Red Water Pond Areas
Baseline Ecological Risk Assessment

Former Plum Brook Ordnance Works
Sandusky, Ohio

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Table of Contents

Page

List of Tables iii
List of Figures v
Acronyms vi
Executive Summary ES-1
1.0 Introduction 1-1
1.1 Scope of Work and Project Objectives 1-1
1.2 Site History and Potential for Contamination 1-2
1.3 Summary of Previous Environmental Studies 1-2
1.3.1 West Area Red Water Ponds 1-2
1.3.2 Pentolite Road Red Water Ponds 1-5
1.4 Summary of Existing Site Conditions 1-6
2.0 SLERA and Problem Formulation 2-1
2.1 SLERA Results 2-1
2.2 Problem Formulation 2-3
2.2.1 Assessment Endpoints 2-4
2.2.2 Conceptual Model and Exposure Pathways 2-5
2.2.3 Risk Questions and Hypotheses 2-6
3.0 BERA Study Design and DQO Process 3-1
4.0 Verification of Field Sampling Design 4-1
5.0 Site Investigation and Data Analysis 5-1
5.1 Collection and Discussion of Analytical Data 5-1
5.1.1 Abiotic Media 5-1
5.1.1.1 Soil Sampling for Earthworm COPEC Uptake Estimates 5-2
5.1.1.2 Surface Water Sampling for COPEC Surface Water Toxicity 5-3
5.1.1.3 Sediment Sampling for COPEC Uptake Estimates 5-3
5.1.1.4 Sediment Sampling for COPEC Sediment Toxicity 5-4
5.1.1.5 Background Sampling 5-5
5.1.2 Biotic Media 5-6
5.1.2.1 Fish and Aquatic Organism Sampling for COPEC Uptake Estimates Based on Tissue 5-6
5.1.2.2 Soil Sampling for Earthworm COPEC Uptake Estimates 5-7

Table of Contents (continued)

Page

5.1.2.3 Sediment Sampling for Aquatic Worm COPEC Uptake Estimates 5-7

5.2 Discussion of Toxicity Data 5-8

5.2.1 Surface Water 5-8

5.2.2 Sediment 5-9

5.2.3 Soil 5-10

6.0 Risk Characterization 6-1

6.1 Refined Selection of COPECs 6-1

6.2 Refined Food Chain Model 6-1

6.2.1 Exposure Characterization 6-2

6.2.2 Ecological Effects Characterization 6-3

6.2.3 Estimated Ecological Hazards 6-4

6.3 Toxicity Testing Findings 6-5

6.3.1 Surface Water Toxicity Correlations 6-5

6.3.2 Sediment Toxicity Correlations 6-6

6.3.3 Soil Toxicity Correlations 6-7

6.4 Weight of Evidence 6-8

6.5 Additional Risk Information. 6-10

6.6 Uncertainty Analysis 6-11

7.0 Conclusions 7-1

8.0 References 8-1

Appendix A - Field Verification Memorandum

Appendix B - Sample Collection Logs and Survey Data

Appendix C-1 - Chemical Analytical Data

Appendix C-2 - Data Validation Summary

Appendix D - Background Statistics Details

Appendix E - Results of Toxicity Testing on Surface Water, Soil, and Sediment

Appendix F - Site-Specific Bioaccumulation Factor Calculation Details

Appendix G - Application of Essential Nutrients in Ecological Risk Assessment

Appendix H - Risk Characterization Spreadsheets

List of Tables

Table	Title	Follows Tab
3-1	Measurement and Assessment Endpoints	
5-1	West Area Ecological Samples	
5-2	Pentolite Road Ecological Samples	
5-3	Summary of Analytical Methods for Soil, Sediment, and Tissue Samples	
5-4	Summary of Detected Constituents - Pentolite Road RWP Abiotic Samples	
5-5	Summary of Detected Constituents - West Area RWP Abiotic Samples	
5-6	Summary of Statistical Tests Comparing Background and Site Data	
5-7	Aquatic Organism Data – Field Counts, Lengths, and Weights	
5-8	Summary of Detected Constituents - Pentolite Road RWP Biotic Samples	
5-9	Summary of Detected Constituents - West Area RWP Biotic Samples	
6-1	Refined Selection of COPECs at West Area – Surface Soil	
6-2	Refined Selection of COPECs at West Area – Total Soil	
6-3	Refined Selection of COPECs at West Area – Surface Water	
6-4	Refined Selection of COPECs at West Area – Sediment	
6-5	Refined Selection of COPECs at Pentolite Road – Surface Soil	
6-6	Refined Selection of COPECs at Pentolite Road – Total Soil	
6-7	Refined Selection of COPECs at Pentolite Road – Surface Water	
6-8	Refined Selection of COPECs at Pentolite Road – Sediment	
6-9	Summary of Site-Specific BCFs for Inorganics in Aquatic Worms and Fish – West Area RWP	
6-10	Summary of Site-Specific BCFs for PAHs and Nitroaromatics in Earth Worms – Red Water Ponds	
6-11	Summary of Site-Specific BCFs for Inorganics in Aquatic Organisms, Multiple Species Results, Central Tendency Approach – Pentolite Road	
6-12	Summary of Site-Specific BCFs for Inorganics in Aquatic Organisms, Multiple Species Results, Reasonable Maximum Exposure Approach – Pentolite Road	
6-13	Reference Toxicity Values Used to Derive Wildlife Toxicity Benchmarks for COPECs	
6-14	Uncertainty Factors for Ecological RTV Extrapolations	
6-15	Terrestrial Receptors Hazard Index Summary for West Area – Central Tendency and Reasonable Maximum Exposure	
6-16	Aquatic Receptors Hazard Index Summary for West Area – Central Tendency and Reasonable Maximum Exposure	

List of Tables (Continued)

Table	*Title*	*Follows Tab*
6-17	Terrestrial Receptors Hazard Index Summary for Pentolite Road – Central Tendency and Reasonable Maximum Exposure	
6-18	Surface Water Toxicity and Surface Water Concentration Correlation Results	
6-19	Sediment Toxicity and Sediment Concentration Correlation Results	
6-20	Soil Toxicity and Soil Concentration Correlation Results	
6-21	Uncertainty Analysis	

List of Figures

Figure	Title	Follows Tab
1-1	Vicinity Map	
1-2	Locations of Areas of Concern	
2-1	Simplified Terrestrial Conceptual Site Model Diagram (CSM)	
2-2	Simplified Aquatic Conceptual Site Model Diagram (CSM)	
5-1	Pentolite Road Red Water Ponds Surface Soil Sample Locations	
5-2	West Area Red Water Ponds Sample Surface Soil Locations	
5-3	Pentolite Road Red Water Ponds Surface Water Sample Locations	
5-4	West Area Red Water Ponds Surface Water Sample Locations	
5-5	Pentolite Road Red Water Ponds Sediment Sample Locations	
5-6	West Area Red Water Ponds Sediment Sample Locations	
5-7	Pentolite Road Red Water Ponds Fish, Crayfish, and Tadpole Sample Locations	
5-8	West Area Red Water Ponds Fish Sample Locations	
6-1	Minnow Survival and Al, As, Ba, Ca Surface Water Concentrations	
6-2	Minnow Survival and Cr, Co, Cu, Fe Surface Water Concentrations	
6-3	Minnow Survival and Pb, Mg, Mn, Ni Surface Water Concentrations	
6-4	Minnow Survival and P, K, Na, Zn Surface Water Concentrations	
6-5	Water Flea Reproduction and Al, As, Ba, Ca Surface Water Concentrations	
6-6	Water Flea Reproduction and Cr, Co, Cu, Fe Surface Water Concentrations	
6-7	Water Flea Reproduction and Pb, Mg, Mn, Ni Surface Water Concentrations	
6-8	Water Flea Reproduction and P, K, Na, Zn Surface Water Concentrations	
6-9	Amphipod Survival and Al, Sb, As, Ba Sediment Concentrations	
6-10	Amphipod Survival and Calcium Sediment Concentrations	
6-11	Amphipod Survival and Cr, Co, Cu, Fe Sediment Concentrations	
6-12	Amphipod Survival and Pb, Mg, Mn, Ni Sediment Concentrations	
6-13	Amphipod Survival and P, K, Na, Zn Sediment Concentrations	
6-14	Earthworm Survival and Anthracene, B(a)P, B(b)F Soil Concentrations	
6-15	Earthworm Survival and B(ghi)P, B(k)F, Chrysene Soil Concentrations	
6-16	Earthworm Survival and D(ah)A, Fluoranthene, I(1,2,3cd)P Soil Concentrations	

List of Acronyms

BCF	biological concentration factor
BERA	baseline ecological risk assessment
bgs	below ground surface
BNA	base neutral/acid extractable compounds
BTEX	benzene, toluene, ethyl benzene, and xylene
COPEC	constituents of potential ecological concern
CT	central tendency
D&M	Dames & Moore
DERP	Defense Environmental Restoration Program
DNB	dinitrobenzene
DNT	dinitrotoluene
DOD	Department of Defense
DQO	data quality objectives
EA	EA Engineering, Science, and Technology, Inc.
EPA	U.S. Environmental Protection Agency
ERA	ecological risk assessment
ERAGS	Ecological Risk Assessment Guidance for Superfund
FUDS	former used defense sites
GRC	John Glenn Research Center
GSA	General Services Administration
GWI	groundwater investigation
HI	hazard index
HQ	hazard quotient
IT	IT Corporation
LOAEL	lowest observed adverse effect level
µg/kg	micrograms per kilogram
µg/L	micrograms per liter
mg/kg	milligrams per kilogram
MK	Morrison-Knudson Corporation
msl	mean sea level
NASA	National Aeronautics and Space Administration
NOAEL	no observed adverse effect level
OEPA	Ohio Environmental Protection Agency
PAH	polycyclic aromatic hydrocarbon

List of Acronyms (Continued)

PBOW	Plum Brook Ordnance Works
PBS	Plum Brook Station
PCB	polychlorinated biphenyls
ppb	parts per billion
ppm	parts per million
PRRWP	Pentolite Road Red Water Pond
QA/QC	quality assurance/quality control
QAPP	quality assurance project plan
RME	reasonable maximum exposure
RTV	reference toxicity value
RWP	Red Water Ponds
SAP	sampling and analysis plan
SAIC	Science Applications International Corporation
SLERA	screening-level ecological risk assessment
SMDP	scientific management decision point
SOW	statement of work
SRT	Standard Reference Toxicant
STL	Severn Trent Laboratory
SVOC	semivolatile organic compounds
TNB	1,3,5-triniotrobenzene
TNT	trinitrotoluene
UCL	upper confidence limit
USACE	U.S. Army Corps of Engineers
VOC	volatile organic compounds
WARWP	West Area Red Water Pond

Executive Summary

This report presents an assessment of potential ecological hazards related to Department of Defense (DOD) activities at the former Plum Brook Ordnance Works (PBOW) located near Sandusky, Ohio. The objective of this Baseline Ecological Risk Assessment (BERA) is to produce a supplement to the Phase I Screening-Level Ecological Risk Assessment (SLERA), prepared by IT Corporation (IT) in 2000, to provide additional site-specific information to risk managers to allow them to decide if revised estimated ecological hazards to potentially exposed receptors are acceptable.

The PBOW was operated from 1941 to 1945 as a manufacturing plant for trinitrotoluene (TNT), dinitrotoluene (DNT), and pentolite. Some of the areas used by the DOD were decontaminated in the 1950s and 1960s in accordance with DOD standards at that time; other areas have been decommissioned, but not decontaminated. The site is currently owned by the National Aeronautics and Space Administration (NASA) and is operated as the Plum Brook Station (PBS) of the John Glenn Research Center at Lewis Field (GRC). The NASA GRC is located in Cleveland, Ohio.

Two sites within the Red Water Ponds (RWP) areas of PBOW are the focus of this BERA: the West Area Red Water Pond (WARWP) and the Pentolite Road Red Water Pond (PRRWP).

Following the Ohio Environmental Protection Agency (OEPA) approved work plan, prepared by IT in 2000, sampling activities for soil, surface water, sediment, and fish and aquatic organism tissue occurred in September 2000. Samples were analyzed for critical chemical analytical parameters (identified in the SLERA), as well as used to perform bioaccumulation studies and toxicity studies. Chemical and biological toxicity results were used to prepare the BERA. Major components of the BERA are (1) refined food chain models for terrestrial and aquatic receptors that use site-specific biological concentration factors (BCF) and other site-specific factors; and (2) a detailed evaluation and discussion of aquatic and terrestrial toxicity test results.

Two different approaches are used for the refined food chain model in order to provide risk managers with a risk range to aid in decision making. The two approaches include a reasonable maximum exposure (RME) scenario and a central tendency (CT) exposure scenario. The RME scenario estimates the upper-end of the risk range by using 95 percent upper confidence limit (UCL) exposure point concentrations, site-specific BCFs calculated in a conservative fashion to overestimate uptake, no observed adverse effect level (NOAEL) toxicity values, and

conservative intraclass toxicity extrapolation factors. The CT exposure scenario estimates a more realistic (less conservative) risk value by using arithmetic mean exposure point concentrations, site-specific BCFs calculated using a more realistic (less conservative) approach, lowest observed adverse effect level (LOAEL) toxicity values, and an intraclass toxicity extrapolation factor of one.

Results of the refined food chain models suggest that ecological hazards for the receptors estimated using the more realistic CT approach are all considerably less than 1, U.S. Environmental Protection Agency (EPA) hazard threshold of concern. Hazard indices were found to range from 0.002 up to 0.4 for both the great blue heron and raccoon. Hazards estimated using the more conservative RME food chain model approach are above 1 for several receptors, with the highest hazard indices (26 for the great blue heron and 21 for the raccoon) due primarily to elevated concentrations of iron in WARWP sediment. Due to the highly conservative approach used in the RME food chain model, it is very unlikely that these elevated hazards would be expected to result in actual adverse effects in the real world.

Results of the site-specific toxicity testing demonstrated some biologically significant toxicity in a few of the surface water, sediment, and soil samples, summarized as follows:

- 10 percent of the surface water samples showed significant minnow toxicity
- 10 percent of the surface water samples showed significant water flea toxicity
- None of the sediment samples showed significant amphipod crustacean toxicity
- 17 percent of the soil samples showed significant earthworm toxicity.

Potential causes of the measured surface water toxicity, based on the available data evaluating using correlation statistics and graphical evaluations, could not be reliably determined. For sediment, elevated arsenic levels, and perhaps iron, were implicated as a potential cause of reduced survival, using correlation results and a graphical evaluation, however, the reduced survival measured was not biologically significant. The potential cause of the measured soil toxicity was convincingly shown to be related to soil polycyclic aromatic hydrocarbon (PAH) concentrations.

It is important to note that the toxicity measured in the site media samples is generally relatively minor, compared with the laboratory controls. Survival or reproduction was reduced by not more than 25 to 30 percent, compared with the laboratory controls. It should also be noted that OEPA uses a significant difference of 20 percent as a level of importance.

It is possible that these relatively minor reductions in survival and reproduction may have insignificant adverse effects at the population or community levels of biological organization.

A weight of evidence summary was based on the two lines of evidence presented in this BERA – namely the refined food chain model and the site surface water, sediment, and soil toxicity studies. It is important to note that the results of the refined food chain model, using the more realistic CT approach, demonstrated no adverse effects. The weight of evidence summary findings are:

- Elevated PAH concentrations in WARWP soils are an ecological concern due to: (1) measured earthworm toxicity; and (2) predicted RME food-chain impacts to the shrew via biological uptake by prey items such as earthworms.

- Elevated iron concentrations in WARWP sediments are also an ecological concern due to the observation that: (1) concentrations were determined to be potentially deleterious to herons and raccoons using the RME food chain model; and (2) the iron concentration used in the RME food chain model is similar to an iron sediment concentration that is associated with reduced survival of sediment amphipods. It should be noted that the amphipod reduced survival that was measured may be due to other sediment factors, as overall iron concentrations were not significantly correlated with sediment toxicity.

- Environmental media at PRRWP do not appear to pose significant unacceptable risks to ecological receptors.

It is important to note that the extent of elevated PAH concentrations in WARWP soil, and the extent of elevated iron concentrations in WARWP sediments appear to be very localized. In addition, the PAH hot spot location is situated in a grassy area commonly used for vehicular access to the WARWP area, and by site visitors and drillers, and is not known to be a historical industrial process location.

In light of current site activities (burning for habitat management), CT hazard index outcomes, biological toxicity text results, and uncertainty analysis discussions, remedial activity based on the results of the BERA is not recommended at this time.

1.0 Introduction

The U.S. Army is conducting studies of the environmental impact of suspected hazardous waste sites at properties previously owned by the U.S. Department of Defense (DOD). The U.S. Army Corps of Engineers (USACE) is pursuing this work under the Defense Environmental Restoration Program (DERP) for formerly used defense sites (FUDS). The former Plum Brook Ordnance Works (PBOW) located in the city of Sandusky, Erie County, Ohio is a DERP FUDS project and is being managed and technically overseen by the Nashville and Huntington Districts of USACE. Figure 1-1 shows the geographic location of the former PBOW site. IT Corporation (IT) performed a baseline ecological risk assessment (BERA) of soil, surface water and sediment at two Red Water Pond (RWP) Areas (the West Area Red Water Ponds [WARWP] and the Pentolite Road Red Water Ponds [PRWWP]). This work was performed under Delivery Order 002 of Contract Number DACA62-00-D-002.

It should be noted that intermediate numerical values presented in some tables or text of this report may temporarily overstate the accuracy of the values, as three or more significant figures may be presented. However, final BERA hazard estimates are generally limited to only one or two significant figures, in order to present final numerical results with the appropriate number of significant figures.

1.1 Scope of Work and Project Objectives

As specified in the scope of work (SOW) (USACE, 2000), the BERA activities included preparation of site-specific work plans, soil, surface water, sediment sampling and biological sampling, evaluation of analytical results from samples collected during the field investigation, preparation and submittal of the BERA report characterizing activities, conclusions, and recommendations for further actions. Figure 1-2 identifies both areas investigated in relation to other site features.

The two RWP areas of PBOW are the focus of this BERA: the WARWP and the PRRWP. It should be noted that although the 8-step process presented in the Ecological Risk Assessment Guidance for Superfund (ERAGS) (U.S. Environmental Protection Agency [EPA, 1997]) is generally followed in this BERA, ERAGS was not the primary guidance document used for the preparation of the screening-level ecological risk assessment (SLERA); therefore, there are some differences between ERAGS and the SLERA. The SLERA was based primarily on the Tri-Service Procedural Guidelines for Ecological Risk Assessments (Wentsel, et al., 1996).

1.2 Site History and Potential for Contamination

The 9,009-acre PBOW site was built in early 1941 as a manufacturing plant for 2,4,6-trinitrotoluene (TNT), dinitrotoluene (DNT), and pentolite. Production of explosives began on December 16, 1941 and continued until 1945. It is estimated that more than 1 billion pounds of explosives were manufactured during the 4-year operating period.

