Appear Normal
Lilliefors (Full: no NDs)	0.121	0.167	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.983	0.983	0.983	0.983

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Full: no NDs)	0.477	0.747	
Kolmogorov-Smirnov (Full: no NDs)	0.126	0.166	Data Appear Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.975	0.975	0.975	0.975

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Full: no NDs)	0.93	0.924	Data Appear Lognormal
Lilliefors (Full: no NDs)	0.119	0.167	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Copper (mg/kg) (rfaap bkgrd ts)

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	79	0	79	77	2	2.53%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	2	0.17	0.17	0.17	0.17	0
Statistics (Detects Only)	77	1.6	38.7	12.25	9.1	9.397
Statistics (All: NDs treated as DL value)	79	0.17	38.7	11.95	9	9.47
Statistics (All: NDs treated as DL/2 value)	79	0.085	38.7	11.94	9	9.473
Statistics (Normal ROS Estimated Data)	79	-11.93	38.7	11.67	9	9.957
Statistics (Gamma ROS Estimated Data)	79	1E-09	38.7	11.94	9	9.475
Statistics (Lognormal ROS Estimated Data)	79	0.988	38.7	11.97	9	9.441

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	1.754	1.696	6.985	2.194	0.828	0.378
Statistics (NDs = DL)	1.438	1.391	8.31	2.094	1.03	0.492
Statistics (NDs = DL/2)	1.381	1.337	8.649	2.076	1.101	0.53
Statistics (Gamma ROS Estimates)	0.698	0.68	17.1	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	2.141	0.882	0.412

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.941	0.944	0.944	0.961

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Lilliefors (Detects Only)	0.152	0.101	Data Not Normal
Lilliefors (NDs = DL)	0.155	0.0997	Data Not Normal
Lilliefors (NDs = DL/2)	0.155	0.0997	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.136	0.0997	Data Not Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.982	0.98	0.979	0.955

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.936	0.767	
Kolmogorov-Smirnov (Detects Only)	0.117	0.103	Data Not Gamma Distributed
Anderson-Darling (NDs = DL)	0.591	0.772	
Kolmogorov-Smirnov (NDs = DL)	0.0861	0.102	Data Appear Gamma Distributed
Anderson-Darling (NDs = DL/2)	0.619	0.773	
Kolmogorov-Smirnov (NDs = DL/2)	0.0788	0.103	Data Appear Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	4.964	0.798	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.209	0.105	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.988	0.951	0.927	0.988

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Lilliefors (Detects Only)	0.082	0.101	Data Appear Lognormal
Lilliefors (NDs = DL)	0.0741	0.0997	Data Appear Lognormal
Lilliefors (NDs = DL/2)	0.0933	0.0997	Data Appear Lognormal
Lilliefors (Lognormal ROS Estimates)	0.0707	0.0997	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Copper (mg/kg) (swmu 59 ts)

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	28	0	28	28	0	0.00%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Full: no NDs)	28	3.3	19.1	11.04	10.75	3.748

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Full: no NDs)	8.129	7.282	1.358	2.338	0.379	0.162

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS

Correlation Coefficient R	0.993	0.993	0.993	0.993

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Full: no NDs)	0.984	0.924	Data Appear Normal
Lilliefors (Full: no NDs)	0.0845	0.167	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.991	0.991	0.991	0.991

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Full: no NDs)	0.18	0.746	
Kolmogorov-Smirnov (Full: no NDs)	0.0767	0.165	Data Appear Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.971	0.971	0.971	0.971

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Full: no NDs)	0.952	0.924	Data Appear Lognormal
Lilliefors (Full: no NDs)	0.101	0.167	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Iron (mg/kg) (rfaap bkgrd ts)

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	79	0	79	79	0	0.00%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Full: no NDs)	79	7250	67700	26963	25200	11990

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Full: no NDs)	4.607	4.441	5852	10.09	0.508	0.0503

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.979	0.979	0.979	0.979

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Lilliefors (Full: no NDs)	0.0648	0.0997	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.984	0.984	0.984	0.984

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Full: no NDs)	0.831	0.755	
Kolmogorov-Smirnov (Full: no NDs)	0.082	0.101	Data appear Approximate Gamma Distribution

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.97	0.97	0.97	0.97

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Lilliefors (Full: no NDs)	0.115	0.0997	Data Not Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Iron (mg/kg) (swmu 59 ts)

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	28	0	28	28	0	0.00%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Full: no NDs)	28	4200	38800	18925	18600	9664

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Full: no NDs)	3.668	3.299	5159	9.706	0.576	0.0593

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.971	0.971	0.971	0.971

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Full: no NDs)	0.93	0.924	Data Appear Normal
Lilliefors (Full: no NDs)	0.134	0.167	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.977	0.977	0.977	0.977

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Full: no NDs)	0.335	0.751	
Kolmogorov-Smirnov (Full: no NDs)	0.0917	0.166	Data Appear Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.976	0.976	0.976	0.976

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Full: no NDs)	0.945	0.924	Data Appear Lognormal
Lilliefors (Full: no NDs)	0.127	0.167	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Lead (mg/kg) (rfaap bkgrd ts)

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	79	0	79	79	0	0.00%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Full: no NDs)	79	2.1	256	22.04	12	39.85

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Full: no NDs)	1.186	1.149	18.59	2.615	0.783	0.299

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.597	0.597	0.597	0.597

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Lilliefors (Full: no NDs)	0.344	0.0997	Data Not Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.803	0.803	0.803	0.803

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Full: no NDs)	7.671	0.777	
Kolmogorov-Smirnov (Full: no NDs)	0.245	0.103	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.929	0.929	0.929	0.929

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Lilliefors (Full: no NDs)	0.147	0.0997	Data Not Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Lead (mg/kg) (swmu 59 ts)

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	28	0	28	28	0	0.00%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Full: no NDs)	28	3.8	30.9	12.23	9.8	6.662

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Full: no NDs)	4.016	3.61	3.044	2.374	0.515	0.217

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.941	0.941	0.941	0.941

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Full: no NDs)	0.886	0.924	Data Not Normal
Lilliefors (Full: no NDs)	0.204	0.167	Data Not Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.988	0.988	0.988	0.988

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Full: no NDs)	0.411	0.75	
Kolmogorov-Smirnov (Full: no NDs)	0.151	0.166	Data Appear Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.994	0.994	0.994	0.994

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Full: no NDs)	0.983	0.924	Data Appear Lognormal
Lilliefors (Full: no NDs)	0.117	0.167	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Magnesium (mg/kg) (rfaap bkgrd ts)

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs

Raw Statistics	79	0	79	72	7	8.86%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	7	3.8	5	4.686	4.8	0.402
Statistics (Detects Only)	72	139	58100	6394	1270	12925
Statistics (All: NDs treated as DL value)	79	3.8	58100	5828	1080	12466
Statistics (All: NDs treated as DL/2 value)	79	1.9	58100	5827	1080	12466
Statistics (Normal ROS Estimated Data)	79	-19110	58100	4438	1080	13862
Statistics (Gamma ROS Estimated Data)	79	1E-09	58100	5827	1080	12466
Statistics (Lognormal ROS Estimated Data)	79	28.2	58100	5832	1080	12464

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	0.484	0.474	13216	7.443	1.571	0.211
Statistics (NDs = DL)	0.379	0.373	15366	6.92	2.257	0.326
Statistics (NDs = DL/2)	0.368	0.363	15828	6.859	2.409	0.351
Statistics (Gamma ROS Estimates)	0.198	0.199	29431	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	7.129	1.812	0.254

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.71	0.697	0.697	0.812

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Lilliefors (Detects Only)	0.323	0.104	Data Not Normal
Lilliefors (NDs = DL)	0.321	0.0997	Data Not Normal
Lilliefors (NDs = DL/2)	0.321	0.0997	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.29	0.0997	Data Not Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.943	0.948	0.949	0.956

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	4.255	0.821	
Kolmogorov-Smirnov (Detects Only)	0.17	0.111	Data Not Gamma Distributed
Anderson-Darling (NDs = DL)	2.668	0.847	
Kolmogorov-Smirnov (NDs = DL)	0.136	0.108	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	2.542	0.849	
Kolmogorov-Smirnov (NDs = DL/2)	0.129	0.108	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	7.068	0.912	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.298	0.111	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.977	0.962	0.948	0.992

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Lilliefors (Detects Only)	0.0868	0.104	Data Appear Lognormal
Lilliefors (NDs = DL)	0.135	0.0997	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.157	0.0997	Data Not Lognormal
Lilliefors (Lognormal ROS Estimates)	0.0546	0.0997	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Magnesium (mg/kg) (swmu 59 ts)

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	28	0	28	28	0	0.00%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Full: no NDs)	28	227	2270	914.1	877.5	541.7

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Full: no NDs)	2.955	2.663	309.3	6.639	0.628	0.0946

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.965	0.965	0.965	0.965

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Full: no NDs)	0.924	0.924	Data Appear Normal
Lilliefors (Full: no NDs)	0.133	0.167	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.993	0.993	0.993	0.993

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Full: no NDs)	0.238	0.754	
Kolmogorov-Smirnov (Full: no NDs)	0.102	0.167	Data Appear Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.991	0.991	0.991	0.991

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Full: no NDs)	0.97	0.924	Data Appear Lognormal
Lilliefors (Full: no NDs)	0.135	0.167	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Manganese (mg/kg) (rfaap bkgrd ts)

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	79	0	79	79	0	0.00%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Full: no NDs)	79	16.7	2040	471.4	359	467.1

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Full: no NDs)	1.121	1.087	420.6	5.647	1.118	0.198

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.894	0.894	0.894	0.894

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Lilliefors (Full: no NDs)	0.165	0.0997	Data Not Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.982	0.982	0.982	0.982

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)

Anderson-Darling (Full: no NDs)	0.359	0.779	
Kolmogorov-Smirnov (Full: no NDs)	0.0515	0.103	Data Appear Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.985	0.985	0.985	0.985

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Lilliefors (Full: no NDs)	0.093	0.0997	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Manganese (mg/kg) (swmu 59 ts)

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	28	0	28	28	0	0.00%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Full: no NDs)	28	67.95	3630	508.3	282.5	791.7

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Full: no NDs)	0.966	0.886	526.2	5.631	0.991	0.176

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.722	0.722	0.722	0.722

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Full: no NDs)	0.541	0.924	Data Not Normal
Lilliefors (Full: no NDs)	0.375	0.167	Data Not Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.917	0.917	0.917	0.917

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Full: no NDs)	1.85	0.775	
Kolmogorov-Smirnov (Full: no NDs)	0.249	0.17	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.963	0.963	0.963	0.963

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Full: no NDs)	0.925	0.924	Data Appear Lognormal
Lilliefors (Full: no NDs)	0.154	0.167	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Mercury (mg/kg) (rfaap bkgrd ts)

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	79	0	79	18	61	77.22%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	61	0.019	0.06	0.0484	0.06	0.0158
Statistics (Detects Only)	18	0.038	1.2	0.187	0.125	0.259
Statistics (All: NDs treated as DL value)	79	0.019	1.2	0.0799	0.06	0.135

Statistics (All: NDs treated as DL/2 value)	79	0.0095	1.2	0.0612	0.03	0.139
Statistics (Normal ROS Estimated Data)	79	-1.214	1.2	-0.361	-0.372	0.403
Statistics (Gamma ROS Estimated Data)	79	0.038	1.2	0.173	0.156	0.138
Statistics (Lognormal ROS Estimated Data)	79	0.0007952	1.2	0.0541	0.0171	0.141

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	1.552	1.501	0.12	-2.035	0.727	-0.358
Statistics (NDs = DL)	1.645	1.591	0.0485	-2.861	0.681	-0.238
Statistics (NDs = DL/2)	0.962	0.934	0.0636	-3.396	0.902	-0.266
Statistics (Gamma ROS Estimates)	3.073	2.965	0.0563	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-4.029	1.44	-0.357

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.64	0.523	0.527	0.977

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.442	0.897	Data Not Normal
Lilliefors (Detects Only)	0.384	0.209	Data Not Normal
Lilliefors (NDs = DL)	0.356	0.0997	Data Not Normal
Lilliefors (NDs = DL/2)	0.361	0.0997	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.067	0.0997	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.801	0.683	0.741	0.816

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	1.702	0.756	
Kolmogorov-Smirnov (Detects Only)	0.274	0.207	Data Not Gamma Distributed
Anderson-Darling (NDs = DL)	6.715	0.768	
Kolmogorov-Smirnov (NDs = DL)	0.33	0.102	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	8.44	0.784	
Kolmogorov-Smirnov (NDs = DL/2)	0.377	0.104	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	0.725	0.759	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.0728	0.101	Data Appear Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.919	0.916	0.914	0.994

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.871	0.897	Data Not Lognormal
Lilliefors (Detects Only)	0.193	0.209	Data Appear Lognormal
Lilliefors (NDs = DL)	0.269	0.0997	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.321	0.0997	Data Not Lognormal
Lilliefors (Lognormal ROS Estimates)	0.062	0.0997	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Mercury (mg/kg) (swmu 59 ts)

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	28	2	26	24	2	7.69%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	2	0.05	0.0611	0.0556	0.0556	0.00785
Statistics (Detects Only)	24	0.029	0.561	0.162	0.1	0.144

Statistics (All: NDs treated as DL value)	26	0.029	0.561	0.154	0.0965	0.141
Statistics (All: NDs treated as DL/2 value)	26	0.025	0.561	0.152	0.0965	0.143
Statistics (Normal ROS Estimated Data)	26	-0.026	0.561	0.148	0.0965	0.148
Statistics (Gamma ROS Estimated Data)	26	1E-09	0.561	0.15	0.0965	0.145
Statistics (Lognormal ROS Estimated Data)	26	0.029	0.561	0.153	0.0965	0.143

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	1.664	1.498	0.0976	-2.147	0.818	-0.381
Statistics (NDs = DL)	1.638	1.475	0.0941	-2.205	0.811	-0.368
Statistics (NDs = DL/2)	1.479	1.334	0.103	-2.258	0.877	-0.389
Statistics (Gamma ROS Estimates)	0.393	0.373	0.381	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-2.239	0.848	-0.379

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.893	0.881	0.889	0.915

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.797	0.916	Data Not Normal
Lilliefors (Detects Only)	0.282	0.181	Data Not Normal
Shapiro-Wilks (NDs = DL)	0.777	0.92	Data Not Normal
Lilliefors (NDs = DL)	0.288	0.174	Data Not Normal
Shapiro-Wilks (NDs = DL/2)	0.789	0.92	Data Not Normal
Lilliefors (NDs = DL/2)	0.281	0.174	Data Not Normal
Shapiro-Wilks (Normal ROS Estimates)	0.838	0.92	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.267	0.174	Data Not Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.981	0.978	0.983	0.968

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.802	0.759	
Kolmogorov-Smirnov (Detects Only)	0.208	0.181	Data Not Gamma Distributed
Anderson-Darling (NDs = DL)	0.966	0.76	
Kolmogorov-Smirnov (NDs = DL)	0.208	0.174	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	0.747	0.762	
Kolmogorov-Smirnov (NDs = DL/2)	0.19	0.174	Data appear Approximate Gamma Distribution
Anderson-Darling (Gamma ROS Estimates)	3.543	0.832	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.331	0.184	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.983	0.981	0.985	0.98

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.956	0.916	Data Appear Lognormal
Lilliefors (Detects Only)	0.153	0.181	Data Appear Lognormal
Shapiro-Wilks (NDs = DL)	0.952	0.92	Data Appear Lognormal
Lilliefors (NDs = DL)	0.151	0.174	Data Appear Lognormal
Shapiro-Wilks (NDs = DL/2)	0.958	0.92	Data Appear Lognormal
Lilliefors (NDs = DL/2)	0.13	0.174	Data Appear Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.946	0.92	Data Appear Lognormal
Lilliefors (Lognormal ROS Estimates)	0.137	0.174	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Nickel (mg/kg) (rfaap bkgrd ts)

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	79	0	79	61	18	22.78%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	18	0.21	1.4	1.066	1.3	0.466
Statistics (Detects Only)	61	4.6	94.2	17.95	13.2	15.68
Statistics (All: NDs treated as DL value)	79	0.21	94.2	14.1	9.4	15.49
Statistics (All: NDs treated as DL/2 value)	79	0.105	94.2	13.98	9.4	15.59
Statistics (Normal ROS Estimated Data)	79	-32.3	94.2	10.45	9.4	19.82
Statistics (Gamma ROS Estimated Data)	79	1E-09	94.2	14.69	9.8	15.1
Statistics (Lognormal ROS Estimated Data)	79	1.082	94.2	14.48	9.4	15.18

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	1.974	1.908	9.092	2.614	0.722	0.276
Statistics (NDs = DL)	0.89	0.865	15.85	1.989	1.367	0.687
Statistics (NDs = DL/2)	0.743	0.723	18.82	1.831	1.622	0.886
Statistics (Gamma ROS Estimates)	0.377	0.371	38.92	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	2.235	0.959	0.429

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.86	0.87	0.874	0.961

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Lilliefors (Detects Only)	0.197	0.113	Data Not Normal
Lilliefors (NDs = DL)	0.185	0.0997	Data Not Normal
Lilliefors (NDs = DL/2)	0.187	0.0997	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.156	0.0997	Data Not Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.969	0.99	0.992	0.988

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.996	0.763	
Kolmogorov-Smirnov (Detects Only)	0.096	0.115	Data appear Approximate Gamma Distribution
Anderson-Darling (NDs = DL)	0.633	0.787	
Kolmogorov-Smirnov (NDs = DL)	0.112	0.104	Data appear Approximate Gamma Distribution
Anderson-Darling (NDs = DL/2)	1.261	0.794	
Kolmogorov-Smirnov (NDs = DL/2)	0.135	0.104	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	11.39	0.847	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.343	0.108	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.986	0.963	0.942	0.997

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Lilliefors (Detects Only)	0.087	0.113	Data Appear Lognormal
Lilliefors (NDs = DL)	0.14	0.0997	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.198	0.0997	Data Not Lognormal
Lilliefors (Lognormal ROS Estimates)	0.0586	0.0997	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Nickel (mg/kg) (swmu 59 ts)

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	28	0	28	28	0	0.00%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Full: no NDs)	28	5.2	13.85	8.274	8.3	2.233

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Full: no NDs)	14.92	13.35	0.554	2.079	0.264	0.127

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.975	0.975	0.975	0.975

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Full: no NDs)	0.944	0.924	Data Appear Normal
Lilliefors (Full: no NDs)	0.103	0.167	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.99	0.99	0.99	0.99

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Full: no NDs)	0.313	0.745	
Kolmogorov-Smirnov (Full: no NDs)	0.098	0.165	Data Appear Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.989	0.989	0.989	0.989

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Full: no NDs)	0.967	0.924	Data Appear Lognormal
Lilliefors (Full: no NDs)	0.0915	0.167	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Potassium (mg/kg) (rfaap bkgrd ts)

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	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	1E-09	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 CV
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

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.813	0.789	0.795	0.88

	Test value	Crit. (0.05)	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

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.972	0.968	0.974	0.962

	Test value	Crit. (0.05)	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

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.989	0.973	0.983	0.98

	Test value	Crit. (0.05)	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: Substitution methods such as DL or DL/2 are not recommended.

Potassium (mg/kg) (swmu 59 ts)

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	28	4	24	24	0	0.00%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Full: no NDs)	24	300	1330	769.2	765	310

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Full: no NDs)	5.528	4.865	139.1	6.552	0.464	0.0709

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.984	0.984	0.984	0.984

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Full: no NDs)	0.953	0.916	Data Appear Normal
Lilliefors (Full: no NDs)	0.12	0.181	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.967	0.967	0.967	0.967

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Full: no NDs)	0.573	0.746	
Kolmogorov-Smirnov (Full: no NDs)	0.147	0.178	Data Appear Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.963	0.963	0.963	0.963

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Full: no NDs)	0.912	0.916	Data Not Lognormal
Lilliefors (Full: no NDs)	0.149	0.181	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Selenium (mg.kg) (rfaap bkgrd ts)

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	79	0	79	2	77	97.47%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	77	N/A	N/A	N/A	N/A	N/A
Statistics (Detects Only)	2	N/A	N/A	N/A	N/A	N/A
Statistics (All: NDs treated as DL value)	79	N/A	N/A	N/A	N/A	N/A
Statistics (All: NDs treated as DL/2 value)	79	N/A	N/A	N/A	N/A	N/A
Statistics (Normal ROS Estimated Data)	79	N/A	N/A	N/A	N/A	N/A

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	N/A	N/A	N/A	N/A

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	N/A	N/A	
Lilliefors (Detects Only)	N/A	N/A	
Lilliefors (NDs = DL)	N/A	N/A	
Lilliefors (NDs = DL/2)	N/A	N/A	
Lilliefors (Normal ROS Estimates)	N/A	N/A	

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	N/A	N/A	N/A	N/A

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	N/A	N/A	
Kolmogorov-Smirnov (Detects Only)	N/A	N/A	
Anderson-Darling (NDs = DL)	N/A	N/A	
Kolmogorov-Smirnov (NDs = DL)	N/A	N/A	
Anderson-Darling (NDs = DL/2)	N/A	N/A	
Kolmogorov-Smirnov (NDs = DL/2)	N/A	N/A	
Anderson-Darling (Gamma ROS Estimates)	N/A	N/A	
Kolmogorov-Smirnov (Gamma ROS Est.)	N/A	N/A	

Note: Substitution methods such as DL or DL/2 are not recommended.

Selenium (mg.kg) (swmu 59 ts)

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	28	1	27	18	9	33.33%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	9	0.11	1.315	0.622	0.25	0.57
Statistics (Detects Only)	18	0.165	11.7	3.151	0.7	3.857
Statistics (All: NDs treated as DL value)	27	0.11	11.7	2.308	0.699	3.362
Statistics (All: NDs treated as DL/2 value)	27	0.055	11.7	2.204	0.6	3.408
Statistics (Normal ROS Estimated Data)	27	-6.863	11.7	1.097	0.38	4.507
Statistics (Gamma ROS Estimated Data)	27	0.165	11.7	2.674	0.838	3.239
Statistics (Lognormal ROS Estimated Data)	27	0.019	11.7	2.146	0.38	3.439

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	0.634	0.588	4.972	0.18	1.522	8.438
Statistics (NDs = DL)	0.587	0.547	3.93	-0.219	1.508	-6.876
Statistics (NDs = DL/2)	0.51	0.478	4.319	-0.45	1.664	-3.695
Statistics (Gamma ROS Estimates)	0.806	0.741	3.318	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-0.669	1.824	-2.725

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.878	0.827	0.81	0.954

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.762	0.897	Data Not Normal
Lilliefors (Detects Only)	0.347	0.209	Data Not Normal
Shapiro-Wilks (NDs = DL)	0.683	0.923	Data Not Normal
Lilliefors (NDs = DL)	0.357	0.171	Data Not Normal
Shapiro-Wilks (NDs = DL/2)	0.656	0.923	Data Not Normal
Lilliefors (NDs = DL/2)	0.409	0.171	Data Not Normal
Shapiro-Wilks (Normal ROS Estimates)	0.911	0.923	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.274	0.171	Data Not Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.948	0.966	0.957	0.98

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	1.358	0.788	
Kolmogorov-Smirnov (Detects Only)	0.301	0.213	Data Not Gamma Distributed
Anderson-Darling (NDs = DL)	1.543	0.799	
Kolmogorov-Smirnov (NDs = DL)	0.217	0.177	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	1.833	0.806	
Kolmogorov-Smirnov (NDs = DL/2)	0.313	0.178	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	1.023	0.782	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.213	0.175	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.94	0.965	0.963	0.968

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.863	0.897	Data Not Lognormal
Lilliefors (Detects Only)	0.242	0.209	Data Not Lognormal
Shapiro-Wilks (NDs = DL)	0.912	0.923	Data Not Lognormal
Lilliefors (NDs = DL)	0.141	0.171	Data Appear Lognormal
Shapiro-Wilks (NDs = DL/2)	0.911	0.923	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.212	0.171	Data Not Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.925	0.923	Data Appear Lognormal
Lilliefors (Lognormal ROS Estimates)	0.167	0.171	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Silver (mg/kg) (rfaap bkgrd ts)

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	79	0	79	1	78	98.73%

Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set!

It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable Silver (mg/kg) (rfaap bkgrd ts) was not processed!

Silver (mg/kg) (swmu 59 ts)

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	28	0	28	1	27	96.43%

Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set!

It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable Silver (mg/kg) (swmu 59 ts) was not processed!

Sodium (mg/kg) (rfaap bkgrd ts)

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	79	0	79	6	73	92.41%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	73	10.8	25.9	15.02	12	4.717
Statistics (Detects Only)	6	114	151	131.7	127	14.76
Statistics (All: NDs treated as DL value)	79	10.8	151	23.88	12.1	31.65
Statistics (All: NDs treated as DL/2 value)	79	5.4	151	16.94	6.05	33.39
Statistics (Normal ROS Estimated Data)	79	-8.416	151	43.69	36.98	33.18
Statistics (Gamma ROS Estimated Data)	79	114	151	131.6	131.6	3.738
Statistics (Lognormal ROS Estimated Data)	79	45.83	151	70.08	64.41	20.82

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	97.1	93.42	1.356	4.875	0.111	0.0227
Statistics (NDs = DL)	1.618	1.565	14.76	2.833	0.653	0.23
Statistics (NDs = DL/2)	0.916	0.889	18.5	2.193	0.823	0.376
Statistics (Gamma ROS Estimates)	1276	1227	0.103	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	4.216	0.249	0.059

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.957	0.639	0.59	0.936

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.901	0.788	Data Appear Normal
Lilliefors (Detects Only)	0.212	0.362	Data Appear Normal
Lilliefors (NDs = DL)	0.404	0.0997	Data Not Normal
Lilliefors (NDs = DL/2)	0.472	0.0997	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.2	0.0997	Data Not Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.959	0.811	0.809	0.571

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.389	0.696	
Kolmogorov-Smirnov (Detects Only)	0.22	0.332	Data Appear Gamma Distributed
Anderson-Darling (NDs = DL)	13.6	0.769	
Kolmogorov-Smirnov (NDs = DL)	0.302	0.102	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	17.64	0.786	
Kolmogorov-Smirnov (NDs = DL/2)	0.386	0.104	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	22.97	0.749	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.448	0.1	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.963	0.798	0.753	0.936

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.913	0.788	Data Appear Lognormal
Lilliefors (Detects Only)	0.198	0.362	Data Appear Lognormal
Lilliefors (NDs = DL)	0.246	0.0997	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.27	0.0997	Data Not Lognormal
Lilliefors (Lognormal ROS Estimates)	0.2	0.0997	Data Not Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Sodium (mg/kg) (swmu 59 ts)

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	28	13	15	11	4	26.67%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	4	42	51	46.5	46.5	4.655
Statistics (Detects Only)	11	35.4	396	220.5	219.5	149.5
Statistics (All: NDs treated as DL value)	15	35.4	396	174.1	72.8	149.4
Statistics (All: NDs treated as DL/2 value)	15	21	396	167.9	72.8	155.3
Statistics (Normal ROS Estimated Data)	15	-40.5	396	155.8	72.8	168.6
Statistics (Gamma ROS Estimated Data)	15	35.4	396	187.1	113.1	139.2
Statistics (Lognormal ROS Estimated Data)	15	30.37	396	170.9	72.8	152.5

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	1.678	1.387	131.4	5.07	0.946	0.187
Statistics (NDs = DL)	1.335	1.112	130.5	4.741	0.98	0.207
Statistics (NDs = DL/2)	1.015	0.856	165.5	4.556	1.191	0.262
Statistics (Gamma ROS Estimates)	1.792	1.478	104.4	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	4.659	1.068	0.229

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.938	0.9	0.909	0.941

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.848	0.85	Data Not Normal
Lilliefors (Detects Only)	0.202	0.267	Data Appear Normal
Shapiro-Wilks (NDs = DL)	0.783	0.881	Data Not Normal
Lilliefors (NDs = DL)	0.285	0.229	Data Not Normal
Shapiro-Wilks (NDs = DL/2)	0.799	0.881	Data Not Normal

Lilliefors (NDs = DL/2)	0.263	0.229	Data Not Normal
Shapiro-Wilks (Normal ROS Estimates)	0.859	0.881	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.222	0.229	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.868	0.9	0.889	0.922

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.75	0.741	
Kolmogorov-Smirnov (Detects Only)	0.226	0.259	Data appear Approximate Gamma Distribution
Anderson-Darling (NDs = DL)	1.242	0.757	
Kolmogorov-Smirnov (NDs = DL)	0.25	0.226	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	0.952	0.763	
Kolmogorov-Smirnov (NDs = DL/2)	0.184	0.228	Data appear Approximate Gamma Distribution
Anderson-Darling (Gamma ROS Estimates)	0.679	0.75	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.18	0.225	Data Appear Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.931	0.922	0.939	0.927

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.841	0.85	Data Not Lognormal
Lilliefors (Detects Only)	0.219	0.267	Data Appear Lognormal
Shapiro-Wilks (NDs = DL)	0.822	0.881	Data Not Lognormal
Lilliefors (NDs = DL)	0.211	0.229	Data Appear Lognormal
Shapiro-Wilks (NDs = DL/2)	0.852	0.881	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.176	0.229	Data Appear Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.828	0.881	Data Not Lognormal
Lilliefors (Lognormal ROS Estimates)	0.186	0.229	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Thallium (mg/kg) (rfaap bkgrd ts)

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	79	0	79	15	64	81.01%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	64	0.13	0.45	0.189	0.15	0.0931
Statistics (Detects Only)	15	1.3	5	2.527	2.2	0.932
Statistics (All: NDs treated as DL value)	79	0.13	5	0.633	0.16	1.007
Statistics (All: NDs treated as DL/2 value)	79	0.065	5	0.556	0.08	1.039
Statistics (Normal ROS Estimated Data)	79	-4.787	5	-0.573	-0.722	1.972
Statistics (Gamma ROS Estimated Data)	79	1.3	5	2.489	2.468	0.399
Statistics (Lognormal ROS Estimated Data)	79	0.155	5	0.998	0.707	0.884

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	8.698	8.377	0.29	0.868	0.352	0.405
Statistics (NDs = DL)	0.753	0.733	0.841	-1.253	1.097	-0.876
Statistics (NDs = DL/2)	0.515	0.504	1.08	-1.814	1.358	-0.748
Statistics (Gamma ROS Estimates)	44.1	42.44	0.0564	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-0.291	0.738	-2.538

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.938	0.746	0.729	0.991

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.893	0.881	Data Appear Normal
Lilliefors (Detects Only)	0.17	0.229	Data Appear Normal
Lilliefors (NDs = DL)	0.382	0.0997	Data Not Normal
Lilliefors (NDs = DL/2)	0.435	0.0997	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.0779	0.0997	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.964	0.943	0.944	0.777

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.367	0.738	
Kolmogorov-Smirnov (Detects Only)	0.145	0.222	Data Appear Gamma Distributed
Anderson-Darling (NDs = DL)	12.86	0.793	
Kolmogorov-Smirnov (NDs = DL)	0.361	0.104	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	14.62	0.817	
Kolmogorov-Smirnov (NDs = DL/2)	0.371	0.106	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	10.13	0.749	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.319	0.1	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.977	0.835	0.815	0.99

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.959	0.881	Data Appear Lognormal
Lilliefors (Detects Only)	0.134	0.229	Data Appear Lognormal
Lilliefors (NDs = DL)	0.334	0.0997	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.34	0.0997	Data Not Lognormal
Lilliefors (Lognormal ROS Estimates)	0.0779	0.0997	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Thallium (mg/kg) (swmu 59 ts)

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	28	0	28	6	22	78.57%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	22	0.26	12	3.289	2.5	3.279
Statistics (Detects Only)	6	0.073	0.21	0.128	0.118	0.0498
Statistics (All: NDs treated as DL value)	28	0.073	12	2.611	0.28	3.179
Statistics (All: NDs treated as DL/2 value)	28	0.073	6	1.319	0.185	1.579
Statistics (Normal ROS Estimated Data)	28	0.0676	0.21	0.128	0.128	0.0354
Statistics (Gamma ROS Estimated Data)	28	0.0649	0.21	0.131	0.136	0.0346
Statistics (Lognormal ROS Estimated Data)	28	0.073	0.21	0.125	0.121	0.035

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	8.394	7.519	0.0153	-2.114	0.38	-0.18
Statistics (NDs = DL)	0.559	0.523	4.668	-0.156	1.696	-10.86
Statistics (NDs = DL/2)	0.628	0.584	2.102	-0.701	1.536	-2.191
Statistics (Gamma ROS Estimates)	13.61	12.18	0.00963	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-2.114	0.274	-0.13

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS

Correlation Coefficient R	0.975	0.882	0.879	0.985

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.949	0.788	Data Appear Normal
Lilliefors (Detects Only)	0.193	0.362	Data Appear Normal
Shapiro-Wilks (NDs = DL)	0.776	0.924	Data Not Normal
Lilliefors (NDs = DL)	0.304	0.167	Data Not Normal
Shapiro-Wilks (NDs = DL/2)	0.771	0.924	Data Not Normal
Lilliefors (NDs = DL/2)	0.295	0.167	Data Not Normal
Shapiro-Wilks (Normal ROS Estimates)	0.966	0.924	Data Appear Normal
Lilliefors (Normal ROS Estimates)	0.179	0.167	Data Not Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.996	0.946	0.951	0.979

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.175	0.698	
Kolmogorov-Smirnov (Detects Only)	0.151	0.333	Data Appear Gamma Distributed
Anderson-Darling (NDs = DL)	2.049	0.804	
Kolmogorov-Smirnov (NDs = DL)	0.308	0.174	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	2.451	0.797	
Kolmogorov-Smirnov (NDs = DL/2)	0.285	0.173	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	0.567	0.745	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.192	0.165	Data appear Approximate Gamma Distribution

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.997	0.932	0.908	0.988

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.991	0.788	Data Appear Lognormal
Lilliefors (Detects Only)	0.131	0.362	Data Appear Lognormal
Shapiro-Wilks (NDs = DL)	0.849	0.924	Data Not Lognormal
Lilliefors (NDs = DL)	0.281	0.167	Data Not Lognormal
Shapiro-Wilks (NDs = DL/2)	0.805	0.924	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.269	0.167	Data Not Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.968	0.924	Data Appear Lognormal
Lilliefors (Lognormal ROS Estimates)	0.143	0.167	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Vanadium (mg/kg) (rfaap bkgrd ts)

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	79	0	79	79	0	0.00%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Full: no NDs)	79	12.2	114	45.84	41.4	20.38

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Full: no NDs)	4.973	4.792	9.218	3.721	0.477	0.128

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.98	0.98	0.98	0.98

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)

Lilliefors (Full: no NDs)	0.0967	0.0997	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.997	0.997	0.997	0.997

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Full: no NDs)	0.228	0.754	
Kolmogorov-Smirnov (Full: no NDs)	0.054	0.101	Data Appear Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.988	0.988	0.988	0.988

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Lilliefors (Full: no NDs)	0.0843	0.0997	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Vanadium (mg/kg) (swmu 59 ts)

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	28	0	28	28	0	0.00%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Full: no NDs)	28	12.1	74.5	36.49	34.3	17.22

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Full: no NDs)	4.651	4.176	7.847	3.486	0.491	0.141

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.975	0.975	0.975	0.975

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Full: no NDs)	0.938	0.924	Data Appear Normal
Lilliefors (Full: no NDs)	0.152	0.167	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.99	0.99	0.99	0.99

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Full: no NDs)	0.203	0.749	
Kolmogorov-Smirnov (Full: no NDs)	0.0903	0.166	Data Appear Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.992	0.992	0.992	0.992

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Full: no NDs)	0.973	0.924	Data Appear Lognormal
Lilliefors (Full: no NDs)	0.0734	0.167	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Zinc (mg/kg) (rfaap bkgrd ts)

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	79	0	79	79	0	0.00%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Full: no NDs)	79	4.7	598	54.94	30.2	87.15

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Full: no NDs)	1.083	1.05	50.74	3.478	0.93	0.267

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.683	0.683	0.683	0.683

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Lilliefors (Full: no NDs)	0.291	0.0997	Data Not Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.88	0.88	0.88	0.88

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Full: no NDs)	3.363	0.78	
Kolmogorov-Smirnov (Full: no NDs)	0.145	0.103	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.982	0.982	0.982	0.982

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Lilliefors (Full: no NDs)	0.0696	0.0997	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Zinc (mg/kg) (swmu 59 ts)

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	28	0	28	28	0	0.00%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Full: no NDs)	28	7.23	76.3	29.33	26.95	15.08

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Full: no NDs)	3.992	3.588	7.348	3.248	0.542	0.167

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.957	0.957	0.957	0.957

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Full: no NDs)	0.924	0.924	Data Appear Normal
Lilliefors (Full: no NDs)	0.128	0.167	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.989	0.989	0.989	0.989

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Full: no NDs)	0.22	0.75	
Kolmogorov-Smirnov (Full: no NDs)	0.102	0.166	Data Appear Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.982	0.982	0.982	0.982

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Full: no NDs)	0.966	0.924	Data Appear Lognormal
Lilliefors (Full: no NDs)	0.129	0.167	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Appendix E.8B
RFAAP SWMU 59 Total Soil vs Background Statistical Comparisons

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Full Data Sets without NDs

User Selected Options	
From File	H:\Risk DB\Radford\SWMUs 50-59\Background Stats\59_ProUCL_input_TS_for BKG.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 (mg/kg)(swmu 59 ts)
Background Data: Aluminum (mg/kg)(rfaap bkgrd ts)

Raw Statistics

	Site	Background
Number of Valid Observations	28	79
Number of Distinct Observations	26	75
Minimum	3120	3620
Maximum	39450	47900
Mean	15188	14204
Median	13900	12100
SD	8410	9433
SE of Mean	1589	1061

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Site or AOC <= Mean/Median of Background

Site Rank Sum W-Stat	1651
WMW Test U-Stat	0.978
WMW Critical Value (0.050)	1.645
P-Value	0.164

Conclusion with Alpha = 0.05
Do Not Reject H0, Conclude Site <= Background
P-Value >= alpha (0.05)

Appendix E.8B
RFAAP SWMU 59 Total Soil vs Background Statistical Comparisons

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	H:\Risk DB\Radford\SWMUs 50-59\Background Stats\59_ProUCL_input_TS_for BKG.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: Antimony (mg/kg)(swmu 59 ts)
Background Data: Antimony (mg/kg)(rfaap bkgrd ts)

Raw Statistics

	Site	Background
Number of Valid Data	28	38
Number of Missing Values	0	41
Number of Non-Detect Data	25	38
Number of Detect Data	3	0
Minimum Non-Detect	0.2	0.23
Maximum Non-Detect	7.14	0.36
Percent Non detects	89.29%	100.00%
Minimum Detected	0.74	N/A
Maximum Detected	1.8	N/A
Mean of Detected Data	1.347	N/A
Median of Detected Data	1.5	N/A
SD of Detected Data	0.546	N/A

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	2.114
Critical z (0.95)	1.645
P-Value	0.0172

Conclusion with Alpha = 0.05
Reject H0, Conclude Site > Background
P-Value < alpha (0.05)

Appendix E.8B
RFAAP SWMU 59 Total Soil vs Background Statistical Comparisons

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	H:\Risk DB\Radford\SWMUs 50-59\Background Stats\59_ProUCL_input_TS_for BKG.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 (mg/kg)(swmu 59 ts)
Background Data: Arsenic (mg/kg)(rfaap bkgrd ts)

Raw Statistics

	Site	Background
Number of Valid Data	28	79
Number of Non-Detect Data	0	3
Number of Detect Data	28	76
Minimum Non-Detect	N/A	0.09
Maximum Non-Detect	N/A	0.12
Percent Non detects	0.00%	3.80%
Minimum Detected	0.97	1.2
Maximum Detected	37	35.9
Mean of Detected Data	5.979	4.989
Median of Detected Data	2.64	3.2
SD of Detected Data	9.053	5.36

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	-0.879
Critical z (0.95)	1.645
P-Value	0.81

Conclusion with Alpha = 0.05
Do Not Reject H0, Conclude Site <= Background
P-Value >= alpha (0.05)

Appendix E.8B
RFAAP SWMU 59 Total Soil vs Background Statistical Comparisons

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	H:\Risk DB\Radford\SWMUs 50-59\Background Stats\59_ProUCL_input_TS_for BKG.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: Barium (mg/kg)(swmu 59 ts)
Background Data: Barium (mg/kg)(rfaap bkgrd ts)

Raw Statistics

	Site	Background
Number of Valid Data	28	79
Number of Non-Detect Data	0	16
Number of Detect Data	28	63
Minimum Non-Detect	N/A	0.36
Maximum Non-Detect	N/A	1.1
Percent Non detects	0.00%	20.25%
Minimum Detected	31.6	23.4
Maximum Detected	190	174
Mean of Detected Data	85.85	68.4
Median of Detected Data	69.3	56.7
SD of Detected Data	51.31	40.39

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	2.953
Critical z (0.95)	1.645
P-Value	0.00157

Conclusion with Alpha = 0.05
Reject H0, Conclude Site > Background
P-Value < alpha (0.05)

Appendix E.8B
RFAAP SWMU 59 Total Soil vs Background Statistical Comparisons

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	H:\Risk DB\Radford\SWMUs 50-59\Background Stats\59_ProUCL_input_TS_for BKG.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: Beryllium (mg/kg)(swmu 59 ts)
Background Data: Beryllium (mg/kg)(rfaap bkgrd ts)

Raw Statistics

	Site	Background
Number of Valid Data	20	79
Number of Missing Values	8	0
Number of Non-Detect Data	0	39
Number of Detect Data	20	40
Minimum Non-Detect	N/A	0.022
Maximum Non-Detect	N/A	0.03
Percent Non detects	0.00%	49.37%
Minimum Detected	0.43	0.61
Maximum Detected	1.3	5.4
Mean of Detected Data	0.726	1.449
Median of Detected Data	0.63	1.1
SD of Detected Data	0.253	1.086

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	1.07
Critical z (0.95)	1.645
P-Value	0.142

Conclusion with Alpha = 0.05
Do Not Reject H0, Conclude Site <= Background
P-Value >= alpha (0.05)

Appendix E.8B
RFAAP SWMU 59 Total Soil vs Background Statistical Comparisons

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	H:\Risk DB\Radford\SWMUs 50-59\Background Stats\59_ProUCL_input_TS_for BKG.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: Cadmium (mg/kg)(swmu 59 ts)
Background Data: Cadmium (mg/kg)(rfaap bkgrd ts)

Raw Statistics

	Site	Background
Number of Valid Data	28	79
Number of Non-Detect Data	26	66
Number of Detect Data	2	13
Minimum Non-Detect	0.051	0.02
Maximum Non-Detect	0.7	0.05
Percent Non detects	92.86%	83.54%
Minimum Detected	0.11	0.57
Maximum Detected	0.11	2.5
Mean of Detected Data	0.11	1.152
Median of Detected Data	0.11	1.1
SD of Detected Data	0	0.585

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	-1.333
Critical z (0.95)	1.645
P-Value	0.909

Conclusion with Alpha = 0.05
Do Not Reject H0, Conclude Site <= Background
P-Value >= alpha (0.05)

Appendix E.8B
RFAAP SWMU 59 Total Soil vs Background Statistical Comparisons

t-Test Site vs Background Comparison for Full Data Sets without NDs

User Selected Options

From File	H:\Risk DB\Radford\SWMUs 50-59\Background Stats\59_ProUCL_input_TS_for BKG.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 (mg/kg)(swmu 59 ts)
Background Data: Chromium (mg/kg)(rfaap bkgrd ts)

Raw Statistics

	Site	Background
Number of Valid Observations	28	79
Number of Distinct Observations	26	70
Minimum	7.5	6.3
Maximum	33.6	75.8
Mean	19.19	26.86
Median	19.2	26
SD	7.285	12.51
SE of Mean	1.377	1.408

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)	105	-3.06	1.659	0.999
Satterthwaite (Unequal Variance)	82	-3.896	1.664	1

Pooled SD 11.401
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
78	27	2.95	0.002

Conclusion with Alpha = 0.05
* Two variances are not equal

Appendix E.8B
RFAAP SWMU 59 Total Soil vs Background Statistical Comparisons

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	H:\Risk DB\Radford\SWMUs 50-59\Background Stats\59_ProUCL_input_TS_for BKG.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: Cobalt (mg/kg)(swmu 59 ts)
Background Data: Cobalt (mg/kg)(rfaap bkgrd ts)

Raw Statistics

	Site	Background
Number of Valid Data	28	79
Number of Non-Detect Data	0	23
Number of Detect Data	28	56
Minimum Non-Detect	N/A	0.11
Maximum Non-Detect	N/A	0.84
Percent Non detects	0.00%	29.11%
Minimum Detected	2.9	5.9
Maximum Detected	10.1	130
Mean of Detected Data	5.736	22.23
Median of Detected Data	5.7	13.3
SD of Detected Data	2.137	23.94

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	-2.749
Critical z (0.95)	1.645
P-Value	0.997

Conclusion with Alpha = 0.05
Do Not Reject H0, Conclude Site <= Background
P-Value >= alpha (0.05)

Appendix E.8B
RFAAP SWMU 59 Total Soil vs Background Statistical Comparisons

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	H:\Risk DB\Radford\SWMUs 50-59\Background Stats\59_ProUCL_input_TS_for BKG.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: Copper (mg/kg)(swmu 59 ts)
Background Data: Copper (mg/kg)(rfaap bkgrd ts)

Raw Statistics

	Site	Background
Number of Valid Data	28	79
Number of Non-Detect Data	0	2
Number of Detect Data	28	77
Minimum Non-Detect	N/A	0.17
Maximum Non-Detect	N/A	0.17
Percent Non detects	0.00%	2.53%
Minimum Detected	3.3	1.6
Maximum Detected	19.1	38.7
Mean of Detected Data	11.04	12.25
Median of Detected Data	10.75	9.1
SD of Detected Data	3.748	9.397

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	0.999
Critical z (0.95)	1.645
P-Value	0.159

Conclusion with Alpha = 0.05
Do Not Reject H0, Conclude Site <= Background
P-Value >= alpha (0.05)

Appendix E.8B
RFAAP SWMU 59 Total Soil vs Background Statistical Comparisons

t-Test Site vs Background Comparison for Full Data Sets without NDs

User Selected Options

From File	H:\Risk DB\Radford\SWMUs 50-59\Background Stats\59_ProUCL_input_TS_for BKG.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 (mg/kg)(swmu 59 ts)
Background Data: Iron (mg/kg)(rfaap bkgrd ts)

Raw Statistics

	Site	Background
Number of Valid Observations	28	79
Number of Distinct Observations	28	72
Minimum	4200	7250
Maximum	38800	67700
Mean	18925	26963
Median	18600	25200
SD	9664	11990
SE of Mean	1826	1349

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)	105	-3.196	1.659	0.999
Satterthwaite (Unequal Variance)	58.5	-3.54	1.672	1

Pooled SD 11437.059
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
78	27	1.539	0.209

Conclusion with Alpha = 0.05
* Two variances appear to be equal

Appendix E.8B
RFAAP SWMU 59 Total Soil vs Background Statistical Comparisons

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Full Data Sets without NDs

User Selected Options	
From File	H:\Risk DB\Radford\SWMUs 50-59\Background Stats\59_ProUCL_input_TS_for BKG.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 (mg/kg)(swmu 59 ts)
Background Data: Lead (mg/kg)(rfaap bkgrd ts)

Raw Statistics

	Site	Background
Number of Valid Observations	28	79
Number of Distinct Observations	27	70
Minimum	3.8	2.1
Maximum	30.9	256
Mean	12.23	22.04
Median	9.8	12
SD	6.662	39.85
SE of Mean	1.259	4.483

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Site or AOC <= Mean/Median of Background

Site Rank Sum W-Stat	1309
WMW Test U-Stat	-1.446
WMW Critical Value (0.050)	1.645
P-Value	0.926

Conclusion with Alpha = 0.05
Do Not Reject H0, Conclude Site <= Background
P-Value >= alpha (0.05)

Appendix E.8B
RFAAP SWMU 59 Total Soil vs Background Statistical Comparisons

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	H:\Risk DB\Radford\SWMUs 50-59\Background Stats\59_ProUCL_input_TS_for BKG.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: Magnesium (mg/kg)(swmu 59 ts)
Background Data: Magnesium (mg/kg)(rfaap bkgrd ts)

Raw Statistics

	Site	Background
Number of Valid Data	28	79
Number of Non-Detect Data	0	7
Number of Detect Data	28	72
Minimum Non-Detect	N/A	3.8
Maximum Non-Detect	N/A	5
Percent Non detects	0.00%	8.86%
Minimum Detected	227	139
Maximum Detected	2270	58100
Mean of Detected Data	914.1	6394
Median of Detected Data	877.5	1270
SD of Detected Data	541.7	12925

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	-1.233
Critical z (0.95)	1.645
P-Value	0.891

Conclusion with Alpha = 0.05
Do Not Reject H0, Conclude Site <= Background
P-Value >= alpha (0.05)

Appendix E.8B
RFAAP SWMU 59 Total Soil vs Background Statistical Comparisons

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Full Data Sets without NDs

User Selected Options	
From File	H:\Risk DB\Radford\SWMUs 50-59\Background Stats\59_ProUCL_input_TS_for BKG.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 (mg/kg)(swmu 59 ts)
Background Data: Manganese (mg/kg)(rfaap bkgrd ts)

Raw Statistics

	Site	Background
Number of Valid Observations	28	79
Number of Distinct Observations	28	78
Minimum	67.95	16.7
Maximum	3630	2040
Mean	508.3	471.4
Median	282.5	359
SD	791.7	467.1
SE of Mean	149.6	52.55

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Site or AOC <= Mean/Median of Background

Site Rank Sum W-Stat	1406
WMW Test U-Stat	-0.755
WMW Critical Value (0.050)	1.645
P-Value	0.775

Conclusion with Alpha = 0.05
Do Not Reject H0, Conclude Site <= Background
P-Value >= alpha (0.05)

Appendix E.8B
RFAAP SWMU 59 Total Soil vs Background Statistical Comparisons

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	H:\Risk DB\Radford\SWMUs 50-59\Background Stats\59_ProUCL_input_TS_for BKG.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: Mercury (mg/kg)(swmu 59 ts)
Background Data: Mercury (mg/kg)(rfaap bkgrd ts)

Raw Statistics

	Site	Background
Number of Valid Data	26	79
Number of Missing Values	2	0
Number of Non-Detect Data	2	61
Number of Detect Data	24	18
Minimum Non-Detect	0.05	0.019
Maximum Non-Detect	0.0611	0.06
Percent Non detects	7.69%	77.22%
Minimum Detected	0.029	0.038
Maximum Detected	0.561	1.2
Mean of Detected Data	0.162	0.187
Median of Detected Data	0.1	0.125
SD of Detected Data	0.144	0.259

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	5.172
Critical z (0.95)	1.645
P-Value	1.16E-07

Conclusion with Alpha = 0.05
Reject H0, Conclude Site > Background
P-Value < alpha (0.05)

Appendix E.8B
RFAAP SWMU 59 Total Soil vs Background Statistical Comparisons

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	H:\Risk DB\Radford\SWMUs 50-59\Background Stats\59_ProUCL_input_TS_for BKG.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: Nickel (mg/kg)(swmu 59 ts)
Background Data: Nickel (mg/kg)(rfaap bkgrd ts)

Raw Statistics

	Site	Background
Number of Valid Data	28	79
Number of Non-Detect Data	0	18
Number of Detect Data	28	61
Minimum Non-Detect	N/A	0.21
Maximum Non-Detect	N/A	1.4
Percent Non detects	0.00%	22.78%
Minimum Detected	5.2	4.6
Maximum Detected	13.85	94.2
Mean of Detected Data	8.274	17.95
Median of Detected Data	8.3	13.2
SD of Detected Data	2.233	15.68

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	-0.824
Critical z (0.95)	1.645
P-Value	0.795

Conclusion with Alpha = 0.05
Do Not Reject H0, Conclude Site <= Background
P-Value >= alpha (0.05)

Appendix E.8B
RFAAP SWMU 59 Total Soil vs Background Statistical Comparisons

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	H:\Risk DB\Radford\SWMUs 50-59\Background Stats\59_ProUCL_input_TS_for BKG.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: Potassium (mg/kg)(swmu 59 ts)
Background Data: Potassium (mg/kg)(rfaap bkgrd ts)

Raw Statistics

	Site	Background
Number of Valid Data	24	79
Number of Missing Values	4	0
Number of Non-Detect Data	0	12
Number of Detect Data	24	67
Minimum Non-Detect	N/A	201
Maximum Non-Detect	N/A	271
Percent Non detects	0.00%	15.19%
Minimum Detected	300	123
Maximum Detected	1330	10900
Mean of Detected Data	769.2	1690
Median of Detected Data	765	694
SD of Detected Data	310	2232

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	0.47
Critical z (0.95)	1.645
P-Value	0.319

Conclusion with Alpha = 0.05
Do Not Reject H0, Conclude Site <= Background
P-Value >= alpha (0.05)

Appendix E.8B
RFAAP SWMU 59 Total Soil vs Background Statistical Comparisons

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	H:\Risk DB\Radford\SWMUs 50-59\Background Stats\59_ProUCL_input_TS_for BKG.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: Selenium (mg.kg)(swmu 59 ts)
Background Data: Selenium (mg.kg)(rfaap bkgrd ts)

Raw Statistics

	Site	Background
Number of Valid Data	27	79
Number of Missing Values	1	0
Number of Non-Detect Data	9	77
Number of Detect Data	18	2
Minimum Non-Detect	0.11	0.14
Maximum Non-Detect	1.315	0.93
Percent Non detects	33.33%	97.47%
Minimum Detected	0.165	0.64
Maximum Detected	11.7	0.77
Mean of Detected Data	3.151	0.705
Median of Detected Data	0.7	0.705
SD of Detected Data	3.857	0.0919

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	7.094
Critical z (0.95)	1.645
P-Value	6.51E-13

Conclusion with Alpha = 0.05
Reject H0, Conclude Site > Background
P-Value < alpha (0.05)

Appendix E.8B
RFAAP SWMU 59 Total Soil vs Background Statistical Comparisons

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	H:\Risk DB\Radford\SWMUs 50-59\Background Stats\59_ProUCL_input_TS_for BKG.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: Silver (mg/kg)(swmu 59 ts)
Background Data: Silver (mg/kg)(rfaap bkgrd ts)

Raw Statistics

	Site	Background
Number of Valid Data	28	79
Number of Non-Detect Data	27	78
Number of Detect Data	1	1
Minimum Non-Detect	0.046	0.16
Maximum Non-Detect	1.315	0.42
Percent Non detects	96.43%	98.73%
Minimum Detected	0.498	4.3
Maximum Detected	0.498	4.3
Mean of Detected Data	0.498	4.3
Median of Detected Data	0.498	4.3
SD of Detected Data	N/A	N/A

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	0.78
Critical z (0.95)	1.645
P-Value	0.218

Conclusion with Alpha = 0.05
Do Not Reject H0, Conclude Site <= Background
P-Value >= alpha (0.05)

Appendix E.8B
RFAAP SWMU 59 Total Soil vs Background Statistical Comparisons

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	H:\Risk DB\Radford\SWMUs 50-59\Background Stats\59_ProUCL_input_TS_for BKG.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: Sodium (mg/kg)(swmu 59 ts)
Background Data: Sodium (mg/kg)(rfaap bkgrd ts)

Raw Statistics

	Site	Background
Number of Valid Data	15	79
Number of Missing Values	13	0
Number of Non-Detect Data	4	73
Number of Detect Data	11	6
Minimum Non-Detect	42	10.8
Maximum Non-Detect	51	25.9
Percent Non detects	26.67%	92.41%
Minimum Detected	35.4	114
Maximum Detected	396	151
Mean of Detected Data	220.5	131.7
Median of Detected Data	219.5	127
SD of Detected Data	149.5	14.76

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	6.153
Critical z (0.95)	1.645
P-Value	3.80E-10

Conclusion with Alpha = 0.05
Reject H0, Conclude Site > Background
P-Value < alpha (0.05)

Appendix E.8B
RFAAP SWMU 59 Total Soil vs Background Statistical Comparisons

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	H:\Risk DB\Radford\SWMUs 50-59\Background Stats\59_ProUCL_input_TS_for BKG.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: Thallium (mg/kg)(swmu 59 ts)
Background Data: Thallium (mg/kg)(rfaap bkgrd ts)

Raw Statistics

	Site	Background
Number of Valid Data	28	79
Number of Non-Detect Data	22	64
Number of Detect Data	6	15
Minimum Non-Detect	0.26	0.13
Maximum Non-Detect	12	0.45
Percent Non detects	78.57%	81.01%
Minimum Detected	0.073	1.3
Maximum Detected	0.21	5
Mean of Detected Data	0.128	2.527
Median of Detected Data	0.118	2.2
SD of Detected Data	0.0498	0.932

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	-1.035
Critical z (0.95)	1.645
P-Value	0.85

Conclusion with Alpha = 0.05
Do Not Reject H0, Conclude Site <= Background
P-Value >= alpha (0.05)

Appendix E.8B
RFAAP SWMU 59 Total Soil vs Background Statistical Comparisons

t-Test Site vs Background Comparison for Full Data Sets without NDs

User Selected Options

From File	H:\Risk DB\Radford\SWMUs 50-59\Background Stats\59_ProUCL_input_TS_for BKG.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 (mg/kg)(swmu 59 ts)
Background Data: Vanadium (mg/kg)(rfaap bkgrd ts)

Raw Statistics

	Site	Background
Number of Valid Observations	28	79
Number of Distinct Observations	28	76
Minimum	12.1	12.2
Maximum	74.5	114
Mean	36.49	45.84
Median	34.3	41.4
SD	17.22	20.38
SE of Mean	3.255	2.293

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)	105	-2.166	1.659	0.984
Satterthwaite (Unequal Variance)	55.7	-2.347	1.673	0.989

Pooled SD 19.618
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
78	27	1.401	0.327

Conclusion with Alpha = 0.05
* Two variances appear to be equal

Appendix E.8B
RFAAP SWMU 59 Total Soil vs Background Statistical Comparisons

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Full Data Sets without NDs

User Selected Options	
From File	H:\Risk DB\Radford\SWMUs 50-59\Background Stats\59_ProUCL_input_TS_for BKG.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 (mg/kg)(swmu 59 ts)
Background Data: Zinc (mg/kg)(rfaap bkgrd ts)

Raw Statistics

	Site	Background
Number of Valid Observations	28	79
Number of Distinct Observations	25	76
Minimum	7.23	4.7
Maximum	76.3	598
Mean	29.33	54.94
Median	26.95	30.2
SD	15.08	87.15
SE of Mean	2.849	9.805

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Site or AOC <= Mean/Median of Background

Site Rank Sum W-Stat	1376
WMW Test U-Stat	-0.971
WMW Critical Value (0.050)	1.645
P-Value	0.834

Conclusion with Alpha = 0.05
Do Not Reject H0, Conclude Site <= Background
P-Value >= alpha (0.05)

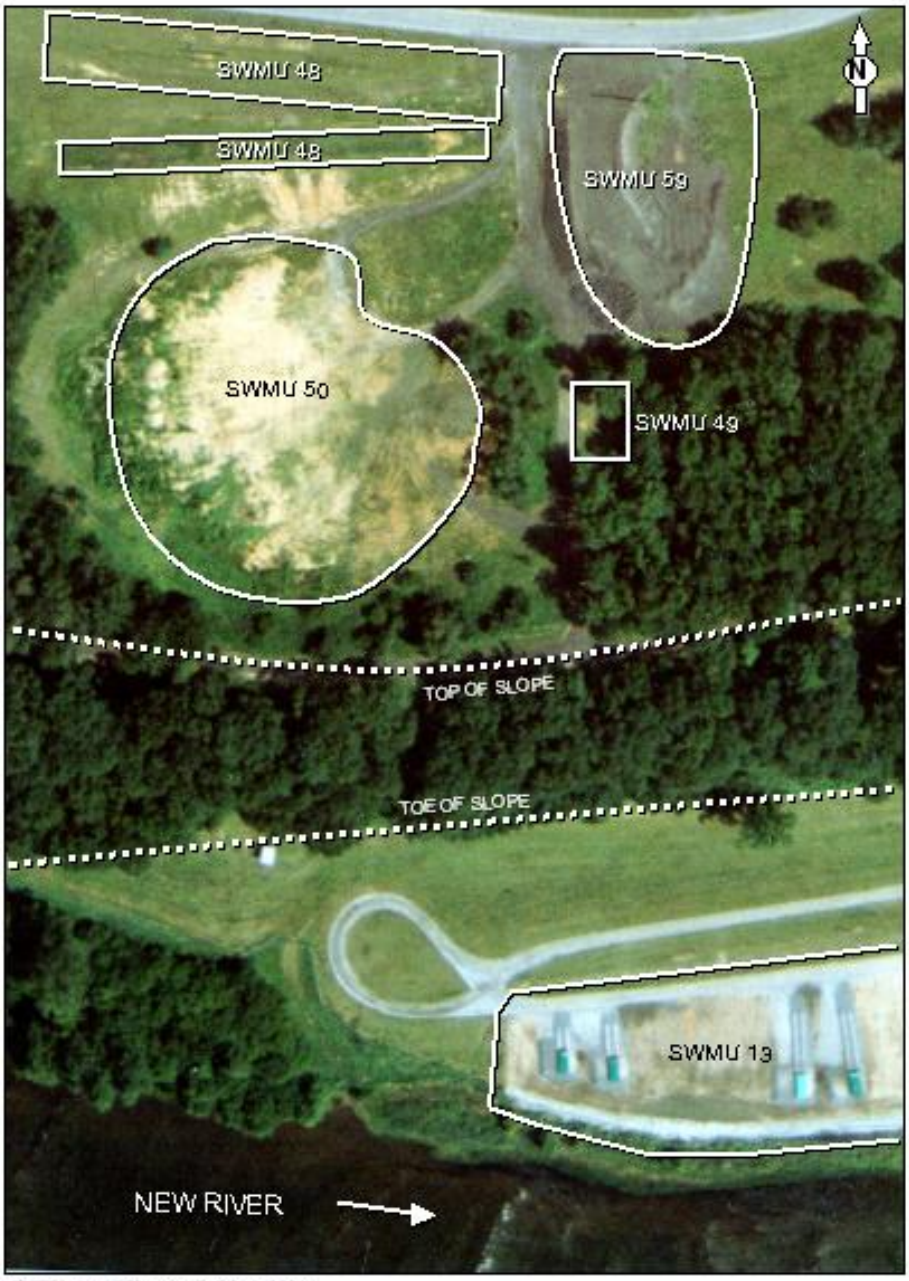
Appendix F

SLERA Tables and Site Photographs

Appendix F-1

Site Photographs

Figure F-1. SWMUs 50, 59 and vicinity.



USEPA Aerial Photograph, July 4, 1984

Figure F-2. Aerial Photograph of SWMUs 50 and 59 and surrounding area.

Figure F-3. Photograph of SWMUs 48 (foreground) and 50 (background).

Appendix F-2

SLERA Risk Characterization Tables

Table F-1
Data Used to Model Exposure[a] in the Indicator Wildlife Species

Indicator Species	Body Weight Range (average) (kg)	Average Home Range (ha) [ac]	Maximum Dietary Intake[b] (kg[dw]/day)	Average Dietary Intake[c] (kg[dw]/day)	Soil/Sed. Intake[d] (%Diet) (Avg – Max) (kg[dw]/day)	Maximum Water Intake[b] (L/day)	Average Water Intake[c] (L/day)	Trophic Level	Dietary Composition
Meadow vole (*Microtus pennsylvanicus*)	0.0170-0.0524 (0.037)	0.036 [0.089]	0.010	0.0080	(2.4%) 0.00019-0.00024	0.0070	0.0051	Herbivore	Plants: 100%
Short-tailed shrew *(Blarina brevicauda)*	0.0125-0.0225 (0.015)	0.39 [0.96]	0.0030	0.0022	(10.4%) 0.00023-0.00031	0.0033	0.0023	Insectivore	Terr. Inverts: 100%
American robin *(Turdus migratorius)*	0.0635-0.103 (0.0773)	0.48 [1.2]	0.020	0.016	(4%) 0.00064-0.00080	0.013	0.011	Omnivore	Plants: 62% Terr Inverts: 38%
Red-tailed hawk (*Buteo jamaicensis*)	0.957-1.235 (1.134)	842 [2081]	0.063	0.059	(0%)	0.068	0.064	Carnivore	Mammals: 76% Birds: 24%
Red fox *(Vulpes vulpes)*	2.95-7.04 (4.53)	892 [2204]	0.34	0.24	(2.8%) 0.0067-0.0095	0.57	0.39	Carnivore	Mammals: 65% Birds: 14% Plants: 17% Terr. Inverts: 4%

[a] From USEPA (1993), except as noted.
[b] Maximum dietary and water intake based on appropriate allometric equation using maximum body weight.
[c] Average dietary and water intake based on appropriate allometric equation using average body weight.
[d] Soil/sediment ingestion rate based on estimated percent soil in diet (dry weight), and maximum or average dietary intake.

Allometric equations for mammals and birds from USEPA (1993), as follows, where FI = food ingestion (dry weight [dw]), WI = water ingestion, Wt = body weight, kg = kilogram, L = liter, and g = gram:
FI (kg/day) = 0.0687 $Wt^{0.822}$ for mammals (shrew and red fox),
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-tail hawk),
FI (g/day) = 0.398 $Wt^{0.850}$ for passerine birds (American robin).
WI (L/day) = 0.099 $Wt^{0.90}$ (Wt in kg) for mammals,
WI (L/day) = 0.059 $Wt^{0.67}$ (Wt in kg) for birds.

ha = hectare
ac = acre, and a hectare = 2.471 acres.

Notes:
The soil ingestion rate for the shrew set equal to the rate for the American woodcock (10.4% of diet), as both species feed predominantly on earthworms.
The soil ingestion rate for the American robin set equal to 48% of the American woodcock value (0.38 x 10.4% = 4%), based on a robin diet of 38% invertebrates (earthworms).

TABLE F-2
TIER 1 CHEMICALS OF POTENTIAL CONCERN EEQs AND HAZARD INDICES FOR MEADOW VOLES AT SWMU 50

Hazard Estimate - Tier 1
Meadow Vole

Chemical	Surface Water Exposure Point Concentration	Units	Sediment Exposure Point Concentration	Units	Soil Exposure Point Concentration	Units	Fish BAF	Aq. Invert. BAF	Terr. Invert. BAF	Plant BAF	Mammal BAF	Bird BAF	PDE Surface Water	PDE Sediment	PDE Soil	PDE Fish	PDE Aq. Invert.	PDE Terr. Invert.	PDE Plants	PDE Mammals	PDE Birds	Total PDE	Chemical-Specific Toxicity Value UF	NOAEL	Adjusted NOAEL	EEQ N	LOAEL	Adjusted LOAEL	EEQ L
							---------- unitless ----------						mg/kg-d	mg/kg-d	mg/kg-d	mg/kg-d	mg/kg-d	mg/kg-d	mg/kg-d	mg/kg-d	mg/kg-d	mg/kg-d		mg/kg-d	mg/kg-d		mg/kg-d	mg/kg-d	
2,3,7,8-TCDD-TE	0.00E+00	mg/L	0.00E+00	mg/kg	9.80E-05	mg/kg	NA	NA	4.21E+01	3.87E-03	2.20E+00	2.20E+00	0.00E+00	0.00E+00	1.38E-06	NA	NA	0.00E+00	2.23E-07	0.00E+00	0.00E+00	1.61E-06	4	1.00E-06	2.50E-07	6.43E+00	1.00E-05	2.50E-06	6.43E-01
1,2-Dichlorobenzene	0.00E+00	mg/L	0.00E+00	mg/kg	1.10E-02	mg/kg	NA	NA	6.18E+00	4.92E-01	1.00E+00	1.00E+00	0.00E+00	0.00E+00	1.55E-04	NA	NA	0.00E+00	3.18E-03	0.00E+00	0.00E+00	3.34E-03	4	8.57E+01	2.14E+01	1.56E-04	4.29E+02	1.07E+02	3.12E-05
1,3-Dichlorobenzene	0.00E+00	mg/L	0.00E+00	mg/kg	8.60E-03	mg/kg	NA	NA	6.31E+00	4.92E-01	1.00E+00	1.00E+00	0.00E+00	0.00E+00	1.21E-04	NA	NA	0.00E+00	2.49E-03	0.00E+00	0.00E+00	2.61E-03	4	8.57E+01	2.14E+01	1.22E-04	4.29E+02	1.07E+02	2.44E-05
1,4-Dichlorobenzene	0.00E+00	mg/L	0.00E+00	mg/kg	1.10E-02	mg/kg	NA	NA	6.31E+00	4.92E-01	1.00E+00	1.00E+00	0.00E+00	0.00E+00	1.55E-04	NA	NA	0.00E+00	3.18E-03	0.00E+00	0.00E+00	3.34E-03	4	2.50E+00	6.25E-01	5.34E-03	1.25E+01	3.13E+00	1.07E-03
2,4-Dinitrotoluene	0.00E+00	mg/L	0.00E+00	mg/kg	8.88E-01	mg/kg	NA	NA	8.30E-01	2.13E+00	1.00E+00	1.00E+00	0.00E+00	0.00E+00	1.25E-02	NA	NA	0.00E+00	1.11E+00	0.00E+00	0.00E+00	1.12E+00	4	5.40E-01	1.35E-01	8.33E+00	2.70E+00	6.75E-01	1.67E+00
4,4'-DDD	0.00E+00	mg/L	0.00E+00	mg/kg	4.47E-04	mg/kg	NA	NA	3.29E+01	1.57E-02	1.00E+00	1.00E+00	0.00E+00	0.00E+00	6.31E-06	NA	NA	0.00E+00	4.12E-06	0.00E+00	0.00E+00	1.04E-05	4	8.00E-01	2.00E-01	5.22E-05	4.00E+00	1.00E+00	1.04E-05
4,4'-DDE	0.00E+00	mg/L	0.00E+00	mg/kg	3.37E-03	mg/kg	NA	NA	2.35E+01	1.32E-02	1.23E+01	1.23E+01	0.00E+00	0.00E+00	4.76E-05	NA	NA	0.00E+00	2.61E-05	0.00E+00	0.00E+00	7.37E-05	4	8.00E-01	2.00E-01	3.69E-04	4.00E+00	1.00E+00	7.37E-05
4,4'-DDT	0.00E+00	mg/L	0.00E+00	mg/kg	1.29E-02	mg/kg	NA	NA	1.48E+01	4.61E-03	1.55E+00	1.55E+00	0.00E+00	0.00E+00	1.82E-04	NA	NA	0.00E+00	3.50E-05	0.00E+00	0.00E+00	2.17E-04	4	8.00E-01	2.00E-01	1.09E-03	4.00E+00	1.00E+00	2.17E-04
Acenaphthene	0.00E+00	mg/L	0.00E+00	mg/kg	1.60E-02	mg/kg	NA	NA	1.47E+00	8.26E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.26E-04	NA	NA	0.00E+00	7.77E-02	0.00E+00	0.00E+00	7.80E-02	4	6.56E+01	1.64E+01	4.75E-03	1.10E+02	2.75E+01	2.83E-03
Acenaphthylene	0.00E+00	mg/L	0.00E+00	mg/kg	2.00E-02	mg/kg	NA	NA	2.29E+01	7.22E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.82E-04	NA	NA	0.00E+00	8.49E-03	0.00E+00	0.00E+00	8.77E-03	4	6.56E+01	1.64E+01	5.35E-04	1.10E+02	2.75E+01	3.19E-04
Anthracene	0.00E+00	mg/L	0.00E+00	mg/kg	1.10E-02	mg/kg	NA	NA	2.42E+00	1.01E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.55E-04	NA	NA	0.00E+00	6.54E-03	0.00E+00	0.00E+00	6.70E-03	4	6.56E+01	1.64E+01	4.08E-04	1.10E+02	2.75E+01	2.43E-04
Aroclor 1254	0.00E+00	mg/L	0.00E+00	mg/kg	1.48E+00	mg/kg	NA	NA	6.52E+01	3.58E-03	1.00E+00	1.00E+00	0.00E+00	0.00E+00	2.09E-02	NA	NA	0.00E+00	3.11E-03	0.00E+00	0.00E+00	2.40E-02	8	1.40E-01	1.75E-02	1.37E+00	6.80E-01	8.50E-02	2.82E-01
Benzo(a)anthracene	0.00E+00	mg/L	0.00E+00	mg/kg	1.37E-01	mg/kg	NA	NA	1.59E+00	1.49E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.93E-03	NA	NA	0.00E+00	1.20E-02	0.00E+00	0.00E+00	1.40E-02	4	6.15E-01	1.54E-01	9.09E-02	3.07E+00	7.68E-01	1.82E-02
Benzo(a)pyrene	0.00E+00	mg/L	0.00E+00	mg/kg	1.50E-01	mg/kg	NA	NA	1.33E+00	1.33E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.12E-03	NA	NA	0.00E+00	1.18E-02	0.00E+00	0.00E+00	1.39E-02	4	1.00E+00	2.50E-01	5.56E-02	1.00E+01	2.50E+00	5.56E-03
Benzo(b)fluoranthene	0.00E+00	mg/L	0.00E+00	mg/kg	1.52E-01	mg/kg	NA	NA	2.60E+00	3.10E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.15E-03	NA	NA	0.00E+00	2.77E-02	0.00E+00	0.00E+00	2.99E-02	4	6.15E-01	1.54E-01	1.94E-01	3.07E+00	7.68E-01	3.89E-02
Benzo(g,h,i)perylene	0.00E+00	mg/L	0.00E+00	mg/kg	5.90E-02	mg/kg	NA	NA	2.94E+00	2.35E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.33E-04	NA	NA	0.00E+00	8.15E-03	0.00E+00	0.00E+00	8.98E-03	4	6.15E-01	1.54E-01	5.84E-02	3.07E+00	7.68E-01	1.17E-02
Benzo(k)fluoranthene	0.00E+00	mg/L	0.00E+00	mg/kg	9.89E-02	mg/kg	NA	NA	2.60E+00	1.60E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.40E-03	NA	NA	0.00E+00	9.31E-03	0.00E+00	0.00E+00	1.07E-02	4	6.15E-01	1.54E-01	6.96E-02	3.07E+00	7.68E-01	1.39E-02
Chrysene	0.00E+00	mg/L	0.00E+00	mg/kg	1.19E-01	mg/kg	NA	NA	2.29E+00	1.58E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.68E-03	NA	NA	0.00E+00	1.11E-02	0.00E+00	0.00E+00	1.27E-02	4	6.15E-01	1.54E-01	8.29E-02	3.07E+00	7.68E-01	1.66E-02
Dibenz(a,h)anthracene	0.00E+00	mg/L	0.00E+00	mg/kg	1.40E-02	mg/kg	NA	NA	2.31E+00	1.30E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.98E-04	NA	NA	0.00E+00	1.07E-03	0.00E+00	0.00E+00	1.27E-03	4	6.15E-01	1.54E-01	8.25E-03	3.07E+00	7.68E-01	1.65E-03
Endosulfan II	0.00E+00	mg/L	0.00E+00	mg/kg	2.24E-03	mg/kg	NA	NA	1.93E-01	3.67E-01	1.00E+00	1.00E+00	0.00E+00	0.00E+00	3.16E-05	NA	NA	0.00E+00	4.84E-04	0.00E+00	0.00E+00	5.16E-04	4	1.50E-01	3.75E-02	1.37E-02	7.50E-01	1.88E-01	2.75E-03
Endrin	0.00E+00	mg/L	0.00E+00	mg/kg	2.88E-04	mg/kg	NA	NA	1.99E+01	2.74E-02	1.00E+00	1.00E+00	0.00E+00	0.00E+00	4.07E-06	NA	NA	0.00E+00	4.64E-06	0.00E+00	0.00E+00	8.71E-06	4	9.20E-02	2.30E-02	3.79E-04	9.20E-01	2.30E-01	3.79E-05
Fluoranthene	0.00E+00	mg/L	0.00E+00	mg/kg	7.30E-02	mg/kg	NA	NA	3.04E+00	5.00E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.03E-03	NA	NA	0.00E+00	2.15E-02	0.00E+00	0.00E+00	2.25E-02	4	6.15E-01	1.54E-01	1.46E-01	3.07E+00	7.68E-01	2.93E-02
Fluorene	0.00E+00	mg/L	0.00E+00	mg/kg	1.80E-02	mg/kg	NA	NA	9.57E+00	6.64E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.54E-04	NA	NA	0.00E+00	7.03E-02	0.00E+00	0.00E+00	7.05E-02	4	6.56E+01	1.64E+01	4.30E-03	1.10E+02	2.75E+01	2.56E-03
Indeno(1,2,3-cd)pyrene	0.00E+00	mg/L	0.00E+00	mg/kg	8.41E-02	mg/kg	NA	NA	2.86E+00	1.10E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.19E-03	NA	NA	0.00E+00	5.44E-03	0.00E+00	0.00E+00	6.63E-03	4	6.15E-01	1.54E-01	4.31E-02	3.07E+00	7.68E-01	8.64E-03
Methoxychlor	0.00E+00	mg/L	0.00E+00	mg/kg	1.29E-03	mg/kg	NA	NA	7.73E+00	2.05E-02	1.00E+00	1.00E+00	0.00E+00	0.00E+00	1.82E-05	NA	NA	0.00E+00	1.55E-05	0.00E+00	0.00E+00	3.37E-05	4	4.00E+00	1.00E+00	3.37E-05	8.00E+00	2.00E+00	1.69E-05
Naphthalene	0.00E+00	mg/L	0.00E+00	mg/kg	2.70E-01	mg/kg	NA	NA	4.40E+00	1.22E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.81E-03	NA	NA	0.00E+00	1.94E+00	0.00E+00	0.00E+00	1.94E+00	4	6.56E+01	1.64E+01	1.18E-01	1.10E+02	2.75E+01	7.06E-02
Phenanthrene	0.00E+00	mg/L	0.00E+00	mg/kg	2.60E-01	mg/kg	NA	NA	1.72E+00	1.41E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.67E-03	NA	NA	0.00E+00	2.16E-01	0.00E+00	0.00E+00	2.20E-01	4	6.56E+01	1.64E+01	1.34E-02	1.10E+02	2.75E+01	7.99E-03
Pyrene	0.00E+00	mg/L	0.00E+00	mg/kg	8.50E-02	mg/kg	NA	NA	1.75E+00	7.20E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.20E-03	NA	NA	0.00E+00	3.60E-02	0.00E+00	0.00E+00	3.72E-02	4	6.15E-01	1.54E-01	2.42E-01	3.07E+00	7.68E-01	4.85E-02
Arsenic	0.00E+00	mg/L	0.00E+00	mg/kg	7.40E+00	mg/kg	NA	NA	1.34E-01	3.75E-02	5.46E-03	5.46E-03	0.00E+00	0.00E+00	1.04E-01	NA	NA	0.00E+00	1.63E-01	0.00E+00	0.00E+00	2.68E-01	4	1.26E-01	3.15E-02	8.50E+00	1.26E+00	3.15E-01	8.50E-01
Cadmium	0.00E+00	mg/L	0.00E+00	mg/kg	1.43E-01	mg/kg	NA	NA	1.23E+01	1.50E+00	7.94E-01	7.94E-01	0.00E+00	0.00E+00	2.02E-03	NA	NA	0.00E+00	1.26E-01	0.00E+00	0.00E+00	1.29E-01	4	1.00E+00	2.50E-01	5.14E-01	1.00E+01	2.50E+00	5.14E-02
Chromium	0.00E+00	mg/L	0.00E+00	mg/kg	1.16E+02	mg/kg	NA	NA	3.06E-01	4.10E-02	6.55E-02	6.55E-02	0.00E+00	0.00E+00	1.64E+00	NA	NA	0.00E+00	2.80E+00	0.00E+00	0.00E+00	4.44E+00	4	2.74E+03	6.84E+02	6.48E-03	1.37E+04	3.42E+03	1.30E-03
Copper	0.00E+00	mg/L	0.00E+00	mg/kg	5.64E+01	mg/kg	NA	NA	5.15E-01	1.69E-01	2.44E-01	2.44E-01	0.00E+00	0.00E+00	7.96E-01	NA	NA	0.00E+00	5.62E+00	0.00E+00	0.00E+00	6.42E+00	8	1.17E+01	1.46E+00	4.39E+00	1.51E+01	1.89E+00	3.40E+00
Lead	0.00E+00	mg/L	0.00E+00	mg/kg	1.78E+02	mg/kg	NA	NA	2.96E-01	2.72E-02	5.99E-02	5.99E-02	0.00E+00	0.00E+00	2.51E+00	NA	NA	0.00E+00	2.85E+00	0.00E+00	0.00E+00	5.37E+00	4	8.00E+00	2.00E+00	2.68E+00	8.00E+01	2.00E+01	2.68E-01
Mercury	0.00E+00	mg/L	0.00E+00	mg/kg	8.16E-01	mg/kg	NA	NA	3.30E+01	4.04E-01	1.05E+00	1.05E+00	0.00E+00	0.00E+00	1.15E-02	NA	NA	0.00E+00	1.94E-01	0.00E+00	0.00E+00	2.05E-01	8	1.00E+00	1.25E-01	1.64E+00	5.00E+00	6.25E-01	3.29E-01
Nickel	0.00E+00	mg/L	0.00E+00	mg/kg	5.01E+01	mg/kg	NA	NA	7.80E+00	4.04E-02	9.66E-02	9.66E-02	0.00E+00	0.00E+00	7.07E-01	NA	NA	0.00E+00	1.19E+00	0.00E+00	0.00E+00	1.90E+00	4	4.00E+01	1.00E+01	1.90E-01	8.00E+01	2.00E+01	9.49E-02
Selenium	0.00E+00	mg/L	0.00E+00	mg/kg	7.40E+00	mg/kg	NA	NA	5.44E-01	6.26E-01	1.89E-01	1.89E-01	0.00E+00	0.00E+00	1.04E-01	NA	NA	0.00E+00	2.72E+00	0.00E+00	0.00E+00	2.83E+00	4	2.00E-01	5.00E-02	5.66E+01	3.30E-01	8.25E-02	3.43E+01
Silver	0.00E+00	mg/L	0.00E+00	mg/kg	8.90E-01	mg/kg	NA	NA	2.05E+00	1.40E-02	4.00E-03	4.00E-03	0.00E+00	0.00E+00	1.26E-02	NA	NA	0.00E+00	7.33E-03	0.00E+00	0.00E+00	1.99E-02	4	2.22E+01	5.55E+00	3.58E-03	2.22E+02	5.55E+01	3.58E-04
Zinc	0.00E+00	mg/L	0.00E+00	mg/kg	9.33E+01	mg/kg	NA	NA	4.06E+00	6.39E-01	1.16E+00	1.16E+00	0.00E+00	0.00E+00	1.32E+00	NA	NA	0.00E+00	3.51E+01	0.00E+00	0.00E+00	3.64E+01	4	1.60E+02	4.00E+01	9.10E-01	3.20E+02	8.00E+01	4.55E-01

Hazard Index (Total EEQ): 9.3E+01 4.3E+01

Intake Equation:

$$Ej = \left(\frac{A}{HR} \left[\sum_{i=1}^{m} \left(\frac{IRi \, x \, Cij}{BW} \right) \right] \right)$$

Where:
Ej = Total Exposure to Chemical
A = Site Area
HR = Home Range
m = Total number of ingested media
i = counter
IRi = Consumption Rate for Medium
Cij = Chemical concentration (j) in medium (I) (mg/kg or mg/L)
BW = Body Weight

Notes:
Tier 1 = Max EEQ using max EPC, max BAF/BCF, max Intake Rates, min BW, and FHR =1.
Tier 2 = EEQ using 95% EPC, non-max BAF/BCF, avg Intake Rates, avg BW and calculated FHR.
BAF = Bioaccumulation Factor (may be BCF if this is the only value available)
EEQ = Ecological Effects Quotient.
L = LOAEL based; N = NOAEL based
LOAEL = Lowest Observed Adverse Effect Level
NOAEL = No Observed Adverse Effect Level
NA = Not applicable/Not available
PDE = Predicted Daily Exposure
BAF (or BCF) values from appropriate text tables (BCF = bioconcentration factor)
Some BAF (or BCF) values based on media regression equations (value in box): n See appropriate text tables for equations.
If BAF/BCF regression equation produced Tier 2 value exceeding maximum Tier 1 BAF/BCF value, Tier 1 value used a default.
LOAEL and NOAEL values from appropriate toxicity summary tables in the text.
UF = Uncertainty Factor for toxicity factor extrapolation, and Adjusted LOAEL or NOAEL = LOAEL/UF or NOAEL/UF
A "0" entry in the exposure concentration column indicates this chemical not selected as a COPEC for this medium.
Receptor diet data and home range data from appropriate text table.
Exposure point concentrations (EPCs) from appropriate text tables.