After plant operations ceased in 1945, decontamination of TNT, acid, pentolite, and DNT processing lines began; decontamination of the lines was completed during the last quarter of 1945. The property was initially transferred to the Ordnance Department, then to the War Assets Administration after it was certified decontaminated by the U.S. Army. In 1949, PBOW was transferred to the General Services Administration (GSA).

The National Aeronautics and Space Administration (NASA) acquired PBOW on March 15, 1963 and is presently utilizing the site. On April 18, 1978, NASA declared approximately 2,152 acres of land as excess. The Perkins Township Board of Education acquired 46 acres of the excess and uses this area as a bus transportation center. GSA retains the remaining acreage and currently has a use agreement with the Ohio National Guard for 604 acres of the land. NASA presently controls approximately 6,400 acres and is using the site to conduct space research as a satellite operation of NASA's John Glenn Research Center (GRC) at Lewis Field. The NASA GRC is located in Cleveland, Ohio. The details of these land transactions are listed in the site management plan and can be found at the NASA Plum Brook Station (PBS).

Potential contaminants in the groundwater at PBOW, based on review of historical use of the site and findings of previous investigations, may include nitroaromatic compounds (explosive residuals), volatile organic compounds (VOC), semivolatile organic compounds (SVOC), pesticides/polychlorinated biphenyls (PCB), cyanide, and dissolved metals.

1.3 Summary of Previous Environmental Studies

The following sections summarize results from previous investigations at the two RWP Areas. Identified sample locations may be referenced on figures in Chapter 2.0 of the ***Risk Assessment and Direct-Push Investigation of the Red Water Ponds*** (IT, 2000a).

1.3.1 West Area Red Water Ponds

In 1984, Battelle Laboratories collected a surface soil sample from the spoils area at the WARWP area. Concentrations of nitroaromatics were detected in the low-parts per million

(ppm) range using a now obsolete analytical method (International Consultants Incorporated [ICI], 1995).

Prior to 1985, a number of studies were conducted on the surface water and sediment from the RWP Areas. In the western pond at the WARWP area, 34 bottom sediment samples were collected in a grid pattern by Ohio National Guard environmental health personnel and screened for TNT and DNT derivatives. The highest values of TNT and DNT found in the sediment were less than 1 ppm. In 1989, IT conducted an investigation to confirm or deny the presence of residual chemical contamination from PBOW operations. Six surface soil samples were collected from 0 to 2 feet below ground surface (bgs) from borings IT-MW02, IT-SB07, IT-SB09, IT-SB10, IT-SB11, and IT-SB12 located at the WARWP area. No VOCs or SVOCs were detected. Four nitroaromatic compounds (1,3-dinitrobenzene [DNB], 1,3,5-trinitrobenzene [TNB], 2,4-DNT, and 2,4,6-TNT) were detected, with the highest concentrations (greater than 600 micrograms per kilogram [µg/kg]) detected at IT-SB12. Manganese was also detected at a concentration exceeding that of the background sample. Monitoring well IT-MW02 was installed downgradient from the WARWP area. A groundwater sample was collected for analysis of VOCs, SVOCs, nitroaromatic compounds, nitrates, sulfates, pH, and metals. Analytical results indicated concentrations of some VOCs and SVOCs were detected in the low (less than 20 micrograms per liter [µg/L]) parts per billion (ppb) range. Nitroaromatics (up to 160 µg/L), chromium (0.12 µg/L), manganese (3.0 µg/L), and sulfate (950 µg/L) were also detected.

In 1991, Science Applications International Corporation (SAIC) conducted a preliminary assessment to evaluate past waste management and hazardous material handling processes. Based on this assessment, SAIC determined that hazardous substances had been released to the environment at the WARWP area.

In 1993, a site inspection was conducted by Morrison-Knudsen Ferguson Corporation (MK) to assess the threat posed by the site on human health and the environment, and to determine the need for additional investigations. MK analyzed sediment and surface water from Pipe Creek near the WARWP area for VOCs, SVOCs, and nitroaromatics. The surface water had no detectable contaminants, but the sediment had a few VOCs and SVOCs in the low-ppb range. No nitroaromatics were detected (ICI, 1995). Four monitoring wells (MK-MW09, MK-MW10, MK-MW11, and MK-MW12) were installed in the vicinity of the WARWP area (MK, 1994). Groundwater was collected from the four new wells and IT-MW02 for analyses of VOCs, SVOCs, nitroaromatic compounds, nitrates, sulfates, and metals. VOCs, SVOCs, and nitroaromatics were not detected in any groundwater samples (ICI, 1995).

In 1994, Dames & Moore, Inc. (D&M) conducted an investigation to evaluate groundwater occurrence and flow conditions in the overburden and bedrock water-bearing zones; assess groundwater quality in the overburden water-bearing zone; and investigate the baseline groundwater quality of the bedrock water-bearing zone to evaluate the necessity of additional work at PBOW (D&M, 1997). Two bedrock wells (BED-MW14 and BED-MW19) and two overburden wells (WA-MW01 and WA-MW02) were installed in the vicinity of the WARWP area. Hydrogeologic data indicated that groundwater flow in the overburden exhibited a strong downward vertical component and the presence of groundwater was strongly seasonally dependent. The general groundwater flow in both water-bearing zones was determined to be to the north toward Lake Erie. Groundwater samples were analyzed for VOCs, base neutral/acid extractable compounds (BNA), nitroaromatics, and metals. Significant concentrations of nitroaromatics were determined to be present adjacent to the ponds in both the overburden and the bedrock aquifers. VOCs and BNAs were also present in the bedrock wells. Some metals (antimony, manganese, and nickel) were also detected at concentrations exceeding their maximum contaminant levels (D&M, 1997).

In 1996, IT conducted a groundwater investigation (GWI) focusing on the western portion of the facility; the investigation consisted of installing three overburden monitoring wells, redeveloping existing monitoring wells, and collecting groundwater samples for laboratory analysis. In addition, one monitoring well (IT-MW10) and one temporary piezometer (IT-MW07) were installed in the vicinity of the RWP Area. It was determined that the overburden material had been impacted by nitroaromatic compounds in the central portion of the WARWP area and that inorganic compounds were present at concentrations exceeding the risk-based screening concentrations throughout the area (IT, 1997). It was recommended that further evaluation of the metals in the groundwater be performed to determine whether they were derived from an on-site source of contamination or were related to background conditions. IT determined that the bedrock water-bearing zone had detectable concentrations of nitroaromatics and other organic compounds north of the WARWP area, but based on analyses, the water from the bedrock aquifer did not have detectable concentrations and would not cause any detrimental effects to exposed individuals for these constituents in the central portion of the area. Inorganic compounds were also present north of this area. It is concluded that further evaluation would be needed to determine the nature and extent of contamination in these areas, after background levels are established for metals in groundwater.

During a November 1997 groundwater sampling event, IT discovered that two of the overburden wells at the WARWP area (IT-MW02 and WA-MW02) and one bedrock well (PB-BED-MW14)

had red-colored water, suggesting the presence of nitroaromatics. The latest (May, 1998) analytical results for these wells indicate elevated concentrations of nitroaromatics. The analytical results of these samples were documented in a separate report (IT, 1999).

In June and November 1998, IT performed a direct-push investigation and risk assessment for soil, groundwater, surface water and sediment at the WARWP. Human health risk from potential chemical carcinogens at both the WARWP and the PRRWP are either at or below Ohio Environmental Protection Agency (OEPA) acceptable limits, for the residential, groundskeeper, and construction worker exposure scenarios. Similarly, human health risk from potential noncarcinogenic chemical hazards at both these sites are below the OEPA acceptable limit. The following recommendation was made as a result of the findings of the human health risk assessment:

- Following completion of bedrock water quality characterization at the two RWP Areas, human health risk from the bedrock groundwater should be evaluated at the two sites.

Recommendations of the ecological risk assessment (ERA) are summarized in Section 2.1 of the current document.

1.3.2 Pentolite Road Red Water Ponds

In 1989, IT conducted an evaluation to determine whether residual chemical contamination was present (IT, 1991). A shallow monitoring well (IT-MW05) was installed on the northern edge of the RWPs, in the suspected downgradient direction. Soil borings IT-SB13 through IT-SB18 were also drilled, and soil samples were collected. 2,4-DNT and 2,6-DNT were detected in the soil at concentrations of at least 0.740 ppm and sodium concentrations in samples from six of the borings exhibited concentrations significantly above the measured background levels (ICI, 1995).

A site inspection was conducted by MK from June through July 1993 to assess the threat posed to human health and the environment and to determine the need for any additional investigation. MK collected and analyzed surface and sediment samples from a drainage ditch along Pentolite Road north of the PRRWP area. Samples were analyzed for VOCs, SVOCs, and nitroaromatic compounds. No samples from the Pentolite Road ditch showed detectable levels of contaminants (MK, 1994).

From May to June of 1994, D&M conducted a GWI to evaluate groundwater conditions in several areas at PBOW. The SOW included an assessment of groundwater quality in the

overburden and bedrock water-bearing zones at the PRRWP area. Overburden monitoring wells PR-MW7, PR-MW8, and PR-MW9 and bedrock monitoring wells BED-15 and BED-16 were installed. The investigation found that the groundwater flow in the overburden exhibited a strong downward vertical component, and the presence of groundwater in the overburden was seasonally dependent. Groundwater sample results indicated that nitroaromatics were present in the overburden water-bearing zone, while lower levels of nitroaromatics were present in the bedrock water-bearing zone (D&M, 1997).

From the sitewide GWI performed by IT in September through October of 1996, it was determined that the overburden water-bearing zone in the PRRWP area had detectable concentrations of nitroaromatic compounds. The bedrock water-bearing zone was also determined to have detectable concentrations of benzene, toluene, ethyl benzene, and total xylenes (BTEX), SVOCs, and nitroaromatic compounds (IT, 1997).

During the November 1997 groundwater sampling event, IT discovered that three of the overburden wells at the PRRWP area (PR-MW07, PR-MW08, and PR-MW09) had red-colored water, suggesting the presence of nitroaromatics. The analytical results from the latest samples (May, 1998) exhibited elevated concentrations of nitroaromatic compounds. The analytical results of these samples are reported in a separate report (IT, 1999) addressing the GWI.

In June and November 1998, IT performed a direct push investigation and risk assessment for soil, groundwater, surface water and sediment at the WARWP. Human health risk from potential chemical carcinogens at both the WARWP and the PRRWP are either at or below OEPA acceptable limits, for the residential, groundskeeper, and construction worker exposure scenarios. Similarly, human health risk from potential noncarcinogenic chemical hazards at both these sites are below the OEPA acceptable limit. The following recommendation was made as a result of the findings of the human health risk assessment:

- Following completion of bedrock water quality characterization at the two RWP Areas, human health risk from the bedrock groundwater should be evaluated at the two sites.

Recommendations of the ERA are summarized in Section 2.1 of the current document.

1.4 Summary of Existing Site Conditions

The former PBOW site is currently owned by the NASA and is operated as the PBS of the NASA GRC in Cleveland, Ohio. Most of the aerospace testing facilities built in the 1960s at the site are on standby or inactive status. The site is located approximately 4 miles south of

Sandusky, Ohio and is specifically located in the Perkins, Oxford, Huron, and Milan Townships. The site is bounded on the north by Bogart Road, on the south by Mason Road, on the west by County Road 43, and on the east by U.S. Highway 250. The areas surrounding PBOW is mostly agricultural and residential.

The topography of PBOW site is characterized by a fairly flat ground surface that slopes gradually northward toward Lake Erie at an average gradient of less than 2 percent. Elevations at the site range from 675 feet above mean sea level (msl) along the southeast edge of the site to about 625 feet msl in the northern portion of the installation at Bogart Road. Eleven streams exist within the site and flow toward Lake Erie. Plum Brook, Ransom Brook, and Pipe Creek are the three major streams and are being monitored by NASA PBS. Both Plum Brook and Ransom Brook, as well as some of the other streams within the site are ephemeral, intermittent, or seasonal. The climate in north central Ohio is a typical continental climate showing significant influence by Lake Erie. Mean annual precipitation is 33.90 inches. The average monthly precipitation is approximately 1.65 inches for February and 3.70 inches for the month of July.

Devonian and Silurian carbonate and clastic rocks, generally dipping to the southeast, characterize bedrock geology at PBOW. The thickness of glacial till or lacustrine deposits range from approximately 5 feet or less for most of the site to approximately 20 feet in the northern border of the site. In many locations, bedrock is exposed on the ground surface. According to the PBOW preliminary assessment (SAIC, 1991) some karst features are present in the carbonate rocks forming the water-bearing formation underneath the soil cover.

2.0 SLERA and Problem Formulation

This chapter presents the results of the SLERA and a problem formulation.

2.1 SLERA Results

In the SLERA (IT, 2000a), ecological hazards were estimated using both historical and 1999 analytical data collected from both RWP areas at the PBOW. Results of the SLERA are briefly discussed in the following paragraphs.

A variety of habitats exist at the RWP, summarized in Section 6.2.1 of the SLERA (IT, 2000a). Habitat pictures, presented in Figures 6-1 through 6-8 of the SLERA, represent typical site conditions in mid-June 1998).

Potential impacts to terrestrial plants were evaluated by comparing source term concentrations of constituents of potential ecological concern (COPEC) calculated for soil at the RWP areas with available benchmark concentrations. None of the available benchmark concentration values were exceeded by source term concentrations at either area. It should be noted that a previous review comment on the SLERA requested additional information on this topic, as some bare soil areas were noted during the site reconnaissance performed in June 1998. The small bare soil area photographed at the WARWP was located near historic sample location DP-23, which was one of the samples used to assess soil geotechnical conditions at the site. This location is adjacent to historic sample location DP-13 and the current BERA soil Sample No. AD0001. As will be discussed later in this report, concentrations of polycyclic aromatic hydrocarbon (PAH) were elevated in Sample No. AD0001. Additional bare soil areas were noted at the PRRWP site during the 1998 reconnaissance, and photographs are presented in the SLERA (IT, 2000a). Based on a review of organic chemical concentrations detected in surface soils (Figure 4-4 of IT, 2000a), a few organic were found to have elevated concentrations (e.g., 4-amino-2,6-dinitrotoluene was found up to 2.7 milligrams per kilogram (mg/kg) at sample location DP-11). Based on this information, bare soils at PRRWP cannot be attributed to COPEC concentrations. As noted in the SLERA, a possible explanation of the bare areas includes heavy deer activity, because many of the bare soil areas were completely covered with deer tracks.

Potential impacts to aquatic biota were evaluated by comparing surface water and sediment COPEC concentrations at the RWP areas with available benchmarks for the protection of aquatic life. Concentrations of aluminum, iron, lead, manganese, and vanadium measured in surface water at the WARWP exceeded acceptable benchmarks to protect aquatic biota. The COPEC

concentration data for sediments at the WARWP exceeded toxicity benchmarks for arsenic, copper, and iron designed to protect aquatic biota. Surface water COPEC concentrations of aluminum, iron, and manganese at the PRRWP also exceeded some of the benchmark concentrations.

Potential risks to terrestrial and aquatic wildlife at the RWPs were evaluated by calculating hazard quotients (HQ) for all COPECs and exposure pathways for each receptor of concern. The HQs were then summed to obtain a hazard index (HI). The summed HQ calculated for each receptor was compared with DOD guidelines (Wentsel, et al., 1996). According to these guidelines, the higher the HQ the greater the potential risk posed by site related contaminants. If the HQ was less than 1, then there is no probable risk. If the HQ was between 1 and 10 then there is a very low potential for ecological effects. If the HQ was between 10 and 100, then significant potential for ecological effects exists. If the HQ was above 100, then very significant potential for ecological effects is present due to site contamination. It should be noted that the OEPA believes any HQs greater than 1 are a potential concern.

For the WARWP, summed HQs for terrestrial receptors (rounded to two significant figures) were 28 for the deer mouse; 9.1 for the cottontail rabbit; 96 for the shrew; 450 for the marsh wren; 38 for the raccoon; 8.3 for the white-tailed deer; and 0.0062 for the red-tailed hawk. Summed HQs for aquatic receptors were 720 for the great blue heron and 670 for the raccoon. Since the raccoon is exposed to both terrestrial and aquatic media, summed HQs were presented for both environments.

For the PRRWP, summed HQs for terrestrial receptors (rounded to two significant figures) were 4.1 for the deer mouse; 2.7 for the cottontail rabbit; 15 for the shrew; 410 for the marsh wren; 6.1 for the raccoon; 1.8 for the white- tailed deer; and 0.0018 for the red-tailed hawk. Summed HQs for aquatic receptors were 130 for the great blue heron and 38 for the raccoon. Again, since the raccoon is exposed to both terrestrial and aquatic media, summed HQs were presented for both environments.

Hazard drivers (i.e., those chemical constituents contributing the most to the elevated total HIs) were as follows, by medium:

- Soil: nitroaromatics (DNT compounds), PAH, and antimony
- Surface Water: aluminum, magnesium, lead, and iron

- Sediment: nitroaromatics (DNT compounds), PAH carbazole, and the inorganics aluminum, iron, magnesium, phosphorus, potassium, and calcium.

Based on results of the SLERA, a decision was reached on ERAGS scientific management decision point (SMDP) No. 1 to prepare a supplement to the SLERA, in the form of a BERA, to address in further detail the potential ecological hazards associated with the RWPs. The following recommendations were made, based on (1) the findings of the SLERA (IT, 2000a) and (2) discussions with USACE:

- Establish additional background concentrations for metals in surface water, sediment, and surface soil

- Conduct terrestrial earthworm and aquatic worm bioaccumulation studies to estimate uptake and bioavailability of chemical constituents from surface soil and sediment, respectively

- Conduct fish uptake studies to estimate bioaccumulation and bioavailability of metals from surface water

- Conduct a literature search to obtain a more accurate avian toxicity benchmark (i.e., no observable adverse effects level (NOAEL) for the nitroaromatic 4-amino-2,6-DNT and other hazard drivers).

2.2 Problem Formulation

Based on the available data, IT prepared a problem formulation for the RWP sites. The problem formulation, presented as follows, is Step 3 of the eight-step ERAGS process (EPA, 1997), and includes assessment endpoints, conceptual site model information, exposure pathways, and risk questions and hypotheses.

As determined in the SLERA (IT, 2000a), the potential exists for adverse ecological effects to ecological entities at the site due to the presence of viable habitat, ecological receptors, exposure pathways, and chemical stressors. HIs significantly above 1 (e.g., up to 720) were estimated for representative ecological receptors using the HQ method in the SLERA (IT, 2000a) (equivalent to Steps 1 and 2 of the ERAGS eight-step process). In addition, potential surface water and sediment hazards to aquatic biota as a result of RWP media COPEC concentrations were identified, as a result of comparisons of site data with surface water and sediment criteria for the protection of aquatic life.

2.2.1 Assessment Endpoints

The protection of ecological resources, such as habitats and species of plants and animals is a principal motivation for conducting ERAs. Key aspects of ecological protection are presented as policy goals. These are general goals established by legislation or agency policy that are based on societal concern for the protection of certain environmental resources. To determine whether these protection goals are met at the site, assessment and measurement endpoints have been formulated to define the specific ecological values to be protected and to define the degree to which each may be protected.