Species-Specific Factors

Plant diet fraction =	1	unitless
Fish diet fraction =	0	unitless
Aq. Invert diet fraction =	0	unitless
Terr. Invert diet fraction =	0	unitless
Mammal diet fraction =	0	unitless
Bird diet fraction =	0	unitless
Soil ingestion rate =	0.00024	kg/d
Sediment ingestion rate =	0	kg/d
Food ingestion rate =	0.01	kg/d
Body weight =	0.017	kg
Home range =	0.089	acres
Water intake rate =	0.007	L/d
Site Area =	2.06	acres
Frac. home range (FHR) =	1.00E+00	unitless

TABLE F-3
TIER 2 CHEMICALS OF POTENTIAL ECOLOGICAL CONCERN EEQs AND HAZARD INDICES FOR MEADOW VOLES AT SWMU 50

Hazard Estimate - Tier 2
Meadow Vole

Chemical	Surface Water Exposure Point Concentration	Units	Sediment Exposure Point Concentration	Units	Soil Exposure Point Concentration	Units	Fish BAF	Aq. Invert. BAF	Terr. Invert. BAF	Plant BAF	Mammal BAF	Bird BAF	PDE Surface Water	PDE Sediment	PDE Soil	PDE Fish	PDE Aq. Invert.	PDE Terr. Invert.	PDE Plants	PDE Mammals	PDE Birds	Total PDE	Chemical-Specific Toxicity Value UF	NOAEL	Adjusted NOAEL	EEQ N	LOAEL	Adjusted LOAEL	EEQ L
							---------- unitless ----------						mg/kg-d	mg/kg-d	mg/kg-d	mg/kg-d	mg/kg-d	mg/kg-d	mg/kg-d	mg/kg-d	mg/kg-d	mg/kg-d		mg/kg-d	mg/kg-d		mg/kg-d	mg/kg-d	
2,3,7,8-TCDD-TE	0.00E+00	mg/L	0.00E+00	mg/kg	6.68E-05	mg/kg	NA	NA	6.05E+00	3.87E-03	2.20E+00	2.20E+00	0.00E+00	0.00E+00	3.43E-07	NA	NA	0.00E+00	5.60E-08	0.00E+00	0.00E+00	3.99E-07	4	1.00E-06	2.50E-07	1.60E+00	1.00E-05	2.50E-06	1.60E-01
1,2-Dichlorobenzene	0.00E+00	mg/L	0.00E+00	mg/kg	1.10E-02	mg/kg	NA	NA	6.10E+00	4.92E-01	5.00E-01	5.00E-01	0.00E+00	0.00E+00	5.65E-05	NA	NA	0.00E+00	1.17E-03	0.00E+00	0.00E+00	1.23E-03	4	8.57E+01	2.14E+01	5.73E-05	4.29E+02	1.07E+02	1.15E-05
1,3-Dichlorobenzene	0.00E+00	mg/L	0.00E+00	mg/kg	8.60E-03	mg/kg	NA	NA	6.23E+00	4.92E-01	5.00E-01	5.00E-01	0.00E+00	0.00E+00	4.42E-05	NA	NA	0.00E+00	9.15E-04	0.00E+00	0.00E+00	9.59E-04	4	8.57E+01	2.14E+01	4.48E-05	4.29E+02	1.07E+02	8.96E-06
1,4-Dichlorobenzene	0.00E+00	mg/L	0.00E+00	mg/kg	1.10E-02	mg/kg	NA	NA	6.23E+00	4.92E-01	5.00E-01	5.00E-01	0.00E+00	0.00E+00	5.65E-05	NA	NA	0.00E+00	1.17E-03	0.00E+00	0.00E+00	1.23E-03	4	2.50E+00	6.25E-01	1.96E-03	1.25E+01	3.13E+00	3.93E-04
2,4-Dinitrotoluene	0.00E+00	mg/L	0.00E+00	mg/kg	4.44E-01	mg/kg	NA	NA	8.20E-01	2.13E+00	5.00E-01	5.00E-01	0.00E+00	0.00E+00	2.28E-03	NA	NA	0.00E+00	2.04E-01	0.00E+00	0.00E+00	2.07E-01	4	5.40E-01	1.35E-01	1.53E+00	2.70E+00	6.75E-01	3.06E-01
4,4'-DDD	0.00E+00	mg/L	0.00E+00	mg/kg	4.47E-04	mg/kg	NA	NA	3.29E+01	1.57E-02	5.00E-01	5.00E-01	0.00E+00	0.00E+00	2.30E-06	NA	NA	0.00E+00	1.51E-06	0.00E+00	0.00E+00	3.81E-06	4	8.00E-01	2.00E-01	1.91E-05	4.00E+00	1.00E+00	3.81E-06
4,4'-DDE	0.00E+00	mg/L	0.00E+00	mg/kg	3.37E-03	mg/kg	NA	NA	2.35E+01	1.32E-02	1.23E+01	1.23E+01	0.00E+00	0.00E+00	1.73E-05	NA	NA	0.00E+00	9.61E-06	0.00E+00	0.00E+00	2.69E-05	4	8.00E-01	2.00E-01	1.35E-04	4.00E+00	1.00E+00	2.69E-05
4,4'-DDT	0.00E+00	mg/L	0.00E+00	mg/kg	6.36E-03	mg/kg	NA	NA	1.62E+01	4.61E-03	1.51E+00	1.51E+00	0.00E+00	0.00E+00	3.26E-05	NA	NA	0.00E+00	6.33E-06	0.00E+00	0.00E+00	3.90E-05	4	8.00E-01	2.00E-01	1.95E-04	4.00E+00	1.00E+00	3.90E-05
Acenaphthene	0.00E+00	mg/L	0.00E+00	mg/kg	1.60E-02	mg/kg	NA	NA	1.47E+00	8.26E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.22E-05	NA	NA	0.00E+00	2.86E-02	0.00E+00	0.00E+00	2.87E-02	4	6.56E+01	1.64E+01	1.75E-03	1.10E+02	2.75E+01	1.04E-03
Acenaphthylene	0.00E+00	mg/L	0.00E+00	mg/kg	1.61E-02	mg/kg	NA	NA	2.29E+01	7.55E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.27E-05	NA	NA	0.00E+00	2.63E-03	0.00E+00	0.00E+00	2.71E-03	4	6.56E+01	1.64E+01	1.65E-04	1.10E+02	2.75E+01	9.86E-05
Anthracene	0.00E+00	mg/L	0.00E+00	mg/kg	1.10E-02	mg/kg	NA	NA	2.42E+00	1.01E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.65E-05	NA	NA	0.00E+00	2.40E-03	0.00E+00	0.00E+00	2.46E-03	4	6.56E+01	1.64E+01	1.50E-04	1.10E+02	2.75E+01	8.95E-05
Aroclor 1254	0.00E+00	mg/L	0.00E+00	mg/kg	3.76E-01	mg/kg	NA	NA	4.51E+00	3.58E-03	5.00E-01	5.00E-01	0.00E+00	0.00E+00	1.93E-03	NA	NA	0.00E+00	2.91E-04	0.00E+00	0.00E+00	2.22E-03	8	1.40E-01	1.75E-02	1.27E-01	6.80E-01	8.50E-02	2.61E-02
Benzo(a)anthracene	0.00E+00	mg/L	0.00E+00	mg/kg	5.31E-02	mg/kg	NA	NA	1.59E+00	2.19E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.73E-04	NA	NA	0.00E+00	2.52E-03	0.00E+00	0.00E+00	2.79E-03	4	6.15E-01	1.54E-01	1.82E-02	3.07E+00	7.68E-01	3.64E-03
Benzo(a)pyrene	0.00E+00	mg/L	0.00E+00	mg/kg	5.27E-02	mg/kg	NA	NA	1.33E+00	1.37E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.71E-04	NA	NA	0.00E+00	1.56E-03	0.00E+00	0.00E+00	1.83E-03	4	1.00E+00	2.50E-01	7.33E-03	1.00E+01	2.50E+00	7.33E-04
Benzo(b)fluoranthene	0.00E+00	mg/L	0.00E+00	mg/kg	5.46E-02	mg/kg	NA	NA	2.60E+00	3.10E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.80E-04	NA	NA	0.00E+00	3.66E-03	0.00E+00	0.00E+00	3.94E-03	4	6.15E-01	1.54E-01	2.56E-02	3.07E+00	7.68E-01	5.13E-03
Benzo(g,h,i)perylene	0.00E+00	mg/L	0.00E+00	mg/kg	2.89E-02	mg/kg	NA	NA	2.94E+00	2.06E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.48E-04	NA	NA	0.00E+00	1.29E-03	0.00E+00	0.00E+00	1.44E-03	4	6.15E-01	1.54E-01	9.34E-03	3.07E+00	7.68E-01	1.87E-03
Benzo(k)fluoranthene	0.00E+00	mg/L	0.00E+00	mg/kg	3.23E-02	mg/kg	NA	NA	2.60E+00	1.87E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.66E-04	NA	NA	0.00E+00	1.31E-03	0.00E+00	0.00E+00	1.47E-03	4	6.15E-01	1.54E-01	9.58E-03	3.07E+00	7.68E-01	1.92E-03
Chrysene	0.00E+00	mg/L	0.00E+00	mg/kg	5.30E-02	mg/kg	NA	NA	2.29E+00	2.20E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.72E-04	NA	NA	0.00E+00	2.52E-03	0.00E+00	0.00E+00	2.79E-03	4	6.15E-01	1.54E-01	1.81E-02	3.07E+00	7.68E-01	3.63E-03
Dibenz(a,h)anthracene	0.00E+00	mg/L	0.00E+00	mg/kg	1.06E-02	mg/kg	NA	NA	2.31E+00	1.30E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.44E-05	NA	NA	0.00E+00	2.98E-04	0.00E+00	0.00E+00	3.52E-04	4	6.15E-01	1.54E-01	2.29E-03	3.07E+00	7.68E-01	4.59E-04
Endosulfan II	0.00E+00	mg/L	0.00E+00	mg/kg	2.24E-03	mg/kg	NA	NA	1.91E-01	3.67E-01	5.00E-01	5.00E-01	0.00E+00	0.00E+00	1.15E-05	NA	NA	0.00E+00	1.78E-04	0.00E+00	0.00E+00	1.89E-04	4	1.50E-01	3.75E-02	5.05E-03	7.50E-01	1.88E-01	1.01E-03
Endrin	0.00E+00	mg/L	0.00E+00	mg/kg	2.88E-04	mg/kg	NA	NA	1.97E+01	2.74E-02	5.00E-01	5.00E-01	0.00E+00	0.00E+00	1.48E-06	NA	NA	0.00E+00	1.71E-06	0.00E+00	0.00E+00	3.19E-06	4	9.20E-02	2.30E-02	1.39E-04	9.20E-01	2.30E-01	1.39E-05
Fluoranthene	0.00E+00	mg/L	0.00E+00	mg/kg	6.23E-02	mg/kg	NA	NA	3.04E+00	5.00E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.20E-04	NA	NA	0.00E+00	6.74E-03	0.00E+00	0.00E+00	7.06E-03	4	6.15E-01	1.54E-01	4.59E-02	3.07E+00	7.68E-01	9.19E-03
Fluorene	0.00E+00	mg/L	0.00E+00	mg/kg	1.38E-02	mg/kg	NA	NA	9.57E+00	1.09E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.09E-05	NA	NA	0.00E+00	3.24E-02	0.00E+00	0.00E+00	3.25E-02	4	6.56E+01	1.64E+01	1.98E-03	1.10E+02	2.75E+01	1.18E-03
Indeno(1,2,3-cd)pyrene	0.00E+00	mg/L	0.00E+00	mg/kg	3.46E-02	mg/kg	NA	NA	2.86E+00	1.10E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.78E-04	NA	NA	0.00E+00	8.23E-04	0.00E+00	0.00E+00	1.00E-03	4	6.15E-01	1.54E-01	6.51E-03	3.07E+00	7.68E-01	1.30E-03
Methoxychlor	0.00E+00	mg/L	0.00E+00	mg/kg	1.29E-03	mg/kg	NA	NA	7.64E+00	2.05E-02	5.00E-01	5.00E-01	0.00E+00	0.00E+00	6.62E-06	NA	NA	0.00E+00	5.70E-06	0.00E+00	0.00E+00	1.23E-05	4	4.00E+00	1.00E+00	1.23E-05	8.00E+00	2.00E+00	6.16E-06
Naphthalene	0.00E+00	mg/L	0.00E+00	mg/kg	2.70E-01	mg/kg	NA	NA	4.40E+00	1.22E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.39E-03	NA	NA	0.00E+00	7.12E-01	0.00E+00	0.00E+00	7.14E-01	4	6.56E+01	1.64E+01	4.35E-02	1.10E+02	2.75E+01	2.59E-02
Phenanthrene	0.00E+00	mg/L	0.00E+00	mg/kg	1.95E-01	mg/kg	NA	NA	1.72E+00	1.57E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.00E-03	NA	NA	0.00E+00	6.64E-02	0.00E+00	0.00E+00	6.74E-02	4	6.56E+01	1.64E+01	4.11E-03	1.10E+02	2.75E+01	2.45E-03
Pyrene	0.00E+00	mg/L	0.00E+00	mg/kg	7.21E-02	mg/kg	NA	NA	1.75E+00	7.20E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.70E-04	NA	NA	0.00E+00	1.12E-02	0.00E+00	0.00E+00	1.16E-02	4	6.15E-01	1.54E-01	7.54E-02	3.07E+00	7.68E-01	1.51E-02
Arsenic	0.00E+00	mg/L	0.00E+00	mg/kg	4.90E+00	mg/kg	NA	NA	1.51E-01	3.75E-02	5.89E-03	5.89E-03	0.00E+00	0.00E+00	2.52E-02	NA	NA	0.00E+00	3.98E-02	0.00E+00	0.00E+00	6.50E-02	4	1.26E-01	3.15E-02	2.06E+00	1.26E+00	3.15E-01	2.06E-01
Cadmium	0.00E+00	mg/L	0.00E+00	mg/kg	1.43E-01	mg/kg	NA	NA	1.23E+01	1.50E+00	7.94E-01	7.94E-01	0.00E+00	0.00E+00	7.34E-04	NA	NA	0.00E+00	4.65E-02	0.00E+00	0.00E+00	4.72E-02	4	1.00E+00	2.50E-01	1.89E-01	1.00E+01	2.50E+00	1.89E-02
Chromium	0.00E+00	mg/L	0.00E+00	mg/kg	4.44E+01	mg/kg	NA	NA	3.06E-01	4.10E-02	8.46E-02	8.46E-02	0.00E+00	0.00E+00	2.28E-01	NA	NA	0.00E+00	3.93E-01	0.00E+00	0.00E+00	6.21E-01	4	2.74E+03	6.84E+02	9.08E-04	1.37E+04	3.42E+03	1.81E-04
Copper	0.00E+00	mg/L	0.00E+00	mg/kg	2.44E+01	mg/kg	NA	NA	5.15E-01	2.82E-01	5.01E-01	5.01E-01	0.00E+00	0.00E+00	1.25E-01	NA	NA	0.00E+00	1.48E+00	0.00E+00	0.00E+00	1.61E+00	8	1.17E+01	1.46E+00	1.10E+00	1.51E+01	1.89E+00	8.52E-01
Lead	0.00E+00	mg/L	0.00E+00	mg/kg	1.09E+02	mg/kg	NA	NA	3.25E-01	3.39E-02	7.90E-02	7.90E-02	0.00E+00	0.00E+00	5.57E-01	NA	NA	0.00E+00	7.94E-01	0.00E+00	0.00E+00	1.35E+00	4	8.00E+00	2.00E+00	6.76E-01	8.00E+01	2.00E+01	6.76E-02
Mercury	0.00E+00	mg/L	0.00E+00	mg/kg	3.78E-01	mg/kg	NA	NA	2.07E+00	5.76E-01	1.92E-01	1.92E-01	0.00E+00	0.00E+00	1.94E-03	NA	NA	0.00E+00	4.70E-02	0.00E+00	0.00E+00	4.90E-02	8	1.00E+00	1.25E-01	3.92E-01	5.00E+00	6.25E-01	7.84E-02
Nickel	0.00E+00	mg/L	0.00E+00	mg/kg	1.81E+01	mg/kg	NA	NA	7.20E-01	5.22E-02	1.66E-01	1.66E-01	0.00E+00	0.00E+00	9.30E-02	NA	NA	0.00E+00	2.04E-01	0.00E+00	0.00E+00	2.97E-01	4	4.00E+01	1.00E+01	2.97E-02	8.00E+01	2.00E+01	1.49E-02
Selenium	0.00E+00	mg/L	0.00E+00	mg/kg	6.25E+00	mg/kg	NA	NA	5.69E-01	6.15E-01	2.11E-01	2.11E-01	0.00E+00	0.00E+00	3.21E-02	NA	NA	0.00E+00	8.30E-01	0.00E+00	0.00E+00	8.62E-01	4	2.00E-01	5.00E-02	1.72E+01	3.30E-01	8.25E-02	1.05E+01
Silver	0.00E+00	mg/L	0.00E+00	mg/kg	6.57E-01	mg/kg	NA	NA	2.05E+00	1.40E-02	4.00E-03	4.00E-03	0.00E+00	0.00E+00	3.37E-03	NA	NA	0.00E+00	1.99E-03	0.00E+00	0.00E+00	5.36E-03	4	2.22E+01	5.55E+00	9.66E-04	2.22E+02	5.55E+01	9.66E-05
Zinc	0.00E+00	mg/L	0.00E+00	mg/kg	6.03E+01	mg/kg	NA	NA	5.45E+00	7.77E-01	1.74E+00	1.74E+00	0.00E+00	0.00E+00	3.09E-01	NA	NA	0.00E+00	1.01E+01	0.00E+00	0.00E+00	1.04E+01	4	1.60E+02	4.00E+01	2.61E-01	3.20E+02	8.00E+01	1.30E-01

Hazard Index (Total EEQ): 2.5E+01 1.2E+01

Intake Equation:

$$Ej = \left(\frac{A}{HR} \left[\sum_{i=1}^{m} \left(\frac{IRi \, x \, Cij}{BW} \right) \right] \right)$$

Where:
Ej = Total Exposure to Chemical
A = Site Area
HR = Home Range
m = Total number of ingested media
i = counter
IRi = Consumption Rate for Medium
Cij = Chemical concentration (j) in medium (I) (mg/kg or mg/L)
BW = Body Weight

Notes:
Tier 1 = Max EEQ using max EPC, max BAF/BCF, max Intake Rates, min BW, and FHR =1.
Tier 2 = EEQ using 95% EPC, non-max BAF/BCF, avg Intake Rates, avg BW and calculated FHR.
BAF = Bioaccumulation Factor (may be BCF if this is the only value available)
EEQ = Ecological Effects Quotient.
L = LOAEL based; N = NOAEL based
LOAEL = Lowest Observed Adverse Effect Level
NOAEL = No Observed Adverse Effect Level
NA = Not applicable/Not available
PDE = Predicted Daily Exposure
BAF (or BCF) values from appropriate text tables (BCF = bioconcentration factor)
Some BAF (or BCF) values based on media regression equations (value in box): n See appropriate text tables for equations.
If BAF/BCF regression equation produced Tier 2 value exceeding maximum Tier 1 BAF/BCF value, Tier 1 value used as default.
LOAEL and NOAEL values from appropriate toxicity summary tables in the text.
UF = Uncertainty Factor for toxicity factor extrapolation, and Adjusted LOAEL or NOAEL = LOAEL/UF or NOAEL/UF
A "0" entry in the exposure concentration column indicates this chemical not selected as a COPEC for this medium.
Receptor diet data and home range data from appropriate text table.
Exposure point concentrations (EPCs) from appropriate text tables.

Species-Specific Factors

Plant diet fraction =	1	unitless
Fish diet fraction =	0	unitless
Aq. Invert diet fraction =	0	unitless
Terr. Invert diet fraction =	0	unitless
Mammal diet fraction =	0	unitless
Bird diet fraction =	0	unitless
Soil ingestion rate =	0.00019	kg/d
Sediment ingestion rate =	0	kg/d
Food ingestion rate =	0.008	kg/d
Body weight =	0.037	kg
Home range =	0.089	acres
Water intake rate =	0.0051	L/d
Site Area =	2.06	acres
Frac. home range (FHR) =	1.00E+00	unitless

TABLE F-4
TIER 1 CHEMICALS OF POTENTIAL CONCERN EEQs AND HAZARD INDICES FOR SHORT-TAILED SHREWS AT SWMU 50

Hazard Estimate - Tier 1
Short-tailed Shrew

Chemical	Surface Water Exposure Point Concentration	Units	Sediment Exposure Point Concentration	Units	Soil Exposure Point Concentration	Units	Fish BAF	Aq. Invert. BAF	Terr. Invert. BAF	Plant BAF	Mammal BAF	Bird BAF	PDE Surface Water	PDE Sediment	PDE Soil	PDE Fish	PDE Aq. Invert.	PDE Terr. Invert.	PDE Plants	PDE Mammals	PDE Birds	Total PDE	Chemical-Specific Toxicity Value UF	NOAEL	Adjusted NOAEL	EEQ N	LOAEL	Adjusted LOAEL	EEQ L
							---------- unitless ----------						mg/kg-d	mg/kg-d	mg/kg-d	mg/kg-d	mg/kg-d	mg/kg-d	mg/kg-d	mg/kg-d	mg/kg-d	mg/kg-d		mg/kg-d	mg/kg-d		mg/kg-d	mg/kg-d	
2,3,7,8-TCDD-TE	0.00E+00	mg/L	0.00E+00	mg/kg	9.80E-05	mg/kg	NA	NA	4.21E+01	3.87E-03	2.20E+00	2.20E+00	0.00E+00	0.00E+00	2.43E-06	NA	NA	9.89E-04	0.00E+00	0.00E+00	0.00E+00	9.92E-04	8	1.00E-06	1.25E-07	7.93E+03	1.00E-05	1.25E-06	7.93E+02
1,2-Dichlorobenzene	0.00E+00	mg/L	0.00E+00	mg/kg	1.10E-02	mg/kg	NA	NA	6.18E+00	4.92E-01	1.00E+00	1.00E+00	0.00E+00	0.00E+00	2.73E-04	NA	NA	1.63E-02	0.00E+00	0.00E+00	0.00E+00	1.66E-02	8	8.57E+01	1.07E+01	1.55E-03	4.29E+02	5.36E+01	3.10E-04
1,3-Dichlorobenzene	0.00E+00	mg/L	0.00E+00	mg/kg	8.60E-03	mg/kg	NA	NA	6.31E+00	4.92E-01	1.00E+00	1.00E+00	0.00E+00	0.00E+00	2.13E-04	NA	NA	1.30E-02	0.00E+00	0.00E+00	0.00E+00	1.32E-02	8	8.57E+01	1.07E+01	1.24E-03	4.29E+02	5.36E+01	2.47E-04
1,4-Dichlorobenzene	0.00E+00	mg/L	0.00E+00	mg/kg	1.10E-02	mg/kg	NA	NA	6.31E+00	4.92E-01	1.00E+00	1.00E+00	0.00E+00	0.00E+00	2.73E-04	NA	NA	1.66E-02	0.00E+00	0.00E+00	0.00E+00	1.69E-02	8	2.50E+00	3.13E-01	5.42E-02	1.25E+01	1.56E+00	1.08E-02
2,4-Dinitrotoluene	0.00E+00	mg/L	0.00E+00	mg/kg	8.88E-01	mg/kg	NA	NA	8.30E-01	2.13E+00	1.00E+00	1.00E+00	0.00E+00	0.00E+00	2.20E-02	NA	NA	1.77E-01	0.00E+00	0.00E+00	0.00E+00	1.99E-01	8	5.40E-01	6.75E-02	2.95E+00	2.70E+00	3.38E-01	5.90E-01
4,4'-DDD	0.00E+00	mg/L	0.00E+00	mg/kg	4.47E-04	mg/kg	NA	NA	3.29E+01	1.57E-02	1.00E+00	1.00E+00	0.00E+00	0.00E+00	1.11E-05	NA	NA	3.53E-03	0.00E+00	0.00E+00	0.00E+00	3.54E-03	8	8.00E-01	1.00E-01	3.54E-02	4.00E+00	5.00E-01	7.09E-03
4,4'-DDE	0.00E+00	mg/L	0.00E+00	mg/kg	3.37E-03	mg/kg	NA	NA	2.35E+01	1.32E-02	1.23E+01	1.23E+01	0.00E+00	0.00E+00	8.36E-05	NA	NA	1.90E-02	0.00E+00	0.00E+00	0.00E+00	1.91E-02	8	8.00E-01	1.00E-01	1.91E-01	4.00E+00	5.00E-01	3.82E-02
4,4'-DDT	0.00E+00	mg/L	0.00E+00	mg/kg	1.29E-02	mg/kg	NA	NA	1.48E+01	4.61E-03	1.55E+00	1.55E+00	0.00E+00	0.00E+00	3.20E-04	NA	NA	4.58E-02	0.00E+00	0.00E+00	0.00E+00	4.62E-02	8	8.00E-01	1.00E-01	4.62E-01	4.00E+00	5.00E-01	9.23E-02
Acenaphthene	0.00E+00	mg/L	0.00E+00	mg/kg	1.60E-02	mg/kg	NA	NA	1.47E+00	8.26E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.97E-04	NA	NA	5.64E-03	0.00E+00	0.00E+00	0.00E+00	6.04E-03	8	6.56E+01	8.20E+00	7.37E-04	1.10E+02	1.38E+01	4.39E-04
Acenaphthylene	0.00E+00	mg/L	0.00E+00	mg/kg	2.00E-02	mg/kg	NA	NA	2.29E+01	7.22E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.96E-04	NA	NA	1.10E-01	0.00E+00	0.00E+00	0.00E+00	1.10E-01	8	6.56E+01	8.20E+00	1.35E-02	1.10E+02	1.38E+01	8.03E-03
Anthracene	0.00E+00	mg/L	0.00E+00	mg/kg	1.10E-02	mg/kg	NA	NA	2.42E+00	1.01E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.73E-04	NA	NA	6.39E-03	0.00E+00	0.00E+00	0.00E+00	6.66E-03	8	6.56E+01	8.20E+00	8.12E-04	1.10E+02	1.38E+01	4.84E-04
Aroclor 1254	0.00E+00	mg/L	0.00E+00	mg/kg	1.48E+00	mg/kg	NA	NA	6.52E+01	3.58E-03	1.00E+00	1.00E+00	0.00E+00	0.00E+00	3.67E-02	NA	NA	2.32E+01	0.00E+00	0.00E+00	0.00E+00	2.32E+01	8	1.40E-01	1.75E-02	1.33E+03	6.80E-01	8.50E-02	2.73E+02
Benzo(a)anthracene	0.00E+00	mg/L	0.00E+00	mg/kg	1.37E-01	mg/kg	NA	NA	1.59E+00	1.49E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.40E-03	NA	NA	5.23E-02	0.00E+00	0.00E+00	0.00E+00	5.57E-02	8	6.15E-01	7.69E-02	7.24E-01	3.07E+00	3.84E-01	1.45E-01
Benzo(a)pyrene	0.00E+00	mg/L	0.00E+00	mg/kg	1.50E-01	mg/kg	NA	NA	1.33E+00	1.33E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.72E-03	NA	NA	4.79E-02	0.00E+00	0.00E+00	0.00E+00	5.16E-02	8	1.00E+00	1.25E-01	4.13E-01	1.00E+01	1.25E+00	4.13E-02
Benzo(b)fluoranthene	0.00E+00	mg/L	0.00E+00	mg/kg	1.52E-01	mg/kg	NA	NA	2.60E+00	3.10E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.77E-03	NA	NA	9.48E-02	0.00E+00	0.00E+00	0.00E+00	9.86E-02	8	6.15E-01	7.69E-02	1.28E+00	3.07E+00	3.84E-01	2.57E-01
Benzo(g,h,i)perylene	0.00E+00	mg/L	0.00E+00	mg/kg	5.90E-02	mg/kg	NA	NA	2.94E+00	2.35E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.46E-03	NA	NA	4.16E-02	0.00E+00	0.00E+00	0.00E+00	4.31E-02	8	6.15E-01	7.69E-02	5.61E-01	3.07E+00	3.84E-01	1.12E-01
Benzo(k)fluoranthene	0.00E+00	mg/L	0.00E+00	mg/kg	9.89E-02	mg/kg	NA	NA	2.60E+00	1.60E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.45E-03	NA	NA	6.17E-02	0.00E+00	0.00E+00	0.00E+00	6.42E-02	8	6.15E-01	7.69E-02	8.35E-01	3.07E+00	3.84E-01	1.67E-01
Chrysene	0.00E+00	mg/L	0.00E+00	mg/kg	1.19E-01	mg/kg	NA	NA	2.29E+00	1.58E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.95E-03	NA	NA	6.54E-02	0.00E+00	0.00E+00	0.00E+00	6.84E-02	8	6.15E-01	7.69E-02	8.89E-01	3.07E+00	3.84E-01	1.78E-01
Dibenz(a,h)anthracene	0.00E+00	mg/L	0.00E+00	mg/kg	1.40E-02	mg/kg	NA	NA	2.31E+00	1.30E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.47E-04	NA	NA	7.76E-03	0.00E+00	0.00E+00	0.00E+00	8.11E-03	8	6.15E-01	7.69E-02	1.05E-01	3.07E+00	3.84E-01	2.11E-02
Endosulfan II	0.00E+00	mg/L	0.00E+00	mg/kg	2.24E-03	mg/kg	NA	NA	1.93E-01	3.67E-01	1.00E+00	1.00E+00	0.00E+00	0.00E+00	5.56E-05	NA	NA	1.04E-04	0.00E+00	0.00E+00	0.00E+00	1.59E-04	8	1.50E-01	1.88E-02	8.51E-03	7.50E-01	9.38E-02	1.70E-03
Endrin	0.00E+00	mg/L	0.00E+00	mg/kg	2.88E-04	mg/kg	NA	NA	1.99E+01	2.74E-02	1.00E+00	1.00E+00	0.00E+00	0.00E+00	7.14E-06	NA	NA	1.38E-03	0.00E+00	0.00E+00	0.00E+00	1.39E-03	8	9.20E-02	1.15E-02	1.21E-01	9.20E-01	1.15E-01	1.21E-02
Fluoranthene	0.00E+00	mg/L	0.00E+00	mg/kg	7.30E-02	mg/kg	NA	NA	3.04E+00	5.00E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.81E-03	NA	NA	5.33E-02	0.00E+00	0.00E+00	0.00E+00	5.51E-02	8	6.15E-01	7.69E-02	7.16E-01	3.07E+00	3.84E-01	1.44E-01
Fluorene	0.00E+00	mg/L	0.00E+00	mg/kg	1.80E-02	mg/kg	NA	NA	9.57E+00	6.64E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.46E-04	NA	NA	4.13E-02	0.00E+00	0.00E+00	0.00E+00	4.18E-02	8	6.56E+01	8.20E+00	5.10E-03	1.10E+02	1.38E+01	3.04E-03
Indeno(1,2,3-cd)pyrene	0.00E+00	mg/L	0.00E+00	mg/kg	8.41E-02	mg/kg	NA	NA	2.86E+00	1.10E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.09E-03	NA	NA	5.77E-02	0.00E+00	0.00E+00	0.00E+00	5.98E-02	8	6.15E-01	7.69E-02	7.78E-01	3.07E+00	3.84E-01	1.56E-01
Methoxychlor	0.00E+00	mg/L	0.00E+00	mg/kg	1.29E-03	mg/kg	NA	NA	7.73E+00	2.05E-02	1.00E+00	1.00E+00	0.00E+00	0.00E+00	3.20E-05	NA	NA	2.39E-03	0.00E+00	0.00E+00	0.00E+00	2.43E-03	8	4.00E+00	5.00E-01	4.85E-03	8.00E+00	1.00E+00	2.43E-03
Naphthalene	0.00E+00	mg/L	0.00E+00	mg/kg	2.70E-01	mg/kg	NA	NA	4.40E+00	1.22E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.70E-03	NA	NA	2.85E-01	0.00E+00	0.00E+00	0.00E+00	2.92E-01	8	6.56E+01	8.20E+00	3.56E-02	1.10E+02	1.38E+01	2.12E-02
Phenanthrene	0.00E+00	mg/L	0.00E+00	mg/kg	2.60E-01	mg/kg	NA	NA	1.72E+00	1.41E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.45E-03	NA	NA	1.07E-01	0.00E+00	0.00E+00	0.00E+00	1.14E-01	8	6.56E+01	8.20E+00	1.39E-02	1.10E+02	1.38E+01	8.27E-03
Arsenic	0.00E+00	mg/L	0.00E+00	mg/kg	7.40E+00	mg/kg	NA	NA	1.34E-01	3.75E-02	5.46E-03	5.46E-03	0.00E+00	0.00E+00	1.84E-01	NA	NA	2.38E-01	0.00E+00	0.00E+00	0.00E+00	4.22E-01	8	1.26E-01	1.58E-02	2.68E+01	1.26E+00	1.58E-01	2.68E+00
Cadmium	0.00E+00	mg/L	0.00E+00	mg/kg	1.43E-01	mg/kg	NA	NA	1.23E+01	1.50E+00	7.94E-01	7.94E-01	0.00E+00	0.00E+00	3.55E-03	NA	NA	4.23E-01	0.00E+00	0.00E+00	0.00E+00	4.27E-01	8	1.00E+00	1.25E-01	3.42E+00	1.00E+01	1.25E+00	3.42E-01
Chromium	0.00E+00	mg/L	0.00E+00	mg/kg	1.16E+02	mg/kg	NA	NA	3.06E-01	4.10E-02	6.55E-02	6.55E-02	0.00E+00	0.00E+00	2.88E+00	NA	NA	8.52E+00	0.00E+00	0.00E+00	0.00E+00	1.14E+01	8	2.74E+03	3.42E+02	3.33E-02	1.37E+04	1.71E+03	6.66E-03
Copper	0.00E+00	mg/L	0.00E+00	mg/kg	5.64E+01	mg/kg	NA	NA	5.15E-01	1.69E-01	2.44E-01	2.44E-01	0.00E+00	0.00E+00	1.40E+00	NA	NA	6.97E+00	0.00E+00	0.00E+00	0.00E+00	8.37E+00	8	1.17E+01	1.46E+00	5.72E+00	1.51E+01	1.89E+00	4.43E+00
Lead	0.00E+00	mg/L	0.00E+00	mg/kg	1.78E+02	mg/kg	NA	NA	2.96E-01	2.72E-02	5.99E-02	5.99E-02	0.00E+00	0.00E+00	4.41E+00	NA	NA	1.26E+01	0.00E+00	0.00E+00	0.00E+00	1.71E+01	8	8.00E+00	1.00E+00	1.71E+01	8.00E+01	1.00E+01	1.71E+00
Mercury	0.00E+00	mg/L	0.00E+00	mg/kg	8.16E-01	mg/kg	NA	NA	3.30E+01	4.04E-01	1.05E+00	1.05E+00	0.00E+00	0.00E+00	2.02E-02	NA	NA	6.46E+00	0.00E+00	0.00E+00	0.00E+00	6.48E+00	8	1.00E+00	1.25E-01	5.19E+01	5.00E+00	6.25E-01	1.04E+01
Nickel	0.00E+00	mg/L	0.00E+00	mg/kg	5.01E+01	mg/kg	NA	NA	7.80E+00	4.04E-02	9.66E-02	9.66E-02	0.00E+00	0.00E+00	1.24E+00	NA	NA	9.38E+01	0.00E+00	0.00E+00	0.00E+00	9.50E+01	8	4.00E+01	5.00E+00	1.90E+01	8.00E+01	1.00E+01	9.50E+00
Selenium	0.00E+00	mg/L	0.00E+00	mg/kg	7.40E+00	mg/kg	NA	NA	5.44E-01	6.26E-01	1.89E-01	1.89E-01	0.00E+00	0.00E+00	1.84E-01	NA	NA	9.66E-01	0.00E+00	0.00E+00	0.00E+00	1.15E+00	8	2.00E-01	2.50E-02	4.60E+01	3.30E-01	4.13E-02	2.79E+01
Silver	0.00E+00	mg/L	0.00E+00	mg/kg	8.90E-01	mg/kg	NA	NA	2.05E+00	1.40E-02	4.00E-03	4.00E-03	0.00E+00	0.00E+00	2.21E-02	NA	NA	4.37E-01	0.00E+00	0.00E+00	0.00E+00	4.59E-01	8	2.22E+01	2.78E+00	1.65E-01	2.22E+02	2.78E+01	1.65E-02
Zinc	0.00E+00	mg/L	0.00E+00	mg/kg	9.33E+01	mg/kg	NA	NA	4.06E+00	6.39E-01	1.16E+00	1.16E+00	0.00E+00	0.00E+00	2.31E+00	NA	NA	9.09E+01	0.00E+00	0.00E+00	0.00E+00	9.32E+01	8	1.60E+02	2.00E+01	4.66E+00	3.20E+02	4.00E+01	2.33E+00
																						Hazard Index (Total EEQ):			9.4E+03			1.1E+03

Intake Equation:

$$Ej = \left(\frac{A}{HR} \left[\sum_{i=1}^{m} \left(\frac{IRi \, x \, Cij}{BW} \right) \right] \right)$$

Where:
Ej = Total Exposure to Chemical
A = Site Area
HR = Home Range
m = Total number of ingested media
i = counter
IRi = Consumption Rate for Medium
Cij = Chemical concentration (j) in medium (I) (mg/kg or mg/L)
BW = Body Weight

Notes:
Tier 1 = Max EEQ using max EPC, max BAF/BCF, max Intake Rates, min BW, and FHR =1.
Tier 2 = EEQ using 95% EPC, non-max BAF/BCF, avg Intake Rates, avg BW and calculated FHR.
BAF = Bioaccumulation Factor (may be BCF if this is the only value available)
EEQ = Ecological Effects Quotient.
L = LOAEL based; N = NOAEL based
LOAEL = Lowest Observed Adverse Effect Level
NOAEL = No Observed Adverse Effect Level
NA = Not applicable/Not available
PDE = Predicted Daily Exposure
BAF (or BCF) values from appropriate text tables (BCF = bioconcentration factor)
Some BAF (or BCF) values based on media regression equations (value in box): n See appropriate text tables for equations.
If BAF/BCF regression equation produced Tier 2 value exceeding maximum Tier 1 BAF/BCF value, Tier 1 value used a default.
LOAEL and NOAEL values from appropriate toxicity summary tables in the text.
UF = Uncertainty Factor for toxicity factor extrapolation, and Adjusted LOAEL or NOAEL = LOAEL/UF or NOAEL/UF
A "0" entry in the exposure concentration column indicates this chemical not selected as a COPEC for this medium.
Receptor diet data and home range data from appropriate text table.
Exposure point concentrations (EPCs) from appropriate text tables.

Species-Specific Factors

Plant diet fraction =	0	unitless
Fish diet fraction =	0	unitless
Aq. Invert diet fraction =	0	unitless
Terr. Invert diet fraction =	1	unitless
Mammal diet fraction =	0	unitless
Bird diet fraction =	0	unitless
Soil ingestion rate =	0.00031	kg/d
Sediment ingestion rate =	0	kg/d
Food ingestion rate =	0.003	kg/d
Body weight =	0.0125	kg
Home range =	0.96	acres
Water intake rate =	0.0033	L/d
Site Area =	2.06	acres
Frac. home range (FHR) =	1.00E+00	unitless

TABLE F-5
TIER 2 CHEMICALS OF POTENTIAL ECOLOGICAL CONCERN EEQs AND HAZARD INDICES FOR SHORT-TAILED SHREWS AT SWMU 50

Hazard Estimate - Tier 2
Short-tailed Shrew

Chemical	Surface Water Exposure Point Concentration	Units	Sediment Exposure Point Concentration	Units	Soil Exposure Point Concentration	Units	Fish BAF	Aq. Invert. BAF	Terr. Invert. BAF	Plant BAF	Mammal BAF	Bird BAF	PDE Surface Water	PDE Sediment	PDE Soil	PDE Fish	PDE Aq. Invert.	PDE Terr. Invert.	PDE Plants	PDE Mammals	PDE Birds	Total PDE	Chemical-Specific Toxicity Value UF	NOAEL	Adjusted NOAEL	EEQ N	LOAEL	Adjusted LOAEL	EEQ L
							---------- unitless ----------						mg/kg-d	mg/kg-d	mg/kg-d	mg/kg-d	mg/kg-d	mg/kg-d	mg/kg-d	mg/kg-d	mg/kg-d	mg/kg-d		mg/kg-d	mg/kg-d		mg/kg-d	mg/kg-d	
2,3,7,8-TCDD-TE	0.00E+00	mg/L	0.00E+00	mg/kg	6.68E-05	mg/kg	NA	NA	6.05E+00	3.87E-03	2.20E+00	2.20E+00	0.00E+00	0.00E+00	1.02E-06	NA	NA	5.93E-05	0.00E+00	0.00E+00	0.00E+00	6.03E-05	8	1.00E-06	1.25E-07	4.82E+02	1.00E-05	1.25E-06	4.82E+01
1,2-Dichlorobenzene	0.00E+00	mg/L	0.00E+00	mg/kg	1.10E-02	mg/kg	NA	NA	6.10E+00	4.92E-01	5.00E-01	5.00E-01	0.00E+00	0.00E+00	1.69E-04	NA	NA	9.85E-03	0.00E+00	0.00E+00	0.00E+00	1.00E-02	8	8.57E+01	1.07E+01	9.35E-04	4.29E+02	5.36E+01	1.87E-04
1,3-Dichlorobenzene	0.00E+00	mg/L	0.00E+00	mg/kg	8.60E-03	mg/kg	NA	NA	6.23E+00	4.92E-01	5.00E-01	5.00E-01	0.00E+00	0.00E+00	1.32E-04	NA	NA	7.86E-03	0.00E+00	0.00E+00	0.00E+00	7.99E-03	8	8.57E+01	1.07E+01	7.46E-04	4.29E+02	5.36E+01	1.49E-04
1,4-Dichlorobenzene	0.00E+00	mg/L	0.00E+00	mg/kg	1.10E-02	mg/kg	NA	NA	6.23E+00	4.92E-01	5.00E-01	5.00E-01	0.00E+00	0.00E+00	1.69E-04	NA	NA	1.01E-02	0.00E+00	0.00E+00	0.00E+00	1.02E-02	8	2.50E+00	3.13E-01	3.27E-02	1.25E+01	1.56E+00	6.54E-03
2,4-Dinitrotoluene	0.00E+00	mg/L	0.00E+00	mg/kg	4.44E-01	mg/kg	NA	NA	8.20E-01	2.13E+00	5.00E-01	5.00E-01	0.00E+00	0.00E+00	6.81E-03	NA	NA	5.34E-02	0.00E+00	0.00E+00	0.00E+00	6.02E-02	8	5.40E-01	6.75E-02	8.92E-01	2.70E+00	3.38E-01	1.78E-01
4,4'-DDD	0.00E+00	mg/L	0.00E+00	mg/kg	4.47E-04	mg/kg	NA	NA	3.29E+01	1.57E-02	5.00E-01	5.00E-01	0.00E+00	0.00E+00	6.85E-06	NA	NA	2.16E-03	0.00E+00	0.00E+00	0.00E+00	2.17E-03	8	8.00E-01	1.00E-01	2.17E-02	4.00E+00	5.00E-01	4.33E-03
4,4'-DDE	0.00E+00	mg/L	0.00E+00	mg/kg	3.37E-03	mg/kg	NA	NA	2.35E+01	1.32E-02	1.23E+01	1.23E+01	0.00E+00	0.00E+00	5.17E-05	NA	NA	1.16E-02	0.00E+00	0.00E+00	0.00E+00	1.17E-02	8	8.00E-01	1.00E-01	1.17E-01	4.00E+00	5.00E-01	2.34E-02
4,4'-DDT	0.00E+00	mg/L	0.00E+00	mg/kg	6.36E-03	mg/kg	NA	NA	1.62E+01	4.61E-03	1.51E+00	1.51E+00	0.00E+00	0.00E+00	9.75E-05	NA	NA	1.51E-02	0.00E+00	0.00E+00	0.00E+00	1.52E-02	8	8.00E-01	1.00E-01	1.52E-01	4.00E+00	5.00E-01	3.05E-02
Acenaphthene	0.00E+00	mg/L	0.00E+00	mg/kg	1.60E-02	mg/kg	NA	NA	1.47E+00	8.26E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.45E-04	NA	NA	3.45E-03	0.00E+00	0.00E+00	0.00E+00	3.69E-03	8	6.56E+01	8.20E+00	4.51E-04	1.10E+02	1.38E+01	2.69E-04
Acenaphthylene	0.00E+00	mg/L	0.00E+00	mg/kg	1.61E-02	mg/kg	NA	NA	2.29E+01	7.55E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.47E-04	NA	NA	5.41E-02	0.00E+00	0.00E+00	0.00E+00	5.43E-02	8	6.56E+01	8.20E+00	6.62E-03	1.10E+02	1.38E+01	3.95E-03
Anthracene	0.00E+00	mg/L	0.00E+00	mg/kg	1.10E-02	mg/kg	NA	NA	2.42E+00	1.01E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.69E-04	NA	NA	3.90E-03	0.00E+00	0.00E+00	0.00E+00	4.07E-03	8	6.56E+01	8.20E+00	4.97E-04	1.10E+02	1.38E+01	2.96E-04
Aroclor 1254	0.00E+00	mg/L	0.00E+00	mg/kg	3.76E-01	mg/kg	NA	NA	4.51E+00	3.58E-03	5.00E-01	5.00E-01	0.00E+00	0.00E+00	5.77E-03	NA	NA	2.49E-01	0.00E+00	0.00E+00	0.00E+00	2.54E-01	8	1.40E-01	1.75E-02	1.45E+01	6.80E-01	8.50E-02	2.99E+00
Benzo(a)anthracene	0.00E+00	mg/L	0.00E+00	mg/kg	5.31E-02	mg/kg	NA	NA	1.59E+00	2.19E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.14E-04	NA	NA	1.24E-02	0.00E+00	0.00E+00	0.00E+00	1.32E-02	8	6.15E-01	7.69E-02	1.72E-01	3.07E+00	3.84E-01	3.44E-02
Benzo(a)pyrene	0.00E+00	mg/L	0.00E+00	mg/kg	5.27E-02	mg/kg	NA	NA	1.33E+00	1.37E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.08E-04	NA	NA	1.03E-02	0.00E+00	0.00E+00	0.00E+00	1.11E-02	8	1.00E+00	1.25E-01	8.87E-02	1.00E+01	1.25E+00	8.87E-03
Benzo(b)fluoranthene	0.00E+00	mg/L	0.00E+00	mg/kg	5.46E-02	mg/kg	NA	NA	2.60E+00	3.10E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.37E-04	NA	NA	2.08E-02	0.00E+00	0.00E+00	0.00E+00	2.17E-02	8	6.15E-01	7.69E-02	2.82E-01	3.07E+00	3.84E-01	5.64E-02
Benzo(g,h,i)perylene	0.00E+00	mg/L	0.00E+00	mg/kg	2.89E-02	mg/kg	NA	NA	2.94E+00	2.06E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.43E-04	NA	NA	1.25E-02	0.00E+00	0.00E+00	0.00E+00	1.29E-02	8	6.15E-01	7.69E-02	1.68E-01	3.07E+00	3.84E-01	3.36E-02
Benzo(k)fluoranthene	0.00E+00	mg/L	0.00E+00	mg/kg	3.23E-02	mg/kg	NA	NA	2.60E+00	1.87E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.95E-04	NA	NA	1.23E-02	0.00E+00	0.00E+00	0.00E+00	1.28E-02	8	6.15E-01	7.69E-02	1.67E-01	3.07E+00	3.84E-01	3.34E-02
Chrysene	0.00E+00	mg/L	0.00E+00	mg/kg	5.30E-02	mg/kg	NA	NA	2.29E+00	2.20E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.13E-04	NA	NA	1.78E-02	0.00E+00	0.00E+00	0.00E+00	1.86E-02	8	6.15E-01	7.69E-02	2.42E-01	3.07E+00	3.84E-01	4.85E-02
Dibenz(a,h)anthracene	0.00E+00	mg/L	0.00E+00	mg/kg	1.06E-02	mg/kg	NA	NA	2.31E+00	1.30E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.63E-04	NA	NA	3.59E-03	0.00E+00	0.00E+00	0.00E+00	3.75E-03	8	6.15E-01	7.69E-02	4.88E-02	3.07E+00	3.84E-01	9.78E-03
Endosulfan II	0.00E+00	mg/L	0.00E+00	mg/kg	2.24E-03	mg/kg	NA	NA	1.91E-01	3.67E-01	5.00E-01	5.00E-01	0.00E+00	0.00E+00	3.43E-05	NA	NA	6.27E-05	0.00E+00	0.00E+00	0.00E+00	9.71E-05	8	1.50E-01	1.88E-02	5.18E-03	7.50E-01	9.38E-02	1.04E-03
Endrin	0.00E+00	mg/L	0.00E+00	mg/kg	2.88E-04	mg/kg	NA	NA	1.97E+01	2.74E-02	5.00E-01	5.00E-01	0.00E+00	0.00E+00	4.42E-06	NA	NA	8.32E-04	0.00E+00	0.00E+00	0.00E+00	8.37E-04	8	9.20E-02	1.15E-02	7.28E-02	9.20E-01	1.15E-01	7.28E-03
Fluoranthene	0.00E+00	mg/L	0.00E+00	mg/kg	6.23E-02	mg/kg	NA	NA	3.04E+00	5.00E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.55E-04	NA	NA	2.78E-02	0.00E+00	0.00E+00	0.00E+00	2.87E-02	8	6.15E-01	7.69E-02	3.74E-01	3.07E+00	3.84E-01	7.49E-02
Fluorene	0.00E+00	mg/L	0.00E+00	mg/kg	1.38E-02	mg/kg	NA	NA	9.57E+00	1.09E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.12E-04	NA	NA	1.94E-02	0.00E+00	0.00E+00	0.00E+00	1.96E-02	8	6.56E+01	8.20E+00	2.39E-03	1.10E+02	1.38E+01	1.42E-03
Indeno(1,2,3-cd)pyrene	0.00E+00	mg/L	0.00E+00	mg/kg	3.46E-02	mg/kg	NA	NA	2.86E+00	1.10E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.31E-04	NA	NA	1.45E-02	0.00E+00	0.00E+00	0.00E+00	1.50E-02	8	6.15E-01	7.69E-02	1.96E-01	3.07E+00	3.84E-01	3.92E-02
Methoxychlor	0.00E+00	mg/L	0.00E+00	mg/kg	1.29E-03	mg/kg	NA	NA	7.64E+00	2.05E-02	5.00E-01	5.00E-01	0.00E+00	0.00E+00	1.98E-05	NA	NA	1.44E-03	0.00E+00	0.00E+00	0.00E+00	1.46E-03	8	4.00E+00	5.00E-01	2.93E-03	8.00E+00	1.00E+00	1.46E-03
Naphthalene	0.00E+00	mg/L	0.00E+00	mg/kg	2.70E-01	mg/kg	NA	NA	4.40E+00	1.22E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.14E-03	NA	NA	1.74E-01	0.00E+00	0.00E+00	0.00E+00	1.78E-01	8	6.56E+01	8.20E+00	2.18E-02	1.10E+02	1.38E+01	1.30E-02
Phenanthrene	0.00E+00	mg/L	0.00E+00	mg/kg	1.95E-01	mg/kg	NA	NA	1.72E+00	1.57E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.99E-03	NA	NA	4.92E-02	0.00E+00	0.00E+00	0.00E+00	5.22E-02	8	6.56E+01	8.20E+00	6.36E-03	1.10E+02	1.38E+01	3.80E-03
Arsenic	0.00E+00	mg/L	0.00E+00	mg/kg	4.90E+00	mg/kg	NA	NA	1.51E-01	3.75E-02	5.89E-03	5.89E-03	0.00E+00	0.00E+00	7.52E-02	NA	NA	1.09E-01	0.00E+00	0.00E+00	0.00E+00	1.84E-01	8	1.26E-01	1.58E-02	1.17E+01	1.26E+00	1.58E-01	1.17E+00
Cadmium	0.00E+00	mg/L	0.00E+00	mg/kg	1.43E-01	mg/kg	NA	NA	1.23E+01	1.50E+00	7.94E-01	7.94E-01	0.00E+00	0.00E+00	2.19E-03	NA	NA	2.59E-01	0.00E+00	0.00E+00	0.00E+00	2.61E-01	8	1.00E+00	1.25E-01	2.09E+00	1.00E+01	1.25E+00	2.09E-01
Chromium	0.00E+00	mg/L	0.00E+00	mg/kg	4.44E+01	mg/kg	NA	NA	3.06E-01	4.10E-02	8.46E-02	8.46E-02	0.00E+00	0.00E+00	6.80E-01	NA	NA	1.99E+00	0.00E+00	0.00E+00	0.00E+00	2.67E+00	8	2.74E+03	3.42E+02	7.81E-03	1.37E+04	1.71E+03	1.56E-03
Copper	0.00E+00	mg/L	0.00E+00	mg/kg	2.44E+01	mg/kg	NA	NA	5.15E-01	2.82E-01	5.01E-01	5.01E-01	0.00E+00	0.00E+00	3.73E-01	NA	NA	1.84E+00	0.00E+00	0.00E+00	0.00E+00	2.21E+00	8	1.17E+01	1.46E+00	1.51E+00	1.51E+01	1.89E+00	1.17E+00
Lead	0.00E+00	mg/L	0.00E+00	mg/kg	1.09E+02	mg/kg	NA	NA	3.25E-01	3.39E-02	7.90E-02	7.90E-02	0.00E+00	0.00E+00	1.66E+00	NA	NA	5.18E+00	0.00E+00	0.00E+00	0.00E+00	6.84E+00	8	8.00E+00	1.00E+00	6.84E+00	8.00E+01	1.00E+01	6.84E-01
Mercury	0.00E+00	mg/L	0.00E+00	mg/kg	3.78E-01	mg/kg	NA	NA	2.07E+00	5.76E-01	1.92E-01	1.92E-01	0.00E+00	0.00E+00	5.80E-03	NA	NA	1.15E-01	0.00E+00	0.00E+00	0.00E+00	1.21E-01	8	1.00E+00	1.25E-01	9.67E-01	5.00E+00	6.25E-01	1.93E-01
Nickel	0.00E+00	mg/L	0.00E+00	mg/kg	1.81E+01	mg/kg	NA	NA	7.20E-01	5.22E-02	1.66E-01	1.66E-01	0.00E+00	0.00E+00	2.78E-01	NA	NA	1.91E+00	0.00E+00	0.00E+00	0.00E+00	2.19E+00	8	4.00E+01	5.00E+00	4.38E-01	8.00E+01	1.00E+01	2.19E-01
Selenium	0.00E+00	mg/L	0.00E+00	mg/kg	6.25E+00	mg/kg	NA	NA	5.69E-01	6.15E-01	2.11E-01	2.11E-01	0.00E+00	0.00E+00	9.58E-02	NA	NA	5.21E-01	0.00E+00	0.00E+00	0.00E+00	6.17E-01	8	2.00E-01	2.50E-02	2.47E+01	3.30E-01	4.13E-02	1.50E+01
Silver	0.00E+00	mg/L	0.00E+00	mg/kg	6.57E-01	mg/kg	NA	NA	2.05E+00	1.40E-02	4.00E-03	4.00E-03	0.00E+00	0.00E+00	1.01E-02	NA	NA	1.97E-01	0.00E+00	0.00E+00	0.00E+00	2.07E-01	8	2.22E+01	2.78E+00	7.46E-02	2.22E+02	2.78E+01	7.46E-03
Zinc	0.00E+00	mg/L	0.00E+00	mg/kg	6.03E+01	mg/kg	NA	NA	5.45E+00	7.77E-01	1.74E+00	1.74E+00	0.00E+00	0.00E+00	9.24E-01	NA	NA	4.81E+01	0.00E+00	0.00E+00	0.00E+00	4.90E+01	8	1.60E+02	2.00E+01	2.45E+00	3.20E+02	4.00E+01	1.23E+00
Pyrene	0.00E+00	mg/L	0.00E+00	mg/kg	7.21E-02	mg/kg	NA	NA	1.75E+00	7.20E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.11E-03	NA	NA	1.85E-02	0.00E+00	0.00E+00	0.00E+00	1.96E-02	8	6.15E-01	7.69E-02	2.55E-01	3.07E+00	3.84E-01	5.11E-02

Hazard Index (Total EEQ): 5.5E+02 7.2E+01

Intake Equation:

$$Ej = \left(\frac{A}{HR} \left[\sum_{i=1}^{m} \left(\frac{IRi \, x \, Cij}{BW} \right) \right] \right)$$

Where:
Ej = Total Exposure to Chemical
A = Site Area
HR = Home Range
m = Total number of ingested media
i = counter
IRi = Consumption Rate for Medium
Cij = Chemical concentration (j) in medium (I) (mg/kg or mg/L)
BW = Body Weight

Notes:
Tier 1 = Max EEQ using max EPC, max BAF/BCF, max Intake Rates, min BW, and FHR =1.
Tier 2 = EEQ using 95% EPC, non-max BAF/BCF, avg Intake Rates, avg BW and calculated FHR.
BAF = Bioaccumulation Factor (may be BCF if this is the only value available)
EEQ = Ecological Effects Quotient.
L = LOAEL based; N = NOAEL based
LOAEL = Lowest Observed Adverse Effect Level
NOAEL = No Observed Adverse Effect Level
NA = Not applicable/Not available
PDE = Predicted Daily Exposure
BAF (or BCF) values from appropriate text tables (BCF = bioconcentration factor)
Some BAF (or BCF) values based on media regression equations (value in box): n See appropriate text tables for equations.
If BAF/BCF regression equation produced Tier 2 value exceeding maximum Tier 1 BAF/BCF value, Tier 1 value used as default.
LOAEL and NOAEL values from appropriate toxicity summary tables in the text.
UF = Uncertainty Factor for toxicity factor extrapolation, and Adjusted LOAEL or NOAEL = LOAEL/UF or NOAEL/UF
A "0" entry in the exposure concentration column indicates this chemical not selected as a COPEC for this medium.
Receptor diet data and home range data from appropriate text table.
Exposure point concentrations (EPCs) from appropriate text tables.

Species-Specific Factors

Plant diet fraction =	0	unitless
Fish diet fraction =	0	unitless
Aq. Invert diet fraction =	0	unitless
Terr. Invert diet fraction =	1	unitless
Mammal diet fraction =	0	unitless
Bird diet fraction =	0	unitless
Soil ingestion rate =	0.00023	kg/d
Sediment ingestion rate =	0	kg/d
Food ingestion rate =	0.0022	kg/d
Body weight =	0.015	kg
Home range =	0.96	acres
Water intake rate =	0.0023	L/d
Site Area =	2.06	acres
Frac. home range (FHR) =	1.00E+00	unitless

TABLE F-6
TIER 1 CHEMICALS OF POTENTIAL CONCERN EEQs AND HAZARD INDICES FOR AMERICAN ROBINS AT SWMU 50

Hazard Estimate - Tier 1
American Robin

Chemical	Surface Water Exposure Point Concentration	Units	Sediment Exposure Point Concentration	Units	Soil Exposure Point Concentration	Units	Fish BAF	Aq. Invert. BAF	Terr. Invert. BAF	Plant BAF	Mammal BAF	Bird BAF	PDE Surface Water	PDE Sediment	PDE Soil	PDE Fish	PDE Aq. Invert.	PDE Terr. Invert.	PDE Plants	PDE Mammals	PDE Birds	Total PDE	Chemical-Specific Toxicity Value UF	NOAEL	Adjusted NOAEL	EEQ N	LOAEL	Adjusted LOAEL	EEQ L
							---------- unitless ----------						mg/kg-d	mg/kg-d	mg/kg-d	mg/kg-d	mg/kg-d	mg/kg-d	mg/kg-d	mg/kg-d	mg/kg-d	mg/kg-d		mg/kg-d	mg/kg-d		mg/kg-d	mg/kg-d	
2,3,7,8-TCDD-TE	0.00E+00	mg/L	0.00E+00	mg/kg	9.80E-05	mg/kg	NA	NA	4.21E+01	3.87E-03	2.20E+00	2.20E+00	0.00E+00	0.00E+00	1.23E-06	NA	NA	4.93E-04	7.42E-08	0.00E+00	0.00E+00	4.95E-04	8	1.40E-05	1.75E-06	2.83E+02	1.40E-04	1.75E-05	2.83E+01
1,2-Dichlorobenzene	0.00E+00	mg/L	0.00E+00	mg/kg	1.10E-02	mg/kg	NA	NA	6.18E+00	4.92E-01	1.00E+00	1.00E+00	0.00E+00	0.00E+00	1.39E-04	NA	NA	8.13E-03	1.06E-03	0.00E+00	0.00E+00	9.33E-03	8	1.61E+01	2.01E+00	4.64E-03	8.04E+01	1.01E+01	9.28E-04
1,3-Dichlorobenzene	0.00E+00	mg/L	0.00E+00	mg/kg	8.60E-03	mg/kg	NA	NA	6.31E+00	4.92E-01	1.00E+00	1.00E+00	0.00E+00	0.00E+00	1.08E-04	NA	NA	6.49E-03	8.27E-04	0.00E+00	0.00E+00	7.43E-03	8	1.61E+01	2.01E+00	3.69E-03	8.04E+01	1.01E+01	7.39E-04
1,4-Dichlorobenzene	0.00E+00	mg/L	0.00E+00	mg/kg	1.10E-02	mg/kg	NA	NA	6.31E+00	4.92E-01	1.00E+00	1.00E+00	0.00E+00	0.00E+00	1.39E-04	NA	NA	8.30E-03	1.06E-03	0.00E+00	0.00E+00	9.50E-03	8	1.61E+01	2.01E+00	4.72E-03	8.04E+01	1.01E+01	9.45E-04
2,4-Dinitrotoluene	0.00E+00	mg/L	0.00E+00	mg/kg	8.88E-01	mg/kg	NA	NA	8.30E-01	2.13E+00	1.00E+00	1.00E+00	0.00E+00	0.00E+00	1.12E-02	NA	NA	8.82E-02	3.69E-01	0.00E+00	0.00E+00	4.68E-01	8	NA	NA	NA	NA	NA	NA
4,4'-DDD	0.00E+00	mg/L	0.00E+00	mg/kg	4.47E-04	mg/kg	NA	NA	3.29E+01	1.57E-02	1.00E+00	1.00E+00	0.00E+00	0.00E+00	5.63E-06	NA	NA	1.76E-03	1.37E-06	0.00E+00	0.00E+00	1.77E-03	8	2.80E-03	3.50E-04	5.05E+00	2.80E-02	3.50E-03	5.05E-01
4,4'-DDE	0.00E+00	mg/L	0.00E+00	mg/kg	3.37E-03	mg/kg	NA	NA	2.35E+01	1.32E-02	1.23E+01	1.23E+01	0.00E+00	0.00E+00	4.25E-05	NA	NA	9.49E-03	8.68E-06	0.00E+00	0.00E+00	9.54E-03	8	2.80E-03	3.50E-04	2.73E+01	2.80E-02	3.50E-03	2.73E+00
4,4'-DDT	0.00E+00	mg/L	0.00E+00	mg/kg	1.29E-02	mg/kg	NA	NA	1.48E+01	4.61E-03	1.55E+00	1.55E+00	0.00E+00	0.00E+00	1.63E-04	NA	NA	2.29E-02	1.16E-05	0.00E+00	0.00E+00	2.30E-02	8	2.80E-03	3.50E-04	6.58E+01	2.80E-02	3.50E-03	6.58E+00
Acenaphthene	0.00E+00	mg/L	0.00E+00	mg/kg	1.60E-02	mg/kg	NA	NA	1.47E+00	8.26E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.02E-04	NA	NA	2.81E-03	2.58E-02	0.00E+00	0.00E+00	2.88E-02	8	5.53E+02	6.91E+01	4.17E-04	2.77E+03	3.46E+02	8.34E-05
Acenaphthylene	0.00E+00	mg/L	0.00E+00	mg/kg	2.00E-02	mg/kg	NA	NA	2.29E+01	7.22E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.52E-04	NA	NA	5.48E-02	2.82E-03	0.00E+00	0.00E+00	5.79E-02	8	5.53E+02	6.91E+01	8.37E-04	2.77E+03	3.46E+02	1.67E-04
Anthracene	0.00E+00	mg/L	0.00E+00	mg/kg	1.10E-02	mg/kg	NA	NA	2.42E+00	1.01E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.39E-04	NA	NA	3.19E-03	2.17E-03	0.00E+00	0.00E+00	5.50E-03	8	5.53E+02	6.91E+01	7.95E-05	2.77E+03	3.46E+02	1.59E-05
Aroclor 1254	0.00E+00	mg/L	0.00E+00	mg/kg	1.48E+00	mg/kg	NA	NA	6.52E+01	3.58E-03	1.00E+00	1.00E+00	0.00E+00	0.00E+00	1.86E-02	NA	NA	1.16E+01	1.03E-03	0.00E+00	0.00E+00	1.16E+01	8	1.80E-01	2.25E-02	5.14E+02	1.80E+00	2.25E-01	5.14E+01
Benzo(a)anthracene	0.00E+00	mg/L	0.00E+00	mg/kg	1.37E-01	mg/kg	NA	NA	1.59E+00	1.49E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.73E-03	NA	NA	2.61E-02	4.00E-03	0.00E+00	0.00E+00	3.18E-02	8	5.53E+02	6.91E+01	4.60E-04	2.77E+03	3.46E+02	9.20E-05
Benzo(a)pyrene	0.00E+00	mg/L	0.00E+00	mg/kg	1.50E-01	mg/kg	NA	NA	1.33E+00	1.33E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.89E-03	NA	NA	2.39E-02	3.91E-03	0.00E+00	0.00E+00	2.97E-02	8	5.53E+02	6.91E+01	4.29E-04	2.77E+03	3.46E+02	8.59E-05
Benzo(b)fluoranthene	0.00E+00	mg/L	0.00E+00	mg/kg	1.52E-01	mg/kg	NA	NA	2.60E+00	3.10E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.91E-03	NA	NA	4.73E-02	9.20E-03	0.00E+00	0.00E+00	5.84E-02	8	5.53E+02	6.91E+01	8.45E-04	2.77E+03	3.46E+02	1.69E-04
Benzo(g,h,i)perylene	0.00E+00	mg/L	0.00E+00	mg/kg	5.90E-02	mg/kg	NA	NA	2.94E+00	2.35E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.43E-04	NA	NA	2.08E-02	2.71E-03	0.00E+00	0.00E+00	2.42E-02	8	5.53E+02	6.91E+01	3.50E-04	2.77E+03	3.46E+02	7.00E-05
Benzo(k)fluoranthene	0.00E+00	mg/L	0.00E+00	mg/kg	9.89E-02	mg/kg	NA	NA	2.60E+00	1.60E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.25E-03	NA	NA	3.08E-02	3.09E-03	0.00E+00	0.00E+00	3.51E-02	8	5.53E+02	6.91E+01	5.08E-04	2.77E+03	3.46E+02	1.02E-04
Chrysene	0.00E+00	mg/L	0.00E+00	mg/kg	1.19E-01	mg/kg	NA	NA	2.29E+00	1.58E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.50E-03	NA	NA	3.26E-02	3.67E-03	0.00E+00	0.00E+00	3.78E-02	8	5.53E+02	6.91E+01	5.47E-04	2.77E+03	3.46E+02	1.09E-04
Dibenz(a,h)anthracene	0.00E+00	mg/L	0.00E+00	mg/kg	1.40E-02	mg/kg	NA	NA	2.31E+00	1.30E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.76E-04	NA	NA	3.87E-03	3.55E-04	0.00E+00	0.00E+00	4.40E-03	8	5.53E+02	6.91E+01	6.37E-05	2.77E+03	3.46E+02	1.27E-05
Endosulfan II	0.00E+00	mg/L	0.00E+00	mg/kg	2.24E-03	mg/kg	NA	NA	1.93E-01	3.67E-01	1.00E+00	1.00E+00	0.00E+00	0.00E+00	2.82E-05	NA	NA	5.18E-05	1.61E-04	0.00E+00	0.00E+00	2.41E-04	8	1.00E+01	1.25E+00	1.93E-04	5.00E+01	6.25E+00	3.85E-05
Endrin	0.00E+00	mg/L	0.00E+00	mg/kg	2.88E-04	mg/kg	NA	NA	1.99E+01	2.74E-02	1.00E+00	1.00E+00	0.00E+00	0.00E+00	3.63E-06	NA	NA	6.88E-04	1.54E-06	0.00E+00	0.00E+00	6.93E-04	8	3.00E-01	3.75E-02	1.85E-02	1.50E+00	1.88E-01	3.69E-03
Fluoranthene	0.00E+00	mg/L	0.00E+00	mg/kg	7.30E-02	mg/kg	NA	NA	3.04E+00	5.00E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.20E-04	NA	NA	2.66E-02	7.13E-03	0.00E+00	0.00E+00	3.46E-02	8	5.53E+02	6.91E+01	5.01E-04	2.77E+03	3.46E+02	1.00E-04
Fluorene	0.00E+00	mg/L	0.00E+00	mg/kg	1.80E-02	mg/kg	NA	NA	9.57E+00	6.64E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.27E-04	NA	NA	2.06E-02	2.33E-02	0.00E+00	0.00E+00	4.42E-02	8	5.53E+02	6.91E+01	6.39E-04	2.77E+03	3.46E+02	1.28E-04
Indeno(1,2,3-cd)pyrene	0.00E+00	mg/L	0.00E+00	mg/kg	8.41E-02	mg/kg	NA	NA	2.86E+00	1.10E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.06E-03	NA	NA	2.88E-02	1.81E-03	0.00E+00	0.00E+00	3.17E-02	8	5.53E+02	6.91E+01	4.58E-04	2.77E+03	3.46E+02	9.16E-05
Methoxychlor	0.00E+00	mg/L	0.00E+00	mg/kg	1.29E-03	mg/kg	NA	NA	7.73E+00	2.05E-02	1.00E+00	1.00E+00	0.00E+00	0.00E+00	1.63E-05	NA	NA	1.19E-03	5.15E-06	0.00E+00	0.00E+00	1.21E-03	8	2.58E+01	3.22E+00	3.77E-04	1.29E+02	1.61E+01	7.54E-05
Naphthalene	0.00E+00	mg/L	0.00E+00	mg/kg	2.70E-01	mg/kg	NA	NA	4.40E+00	1.22E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.40E-03	NA	NA	1.42E-01	6.43E-01	0.00E+00	0.00E+00	7.89E-01	8	5.53E+02	6.91E+01	1.14E-02	2.77E+03	3.46E+02	2.28E-03
Phenanthrene	0.00E+00	mg/L	0.00E+00	mg/kg	2.60E-01	mg/kg	NA	NA	1.72E+00	1.41E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.28E-03	NA	NA	5.35E-02	7.17E-02	0.00E+00	0.00E+00	1.28E-01	8	5.53E+02	6.91E+01	1.86E-03	2.77E+03	3.46E+02	3.72E-04
Pyrene	0.00E+00	mg/L	0.00E+00	mg/kg	8.50E-02	mg/kg	NA	NA	1.75E+00	7.20E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.07E-03	NA	NA	1.78E-02	1.20E-02	0.00E+00	0.00E+00	3.08E-02	8	5.53E+02	6.91E+01	4.46E-04	2.77E+03	3.46E+02	8.92E-05
Arsenic	0.00E+00	mg/L	0.00E+00	mg/kg	7.40E+00	mg/kg	NA	NA	1.34E-01	3.75E-02	5.46E-03	5.46E-03	0.00E+00	0.00E+00	9.32E-02	NA	NA	1.19E-01	5.42E-02	0.00E+00	0.00E+00	2.66E-01	8	5.14E+00	6.43E-01	4.14E-01	1.28E+01	1.61E+00	1.66E-01
Cadmium	0.00E+00	mg/L	0.00E+00	mg/kg	1.43E-01	mg/kg	NA	NA	1.23E+01	1.50E+00	7.94E-01	7.94E-01	0.00E+00	0.00E+00	1.80E-03	NA	NA	2.11E-01	4.20E-02	0.00E+00	0.00E+00	2.55E-01	8	1.45E+00	1.81E-01	1.41E+00	2.00E+01	2.50E+00	1.02E-01
Chromium	0.00E+00	mg/L	0.00E+00	mg/kg	1.16E+02	mg/kg	NA	NA	3.06E-01	4.10E-02	6.55E-02	6.55E-02	0.00E+00	0.00E+00	1.46E+00	NA	NA	4.25E+00	9.29E-01	0.00E+00	0.00E+00	6.64E+00	8	2.66E+00	3.33E-01	2.00E+01	2.78E+00	3.48E-01	1.91E+01
Copper	0.00E+00	mg/L	0.00E+00	mg/kg	5.64E+01	mg/kg	NA	NA	5.15E-01	1.69E-01	2.44E-01	2.44E-01	0.00E+00	0.00E+00	7.11E-01	NA	NA	3.48E+00	1.87E+00	0.00E+00	0.00E+00	6.05E+00	8	4.70E+01	5.88E+00	1.03E+00	6.20E+01	7.75E+00	7.81E-01
Lead	0.00E+00	mg/L	0.00E+00	mg/kg	1.78E+02	mg/kg	NA	NA	2.96E-01	2.72E-02	5.99E-02	5.99E-02	0.00E+00	0.00E+00	2.24E+00	NA	NA	6.30E+00	9.47E-01	0.00E+00	0.00E+00	9.49E+00	8	3.85E+00	4.81E-01	1.97E+01	1.93E+01	2.41E+00	3.94E+00
Mercury	0.00E+00	mg/L	0.00E+00	mg/kg	8.16E-01	mg/kg	NA	NA	3.30E+01	4.04E-01	1.05E+00	1.05E+00	0.00E+00	0.00E+00	1.03E-02	NA	NA	3.22E+00	6.44E-02	0.00E+00	0.00E+00	3.30E+00	8	4.50E-01	5.63E-02	5.86E+01	9.00E-01	1.13E-01	2.93E+01
Nickel	0.00E+00	mg/L	0.00E+00	mg/kg	5.01E+01	mg/kg	NA	NA	7.80E+00	4.04E-02	9.66E-02	9.66E-02	0.00E+00	0.00E+00	6.31E-01	NA	NA	4.68E+01	3.95E-01	0.00E+00	0.00E+00	4.78E+01	8	7.74E+01	9.68E+00	4.94E+00	1.07E+02	1.34E+01	3.57E+00
Selenium	0.00E+00	mg/L	0.00E+00	mg/kg	7.40E+00	mg/kg	NA	NA	5.44E-01	6.26E-01	1.89E-01	1.89E-01	0.00E+00	0.00E+00	9.32E-02	NA	NA	4.82E-01	9.04E-01	0.00E+00	0.00E+00	1.48E+00	8	5.00E-01	6.25E-02	2.37E+01	1.00E+00	1.25E-01	1.18E+01
Silver	0.00E+00	mg/L	0.00E+00	mg/kg	8.90E-01	mg/kg	NA	NA	2.05E+00	1.40E-02	4.00E-03	4.00E-03	0.00E+00	0.00E+00	1.12E-02	NA	NA	2.18E-01	2.43E-03	0.00E+00	0.00E+00	2.31E-01	8	1.78E+02	2.23E+01	1.04E-02	8.90E+02	1.11E+02	2.08E-03
Zinc	0.00E+00	mg/L	0.00E+00	mg/kg	9.33E+01	mg/kg	NA	NA	4.06E+00	6.39E-01	1.16E+00	1.16E+00	0.00E+00	0.00E+00	1.18E+00	NA	NA	4.53E+01	1.16E+01	0.00E+00	0.00E+00	5.81E+01	8	1.45E+01	1.81E+00	3.21E+01	1.31E+02	1.64E+01	3.55E+00

Hazard Index (Total EEQ): 1.1E+03 1.6E+02

Intake Equation:

$$Ej = \left(\frac{A}{HR} \left[\sum_{i=1}^{m} \left(\frac{IRi \, x \, Cij}{BW} \right) \right] \right)$$

Where:
Ej = Total Exposure to Chemical
A = Site Area
HR = Home Range
m = Total number of ingested media
i = counter
IRi = Consumption Rate for Medium
Cij = Chemical concentration (j) in medium (I) (mg/kg or mg/L)
BW = Body Weight

Notes:
Tier 1 = Max EEQ using max EPC, max BAF/BCF, max Intake Rates, min BW, and FHR =1.
Tier 2 = EEQ using 95% EPC, non-max BAF/BCF, avg Intake Rates, avg BW and calculated FHR.
BAF = Bioaccumulation Factor (may be BCF if this is the only value available)
EEQ = Ecological Effects Quotient.
L = LOAEL based; N = NOAEL based
LOAEL = Lowest Observed Adverse Effect Level
NOAEL = No Observed Adverse Effect Level
NA = Not applicable/Not available
PDE = Predicted Daily Exposure
BAF (or BCF) values from appropriate text tables (BCF = bioconcentration factor)
Some BAF (or BCF) values based on media regression equations (value in box): n See appropriate text tables for equations.
If BAF/BCF regression equation produced Tier 2 value exceeding maximum Tier 1 BAF/BCF value, Tier 1 value used a default.
LOAEL and NOAEL values from appropriate toxicity summary tables in the text.
UF = Uncertainty Factor for toxicity factor extrapolation, and Adjusted LOAEL or NOAEL = LOAEL/UF or NOAEL/UF
A "0" entry in the exposure concentration column indicates this chemical not selected as a COPEC for this medium.
Receptor diet data and home range data from appropriate text table.
Exposure point concentrations (EPCs) from appropriate text tables.