Given the diversity of the biological world and the multiple values placed on it by society, there is no universally applicable list of assessment endpoints. Suggested criteria that may be considered in selecting assessment endpoints suitable for a specific ecological risk assessment are: (1) ecological relevance, (2) susceptibility to the contaminant(s), (3) accessibility to prediction and/or measurement, and (4) definable in clear, operational terms (Suter, 1993). Selected assessment endpoints should reflect environmental values that are protected by law, are critical resources, or have relevance to ecological functions that may be impaired. Both the entity and attribute should be identified for each selected assessment endpoint.

Assessment endpoints are inferred from effects to one or more measurement endpoints. Measurement endpoints (discussed in Chapter 3.0 as part of the BERA Study Design) are a measurable response to a stressor that is related to the valued attribute of the chosen assessment endpoint. It serves as a surrogate attribute of the ecological entity of interest (or of a closely related ecological entity) that can be used to draw a predictive conclusion about the potential for effects to the assessment endpoint. Information collected during previous site reconnaissance activities (IT, 2000a) was used to assist in the selection of assessment (and measurement) endpoints. Assessment endpoints for the BERA, formal expressions of the environmental values to be protected (Suter, 1993), are presented below.

- Protection of long-term survival and reproductive capabilities for omnivorous mammal populations
- Protection of long-term survival and reproductive capabilities for small insectivorous mammal populations
- Protection of long-term survival and reproductive capabilities for insectivorous bird populations
- Protection of long-term survival and reproductive capabilities for benthic invertebrate populations

- Protection of long-term survival and reproductive capabilities for aquatic vertebrate (fin fish) populations

- Protection of long-term survival and reproductive capabilities for semi-aquatic omnivorous mammal populations

- Protection of long-term survival and reproductive capabilities for piscivorous bird populations.

2.2.2 Conceptual Model and Exposure Pathways

An important component of the problem formulation includes an exposure pathways analysis. Exposure pathways consist of four primary components: source and mechanism of contaminant release, transport medium, potential receptors, and exposure route. A chemical may also be transferred between several intermediate media before reaching a potential receptor. All of these components are important for the RWPs. The exposure pathways considered for the representative terrestrial and aquatic receptors at the RWP sites are presented in conceptual site model diagrams (Figures 2-1 and 2-2).

Exposure to different categories of environmental media is addressed in this pathways analysis, as discussed in the following subsections. It should be noted that some of the components of these pathways (e.g., soil COPEC plant toxicity) were adequately addressed in the SLERA and do not need to be reevaluated .

Soil Exposure Pathway. Soil exposure pathways are potentially important for terrestrial plants and animals at the sites. For non-burrowing animal exposure, soil samples obtained from a depth of 0 to 1 foot are generally considered, as this would be the point of exposure. Note: The agency-approved work plan for the SLERA defined surface soil as 0 to 1 foot, however, due to depth compositing of 0 to 2 feet and 0 to 3 feet in the historic dataset, all soils from the 0 to 3 foot depth interval are considered as surface soil. For burrowing animals such as the shrew, soil samples obtained from a depth of 0 to 6 feet are considered. For uncertainties associated with the 0 to 6 foot depth interval, see the Uncertainty Analysis (Section 6.6).

For deep-rooted plant exposure, soil samples taken from 0 to 6 feet are considered because some feeder roots are located within this depth. In the SLERA the white-tailed deer was assumed to ingest leaves of trees translocating COPECs from subsoils.

Sediment Exposure Pathway. Sediment generally consists of soil or other material settled out of suspension in surface water or native soils underlying flowing or standing water bodies.

Potential contaminant sources for sediment include buried or stored waste, and contaminated surface water, groundwater, and soil. The release mechanisms include surface water runoff, groundwater discharge, and airborne deposition. Potential receptors of chemicals in contaminated sediment include aquatic flora and fauna. Direct exposure routes for impacted sediment include contact by benthic-dwelling organisms such as catfish, uptake by aquatic flora, and ingestion by aquatic fauna. Indirect exposure pathways from sediment include consumption of bioaccumulated contaminants by consumers in the food chain.

Surface Water Exposure Pathway. Surface water represents a potential transport medium for COPECs. Potential sources for contaminated surface water include: buried or stored waste, stored or spilled fuel, contaminated soil and groundwater, and deposition of airborne contaminants. The release mechanisms include surface runoff, leaching, and groundwater seepage. Potential receptors of contaminated surface water include terrestrial and aquatic fauna and aquatic flora. Exposure routes for contaminated surface water include ingestion by terrestrial fauna, and uptake and absorption by aquatic flora and fauna. Consumption of bioaccumulated constituents constitutes a potential indirect exposure pathway for faunal receptors. Chemical bioavailability of some metals and other chemicals is controlled by water hardness, pH, and total suspended solids.

2.2.3 Risk Questions and Hypotheses

This problem formulation has demonstrated that the estimated ecological hazards at PBOW RWPs are unacceptable based on the conservative assumptions used in the SLERA, and further ecological assessment is required to obtain more site-specific and chemical-specific data to refine the estimated ecological hazards. This further assessment has been accomplished using the study design presented in Chapter 3.0 to address the issues raised in the problem formulation stated herein.

Risk questions and hypotheses for the BERA are stated as null hypotheses as follows:

- The potential for adverse ecological effects to ecological entities at the site is minimal or nonexistent due to the lack of potential chemical stressors, due to low COPEC frequency of detection and/or no significant difference between COPEC concentrations in site media and background samples.

- The potential for significant biological uptake of COPECs from surface soil, sediment, or surface water is minimal or nonexistent due to limited bioavailability as demonstrated by site-specific laboratory bioaccumulation tests.

- The potential for significant toxicity of COPECs in surface water, soil, and/or sediment is minimal or nonexistent as demonstrated by laboratory chronic toxicity tests.

- The potential for adverse ecological effects to ecological entities at the site is minimal or nonexistent as demonstrated by a refined food chain model executed using site-specific bioaccumulation factors, more realistic exposure assumptions, and/or more realistic toxicity reference values.

If one or more of these null hypotheses is accepted based on the results of the BERA, and a weight-of-evidence evaluation has determined that significant ecological risks may not be occurring at the RWP sites, a recommendation of no further action may be warranted.

3.0 BERA Study Design and DQO Process

The BERA study design and data quality objectives (DQO) process is cited in this chapter, including a summary of the selected measurement endpoints. The measurement endpoint is a measurable response to a stressor that is related to the valued attribute of the chosen assessment endpoint. Measurement endpoints (along with the selected assessment endpoints) are presented in Table 3-1.

The *Work Plan, Phase 2 Ecological Risk Assessment, Red Water Ponds* was prepared by IT (2000b), and was subsequently approved by OEPA. The work plan discussed the details of the BERA study design and DQO process. The work plan was of sufficient quality for stakeholders to agree on ERAGS SMDP Nos. 2 and 3, that are composed of (1) the conceptual site model, assessment endpoints, exposure pathways, and risk hypotheses; and (2) measurement endpoints, study design, and data interpretation and analysis.

The sampling and analysis plan of the study design, presented in the approved work plan (IT, 2000b), included the following components:

- Data needs
- Analytical procedures
- Sampling techniques
- Quality assurance/quality control
- Land surveying
- Decontamination procedures
- Sample preservation, packing, and shipping
- Investigation-derived waste management plan.

The DQO process, which was implemented during the preparation of the work plan (IT, 2000b) evaluated data requirements needed to support the decision-making process and selected the best action to satisfy these requirements. Incorporated components of the DQO, described in the EPA publication 9355.9-01 *Data Quality Objectives Process for Superfund* (EPA, 1993), are discussed in detail in Section 3.3 of the sampling and analysis plan (SAP) (IT, 1996a). Determining factors for procedures necessary to satisfy investigative objectives and to establish the basis of future actions at PBOW are presented in Figure 3-2 of the SAP (IT, 1996a).

Soil, surface water, fish and other aquatic tissue, and sediment samples were collected and analyzed to meet the objectives of the BERA. Quality assurance/quality control (QA/QC) samples were collected for all sample types, as appropriate. All samples were analyzed by EPA-

approved methods and complied with EPA-definitive data requirements. In addition to meeting the quality needs of the BERA, data analyzed at this level of quality were appropriate for all phases of the characterization and risk assessment. Laboratory requirements of precision, accuracy, and completeness for confirmation samples generated during the BERA are provided in Chapter 12.0 of the quality assurance project plan (QAPP) (IT, 1996b).

All samples collected by IT field personnel were documented through the use of sample collection logs and analysis request/chain-of-custody record forms (Figure 6-2 of the SAP [IT, 1996a]) following field custody procedures specified in Section 5.1 of the QAPP (IT, 1996b).

Soil, Surface Water and Sediment. Soil, surface water, and sediment samples were collected and analyzed to meet the objectives of the BERA. QA/QC samples were collected for all sample types, as appropriate. All samples were analyzed by EPA-approved methods and complied with EPA-definitive data requirements. Laboratory requirements of precision, accuracy, and completeness for confirmation samples generated during the investigation are provided in Chapter 12.0 of the QAPP (IT, 1996b).

Fish Tissue. Fish tissue (and aquatic tissue) samples were collected and analyzed to meet the objectives of the BERA. All samples were analyzed by EPA-approved methods and complied with EPA-definitive data requirements. Laboratory requirements of precision, accuracy, and completeness for confirmation samples generated during the investigation are provided in Chapter 12.0 of the QAPP (IT, 1996b).

Toxicity Testing. The mandatory inclusion of controls in the toxicity testing that was conducted provided the QA/QC for this component of the BERA. For the toxicity tests to be considered valid, test organism survival of at least 80 percent is required in the controls. Toxicity is defined based on comparisons to the control samples. Samples are considered toxic if a given test endpoint (survival or weight) is statistically different ($p<0.05$) from the control sample or from the reference site (if available), and at least 20 percent lower than mean test organism response in the control samples. This approach is consistent with statistical evaluation procedures recommended by EPA. Organisms to be used for testing were positively identified by a qualified expert and were of similar age and life stage. Only organisms that behave normally, appear healthy and feed normally in culture were used. The quality and general health of test organisms were verified through positive and negative control tests. Positive control tests, or Standard Reference Toxicant (SRT) tests, provide documentation that test organisms are responding to a SRT as expected and are not more or less tolerant. This is documented through control charts for the organism and SRT. Negative controls or laboratory control sediments

provide a measure of nonchemical related stress to which organisms may be subjected during the course of the testing. Unacceptable mortality in the control indicates that test organisms are being adversely affected by something other than the contaminants being tested. For tests to be considered valid, control organisms must achieve at least 80 percent survival.

4.0 Verification of Field Sampling Design

Field verification is Step 5 of the ERAGS eight-step process. IT provided an ecological risk professional to the project to verify that methods and sampling efforts as described in the work plan (IT, 2000b) were actually feasible at the RWP sites. The field verification visit was conducted June 29 and 30, 2000, and a field verification memorandum documenting the site visit, dated July 18, 2000, is provided in Appendix A. The site conditions and feasibility of the proposed approach that were documented in the memorandum were sent to CELRN, PBS, and OEPA on July 18, 2000. OEPA review comments on the work plan and memorandum were received August 1, 2000. The work plan was subsequently revised and resubmitted to OEPA on August 31, 2000. It should be noted that the potential laboratory spiking of COPECs, as discussed in the memorandum, was not performed due to the complexities of obtaining reliable data through this process.

The field verification memorandum (Appendix A) and the revised work plan (IT, 2000b) fulfilled SMDP No. 4 for Step 5 of the ERAGS eight-step process (EPA, 1997).

5.0 Site Investigation and Data Analysis

This chapter presents information on the collection and analysis of analytical data (Section 5.1) and discussion of the toxicity data (Section 5.2).

5.1 Collection and Discussion of Analytical Data

The section presents information on abiotic media (soil, surface water, and sediment; Section 5.1.1) and biotic media (fish tissue, earthworms, and aquatic worms; Section 5.1.2). Lists of all abiotic and biotic media samples used in the BERA, either collected at the sites, or obtained via laboratory bioaccumulation studies using site media, are presented in Tables 5-1 and 5-2, for WARWP and PRRWP, respectively. Two field duplicate samples were collected, Sample No. AD1011 as a duplicate of Sample No. AD1002, and Sample No. AC0006, as a duplicate of Sample No. AC0001. Also presented in Tables 5-1 and 5-2 are the analytical tests performed on the samples. Analytical methods utilized by the laboratory are summarized in Table 5-3. Chemical analysis of surface water, sediment, soil, and tissue samples was performed by Severn Trent Laboratory (STL), Sparks, Maryland and University Park, Illinois. Bioaccumulation studies and biological toxicity studies were performed by EA Engineering, Science, and Technology, Inc. (EA), Sparks, Maryland.

5.1.1 Abiotic Media

This section presents site investigation sampling activities for abiotic media (soil, surface water, and sediment) conducted by IT from September 12 through 16, 2000. Sample collection logs and survey data are presented in Appendix B. All samples were collected in accordance with the procedures discussed in the approved work plan (IT, 2000b) and in accordance with the procedures used during the previous IT RWP direct-push investigation (IT, 2000a). Throughout the following sections, "hot spot area" is defined as the historical sample location(s) where the concentrations of the COPECs contributing the most to the ecological hazard were the greatest. All chemical analytical data are presented in Appendix C-1, with a data validation summary presented in Appendix C-2. All analytical results were 100 percent reviewed by an independent party separate from the primary analytical laboratory used for the project. The criteria outlined in the *Laboratory Data Validation Functional Guidelines for Evaluating Organic Analysis* (EPA, 1998) and *EPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review* (EPA, 1994) were used. Field sampling locations were surveyed by a licensed State of Ohio surveyor.

5.1.1.1 Soil Sampling for Earthworm COPEC Uptake Estimates

Discrete surface soil samples were collected from identified RWP area hot spots and sent to the selected bioassay laboratory and analytical laboratory. The bioassay lab held the samples until chemical analytical results were available from the analytical laboratory. Once given the go-ahead by IT, the bioassay lab introduced earthworms to the impacted soil. The earthworms were allowed to bioaccumulate COPECs as they burrowed over the 28-day study period, and at the end of the study these invertebrates were sacrificed and tissue COPEC concentrations were determined. These analytical results are utilized, in conjunction with paired surface soil COPEC data, to calculate site-specific invertebrate bioaccumulation factors for use in the BERA. Note: soil COPEC earthworm toxicity data were also obtained from the study.

PRRWP. The PRRWP COPECs in invertebrates were nitroaromatics (SLERA; IT, 2000a). IT collected five (5) surface soil samples for the uptake study (Sample Nos. AC0001 through AC0005). These samples were split, with sample volume sent to the bioassay laboratory and to the analytical laboratory for the analysis of nitroaromatic constituents by EPA Method 8330. Detected constituent concentrations are presented in Table 5-4. The sample locations (Figure 5-1) were all situated at the potential hot spot area, to maximize the potential for usable uptake study results. It should be noted that the nitroaromatics of concern (4-amino-2,6-DNT and, to a much lesser extent, 1,3-DNB) were very infrequently detected historically in surface soil. The nitroaromatic 4-amino-2,6-DNT was only detected in one out of 50 historical surface soil samples, and 1,3-DNB was only detected in six out of 50 historical surface soil samples. Based on analytical results, only Sample No. AC0001 had an uptake study performed (see Section 5.1.2.2 for further details).

WARWP. The WARWP COPECs in invertebrates were nitroaromatics and PAHs (SLERA; IT, 2000a). IT collected five (5) surface soil samples for the uptake study (Sample Nos. AD0001 through AD0005) (Table 5-1). These samples were split, with sample volume sent to the bioassay laboratory and to the analytical laboratory for the analysis of nitroaromatic by EPA Method 8330 and PAH constituents by Method 8310. Detected constituent concentrations are presented in Table 5-5. The sample locations (Figure 5-2) were all situated at the potential hot spot area, to maximize the potential for usable uptake study results. It should be noted that the COPECs (4-amino-2,6-DNT and PAHs) were very infrequently detected historical in surface soils. The nitroaromatic 4-amino-2,6-DNT was only detected historically in one out of 40 surface soil samples, and PAHs were only detected historically in one out of 10 surface soil samples.

5.1.1.2 Surface Water Sampling for COPEC Surface Water Toxicity

Discrete surface water grab samples were collected from the RWP areas for fish (*Pimephales promelas*) and cladoceran (*Ceriodaphnia dubia*) toxicity studies and sent to the selected bioassay laboratory where surface water toxicity bioassays were performed. The surface water toxicity results were utilized in the BERA, in conjunction with paired surface water COPEC concentration data, to determine whether or not surface water is potentially toxic to water-column-dwelling organisms at PRRWP and WARWP.

PRRWP. The PRRWP COPECs for surface water toxicity were aluminum, iron and manganese (SLERA; IT, 2000a). IT collected five (5) surface water samples for the toxicity study (Sample Nos. AC2006 through AC2010) (Table 5-2). These samples were split, with sample volume sent to the bioassay laboratory and to the analytical laboratory for the analysis of inorganics (EPA Methods 6010B and 365.3). Detected constituent concentrations are presented in Table 5-4. The sample locations (Figure 5-3) were situated at both potential hot spot and non-hot spot areas, so as to maximize the potential for usable toxicity study results (i.e., a concentration gradient was planned that would allow a better determination of potential surface water toxicity).

WARWP. The WARWP COPECs for surface water toxicity were aluminum, iron, lead, manganese, and vanadium (SLERA; IT, 2000a). IT collected five (5) surface water samples for the toxicity study (Sample Nos. AD2006 through AD2010) (Table 5-1). These samples were split, with sample volume sent to the bioassay laboratory, and to the analytical laboratory for the analysis of inorganics (EPA Methods 6010B and 365.3). Detected constituent concentrations are presented in Table 5-5. The sample locations (Figure 5-4) were situated at both potential hot spot and non-hot spot areas, so as to maximize the potential for usable toxicity study results (i.e., a concentration gradient was planned that would allow a better determination of potential surface water toxicity).

5.1.1.3 Sediment Sampling for COPEC Uptake Estimates

Discrete sediment samples were collected from identified RWP area hot spots for invertebrate uptake studies, and sent to the selected bioassay laboratory and the analytical laboratory. The bioassay laboratory held the samples until the chemical analytical results were available from the analytical laboratory, and then, when given the go-ahead by IT, introduced sediment invertebrates (using the invertebrate aquatic worm species *Lumbriculus variegatus*) to the impacted sediment. The invertebrates were allowed to bioaccumulate COPECs as they burrowed over the 28-day study period, and at the end of the study these invertebrates were sacrificed and tissue COPEC concentrations were determined. These analytical results are utilized, in

conjunction with paired sediment COPEC data, to calculate site-specific bioaccumulation factors for use in the BERA.

PRRWP. The PRRWP COPECs in aquatic invertebrates were the PAH carbazole and the inorganic potassium (SLERA; IT, 2000a). IT collected five (5) sediment samples for the uptake study (Sample Nos. AC1001 through AC1005). These samples were split, with sample volume sent to the bioassay laboratory and to the analytical laboratory for the analysis of SVOCs and inorganics (EPA Methods 8270C, 6010B, and 365.3). Detected constituent concentrations are presented in Table 5-4. The sample locations (Figure 5-5) were all situated at the potential hot spot area, to maximize the potential for usable uptake study results. It should be noted that the sediment COPECs were only historically detected in one out of two samples in previous studies (IT, 2000a).

WARWP. The WARWP COPECs in aquatic invertebrates were the nitroaromatic 2-amino-4,6-DNT and the inorganics aluminum, calcium, and phosphorus (SLERA; IT, 2000a). IT collected five (5) sediment samples for the uptake study (Sample Nos. AD1001 through AD1005). These samples were split, with sample volume sent to the bioassay laboratory and to the analytical laboratory for the analysis of nitroaromatics, inorganics, and total organic carbon (EPA Methods 8330, 6010B, 365.3, and 9060). Detected constituent concentrations are presented in Table 5-5. The sample locations (Figure 5-6) were all situated at the potential hot spot area, to maximize the potential for usable uptake study results. It should be noted that 2-amino-4,6-DNT was very infrequently detected in sediments in previous studies (IT, 2000a). The nitroaromatic 2-amino-4,6-DNT was only detected in one out of 13 historical sediment samples.

5.1.1.4 Sediment Sampling for COPEC Sediment Toxicity

Discrete sediment samples were collected from the WARWP for invertebrate toxicity studies (using the invertebrate species *Hyalella azteca*) and sent to the selected bioassay laboratory where sediment toxicity bioassays were performed. It should be noted that for the PRRWP area, sediment toxicity was not predicted (IT, 2000a); therefore, no sediment toxicity tests using sediment from PRRWP were performed. The WARWP sediment toxicity results were utilized in the BERA, in conjunction with paired sediment COPEC concentration data, to determine whether or not sediment is potentially toxic to sediment-dwelling organisms at WARWP.

WARWP. The WARWP COPECs for sediment invertebrate toxicity were arsenic, copper, and iron (SLERA; IT, 2000a). IT collected five (5) sediment samples for the toxicity study (Sample Nos. AD1006 through AD1010). These samples were split, with sample volume sent to the bioassay laboratory and to the analytical laboratory for the analysis of inorganics (EPA Methods

6010B and 365.3). Detected constituent concentrations are presented in Table 5-5. The sample locations (Figure 5-6) were situated at both potential hot spot and non-hot spot areas, so as to maximize the potential for usable toxicity study results (i.e., a concentration gradient was planned that would allow a better determination of potential sediment toxicity). The upstream reference sample location was selected to match the substrate type (e.g., sediment grain size) of the impacted downstream areas.

5.1.1.5 Background Sampling

To assess whether inorganic concentrations in surface water and sediment were related to background, six (6) additional background surface water and sediment samples were collected for the BERA to supplement the SLERA. Background surface water and sediment samples were collected at locations hydraulically upgradient from the RWP sites and analyzed for the 18 target metals as listed in Table 5-3. These included 3 surface water samples (Sample Nos. AE2001 through AE2003, Table 5-2), 3 sediment samples (Sample Nos. AE1001 through AE1003, Table 5-2) near PRRWP, and 3 surface water samples (Sample Nos. AE2004 through AE2006, Table 5-1) and 3 sediment samples (Sample Nos. AE1004 through AE1006, Table 5-1) near WARWP (Figures 5-3 through 5-6). For the surface water samples, total (unfiltered) metal samples were collected. Detected constituent concentrations are presented in Tables 5-4 and 5-5.

In addition, to assess whether inorganic and/or PAH concentrations in surface soil are related to background, anthropogenic or non-RWP activities, six (6) background surface soil samples were collected for the BERA to supplement the SLERA (3 samples near PRRWP [Sample Nos. AE0001 through AE0003, Table 5-2] and 3 samples near WARWP [Sample Nos. AE0004 through AE0006, Table 5-1]). It should be noted that only PAHs are considered to be anthropogenic related. Background soil sample locations (Figures 5-1 and 5-2) were finalized during the field verification step (Chapter 4.0; Appendix A), as site-specific factors had to be taken into account. Detected constituent concentrations are presented in Tables 5-4 and 5-5.

Statistical comparisons between constituent concentrations in background samples and site samples were performed using the nonparametric Mann-Whitney test (also called the Wilcoxin Rank Sum test). The Mann-Whitney test is the nonparametric version of the two groups paired t-test and tests the hypothesis that the distributions underlying the two groups are the same. The requirements for validity of the Mann-Whitney test are that the two groups of observations come from continuous distributions and are independent of each other, both within and between groups. Since the Mann-Whitney test does not look at the observations but instead considers their ranks, it is resistant to outliers in either of the groups being compared and does not require assumptions of normality. Table 5-6 presents a summary of the statistical tests comparing the

background and site data, by medium for each area, and determines whether or not a COPEC is background related. Background statistical test details are presented in Appendix D.

5.1.2 Biotic Media

This section presents information on the collection and analysis of biotic media obtained either from the RWPs (fish or aquatic organism tissue) or from abiotic media obtained from the RWPs (earthworm tissue harvested in the lab from site soils and aquatic worm tissue harvested in the lab from site sediments). Site samples were collected by IT from September 12 through 16, 2000.

5.1.2.1 Fish and Aquatic Organism Sampling for COPEC Uptake Estimates Based on Tissue

Available fish and aquatic organism samples were collected from the two RWP sites. Although the goal was to collect both water column feeders (such as sunfish) and bottom feeders (such as catfish), no fin fish bottom feeders were found after repeated electroshocking and seining events, thus no bottom feeder fish tissue samples were collected. Similar aquatic species were composited into individual samples, resulting in three samples from PRRWP and four samples from WARWP. Organism counts, length, and weight were recorded prior to compositing, and data are presented in Table 5-7. The aquatic tissue samples were whole organism (not fillets), to best represent the diet of piscivorous (fish-eating) predators such as the great blue heron. The goal of each aquatic organism composite sample was to represent a similar aquatic organism size and age group. The samples were frozen and sent on ice to the analytical laboratory for metals analysis, as inorganic COPECs were the hazard drivers estimated in fish (IT, 2000a). Concurrent unfiltered water column samples were collected and sent to the analytical laboratory, in order to obtained paired aquatic organism/surface water data from which to estimate uptake factors (i.e., surface water to fish tissue bioaccumulation factors) for subsequent use in the BERA.

PRRWP. A shallow stream located at the bottom of a deep ravine runs adjacent to the PRRWP and is filled with emergent vegetation. Another stream flows along Pentolite Road north of the site, and may receive drainage from the site via an old discharge pipe (IT, 2000a). Metals of concern in potential fish at PRRWP were iron and aluminum (SLERA; IT, 2000a). Aquatic sample collection was successful, as fish (Sample No. AC4001), tadpoles (Sample No. AC4002) and crayfish (Sample No. AC4003) were collected from the surface water along Pentolite Road using aquatic dipnets and electroshocking, and seines (Table 5-2). The aquatic biota sample locations are shown in Figure 5-7. Detected constituent concentrations are presented in Table 5-8.

WARWP. A large open water pond and a smaller pond covered with emergent aquatic vegetation are located at the WARWP. Metals of concern in fish at WARWP were iron, lead, aluminum, and magnesium (SLERA; IT, 2000a). Four composite fish samples (two fathead minnow and two green sunfish) were collected from the large open water pond (Sample Nos. AD4001 through AD4004, Table 5-1). Fish sample locations are shown in Figure 5-8. Fish collection techniques involved boat-mounted electroshocking and retrieval of stunned fish using an aquatic dipnet. Detected constituent concentrations are presented in Table 5-9.

5.1.2.2 Soil Sampling for Earthworm COPEC Uptake Estimates

Discrete surface soil samples were collected from the RWP areas on September 15, 2000 and sent to EA for bioaccumulation testing using the invertebrate species *Eisenia foetida*. All soils used for bioaccumulation testing were used within 60 days of sample collection. EA introduced earthworms to the impacted soil samples for the 28-day study. The earthworms were allowed to bioaccumulate COPECs as they burrowed in the soil over the duration of the study, and at the end of the study these invertebrates were sacrificed and tissue COPEC concentrations were determined by STL. The chronic bioaccumulation tests with *E. foetida* were performed on five WARWP surface soils (Sample Nos. AD0001 through AD0005), and one PRRWP soil sample (Sample No. AC0001) to obtain five WARWP tissue samples (Sample Nos. AD4011 through AD4015, Table 5-1) and one PRRWP tissue sample (Sample No. AC4011, Table 5-2). Detected constituent concentrations are presented in Tables 5-8 and 5-9. Sample locations are shown on Figures 5-1 and 5-2. These analytical results are utilized, in conjunction with paired surface soil COPEC data, to calculate site-specific invertebrate bioaccumulation factors for use in the BERA (Section 6.2.1). It should be noted that four of the PRRWP soil samples (Sample Nos. AC0002 through AC0005) did not have bioaccumulation tests run because the nitroaromatic COPECs were not detected in the soils (Sample Nos. AC0002 through AC0005), and therefore the uptake study would not have produced usable results.

5.1.2.3 Sediment Sampling for Aquatic Worm COPEC Uptake Estimates

Discrete sediment samples were collected from the WARWP area on September 14, 2000 and sent to EA for bioaccumulation testing using the invertebrate species *Lumbriculus variegatus*. All sediments used for bioaccumulation testing were used within 45 days of sample collection. EA introduced freshwater aquatic worms to the impacted sediment for the 28-day study. The invertebrates were allowed to bioaccumulate COPECs as they burrowed in the sediment over the duration of the study, and at the end of the study these invertebrates were sacrificed and tissue COPEC concentrations were determined by STL. The chronic bioaccumulation tests with *L. variegatus* were performed on five WARWP sediments (Sample Nos. AD1001 through AD1005) to obtain five WARWP tissue samples (Sample Nos. AD4016 through AD4020, Table 5-1).

Detected constituent concentrations are presented in Table 5-9 and sample locations are shown on Figure 5-6. These analytical results are utilized, in conjunction with paired sediment COPEC data, to calculate site-specific bioaccumulation factors for use in the BERA (Section 6.2.1). It should be noted that none of the PRRWP sediment samples (Sample Nos. AC4016 through AC4020) had bioaccumulation tests run because the primary COPEC (i.e., the PAH carbazole) was not detected in sediment (Sample Nos. AC1001 through AC1005), and therefore the uptake study would not have produced usable results.

5.2 Discussion of Toxicity Data

This section presents a discussion of site-specific toxicity data for surface water (Section 5.2.1), sediment (Section 5.2.2), and soil (Section 5.2.3). The complete results of the toxicity testing are presented in Appendix E. EA performed the toxicity tests, and the tests used appropriate laboratory-supplied freshwater invertebrate and vertebrate test species. Each media sample run for toxicity included a method-specified number of sample replicates. Replicate data were used to perform appropriate statistical analyses in order to determine whether or not the toxicity recorded, if any, was statistically different from the laboratory control. For surface water samples the water flea tests included 10 replicates and the fathead minnow tests included five replicates; for sediment samples the ***Hyalella azteca*** tests included eight replicates; and for soil samples the earthworm tests included five replicates (Appendix E, Attachments I through V).

5.2.1 Surface Water

As discussed in Section 5.1.1, discrete surface water grab samples were collected from the RWP areas on September 13 and 14, 2000 and sent to EA for chronic toxicity testing using ***Pimephales promelas*** (fathead minnow) and ***Ceriodaphnia dubia*** (water flea). Due to an error by the courier service, the PRRWP surface water samples did not arrive at EA in time to initiate toxicity testing within 36 hours of collection. All surface waters used for toxicity testing, however, were used within 56 hours of sample collection. Given that (1) the surface water hazard drivers identified in the SLERA were limited to metals (Section 2.1) and metals are expected to be persistent in surface water; (2) both WARWP and PRRWP samples showed some toxicity; and (3) the acceptable surface water holding time ranges from 36 to 72 hours (Weber et al., 1989), the initiation of the PRRWP toxicity testing beyond 36 hours from the time of collection is considered insignificant.

Chronic 6-day toxicity tests with ***C. dubia*** were conducted on five WARWP surface waters (Sample Nos. AD2006 through AD2010) and five PRRWP surface waters (Sample Nos. AC2006 through AC2010). Two of the ten surface water samples, (WARWP Sample Nos. AD2008 and AD2009) had a statistically significant (p=0.05) decrease in young production compared to the

hardness control, however, only Sample No. AD2008 was biologically significant as the reproduction rate was more than 20 percent lower than the control. For the remaining surface waters samples (three surface waters from WARWP and the five surface waters from PRRWP), there was no significant difference in survival or reproduction as compared to the hardness control.

Chronic 7-day toxicity tests with ***P. promelas*** were performed on five WARWP surface waters (AD2006-AD2010) and five PRRWP surface waters (Sample Nos. AC2006 through AC2010). The five surface waters from WARWP did not show a statistically significant decrease in survival of ***P. promelas***. Two of the PRRWP surface waters (PRRWP Sample Nos. AC2006 and AC2008) did show a statistically significant (p=0.05) lower survival than the hardness control for ***P. promelas***. However, only the survival in Sample No. AC2006 was biologically significant as the survival rate was more than 20 percent lower than the control.

In summary, two surface water samples showed biologically significant toxicity, including PRRWP Sample No. AC2006 and WARWP Sample No. AD2008. A discussion of which surface water constituents may be responsible for the measured toxicity is presented in Section 6.3.

5.2.2 Sediment

As discussed in Section 5.1.1, discrete sediment samples were collected from the WARWP on September 13 and 14, 2000 and sent to EA for invertebrate toxicity testing using the invertebrate species ***Hyalella azteca***. All sediments used for toxicity testing were used within 10 days of sample collection. PRRWP sediment samples were not collected for ***H. azteca*** toxicity testing because in the SLERA (IT, 2000a) PRRWP sediments were not predicted to be toxic to aquatic organisms.

Chronic 10-day toxicity tests with ***H. azteca*** were performed on five sediment samples (WARWP Sample Nos. AD1006 through AD1010). Two of the five WARWP sediments (Sample Nos. AD1006 and AD1008) had statistically significant (p=0.05) lower survival than the hardness control; however, neither had a biologically significant reduction in survival, as survival was not reduced by more than 20 percent compared with the control. The remaining three sediment samples had survival that was not significantly different from the control.

In summary, no sediment samples showed biologically significant toxicity. A discussion comparing sediment concentrations and measured survival is presented in Section 6.3 for informational purposes only.

5.2.3 Soil

As discussed in Section 5.1.1, discrete surface soil samples were collected from the RWP areas on September 15, 2000 and sent to EA for bioaccumulation testing using the invertebrate earthworm species ***Eisenia foetida***. All soils used for bioaccumulation testing were used within 60 days of sample collection. Although the test was primarily for an assessment of bioaccumulation of COPECs from soil, information on toxicity was obtained as well.

Chronic (28-day) bioaccumulation tests with ***E. foetida*** were performed on five WARWP soils (Sample Nos. AD0001 through AD0005) and one PRRWP soil sample (Sample No. AC0001). Survival was significantly (p=0.05) lower in WARWP Sample Nos. AD0001, AD0005, and AC001, but was only reduced by more than 20 percent in Sample No. AD0001. The remaining soil samples did not have survival that was statistically significantly different from the control. In summary, one soil sample showed biologically significant toxicity (Sample No. AD0001). A discussion of which soil constituents may be responsible for the toxicity is presented in Section 6.3.

6.0 Risk Characterization

This risk characterization chapter presents a refined selection of COPECs (Section 6.1), a refined food chain model (Section 6.2), a discussion of the toxicity test results and possible correlations with chemical concentrations (Section 6.3), a risk characterization weight of evidence discussion (Section 6.4), a discussion of additional risk information (Section 6.5), and an uncertainties analysis (Section 6.6).

6.1 Refined Selection of COPECs

COPECs identified as hazard drivers in the SLERA (IT, 2000a) were summarized, by media, in Section 2.1. These hazard drivers are reevaluated using the additional data collected as part of this BERA (Section 5.1), specifically considering (1) results of statistical tests comparing concentrations measured in site samples and background samples; and (2) the frequency of detection. Constituents were eliminated as hazard driver COPECs if concentrations were not found to be statistically greater than background concentrations (Table 5-6) or if the frequency of detection (by media) was less than 5 percent and the constituent was not detected in the current site investigation sampling event. COPEC hazard drivers that were retained were carried forward for assessment in the refined food chain model (Section 6-2). It is assumed that focusing on only the hazard driver COPECs is appropriate for the BERA refined food chain model, as other COPECs have not been shown to contribute significantly to the estimated receptor hazards (IT, 2000a). Tables 6-1 through 6-8 present the results of the refined COPEC selection process. Results show that for surface soil and total soil at WARWP, 8 and 10 hazard driver COPECs were retained, respectively (Tables 6-1 and 6-2). For WARWP surface water three COPEC hazard drivers were retained (Table 6-3), whereas for sediment two COPEC hazard drivers were retained (Table 6-4). For PRRWP surface soil and total soil, two COPEC hazard drivers were retained for each medium (Tables 6-5 and 6-6, respectively). For PRRWP surface water and sediment, however, no COPEC hazard drivers were retained, as all concentrations were related to background (Tables 6-7 and 6-8, respectively) as discussed in Section 5.1.1.5 – Background Sampling.

6.2 Refined Food Chain Model

This section presents a summarized approach and detailed results for a refined food chain model for terrestrial and aquatic receptors. A screening level food chain model was presented in the SLERA (IT, 2000a), and this model is refined herein using more realistic exposure assumptions. The exposure characterization (Section 6.2.1) is based on site-specific data collected as part of this BERA. The ecological effects characterization (Section 6.2.2) considers both NOAELs and

lowest observed adverse effect level (LOAEL). Estimated ecological hazards from this refined food chain model are summarized in Section 6.2.3.

6.2.1 Exposure Characterization

General exposure pathways for the RWP sites were summarized in Section 2.2.2. Details on the general exposure characterization approach used in the food chain model are presented and discussed in detail in Section 6.3 of the SLERA (IT, 2000a) and are not repeated herein.

For the refined food chain model (based on the food chain model used in the SLERA), two different approaches are presented in order to provide risk managers with a risk range to aid in decision making. The two approaches include a reasonable maximum exposure (RME) scenario and a central tendency (CT) exposure scenario. The RME scenario estimates the upper-end of the risk range by using 95 percent upper confidence level (UCL) exposure-point concentrations and site-specific biological concentration factors (BCF) calculated in a conservative fashion to overestimate uptake (described below). The CT exposure scenario estimates a more realistic risk value by using arithmetic mean exposure-point concentrations and site-specific BCFs calculated using a more realistic approach (described below).

Exposure point concentrations (i.e., 95 percent UCL and arithmetic mean) for both approaches are presented in Tables 6-1 through 6-8 for the retained COPEC hazard drivers. These exposure-point concentrations are based on data collected and presented in the SLERA (IT, 2000a). Details on how the 95 percent UCL exposure-point concentrations were calculated are presented in Section 6.2.2.2 of the SLERA (IT, 2000a). Sample results collected as part of the BERA (Section 5.1) were not used to recalculated the exposure-point concentrations because the BERA sampling program (IT, 2000b) was not designed for this purpose. As the BERA samples were collected using a biased sampling approach, in order to resample the hazard driver "hot spots" for subsequent use in toxicity or uptake studies, inclusion of these data would overestimate the receptor exposure point concentrations. Therefore, the more representative SLERA data were retained to estimate the exposure point concentrations.