Species-Specific Factors

Plant diet fraction =	0.62	unitless
Fish diet fraction =	0	unitless
Aq. Invert diet fraction =	0	unitless
Terr. Invert diet fraction =	0.38	unitless
Mammal diet fraction =	0	unitless
Bird diet fraction =	0	unitless
Soil ingestion rate =	0.0008	kg/d
Sediment ingestion rate =	0	kg/d
Food ingestion rate =	0.02	kg/d
Body weight =	0.0635	kg
Home range =	1.2	acres
Water intake rate =	0.013	L/d
Site Area =	2.06	acres
Frac. home range (FHR) =	1.00E+00	unitless

TABLE F-7
TIER 2 CHEMICALS OF POTENTIAL ECOLOGICAL CONCERN EEQs AND HAZARD INDICES FOR AMERICAN ROBINS AT SWMU 50

Hazard Estimate - Tier 2
American Robin

Chemical	Surface Water Exposure Point Concentration	Units	Sediment Exposure Point Concentration	Units	Soil Exposure Point Concentration	Units	Fish BAF	Aq. Invert. BAF	Terr. Invert. BAF	Plant BAF	Mammal BAF	Bird BAF	PDE Surface Water	PDE Sediment	PDE Soil	PDE Fish	PDE Aq. Invert.	PDE Terr. Invert.	PDE Plants	PDE Mammals	PDE Birds	Total PDE	Chemical-Specific Toxicity Value UF	NOAEL	Adjusted NOAEL	EEQ N	LOAEL	Adjusted LOAEL	EEQ L
							---------- unitless ----------						mg/kg-d	mg/kg-d	mg/kg-d	mg/kg-d	mg/kg-d	mg/kg-d	mg/kg-d	mg/kg-d	mg/kg-d	mg/kg-d		mg/kg-d	mg/kg-d		mg/kg-d	mg/kg-d	
2,3,7,8-TCDD-TE	0.00E+00	mg/L	0.00E+00	mg/kg	6.68E-05	mg/kg	NA	NA	6.05E+00	3.87E-03	2.20E+00	2.20E+00	0.00E+00	0.00E+00	5.53E-07	NA	NA	3.18E-05	3.32E-08	0.00E+00	0.00E+00	3.24E-05	8	1.40E-05	1.75E-06	1.85E+01	1.40E-04	1.75E-05	1.85E+00
1,2-Dichlorobenzene	0.00E+00	mg/L	0.00E+00	mg/kg	1.10E-02	mg/kg	NA	NA	6.10E+00	4.92E-01	5.00E-01	5.00E-01	0.00E+00	0.00E+00	9.11E-05	NA	NA	5.28E-03	6.95E-04	0.00E+00	0.00E+00	6.07E-03	8	1.61E+01	2.01E+00	3.01E-03	8.04E+01	1.01E+01	6.04E-04
1,3-Dichlorobenzene	0.00E+00	mg/L	0.00E+00	mg/kg	8.60E-03	mg/kg	NA	NA	6.23E+00	4.92E-01	5.00E-01	5.00E-01	0.00E+00	0.00E+00	7.12E-05	NA	NA	4.21E-03	5.43E-04	0.00E+00	0.00E+00	4.83E-03	8	1.61E+01	2.01E+00	2.40E-03	8.04E+01	1.01E+01	4.80E-04
1,4-Dichlorobenzene	0.00E+00	mg/L	0.00E+00	mg/kg	1.10E-02	mg/kg	NA	NA	6.23E+00	4.92E-01	5.00E-01	5.00E-01	0.00E+00	0.00E+00	9.11E-05	NA	NA	5.39E-03	6.95E-04	0.00E+00	0.00E+00	6.18E-03	8	1.61E+01	2.01E+00	3.07E-03	8.04E+01	1.01E+01	6.15E-04
2,4-Dinitrotoluene	0.00E+00	mg/L	0.00E+00	mg/kg	4.44E-01	mg/kg	NA	NA	8.20E-01	2.13E+00	5.00E-01	5.00E-01	0.00E+00	0.00E+00	3.68E-03	NA	NA	2.86E-02	1.21E-01	0.00E+00	0.00E+00	1.54E-01	8	NA	NA	NA	NA	NA	NA
4,4'-DDD	0.00E+00	mg/L	0.00E+00	mg/kg	4.47E-04	mg/kg	NA	NA	3.29E+01	1.57E-02	5.00E-01	5.00E-01	0.00E+00	0.00E+00	3.70E-06	NA	NA	1.16E-03	8.99E-07	0.00E+00	0.00E+00	1.16E-03	8	2.80E-03	3.50E-04	3.32E+00	2.80E-02	3.50E-03	3.32E-01
4,4'-DDE	0.00E+00	mg/L	0.00E+00	mg/kg	3.37E-03	mg/kg	NA	NA	2.35E+01	1.32E-02	1.23E+01	1.23E+01	0.00E+00	0.00E+00	2.79E-05	NA	NA	6.24E-03	5.70E-06	0.00E+00	0.00E+00	6.27E-03	8	2.80E-03	3.50E-04	1.79E+01	2.80E-02	3.50E-03	1.79E+00
4,4'-DDT	0.00E+00	mg/L	0.00E+00	mg/kg	6.36E-03	mg/kg	NA	NA	1.62E+01	4.61E-03	1.51E+00	1.51E+00	0.00E+00	0.00E+00	5.26E-05	NA	NA	8.12E-03	3.76E-06	0.00E+00	0.00E+00	8.18E-03	8	2.80E-03	3.50E-04	2.34E+01	2.80E-02	3.50E-03	2.34E+00
Acenaphthene	0.00E+00	mg/L	0.00E+00	mg/kg	1.60E-02	mg/kg	NA	NA	1.47E+00	8.26E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.32E-04	NA	NA	1.85E-03	1.70E-02	0.00E+00	0.00E+00	1.89E-02	8	5.53E+02	6.91E+01	2.74E-04	2.77E+03	3.46E+02	5.48E-05
Acenaphthylene	0.00E+00	mg/L	0.00E+00	mg/kg	1.61E-02	mg/kg	NA	NA	2.29E+01	7.55E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.33E-04	NA	NA	2.90E-02	1.56E-03	0.00E+00	0.00E+00	3.07E-02	8	5.53E+02	6.91E+01	4.44E-04	2.77E+03	3.46E+02	8.88E-05
Anthracene	0.00E+00	mg/L	0.00E+00	mg/kg	1.10E-02	mg/kg	NA	NA	2.42E+00	1.01E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.11E-05	NA	NA	2.09E-03	1.43E-03	0.00E+00	0.00E+00	3.61E-03	8	5.53E+02	6.91E+01	5.22E-05	2.77E+03	3.46E+02	1.04E-05
Aroclor 1254	0.00E+00	mg/L	0.00E+00	mg/kg	3.76E-01	mg/kg	NA	NA	4.51E+00	3.58E-03	5.00E-01	5.00E-01	0.00E+00	0.00E+00	3.11E-03	NA	NA	1.33E-01	1.73E-04	0.00E+00	0.00E+00	1.37E-01	8	1.80E-01	2.25E-02	6.07E+00	1.80E+00	2.25E-01	6.07E-01
Benzo(a)anthracene	0.00E+00	mg/L	0.00E+00	mg/kg	5.31E-02	mg/kg	NA	NA	1.59E+00	2.19E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.40E-04	NA	NA	6.64E-03	1.49E-03	0.00E+00	0.00E+00	8.58E-03	8	5.53E+02	6.91E+01	1.24E-04	2.77E+03	3.46E+02	2.48E-05
Benzo(a)pyrene	0.00E+00	mg/L	0.00E+00	mg/kg	5.27E-02	mg/kg	NA	NA	1.33E+00	1.37E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.36E-04	NA	NA	5.51E-03	9.26E-04	0.00E+00	0.00E+00	6.88E-03	8	5.53E+02	6.91E+01	9.95E-05	2.77E+03	3.46E+02	1.99E-05
Benzo(b)fluoranthene	0.00E+00	mg/L	0.00E+00	mg/kg	5.46E-02	mg/kg	NA	NA	2.60E+00	3.10E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.52E-04	NA	NA	1.12E-02	2.17E-03	0.00E+00	0.00E+00	1.38E-02	8	5.53E+02	6.91E+01	1.99E-04	2.77E+03	3.46E+02	3.99E-05
Benzo(g,h,i)perylene	0.00E+00	mg/L	0.00E+00	mg/kg	2.89E-02	mg/kg	NA	NA	2.94E+00	2.06E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.39E-04	NA	NA	6.68E-03	7.64E-04	0.00E+00	0.00E+00	7.69E-03	8	5.53E+02	6.91E+01	1.11E-04	2.77E+03	3.46E+02	2.22E-05
Benzo(k)fluoranthene	0.00E+00	mg/L	0.00E+00	mg/kg	3.23E-02	mg/kg	NA	NA	2.60E+00	1.87E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.67E-04	NA	NA	6.61E-03	7.76E-04	0.00E+00	0.00E+00	7.65E-03	8	5.53E+02	6.91E+01	1.11E-04	2.77E+03	3.46E+02	2.21E-05
Chrysene	0.00E+00	mg/L	0.00E+00	mg/kg	5.30E-02	mg/kg	NA	NA	2.29E+00	2.20E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.39E-04	NA	NA	9.55E-03	1.49E-03	0.00E+00	0.00E+00	1.15E-02	8	5.53E+02	6.91E+01	1.66E-04	2.77E+03	3.46E+02	3.32E-05
Dibenz(a,h)anthracene	0.00E+00	mg/L	0.00E+00	mg/kg	1.06E-02	mg/kg	NA	NA	2.31E+00	1.30E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.78E-05	NA	NA	1.93E-03	1.77E-04	0.00E+00	0.00E+00	2.19E-03	8	5.53E+02	6.91E+01	3.17E-05	2.77E+03	3.46E+02	6.34E-06
Endosulfan II	0.00E+00	mg/L	0.00E+00	mg/kg	2.24E-03	mg/kg	NA	NA	1.91E-01	3.67E-01	5.00E-01	5.00E-01	0.00E+00	0.00E+00	1.85E-05	NA	NA	3.36E-05	1.06E-04	0.00E+00	0.00E+00	1.58E-04	8	1.00E+01	1.25E+00	1.26E-04	5.00E+01	6.25E+00	2.52E-05
Endrin	0.00E+00	mg/L	0.00E+00	mg/kg	2.88E-04	mg/kg	NA	NA	1.97E+01	2.74E-02	5.00E-01	5.00E-01	0.00E+00	0.00E+00	2.38E-06	NA	NA	4.46E-04	1.01E-06	0.00E+00	0.00E+00	4.50E-04	8	3.00E-01	3.75E-02	1.20E-02	1.50E+00	1.88E-01	2.40E-03
Fluoranthene	0.00E+00	mg/L	0.00E+00	mg/kg	6.23E-02	mg/kg	NA	NA	3.04E+00	5.00E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.16E-04	NA	NA	1.49E-02	4.00E-03	0.00E+00	0.00E+00	1.94E-02	8	5.53E+02	6.91E+01	2.81E-04	2.77E+03	3.46E+02	5.62E-05
Fluorene	0.00E+00	mg/L	0.00E+00	mg/kg	1.38E-02	mg/kg	NA	NA	9.57E+00	1.09E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.14E-04	NA	NA	1.04E-02	1.92E-02	0.00E+00	0.00E+00	2.97E-02	8	5.53E+02	6.91E+01	4.30E-04	2.77E+03	3.46E+02	8.61E-05
Indeno(1,2,3-cd)pyrene	0.00E+00	mg/L	0.00E+00	mg/kg	3.46E-02	mg/kg	NA	NA	2.86E+00	1.10E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.86E-04	NA	NA	7.78E-03	4.88E-04	0.00E+00	0.00E+00	8.56E-03	8	5.53E+02	6.91E+01	1.24E-04	2.77E+03	3.46E+02	2.48E-05
Methoxychlor	0.00E+00	mg/L	0.00E+00	mg/kg	1.29E-03	mg/kg	NA	NA	7.64E+00	2.05E-02	5.00E-01	5.00E-01	0.00E+00	0.00E+00	1.07E-05	NA	NA	7.75E-04	3.39E-06	0.00E+00	0.00E+00	7.89E-04	8	2.58E+01	3.22E+00	2.45E-04	1.29E+02	1.61E+01	4.90E-05
Naphthalene	0.00E+00	mg/L	0.00E+00	mg/kg	2.70E-01	mg/kg	NA	NA	4.40E+00	1.22E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.24E-03	NA	NA	9.34E-02	4.23E-01	0.00E+00	0.00E+00	5.18E-01	8	5.53E+02	6.91E+01	7.50E-03	2.77E+03	3.46E+02	1.50E-03
Phenanthrene	0.00E+00	mg/L	0.00E+00	mg/kg	1.95E-01	mg/kg	NA	NA	1.72E+00	1.57E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.61E-03	NA	NA	2.64E-02	3.94E-02	0.00E+00	0.00E+00	6.74E-02	8	5.53E+02	6.91E+01	9.75E-04	2.77E+03	3.46E+02	1.95E-04
Pyrene	0.00E+00	mg/L	0.00E+00	mg/kg	7.21E-02	mg/kg	NA	NA	1.75E+00	7.20E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.97E-04	NA	NA	9.92E-03	6.66E-03	0.00E+00	0.00E+00	1.72E-02	8	5.53E+02	6.91E+01	2.49E-04	2.77E+03	3.46E+02	4.97E-05
Arsenic	0.00E+00	mg/L	0.00E+00	mg/kg	4.90E+00	mg/kg	NA	NA	1.51E-01	3.75E-02	5.89E-03	5.89E-03	0.00E+00	0.00E+00	4.06E-02	NA	NA	5.84E-02	2.36E-02	0.00E+00	0.00E+00	1.23E-01	8	5.14E+00	6.43E-01	1.91E-01	1.28E+01	1.61E+00	7.64E-02
Cadmium	0.00E+00	mg/L	0.00E+00	mg/kg	1.43E-01	mg/kg	NA	NA	1.23E+01	1.50E+00	7.94E-01	7.94E-01	0.00E+00	0.00E+00	1.18E-03	NA	NA	1.39E-01	2.76E-02	0.00E+00	0.00E+00	1.68E-01	8	1.45E+00	1.81E-01	9.24E-01	2.00E+01	2.50E+00	6.70E-02
Chromium	0.00E+00	mg/L	0.00E+00	mg/kg	4.44E+01	mg/kg	NA	NA	3.06E-01	4.10E-02	8.46E-02	8.46E-02	0.00E+00	0.00E+00	3.67E-01	NA	NA	1.07E+00	2.33E-01	0.00E+00	0.00E+00	1.67E+00	8	2.66E+00	3.33E-01	5.02E+00	2.78E+00	3.48E-01	4.80E+00
Copper	0.00E+00	mg/L	0.00E+00	mg/kg	2.44E+01	mg/kg	NA	NA	5.15E-01	2.82E-01	5.01E-01	5.01E-01	0.00E+00	0.00E+00	2.02E-01	NA	NA	9.86E-01	8.80E-01	0.00E+00	0.00E+00	2.07E+00	8	4.70E+01	5.88E+00	3.52E-01	6.20E+01	7.75E+00	2.67E-01
Lead	0.00E+00	mg/L	0.00E+00	mg/kg	1.09E+02	mg/kg	NA	NA	3.25E-01	3.39E-02	7.90E-02	7.90E-02	0.00E+00	0.00E+00	8.98E-01	NA	NA	2.78E+00	4.71E-01	0.00E+00	0.00E+00	4.15E+00	8	3.85E+00	4.81E-01	8.62E+00	1.93E+01	2.41E+00	1.72E+00
Mercury	0.00E+00	mg/L	0.00E+00	mg/kg	3.78E-01	mg/kg	NA	NA	2.07E+00	5.76E-01	1.92E-01	1.92E-01	0.00E+00	0.00E+00	3.13E-03	NA	NA	6.17E-02	2.79E-02	0.00E+00	0.00E+00	9.27E-02	8	4.50E-01	5.63E-02	1.65E+00	9.00E-01	1.13E-01	8.24E-01
Nickel	0.00E+00	mg/L	0.00E+00	mg/kg	1.81E+01	mg/kg	NA	NA	7.20E-01	5.22E-02	1.66E-01	1.66E-01	0.00E+00	0.00E+00	1.50E-01	NA	NA	1.03E+00	1.21E-01	0.00E+00	0.00E+00	1.30E+00	8	7.74E+01	9.68E+00	1.34E-01	1.07E+02	1.34E+01	9.70E-02
Selenium	0.00E+00	mg/L	0.00E+00	mg/kg	6.25E+00	mg/kg	NA	NA	5.69E-01	6.15E-01	2.11E-01	2.11E-01	0.00E+00	0.00E+00	5.17E-02	NA	NA	2.79E-01	4.93E-01	0.00E+00	0.00E+00	8.24E-01	8	5.00E-01	6.25E-02	1.32E+01	1.00E+00	1.25E-01	6.59E+00
Silver	0.00E+00	mg/L	0.00E+00	mg/kg	6.57E-01	mg/kg	NA	NA	2.05E+00	1.40E-02	4.00E-03	4.00E-03	0.00E+00	0.00E+00	5.44E-03	NA	NA	1.06E-01	1.18E-03	0.00E+00	0.00E+00	1.12E-01	8	1.78E+02	2.23E+01	5.05E-03	8.90E+02	1.11E+02	1.01E-03
Zinc	0.00E+00	mg/L	0.00E+00	mg/kg	6.03E+01	mg/kg	NA	NA	5.45E+00	7.77E-01	1.74E+00	1.74E+00	0.00E+00	0.00E+00	4.99E-01	NA	NA	2.58E+01	6.00E+00	0.00E+00	0.00E+00	3.23E+01	8	1.45E+01	1.81E+00	1.78E+01	1.31E+02	1.64E+01	1.97E+00

Hazard Index (Total EEQ): 1.2E+02 2.3E+01

Intake Equation:

$$Ej = \left(\frac{A}{HR} \left[\sum_{i=1}^{m} \left(\frac{IRi \, x \, Cij}{BW} \right) \right] \right)$$

Where:
Ej = Total Exposure to Chemical
A = Site Area
HR = Home Range
m = Total number of ingested media
i = counter
IRi = Consumption Rate for Medium
Cij = Chemical concentration (j) in medium (I) (mg/kg or mg/L)
BW = Body Weight

Notes:
Tier 1 = Max EEQ using max EPC, max BAF/BCF, max Intake Rates, min BW, and FHR =1.
Tier 2 = EEQ using 95% EPC, non-max BAF/BCF, avg Intake Rates, avg BW and calculated FHR.
BAF = Bioaccumulation Factor (may be BCF if this is the only value available)
EEQ = Ecological Effects Quotient.
L = LOAEL based; N = NOAEL based
LOAEL = Lowest Observed Adverse Effect Level
NOAEL = No Observed Adverse Effect Level
NA = Not applicable/Not available
PDE = Predicted Daily Exposure
BAF (or BCF) values from appropriate text tables (BCF = bioconcentration factor)
Some BAF (or BCF) values based on media regression equations (value in box): n See appropriate text tables for equations.
If BAF/BCF regression equation produced Tier 2 value exceeding maximum Tier 1 BAF/BCF value, Tier 1 value used as default.
LOAEL and NOAEL values from appropriate toxicity summary tables in the text.
UF = Uncertainty Factor for toxicity factor extrapolation, and Adjusted LOAEL or NOAEL = LOAEL/UF or NOAEL/UF
A "0" entry in the exposure concentration column indicates this chemical not selected as a COPEC for this medium.
Receptor diet data and home range data from appropriate text table.
Exposure point concentrations (EPCs) from appropriate text tables.

Species-Specific Factors

Plant diet fraction =	0.62	unitless
Fish diet fraction =	0	unitless
Aq. Invert diet fraction =	0	unitless
Terr. Invert diet fraction =	0.38	unitless
Mammal diet fraction =	0	unitless
Bird diet fraction =	0	unitless
Soil ingestion rate =	0.00064	kg/d
Sediment ingestion rate =	0	kg/d
Food ingestion rate =	0.016	kg/d
Body weight =	0.0773	kg
Home range =	1.2	acres
Water intake rate =	0.011	L/d
Site Area =	2.06	acres
Frac. home range (FHR) =	1.00E+00	unitless

TABLE F-8
TIER 1 CHEMICALS OF POTENTIAL CONCERN EEQs AND HAZARD INDICES FOR RED-TAILED HAWKS AT SWMU 50

Hazard Estimate - Tier 1
Red-tailed Hawk

Chemical	Surface Water Exposure Point Concentration	Units	Sediment Exposure Point Concentration	Units	Soil Exposure Point Concentration	Units	Fish BAF	Aq. Invert. BAF	Terr. Invert. BAF	Plant BAF	Mammal BAF	Bird BAF	PDE Surface Water	PDE Sediment	PDE Soil	PDE Fish	PDE Aq. Invert.	PDE Terr. Invert.	PDE Plants	PDE Mammals	PDE Birds	Total PDE	Chemical-Specific Toxicity Value UF	NOAEL	Adjusted NOAEL	EEQ N	LOAEL	Adjusted LOAEL	EEQ L
							---------- unitless ----------						mg/kg-d	mg/kg-d	mg/kg-d	mg/kg-d	mg/kg-d	mg/kg-d	mg/kg-d	mg/kg-d	mg/kg-d	mg/kg-d		mg/kg-d	mg/kg-d		mg/kg-d	mg/kg-d	
2,3,7,8-TCDD-TE	0.00E+00	mg/L	0.00E+00	mg/kg	9.80E-05	mg/kg	NA	NA	4.21E+01	3.87E-03	2.20E+00	2.20E+00	0.00E+00	0.00E+00	0.00E+00	NA	NA	0.00E+00	0.00E+00	1.08E-05	3.41E-06	1.42E-05	8	1.40E-05	1.75E-06	8.11E+00	1.40E-04	1.75E-05	8.11E-01
1,2-Dichlorobenzene	0.00E+00	mg/L	0.00E+00	mg/kg	1.10E-02	mg/kg	NA	NA	6.18E+00	4.92E-01	1.00E+00	1.00E+00	0.00E+00	0.00E+00	0.00E+00	NA	NA	0.00E+00	0.00E+00	5.50E-04	1.74E-04	7.24E-04	8	1.61E+01	2.01E+00	3.60E-04	8.04E+01	1.01E+01	7.21E-05
1,3-Dichlorobenzene	0.00E+00	mg/L	0.00E+00	mg/kg	8.60E-03	mg/kg	NA	NA	6.31E+00	4.92E-01	1.00E+00	1.00E+00	0.00E+00	0.00E+00	0.00E+00	NA	NA	0.00E+00	0.00E+00	4.30E-04	1.36E-04	5.66E-04	8	1.61E+01	2.01E+00	2.81E-04	8.04E+01	1.01E+01	5.63E-05
1,4-Dichlorobenzene	0.00E+00	mg/L	0.00E+00	mg/kg	1.10E-02	mg/kg	NA	NA	6.31E+00	4.92E-01	1.00E+00	1.00E+00	0.00E+00	0.00E+00	0.00E+00	NA	NA	0.00E+00	0.00E+00	5.50E-04	1.74E-04	7.24E-04	8	1.61E+01	2.01E+00	3.60E-04	8.04E+01	1.01E+01	7.21E-05
2,4-Dinitrotoluene	0.00E+00	mg/L	0.00E+00	mg/kg	8.88E-01	mg/kg	NA	NA	8.30E-01	2.13E+00	1.00E+00	1.00E+00	0.00E+00	0.00E+00	0.00E+00	NA	NA	0.00E+00	0.00E+00	4.44E-02	1.40E-02	5.85E-02	8	NA	NA	NA	NA	NA	NA
4,4'-DDD	0.00E+00	mg/L	0.00E+00	mg/kg	4.47E-04	mg/kg	NA	NA	3.29E+01	1.57E-02	1.00E+00	1.00E+00	0.00E+00	0.00E+00	0.00E+00	NA	NA	0.00E+00	0.00E+00	2.24E-05	7.06E-06	2.94E-05	8	2.80E-03	3.50E-04	8.41E-02	2.80E-02	3.50E-03	8.41E-03
4,4'-DDE	0.00E+00	mg/L	0.00E+00	mg/kg	3.37E-03	mg/kg	NA	NA	2.35E+01	1.32E-02	1.23E+01	1.23E+01	0.00E+00	0.00E+00	0.00E+00	NA	NA	0.00E+00	0.00E+00	2.07E-03	6.53E-04	2.72E-03	8	2.80E-03	3.50E-04	7.77E+00	2.80E-02	3.50E-03	7.77E-01
4,4'-DDT	0.00E+00	mg/L	0.00E+00	mg/kg	1.29E-02	mg/kg	NA	NA	1.48E+01	4.61E-03	1.55E+00	1.55E+00	0.00E+00	0.00E+00	0.00E+00	NA	NA	0.00E+00	0.00E+00	1.00E-03	3.16E-04	1.32E-03	8	2.80E-03	3.50E-04	3.76E+00	2.80E-02	3.50E-03	3.76E-01
Acenaphthene	0.00E+00	mg/L	0.00E+00	mg/kg	1.60E-02	mg/kg	NA	NA	1.47E+00	8.26E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	NA	NA	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8	5.53E+02	6.91E+01	0.00E+00	2.77E+03	3.46E+02	0.00E+00
Acenaphthylene	0.00E+00	mg/L	0.00E+00	mg/kg	2.00E-02	mg/kg	NA	NA	2.29E+01	7.22E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	NA	NA	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8	5.53E+02	6.91E+01	0.00E+00	2.77E+03	3.46E+02	0.00E+00
Anthracene	0.00E+00	mg/L	0.00E+00	mg/kg	1.10E-02	mg/kg	NA	NA	2.42E+00	1.01E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	NA	NA	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8	5.53E+02	6.91E+01	0.00E+00	2.77E+03	3.46E+02	0.00E+00
Aroclor 1254	0.00E+00	mg/L	0.00E+00	mg/kg	1.48E+00	mg/kg	NA	NA	6.52E+01	3.58E-03	1.00E+00	1.00E+00	0.00E+00	0.00E+00	0.00E+00	NA	NA	0.00E+00	0.00E+00	7.40E-02	2.34E-02	9.74E-02	8	1.80E-01	2.25E-02	4.33E+00	1.80E+00	2.25E-01	4.33E-01
Benzo(a)anthracene	0.00E+00	mg/L	0.00E+00	mg/kg	1.37E-01	mg/kg	NA	NA	1.59E+00	1.49E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	NA	NA	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8	5.53E+02	6.91E+01	0.00E+00	2.77E+03	3.46E+02	0.00E+00
Benzo(a)pyrene	0.00E+00	mg/L	0.00E+00	mg/kg	1.50E-01	mg/kg	NA	NA	1.33E+00	1.33E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	NA	NA	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8	5.53E+02	6.91E+01	0.00E+00	2.77E+03	3.46E+02	0.00E+00
Benzo(b)fluoranthene	0.00E+00	mg/L	0.00E+00	mg/kg	1.52E-01	mg/kg	NA	NA	2.60E+00	3.10E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	NA	NA	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8	5.53E+02	6.91E+01	0.00E+00	2.77E+03	3.46E+02	0.00E+00
Benzo(g,h,i)perylene	0.00E+00	mg/L	0.00E+00	mg/kg	5.90E-02	mg/kg	NA	NA	2.94E+00	2.35E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	NA	NA	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8	5.53E+02	6.91E+01	0.00E+00	2.77E+03	3.46E+02	0.00E+00
Benzo(k)fluoranthene	0.00E+00	mg/L	0.00E+00	mg/kg	9.89E-02	mg/kg	NA	NA	2.60E+00	1.60E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	NA	NA	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8	5.53E+02	6.91E+01	0.00E+00	2.77E+03	3.46E+02	0.00E+00
Chrysene	0.00E+00	mg/L	0.00E+00	mg/kg	1.19E-01	mg/kg	NA	NA	2.29E+00	1.58E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	NA	NA	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8	5.53E+02	6.91E+01	0.00E+00	2.77E+03	3.46E+02	0.00E+00
Dibenz(a,h)anthracene	0.00E+00	mg/L	0.00E+00	mg/kg	1.40E-02	mg/kg	NA	NA	2.31E+00	1.30E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	NA	NA	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8	5.53E+02	6.91E+01	0.00E+00	2.77E+03	3.46E+02	0.00E+00
Endosulfan II	0.00E+00	mg/L	0.00E+00	mg/kg	2.24E-03	mg/kg	NA	NA	1.93E-01	3.67E-01	1.00E+00	1.00E+00	0.00E+00	0.00E+00	0.00E+00	NA	NA	0.00E+00	0.00E+00	1.12E-04	3.54E-05	1.47E-04	8	1.00E+01	1.25E+00	1.18E-04	5.00E+01	6.25E+00	2.36E-05
Endrin	0.00E+00	mg/L	0.00E+00	mg/kg	2.88E-04	mg/kg	NA	NA	1.99E+01	2.74E-02	1.00E+00	1.00E+00	0.00E+00	0.00E+00	0.00E+00	NA	NA	0.00E+00	0.00E+00	1.44E-05	4.55E-06	1.90E-05	8	3.00E-01	3.75E-02	5.06E-04	1.50E+00	1.88E-01	1.01E-04
Fluoranthene	0.00E+00	mg/L	0.00E+00	mg/kg	7.30E-02	mg/kg	NA	NA	3.04E+00	5.00E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	NA	NA	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8	5.53E+02	6.91E+01	0.00E+00	2.77E+03	3.46E+02	0.00E+00
Fluorene	0.00E+00	mg/L	0.00E+00	mg/kg	1.80E-02	mg/kg	NA	NA	9.57E+00	6.64E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	NA	NA	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8	5.53E+02	6.91E+01	0.00E+00	2.77E+03	3.46E+02	0.00E+00
Indeno(1,2,3-cd)pyrene	0.00E+00	mg/L	0.00E+00	mg/kg	8.41E-02	mg/kg	NA	NA	2.86E+00	1.10E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	NA	NA	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8	5.53E+02	6.91E+01	0.00E+00	2.77E+03	3.46E+02	0.00E+00
Methoxychlor	0.00E+00	mg/L	0.00E+00	mg/kg	1.29E-03	mg/kg	NA	NA	7.73E+00	2.05E-02	1.00E+00	1.00E+00	0.00E+00	0.00E+00	0.00E+00	NA	NA	0.00E+00	0.00E+00	6.45E-05	2.04E-05	8.49E-05	8	2.58E+01	3.22E+00	2.64E-05	1.29E+02	1.61E+01	5.27E-06
Naphthalene	0.00E+00	mg/L	0.00E+00	mg/kg	2.70E-01	mg/kg	NA	NA	4.40E+00	1.22E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	NA	NA	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8	5.53E+02	6.91E+01	0.00E+00	2.77E+03	3.46E+02	0.00E+00
Phenanthrene	0.00E+00	mg/L	0.00E+00	mg/kg	2.60E-01	mg/kg	NA	NA	1.72E+00	1.41E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	NA	NA	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8	5.53E+02	6.91E+01	0.00E+00	2.77E+03	3.46E+02	0.00E+00
Pyrene	0.00E+00	mg/L	0.00E+00	mg/kg	8.50E-02	mg/kg	NA	NA	1.75E+00	7.20E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	NA	NA	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8	5.53E+02	6.91E+01	0.00E+00	2.77E+03	3.46E+02	0.00E+00
Arsenic	0.00E+00	mg/L	0.00E+00	mg/kg	7.40E+00	mg/kg	NA	NA	1.34E-01	3.75E-02	5.46E-03	5.46E-03	0.00E+00	0.00E+00	0.00E+00	NA	NA	0.00E+00	0.00E+00	2.02E-03	6.39E-04	2.66E-03	8	5.14E+00	6.43E-01	4.14E-03	1.28E+01	1.61E+00	1.66E-03
Cadmium	0.00E+00	mg/L	0.00E+00	mg/kg	1.43E-01	mg/kg	NA	NA	1.23E+01	1.50E+00	7.94E-01	7.94E-01	0.00E+00	0.00E+00	0.00E+00	NA	NA	0.00E+00	0.00E+00	5.68E-03	1.79E-03	7.47E-03	8	1.45E+00	1.81E-01	4.12E-02	2.00E+01	2.50E+00	2.99E-03
Chromium	0.00E+00	mg/L	0.00E+00	mg/kg	1.16E+02	mg/kg	NA	NA	3.06E-01	4.10E-02	6.55E-02	6.55E-02	0.00E+00	0.00E+00	0.00E+00	NA	NA	0.00E+00	0.00E+00	3.80E-01	1.20E-01	5.00E-01	8	2.66E+00	3.33E-01	1.50E+00	2.78E+00	3.48E-01	1.44E+00
Copper	0.00E+00	mg/L	0.00E+00	mg/kg	5.64E+01	mg/kg	NA	NA	5.15E-01	1.69E-01	2.44E-01	2.44E-01	0.00E+00	0.00E+00	0.00E+00	NA	NA	0.00E+00	0.00E+00	6.89E-01	2.18E-01	9.07E-01	8	4.70E+01	5.88E+00	1.54E-01	6.20E+01	7.75E+00	1.17E-01
Lead	0.00E+00	mg/L	0.00E+00	mg/kg	1.78E+02	mg/kg	NA	NA	2.96E-01	2.72E-02	5.99E-02	5.99E-02	0.00E+00	0.00E+00	0.00E+00	NA	NA	0.00E+00	0.00E+00	5.34E-01	1.69E-01	7.02E-01	8	3.85E+00	4.81E-01	1.46E+00	1.93E+01	2.41E+00	2.92E-01
Mercury	0.00E+00	mg/L	0.00E+00	mg/kg	8.16E-01	mg/kg	NA	NA	3.30E+01	4.04E-01	1.05E+00	1.05E+00	0.00E+00	0.00E+00	0.00E+00	NA	NA	0.00E+00	0.00E+00	4.27E-02	1.35E-02	5.62E-02	8	4.50E-01	5.63E-02	9.99E-01	9.00E-01	1.13E-01	4.99E-01
Nickel	0.00E+00	mg/L	0.00E+00	mg/kg	5.01E+01	mg/kg	NA	NA	7.80E+00	4.04E-02	9.66E-02	9.66E-02	0.00E+00	0.00E+00	0.00E+00	NA	NA	0.00E+00	0.00E+00	2.42E-01	7.65E-02	3.19E-01	8	7.74E+01	9.68E+00	3.29E-02	1.07E+02	1.34E+01	2.38E-02
Selenium	0.00E+00	mg/L	0.00E+00	mg/kg	7.40E+00	mg/kg	NA	NA	5.44E-01	6.26E-01	1.89E-01	1.89E-01	0.00E+00	0.00E+00	0.00E+00	NA	NA	0.00E+00	0.00E+00	7.01E-02	2.21E-02	9.23E-02	8	5.00E-01	6.25E-02	1.48E+00	1.00E+00	1.25E-01	7.38E-01
Silver	0.00E+00	mg/L	0.00E+00	mg/kg	8.90E-01	mg/kg	NA	NA	2.05E+00	1.40E-02	4.00E-03	4.00E-03	0.00E+00	0.00E+00	0.00E+00	NA	NA	0.00E+00	0.00E+00	1.78E-04	5.62E-05	2.34E-04	8	1.78E+02	2.23E+01	1.05E-05	8.90E+02	1.11E+02	2.11E-06
Zinc	0.00E+00	mg/L	0.00E+00	mg/kg	9.33E+01	mg/kg	NA	NA	4.06E+00	6.39E-01	1.16E+00	1.16E+00	0.00E+00	0.00E+00	0.00E+00	NA	NA	0.00E+00	0.00E+00	5.41E+00	1.71E+00	7.12E+00	8	1.45E+01	1.81E+00	3.93E+00	1.31E+02	1.64E+01	4.35E-01

Hazard Index (Total EEQ): 3.4E+01 6.0E+00

Intake Equation:

$$Ej = \left(\frac{A}{HR} \left[\sum_{i=1}^{m} \left(\frac{IRi \, x \, Cij}{BW} \right) \right] \right)$$

Where:
Ej = Total Exposure to Chemical
A = Site Area
HR = Home Range
m = Total number of ingested media
i = counter
IRi = Consumption Rate for Medium
Cij = Chemical concentration (j) in medium (I) (mg/kg or mg/L)
BW = Body Weight

Notes:
Tier 1 = Max EEQ using max EPC, max BAF/BCF, max Intake Rates, min BW, and FHR =1.
Tier 2 = EEQ using 95% EPC, non-max BAF/BCF, avg Intake Rates, avg BW and calculated FHR.
BAF = Bioaccumulation Factor (may be BCF if this is the only value available)
EEQ = Ecological Effects Quotient.
L = LOAEL based; N = NOAEL based
LOAEL = Lowest Observed Adverse Effect Level
NOAEL = No Observed Adverse Effect Level
NA = Not applicable/Not available
PDE = Predicted Daily Exposure
BAF (or BCF) values from appropriate text tables (BCF = bioconcentration factor)
Some BAF (or BCF) values based on media regression equations (value in box): n See appropriate text tables for equations.
If BAF/BCF regression equation produced Tier 2 value exceeding maximum Tier 1 BAF/BCF value, Tier 1 value used a default.
LOAEL and NOAEL values from appropriate toxicity summary tables in the text.
UF = Uncertainty Factor for toxicity factor extrapolation, and Adjusted LOAEL or NOAEL = LOAEL/UF or NOAEL/UF
A "0" entry in the exposure concentration column indicates this chemical not selected as a COPEC for this medium.
Receptor diet data and home range data from appropriate text table.
Exposure point concentrations (EPCs) from appropriate text tables.

Species-Specific Factors

Plant diet fraction =	0	unitless
Fish diet fraction =	0	unitless
Aq. Invert diet fraction =	0	unitless
Terr. Invert diet fraction =	0	unitless
Mammal diet fraction =	0.76	unitless
Bird diet fraction =	0.24	unitless
Soil ingestion rate =	0	kg/d
Sediment ingestion rate =	0	kg/d
Food ingestion rate =	0.063	kg/d
Body weight =	0.957	kg
Home range =	2081	acres
Water intake rate =	0.068	L/d
Site Area =	2.06	acres
Frac. home range (FHR) =	1.00E+00	unitless

TABLE F-9
TIER 2 CHEMICALS OF POTENTIAL ECOLOGICAL CONCERN EEQs AND HAZARD INDICES FOR RED -TAILED HAWKS AT SWMU 50

Hazard Estimate - Tier 2
Red-tailed Hawk

Chemical	Surface Water Exposure Point Concentration	Units	Sediment Exposure Point Concentration	Units	Soil Exposure Point Concentration	Units	Fish BAF	Aq. Invert. BAF	Terr. Invert. BAF	Plant BAF	Mammal BAF	Bird BAF	PDE Surface Water	PDE Sediment	PDE Soil	PDE Fish	PDE Aq. Invert.	PDE Terr. Invert.	PDE Plants	PDE Mammals	PDE Birds	Total PDE	Chemical-Specific Toxicity Value UF	NOAEL	Adjusted NOAEL	EEQ N	LOAEL	Adjusted LOAEL	EEQ L
							---------- unitless ----------						mg/kg-d	mg/kg-d	mg/kg-d	mg/kg-d	mg/kg-d	mg/kg-d	mg/kg-d	mg/kg-d	mg/kg-d	mg/kg-d		mg/kg-d	mg/kg-d		mg/kg-d	mg/kg-d	
2,3,7,8-TCDD-TE	0.00E+00	mg/L	0.00E+00	mg/kg	6.68E-05	mg/kg	NA	NA	6.05E+00	3.87E-03	2.20E+00	2.20E+00	0.00E+00	0.00E+00	0.00E+00	NA	NA	0.00E+00	0.00E+00	5.76E-09	1.82E-09	7.57E-09	8	1.40E-05	1.75E-06	4.33E-03	1.40E-04	1.75E-05	4.33E-04
1,2-Dichlorobenzene	0.00E+00	mg/L	0.00E+00	mg/kg	1.10E-02	mg/kg	NA	NA	6.10E+00	4.92E-01	5.00E-01	5.00E-01	0.00E+00	0.00E+00	0.00E+00	NA	NA	0.00E+00	0.00E+00	2.15E-07	6.80E-08	2.83E-07	8	1.61E+01	2.01E+00	1.41E-07	8.04E+01	1.01E+01	2.82E-08
1,3-Dichlorobenzene	0.00E+00	mg/L	0.00E+00	mg/kg	8.60E-03	mg/kg	NA	NA	6.23E+00	4.92E-01	5.00E-01	5.00E-01	0.00E+00	0.00E+00	0.00E+00	NA	NA	0.00E+00	0.00E+00	1.68E-07	5.32E-08	2.21E-07	8	1.61E+01	2.01E+00	1.10E-07	8.04E+01	1.01E+01	2.20E-08
1,4-Dichlorobenzene	0.00E+00	mg/L	0.00E+00	mg/kg	1.10E-02	mg/kg	NA	NA	6.23E+00	4.92E-01	5.00E-01	5.00E-01	0.00E+00	0.00E+00	0.00E+00	NA	NA	0.00E+00	0.00E+00	2.15E-07	6.80E-08	2.83E-07	8	1.61E+01	2.01E+00	1.41E-07	8.04E+01	1.01E+01	2.82E-08
2,4-Dinitrotoluene	0.00E+00	mg/L	0.00E+00	mg/kg	4.44E-01	mg/kg	NA	NA	8.20E-01	2.13E+00	5.00E-01	5.00E-01	0.00E+00	0.00E+00	0.00E+00	NA	NA	0.00E+00	0.00E+00	8.69E-06	2.74E-06	1.14E-05	8	NA	NA	NA	NA	NA	NA
4,4'-DDD	0.00E+00	mg/L	0.00E+00	mg/kg	4.47E-04	mg/kg	NA	NA	3.29E+01	1.57E-02	5.00E-01	5.00E-01	0.00E+00	0.00E+00	0.00E+00	NA	NA	0.00E+00	0.00E+00	8.75E-09	2.76E-09	1.15E-08	8	2.80E-03	3.50E-04	3.29E-05	2.80E-02	3.50E-03	3.29E-06
4,4'-DDE	0.00E+00	mg/L	0.00E+00	mg/kg	3.37E-03	mg/kg	NA	NA	2.35E+01	1.32E-02	1.23E+01	1.23E+01	0.00E+00	0.00E+00	0.00E+00	NA	NA	0.00E+00	0.00E+00	1.62E-06	5.11E-07	2.13E-06	8	2.80E-03	3.50E-04	6.08E-03	2.80E-02	3.50E-03	6.08E-04
4,4'-DDT	0.00E+00	mg/L	0.00E+00	mg/kg	6.36E-03	mg/kg	NA	NA	1.62E+01	4.61E-03	1.51E+00	1.51E+00	0.00E+00	0.00E+00	0.00E+00	NA	NA	0.00E+00	0.00E+00	3.76E-07	1.19E-07	4.95E-07	8	2.80E-03	3.50E-04	1.41E-03	2.80E-02	3.50E-03	1.41E-04
Acenaphthene	0.00E+00	mg/L	0.00E+00	mg/kg	1.60E-02	mg/kg	NA	NA	1.47E+00	8.26E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	NA	NA	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8	5.53E+02	6.91E+01	0.00E+00	2.77E+03	3.46E+02	0.00E+00
Acenaphthylene	0.00E+00	mg/L	0.00E+00	mg/kg	1.61E-02	mg/kg	NA	NA	2.29E+01	7.55E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	NA	NA	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8	5.53E+02	6.91E+01	0.00E+00	2.77E+03	3.46E+02	0.00E+00
Anthracene	0.00E+00	mg/L	0.00E+00	mg/kg	1.10E-02	mg/kg	NA	NA	2.42E+00	1.01E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	NA	NA	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8	5.53E+02	6.91E+01	0.00E+00	2.77E+03	3.46E+02	0.00E+00
Aroclor 1254	0.00E+00	mg/L	0.00E+00	mg/kg	3.76E-01	mg/kg	NA	NA	4.51E+00	3.58E-03	5.00E-01	5.00E-01	0.00E+00	0.00E+00	0.00E+00	NA	NA	0.00E+00	0.00E+00	7.36E-06	2.32E-06	9.68E-06	8	1.80E-01	2.25E-02	4.30E-04	1.80E+00	2.25E-01	4.30E-05
Benzo(a)anthracene	0.00E+00	mg/L	0.00E+00	mg/kg	5.31E-02	mg/kg	NA	NA	1.59E+00	2.19E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	NA	NA	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8	5.53E+02	6.91E+01	0.00E+00	2.77E+03	3.46E+02	0.00E+00
Benzo(a)pyrene	0.00E+00	mg/L	0.00E+00	mg/kg	5.27E-02	mg/kg	NA	NA	1.33E+00	1.37E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	NA	NA	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8	5.53E+02	6.91E+01	0.00E+00	2.77E+03	3.46E+02	0.00E+00
Benzo(b)fluoranthene	0.00E+00	mg/L	0.00E+00	mg/kg	5.46E-02	mg/kg	NA	NA	2.60E+00	3.10E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	NA	NA	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8	5.53E+02	6.91E+01	0.00E+00	2.77E+03	3.46E+02	0.00E+00
Benzo(g,h,i)perylene	0.00E+00	mg/L	0.00E+00	mg/kg	2.89E-02	mg/kg	NA	NA	2.94E+00	2.06E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	NA	NA	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8	5.53E+02	6.91E+01	0.00E+00	2.77E+03	3.46E+02	0.00E+00
Benzo(k)fluoranthene	0.00E+00	mg/L	0.00E+00	mg/kg	3.23E-02	mg/kg	NA	NA	2.60E+00	1.87E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	NA	NA	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8	5.53E+02	6.91E+01	0.00E+00	2.77E+03	3.46E+02	0.00E+00
Chrysene	0.00E+00	mg/L	0.00E+00	mg/kg	5.30E-02	mg/kg	NA	NA	2.29E+00	2.20E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	NA	NA	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8	5.53E+02	6.91E+01	0.00E+00	2.77E+03	3.46E+02	0.00E+00
Dibenz(a,h)anthracene	0.00E+00	mg/L	0.00E+00	mg/kg	1.06E-02	mg/kg	NA	NA	2.31E+00	1.30E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	NA	NA	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8	5.53E+02	6.91E+01	0.00E+00	2.77E+03	3.46E+02	0.00E+00
Endosulfan II	0.00E+00	mg/L	0.00E+00	mg/kg	2.24E-03	mg/kg	NA	NA	1.91E-01	3.67E-01	5.00E-01	5.00E-01	0.00E+00	0.00E+00	0.00E+00	NA	NA	0.00E+00	0.00E+00	4.38E-08	1.38E-08	5.77E-08	8	1.00E+01	1.25E+00	4.61E-08	5.00E+01	6.25E+00	9.23E-09
Endrin	0.00E+00	mg/L	0.00E+00	mg/kg	2.88E-04	mg/kg	NA	NA	1.97E+01	2.74E-02	5.00E-01	5.00E-01	0.00E+00	0.00E+00	0.00E+00	NA	NA	0.00E+00	0.00E+00	5.64E-09	1.78E-09	7.42E-09	8	3.00E-01	3.75E-02	1.98E-07	1.50E+00	1.88E-01	3.96E-08
Fluoranthene	0.00E+00	mg/L	0.00E+00	mg/kg	6.23E-02	mg/kg	NA	NA	3.04E+00	5.00E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	NA	NA	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8	5.53E+02	6.91E+01	0.00E+00	2.77E+03	3.46E+02	0.00E+00
Fluorene	0.00E+00	mg/L	0.00E+00	mg/kg	1.38E-02	mg/kg	NA	NA	9.57E+00	1.09E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	NA	NA	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8	5.53E+02	6.91E+01	0.00E+00	2.77E+03	3.46E+02	0.00E+00
Indeno(1,2,3-cd)pyrene	0.00E+00	mg/L	0.00E+00	mg/kg	3.46E-02	mg/kg	NA	NA	2.86E+00	1.10E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	NA	NA	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8	5.53E+02	6.91E+01	0.00E+00	2.77E+03	3.46E+02	0.00E+00
Methoxychlor	0.00E+00	mg/L	0.00E+00	mg/kg	1.29E-03	mg/kg	NA	NA	7.64E+00	2.05E-02	5.00E-01	5.00E-01	0.00E+00	0.00E+00	0.00E+00	NA	NA	0.00E+00	0.00E+00	2.52E-08	7.97E-09	3.32E-08	8	2.58E+01	3.22E+00	1.03E-08	1.29E+02	1.61E+01	2.06E-09
Naphthalene	0.00E+00	mg/L	0.00E+00	mg/kg	2.70E-01	mg/kg	NA	NA	4.40E+00	1.22E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	NA	NA	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8	5.53E+02	6.91E+01	0.00E+00	2.77E+03	3.46E+02	0.00E+00
Phenanthrene	0.00E+00	mg/L	0.00E+00	mg/kg	1.95E-01	mg/kg	NA	NA	1.72E+00	1.57E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	NA	NA	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8	5.53E+02	6.91E+01	0.00E+00	2.77E+03	3.46E+02	0.00E+00
Pyrene	0.00E+00	mg/L	0.00E+00	mg/kg	7.21E-02	mg/kg	NA	NA	1.75E+00	7.20E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	NA	NA	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8	5.53E+02	6.91E+01	0.00E+00	2.77E+03	3.46E+02	0.00E+00
Arsenic	0.00E+00	mg/L	0.00E+00	mg/kg	4.90E+00	mg/kg	NA	NA	1.51E-01	3.75E-02	5.00E-03	5.00E-03	0.00E+00	0.00E+00	0.00E+00	NA	NA	0.00E+00	0.00E+00	9.61E-07	3.03E-07	1.26E-06	8	5.14E+00	6.43E-01	1.97E-06	1.28E+01	1.61E+00	7.88E-07
Cadmium	0.00E+00	mg/L	0.00E+00	mg/kg	1.43E-01	mg/kg	NA	NA	1.23E+01	1.50E+00	7.94E-01	7.94E-01	0.00E+00	0.00E+00	0.00E+00	NA	NA	0.00E+00	0.00E+00	4.44E-06	1.40E-06	5.85E-06	8	1.45E+00	1.81E-01	3.23E-05	2.00E+01	2.50E+00	2.34E-06
Chromium	0.00E+00	mg/L	0.00E+00	mg/kg	4.44E+01	mg/kg	NA	NA	3.06E-01	4.10E-02	8.46E-02	8.46E-02	0.00E+00	0.00E+00	0.00E+00	NA	NA	0.00E+00	0.00E+00	1.47E-04	4.64E-05	1.93E-04	8	2.66E+00	3.33E-01	5.82E-04	2.78E+00	3.48E-01	5.57E-04
Copper	0.00E+00	mg/L	0.00E+00	mg/kg	2.44E+01	mg/kg	NA	NA	5.15E-01	2.82E-01	5.01E-01	5.01E-01	0.00E+00	0.00E+00	0.00E+00	NA	NA	0.00E+00	0.00E+00	4.78E-04	1.51E-04	6.29E-04	8	4.70E+01	5.88E+00	1.07E-04	6.20E+01	7.75E+00	8.11E-05
Lead	0.00E+00	mg/L	0.00E+00	mg/kg	1.09E+02	mg/kg	NA	NA	3.25E-01	3.39E-02	7.90E-02	7.90E-02	0.00E+00	0.00E+00	0.00E+00	NA	NA	0.00E+00	0.00E+00	3.36E-04	1.06E-04	4.42E-04	8	3.85E+00	4.81E-01	9.17E-04	1.93E+01	2.41E+00	1.83E-04
Mercury	0.00E+00	mg/L	0.00E+00	mg/kg	3.78E-01	mg/kg	NA	NA	2.07E+00	5.76E-01	1.92E-01	1.92E-01	0.00E+00	0.00E+00	0.00E+00	NA	NA	0.00E+00	0.00E+00	2.84E-06	8.97E-07	3.74E-06	8	4.50E-01	5.63E-02	6.65E-05	9.00E-01	1.13E-01	3.32E-05
Nickel	0.00E+00	mg/L	0.00E+00	mg/kg	1.81E+01	mg/kg	NA	NA	7.20E-01	5.22E-02	1.66E-01	1.66E-01	0.00E+00	0.00E+00	0.00E+00	NA	NA	0.00E+00	0.00E+00	1.18E-04	3.73E-05	1.55E-04	8	7.74E+01	9.68E+00	1.60E-05	1.07E+02	1.34E+01	1.16E-05
Selenium	0.00E+00	mg/L	0.00E+00	mg/kg	6.25E+00	mg/kg	NA	NA	5.69E-01	6.15E-01	2.11E-01	2.11E-01	0.00E+00	0.00E+00	0.00E+00	NA	NA	0.00E+00	0.00E+00	5.15E-05	1.63E-05	6.77E-05	8	5.00E-01	6.25E-02	1.08E-03	1.00E+00	1.25E-01	5.42E-04
Silver	0.00E+00	mg/L	0.00E+00	mg/kg	6.57E-01	mg/kg	NA	NA	2.05E+00	1.40E-02	4.00E-03	4.00E-03	0.00E+00	0.00E+00	0.00E+00	NA	NA	0.00E+00	0.00E+00	1.03E-07	3.25E-08	1.35E-07	8	1.78E+02	2.23E+01	6.08E-09	8.90E+02	1.11E+02	1.22E-09
Zinc	0.00E+00	mg/L	0.00E+00	mg/kg	6.03E+01	mg/kg	NA	NA	5.45E+00	7.77E-01	1.74E+00	1.74E+00	0.00E+00	0.00E+00	0.00E+00	NA	NA	0.00E+00	0.00E+00	4.10E-03	1.30E-03	5.40E-03	8	1.45E+01	1.81E+00	2.98E-03	1.31E+02	1.64E+01	3.30E-04

Hazard Index (Total EEQ): 1.8E-02 3.0E-03

Intake Equation:

$$Ej = \left(\frac{A}{HR} \left[\sum_{i=1}^{m} \left(\frac{IRi \, x \, Cij}{BW} \right) \right] \right)$$

Where:
Ej = Total Exposure to Chemical
A = Site Area
HR = Home Range
m = Total number of ingested media
i = counter
IRi = Consumption Rate for Medium
Cij = Chemical concentration (j) in medium (I) (mg/kg or mg/L)
BW = Body Weight

Notes:
Tier 1 = Max EEQ using max EPC, max BAF/BCF, max Intake Rates, min BW, and FHR =1.
Tier 2 = EEQ using 95% EPC, non-max BAF/BCF, avg Intake Rates, avg BW and calculated FHR.
BAF = Bioaccumulation Factor (may be BCF if this is the only value available)
EEQ = Ecological Effects Quotient.
L = LOAEL based; N = NOAEL based
LOAEL = Lowest Observed Adverse Effect Level
NOAEL = No Observed Adverse Effect Level
NA = Not applicable/Not available
PDE = Predicted Daily Exposure
BAF (or BCF) values from appropriate text tables (BCF = bioconcentration factor)
Some BAF (or BCF) values based on media regression equations (value in box): n See appropriate text tables for equations.
If BAF/BCF regression equation produced Tier 2 value exceeding maximum Tier 1 BAF/BCF value, Tier 1 value used as default.
LOAEL and NOAEL values from appropriate toxicity summary tables in the text.
UF = Uncertainty Factor for toxicity factor extrapolation, and Adjusted LOAEL or NOAEL = LOAEL/UF or NOAEL/UF
A "0" entry in the exposure concentration column indicates this chemical not selected as a COPEC for this medium.
Receptor diet data and home range data from appropriate text table.
Exposure point concentrations (EPCs) from appropriate text tables.

Species-Specific Factors

Plant diet fraction =	0	unitless
Fish diet fraction =	0	unitless
Aq. Invert diet fraction =	0	unitless
Terr. Invert diet fraction =	0	unitless
Mammal diet fraction =	0.76	unitless
Bird diet fraction =	0.24	unitless
Soil ingestion rate =	0	kg/d
Sediment ingestion rate =	0	kg/d
Food ingestion rate =	0.059	kg/d
Body weight =	1.134	kg
Home range =	2081	acres
Water intake rate =	0.064	L/d
Site Area =	2.06	acres
Frac. home range (FHR) =	9.90E-04	unitless

TABLE F-10
TIER 1 CHEMICALS OF POTENTIAL CONCERN EEQs AND HAZARD INDICES FOR RED FOXES AT SWMU 50

Hazard Estimate - Tier 1
Red Fox

Chemical	Surface Water Exposure Point Concentration	Units	Sediment Exposure Point Concentration	Units	Soil Exposure Point Concentration	Units	Fish BAF	Aq. Invert. BAF	Terr. Invert. BAF	Plant BAF	Mammal BAF	Bird BAF	PDE Surface Water	PDE Sediment	PDE Soil	PDE Fish	PDE Aq. Invert.	PDE Terr. Invert.	PDE Plants	PDE Mammals	PDE Birds	Total PDE	Chemical-Specific Toxicity Value UF	NOAEL	Adjusted NOAEL	EEQ N	LOAEL	Adjusted LOAEL	EEQ L
							---------- unitless ----------						mg/kg-d	mg/kg-d	mg/kg-d	mg/kg-d	mg/kg-d	mg/kg-d	mg/kg-d	mg/kg-d	mg/kg-d	mg/kg-d		mg/kg-d	mg/kg-d		mg/kg-d	mg/kg-d	
2,3,7,8-TCDD-TE	0.00E+00	mg/L	0.00E+00	mg/kg	9.80E-05	mg/kg	NA	NA	4.21E+01	3.87E-03	2.20E+00	2.20E+00	0.00E+00	0.00E+00	3.16E-07	NA	NA	1.90E-05	7.44E-09	1.62E-05	3.48E-06	3.90E-05	8	1.00E-06	1.25E-07	3.12E+02	1.00E-05	1.25E-06	3.12E+01
1,2-Dichlorobenzene	0.00E+00	mg/L	0.00E+00	mg/kg	1.10E-02	mg/kg	NA	NA	6.18E+00	4.92E-01	1.00E+00	1.00E+00	0.00E+00	0.00E+00	3.54E-05	NA	NA	3.13E-04	1.06E-04	8.24E-04	1.77E-04	1.46E-03	8	8.57E+01	1.07E+01	1.36E-04	4.29E+02	5.36E+01	2.72E-05
1,3-Dichlorobenzene	0.00E+00	mg/L	0.00E+00	mg/kg	8.60E-03	mg/kg	NA	NA	6.31E+00	4.92E-01	1.00E+00	1.00E+00	0.00E+00	0.00E+00	2.77E-05	NA	NA	2.50E-04	8.29E-05	6.44E-04	1.39E-04	1.14E-03	8	8.57E+01	1.07E+01	1.07E-04	4.29E+02	5.36E+01	2.14E-05
1,4-Dichlorobenzene	0.00E+00	mg/L	0.00E+00	mg/kg	1.10E-02	mg/kg	NA	NA	6.31E+00	4.92E-01	1.00E+00	1.00E+00	0.00E+00	0.00E+00	3.54E-05	NA	NA	3.20E-04	1.06E-04	8.24E-04	1.77E-04	1.46E-03	8	2.50E+00	3.13E-01	4.68E-03	1.25E+01	1.56E+00	9.36E-04
2,4-Dinitrotoluene	0.00E+00	mg/L	0.00E+00	mg/kg	8.88E-01	mg/kg	NA	NA	8.30E-01	2.13E+00	1.00E+00	1.00E+00	0.00E+00	0.00E+00	2.86E-03	NA	NA	3.40E-03	3.70E-02	6.65E-02	1.43E-02	1.24E-01	8	5.40E-01	6.75E-02	1.84E+00	2.70E+00	3.38E-01	3.68E-01
4,4'-DDD	0.00E+00	mg/L	0.00E+00	mg/kg	4.47E-04	mg/kg	NA	NA	3.29E+01	1.57E-02	1.00E+00	1.00E+00	0.00E+00	0.00E+00	1.44E-06	NA	NA	6.79E-05	1.37E-07	3.35E-05	7.21E-06	1.10E-04	8	8.00E-01	1.00E-01	1.10E-03	4.00E+00	5.00E-01	2.20E-04
4,4'-DDE	0.00E+00	mg/L	0.00E+00	mg/kg	3.37E-03	mg/kg	NA	NA	2.35E+01	1.32E-02	1.23E+01	1.23E+01	0.00E+00	0.00E+00	1.09E-05	NA	NA	3.65E-04	8.70E-07	3.10E-03	6.67E-04	4.14E-03	8	8.00E-01	1.00E-01	4.14E-02	4.00E+00	5.00E-01	8.28E-03
4,4'-DDT	0.00E+00	mg/L	0.00E+00	mg/kg	1.29E-02	mg/kg	NA	NA	1.48E+01	4.61E-03	1.55E+00	1.55E+00	0.00E+00	0.00E+00	4.15E-05	NA	NA	8.81E-04	1.16E-06	1.50E-03	3.23E-04	2.74E-03	8	8.00E-01	1.00E-01	2.74E-02	4.00E+00	5.00E-01	5.49E-03
Acenaphthene	0.00E+00	mg/L	0.00E+00	mg/kg	1.60E-02	mg/kg	NA	NA	1.47E+00	8.26E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.15E-05	NA	NA	1.08E-04	2.59E-03	0.00E+00	0.00E+00	2.75E-03	8	6.56E+01	8.20E+00	3.35E-04	1.10E+02	1.38E+01	2.00E-04
Acenaphthylene	0.00E+00	mg/L	0.00E+00	mg/kg	2.00E-02	mg/kg	NA	NA	2.29E+01	7.22E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.44E-05	NA	NA	2.11E-03	2.83E-04	0.00E+00	0.00E+00	2.46E-03	8	6.56E+01	8.20E+00	3.00E-04	1.10E+02	1.38E+01	1.79E-04
Anthracene	0.00E+00	mg/L	0.00E+00	mg/kg	1.10E-02	mg/kg	NA	NA	2.42E+00	1.01E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.54E-05	NA	NA	1.23E-04	2.18E-04	0.00E+00	0.00E+00	3.76E-04	8	6.56E+01	8.20E+00	4.59E-05	1.10E+02	1.38E+01	2.73E-05
Aroclor 1254	0.00E+00	mg/L	0.00E+00	mg/kg	1.48E+00	mg/kg	NA	NA	6.52E+01	3.58E-03	1.00E+00	1.00E+00	0.00E+00	0.00E+00	4.77E-03	NA	NA	4.45E-01	1.04E-04	1.11E-01	2.39E-02	5.85E-01	8	1.40E-01	1.75E-02	3.34E+01	6.80E-01	8.50E-02	6.88E+00
Benzo(a)anthracene	0.00E+00	mg/L	0.00E+00	mg/kg	1.37E-01	mg/kg	NA	NA	1.59E+00	1.49E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.41E-04	NA	NA	1.00E-03	4.01E-04	0.00E+00	0.00E+00	1.85E-03	8	6.15E-01	7.69E-02	2.40E-02	3.07E+00	3.84E-01	4.81E-03
Benzo(a)pyrene	0.00E+00	mg/L	0.00E+00	mg/kg	1.50E-01	mg/kg	NA	NA	1.33E+00	1.33E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.83E-04	NA	NA	9.20E-04	3.92E-04	0.00E+00	0.00E+00	1.79E-03	8	1.00E+00	1.25E-01	1.44E-02	1.00E+01	1.25E+00	1.44E-03
Benzo(b)fluoranthene	0.00E+00	mg/L	0.00E+00	mg/kg	1.52E-01	mg/kg	NA	NA	2.60E+00	3.10E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.89E-04	NA	NA	1.82E-03	9.23E-04	0.00E+00	0.00E+00	3.23E-03	8	6.15E-01	7.69E-02	4.21E-02	3.07E+00	3.84E-01	8.43E-03
Benzo(g,h,i)perylene	0.00E+00	mg/L	0.00E+00	mg/kg	5.90E-02	mg/kg	NA	NA	2.94E+00	2.35E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.90E-04	NA	NA	8.00E-04	2.71E-04	0.00E+00	0.00E+00	1.26E-03	8	6.15E-01	7.69E-02	1.64E-02	3.07E+00	3.84E-01	3.29E-03
Benzo(k)fluoranthene	0.00E+00	mg/L	0.00E+00	mg/kg	9.89E-02	mg/kg	NA	NA	2.60E+00	1.60E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.18E-04	NA	NA	1.19E-03	3.10E-04	0.00E+00	0.00E+00	1.81E-03	8	6.15E-01	7.69E-02	2.36E-02	3.07E+00	3.84E-01	4.73E-03
Chrysene	0.00E+00	mg/L	0.00E+00	mg/kg	1.19E-01	mg/kg	NA	NA	2.29E+00	1.58E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.83E-04	NA	NA	1.26E-03	3.69E-04	0.00E+00	0.00E+00	2.01E-03	8	6.15E-01	7.69E-02	2.61E-02	3.07E+00	3.84E-01	5.23E-03
Dibenz(a,h)anthracene	0.00E+00	mg/L	0.00E+00	mg/kg	1.40E-02	mg/kg	NA	NA	2.31E+00	1.30E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.51E-05	NA	NA	1.49E-04	3.57E-05	0.00E+00	0.00E+00	2.30E-04	8	6.15E-01	7.69E-02	2.99E-03	3.07E+00	3.84E-01	5.99E-04
Endosulfan II	0.00E+00	mg/L	0.00E+00	mg/kg	2.24E-03	mg/kg	NA	NA	1.93E-01	3.67E-01	1.00E+00	1.00E+00	0.00E+00	0.00E+00	7.21E-06	NA	NA	2.00E-06	1.61E-05	1.68E-04	3.61E-05	2.29E-04	8	1.50E-01	1.88E-02	1.22E-02	7.50E-01	9.38E-02	2.45E-03
Endrin	0.00E+00	mg/L	0.00E+00	mg/kg	2.88E-04	mg/kg	NA	NA	1.99E+01	2.74E-02	1.00E+00	1.00E+00	0.00E+00	0.00E+00	9.27E-07	NA	NA	2.65E-05	1.55E-07	2.16E-05	4.65E-06	5.38E-05	8	9.20E-02	1.15E-02	4.68E-03	9.20E-01	1.15E-01	4.68E-04
Fluoranthene	0.00E+00	mg/L	0.00E+00	mg/kg	7.30E-02	mg/kg	NA	NA	3.04E+00	5.00E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.35E-04	NA	NA	1.02E-03	7.15E-04	0.00E+00	0.00E+00	1.97E-03	8	6.15E-01	7.69E-02	2.57E-02	3.07E+00	3.84E-01	5.14E-03
Fluorene	0.00E+00	mg/L	0.00E+00	mg/kg	1.80E-02	mg/kg	NA	NA	9.57E+00	6.64E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.80E-05	NA	NA	7.94E-04	2.34E-03	0.00E+00	0.00E+00	3.19E-03	8	6.56E+01	8.20E+00	3.89E-04	1.10E+02	1.38E+01	2.32E-04
Indeno(1,2,3-cd)pyrene	0.00E+00	mg/L	0.00E+00	mg/kg	8.41E-02	mg/kg	NA	NA	2.86E+00	1.10E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.71E-04	NA	NA	1.11E-03	1.81E-04	0.00E+00	0.00E+00	1.56E-03	8	6.15E-01	7.69E-02	2.03E-02	3.07E+00	3.84E-01	4.07E-03
Methoxychlor	0.00E+00	mg/L	0.00E+00	mg/kg	1.29E-03	mg/kg	NA	NA	7.73E+00	2.05E-02	1.00E+00	1.00E+00	0.00E+00	0.00E+00	4.15E-06	NA	NA	4.60E-05	5.17E-07	9.66E-05	2.08E-05	1.68E-04	8	4.00E+00	5.00E-01	3.36E-04	8.00E+00	1.00E+00	1.68E-04
Naphthalene	0.00E+00	mg/L	0.00E+00	mg/kg	2.70E-01	mg/kg	NA	NA	4.40E+00	1.22E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.69E-04	NA	NA	5.48E-03	6.45E-02	0.00E+00	0.00E+00	7.09E-02	8	6.56E+01	8.20E+00	8.64E-03	1.10E+02	1.38E+01	5.16E-03
Phenanthrene	0.00E+00	mg/L	0.00E+00	mg/kg	2.60E-01	mg/kg	NA	NA	1.72E+00	1.41E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.37E-04	NA	NA	2.06E-03	7.19E-03	0.00E+00	0.00E+00	1.01E-02	8	6.56E+01	8.20E+00	1.23E-03	1.10E+02	1.38E+01	7.34E-04
Pyrene	0.00E+00	mg/L	0.00E+00	mg/kg	8.50E-02	mg/kg	NA	NA	1.75E+00	7.20E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.74E-04	NA	NA	6.86E-04	1.20E-03	0.00E+00	0.00E+00	2.16E-03	8	6.15E-01	7.69E-02	2.81E-02	3.07E+00	3.84E-01	5.63E-03
Arsenic	0.00E+00	mg/L	0.00E+00	mg/kg	7.40E+00	mg/kg	NA	NA	1.34E-01	3.75E-02	5.46E-03	5.46E-03	0.00E+00	0.00E+00	2.38E-02	NA	NA	4.57E-03	5.44E-03	3.03E-03	6.52E-04	3.75E-02	8	1.26E-01	1.58E-02	2.38E+00	1.26E+00	1.58E-01	2.38E-01
Cadmium	0.00E+00	mg/L	0.00E+00	mg/kg	1.43E-01	mg/kg	NA	NA	1.23E+01	1.50E+00	7.94E-01	7.94E-01	0.00E+00	0.00E+00	4.61E-04	NA	NA	8.13E-03	4.21E-03	8.51E-03	1.83E-03	2.31E-02	8	1.00E+00	1.25E-01	1.85E-01	1.00E+01	1.25E+00	1.85E-02
Chromium	0.00E+00	mg/L	0.00E+00	mg/kg	1.16E+02	mg/kg	NA	NA	3.06E-01	4.10E-02	6.55E-02	6.55E-02	0.00E+00	0.00E+00	3.74E-01	NA	NA	1.64E-01	9.32E-02	5.69E-01	1.23E-01	1.32E+00	8	2.74E+03	3.42E+02	3.87E-03	1.37E+04	1.71E+03	7.73E-04
Copper	0.00E+00	mg/L	0.00E+00	mg/kg	5.64E+01	mg/kg	NA	NA	5.15E-01	1.69E-01	2.44E-01	2.44E-01	0.00E+00	0.00E+00	1.82E-01	NA	NA	1.34E-01	1.87E-01	1.03E+00	2.22E-01	1.76E+00	8	1.17E+01	1.46E+00	1.20E+00	1.51E+01	1.89E+00	9.31E-01
Lead	0.00E+00	mg/L	0.00E+00	mg/kg	1.78E+02	mg/kg	NA	NA	2.96E-01	2.72E-02	5.99E-02	5.99E-02	0.00E+00	0.00E+00	5.73E-01	NA	NA	2.43E-01	9.50E-02	7.99E-01	1.72E-01	1.88E+00	8	8.00E+00	1.00E+00	1.88E+00	8.00E+01	1.00E+01	1.88E-01
Mercury	0.00E+00	mg/L	0.00E+00	mg/kg	8.16E-01	mg/kg	NA	NA	3.30E+01	4.04E-01	1.05E+00	1.05E+00	0.00E+00	0.00E+00	2.63E-03	NA	NA	1.24E-01	6.46E-03	6.39E-02	1.38E-02	2.11E-01	8	1.00E+00	1.25E-01	1.69E+00	5.00E+00	6.25E-01	3.38E-01
Nickel	0.00E+00	mg/L	0.00E+00	mg/kg	5.01E+01	mg/kg	NA	NA	7.80E+00	4.04E-02	9.66E-02	9.66E-02	0.00E+00	0.00E+00	1.61E-01	NA	NA	1.80E+00	3.96E-02	3.63E-01	7.81E-02	2.44E+00	8	4.00E+01	5.00E+00	4.89E-01	8.00E+01	1.00E+01	2.44E-01
Selenium	0.00E+00	mg/L	0.00E+00	mg/kg	7.40E+00	mg/kg	NA	NA	5.44E-01	6.26E-01	1.89E-01	1.89E-01	0.00E+00	0.00E+00	2.38E-02	NA	NA	1.85E-02	9.07E-02	1.05E-01	2.26E-02	2.61E-01	8	2.00E-01	2.50E-02	1.04E+01	3.30E-01	4.13E-02	6.32E+00
Silver	0.00E+00	mg/L	0.00E+00	mg/kg	8.90E-01	mg/kg	NA	NA	2.05E+00	1.40E-02	4.00E-03	4.00E-03	0.00E+00	0.00E+00	2.87E-03	NA	NA	8.39E-03	2.44E-04	2.67E-04	5.74E-05	1.18E-02	8	2.22E+01	2.78E+00	4.26E-03	2.22E+02	2.78E+01	4.26E-04
Zinc	0.00E+00	mg/L	0.00E+00	mg/kg	9.33E+01	mg/kg	NA	NA	4.06E+00	6.39E-01	1.16E+00	1.16E+00	0.00E+00	0.00E+00	3.00E-01	NA	NA	1.75E+00	1.17E+00	8.10E+00	1.74E+00	1.31E+01	8	1.60E+02	2.00E+01	6.53E-01	3.20E+02	4.00E+01	3.27E-01
																						Hazard Index (Total EEQ):			3.7E+02			4.7E+01

Intake Equation:

$$Ej = \left(\frac{A}{HR} \left[\sum_{i=1}^{m} \left(\frac{IRi \, x \, Cij}{BW} \right) \right] \right)$$

Where:
Ej = Total Exposure to Chemical
A = Site Area
HR = Home Range
m = Total number of ingested media
i = counter
IRi = Consumption Rate for Medium
Cij = Chemical concentration (j) in medium (I) (mg/kg or mg/L)
BW = Body Weight

Notes:
Tier 1 = Max EEQ using max EPC, max BAF/BCF, max Intake Rates, min BW, and FHR =1.
Tier 2 = EEQ using 95% EPC, non-max BAF/BCF, avg Intake Rates, avg BW and calculated FHR.
BAF = Bioaccumulation Factor (may be BCF if this is the only value available)
EEQ = Ecological Effects Quotient.
L = LOAEL based; N = NOAEL based
LOAEL = Lowest Observed Adverse Effect Level
NOAEL = No Observed Adverse Effect Level
NA = Not applicable/Not available
PDE = Predicted Daily Exposure
BAF (or BCF) values from appropriate text tables (BCF = bioconcentration factor)
Some BAF (or BCF) values based on media regression equations (value in box): n See appropriate text tables for equations.
If BAF/BCF regression equation produced Tier 2 value exceeding maximum Tier 1 BAF/BCF value, Tier 1 value used a default.
LOAEL and NOAEL values from appropriate toxicity summary tables in the text.
UF = Uncertainty Factor for toxicity factor extrapolation, and Adjusted LOAEL or NOAEL = LOAEL/UF or NOAEL/UF
A "0" entry in the exposure concentration column indicates this chemical not selected as a COPEC for this medium.
Receptor diet data and home range data from appropriate text table.
Exposure point concentrations (EPCs) from appropriate text tables.