Site-specific BCFs were calculated by dividing COPEC tissue concentrations (i.e., fish, crayfish, tadpole, aquatic worm, and terrestrial earthworm) by the appropriate paired media constituent concentration (i.e., in surface water, sediment, or soil). Some tissue concentrations were reported as blank related (i.e., qualified with a "B" following the 5-times and 10-times convention for common and non-common laboratory contaminants, per ***Guidance for Data Usability in Risk Assessment*** [EPA, 1992]), that is, the constituent concentration in the tissue was within 5-times or 10-times the constituent concentration in the corresponding blank sample. For

earthworm and aquatic worm tissue, the blank sample was the pretest tissue sample (prior to execution of the bioaccumulation study at the laboratory). For other tissue samples, the blank samples were standard laboratory water blanks. For the RME approach, BCFs were estimated using one-half of the B-qualified constituent concentration in the tissue, thereby potentially overestimating the resultant BCF. For the CT approach, BCFs were estimated using one-half of the associated analytical detection limit concentration for the B-qualified tissue constituent, thereby obtaining a more reasonable BCF value.

For all of the site-specific BCF calculations (summarized in Tables 6-9 through 6-12), one-half of the analytical detection limit was used if the constituent was not detected in the sample. If both sample components of a BCF sample pair were not detected (e.g., if arsenic in worm tissue was not detected and arsenic in the corresponding soil sample was not detected), then no BCF value was estimated. For the estimation of aquatic tissue BCFs from surface water, all of the surface water constituent concentrations for a site were averaged together first, prior to use in the divisor of the BCF calculation. This approach was taken because the fish, tadpoles, and/or crayfish were collected by seining and electroshocking throughout the surface water area at the sites, and not at just one specific location. These aquatic species are mobile and are expected to integrate exposure as they move throughout the water column. For PRRWP, separate BCFs were calculated for fathead minnows, tadpoles, and crayfish because all three species were collected. The CT approach used the mean BCF value, whereas the RME approach used the maximum species BCF value (Tables 6-11 and 6-12, respectively). All individual sample data used in calculating the BCFs are presented in Appendix F.

If a site-specific BCF could not be calculated for a particular constituent due to the fact that the constituent was not detected in both the media and paired tissue sample, and a BCF value was needed for a hazard driver constituent for the refined food chain model, the screening-level BCF value from the SLERA (IT, 2000a) was used.

6.2.2 Ecological Effects Characterization

Ecological effects were estimated in the refined food chain models using reference toxicity values (RTV), following the general approach used in the SLERA, as recommended by Wentsel et al. (1996) (Section 6.4 of IT, 2000a). For the RME approach, NOAEL RTVs were used, whereas for the CT approach, LOAEL RTVs were used (Table 6-13). If LOAELs were not available from the literature, they were generally estimated by multiplying the NOAEL value by a factor of 10, based on guidance presented in Sample et al. (1996). For essential nutrients (calcium, iron, magnesium, phosphorus, and potassium), NOAELs are discussed and derived as in the SLERA (IT, 2000a), with information presented in Appendix G. LOAELs for nutrients

were estimate by multiplying the derived NOAELs by a factor a 5, due to the fact that the nutrient NOAELs that have been derived (Appendix G) may be overly conservative.

In the SLERA (IT, 2000a), intraclass extrapolation factors were used to account for uncertainty in applying RTVs derived for laboratory species to another species representing the selected wildlife receptor. These extrapolation factors are presented in Table 6-14. These factors were retained in the refined food chain model for the RME approach. However, as ERAGS (EPA, 1997) does not require this conservative approach, the RTV intraclass extrapolation factors default to 1 for the CT approach.

As specified in Chapter 2.0, a literature search was performed to obtain a more accurate avian RTV for the nitroaromatic hazard driver COPECs (the amino-DNTs). In the SLERA (IT, 2000a), avian toxicity to amino-DNTs was assessed using acute data (i.e., lethal dose data [LD_{50}]), and this former approach added considerable uncertainty to the assessment. No chronic or subchronic toxicity studies could be found that assessed avian toxicity to amino-DNTs. However, a recent toxicity study (Johnson and McAtee, 2000) on the effects of 2,4,6-TNT to birds was located in the literature, and RTVs from this study were used as appropriate surrogates for avian amino-DNT toxicity.

6.2.3 Estimated Ecological Hazards

Estimated ecological hazards from the refined food chain model are presented in Tables 6-15 through 6-17. Risk characterization spreadsheets with all exposure and toxicity input values are presented in Appendix H. The terrestrial hazards for WARWP are estimated to range from 0.009 to 0.8 for the deer mouse (CT to RME estimates, respectively); from 0.005 to 0.3 for the cottontail rabbit, from 0.03 to 2.7 for the shrew; from 0.01 to 1.0 for the marsh wren; from 0.01 to 1.2 for the raccoon, and from 0.004 to 0.3 for the deer (Table 6-15). For the shrew, hazard drivers are PAHs as a result of predicted ingestion of soil invertebrates.

The aquatic hazards for WARWP are estimated to range from 0.4 to 26 for the great blue heron, and from 0.4 to 21 for the raccoon (CT to RME estimates, respectively) (Table 6-16). For the heron, the hazard driver is iron due to the predicted ingestion of impacted sediment. For the raccoon, the hazard driver is also iron as a result of the predicted ingestion of impacted sediment (Table 6-16).

The terrestrial hazards for PRRWP are estimated to range from 0.06 to 2.7 for the deer mouse (CT to RME estimates, respectively); from 0.07 to 3.2 for the cottontail rabbit; from 0.01 to 0.3 for the shrew; from 0.01 to 0.5 for the marsh wren; from 0.05 to 2.2 for the raccoon; and from

0.002 to 0.03 for the deer (Table 6-17). For the mouse, cottontail, and raccoon, the hazard driver is 1,3-DNB, as a result of predicted ingestion of impacted plants. No aquatic hazards are estimated for PRRWP as all of the surface water and sediment hazard driver COPECs were eliminated as a result of either statistical similarity with background concentrations or a frequency of detection less than 5 percent (Section 6.1).

6.3 Toxicity Testing Findings

This section presents a summary of toxicity test results and potential correlations with surface water, sediment, and soil concentrations. A significant correlation between toxicity and media concentrations suggests a potential relationship between toxicity and the measured chemical concentrations, although not a definitive cause and effect linkage. The finding is not definitive because concentrations of other chemicals or stressors not measured in the media may be responsible for the observed toxicity.

6.3.1 Surface Water Toxicity Correlations

As discussed in Section 5.2.1, some of the surface water samples collected from WARWP and PRRWP were found to exhibit biologically significant toxicity to the laboratory test organisms, compared to the laboratory controls. In order to assess which chemical parameters in surface water may be responsible for the measured toxicity, statistical and graphical evaluations have been performed. Table 6-18 presents results of statistical correlations between fathead minnow (*P. promelas*) survival and surface water constituent concentrations, and between water flea (*C. dubia*) offspring production and surface water constituent concentrations. Statistical correlation results may range from +1.0 to ! 1.0, with a positive value indicating a positive correlation, and a negative value indicating a negative correlation. Correlation values near zero suggest poor statistical correlation, whereas values near " 1.0 suggest good statistical correlation, however, whether or not a correlation value is statistically significant at the 0.05-level of significance depends on the number of sample pairs used in the statistical analysis. The number of samples used in a statistical test is used to calculate the degrees of freedom, and the degrees of freedom are used to determine which correlations are statistically significant. For minnow survival, concentrations of calcium show a statistically significant ($P_{0.05}$) correlation of ! 0.93, meaning that 93 percent of the variability is accounted for between this constituent's surface water concentration and the associated minnow survival. The correlation is negative because as calcium concentrations increase, percent survival decreases. Although no other constituent concentrations show a statistically significant negative correlation with minnow survival, the next highest negative correlation was for barium, with a correlation of ! 0.47 (Table 6-18). Neither calcium nor barium were found to be surface water hazard drivers in the SLERA, although aluminum, manganese, vanadium, and iron were potential hazard drivers, as

concentrations exceeded water quality criteria for the protection of aquatic life (IT, 2000a). It should be noted that concentrations of aluminum, manganese, and iron in the current samples were generally similar to concentrations used in the SLERA, although vanadium concentrations were blank related.

Graphical plots of minnow survival and associated inorganic surface water concentrations are presented in Figures 6-1 through 6-4. Sample No. AC2006 (collected from PRRWP) demonstrated biologically significant toxicity (i.e., 70 percent survival) compared to the laboratory hardness control with 94 percent survival, however, none of the 16 inorganics appear to have an elevated relative concentration in this sample. Thus, although calcium and perhaps barium surface water concentrations show an overall negative correlation with survival, concentrations of these two constituents in Sample No. AC2006 were not greater than in the other samples. This finding suggests that the cause of the biologically significant toxicity in this sample is unknown based on the available data.

For water flea reproduction, no inorganic constituent concentrations show a statistically significant ($P_{0.05}$) correlation (Table 6-18). The highest negative correlation was for barium, with a correlation of ! 0.43, although this relationship was not statistically significant. Graphical plots of water flea offspring production and associated inorganic surface water concentrations are presented in Figures 6-5 through 6-8. Sample No. AD2008 (collected from WARWP) demonstrated biologically significant toxicity (i.e., production of 17.3) compared to the laboratory control with a measured offspring production of 23.3, however, none of the 16 inorganics appear to have an elevated relative concentration in this samples. Thus, although barium surface water concentrations appear to show an overall negative correlation with reproduction, the concentration of this constituent in Sample No. AD2008 was not greater than in the other samples. This finding suggests that the cause of the biologically significant toxicity in this sample is unknown based on the available data.

6.3.2 Sediment Toxicity Correlations

As discussed in Section 5.2.2, none of the sediment samples collected from WARWP were found to exhibit biologically significant toxicity to the laboratory test organisms, relative to the laboratory control. However, some statistically significant differences in survival were measured, although not reducing survival by more than 20 percent (considered to be the biological significance threshold). In order to assess which chemical parameters in sediment may be responsible for the measured survival difference, statistical and graphical evaluations have been performed for informational purposes. Table 6-19 presents results of statistical correlations between amphipod crustacean (*H. azteca*) survival and sediment constituent

concentrations. Depending on the number of samples used in the statistical test, the degrees of freedom may be calculated thereby allowing a determination of which correlations are statistically significant. For amphipod survival, concentrations of antimony show a statistically significant ($P_{0.05}$) correlation of ! 0.94, meaning that 94 percent of the variability is accounted for between this constituent's sediment concentration and the associated amphipod survival. The correlation is negative because as antimony concentrations increase, percent survival decreases. The correlation for antimony is likely spurious, as four of the five antimony concentrations were nondetect, and the correlation test was run using one-half of the analytical detection limit for those samples with nondetect results. No other constituent concentrations show a statistically significant negative correlation with amphipod survival, however, the next two highest negative correlations are for arsenic and cobalt, with correlations of ! 0.80 and ! 0.65, respectively (Table 6-19). It should be noted that arsenic's correlation value is almost significant at the $P_{0.05}$ level, as the significance correlation threshold for the sample size is " 0.81. Both arsenic and cobalt were detected in all of the five sediment samples collected and tested. Arsenic was found to be a sediment hazard driver in the SLERA, along with copper and iron, as concentrations exceeded sediment quality criteria for the protection of aquatic life (IT, 2000a). It should be noted that concentrations of arsenic, cobalt, copper, and iron in the current sediment samples were similar to those used in the SLERA.

Graphical plots of amphipod survival and associated inorganic concentrations are presented in Figures 6-9 through 6-13. No samples demonstrated biologically significant toxicity compared to the laboratory control with a measured survival of 94 percent, and none of the 17 inorganics appear to have elevated relative concentrations in these two samples with reduced survival (e.g., Sample Nos. AD1006 and AD1008), except for perhaps arsenic, calcium, iron, lead and manganese. Note: antimony concentrations are uncertain as one-half of the detection limit was used for four of the five samples that had nondetectable concentrations of this inorganic. Thus, although arsenic and perhaps cobalt sediment concentrations show an overall negative correlation with survival, of these two constituents, only arsenic concentrations in Sample Nos. AD1006 and AD1008 were greater than in the other samples. This finding suggests that the cause of the reduced survival in these samples may be related to arsenic concentrations; however, it is important to note that the reduced survival is not considered biologically significant.

6.3.3 Soil Toxicity Correlations

As discussed in Section 5.2.3, one of the soil samples collected from WARWP was found to exhibit biologically significant toxicity to the laboratory test organisms, relative to the laboratory control (i.e., 70 vs. 99.7 percent survival). In order to assess which chemical parameters in soil

may be responsible for the measured toxicity, statistical and graphical evaluations have been performed. Table 6-20 presents results of statistical correlations between earthworm (*E. foetida*) survival and soil constituent concentrations. Depending on the number of samples used in the statistical test, the degrees of freedom may be calculated thereby allowing a determination of which correlations are statistically significant. For earthworm survival, concentrations of nine of the PAHs show a statistically significant ($P_{0.05}$) correlation, ranging from ! 0.98 to ! 1.0, meaning that most of the variability is accounted for between these constituent's soil concentrations and the associated earthworm survival. The correlations are negative because as PAH concentrations increase, percent survival decreases. PAHs were found to be soil COPECs in the SLERA as concentrations were above EPA Region 3 Biological Technical Advisory Group screening levels for soil (IT, 2000a). It should be noted that PAH concentrations in the current WARWP soil samples are approximately an order of magnitude lower than those used in the SLERA.

Graphical plots of earthworm survival and associated PAH concentrations are presented in Figures 6-14 through 6-16. It should be noted that only PAH constituents that had statistically significant negative correlations were graphed and the one sample collected from PRRWP (Sample No. AC0001) is not included in this discussion as the soil from this sample was analyzed for a different suite of chemical constituents and the sample did not exhibit biologically significant toxicity to earthworms. Sample No. AD0001 (collected from WARWP) demonstrated biologically significant toxicity (i.e., 70 percent survival) compared to the laboratory control with a measured survival of 99.7 percent. Almost all of the nine PAHs appear to have elevated relative concentrations in this one sample, except for perhaps anthracene (Figures 6-14 through 6-16). These results suggest that elevated PAH concentrations in one surface soil sample are potentially toxic to earthworms at WARWP.

6.4 Weight of Evidence

Results of the refined food chain models, using site-specific BCFs, demonstrated that ecological hazards for the receptors estimated using the more realistic CT approach were all considerably less than 1, EPA's hazard threshold of concern. HIs were found to range from 0.002 up to 0.4 for both the great blue heron and raccoon. Hazards estimated using the more conservative RME food chain model approach were above 1 for several receptors, with the highest HIs (26 for the great blue heron and 21 for the raccoon) due primarily to elevated concentrations of iron in WARWP sediment. Due to the highly conservative approach used in the RME food chain model, it is very unlikely that these elevated hazards would be expected to result in actual adverse effects in the real world.

Results of the site-specific toxicity testing demonstrated some biologically significant toxicity in a few of the surface water, sediment, and soil samples, summarized as follows:

- 10 percent of the surface water samples showed significant minnow toxicity (Sample No. PRRWP-AC2006)
- 10 percent of the surface water samples showed significant water flea toxicity (Sample No. WARWP-AD2008)
- None of the sediment samples showed significant amphipod crustacean toxicity)
- 17 percent of the soil samples showed significant earthworm toxicity (Sample No. WARWP-AD0001).

Potential causes of the measured surface water toxicity, based on the available data evaluating using correlation statistics and graphical evaluations, could not be reliably determined. Although elevated calcium concentrations were implicated by the correlation results, surface water calcium levels were not noticeably greater in the one sample demonstrating biologically significant toxicity. For sediment, elevated arsenic levels were implicated as a potential cause of reduced survival, using correlation results and a graphical evaluation, however, the reduced survival measured was not biologically significant. The potential cause of the measured soil toxicity was convincingly shown to be related to soil PAH concentrations.

It is important to note that the toxicity measured in the site media samples was generally relatively minor, compared with the laboratory controls. Survival or reproduction was reduced by not more than 25 to 30 percent, as shown below.

Survival or Reproduction Measured in Site Sample(s) [a]	Survival or Reproduction in Associated Laboratory Control Sample	Calculated Reduction in Survival or Reproduction (Site vs. Lab Control) [b]
70 percent (minnow)	94 percent (minnow)	25 percent
17.3 (water flea offspring)	23.3 (water flea offspring)	26 percent
70 percent (earthworm)	99.7 percent (earthworm)	30 percent

[a] Only samples results determined to have biologically significant toxicity are presented.
[b] Calculated by comparing laboratory control result with site sample result.

It is possible that these relatively minor reductions in survival and reproduction may have insignificant adverse effects at the population or community levels of biological organization.

A weight of evidence summary may be based on the two lines of evidence presented in this BERA – namely the refined food chain model and the site surface water, sediment, and soil

toxicity studies. The more realistic CT food chain model approach demonstrated no adverse ecological impacts for either of the two RWP sites. Alternatively, the highly conservative RME food chain model approach suggested some potential adverse effects (from iron sediment concentrations at WARWP; from 1,3-DNB soil concentrations at PRRWP; and from PAH soil concentrations at WARWP). Using results from the toxicity studies, arsenic levels in sediment at WARWP were implicated as a potential cause of reduced survival, whereas for WARWP soils, the potential cause of the measured soil toxicity was convincingly shown to be related to soil PAHs concentrations. Constituents contributing to the measured surface water toxicity could not be identified based on the available data.

Based on the previous discussion, the following weight of evidence summary is presented:

- Elevated PAH concentrations in WARWP soils are an ecological concern due to: (1) measured earthworm toxicity; and (2) predicted RME food-chain impacts to the shrew via biological uptake by prey items such as earthworms.

- Elevated iron concentrations in WARWP sediments are also an ecological concern due to the observation that: (1) concentrations were determined to be potentially deleterious to herons and raccoons using the RME food chain model; and (2) the iron concentration used in the RME food chain model (24,300 mg/kg) is similar to an iron sediment concentration of 24,200 mg/kg that is associated with reduced survival of sediment amphipods (in WARWP Sample No. AD1008). It should be noted that the amphipod reduced survival that was measured may be due to other sediment factors, as overall iron concentrations were not significantly correlated with sediment toxicity (Table 6-19).

- In light of current site activities (burning for habitat management), CT HI outcomes, biological toxicity text results, and uncertainty analysis discussions, remedial activity based on the results of the BERA is not recommended at this time.

6.5 Additional Risk Information

This section presents a discussion on the extent, magnitude, and potential ecological significance of BERA findings, following guidance in Section 7.7.3 of ERAGS (EPA, 1997).

Based on the data presented in the BERA, the elevated concentrations of PAHs in soil at WARWP are a potential ecological concern. The elevated PAH concentrations are limited to Sample No. AD0001 (Figure 5-2), which is also located near the historic PAH hot spot soil sample collected at DP-13 (IT, 2000a). This location is situated in a grassy area commonly used for vehicular access to the WARWP area, and by site visitors and drillers. As mentioned in Section 6.4, it is possible that the 30 percent reduction in earthworm survival may have an

insignificant adverse effect at the population or community levels of biological organization at the WARWP site. Although there are predicted RME food-chain impacts to the shrew from biological uptake of PAHs by prey items such as earthworms, the RME HI is only 2.5, and the CT HI is even lower at 0.03.

Based on the data presented in the BERA, the elevated concentrations of iron in sediment at WARWP are a potential ecological concern. The elevated iron concentrations are limited to Sample No. AD1008 (Figure 5-6) and the historic iron hot spot sediment sample collected at WARP-SD04 located downstream on Pipe Creek adjacent to the eastern RWP (IT, 2000a). It should be noted that this historic sample is very close to Sample No. AD1010 (Figure 5-6) that reported a relatively low sediment iron concentration of 8,790 mg/kg. The 12 percent reduction in amphipod survival (that may be due to the sediment iron level) is expected to have an insignificant adverse effect at the population or community levels of biological organization at the WARWP site, as the reduction in survival is not considered biologically significant (i.e., it is not greater than 20 percent). Although there are predicted RME food-chain impacts due to sediment iron concentrations (i.e., an HI of 26 for the great blue heron and an HI of 21 for the raccoon), the more realistic CT food chain hazards are estimated to be approximately 0.4.

6.6 Uncertainty Analysis

The results of the BERA are influenced to some degree by variability and uncertainty. In theory, investigators reduce variability by increasing sample size of the media or species sampled. Alternatively, uncertainty within the risk analysis can be reduced by using species-specific and site-specific data (i.e., to better quantify contamination of media, vegetation, and prey through direct field measurements, toxicity testing of site-specific media, and field studies using site-specific receptor species). Several of these approaches have been used in the BERA, including the collection of additional samples to supplement the SLERA, the development of site-specific BCFs, and the performance of toxicity testing of site media.

A number of factors, however, still contribute to the overall variability and uncertainty inherent in the BERA. Variability is due primarily to measurement error; laboratory media analyses and receptor study design are the major sources of this kind of error. Uncertainty, on the other hand, is associated primarily with deficiency or irrelevancy of effects, exposure, or habitat data to actual ecological conditions at the site. Species physiology, feeding patterns, and nesting behavior are poorly predictable; therefore, all toxicity information derived from toxicity testing, field studies, or observation will have uncertainties associated with them. Laboratory studies conducted to obtain site-specific, measured information often suffer from poor relevance to the actual exposure and uptake conditions on site (i.e., bioavailability, exposure, assimilation, etc.,

are generally greater under laboratory conditions as compared to field conditions). Calculating an estimated value based on a large number of assumptions is often the only alternative to the accurate (but costly) method of direct field or laboratory observation, measurement, or testing.

The BERA uses a soil exposure depth of 0 to 6 feet to account for burrowing mammals such as the shrew. While it is true that a shrew species may not burrow as deep as 6 feet, this depth interval was used in the BERA for consistency with other PBOW ERAs that have been performed (i.e., TNT Areas A, B, and C). In addition, the shrew was selected as a "representative" burrowing insectivorous mammal and there may be other burrowing mammals at the site that do burrow to depths approaching six feet. Another reason for use of the 0 to 6 foot depth interval was due, in part, to the limitations of the sampling data. Many of the surface samples represent an interval of 0 to 2 feet, and many of the next depths represent 4 to 6 feet. It was believed that use of only 0 to 2 foot soil data would underestimate burrowing mammal exposure to subsurface COPECs. Based on the previous discussion, there is the potential for overestimation of risk due to using COPEC concentrations from as deep as 6 feet for shrew HI calculations.

The uncertainty analysis is presented in Table 6-21 and this table lists some of the major assumptions made for the BERA; the direction of bias caused by each assumption (i.e., if the uncertainty results in an overestimate or underestimate of risk); the likely magnitude of impact (quantitative [percent difference], or qualitative [high, medium, low, or unknown]); and, if possible, a description of recommendations for minimizing the identified uncertainty.

7.0 Conclusions

The purpose of the BERA was to produce a supplement to the SLERA (IT, 2000a), to provide additional site-specific information to risk managers to allow them to decide if revised estimated ecological hazards to potentially exposed receptors are acceptable. The investigation evaluated current and future risk from environmental media including soil, sediment, and surface water. BERA findings are discussed using a weight of evidence approach (Section 6.4) and weight of evidence conclusions are summarized in the following bullets.

- Elevated PAH concentrations in WARWP soils are an ecological concern due to: (1) measured earthworm toxicity; and (2) predicted RME food-chain impacts to the shrew via biological uptake by prey items such as earthworms.

- Elevated iron concentrations in WARWP sediments are also an ecological concern due to the observation that: (1) concentrations were determined to be potentially deleterious to herons and raccoons using the RME food chain model; and (2) the iron concentrations may be associated with reduced sediment amphipod survival.

- Environmental media at PRRWP do not appear to pose significant unacceptable risks to ecological receptors.

It is important to note that the extent of elevated PAH concentrations in WARWP soil, and the extent of elevated iron concentrations in WARWP sediments appear to be very localized. In addition, the toxicity associated with some RWP site media may not have a significant adverse effect at the population or community levels of biological organization, due to the fact that reductions in survival or reproduction were not more than 25 to 30 percent, compared with the laboratory controls. Finally, the results of the refined food chain model, using the more realistic CT approach, demonstrated no adverse effects.

In light of current site activities (burning for habitat management), CT HI outcomes, biological toxicity text results, and uncertainty analysis discussions, remedial activity based on the results of the BERA is not recommended at this time.

8.0 References

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TABLES

Table 3-1

Measurement and Assessment Endpoints
Plum Brook Ordnance Works, Sandusky, Ohio

Assessment Goal	Assessment Endpoint	Null Hypothesis (H_o)	Selected Receptor and Exposure Routes	Measurement Endpoint
Protection of terrestrial ecosystem structure and function.	Protection of long-term survival and reproductive capabilities for soil invertebrate populations.	The presence of site contaminants within surficial soils will have no adverse effect on survival and reproductive capabilities of terrestrial invertebrates.	Terrestrial invertebrates ingestion of soil and direct exposure to soil	Survival and growth of earthworms in site-specific soil bioassays
	Protection of long-term survival and reproductive capabilities for herbivorous mammal populations.	The presence of site contaminants within surface and subsurface soils, surface water, and vegetation will have no adverse effect on survival and reproductive capabilities of herbivorous mammals.	Eastern cottontail (*Sylvilagus floridanus*) white-tailed deer (*Odocoileus virginianus*) ingestion of plants, water, and incidental soil	Comparison of total daily dose to species-specific toxicity endpoint values (TEV) using refined food chain model.
	Protection of long-term survival and reproductive capabilities for omnivorous mammal populations.	The presence of site contaminants within surface soils, surface water, terrestrial invertebrates and vegetation will have no adverse effect on survival and reproductive capabilities of omnivorous mammals.	Raccoon (*Procyon lotor*) ingestion of terrestrial plants, and invertebrates, small mammals, water and incidental soil	Comparison of total daily dose to species-specific toxicity endpoint values (TEV) using refined food chain model.
	Protection of long-term survival and reproductive capabilities for omnivorous mammal populations.	The presence of site contaminants within surficial soils, surface water, terrestrial invertebrates, and vegetation will have no adverse effect on survival and reproductive capabilities of omnivorous mammals.	Deer mouse (*Peromyscus maniculatus*) ingestion of terrestrial invertebrates, plants, water, and incidental soil	Comparison of total daily dose to species-specific TEVs using refined food chain model.

Table 3-1

Measurement and Assessment Endpoints
Plum Brook Ordnance Works, Sandusky, Ohio

Assessment Goal	Assessment Endpoint	Null Hypothesis (H_o)	Selected Receptor and Exposure Routes	Measurement Endpoint
Protection of terrestrial ecosystem structure and function.	Protection of long-term survival and reproductive capabilities for small insectivorous mammal populations.	The presence of site contaminants within surficial soils, surface water, and terrestrial invertebrates will have no adverse effect on survival and reproductive capabilities of insectivorous mammals.	short-tailed shrew (*Blarnia brevicauda*) ingestion of terrestrial invertebrates, water, and incidental soil	Comparison of total daily dose to species-specific TEVs using refined food chain model.
	Protection of long-term survival and reproductive capabilities for insectivorous bird populations.	The presence of site contaminants within surficial soils, surface water, and terrestrial invertebrates will have no adverse effect on survival and reproductive capabilities of insectivorous birds.	marsh wren (*Cistorthorus palustris*) ingestion of terrestrial invertebrates, water, and incidental soil	Comparison of total daily dose to species-specific TEVs using refined food chain model.

Table 3-1

Measurement and Assessment Endpoints
Plum Brook Ordnance Works, Sandusky, Ohio

Assessment Goal	Assessment Endpoint	Null Hypothesis (H_o)	Selected Receptor and Exposure Routes	Measurement Endpoint
Protection of aquatic ecosystem structure and function.	Protection of long-term survival and reproductive capabilities for benthic invertebrate populations.	The presence of site contaminants within sediments and surface water will have no adverse effect on survival and reproductive capabilities of benthic invertebrates.	Benthic invertebrates ingestion of sediment and direct exposure to surface water	Survival and growth of *Hyalella azteca* in site-specific sediment bioassays.
	Protection of long-term survival and reproductive capabilities for aquatic vertebrate (fin fish) populations.	The presence of site contaminants within surface water, benthic invertebrates, and plants will have no adverse effect on survival and reproductive capabilities of aquatic vertebrates.	aquatic vertebrates ingestion of benthic invertebrates, plants, and direct exposure to water	Survival and growth of fathead minnows and survival and reproduction of cladocerans in site-specific surface water bioassays.
	Protection of long-term survival and reproductive capabilities for semi-aquatic omnivorous mammal populations (also considered in the terrestrial assessment).	The presence of site contaminants within surface water, sediments, aquatic invertebrates, and fish have no adverse effect on survival and reproductive capabilities of aquatic mammals.	raccoon (*Procyon lotor*) ingestion of aquatic invertebrates, fish, water and incidental sediment	Comparison of total daily dose to species-specific TEVs using refined food chain model.
	Protection of long-term survival and reproductive capabilities for piscivorous bird populations.	The presence of site contaminants within aquatic vertebrates and benthic invertebrates will have no adverse effect on survival and reproductive capabilities of piscivorous birds.	great blue heron (*Ardea herodias*) ingestion of aquatic vertebrates, benthic invertebrates, water, and incidental sediment	Comparison of total daily dose to species-specific TEVs using refined food chain model.

Table 5-1

West Area Ecological Samples
Red Water Ponds, PBOW, Sandusky, Ohio

Soil/Water Samples	Tissue Samples	Analytical Suite	Comments
Earthworm COPEC Uptake Estimates			
Soil	Earthworm Tissue	Analytical	Comments
AD0001	AD4011	Nitroaromatics, PAHs	Uptake study run
AD0002	AD4012	Nitroaromatics, PAHs	
AD0003	AD4013	Nitroaromatics, PAHs	
AD0004	AD4014	Nitroaromatics, PAHs	
AD0005	AD4015	Nitroaromatics, PAHs	
Fish COPEC Uptake Estimates			
Surface Water	Fish Tissue	Analytical	
AD2001 (not collected	AD4001	Metals, Lipids in fish	Results from AD2006 AD2010 used for metal surface water concentrations. Only enough fish biomass collected for four samples.
AD2002 (not collected	AD4002	Metals, Lipids in fish	
AD2003 (not collected	AD4003	Metals, Lipids in fish	
AD2004 (not collected	AD4004	Metals, Lipids in fish	
AD2005 (not collected	*AD4005 (not collected)*	NA	
	AD4006 (not collected)	NA	
	AD4007 (not collected)	NA	
	AD4008 (not collected)	NA	
	AD4009 (not collected)	NA	
	AD4010 (not collected)	NA	
Surface Water Toxicity			
Surface Water		Analytical	
AD2006		Metals	Toxicity study completed
AD2007		Metals	
AD2008		Metals	
AD2009		Metals	
AD2010		Metals	
Aquatic Invertebrate COPEC Uptake Estimates			
Sediment	Aquatic Worm Tissue	Analytical	
AD1001	AD4016	Metals, Nitroaromatics, TOC in Sediment	Uptake study run
AD1002	AD4017	Metals, Nitroaromatics, TOC in Sediment	
AD1003	AD4018	Metals, Nitroaromatics, TOC in Sediment	
AD1004	AD4019	Metals, Nitroaromatics, TOC in Sediment	
AD1005	AD4020	Metals, Nitroaromatics, TOC in Sediment	
Sediment Toxicity			
Sediment		Analytical	
AD1006		Metals	Toxicity study completed
AD1007		Metals	
AD1008		Metals	
AD1009		Metals	
AD1010		Metals	
Background			
Soil		Analytical	
AE0004		Metals, PAHs	Collected
AE0005		Metals, PAHs	
AE0006		Metals, PAHs	
Surface Water		Analytical	
AE2004		Metals	Collected
AE2005		Metals	
AE2006		Metals	
Sediment		Analytical	
AE1004		Metals	Collected
AE1005		Metals	
AE1006		Metals	

Note: Shaded text indicates samples not collected, or study not run, as proposed in the Work Plan. See comments for explanation.
COPEC - Constituent of potential ecological concern.
NA - Not Applicable
PAH - Polynuclear aromatic hydrocarbon.
TOC - Total organic carbon.

Table 5-2

Pentolite Road Ecological Samples
Red Water Ponds, PBOW, Sandusky, Ohio

Soil/Water Samples	Tissue Samples	Analytical Suite	Comments
Earthworm COPEC Uptake Estimates			
Soil	Earthworm Tissue Samples	Analytical	Comments
AC0001	AC4011	Nitroaromatics	COPECs not detected in some soil samples, thus uptake study not run.
AC0002	*AC4012 (uptake study not run)*	Nitroaromatics	
AC0003	*AC4013 (uptake study not run)*	Nitroaromatics	
AC0004	*AC4014 (uptake study not run)*	Nitroaromatics	
AC0005	*AC4015 (uptake study not run)*	Nitroaromatics	
Fish COPEC Uptake Estimates			
Surface Water	Fish Tissue Samples	Analytical	
AC2001 (not collected)	AC4001 (fatheads)	Metals, Lipids in tiss	Results from AC 2006 AC2010 used for metal surface water concentrations. Only enough biomass for three samples.
AC2002 (not collected)	AC4002 (tadpoles)	Metals, Lipids in tiss	
AC2003 (not collected)	AC4003 (crayfish)	Metals, Lipids in tiss	
AC2004	*AC4004 (not collected)*	Metals	
AC2005 (not collected)	*AC4005 (not collected)*	NA	
	AC4006 (not collected)	NA	
	AC4007 (not collected)	NA	
	AC4008 (not collected)	NA	
	AC4009 (not collected)	NA	
	AC4010 (not collected)	NA	
Surface Water Toxicity			
Surface Water		Analytical	
AC2006		Metals	Toxicity study completed
AC2007		Metals	
AC2008		Metals	
AC2009		Metals	
AC2010		Metals	
Aquatic Invertebrate COPEC Uptake Estimates			
Sediment	Acquatic Worm Tissue	Analytical	
AC1001	*AC4016 (uptake study not run)*	Metals, SVOCs	COPECs not detected in sediment samples, thus uptake study not run.
AC1002	*AC4017 (uptake study not run)*	Metals, SVOCs	
AC1003	*AC4018 (uptake study not run)*	Metals, SVOCs	
AC1004	*AC4019 (uptake study not run)*	Metals, SVOCs	
AC1005	*AC4020 (uptake study not run)*	Metals, SVOCs	
Background			
Soil		Analytical	
AE0001		Metals, PAHs	Samples collected
AE0002		Metals, PAHs	
AE0003		Metals, PAHs	
Surface Water		Analytical	
AE2001		Metals	Samples collected
AE2002		Metals	
AE2003		Metals	
Sediment		Analytical	
AE1001		Metals	Samples collected
AE1002		Metals	
AE1003		Metals	

Note: Shaded text indicates samples not collected, or study not run, as proposed in the Work Plan. See comments for explanation.

COPEC - Constituent of potential ecological concern.

NA - Not Applicable.

PAH - Polynuclear aromatic hydrocarbon.

SVOC - Semivolatile organic compound.