Species-Specific Factors

Plant diet fraction =	0.17	unitless
Fish diet fraction =	0	unitless
Aq. Invert diet fraction =	0	unitless
Terr. Invert diet fraction =	0.04	unitless
Mammal diet fraction =	0.65	unitless
Bird diet fraction =	0.14	unitless
Soil ingestion rate =	0.0095	kg/d
Sediment ingestion rate =	0	kg/d
Food ingestion rate =	0.34	kg/d
Body weight =	2.95	kg
Home range =	2204	acres
Water intake rate =	0.57	L/d
Site Area =	2.06	acres
Frac. home range (FHR) =	1.00E+00	unitless

TABLE F-11
TIER 2 CHEMICALS OF POTENTIAL CONCERN EEQs AND HAZARD INDICES FOR RED FOXES AT SWMU 50

Hazard Estimate - Tier 2
Red Fox

Chemical	Surface Water Exposure Point Concentration	Units	Sediment Exposure Point Concentration	Units	Soil Exposure Point Concentration	Units	Fish BAF	Aq. Invert. BAF	Terr. Invert. BAF	Plant BAF	Mammal BAF	Bird BAF	PDE Surface Water	PDE Sediment	PDE Soil	PDE Fish	PDE Aq. Invert.	PDE Terr. Invert.	PDE Plants	PDE Mammals	PDE Birds	Total PDE	Chemical-Specific Toxicity Value UF	NOAEL	Adjusted NOAEL	EEQ N	LOAEL	Adjusted LOAEL	EEQ L
							---------- unitless ----------						mg/kg-d	mg/kg-d	mg/kg-d	mg/kg-d	mg/kg-d	mg/kg-d	mg/kg-d	mg/kg-d	mg/kg-d	mg/kg-d		mg/kg-d	mg/kg-d		mg/kg-d	mg/kg-d	
2,3,7,8-TCDD-TE	0.00E+00	mg/L	0.00E+00	mg/kg	6.68E-05	mg/kg	NA	NA	6.05E+00	3.87E-03	2.20E+00	2.20E+00	0.00E+00	0.00E+00	9.24E-11	NA	NA	8.01E-10	2.18E-12	4.73E-09	1.02E-09	6.65E-09	8	1.00E-06	1.25E-07	5.32E-02	1.00E-05	1.25E-06	5.32E-03
1,2-Dichlorobenzene	0.00E+00	mg/L	0.00E+00	mg/kg	1.10E-02	mg/kg	NA	NA	6.10E+00	4.92E-01	5.00E-01	5.00E-01	0.00E+00	0.00E+00	1.52E-08	NA	NA	1.33E-07	4.56E-08	1.77E-07	3.81E-08	4.09E-07	8	8.57E+01	1.07E+01	3.82E-08	4.29E+02	5.36E+01	7.63E-09
1,3-Dichlorobenzene	0.00E+00	mg/L	0.00E+00	mg/kg	8.60E-03	mg/kg	NA	NA	6.23E+00	4.92E-01	5.00E-01	5.00E-01	0.00E+00	0.00E+00	1.19E-08	NA	NA	1.06E-07	3.56E-08	1.38E-07	2.98E-08	3.22E-07	8	8.57E+01	1.07E+01	3.00E-08	4.29E+02	5.36E+01	6.01E-09
1,4-Dichlorobenzene	0.00E+00	mg/L	0.00E+00	mg/kg	1.10E-02	mg/kg	NA	NA	6.23E+00	4.92E-01	5.00E-01	5.00E-01	0.00E+00	0.00E+00	1.52E-08	NA	NA	1.36E-07	4.56E-08	1.77E-07	3.81E-08	4.12E-07	8	2.50E+00	3.13E-01	1.32E-06	1.25E+01	1.56E+00	2.63E-07
2,4-Dinitrotoluene	0.00E+00	mg/L	0.00E+00	mg/kg	4.44E-01	mg/kg	NA	NA	8.20E-01	2.13E+00	5.00E-01	5.00E-01	0.00E+00	0.00E+00	6.14E-07	NA	NA	7.21E-07	7.95E-06	7.15E-06	1.54E-06	1.80E-05	8	5.40E-01	6.75E-02	2.66E-04	2.70E+00	3.38E-01	5.33E-05
4,4'-DDD	0.00E+00	mg/L	0.00E+00	mg/kg	4.47E-04	mg/kg	NA	NA	3.29E+01	1.57E-02	5.00E-01	5.00E-01	0.00E+00	0.00E+00	6.18E-10	NA	NA	2.92E-08	5.90E-11	7.19E-09	1.55E-09	3.86E-08	8	8.00E-01	1.00E-01	3.86E-07	4.00E+00	5.00E-01	7.72E-08
4,4'-DDE	0.00E+00	mg/L	0.00E+00	mg/kg	3.37E-03	mg/kg	NA	NA	2.35E+01	1.32E-02	1.23E+01	1.23E+01	0.00E+00	0.00E+00	4.66E-09	NA	NA	1.57E-07	3.74E-10	1.33E-06	2.86E-07	1.78E-06	8	8.00E-01	1.00E-01	1.78E-05	4.00E+00	5.00E-01	3.56E-06
4,4'-DDT	0.00E+00	mg/L	0.00E+00	mg/kg	6.36E-03	mg/kg	NA	NA	1.62E+01	4.61E-03	1.51E+00	1.51E+00	0.00E+00	0.00E+00	8.79E-09	NA	NA	2.05E-07	2.47E-10	3.09E-07	6.66E-08	5.90E-07	8	8.00E-01	1.00E-01	5.90E-06	4.00E+00	5.00E-01	1.18E-06
Acenaphthene	0.00E+00	mg/L	0.00E+00	mg/kg	1.60E-02	mg/kg	NA	NA	1.47E+00	8.26E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.21E-08	NA	NA	4.66E-08	1.11E-06	0.00E+00	0.00E+00	1.18E-06	8	6.56E+01	8.20E+00	1.44E-07	1.10E+02	1.38E+01	8.59E-08
Acenaphthylene	0.00E+00	mg/L	0.00E+00	mg/kg	1.61E-02	mg/kg	NA	NA	2.29E+01	7.55E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.23E-08	NA	NA	7.30E-07	1.02E-07	0.00E+00	0.00E+00	8.55E-07	8	6.56E+01	8.20E+00	1.04E-07	1.10E+02	1.38E+01	6.22E-08
Anthracene	0.00E+00	mg/L	0.00E+00	mg/kg	1.10E-02	mg/kg	NA	NA	2.42E+00	1.01E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.52E-08	NA	NA	5.27E-08	9.36E-08	0.00E+00	0.00E+00	1.62E-07	8	6.56E+01	8.20E+00	1.97E-08	1.10E+02	1.38E+01	1.17E-08
Aroclor 1254	0.00E+00	mg/L	0.00E+00	mg/kg	3.76E-01	mg/kg	NA	NA	4.51E+00	3.58E-03	5.00E-01	5.00E-01	0.00E+00	0.00E+00	5.20E-07	NA	NA	3.36E-06	1.13E-08	6.05E-06	1.30E-06	1.12E-05	8	1.40E-01	1.75E-02	6.43E-04	6.80E-01	8.50E-02	1.32E-04
Benzo(a)anthracene	0.00E+00	mg/L	0.00E+00	mg/kg	5.31E-02	mg/kg	NA	NA	1.59E+00	2.19E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.34E-08	NA	NA	1.67E-07	9.80E-08	0.00E+00	0.00E+00	3.39E-07	8	6.15E-01	7.69E-02	4.41E-06	3.07E+00	3.84E-01	8.83E-07
Benzo(a)pyrene	0.00E+00	mg/L	0.00E+00	mg/kg	5.27E-02	mg/kg	NA	NA	1.33E+00	1.37E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.29E-08	NA	NA	1.39E-07	6.08E-08	0.00E+00	0.00E+00	2.72E-07	8	1.00E+00	1.25E-01	2.18E-06	1.00E+01	1.25E+00	2.18E-07
Benzo(b)fluoranthene	0.00E+00	mg/L	0.00E+00	mg/kg	5.46E-02	mg/kg	NA	NA	2.60E+00	3.10E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.55E-08	NA	NA	2.81E-07	1.42E-07	0.00E+00	0.00E+00	4.99E-07	8	6.15E-01	7.69E-02	6.49E-06	3.07E+00	3.84E-01	1.30E-06
Benzo(g,h,i)perylene	0.00E+00	mg/L	0.00E+00	mg/kg	2.89E-02	mg/kg	NA	NA	2.94E+00	2.06E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.00E-08	NA	NA	1.68E-07	5.01E-08	0.00E+00	0.00E+00	2.58E-07	8	6.15E-01	7.69E-02	3.36E-06	3.07E+00	3.84E-01	6.73E-07
Benzo(k)fluoranthene	0.00E+00	mg/L	0.00E+00	mg/kg	3.23E-02	mg/kg	NA	NA	2.60E+00	1.87E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.47E-08	NA	NA	1.66E-07	5.09E-08	0.00E+00	0.00E+00	2.62E-07	8	6.15E-01	7.69E-02	3.41E-06	3.07E+00	3.84E-01	6.82E-07
Chrysene	0.00E+00	mg/L	0.00E+00	mg/kg	5.30E-02	mg/kg	NA	NA	2.29E+00	2.20E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.33E-08	NA	NA	2.40E-07	9.79E-08	0.00E+00	0.00E+00	4.12E-07	8	6.15E-01	7.69E-02	5.35E-06	3.07E+00	3.84E-01	1.07E-06
Dibenz(a,h)anthracene	0.00E+00	mg/L	0.00E+00	mg/kg	1.06E-02	mg/kg	NA	NA	2.31E+00	1.30E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.47E-08	NA	NA	4.85E-08	1.16E-08	0.00E+00	0.00E+00	7.48E-08	8	6.15E-01	7.69E-02	9.72E-07	3.07E+00	3.84E-01	1.95E-07
Endosulfan II	0.00E+00	mg/L	0.00E+00	mg/kg	2.24E-03	mg/kg	NA	NA	1.91E-01	3.67E-01	5.00E-01	5.00E-01	0.00E+00	0.00E+00	3.10E-09	NA	NA	8.47E-10	6.93E-09	3.60E-08	7.76E-09	5.47E-08	8	1.50E-01	1.88E-02	2.92E-06	7.50E-01	9.38E-02	5.83E-07
Endrin	0.00E+00	mg/L	0.00E+00	mg/kg	2.88E-04	mg/kg	NA	NA	1.97E+01	2.74E-02	5.00E-01	5.00E-01	0.00E+00	0.00E+00	3.98E-10	NA	NA	1.12E-08	6.65E-11	4.63E-09	9.98E-10	1.73E-08	8	9.20E-02	1.15E-02	1.51E-06	9.20E-01	1.15E-01	1.51E-07
Fluoranthene	0.00E+00	mg/L	0.00E+00	mg/kg	6.23E-02	mg/kg	NA	NA	3.04E+00	5.00E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.61E-08	NA	NA	3.75E-07	2.62E-07	0.00E+00	0.00E+00	7.23E-07	8	6.15E-01	7.69E-02	9.41E-06	3.07E+00	3.84E-01	1.89E-06
Fluorene	0.00E+00	mg/L	0.00E+00	mg/kg	1.38E-02	mg/kg	NA	NA	9.57E+00	1.09E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.91E-08	NA	NA	2.62E-07	1.26E-06	0.00E+00	0.00E+00	1.54E-06	8	6.56E+01	8.20E+00	1.88E-07	1.10E+02	1.38E+01	1.12E-07
Indeno(1,2,3-cd)pyrene	0.00E+00	mg/L	0.00E+00	mg/kg	3.46E-02	mg/kg	NA	NA	2.86E+00	1.10E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.78E-08	NA	NA	1.96E-07	3.20E-08	0.00E+00	0.00E+00	2.76E-07	8	6.15E-01	7.69E-02	3.59E-06	3.07E+00	3.84E-01	7.19E-07
Methoxychlor	0.00E+00	mg/L	0.00E+00	mg/kg	1.29E-03	mg/kg	NA	NA	7.64E+00	2.05E-02	5.00E-01	5.00E-01	0.00E+00	0.00E+00	1.78E-09	NA	NA	1.95E-08	2.22E-10	2.08E-08	4.47E-09	4.68E-08	8	4.00E+00	5.00E-01	9.35E-08	8.00E+00	1.00E+00	4.68E-08
Naphthalene	0.00E+00	mg/L	0.00E+00	mg/kg	2.70E-01	mg/kg	NA	NA	4.40E+00	1.22E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.73E-07	NA	NA	2.35E-06	2.77E-05	0.00E+00	0.00E+00	3.05E-05	8	6.56E+01	8.20E+00	3.71E-06	1.10E+02	1.38E+01	2.21E-06
Phenanthrene	0.00E+00	mg/L	0.00E+00	mg/kg	1.95E-01	mg/kg	NA	NA	1.72E+00	1.57E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.70E-07	NA	NA	6.64E-07	2.59E-06	0.00E+00	0.00E+00	3.52E-06	8	6.56E+01	8.20E+00	4.29E-07	1.10E+02	1.38E+01	2.56E-07
Arsenic	0.00E+00	mg/L	0.00E+00	mg/kg	4.90E+00	mg/kg	NA	NA	1.51E-01	3.75E-02	5.00E-03	5.00E-03	0.00E+00	0.00E+00	6.78E-06	NA	NA	1.47E-06	1.55E-06	7.90E-07	1.70E-07	1.08E-05	8	1.26E-01	1.58E-02	6.83E-04	1.26E+00	1.58E-01	6.83E-05
Cadmium	0.00E+00	mg/L	0.00E+00	mg/kg	1.43E-01	mg/kg	NA	NA	1.23E+01	1.50E+00	7.94E-01	7.94E-01	0.00E+00	0.00E+00	1.98E-07	NA	NA	3.49E-06	1.81E-06	3.65E-06	7.87E-07	9.94E-06	8	1.00E+00	1.25E-01	7.96E-05	1.00E+01	1.25E+00	7.96E-06
Chromium	0.00E+00	mg/L	0.00E+00	mg/kg	4.44E+01	mg/kg	NA	NA	3.06E-01	4.10E-02	8.46E-02	8.46E-02	0.00E+00	0.00E+00	6.13E-05	NA	NA	2.69E-05	1.53E-05	1.21E-04	2.60E-05	2.50E-04	8	2.74E+03	3.42E+02	7.32E-07	1.37E+04	1.71E+03	1.46E-07
Copper	0.00E+00	mg/L	0.00E+00	mg/kg	2.44E+01	mg/kg	NA	NA	5.15E-01	2.82E-01	5.01E-01	5.01E-01	0.00E+00	0.00E+00	3.37E-05	NA	NA	2.48E-05	5.78E-05	3.93E-04	8.46E-05	5.94E-04	8	1.17E+01	1.46E+00	4.06E-04	1.51E+01	1.89E+00	3.15E-04
Lead	0.00E+00	mg/L	0.00E+00	mg/kg	1.09E+02	mg/kg	NA	NA	3.25E-01	3.39E-02	7.90E-02	7.90E-02	0.00E+00	0.00E+00	1.50E-04	NA	NA	6.99E-05	3.09E-05	2.76E-04	5.94E-05	5.86E-04	8	8.00E+00	1.00E+00	5.86E-04	8.00E+01	1.00E+01	5.86E-05
Mercury	0.00E+00	mg/L	0.00E+00	mg/kg	3.78E-01	mg/kg	NA	NA	2.07E+00	5.76E-01	1.92E-01	1.92E-01	0.00E+00	0.00E+00	5.23E-07	NA	NA	1.55E-06	1.83E-06	2.34E-06	5.03E-07	6.75E-06	8	1.00E+00	1.25E-01	5.40E-05	5.00E+00	6.25E-01	1.08E-05
Nickel	0.00E+00	mg/L	0.00E+00	mg/kg	1.81E+01	mg/kg	NA	NA	7.20E-01	5.22E-02	1.66E-01	1.66E-01	0.00E+00	0.00E+00	2.50E-05	NA	NA	2.58E-05	7.96E-06	9.70E-05	2.09E-05	1.77E-04	8	4.00E+01	5.00E+00	3.54E-05	8.00E+01	1.00E+01	1.77E-05
Selenium	0.00E+00	mg/L	0.00E+00	mg/kg	6.25E+00	mg/kg	NA	NA	5.69E-01	6.15E-01	2.11E-01	2.11E-01	0.00E+00	0.00E+00	8.63E-06	NA	NA	7.04E-06	3.23E-05	4.23E-05	9.12E-06	9.94E-05	8	2.00E-01	2.50E-02	3.98E-03	3.30E-01	4.13E-02	2.41E-03
Silver	0.00E+00	mg/L	0.00E+00	mg/kg	6.57E-01	mg/kg	NA	NA	2.05E+00	1.40E-02	4.00E-03	4.00E-03	0.00E+00	0.00E+00	9.08E-07	NA	NA	2.66E-06	7.74E-08	8.46E-08	1.82E-08	3.75E-06	8	2.22E+01	2.78E+00	1.35E-06	2.22E+02	2.78E+01	1.35E-07
Zinc	0.00E+00	mg/L	0.00E+00	mg/kg	6.03E+01	mg/kg	NA	NA	5.45E+00	7.77E-01	1.74E+00	1.74E+00	0.00E+00	0.00E+00	8.33E-05	NA	NA	6.50E-04	3.94E-04	3.37E-03	7.27E-04	5.23E-03	8	1.60E+02	2.00E+01	2.61E-04	3.20E+02	4.00E+01	1.31E-04
Pyrene	0.00E+00	mg/L	0.00E+00	mg/kg	7.21E-02	mg/kg	NA	NA	1.75E+00	7.20E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.97E-08	NA	NA	2.50E-07	4.37E-07	0.00E+00	0.00E+00	7.87E-07	8	6.15E-01	7.69E-02	1.02E-05	3.07E+00	3.84E-01	2.05E-06

Hazard Index (Total EEQ): 6.0E-02 8.5E-03

Intake Equation:

$$Ej = \left(\frac{A}{HR} \left[\sum_{i=1}^{m} \left(\frac{IRi \, x \, Cij}{BW} \right) \right] \right)$$

Where:
Ej = Total Exposure to Chemical
A = Site Area
HR = Home Range
m = Total number of ingested media
i = counter
IRi = Consumption Rate for Medium
Cij = Chemical concentration (j) in medium (I) (mg/kg or mg/L)
BW = Body Weight

Notes:
Tier 1 = Max EEQ using max EPC, max BAF/BCF, max Intake Rates, min BW, and FHR =1.
Tier 2 = EEQ using 95% EPC, non-max BAF/BCF, avg Intake Rates, avg BW and calculated FHR.
BAF = Bioaccumulation Factor (may be BCF if this is the only value available)
EEQ = Ecological Effects Quotient.
L = LOAEL based; N = NOAEL based
LOAEL = Lowest Observed Adverse Effect Level
NOAEL = No Observed Adverse Effect Level
NA = Not applicable/Not available
PDE = Predicted Daily Exposure
BAF (or BCF) values from appropriate text tables (BCF = bioconcentration factor)
Some BAF (or BCF) values based on media regression equations (value in box): n See appropriate text tables for equations.
If BAF/BCF regression equation produced Tier 2 value exceeding maximum Tier 1 BAF/BCF value, Tier 1 value used as default.
LOAEL and NOAEL values from appropriate toxicity summary tables in the text.
UF = Uncertainty Factor for toxicity factor extrapolation, and Adjusted LOAEL or NOAEL = LOAEL/UF or NOAEL/UF
A "0" entry in the exposure concentration column indicates this chemical not selected as a COPEC for this medium.
Receptor diet data and home range data from appropriate text table.
Exposure point concentrations (EPCs) from appropriate text tables.

Species-Specific Factors

Plant diet fraction =	0.17	unitless
Fish diet fraction =	0	unitless
Aq. Invert diet fraction =	0	unitless
Terr. Invert diet fraction =	0.04	unitless
Mammal diet fraction =	0.65	unitless
Bird diet fraction =	0.14	unitless
Soil ingestion rate =	0.0067	kg/d
Sediment ingestion rate =	0	kg/d
Food ingestion rate =	0.24	kg/d
Body weight =	4.53	kg
Home range =	2204	acres
Water intake rate =	0.39	L/d
Site Area =	2.06	acres
Frac. home range (FHR) =	9.35E-04	unitless

TABLE F-12
TIER 1 CHEMICALS OF POTENTIAL CONCERN EEQs AND HAZARD INDICES FOR MEADOW VOLES AT SWMU 59

Hazard Estimate - Tier 1
Meadow Vole

Chemical	Surface Water Exposure Point Concentration	Units	Sediment Exposure Point Concentration	Units	Soil Exposure Point Concentration	Units	Fish BAF	Aq. Invert. BAF	Terr. Invert. BAF	Plant BAF	Mammal BAF	Bird BAF	PDE Surface Water	PDE Sediment	PDE Soil	PDE Fish	PDE Aq. Invert.	PDE Terr. Invert.	PDE Plants	PDE Mammals	PDE Birds	Total PDE	Chemical-Specific Toxicity Value UF	NOAEL	Adjusted NOAEL	EEQ N	LOAEL	Adjusted LOAEL	EEQ L
							---------- unitless ----------						mg/kg-d	mg/kg-d	mg/kg-d	mg/kg-d	mg/kg-d	mg/kg-d	mg/kg-d	mg/kg-d	mg/kg-d	mg/kg-d		mg/kg-d	mg/kg-d		mg/kg-d	mg/kg-d	
2,3,7,8-TCDD-TE	0.00E+00	mg/L	0.00E+00	mg/kg	1.21E-05	mg/kg	NA	NA	4.21E+01	3.87E-03	2.20E+00	2.20E+00	0.00E+00	0.00E+00	1.71E-07	NA	NA	0.00E+00	2.77E-08	0.00E+00	0.00E+00	1.99E-07	4	1.00E-06	2.50E-07	7.96E-01	1.00E-05	2.50E-06	7.96E-02
1,3,5-Trinitrobenzene	0.00E+00	mg/L	0.00E+00	mg/kg	1.38E-01	mg/kg	NA	NA	6.42E-02	5.62E+00	1.00E+00	1.00E+00	0.00E+00	0.00E+00	1.95E-03	NA	NA	0.00E+00	4.56E-01	0.00E+00	0.00E+00	4.58E-01	4	1.34E+01	3.35E+00	1.37E-01	6.70E+01	1.68E+01	2.74E-02
4,4'-DDD	0.00E+00	mg/L	0.00E+00	mg/kg	1.00E-03	mg/kg	NA	NA	2.58E+01	1.57E-02	1.00E+00	1.00E+00	0.00E+00	0.00E+00	1.41E-05	NA	NA	0.00E+00	9.22E-06	0.00E+00	0.00E+00	2.33E-05	4	8.00E-01	2.00E-01	1.17E-04	4.00E+00	1.00E+00	2.33E-05
4,4'-DDT	0.00E+00	mg/L	0.00E+00	mg/kg	4.41E-03	mg/kg	NA	NA	1.70E+01	4.61E-03	1.49E+00	1.49E+00	0.00E+00	0.00E+00	6.23E-05	NA	NA	0.00E+00	1.20E-05	0.00E+00	0.00E+00	7.42E-05	4	8.00E-01	2.00E-01	3.71E-04	4.00E+00	1.00E+00	7.42E-05
Acenaphthylene	0.00E+00	mg/L	0.00E+00	mg/kg	2.90E-03	mg/kg	NA	NA	2.29E+01	1.08E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.09E-05	NA	NA	0.00E+00	1.84E-03	0.00E+00	0.00E+00	1.88E-03	4	6.56E+01	1.64E+01	1.15E-04	1.10E+02	2.75E+01	6.85E-05
Anthracene	0.00E+00	mg/L	0.00E+00	mg/kg	2.00E-02	mg/kg	NA	NA	2.42E+00	8.85E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.82E-04	NA	NA	0.00E+00	1.04E-02	0.00E+00	0.00E+00	1.07E-02	4	6.56E+01	1.64E+01	6.52E-04	1.10E+02	2.75E+01	3.89E-04
Aroclor 1254	0.00E+00	mg/L	0.00E+00	mg/kg	6.10E-02	mg/kg	NA	NA	6.52E+01	3.58E-03	1.00E+00	1.00E+00	0.00E+00	0.00E+00	8.61E-04	NA	NA	0.00E+00	1.28E-04	0.00E+00	0.00E+00	9.90E-04	8	1.40E-01	1.75E-02	5.65E-02	6.80E-01	8.50E-02	1.16E-02
Benzo(a)anthracene	0.00E+00	mg/L	0.00E+00	mg/kg	6.00E-02	mg/kg	NA	NA	1.59E+00	2.09E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.47E-04	NA	NA	0.00E+00	7.37E-03	0.00E+00	0.00E+00	8.21E-03	4	6.15E-01	1.54E-01	5.34E-02	3.07E+00	7.68E-01	1.07E-02
Benzo(a)pyrene	0.00E+00	mg/L	0.00E+00	mg/kg	4.60E-02	mg/kg	NA	NA	1.33E+00	1.37E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.49E-04	NA	NA	0.00E+00	3.72E-03	0.00E+00	0.00E+00	4.37E-03	4	1.00E+00	2.50E-01	1.75E-02	1.00E+01	2.50E+00	1.75E-03
Benzo(b)fluoranthene	0.00E+00	mg/L	0.00E+00	mg/kg	6.30E-02	mg/kg	NA	NA	2.60E+00	3.10E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.89E-04	NA	NA	0.00E+00	1.15E-02	0.00E+00	0.00E+00	1.24E-02	4	6.15E-01	1.54E-01	8.05E-02	3.07E+00	7.68E-01	1.61E-02
Benzo(g,h,i)perylene	0.00E+00	mg/L	0.00E+00	mg/kg	2.50E-02	mg/kg	NA	NA	2.94E+00	2.01E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.53E-04	NA	NA	0.00E+00	2.95E-03	0.00E+00	0.00E+00	3.30E-03	4	6.15E-01	1.54E-01	2.15E-02	3.07E+00	7.68E-01	4.31E-03
Benzo(k)fluoranthene	0.00E+00	mg/L	0.00E+00	mg/kg	3.30E-02	mg/kg	NA	NA	2.60E+00	1.87E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.66E-04	NA	NA	0.00E+00	3.62E-03	0.00E+00	0.00E+00	4.09E-03	4	6.15E-01	1.54E-01	2.66E-02	3.07E+00	7.68E-01	5.33E-03
Chrysene	0.00E+00	mg/L	0.00E+00	mg/kg	5.70E-02	mg/kg	NA	NA	2.29E+00	2.13E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.05E-04	NA	NA	0.00E+00	7.15E-03	0.00E+00	0.00E+00	7.95E-03	4	6.15E-01	1.54E-01	5.17E-02	3.07E+00	7.68E-01	1.04E-02
Dibenz(a,h)anthracene	0.00E+00	mg/L	0.00E+00	mg/kg	6.40E-03	mg/kg	NA	NA	2.31E+00	1.30E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.04E-05	NA	NA	0.00E+00	4.89E-04	0.00E+00	0.00E+00	5.80E-04	4	6.15E-01	1.54E-01	3.77E-03	3.07E+00	7.68E-01	7.55E-04
Dieldrin	0.00E+00	mg/L	0.00E+00	mg/kg	4.52E-03	mg/kg	NA	NA	1.47E+01	4.10E-01	1.76E+01	1.76E+01	0.00E+00	0.00E+00	6.38E-05	NA	NA	0.00E+00	1.09E-03	0.00E+00	0.00E+00	1.15E-03	4	1.50E-02	3.75E-03	3.08E-01	3.00E-02	7.50E-03	1.54E-01
Endosulfan I	0.00E+00	mg/L	0.00E+00	mg/kg	9.61E-04	mg/kg	NA	NA	1.93E-01	3.67E-01	1.00E+00	1.00E+00	0.00E+00	0.00E+00	1.36E-05	NA	NA	0.00E+00	2.08E-04	0.00E+00	0.00E+00	2.21E-04	4	1.50E-01	3.75E-02	5.90E-03	7.50E-01	1.88E-01	1.18E-03
Endosulfan II	0.00E+00	mg/L	0.00E+00	mg/kg	3.94E-03	mg/kg	NA	NA	1.93E-01	3.67E-01	1.00E+00	1.00E+00	0.00E+00	0.00E+00	5.56E-05	NA	NA	0.00E+00	8.51E-04	0.00E+00	0.00E+00	9.07E-04	4	1.50E-01	3.75E-02	2.42E-02	7.50E-01	1.88E-01	4.84E-03
Endosulfan sulfate	0.00E+00	mg/L	0.00E+00	mg/kg	7.10E-03	mg/kg	NA	NA	1.74E-01	3.05E-01	1.00E+00	1.00E+00	0.00E+00	0.00E+00	1.00E-04	NA	NA	0.00E+00	1.27E-03	0.00E+00	0.00E+00	1.37E-03	4	1.50E-01	3.75E-02	3.66E-02	7.50E-01	1.88E-01	7.32E-03
Endrin aldehyde	0.00E+00	mg/L	0.00E+00	mg/kg	4.28E-04	mg/kg	NA	NA	5.32E+00	6.51E-02	1.00E+00	1.00E+00	0.00E+00	0.00E+00	6.04E-06	NA	NA	0.00E+00	1.64E-05	0.00E+00	0.00E+00	2.24E-05	4	9.20E-02	2.30E-02	9.75E-04	9.20E-01	2.30E-01	9.75E-05
Endrin ketone	0.00E+00	mg/L	0.00E+00	mg/kg	2.90E-03	mg/kg	NA	NA	8.76E+00	5.06E-02	1.00E+00	1.00E+00	0.00E+00	0.00E+00	4.09E-05	NA	NA	0.00E+00	8.62E-05	0.00E+00	0.00E+00	1.27E-04	4	9.20E-02	2.30E-02	5.53E-03	9.20E-01	2.30E-01	5.53E-04
Fluoranthene	0.00E+00	mg/L	0.00E+00	mg/kg	1.10E-01	mg/kg	NA	NA	3.04E+00	5.00E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.55E-03	NA	NA	0.00E+00	3.24E-02	0.00E+00	0.00E+00	3.39E-02	4	6.15E-01	1.54E-01	2.21E-01	3.07E+00	7.68E-01	4.42E-02
Fluorene	0.00E+00	mg/L	0.00E+00	mg/kg	9.10E-03	mg/kg	NA	NA	9.57E+00	2.35E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.28E-04	NA	NA	0.00E+00	1.26E-01	0.00E+00	0.00E+00	1.26E-01	4	6.56E+01	1.64E+01	7.69E-03	1.10E+02	2.75E+01	4.59E-03
gamma-Chlordane	0.00E+00	mg/L	0.00E+00	mg/kg	1.10E-03	mg/kg	NA	NA	1.24E+01	9.33E-03	1.00E+00	1.00E+00	0.00E+00	0.00E+00	1.55E-05	NA	NA	0.00E+00	6.03E-06	0.00E+00	0.00E+00	2.16E-05	4	4.60E+00	1.15E+00	1.88E-05	9.20E+00	2.30E+00	9.38E-06
Heptachlor epoxide	0.00E+00	mg/L	0.00E+00	mg/kg	1.06E-03	mg/kg	NA	NA	6.76E+00	8.96E-02	1.00E+00	1.00E+00	0.00E+00	0.00E+00	1.50E-05	NA	NA	0.00E+00	5.59E-05	0.00E+00	0.00E+00	7.08E-05	8	1.00E-01	1.25E-02	5.67E-03	1.00E+00	1.25E-01	5.67E-04
Indeno(1,2,3-cd)pyrene	0.00E+00	mg/L	0.00E+00	mg/kg	2.63E-02	mg/kg	NA	NA	2.86E+00	1.10E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.71E-04	NA	NA	0.00E+00	1.70E-03	0.00E+00	0.00E+00	2.07E-03	4	6.15E-01	1.54E-01	1.35E-02	3.07E+00	7.68E-01	2.70E-03
Methoxychlor	0.00E+00	mg/L	0.00E+00	mg/kg	1.02E-02	mg/kg	NA	NA	7.73E+00	2.05E-02	1.00E+00	1.00E+00	0.00E+00	0.00E+00	1.44E-04	NA	NA	0.00E+00	1.23E-04	0.00E+00	0.00E+00	2.67E-04	4	4.00E+00	1.00E+00	2.67E-04	8.00E+00	2.00E+00	1.33E-04
Naphthalene	0.00E+00	mg/L	0.00E+00	mg/kg	1.30E-01	mg/kg	NA	NA	4.40E+00	1.22E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.84E-03	NA	NA	0.00E+00	9.33E-01	0.00E+00	0.00E+00	9.35E-01	4	6.56E+01	1.64E+01	5.70E-02	1.10E+02	2.75E+01	3.40E-02
Phenanthrene	0.00E+00	mg/L	0.00E+00	mg/kg	3.00E-01	mg/kg	NA	NA	1.72E+00	1.34E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.24E-03	NA	NA	0.00E+00	2.36E-01	0.00E+00	0.00E+00	2.41E-01	4	6.56E+01	1.64E+01	1.47E-02	1.10E+02	2.75E+01	8.75E-03
Pyrene	0.00E+00	mg/L	0.00E+00	mg/kg	9.20E-02	mg/kg	NA	NA	1.75E+00	7.20E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.30E-03	NA	NA	0.00E+00	3.90E-02	0.00E+00	0.00E+00	4.03E-02	4	6.15E-01	1.54E-01	2.62E-01	3.07E+00	7.68E-01	5.25E-02
Arsenic	0.00E+00	mg/L	0.00E+00	mg/kg	3.70E+01	mg/kg	NA	NA	8.35E-02	3.75E-02	4.08E-03	4.08E-03	0.00E+00	0.00E+00	5.22E-01	NA	NA	0.00E+00	8.17E-01	0.00E+00	0.00E+00	1.34E+00	4	1.26E-01	3.15E-02	4.25E+01	1.26E+00	3.15E-01	4.25E+00
Cadmium	0.00E+00	mg/L	0.00E+00	mg/kg	1.10E-01	mg/kg	NA	NA	1.30E+01	1.69E+00	9.12E-01	9.12E-01	0.00E+00	0.00E+00	1.55E-03	NA	NA	0.00E+00	1.10E-01	0.00E+00	0.00E+00	1.11E-01	4	1.00E+00	2.50E-01	4.45E-01	1.00E+01	2.50E+00	4.45E-02
Chromium	0.00E+00	mg/L	0.00E+00	mg/kg	2.88E+01	mg/kg	NA	NA	3.06E-01	4.10E-02	9.49E-02	9.49E-02	0.00E+00	0.00E+00	4.07E-01	NA	NA	0.00E+00	6.95E-01	0.00E+00	0.00E+00	1.10E+00	4	2.74E+03	6.84E+02	1.61E-03	1.37E+04	3.42E+03	3.22E-04
Copper	0.00E+00	mg/L	0.00E+00	mg/kg	1.53E+01	mg/kg	NA	NA	5.15E-01	3.73E-01	7.46E-01	7.46E-01	0.00E+00	0.00E+00	2.16E-01	NA	NA	0.00E+00	3.36E+00	0.00E+00	0.00E+00	3.58E+00	8	1.17E+01	1.46E+00	2.45E+00	1.51E+01	1.89E+00	1.89E+00
Lead	0.00E+00	mg/L	0.00E+00	mg/kg	3.09E+01	mg/kg	NA	NA	4.15E-01	5.88E-02	1.59E-01	1.59E-01	0.00E+00	0.00E+00	4.36E-01	NA	NA	0.00E+00	1.07E+00	0.00E+00	0.00E+00	1.50E+00	4	8.00E+00	2.00E+00	7.52E-01	8.00E+01	2.00E+01	7.52E-02
Mercury	0.00E+00	mg/L	0.00E+00	mg/kg	5.61E-01	mg/kg	NA	NA	3.30E+01	4.80E-01	1.05E+00	1.05E+00	0.00E+00	0.00E+00	7.92E-03	NA	NA	0.00E+00	1.58E-01	0.00E+00	0.00E+00	1.66E-01	8	1.00E+00	1.25E-01	1.33E+00	5.00E+00	6.25E-01	2.66E-01
Nickel	0.00E+00	mg/L	0.00E+00	mg/kg	1.28E+01	mg/kg	NA	NA	7.80E+00	5.70E-02	2.00E-01	2.00E-01	0.00E+00	0.00E+00	1.81E-01	NA	NA	0.00E+00	4.29E-01	0.00E+00	0.00E+00	6.10E-01	4	4.00E+01	1.00E+01	6.10E-02	8.00E+01	2.00E+01	3.05E-02
Selenium	0.00E+00	mg/L	0.00E+00	mg/kg	7.00E+00	mg/kg	NA	NA	5.52E-01	6.22E-01	1.96E-01	1.96E-01	0.00E+00	0.00E+00	9.88E-02	NA	NA	0.00E+00	2.56E+00	0.00E+00	0.00E+00	2.66E+00	4	2.00E-01	5.00E-02	5.32E+01	3.30E-01	8.25E-02	3.22E+01
Silver	0.00E+00	mg/L	0.00E+00	mg/kg	4.98E-01	mg/kg	NA	NA	2.05E+00	1.40E-02	4.00E-03	4.00E-03	0.00E+00	0.00E+00	7.03E-03	NA	NA	0.00E+00	4.10E-03	0.00E+00	0.00E+00	1.11E-02	4	2.22E+01	5.55E+00	2.01E-03	2.22E+02	5.55E+01	2.01E-04
Zinc	0.00E+00	mg/L	0.00E+00	mg/kg	7.63E+01	mg/kg	NA	NA	4.65E+00	6.99E-01	1.40E+00	1.40E+00	0.00E+00	0.00E+00	1.08E+00	NA	NA	0.00E+00	3.14E+01	0.00E+00	0.00E+00	3.24E+01	4	1.60E+02	4.00E+01	8.11E-01	3.20E+02	8.00E+01	4.06E-01

Hazard Index (Total EEQ): 1.0E+02 4.0E+01

Intake Equation:

$$Ej = \left(\frac{A}{HR} \left[\sum_{i=1}^{m} \left(\frac{IRi \, x \, Cij}{BW} \right) \right] \right)$$

Where:
Ej = Total Exposure to Chemical
A = Site Area
HR = Home Range
m = Total number of ingested media
i = counter
IRi = Consumption Rate for Medium
Cij = Chemical concentration (j) in medium (I) (mg/kg or mg/L)
BW = Body Weight

Notes:
Tier 1 = Max EEQ using max EPC, max BAF/BCF, max Intake Rates, min BW, and FHR =1.
Tier 2 = EEQ using 95% EPC, non-max BAF/BCF, avg Intake Rates, avg BW and calculated FHR.
BAF = Bioaccumulation Factor (may be BCF if this is the only value available)
EEQ = Ecological Effects Quotient.
L = LOAEL based; N = NOAEL based
LOAEL = Lowest Observed Adverse Effect Level
NOAEL = No Observed Adverse Effect Level
NA = Not applicable/Not available
PDE = Predicted Daily Exposure
BAF (or BCF) values from appropriate text tables (BCF = bioconcentration factor)
Some BAF (or BCF) values based on media regression equations (value in box): n See appropriate text tables for equations.
If BAF/BCF regression equation produced Tier 2 value exceeding maximum Tier 1 BAF/BCF value, Tier 1 value used a default.
LOAEL and NOAEL values from appropriate toxicity summary tables in the text.
UF = Uncertainty Factor for toxicity factor extrapolation, and Adjusted LOAEL or NOAEL = LOAEL/UF or NOAEL/UF
A "0" entry in the exposure concentration column indicates this chemical not selected as a COPEC for this medium.
Receptor diet data and home range data from appropriate text table.
Exposure point concentrations (EPCs) from appropriate text tables.

Species-Specific Factors

Plant diet fraction =	1	unitless
Fish diet fraction =	0	unitless
Aq. Invert diet fraction =	0	unitless
Terr. Invert diet fraction =	0	unitless
Mammal diet fraction =	0	unitless
Bird diet fraction =	0	unitless
Soil ingestion rate =	0.00024	kg/d
Sediment ingestion rate =	0	kg/d
Food ingestion rate =	0.01	kg/d
Body weight =	0.017	kg
Home range =	0.089	acres
Water intake rate =	0.007	L/d
Site Area =	0.57	acres
Frac. home range (FHR) =	1.00E+00	unitless

TABLE F-13
TIER 2 CHEMICALS OF POTENTIAL ECOLOGICAL CONCERN EEQs AND HAZARD INDICES FOR MEADOW VOLES AT SWMU 59

Hazard Estimate - Tier 2
Meadow Vole

Chemical	Surface Water Exposure Point Concentration	Units	Sediment Exposure Point Concentration	Units	Soil Exposure Point Concentration	Units	Fish BAF	Aq. Invert. BAF	Terr. Invert. BAF	Plant BAF	Mammal BAF	Bird BAF	PDE Surface Water	PDE Sediment	PDE Soil	PDE Fish	PDE Aq. Invert.	PDE Terr. Invert.	PDE Plants	PDE Mammals	PDE Birds	Total PDE	Chemical-Specific Toxicity Value UF	NOAEL	Adjusted NOAEL	EEQ N	LOAEL	Adjusted LOAEL	EEQ L
							---------- unitless ----------						mg/kg-d	mg/kg-d	mg/kg-d	mg/kg-d	mg/kg-d	mg/kg-d	mg/kg-d	mg/kg-d	mg/kg-d	mg/kg-d		mg/kg-d	mg/kg-d		mg/kg-d	mg/kg-d	
2,3,7,8-TCDD-TE	0.00E+00	mg/L	0.00E+00	mg/kg	8.67E-06	mg/kg	NA	NA	4.19E+00	3.87E-03	2.20E+00	2.20E+00	0.00E+00	0.00E+00	4.45E-08	NA	NA	0.00E+00	7.26E-09	0.00E+00	0.00E+00	5.18E-08	4	1.00E-06	2.50E-07	2.07E-01	1.00E-05	2.50E-06	2.07E-02
1,3,5-Trinitrobenzene	0.00E+00	mg/L	0.00E+00	mg/kg	1.38E-01	mg/kg	NA	NA	6.35E-02	5.62E+00	5.00E-01	5.00E-01	0.00E+00	0.00E+00	7.09E-04	NA	NA	0.00E+00	1.68E-01	0.00E+00	0.00E+00	1.68E-01	4	1.34E+01	3.35E+00	5.03E-02	6.70E+01	1.68E+01	1.01E-02
4,4'-DDD	0.00E+00	mg/L	0.00E+00	mg/kg	1.00E-03	mg/kg	NA	NA	2.58E+01	1.57E-02	5.00E-01	5.00E-01	0.00E+00	0.00E+00	5.14E-06	NA	NA	0.00E+00	3.39E-06	0.00E+00	0.00E+00	8.52E-06	4	8.00E-01	2.00E-01	4.26E-05	4.00E+00	1.00E+00	8.52E-06
4,4'-DDT	0.00E+00	mg/L	0.00E+00	mg/kg	4.41E-03	mg/kg	NA	NA	1.70E+01	4.61E-03	1.49E+00	1.49E+00	0.00E+00	0.00E+00	2.26E-05	NA	NA	0.00E+00	4.39E-06	0.00E+00	0.00E+00	2.70E-05	4	8.00E-01	2.00E-01	1.35E-04	4.00E+00	1.00E+00	2.70E-05
Acenaphthylene	0.00E+00	mg/L	0.00E+00	mg/kg	2.90E-03	mg/kg	NA	NA	2.29E+01	1.08E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.49E-05	NA	NA	0.00E+00	6.77E-04	0.00E+00	0.00E+00	6.92E-04	4	6.56E+01	1.64E+01	4.22E-05	1.10E+02	2.75E+01	2.52E-05
Anthracene	0.00E+00	mg/L	0.00E+00	mg/kg	2.00E-02	mg/kg	NA	NA	2.42E+00	8.85E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.03E-04	NA	NA	0.00E+00	3.83E-03	0.00E+00	0.00E+00	3.93E-03	4	6.56E+01	1.64E+01	2.40E-04	1.10E+02	2.75E+01	1.43E-04
Aroclor 1254	0.00E+00	mg/L	0.00E+00	mg/kg	2.80E-02	mg/kg	NA	NA	2.12E+00	3.58E-03	5.00E-01	5.00E-01	0.00E+00	0.00E+00	1.44E-04	NA	NA	0.00E+00	2.17E-05	0.00E+00	0.00E+00	1.65E-04	8	1.40E-01	1.75E-02	9.45E-03	6.80E-01	8.50E-02	1.95E-03
Benzo(a)anthracene	0.00E+00	mg/L	0.00E+00	mg/kg	3.67E-02	mg/kg	NA	NA	1.59E+00	2.55E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.88E-04	NA	NA	0.00E+00	2.02E-03	0.00E+00	0.00E+00	2.21E-03	4	6.15E-01	1.54E-01	1.44E-02	3.07E+00	7.68E-01	2.88E-03
Benzo(a)pyrene	0.00E+00	mg/L	0.00E+00	mg/kg	3.59E-02	mg/kg	NA	NA	1.33E+00	1.38E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.84E-04	NA	NA	0.00E+00	1.07E-03	0.00E+00	0.00E+00	1.26E-03	4	1.00E+00	2.50E-01	5.03E-03	1.00E+01	2.50E+00	5.03E-04
Benzo(b)fluoranthene	0.00E+00	mg/L	0.00E+00	mg/kg	3.87E-02	mg/kg	NA	NA	2.60E+00	3.10E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.99E-04	NA	NA	0.00E+00	2.59E-03	0.00E+00	0.00E+00	2.79E-03	4	6.15E-01	1.54E-01	1.82E-02	3.07E+00	7.68E-01	3.64E-03
Benzo(g,h,i)perylene	0.00E+00	mg/L	0.00E+00	mg/kg	2.21E-02	mg/kg	NA	NA	2.94E+00	1.96E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.13E-04	NA	NA	0.00E+00	9.38E-04	0.00E+00	0.00E+00	1.05E-03	4	6.15E-01	1.54E-01	6.84E-03	3.07E+00	7.68E-01	1.37E-03
Benzo(k)fluoranthene	0.00E+00	mg/L	0.00E+00	mg/kg	2.90E-02	mg/kg	NA	NA	2.60E+00	1.90E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.49E-04	NA	NA	0.00E+00	1.19E-03	0.00E+00	0.00E+00	1.34E-03	4	6.15E-01	1.54E-01	8.72E-03	3.07E+00	7.68E-01	1.75E-03
Chrysene	0.00E+00	mg/L	0.00E+00	mg/kg	3.87E-02	mg/kg	NA	NA	2.29E+00	2.49E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.99E-04	NA	NA	0.00E+00	2.09E-03	0.00E+00	0.00E+00	2.29E-03	4	6.15E-01	1.54E-01	1.49E-02	3.07E+00	7.68E-01	2.98E-03
Dibenz(a,h)anthracene	0.00E+00	mg/L	0.00E+00	mg/kg	6.40E-03	mg/kg	NA	NA	2.31E+00	1.30E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.29E-05	NA	NA	0.00E+00	1.80E-04	0.00E+00	0.00E+00	2.13E-04	4	6.15E-01	1.54E-01	1.38E-03	3.07E+00	7.68E-01	2.77E-04
Dieldrin	0.00E+00	mg/L	0.00E+00	mg/kg	4.52E-03	mg/kg	NA	NA	1.47E+01	4.10E-01	1.76E+01	1.76E+01	0.00E+00	0.00E+00	2.32E-05	NA	NA	0.00E+00	4.01E-04	0.00E+00	0.00E+00	4.24E-04	4	1.50E-02	3.75E-03	1.13E-01	3.00E-02	7.50E-03	5.65E-02
Endosulfan I	0.00E+00	mg/L	0.00E+00	mg/kg	9.61E-04	mg/kg	NA	NA	1.91E-01	3.67E-01	5.00E-01	5.00E-01	0.00E+00	0.00E+00	4.93E-06	NA	NA	0.00E+00	7.63E-05	0.00E+00	0.00E+00	8.13E-05	4	1.50E-01	3.75E-02	2.17E-03	7.50E-01	1.88E-01	4.33E-04
Endosulfan II	0.00E+00	mg/L	0.00E+00	mg/kg	3.94E-03	mg/kg	NA	NA	1.91E-01	3.67E-01	5.00E-01	5.00E-01	0.00E+00	0.00E+00	2.02E-05	NA	NA	0.00E+00	3.13E-04	0.00E+00	0.00E+00	3.33E-04	4	1.50E-01	3.75E-02	8.88E-03	7.50E-01	1.88E-01	1.78E-03
Endosulfan sulfate	0.00E+00	mg/L	0.00E+00	mg/kg	7.10E-03	mg/kg	NA	NA	1.72E-01	3.05E-01	5.00E-01	5.00E-01	0.00E+00	0.00E+00	3.65E-05	NA	NA	0.00E+00	4.68E-04	0.00E+00	0.00E+00	5.04E-04	4	1.50E-01	3.75E-02	1.35E-02	7.50E-01	1.88E-01	2.69E-03
Endrin aldehyde	0.00E+00	mg/L	0.00E+00	mg/kg	4.28E-04	mg/kg	NA	NA	5.26E+00	6.51E-02	5.00E-01	5.00E-01	0.00E+00	0.00E+00	2.20E-06	NA	NA	0.00E+00	6.02E-06	0.00E+00	0.00E+00	8.22E-06	4	9.20E-02	2.30E-02	3.57E-04	9.20E-01	2.30E-01	3.57E-05
Endrin ketone	0.00E+00	mg/L	0.00E+00	mg/kg	2.90E-03	mg/kg	NA	NA	8.65E+00	5.06E-02	5.00E-01	5.00E-01	0.00E+00	0.00E+00	1.49E-05	NA	NA	0.00E+00	3.17E-05	0.00E+00	0.00E+00	4.66E-05	4	9.20E-02	2.30E-02	2.03E-03	9.20E-01	2.30E-01	2.03E-04
Fluoranthene	0.00E+00	mg/L	0.00E+00	mg/kg	8.28E-02	mg/kg	NA	NA	3.04E+00	5.00E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.25E-04	NA	NA	0.00E+00	8.95E-03	0.00E+00	0.00E+00	9.38E-03	4	6.15E-01	1.54E-01	6.10E-02	3.07E+00	7.68E-01	1.22E-02
Fluorene	0.00E+00	mg/L	0.00E+00	mg/kg	9.10E-03	mg/kg	NA	NA	9.57E+00	2.35E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.67E-05	NA	NA	0.00E+00	4.63E-02	0.00E+00	0.00E+00	4.63E-02	4	6.56E+01	1.64E+01	2.83E-03	1.10E+02	2.75E+01	1.69E-03
gamma-Chlordane	0.00E+00	mg/L	0.00E+00	mg/kg	1.10E-03	mg/kg	NA	NA	1.22E+01	9.33E-03	5.00E-01	5.00E-01	0.00E+00	0.00E+00	5.65E-06	NA	NA	0.00E+00	2.22E-06	0.00E+00	0.00E+00	7.87E-06	4	4.60E+00	1.15E+00	6.84E-06	9.20E+00	2.30E+00	3.42E-06
Heptachlor epoxide	0.00E+00	mg/L	0.00E+00	mg/kg	1.06E-03	mg/kg	NA	NA	6.68E+00	8.96E-02	5.00E-01	5.00E-01	0.00E+00	0.00E+00	5.44E-06	NA	NA	0.00E+00	2.05E-05	0.00E+00	0.00E+00	2.60E-05	8	1.00E-01	1.25E-02	2.08E-03	1.00E+00	1.25E-01	2.08E-04
Indeno(1,2,3-cd)pyrene	0.00E+00	mg/L	0.00E+00	mg/kg	2.27E-02	mg/kg	NA	NA	2.86E+00	1.10E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.17E-04	NA	NA	0.00E+00	5.40E-04	0.00E+00	0.00E+00	6.56E-04	4	6.15E-01	1.54E-01	4.27E-03	3.07E+00	7.68E-01	8.55E-04
Methoxychlor	0.00E+00	mg/L	0.00E+00	mg/kg	1.02E-02	mg/kg	NA	NA	7.64E+00	2.05E-02	5.00E-01	5.00E-01	0.00E+00	0.00E+00	5.24E-05	NA	NA	0.00E+00	4.51E-05	0.00E+00	0.00E+00	9.75E-05	4	4.00E+00	1.00E+00	9.75E-05	8.00E+00	2.00E+00	4.87E-05
Naphthalene	0.00E+00	mg/L	0.00E+00	mg/kg	1.30E-01	mg/kg	NA	NA	4.40E+00	1.22E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.68E-04	NA	NA	0.00E+00	3.43E-01	0.00E+00	0.00E+00	3.44E-01	4	6.56E+01	1.64E+01	2.10E-02	1.10E+02	2.75E+01	1.25E-02
Phenanthrene	0.00E+00	mg/L	0.00E+00	mg/kg	1.10E-01	mg/kg	NA	NA	1.72E+00	1.96E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.65E-04	NA	NA	0.00E+00	4.66E-02	0.00E+00	0.00E+00	4.71E-02	4	6.56E+01	1.64E+01	2.87E-03	1.10E+02	2.75E+01	1.71E-03
Pyrene	0.00E+00	mg/L	0.00E+00	mg/kg	8.34E-02	mg/kg	NA	NA	1.75E+00	7.20E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.28E-04	NA	NA	0.00E+00	1.30E-02	0.00E+00	0.00E+00	1.34E-02	4	6.15E-01	1.54E-01	8.72E-02	3.07E+00	7.68E-01	1.75E-02
Arsenic	0.00E+00	mg/L	0.00E+00	mg/kg	2.07E+01	mg/kg	NA	NA	9.90E-02	3.75E-02	4.53E-03	4.53E-03	0.00E+00	0.00E+00	1.06E-01	NA	NA	0.00E+00	1.68E-01	0.00E+00	0.00E+00	2.75E-01	4	1.26E-01	3.15E-02	8.72E+00	1.26E+00	3.15E-01	8.72E-01
Cadmium	0.00E+00	mg/L	0.00E+00	mg/kg	1.10E-01	mg/kg	NA	NA	1.30E+01	1.69E+00	9.12E-01	9.12E-01	0.00E+00	0.00E+00	5.65E-04	NA	NA	0.00E+00	4.03E-02	0.00E+00	0.00E+00	4.09E-02	4	1.00E+00	2.50E-01	1.63E-01	1.00E+01	2.50E+00	1.63E-02
Chromium	0.00E+00	mg/L	0.00E+00	mg/kg	1.91E+01	mg/kg	NA	NA	3.06E-01	4.10E-02	1.06E-01	1.06E-01	0.00E+00	0.00E+00	9.81E-02	NA	NA	0.00E+00	1.69E-01	0.00E+00	0.00E+00	2.68E-01	4	2.74E+03	6.84E+02	3.91E-04	1.37E+04	3.42E+03	7.82E-05
Copper	0.00E+00	mg/L	0.00E+00	mg/kg	1.20E+01	mg/kg	NA	NA	5.15E-01	4.33E-01	9.20E-01	9.20E-01	0.00E+00	0.00E+00	6.15E-02	NA	NA	0.00E+00	1.12E+00	0.00E+00	0.00E+00	1.18E+00	8	1.17E+01	1.46E+00	8.09E-01	1.51E+01	1.89E+00	6.27E-01
Lead	0.00E+00	mg/L	0.00E+00	mg/kg	1.82E+01	mg/kg	NA	NA	4.60E-01	7.42E-02	2.14E-01	2.14E-01	0.00E+00	0.00E+00	9.33E-02	NA	NA	0.00E+00	2.91E-01	0.00E+00	0.00E+00	3.85E-01	4	8.00E+00	2.00E+00	1.92E-01	8.00E+01	2.00E+01	1.92E-02
Mercury	0.00E+00	mg/L	0.00E+00	mg/kg	3.00E-01	mg/kg	NA	NA	2.42E+00	6.40E-01	1.92E-01	1.92E-01	0.00E+00	0.00E+00	1.54E-03	NA	NA	0.00E+00	4.15E-02	0.00E+00	0.00E+00	4.31E-02	8	1.00E+00	1.25E-01	3.44E-01	5.00E+00	6.25E-01	6.89E-02
Nickel	0.00E+00	mg/L	0.00E+00	mg/kg	8.80E+00	mg/kg	NA	NA	4.51E+00	6.26E-02	2.45E-01	2.45E-01	0.00E+00	0.00E+00	4.52E-02	NA	NA	0.00E+00	1.19E-01	0.00E+00	0.00E+00	1.64E-01	4	4.00E+01	1.00E+01	1.64E-02	8.00E+01	2.00E+01	8.21E-03
Selenium	0.00E+00	mg/L	0.00E+00	mg/kg	6.70E+00	mg/kg	NA	NA	5.58E-01	6.19E-01	2.02E-01	2.02E-01	0.00E+00	0.00E+00	3.44E-02	NA	NA	0.00E+00	8.97E-01	0.00E+00	0.00E+00	9.31E-01	4	2.00E-01	5.00E-02	1.86E+01	3.30E-01	8.25E-02	1.13E+01
Silver	0.00E+00	mg/L	0.00E+00	mg/kg	3.44E-01	mg/kg	NA	NA	2.05E+00	1.40E-02	4.00E-03	4.00E-03	0.00E+00	0.00E+00	1.77E-03	NA	NA	0.00E+00	1.04E-03	0.00E+00	0.00E+00	2.81E-03	4	2.22E+01	5.55E+00	5.06E-04	2.22E+02	5.55E+01	5.06E-05
Zinc	0.00E+00	mg/L	0.00E+00	mg/kg	3.80E+01	mg/kg	NA	NA	7.43E+00	9.54E-01	2.67E+00	2.67E+00	0.00E+00	0.00E+00	1.95E-01	NA	NA	0.00E+00	7.83E+00	0.00E+00	0.00E+00	8.03E+00	4	1.60E+02	4.00E+01	2.01E-01	3.20E+02	8.00E+01	1.00E-01
																					Hazard Index (Total EEQ):			3.0E+01			1.3E+01

Intake Equation:

$$Ej = \left(\frac{A}{HR} \left[\sum_{i=1}^{m} \left(\frac{IRi \, x \, Cij}{BW} \right) \right] \right)$$

Where:
Ej = Total Exposure to Chemical
A = Site Area
HR = Home Range
m = Total number of ingested media
i = counter
IRi = Consumption Rate for Medium
Cij = Chemical concentration (j) in medium (I) (mg/kg or mg/L)
BW = Body Weight

Notes:
Tier 1 = Max EEQ using max EPC, max BAF/BCF, max Intake Rates, min BW, and FHR =1.
Tier 2 = EEQ using 95% EPC, non-max BAF/BCF, avg Intake Rates, avg BW and calculated FHR.
BAF = Bioaccumulation Factor (may be BCF if this is the only value available)
EEQ = Ecological Effects Quotient.
L = LOAEL based; N = NOAEL based
LOAEL = Lowest Observed Adverse Effect Level
NOAEL = No Observed Adverse Effect Level
NA = Not applicable/Not available
PDE = Predicted Daily Exposure
BAF (or BCF) values from appropriate text tables (BCF = bioconcentration factor)
Some BAF (or BCF) values based on media regression equations (value in box): n See appropriate text tables for equations.
If BAF/BCF regression equation produced Tier 2 value exceeding maximum Tier 1 BAF/BCF value, Tier 1 value used as default.
LOAEL and NOAEL values from appropriate toxicity summary tables in the text.
UF = Uncertainty Factor for toxicity factor extrapolation, and Adjusted LOAEL or NOAEL = LOAEL/UF or NOAEL/UF
A "0" entry in the exposure concentration column indicates this chemical not selected as a COPEC for this medium.
Receptor diet data and home range data from appropriate text table.
Exposure point concentrations (EPCs) from appropriate text tables.

Species-Specific Factors

Plant diet fraction =	1	unitless
Fish diet fraction =	0	unitless
Aq. Invert diet fraction =	0	unitless
Terr. Invert diet fraction =	0	unitless
Mammal diet fraction =	0	unitless
Bird diet fraction =	0	unitless
Soil ingestion rate =	0.00019	kg/d
Sediment ingestion rate =	0	kg/d
Food ingestion rate =	0.008	kg/d
Body weight =	0.037	kg
Home range =	0.089	acres
Water intake rate =	0.0051	L/d
Site Area =	0.57	acres
Frac. home range (FHR) =	1.00E+00	unitless

TABLE F-14
TIER 1 CHEMICALS OF POTENTIAL CONCERN EEQs AND HAZARD INDICES FOR SHORT-TAILED SHREWS AT SWMU 59

Hazard Estimate - Tier 1
Short-tailed Shrew

Chemical	Surface Water Exposure Point Concentration	Units	Sediment Exposure Point Concentration	Units	Soil Exposure Point Concentration	Units	Fish BAF	Aq. Invert. BAF	Terr. Invert. BAF	Plant BAF	Mammal BAF	Bird BAF	PDE Surface Water	PDE Sediment	PDE Soil	PDE Fish	PDE Aq. Invert.	PDE Terr. Invert.	PDE Plants	PDE Mammals	PDE Birds	Total PDE	Chemical-Specific Toxicity Value UF	NOAEL	Adjusted NOAEL	EEQ N	LOAEL	Adjusted LOAEL	EEQ L
							---------- unitless ----------						mg/kg-d	mg/kg-d	mg/kg-d	mg/kg-d	mg/kg-d	mg/kg-d	mg/kg-d	mg/kg-d	mg/kg-d	mg/kg-d		mg/kg-d	mg/kg-d		mg/kg-d	mg/kg-d	
2,3,7,8-TCDD-TE	0.00E+00	mg/L	0.00E+00	mg/kg	1.21E-05	mg/kg	NA	NA	4.21E+01	3.87E-03	2.20E+00	2.20E+00	0.00E+00	0.00E+00	3.01E-07	NA	NA	1.23E-04	0.00E+00	0.00E+00	0.00E+00	1.23E-04	8	1.00E-06	1.25E-07	9.83E+02	1.00E-05	1.25E-06	9.83E+01
1,3,5-Trinitrobenzene	0.00E+00	mg/L	0.00E+00	mg/kg	1.38E-01	mg/kg	NA	NA	6.42E-02	5.62E+00	1.00E+00	1.00E+00	0.00E+00	0.00E+00	3.42E-03	NA	NA	2.13E-03	0.00E+00	0.00E+00	0.00E+00	5.55E-03	8	1.34E+01	1.68E+00	3.31E-03	6.70E+01	8.38E+00	6.63E-04
4,4'-DDD	0.00E+00	mg/L	0.00E+00	mg/kg	1.00E-03	mg/kg	NA	NA	2.58E+01	1.57E-02	1.00E+00	1.00E+00	0.00E+00	0.00E+00	2.48E-05	NA	NA	6.20E-03	0.00E+00	0.00E+00	0.00E+00	6.22E-03	8	8.00E-01	1.00E-01	6.22E-02	4.00E+00	5.00E-01	1.24E-02
4,4'-DDT	0.00E+00	mg/L	0.00E+00	mg/kg	4.41E-03	mg/kg	NA	NA	1.70E+01	4.61E-03	1.49E+00	1.49E+00	0.00E+00	0.00E+00	1.09E-04	NA	NA	1.80E-02	0.00E+00	0.00E+00	0.00E+00	1.81E-02	8	8.00E-01	1.00E-01	1.81E-01	4.00E+00	5.00E-01	3.63E-02
Acenaphthylene	0.00E+00	mg/L	0.00E+00	mg/kg	2.90E-03	mg/kg	NA	NA	2.29E+01	1.08E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.19E-05	NA	NA	1.59E-02	0.00E+00	0.00E+00	0.00E+00	1.60E-02	8	6.56E+01	8.20E+00	1.95E-03	1.10E+02	1.38E+01	1.16E-03
Anthracene	0.00E+00	mg/L	0.00E+00	mg/kg	2.00E-02	mg/kg	NA	NA	2.42E+00	8.85E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.96E-04	NA	NA	1.16E-02	0.00E+00	0.00E+00	0.00E+00	1.21E-02	8	6.56E+01	8.20E+00	1.48E-03	1.10E+02	1.38E+01	8.81E-04
Aroclor 1254	0.00E+00	mg/L	0.00E+00	mg/kg	6.10E-02	mg/kg	NA	NA	6.52E+01	3.58E-03	1.00E+00	1.00E+00	0.00E+00	0.00E+00	1.51E-03	NA	NA	9.55E-01	0.00E+00	0.00E+00	0.00E+00	9.56E-01	8	1.40E-01	1.75E-02	5.47E+01	6.80E-01	8.50E-02	1.13E+01
Benzo(a)anthracene	0.00E+00	mg/L	0.00E+00	mg/kg	6.00E-02	mg/kg	NA	NA	1.59E+00	2.09E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.49E-03	NA	NA	2.29E-02	0.00E+00	0.00E+00	0.00E+00	2.44E-02	8	6.15E-01	7.69E-02	3.17E-01	3.07E+00	3.84E-01	6.35E-02
Benzo(a)pyrene	0.00E+00	mg/L	0.00E+00	mg/kg	4.60E-02	mg/kg	NA	NA	1.33E+00	1.37E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.14E-03	NA	NA	1.47E-02	0.00E+00	0.00E+00	0.00E+00	1.58E-02	8	1.00E+00	1.25E-01	1.27E-01	1.00E+01	1.25E+00	1.27E-02
Benzo(b)fluoranthene	0.00E+00	mg/L	0.00E+00	mg/kg	6.30E-02	mg/kg	NA	NA	2.60E+00	3.10E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.56E-03	NA	NA	3.93E-02	0.00E+00	0.00E+00	0.00E+00	4.09E-02	8	6.15E-01	7.69E-02	5.32E-01	3.07E+00	3.84E-01	1.07E-01
Benzo(g,h,i)perylene	0.00E+00	mg/L	0.00E+00	mg/kg	2.50E-02	mg/kg	NA	NA	2.94E+00	2.01E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.20E-04	NA	NA	1.76E-02	0.00E+00	0.00E+00	0.00E+00	1.83E-02	8	6.15E-01	7.69E-02	2.38E-01	3.07E+00	3.84E-01	4.76E-02
Benzo(k)fluoranthene	0.00E+00	mg/L	0.00E+00	mg/kg	3.30E-02	mg/kg	NA	NA	2.60E+00	1.87E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.18E-04	NA	NA	2.06E-02	0.00E+00	0.00E+00	0.00E+00	2.14E-02	8	6.15E-01	7.69E-02	2.79E-01	3.07E+00	3.84E-01	5.58E-02
Chrysene	0.00E+00	mg/L	0.00E+00	mg/kg	5.70E-02	mg/kg	NA	NA	2.29E+00	2.13E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.41E-03	NA	NA	3.13E-02	0.00E+00	0.00E+00	0.00E+00	3.27E-02	8	6.15E-01	7.69E-02	4.26E-01	3.07E+00	3.84E-01	8.53E-02
Dibenz(a,h)anthracene	0.00E+00	mg/L	0.00E+00	mg/kg	6.40E-03	mg/kg	NA	NA	2.31E+00	1.30E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.59E-04	NA	NA	3.55E-03	0.00E+00	0.00E+00	0.00E+00	3.71E-03	8	6.15E-01	7.69E-02	4.82E-02	3.07E+00	3.84E-01	9.66E-03
Dieldrin	0.00E+00	mg/L	0.00E+00	mg/kg	4.52E-03	mg/kg	NA	NA	1.47E+01	4.10E-01	1.76E+01	1.76E+01	0.00E+00	0.00E+00	1.12E-04	NA	NA	1.59E-02	0.00E+00	0.00E+00	0.00E+00	1.61E-02	8	1.50E-02	1.88E-03	8.56E+00	3.00E-02	3.75E-03	4.28E+00
Endosulfan I	0.00E+00	mg/L	0.00E+00	mg/kg	9.61E-04	mg/kg	NA	NA	1.93E-01	3.67E-01	1.00E+00	1.00E+00	0.00E+00	0.00E+00	2.38E-05	NA	NA	4.46E-05	0.00E+00	0.00E+00	0.00E+00	6.84E-05	8	1.50E-01	1.88E-02	3.65E-03	7.50E-01	9.38E-02	7.30E-04
Endosulfan II	0.00E+00	mg/L	0.00E+00	mg/kg	3.94E-03	mg/kg	NA	NA	1.93E-01	3.67E-01	1.00E+00	1.00E+00	0.00E+00	0.00E+00	9.77E-05	NA	NA	1.83E-04	0.00E+00	0.00E+00	0.00E+00	2.81E-04	8	1.50E-01	1.88E-02	1.50E-02	7.50E-01	9.38E-02	2.99E-03
Endosulfan sulfate	0.00E+00	mg/L	0.00E+00	mg/kg	7.10E-03	mg/kg	NA	NA	1.74E-01	3.05E-01	1.00E+00	1.00E+00	0.00E+00	0.00E+00	1.76E-04	NA	NA	2.97E-04	0.00E+00	0.00E+00	0.00E+00	4.73E-04	8	1.50E-01	1.88E-02	2.52E-02	7.50E-01	9.38E-02	5.05E-03
Endrin aldehyde	0.00E+00	mg/L	0.00E+00	mg/kg	4.28E-04	mg/kg	NA	NA	5.32E+00	6.51E-02	1.00E+00	1.00E+00	0.00E+00	0.00E+00	1.06E-05	NA	NA	5.47E-04	0.00E+00	0.00E+00	0.00E+00	5.58E-04	8	9.20E-02	1.15E-02	4.85E-02	9.20E-01	1.15E-01	4.85E-03
Endrin ketone	0.00E+00	mg/L	0.00E+00	mg/kg	2.90E-03	mg/kg	NA	NA	8.76E+00	5.06E-02	1.00E+00	1.00E+00	0.00E+00	0.00E+00	7.19E-05	NA	NA	6.09E-03	0.00E+00	0.00E+00	0.00E+00	6.17E-03	8	9.20E-02	1.15E-02	5.36E-01	9.20E-01	1.15E-01	5.36E-02
Fluoranthene	0.00E+00	mg/L	0.00E+00	mg/kg	1.10E-01	mg/kg	NA	NA	3.04E+00	5.00E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.73E-03	NA	NA	8.03E-02	0.00E+00	0.00E+00	0.00E+00	8.30E-02	8	6.15E-01	7.69E-02	1.08E+00	3.07E+00	3.84E-01	2.16E-01
Fluorene	0.00E+00	mg/L	0.00E+00	mg/kg	9.10E-03	mg/kg	NA	NA	9.57E+00	2.35E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.26E-04	NA	NA	2.09E-02	0.00E+00	0.00E+00	0.00E+00	2.11E-02	8	6.56E+01	8.20E+00	2.58E-03	1.10E+02	1.38E+01	1.54E-03
gamma-Chlordane	0.00E+00	mg/L	0.00E+00	mg/kg	1.10E-03	mg/kg	NA	NA	1.24E+01	9.33E-03	1.00E+00	1.00E+00	0.00E+00	0.00E+00	2.73E-05	NA	NA	3.26E-03	0.00E+00	0.00E+00	0.00E+00	3.29E-03	8	4.60E+00	5.75E-01	5.72E-03	9.20E+00	1.15E+00	2.86E-03
Heptachlor epoxide	0.00E+00	mg/L	0.00E+00	mg/kg	1.06E-03	mg/kg	NA	NA	6.76E+00	8.96E-02	1.00E+00	1.00E+00	0.00E+00	0.00E+00	2.63E-05	NA	NA	1.72E-03	0.00E+00	0.00E+00	0.00E+00	1.75E-03	8	1.00E-01	1.25E-02	1.40E-01	1.00E+00	1.25E-01	1.40E-02
Indeno(1,2,3-cd)pyrene	0.00E+00	mg/L	0.00E+00	mg/kg	2.63E-02	mg/kg	NA	NA	2.86E+00	1.10E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.52E-04	NA	NA	1.81E-02	0.00E+00	0.00E+00	0.00E+00	1.87E-02	8	6.15E-01	7.69E-02	2.43E-01	3.07E+00	3.84E-01	4.87E-02
Methoxychlor	0.00E+00	mg/L	0.00E+00	mg/kg	1.02E-02	mg/kg	NA	NA	7.73E+00	2.05E-02	1.00E+00	1.00E+00	0.00E+00	0.00E+00	2.53E-04	NA	NA	1.89E-02	0.00E+00	0.00E+00	0.00E+00	1.92E-02	8	4.00E+00	5.00E-01	3.84E-02	8.00E+00	1.00E+00	1.92E-02
Naphthalene	0.00E+00	mg/L	0.00E+00	mg/kg	1.30E-01	mg/kg	NA	NA	4.40E+00	1.22E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.22E-03	NA	NA	1.37E-01	0.00E+00	0.00E+00	0.00E+00	1.41E-01	8	6.56E+01	8.20E+00	1.71E-02	1.10E+02	1.38E+01	1.02E-02
Phenanthrene	0.00E+00	mg/L	0.00E+00	mg/kg	3.00E-01	mg/kg	NA	NA	1.72E+00	1.34E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.44E-03	NA	NA	1.24E-01	0.00E+00	0.00E+00	0.00E+00	1.31E-01	8	6.56E+01	8.20E+00	1.60E-02	1.10E+02	1.38E+01	9.55E-03
Pyrene	0.00E+00	mg/L	0.00E+00	mg/kg	9.20E-02	mg/kg	NA	NA	1.75E+00	7.20E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.28E-03	NA	NA	3.86E-02	0.00E+00	0.00E+00	0.00E+00	4.09E-02	8	6.15E-01	7.69E-02	5.32E-01	3.07E+00	3.84E-01	1.07E-01
Arsenic	0.00E+00	mg/L	0.00E+00	mg/kg	3.70E+01	mg/kg	NA	NA	8.35E-02	3.75E-02	4.08E-03	4.08E-03	0.00E+00	0.00E+00	9.18E-01	NA	NA	7.42E-01	0.00E+00	0.00E+00	0.00E+00	1.66E+00	8	1.26E-01	1.58E-02	1.05E+02	1.26E+00	1.58E-01	1.05E+01
Cadmium	0.00E+00	mg/L	0.00E+00	mg/kg	1.10E-01	mg/kg	NA	NA	1.30E+01	1.69E+00	9.12E-01	9.12E-01	0.00E+00	0.00E+00	2.73E-03	NA	NA	3.44E-01	0.00E+00	0.00E+00	0.00E+00	3.46E-01	8	1.00E+00	1.25E-01	2.77E+00	1.00E+01	1.25E+00	2.77E-01
Chromium	0.00E+00	mg/L	0.00E+00	mg/kg	2.88E+01	mg/kg	NA	NA	3.06E-01	4.10E-02	9.49E-02	9.49E-02	0.00E+00	0.00E+00	7.14E-01	NA	NA	2.12E+00	0.00E+00	0.00E+00	0.00E+00	2.83E+00	8	2.74E+03	3.42E+02	8.27E-03	1.37E+04	1.71E+03	1.65E-03
Copper	0.00E+00	mg/L	0.00E+00	mg/kg	1.53E+01	mg/kg	NA	NA	5.15E-01	3.73E-01	7.46E-01	7.46E-01	0.00E+00	0.00E+00	3.79E-01	NA	NA	1.89E+00	0.00E+00	0.00E+00	0.00E+00	2.27E+00	8	1.17E+01	1.46E+00	1.55E+00	1.51E+01	1.89E+00	1.20E+00
Lead	0.00E+00	mg/L	0.00E+00	mg/kg	3.09E+01	mg/kg	NA	NA	4.15E-01	5.88E-02	1.59E-01	1.59E-01	0.00E+00	0.00E+00	7.66E-01	NA	NA	3.08E+00	0.00E+00	0.00E+00	0.00E+00	3.84E+00	8	8.00E+00	1.00E+00	3.84E+00	8.00E+01	1.00E+01	3.84E-01
Mercury	0.00E+00	mg/L	0.00E+00	mg/kg	5.61E-01	mg/kg	NA	NA	3.30E+01	4.80E-01	1.05E+00	1.05E+00	0.00E+00	0.00E+00	1.39E-02	NA	NA	4.44E+00	0.00E+00	0.00E+00	0.00E+00	4.46E+00	8	1.00E+00	1.25E-01	3.57E+01	5.00E+00	6.25E-01	7.13E+00
Nickel	0.00E+00	mg/L	0.00E+00	mg/kg	1.28E+01	mg/kg	NA	NA	7.80E+00	5.70E-02	2.00E-01	2.00E-01	0.00E+00	0.00E+00	3.17E-01	NA	NA	2.40E+01	0.00E+00	0.00E+00	0.00E+00	2.43E+01	8	4.00E+01	5.00E+00	4.86E+00	8.00E+01	1.00E+01	2.43E+00
Selenium	0.00E+00	mg/L	0.00E+00	mg/kg	7.00E+00	mg/kg	NA	NA	5.52E-01	6.22E-01	1.96E-01	1.96E-01	0.00E+00	0.00E+00	1.74E-01	NA	NA	9.27E-01	0.00E+00	0.00E+00	0.00E+00	1.10E+00	8	2.00E-01	2.50E-02	4.40E+01	3.30E-01	4.13E-02	2.67E+01
Silver	0.00E+00	mg/L	0.00E+00	mg/kg	4.98E-01	mg/kg	NA	NA	2.05E+00	1.40E-02	4.00E-03	4.00E-03	0.00E+00	0.00E+00	1.24E-02	NA	NA	2.44E-01	0.00E+00	0.00E+00	0.00E+00	2.57E-01	8	2.22E+01	2.78E+00	9.25E-02	2.22E+02	2.78E+01	9.25E-03
Zinc	0.00E+00	mg/L	0.00E+00	mg/kg	7.63E+01	mg/kg	NA	NA	4.65E+00	6.99E-01	1.40E+00	1.40E+00	0.00E+00	0.00E+00	1.89E+00	NA	NA	8.51E+01	0.00E+00	0.00E+00	0.00E+00	8.70E+01	8	1.60E+02	2.00E+01	4.35E+00	3.20E+02	4.00E+01	2.17E+00
																						Hazard Index (Total EEQ):			1.3E+03			1.7E+02

Intake Equation:

$$Ej = \left(\frac{A}{HR} \left[\sum_{i=1}^{m} \left(\frac{IRi \, x \, Cij}{BW} \right) \right] \right)$$

Where:
Ej = Total Exposure to Chemical
A = Site Area
HR = Home Range
m = Total number of ingested media
i = counter
IRi = Consumption Rate for Medium
Cij = Chemical concentration (j) in medium (I) (mg/kg or mg/L)
BW = Body Weight

Notes:
Tier 1 = Max EEQ using max EPC, max BAF/BCF, max Intake Rates, min BW, and FHR =1.
Tier 2 = EEQ using 95% EPC, non-max BAF/BCF, avg Intake Rates, avg BW and calculated FHR.
BAF = Bioaccumulation Factor (may be BCF if this is the only value available)
EEQ = Ecological Effects Quotient.
L = LOAEL based; N = NOAEL based
LOAEL = Lowest Observed Adverse Effect Level
NOAEL = No Observed Adverse Effect Level
NA = Not applicable/Not available
PDE = Predicted Daily Exposure
BAF (or BCF) values from appropriate text tables (BCF = bioconcentration factor)
Some BAF (or BCF) values based on media regression equations (value in box): n See appropriate text tables for equations.
If BAF/BCF regression equation produced Tier 2 value exceeding maximum Tier 1 BAF/BCF value, Tier 1 value used a default.
LOAEL and NOAEL values from appropriate toxicity summary tables in the text.
UF = Uncertainty Factor for toxicity factor extrapolation, and Adjusted LOAEL or NOAEL = LOAEL/UF or NOAEL/UF
A "0" entry in the exposure concentration column indicates this chemical not selected as a COPEC for this medium.
Receptor diet data and home range data from appropriate text table.
Exposure point concentrations (EPCs) from appropriate text tables.