Table 5-3

Summary of Analytical Methods for Soil, Sediment, and Tissue Samples
Red Water Ponds, PBOW, Sandusky, Ohio

Parameter Name	Soil, Sediment and Tissue Method Number	Surface Water Method Number
Nitroaromatics	8330	NA
Total Inorganics[a]	6010B/365.3	6010B/365.3
Total Organic Carbon	9060	NA
Lipids in Tissue	STL-M-LIPIDS-REV3	NA
Semivolatile Organic Compounds	8270C	NA
Polynuclear Aromatic Hydrocarbons	8310	NA
Toxicity	USEPA (2000)	Weber (1989)
Bioaccumulation in Soil	Linder (1992)	NA
Bioaccumulation in Sediment	USEPA (2000)	NA

[a] Total inorganics include 18 key constituents of concern for the Red Water Pond Areas as follows:

Aluminum	Lead
Antimony	Magnesium
Arsenic	Manganese
Barium	Nickel
Calcium	Phosphorus
Chromium	Potassium
Cobalt	Sodium
Copper	Vanadium
Iron	Zinc

Table 5-4

Summary of Detected Constituents
Pentolite Road Red Water Pond - Abiotic Samples
Red Water Ponds, PBOW, Sandusky, Ohio

SEDIMENT

		GROUP_NAME	PRRP			PRRP			PRRP			PRRP			PRRP		
		LOCATION_CODE	PRWP-SD001			PRWP-SD002			PRWP-SD003			PRWP-SD004			PRWP-SD005		
		SAMPLE_NO	AC1001			AC1002			AC1003			AC1004			AC1005		
		SAMPLE_DATE	15-Sep-00			15-Sep-00			15-Sep-00			15-Sep-00			15-Sep-00		
		START_DEPTH	0			0			0			0			0		
		END_DEPTH	0			0.5			0.5			0.5			0.5		
		SAMPLE_PURPOSE	REG			REG			REG			REG			REG		
Parameter	Units	Filtered	Result	Qual	ValQual	Result	Qual	ValQual	Result	Qual	ValQual	Result	Qual	ValQual	Result	Qual	ValQual
GEN CHEMISTRY																	
% Solids	Percent	N															
Phosphorous	mg/kg	N	138												87.4		
Total organic carbon	mg/kg	N	24800			25900			9040			5190			10400		
METALS																	
Aluminum	mg/kg	N	6520			5570			8420			5840			6880		
Arsenic	mg/kg	N	5.7			5.6			5			6.3			7.7		
Barium	mg/kg	N	100			63.3			62.5			55.1			49		
Calcium	mg/kg	N	93400			44500			48700			39400			27500		
Chromium	mg/kg	N	12.6			10.1			13.8			10.3			12.2		
Cobalt	mg/kg	N	6.7			6.2			8.8			7			6.7		
Copper	mg/kg	N	17.2			14.8			19.6			13.9			13.7		
Iron	mg/kg	N	15500			13700			19800			15800			18100		
Lead	mg/kg	N	9.8		J	9.4		J	9.5		J	7.2		J	9		J
Magnesium	mg/kg	N	11200			9140			15900			12400			6920		
Manganese	mg/kg	N	491			310			461			361			1050		
Nickel	mg/kg	N	16.2		J	15.1		J	22.9		J	17.1		J	16.6		J
Potassium	mg/kg	N	1530		B	1170		B	2480		J	1650		J	1520		B
Sodium	mg/kg	N	158			113			174			138			118		
Vanadium	mg/kg	N	19.3		B	16.5		B	23.5		B	19.9		B	22.3		B
Zinc	mg/kg	N	130			135			47.8			36.2			50.5		
SEMIVOLATILES																	
Benzo(a)anthracene	µg/kg	N	67	J	J												
Benzo(a)pyrene	µg/kg	N	82	J	J												
Benzo(b)fluoranthene	µg/kg	N	100	J	J												
Benzo(k)fluoranthene	µg/kg	N	68	J	J												
Chrysene	µg/kg	N	100	J	J												
Fluoranthene	µg/kg	N	140	J	J												
Phenanthrene	µg/kg	N	96	J	J												
Pyrene	µg/kg	N	190	J	J												

Table 5-4

Summary of Detected Constituents
Pentolite Road Red Water Pond - Abiotic Samples
Red Water Ponds, PBOW, Sandusky, Ohio

SEDIMENT

		GROUP_NAME	BCG			BCG			BCG		
		LOCATION_CODE	BCG-SD001			BCG-SD002			BCG-SD003		
		SAMPLE_NO	AE1001			AE1002			AE1003		
		SAMPLE_DATE	15-Sep-00			15-Sep-00			15-Sep-00		
		START_DEPTH	0			0			0		
		END_DEPTH	1			1			1		
		SAMPLE_PURPOSE	REG			REG			REG		
Parameter	Units	Filtered	Result	Qual	ValQual	Result	Qual	ValQual	Result	Qual	ValQual
GEN CHEMISTRY											
% Solids	Percent	N	40.9			14.8			39.5		
Phosphorous	mg/kg	N				530					
Total organic carbon	mg/kg	N									
METALS											
Aluminum	mg/kg	N	6190		J	11400		J	10400		J
Arsenic	mg/kg	N	7.4		J	3.4		J	6.1		J
Barium	mg/kg	N	51.5		J	86.2		J	58.3		J
Calcium	mg/kg	N	34500		J	79100		J	47900		J
Chromium	mg/kg	N	13.7		J	17.1		J	15.5		J
Cobalt	mg/kg	N	6.6		J	8.1		J	9.5		J
Copper	mg/kg	N	16.9			21			20.3		
Iron	mg/kg	N	14100		J	20900		J	19500		J
Lead	mg/kg	N	13.1		J	18.9		J	15		J
Magnesium	mg/kg	N	10300		J	7940		J	8480		J
Manganese	mg/kg	N	275		J	1330		J	575		J
Nickel	mg/kg	N	16.2		J	22.5		J	23		J
Potassium	mg/kg	N	1210		J	3240		J	2110		J
Sodium	mg/kg	N	776			1060			955		
Vanadium	mg/kg	N	18.9		J	26.2		J	26.4		J
Zinc	mg/kg	N	96		J	118		J	66		J
SEMIVOLATILES											
Benzo(a)anthracene	µg/kg	N									
Benzo(a)pyrene	µg/kg	N									
Benzo(b)fluoranthene	µg/kg	N									
Benzo(k)fluoranthene	µg/kg	N									
Chrysene	µg/kg	N									
Fluoranthene	µg/kg	N									
Phenanthrene	µg/kg	N									
Pyrene	µg/kg	N									

Table 5-4

Summary of Detected Constituents
Pentolite Road Red Water Pond - Abiotic Samples
PBOW, Sandusky, Ohio

SURFACE SOIL

		GROUP_NAME	PRRP			PRRP			BCG			BCG			BCG		
		LOCATION_CODE	PRWP-SO001			PRWP-SO001			BCG-SO001			BCG-SO002			BCG-SO003		
		SAMPLE_NO	AC0001			AC0006			AE0001			AE0002			AE0003		
		SAMPLE_DATE	15-Sep-00			15-Sep-00			12-Sep-00			12-Sep-00			12-Sep-00		
		START_DEPTH	0			0			0			0			0		
		END_DEPTH	1			1			1			1			1		
		SAMPLE_PURPOSE	REG			FD			REG			REG			REG		
Parameter	Units	Filtered	Result	Qual	ValQual	Result	Qual	ValQual	Result	Qual	ValQual	Result	Qual	ValQual	Result	Qual	ValQual
GEN CHEMISTRY																	
% Solids	Percent	N							72.4			75			66.8		
Phosphorous	mg/kg	N										10.7			141		
METALS																	
Aluminum	mg/kg	N							10600		J	10400		J	7900		J
Arsenic	mg/kg	N							9.3		J	4.5		J	5.1		J
Barium	mg/kg	N							104		J	48.8		J	110		J
Calcium	mg/kg	N							5740		J	4550		J	5930		J
Chromium	mg/kg	N							14.8		J	14.2		J	12.1		J
Cobalt	mg/kg	N							7.1		J	4.3		J	4.8		J
Copper	mg/kg	N							14.2			12.4			10.9		
Iron	mg/kg	N							26200		J	14700		J	17900		J
Lead	mg/kg	N							12.8		J	11.6		J	12.8		J
Magnesium	mg/kg	N							2320		J	2180		J	1540		J
Manganese	mg/kg	N							465		J	152		J	605		J
Nickel	mg/kg	N							17.4		J	14.8		J	13.1		J
Potassium	mg/kg	N							1010		J	1250		J	683		J
Sodium	mg/kg	N							774			732			686		
Vanadium	mg/kg	N							28.9		J	21.7		J	22.1		J
Zinc	mg/kg	N							46.8		J	38.2		J	32.1		J
NITROAROMATICS																	
2,4-Dinitrotoluene	µg/kg	N	1200			680											
SEMIVOLATILES																	
Anthracene	mg/kg	N										0.0009	J	J	0.001	J	J
Benzo(a)anthracene	mg/kg	N							0.0071			0.0059			0.01		
Benzo(a)pyrene	mg/kg	N							0.01			0.0087			0.016		
Benzo(b)fluoranthene	mg/kg	N							0.01			0.0081			0.0078		
Benzo(k)fluoranthene	mg/kg	N							0.004			0.0038			0.0062		
Chrysene	mg/kg	N							0.01			0.009			0.012		
Fluoranthene	mg/kg	N							0.023			0.021			0.032		
Indeno(1,2,3-cd)pyrene	mg/kg	N							0.0084			0.0058			0.028		
Phenanthrene	mg/kg	N							0.0098			0.01			0.017		
Pyrene	mg/kg	N							0.017			0.016			0.025		

Table 5-4

Summary of Detected Constituents
Pentolite Road Red Water Pond - Abiotic Samples
PBOW, Sandusky, Ohio

SURFACE WATER

		GROUP_NAME	PRRP			PRRP			PRRP			PRRP			PRRP			PRRP		
		LOCATION_CODE	PRWP-SW004			PRWP-SW006			PRWP-SW007			PRWP-SW008			PRWP-SW009			PRWP-SW010		
		SAMPLE_NO	AC2004			AC2006			AC2007			AC2008			AC2009			AC2010		
		SAMPLE_DATE	14-Sep-00			14-Sep-00			14-Sep-00			14-Sep-00			14-Sep-00			14-Sep-00		
		SAMPLE_PURPOSE	REG			REG			REG			REG			REG			REG		
Parameter	Units	Filtered	Result	Qual	ValQual	Result	Qual	ValQual	Result	Qual	ValQual	Result	Qual	ValQual	Result	Qual	ValQual	Result	Qual	ValQual
GEN CHEMISTRY																				
Phosphorous	mg/L	N				0.05			0.066			0.12			0.051			0.086		
METALS																				
Aluminum	µg/L	N	712						137			237						494		
Barium	µg/L	N	88.6			74.1			82.5			86.9			83.1			89.7		
Calcium	µg/L	N	109000			107000			118000			117000			118000			113000		
Chromium	µg/L	N	1.2			1.1			0.8			0.9			1.9			0.9		
Cobalt	µg/L	N	1.8																	
Copper	µg/L	N	2.4			1.8			1.8			1.8						7.4		
Iron	µg/L	N	1220			388			364			608			314			1010		
Magnesium	µg/L	N	26000			24400			27100			27100			27300			26400		
Manganese	µg/L	N	149			104			106			148			101			147		
Nickel	µg/L	N	1.7																	
Potassium	µg/L	N	2330			1870			2100			2190			2110			2090		
Sodium	µg/L	N	9510			8950			9910			9790			9920			9620		
Vanadium	µg/L	N	7.2		B	3.6		B	4.1		B	5		B	4.4		B	4.3		B
Zinc	µg/L	N	54.3		J	14		J	13		J	15.2		J	12.1		J	14		J

Table 5-4

Summary of Detected Constituents
Pentolite Road Red Water Pond - Abiotic Samples
PBOW, Sandusky, Ohio

SURFACE WATER

		GROUP_NAME	BCG			BCG			BCG		
		LOCATION_CODE	BCG-SW001			BCG-SW002			BCG-SW003		
		SAMPLE_NO	AE2001			AE2002			AE2003		
		SAMPLE_DATE	15-Sep-00			15-Sep-00			15-Sep-00		
		SAMPLE_PURPOSE	REG			REG			REG		
Parameter	Units	Filtered	Result	Qual	ValQual	Result	Qual	ValQual	Result	Qual	ValQual
GEN CHEMISTRY											
Phosphorous	mg/L	N	0.11			0.084					
METALS											
Aluminum	µg/L	N	270			435					
Barium	µg/L	N	77.2			37.4			32.7		
Calcium	µg/L	N	105000			109000			113000		
Chromium	µg/L	N	0.9		B	1.1		B	1.1		B
Cobalt	µg/L	N									
Copper	µg/L	N	2.3			2.2			1.7		
Iron	µg/L	N	717			1070			618		
Magnesium	µg/L	N	24800			22700			23100		
Manganese	µg/L	N	109			357			332		
Nickel	µg/L	N				1.6					
Potassium	µg/L	N	2050			3050			2990		
Sodium	µg/L	N	9660			24600			21200		
Vanadium	µg/L	N	4.5		B	4.7		B	5.2		B
Zinc	µg/L	N	45.9			11			4.4		B

Table 5-4

Summary of Detected Constituents
Pentolite Road Red Water Pond - Abiotic Samples
Red Water Ponds, PBOW, Sandusky, Ohio

NOTES

Laboratory Qualifiers
J - Result was less than the reporting limit but greater than the instrument detection limit (value is estimated).
B - Analyte was detected in an associated method blank.

Validation Qualifiers
J - Estimated value.
B - Analyte was detected in an associated method blank.

mg/kg - Milligrams per kilogram.
mg/L - Milligrams per liter.
µg/kg - Micrograms per kilogram.
µg/L - Micrograms per liter.
Qual - Laboratory qualifier.
ValQual - Validation qualifier.
REG - Field sample.

Filtered
N - No (applicable to surface water only).

For all analytical results, see Appendix C.

Table 5-5

Summary of Detected Constituents
West Area Red Water Pond - Abiotic Samples
Red Water Ponds, PBOW, Sandusky, Ohio

SEDIMENT

		GROUP_NAME	WARP			WARP			WARP			WARP			WARP			WARP		
		LOCATION_CODE	WRWP-SD001			WRWP-SD001			WRWP-SD002			WRWP-SD003			WRWP-SD004			WRWP-SD005		
		SAMPLE_NO	AD1001			AD1011			AD1002			AD1003			AD1004			AD1005		
		SAMPLE_DATE	14-Sep-00			14-Sep-00			14-Sep-00			14-Sep-00			14-Sep-00			14-Sep-00		
		START_DEPTH	0			0			0			0			0			0		
		END_DEPTH	1			1			1			1			1			1		
		SAMPLE_PURPOSE	REG			FD			REG			REG			REG			REG		
Parameter	Units	Filtered	Result	Qual	ValQual	Result	Qual	ValQual	Result	Qual	ValQual	Result	Qual	ValQual	Result	Qual	ValQual	Result	Qual	ValQual
GEN CHEMISTRY																				
% Solids	Percent	N																		
Phosphorous	mg/kg	N	17.5									29.9						35.2		
Total organic carbon	mg/kg	N	17300						17300			17100			36600			38000		
METALS																				
Aluminum	mg/kg	N	9150			7800			8690			17600			10600			12300		
Antimony	mg/kg	N																		
Arsenic	mg/kg	N	5.1			3.4			3.6			7.7			4.3			4.9		
Barium	mg/kg	N	83.9			46.1			46			126			94.4			102		
Calcium	mg/kg	N	3220			3650			2710			2890			2880			3570		
Chromium	mg/kg	N	12.9			10.6			11.7			22.3			13.9			16.5		
Cobalt	mg/kg	N	8.9			5.5			6.4			11.3			13.1			15.2		
Copper	mg/kg	N	12.5			9.4			9.2			18.3			15.5			17.6		
Iron	mg/kg	N	18000			13200			14100			29300			17600			20900		
Lead	mg/kg	N	25		J	17			14.1		J	23.4		J	14.7		J	19.8		J
Magnesium	mg/kg	N	2630			2390			2390			3880			2900			3460		
Manganese	mg/kg	N	301			157			142			371			321			347		
Nickel	mg/kg	N	16.7		J	11			12.3		J	29		J	23.6		J	23.6		J
Potassium	mg/kg	N	1070		B	855			937		B	2420		J	1490		B	1880		J
Sodium	mg/kg	N	549			755			268			488			420			426		
Vanadium	mg/kg	N	20.2		B	16.6		B	18		B	36.5		B	20.5		B	24.8		B
Zinc	mg/kg	N	56.8			42.7		J	47.2			94.8			77.6			77.2		

Table 5-5

Summary of Detected Constituents
West Area Red Water Pond - Abiotic Samples
Red Water Ponds, PBOW, Sandusky, Ohio

SEDIMENT

		GROUP_NAME	WARP			WARP			WARP			WARP			WARP			BCG		
		LOCATION_CODE	WRWP-SD006			WRWP-SD007			WRWP-SD008			WRWP-SD009			WRWP-SD010			BCG-SD004		
		SAMPLE_NO	AD1006			AD1007			AD1008			AD1009			AD1010			AE1004		
		SAMPLE_DATE	13-Sep-00			14-Sep-00			14-Sep-00			13-Sep-00			13-Sep-00			15-Sep-00		
		START_DEPTH	0			0			0			0			0			0		
		END_DEPTH	1			1			1			1			1			0.5		
		SAMPLE_PURPOSE	REG			REG			REG			REG			REG			REG		
Parameter	Units	Filtered	Result	Qual	ValQual	Result	Qual	ValQual	Result	Qual	ValQual	Result	Qual	ValQual	Result	Qual	ValQual	Result	Qual	ValQual
GEN CHEMISTRY																				
% Solids	Percent	N																63.1		
Phosphorous	mg/kg	N				236			221			208								
Total organic carbon	mg/kg	N																		
METALS																				
Aluminum	mg/kg	N	6930			9270			16400			2170			3630			4920		J
Antimony	mg/kg	N	0.83		J															
Arsenic	mg/kg	N	4.9			3.5			5.5			2.9			3.1			3.9		J
Barium	mg/kg	N	62.5			92.2			154			19.2			26.9			40		J
Calcium	mg/kg	N	11000			3400			6470			8810			7990			10900		J
Chromium	mg/kg	N	12			12.7			22			3.7		B	5.8			7.4		J
Cobalt	mg/kg	N	10.5			7.7			15			4.9			6.4			8.2		J
Copper	mg/kg	N	13.2			19.7			23.4			5.6			9.8			12.1		
Iron	mg/kg	N	13800			16300			24200			7490			8790			11400		J
Lead	mg/kg	N	27.3		J	18		J	68.5		J	5		J	7.5		J	9.1		J
Magnesium	mg/kg	N	2780			2780			5170			1750			1900			2200		J
Manganese	mg/kg	N	283			230			637			178			183			390		J
Nickel	mg/kg	N	14.3		J	20.8		J	36.5		J	10.6		J	14.8		J	20.2		J
Potassium	mg/kg	N	838		B	1040		B	3230		J	596		B	804		B	916		J
Sodium	mg/kg	N	553			860			1890			63.5			93.7			513		
Vanadium	mg/kg	N	15.7		B	18.7		B	30.1		B	6.4		B	9.4		B	11.2		J
Zinc	mg/kg	N	45.7			60.2			117			24.7			36.7			45.6		J

Table 5-5

Summary of Detected Constituents
West Area Red Water Pond - Abiotic Samples
Red Water Ponds, PBOW, Sandusky, Ohio

SEDIMENT

	GROUP_NAME		BCG			BCG		
	LOCATION_CODE		BCG-SD005			BCG-SD006		
	SAMPLE_NO		AE1005			AE1006		
	SAMPLE_DATE		15-Sep-00			15-Sep-00		
	START_DEPTH		0			0		
	END_DEPTH		0.5			0.5		
	SAMPLE_PURPOSE		REG			REG		
Parameter	Units	Filtered	Result	Qual	ValQual	Result	Qual	ValQual
GEN CHEMISTRY								
% Solids	Percent	N	60.8			71		
Phosphorous	mg/kg	N	12.3					
Total organic carbon	mg/kg	N						
METALS								
Aluminum	mg/kg	N	7680		J	6260		J
Antimony	mg/kg	N						
Arsenic	mg/kg	N	5.2		J	3.5		J
Barium	mg/kg	N	48		J	40		J
Calcium	mg/kg	N	9750		J	8190		J
Chromium	mg/kg	N	10.5		J	8.7		J
Cobalt	mg/kg	N	9.3		J	7.6		J
Copper	mg/kg	N	13.6			11.6		
Iron	mg/kg	N	14700		J	11700		J
Lead	mg/kg	N	12.2		J	9.9		J
Magnesium	mg/kg	N	3070		J	2340		J
Manganese	mg/kg	N	321		J	279		J
Nickel	mg/kg	N	21.7		J	17.6		J
Potassium	mg/kg	N	1440		J	1140		J
Sodium	mg/kg	N	744			605		
Vanadium	mg/kg	N	17		J	14.2		J
Zinc	mg/kg	N	56.3		J	44.3		J

Table 5-5

Summary of Detected Constituents
West Area Red Water Pond - Abiotic Samples
Red Water Ponds, PBOW, Sandusky, Ohio