Species-Specific Factors

Plant diet fraction =	0	unitless
Fish diet fraction =	0	unitless
Aq. Invert diet fraction =	0	unitless
Terr. Invert diet fraction =	1	unitless
Mammal diet fraction =	0	unitless
Bird diet fraction =	0	unitless
Soil ingestion rate =	0.00031	kg/d
Sediment ingestion rate =	0	kg/d
Food ingestion rate =	0.003	kg/d
Body weight =	0.0125	kg
Home range =	0.96	acres
Water intake rate =	0.0033	L/d
Site Area =	0.57	acres
Frac. home range (FHR) =	1.00E+00	unitless

TABLE F-15
TIER 2 CHEMICALS OF POTENTIAL ECOLOGICAL CONCERN EEQs AND HAZARD INDICES FOR SHORT-TAILED SHREWS AT SWMU 59

Hazard Estimate - Tier 2
Short-tailed Shrew

Chemical	Surface Water Exposure Point Concentration	Units	Sediment Exposure Point Concentration	Units	Soil Exposure Point Concentration	Units	Fish BAF	Aq. Invert. BAF	Terr. Invert. BAF	Plant BAF	Mammal BAF	Bird BAF	PDE Surface Water	PDE Sediment	PDE Soil	PDE Fish	PDE Aq. Invert.	PDE Terr. Invert.	PDE Plants	PDE Mammals	PDE Birds	Total PDE	Chemical-Specific Toxicity Value UF	NOAEL	Adjusted NOAEL	EEQ N	LOAEL	Adjusted LOAEL	EEQ L
							---------- unitless ----------						mg/kg-d	mg/kg-d	mg/kg-d	mg/kg-d	mg/kg-d	mg/kg-d	mg/kg-d	mg/kg-d	mg/kg-d	mg/kg-d		mg/kg-d	mg/kg-d		mg/kg-d	mg/kg-d	
2,3,7,8-TCDD-TE	0.00E+00	mg/L	0.00E+00	mg/kg	8.67E-06	mg/kg	NA	NA	4.19E+00	3.87E-03	2.20E+00	2.20E+00	0.00E+00	0.00E+00	7.89E-08	NA	NA	3.16E-06	0.00E+00	0.00E+00	0.00E+00	3.24E-06	8	1.00E-06	1.25E-07	2.59E+01	1.00E-05	1.25E-06	2.59E+00
1,3,5-Trinitrobenzene	0.00E+00	mg/L	0.00E+00	mg/kg	1.38E-01	mg/kg	NA	NA	6.35E-02	5.62E+00	5.00E-01	5.00E-01	0.00E+00	0.00E+00	1.26E-03	NA	NA	7.63E-04	0.00E+00	0.00E+00	0.00E+00	2.02E-03	8	1.34E+01	1.68E+00	1.21E-03	6.70E+01	8.38E+00	2.41E-04
4,4'-DDD	0.00E+00	mg/L	0.00E+00	mg/kg	1.00E-03	mg/kg	NA	NA	2.58E+01	1.57E-02	5.00E-01	5.00E-01	0.00E+00	0.00E+00	9.10E-06	NA	NA	2.25E-03	0.00E+00	0.00E+00	0.00E+00	2.26E-03	8	8.00E-01	1.00E-01	2.26E-02	4.00E+00	5.00E-01	4.51E-03
4,4'-DDT	0.00E+00	mg/L	0.00E+00	mg/kg	4.41E-03	mg/kg	NA	NA	1.70E+01	4.61E-03	1.49E+00	1.49E+00	0.00E+00	0.00E+00	4.01E-05	NA	NA	6.55E-03	0.00E+00	0.00E+00	0.00E+00	6.59E-03	8	8.00E-01	1.00E-01	6.59E-02	4.00E+00	5.00E-01	1.32E-02
Acenaphthylene	0.00E+00	mg/L	0.00E+00	mg/kg	2.90E-03	mg/kg	NA	NA	2.29E+01	1.08E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.64E-05	NA	NA	5.78E-03	0.00E+00	0.00E+00	0.00E+00	5.81E-03	8	6.56E+01	8.20E+00	7.08E-04	1.10E+02	1.38E+01	4.23E-04
Anthracene	0.00E+00	mg/L	0.00E+00	mg/kg	2.00E-02	mg/kg	NA	NA	2.42E+00	8.85E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.82E-04	NA	NA	4.21E-03	0.00E+00	0.00E+00	0.00E+00	4.40E-03	8	6.56E+01	8.20E+00	5.36E-04	1.10E+02	1.38E+01	3.20E-04
Aroclor 1254	0.00E+00	mg/L	0.00E+00	mg/kg	2.80E-02	mg/kg	NA	NA	2.12E+00	3.58E-03	5.00E-01	5.00E-01	0.00E+00	0.00E+00	2.55E-04	NA	NA	5.18E-03	0.00E+00	0.00E+00	0.00E+00	5.43E-03	8	1.40E-01	1.75E-02	3.10E-01	6.80E-01	8.50E-02	6.39E-02
Benzo(a)anthracene	0.00E+00	mg/L	0.00E+00	mg/kg	3.67E-02	mg/kg	NA	NA	1.59E+00	2.55E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.34E-04	NA	NA	5.08E-03	0.00E+00	0.00E+00	0.00E+00	5.42E-03	8	6.15E-01	7.69E-02	7.04E-02	3.07E+00	3.84E-01	1.41E-02
Benzo(a)pyrene	0.00E+00	mg/L	0.00E+00	mg/kg	3.59E-02	mg/kg	NA	NA	1.33E+00	1.38E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.27E-04	NA	NA	4.16E-03	0.00E+00	0.00E+00	0.00E+00	4.48E-03	8	1.00E+00	1.25E-01	3.59E-02	1.00E+01	1.25E+00	3.59E-03
Benzo(b)fluoranthene	0.00E+00	mg/L	0.00E+00	mg/kg	3.87E-02	mg/kg	NA	NA	2.60E+00	3.10E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.52E-04	NA	NA	8.76E-03	0.00E+00	0.00E+00	0.00E+00	9.11E-03	8	6.15E-01	7.69E-02	1.19E-01	3.07E+00	3.84E-01	2.38E-02
Benzo(g,h,i)perylene	0.00E+00	mg/L	0.00E+00	mg/kg	2.21E-02	mg/kg	NA	NA	2.94E+00	1.96E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.01E-04	NA	NA	5.66E-03	0.00E+00	0.00E+00	0.00E+00	5.86E-03	8	6.15E-01	7.69E-02	7.62E-02	3.07E+00	3.84E-01	1.53E-02
Benzo(k)fluoranthene	0.00E+00	mg/L	0.00E+00	mg/kg	2.90E-02	mg/kg	NA	NA	2.60E+00	1.90E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.64E-04	NA	NA	6.57E-03	0.00E+00	0.00E+00	0.00E+00	6.83E-03	8	6.15E-01	7.69E-02	8.88E-02	3.07E+00	3.84E-01	1.78E-02
Chrysene	0.00E+00	mg/L	0.00E+00	mg/kg	3.87E-02	mg/kg	NA	NA	2.29E+00	2.49E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.52E-04	NA	NA	7.72E-03	0.00E+00	0.00E+00	0.00E+00	8.07E-03	8	6.15E-01	7.69E-02	1.05E-01	3.07E+00	3.84E-01	2.10E-02
Dibenz(a,h)anthracene	0.00E+00	mg/L	0.00E+00	mg/kg	6.40E-03	mg/kg	NA	NA	2.31E+00	1.30E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.83E-05	NA	NA	1.29E-03	0.00E+00	0.00E+00	0.00E+00	1.35E-03	8	6.15E-01	7.69E-02	1.75E-02	3.07E+00	3.84E-01	3.51E-03
Dieldrin	0.00E+00	mg/L	0.00E+00	mg/kg	4.52E-03	mg/kg	NA	NA	1.47E+01	4.10E-01	1.76E+01	1.76E+01	0.00E+00	0.00E+00	4.12E-05	NA	NA	5.79E-03	0.00E+00	0.00E+00	0.00E+00	5.83E-03	8	1.50E-02	1.88E-03	3.11E+00	3.00E-02	3.75E-03	1.55E+00
Endosulfan I	0.00E+00	mg/L	0.00E+00	mg/kg	9.61E-04	mg/kg	NA	NA	1.91E-01	3.67E-01	5.00E-01	5.00E-01	0.00E+00	0.00E+00	8.75E-06	NA	NA	1.60E-05	0.00E+00	0.00E+00	0.00E+00	2.47E-05	8	1.50E-01	1.88E-02	1.32E-03	7.50E-01	9.38E-02	2.64E-04
Endosulfan II	0.00E+00	mg/L	0.00E+00	mg/kg	3.94E-03	mg/kg	NA	NA	1.91E-01	3.67E-01	5.00E-01	5.00E-01	0.00E+00	0.00E+00	3.59E-05	NA	NA	6.55E-05	0.00E+00	0.00E+00	0.00E+00	1.01E-04	8	1.50E-01	1.88E-02	5.41E-03	7.50E-01	9.38E-02	1.08E-03
Endosulfan sulfate	0.00E+00	mg/L	0.00E+00	mg/kg	7.10E-03	mg/kg	NA	NA	1.72E-01	3.05E-01	5.00E-01	5.00E-01	0.00E+00	0.00E+00	6.46E-05	NA	NA	1.06E-04	0.00E+00	0.00E+00	0.00E+00	1.71E-04	8	1.50E-01	1.88E-02	9.13E-03	7.50E-01	9.38E-02	1.83E-03
Endrin aldehyde	0.00E+00	mg/L	0.00E+00	mg/kg	4.28E-04	mg/kg	NA	NA	5.26E+00	6.51E-02	5.00E-01	5.00E-01	0.00E+00	0.00E+00	3.90E-06	NA	NA	1.96E-04	0.00E+00	0.00E+00	0.00E+00	2.00E-04	8	9.20E-02	1.15E-02	1.74E-02	9.20E-01	1.15E-01	1.74E-03
Endrin ketone	0.00E+00	mg/L	0.00E+00	mg/kg	2.90E-03	mg/kg	NA	NA	8.65E+00	5.06E-02	5.00E-01	5.00E-01	0.00E+00	0.00E+00	2.64E-05	NA	NA	2.18E-03	0.00E+00	0.00E+00	0.00E+00	2.21E-03	8	9.20E-02	1.15E-02	1.92E-01	9.20E-01	1.15E-01	1.92E-02
Fluoranthene	0.00E+00	mg/L	0.00E+00	mg/kg	8.28E-02	mg/kg	NA	NA	3.04E+00	5.00E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.54E-04	NA	NA	2.19E-02	0.00E+00	0.00E+00	0.00E+00	2.27E-02	8	6.15E-01	7.69E-02	2.95E-01	3.07E+00	3.84E-01	5.91E-02
Fluorene	0.00E+00	mg/L	0.00E+00	mg/kg	9.10E-03	mg/kg	NA	NA	9.57E+00	2.35E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.28E-05	NA	NA	7.58E-03	0.00E+00	0.00E+00	0.00E+00	7.67E-03	8	6.56E+01	8.20E+00	9.35E-04	1.10E+02	1.38E+01	5.58E-04
gamma-Chlordane	0.00E+00	mg/L	0.00E+00	mg/kg	1.10E-03	mg/kg	NA	NA	1.22E+01	9.33E-03	5.00E-01	5.00E-01	0.00E+00	0.00E+00	1.00E-05	NA	NA	1.17E-03	0.00E+00	0.00E+00	0.00E+00	1.18E-03	8	4.60E+00	5.75E-01	2.05E-03	9.20E+00	1.15E+00	1.03E-03
Heptachlor epoxide	0.00E+00	mg/L	0.00E+00	mg/kg	1.06E-03	mg/kg	NA	NA	6.68E+00	8.96E-02	5.00E-01	5.00E-01	0.00E+00	0.00E+00	9.65E-06	NA	NA	6.16E-04	0.00E+00	0.00E+00	0.00E+00	6.26E-04	8	1.00E-01	1.25E-02	5.01E-02	1.00E+00	1.25E-01	5.01E-03
Indeno(1,2,3-cd)pyrene	0.00E+00	mg/L	0.00E+00	mg/kg	2.27E-02	mg/kg	NA	NA	2.86E+00	1.10E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.07E-04	NA	NA	5.65E-03	0.00E+00	0.00E+00	0.00E+00	5.86E-03	8	6.15E-01	7.69E-02	7.62E-02	3.07E+00	3.84E-01	1.53E-02
Methoxychlor	0.00E+00	mg/L	0.00E+00	mg/kg	1.02E-02	mg/kg	NA	NA	7.64E+00	2.05E-02	5.00E-01	5.00E-01	0.00E+00	0.00E+00	9.29E-05	NA	NA	6.78E-03	0.00E+00	0.00E+00	0.00E+00	6.88E-03	8	4.00E+00	5.00E-01	1.38E-02	8.00E+00	1.00E+00	6.88E-03
Naphthalene	0.00E+00	mg/L	0.00E+00	mg/kg	1.30E-01	mg/kg	NA	NA	4.40E+00	1.22E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.18E-03	NA	NA	4.98E-02	0.00E+00	0.00E+00	0.00E+00	5.10E-02	8	6.56E+01	8.20E+00	6.22E-03	1.10E+02	1.38E+01	3.71E-03
Phenanthrene	0.00E+00	mg/L	0.00E+00	mg/kg	1.10E-01	mg/kg	NA	NA	1.72E+00	1.96E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.00E-03	NA	NA	1.65E-02	0.00E+00	0.00E+00	0.00E+00	1.75E-02	8	6.56E+01	8.20E+00	2.13E-03	1.10E+02	1.38E+01	1.27E-03
Pyrene	0.00E+00	mg/L	0.00E+00	mg/kg	8.34E-02	mg/kg	NA	NA	1.75E+00	7.20E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.59E-04	NA	NA	1.27E-02	0.00E+00	0.00E+00	0.00E+00	1.35E-02	8	6.15E-01	7.69E-02	1.75E-01	3.07E+00	3.84E-01	3.51E-02
Arsenic	0.00E+00	mg/L	0.00E+00	mg/kg	2.07E+01	mg/kg	NA	NA	9.90E-02	3.75E-02	4.53E-03	4.53E-03	0.00E+00	0.00E+00	1.89E-01	NA	NA	1.79E-01	0.00E+00	0.00E+00	0.00E+00	3.68E-01	8	1.26E-01	1.58E-02	2.33E+01	1.26E+00	1.58E-01	2.33E+00
Cadmium	0.00E+00	mg/L	0.00E+00	mg/kg	1.10E-01	mg/kg	NA	NA	1.30E+01	1.69E+00	9.12E-01	9.12E-01	0.00E+00	0.00E+00	1.00E-03	NA	NA	1.25E-01	0.00E+00	0.00E+00	0.00E+00	1.26E-01	8	1.00E+00	1.25E-01	1.01E+00	1.00E+01	1.25E+00	1.01E-01
Chromium	0.00E+00	mg/L	0.00E+00	mg/kg	1.91E+01	mg/kg	NA	NA	3.06E-01	4.10E-02	1.06E-01	1.06E-01	0.00E+00	0.00E+00	1.74E-01	NA	NA	5.09E-01	0.00E+00	0.00E+00	0.00E+00	6.83E-01	8	2.74E+03	3.42E+02	2.00E-03	1.37E+04	1.71E+03	3.99E-04
Copper	0.00E+00	mg/L	0.00E+00	mg/kg	1.20E+01	mg/kg	NA	NA	5.15E-01	4.33E-01	9.20E-01	9.20E-01	0.00E+00	0.00E+00	1.09E-01	NA	NA	5.37E-01	0.00E+00	0.00E+00	0.00E+00	6.46E-01	8	1.17E+01	1.46E+00	4.42E-01	1.51E+01	1.89E+00	3.42E-01
Lead	0.00E+00	mg/L	0.00E+00	mg/kg	1.82E+01	mg/kg	NA	NA	4.60E-01	7.42E-02	2.14E-01	2.14E-01	0.00E+00	0.00E+00	1.65E-01	NA	NA	7.27E-01	0.00E+00	0.00E+00	0.00E+00	8.92E-01	8	8.00E+00	1.00E+00	8.92E-01	8.00E+01	1.00E+01	8.92E-02
Mercury	0.00E+00	mg/L	0.00E+00	mg/kg	3.00E-01	mg/kg	NA	NA	2.42E+00	6.40E-01	1.92E-01	1.92E-01	0.00E+00	0.00E+00	2.73E-03	NA	NA	6.33E-02	0.00E+00	0.00E+00	0.00E+00	6.60E-02	8	1.00E+00	1.25E-01	5.28E-01	5.00E+00	6.25E-01	1.06E-01
Nickel	0.00E+00	mg/L	0.00E+00	mg/kg	8.80E+00	mg/kg	NA	NA	4.51E+00	6.26E-02	2.45E-01	2.45E-01	0.00E+00	0.00E+00	8.01E-02	NA	NA	3.46E+00	0.00E+00	0.00E+00	0.00E+00	3.54E+00	8	4.00E+01	5.00E+00	7.07E-01	8.00E+01	1.00E+01	3.54E-01
Selenium	0.00E+00	mg/L	0.00E+00	mg/kg	6.70E+00	mg/kg	NA	NA	5.58E-01	6.19E-01	2.02E-01	2.02E-01	0.00E+00	0.00E+00	6.10E-02	NA	NA	3.26E-01	0.00E+00	0.00E+00	0.00E+00	3.87E-01	8	2.00E-01	2.50E-02	1.55E+01	3.30E-01	4.13E-02	9.37E+00
Silver	0.00E+00	mg/L	0.00E+00	mg/kg	3.44E-01	mg/kg	NA	NA	2.05E+00	1.40E-02	4.00E-03	4.00E-03	0.00E+00	0.00E+00	3.13E-03	NA	NA	6.13E-02	0.00E+00	0.00E+00	0.00E+00	6.44E-02	8	2.22E+01	2.78E+00	2.32E-02	2.22E+02	2.78E+01	2.32E-03
Zinc	0.00E+00	mg/L	0.00E+00	mg/kg	3.80E+01	mg/kg	NA	NA	7.43E+00	9.54E-01	2.67E+00	2.67E+00	0.00E+00	0.00E+00	3.46E-01	NA	NA	2.46E+01	0.00E+00	0.00E+00	0.00E+00	2.49E+01	8	1.60E+02	2.00E+01	1.25E+00	3.20E+02	4.00E+01	6.23E-01

Hazard Index (Total EEQ): 7.4E+01 1.8E+01

Intake Equation:

$$Ej = \left(\frac{A}{HR} \left[\sum_{i=1}^{m} \left(\frac{IRi \, x Cij}{BW} \right) \right] \right)$$

Where:
Ej = Total Exposure to Chemical
A = Site Area
HR = Home Range
m = Total number of ingested media
i = counter
IRi = Consumption Rate for Medium
Cij = Chemical concentration (j) in medium (I) (mg/kg or mg/L)
BW = Body Weight

Notes:
Tier 1 = Max EEQ using max EPC, max BAF/BCF, max Intake Rates, min BW, and FHR =1.
Tier 2 = EEQ using 95% EPC, non-max BAF/BCF, avg Intake Rates, avg BW and calculated FHR.
BAF = Bioaccumulation Factor (may be BCF if this is the only value available)
EEQ = Ecological Effects Quotient.
L = LOAEL based; N = NOAEL based
LOAEL = Lowest Observed Adverse Effect Level
NOAEL = No Observed Adverse Effect Level
NA = Not applicable/Not available
PDE = Predicted Daily Exposure
BAF (or BCF) values from appropriate text tables (BCF = bioconcentration factor)
Some BAF (or BCF) values based on media regression equations (value in box): n See appropriate text tables for equations.
If BAF/BCF regression equation produced Tier 2 value exceeding maximum Tier 1 BAF/BCF value, Tier 1 value used as default.
LOAEL and NOAEL values from appropriate toxicity summary tables in the text.
UF = Uncertainty Factor for toxicity factor extrapolation, and Adjusted LOAEL or NOAEL = LOAEL/UF or NOAEL/UF
A "0" entry in the exposure concentration column indicates this chemical not selected as a COPEC for this medium.
Receptor diet data and home range data from appropriate text table.
Exposure point concentrations (EPCs) from appropriate text tables.

Species-Specific Factors

Plant diet fraction =	0	unitless
Fish diet fraction =	0	unitless
Aq. Invert diet fraction =	0	unitless
Terr. Invert diet fraction =	1	unitless
Mammal diet fraction =	0	unitless
Bird diet fraction =	0	unitless
Soil ingestion rate =	0.00023	kg/d
Sediment ingestion rate =	0	kg/d
Food ingestion rate =	0.0022	kg/d
Body weight =	0.015	kg
Home range =	0.96	acres
Water intake rate =	0.0023	L/d
Site Area =	0.57	acres
Frac. home range (FHR) =	5.94E-01	unitless

TABLE F-16
TIER 1 CHEMICALS OF POTENTIAL CONCERN EEQs AND HAZARD INDICES FOR AMERICAN ROBINS AT SWMU 59

Hazard Estimate - Tier 1
American Robin

Chemical	Surface Water Exposure Point Concentration	Units	Sediment Exposure Point Concentration	Units	Soil Exposure Point Concentration	Units	Fish BAF	Aq. Invert. BAF	Terr. Invert. BAF	Plant BAF	Mammal BAF	Bird BAF	PDE Surface Water	PDE Sediment	PDE Soil	PDE Fish	PDE Aq. Invert.	PDE Terr. Invert.	PDE Plants	PDE Mammals	PDE Birds	Total PDE	Chemical-Specific Toxicity Value UF	NOAEL	Adjusted NOAEL	EEQ N	LOAEL	Adjusted LOAEL	EEQ L
							---------- unitless ----------						mg/kg-d	mg/kg-d	mg/kg-d	mg/kg-d	mg/kg-d	mg/kg-d	mg/kg-d	mg/kg-d	mg/kg-d	mg/kg-d		mg/kg-d	mg/kg-d		mg/kg-d	mg/kg-d	
2,3,7,8-TCDD-TE	0.00E+00	mg/L	0.00E+00	mg/kg	1.21E-05	mg/kg	NA	NA	4.21E+01	3.87E-03	2.20E+00	2.20E+00	0.00E+00	0.00E+00	1.53E-07	NA	NA	6.11E-05	9.19E-09	0.00E+00	0.00E+00	6.13E-05	8	1.40E-05	1.75E-06	3.50E+01	1.40E-04	1.75E-05	3.50E+00
1,3,5-Trinitrobenzene	0.00E+00	mg/L	0.00E+00	mg/kg	1.38E-01	mg/kg	NA	NA	6.42E-02	5.62E+00	1.00E+00	1.00E+00	0.00E+00	0.00E+00	1.74E-03	NA	NA	1.06E-03	1.52E-01	0.00E+00	0.00E+00	1.54E-01	8	NA	NA	NA	NA	NA	NA
4,4'-DDD	0.00E+00	mg/L	0.00E+00	mg/kg	1.00E-03	mg/kg	NA	NA	2.58E+01	1.57E-02	1.00E+00	1.00E+00	0.00E+00	0.00E+00	1.26E-05	NA	NA	3.09E-03	3.06E-06	0.00E+00	0.00E+00	3.11E-03	8	2.80E-03	3.50E-04	8.87E+00	2.80E-02	3.50E-03	8.87E-01
4,4'-DDT	0.00E+00	mg/L	0.00E+00	mg/kg	4.41E-03	mg/kg	NA	NA	1.70E+01	4.61E-03	1.49E+00	1.49E+00	0.00E+00	0.00E+00	5.56E-05	NA	NA	9.00E-03	3.97E-06	0.00E+00	0.00E+00	9.06E-03	8	2.80E-03	3.50E-04	2.59E+01	2.80E-02	3.50E-03	2.59E+00
Acenaphthylene	0.00E+00	mg/L	0.00E+00	mg/kg	2.90E-03	mg/kg	NA	NA	2.29E+01	1.08E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.65E-05	NA	NA	7.95E-03	6.12E-04	0.00E+00	0.00E+00	8.60E-03	8	5.53E+02	6.91E+01	1.24E-04	2.77E+03	3.46E+02	2.49E-05
Anthracene	0.00E+00	mg/L	0.00E+00	mg/kg	2.00E-02	mg/kg	NA	NA	2.42E+00	8.85E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.52E-04	NA	NA	5.79E-03	3.46E-03	0.00E+00	0.00E+00	9.50E-03	8	5.53E+02	6.91E+01	1.37E-04	2.77E+03	3.46E+02	2.75E-05
Aroclor 1254	0.00E+00	mg/L	0.00E+00	mg/kg	6.10E-02	mg/kg	NA	NA	6.52E+01	3.58E-03	1.00E+00	1.00E+00	0.00E+00	0.00E+00	7.69E-04	NA	NA	4.76E-01	4.26E-05	0.00E+00	0.00E+00	4.77E-01	8	1.80E-01	2.25E-02	2.12E+01	1.80E+00	2.25E-01	2.12E+00
Benzo(a)anthracene	0.00E+00	mg/L	0.00E+00	mg/kg	6.00E-02	mg/kg	NA	NA	1.59E+00	2.09E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.56E-04	NA	NA	1.14E-02	2.45E-03	0.00E+00	0.00E+00	1.46E-02	8	5.53E+02	6.91E+01	2.11E-04	2.77E+03	3.46E+02	4.23E-05
Benzo(a)pyrene	0.00E+00	mg/L	0.00E+00	mg/kg	4.60E-02	mg/kg	NA	NA	1.33E+00	1.37E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.80E-04	NA	NA	7.32E-03	1.23E-03	0.00E+00	0.00E+00	9.14E-03	8	5.53E+02	6.91E+01	1.32E-04	2.77E+03	3.46E+02	2.64E-05
Benzo(b)fluoranthene	0.00E+00	mg/L	0.00E+00	mg/kg	6.30E-02	mg/kg	NA	NA	2.60E+00	3.10E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.94E-04	NA	NA	1.96E-02	3.81E-03	0.00E+00	0.00E+00	2.42E-02	8	5.53E+02	6.91E+01	3.50E-04	2.77E+03	3.46E+02	7.01E-05
Benzo(g,h,i)perylene	0.00E+00	mg/L	0.00E+00	mg/kg	2.50E-02	mg/kg	NA	NA	2.94E+00	2.01E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.15E-04	NA	NA	8.80E-03	9.80E-04	0.00E+00	0.00E+00	1.01E-02	8	5.53E+02	6.91E+01	1.46E-04	2.77E+03	3.46E+02	2.92E-05
Benzo(k)fluoranthene	0.00E+00	mg/L	0.00E+00	mg/kg	3.30E-02	mg/kg	NA	NA	2.60E+00	1.87E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.16E-04	NA	NA	1.03E-02	1.20E-03	0.00E+00	0.00E+00	1.19E-02	8	5.53E+02	6.91E+01	1.72E-04	2.77E+03	3.46E+02	3.44E-05
Chrysene	0.00E+00	mg/L	0.00E+00	mg/kg	5.70E-02	mg/kg	NA	NA	2.29E+00	2.13E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.18E-04	NA	NA	1.56E-02	2.37E-03	0.00E+00	0.00E+00	1.87E-02	8	5.53E+02	6.91E+01	2.71E-04	2.77E+03	3.46E+02	5.41E-05
Dibenz(a,h)anthracene	0.00E+00	mg/L	0.00E+00	mg/kg	6.40E-03	mg/kg	NA	NA	2.31E+00	1.30E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.06E-05	NA	NA	1.77E-03	1.62E-04	0.00E+00	0.00E+00	2.01E-03	8	5.53E+02	6.91E+01	2.91E-05	2.77E+03	3.46E+02	5.82E-06
Dieldrin	0.00E+00	mg/L	0.00E+00	mg/kg	4.52E-03	mg/kg	NA	NA	1.47E+01	4.10E-01	1.76E+01	1.76E+01	0.00E+00	0.00E+00	5.69E-05	NA	NA	7.95E-03	3.62E-04	0.00E+00	0.00E+00	8.37E-03	8	7.09E-02	8.86E-03	9.45E-01	1.22E-01	1.53E-02	5.49E-01
Endosulfan I	0.00E+00	mg/L	0.00E+00	mg/kg	9.61E-04	mg/kg	NA	NA	1.93E-01	3.67E-01	1.00E+00	1.00E+00	0.00E+00	0.00E+00	1.21E-05	NA	NA	2.22E-05	6.89E-05	0.00E+00	0.00E+00	1.03E-04	8	1.00E+01	1.25E+00	8.26E-05	5.00E+01	6.25E+00	1.65E-05
Endosulfan II	0.00E+00	mg/L	0.00E+00	mg/kg	3.94E-03	mg/kg	NA	NA	1.93E-01	3.67E-01	1.00E+00	1.00E+00	0.00E+00	0.00E+00	4.96E-05	NA	NA	9.12E-05	2.83E-04	0.00E+00	0.00E+00	4.23E-04	8	1.00E+01	1.25E+00	3.39E-04	5.00E+01	6.25E+00	6.77E-05
Endosulfan sulfate	0.00E+00	mg/L	0.00E+00	mg/kg	7.10E-03	mg/kg	NA	NA	1.74E-01	3.05E-01	1.00E+00	1.00E+00	0.00E+00	0.00E+00	8.94E-05	NA	NA	1.48E-04	4.23E-04	0.00E+00	0.00E+00	6.60E-04	8	1.00E+01	1.25E+00	5.28E-04	5.00E+01	6.25E+00	1.06E-04
Endrin aldehyde	0.00E+00	mg/L	0.00E+00	mg/kg	4.28E-04	mg/kg	NA	NA	5.32E+00	6.51E-02	1.00E+00	1.00E+00	0.00E+00	0.00E+00	5.39E-06	NA	NA	2.73E-04	5.44E-06	0.00E+00	0.00E+00	2.84E-04	8	3.00E-01	3.75E-02	7.56E-03	1.50E+00	1.88E-01	1.51E-03
Endrin ketone	0.00E+00	mg/L	0.00E+00	mg/kg	2.90E-03	mg/kg	NA	NA	8.76E+00	5.06E-02	1.00E+00	1.00E+00	0.00E+00	0.00E+00	3.65E-05	NA	NA	3.04E-03	2.86E-05	0.00E+00	0.00E+00	3.10E-03	8	3.00E-01	3.75E-02	8.28E-02	1.50E+00	1.88E-01	1.66E-02
Fluoranthene	0.00E+00	mg/L	0.00E+00	mg/kg	1.10E-01	mg/kg	NA	NA	3.04E+00	5.00E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.39E-03	NA	NA	4.00E-02	1.07E-02	0.00E+00	0.00E+00	5.21E-02	8	5.53E+02	6.91E+01	7.54E-04	2.77E+03	3.46E+02	1.51E-04
Fluorene	0.00E+00	mg/L	0.00E+00	mg/kg	9.10E-03	mg/kg	NA	NA	9.57E+00	2.35E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.15E-04	NA	NA	1.04E-02	4.18E-02	0.00E+00	0.00E+00	5.24E-02	8	5.53E+02	6.91E+01	7.57E-04	2.77E+03	3.46E+02	1.51E-04
gamma-Chlordane	0.00E+00	mg/L	0.00E+00	mg/kg	1.10E-03	mg/kg	NA	NA	1.24E+01	9.33E-03	1.00E+00	1.00E+00	0.00E+00	0.00E+00	1.39E-05	NA	NA	1.63E-03	2.00E-06	0.00E+00	0.00E+00	1.64E-03	8	2.14E+00	2.68E-01	6.14E-03	1.07E+01	1.34E+00	1.23E-03
Heptachlor epoxide	0.00E+00	mg/L	0.00E+00	mg/kg	1.06E-03	mg/kg	NA	NA	6.76E+00	8.96E-02	1.00E+00	1.00E+00	0.00E+00	0.00E+00	1.34E-05	NA	NA	8.58E-04	1.85E-05	0.00E+00	0.00E+00	8.89E-04	8	9.20E-01	1.15E-01	7.73E-03	4.60E+00	5.75E-01	1.55E-03
Indeno(1,2,3-cd)pyrene	0.00E+00	mg/L	0.00E+00	mg/kg	2.63E-02	mg/kg	NA	NA	2.86E+00	1.10E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.31E-04	NA	NA	9.00E-03	5.65E-04	0.00E+00	0.00E+00	9.90E-03	8	5.53E+02	6.91E+01	1.43E-04	2.77E+03	3.46E+02	2.86E-05
Methoxychlor	0.00E+00	mg/L	0.00E+00	mg/kg	1.02E-02	mg/kg	NA	NA	7.73E+00	2.05E-02	1.00E+00	1.00E+00	0.00E+00	0.00E+00	1.29E-04	NA	NA	9.44E-03	4.07E-05	0.00E+00	0.00E+00	9.61E-03	8	2.58E+01	3.22E+00	2.98E-03	1.29E+02	1.61E+01	5.96E-04
Naphthalene	0.00E+00	mg/L	0.00E+00	mg/kg	1.30E-01	mg/kg	NA	NA	4.40E+00	1.22E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.64E-03	NA	NA	6.85E-02	3.10E-01	0.00E+00	0.00E+00	3.80E-01	8	5.53E+02	6.91E+01	5.49E-03	2.77E+03	3.46E+02	1.10E-03
Phenanthrene	0.00E+00	mg/L	0.00E+00	mg/kg	3.00E-01	mg/kg	NA	NA	1.72E+00	1.34E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.78E-03	NA	NA	6.18E-02	7.85E-02	0.00E+00	0.00E+00	1.44E-01	8	5.53E+02	6.91E+01	2.08E-03	2.77E+03	3.46E+02	4.17E-04
Pyrene	0.00E+00	mg/L	0.00E+00	mg/kg	9.20E-02	mg/kg	NA	NA	1.75E+00	7.20E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.16E-03	NA	NA	1.93E-02	1.29E-02	0.00E+00	0.00E+00	3.34E-02	8	5.53E+02	6.91E+01	4.83E-04	2.77E+03	3.46E+02	9.65E-05
Arsenic	0.00E+00	mg/L	0.00E+00	mg/kg	3.70E+01	mg/kg	NA	NA	8.35E-02	3.75E-02	4.08E-03	4.08E-03	0.00E+00	0.00E+00	4.66E-01	NA	NA	3.70E-01	2.71E-01	0.00E+00	0.00E+00	1.11E+00	8	5.14E+00	6.43E-01	1.72E+00	1.28E+01	1.61E+00	6.90E-01
Cadmium	0.00E+00	mg/L	0.00E+00	mg/kg	1.10E-01	mg/kg	NA	NA	1.30E+01	1.69E+00	9.12E-01	9.12E-01	0.00E+00	0.00E+00	1.39E-03	NA	NA	1.71E-01	3.64E-02	0.00E+00	0.00E+00	2.09E-01	8	1.45E+00	1.81E-01	1.15E+00	2.00E+01	2.50E+00	8.37E-02
Chromium	0.00E+00	mg/L	0.00E+00	mg/kg	2.88E+01	mg/kg	NA	NA	3.06E-01	4.10E-02	9.49E-02	9.49E-02	0.00E+00	0.00E+00	3.63E-01	NA	NA	1.05E+00	2.31E-01	0.00E+00	0.00E+00	1.65E+00	8	2.66E+00	3.33E-01	4.96E+00	2.78E+00	3.48E-01	4.74E+00
Copper	0.00E+00	mg/L	0.00E+00	mg/kg	1.53E+01	mg/kg	NA	NA	5.15E-01	3.73E-01	7.46E-01	7.46E-01	0.00E+00	0.00E+00	1.93E-01	NA	NA	9.43E-01	1.12E+00	0.00E+00	0.00E+00	2.25E+00	8	4.70E+01	5.88E+00	3.83E-01	6.20E+01	7.75E+00	2.91E-01
Lead	0.00E+00	mg/L	0.00E+00	mg/kg	3.09E+01	mg/kg	NA	NA	4.15E-01	5.88E-02	1.59E-01	1.59E-01	0.00E+00	0.00E+00	3.89E-01	NA	NA	1.53E+00	3.55E-01	0.00E+00	0.00E+00	2.28E+00	8	3.85E+00	4.81E-01	4.73E+00	1.93E+01	2.41E+00	9.47E-01
Mercury	0.00E+00	mg/L	0.00E+00	mg/kg	5.61E-01	mg/kg	NA	NA	3.30E+01	4.80E-01	1.05E+00	1.05E+00	0.00E+00	0.00E+00	7.07E-03	NA	NA	2.22E+00	5.26E-02	0.00E+00	0.00E+00	2.28E+00	8	4.50E-01	5.63E-02	4.05E+01	9.00E-01	1.13E-01	2.02E+01
Nickel	0.00E+00	mg/L	0.00E+00	mg/kg	1.28E+01	mg/kg	NA	NA	7.80E+00	5.70E-02	2.00E-01	2.00E-01	0.00E+00	0.00E+00	1.61E-01	NA	NA	1.19E+01	1.42E-01	0.00E+00	0.00E+00	1.23E+01	8	7.74E+01	9.68E+00	1.27E+00	1.07E+02	1.34E+01	9.16E-01
Selenium	0.00E+00	mg/L	0.00E+00	mg/kg	7.00E+00	mg/kg	NA	NA	5.52E-01	6.22E-01	1.96E-01	1.96E-01	0.00E+00	0.00E+00	8.82E-02	NA	NA	4.62E-01	8.50E-01	0.00E+00	0.00E+00	1.40E+00	8	5.00E-01	6.25E-02	2.24E+01	1.00E+00	1.25E-01	1.12E+01
Silver	0.00E+00	mg/L	0.00E+00	mg/kg	4.98E-01	mg/kg	NA	NA	2.05E+00	1.40E-02	4.00E-03	4.00E-03	0.00E+00	0.00E+00	6.27E-03	NA	NA	1.22E-01	1.36E-03	0.00E+00	0.00E+00	1.30E-01	8	1.78E+02	2.23E+01	5.82E-03	8.90E+02	1.11E+02	1.16E-03
Zinc	0.00E+00	mg/L	0.00E+00	mg/kg	7.63E+01	mg/kg	NA	NA	4.65E+00	6.99E-01	1.40E+00	1.40E+00	0.00E+00	0.00E+00	9.61E-01	NA	NA	4.24E+01	1.04E+01	0.00E+00	0.00E+00	5.38E+01	8	1.45E+01	1.81E+00	2.97E+01	1.31E+02	1.64E+01	3.29E+00

Hazard Index (Total EEQ): 2.0E+02 5.2E+01

Intake Equation:

$$Ej = \left(\frac{A}{HR} \left[\sum_{i=1}^{m} \left(\frac{IRi \, x \, Cij}{BW} \right) \right] \right)$$

Where:
Ej = Total Exposure to Chemical
A = Site Area
HR = Home Range
m = Total number of ingested media
i = counter
IRi = Consumption Rate for Medium
Cij = Chemical concentration (j) in medium (I) (mg/kg or mg/L)
BW = Body Weight

Notes:
Tier 1 = Max EEQ using max EPC, max BAF/BCF, max Intake Rates, min BW, and FHR =1.
Tier 2 = EEQ using 95% EPC, non-max BAF/BCF, avg Intake Rates, avg BW and calculated FHR.
BAF = Bioaccumulation Factor (may be BCF if this is the only value available)
EEQ = Ecological Effects Quotient.
L = LOAEL based; N = NOAEL based
LOAEL = Lowest Observed Adverse Effect Level
NOAEL = No Observed Adverse Effect Level
NA = Not applicable/Not available
PDE = Predicted Daily Exposure
BAF (or BCF) values from appropriate text tables (BCF = bioconcentration factor)
Some BAF (or BCF) values based on media regression equations (value in box): n See appropriate text tables for equations.
If BAF/BCF regression equation produced Tier 2 value exceeding maximum Tier 1 BAF/BCF value, Tier 1 value used a default.
LOAEL and NOAEL values from appropriate toxicity summary tables in the text.
UF = Uncertainty Factor for toxicity factor extrapolation, and Adjusted LOAEL or NOAEL = LOAEL/UF or NOAEL/UF
A "0" entry in the exposure concentration column indicates this chemical not selected as a COPEC for this medium.
Receptor diet data and home range data from appropriate text table.
Exposure point concentrations (EPCs) from appropriate text tables.

Species-Specific Factors

Plant diet fraction =	0.62	unitless
Fish diet fraction =	0	unitless
Aq. Invert diet fraction =	0	unitless
Terr. Invert diet fraction =	0.38	unitless
Mammal diet fraction =	0	unitless
Bird diet fraction =	0	unitless
Soil ingestion rate =	0.0008	kg/d
Sediment ingestion rate =	0	kg/d
Food ingestion rate =	0.02	kg/d
Body weight =	0.0635	kg
Home range =	1.2	acres
Water intake rate =	0.013	L/d
Site Area =	0.57	acres
Frac. home range (FHR) =	1.00E+00	unitless

TABLE F-17
TIER 2 CHEMICALS OF POTENTIAL ECOLOGICAL CONCERN EEQs AND HAZARD INDICES FOR AMERICAN ROBINS AT SWMU 59

Hazard Estimate - Tier 2
American Robin

Chemical	Surface Water Exposure Point Concentration	Units	Sediment Exposure Point Concentration	Units	Soil Exposure Point Concentration	Units	Fish BAF	Aq. Invert. BAF	Terr. Invert. BAF	Plant BAF	Mammal BAF	Bird BAF	PDE Surface Water	PDE Sediment	PDE Soil	PDE Fish	PDE Aq. Invert.	PDE Terr. Invert.	PDE Plants	PDE Mammals	PDE Birds	Total PDE	Chemical-Specific Toxicity Value UF	NOAEL	Adjusted NOAEL	EEQ N	LOAEL	Adjusted LOAEL	EEQ L
							---------- unitless ----------						mg/kg-d	mg/kg-d	mg/kg-d	mg/kg-d	mg/kg-d	mg/kg-d	mg/kg-d	mg/kg-d	mg/kg-d	mg/kg-d		mg/kg-d	mg/kg-d		mg/kg-d	mg/kg-d	
2,3,7,8-TCDD-TE	0.00E+00	mg/L	0.00E+00	mg/kg	8.67E-06	mg/kg	NA	NA	4.19E+00	3.87E-03	2.20E+00	2.20E+00	0.00E+00	0.00E+00	3.41E-08	NA	NA	1.36E-06	2.05E-09	0.00E+00	0.00E+00	1.39E-06	8	1.40E-05	1.75E-06	7.96E-01	1.40E-04	1.75E-05	7.96E-02
1,3,5-Trinitrobenzene	0.00E+00	mg/L	0.00E+00	mg/kg	1.38E-01	mg/kg	NA	NA	6.35E-02	5.62E+00	5.00E-01	5.00E-01	0.00E+00	0.00E+00	5.43E-04	NA	NA	3.27E-04	4.73E-02	0.00E+00	0.00E+00	4.82E-02	8	NA	NA	NA	NA	NA	NA
4,4'-DDD	0.00E+00	mg/L	0.00E+00	mg/kg	1.00E-03	mg/kg	NA	NA	2.58E+01	1.57E-02	5.00E-01	5.00E-01	0.00E+00	0.00E+00	3.93E-06	NA	NA	9.64E-04	9.55E-07	0.00E+00	0.00E+00	9.69E-04	8	2.80E-03	3.50E-04	2.77E+00	2.80E-02	3.50E-03	2.77E-01
4,4'-DDT	0.00E+00	mg/L	0.00E+00	mg/kg	4.41E-03	mg/kg	NA	NA	1.70E+01	4.61E-03	1.49E+00	1.49E+00	0.00E+00	0.00E+00	1.73E-05	NA	NA	2.81E-03	1.24E-06	0.00E+00	0.00E+00	2.83E-03	8	2.80E-03	3.50E-04	8.08E+00	2.80E-02	3.50E-03	8.08E-01
Acenaphthylene	0.00E+00	mg/L	0.00E+00	mg/kg	2.90E-03	mg/kg	NA	NA	2.29E+01	1.08E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.14E-05	NA	NA	2.48E-03	1.91E-04	0.00E+00	0.00E+00	2.68E-03	8	5.53E+02	6.91E+01	3.88E-05	2.77E+03	3.46E+02	7.76E-06
Anthracene	0.00E+00	mg/L	0.00E+00	mg/kg	2.00E-02	mg/kg	NA	NA	2.42E+00	8.85E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.87E-05	NA	NA	1.81E-03	1.08E-03	0.00E+00	0.00E+00	2.97E-03	8	5.53E+02	6.91E+01	4.29E-05	2.77E+03	3.46E+02	8.58E-06
Aroclor 1254	0.00E+00	mg/L	0.00E+00	mg/kg	2.80E-02	mg/kg	NA	NA	2.12E+00	3.58E-03	5.00E-01	5.00E-01	0.00E+00	0.00E+00	1.10E-04	NA	NA	2.22E-03	6.11E-06	0.00E+00	0.00E+00	2.34E-03	8	1.80E-01	2.25E-02	1.04E-01	1.80E+00	2.25E-01	1.04E-02
Benzo(a)anthracene	0.00E+00	mg/L	0.00E+00	mg/kg	3.67E-02	mg/kg	NA	NA	1.59E+00	2.55E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.44E-04	NA	NA	2.18E-03	5.70E-04	0.00E+00	0.00E+00	2.89E-03	8	5.53E+02	6.91E+01	4.19E-05	2.77E+03	3.46E+02	8.37E-06
Benzo(a)pyrene	0.00E+00	mg/L	0.00E+00	mg/kg	3.59E-02	mg/kg	NA	NA	1.33E+00	1.38E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.41E-04	NA	NA	1.78E-03	3.03E-04	0.00E+00	0.00E+00	2.23E-03	8	5.53E+02	6.91E+01	3.22E-05	2.77E+03	3.46E+02	6.45E-06
Benzo(b)fluoranthene	0.00E+00	mg/L	0.00E+00	mg/kg	3.87E-02	mg/kg	NA	NA	2.60E+00	3.10E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.52E-04	NA	NA	3.76E-03	7.31E-04	0.00E+00	0.00E+00	4.64E-03	8	5.53E+02	6.91E+01	6.72E-05	2.77E+03	3.46E+02	1.34E-05
Benzo(g,h,i)perylene	0.00E+00	mg/L	0.00E+00	mg/kg	2.21E-02	mg/kg	NA	NA	2.94E+00	1.96E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.69E-05	NA	NA	2.43E-03	2.64E-04	0.00E+00	0.00E+00	2.78E-03	8	5.53E+02	6.91E+01	4.02E-05	2.77E+03	3.46E+02	8.04E-06
Benzo(k)fluoranthene	0.00E+00	mg/L	0.00E+00	mg/kg	2.90E-02	mg/kg	NA	NA	2.60E+00	1.90E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.14E-04	NA	NA	2.82E-03	3.36E-04	0.00E+00	0.00E+00	3.27E-03	8	5.53E+02	6.91E+01	4.73E-05	2.77E+03	3.46E+02	9.45E-06
Chrysene	0.00E+00	mg/L	0.00E+00	mg/kg	3.87E-02	mg/kg	NA	NA	2.29E+00	2.49E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.52E-04	NA	NA	3.31E-03	5.88E-04	0.00E+00	0.00E+00	4.05E-03	8	5.53E+02	6.91E+01	5.86E-05	2.77E+03	3.46E+02	1.17E-05
Dibenz(a,h)anthracene	0.00E+00	mg/L	0.00E+00	mg/kg	6.40E-03	mg/kg	NA	NA	2.31E+00	1.30E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.52E-05	NA	NA	5.52E-04	5.07E-05	0.00E+00	0.00E+00	6.28E-04	8	5.53E+02	6.91E+01	9.09E-06	2.77E+03	3.46E+02	1.82E-06
Dieldrin	0.00E+00	mg/L	0.00E+00	mg/kg	4.52E-03	mg/kg	NA	NA	1.47E+01	4.10E-01	1.76E+01	1.76E+01	0.00E+00	0.00E+00	1.78E-05	NA	NA	2.48E-03	1.13E-04	0.00E+00	0.00E+00	2.61E-03	8	7.09E-02	8.86E-03	2.95E-01	1.22E-01	1.53E-02	1.71E-01
Endosulfan I	0.00E+00	mg/L	0.00E+00	mg/kg	9.61E-04	mg/kg	NA	NA	1.91E-01	3.67E-01	5.00E-01	5.00E-01	0.00E+00	0.00E+00	3.78E-06	NA	NA	6.86E-06	2.15E-05	0.00E+00	0.00E+00	3.22E-05	8	1.00E+01	1.25E+00	2.57E-05	5.00E+01	6.25E+00	5.14E-06
Endosulfan II	0.00E+00	mg/L	0.00E+00	mg/kg	3.94E-03	mg/kg	NA	NA	1.91E-01	3.67E-01	5.00E-01	5.00E-01	0.00E+00	0.00E+00	1.55E-05	NA	NA	2.81E-05	8.82E-05	0.00E+00	0.00E+00	1.32E-04	8	1.00E+01	1.25E+00	1.05E-04	5.00E+01	6.25E+00	2.11E-05
Endosulfan sulfate	0.00E+00	mg/L	0.00E+00	mg/kg	7.10E-03	mg/kg	NA	NA	1.72E-01	3.05E-01	5.00E-01	5.00E-01	0.00E+00	0.00E+00	2.79E-05	NA	NA	4.57E-05	1.32E-04	0.00E+00	0.00E+00	2.06E-04	8	1.00E+01	1.25E+00	1.64E-04	5.00E+01	6.25E+00	3.29E-05
Endrin aldehyde	0.00E+00	mg/L	0.00E+00	mg/kg	4.28E-04	mg/kg	NA	NA	5.26E+00	6.51E-02	5.00E-01	5.00E-01	0.00E+00	0.00E+00	1.68E-06	NA	NA	8.41E-05	1.70E-06	0.00E+00	0.00E+00	8.75E-05	8	3.00E-01	3.75E-02	2.33E-03	1.50E+00	1.88E-01	4.67E-04
Endrin ketone	0.00E+00	mg/L	0.00E+00	mg/kg	2.90E-03	mg/kg	NA	NA	8.65E+00	5.06E-02	5.00E-01	5.00E-01	0.00E+00	0.00E+00	1.14E-05	NA	NA	9.37E-04	8.94E-06	0.00E+00	0.00E+00	9.57E-04	8	3.00E-01	3.75E-02	2.55E-02	1.50E+00	1.88E-01	5.11E-03
Fluoranthene	0.00E+00	mg/L	0.00E+00	mg/kg	8.28E-02	mg/kg	NA	NA	3.04E+00	5.00E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.26E-04	NA	NA	9.40E-03	2.52E-03	0.00E+00	0.00E+00	1.23E-02	8	5.53E+02	6.91E+01	1.77E-04	2.77E+03	3.46E+02	3.55E-05
Fluorene	0.00E+00	mg/L	0.00E+00	mg/kg	9.10E-03	mg/kg	NA	NA	9.57E+00	2.35E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.58E-05	NA	NA	3.25E-03	1.31E-02	0.00E+00	0.00E+00	1.63E-02	8	5.53E+02	6.91E+01	2.36E-04	2.77E+03	3.46E+02	4.73E-05
gamma-Chlordane	0.00E+00	mg/L	0.00E+00	mg/kg	1.10E-03	mg/kg	NA	NA	1.22E+01	9.33E-03	5.00E-01	5.00E-01	0.00E+00	0.00E+00	4.33E-06	NA	NA	5.02E-04	6.25E-07	0.00E+00	0.00E+00	5.07E-04	8	2.14E+00	2.68E-01	1.89E-03	1.07E+01	1.34E+00	3.79E-04
Heptachlor epoxide	0.00E+00	mg/L	0.00E+00	mg/kg	1.06E-03	mg/kg	NA	NA	6.68E+00	8.96E-02	5.00E-01	5.00E-01	0.00E+00	0.00E+00	4.17E-06	NA	NA	2.64E-04	5.79E-06	0.00E+00	0.00E+00	2.74E-04	8	9.20E-01	1.15E-01	2.39E-03	4.60E+00	5.75E-01	4.77E-04
Indeno(1,2,3-cd)pyrene	0.00E+00	mg/L	0.00E+00	mg/kg	2.27E-02	mg/kg	NA	NA	2.86E+00	1.10E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.93E-05	NA	NA	2.43E-03	1.52E-04	0.00E+00	0.00E+00	2.67E-03	8	5.53E+02	6.91E+01	3.86E-05	2.77E+03	3.46E+02	7.72E-06
Methoxychlor	0.00E+00	mg/L	0.00E+00	mg/kg	1.02E-02	mg/kg	NA	NA	7.64E+00	2.05E-02	5.00E-01	5.00E-01	0.00E+00	0.00E+00	4.01E-05	NA	NA	2.91E-03	1.27E-05	0.00E+00	0.00E+00	2.96E-03	8	2.58E+01	3.22E+00	9.19E-04	1.29E+02	1.61E+01	1.84E-04
Naphthalene	0.00E+00	mg/L	0.00E+00	mg/kg	1.30E-01	mg/kg	NA	NA	4.40E+00	1.22E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.11E-04	NA	NA	2.14E-02	9.67E-02	0.00E+00	0.00E+00	1.19E-01	8	5.53E+02	6.91E+01	1.72E-03	2.77E+03	3.46E+02	3.43E-04
Phenanthrene	0.00E+00	mg/L	0.00E+00	mg/kg	1.10E-01	mg/kg	NA	NA	1.72E+00	1.96E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.33E-04	NA	NA	7.07E-03	1.31E-02	0.00E+00	0.00E+00	2.06E-02	8	5.53E+02	6.91E+01	2.98E-04	2.77E+03	3.46E+02	5.97E-05
Pyrene	0.00E+00	mg/L	0.00E+00	mg/kg	8.34E-02	mg/kg	NA	NA	1.75E+00	7.20E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.28E-04	NA	NA	5.45E-03	3.66E-03	0.00E+00	0.00E+00	9.44E-03	8	5.53E+02	6.91E+01	1.37E-04	2.77E+03	3.46E+02	2.73E-05
Arsenic	0.00E+00	mg/L	0.00E+00	mg/kg	2.07E+01	mg/kg	NA	NA	9.90E-02	3.75E-02	4.53E-03	4.53E-03	0.00E+00	0.00E+00	8.15E-02	NA	NA	7.67E-02	4.74E-02	0.00E+00	0.00E+00	2.06E-01	8	5.14E+00	6.43E-01	3.20E-01	1.28E+01	1.61E+00	1.28E-01
Cadmium	0.00E+00	mg/L	0.00E+00	mg/kg	1.10E-01	mg/kg	NA	NA	1.30E+01	1.69E+00	9.12E-01	9.12E-01	0.00E+00	0.00E+00	4.33E-04	NA	NA	5.35E-02	1.14E-02	0.00E+00	0.00E+00	6.53E-02	8	1.45E+00	1.81E-01	3.60E-01	2.00E+01	2.50E+00	2.61E-02
Chromium	0.00E+00	mg/L	0.00E+00	mg/kg	1.91E+01	mg/kg	NA	NA	3.06E-01	4.10E-02	1.06E-01	1.06E-01	0.00E+00	0.00E+00	7.52E-02	NA	NA	2.18E-01	4.78E-02	0.00E+00	0.00E+00	3.41E-01	8	2.66E+00	3.33E-01	1.03E+00	2.78E+00	3.48E-01	9.82E-01
Copper	0.00E+00	mg/L	0.00E+00	mg/kg	1.20E+01	mg/kg	NA	NA	5.15E-01	4.33E-01	9.20E-01	9.20E-01	0.00E+00	0.00E+00	4.71E-02	NA	NA	2.30E-01	3.16E-01	0.00E+00	0.00E+00	5.94E-01	8	4.70E+01	5.88E+00	1.01E-01	6.20E+01	7.75E+00	7.66E-02
Lead	0.00E+00	mg/L	0.00E+00	mg/kg	1.82E+01	mg/kg	NA	NA	4.60E-01	7.42E-02	2.14E-01	2.14E-01	0.00E+00	0.00E+00	7.14E-02	NA	NA	3.12E-01	8.22E-02	0.00E+00	0.00E+00	4.65E-01	8	3.85E+00	4.81E-01	9.67E-01	1.93E+01	2.41E+00	1.93E-01
Mercury	0.00E+00	mg/L	0.00E+00	mg/kg	3.00E-01	mg/kg	NA	NA	2.42E+00	6.40E-01	1.92E-01	1.92E-01	0.00E+00	0.00E+00	1.18E-03	NA	NA	2.71E-02	1.17E-02	0.00E+00	0.00E+00	4.00E-02	8	4.50E-01	5.63E-02	7.12E-01	9.00E-01	1.13E-01	3.56E-01
Nickel	0.00E+00	mg/L	0.00E+00	mg/kg	8.80E+00	mg/kg	NA	NA	4.51E+00	6.26E-02	2.45E-01	2.45E-01	0.00E+00	0.00E+00	3.46E-02	NA	NA	1.48E+00	3.36E-02	0.00E+00	0.00E+00	1.55E+00	8	7.74E+01	9.68E+00	1.60E-01	1.07E+02	1.34E+01	1.16E-01
Selenium	0.00E+00	mg/L	0.00E+00	mg/kg	6.70E+00	mg/kg	NA	NA	5.58E-01	6.19E-01	2.02E-01	2.02E-01	0.00E+00	0.00E+00	2.63E-02	NA	NA	1.40E-01	2.53E-01	0.00E+00	0.00E+00	4.19E-01	8	5.00E-01	6.25E-02	6.70E+00	1.00E+00	1.25E-01	3.35E+00
Silver	0.00E+00	mg/L	0.00E+00	mg/kg	3.44E-01	mg/kg	NA	NA	2.05E+00	1.40E-02	4.00E-03	4.00E-03	0.00E+00	0.00E+00	1.35E-03	NA	NA	2.63E-02	2.94E-04	0.00E+00	0.00E+00	2.79E-02	8	1.78E+02	2.23E+01	1.26E-03	8.90E+02	1.11E+02	2.51E-04
Zinc	0.00E+00	mg/L	0.00E+00	mg/kg	3.80E+01	mg/kg	NA	NA	7.43E+00	9.54E-01	2.67E+00	2.67E+00	0.00E+00	0.00E+00	1.49E-01	NA	NA	1.05E+01	2.21E+00	0.00E+00	0.00E+00	1.29E+01	8	1.45E+01	1.81E+00	7.11E+00	1.31E+02	1.64E+01	7.87E-01
																					Hazard Index (Total EEQ):			3.0E+01			7.4E+00

Intake Equation:

$$Ej = \left(\frac{A}{HR} \left[\sum_{i=1}^{m} \left(\frac{IRi \, x \, Cij}{BW} \right) \right] \right)$$

Where:
Ej = Total Exposure to Chemical
A = Site Area
HR = Home Range
m = Total number of ingested media
i = counter
IRi = Consumption Rate for Medium
Cij = Chemical concentration (j) in medium (I) (mg/kg or mg/L)
BW = Body Weight

Notes:
Tier 1 = Max EEQ using max EPC, max BAF/BCF, max Intake Rates, min BW, and FHR =1.
Tier 2 = EEQ using 95% EPC, non-max BAF/BCF, avg Intake Rates, avg BW and calculated FHR.
BAF = Bioaccumulation Factor (may be BCF if this is the only value available)
EEQ = Ecological Effects Quotient.
L = LOAEL based; N = NOAEL based
LOAEL = Lowest Observed Adverse Effect Level
NOAEL = No Observed Adverse Effect Level
NA = Not applicable/Not available
PDE = Predicted Daily Exposure
BAF (or BCF) values from appropriate text tables (BCF = bioconcentration factor)
Some BAF (or BCF) values based on media regression equations (value in box): n See appropriate text tables for equations.
If BAF/BCF regression equation produced Tier 2 value exceeding maximum Tier 1 BAF/BCF value, Tier 1 value used as default.
LOAEL and NOAEL values from appropriate toxicity summary tables in the text.
UF = Uncertainty Factor for toxicity factor extrapolation, and Adjusted LOAEL or NOAEL = LOAEL/UF or NOAEL/UF
A "0" entry in the exposure concentration column indicates this chemical not selected as a COPEC for this medium.
Receptor diet data and home range data from appropriate text table.
Exposure point concentrations (EPCs) from appropriate text tables.

Species-Specific Factors

Plant diet fraction =	0.62	unitless
Fish diet fraction =	0	unitless
Aq. Invert diet fraction =	0	unitless
Terr. Invert diet fraction =	0.38	unitless
Mammal diet fraction =	0	unitless
Bird diet fraction =	0	unitless
Soil ingestion rate =	0.00064	kg/d
Sediment ingestion rate =	0	kg/d
Food ingestion rate =	0.016	kg/d
Body weight =	0.0773	kg
Home range =	1.2	acres
Water intake rate =	0.011	L/d
Site Area =	0.57	acres
Frac. home range (FHR) =	4.75E-01	unitless

TABLE F-18
TIER 1 CHEMICALS OF POTENTIAL CONCERN EEQs AND HAZARD INDICES FOR RED-TAILED HAWKS AT SWMU 59

Hazard Estimate - Tier 1
Red-tailed Hawk

Chemical	Surface Water Exposure Point Concentration	Units	Sediment Exposure Point Concentration	Units	Soil Exposure Point Concentration	Units	Fish BAF	Aq. Invert. BAF	Terr. Invert. BAF	Plant BAF	Mammal BAF	Bird BAF	PDE Surface Water	PDE Sediment	PDE Soil	PDE Fish	PDE Aq. Invert.	PDE Terr. Invert.	PDE Plants	PDE Mammals	PDE Birds	Total PDE	Chemical-Specific Toxicity Value UF	NOAEL	Adjusted NOAEL	EEQ N	LOAEL	Adjusted LOAEL	EEQ L
							---------- unitless ----------						mg/kg-d	mg/kg-d	mg/kg-d	mg/kg-d	mg/kg-d	mg/kg-d	mg/kg-d	mg/kg-d	mg/kg-d	mg/kg-d		mg/kg-d	mg/kg-d		mg/kg-d	mg/kg-d	
2,3,7,8-TCDD-TE	0.00E+00	mg/L	0.00E+00	mg/kg	1.21E-05	mg/kg	NA	NA	4.21E+01	3.87E-03	2.20E+00	2.20E+00	0.00E+00	0.00E+00	0.00E+00	NA	NA	0.00E+00	0.00E+00	1.34E-06	4.22E-07	1.76E-06	8	1.40E-05	1.75E-06	1.00E+00	1.40E-04	1.75E-05	1.00E-01
1,3,5-Trinitrobenzene	0.00E+00	mg/L	0.00E+00	mg/kg	1.38E-01	mg/kg	NA	NA	6.42E-02	5.62E+00	1.00E+00	1.00E+00	0.00E+00	0.00E+00	0.00E+00	NA	NA	0.00E+00	0.00E+00	6.90E-03	2.18E-03	9.08E-03	8	NA	NA	NA	NA	NA	NA
4,4'-DDD	0.00E+00	mg/L	0.00E+00	mg/kg	1.00E-03	mg/kg	NA	NA	2.58E+01	1.57E-02	1.00E+00	1.00E+00	0.00E+00	0.00E+00	0.00E+00	NA	NA	0.00E+00	0.00E+00	5.00E-05	1.58E-05	6.58E-05	8	2.80E-03	3.50E-04	1.88E-01	2.80E-02	3.50E-03	1.88E-02
4,4'-DDT	0.00E+00	mg/L	0.00E+00	mg/kg	4.41E-03	mg/kg	NA	NA	1.70E+01	4.61E-03	1.49E+00	1.49E+00	0.00E+00	0.00E+00	0.00E+00	NA	NA	0.00E+00	0.00E+00	3.29E-04	1.04E-04	4.33E-04	8	2.80E-03	3.50E-04	1.24E+00	2.80E-02	3.50E-03	1.24E-01
Acenaphthylene	0.00E+00	mg/L	0.00E+00	mg/kg	2.90E-03	mg/kg	NA	NA	2.29E+01	1.08E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	NA	NA	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8	5.53E+02	6.91E+01	0.00E+00	2.77E+03	3.46E+02	0.00E+00
Anthracene	0.00E+00	mg/L	0.00E+00	mg/kg	2.00E-02	mg/kg	NA	NA	2.42E+00	8.85E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	NA	NA	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8	5.53E+02	6.91E+01	0.00E+00	2.77E+03	3.46E+02	0.00E+00
Aroclor 1254	0.00E+00	mg/L	0.00E+00	mg/kg	6.10E-02	mg/kg	NA	NA	6.52E+01	3.58E-03	1.00E+00	1.00E+00	0.00E+00	0.00E+00	0.00E+00	NA	NA	0.00E+00	0.00E+00	3.05E-03	9.64E-04	4.02E-03	8	1.80E-01	2.25E-02	1.78E-01	1.80E+00	2.25E-01	1.78E-02
Benzo(a)anthracene	0.00E+00	mg/L	0.00E+00	mg/kg	6.00E-02	mg/kg	NA	NA	1.59E+00	2.09E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	NA	NA	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8	5.53E+02	6.91E+01	0.00E+00	2.77E+03	3.46E+02	0.00E+00
Benzo(a)pyrene	0.00E+00	mg/L	0.00E+00	mg/kg	4.60E-02	mg/kg	NA	NA	1.33E+00	1.37E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	NA	NA	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8	5.53E+02	6.91E+01	0.00E+00	2.77E+03	3.46E+02	0.00E+00
Benzo(b)fluoranthene	0.00E+00	mg/L	0.00E+00	mg/kg	6.30E-02	mg/kg	NA	NA	2.60E+00	3.10E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	NA	NA	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8	5.53E+02	6.91E+01	0.00E+00	2.77E+03	3.46E+02	0.00E+00
Benzo(g,h,i)perylene	0.00E+00	mg/L	0.00E+00	mg/kg	2.50E-02	mg/kg	NA	NA	2.94E+00	2.01E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	NA	NA	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8	5.53E+02	6.91E+01	0.00E+00	2.77E+03	3.46E+02	0.00E+00
Benzo(k)fluoranthene	0.00E+00	mg/L	0.00E+00	mg/kg	3.30E-02	mg/kg	NA	NA	2.60E+00	1.87E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	NA	NA	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8	5.53E+02	6.91E+01	0.00E+00	2.77E+03	3.46E+02	0.00E+00
Chrysene	0.00E+00	mg/L	0.00E+00	mg/kg	5.70E-02	mg/kg	NA	NA	2.29E+00	2.13E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	NA	NA	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8	5.53E+02	6.91E+01	0.00E+00	2.77E+03	3.46E+02	0.00E+00
Dibenz(a,h)anthracene	0.00E+00	mg/L	0.00E+00	mg/kg	6.40E-03	mg/kg	NA	NA	2.31E+00	1.30E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	NA	NA	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8	5.53E+02	6.91E+01	0.00E+00	2.77E+03	3.46E+02	0.00E+00
Dieldrin	0.00E+00	mg/L	0.00E+00	mg/kg	4.52E-03	mg/kg	NA	NA	1.47E+01	4.10E-01	1.76E+01	1.76E+01	0.00E+00	0.00E+00	0.00E+00	NA	NA	0.00E+00	0.00E+00	3.99E-03	1.26E-03	5.25E-03	8	7.09E-02	8.86E-03	5.92E-01	1.22E-01	1.53E-02	3.44E-01
Endosulfan I	0.00E+00	mg/L	0.00E+00	mg/kg	9.61E-04	mg/kg	NA	NA	1.93E-01	3.67E-01	1.00E+00	1.00E+00	0.00E+00	0.00E+00	0.00E+00	NA	NA	0.00E+00	0.00E+00	4.81E-05	1.52E-05	6.33E-05	8	1.00E+01	1.25E+00	5.06E-05	5.00E+01	6.25E+00	1.01E-05
Endosulfan II	0.00E+00	mg/L	0.00E+00	mg/kg	3.94E-03	mg/kg	NA	NA	1.93E-01	3.67E-01	1.00E+00	1.00E+00	0.00E+00	0.00E+00	0.00E+00	NA	NA	0.00E+00	0.00E+00	1.97E-04	6.22E-05	2.59E-04	8	1.00E+01	1.25E+00	2.07E-04	5.00E+01	6.25E+00	4.15E-05
Endosulfan sulfate	0.00E+00	mg/L	0.00E+00	mg/kg	7.10E-03	mg/kg	NA	NA	1.74E-01	3.05E-01	1.00E+00	1.00E+00	0.00E+00	0.00E+00	0.00E+00	NA	NA	0.00E+00	0.00E+00	3.55E-04	1.12E-04	4.67E-04	8	1.00E+01	1.25E+00	3.74E-04	5.00E+01	6.25E+00	7.48E-05
Endrin aldehyde	0.00E+00	mg/L	0.00E+00	mg/kg	4.28E-04	mg/kg	NA	NA	5.32E+00	6.51E-02	1.00E+00	1.00E+00	0.00E+00	0.00E+00	0.00E+00	NA	NA	0.00E+00	0.00E+00	2.14E-05	6.76E-06	2.82E-05	8	3.00E-01	3.75E-02	7.51E-04	1.50E+00	1.88E-01	1.50E-04
Endrin ketone	0.00E+00	mg/L	0.00E+00	mg/kg	2.90E-03	mg/kg	NA	NA	8.76E+00	5.06E-02	1.00E+00	1.00E+00	0.00E+00	0.00E+00	0.00E+00	NA	NA	0.00E+00	0.00E+00	1.45E-04	4.58E-05	1.91E-04	8	3.00E-01	3.75E-02	5.09E-03	1.50E+00	1.88E-01	1.02E-03
Fluoranthene	0.00E+00	mg/L	0.00E+00	mg/kg	1.10E-01	mg/kg	NA	NA	3.04E+00	5.00E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	NA	NA	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8	5.53E+02	6.91E+01	0.00E+00	2.77E+03	3.46E+02	0.00E+00
Fluorene	0.00E+00	mg/L	0.00E+00	mg/kg	9.10E-03	mg/kg	NA	NA	9.57E+00	2.35E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	NA	NA	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8	5.53E+02	6.91E+01	0.00E+00	2.77E+03	3.46E+02	0.00E+00
gamma-Chlordane	0.00E+00	mg/L	0.00E+00	mg/kg	1.10E-03	mg/kg	NA	NA	1.24E+01	9.33E-03	1.00E+00	1.00E+00	0.00E+00	0.00E+00	0.00E+00	NA	NA	0.00E+00	0.00E+00	5.50E-05	1.74E-05	7.24E-05	8	2.14E+00	2.68E-01	2.71E-04	1.07E+01	1.34E+00	5.41E-05
Heptachlor epoxide	0.00E+00	mg/L	0.00E+00	mg/kg	1.06E-03	mg/kg	NA	NA	6.76E+00	8.96E-02	1.00E+00	1.00E+00	0.00E+00	0.00E+00	0.00E+00	NA	NA	0.00E+00	0.00E+00	5.30E-05	1.67E-05	6.98E-05	8	9.20E-01	1.15E-01	6.07E-04	4.60E+00	5.75E-01	1.21E-04
Indeno(1,2,3-cd)pyrene	0.00E+00	mg/L	0.00E+00	mg/kg	2.63E-02	mg/kg	NA	NA	2.86E+00	1.10E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	NA	NA	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8	5.53E+02	6.91E+01	0.00E+00	2.77E+03	3.46E+02	0.00E+00
Methoxychlor	0.00E+00	mg/L	0.00E+00	mg/kg	1.02E-02	mg/kg	NA	NA	7.73E+00	2.05E-02	1.00E+00	1.00E+00	0.00E+00	0.00E+00	0.00E+00	NA	NA	0.00E+00	0.00E+00	5.10E-04	1.61E-04	6.71E-04	8	2.58E+01	3.22E+00	2.08E-04	1.29E+02	1.61E+01	4.17E-05
Naphthalene	0.00E+00	mg/L	0.00E+00	mg/kg	1.30E-01	mg/kg	NA	NA	4.40E+00	1.22E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	NA	NA	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8	5.53E+02	6.91E+01	0.00E+00	2.77E+03	3.46E+02	0.00E+00
Phenanthrene	0.00E+00	mg/L	0.00E+00	mg/kg	3.00E-01	mg/kg	NA	NA	1.72E+00	1.34E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	NA	NA	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8	5.53E+02	6.91E+01	0.00E+00	2.77E+03	3.46E+02	0.00E+00
Pyrene	0.00E+00	mg/L	0.00E+00	mg/kg	9.20E-02	mg/kg	NA	NA	1.75E+00	7.20E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	NA	NA	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8	5.53E+02	6.91E+01	0.00E+00	2.77E+03	3.46E+02	0.00E+00
Arsenic	0.00E+00	mg/L	0.00E+00	mg/kg	3.70E+01	mg/kg	NA	NA	8.35E-02	3.75E-02	4.08E-03	4.08E-03	0.00E+00	0.00E+00	0.00E+00	NA	NA	0.00E+00	0.00E+00	7.55E-03	2.39E-03	9.94E-03	8	5.14E+00	6.43E-01	1.55E-02	1.28E+01	1.61E+00	6.19E-03
Cadmium	0.00E+00	mg/L	0.00E+00	mg/kg	1.10E-01	mg/kg	NA	NA	1.30E+01	1.69E+00	9.12E-01	9.12E-01	0.00E+00	0.00E+00	0.00E+00	NA	NA	0.00E+00	0.00E+00	5.02E-03	1.58E-03	6.60E-03	8	1.45E+00	1.81E-01	3.64E-02	2.00E+01	2.50E+00	2.64E-03
Chromium	0.00E+00	mg/L	0.00E+00	mg/kg	2.88E+01	mg/kg	NA	NA	3.06E-01	4.10E-02	9.49E-02	9.49E-02	0.00E+00	0.00E+00	0.00E+00	NA	NA	0.00E+00	0.00E+00	1.37E-01	4.32E-02	1.80E-01	8	2.66E+00	3.33E-01	5.41E-01	2.78E+00	3.48E-01	5.18E-01
Copper	0.00E+00	mg/L	0.00E+00	mg/kg	1.53E+01	mg/kg	NA	NA	5.15E-01	3.73E-01	7.46E-01	7.46E-01	0.00E+00	0.00E+00	0.00E+00	NA	NA	0.00E+00	0.00E+00	5.71E-01	1.80E-01	7.51E-01	8	4.70E+01	5.88E+00	1.28E-01	6.20E+01	7.75E+00	9.70E-02
Lead	0.00E+00	mg/L	0.00E+00	mg/kg	3.09E+01	mg/kg	NA	NA	4.15E-01	5.88E-02	1.59E-01	1.59E-01	0.00E+00	0.00E+00	0.00E+00	NA	NA	0.00E+00	0.00E+00	2.46E-01	7.77E-02	3.24E-01	8	3.85E+00	4.81E-01	6.73E-01	1.93E+01	2.41E+00	1.35E-01
Mercury	0.00E+00	mg/L	0.00E+00	mg/kg	5.61E-01	mg/kg	NA	NA	3.30E+01	4.80E-01	1.05E+00	1.05E+00	0.00E+00	0.00E+00	0.00E+00	NA	NA	0.00E+00	0.00E+00	2.94E-02	9.27E-03	3.86E-02	8	4.50E-01	5.63E-02	6.87E-01	9.00E-01	1.13E-01	3.43E-01
Nickel	0.00E+00	mg/L	0.00E+00	mg/kg	1.28E+01	mg/kg	NA	NA	7.80E+00	5.70E-02	2.00E-01	2.00E-01	0.00E+00	0.00E+00	0.00E+00	NA	NA	0.00E+00	0.00E+00	1.28E-01	4.05E-02	1.69E-01	8	7.74E+01	9.68E+00	1.74E-02	1.07E+02	1.34E+01	1.26E-02
Selenium	0.00E+00	mg/L	0.00E+00	mg/kg	7.00E+00	mg/kg	NA	NA	5.52E-01	6.22E-01	1.96E-01	1.96E-01	0.00E+00	0.00E+00	0.00E+00	NA	NA	0.00E+00	0.00E+00	6.87E-02	2.17E-02	9.04E-02	8	5.00E-01	6.25E-02	1.45E+00	1.00E+00	1.25E-01	7.23E-01
Silver	0.00E+00	mg/L	0.00E+00	mg/kg	4.98E-01	mg/kg	NA	NA	2.05E+00	1.40E-02	4.00E-03	4.00E-03	0.00E+00	0.00E+00	0.00E+00	NA	NA	0.00E+00	0.00E+00	9.97E-05	3.15E-05	1.31E-04	8	1.78E+02	2.23E+01	5.89E-06	8.90E+02	1.11E+02	1.18E-06
Zinc	0.00E+00	mg/L	0.00E+00	mg/kg	7.63E+01	mg/kg	NA	NA	4.65E+00	6.99E-01	1.40E+00	1.40E+00	0.00E+00	0.00E+00	0.00E+00	NA	NA	0.00E+00	0.00E+00	5.33E+00	1.68E+00	7.02E+00	8	1.45E+01	1.81E+00	3.87E+00	1.31E+02	1.64E+01	4.29E-01

Hazard Index (Total EEQ): 1.1E+01 2.9E+00

Intake Equation:

$$Ej = \left(\frac{A}{HR} \left[\sum_{i=1}^{m} \left(\frac{IRi \, x \, Cij}{BW} \right) \right] \right)$$

Where:
Ej = Total Exposure to Chemical
A = Site Area
HR = Home Range
m = Total number of ingested media
i = counter
IRi = Consumption Rate for Medium
Cij = Chemical concentration (j) in medium (I) (mg/kg or mg/L)
BW = Body Weight

Notes:
Tier 1 = Max EEQ using max EPC, max BAF/BCF, max Intake Rates, min BW, and FHR =1.
Tier 2 = EEQ using 95% EPC, non-max BAF/BCF, avg Intake Rates, avg BW and calculated FHR.
BAF = Bioaccumulation Factor (may be BCF if this is the only value available)
EEQ = Ecological Effects Quotient.
L = LOAEL based; N = NOAEL based
LOAEL = Lowest Observed Adverse Effect Level
NOAEL = No Observed Adverse Effect Level
NA = Not applicable/Not available
PDE = Predicted Daily Exposure
BAF (or BCF) values from appropriate text tables (BCF = bioconcentration factor)
Some BAF (or BCF) values based on media regression equations (value in box): n See appropriate text tables for equations.
If BAF/BCF regression equation produced Tier 2 value exceeding maximum Tier 1 BAF/BCF value, Tier 1 value used a default.
LOAEL and NOAEL values from appropriate toxicity summary tables in the text.
UF = Uncertainty Factor for toxicity factor extrapolation, and Adjusted LOAEL or NOAEL = LOAEL/UF or NOAEL/UF
A "0" entry in the exposure concentration column indicates this chemical not selected as a COPEC for this medium.
Receptor diet data and home range data from appropriate text table.
Exposure point concentrations (EPCs) from appropriate text tables.

Species-Specific Factors

Plant diet fraction =	0	unitless
Fish diet fraction =	0	unitless
Aq. Invert diet fraction =	0	unitless
Terr. Invert diet fraction =	0	unitless
Mammal diet fraction =	0.76	unitless
Bird diet fraction =	0.24	unitless
Soil ingestion rate =	0	kg/d
Sediment ingestion rate =	0	kg/d
Food ingestion rate =	0.063	kg/d
Body weight =	0.957	kg
Home range =	2081	acres
Water intake rate =	0.068	L/d
Site Area =	0.57	acres
Frac. home range (FHR) =	1.00E+00	unitless

TABLE F-19
TIER 2 CHEMICALS OF POTENTIAL ECOLOGICAL CONCERN EEQs AND HAZARD INDICES FOR RED -TAILED HAWKS AT SWMU 59

Hazard Estimate - Tier 2
Red-tailed Hawk

Chemical	Surface Water Exposure Point Concentration	Units	Sediment Exposure Point Concentration	Units	Soil Exposure Point Concentration	Units	Fish BAF	Aq. Invert. BAF	Terr. Invert. BAF	Plant BAF	Mammal BAF	Bird BAF	PDE Surface Water	PDE Sediment	PDE Soil	PDE Fish	PDE Aq. Invert.	PDE Terr. Invert.	PDE Plants	PDE Mammals	PDE Birds	Total PDE	Chemical-Specific Toxicity Value UF	NOAEL	Adjusted NOAEL	EEQ N	LOAEL	Adjusted LOAEL	EEQ L
							---------- unitless ----------						mg/kg-d	mg/kg-d	mg/kg-d	mg/kg-d	mg/kg-d	mg/kg-d	mg/kg-d	mg/kg-d	mg/kg-d	mg/kg-d		mg/kg-d	mg/kg-d		mg/kg-d	mg/kg-d	
2,3,7,8-TCDD-TE	0.00E+00	mg/L	0.00E+00	mg/kg	8.67E-06	mg/kg	NA	NA	4.19E+00	3.87E-03	2.20E+00	2.20E+00	0.00E+00	0.00E+00	0.00E+00	NA	NA	0.00E+00	0.00E+00	2.07E-10	6.52E-11	2.72E-10	8	1.40E-05	1.75E-06	1.55E-04	1.40E-04	1.75E-05	1.55E-05
1,3,5-Trinitrobenzene	0.00E+00	mg/L	0.00E+00	mg/kg	1.38E-01	mg/kg	NA	NA	6.35E-02	5.62E+00	5.00E-01	5.00E-01	0.00E+00	0.00E+00	0.00E+00	NA	NA	0.00E+00	0.00E+00	7.47E-07	2.36E-07	9.83E-07	8	NA	NA	NA	NA	NA	NA
4,4'-DDD	0.00E+00	mg/L	0.00E+00	mg/kg	1.00E-03	mg/kg	NA	NA	2.58E+01	1.57E-02	5.00E-01	5.00E-01	0.00E+00	0.00E+00	0.00E+00	NA	NA	0.00E+00	0.00E+00	5.42E-09	1.71E-09	7.13E-09	8	2.80E-03	3.50E-04	2.04E-05	2.80E-02	3.50E-03	2.04E-06
4,4'-DDT	0.00E+00	mg/L	0.00E+00	mg/kg	4.41E-03	mg/kg	NA	NA	1.70E+01	4.61E-03	1.49E+00	1.49E+00	0.00E+00	0.00E+00	0.00E+00	NA	NA	0.00E+00	0.00E+00	7.13E-08	2.25E-08	9.38E-08	8	2.80E-03	3.50E-04	2.68E-04	2.80E-02	3.50E-03	2.68E-05
Acenaphthylene	0.00E+00	mg/L	0.00E+00	mg/kg	2.90E-03	mg/kg	NA	NA	2.29E+01	1.08E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	NA	NA	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8	5.53E+02	6.91E+01	0.00E+00	2.77E+03	3.46E+02	0.00E+00
Anthracene	0.00E+00	mg/L	0.00E+00	mg/kg	2.00E-02	mg/kg	NA	NA	2.42E+00	8.85E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	NA	NA	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8	5.53E+02	6.91E+01	0.00E+00	2.77E+03	3.46E+02	0.00E+00
Aroclor 1254	0.00E+00	mg/L	0.00E+00	mg/kg	2.80E-02	mg/kg	NA	NA	2.12E+00	3.58E-03	5.00E-01	5.00E-01	0.00E+00	0.00E+00	0.00E+00	NA	NA	0.00E+00	0.00E+00	1.52E-07	4.79E-08	2.00E-07	8	1.80E-01	2.25E-02	8.87E-06	1.80E+00	2.25E-01	8.87E-07
Benzo(a)anthracene	0.00E+00	mg/L	0.00E+00	mg/kg	3.67E-02	mg/kg	NA	NA	1.59E+00	2.55E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	NA	NA	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8	5.53E+02	6.91E+01	0.00E+00	2.77E+03	3.46E+02	0.00E+00
Benzo(a)pyrene	0.00E+00	mg/L	0.00E+00	mg/kg	3.59E-02	mg/kg	NA	NA	1.33E+00	1.38E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	NA	NA	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8	5.53E+02	6.91E+01	0.00E+00	2.77E+03	3.46E+02	0.00E+00
Benzo(b)fluoranthene	0.00E+00	mg/L	0.00E+00	mg/kg	3.87E-02	mg/kg	NA	NA	2.60E+00	3.10E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	NA	NA	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8	5.53E+02	6.91E+01	0.00E+00	2.77E+03	3.46E+02	0.00E+00
Benzo(g,h,i)perylene	0.00E+00	mg/L	0.00E+00	mg/kg	2.21E-02	mg/kg	NA	NA	2.94E+00	1.96E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	NA	NA	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8	5.53E+02	6.91E+01	0.00E+00	2.77E+03	3.46E+02	0.00E+00
Benzo(k)fluoranthene	0.00E+00	mg/L	0.00E+00	mg/kg	2.90E-02	mg/kg	NA	NA	2.60E+00	1.90E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	NA	NA	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8	5.53E+02	6.91E+01	0.00E+00	2.77E+03	3.46E+02	0.00E+00
Chrysene	0.00E+00	mg/L	0.00E+00	mg/kg	3.87E-02	mg/kg	NA	NA	2.29E+00	2.49E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	NA	NA	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8	5.53E+02	6.91E+01	0.00E+00	2.77E+03	3.46E+02	0.00E+00
Dibenz(a,h)anthracene	0.00E+00	mg/L	0.00E+00	mg/kg	6.40E-03	mg/kg	NA	NA	2.31E+00	1.30E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	NA	NA	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8	5.53E+02	6.91E+01	0.00E+00	2.77E+03	3.46E+02	0.00E+00
Dieldrin	0.00E+00	mg/L	0.00E+00	mg/kg	4.52E-03	mg/kg	NA	NA	1.47E+01	4.10E-01	1.76E+01	1.76E+01	0.00E+00	0.00E+00	0.00E+00	NA	NA	0.00E+00	0.00E+00	8.64E-07	2.73E-07	1.14E-06	8	7.09E-02	8.86E-03	1.28E-04	1.22E-01	1.53E-02	7.45E-05
Endosulfan I	0.00E+00	mg/L	0.00E+00	mg/kg	9.61E-04	mg/kg	NA	NA	1.91E-01	3.67E-01	5.00E-01	5.00E-01	0.00E+00	0.00E+00	0.00E+00	NA	NA	0.00E+00	0.00E+00	5.20E-09	1.64E-09	6.85E-09	8	1.00E+01	1.25E+00	5.48E-09	5.00E+01	6.25E+00	1.10E-09
Endosulfan II	0.00E+00	mg/L	0.00E+00	mg/kg	3.94E-03	mg/kg	NA	NA	1.91E-01	3.67E-01	5.00E-01	5.00E-01	0.00E+00	0.00E+00	0.00E+00	NA	NA	0.00E+00	0.00E+00	2.13E-08	6.74E-09	2.81E-08	8	1.00E+01	1.25E+00	2.25E-08	5.00E+01	6.25E+00	4.49E-09
Endosulfan sulfate	0.00E+00	mg/L	0.00E+00	mg/kg	7.10E-03	mg/kg	NA	NA	1.72E-01	3.05E-01	5.00E-01	5.00E-01	0.00E+00	0.00E+00	0.00E+00	NA	NA	0.00E+00	0.00E+00	3.84E-08	1.21E-08	5.06E-08	8	1.00E+01	1.25E+00	4.05E-08	5.00E+01	6.25E+00	8.09E-09
Endrin aldehyde	0.00E+00	mg/L	0.00E+00	mg/kg	4.28E-04	mg/kg	NA	NA	5.26E+00	6.51E-02	5.00E-01	5.00E-01	0.00E+00	0.00E+00	0.00E+00	NA	NA	0.00E+00	0.00E+00	2.32E-09	7.32E-10	3.05E-09	8	3.00E-01	3.75E-02	8.13E-08	1.50E+00	1.88E-01	1.63E-08
Endrin ketone	0.00E+00	mg/L	0.00E+00	mg/kg	2.90E-03	mg/kg	NA	NA	8.65E+00	5.06E-02	5.00E-01	5.00E-01	0.00E+00	0.00E+00	0.00E+00	NA	NA	0.00E+00	0.00E+00	1.57E-08	4.96E-09	2.07E-08	8	3.00E-01	3.75E-02	5.51E-07	1.50E+00	1.88E-01	1.10E-07
Fluoranthene	0.00E+00	mg/L	0.00E+00	mg/kg	8.28E-02	mg/kg	NA	NA	3.04E+00	5.00E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	NA	NA	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8	5.53E+02	6.91E+01	0.00E+00	2.77E+03	3.46E+02	0.00E+00
Fluorene	0.00E+00	mg/L	0.00E+00	mg/kg	9.10E-03	mg/kg	NA	NA	9.57E+00	2.35E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	NA	NA	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8	5.53E+02	6.91E+01	0.00E+00	2.77E+03	3.46E+02	0.00E+00
gamma-Chlordane	0.00E+00	mg/L	0.00E+00	mg/kg	1.10E-03	mg/kg	NA	NA	1.22E+01	9.33E-03	5.00E-01	5.00E-01	0.00E+00	0.00E+00	0.00E+00	NA	NA	0.00E+00	0.00E+00	5.96E-09	1.88E-09	7.84E-09	8	2.14E+00	2.68E-01	2.93E-08	1.07E+01	1.34E+00	5.86E-09
Heptachlor epoxide	0.00E+00	mg/L	0.00E+00	mg/kg	1.06E-03	mg/kg	NA	NA	6.68E+00	8.96E-02	5.00E-01	5.00E-01	0.00E+00	0.00E+00	0.00E+00	NA	NA	0.00E+00	0.00E+00	5.74E-09	1.81E-09	7.55E-09	8	9.20E-01	1.15E-01	6.57E-08	4.60E+00	5.75E-01	1.31E-08
Indeno(1,2,3-cd)pyrene	0.00E+00	mg/L	0.00E+00	mg/kg	2.27E-02	mg/kg	NA	NA	2.86E+00	1.10E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	NA	NA	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8	5.53E+02	6.91E+01	0.00E+00	2.77E+03	3.46E+02	0.00E+00
Methoxychlor	0.00E+00	mg/L	0.00E+00	mg/kg	1.02E-02	mg/kg	NA	NA	7.64E+00	2.05E-02	5.00E-01	5.00E-01	0.00E+00	0.00E+00	0.00E+00	NA	NA	0.00E+00	0.00E+00	5.52E-08	1.74E-08	7.27E-08	8	2.58E+01	3.22E+00	2.26E-08	1.29E+02	1.61E+01	4.51E-09
Naphthalene	0.00E+00	mg/L	0.00E+00	mg/kg	1.30E-01	mg/kg	NA	NA	4.40E+00	1.22E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	NA	NA	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8	5.53E+02	6.91E+01	0.00E+00	2.77E+03	3.46E+02	0.00E+00
Phenanthrene	0.00E+00	mg/L	0.00E+00	mg/kg	1.10E-01	mg/kg	NA	NA	1.72E+00	1.96E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	NA	NA	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8	5.53E+02	6.91E+01	0.00E+00	2.77E+03	3.46E+02	0.00E+00
Pyrene	0.00E+00	mg/L	0.00E+00	mg/kg	8.34E-02	mg/kg	NA	NA	1.75E+00	7.20E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	NA	NA	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8	5.53E+02	6.91E+01	0.00E+00	2.77E+03	3.46E+02	0.00E+00
Arsenic	0.00E+00	mg/L	0.00E+00	mg/kg	2.07E+01	mg/kg	NA	NA	9.90E-02	3.75E-02	5.00E-03	5.00E-03	0.00E+00	0.00E+00	0.00E+00	NA	NA	0.00E+00	0.00E+00	1.12E-06	3.55E-07	1.48E-06	8	5.14E+00	6.43E-01	2.30E-06	1.28E+01	1.61E+00	9.21E-07
Cadmium	0.00E+00	mg/L	0.00E+00	mg/kg	1.10E-01	mg/kg	NA	NA	1.30E+01	1.69E+00	9.12E-01	9.12E-01	0.00E+00	0.00E+00	0.00E+00	NA	NA	0.00E+00	0.00E+00	1.09E-06	3.43E-07	1.43E-06	8	1.45E+00	1.81E-01	7.89E-06	2.00E+01	2.50E+00	5.72E-07
Chromium	0.00E+00	mg/L	0.00E+00	mg/kg	1.91E+01	mg/kg	NA	NA	3.06E-01	4.10E-02	1.06E-01	1.06E-01	0.00E+00	0.00E+00	0.00E+00	NA	NA	0.00E+00	0.00E+00	2.19E-05	6.92E-06	2.88E-05	8	2.66E+00	3.33E-01	8.67E-05	2.78E+00	3.48E-01	8.30E-05
Copper	0.00E+00	mg/L	0.00E+00	mg/kg	1.20E+01	mg/kg	NA	NA	5.15E-01	4.33E-01	9.20E-01	9.20E-01	0.00E+00	0.00E+00	0.00E+00	NA	NA	0.00E+00	0.00E+00	1.19E-04	3.77E-05	1.57E-04	8	4.70E+01	5.88E+00	2.67E-05	6.20E+01	7.75E+00	2.03E-05
Lead	0.00E+00	mg/L	0.00E+00	mg/kg	1.82E+01	mg/kg	NA	NA	4.60E-01	7.42E-02	2.14E-01	2.14E-01	0.00E+00	0.00E+00	0.00E+00	NA	NA	0.00E+00	0.00E+00	4.21E-05	1.33E-05	5.54E-05	8	3.85E+00	4.81E-01	1.15E-04	1.93E+01	2.41E+00	2.30E-05
Mercury	0.00E+00	mg/L	0.00E+00	mg/kg	3.00E-01	mg/kg	NA	NA	2.42E+00	6.40E-01	1.92E-01	1.92E-01	0.00E+00	0.00E+00	0.00E+00	NA	NA	0.00E+00	0.00E+00	6.24E-07	1.97E-07	8.21E-07	8	4.50E-01	5.63E-02	1.46E-05	9.00E-01	1.13E-01	7.30E-06
Nickel	0.00E+00	mg/L	0.00E+00	mg/kg	8.80E+00	mg/kg	NA	NA	4.51E+00	6.26E-02	2.45E-01	2.45E-01	0.00E+00	0.00E+00	0.00E+00	NA	NA	0.00E+00	0.00E+00	2.33E-05	7.36E-06	3.07E-05	8	7.74E+01	9.68E+00	3.17E-06	1.07E+02	1.34E+01	2.29E-06
Selenium	0.00E+00	mg/L	0.00E+00	mg/kg	6.70E+00	mg/kg	NA	NA	5.58E-01	6.19E-01	2.02E-01	2.02E-01	0.00E+00	0.00E+00	0.00E+00	NA	NA	0.00E+00	0.00E+00	1.46E-05	4.62E-06	1.92E-05	8	5.00E-01	6.25E-02	3.08E-04	1.00E+00	1.25E-01	1.54E-04
Silver	0.00E+00	mg/L	0.00E+00	mg/kg	3.44E-01	mg/kg	NA	NA	2.05E+00	1.40E-02	4.00E-03	4.00E-03	0.00E+00	0.00E+00	0.00E+00	NA	NA	0.00E+00	0.00E+00	1.49E-08	4.71E-09	1.96E-08	8	1.78E+02	2.23E+01	8.81E-10	8.90E+02	1.11E+02	1.76E-10
Zinc	0.00E+00	mg/L	0.00E+00	mg/kg	3.80E+01	mg/kg	NA	NA	7.43E+00	9.54E-01	2.67E+00	2.67E+00	0.00E+00	0.00E+00	0.00E+00	NA	NA	0.00E+00	0.00E+00	1.10E-03	3.47E-04	1.45E-03	8	1.45E+01	1.81E+00	7.98E-04	1.31E+02	1.64E+01	8.83E-05

Hazard Index (Total EEQ): 1.9E-03 5.0E-04

Intake Equation:

$$Ej = \left(\frac{A}{HR} \left[\sum_{i=1}^{m} \left(\frac{IRi \, x \, Cij}{BW} \right) \right] \right)$$

Where:
Ej = Total Exposure to Chemical
A = Site Area
HR = Home Range
m = Total number of ingested media
i = counter
IRi = Consumption Rate for Medium
Cij = Chemical concentration (j) in medium (I) (mg/kg or mg/L)
BW = Body Weight

Notes:
Tier 1 = Max EEQ using max EPC, max BAF/BCF, max Intake Rates, min BW, and FHR =1.
Tier 2 = EEQ using 95% EPC, non-max BAF/BCF, avg Intake Rates, avg BW and calculated FHR.
BAF = Bioaccumulation Factor (may be BCF if this is the only value available)
EEQ = Ecological Effects Quotient.
L = LOAEL based; N = NOAEL based
LOAEL = Lowest Observed Adverse Effect Level
NOAEL = No Observed Adverse Effect Level
NA = Not applicable/Not available
PDE = Predicted Daily Exposure
BAF (or BCF) values from appropriate text tables (BCF = bioconcentration factor)
Some BAF (or BCF) values based on media regression equations (value in box): n See appropriate text tables for equations.
If BAF/BCF regression equation produced Tier 2 value exceeding maximum Tier 1 BAF/BCF value, Tier 1 value used as default.
LOAEL and NOAEL values from appropriate toxicity summary tables in the text.
UF = Uncertainty Factor for toxicity factor extrapolation, and Adjusted LOAEL or NOAEL = LOAEL/UF or NOAEL/UF
A "0" entry in the exposure concentration column indicates this chemical not selected as a COPEC for this medium.
Receptor diet data and home range data from appropriate text table.
Exposure point concentrations (EPCs) from appropriate text tables.

Species-Specific Factors

Plant diet fraction =	0	unitless
Fish diet fraction =	0	unitless
Aq. Invert diet fraction =	0	unitless
Terr. Invert diet fraction =	0	unitless
Mammal diet fraction =	0.76	unitless
Bird diet fraction =	0.24	unitless
Soil ingestion rate =	0	kg/d
Sediment ingestion rate =	0	kg/d
Food ingestion rate =	0.059	kg/d
Body weight =	1.134	kg
Home range =	2081	acres
Water intake rate =	0.064	L/d
Site Area =	0.57	acres
Frac. home range (FHR) =	2.74E-04	unitless

TABLE F-20
TIER 1 CHEMICALS OF POTENTIAL CONCERN EEQs AND HAZARD INDICES FOR RED FOXES AT SWMU 59

Hazard Estimate - Tier 1
Red Fox

Chemical	Surface Water Exposure Point Concentration	Units	Sediment Exposure Point Concentration	Units	Soil Exposure Point Concentration	Units	Fish BAF	Aq. Invert. BAF	Terr. Invert. BAF	Plant BAF	Mammal BAF	Bird BAF	PDE Surface Water	PDE Sediment	PDE Soil	PDE Fish	PDE Aq. Invert.	PDE Terr. Invert.	PDE Plants	PDE Mammals	PDE Birds	Total PDE	Chemical-Specific Toxicity Value UF	NOAEL	Adjusted NOAEL	EEQ N	LOAEL	Adjusted LOAEL	EEQ L
							---------- unitless ----------						mg/kg-d	mg/kg-d	mg/kg-d	mg/kg-d	mg/kg-d	mg/kg-d	mg/kg-d	mg/kg-d	mg/kg-d	mg/kg-d		mg/kg-d	mg/kg-d		mg/kg-d	mg/kg-d	
2,3,7,8-TCDD-TE	0.00E+00	mg/L	0.00E+00	mg/kg	1.21E-05	mg/kg	NA	NA	4.21E+01	3.87E-03	2.20E+00	2.20E+00	0.00E+00	0.00E+00	3.91E-08	NA	NA	2.35E-06	9.22E-10	2.00E-06	4.31E-07	4.83E-06	8	1.00E-06	1.25E-07	3.86E+01	1.00E-05	1.25E-06	3.86E+00
1,3,5-Trinitrobenzene	0.00E+00	mg/L	0.00E+00	mg/kg	1.38E-01	mg/kg	NA	NA	6.42E-02	5.62E+00	1.00E+00	1.00E+00	0.00E+00	0.00E+00	4.44E-04	NA	NA	4.09E-05	1.52E-02	1.03E-02	2.23E-03	2.83E-02	8	1.34E+01	1.68E+00	1.69E-02	6.70E+01	8.38E+00	3.37E-03
4,4'-DDD	0.00E+00	mg/L	0.00E+00	mg/kg	1.00E-03	mg/kg	NA	NA	2.58E+01	1.57E-02	1.00E+00	1.00E+00	0.00E+00	0.00E+00	3.22E-06	NA	NA	1.19E-04	3.07E-07	7.49E-05	1.61E-05	2.14E-04	8	8.00E-01	1.00E-01	2.14E-03	4.00E+00	5.00E-01	4.27E-04
4,4'-DDT	0.00E+00	mg/L	0.00E+00	mg/kg	4.41E-03	mg/kg	NA	NA	1.70E+01	4.61E-03	1.49E+00	1.49E+00	0.00E+00	0.00E+00	1.42E-05	NA	NA	3.47E-04	3.98E-07	4.93E-04	1.06E-04	9.60E-04	8	8.00E-01	1.00E-01	9.60E-03	4.00E+00	5.00E-01	1.92E-03
Acenaphthylene	0.00E+00	mg/L	0.00E+00	mg/kg	2.90E-03	mg/kg	NA	NA	2.29E+01	1.08E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.34E-06	NA	NA	3.06E-04	6.14E-05	0.00E+00	0.00E+00	3.77E-04	8	6.56E+01	8.20E+00	4.60E-05	1.10E+02	1.38E+01	2.74E-05
Anthracene	0.00E+00	mg/L	0.00E+00	mg/kg	2.00E-02	mg/kg	NA	NA	2.42E+00	8.85E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.44E-05	NA	NA	2.23E-04	3.47E-04	0.00E+00	0.00E+00	6.34E-04	8	6.56E+01	8.20E+00	7.74E-05	1.10E+02	1.38E+01	4.61E-05
Aroclor 1254	0.00E+00	mg/L	0.00E+00	mg/kg	6.10E-02	mg/kg	NA	NA	6.52E+01	3.58E-03	1.00E+00	1.00E+00	0.00E+00	0.00E+00	1.96E-04	NA	NA	1.83E-02	4.28E-06	4.57E-03	9.84E-04	2.41E-02	8	1.40E-01	1.75E-02	1.38E+00	6.80E-01	8.50E-02	2.84E-01
Benzo(a)anthracene	0.00E+00	mg/L	0.00E+00	mg/kg	6.00E-02	mg/kg	NA	NA	1.59E+00	2.09E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.93E-04	NA	NA	4.40E-04	2.45E-04	0.00E+00	0.00E+00	8.78E-04	8	6.15E-01	7.69E-02	1.14E-02	3.07E+00	3.84E-01	2.29E-03
Benzo(a)pyrene	0.00E+00	mg/L	0.00E+00	mg/kg	4.60E-02	mg/kg	NA	NA	1.33E+00	1.37E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.48E-04	NA	NA	2.82E-04	1.24E-04	0.00E+00	0.00E+00	5.54E-04	8	1.00E+00	1.25E-01	4.43E-03	1.00E+01	1.25E+00	4.43E-04
Benzo(b)fluoranthene	0.00E+00	mg/L	0.00E+00	mg/kg	6.30E-02	mg/kg	NA	NA	2.60E+00	3.10E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.03E-04	NA	NA	7.55E-04	3.83E-04	0.00E+00	0.00E+00	1.34E-03	8	6.15E-01	7.69E-02	1.74E-02	3.07E+00	3.84E-01	3.49E-03
Benzo(g,h,i)perylene	0.00E+00	mg/L	0.00E+00	mg/kg	2.50E-02	mg/kg	NA	NA	2.94E+00	2.01E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.05E-05	NA	NA	3.39E-04	9.83E-05	0.00E+00	0.00E+00	5.18E-04	8	6.15E-01	7.69E-02	6.73E-03	3.07E+00	3.84E-01	1.35E-03
Benzo(k)fluoranthene	0.00E+00	mg/L	0.00E+00	mg/kg	3.30E-02	mg/kg	NA	NA	2.60E+00	1.87E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.06E-04	NA	NA	3.96E-04	1.21E-04	0.00E+00	0.00E+00	6.22E-04	8	6.15E-01	7.69E-02	8.10E-03	3.07E+00	3.84E-01	1.62E-03
Chrysene	0.00E+00	mg/L	0.00E+00	mg/kg	5.70E-02	mg/kg	NA	NA	2.29E+00	2.13E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.84E-04	NA	NA	6.02E-04	2.38E-04	0.00E+00	0.00E+00	1.02E-03	8	6.15E-01	7.69E-02	1.33E-02	3.07E+00	3.84E-01	2.67E-03
Dibenz(a,h)anthracene	0.00E+00	mg/L	0.00E+00	mg/kg	6.40E-03	mg/kg	NA	NA	2.31E+00	1.30E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.06E-05	NA	NA	6.82E-05	1.63E-05	0.00E+00	0.00E+00	1.05E-04	8	6.15E-01	7.69E-02	1.37E-03	3.07E+00	3.84E-01	2.74E-04
Dieldrin	0.00E+00	mg/L	0.00E+00	mg/kg	4.52E-03	mg/kg	NA	NA	1.47E+01	4.10E-01	1.76E+01	1.76E+01	0.00E+00	0.00E+00	1.46E-05	NA	NA	3.06E-04	3.63E-05	5.97E-03	1.29E-03	7.62E-03	8	1.50E-02	1.88E-03	4.06E+00	3.00E-02	3.75E-03	2.03E+00
Endosulfan I	0.00E+00	mg/L	0.00E+00	mg/kg	9.61E-04	mg/kg	NA	NA	1.93E-01	3.67E-01	1.00E+00	1.00E+00	0.00E+00	0.00E+00	3.09E-06	NA	NA	8.56E-07	6.92E-06	7.20E-05	1.55E-05	9.84E-05	8	1.50E-01	1.88E-02	5.25E-03	7.50E-01	9.38E-02	1.05E-03
Endosulfan II	0.00E+00	mg/L	0.00E+00	mg/kg	3.94E-03	mg/kg	NA	NA	1.93E-01	3.67E-01	1.00E+00	1.00E+00	0.00E+00	0.00E+00	1.27E-05	NA	NA	3.51E-06	2.84E-05	2.95E-04	6.36E-05	4.03E-04	8	1.50E-01	1.88E-02	2.15E-02	7.50E-01	9.38E-02	4.30E-03
Endosulfan sulfate	0.00E+00	mg/L	0.00E+00	mg/kg	7.10E-03	mg/kg	NA	NA	1.74E-01	3.05E-01	1.00E+00	1.00E+00	0.00E+00	0.00E+00	2.29E-05	NA	NA	5.71E-06	4.24E-05	5.32E-04	1.15E-04	7.17E-04	8	1.50E-01	1.88E-02	3.83E-02	7.50E-01	9.38E-02	7.65E-03
Endrin aldehyde	0.00E+00	mg/L	0.00E+00	mg/kg	4.28E-04	mg/kg	NA	NA	5.32E+00	6.51E-02	1.00E+00	1.00E+00	0.00E+00	0.00E+00	1.38E-06	NA	NA	1.05E-05	5.46E-07	3.21E-05	6.91E-06	5.14E-05	8	9.20E-02	1.15E-02	4.47E-03	9.20E-01	1.15E-01	4.47E-04
Endrin ketone	0.00E+00	mg/L	0.00E+00	mg/kg	2.90E-03	mg/kg	NA	NA	8.76E+00	5.06E-02	1.00E+00	1.00E+00	0.00E+00	0.00E+00	9.34E-06	NA	NA	1.17E-04	2.87E-06	2.17E-04	4.68E-05	3.93E-04	8	9.20E-02	1.15E-02	3.42E-02	9.20E-01	1.15E-01	3.42E-03
Fluoranthene	0.00E+00	mg/L	0.00E+00	mg/kg	1.10E-01	mg/kg	NA	NA	3.04E+00	5.00E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.54E-04	NA	NA	1.54E-03	1.08E-03	0.00E+00	0.00E+00	2.97E-03	8	6.15E-01	7.69E-02	3.87E-02	3.07E+00	3.84E-01	7.75E-03
Fluorene	0.00E+00	mg/L	0.00E+00	mg/kg	9.10E-03	mg/kg	NA	NA	9.57E+00	2.35E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.93E-05	NA	NA	4.01E-04	4.20E-03	0.00E+00	0.00E+00	4.63E-03	8	6.56E+01	8.20E+00	5.64E-04	1.10E+02	1.38E+01	3.36E-04
gamma-Chlordane	0.00E+00	mg/L	0.00E+00	mg/kg	1.10E-03	mg/kg	NA	NA	1.24E+01	9.33E-03	1.00E+00	1.00E+00	0.00E+00	0.00E+00	3.54E-06	NA	NA	6.27E-05	2.01E-07	8.24E-05	1.77E-05	1.67E-04	8	4.60E+00	5.75E-01	2.90E-04	9.20E+00	1.15E+00	1.45E-04
Heptachlor epoxide	0.00E+00	mg/L	0.00E+00	mg/kg	1.06E-03	mg/kg	NA	NA	6.76E+00	8.96E-02	1.00E+00	1.00E+00	0.00E+00	0.00E+00	3.41E-06	NA	NA	3.30E-05	1.86E-06	7.94E-05	1.71E-05	1.35E-04	8	1.00E-01	1.25E-02	1.08E-02	1.00E+00	1.25E-01	1.08E-03
Indeno(1,2,3-cd)pyrene	0.00E+00	mg/L	0.00E+00	mg/kg	2.63E-02	mg/kg	NA	NA	2.86E+00	1.10E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.47E-05	NA	NA	3.47E-04	5.67E-05	0.00E+00	0.00E+00	4.88E-04	8	6.15E-01	7.69E-02	6.35E-03	3.07E+00	3.84E-01	1.27E-03
Methoxychlor	0.00E+00	mg/L	0.00E+00	mg/kg	1.02E-02	mg/kg	NA	NA	7.73E+00	2.05E-02	1.00E+00	1.00E+00	0.00E+00	0.00E+00	3.28E-05	NA	NA	3.64E-04	4.09E-06	7.64E-04	1.65E-04	1.33E-03	8	4.00E+00	5.00E-01	2.66E-03	8.00E+00	1.00E+00	1.33E-03
Naphthalene	0.00E+00	mg/L	0.00E+00	mg/kg	1.30E-01	mg/kg	NA	NA	4.40E+00	1.22E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.19E-04	NA	NA	2.64E-03	3.11E-02	0.00E+00	0.00E+00	3.41E-02	8	6.56E+01	8.20E+00	4.16E-03	1.10E+02	1.38E+01	2.48E-03
Phenanthrene	0.00E+00	mg/L	0.00E+00	mg/kg	3.00E-01	mg/kg	NA	NA	1.72E+00	1.34E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.66E-04	NA	NA	2.38E-03	7.88E-03	0.00E+00	0.00E+00	1.12E-02	8	6.56E+01	8.20E+00	1.37E-03	1.10E+02	1.38E+01	8.16E-04
Pyrene	0.00E+00	mg/L	0.00E+00	mg/kg	9.20E-02	mg/kg	NA	NA	1.75E+00	7.20E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.96E-04	NA	NA	7.42E-04	1.30E-03	0.00E+00	0.00E+00	2.34E-03	8	6.15E-01	7.69E-02	3.04E-02	3.07E+00	3.84E-01	6.09E-03
Arsenic	0.00E+00	mg/L	0.00E+00	mg/kg	3.70E+01	mg/kg	NA	NA	8.35E-02	3.75E-02	4.08E-03	4.08E-03	0.00E+00	0.00E+00	1.19E-01	NA	NA	1.42E-02	2.72E-02	1.13E-02	2.44E-03	1.74E-01	8	1.26E-01	1.58E-02	1.11E+01	1.26E+00	1.58E-01	1.11E+00
Cadmium	0.00E+00	mg/L	0.00E+00	mg/kg	1.10E-01	mg/kg	NA	NA	1.30E+01	1.69E+00	9.12E-01	9.12E-01	0.00E+00	0.00E+00	3.54E-04	NA	NA	6.60E-03	3.65E-03	7.51E-03	1.62E-03	1.97E-02	8	1.00E+00	1.25E-01	1.58E-01	1.00E+01	1.25E+00	1.58E-02
Chromium	0.00E+00	mg/L	0.00E+00	mg/kg	2.88E+01	mg/kg	NA	NA	3.06E-01	4.10E-02	9.49E-02	9.49E-02	0.00E+00	0.00E+00	9.27E-02	NA	NA	4.06E-02	2.31E-02	2.05E-01	4.41E-02	4.05E-01	8	2.74E+03	3.42E+02	1.19E-03	1.37E+04	1.71E+03	2.37E-04
Copper	0.00E+00	mg/L	0.00E+00	mg/kg	1.53E+01	mg/kg	NA	NA	5.15E-01	3.73E-01	7.46E-01	7.46E-01	0.00E+00	0.00E+00	4.93E-02	NA	NA	3.63E-02	1.12E-01	8.55E-01	1.84E-01	1.24E+00	8	1.17E+01	1.46E+00	8.46E-01	1.51E+01	1.89E+00	6.55E-01
Lead	0.00E+00	mg/L	0.00E+00	mg/kg	3.09E+01	mg/kg	NA	NA	4.15E-01	5.88E-02	1.59E-01	1.59E-01	0.00E+00	0.00E+00	9.95E-02	NA	NA	5.91E-02	3.56E-02	3.69E-01	7.94E-02	6.42E-01	8	8.00E+00	1.00E+00	6.42E-01	8.00E+01	1.00E+01	6.42E-02
Mercury	0.00E+00	mg/L	0.00E+00	mg/kg	5.61E-01	mg/kg	NA	NA	3.30E+01	4.80E-01	1.05E+00	1.05E+00	0.00E+00	0.00E+00	1.81E-03	NA	NA	8.53E-02	5.28E-03	4.40E-02	9.47E-03	1.46E-01	8	1.00E+00	1.25E-01	1.17E+00	5.00E+00	6.25E-01	2.33E-01
Nickel	0.00E+00	mg/L	0.00E+00	mg/kg	1.28E+01	mg/kg	NA	NA	7.80E+00	5.70E-02	2.00E-01	2.00E-01	0.00E+00	0.00E+00	4.12E-02	NA	NA	4.60E-01	1.43E-02	1.92E-01	4.14E-02	7.49E-01	8	4.00E+01	5.00E+00	1.50E-01	8.00E+01	1.00E+01	7.49E-02
Selenium	0.00E+00	mg/L	0.00E+00	mg/kg	7.00E+00	mg/kg	NA	NA	5.52E-01	6.22E-01	1.96E-01	1.96E-01	0.00E+00	0.00E+00	2.25E-02	NA	NA	1.78E-02	8.53E-02	1.03E-01	2.21E-02	2.51E-01	8	2.00E-01	2.50E-02	1.00E+01	3.30E-01	4.13E-02	6.08E+00
Silver	0.00E+00	mg/L	0.00E+00	mg/kg	4.98E-01	mg/kg	NA	NA	2.05E+00	1.40E-02	4.00E-03	4.00E-03	0.00E+00	0.00E+00	1.60E-03	NA	NA	4.70E-03	1.37E-04	1.49E-04	3.21E-05	6.62E-03	8	2.22E+01	2.78E+00	2.38E-03	2.22E+02	2.78E+01	2.38E-04
Zinc	0.00E+00	mg/L	0.00E+00	mg/kg	7.63E+01	mg/kg	NA	NA	4.65E+00	6.99E-01	1.40E+00	1.40E+00	0.00E+00	0.00E+00	2.46E-01	NA	NA	1.63E+00	1.04E+00	7.99E+00	1.72E+00	1.26E+01	8	1.60E+02	2.00E+01	6.32E-01	3.20E+02	4.00E+01	3.16E-01

Hazard Index (Total EEQ): 6.9E+01 1.5E+01

Intake Equation:

$$Ej = \left(\frac{A}{HR} \left[\sum_{i=1}^{m} \left(\frac{IRi \, x \, Cij}{BW} \right) \right] \right)$$

Where:
Ej = Total Exposure to Chemical
A = Site Area
HR = Home Range
m = Total number of ingested media
i = counter
IRi = Consumption Rate for Medium
Cij = Chemical concentration (j) in medium (I) (mg/kg or mg/L)
BW = Body Weight

Notes:
Tier 1 = Max EEQ using max EPC, max BAF/BCF, max Intake Rates, min BW, and FHR =1.
Tier 2 = EEQ using 95% EPC, non-max BAF/BCF, avg Intake Rates, avg BW and calculated FHR.
BAF = Bioaccumulation Factor (may be BCF if this is the only value available)
EEQ = Ecological Effects Quotient.
L = LOAEL based; N = NOAEL based
LOAEL = Lowest Observed Adverse Effect Level
NOAEL = No Observed Adverse Effect Level
NA = Not applicable/Not available
PDE = Predicted Daily Exposure
BAF (or BCF) values from appropriate text tables (BCF = bioconcentration factor)
Some BAF (or BCF) values based on media regression equations (value in box): n See appropriate text tables for equations.
If BAF/BCF regression equation produced Tier 2 value exceeding maximum Tier 1 BAF/BCF value, Tier 1 value used a default.
LOAEL and NOAEL values from appropriate toxicity summary tables in the text.
UF = Uncertainty Factor for toxicity factor extrapolation, and Adjusted LOAEL or NOAEL = LOAEL/UF or NOAEL/UF
A "0" entry in the exposure concentration column indicates this chemical not selected as a COPEC for this medium.
Receptor diet data and home range data from appropriate text table.
Exposure point concentrations (EPCs) from appropriate text tables.

Species-Specific Factors

Plant diet fraction =	0.17	unitless
Fish diet fraction =	0	unitless
Aq. Invert diet fraction =	0	unitless
Terr. Invert diet fraction =	0.04	unitless
Mammal diet fraction =	0.65	unitless
Bird diet fraction =	0.14	unitless
Soil ingestion rate =	0.0095	kg/d
Sediment ingestion rate =	0	kg/d
Food ingestion rate =	0.34	kg/d
Body weight =	2.95	kg
Home range =	2204	acres
Water intake rate =	0.57	L/d
Site Area =	0.57	acres
Frac. home range (FHR) =	1.00E+00	unitless

TABLE F-21
TIER 2 CHEMICALS OF POTENTIAL CONCERN EEQs AND HAZARD INDICES FOR RED FOXES AT SWMU 59

Hazard Estimate - Tier 2
Red Fox

Chemical	Surface Water Exposure Point Concentration	Units	Sediment Exposure Point Concentration	Units	Soil Exposure Point Concentration	Units	Fish BAF	Aq. Invert. BAF	Terr. Invert. BAF	Plant BAF	Mammal BAF	Bird BAF	PDE Surface Water	PDE Sediment	PDE Soil	PDE Fish	PDE Aq. Invert.	PDE Terr. Invert.	PDE Plants	PDE Mammals	PDE Birds	Total PDE	Chemical-Specific Toxicity Value UF	NOAEL	Adjusted NOAEL	EEQ N	LOAEL	Adjusted LOAEL	EEQ L
							---------- unitless ----------						mg/kg-d	mg/kg-d	mg/kg-d	mg/kg-d	mg/kg-d	mg/kg-d	mg/kg-d	mg/kg-d	mg/kg-d	mg/kg-d		mg/kg-d	mg/kg-d		mg/kg-d	mg/kg-d	
2,3,7,8-TCDD-TE	0.00E+00	mg/L	0.00E+00	mg/kg	8.67E-06	mg/kg	NA	NA	4.19E+00	3.87E-03	2.20E+00	2.20E+00	0.00E+00	0.00E+00	3.32E-12	NA	NA	1.99E-11	7.82E-14	1.70E-10	3.66E-11	2.30E-10	8	1.00E-06	1.25E-07	1.84E-03	1.00E-05	1.25E-06	1.84E-04
1,3,5-Trinitrobenzene	0.00E+00	mg/L	0.00E+00	mg/kg	1.38E-01	mg/kg	NA	NA	6.35E-02	5.62E+00	5.00E-01	5.00E-01	0.00E+00	0.00E+00	5.28E-08	NA	NA	4.80E-09	1.81E-06	6.15E-07	1.32E-07	2.61E-06	8	1.34E+01	1.68E+00	1.56E-06	6.70E+01	8.38E+00	3.12E-07
4,4'-DDD	0.00E+00	mg/L	0.00E+00	mg/kg	1.00E-03	mg/kg	NA	NA	2.58E+01	1.57E-02	5.00E-01	5.00E-01	0.00E+00	0.00E+00	3.83E-10	NA	NA	1.41E-08	3.65E-11	4.45E-09	9.59E-10	2.00E-08	8	8.00E-01	1.00E-01	2.00E-07	4.00E+00	5.00E-01	4.00E-08
4,4'-DDT	0.00E+00	mg/L	0.00E+00	mg/kg	4.41E-03	mg/kg	NA	NA	1.70E+01	4.61E-03	1.49E+00	1.49E+00	0.00E+00	0.00E+00	1.69E-09	NA	NA	4.12E-08	4.73E-11	5.86E-08	1.26E-08	1.14E-07	8	8.00E-01	1.00E-01	1.14E-06	4.00E+00	5.00E-01	2.28E-07
Acenaphthylene	0.00E+00	mg/L	0.00E+00	mg/kg	2.90E-03	mg/kg	NA	NA	2.29E+01	1.08E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.11E-09	NA	NA	3.64E-08	7.30E-09	0.00E+00	0.00E+00	4.48E-08	8	6.56E+01	8.20E+00	5.46E-09	1.10E+02	1.38E+01	3.26E-09
Anthracene	0.00E+00	mg/L	0.00E+00	mg/kg	2.00E-02	mg/kg	NA	NA	2.42E+00	8.85E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.65E-09	NA	NA	2.65E-08	4.12E-08	0.00E+00	0.00E+00	7.54E-08	8	6.56E+01	8.20E+00	9.20E-09	1.10E+02	1.38E+01	5.49E-09
Aroclor 1254	0.00E+00	mg/L	0.00E+00	mg/kg	2.80E-02	mg/kg	NA	NA	2.12E+00	3.58E-03	5.00E-01	5.00E-01	0.00E+00	0.00E+00	1.07E-08	NA	NA	3.26E-08	2.33E-10	1.25E-07	2.69E-08	1.95E-07	8	1.40E-01	1.75E-02	1.11E-05	6.80E-01	8.50E-02	2.29E-06
Benzo(a)anthracene	0.00E+00	mg/L	0.00E+00	mg/kg	3.67E-02	mg/kg	NA	NA	1.59E+00	2.55E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.40E-08	NA	NA	3.20E-08	2.18E-08	0.00E+00	0.00E+00	6.78E-08	8	6.15E-01	7.69E-02	8.82E-07	3.07E+00	3.84E-01	1.77E-07
Benzo(a)pyrene	0.00E+00	mg/L	0.00E+00	mg/kg	3.59E-02	mg/kg	NA	NA	1.33E+00	1.38E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.37E-08	NA	NA	2.62E-08	1.16E-08	0.00E+00	0.00E+00	5.15E-08	8	1.00E+00	1.25E-01	4.12E-07	1.00E+01	1.25E+00	4.12E-08
Benzo(b)fluoranthene	0.00E+00	mg/L	0.00E+00	mg/kg	3.87E-02	mg/kg	NA	NA	2.60E+00	3.10E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.48E-08	NA	NA	5.51E-08	2.79E-08	0.00E+00	0.00E+00	9.79E-08	8	6.15E-01	7.69E-02	1.27E-06	3.07E+00	3.84E-01	2.55E-07
Benzo(g,h,i)perylene	0.00E+00	mg/L	0.00E+00	mg/kg	2.21E-02	mg/kg	NA	NA	2.94E+00	1.96E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.45E-09	NA	NA	3.56E-08	1.01E-08	0.00E+00	0.00E+00	5.42E-08	8	6.15E-01	7.69E-02	7.05E-07	3.07E+00	3.84E-01	1.41E-07
Benzo(k)fluoranthene	0.00E+00	mg/L	0.00E+00	mg/kg	2.90E-02	mg/kg	NA	NA	2.60E+00	1.90E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.11E-08	NA	NA	4.13E-08	1.28E-08	0.00E+00	0.00E+00	6.53E-08	8	6.15E-01	7.69E-02	8.49E-07	3.07E+00	3.84E-01	1.70E-07
Chrysene	0.00E+00	mg/L	0.00E+00	mg/kg	3.87E-02	mg/kg	NA	NA	2.29E+00	2.49E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.48E-08	NA	NA	4.86E-08	2.25E-08	0.00E+00	0.00E+00	8.59E-08	8	6.15E-01	7.69E-02	1.12E-06	3.07E+00	3.84E-01	2.24E-07
Dibenz(a,h)anthracene	0.00E+00	mg/L	0.00E+00	mg/kg	6.40E-03	mg/kg	NA	NA	2.31E+00	1.30E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.45E-09	NA	NA	8.10E-09	1.94E-09	0.00E+00	0.00E+00	1.25E-08	8	6.15E-01	7.69E-02	1.62E-07	3.07E+00	3.84E-01	3.25E-08
Dieldrin	0.00E+00	mg/L	0.00E+00	mg/kg	4.52E-03	mg/kg	NA	NA	1.47E+01	4.10E-01	1.76E+01	1.76E+01	0.00E+00	0.00E+00	1.73E-09	NA	NA	3.64E-08	4.32E-09	7.10E-07	1.53E-07	9.06E-07	8	1.50E-02	1.88E-03	4.83E-04	3.00E-02	3.75E-03	2.41E-04
Endosulfan I	0.00E+00	mg/L	0.00E+00	mg/kg	9.61E-04	mg/kg	NA	NA	1.91E-01	3.67E-01	5.00E-01	5.00E-01	0.00E+00	0.00E+00	3.68E-10	NA	NA	1.01E-10	8.22E-10	4.28E-09	9.22E-10	6.49E-09	8	1.50E-01	1.88E-02	3.46E-07	7.50E-01	9.38E-02	6.92E-08
Endosulfan II	0.00E+00	mg/L	0.00E+00	mg/kg	3.94E-03	mg/kg	NA	NA	1.91E-01	3.67E-01	5.00E-01	5.00E-01	0.00E+00	0.00E+00	1.51E-09	NA	NA	4.12E-10	3.37E-09	1.75E-08	3.78E-09	2.66E-08	8	1.50E-01	1.88E-02	1.42E-06	7.50E-01	9.38E-02	2.84E-07
Endosulfan sulfate	0.00E+00	mg/L	0.00E+00	mg/kg	7.10E-03	mg/kg	NA	NA	1.72E-01	3.05E-01	5.00E-01	5.00E-01	0.00E+00	0.00E+00	2.72E-09	NA	NA	6.70E-10	5.04E-09	3.16E-08	6.81E-09	4.69E-08	8	1.50E-01	1.88E-02	2.50E-06	7.50E-01	9.38E-02	5.00E-07
Endrin aldehyde	0.00E+00	mg/L	0.00E+00	mg/kg	4.28E-04	mg/kg	NA	NA	5.26E+00	6.51E-02	5.00E-01	5.00E-01	0.00E+00	0.00E+00	1.64E-10	NA	NA	1.23E-09	6.49E-11	1.91E-09	4.11E-10	3.78E-09	8	9.20E-02	1.15E-02	3.29E-07	9.20E-01	1.15E-01	3.29E-08
Endrin ketone	0.00E+00	mg/L	0.00E+00	mg/kg	2.90E-03	mg/kg	NA	NA	8.65E+00	5.06E-02	5.00E-01	5.00E-01	0.00E+00	0.00E+00	1.11E-09	NA	NA	1.37E-08	3.42E-10	1.29E-08	2.78E-09	3.09E-08	8	9.20E-02	1.15E-02	2.69E-06	9.20E-01	1.15E-01	2.69E-07
Fluoranthene	0.00E+00	mg/L	0.00E+00	mg/kg	8.28E-02	mg/kg	NA	NA	3.04E+00	5.00E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.17E-08	NA	NA	1.38E-07	9.64E-08	0.00E+00	0.00E+00	2.66E-07	8	6.15E-01	7.69E-02	3.46E-06	3.07E+00	3.84E-01	6.93E-07
Fluorene	0.00E+00	mg/L	0.00E+00	mg/kg	9.10E-03	mg/kg	NA	NA	9.57E+00	2.35E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.48E-09	NA	NA	4.77E-08	4.99E-07	0.00E+00	0.00E+00	5.50E-07	8	6.56E+01	8.20E+00	6.71E-08	1.10E+02	1.38E+01	4.00E-08
gamma-Chlordane	0.00E+00	mg/L	0.00E+00	mg/kg	1.10E-03	mg/kg	NA	NA	1.22E+01	9.33E-03	5.00E-01	5.00E-01	0.00E+00	0.00E+00	4.21E-10	NA	NA	7.36E-09	2.39E-11	4.90E-09	1.06E-09	1.38E-08	8	4.60E+00	5.75E-01	2.39E-08	9.20E+00	1.15E+00	1.20E-08
Heptachlor epoxide	0.00E+00	mg/L	0.00E+00	mg/kg	1.06E-03	mg/kg	NA	NA	6.68E+00	8.96E-02	5.00E-01	5.00E-01	0.00E+00	0.00E+00	4.05E-10	NA	NA	3.88E-09	2.21E-10	4.72E-09	1.02E-09	1.02E-08	8	1.00E-01	1.25E-02	8.19E-07	1.00E+00	1.25E-01	8.19E-08
Indeno(1,2,3-cd)pyrene	0.00E+00	mg/L	0.00E+00	mg/kg	2.27E-02	mg/kg	NA	NA	2.86E+00	1.10E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.68E-09	NA	NA	3.56E-08	5.82E-09	0.00E+00	0.00E+00	5.01E-08	8	6.15E-01	7.69E-02	6.51E-07	3.07E+00	3.84E-01	1.31E-07
Methoxychlor	0.00E+00	mg/L	0.00E+00	mg/kg	1.02E-02	mg/kg	NA	NA	7.64E+00	2.05E-02	5.00E-01	5.00E-01	0.00E+00	0.00E+00	3.90E-09	NA	NA	4.27E-08	4.86E-10	4.54E-08	9.78E-09	1.02E-07	8	4.00E+00	5.00E-01	2.05E-07	8.00E+00	1.00E+00	1.02E-07
Naphthalene	0.00E+00	mg/L	0.00E+00	mg/kg	1.30E-01	mg/kg	NA	NA	4.40E+00	1.22E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.97E-08	NA	NA	3.13E-07	3.69E-06	0.00E+00	0.00E+00	4.06E-06	8	6.56E+01	8.20E+00	4.95E-07	1.10E+02	1.38E+01	2.95E-07
Phenanthrene	0.00E+00	mg/L	0.00E+00	mg/kg	1.10E-01	mg/kg	NA	NA	1.72E+00	1.96E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.21E-08	NA	NA	1.04E-07	5.02E-07	0.00E+00	0.00E+00	6.47E-07	8	6.56E+01	8.20E+00	7.89E-08	1.10E+02	1.38E+01	4.71E-08
Pyrene	0.00E+00	mg/L	0.00E+00	mg/kg	8.34E-02	mg/kg	NA	NA	1.75E+00	7.20E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.19E-08	NA	NA	8.00E-08	1.40E-07	0.00E+00	0.00E+00	2.52E-07	8	6.15E-01	7.69E-02	3.27E-06	3.07E+00	3.84E-01	6.56E-07
Arsenic	0.00E+00	mg/L	0.00E+00	mg/kg	2.07E+01	mg/kg	NA	NA	9.90E-02	3.75E-02	5.00E-03	5.00E-03	0.00E+00	0.00E+00	7.93E-06	NA	NA	1.13E-06	1.81E-06	9.24E-07	1.99E-07	1.20E-05	8	1.26E-01	1.58E-02	7.61E-04	1.26E+00	1.58E-01	7.61E-05
Cadmium	0.00E+00	mg/L	0.00E+00	mg/kg	1.10E-01	mg/kg	NA	NA	1.30E+01	1.69E+00	9.12E-01	9.12E-01	0.00E+00	0.00E+00	4.21E-08	NA	NA	7.85E-07	4.34E-07	8.93E-07	1.92E-07	2.35E-06	8	1.00E+00	1.25E-01	1.88E-05	1.00E+01	1.25E+00	1.88E-06
Chromium	0.00E+00	mg/L	0.00E+00	mg/kg	1.91E+01	mg/kg	NA	NA	3.06E-01	4.10E-02	1.06E-01	1.06E-01	0.00E+00	0.00E+00	7.31E-06	NA	NA	3.20E-06	1.83E-06	1.80E-05	3.88E-06	3.42E-05	8	2.74E+03	3.42E+02	1.00E-07	1.37E+04	1.71E+03	2.00E-08
Copper	0.00E+00	mg/L	0.00E+00	mg/kg	1.20E+01	mg/kg	NA	NA	5.15E-01	4.33E-01	9.20E-01	9.20E-01	0.00E+00	0.00E+00	4.58E-06	NA	NA	3.38E-06	1.21E-05	9.81E-05	2.11E-05	1.39E-04	8	1.17E+01	1.46E+00	9.52E-05	1.51E+01	1.89E+00	7.38E-05
Lead	0.00E+00	mg/L	0.00E+00	mg/kg	1.82E+01	mg/kg	NA	NA	4.60E-01	7.42E-02	2.14E-01	2.14E-01	0.00E+00	0.00E+00	6.95E-06	NA	NA	4.57E-06	3.14E-06	3.46E-05	7.46E-06	5.68E-05	8	8.00E+00	1.00E+00	5.68E-05	8.00E+01	1.00E+01	5.68E-06
Mercury	0.00E+00	mg/L	0.00E+00	mg/kg	3.00E-01	mg/kg	NA	NA	2.42E+00	6.40E-01	1.92E-01	1.92E-01	0.00E+00	0.00E+00	1.15E-07	NA	NA	3.98E-07	4.47E-07	5.13E-07	1.10E-07	1.58E-06	8	1.00E+00	1.25E-01	1.27E-05	5.00E+00	6.25E-01	2.53E-06
Nickel	0.00E+00	mg/L	0.00E+00	mg/kg	8.80E+00	mg/kg	NA	NA	4.51E+00	6.26E-02	2.45E-01	2.45E-01	0.00E+00	0.00E+00	3.37E-06	NA	NA	2.18E-05	1.28E-06	1.92E-05	4.13E-06	4.97E-05	8	4.00E+01	5.00E+00	9.94E-06	8.00E+01	1.00E+01	4.97E-06
Selenium	0.00E+00	mg/L	0.00E+00	mg/kg	6.70E+00	mg/kg	NA	NA	5.58E-01	6.19E-01	2.02E-01	2.02E-01	0.00E+00	0.00E+00	2.56E-06	NA	NA	2.05E-06	9.66E-06	1.20E-05	2.59E-06	2.89E-05	8	2.00E-01	2.50E-02	1.16E-03	3.30E-01	4.13E-02	7.00E-04
Silver	0.00E+00	mg/L	0.00E+00	mg/kg	3.44E-01	mg/kg	NA	NA	2.05E+00	1.40E-02	4.00E-03	4.00E-03	0.00E+00	0.00E+00	1.32E-07	NA	NA	3.86E-07	1.12E-08	1.23E-08	2.64E-09	5.43E-07	8	2.22E+01	2.78E+00	1.96E-07	2.22E+02	2.78E+01	1.96E-08
Zinc	0.00E+00	mg/L	0.00E+00	mg/kg	3.80E+01	mg/kg	NA	NA	7.43E+00	9.54E-01	2.67E+00	2.67E+00	0.00E+00	0.00E+00	1.45E-05	NA	NA	1.55E-04	8.44E-05	9.04E-04	1.95E-04	1.35E-03	8	1.60E+02	2.00E+01	6.76E-05	3.20E+02	4.00E+01	3.38E-05
																					Hazard Index (Total EEQ):				4.5E-03			1.3E-03

Intake Equation:

$$Ej = \left(\frac{A}{HR} \left[\sum_{i=1}^{m} \left(\frac{IRi \, x \, Cij}{BW} \right) \right] \right)$$

Where:
Ej = Total Exposure to Chemical
A = Site Area
HR = Home Range
m = Total number of ingested media
i = counter
IRi = Consumption Rate for Medium
Cij = Chemical concentration (j) in medium (I) (mg/kg or mg/L)
BW = Body Weight

Notes:
Tier 1 = Max EEQ using max EPC, max BAF/BCF, max Intake Rates, min BW, and FHR =1.
Tier 2 = EEQ using 95% EPC, non-max BAF/BCF, avg Intake Rates, avg BW and calculated FHR.
BAF = Bioaccumulation Factor (may be BCF if this is the only value available)
EEQ = Ecological Effects Quotient.
L = LOAEL based; N = NOAEL based
LOAEL = Lowest Observed Adverse Effect Level
NOAEL = No Observed Adverse Effect Level
NA = Not applicable/Not available
PDE = Predicted Daily Exposure
BAF (or BCF) values from appropriate text tables (BCF = bioconcentration factor)
Some BAF (or BCF) values based on media regression equations (value in box): n See appropriate text tables for equations.
If BAF/BCF regression equation produced Tier 2 value exceeding maximum Tier 1 BAF/BCF value, Tier 1 value used as default.
LOAEL and NOAEL values from appropriate toxicity summary tables in the text.
UF = Uncertainty Factor for toxicity factor extrapolation, and Adjusted LOAEL or NOAEL = LOAEL/UF or NOAEL/UF
A "0" entry in the exposure concentration column indicates this chemical not selected as a COPEC for this medium.
Receptor diet data and home range data from appropriate text table.
Exposure point concentrations (EPCs) from appropriate text tables.

Species-Specific Factors

Plant diet fraction =	0.17	unitless
Fish diet fraction =	0	unitless
Aq. Invert diet fraction =	0	unitless
Terr. Invert diet fraction =	0.04	unitless
Mammal diet fraction =	0.65	unitless
Bird diet fraction =	0.14	unitless
Soil ingestion rate =	0.0067	kg/d
Sediment ingestion rate =	0	kg/d
Food ingestion rate =	0.24	kg/d
Body weight =	4.53	kg
Home range =	2204	acres
Water intake rate =	0.39	L/d
Site Area =	0.57	acres
Frac. home range (FHR) =	2.59E-04	unitless

TABLE F-22
TIER 2 CHEMICALS OF POTENTIAL CONCERN EEQs AND HAZARD INDICES FOR RED FOXES AT SWMU 59 (EXAMPLE CALCULATIONS)

Hazard Estimate - Tier 2
Red Fox

Chemical	Surface Water Exposure Point Concentration	Units	Sediment Exposure Point Concentration	Units	Soil Exposure Point Concentration	Units	Fish BAF	Aq. Invert. BAF	Terr. Invert. BAF
2,3,7,8-TCDD-TE	0	mg/L	0	mg/kg	0.00000867	mg/kg	NA	NA	=EXP(1.18*LN(F8)+3.53)/F8
1,3,5-Trinitrobenzene	0	mg/L	0	mg/kg	0.138	mg/kg	NA	NA	0.0634555445188687
4,4'-DDD	0	mg/L	0	mg/kg	0.001	mg/kg	NA	NA	=EXP(0.6975*LN(F10)+1.1613)/F10
4,4'-DDT	0	mg/L	0	mg/kg	0.00441	mg/kg	NA	NA	=EXP(0.8689*LN(F11)+2.1247)/F11
Acenaphthylene	0	mg/L	0	mg/kg	0.0029	mg/kg	NA	NA	22.9
Anthracene	0	mg/L	0	mg/kg	0.02	mg/kg	NA	NA	2.42
Aroclor 1254	0	mg/L	0	mg/kg	0.028	mg/kg	NA	NA	=EXP(1.29*LN(F14)+1.79)/F14
Benzo(a)anthracene	0	mg/L	0	mg/kg	0.0367	mg/kg	NA	NA	1.59
Benzo(a)pyrene	0	mg/L	0	mg/kg	0.0359	mg/kg	NA	NA	1.33
Benzo(b)fluoranthene	0	mg/L	0	mg/kg	0.0387	mg/kg	NA	NA	2.6
Benzo(g,h,i)perylene	0	mg/L	0	mg/kg	0.0221	mg/kg	NA	NA	2.94
Benzo(k)fluoranthene	0	mg/L	0	mg/kg	0.029	mg/kg	NA	NA	2.6
Chrysene	0	mg/L	0	mg/kg	0.0387	mg/kg	NA	NA	2.29
Dibenz(a,h)anthracene	0	mg/L	0	mg/kg	0.0064	mg/kg	NA	NA	2.31
Dieldrin	0	mg/L	0	mg/kg	0.00452	mg/kg	NA	NA	14.7
Endosulfan I	0	mg/L	0	mg/kg	0.000961	mg/kg	NA	NA	0.190973625217356
Endosulfan II	0	mg/L	0	mg/kg	0.00394	mg/kg	NA	NA	0.190973625217356
Endosulfan sulfate	0	mg/L	0	mg/kg	0.0071	mg/kg	NA	NA	0.172184300571347
Endrin aldehyde	0	mg/L	0	mg/kg	0.000428	mg/kg	NA	NA	5.25983738602124
Endrin ketone	0	mg/L	0	mg/kg	0.0029	mg/kg	NA	NA	8.64913519151849
Fluoranthene	0	mg/L	0	mg/kg	0.0828	mg/kg	NA	NA	3.04
Fluorene	0	mg/L	0	mg/kg	0.0091	mg/kg	NA	NA	9.57
gamma-Chlordane	0	mg/L	0	mg/kg	0.0011	mg/kg	NA	NA	12.2061014616866
Heptachlor epoxide	0	mg/L	0	mg/kg	0.00106	mg/kg	NA	NA	6.67744514475022
Indeno(1,2,3-cd)pyrene	0	mg/L	0	mg/kg	0.0227	mg/kg	NA	NA	2.86
Methoxychlor	0	mg/L	0	mg/kg	0.0102	mg/kg	NA	NA	7.63672484573625
Naphthalene	0	mg/L	0	mg/kg	0.13	mg/kg	NA	NA	4.4
Phenanthrene	0	mg/L	0	mg/kg	0.11	mg/kg	NA	NA	1.72
Pyrene	0	mg/L	0	mg/kg	0.0834	mg/kg	NA	NA	1.75
Arsenic	0	mg/L	0	mg/kg	20.73	mg/kg	NA	NA	=EXP(0.706*LN(F37)-1.421)/F37
Cadmium	0	mg/L	0	mg/kg	0.11	mg/kg	NA	NA	=EXP(0.795*LN(F38)+2.114)/F38
Chromium	0	mg/L	0	mg/kg	19.11	mg/kg	NA	NA	0.306
Copper	0	mg/L	0	mg/kg	11.97	mg/kg	NA	NA	0.515
Lead	0	mg/L	0	mg/kg	18.16	mg/kg	NA	NA	=EXP(0.807*LN(F41)-0.218)/F41
Mercury	0	mg/L	0	mg/kg	0.3	mg/kg	NA	NA	=EXP(0.33*LN(F42)+0.078)/F42
Nickel	0	mg/L	0	mg/kg	8.798	mg/kg	NA	NA	=EXP(-1.54*LN(F43)+7.03)/F43
Selenium	0	mg/L	0	mg/kg	6.697	mg/kg	NA	NA	=EXP(0.733*LN(F44)-0.075)/F44
Silver	0	mg/L	0	mg/kg	0.343975358613006	mg/kg	NA	NA	2.045
Zinc	0	mg/L	0	mg/kg	37.96	mg/kg	NA	NA	=EXP(0.328*LN(F46)+4.449)/F46

Intake Equation:

$$Ej = \left(\frac{A}{HR} \left[\sum_{i=1}^{m} \left(\frac{IRi \, x Cij}{BW} \right) \right] \right)$$

Where:
Ej = Total Exposure to Chemical
A = Site Area
HR = Home Range
m = Total number of ingested media
i = counter
IRi = Consumption Rate for Medium
Cij = Chemical concentration (j) in med
BW = Body Weight

TABLE F-22
TIER 2 CHEMICALS OF POTENTIAL CONCERN EEQs AND HAZARD INDICES FOR RED FOXES AT SWMU 59 (EXAMPLE CALCULATIONS)

Plant BAF	Mammal BAF	Bird BAF	PDE Surface Water	PDE Sediment	PDE Soil
---------- unitless ----------			mg/kg-d	mg/kg-d	mg/kg-d
0.00387471710547971	2.2	2.2	=$AA$64*B8*$AA$66/$AA$62	=$AA$60*D8*$AA$66/$AA$62	=$AA$59*F8*$AA$66/$AA$62
5.62211856221332	0.5	0.5	=$AA$64*B9*$AA$66/$AA$62	=$AA$60*D9*$AA$66/$AA$62	=$AA$59*F9*$AA$66/$AA$62
0.015672562123952 8	0.5	0.5	=$AA$64*B10*$AA$66/$AA$62	=$AA$60*D10*$AA$66/$AA$62	=$AA$59*F10*$AA$66/$AA$62
0.00460659466189216	=EXP(0.7254*LN(J11)+1.1788)/J11	=EXP(0.7254*LN(J11)+1.1788)/J11	=$AA$64*B11*$AA$66/$AA$62	=$AA$60*D11*$AA$66/$AA$62	=$AA$59*F11*$AA$66/$AA$62
=EXP(0.791*LN(F12)-1.144)/F12	0	0	=$AA$64*B12*$AA$66/$AA$62	=$AA$60*D12*$AA$66/$AA$62	=$AA$59*F12*$AA$66/$AA$62
=EXP(0.7784*LN(F13)-0.9887)/F13	0	0	=$AA$64*B13*$AA$66/$AA$62	=$AA$60*D13*$AA$66/$AA$62	=$AA$59*F13*$AA$66/$AA$62
0.00357733819916289	0.5	0.5	=$AA$64*B14*$AA$66/$AA$62	=$AA$60*D14*$AA$66/$AA$62	=$AA$59*F14*$AA$66/$AA$62
=EXP(0.5944*LN(F15)-2.7078)/F15	0	0	=$AA$64*B15*$AA$66/$AA$62	=$AA$60*D15*$AA$66/$AA$62	=$AA$59*F15*$AA$66/$AA$62
=EXP(0.975*LN(F16)-2.0615)/F16	0	0	=$AA$64*B16*$AA$66/$AA$62	=$AA$60*D16*$AA$66/$AA$62	=$AA$59*F16*$AA$66/$AA$62
0.31	0	0	=$AA$64*B17*$AA$66/$AA$62	=$AA$60*D17*$AA$66/$AA$62	=$AA$59*F17*$AA$66/$AA$62
=EXP(1.1829*LN(F18)-0.9313)/F18	0	0	=$AA$64*B18*$AA$66/$AA$62	=$AA$60*D18*$AA$66/$AA$62	=$AA$59*F18*$AA$66/$AA$62
=EXP(0.8595*LN(F19)-2.1579)/F19	0	0	=$AA$64*B19*$AA$66/$AA$62	=$AA$60*D19*$AA$66/$AA$62	=$AA$59*F19*$AA$66/$AA$62
=EXP(0.5944*LN(F20)-2.7078)/F20	0	0	=$AA$64*B20*$AA$66/$AA$62	=$AA$60*D20*$AA$66/$AA$62	=$AA$59*F20*$AA$66/$AA$62
0.13	0	0	=$AA$64*B21*$AA$66/$AA$62	=$AA$60*D21*$AA$66/$AA$62	=$AA$59*F21*$AA$66/$AA$62
0.41	=1.2*J22	=1.2*J22	=$AA$64*B22*$AA$66/$AA$62	=$AA$60*D22*$AA$66/$AA$62	=$AA$59*F22*$AA$66/$AA$62
0.367282300498085	0.5	0.5	=$AA$64*B23*$AA$66/$AA$62	=$AA$60*D23*$AA$66/$AA$62	=$AA$59*F23*$AA$66/$AA$62
0.367282300498085	0.5	0.5	=$AA$64*B24*$AA$66/$AA$62	=$AA$60*D24*$AA$66/$AA$62	=$AA$59*F24*$AA$66/$AA$62
0.304845648434742	0.5	0.5	=$AA$64*B25*$AA$66/$AA$62	=$AA$60*D25*$AA$66/$AA$62	=$AA$59*F25*$AA$66/$AA$62
0.0651028498434862	0.5	0.5	=$AA$64*B26*$AA$66/$AA$62	=$AA$60*D26*$AA$66/$AA$62	=$AA$59*F26*$AA$66/$AA$62
0.0505568491940655	0.5	0.5	=$AA$64*B27*$AA$66/$AA$62	=$AA$60*D27*$AA$66/$AA$62	=$AA$59*F27*$AA$66/$AA$62
0.5	0	0	=$AA$64*B28*$AA$66/$AA$62	=$AA$60*D28*$AA$66/$AA$62	=$AA$59*F28*$AA$66/$AA$62
=EXP(-0.8556*LN(F29)-5.562)/F29	0	0	=$AA$64*B29*$AA$66/$AA$62	=$AA$60*D29*$AA$66/$AA$62	=$AA$59*F29*$AA$66/$AA$62
0.00932652803434191	0.5	0.5	=$AA$64*B30*$AA$66/$AA$62	=$AA$60*D30*$AA$66/$AA$62	=$AA$59*F30*$AA$66/$AA$62
0.0896024737802322	0.5	0.5	=$AA$64*B31*$AA$66/$AA$62	=$AA$60*D31*$AA$66/$AA$62	=$AA$59*F31*$AA$66/$AA$62
0.11	0	0	=$AA$64*B32*$AA$66/$AA$62	=$AA$60*D32*$AA$66/$AA$62	=$AA$59*F32*$AA$66/$AA$62
0.0204521985402521	0.5	0.5	=$AA$64*B33*$AA$66/$AA$62	=$AA$60*D33*$AA$66/$AA$62	=$AA$59*F33*$AA$66/$AA$62
12.2	0	0	=$AA$64*B34*$AA$66/$AA$62	=$AA$60*D34*$AA$66/$AA$62	=$AA$59*F34*$AA$66/$AA$62
=EXP(0.6203*LN(F35)-0.1665)/F35	0	0	=$AA$64*B35*$AA$66/$AA$62	=$AA$60*D35*$AA$66/$AA$62	=$AA$59*F35*$AA$66/$AA$62
0.72	0	0	=$AA$64*B36*$AA$66/$AA$62	=$AA$60*D36*$AA$66/$AA$62	=$AA$59*F36*$AA$66/$AA$62
0.03752	0.00500476367585271	0.00500476367585271	=$AA$64*B37*$AA$66/$AA$62	=$AA$60*D37*$AA$66/$AA$62	=$AA$59*F37*$AA$66/$AA$62
=EXP(0.546*LN(F38)-0.475)/F38	=EXP(0.4723*LN(F38)-1.2571)/F38	=EXP(0.4723*LN(F38)-1.2571)/F38	=$AA$64*B38*$AA$66/$AA$62	=$AA$60*D38*$AA$66/$AA$62	=$AA$59*F38*$AA$66/$AA$62
0.041	=EXP(0.7338*LN(F39)-1.4599)/F39	=EXP(0.7338*LN(F39)-1.4599)/F39	=$AA$64*B39*$AA$66/$AA$62	=$AA$60*D39*$AA$66/$AA$62	=$AA$59*F39*$AA$66/$AA$62
=EXP(0.394*LN(F40)+0.668)/F40	=EXP(0.144*LN(F40)+2.042)/F40	=EXP(0.144*LN(F40)+2.042)/F40	=$AA$64*B40*$AA$66/$AA$62	=$AA$60*D40*$AA$66/$AA$62	=$AA$59*F40*$AA$66/$AA$62
=EXP(0.561*LN(F41)-1.328)/F41	=EXP(0.4422*LN(F41)+0.0761)/F41	=EXP(0.4422*LN(F41)+0.0761)/F41	=$AA$64*B41*$AA$66/$AA$62	=$AA$60*D41*$AA$66/$AA$62	=$AA$59*F41*$AA$66/$AA$62
=EXP(0.54*LN(F42)-1)/F42	0.192	0.192	=$AA$64*B42*$AA$66/$AA$62	=$AA$60*D42*$AA$66/$AA$62	=$AA$59*F42*$AA$66/$AA$62
=EXP(0.748*LN(F43)-2.223)/F43	=EXP(0.4658*LN(F43)-0.2462)/F43	=EXP(0.4658*LN(F43)-0.2462)/F43	=$AA$64*B43*$AA$66/$AA$62	=$AA$60*D43*$AA$66/$AA$62	=$AA$59*F43*$AA$66/$AA$62
=EXP(1.104*LN(F44)-0.677)/F44	=EXP(0.3764*LN(F44)-0.4158)/F44	=EXP(0.3764*LN(F44)-0.4158)/F44	=$AA$64*B44*$AA$66/$AA$62	=$AA$60*D44*$AA$66/$AA$62	=$AA$59*F44*$AA$66/$AA$62
0.014	0.004	0.004	=$AA$64*B45*$AA$66/$AA$62	=$AA$60*D45*$AA$66/$AA$62	=$AA$59*F45*$AA$66/$AA$62
=EXP(0.554*LN(F46)+1.575)/F46	=EXP(0.0706*LN(F46)+4.3632)/F46	=EXP(0.0706*LN(F46)+4.3632)/F46	=$AA$64*B46*$AA$66/$AA$62	=$AA$60*D46*$AA$66/$AA$62	=$AA$59*F46*$AA$66/$AA$62

Notes:

Tier 1 = Max EEQ using max EPC, max BAF/BCF, max Intake Rates, min BW, and FHR =1.
Tier 2 = EEQ using 95% EPC, non-max BAF/BCF, avg Intake Rates, avg BW and calculated FHR.
BAF = Bioaccumulation Factor (may be BCF if this is the only value available)
EEQ = Ecological Effects Quotient.
L = LOAEL based; N = NOAEL based
LOAEL = Lowest Observed Adverse Effect Level
NOAEL = No Observed Adverse Effect Level
NA = Not applicable/Not available
PDE = Predicted Daily Exposure
BAF (or BCF) values from appropriate text tables (BCF = bioconcentration factor)
Some BAF (or BCF) values based on media regression equations (value in box):
If BAF/BCF regression equation produced Tier 2 value exceeding maximum Tier 1 BAF/BCF value, Tier 1 value used as default.
LOAEL and NOAEL values from appropriate toxicity summary tables in the text.
UF = Uncertainty Factor for toxicity factor extrapolation, and Adjusted LOAEL or NOAEL = LOAEL/UF or NOAEL/UF
A "0" entry in the exposure concentration column indicates this chemical not selected as a COPEC for this medium.
Receptor diet data and home range data from appropriate text table.
Exposure point concentrations (EPCs) from appropriate text tables.

TABLE F-22
TIER 2 CHEMICALS OF POTENTIAL CONCERN EEQs AND HAZARD INDICES FOR RED FOXES AT SWMU 59 (EXAMPLE CALCULATIONS)

PDE Fish mg/kg-d	PDE Aq. Invert. mg/kg-d	PDE Terr. Invert. mg/kg-d	PDE Plants mg/kg-d	PDE Mammals mg/kg-d
=IF(H8="NA","NA",$AA$54*B8*H8*$AA$61*$AA$66/$AA$62)	=IF(I8="NA","NA",$AA$55*D8*I8*$AA$61*$AA$66/$AA$62)	=IF(J8="NA","NA",$AA$56*F8*J8*$AA$61*$AA$66/$AA$62)	=IF(K8="NA","NA",$AA$53*F8*K8*$AA$61*$AA$66/$AA$62)	=IF(L8="NA","NA",$AA$57*F8*L8*$AA$61*$AA$66/$AA$62)
=IF(H9="NA","NA",$AA$54*B9*H9*$AA$61*$AA$66/$AA$62)	=IF(I9="NA","NA",$AA$55*D9*I9*$AA$61*$AA$66/$AA$62)	=IF(J9="NA","NA",$AA$56*F9*J9*$AA$61*$AA$66/$AA$62)	=IF(K9="NA","NA",$AA$53*F9*K9*$AA$61*$AA$66/$AA$62)	=IF(L9="NA","NA",$AA$57*F9*L9*$AA$61*$AA$66/$AA$62)
=IF(H10="NA","NA",$AA$54*B10*H10*$AA$61*$AA$66/$AA$62)	=IF(I10="NA","NA",$AA$55*D10*I10*$AA$61*$AA$66/$AA$62)	=IF(J10="NA","NA",$AA$56*F10*J10*$AA$61*$AA$66/$AA$62)	=IF(K10="NA","NA",$AA$53*F10*K10*$AA$61*$AA$66/$AA$62)	=IF(L10="NA","NA",$AA$57*F10*L10*$AA$61*$AA$66/$AA$62)
=IF(H11="NA","NA",$AA$54*B11*H11*$AA$61*$AA$66/$AA$62)	=IF(I11="NA","NA",$AA$55*D11*I11*$AA$61*$AA$66/$AA$62)	=IF(J11="NA","NA",$AA$56*F11*J11*$AA$61*$AA$66/$AA$62)	=IF(K11="NA","NA",$AA$53*F11*K11*$AA$61*$AA$66/$AA$62)	=IF(L11="NA","NA",$AA$57*F11*L11*$AA$61*$AA$66/$AA$62)
=IF(H12="NA","NA",$AA$54*B12*H12*$AA$61*$AA$66/$AA$62)	=IF(I12="NA","NA",$AA$55*D12*I12*$AA$61*$AA$66/$AA$62)	=IF(J12="NA","NA",$AA$56*F12*J12*$AA$61*$AA$66/$AA$62)	=IF(K12="NA","NA",$AA$53*F12*K12*$AA$61*$AA$66/$AA$62)	=IF(L12="NA","NA",$AA$57*F12*L12*$AA$61*$AA$66/$AA$62)
=IF(H13="NA","NA",$AA$54*B13*H13*$AA$61*$AA$66/$AA$62)	=IF(I13="NA","NA",$AA$55*D13*I13*$AA$61*$AA$66/$AA$62)	=IF(J13="NA","NA",$AA$56*F13*J13*$AA$61*$AA$66/$AA$62)	=IF(K13="NA","NA",$AA$53*F13*K13*$AA$61*$AA$66/$AA$62)	=IF(L13="NA","NA",$AA$57*F13*L13*$AA$61*$AA$66/$AA$62)
=IF(H14="NA","NA",$AA$54*B14*H14*$AA$61*$AA$66/$AA$62)	=IF(I14="NA","NA",$AA$55*D14*I14*$AA$61*$AA$66/$AA$62)	=IF(J14="NA","NA",$AA$56*F14*J14*$AA$61*$AA$66/$AA$62)	=IF(K14="NA","NA",$AA$53*F14*K14*$AA$61*$AA$66/$AA$62)	=IF(L14="NA","NA",$AA$57*F14*L14*$AA$61*$AA$66/$AA$62)
=IF(H15="NA","NA",$AA$54*B15*H15*$AA$61*$AA$66/$AA$62)	=IF(I15="NA","NA",$AA$55*D15*I15*$AA$61*$AA$66/$AA$62)	=IF(J15="NA","NA",$AA$56*F15*J15*$AA$61*$AA$66/$AA$62)	=IF(K15="NA","NA",$AA$53*F15*K15*$AA$61*$AA$66/$AA$62)	=IF(L15="NA","NA",$AA$57*F15*L15*$AA$61*$AA$66/$AA$62)
=IF(H16="NA","NA",$AA$54*B16*H16*$AA$61*$AA$66/$AA$62)	=IF(I16="NA","NA",$AA$55*D16*I16*$AA$61*$AA$66/$AA$62)	=IF(J16="NA","NA",$AA$56*F16*J16*$AA$61*$AA$66/$AA$62)	=IF(K16="NA","NA",$AA$53*F16*K16*$AA$61*$AA$66/$AA$62)	=IF(L16="NA","NA",$AA$57*F16*L16*$AA$61*$AA$66/$AA$62)
=IF(H17="NA","NA",$AA$54*B17*H17*$AA$61*$AA$66/$AA$62)	=IF(I17="NA","NA",$AA$55*D17*I17*$AA$61*$AA$66/$AA$62)	=IF(J17="NA","NA",$AA$56*F17*J17*$AA$61*$AA$66/$AA$62)	=IF(K17="NA","NA",$AA$53*F17*K17*$AA$61*$AA$66/$AA$62)	=IF(L17="NA","NA",$AA$57*F17*L17*$AA$61*$AA$66/$AA$62)
=IF(H18="NA","NA",$AA$54*B18*H18*$AA$61*$AA$66/$AA$62)	=IF(I18="NA","NA",$AA$55*D18*I18*$AA$61*$AA$66/$AA$62)	=IF(J18="NA","NA",$AA$56*F18*J18*$AA$61*$AA$66/$AA$62)	=IF(K18="NA","NA",$AA$53*F18*K18*$AA$61*$AA$66/$AA$62)	=IF(L18="NA","NA",$AA$57*F18*L18*$AA$61*$AA$66/$AA$62)
=IF(H19="NA","NA",$AA$54*B19*H19*$AA$61*$AA$66/$AA$62)	=IF(I19="NA","NA",$AA$55*D19*I19*$AA$61*$AA$66/$AA$62)	=IF(J19="NA","NA",$AA$56*F19*J19*$AA$61*$AA$66/$AA$62)	=IF(K19="NA","NA",$AA$53*F19*K19*$AA$61*$AA$66/$AA$62)	=IF(L19="NA","NA",$AA$57*F19*L19*$AA$61*$AA$66/$AA$62)
=IF(H20="NA","NA",$AA$54*B20*H20*$AA$61*$AA$66/$AA$62)	=IF(I20="NA","NA",$AA$55*D20*I20*$AA$61*$AA$66/$AA$62)	=IF(J20="NA","NA",$AA$56*F20*J20*$AA$61*$AA$66/$AA$62)	=IF(K20="NA","NA",$AA$53*F20*K20*$AA$61*$AA$66/$AA$62)	=IF(L20="NA","NA",$AA$57*F20*L20*$AA$61*$AA$66/$AA$62)
=IF(H21="NA","NA",$AA$54*B21*H21*$AA$61*$AA$66/$AA$62)	=IF(I21="NA","NA",$AA$55*D21*I21*$AA$61*$AA$66/$AA$62)	=IF(J21="NA","NA",$AA$56*F21*J21*$AA$61*$AA$66/$AA$62)	=IF(K21="NA","NA",$AA$53*F21*K21*$AA$61*$AA$66/$AA$62)	=IF(L21="NA","NA",$AA$57*F21*L21*$AA$61*$AA$66/$AA$62)
=IF(H22="NA","NA",$AA$54*B22*H22*$AA$61*$AA$66/$AA$62)	=IF(I22="NA","NA",$AA$55*D22*I22*$AA$61*$AA$66/$AA$62)	=IF(J22="NA","NA",$AA$56*F22*J22*$AA$61*$AA$66/$AA$62)	=IF(K22="NA","NA",$AA$53*F22*K22*$AA$61*$AA$66/$AA$62)	=IF(L22="NA","NA",$AA$57*F22*L22*$AA$61*$AA$66/$AA$62)
=IF(H23="NA","NA",$AA$54*B23*H23*$AA$61*$AA$66/$AA$62)	=IF(I23="NA","NA",$AA$55*D23*I23*$AA$61*$AA$66/$AA$62)	=IF(J23="NA","NA",$AA$56*F23*J23*$AA$61*$AA$66/$AA$62)	=IF(K23="NA","NA",$AA$53*F23*K23*$AA$61*$AA$66/$AA$62)	=IF(L23="NA","NA",$AA$57*F23*L23*$AA$61*$AA$66/$AA$62)
=IF(H24="NA","NA",$AA$54*B24*H24*$AA$61*$AA$66/$AA$62)	=IF(I24="NA","NA",$AA$55*D24*I24*$AA$61*$AA$66/$AA$62)	=IF(J24="NA","NA",$AA$56*F24*J24*$AA$61*$AA$66/$AA$62)	=IF(K24="NA","NA",$AA$53*F24*K24*$AA$61*$AA$66/$AA$62)	=IF(L24="NA","NA",$AA$57*F24*L24*$AA$61*$AA$66/$AA$62)
=IF(H25="NA","NA",$AA$54*B25*H25*$AA$61*$AA$66/$AA$62)	=IF(I25="NA","NA",$AA$55*D25*I25*$AA$61*$AA$66/$AA$62)	=IF(J25="NA","NA",$AA$56*F25*J25*$AA$61*$AA$66/$AA$62)	=IF(K25="NA","NA",$AA$53*F25*K25*$AA$61*$AA$66/$AA$62)	=IF(L25="NA","NA",$AA$57*F25*L25*$AA$61*$AA$66/$AA$62)
=IF(H26="NA","NA",$AA$54*B26*H26*$AA$61*$AA$66/$AA$62)	=IF(I26="NA","NA",$AA$55*D26*I26*$AA$61*$AA$66/$AA$62)	=IF(J26="NA","NA",$AA$56*F26*J26*$AA$61*$AA$66/$AA$62)	=IF(K26="NA","NA",$AA$53*F26*K26*$AA$61*$AA$66/$AA$62)	=IF(L26="NA","NA",$AA$57*F26*L26*$AA$61*$AA$66/$AA$62)
=IF(H27="NA","NA",$AA$54*B27*H27*$AA$61*$AA$66/$AA$62)	=IF(I27="NA","NA",$AA$55*D27*I27*$AA$61*$AA$66/$AA$62)	=IF(J27="NA","NA",$AA$56*F27*J27*$AA$61*$AA$66/$AA$62)	=IF(K27="NA","NA",$AA$53*F27*K27*$AA$61*$AA$66/$AA$62)	=IF(L27="NA","NA",$AA$57*F27*L27*$AA$61*$AA$66/$AA$62)
=IF(H28="NA","NA",$AA$54*B28*H28*$AA$61*$AA$66/$AA$62)	=IF(I28="NA","NA",$AA$55*D28*I28*$AA$61*$AA$66/$AA$62)	=IF(J28="NA","NA",$AA$56*F28*J28*$AA$61*$AA$66/$AA$62)	=IF(K28="NA","NA",$AA$53*F28*K28*$AA$61*$AA$66/$AA$62)	=IF(L28="NA","NA",$AA$57*F28*L28*$AA$61*$AA$66/$AA$62)
=IF(H29="NA","NA",$AA$54*B29*H29*$AA$61*$AA$66/$AA$62)	=IF(I29="NA","NA",$AA$55*D29*I29*$AA$61*$AA$66/$AA$62)	=IF(J29="NA","NA",$AA$56*F29*J29*$AA$61*$AA$66/$AA$62)	=IF(K29="NA","NA",$AA$53*F29*K29*$AA$61*$AA$66/$AA$62)	=IF(L29="NA","NA",$AA$57*F29*L29*$AA$61*$AA$66/$AA$62)
=IF(H30="NA","NA",$AA$54*B30*H30*$AA$61*$AA$66/$AA$62)	=IF(I30="NA","NA",$AA$55*D30*I30*$AA$61*$AA$66/$AA$62)	=IF(J30="NA","NA",$AA$56*F30*J30*$AA$61*$AA$66/$AA$62)	=IF(K30="NA","NA",$AA$53*F30*K30*$AA$61*$AA$66/$AA$62)	=IF(L30="NA","NA",$AA$57*F30*L30*$AA$61*$AA$66/$AA$62)
=IF(H31="NA","NA",$AA$54*B31*H31*$AA$61*$AA$66/$AA$62)	=IF(I31="NA","NA",$AA$55*D31*I31*$AA$61*$AA$66/$AA$62)	=IF(J31="NA","NA",$AA$56*F31*J31*$AA$61*$AA$66/$AA$62)	=IF(K31="NA","NA",$AA$53*F31*K31*$AA$61*$AA$66/$AA$62)	=IF(L31="NA","NA",$AA$57*F31*L31*$AA$61*$AA$66/$AA$62)
=IF(H32="NA","NA",$AA$54*B32*H32*$AA$61*$AA$66/$AA$62)	=IF(I32="NA","NA",$AA$55*D32*I32*$AA$61*$AA$66/$AA$62)	=IF(J32="NA","NA",$AA$56*F32*J32*$AA$61*$AA$66/$AA$62)	=IF(K32="NA","NA",$AA$53*F32*K32*$AA$61*$AA$66/$AA$62)	=IF(L32="NA","NA",$AA$57*F32*L32*$AA$61*$AA$66/$AA$62)
=IF(H33="NA","NA",$AA$54*B33*H33*$AA$61*$AA$66/$AA$62)	=IF(I33="NA","NA",$AA$55*D33*I33*$AA$61*$AA$66/$AA$62)	=IF(J33="NA","NA",$AA$56*F33*J33*$AA$61*$AA$66/$AA$62)	=IF(K33="NA","NA",$AA$53*F33*K33*$AA$61*$AA$66/$AA$62)	=IF(L33="NA","NA",$AA$57*F33*L33*$AA$61*$AA$66/$AA$62)
=IF(H34="NA","NA",$AA$54*B34*H34*$AA$61*$AA$66/$AA$62)	=IF(I34="NA","NA",$AA$55*D34*I34*$AA$61*$AA$66/$AA$62)	=IF(J34="NA","NA",$AA$56*F34*J34*$AA$61*$AA$66/$AA$62)	=IF(K34="NA","NA",$AA$53*F34*K34*$AA$61*$AA$66/$AA$62)	=IF(L34="NA","NA",$AA$57*F34*L34*$AA$61*$AA$66/$AA$62)
=IF(H35="NA","NA",$AA$54*B35*H35*$AA$61*$AA$66/$AA$62)	=IF(I35="NA","NA",$AA$55*D35*I35*$AA$61*$AA$66/$AA$62)	=IF(J35="NA","NA",$AA$56*F35*J35*$AA$61*$AA$66/$AA$62)	=IF(K35="NA","NA",$AA$53*F35*K35*$AA$61*$AA$66/$AA$62)	=IF(L35="NA","NA",$AA$57*F35*L35*$AA$61*$AA$66/$AA$62)
=IF(H36="NA","NA",$AA$54*B36*H36*$AA$61*$AA$66/$AA$62)	=IF(I36="NA","NA",$AA$55*D36*I36*$AA$61*$AA$66/$AA$62)	=IF(J36="NA","NA",$AA$56*F36*J36*$AA$61*$AA$66/$AA$62)	=IF(K36="NA","NA",$AA$53*F36*K36*$AA$61*$AA$66/$AA$62)	=IF(L36="NA","NA",$AA$57*F36*L36*$AA$61*$AA$66/$AA$62)
=IF(H37="NA","NA",$AA$54*B37*H37*$AA$61*$AA$66/$AA$62)	=IF(I37="NA","NA",$AA$55*D37*I37*$AA$61*$AA$66/$AA$62)	=IF(J37="NA","NA",$AA$56*F37*J37*$AA$61*$AA$66/$AA$62)	=IF(K37="NA","NA",$AA$53*F37*K37*$AA$61*$AA$66/$AA$62)	=IF(L37="NA","NA",$AA$57*F37*L37*$AA$61*$AA$66/$AA$62)
=IF(H38="NA","NA",$AA$54*B38*H38*$AA$61*$AA$66/$AA$62)	=IF(I38="NA","NA",$AA$55*D38*I38*$AA$61*$AA$66/$AA$62)	=IF(J38="NA","NA",$AA$56*F38*J38*$AA$61*$AA$66/$AA$62)	=IF(K38="NA","NA",$AA$53*F38*K38*$AA$61*$AA$66/$AA$62)	=IF(L38="NA","NA",$AA$57*F38*L38*$AA$61*$AA$66/$AA$62)
=IF(H39="NA","NA",$AA$54*B39*H39*$AA$61*$AA$66/$AA$62)	=IF(I39="NA","NA",$AA$55*D39*I39*$AA$61*$AA$66/$AA$62)	=IF(J39="NA","NA",$AA$56*F39*J39*$AA$61*$AA$66/$AA$62)	=IF(K39="NA","NA",$AA$53*F39*K39*$AA$61*$AA$66/$AA$62)	=IF(L39="NA","NA",$AA$57*F39*L39*$AA$61*$AA$66/$AA$62)
=IF(H40="NA","NA",$AA$54*B40*H40*$AA$61*$AA$66/$AA$62)	=IF(I40="NA","NA",$AA$55*D40*I40*$AA$61*$AA$66/$AA$62)	=IF(J40="NA","NA",$AA$56*F40*J40*$AA$61*$AA$66/$AA$62)	=IF(K40="NA","NA",$AA$53*F40*K40*$AA$61*$AA$66/$AA$62)	=IF(L40="NA","NA",$AA$57*F40*L40*$AA$61*$AA$66/$AA$62)
=IF(H41="NA","NA",$AA$54*B41*H41*$AA$61*$AA$66/$AA$62)	=IF(I41="NA","NA",$AA$55*D41*I41*$AA$61*$AA$66/$AA$62)	=IF(J41="NA","NA",$AA$56*F41*J41*$AA$61*$AA$66/$AA$62)	=IF(K41="NA","NA",$AA$53*F41*K41*$AA$61*$AA$66/$AA$62)	=IF(L41="NA","NA",$AA$57*F41*L41*$AA$61*$AA$66/$AA$62)
=IF(H42="NA","NA",$AA$54*B42*H42*$AA$61*$AA$66/$AA$62)	=IF(I42="NA","NA",$AA$55*D42*I42*$AA$61*$AA$66/$AA$62)	=IF(J42="NA","NA",$AA$56*F42*J42*$AA$61*$AA$66/$AA$62)	=IF(K42="NA","NA",$AA$53*F42*K42*$AA$61*$AA$66/$AA$62)	=IF(L42="NA","NA",$AA$57*F42*L42*$AA$61*$AA$66/$AA$62)
=IF(H43="NA","NA",$AA$54*B43*H43*$AA$61*$AA$66/$AA$62)	=IF(I43="NA","NA",$AA$55*D43*I43*$AA$61*$AA$66/$AA$62)	=IF(J43="NA","NA",$AA$56*F43*J43*$AA$61*$AA$66/$AA$62)	=IF(K43="NA","NA",$AA$53*F43*K43*$AA$61*$AA$66/$AA$62)	=IF(L43="NA","NA",$AA$57*F43*L43*$AA$61*$AA$66/$AA$62)
=IF(H44="NA","NA",$AA$54*B44*H44*$AA$61*$AA$66/$AA$62)	=IF(I44="NA","NA",$AA$55*D44*I44*$AA$61*$AA$66/$AA$62)	=IF(J44="NA","NA",$AA$56*F44*J44*$AA$61*$AA$66/$AA$62)	=IF(K44="NA","NA",$AA$53*F44*K44*$AA$61*$AA$66/$AA$62)	=IF(L44="NA","NA",$AA$57*F44*L44*$AA$61*$AA$66/$AA$62)
=IF(H45="NA","NA",$AA$54*B45*H45*$AA$61*$AA$66/$AA$62)	=IF(I45="NA","NA",$AA$55*D45*I45*$AA$61*$AA$66/$AA$62)	=IF(J45="NA","NA",$AA$56*F45*J45*$AA$61*$AA$66/$AA$62)	=IF(K45="NA","NA",$AA$53*F45*K45*$AA$61*$AA$66/$AA$62)	=IF(L45="NA","NA",$AA$57*F45*L45*$AA$61*$AA$66/$AA$62)
=IF(H46="NA","NA",$AA$54*B46*H46*$AA$61*$AA$66/$AA$62)	=IF(I46="NA","NA",$AA$55*D46*I46*$AA$61*$AA$66/$AA$62)	=IF(J46="NA","NA",$AA$56*F46*J46*$AA$61*$AA$66/$AA$62)	=IF(K46="NA","NA",$AA$53*F46*K46*$AA$61*$AA$66/$AA$62)	=IF(L46="NA","NA",$AA$57*F46*L46*$AA$61*$AA$66/$AA$62)

n — See appropriate text tables for equations.

TABLE F-22
TIER 2 CHEMICALS OF POTENTIAL CONCERN EEQs AND HAZARD INDICES FOR RED FOXES AT SWMU 59 (EXAMPLE CALCULATIONS)

PDE Birds mg/kg-d	Total PDE mg/kg-d		Chemical-Specific Toxicity Value UF	NOAEL mg/kg-d	Adjusted NOAEL mg/kg-d	EEQ N	LOAEL mg/kg-d	Adjusted LOAEL mg/kg-d	EEQ L
=IF(M8="NA","NA",$AA$58*F8*M8*$AA$61*$AA$66/$AA$62)	=SUM(N8:V8)	8		0.000001	=IF(Y8="NA","NA",Y8/X8)	=IF(Y8="NA","NA",W8/Z8)	0.00001	=IF(AB8="NA","NA",AB8/X8)	=IF(AB8="NA","NA",W8/AC8)
=IF(M9="NA","NA",$AA$58*F9*M9*$AA$61*$AA$66/$AA$62)	=SUM(N9:V9)	8		13.4	=IF(Y9="NA","NA",Y9/X9)	=IF(Y9="NA","NA",W9/Z9)	67	=IF(AB9="NA","NA",AB9/X9)	=IF(AB9="NA","NA",W9/AC9)
=IF(M10="NA","NA",$AA$58*F10*M10*$AA$61*$AA$66/$AA$62)	=SUM(N10:V10)	8		0.8	=IF(Y10="NA","NA",Y10/X10)	=IF(Y10="NA","NA",W10/Z10)	4	=IF(AB10="NA","NA",AB10/X10)	=IF(AB10="NA","NA",W10/AC10)
=IF(M11="NA","NA",$AA$58*F11*M11*$AA$61*$AA$66/$AA$62)	=SUM(N11:V11)	8		0.8	=IF(Y11="NA","NA",Y11/X11)	=IF(Y11="NA","NA",W11/Z11)	4	=IF(AB11="NA","NA",AB11/X11)	=IF(AB11="NA","NA",W11/AC11)
=IF(M12="NA","NA",$AA$58*F12*M12*$AA$61*$AA$66/$AA$62)	=SUM(N12:V12)	8		65.6	=IF(Y12="NA","NA",Y12/X12)	=IF(Y12="NA","NA",W12/Z12)	110	=IF(AB12="NA","NA",AB12/X12)	=IF(AB12="NA","NA",W12/AC12)
=IF(M13="NA","NA",$AA$58*F13*M13*$AA$61*$AA$66/$AA$62)	=SUM(N13:V13)	8		65.6	=IF(Y13="NA","NA",Y13/X13)	=IF(Y13="NA","NA",W13/Z13)	110	=IF(AB13="NA","NA",AB13/X13)	=IF(AB13="NA","NA",W13/AC13)
=IF(M14="NA","NA",$AA$58*F14*M14*$AA$61*$AA$66/$AA$62)	=SUM(N14:V14)	8		0.14	=IF(Y14="NA","NA",Y14/X14)	=IF(Y14="NA","NA",W14/Z14)	0.68	=IF(AB14="NA","NA",AB14/X14)	=IF(AB14="NA","NA",W14/AC14)
=IF(M15="NA","NA",$AA$58*F15*M15*$AA$61*$AA$66/$AA$62)	=SUM(N15:V15)	8		0.615	=IF(Y15="NA","NA",Y15/X15)	=IF(Y15="NA","NA",W15/Z15)	3.07	=IF(AB15="NA","NA",AB15/X15)	=IF(AB15="NA","NA",W15/AC15)
=IF(M16="NA","NA",$AA$58*F16*M16*$AA$61*$AA$66/$AA$62)	=SUM(N16:V16)	8		1	=IF(Y16="NA","NA",Y16/X16)	=IF(Y16="NA","NA",W16/Z16)	10	=IF(AB16="NA","NA",AB16/X16)	=IF(AB16="NA","NA",W16/AC16)
=IF(M17="NA","NA",$AA$58*F17*M17*$AA$61*$AA$66/$AA$62)	=SUM(N17:V17)	8		0.615	=IF(Y17="NA","NA",Y17/X17)	=IF(Y17="NA","NA",W17/Z17)	3.07	=IF(AB17="NA","NA",AB17/X17)	=IF(AB17="NA","NA",W17/AC17)
=IF(M18="NA","NA",$AA$58*F18*M18*$AA$61*$AA$66/$AA$62)	=SUM(N18:V18)	8		0.615	=IF(Y18="NA","NA",Y18/X18)	=IF(Y18="NA","NA",W18/Z18)	3.07	=IF(AB18="NA","NA",AB18/X18)	=IF(AB18="NA","NA",W18/AC18)
=IF(M19="NA","NA",$AA$58*F19*M19*$AA$61*$AA$66/$AA$62)	=SUM(N19:V19)	8		0.615	=IF(Y19="NA","NA",Y19/X19)	=IF(Y19="NA","NA",W19/Z19)	3.07	=IF(AB19="NA","NA",AB19/X19)	=IF(AB19="NA","NA",W19/AC19)
=IF(M20="NA","NA",$AA$58*F20*M20*$AA$61*$AA$66/$AA$62)	=SUM(N20:V20)	8		0.615	=IF(Y20="NA","NA",Y20/X20)	=IF(Y20="NA","NA",W20/Z20)	3.07	=IF(AB20="NA","NA",AB20/X20)	=IF(AB20="NA","NA",W20/AC20)
=IF(M21="NA","NA",$AA$58*F21*M21*$AA$61*$AA$66/$AA$62)	=SUM(N21:V21)	8		0.615	=IF(Y21="NA","NA",Y21/X21)	=IF(Y21="NA","NA",W21/Z21)	3.07	=IF(AB21="NA","NA",AB21/X21)	=IF(AB21="NA","NA",W21/AC21)
=IF(M22="NA","NA",$AA$58*F22*M22*$AA$61*$AA$66/$AA$62)	=SUM(N22:V22)	8		0.015	=IF(Y22="NA","NA",Y22/X22)	=IF(Y22="NA","NA",W22/Z22)	0.03	=IF(AB22="NA","NA",AB22/X22)	=IF(AB22="NA","NA",W22/AC22)
=IF(M23="NA","NA",$AA$58*F23*M23*$AA$61*$AA$66/$AA$62)	=SUM(N23:V23)	8		0.15	=IF(Y23="NA","NA",Y23/X23)	=IF(Y23="NA","NA",W23/Z23)	0.75	=IF(AB23="NA","NA",AB23/X23)	=IF(AB23="NA","NA",W23/AC23)
=IF(M24="NA","NA",$AA$58*F24*M24*$AA$61*$AA$66/$AA$62)	=SUM(N24:V24)	8		0.15	=IF(Y24="NA","NA",Y24/X24)	=IF(Y24="NA","NA",W24/Z24)	0.75	=IF(AB24="NA","NA",AB24/X24)	=IF(AB24="NA","NA",W24/AC24)
=IF(M25="NA","NA",$AA$58*F25*M25*$AA$61*$AA$66/$AA$62)	=SUM(N25:V25)	8		0.15	=IF(Y25="NA","NA",Y25/X25)	=IF(Y25="NA","NA",W25/Z25)	0.75	=IF(AB25="NA","NA",AB25/X25)	=IF(AB25="NA","NA",W25/AC25)
=IF(M26="NA","NA",$AA$58*F26*M26*$AA$61*$AA$66/$AA$62)	=SUM(N26:V26)	8		0.092	=IF(Y26="NA","NA",Y26/X26)	=IF(Y26="NA","NA",W26/Z26)	0.92	=IF(AB26="NA","NA",AB26/X26)	=IF(AB26="NA","NA",W26/AC26)
=IF(M27="NA","NA",$AA$58*F27*M27*$AA$61*$AA$66/$AA$62)	=SUM(N27:V27)	8		0.092	=IF(Y27="NA","NA",Y27/X27)	=IF(Y27="NA","NA",W27/Z27)	0.92	=IF(AB27="NA","NA",AB27/X27)	=IF(AB27="NA","NA",W27/AC27)
=IF(M28="NA","NA",$AA$58*F28*M28*$AA$61*$AA$66/$AA$62)	=SUM(N28:V28)	8		0.615	=IF(Y28="NA","NA",Y28/X28)	=IF(Y28="NA","NA",W28/Z28)	3.07	=IF(AB28="NA","NA",AB28/X28)	=IF(AB28="NA","NA",W28/AC28)
=IF(M29="NA","NA",$AA$58*F29*M29*$AA$61*$AA$66/$AA$62)	=SUM(N29:V29)	8		65.6	=IF(Y29="NA","NA",Y29/X29)	=IF(Y29="NA","NA",W29/Z29)	110	=IF(AB29="NA","NA",AB29/X29)	=IF(AB29="NA","NA",W29/AC29)
=IF(M30="NA","NA",$AA$58*F30*M30*$AA$61*$AA$66/$AA$62)	=SUM(N30:V30)	8		4.6	=IF(Y30="NA","NA",Y30/X30)	=IF(Y30="NA","NA",W30/Z30)	9.2	=IF(AB30="NA","NA",AB30/X30)	=IF(AB30="NA","NA",W30/AC30)
=IF(M31="NA","NA",$AA$58*F31*M31*$AA$61*$AA$66/$AA$62)	=SUM(N31:V31)	8		0.1	=IF(Y31="NA","NA",Y31/X31)	=IF(Y31="NA","NA",W31/Z31)	1	=IF(AB31="NA","NA",AB31/X31)	=IF(AB31="NA","NA",W31/AC31)
=IF(M32="NA","NA",$AA$58*F32*M32*$AA$61*$AA$66/$AA$62)	=SUM(N32:V32)	8		0.615	=IF(Y32="NA","NA",Y32/X32)	=IF(Y32="NA","NA",W32/Z32)	3.07	=IF(AB32="NA","NA",AB32/X32)	=IF(AB32="NA","NA",W32/AC32)
=IF(M33="NA","NA",$AA$58*F33*M33*$AA$61*$AA$66/$AA$62)	=SUM(N33:V33)	8		4	=IF(Y33="NA","NA",Y33/X33)	=IF(Y33="NA","NA",W33/Z33)	8	=IF(AB33="NA","NA",AB33/X33)	=IF(AB33="NA","NA",W33/AC33)
=IF(M34="NA","NA",$AA$58*F34*M34*$AA$61*$AA$66/$AA$62)	=SUM(N34:V34)	8		65.6	=IF(Y34="NA","NA",Y34/X34)	=IF(Y34="NA","NA",W34/Z34)	110	=IF(AB34="NA","NA",AB34/X34)	=IF(AB34="NA","NA",W34/AC34)
=IF(M35="NA","NA",$AA$58*F35*M35*$AA$61*$AA$66/$AA$62)	=SUM(N35:V35)	8		65.6	=IF(Y35="NA","NA",Y35/X35)	=IF(Y35="NA","NA",W35/Z35)	110	=IF(AB35="NA","NA",AB35/X35)	=IF(AB35="NA","NA",W35/AC35)
=IF(M36="NA","NA",$AA$58*F36*M36*$AA$61*$AA$66/$AA$62)	=SUM(N36:V36)	8		0.615	=IF(Y36="NA","NA",Y36/X36)	=IF(Y36="NA","NA",W36/Z36)	3.07	=IF(AB36="NA","NA",AB36/X36)	=IF(AB36="NA","NA",W36/AC36)
=IF(M37="NA","NA",$AA$58*F37*M37*$AA$61*$AA$66/$AA$62)	=SUM(N37:V37)	8		0.126	=IF(Y37="NA","NA",Y37/X37)	=IF(Y37="NA","NA",W37/Z37)	1.26	=IF(AB37="NA","NA",AB37/X37)	=IF(AB37="NA","NA",W37/AC37)
=IF(M38="NA","NA",$AA$58*F38*M38*$AA$61*$AA$66/$AA$62)	=SUM(N38:V38)	8		1	=IF(Y38="NA","NA",Y38/X38)	=IF(Y38="NA","NA",W38/Z38)	10	=IF(AB38="NA","NA",AB38/X38)	=IF(AB38="NA","NA",W38/AC38)
=IF(M39="NA","NA",$AA$58*F39*M39*$AA$61*$AA$66/$AA$62)	=SUM(N39:V39)	8		2737	=IF(Y39="NA","NA",Y39/X39)	=IF(Y39="NA","NA",W39/Z39)	13690	=IF(AB39="NA","NA",AB39/X39)	=IF(AB39="NA","NA",W39/AC39)
=IF(M40="NA","NA",$AA$58*F40*M40*$AA$61*$AA$66/$AA$62)	=SUM(N40:V40)	8		11.7	=IF(Y40="NA","NA",Y40/X40)	=IF(Y40="NA","NA",W40/Z40)	15.1	=IF(AB40="NA","NA",AB40/X40)	=IF(AB40="NA","NA",W40/AC40)
=IF(M41="NA","NA",$AA$58*F41*M41*$AA$61*$AA$66/$AA$62)	=SUM(N41:V41)	8		8	=IF(Y41="NA","NA",Y41/X41)	=IF(Y41="NA","NA",W41/Z41)	80	=IF(AB41="NA","NA",AB41/X41)	=IF(AB41="NA","NA",W41/AC41)
=IF(M42="NA","NA",$AA$58*F42*M42*$AA$61*$AA$66/$AA$62)	=SUM(N42:V42)	8		1	=IF(Y42="NA","NA",Y42/X42)	=IF(Y42="NA","NA",W42/Z42)	5	=IF(AB42="NA","NA",AB42/X42)	=IF(AB42="NA","NA",W42/AC42)
=IF(M43="NA","NA",$AA$58*F43*M43*$AA$61*$AA$66/$AA$62)	=SUM(N43:V43)	8		40	=IF(Y43="NA","NA",Y43/X43)	=IF(Y43="NA","NA",W43/Z43)	80	=IF(AB43="NA","NA",AB43/X43)	=IF(AB43="NA","NA",W43/AC43)
=IF(M44="NA","NA",$AA$58*F44*M44*$AA$61*$AA$66/$AA$62)	=SUM(N44:V44)	8		0.2	=IF(Y44="NA","NA",Y44/X44)	=IF(Y44="NA","NA",W44/Z44)	0.33	=IF(AB44="NA","NA",AB44/X44)	=IF(AB44="NA","NA",W44/AC44)
=IF(M45="NA","NA",$AA$58*F45*M45*$AA$61*$AA$66/$AA$62)	=SUM(N45:V45)	8		22.2	=IF(Y45="NA","NA",Y45/X45)	=IF(Y45="NA","NA",W45/Z45)	222	=IF(AB45="NA","NA",AB45/X45)	=IF(AB45="NA","NA",W45/AC45)
=IF(M46="NA","NA",$AA$58*F46*M46*$AA$61*$AA$66/$AA$62)	=SUM(N46:V46)	8		160	=IF(Y46="NA","NA",Y46/X46)	=IF(Y46="NA","NA",W46/Z46)	320	=IF(AB46="NA","NA",AB46/X46)	=IF(AB46="NA","NA",W46/AC46)
			Hazard Index (Total EEQ):			=SUM(AA8:AA46)			=SUM(AD8:AD46)

Species-Specific Factors

Plant diet fraction =	0.17	unitless
Fish diet fraction =	0	unitless
Aq. Invert diet fraction =	0	unitless
Terr. Invert diet fraction =	0.04	unitless
Mammal diet fraction =	0.65	unitless
Bird diet fraction =	0.14	unitless
Soil ingestion rate =	0.0067	kg/d
Sediment ingestion rate =	0	kg/d
Food ingestion rate =	0.24	kg/d
Body weight =	4.53	kg
Home range =	2204	acres
Water intake rate =	0.39	L/d
Site Area =	0.57	acres
Frac. home range (FHR) =	=IF(((AA65/AA63)>1),1,(AA65/AA63))	unitless

Table F-23
Recommended Bioaccumulation/Bioconcentration Factors or Regression Equations Utilized for the Soil-to-Plant Pathway at SWMUs 50 and 59

Constituent	USEPA (2007) Eco-SSL Uptake Equation [a]	Alternate Regression Equation [b, c]	Alternate BAF/BCF	Recommended Tier 1 BAF/BCF	Rationale for Recommended Tier 1 BAF/BCF	Recommended Tier 2 BAF/BCF	Rationale for Recommended Tier 2 BAF/BCF
2,3,7,8-TCDD-TE	--[d]	Log (PC)= -0.578(Log[Kow])+1.588	--	0.004	Travis & Arms K_{ow} Regression Eq.	0.004	Travis & Arms K_{ow} Regression Eq.
1,2-Dichlorobenzene	--	Log (PC)= -0.578(Log[Kow])+1.588	--	0.49	Travis & Arms K_{ow} Regression Eq.	0.49	Travis & Arms K_{ow} Regression Eq.
1,3-Dichlorobenzene	--	Log (PC)= -0.578(Log[Kow])+1.588	--	0.49	Travis & Arms K_{ow} Regression Eq.	0.49	Travis & Arms K_{ow} Regression Eq.
1,4-Dichlorobenzene	--	Log (PC)= -0.578(Log[Kow])+1.588	--	0.49	Travis & Arms K_{ow} Regression Eq.	0.49	Travis & Arms K_{ow} Regression Eq.
1,3,5-Trinitrobenzene	--	Log (PC)= -0.578(Log[Kow])+1.588	--	5.62	Travis & Arms K_{ow} Regression Eq.	5.62	Travis & Arms K_{ow} Regression Eq.
2,4-Dinitrotoluene	--	Log (PC)= -0.578(Log[Kow])+1.588	--	2.13	Travis & Arms K_{ow} Regression Eq.	2.13	Travis & Arms K_{ow} Regression Eq.
4,4'-DDD	--	Log (PC)= -0.578(Log[Kow])+1.588	--	0.016	Travis & Arms K_{ow} Regression Eq.	0.016	Travis & Arms K_{ow} Regression Eq.
4,4'-DDE	--	Log (PC)= -0.578(Log[Kow])+1.588	--	0.013	Travis & Arms K_{ow} Regression Eq.	0.013	Travis & Arms K_{ow} Regression Eq.
4,4'-DDT	--	Log (PC)= -0.578(Log[Kow])+1.588	--	0.0046	Travis & Arms K_{ow} Regression Eq.	0.0046	Travis & Arms K_{ow} Regression Eq.
Acenaphthene	ln (Pc)= -0.8556(ln[soil])-5.562	--	--	Regression Eq.	Recommended Equation (USEPA 2007)	Regression Eq.	Recommended Equation (USEPA 2007)
Acenaphthylene	ln (Pc)= 0.791(ln[soil])-1.144	--	--	Regression Eq.	Recommended Equation (USEPA 2007)	Regression Eq.	Recommended Equation (USEPA 2007)
Anthracene	ln (Pc)= 0.7784(ln[soil])-0.9887	--	--	Regression Eq.	Recommended Equation (USEPA 2007)	Regression Eq.	Recommended Equation (USEPA 2007)
Aroclor 1254	--	Log (PC)= -0.578(Log[Kow])+1.588	--	0.004	Travis & Arms K_{ow} Regression Eq.	0.004	Travis & Arms K_{ow} Regression Eq.
Benzo(a)anthracene	ln (Pc)= 0.5944(ln[soil])-2.7078	--	--	Regression Eq.	Recommended Equation (USEPA 2007)	Regression Eq.	Recommended Equation (USEPA 2007)
Benzo(a)pyrene	ln (Pc)= 0.9750(ln[soil])-2.0615	--	--	Regression Eq.	Recommended Equation (USEPA 2007)	Regression Eq.	Recommended Equation (USEPA 2007)
Benzo(b)fluoranthene	Pc= 0.31(soil)	--	--	0.31	Recommended BAF from USEPA (2007)	0.31	Recommended BAF from USEPA (2007)
Benzo(g,h,i)perylene	ln (Pc)= 1.1829(ln[soil])-0.9313	--	--	Regression Eq.	Recommended Equation (USEPA 2007)	Regression Eq.	Recommended Equation (USEPA 2007)
Benzo(k)fluoranthene	ln (Pc)= 0.8595(ln[soil])-2.1579	--	--	Regression Eq.	Recommended Equation (USEPA 2007)	Regression Eq.	Recommended Equation (USEPA 2007)
Chrysene	ln (Pc)= 0.5944(ln[soil])-2.7078	--	--	Regression Eq.	Recommended Equation (USEPA 2007)	Regression Eq.	Recommended Equation (USEPA 2007)
Dibenz(a,h)anthracene	Pc= 0.13(soil)	--	--	0.13	Recommended BAF from USEPA (2007)	0.13	Recommended BAF from USEPA (2007)
Dieldrin	Pc= 0.41(soil)	--	--	0.41	Recommended BAF from USEPA (2007)	0.41	Recommended BAF from USEPA (2007)
Endosulfan I	--	Log (PC)= -0.578(Log[Kow])+1.588	--	0.37	Travis & Arms K_{ow} Regression Eq.	0.37	Travis & Arms K_{ow} Regression Eq.
Endosulfan II	--	Log (PC)= -0.578(Log[Kow])+1.588	--	0.37	Travis & Arms K_{ow} Regression Eq.	0.37	Travis & Arms K_{ow} Regression Eq.
Endosulfan sulfate	--	Log (PC)= -0.578(Log[Kow])+1.588	--	0.30	Travis & Arms K_{ow} Regression Eq.	0.30	Travis & Arms K_{ow} Regression Eq.
Endrin	--	Log (PC)= -0.578(Log[Kow])+1.588	--	0.03	Travis & Arms K_{ow} Regression Eq.	0.027	Travis & Arms K_{ow} Regression Eq.
Endrin aldehyde	--	Log (PC)= -0.578(Log[Kow])+1.588	--	0.065	Travis & Arms K_{ow} Regression Eq.	0.065	Travis & Arms K_{ow} Regression Eq.
Endrin ketone	--	Log (PC)= -0.578(Log[Kow])+1.588	--	0.051	Travis & Arms K_{ow} Regression Eq.	0.051	Travis & Arms K_{ow} Regression Eq.
Fluoranthene	Pc= 0.50(soil)	--	--	0.50	Recommended BAF from USEPA (2007)	0.50	Recommended BAF from USEPA (2007)
Fluorene	ln (Pc)= -0.8556(ln[soil])-5.562	--	--	Regression Eq.	Recommended Equation (USEPA 2007)	Regression Eq.	Recommended Equation (USEPA 2007)
gamma-Chlordane	--	Log (PC)= -0.578(Log[Kow])+1.588	--	0.009	Travis & Arms K_{ow} Regression Eq.	0.009	Travis & Arms K_{ow} Regression Eq.
Heptachlor epoxide	--	Log (PC)= -0.578(Log[Kow])+1.588	--	0.09	Travis & Arms K_{ow} Regression Eq.	0.09	Travis & Arms K_{ow} Regression Eq.
Indeno(1,2,3-cd)pyrene	Pc= 0.11(soil)	--	--	0.11	Recommended BAF from USEPA (2007)	0.11	Recommended BAF from USEPA (2007)
Methoxychlor	--	Log (PC)= -0.578(Log[Kow])+1.588	--	0.02	Travis & Arms K_{ow} Regression Eq.	0.02	Travis & Arms K_{ow} Regression Eq.
Naphthalene	Pc= 0.12.2(soil)	--	--	12.2	Recommended BAF from USEPA (2007)	12.2	Recommended BAF from USEPA (2007)
Phenanthrene	ln (Pc)= 0.6203(ln[soil])-0.1665	--	--	Regression Eq.	Recommended Equation (USEPA 2007)	Regression Eq.	Recommended Equation (USEPA 2007)
Pyrene	Pc= 0.72(soil)	--	--	0.72	Recommended BAF from USEPA (2007)	0.72	Recommended BAF from USEPA (2007)
Arsenic	Pc= 0.03752(soil)	--	--	0.038	Recommended BAF from USEPA (2007)	0.038	Recommended BAF from USEPA (2007)
Cadmium	ln (Pc)= 0.546(ln[soil])-0.475	--	--	Regression Eq.	Recommended Equation (USEPA 2007)	Regression Eq.	Recommended Equation (USEPA 2007)
Chromium	Pc= 0.041(soil)	--	--	0.041	Recommended BAF from USEPA (2007)	0.041	Recommended BAF from USEPA (2007)
Copper	ln (Pc)= 0.394(ln[soil])+0.668	--	--	Regression Eq.	Recommended Equation (USEPA 2007)	Regression Eq.	Recommended Equation (USEPA 2007)

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Recommended Bioaccumulation/Bioconcentration Factors or Regression Equations Utilized for the Soil-to-Plant Pathway at SWMUs 50 and 59

Constituent	USEPA (2007) Eco-SSL Uptake Equation [a]	Alternate Regression Equation [b, c]	Alternate BAF/BCF	Recommended Tier 1 BAF/BCF	Rationale for Recommended Tier 1 BAF/BCF	Recommended Tier 2 BAF/BCF	Rationale for Recommended Tier 2 BAF/BCF
Lead	ln (Pc)= 0.561(ln[soil])-1.328	--	--	Regression Eq.	Recommended Equation (USEPA 2007)	Regression Eq.	Recommended Equation (USEPA 2007)
Mercury	--	ln (Pc)=0.54(ln[soil])-1.00	--	Regression Eq.	Efroymson, et al. Regression Equation	Regression Eq.	Efroymson, et al. Regression Equation
Nickel	ln (Pc)= 0.748(ln[soil])-2.223	--	--	Regression Eq.	Recommended Equation (USEPA 2007)	Regression Eq.	Recommended Equation (USEPA 2007)
Selenium	ln (Pc)= 1.104(ln[soil])-0.677	--	--	Regression Eq.	Recommended Equation (USEPA 2007)	Regression Eq.	Recommended Equation (USEPA 2007)
Silver	Pc= 0.014(soil)	--	--	0.014	Recommended BAF from USEPA (2007)	0.014	Recommended BAF from USEPA (2007)
Zinc	ln (Pc)= 0.554(ln[soil])+1.575	--	--	Regression Eq.	Recommended Equation (USEPA 2007)	Regression Eq.	Recommended Equation (USEPA 2007)

Notes: Pc (plant tissue concentration [mg/kg d.w.]); soil (concentration in soil [mg/kg d.w.]); BAF/BCF (bioaccumulation/bioconcentration factor); log K_{ow} (octanol/water partition coefficient).

If a soil to plant BAF/BCF was not available from USEPA, 2007, Ecological Soil Screening Level Guidance, an alternate value was used (see below).

[a] USEPA, 2007, Ecological Soil Screening Level Guidance, Soil to Plant Uptake Equations, OSWER Directive 9285.7-55.

[b] for organic chemicals: BAF estimated using Travis and Arms (1988) K_{ow} regression equation, with the log K_{ow} from USEPA, 2007, Estimation Programs Interface (EPI) Suite, v3.20 (Tier 2).

Constituent	Tier 1 and Tier 2 Log K_{ow}	Reference
2,3,7,8-TCDD TE	6.92	USEPA EPI Suite, 2007
1,2-Dichlorobenzene	3.28	USEPA EPI Suite, 2007
1,3-Dichlorobenzene	3.28	USEPA EPI Suite, 2007
1,4-Dichlorobenzene	3.28	USEPA EPI Suite, 2007
1,3,5-Trinitrobenzene	1.45	USEPA EPI Suite, 2007
2,4-Dinitrotoluene	2.18	USEPA EPI Suite, 2007
4,4'-DDD	5.87	USEPA EPI Suite, 2007
4,4'-DDE	6.00	USEPA EPI Suite, 2007
4,4'-DDT	6.79	USEPA EPI Suite, 2007
Aroclor 1254	6.98	USEPA EPI Suite, 2007
Endosulfan I	3.50	USEPA EPI Suite, 2007
Endosulfan II	3.50	USEPA EPI Suite, 2007
Endosulfan sulfate	3.64	USEPA EPI Suite, 2007
Endrin	5.45	USEPA EPI Suite, 2007
Endrin aldehyde	4.80	USEPA EPI Suite, 2007
Endrin ketone	4.99	USEPA EPI Suite, 2007
gamma-Chlordane	6.26	USEPA EPI Suite, 2007
Heptachlor epoxide	4.56	USEPA EPI Suite, 2007
Methoxychlor	5.67	USEPA EPI Suite, 2007

[c] for inorganic chemicals: Efroymson, R.A., et. al., 2001, Uptake of Inorganic Chemicals from Soil by Plant Leaves: Regressions of Field Data, Environ. Tox. Chem., 20:2561-2571.

[d] -- indicates that a BAF/BCF or regression equation is not available or not applicable.

Table F-24
Recommended Bioaccumulation/Bioconcentration Factors or Regression Equations Utilized for the Soil-to-Earthworm Pathway at SWMUs 50 and 59

Constituent	USEPA (2007) Eco-SSL Uptake Equation [a]	Sample, et al. 1998 [b]			Sample et al. 1999 [c]	Recommended Tier 1 BAF/BCF	Rationale for Recommended Tier 1 BAF/BCF	Recommended Tier 2 BAF/BCF	Rationale for Recommended Tier 2 BAF/BCF
		Median BAF/BCF	90th Percentile BAF/BCF	Maximum BAF/BCF	Regression Equation				
2,3,7,8-TCDD-TE	-- [d]	11.011	22.229	42.068	ln (EW)=1.18(ln[soil])+3.53	42.068	Maximum value	Regression Eq.	Chemical-specific Regression Eq.
1,2-Dichlorobenzene	--	--	--	--	--	6.18	Kow Regression Eq., using geo-mean TOC	6.10	Kow Regression Eq., using arith-mean TOC
1,3-Dichlorobenzene	--	--	--	--	--	6.31	Kow Regression Eq., using geo-mean TOC	6.23	Kow Regression Eq., using arith-mean TOC
1,4-Dichlorobenzene	--	--	--	--	--	6.31	Kow Regression Eq., using geo-mean TOC	6.23	Kow Regression Eq., using arith-mean TOC
1,3,5-Trinitrobenzene	--	--	--	--	--	0.06	Kow Regression Eq., using geo-mean TOC	0.06	Kow Regression Eq., using arith-mean TOC
2,4-Dinitrotoluene	--	--	--	--	--	0.83	Kow Regression Eq., using geo-mean TOC	0.82	Kow Regression Eq., using arith-mean TOC
4,4'-DDD	ln (EW)= 0.6975(ln[soil])+1.1613	--	--	--	--	Regression Eq.	Recommended Equation (USEPA 2007)	Regression Eq.	Recommended Equation (USEPA 2007)
4,4'-DDE	ln (EW)= 0.8804(ln[soil])+2.4771	--	--	--	--	Regression Eq.	Recommended Equation (USEPA 2007)	Regression Eq.	Recommended Equation (USEPA 2007)
4,4'-DDT	ln (EW)= 0.8689(ln[soil])+2.1247	--	--	--	--	Regression Eq.	Recommended Equation (USEPA 2007)	Regression Eq.	Recommended Equation (USEPA 2007)
Acenaphthene	(EW)= 1.47(soil)	--	--	--	--	1.47	Recommended BAF (USEPA 2007)	1.47	Recommended BAF (USEPA 2007)
Acenaphthylene	(EW)= 22.9(soil)	--	--	--	--	22.9	Recommended BAF (USEPA 2007)	22.9	Recommended BAF (USEPA 2007)
Anthracene	(EW)= 2.42(soil)	--	--	--	--	2.42	Recommended BAF (USEPA 2007)	2.42	Recommended BAF (USEPA 2007)
Aroclor 1254	--	6.67	15.909	65.227	ln (EW)=1.29(ln[soil])+1.79	65.227	Maximum value	Regression Eq.	Chemical-specific Regression Eq.
Benzo(a)anthracene	(EW)= 1.59(soil)	--	--	--	--	1.59	Recommended BAF (USEPA 2007)	1.59	Recommended BAF (USEPA 2007)
Benzo(a)pyrene	(EW)= 1.33(soil)	--	--	--	--	1.33	Recommended BAF (USEPA 2007)	1.33	Recommended BAF (USEPA 2007)
Benzo(b)fluoranthene	(EW)= 2.6(soil)	--	--	--	--	2.6	Recommended BAF (USEPA 2007)	2.6	Recommended BAF (USEPA 2007)
Benzo(g,h,i)perylene	(EW)= 2.94(soil)	--	--	--	--	2.94	Recommended BAF (USEPA 2007)	2.94	Recommended BAF (USEPA 2007)
Benzo(k)fluoranthene	(EW)= 2.6(soil)	--	--	--	--	2.6	Recommended BAF (USEPA 2007)	2.6	Recommended BAF (USEPA 2007)
Chrysene	(EW)= 2.29(soil)	--	--	--	--	2.29	Recommended BAF (USEPA 2007)	2.29	Recommended BAF (USEPA 2007)
Dibenz(a,h)anthracene	(EW)= 2.31(soil)	--	--	--	--	2.31	Recommended BAF (USEPA 2007)	2.31	Recommended BAF (USEPA 2007)
Dieldrin	(EW)= 14.7(soil)	--	--	--	--	14.7	Recommended BAF (USEPA 2007)	14.7	Recommended BAF (USEPA 2007)
Endosulfan I	--	--	--	--	--	0.19	Kow Regression Eq., using geo-mean TOC	0.19	Kow Regression Eq., using arith-mean TOC
Endosulfan II	--	--	--	--	--	0.19	Kow Regression Eq., using geo-mean TOC	0.19	Kow Regression Eq., using arith-mean TOC
Endosulfan sulfate	--	--	--	--	--	0.17	Kow Regression Eq., using geo-mean TOC	0.17	Kow Regression Eq., using arith-mean TOC
Endrin	--	--	--	--	--	19.95	Kow Regression Eq., using geo-mean TOC	19.71	Kow Regression Eq., using arith-mean TOC
Endrin aldehyde	--	--	--	--	--	5.32	Kow Regression Eq., using geo-mean TOC	5.26	Kow Regression Eq., using arith-mean TOC
Endrin ketone	--	--	--	--	--	8.76	Kow Regression Eq., using geo-mean TOC	8.65	Kow Regression Eq., using arith-mean TOC
Fluoranthene	(EW)= 3.04(soil)	--	--	--	--	3.04	Recommended BAF (USEPA 2007)	3.04	Recommended BAF (USEPA 2007)
Fluorene	(EW)= 9.57(soil)	--	--	--	--	9.57	Recommended BAF (USEPA 2007)	9.57	Recommended BAF (USEPA 2007)
gamma-Chlordane	--	--	--	--	--	12.36	Kow Regression Eq., using geo-mean TOC	12.21	Kow Regression Eq., using arith-mean TOC
Heptachlor epoxide	--	--	--	--	--	6.76	Kow Regression Eq., using geo-mean TOC	6.68	Kow Regression Eq., using arith-mean TOC
Indeno(1,2,3-cd)pyrene	(EW)= 2.86(soil)	--	--	--	--	2.86	Recommended BAF (USEPA 2007)	2.86	Recommended BAF (USEPA 2007)
Methoxychlor	--	--	--	--	--	7.73	Kow Regression Eq., using geo-mean TOC	7.64	Kow Regression Eq., using arith-mean TOC
Naphthalene	(EW)= 4.4(soil)	--	--	--	--	4.40	Recommended BAF (USEPA 2007)	4.40	Recommended BAF (USEPA 2007)
Phenanthrene	(EW)= 1.72(soil)	--	--	--	--	1.72	Recommended BAF (USEPA 2007)	1.72	Recommended BAF (USEPA 2007)
Pyrene	(EW)= 1.75(soil)	--	--	--	--	1.75	Recommended BAF (USEPA 2007)	1.75	Recommended BAF (USEPA 2007)
Arsenic	ln (EW)= 0.706(ln[soil])-1.421	--	--	--	--	Regression Eq.	Recommended Equation (USEPA 2007)	Regression Eq.	Recommended Equation (USEPA 2007)
Cadmium	ln (EW)= 0.795(ln[soil])+2.114	--	--	--	--	Regression Eq.	Recommended Equation (USEPA 2007)	Regression Eq.	Recommended Equation (USEPA 2007)
Chromium	(EW)= 0.306(soil)	--	--	--	--	0.306	Recommended BAF (USEPA 2007)	0.306	Recommended BAF (USEPA 2007)
Copper	(EW)= 0.515(soil)	--	--	--	--	0.515	Recommended BAF (USEPA 2007)	0.515	Recommended BAF (USEPA 2007)
Lead	ln (EW)= 0.807(ln[soil])-0.218	--	--	--	--	Regression Eq.	Recommended Equation (USEPA 2007)	Regression Eq.	Recommended Equation (USEPA 2007)
Mercury	--	1.693	20.625	33	ln (EW)=0.33(ln[soil])+0.078	33	Maximum value	Regression Eq.	Chemical-specific Regression Eq.
Nickel	--	1.059	4.73	7.8	ln (EW)= -1.54(ln[soil])+7.03	7.8	Maximum value	Regression Eq.	Chemical-specific Regression Eq.
Selenium	ln (EW)= 0.733(ln[soil])-0.075	--	--	--	--	Regression Eq.	Recommended Equation (USEPA 2007)	Regression Eq.	Recommended Equation (USEPA 2007)
Silver	(EW)= 2.045(soil)	--	--	--	--	2.045	Recommended BAF (USEPA 2007)	2.045	Recommended BAF (USEPA 2007)
Zinc	ln (EW)= 0.328(ln[soil])+4.449	--	--	--	--	Regression Eq.	Recommended Equation (USEPA 2007)	Regression Eq.	Recommended Equation (USEPA 2007)

Notes: EW (earthworm tissue concentration [mg/kg d.w.]); soil (concentration in soil [mg/kg d.w.]); BAF/BCF (bioaccumulation/bioconcentration factor); log Kow (octanol/water partition coefficient); -- indicates that a BAF/BCF or regression equation is not available or not applicable.
Hierarchy for Selection of BAFs:

[a] USEPA, 2007, Ecological Soil Screening Level Guidance (Eco-SSL), Soil to Earthworm Uptake Equations, OSWER Directive 9285.7-55.

Table F-24
Recommended Bioaccumulation/Bioconcentration Factors or Regression Equations Utilized for the Soil-to-Earthworm Pathway at SWMUs 50 and 59

Constituent	USEPA (2007) Eco-SSL Uptake Equation [a]	Sample, et al. 1998 [b]			Sample et al. 1999 [c]	Recommended Tier 1	Rationale for Recommended Tier 1 BAF/BCF	Recommended Tier 2	Rationale for Recommended Tier 2 BAF/BCF
		Median BAF/BCF	90th Percentile BAF/BCF	Maximum BAF/BCF	Regression Equation	BAF/BCF		BAF/BCF	

[b] Sample, B. E, et. al., 1998. Development and Validation of Bioaccumulation Models for Earthworms, ES/ER/TM-220.

[c] Sample, B.E, et. al., 1999, Literature-Derived Bioaccumulation Models for Earthworms: Development and Validation, Environ. Toxicol. Chem., 18(9): 2110-2120 (models from Table 3 of publication).

[e] USEPA, 2007, EcoSSL regression equation using site specific TOC values and chemical specific log Kow and Koc values. Equation details provided below.

Log Kow values and Koc values are from: USEPA, 2007, Estimation Programs Interface (EPI) Suite, v3.20.

TOC values collected at SWMU 50 snd 59 were utilized as follows: Tier 1: Lower-bound (geometric mean of samples) surface soil TOC **1.63%**; Tier 2 arithmetic mean (mean of samples) surface soil TOC =**1.65%**.

TOC values:	Sample ID	Area / Matrix	Analyte	Result	Units
	50SS01	SWMU 50 / SS	Total Organic Carbon	18900	mg/kg
	59SS03	SWMU 59 / SS	Total Organic Carbon	14000	mg/kg
			(Tier 1) TOC Geo. Mean =	**16267**	**mg/kg**
			(Tier 2) TOC Arithmetic Mean =	**16450**	**mg/kg**

Equation:

$$BAF = \frac{((10^{(0.87*\log Kow-2)})/0.16)}{foc* Koc}$$

Log Kow, Koc, BAF Results:	Constituent	Koc	Log Kow	Tier 1 BAF/BCF	Tier 2 BAF/BCF
	1,2-Dichlorobenzene	443	3.28	6.18	6.10
	1,3-Dichlorobenzene	434	3.28	6.31	6.23
	1,4-Dichlorobenzene	434	3.28	6.31	6.23
	1,3,5-Trinitrobenzene	1090	1.45	0.06	0.06
	2,4-Dinitrotoluene	364	2.18	0.83	0.82
	Endosulfan I	22000	3.5	0.19	0.19
	Endosulfan II	22000	3.5	0.19	0.19
	Endosulfan sulfate	32300	3.64	0.17	0.17
	Endrin	10600	5.45	19.95	19.71
	Endrin aldehyde	10800	4.8	5.32	5.26
	Endrin ketone	9610	4.99	8.76	8.65
	gamma-Chlordane	86700	6.26	12.36	12.21
	Heptachlor epoxide	5260	4.56	6.76	6.68
	Methoxychlor	42500	5.67	7.73	7.64

Table F-25
Recommended Bioaccumulation/Bioconcentration Factors Utilized for the Soil-to-Small Mammal and Bird Pathways at SWMUs 50 and 59

Constituent	USEPA (2007) Eco-SSL Uptake Equation [a]	Sample et al., 1998 [b]						Recommended Tier 1 BAF/BCF	Rationale for Recommended Tier 1 BAF/BCF	Recommended Tier 2 BAF/BCF	Rationale for Recommended Tier 2 BAF/BCF
		Insectivore Median BAF/BCF	Herbivore Median BAF/BCF	Omnivore Median BAF/BCF	General [c] Median BAF/BCF	General [c] Maximum BAF/BCF	General [c] 90th percentile BAF/BCF				
2,3,7,8-TCDD-TE	--[d]	--	1.2857	0.7783	1.07	2.2	2.2	2.2	General maximum value	2.2	General 90th percentile value
1,2-Dichlorobenzene	--	--	--	--	--	--	--	1 [f]	Conservative value for Tier 2 organics see footnote "f"	0.5 [f]	Conservative value for Tier 2 organics see footnote "f"
1,3-Dichlorobenzene	--	--	--	--	--	--	--	1 [f]	Conservative value for Tier 2 organics see footnote "f"	0.5 [f]	Conservative value for Tier 2 organics see footnote "f"
1,4-Dichlorobenzene	--	--	--	--	--	--	--	1 [f]	Conservative value for Tier 2 organics see footnote "f"	0.5 [f]	Conservative value for Tier 2 organics see footnote "f"
1,3,5-Trinitrobenzene	--	--	--	--	--	--	--	1 [f]	Conservative value for Tier 2 organics see footnote "f"	0.5 [f]	Conservative value for Tier 2 organics see footnote "f"
2,4-Dinitrotoluene	--	--	--	--	--	--	--	1 [f]	Conservative value for Tier 2 organics see footnote "f"	0.5 [f]	Conservative value for Tier 2 organics see footnote "f"
4,4'-DDD	--	--	--	--	--	--	--	1 [f]	Conservative value for Tier 2 organics see footnote "f"	0.5 [f]	Conservative value for Tier 2 organics see footnote "f"
4,4'-DDE	ln(mam)= 0.641(ln[diet])+3.6401	--	--	--	--	--	--	Regression Eq.	Recommended Regression Eq. (USEPA 2007)	Regression Eq.	Recommended Regression Eq. (USEPA 2007)
4,4'-DDT	ln(mam)= 0.7254(ln[diet])+1.1788	--	--	--	--	--	--	Regression Eq.	Recommended Regression Eq. (USEPA 2007)	Regression Eq.	Recommended Regression Eq. (USEPA 2007)
Acenaphthene	Mam = 0	--	--	--	--	--	--	0	Uptake assumed to be negligible (USEPA 2007)	0	Uptake assumed to be negligible (USEPA 2007)
Acenaphthylene	Mam = 0	--	--	--	--	--	--	0	Uptake assumed to be negligible (USEPA 2007)	0	Uptake assumed to be negligible (USEPA 2007)
Anthracene	Mam = 0	--	--	--	--	--	--	0	Uptake assumed to be negligible (USEPA 2007)	0	Uptake assumed to be negligible (USEPA 2007)
Aroclor 1254	--	--	--	--	--	--	--	1 [f]	Conservative value for Tier 2 organics see footnote "f"	0.5 [f]	Conservative value for Tier 2 organics see footnote "f"
Benzo(a)anthracene	Mam = 0	--	--	--	--	--	--	0	Uptake assumed to be negligible (USEPA 2007)	0	Uptake assumed to be negligible (USEPA 2007)
Benzo(a)pyrene	Mam = 0	--	--	--	--	--	--	0	Uptake assumed to be negligible (USEPA 2007)	0	Uptake assumed to be negligible (USEPA 2007)
Benzo(b)fluoranthene	Mam = 0	--	--	--	--	--	--	0	Uptake assumed to be negligible (USEPA 2007)	0	Uptake assumed to be negligible (USEPA 2007)
Benzo(g,h,i)perylene	Mam = 0	--	--	--	--	--	--	0	Uptake assumed to be negligible (USEPA 2007)	0	Uptake assumed to be negligible (USEPA 2007)
Benzo(k)fluoranthene	Mam = 0	--	--	--	--	--	--	0	Uptake assumed to be negligible (USEPA 2007)	0	Uptake assumed to be negligible (USEPA 2007)
Chrysene	Mam = 0	--	--	--	--	--	--	0	Uptake assumed to be negligible (USEPA 2007)	0	Uptake assumed to be negligible (USEPA 2007)
Dibenz(a,h)anthracene	Mam = 0	--	--	--	--	--	--	0	Uptake assumed to be negligible (USEPA 2007)	0	Uptake assumed to be negligible (USEPA 2007)
Dieldrin	(mam)= 1.2(diet)	--	--	--	--	--	--	1.2	Recommended BAF (USEPA 2007)	1.2	Recommended BAF (USEPA 2007)
Endosulfan I	--	--	--	--	--	--	--	1 [f]	Conservative value for Tier 2 organics see footnote "f"	0.5 [f]	Conservative value for Tier 2 organics see footnote "f"
Endosulfan II	--	--	--	--	--	--	--	1 [f]	Conservative value for Tier 2 organics see footnote "f"	0.5 [f]	Conservative value for Tier 2 organics see footnote "f"
Endosulfan sulfate	--	--	--	--	--	--	--	1 [f]	Conservative value for Tier 2 organics see footnote "f"	0.5 [f]	Conservative value for Tier 2 organics see footnote "f"
Endrin	--	--	--	--	--	--	--	1 [f]	Conservative value for Tier 2 organics see footnote "f"	0.5 [f]	Conservative value for Tier 2 organics see footnote "f"
Endrin aldehyde	--	--	--	--	--	--	--	1 [f]	Conservative value for Tier 2 organics see footnote "f"	0.5 [f]	Conservative value for Tier 2 organics see footnote "f"
Endrin ketone	--	--	--	--	--	--	--	1 [f]	Conservative value for Tier 2 organics see footnote "f"	0.5 [f]	Conservative value for Tier 2 organics see footnote "f"
Fluoranthene	Mam = 0	--	--	--	--	--	--	0	Uptake assumed to be negligible (USEPA 2007)	0	Uptake assumed to be negligible (USEPA 2007)
Fluorene	Mam = 0	--	--	--	--	--	--	0	Uptake assumed to be negligible (USEPA 2007)	0	Uptake assumed to be negligible (USEPA 2007)
gamma-Chlordane	--	--	--	--	--	--	--	1 [f]	Conservative value for Tier 2 organics see footnote "f"	0.5 [f]	Conservative value for Tier 2 organics see footnote "f"
Heptachlor epoxide	--	--	--	--	--	--	--	1 [f]	Conservative value for Tier 2 organics see footnote "f"	0.5 [f]	Conservative value for Tier 2 organics see footnote "f"
Indeno(1,2,3-cd)pyrene	Mam = 0	--	--	--	--	--	--	0	Uptake assumed to be negligible (USEPA 2007)	0	Uptake assumed to be negligible (USEPA 2007)
Methoxychlor	--	--	--	--	--	--	--	1 [f]	Conservative value for Tier 2 organics see footnote "f"	0.5 [f]	Conservative value for Tier 2 organics see footnote "f"
Naphthalene	Mam = 0	--	--	--	--	--	--	0	Uptake assumed to be negligible (USEPA 2007)	0	Uptake assumed to be negligible (USEPA 2007)
Phenanthrene	Mam = 0	--	--	--	--	--	--	0	Uptake assumed to be negligible (USEPA 2007)	0	Uptake assumed to be negligible (USEPA 2007)
Pyrene	Mam = 0	--	--	--	--	--	--	0	Uptake assumed to be negligible (USEPA 2007)	0	Uptake assumed to be negligible (USEPA 2007)
Arsenic	ln(mam)= 0.8188(ln[soil])-4.8471	--	--	--	--	--	--	Regression Eq.	Recommended Regression Eq. (USEPA 2007)	Regression Eq.	Recommended Regression Eq. (USEPA 2007)
Cadmium	ln(mam)= 0.4723(ln[soil])-1.2571	--	--	--	--	--	--	Regression Eq.	Recommended Regression Eq. (USEPA 2007)	Regression Eq.	Recommended Regression Eq. (USEPA 2007)
Chromium	ln(mam)= 0.7338(ln[soil])-1.4599	--	--	--	--	--	--	Regression Eq.	Recommended Regression Eq. (USEPA 2007)	Regression Eq.	Recommended Regression Eq. (USEPA 2007)
Copper	ln(mam)= 0.144(ln[soil])+2.042	--	--	--	--	--	--	Regression Eq.	Recommended Regression Eq. (USEPA 2007)	Regression Eq.	Recommended Regression Eq. (USEPA 2007)
Lead	ln(mam)= 0.4422(ln[soil])+0.0761	--	--	--	--	--	--	Regression Eq.	Recommended Regression Eq. (USEPA 2007)	Regression Eq.	Recommended Regression Eq. (USEPA 2007)
Mercury	--	1.046 [g]	0.0239 [g]	0.0543	0.0543	1.046	0.192	1.046	General maximum value	0.192	General 90th percentile value
Nickel	ln(mam)= 0.4658(ln[soil])-0.2462	--	--	--	--	--	--	Regression Eq.	Recommended Regression Eq. (USEPA 2007)	Regression Eq.	Recommended Regression Eq. (USEPA 2007)
Selenium	ln(mam)= 0.3764(ln[soil])-0.4158	--	--	--	--	--	--	Regression Eq.	Recommended Regression Eq. (USEPA 2007)	Regression Eq.	Recommended Regression Eq. (USEPA 2007)
Silver	(mam)= 0.004(soil)	--	--	--	--	--	--	0.004	Recommended BAF (USEPA 2007)	0.004	Recommended BAF (USEPA 2007)
Zinc	ln(mam)= 0.0706(ln[soil])+4.3632	--	--	--	--	--	--	Regression Eq.	Recommended Regression Eq. (USEPA 2007)	Regression Eq.	Recommended Regression Eq. (USEPA 2007)

Notes: mam (mammal or bird tissue concentration [mg/kg d.w.]); diet (concentration in diet [mg/kg d.w.] assuming 100% earthworm consumption); soil (concentration in soil [mg/kg d.w.]); BAF/BCF (bioaccumulation/bioconcentration factor).

Bird BAF/BCF values were based on the recommended small mammal BAF/BCF values, as bird uptake values are not readily available.

[a] USEPA, 2007, Ecological Soil Screening Level Guidance, Soil to Small Mammal Uptake Equations, OSWER Directive 9285.7-55.

[b] Sample et al., 1998, Development and Validation of Bioaccumulation Models for Small Mammals, ES/ER/TM-219.

[c] General = combination dataset used for insectivore, herbivore, and omnivore receptors to estimate a "general" receptor BAF/BCF value.

[d] "--" indicates that a BAF/BCF is not available or not applicable.

Table F-25
Recommended Bioaccumulation/Bioconcentration Factors Utilized for the Soil-to-Small Mammal and Bird Pathways at SWMUs 50 and 59

Constituent	USEPA (2007) Eco-SSL Uptake Equation [a]	Sample et al., 1998 [b]						Recommended Tier 1 BAF/BCF	Rationale for Recommended Tier 1 BAF/BCF	Recommended Tier 2 BAF/BCF	Rationale for Recommended Tier 2 BAF/BCF
		Insectivore Median BAF/BCF	Herbivore Median BAF/BCF	Omnivore Median BAF/BCF	General [c] Median BAF/BCF	General [c] Maximum BAF/BCF	General [c] 90th percentile BAF/BCF				

[e] Uptake assumed to be negligible (USEPA 2005).

[f] Known bioaccumulative organics (TCDD and TCDF) have BAFs/BCFs of 1.1 and 0.13 (median) and 2.2 and 0.16 (maximum) from Sample et al. (1998).
Conservative BAF/BCF default values of 1 and 0.5 were selected for other organics at the site, as they are not expected to be as bioaccumulative as TCDD/TCDF.

[g] Only one BAF/BCF value available for exposure to mercury in soil (median is also 90th percentile value and maximum value).

Table F-26
NOAEL Toxicity Reference Values Used to Derive
Wildlife Toxicity Benchmarks for COPECs at SWMUs 50 and 59

COPEC	Mammalian Data				Avian Data			
	Toxicity Value	NOAEL (mg/kg/d)	Test Species	Reference	Toxicity Value	NOAEL (mg/kg/d)	Test Species	Reference
Organics								
2,3,7,8-TCDD-TE	--	1.00E-06	rat	Sample, et. al. (1996)	--	1.40E-05	ring-necked pheasant	Sample, et al. (1996)
1,2-Dichlorobenzene	--	8.57E+01	rat	USEPA, 2008	1608 (LD50)	1.61E+01	northern bobwhite	Based on 1,4-Dichlorobenzene, Ecotox (2008)
1,3-Dichlorobenzene	--	8.57E+01	rat	Based on 1,2-Dichlorobenzene, USEPA, 2008	1608 (LD50)	1.61E+01	northern bobwhite	Based on 1,4-Dichlorobenzene, Ecotox (2008)
1,4-Dichlorobenzene	--	2.50E+00	rat	LANL, 2005	1608 (LD50)	1.61E+01	northern bobwhite	Ecotox (2008)
1,3,5-Trinitrobenzene	--	1.34E+01	rat	LANL, 2005	--	--	--	--
2,4-Dinitrotoluene	--	5.40E-01	rat	LANL, 2005	--	--	--	--
4,4'-DDD	--	8.00E-01	rat	Based on DDT, Sample, et. al. (1996)	--	2.80E-03	brown pelican	Based on DDT, Sample, et. al. (1996)
4,4'-DDE	--	8.00E-01	rat	Based on DDT, Sample, et. al. (1996)	--	2.80E-03	brown pelican	Based on DDT, Sample, et. al. (1996)
4,4'-DDT	--	8.00E-01	rat	Sample, et. al. (1996)	--	2.80E-03	brown pelican	Sample, et. al. (1996)
Acenaphthene	--	6.56E+01	rat	EcoSSL (EPA, 2007)	--	5.53E+02	mallard duck	Based on B(a)P, Eisler (1987)
Acenaphthylene	--	6.56E+01	rat	EcoSSL (EPA, 2007)	--	5.53E+02	mallard duck	Based on B(a)P, Eisler (1987)
Anthracene	--	6.56E+01	rat	EcoSSL (EPA, 2007)	--	5.53E+02	mallard duck	Based on B(a)P, Eisler (1987)
Aroclor 1254	--	1.40E-01	mink	Sample, et. al. (1996)	--	1.80E-01	ring-necked pheasant	Sample, et. al. (1996)
Benzo(a)anthracene	--	6.15E-01	mouse	EcoSSL (EPA, 2007)	--	5.53E+02	mallard duck	Based on B(a)P, Eisler (1987)
Benzo(a)pyrene	--	1.00E+00	mouse	Sample, et. al. (1996)	--	5.53E+02	mallard duck	Eisler (1987)
Benzo(b)fluoranthene	--	6.15E-01	mouse	EcoSSL (EPA, 2007)	--	5.53E+02	mallard duck	Based on B(a)P, Eisler (1987)
Benzo(g,h,i)perylene	--	6.15E-01	mouse	EcoSSL (EPA, 2007)	--	5.53E+02	mallard duck	Based on B(a)P, Eisler (1987)
Benzo(k)fluoranthene	--	6.15E-01	mouse	EcoSSL (EPA, 2007)	--	5.53E+02	mallard duck	Based on B(a)P, Eisler (1987)
Chrysene	--	6.15E-01	mouse	EcoSSL (EPA, 2007)	--	5.53E+02	mallard duck	Based on B(a)P, Eisler (1987)
Dibenz(a,h)anthracene	--	6.15E-01	mouse	EcoSSL (EPA, 2007)	--	5.53E+02	mallard duck	Based on B(a)P, Eisler (1987)
Dieldrin		1.50E-02	rat	EcoSSL (EPA, 2007)	--	7.09E-02	mallard duck	EcoSSL (EPA, 2007)
Endosulfan I	--	1.50E-01	rat	Based on Endosulfan, Sample et. al. (1996)	--	1.00E+01	gray partridge	Based on Endosulfan, Sample et. al. (1996)
Endosulfan II	--	1.50E-01	rat	Based on Endosulfan, Sample et. al. (1996)	--	1.00E+01	gray partridge	Based on Endosulfan, Sample et. al. (1996)
Endosulfan sulfate	--	1.50E-01	rat	Based on Endosulfan, Sample et. al. (1996)	--	1.00E+01	gray partridge	Based on Endosulfan, Sample et. al. (1996)
Endrin	0.92 (LOAEL)	9.20E-02	mouse	Sample et. al. (1996)	--	3.00E-01	mallard duck	Sample, et. al. (1996)
Endrin aldehyde	0.92 (LOAEL)	9.20E-02	mouse	Based on Endrin, Sample et. al. (1996)	--	3.00E-01	mallard duck	Based on Endrin, Sample et. al. (1996)
Endrin ketone	0.92 (LOAEL)	9.20E-02	mouse	Based on Endrin, Sample et. al. (1996)	--	3.00E-01	mallard duck	Based on Endrin, Sample et. al. (1996)
Fluoranthene	--	6.15E-01	mouse	EcoSSL (EPA, 2007)	--	5.53E+02	mallard duck	Based on B(a)P, Eisler (1987)
Fluorene	--	6.56E+01	rat	EcoSSL (EPA, 2007)	--	5.53E+02	mallard duck	Based on B(a)P, Eisler, 1987
gamma-Chlordane	--	4.60E+00	mouse	Based on Chlordane, Sample, et. al. (1996)	--	2.14E+00	red-winged blackbird	Based on Chlordane, Sample, et. al. (1996)
Heptachlor epoxide	--	1.00E-01	mink	Based on Heptachlor, Sample, et. al. (1996)	92 (LC50)	9.20E-01	quail	Based on Heptachlor, LANL (2005)
Indeno(1,2,3-cd)pyrene	--	6.15E-01	mouse	EcoSSL (EPA, 2007)	--	5.53E+02	mallard duck	Based on B(a)P, Eisler (1987)
Methoxychlor	--	4.00E+00	rat	Sample, et. al. (1996)	--	2.58E+01	Japanese quail	LANL, 2005

Table F-26
NOAEL Toxicity Reference Values Used to Derive
Wildlife Toxicity Benchmarks for COPECs at SWMUs 50 and 59

COPEC	Mammalian Data				Avian Data			
	Toxicity Value	NOAEL (mg/kg/d)	Test Species	Reference	Toxicity Value	NOAEL (mg/kg/d)	Test Species	Reference
Naphthalene	--	6.56E+01	rat	EcoSSL (EPA, 2007)	--	5.53E+02	mallard duck	Based on B(a)P, Eisler (1987)
Phenanthrene	--	6.56E+01	rat	EcoSSL (EPA, 2007)	--	5.53E+02	mallard duck	Based on B(a)P, Eisler (1987)
Pyrene	--	6.15E-01	mouse	EcoSSL (EPA, 2007)	--	5.53E+02	mallard duck	Based on B(a)P, Eisler (1987)
Inorganics								
Arsenic	--	1.26E-01	mouse	Sample, et. al. (1996)	--	5.14E+00	mallard duck	Sample, et al. (1996)
Cadmium	--	1.00E+00	rat	Sample, et. al. (1996)	--	1.45E+00	mallard duck	Sample, et. al. (1996)
Chromium	--	2.74E+03	rat	Sample, et al. (1996)	--	2.66E+00	chicken, black duck, turkey	EcoSSL (EPA, 2007)
Copper	--	1.17E+01	mink	Sample, et. al. (1996)	--	4.70E+01	chicks	Sample, et al. (1996)
Lead	--	8.00E+00	rat	Sample, et. al. (1996)	--	3.85E+00	American kestrel	Sample, et al. (1996)
Mercury	--	1.00E+00	mink	Sample, et. al. (1996)	--	4.50E-01	Japanese quail	Sample, et al. (1996)
Nickel	--	4.00E+01	rat	Sample, et. al. (1996)	--	7.74E+01	mallard duck	Sample, et al. (1996)
Selenium	--	2.00E-01	rat	Sample, et. al. (1996)	--	5.00E-01	mallard duck	Sample, et al. (1996)
Silver	222 (LOAEL)	2.22E+01	rat	ATSDR (1990)	--	1.78E+02	mallard duck	Terr. Tox. Database (USACHPPM, 2002)
Zinc	--	1.60E+02	rat	Sample, et. al. (1996)	--	1.45E+01	hens	Sample, et al. (1996)

N/A indicates that the information is not available.

As recommended by Wentsel, et. al. (1996), Tri-Service Procedural Guidelines for Ecological Risk Assessments, the following adjustments were made to toxicity data when NOAEL or LOAEL data were not available:

- Subchronic LOAELs were converted to chronic NOAELs by dividing by a factor of 20.
- Chronic NOAELs were converted to chronic LOAELs by multiplying by a factor of 5.0.
- Subchronic NOAELs/LOAELs were converted to chronic NOAELs/LOAELs by dividing by a factor of 10.
- Chronic LOAELs were converted to chronic NOAELs by dividing by a factor of 10.
- LD_{50} concentrations were converted to chronic NOAELs by dividing by a factor of 100.
- LD_{50} concentrations were converted to chronic LOAELs by dividing by a factor of 20.

Methodology for Selection of TRVs:

(1) Sample, et al., 1996, Toxicological Benchmarks for Wildlife.

(2) USEPA, 2007, Ecological Screening Levels (Eco-SSL). Low molecular weigh (LMW) PAH NOAELs based on Verschuuren et al., 1976; high molecular weight (HMW) PAH NOAELs based on Culp, et al., 1998; LMW LOAELs based on Murata et al., 1997; HMW PAH LOAELs based on Culp, et al., 1998.

(3) LANL (2005). Ecorisk Database, Release 2.2, September 2005, Los Alamos National Laboratory.

(4) Others as listed below:

ATSDR, 1990, Toxicological Profile for Silver, U.S. Public Health Service.
ATSDR, 1996, Toxicological Profile for 1,1,2,2-Tetrachloroethane, U.S. Public Health Service.
Eisler, 1987, PAH Hazards to Fish, Wildlife, and Invertebrates: A Synoptic Review.
TERRETOX, http://www.epa.gov/ecotox.
USACHPPM, 2002, Terrestrial Toxicity Database.
USEPA, 1999, SLERA Protocol for Hazardous Waste Combustion Facilties.
USEPA, 2000, OPP (Office of Pesticide Programs). Environmental Effects Database (EEDB).
USEPA, 2008, Integrated Risk Information System (IRIS).

Table F-27
LOAEL Toxicity Reference Values Used to Derive
Wildlife Toxicity Benchmarks for COPECs at SWMUs 50 and 59

COPEC	Mammalian Data				Avian Data			
	Toxicity Value	LOAEL (mg/kg/d)	Test Species	Reference	Toxicity Value	LOAEL (mg/kg/d)	Test Species	Reference
Organics								
2,3,7,8-TCDD-TE	--	1.00E-05	rat	Sample, et al. (1996)	--	1.40E-04	ring-necked pheasant	Sample, et al. (1996)
1,2-Dichlorobenzene	85.7 (chronic NOAEL)	4.29E+02	rat	USEPA, 2008	1608 (LD50)	8.04E+01	northern bobwhite	Based on 1,4-Dichlorobenzene, Ecotox (2008)
1,3-Dichlorobenzene	85.7 (chronic NOAEL)	4.29E+02	rat	Based on 1,2-Dichlorobenzene, USEPA, 2008	1608 (LD50)	8.04E+01	northern bobwhite	Based on 1,4-Dichlorobenzene, Ecotox (2008)
1,4-Dichlorobenzene	2.5 (chronic NOAEL)	1.25E+01	rat	LANL, 2005	1608 (LD50)	8.04E+01	northern bobwhite	Ecotox (2008)
1,3,5-Trinitrobenzene	13.4 (chronic NOAEL)	6.70E+01	rat	LANL, 2005	--	--	--	--
2,4-Dinitrotoluene	0.54 (chronic NOAEL)	2.70E+00	rat	LANL, 2005	--	--	--	--
4,4'-DDD	--	4.00E+00	rat	Based on DDT, Sample, et. al. (1996)	--	2.80E-02	brown pelican	Based on DDT, Sample, et. al. (1996)
4,4'-DDE	--	4.00E+00	rat	Based on DDT, Sample, et. al. (1996)	--	2.80E-02	brown pelican	Based on DDT, Sample, et. al. (1996)
4,4'-DDT	--	4.00E+00	rat	Sample, et. al. (1996)	--	2.80E-02	brown pelican	Sample, et. al. (1996)
Acenaphthene	--	1.10E+02	mouse	EcoSSL (EPA, 2007)	553 (NOAEL)	2.77E+03	mallard duck	Based on B(a)P, Eisler (1987)
Acenaphthylene	--	1.10E+02	mouse	EcoSSL (EPA, 2007)	553 (NOAEL)	2.77E+03	mallard duck	Based on B(a)P, Eisler (1987)
Anthracene	--	1.10E+02	mouse	EcoSSL (EPA, 2007)	553 (NOAEL)	2.77E+03	mallard duck	Based on B(a)P, Eisler (1987)
Aroclor 1254	--	6.80E-01	mouse	Sample, et. al. (1996)	--	1.80E+00	ring-necked pheasant	Sample, et. al. (1996)
Benzo(a)anthracene	--	3.07E+00	mouse	EcoSSL (EPA, 2007)	553 (NOAEL)	2.77E+03	mallard duck	Based on B(a)P, Eisler (1987)
Benzo(a)pyrene	--	1.00E+01	mouse	Sample, et. al. (1996)	553 (NOAEL)	2.77E+03	mallard duck	Eisler (1987)
Benzo(b)fluoranthene	--	3.07E+00	mouse	EcoSSL (EPA, 2007)	553 (NOAEL)	2.77E+03	mallard duck	Based on B(a)P, Eisler (1987)
Benzo(g,h,i)perylene	--	3.07E+00	mouse	EcoSSL (EPA, 2007)	553 (NOAEL)	2.77E+03	mallard duck	Based on B(a)P, Eisler (1987)
Benzo(k)fluoranthene	--	3.07E+00	mouse	EcoSSL (EPA, 2007)	553 (NOAEL)	2.77E+03	mallard duck	Based on B(a)P, Eisler (1987)
Chrysene	--	3.07E+00	mouse	EcoSSL (EPA, 2007)	553 (NOAEL)	2.77E+03	mallard duck	Based on B(a)P, Eisler (1987)
Dibenz(a,h)anthracene	--	3.07E+00	mouse	EcoSSL (EPA, 2007)	553 (NOAEL)	2.77E+03	mallard duck	Based on B(a)P, Eisler (1987)
Dieldrin	--	3.00E-02	rat	EcoSSL (EPA, 2007)	--	1.22E-01	mallard duck	EcoSSL (EPA, 2007)
Endosulfan I	0.15 (NOAEL)	7.50E-01	rat	Based on Endosulfan, Sample et. al. (1996)	10 (NOAEL)	5.00E+01	gray partridge	Based on Endosulfan, Sample et. al. (1996)
Endosulfan II	0.15 (NOAEL)	7.50E-01	rat	Based on Endosulfan, Sample et. al. (1996)	10 (NOAEL)	5.00E+01	gray partridge	Based on Endosulfan, Sample et. al. (1996)
Endosulfan sulfate	0.15 (NOAEL)	7.50E-01	rat	Based on Endosulfan, Sample et. al. (1996)	10 (NOAEL)	5.00E+01	gray partridge	Based on Endosulfan, Sample et. al. (1996)
Endrin	--	9.20E-01	mouse	Sample et. al. (1996)	0.3 (NOAEL)	1.50E+00	mallard duck	Sample, et. al. (1996)
Endrin aldehyde	--	9.20E-01	mouse	Based on Endrine, Sample et.al. (1996)	0.3 (NOAEL)	1.50E+00	mallard duck	Based on Endrine, Sample et.al. (1996)
Endrin ketone	--	9.20E-01	mouse	Based on Endrine, Sample et.al. (1996)	0.3 (NOAEL)	1.50E+00	mallard duck	Based on Endrine, Sample et.al. (1996)
Fluoranthene	--	3.07E+00	mouse	EcoSSL (EPA, 2007)	553 (NOAEL)	2.77E+03	mallard duck	Based on B(a)P, Eisler (1987)
Fluorene	--	1.10E+02	mouse	EcoSSL (EPA, 2007)	553 (NOAEL)	2.77E+03	mallard duck	Based on Benzo(a)pyrene, Eisler 1987
gamma-Chlordane	--	9.20E+00	mouse	Based on Chlordane, Sample, et. al. (1996)	--	1.07E+01	red-winged blackbird	Based on Chlordane, Sample, et. al. (1996)
Heptachlor epoxide	--	1.00E+00	mink	Based on Heptachlor, Sample, et. al. (1996)	92 (LC50)	4.60E+00	quail	Based on Heptachlor, LANL (2005)
Indeno(1,2,3-cd)pyrene	--	3.07E+00	mouse	EcoSSL (EPA, 2007)	553 (NOAEL)	2.77E+03	mallard duck	Based on B(a)P, Eisler (1987)

Table F-27
LOAEL Toxicity Reference Values Used to Derive
Wildlife Toxicity Benchmarks for COPECs at SWMUs 50 and 59

COPEC	Mammalian Data				Avian Data			
	Toxicity Value	LOAEL (mg/kg/d)	Test Species	Reference	Toxicity Value	LOAEL (mg/kg/d)	Test Species	Reference
Methoxychlor	--	8.00E+00	rat	Sample, et. al. (1996)	25.78 (chronic NOAEL)	1.29E+02	Japanese quail	LANL, 2005
Naphthalene	--	1.10E+02	mouse	EcoSSL (EPA, 2007)	553 (NOAEL)	2.77E+03	mallard duck	Based on B(a)P, Eisler (1987)
Phenanthrene	--	1.10E+02	mouse	EcoSSL (EPA, 2007)	553 (NOAEL)	2.77E+03	mallard duck	Based on B(a)P, Eisler (1987)
Pyrene	--	3.07E+00	mouse	EcoSSL (EPA, 2007)	553 (NOAEL)	2.77E+03	mallard duck	Based on B(a)P, Eisler (1987)
Inorganics								
Arsenic	--	1.26E+00	mouse	Sample, et al. (1996)	--	1.28E+01	mallard duck	Sample, et al. (1996)
Cadmium	--	1.00E+01	rat	Sample, et. al. (1996)	--	2.00E+01	mallard duck	Sample, et. al. (1996)
Chromium	2,737 (NOAEL)	1.37E+04	rat	Sample, et al. (1996)	--	2.78E+00	chicken, black duck, turkey	EcoSSL (EPA, 2007)
Copper	--	1.51E+01	mink	Sample, et al. (1996)	--	6.20E+01	chicks	Sample, et al. (1996)
Lead	--	8.00E+01	rat	Sample, et al. (1996)	3.85 (NOAEL)	1.93E+01	American kestrel	Sample, et al. (1996)
Mercury	1.0 (NOAEL)	5.00E+00	mink	Sample, et al. (1996)	--	9.00E-01	Japanese quail	Sample, et al. (1996)
Nickel	--	8.00E+01	rat	Sample, et al. (1996)	--	1.07E+02	mallard duck	Sample, et al. (1996)
Selenium	--	3.30E-01	rat	Sample, et. al. (1996)	--	1.00E+00	mallard duck	Sample, et. al. (1996)
Silver	--	2.22E+02	rat	ATSDR (1990)	178 (NOAEL)	8.90E+02	mallard duck	Terr. Tox. Database (USACHPPM, 2002)
Zinc	--	3.20E+02	rat	Sample, et al. (1996)	--	1.31E+02	hens	Sample et al. (1996)

N/A indicates that the information is not available.

As recommended by Wentsel, et. al. (1996), Tri-Service Procedural Guidelines for Ecological Risk Assessments, the following adjustments were made to toxicity data when NOAEL or LOAEL data were not available:

- Subchronic LOAELs were converted to chronic NOAELs by dividing by a factor of 20.
- Chronic NOAELs were converted to chronic LOAELs by multiplying by a factor of 5.0.
- Subchronic NOAELs/LOAELs were converted to chronic NOAELs/LOAELs by dividing by a factor of 10.
- Chronic LOAELs were converted to chronic NOAELs by dividing by a factor of 10.
- LD_{50} concentrations were converted to chronic NOAELs by dividing by a factor of 100.
- LD_{50} concentrations were converted to chronic LOAELs by dividing by a factor of 20.

Methodology for Selection of TRVs:

(1) Sample, et al., 1996, Toxicological Benchmarks for Wildlife.
(2) USEPA, 2007, Ecological Screening Levels (Eco-SSL). Low molecular weigh (LMW) PAH NOAELs based on Verschuuren et al., 1976; high molecular weight (HMW) PAH NOAELs based on Culp, et al., 1998; LMW LOAELs based on Murata et al., 1997; HMW PAH LOAELs based on Culp, et al., 1998.
(3) LANL (2005). Ecorisk Database, Release 2.2, September 2005, Los Alamos National Laboratory.
(4) Others as listed below:

ATSDR, 1990, Toxicological Profile for Silver, U.S. Public Health Service.
ATSDR, 1996, Toxicological Profile for 1,1,2,2-Tetrachloroethane, U.S. Public Health Service.
Eisler, 1987, PAH Hazards to Fish, Wildlife, and Invertebrates: A Synoptic Review.
TERRETOX, http://www.epa.gov/ecotox.
USACHPPM, 2002, Terrestrial Toxicity Database.
USEPA, 1999, SLERA Protocol for Hazardous Waste Combustion Facilties.
USEPA, 2000, OPP (Office of Pesticide Programs). Environmental Effects Database (EEDB).
USEPA, 2008, Integrated Risk Information System (IRIS).

Table F-28
Uncertainty Factors[a] for Ecological TRV[b] Extrapolations[c] at SWMUs 50 and 59
(Page 1 of 2)

Laboratory Animals (toxicity data base)		Selected Site Receptor Species	
Rat	G: *Rattus* F: Muridae O: Rodentia	Meadow vole	G: *Microtus* F: Muridae O: Rodentia
Mouse	G: *Mus* F: Muridae O: Rodentia	Short-tailed shrew	G: *Blarina* F: Soricidae O: Insectivora
Mink	G: *Mustela* F: Mustelidae O: Carnivora	American robin	G: *Turdus* F: Muscicapidae O: Passeriformes
Pheasant	G: *Phasianus* F: Phasianidae O: Galliformes	Red-tailed hawk	G: *Buteo* F: Accipitridae O: Ciconiiformes
American kestrel	G: *Falco* F: Falconidae O: Ciconiiformes	Red fox	G: *Vulpes* F: Canidae O: Carnivora
Chick, Hens Poultry	G: *Gallus* F: Phasianidae O: Galliformes		
Brown pelican	G: *Pelecanus* F: Pelicanidae O: Pelicaniformes		
Red-winged blackbird	G: *Agelaius* F: Icteridae O: Passeriformes		
Northern bobwhite	G: *Colinus* F: Odontophoridae O: Galliformes		
Black duck, Mallard	G: *Anas* F: Anatidae O: Anseriformes		

Continued on next page

Table F-28
Uncertainty Factors[a] for Ecological TRV[b] Extrapolations[c] at SWMUs 50 and 59

Laboratory Animals (toxicity data base)	
Japanese quail	G: *Coturnix* F: Phasianidae O: Galliformes
Gray partridge	G: *Perdix* F: Phasianidae O: Galliformes
Turkey	G: *Meleagris* F: Meleagrididae O: Galliformes

[a] From ***Tri-Service Procedural Guidelines for Ecological Risk Assessment*** (Wentsel et al. 1996)
[b] TRV = Toxicity Reference Value
[c] Interclass extrapolations not performed; only within bird class or within mammal class.

The Uncertainty Factors Used for TRV Extrapolations are Summarized Below:

- Extrapolation between two different species = uncertainty factor of 2
- Extrapolation between two different genera (G) = uncertainty factor of 4
- Extrapolation between two different families (F) or orders (O) = uncertainty factor of 8
- Thus, for all extrapolations used in the SLERA food chain model an uncertainty factor of 8 was used, except for:
    - rat or mouse toxicity values extrapolated to the meadow vole where an uncertainty factor of 4 was used; and

Table F-29
Summary of Screening for Non-Detected Chemicals
Current/Future - Surface Soil at SWMU 50

Scenario Timeframe: Current/Future
Medium: Soil
Exposure Medium: Surface Soil

Exposure Point	CAS Number	Chemical	Minimum Concentration (Qualifier)	Maximum Concentration (Qualifier)	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Ecological Screening Value (2)	Region III BTAG Screening Levels (3)	Above Screening Value (Y/N)
	99-35-4	1,3,5-Trinitrobenzene			mg/kg		0/14	1.00E-01 - 2.50E-01	2.50E-01	3.76E-01	NVA	No
Surface Soil	99-65-0	1,3-Dinitrobenzene			mg/kg		0/14	1.00E-01 - 2.50E-01	2.50E-01	6.55E-01	NVA	No
	90-12-0	1-Methylnaphthalene			mg/kg		0/10	2.80E-01 - 1.50E+00	1.50E+00	3.24E+00	NVA	No
	118-96-7	2,4,6-Trinitrotoluene			mg/kg		0/14	2.00E-01 - 4.00E-01	4.00E-01	6.40E+00	NVA	No
	35572-78-2	2-amino-4,6-Dinitrotoluene			mg/kg		0/14	2.00E-01 - 4.00E-01	4.00E-01	2.10E+00	NVA	No
	88-72-2	2-Nitrotoluene			mg/kg		0/14	2.20E-01 - 8.00E-01	8.00E-01	2.00E+00	NVA	No
	NA	**3&4-Methylphenol**			**mg/kg**		**0/10**	**1.70E-01 - 7.70E-01**	**7.70E-01**	**4.04E+01**	**1.00E-01**	**Yes**
	99-08-1	3-Nitrotoluene			mg/kg		0/14	2.20E-01 - 8.00E-01	8.00E-01	2.40E+00	NVA	No
	19406-51-0	4-amino-2,6-Dinitrotoluene			mg/kg		0/14	2.00E-01 - 4.00E-01	4.00E-01	7.30E-01	NVA	No
	99-99-0	4-Nitrotoluene			mg/kg		0/14	2.20E-01 - 8.00E-01	8.00E-01	4.40E+00	NVA	No
	100-51-6	Benzyl alcohol			mg/kg		0/15	1.70E-01 - 3.70E+00	3.70E+00	6.58E+01	NVA	No
	156-59-2	cis-1,2-Dichloroethene			mg/kg		0/14	4.90E-03 - 9.00E-03	9.00E-03	7.84E-01	3.00E-01	No
	121-82-4	Cyclonite			mg/kg		0/14	2.00E-01 - 4.00E-01	4.00E-01	7.50E+00	NVA	No
	2691-41-0	HMX			mg/kg		0/14	2.00E-01 - 4.00E-01	4.00E-01	2.70E+01	NVA	No
	ICF87	m+p-Xylenes			mg/kg		0/14	9.80E-03 - 1.80E-02	1.80E-02	1.00E+01	1.00E-01	No
	55-63-0	Nitroglycerin			mg/kg		0/14	3.28E-01 - 2.00E+00	2.00E+00	7.10E+01	NVA	No
	95-47-6	o-Xylene			mg/kg		0/14	4.90E-03 - 9.00E-03	9.00E-03	1.00E+01	1.00E-01	No
	78-11-5	Pentaerythritol tetranitrate			mg/kg		0/14	3.28E-01 - 2.00E+00	2.00E+00	8.60E+03	NVA	No
	110-86-1	**Pyridine**			**mg/kg**		**0/5**	**1.90E-01 - 3.70E+00**	**3.70E+00**	**1.03E+00**	**NVA**	**Yes**
	479-45-8	Tetryl			mg/kg		0/14	2.00E-01 - 5.00E-01	5.00E-01	9.90E-01	NVA	No
	156-60-5	trans-1,2-Dichloroethene			mg/kg		0/14	4.90E-03 - 9.00E-03	9.00E-03	7.84E-01	3.00E-01	No
	7440-28-0	**Thallium**			**mg/kg**		**0/10**	**2.40E+00 - 1.30E+01**	**1.30E+01**	**1.00E+00**	**1.00E-03**	**Yes**
	93-72-1	**2,4,5-TP (Silvex)**			**mg/kg**		**0/12**	**1.11E-02 - 1.14E-01**	**1.14E-01**	**1.09E-01**	**NVA**	**Yes**
	94-82-6	2,4-DB			mg/kg		0/12	7.10E-02 - 1.14E+00	1.14E+00	NVA	NVA	No
	309-00-2	**Aldrin**			**mg/kg**		**0/12**	**7.43E-04 - 1.90E-02**	**1.90E-02**	**3.32E-03**	**1.00E-01**	**Yes**
	319-84-6	alpha-BHC			mg/kg		0/12	7.43E-04 - 1.90E-02	1.90E-02	9.94E-02	NVA	No
	5103-71-9	alpha-Chlordane			mg/kg		0/12	7.43E-04 - 1.90E-02	1.90E-02	2.24E-01	1.00E-01	No
	319-85-7	**beta-BHC**			**mg/kg**		**0/12**	**7.43E-04 - 1.90E-02**	**1.90E-02**	**3.98E-03**	**NVA**	**Yes**
	75-99-0	Dalapon			mg/kg		0/12	3.60E-02 - 1.14E+00	1.14E+00	NVA	NVA	No
	319-86-8	delta-BHC			mg/kg		0/12	7.43E-04 - 1.90E-02	1.90E-02	9.94E+00	NVA	No
	1918-00-9	Dicamba			mg/kg		0/11	7.10E-03 - 2.28E-01	2.28E-01	NVA	NVA	No
	120-36-5	Dichloroprop			mg/kg		0/12	2.23E-02 - 2.28E-01	2.28E-01	NVA	NVA	No
	60-57-1	**Dieldrin**			**mg/kg**		**0/12**	**7.43E-04 - 1.90E-02**	**1.90E-02**	**4.90E-03**	**1.00E-01**	**Yes**

Table F-29
Summary of Screening for Non-Detected Chemicals
Current/Future - Surface Soil at SWMU 50

Scenario Timeframe: Current/Future
Medium: Soil
Exposure Medium: Surface Soil

Exposure Point	CAS Number	Chemical	Minimum Concentration (Qualifier)	Maximum Concentration (Qualifier)	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Ecological Screening Value (2)	Region III BTAG Screening Levels (3)	Above Screening Value (Y/N)
	959-98-8	Endosulfan I			mg/kg		0/12	7.43E-04 - 1.90E-02	1.90E-02	1.19E-01	NVA	No
	1031-07-8	**Endosulfan sulfate**			**mg/kg**		**0/12**	**7.43E-04 - 3.80E-02**	**3.80E-02**	**3.58E-02**	**NVA**	**Yes**
	7421-93-4	**Endrin aldehyde**			**mg/kg**		**0/12**	**7.43E-04 - 3.80E-02**	**3.80E-02**	**1.05E-02**	**NVA**	**Yes**
	53494-70-5	Endrin ketone			mg/kg		0/12	7.43E-04 - 3.80E-02	3.80E-02	NVA	NVA	No
	58-89-9	**gamma-BHC (Lindane)**			**mg/kg**		**0/12**	**7.43E-04 - 1.90E-02**	**1.90E-02**	**5.00E-03**	**1.00E-01**	**Yes**
	5103-74-2	gamma-Chlordane			mg/kg		0/12	7.43E-04 - 1.90E-02	1.90E-02	2.24E-01	1.00E-01	No
	76-44-8	**Heptachlor**			**mg/kg**		**0/12**	**7.43E-04 - 1.90E-02**	**1.90E-02**	**5.98E-03**	**NVA**	**Yes**
	1024-57-3	Heptachlor epoxide			mg/kg		0/12	7.43E-04 - 1.90E-02	1.90E-02	1.52E-01	1.00E-01	No
	94-74-6	MCPA			mg/kg		0/12	1.80E-01 - 1.14E+02	1.14E+02	NVA	NVA	No
	93-65-2	MCPP			mg/kg		0/12	1.80E-01 - 1.14E+02	1.14E+02	NVA	NVA	No
	8001-35-2	**Toxaphene**			**mg/kg**		**0/12**	**3.71E-02 - 9.40E-01**	**9.40E-01**	**1.19E-01**	**NVA**	**Yes**
	12674-11-2	**Aroclor 1016**			**mg/kg**		**0/14**	**1.80E-02 - 3.80E-01**	**3.80E-01**	**3.71E-01**	**1.00E-01**	**Yes**
	11104-28-2	**Aroclor 1221**			**mg/kg**		**0/14**	**1.80E-02 - 3.80E-01**	**3.80E-01**	**3.71E-01**	**1.00E-01**	**Yes**
	11141-16-5	**Aroclor 1232**			**mg/kg**		**0/14**	**1.80E-02 - 3.80E-01**	**3.80E-01**	**3.71E-01**	**1.00E-01**	**Yes**
	53469-21-9	**Aroclor 1242**			**mg/kg**		**0/14**	**1.80E-02 - 3.80E-01**	**3.80E-01**	**3.71E-01**	**1.00E-01**	**Yes**
	12672-29-6	**Aroclor 1248**			**mg/kg**		**0/14**	**1.80E-02 - 3.80E-01**	**3.80E-01**	**3.71E-01**	**1.00E-01**	**Yes**
	11096-82-5	**Aroclor 1260**			**mg/kg**		**0/14**	**1.80E-02 - 3.80E-01**	**3.80E-01**	**3.71E-01**	**1.00E-01**	**Yes**
	120-82-1	**1,2,4-Trichlorobenzene**			**mg/kg**		**0/15**	**1.70E-01 - 3.70E+00**	**3.70E+00**	**2.00E+01**	**1.00E-01**	**Yes**
	95-95-4	**2,4,5-Trichlorophenol**			**mg/kg**		**0/15**	**1.70E-01 - 3.70E+00**	**3.70E+00**	**9.00E+00**	**1.00E-01**	**Yes**
	88-06-2	**2,4,6-Trichlorophenol**			**mg/kg**		**0/15**	**1.70E-01 - 3.70E+00**	**3.70E+00**	**4.00E+00**	**1.00E-01**	**Yes**
	120-83-2	**2,4-Dichlorophenol**			**mg/kg**		**0/15**	**1.70E-01 - 3.70E+00**	**3.70E+00**	**8.75E+01**	**1.00E-01**	**Yes**
	105-67-9	**2,4-Dimethylphenol**			**mg/kg**		**0/15**	**1.70E-01 - 3.70E+00**	**3.70E+00**	**1.00E-02**	**1.00E-01**	**Yes**
	51-28-5	**2,4-Dinitrophenol**			**mg/kg**		**0/15**	**8.70E-01 - 1.80E+01**	**1.80E+01**	**2.00E+01**	**1.00E-01**	**Yes**
	606-20-2	**2,6-Dinitrotoluene**			**mg/kg**		**0/14**	**2.00E-01 - 4.00E-01**	**4.00E-01**	**3.28E-02**	**NVA**	**Yes**
	91-58-7	**2-Chloronaphthalene**			**mg/kg**		**0/15**	**1.70E-01 - 3.70E+00**	**3.70E+00**	**1.22E-02**	**NVA**	**Yes**
	95-57-8	**2-Chlorophenol**			**mg/kg**		**0/15**	**1.70E-01 - 3.70E+00**	**3.70E+00**	**2.43E-01**	**1.00E-01**	**Yes**
	88-74-4	2-Nitroaniline			mg/kg		0/15	1.90E-01 - 3.70E+00	3.70E+00	7.41E+01	NVA	No
	88-75-5	**2-Nitrophenol**			**mg/kg**		**0/15**	**1.70E-01 - 3.70E+00**	**3.70E+00**	**1.60E+00**	**1.00E-01**	**Yes**
	88-85-7	**2-sec-butyl-4,6-dinitrophenol**			**mg/kg**		**0/12**	**7.10E-03 - 2.28E-01**	**2.28E-01**	**2.18E-02**	**NVA**	**Yes**
	91-94-1	**3,3'-Dichlorobenzidine**			**mg/kg**		**0/15**	**1.90E-01 - 3.70E+00**	**3.70E+00**	**6.46E-01**	**NVA**	**Yes**
	99-09-2	**3-Nitroaniline**			**mg/kg**		**0/15**	**1.90E-01 - 3.70E+00**	**3.70E+00**	**3.16E+00**	**NVA**	**Yes**
	534-52-1	**4,6-Dinitro-o-cresol**			**mg/kg**		**0/15**	**3.50E-01 - 1.80E+01**	**1.80E+01**	**1.44E-01**	**NVA**	**Yes**
	100-01-6	4-Nitroaniline			mg/kg		0/15	1.90E-01 - 3.70E+00	3.70E+00	2.19E+01	NVA	No

Table F-29
Summary of Screening for Non-Detected Chemicals
Current/Future - Surface Soil at SWMU 50

Scenario Timeframe: Current/Future
Medium: Soil
Exposure Medium: Surface Soil

Exposure Point	CAS Number	Chemical	Minimum Concentration (Qualifier)	Maximum Concentration (Qualifier)	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Ecological Screening Value (2)	Region III BTAG Screening Levels (3)	Above Screening Value (Y/N)
	100-02-7	**4-Nitrophenol**			**mg/kg**		**0/15**	**8.70E-01 - 1.80E+01**	**1.80E+01**	**7.00E+00**	**1.00E-01**	**Yes**
	65-85-0	**Benzoic Acid**			**mg/kg**		**0/15**	**8.70E-01 - 1.80E+01**	**1.80E+01**	**1.00E+00**	**NVA**	**Yes**
	111-91-1	**bis(2-Chloroethoxy)methane**			**mg/kg**		**0/15**	**1.70E-01 - 3.70E+00**	**3.70E+00**	**3.02E-01**	**NVA**	**Yes**
	111-44-4	bis(2-Chloroethyl)ether			mg/kg		0/15	1.70E-01 - 3.70E+00	3.70E+00	2.37E+01	NVA	No
	108-60-1	bis(2-Chloroisopropyl)ether			mg/kg		0/15	1.70E-01 - 3.70E+00	3.70E+00	1.99E+01	NVA	No
	117-81-7	**bis(2-Ethylhexyl) phthalate**			**mg/kg**		**0/11**	**1.90E-01 - 1.50E+00**	**1.50E+00**	**9.26E-01**	**NVA**	**Yes**
	84-66-2	Diethyl phthalate			mg/kg		0/12	1.90E-01 - 3.70E+00	3.70E+00	1.00E+02	NVA	No
	117-84-0	Di-n-octyl phthalate			mg/kg		0/15	1.90E-01 - 3.70E+00	3.70E+00	7.09E+02	NVA	No
	118-74-1	**Hexachlorobenzene**			**mg/kg**		**0/15**	**1.70E-01 - 3.70E+00**	**3.70E+00**	**1.99E-01**	**NVA**	**Yes**
	87-68-3	**Hexachlorobutadiene**			**mg/kg**		**0/15**	**1.70E-01 - 3.70E+00**	**3.70E+00**	**3.98E-02**	**NVA**	**Yes**
	77-47-4	Hexachlorocyclopentadiene			mg/kg		0/15	1.70E-01 - 3.70E+00	3.70E+00	1.00E+01	NVA	No
	67-72-1	**Hexachloroethane**			**mg/kg**		**0/15**	**1.70E-01 - 3.70E+00**	**3.70E+00**	**5.96E-01**	**NVA**	**Yes**
	78-59-1	Isophorone			mg/kg		0/15	1.70E-01 - 3.70E+00	3.70E+00	1.39E+02	NVA	No
	98-95-3	Nitrobenzene			mg/kg		0/14	2.00E-01 - 4.00E-01	4.00E-01	1.31E+00	NVA	No
	621-64-7	**n-Nitroso-di-n-propylamine**			**mg/kg**		**0/15**	**1.70E-01 - 3.70E+00**	**3.70E+00**	**5.44E-01**	**NVA**	**Yes**
	95-48-7	**o-Cresol**			**mg/kg**		**0/15**	**1.70E-01 - 3.70E+00**	**3.70E+00**	**4.04E+01**	**1.00E-01**	**Yes**
	106-47-8	**p-Chloroaniline**			**mg/kg**		**0/15**	**1.70E-01 - 3.70E+00**	**3.70E+00**	**1.10E+00**	**NVA**	**Yes**
	59-50-7	p-Chloro-m-cresol			mg/kg		0/15	1.70E-01 - 3.70E+00	3.70E+00	7.95E+00	NVA	No
	106-44-5	**p-Cresol**			**mg/kg**		**0/5**	**1.90E-01 - 3.70E+00**	**3.70E+00**	**1.63E+02**	**1.00E-01**	**Yes**
	87-86-5	**Pentachlorophenol**			**mg/kg**		**0/15**	**8.70E-01 - 1.80E+01**	**1.80E+01**	**2.10E+00**	**1.00E-01**	**Yes**
	108-95-2	**Phenol**			**mg/kg**		**0/15**	**1.70E-01 - 3.70E+00**	**3.70E+00**	**3.00E+01**	**1.00E-01**	**Yes**
	71-55-6	1,1,1-Trichloroethane			mg/kg		0/14	4.90E-03 - 9.00E-03	9.00E-03	2.98E+01	3.00E-01	No
	79-34-5	1,1,2,2-Tetrachloroethane			mg/kg		0/14	4.90E-03 - 9.00E-03	9.00E-03	1.27E-01	3.00E-01	No
	79-00-5	1,1,2-Trichloroethane			mg/kg		0/14	4.90E-03 - 9.00E-03	9.00E-03	2.86E+01	3.00E-01	No
	75-34-3	1,1-Dichloroethane			mg/kg		0/14	4.90E-03 - 9.00E-03	9.00E-03	2.01E+01	3.00E-01	No
	75-35-4	1,1-Dichloroethene			mg/kg		0/14	4.90E-03 - 9.00E-03	9.00E-03	8.28E+00	NVA	No
	107-06-2	1,2-Dichloroethane			mg/kg		0/14	4.90E-03 - 9.00E-03	9.00E-03	2.12E+01	8.70E+02	No
	78-87-5	1,2-Dichloropropane			mg/kg		0/14	4.90E-03 - 9.00E-03	9.00E-03	3.27E+01	3.00E-01	No
	78-93-3	2-Butanone			mg/kg		0/14	5.60E-03 - 4.50E-02	4.50E-02	8.96E+01	NVA	No
	591-78-6	2-Hexanone			mg/kg		0/14	5.60E-03 - 4.50E-02	4.50E-02	1.26E+01	NVA	No
	101-55-3	4-Bromophenyl phenylether			mg/kg		0/15	1.70E-01 - 3.70E+00	3.70E+00	NVA	NVA	No
	7005-72-3	4-Chlorophenyl phenylether			mg/kg		0/15	1.70E-01 - 3.70E+00	3.70E+00	NVA	NVA	No
	108-10-1	4-Methyl-2-pentanone			mg/kg		0/14	5.60E-03 - 4.50E-02	4.50E-02	4.43E+02	1.00E+02	No

Table F-29
Summary of Screening for Non-Detected Chemicals
Current/Future - Surface Soil at SWMU 50

Scenario Timeframe: Current/Future
Medium: Soil
Exposure Medium: Surface Soil

Exposure Point	CAS Number	Chemical	Minimum Concentration (Qualifier)	Maximum Concentration (Qualifier)	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Ecological Screening Value (2)	Region III BTAG Screening Levels (3)	Above Screening Value (Y/N)
	71-43-2	Benzene			mg/kg		0/14	4.90E-03 - 9.00E-03	9.00E-03	2.55E-01	1.00E-01	No
	75-27-4	Bromodichloromethane			mg/kg		0/14	4.90E-03 - 9.00E-03	9.00E-03	5.40E-01	4.50E+02	No
	74-83-9	Bromomethane			mg/kg		0/14	4.90E-03 - 9.00E-03	9.00E-03	2.35E-01	NVA	No
	75-15-0	Carbon disulfide			mg/kg		0/13	4.90E-03 - 9.00E-03	9.00E-03	9.41E-02	NVA	No
	56-23-5	Carbon tetrachloride			mg/kg		0/14	4.90E-03 - 9.00E-03	9.00E-03	2.98E+00	3.00E-01	No
	108-90-7	Chlorobenzene			mg/kg		0/14	4.90E-03 - 9.00E-03	9.00E-03	4.00E+01	1.00E-01	No
	75-00-3	Chloroethane			mg/kg		0/14	4.90E-03 - 9.00E-03	9.00E-03	NVA	NVA	No
	67-66-3	Chloroform			mg/kg		0/14	4.90E-03 - 9.00E-03	9.00E-03	1.19E+00	3.00E-01	No
	74-87-3	Chloromethane			mg/kg		0/14	4.90E-03 - 9.00E-03	9.00E-03	1.04E+01	NVA	No
	10061-01-5	cis-1,3-Dichloro-1-propene			mg/kg		0/14	4.90E-03 - 9.00E-03	9.00E-03	3.98E-01	3.00E-01	No
	124-48-1	Dibromochloromethane			mg/kg		0/14	4.90E-03 - 9.00E-03	9.00E-03	2.05E+00	NVA	No
	100-41-4	Ethylbenzene			mg/kg		0/14	4.90E-03 - 9.00E-03	9.00E-03	5.16E+00	1.00E-01	No
	75-09-2	Methylene chloride			mg/kg		0/14	5.60E-03 - 1.80E-02	1.80E-02	4.05E+00	3.00E-01	No
	100-42-5	Styrene			mg/kg		0/14	4.90E-03 - 9.00E-03	9.00E-03	3.00E+02	1.00E-01	No
	127-18-4	Tetrachloroethene			mg/kg		0/14	4.90E-03 - 9.00E-03	9.00E-03	9.92E+00	3.00E-01	No
	108-88-3	Toluene			mg/kg		0/14	4.90E-03 - 9.00E-03	9.00E-03	2.00E+02	1.00E-01	No
	10061-02-6	trans-1,3-Dichloropropene			mg/kg		0/14	4.90E-03 - 9.00E-03	9.00E-03	3.98E-01	3.00E-01	No
	75-25-2	Tribromomethane			mg/kg		0/14	4.90E-03 - 9.00E-03	9.00E-03	1.59E+01	1.15E+03	No
	79-01-6	Trichloroethene			mg/kg		0/14	4.90E-03 - 9.00E-03	9.00E-03	1.24E+01	3.00E-01	No
	75-01-4	Vinyl Chloride			mg/kg		0/14	4.90E-03 - 9.00E-03	9.00E-03	6.46E-01	3.00E-01	No

(1) Maximum non-detect limit value used for screening.

(2) Screening toxicity values from USEPA Eco SSLs (2009); Efroymson et al., PRGs (1997); and USEPA Region V EDQLs (1999); and other sources. See text for derivation.

(3) Screening toxicity values from USEPA Region III BTAG Screening Table (September, 1995).

Definitions: N/A = Not Applicable or Not Available
NVA = No Value Available

Table F-30
Summary of Screening for Non-Detected Chemicals
Current/Future - Surface Soil at SWMU 59

Scenario Timeframe: Current/Future

Medium: Soil
Exposure Medium: Surface Soil

Exposure Point	CAS Number	Chemical	Minimum Concentration (Qualifier)	Maximum Concentration (Qualifier)	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Ecological Screening Value (2)	Region III BTAG Screening Levels (3)	Above Screening Value (Y/N)
	122-66-7	1,2-Diphenylhydrazine			mg/kg		0/2	1.40E-01 - 5.00E-01	5.00E-01	NVA	NVA	No
Surface Soil	99-65-0	1,3-Dinitrobenzene			mg/kg		0/13	1.00E-01 - 2.50E-01	2.50E-01	6.55E-01	NVA	No
	118-96-7	2,4,6-Trinitrotoluene			mg/kg		0/13	2.00E-01 - 2.50E-01	2.50E-01	6.40E+00	NVA	No
	35572-78-2	2-amino-4,6-Dinitrotoluene			mg/kg		0/13	2.00E-01 - 2.50E-01	2.50E-01	2.10E+00	NVA	No
	88-72-2	2-Nitrotoluene			mg/kg		0/13	2.10E-01 - 4.00E-01	4.00E-01	2.00E+00	NVA	No
	NA	**3&4-Methylphenol**			**mg/kg**		**0/10**	**1.70E-01 - 1.90E-01**	**1.90E-01**	**4.04E+01**	**1.00E-01**	**Yes**
	99-08-1	3-Nitrotoluene			mg/kg		0/13	2.10E-01 - 4.00E-01	4.00E-01	2.40E+00	NVA	No
	19406-51-0	4-amino-2,6-Dinitrotoluene			mg/kg		0/13	2.00E-01 - 2.50E-01	2.50E-01	7.30E-01	NVA	No
	99-99-0	4-Nitrotoluene			mg/kg		0/13	2.10E-01 - 4.00E-01	4.00E-01	4.40E+00	NVA	No
	92-87-5	Benzidine			mg/kg		0/2	8.50E-01 - 4.00E+00	4.00E+00	NVA	NVA	No
	100-51-6	Benzyl alcohol			mg/kg		0/15	1.70E-01 - 1.00E+01	1.00E+01	6.58E+01	NVA	No
	156-59-2	cis-1,2-Dichloroethene			mg/kg		0/13	5.40E-03 - 1.30E-02	1.30E-02	7.84E-01	3.00E-01	No
	121-82-4	Cyclonite			mg/kg		0/13	2.00E-01 - 2.50E-01	2.50E-01	7.50E+00	NVA	No
	2691-41-0	HMX			mg/kg		0/13	2.00E-01 - 2.50E-01	2.50E-01	2.70E+01	NVA	No
	NA	m+p-Xylenes			mg/kg		0/13	1.10E-02 - 2.50E-02	2.50E-02	1.00E+01	1.00E-01	No
	55-63-0	Nitroglycerin			mg/kg		0/13	3.42E-01 - 2.00E+00	2.00E+00	7.10E+01	NVA	No
	62-75-9	**N-Nitrosodimethylamine**			**mg/kg**		**0/2**	**1.40E-01 - 5.00E-01**	**5.00E-01**	**3.21E-05**	**NVA**	**Yes**
	95-47-6	o-Xylene			mg/kg		0/13	5.40E-03 - 1.30E-02	1.30E-02	1.00E+01	1.00E-01	No
	78-11-5	Pentaerythritol tetranitrate			mg/kg		0/13	3.42E-01 - 2.00E+00	2.00E+00	8.60E+03	NVA	No
	110-86-1	Pyridine			mg/kg		0/3	1.90E-01 - 2.00E-01	2.00E-01	1.03E+00	NVA	No
	479-45-8	Tetryl			mg/kg		0/13	2.00E-01 - 4.90E-01	4.90E-01	9.90E-01	NVA	No
	156-60-5	trans-1,2-Dichloroethene			mg/kg		0/13	5.40E-03 - 1.30E-02	1.30E-02	7.84E-01	3.00E-01	No
	93-72-1	**2,4,5-TP (Silvex)**			**mg/kg**		**0/13**	**1.17E-02 - 1.20E-01**	**1.20E-01**	**1.09E-01**	**NVA**	**Yes**
	94-75-7	**2,4-D**			**mg/kg**		**0/13**	**2.33E-02 - 2.39E-01**	**2.39E-01**	**2.73E-02**	**NVA**	**Yes**
	94-82-6	2,4-DB			mg/kg		0/13	7.00E-02 - 1.20E+00	1.20E+00	NVA	NVA	No
	72-55-9	**4,4'-DDE**			**mg/kg**		**0/14**	**7.60E-04 - 2.00E+00**	**2.00E+00**	**2.10E-02**	**1.00E-01**	**Yes**
	309-00-2	**Aldrin**			**mg/kg**		**0/15**	**7.60E-04 - 2.00E+00**	**2.00E+00**	**3.32E-03**	**1.00E-01**	**Yes**
	319-84-6	**alpha-BHC**			**mg/kg**		**0/15**	**7.60E-04 - 2.00E+00**	**2.00E+00**	**9.94E-02**	**NVA**	**Yes**
	5103-71-9	**alpha-Chlordane**			**mg/kg**		**0/15**	**7.60E-04 - 2.00E+00**	**2.00E+00**	**2.24E-01**	**1.00E-01**	**Yes**
	319-85-7	**beta-BHC**			**mg/kg**		**0/15**	**7.60E-04 - 2.00E+00**	**2.00E+00**	**3.98E-03**	**NVA**	**Yes**
	75-99-0	Dalapon			mg/kg		0/13	3.50E-02 - 1.20E+00	1.20E+00	NVA	NVA	No
	319-86-8	delta-BHC			mg/kg		0/15	7.60E-04 - 2.00E+00	2.00E+00	9.94E+00	NVA	No
	1918-00-9	Dicamba			mg/kg		0/13	7.00E-03 - 2.39E-01	2.39E-01	NVA	NVA	No

Table F-30
Summary of Screening for Non-Detected Chemicals
Current/Future - Surface Soil at SWMU 59

Scenario Timeframe: Current/Future

Medium: Soil
Exposure Medium: Surface Soil

Exposure Point	CAS Number	Chemical	Minimum Concentration (Qualifier)	Maximum Concentration (Qualifier)	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Ecological Screening Value (2)	Region III BTAG Screening Levels (3)	Above Screening Value (Y/N)
	120-36-5	Dichloroprop			mg/kg		0/13	2.33E-02 - 2.39E-01	2.39E-01	NVA	NVA	No
	72-20-8	**Endrin**			**mg/kg**		**0/15**	**7.60E-04 - 2.00E+00**	**2.00E+00**	**1.01E-02**	**1.00E-01**	**Yes**
	58-89-9	**gamma-BHC (Lindane)**			**mg/kg**		**0/15**	**7.60E-04 - 2.00E+00**	**2.00E+00**	**5.00E-03**	**1.00E-01**	**Yes**
	76-44-8	**Heptachlor**			**mg/kg**		**0/15**	**7.60E-04 - 5.00E-01**	**5.00E-01**	**5.98E-03**	**NVA**	**Yes**
	94-74-6	MCPA			mg/kg		0/13	1.70E-01 - 1.20E+02	1.20E+02	NVA	NVA	No
	93-65-2	MCPP			mg/kg		0/13	1.70E-01 - 1.20E+02	1.20E+02	NVA	NVA	No
	8001-35-2	**Toxaphene**			**mg/kg**		**0/15**	**3.79E-02 - 2.00E+01**	**2.00E+01**	**1.19E-01**	**NVA**	**Yes**
	12674-11-2	**Aroclor 1016**			**mg/kg**		**0/15**	**1.70E-02 - 5.00E+00**	**5.00E+00**	**3.71E-01**	**1.00E-01**	**Yes**
	11104-28-2	**Aroclor 1221**			**mg/kg**		**0/15**	**1.70E-02 - 5.00E+00**	**5.00E+00**	**3.71E-01**	**1.00E-01**	**Yes**
	11141-16-5	**Aroclor 1232**			**mg/kg**		**0/15**	**1.70E-02 - 5.00E+00**	**5.00E+00**	**3.71E-01**	**1.00E-01**	**Yes**
	53469-21-9	**Aroclor 1242**			**mg/kg**		**0/15**	**1.70E-02 - 5.00E+00**	**5.00E+00**	**3.71E-01**	**1.00E-01**	**Yes**
	12672-29-6	**Aroclor 1248**			**mg/kg**		**0/15**	**1.70E-02 - 1.00E+01**	**1.00E+01**	**3.71E-01**	**1.00E-01**	**Yes**
	11096-82-5	**Aroclor 1260**			**mg/kg**		**0/15**	**1.70E-02 - 2.00E+01**	**2.00E+01**	**3.71E-01**	**1.00E-01**	**Yes**
	131-11-3	Dimethylphthalate			mg/kg		0/15	1.70E-01 - 8.00E-01	8.00E-01	7.34E+02	NVA	No
	120-82-1	**1,2,4-Trichlorobenzene**			**mg/kg**		**0/15**	**4.00E-02 - 2.00E-01**	**2.00E-01**	**2.00E+01**	**1.00E-01**	**Yes**
	95-50-1	**1,2-Dichlorobenzene**			**mg/kg**		**0/15**	**1.10E-01 - 6.00E-01**	**6.00E-01**	**2.96E+00**	**1.00E-01**	**Yes**
	541-73-1	1,3-Dichlorobenzene			mg/kg		0/15	1.30E-01 - 6.00E-01	6.00E-01	3.77E+01	NVA	No
	106-46-7	**1,4-Dichlorobenzene**			**mg/kg**		**0/15**	**9.80E-02 - 5.00E-01**	**5.00E-01**	**2.00E+01**	**1.00E-01**	**Yes**
	95-95-4	**2,4,5-Trichlorophenol**			**mg/kg**		**0/15**	**1.00E-01 - 5.00E-01**	**5.00E-01**	**9.00E+00**	**1.00E-01**	**Yes**
	88-06-2	**2,4,6-Trichlorophenol**			**mg/kg**		**0/15**	**1.70E-01 - 8.00E-01**	**8.00E-01**	**4.00E+00**	**1.00E-01**	**Yes**
	120-83-2	**2,4-Dichlorophenol**			**mg/kg**		**0/15**	**1.70E-01 - 9.00E-01**	**9.00E-01**	**8.75E+01**	**1.00E-01**	**Yes**
	105-67-9	**2,4-Dimethylphenol**			**mg/kg**		**0/15**	**1.70E-01 - 3.00E+00**	**3.00E+00**	**1.00E-02**	**1.00E-01**	**Yes**
	51-28-5	**2,4-Dinitrophenol**			**mg/kg**		**0/15**	**8.70E-01 - 6.00E+00**	**6.00E+00**	**2.00E+01**	**1.00E-01**	**Yes**
	121-14-2	2,4-Dinitrotoluene			mg/kg		0/15	1.40E-01 - 7.00E-01	7.00E-01	1.28E+00	NVA	No
	606-20-2	**2,6-Dinitrotoluene**			**mg/kg**		**0/15**	**8.50E-02 - 4.00E-01**	**4.00E-01**	**3.28E-02**	**NVA**	**Yes**
	91-58-7	**2-Chloronaphthalene**			**mg/kg**		**0/15**	**3.60E-02 - 2.00E-01**	**2.00E-01**	**1.22E-02**	**NVA**	**Yes**
	95-57-8	**2-Chlorophenol**			**mg/kg**		**0/15**	**6.00E-02 - 3.00E-01**	**3.00E-01**	**2.43E-01**	**1.00E-01**	**Yes**
	88-74-4	2-Nitroaniline			mg/kg		0/15	6.20E-02 - 3.80E-01	3.80E-01	7.41E+01	NVA	No
	88-75-5	**2-Nitrophenol**			**mg/kg**		**0/15**	**1.40E-01 - 7.00E-01**	**7.00E-01**	**1.60E+00**	**1.00E-01**	**Yes**
	88-85-7	**2-sec-butyl-4,6-dinitrophenol**			**mg/kg**		**0/13**	**7.00E-03 - 2.39E-01**	**2.39E-01**	**2.18E-02**	**NVA**	**Yes**
	91-94-1	**3,3'-Dichlorobenzidine**			**mg/kg**		**0/15**	**1.90E-01 - 3.00E+01**	**3.00E+01**	**6.46E-01**	**NVA**	**Yes**
	99-09-2	3-Nitroaniline			mg/kg		0/15	1.90E-01 - 2.00E+00	2.00E+00	3.16E+00	NVA	No
	534-52-1	**4,6-Dinitro-o-cresol**			**mg/kg**		**0/15**	**3.50E-01 - 3.00E+00**	**3.00E+00**	**1.44E-01**	**NVA**	**Yes**

Table F-30
Summary of Screening for Non-Detected Chemicals
Current/Future - Surface Soil at SWMU 59

Scenario Timeframe: Current/Future

Medium: Soil
Exposure Medium: Surface Soil

Exposure Point	CAS Number	Chemical	Minimum Concentration (Qualifier)	Maximum Concentration (Qualifier)	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Ecological Screening Value (2)	Region III BTAG Screening Levels (3)	Above Screening Value (Y/N)
	100-01-6	4-Nitroaniline			mg/kg		0/15	1.90E-01 - 2.00E+00	2.00E+00	2.19E+01	NVA	No
	100-02-7	**4-Nitrophenol**			**mg/kg**		**0/15**	**8.70E-01 - 7.00E+00**	**7.00E+00**	**7.00E+00**	**1.00E-01**	**Yes**
	83-32-9	**Acenaphthene**			**mg/kg**		**0/12**	**3.60E-02 - 3.00E-01**	**3.00E-01**	**2.00E+01**	**1.00E-01**	**Yes**
	65-85-0	**Benzoic Acid**			**mg/kg**		**0/15**	**8.70E-01 - 3.00E+01**	**3.00E+01**	**1.00E+00**	**NVA**	**Yes**
	111-91-1	bis(2-Chloroethoxy)methane			mg/kg		0/15	5.90E-02 - 3.00E-01	3.00E-01	3.02E-01	NVA	No
	111-44-4	bis(2-Chloroethyl)ether			mg/kg		0/15	3.30E-02 - 2.00E-01	2.00E-01	2.37E+01	NVA	No
	108-60-1	bis(2-Chloroisopropyl)ether			mg/kg		0/15	1.70E-01 - 1.00E+00	1.00E+00	1.99E+01	NVA	No
	117-81-7	**bis(2-Ethylhexyl) phthalate**			**mg/kg**		**0/15**	**1.90E-01 - 3.00E+00**	**3.00E+00**	**9.26E-01**	**NVA**	**Yes**
	85-68-7	**Butyl benzyl phthalate**			**mg/kg**		**0/15**	**1.70E-01 - 8.00E-01**	**8.00E-01**	**2.39E-01**	**NVA**	**Yes**
	84-66-2	Diethyl phthalate			mg/kg		0/15	1.90E-01 - 1.00E+00	1.00E+00	1.00E+02	NVA	No
	84-74-2	Di-n-butyl phthalate			mg/kg		0/15	6.10E-02 - 3.80E-01	3.80E-01	2.00E+02	NVA	No
	117-84-0	Di-n-octyl phthalate			mg/kg		0/15	1.90E-01 - 1.00E+01	1.00E+01	7.09E+02	NVA	No
	118-74-1	**Hexachlorobenzene**			**mg/kg**		**0/15**	**3.30E-02 - 2.00E-01**	**2.00E-01**	**1.99E-01**	**NVA**	**Yes**
	87-68-3	**Hexachlorobutadiene**			**mg/kg**		**0/15**	**1.70E-01 - 1.00E+00**	**1.00E+00**	**3.98E-02**	**NVA**	**Yes**
	77-47-4	**Hexachlorocyclopentadiene**			**mg/kg**		**0/15**	**1.70E-01 - 3.00E+01**	**3.00E+01**	**1.00E+01**	**NVA**	**Yes**
	67-72-1	**Hexachloroethane**			**mg/kg**		**0/15**	**1.50E-01 - 8.00E-01**	**8.00E-01**	**5.96E-01**	**NVA**	**Yes**
	78-59-1	Isophorone			mg/kg		0/15	3.30E-02 - 2.00E-01	2.00E-01	1.39E+02	NVA	No
	98-95-3	Nitrobenzene			mg/kg		0/15	4.50E-02 - 2.50E-01	2.50E-01	1.31E+00	NVA	No
	621-64-7	**n-Nitroso-di-n-propylamine**			**mg/kg**		**0/15**	**1.70E-01 - 1.00E+00**	**1.00E+00**	**5.44E-01**	**NVA**	**Yes**
	86-30-6	**n-Nitrosodiphenylamine**			**mg/kg**		**0/15**	**1.70E-01 - 1.00E+01**	**1.00E+01**	**5.45E-01**	**NVA**	**Yes**
	95-48-7	**o-Cresol**			**mg/kg**		**0/15**	**2.90E-02 - 2.00E-01**	**2.00E-01**	**4.04E+01**	**1.00E-01**	**Yes**
	106-47-8	**p-Chloroaniline**			**mg/kg**		**0/15**	**1.80E-01 - 4.00E+00**	**4.00E+00**	**1.10E+00**	**NVA**	**Yes**
	59-50-7	p-Chloro-m-cresol			mg/kg		0/15	9.50E-02 - 5.00E-01	5.00E-01	7.95E+00	NVA	No
	106-44-5	**p-Cresol**			**mg/kg**		**0/5**	**1.90E-01 - 1.00E+00**	**1.00E+00**	**1.63E+02**	**1.00E-01**	**Yes**
	87-86-5	**Pentachlorophenol**			**mg/kg**		**0/15**	**8.70E-01 - 6.00E+00**	**6.00E+00**	**2.10E+00**	**1.00E-01**	**Yes**
	108-95-2	**Phenol**			**mg/kg**		**0/15**	**1.10E-01 - 6.00E-01**	**6.00E-01**	**3.00E+01**	**1.00E-01**	**Yes**
	71-55-6	1,1,1-Trichloroethane			mg/kg		0/13	5.40E-03 - 1.30E-02	1.30E-02	2.98E+01	3.00E-01	No
	79-34-5	1,1,2,2-Tetrachloroethane			mg/kg		0/13	5.40E-03 - 1.30E-02	1.30E-02	1.27E-01	3.00E-01	No
	79-00-5	1,1,2-Trichloroethane			mg/kg		0/13	5.40E-03 - 1.30E-02	1.30E-02	2.86E+01	3.00E-01	No
	75-34-3	1,1-Dichloroethane			mg/kg		0/13	5.40E-03 - 1.30E-02	1.30E-02	2.01E+01	3.00E-01	No
	75-35-4	1,1-Dichloroethene			mg/kg		0/13	5.40E-03 - 1.30E-02	1.30E-02	8.28E+00	NVA	No
	107-06-2	1,2-Dichloroethane			mg/kg		0/13	5.40E-03 - 1.30E-02	1.30E-02	2.12E+01	8.70E+02	No
	78-87-5	1,2-Dichloropropane			mg/kg		0/13	5.40E-03 - 1.30E-02	1.30E-02	3.27E+01	3.00E-01	No

Table F-30
Summary of Screening for Non-Detected Chemicals
Current/Future - Surface Soil at SWMU 59

Scenario Timeframe: Current/Future

Medium: Soil
Exposure Medium: Surface Soil

Exposure Point	CAS Number	Chemical	Minimum Concentration (Qualifier)	Maximum Concentration (Qualifier)	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Ecological Screening Value (2)	Region III BTAG Screening Levels (3)	Above Screening Value (Y/N)
	78-93-3	2-Butanone			mg/kg		0/13	5.40E-03 - 6.30E-02	6.30E-02	8.96E+01	NVA	No
	591-78-6	2-Hexanone			mg/kg		0/13	5.40E-03 - 6.30E-02	6.30E-02	1.26E+01	NVA	No
	101-55-3	4-Bromophenyl phenylether			mg/kg		0/15	3.30E-02 - 2.00E-01	2.00E-01	NVA	NVA	No
	7005-72-3	4-Chlorophenyl phenylether			mg/kg		0/15	3.30E-02 - 2.00E-01	2.00E-01	NVA	NVA	No
	108-10-1	4-Methyl-2-pentanone			mg/kg		0/13	5.40E-03 - 6.30E-02	6.30E-02	4.43E+02	1.00E+02	No
	71-43-2	Benzene			mg/kg		0/13	5.40E-03 - 1.30E-02	1.30E-02	2.55E-01	1.00E-01	No
	75-27-4	Bromodichloromethane			mg/kg		0/13	5.40E-03 - 1.30E-02	1.30E-02	5.40E-01	4.50E+02	No
	74-83-9	Bromomethane			mg/kg		0/13	5.40E-03 - 1.30E-02	1.30E-02	2.35E-01	NVA	No
	75-15-0	Carbon disulfide			mg/kg		0/12	5.40E-03 - 1.30E-02	1.30E-02	9.41E-02	NVA	No
	56-23-5	Carbon tetrachloride			mg/kg		0/13	5.40E-03 - 1.30E-02	1.30E-02	2.98E+00	3.00E-01	No
	108-90-7	Chlorobenzene			mg/kg		0/13	5.40E-03 - 1.30E-02	1.30E-02	4.00E+01	1.00E-01	No
	75-00-3	Chloroethane			mg/kg		0/13	5.40E-03 - 1.30E-02	1.30E-02	NVA	NVA	No
	67-66-3	Chloroform			mg/kg		0/13	5.40E-03 - 1.30E-02	1.30E-02	1.19E+00	3.00E-01	No
	74-87-3	Chloromethane			mg/kg		0/13	5.40E-03 - 1.30E-02	1.30E-02	1.04E+01	NVA	No
	10061-01-5	cis-1,3-Dichloro-1-propene			mg/kg		0/13	5.40E-03 - 1.30E-02	1.30E-02	3.98E-01	3.00E-01	No
	124-48-1	Dibromochloromethane			mg/kg		0/13	5.40E-03 - 1.30E-02	1.30E-02	2.05E+00	NVA	No
	100-41-4	Ethylbenzene			mg/kg		0/13	5.40E-03 - 1.30E-02	1.30E-02	5.16E+00	1.00E-01	No
	75-09-2	Methylene chloride			mg/kg		0/13	5.40E-03 - 2.50E-02	2.50E-02	4.05E+00	3.00E-01	No
	100-42-5	Styrene			mg/kg		0/13	5.40E-03 - 1.30E-02	1.30E-02	3.00E+02	1.00E-01	No
	127-18-4	Tetrachloroethene			mg/kg		0/13	5.40E-03 - 1.30E-02	1.30E-02	9.92E+00	3.00E-01	No
	10061-02-6	trans-1,3-Dichloropropene			mg/kg		0/13	5.40E-03 - 1.30E-02	1.30E-02	3.98E-01	3.00E-01	No
	75-25-2	Tribromomethane			mg/kg		0/13	5.40E-03 - 1.30E-02	1.30E-02	1.59E+01	1.15E+03	No
	79-01-6	Trichloroethene			mg/kg		0/13	5.40E-03 - 1.30E-02	1.30E-02	1.24E+01	3.00E-01	No
	75-01-4	Vinyl Chloride			mg/kg		0/13	5.40E-03 - 1.30E-02	1.30E-02	6.46E-01	3.00E-01	No

(1) Maximum non-detect limit value used for screening.

(2) Screening toxicity values from USEPA Eco SSLs (2009); Efroymson et al., PRGs (1997); and USEPA Region V EDQLs (1999); and other sources. See text for derivation.

(3) Screening toxicity values from USEPA Region III BTAG Screening Table (September, 1995).

Definitions: N/A = Not Applicable or Not Available
NVA = No Value Available

Table F-31
Selection of Ecological Soil Screening Toxicity Values for SWMUs 50 and 59

Parameter	Ecological Soil Screening Levels[a] (mg/kg)	Ecological Preliminary Remediation Goals[b] (mg/kg)	Ecological Data Quality Levels[c] (mg/kg)	Other Ecological Soil Screening Levels[d] (mg/kg)	Selected Ecological Screening Toxicity Value[e] (mg/kg)
Inorganic Compounds					
Aluminum	NVA	NVA	NVA	pH Dependant	pH Dependant
Antimony	$0.27_{(mammal)}$	$5_{(plant)}$	1.42E-01	--	2.70E-01
Arsenic	$18_{(plant)}$	$9.9_{(mammal, plant)}$	5.70E+00	--	9.90E+00
Barium	$330_{(earthworm)}$	2.83E+02	1.04E+00	--	2.83E+02
Beryllium	$21_{(mammal)}$	1.00E+01	1.06E+00	--	1.00E+01
Cadmium	$0.36_{(mammal)}$	$4_{(plant, bird)}$	2.22E-03	--	3.60E-01
Calcium	NVA	NVA	NVA	NVA	Nutrient
Chromium	$26_{(bird)}$	$0.4_{(earthworm)}$	4.00E-01	--	4.00E-01
Cobalt	$13_{(plant)}$	$20_{(plant)}$	1.40E-01	--	1.30E+01
Copper	$28_{(bird)}$	$60_{(earthworm)}$	3.13E-01	--	2.80E+01
Iron	NVA	NVA	NVA	NVA	NVA
Lead	$11_{(bird)}$	4.05E+01	5.37E-02	--	1.10E+01
Magnesium	NVA	NVA	NVA	NVA	Nutrient
Manganese	$220_{(plant)}$	NVA	NVA	50[f]	2.20E+02
Mercury	NVA	5.10E-04	1.00E-01	--	5.10E-04
Nickel	$38_{(plant)}$	3.00E+01	1.36E+01	--	3.00E+01
Potassium	NVA	NVA	NVA	NVA	Nutrient
Selenium	$0.52_{(plant)}$	2.10E-01	2.77E-02	--	2.10E-01
Silver	$4.2_{(bird)}$	$2_{(plant)}$	4.04E+00	--	2.00E+00
Sodium	NVA	NVA	NVA	NVA	Nutrient
Thallium	NVA	1.00E+00	5.69E-02	--	1.00E+00
Vanadium	$7.8_{(bird)}$	2.00E+00	1.59E+00	--	2.00E+00
Zinc	$46_{(bird)}$	$8.5_{(bird)}$	6.62E+00	--	8.50E+00
Total Organic Carbon	NVA	NVA	NVA	NVA	NVA
Organic Compounds					
1,1,1,2-Tetrachloroethane	NVA	NVA	2.25E+02	--	2.25E+02
1,1,1-Trichloroethane	NVA	NVA	2.98E+01	--	2.98E+01
1,1,2,2-Tetrachloroethane	NVA	NVA	1.27E-01	--	1.27E-01
1,1,2-Trichloroethane	NVA	NVA	2.86E+01	--	2.86E+01
1,1-Dichloroethane	NVA	NVA	2.01E+01	--	2.01E+01
1,1-Dichloroethene	NVA	NVA	8.28E+00	--	8.28E+00
1,1-Dichloropropene	NVA	NVA	NVA	NVA	NVA
1,2,3,4,6,7,8-Heptachlorodibenzofuran	NVA	NVA	3.86E-05	--	3.86E-05
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	NVA	NVA	1.99E-07	--	1.99E-07
1,2,3,4,7,8-Hexachlorodibenzofuran	NVA	NVA	3.86E-05	--	3.86E-05
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	NVA	NVA	1.99E-07	--	1.99E-07
1,2,3,6,7,8-Hexachlorodibenzofuran	NVA	NVA	3.86E-05	--	3.86E-05
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	NVA	NVA	1.99E-07	--	1.99E-07
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	NVA	NVA	1.99E-07	--	1.99E-07
1,2,3-Trichlorobenzene	NVA	NVA	NVA	NVA	NVA
1,2,3-Trichloropropane	NVA	NVA	3.36E+00	--	3.36E+00
1,2,4,5-Tetrachlorobenzene	NVA	NVA	2.02E+00	--	2.02E+00
1,2,4-Trichlorobenzene	NVA	$20_{(earthworm)}$	1.11E+01	--	2.00E+01
1,2,4-Trimethylbenzene	NVA	NVA	NVA	NVA	NVA
1,2-Dibromo-3-chloropropane	NVA	NVA	3.52E-02	--	3.52E-01
1,2-Dibromoethane	NVA	NVA	1.23E+00	--	1.23E+00
1,2-Dichlorobenzene	NVA	NVA	2.96E+00	--	2.96E+00
1,2-Dichloroethane	NVA	NVA	2.12E+01	--	2.12E+01

Table F-31
Selection of Ecological Soil Screening Toxicity Values for SWMUs 50 and 59

Parameter	Ecological Soil Screening Levels[a] (mg/kg)	Ecological Preliminary Remediation Goals[b] (mg/kg)	Ecological Data Quality Levels[c] (mg/kg)	Other Ecological Soil Screening Levels[d] (mg/kg)	Selected Ecological Screening Toxicity Value[e] (mg/kg)
1,2-Dichloroethene (total)	NVA	NVA	7.84E-01	--	7.84E-01
1,2-Dichloropropane	NVA	NVA	3.27E+01	--	3.27E+01
1,2-Diphenylhydrazine	NVA	NVA	NVA	NVA	NVA
1,3,5-Trimethylbenzene	NVA	NVA	NVA	NVA	NVA
1,3,5-Trinitrobenzene	NVA	NVA	3.76E-01	--	3.76E-01
1,3,5-Trinitrobenzene	NVA	NVA	3.76E-01	--	3.76E-01
1,3-Dichlorobenzene	NVA	NVA	3.77E+01	--	3.77E+01
1,3-Dichloropropane	NVA	NVA	NVA	NVA	NVA
1,3-Dinitrobenzene	NVA	NVA	6.55E-01	--	6.55E-01
1,3-Dinitrobenzene	NVA	NVA	6.55E-01	--	6.55E-01
1,4-Dichlorobenzene	NVA	$20_{(earthworm)}$	5.46E-01	--	2.00E+01
1-Methylnaphthalene	NVA	NVA	3.24E+00	--	3.24E+00
2,2-Dichloropropane	NVA	NVA	NVA	NVA	NVA
2,3,7,8-Tetrachlorodibenzo-p-dioxin	NVA	3.15E-06	1.99E-07	--	3.15E-06
2,4,5-T	NVA	NVA	5.96E-01	--	5.96E-01
2,4,5-TP (Silvex)	NVA	NVA	1.09E-01	--	1.09E-01
2,4,5-Trichlorophenol	NVA	$9_{(earthworm)}$	1.41E+01	--	9.00E+00
2,4,6-Trichlorophenol	NVA	$4_{(plant)}$	9.94E+00	--	4.00E+00
2,4,6-Trinitrotoluene	NVA	NVA	NVA	6.40E+00	6.40E+00
2,4-D	NVA	NVA	2.73E-02	--	2.73E-02
2,4-DB	NVA	NVA	NVA	NVA	NVA
2,4-Dichlorophenol	NVA	NVA	8.75E+01	--	8.75E+01
2,4-Dimethylphenol	NVA	NVA	1.00E-02	--	1.00E-02
2,4-Dinitrophenol	NVA	$20_{(plant)}$	6.09E-02	--	2.00E+01
2,4-Dinitrotoluene	NVA	NVA	1.28E+00	--	1.28E+00
2,6-Dinitrotoluene	NVA	NVA	3.28E-02	--	3.28E-02
2-amino-4,6-Dinitrotoluene	NVA	NVA	NVA	2.10E+00	2.10E+00
2-Butanone	NVA	NVA	8.96E+01	--	8.96E+01
2-Chloroethyl vinyl ether	NVA	NVA	NVA	NVA	NVA
2-Chloronaphthalene	NVA	NVA	1.22E-02	--	1.22E-02
2-Chlorophenol	NVA	NVA	2.43E-01	--	2.43E-01
2-Chlorotoluene	NVA	NVA	NVA	NVA	NVA
2-Hexanone	NVA	NVA	1.26E+01	--	1.26E+01
2-Methylnaphthalene	NVA	NVA	3.24E+00	--	3.24E+00
2-Nitroaniline	NVA	NVA	7.41E+01	--	7.41E+01
2-Nitrophenol	NVA	NVA	1.60E+00	--	1.60E+00
2-Nitrotoluene	NVA	NVA	NVA	2.00E+00	2.00E+00
2-sec-butyl-4,6-dinitrophenol	NVA	NVA	2.18E-02	--	2.18E-02
3&4-Methylphenol	NVA	NVA	4.04E+01	--	4.04E+01
3,3'-Dichlorobenzidine	NVA	NVA	6.46E-01	--	6.46E-01
3-Nitroaniline	NVA	NVA	3.16E+00	--	3.16E+00
3-Nitrotoluene	NVA	NVA	NVA	2.40E+00	2.40E+00
4,4'-DDD	$0.021_{(mammal)}$	NVA	7.58E-01	--	2.10E-02
4,4'-DDE	$0.021_{(mammal)}$	NVA	5.96E-01	--	2.10E-02
4,4'-DDT	$0.021_{(mammal)}$	NVA	1.75E-02	--	2.10E-02
4,6-Dinitro-o-cresol	NVA	NVA	1.44E-01	--	1.44E-01
4-amino-2,6-Dinitrotoluene	NVA	NVA	NVA	7.30E-01	7.30E-01
4-Bromophenyl phenylether	NVA	NVA	NVA	NVA	NVA
4-Chlorophenyl phenylether	NVA	NVA	NVA	NVA	NVA
4-Methyl-2-pentanone	NVA	NVA	4.43E+02	--	4.43E+02
4-Nitroaniline	NVA	NVA	2.19E+01	--	2.19E+01

Table F-31
Selection of Ecological Soil Screening Toxicity Values for SWMUs 50 and 59

Parameter	Ecological Soil Screening Levels[a] (mg/kg)	Ecological Preliminary Remediation Goals[b] (mg/kg)	Ecological Data Quality Levels[c] (mg/kg)	Other Ecological Soil Screening Levels[d] (mg/kg)	Selected Ecological Screening Toxicity Value[e] (mg/kg)
4-Nitrophenol	NVA	$7_{(earthworm)}$	5.12E+00	--	7.00E+00
4-Nitrotoluene	NVA	NVA	NVA	4.40E+00	4.40E+00
Acenaphthene	$29_{(earthworm)}$	$20_{(plant)}$	6.82E+02	--	2.00E+01
Acenaphthylene	$29_{(earthworm)}$	NVA	6.82E+02	--	2.90E+01
Acetone	NVA	NVA	2.50E+00	--	2.50E+00
Acetonitrile	NVA	NVA	1.37E+00	--	1.37E+00
Acetophenone	NVA	NVA	3.00E+02	--	3.00E+02
Acraldehyde	NVA	NVA	5.27E+00	--	5.27E+00
Acrylonitrile	NVA	NVA	2.39E-02	--	2.39E-02
Aldrin	NVA	NVA	3.32E-03	--	3.32E-03
alpha-BHC	NVA	NVA	9.94E-02	--	9.94E-02
alpha-Chlordane	NVA	NVA	2.24E-01	--	2.24E-01
Anthracene	$29_{(earthworm)}$	NVA	1.48E+03	--	2.90E+01
Aroclor 1016	NVA	$0.371_{(mammal)}$	3.32E-04	--	3.71E-01
Aroclor 1221	NVA	$0.371_{(mammal)}$	3.32E-04	--	3.71E-01
Aroclor 1232	NVA	$0.371_{(mammal)}$	3.32E-04	--	3.71E-01
Aroclor 1242	NVA	$0.371_{(mammal)}$	3.32E-04	--	3.71E-01
Aroclor 1248	NVA	$0.371_{(mammal)}$	3.32E-04	--	3.71E-01
Aroclor 1254	NVA	$0.371_{(mammal)}$	3.32E-04	--	3.71E-01
Aroclor 1260	NVA	$0.371_{(mammal)}$	3.32E-04	--	3.71E-01
Atrazine	NVA	NVA	NVA	NVA	NVA
Benzaldehyde	NVA	NVA	NVA	NVA	NVA
Benzene	NVA	NVA	2.55E-01	--	2.55E-01
Benzidine	NVA	NVA	NVA	NVA	NVA
Benzo(a)anthracene	$1.1_{(mammal)}$	NVA	5.21E+00	--	1.10E+00
Benzo(a)pyrene	$1.1_{(mammal)}$	NVA	1.52E+00	--	1.10E+00
Benzo(b)fluoranthene	$1.1_{(mammal)}$	NVA	5.98E+01	--	1.10E+00
Benzo(g,h,i)perylene	$1.1_{(mammal)}$	NVA	1.19E+02	--	1.10E+00
Benzo(k)fluoranthene	$1.1_{(mammal)}$	NVA	1.48E+02	--	1.10E+00
Benzoic acid	NVA	NVA	NVA	1.00E+00	1.00E+00
Benzyl alcohol	NVA	NVA	6.58E+01	--	6.58E+01
beta-BHC	NVA	NVA	3.98E-03	--	3.98E-03
Biphenyl	NVA	60(plant)	NVA	--	6.00E+01
bis(2-Chloroethoxy)methane	NVA	NVA	3.02E-01	--	3.02E-01
bis(2-Chloroethyl)ether	NVA	NVA	2.37E+01	--	2.37E+01
bis(2-Chloroisopropyl)ether	NVA	NVA	1.99E+01	--	1.99E+01
bis(2-Ethylhexyl) phthalate	NVA	NVA	9.26E-01	--	9.26E-01
Bromobenzene	NVA	NVA	NVA	NVA	NVA
Bromodichloromethane	NVA	NVA	5.40E-01	--	5.40E-01
Bromomethane	NVA	NVA	2.35E-01	--	2.35E-01
Butyl benzyl phthalate	NVA	NVA	2.39E-01	--	2.39E-01
Caprolactam	NVA	NVA	NVA	NVA	NVA
Carbazole	NVA	NVA	NVA	NVA	NVA
Carbon disulfide	NVA	NVA	9.41E-02	--	9.41E-02
Carbon tetrachloride	NVA	NVA	2.98E+00	--	2.98E+00
Chlorobenzene	NVA	$40_{(earthworm)}$	1.31E+01	--	4.00E+01
Chlorobromomethane	NVA	NVA	NVA	NVA	NVA
Chloroethane	NVA	NVA	NVA	NVA	NVA
Chloroform	NVA	NVA	1.19E+00	--	1.19E+00

Table F-31
Selection of Ecological Soil Screening Toxicity Values for SWMUs 50 and 59

Parameter	Ecological Soil Screening Levels[a] (mg/kg)	Ecological Preliminary Remediation Goals[b] (mg/kg)	Ecological Data Quality Levels[c] (mg/kg)	Other Ecological Soil Screening Levels[d] (mg/kg)	Selected Ecological Screening Toxicity Value[e] (mg/kg)
Chloromethane	NVA	NVA	1.04E+01	--	1.04E+01
Chrysene	$1.1_{(mammal)}$	NVA	4.73E+00	--	1.10E+00
cis-1,2-Dichloroethene	NVA	NVA	7.84E-01	--	7.84E-01
cis-1,3-Dichloro-1-propene	NVA	NVA	3.98E-01	--	3.98E-01
Cyclohexane	NVA	NVA	NVA	NVA	NVA
Cyclonite	NVA	NVA	NVA	7.50E+00	7.50E+00
Dalapon	NVA	NVA	NVA	NVA	NVA
delta-BHC	NVA	NVA	9.94E+00	--	9.94E+00
Dibenz(a,h)anthracene	$1.1_{(mammal)}$	NVA	1.84E+01	--	1.10E+00
Dibenzofuran	NVA	NVA	NVA	6.10E+00	6.10E+00
Dibromochloromethane	NVA	NVA	2.05E+00	--	2.05E+00
Dibromomethane	NVA	NVA	NVA	NVA	NVA
Dicamba	NVA	NVA	NVA	NVA	NVA
Dichlorodifluoromethane	NVA	NVA	NVA	NVA	NVA
Dichloroprop	NVA	NVA	NVA	NVA	NVA
Dieldrin	$0.0049_{(mammal)}$	NVA	2.38E-03	--	4.90E-03
Diethyl phthalate	NVA	$100_{(plant)}$	2.48E+01	--	1.00E+02
Dimethylphthalate	NVA	NVA	7.34E+02	--	7.34E+02
Di-n-butyl phthalate	NVA	$200_{(plant)}$	1.50E-01	--	2.00E+02
Di-n-octyl phthalate	NVA	NVA	7.09E+02	--	7.09E+02
Endosulfan I	NVA	NVA	1.19E-01	--	1.19E-01
Endosulfan II	NVA	NVA	1.19E-01	--	1.19E-01
Endosulfan sulfate	NVA	NVA	3.58E-02	--	3.58E-02
Endrin	NVA	NVA	1.01E-02	--	1.01E-02
Endrin Aldehyde	NVA	NVA	1.05E-02	--	1.05E-02
Endrin ketone	NVA	NVA	NVA	NVA	NVA
Ethanol	NVA	NVA	NVA	NVA	NVA
Ethylbenzene	NVA	NVA	5.16E+00	--	5.16E+00
Fluoranthene	$1.1_{(mammal)}$	NVA	1.22E+02	--	1.10E+00
Fluorene	$29_{(earthworm)}$	NVA	1.22E+02	--	2.90E+01
Freon 113	NVA	NVA	NVA	NVA	NVA
gamma-BHC (Lindane)	NVA	NVA	5.00E-03	--	5.00E-03
gamma-Chlordane	NVA	NVA	2.24E-01	--	2.24E-01
Heptachlor	NVA	NVA	5.98E-03	--	5.98E-03
Heptachlor epoxide	NVA	NVA	1.52E-01	--	1.52E-01
Hexachlorobenzene	NVA	NVA	1.99E-01	--	1.99E-01
Hexachlorobutadiene	NVA	NVA	3.98E-02	--	3.98E-02
Hexachlorocyclopentadiene	NVA	$10_{(plant)}$	7.55E-01	--	1.00E+01
Hexachloroethane	NVA	NVA	5.96E-01	--	5.96E-01
HMX	NVA	NVA	NVA	2.70E+01	2.70E+01
Indeno(1,2,3-cd)pyrene	$1.1_{(mammal)}$	NVA	1.09E+02	--	1.10E+00
Isophorone	NVA	NVA	1.39E+02	--	1.39E+02
Isopropylbenzene	NVA	NVA	NVA	NVA	NVA
m+p-Xylenes	NVA	NVA	1.00E+01	--	1.00E+01
MCPA	NVA	NVA	NVA	NVA	NVA
MCPP	NVA	NVA	NVA	NVA	NVA
Methoxychlor	NVA	NVA	1.99E-02	--	1.99E-02
Methyl Acetate	NVA	NVA	NVA	NVA	NVA
Methyl tert-butyl ether	NVA	NVA	NVA	NVA	NVA
Methylene chloride	NVA	NVA	4.05E+00	--	4.05E+00

Table F-31
Selection of Ecological Soil Screening Toxicity Values for SWMUs 50 and 59

Parameter	Ecological Soil Screening Levels[a] (mg/kg)	Ecological Preliminary Remediation Goals[b] (mg/kg)	Ecological Data Quality Levels[c] (mg/kg)	Other Ecological Soil Screening Levels[d] (mg/kg)	Selected Ecological Screening Toxicity Value[e] (mg/kg)
Naphthalene	$29_{(earthworm)}$	NVA	9.94E-02	--	2.90E+01
n-Butylbenzene	NVA	NVA	NVA	NVA	NVA
Nitrobenzene	NVA	NVA	1.31E+00	--	1.31E+00
Nitroglycerin	NVA	NVA	NVA	7.10E+01	7.10E+01
n-Nitroso-di-n-propylamine	NVA	NVA	5.44E-01	--	5.44E-01
n-Nitrosodimethylamine	NVA	NVA	3.21E-05	--	3.21E-05
n-Nitrosodiphenylamine	NVA	NVA	5.45E-01	--	5.45E-01
n-Propylbenzene	NVA	NVA	NVA	NVA	NVA
o-Cresol	NVA	NVA	4.04E+01	--	4.04E+01
Octachlorodibenzodioxin	NVA	NVA	1.99E-07	--	1.99E-07
Octachlorodibenzofuran	NVA	NVA	3.86E-05	--	3.86E-05
o-Xylene	NVA	NVA	1.00E+01	--	1.00E+01
p-Chloroaniline	NVA	NVA	1.10E+00	--	1.10E+00
p-Chloro-m-cresol	NVA	NVA	7.95E+00	--	7.95E+00
p-Chlorotoluene	NVA	NVA	NVA	NVA	NVA
p-Cresol	NVA	NVA	1.63E+02	--	1.63E+02
p-Cymene	NVA	NVA	NVA	NVA	NVA
Pentachlorophenol	$2.1_{(bird)}$	$3_{(plant)}$	1.19E-01	--	2.10E+00
Pentaerythritol tetranitrate (PETN)	NVA	NVA	NVA	8.60E+03	8.60E+03
Phenanthrene	$29_{(earthworm)}$	NVA	4.57E+01	--	2.90E+01
Phenol	NVA	$30_{(earthworm)}$	1.20E+02	--	3.00E+01
Pyrene	$1.1_{(mammal)}$	NVA	7.85E+01	--	1.10E+00
Pyridine	NVA	NVA	1.03E+00	--	1.03E+00
sec-Butylbenzene	NVA	NVA	NVA	NVA	NVA
Styrene	NVA	$300_{(plant)}$	4.69E+00	--	3.00E+02
TCDD TE	NVA	3.15E-06	1.99E-07	--	3.15E-06
tert-Butylbenzene	NVA	NVA	NVA	NVA	NVA
Tetrachloroethene	NVA	NVA	9.92E+00	--	9.92E+00
Tetryl	NVA	NVA	NVA	9.90E-01	9.90E-01
Toluene	NVA	$200_{(plant)}$	5.45E+00	--	2.00E+02
Total HPCDD	NVA	NVA	1.99E-07		1.99E-07
Total HPCDF	NVA	NVA	3.86E-05		3.86E-05
Total HXCDD	NVA	NVA	1.99E-07		1.99E-07
Total HXCDF	NVA	NVA	3.86E-05		3.86E-05
Total PECDF	NVA	NVA	3.86E-05		3.86E-05
Total Petroleum Hydrocarbons	NVA	NVA	NVA	NVA	NVA
Toxaphene	NVA	NVA	1.19E-01	--	1.19E-01
trans-1,2-Dichloroethene	NVA	NVA	7.84E-01	--	7.84E-01
trans-1,3-Dichloropropene	NVA	NVA	3.98E-01	--	3.98E-01
Tribromomethane	NVA	NVA	1.59E+01	--	1.59E+01
Trichloroethene	NVA	NVA	1.24E+01	--	1.24E+01
Trichlorofluoromethane	NVA	NVA	1.64E+01	--	1.64E+01
Trichloromethane	NVA	NVA	1.19E+00	--	1.19E+00
Vinyl Acetate	NVA	NVA	1.27E+01	--	1.27E+01
Vinyl Chloride	NVA	NVA	6.46E-01	--	6.46E-01
Xylenes (total)	NVA	NVA	1.00E+01	--	1.00E+01

a USEPA (2009), Ecological Soil Screening Level Guidance. Available on-line: http://www.epa.gov/ecotox/ecossl/

b Preliminary Remediation Goals for Ecological Endpoints, R. A. Efroymson, et. al., August 1997.

c Ecological Data Quality Levels, U.S.EPA Region 5, October 1999.

Table F-31
Selection of Ecological Soil Screening Toxicity Values for SWMUs 50 and 59

Parameter	Ecological Soil Screening Levels[a] (mg/kg)	Ecological Preliminary Remediation Goals[b] (mg/kg)	Ecological Data Quality Levels[c] (mg/kg)	Other Ecological Soil Screening Levels[d] (mg/kg)	Selected Ecological Screening Toxicity Value[e] (mg/kg)

d LANL (2005). Ecorisk Database Release 2.2, Los Alamos National Laboratory, September.

e The following hierarchy was utilized to select the final Ecological Screening Toxicity Values for this assessment:

1. The lower value of either the Ecological Soil Screening Level Guidance or the Preliminary Remediation Goals for Ecological Endpoints.
2. Ecological Data Quality Levels, U.S.EPA Region 5
3. If no other value is available, the selected ESL is from LANL, 2005.

NVA = No Value Available