SURFACE SOIL

		GROUP_NAME	WARP			WARP			WARP			WARP		
		LOCATION_CODE	WRWP-SO001			WRWP-SO002			WRWP-SO003			WRWP-SO004		
		SAMPLE_NO	AD0001			AD0002			AD0003			AD0004		
		SAMPLE_DATE	15-Sep-00			15-Sep-00			15-Sep-00			15-Sep-00		
		START_DEPTH	0			0			0			0		
		END_DEPTH	1			1			1			1		
		SAMPLE_PURPOSE	REG			REG			REG			REG		
Parameter	Units	Filtered	Result	Qual	ValQual	Result	Qual	ValQual	Result	Qual	ValQual	Result	Qual	ValQual
GEN CHEMISTRY														
% Solids	Percent	N												
Phosphorous	mg/kg	N												
METALS														
Aluminum	mg/kg	N												
Arsenic	mg/kg	N												
Barium	mg/kg	N												
Calcium	mg/kg	N												
Chromium	mg/kg	N												
Cobalt	mg/kg	N												
Copper	mg/kg	N												
Iron	mg/kg	N												
Lead	mg/kg	N												
Magnesium	mg/kg	N												
Manganese	mg/kg	N												
Nickel	mg/kg	N												
Potassium	mg/kg	N												
Sodium	mg/kg	N												
Vanadium	mg/kg	N												
Zinc	mg/kg	N												
SEMIVOLATILES														
Anthracene	µg/kg	N	3.6											
Benzo(a)anthracene	µg/kg	N	25			49	J	J	5.9			3.6	J	J
Benzo(a)pyrene	µg/kg	N	39			7.4			9.9			5.5		
Benzo(b)fluoranthene	µg/kg	N	33			6			9.5			4.8		
Benzo(ghi)perylene	µg/kg	N	16											
Benzo(k)fluoranthene	µg/kg	N	19	D		3.3			3.9			2.6		
Chrysene	µg/kg	N	26			6.7			8.2			4.7	J	J
Dibenz(a,h)anthracene	µg/kg	N	22						9.5	J	J			
Fluoranthene	µg/kg	N	76			17			21			13		
Fluorene	µg/kg	N				6	J	J	7.4	J	J	6.9	J	J
Indeno(1,2,3-cd)pyrene	µg/kg	N	29			6.8			8.3			4.6	J	J
Phenanthrene	µg/kg	N	32			33			40			40		
Pyrene	µg/kg	N	55			120			15			9	J	J

Table 5-5

Summary of Detected Constituents
West Area Red Water Pond - Abiotic Samples
Red Water Ponds, PBOW, Sandusky, Ohio

SURFACE SOIL

		GROUP_NAME	WARP			BCG			BCG			BCG		
		LOCATION_CODE	WRWP-SO005			BCG-SO004			BCG-SO005			BCG-SO006		
		SAMPLE_NO	AD0005			AE0004			AE0005			AE0006		
		SAMPLE_DATE	15-Sep-00			12-Sep-00			12-Sep-00			12-Sep-00		
		START_DEPTH	0			0			0			0		
		END_DEPTH	1.5			1			1			1		
		SAMPLE_PURPOSE	REG			REG			REG			REG		
Parameter	Units	Filtered	Result	Qual	ValQual	Result	Qual	ValQual	Result	Qual	ValQual	Result	Qual	ValQual
GEN CHEMISTRY														
% Solids	Percent	N				80.8			79.7			80.8		
Phosphorous	mg/kg	N				9.1			29.5					
METALS														
Aluminum	mg/kg	N				8280		J	6970		J	6330		J
Arsenic	mg/kg	N				2.3		J	2.6		J	2		J
Barium	mg/kg	N				39.2		J	34.4		J	44.3		J
Calcium	mg/kg	N				1350		J	2300		J	2830		J
Chromium	mg/kg	N				8.4		J	8.1		J	6.3		J
Cobalt	mg/kg	N				2.5		J	2.5		J	2.3		J
Copper	mg/kg	N				4.7		B	5.5		B	8.4		B
Iron	mg/kg	N				10600		J	9890		J	8230		J
Lead	mg/kg	N				7		J	10.4		J	8.3		J
Magnesium	mg/kg	N				949		J	904		J	832		J
Manganese	mg/kg	N				242		J	216		J	277		J
Nickel	mg/kg	N				7.5		J	6.8		J	5.8		J
Potassium	mg/kg	N				430		B	384		J	381		B
Sodium	mg/kg	N				548			469			436		
Vanadium	mg/kg	N				18.3		J	17.5		J	12.5		J
Zinc	mg/kg	N				97.9		J	34.4		J	33.4		J
SEMIVOLATILES														
Anthracene	µg/kg	N	1	J	J									
Benzo(a)anthracene	µg/kg	N	6.6						0.0049	J	J	0.0048	J	J
Benzo(a)pyrene	µg/kg	N	12			0.0038	J	J	0.0078			0.0078		
Benzo(b)fluoranthene	µg/kg	N	9.9			0.0036			0.0078			0.0074		
Benzo(ghi)perylene	µg/kg	N												
Benzo(k)fluoranthene	µg/kg	N	2.9			0.0018	J	J	0.0035			0.0038		
Chrysene	µg/kg	N	9.2			0.0032	J	J	0.0062			0.0063		
Dibenz(a,h)anthracene	µg/kg	N												
Fluoranthene	µg/kg	N	26			0.0085			0.016			0.017		
Fluorene	µg/kg	N												
Indeno(1,2,3-cd)pyrene	µg/kg	N	8.6			0.0022	J	J	0.0074			0.0048	J	J
Phenanthrene	µg/kg	N	32			0.056			0.068			0.13	D	
Pyrene	µg/kg	N	20			0.0058	J	J	0.012			0.012		

Table 5-5

Summary of Detected Constituents
West Area Red Water Pond - Abiotic Samples
PBOW, Sandusky, Ohio

SURFACE WATER

		GROUP_NAME	WARP			WARP			WARP			WARP			WARP		
		LOCATION_CODE	WRWP-SW006			WRWP-SW007			WRWP-SW008			WRWP-SW009			WRWP-SW010		
		SAMPLE_NO	AD2006			AD2007			AD2008			AD2009			AD2010		
		SAMPLE_DATE	13-Sep-00			13-Sep-00			13-Sep-00			13-Sep-00			13-Sep-00		
		SAMPLE_PURPOSE	REG			REG			REG			REG			REG		
Parameter	Units	Filtered	Result	Qual	ValQual	Result	Qual	ValQual	Result	Qual	ValQual	Result	Qual	ValQual	Result	Qual	ValQual
GEN CHEMISTRY																	
Phosphorous	mg/L	N	0.26			0.37			0.26						0.21		
METALS																	
Aluminum	µg/L	N	286			888			313			13500			2610		
Arsenic	µg/L	N	9.6			7.2			7.1			10.7					
Barium	µg/L	N	18.3			22			20.4			131			57.1		
Calcium	µg/L	N	15400			18800			16000			21800			69600		
Chromium	µg/L	N				2.5		B	1.2		B	19.8			3.3		B
Cobalt	µg/L	N				1.6						18.7			2.1		
Copper	µg/L	N	3			2.9			1.4			20.5			7.2		
Iron	µg/L	N	331			1060			284			26000			2980		
Lead	µg/L	N										16.8			2.8		
Magnesium	µg/L	N	29700			43600			34000			9040			15500		
Manganese	µg/L	N	91.3			265			130			2960			104		
Nickel	µg/L	N	2.1			3.2			2.1			32.7			8.9		
Potassium	µg/L	N	878		B	1810			726		B	12800			5060		
Sodium	µg/L	N	56000			63200			58400			27100			20100		
Vanadium	µg/L	N	7.5		B	9.7		B	7.9		B	32.7		B	7.6		B
Zinc	µg/L	N	14			11.3			31.9			145			19.9		

Table 5-5

Summary of Detected Constituents
West Area Red Water Pond - Abiotic Samples
PBOW, Sandusky, Ohio

SURFACE WATER

		GROUP_NAME	BCG			BCG			BCG		
		LOCATION_CODE	BCG-SW004			BCG-SW005			BCG-SW006		
		SAMPLE_NO	AE2004			AE2005			AE2006		
		SAMPLE_DATE	15-Sep-00			15-Sep-00			15-Sep-00		
		SAMPLE_PURPOSE	REG			REG			REG		
Parameter	Units	Filtered	Result	Qual	ValQual	Result	Qual	ValQual	Result	Qual	ValQual
GEN CHEMISTRY											
Phosphorous	mg/L	N	0.074			0.073			0.085		
METALS											
Aluminum	µg/L	N	478			361			182		
Arsenic	µg/L	N									
Barium	µg/L	N	49.9			50.8			52		
Calcium	µg/L	N	85000			87700			90400		
Chromium	µg/L	N	1.6		B	0.8		B	1		B
Cobalt	µg/L	N				1.1					
Copper	µg/L	N	3.2			2.6			6.7		
Iron	µg/L	N	457			362			201		
Lead	µg/L	N									
Magnesium	µg/L	N	18200			18800			19300		
Manganese	µg/L	N	19.9			19.3			20.4		
Nickel	µg/L	N	4.4			4.3			4.4		
Potassium	µg/L	N	4890			5030			5070		
Sodium	µg/L	N	28000			28200			29000		
Vanadium	µg/L	N	4.7		B	4.9		B	3.9		B
Zinc	µg/L	N	8			6.1			6.1		

Table 5-5

Summary of Detected Constituents
West Area Red Water Pond - Abiotic Samples
PBOW, Sandusky, Ohio

NOTES

Laboratory Qualifers
D - Sample required dilution.
J - Result was less than the reporting limit but greater than the instrument detection limit (value estimated).

Validation Qualifiers
J - Estimated value.
B - Analyte was detected in associated method blank.

µg/kg - Micrograms per kilogram.
µg/L - Micrograms per liter.
mg/kg - Milligrams per kilogram.
mg/L - Milligrams per liter.
REG - Field sample.
FD - Field duplicate.
Qual - Laboratory qualifier.
ValQual - Validation qualifier.

Filtered
N - No (for surface water only).

For all analytical results, see Appendix C.

Table 5-6

Summary of Statistical Tests Comparing Background and Site Data
Plum Brook Ordnance Works, Sandusky, Ohio

Location	Media	COPEC[a]	P-Value[b]	Significant?[c]	Mean Background Rank[d]	Mean Onsite Rank[d]	COPEC Background Related?[e]
West Area RWP	Sediment	Aluminum	0.46	No	4.40	5.75	Yes
		Iron	0.014	Yes	3.00	7.50	No
		Arsenic	0.70	No	12.5	11.2	Yes
		Calcium	0.33	No	4.20	6.00	Yes
		Copper	0.038	Yes	16.8	9.94	Yes
		Phosphorus	0.65	No	2.33	3.00	Yes
	Surface Water	Aluminum	0.54	No	4.50	5.63	Yes
		Iron	0.05	Yes	3.40	7.00	No
		Lead	0.005	Yes	3.40	9.78	No
		Magnesium	0.086	No	3.60	6.75	Yes
		Manganese	0.028	Yes	4.20	9.33	No
		Vanadium	0.055	No	3.60	6.75	Yes
	Soil	Anthracene	0.006	Yes	2.00	12.5	No
		Benzo(a)anthracene	0.006	Yes	2.00	12.5	No
		Benzo(a)pyrene	0.006	Yes	2.00	12.5	No
		Benzo(b)fluoranthene	0.006	Yes	2.00	12.5	No
		Benzo(ghi)perylene	0.006	Yes	2.00	12.5	No
		Benzo(k)fluoranthene	0.006	Yes	2.00	12.5	No
		Chrysene	0.006	Yes	2.00	12.5	No
		Indeno(123-cd)pyrene	0.006	Yes	2.00	12.5	No
		Phenanthrene	0.006	Yes	2.00	12.5	No
Pentolite Road RWP	Sediment	Magnesium	0.062	No	4.20	8.14	Yes
		Potassium	0.17	No	8.20	5.29	Yes
		Carbazole	0.14	No	2.50	5.71	Yes
	Surface Water	Aluminum	0.77	No	6.60	7.25	Yes
		Iron	0.46	No	8.00	6.38	Yes
		Lead	0.72	No	7.40	6.75	Yes
		Manganese	0.66	No	7.60	6.63	Yes
	Soil	Antimony	<0.0001	Yes	92.2	49.6	Yes

See footnotes on page 2.

Table 5-6
Summary of Statistical Tests Comparing Background and Site Data
Plum Brook Ordnance Works, Sandusky, Ohio

[a] Only risk drivers presented, i.e., the COPECs that contributed the majority of the estimated risk in the SLERA.
[b] Calculated using the Mann-Whitney nonparametric statistical test, and tied p-values used.
[c] A p-value of 0.05 or lower is considered statistically significant for a one-tailed test.
[d] Values ranked from lowest to highest, with rank number 1 = lowest rank.
[e] If on-site COPEC mean concentration rank was significantly greater than background mean concentration rank, then the COPEC not considered to be background related. If on-site COPEC mean concentration rank not significantly greater than background mean concentration rank, then the COPEC considered to be background related.

Note: Statistical test details presented in the Appendix D.

Table 5-7

Aquatic Organism Data – Field Counts, Lengths, and Weights
Red Water Ponds, PBOW, Sandusky, Ohio

Location/Sample ID	Species	Count	Total Weight (g)	Average Weight (g)	Lengths (cm)
West Area/AD4001	Fathead minnow	150	240	1.6	3.5 (average)
West Area/AD4002	Green sunfish	29	90	3.1	5.4, 6.0, 4.0, 4.5, 3.8, 6.0, 4.8, 4.4, 6.0, 4.8, 6.2, 5.4, 4.5, 4.5, 5.5, 3.8, 5.0, 6.0, 5.6, 3.4, 6.2, 4.0, 6.0, 3.4, 5.0, 4.4, 3.8, 3.8, 4.0 average = 4.8
West Area/AD4003	Green sunfish	9	115	13	8.0, 7.5, 8.0, 8.2, 8.3, 8.0, 7.5, 7.6, 8.8 average = 8.0
West Area/AD4004	Fathead minnow	170	250	1.5	3.5 (average)
Pentolite Rd/AC4001	Fathead minnow	165	140	0.85	2 - 4, some 7
Pentolite Rd/AC4002	Tadpoles	42	75	1.8	4 and 7 (2 size classes)
Pentolite Rd/AC4003	Crayfish	59	130	2.2	5.0 (average)

g - Grams.
cm - Centimeters.

Table 5-8

Summary of Detected Constituents
Pentolite Road Red Water Pond - Biotic Samples
Red Water Ponds, PBOW, Sandusky, Ohio

		GROUP_NAME	PRRP			PRRP			PRRP		
		LOCATION_CODE	PRWP-BI001			PRWP-BI002			PRWP-BI003		
		SAMPLE_NO	AC4001			AC4002			AC4003		
		SAMPLE_DATE	14-Sep-00			14-Sep-00			14-Sep-00		
		SAMPLE_PURPOSE	REG			REG			REG		
Parameter	Units	Filtered	Result	Qual	ValQual	Result	Qual	ValQual	Result	Qual	ValQual
GEN CHEMISTRY											
Percent Lipids	Percent	N	1.4			1.3			0.69		
Phosphorous	mg/kg	N	124		J	162		J	173		J
METALS											
Aluminum	mg/kg	N	148	*	J	541	*	J	183	*	J
Antimony	mg/kg	N	0.16	B	B	0.13	B	B	0.08	B	B
Arsenic	mg/kg	N				1.5	B	J			
Barium	mg/kg	N	5.9	B	J	24			21.3		
Calcium	mg/kg	N	8310			9670			23200		
Chromium	mg/kg	N	0.72	B	J	1.2			0.56	B	J
Cobalt	mg/kg	N				1	B	B			
Copper	mg/kg	N	0.43	B	J	1.7			16.6		
Iron	mg/kg	N	442	N*	J	2900	N*	J	696	N*	J
Lead	mg/kg	N	0.36	B	B	1.4		B	0.55	B	B
Magnesium	mg/kg	N	541			1360			642		
Manganese	mg/kg	N	16.3			68.8			89.7		
Nickel	mg/kg	N	0.58	B	J	2.2			0.66	B	J
Potassium	mg/kg	N	2440			1840			2120		
Sodium	mg/kg	N	727	B	J	1140			1620		
Vanadium	mg/kg	N	0.58	B	J	1.2	B	J	0.38	B	J
Zinc	mg/kg	N	27.3			26			19.3	B	J

mg/kg - Milligrams per kilogram.
Qual - Laboratory qualifier.
ValQual - Validation qualifier.

Laboratory Qualifiers

B - Analyte detected in laboratory or field blank at concentration greater than the reporting limit (and greater than zero).
N - Spiked sample recovery not within control limits.
* - Duplicate analysis not within control limits.

Validation Qualifiers

J -Estimated value.
B - Analyte was detected in associated method blank.

Table 5-9

Summary of Detected Constituents
West Area Red Water Pond - Biotic Samples
Red Water Ponds, PBOW, Sandusky, Ohio

(Page 1 of 2)

		GROUP_NAME	WARP			WARP			WARP			WARP			WARP			WARP			WARP		
		LOCATION_CODE	WRWP-BI001			WRWP-BI002			WRWP-BI003			WRWP-BI004			WRWP-BI011			WRWP-BI012			WRWP-BI013		
		SAMPLE_NO	AD4001			AD4002			AD4003			AD4004			AD4011			AD4012			AD4013		
		SAMPLE_DATE	13-Sep-00			13-Sep-00			13-Sep-00			13-Sep-00			28-Nov-00			28-Nov-00			28-Nov-00		
		SAMPLE_PURPOSE	REG			REG			REG			REG			REG			REG			REG		
Parameter	Units	Filtered	Result	Qual	ValQual	Result	Qual	ValQual	Result	Qual	ValQual	Result	Qual	ValQual	Result	Qual	ValQual	Result	Qual	ValQual	Result	Qual	ValQual
GEN CHEMISTRY																							
Percent Lipids	Percent	N	1.4			3.9			2.5			1.5											
Phosphorous	mg/kg	N	129		J	37.8		J	54.6		J	152		J									
METALS																							
Aluminum	mg/kg	N	106	*	J	25	*	J	11.8	B*	J	61.9	*	J									
Antimony	mg/kg	N	0.09	B	B	0.09	B	B	0.1	B	B	0.14	B	B									
Arsenic	mg/kg	N																					
Barium	mg/kg	N	10.1	B	J	1.2	B	J				5.7	B	J									
Cadmium	mg/kg	N																					
Calcium	mg/kg	N	9160			12200			5900			6980											
Chromium	mg/kg	N	0.21	B	J	0.12	B	J				0.11	B	J									
Cobalt	mg/kg	N																					
Copper	mg/kg	N	2									0.44	B	J									
Iron	mg/kg	N	234	*	J	37.6	BN*	J	20.8	B*	J	144	N*	J									
Lead	mg/kg	N	0.52	B	B				0.29	B	B	0.39	B	B									
Magnesium	mg/kg	N	456			411			277			377											
Manganese	mg/kg	N	14.7			6			4	B	J	11											
Nickel	mg/kg	N																					
Potassium	mg/kg	N	2460			2800			2600			2380											
Sodium	mg/kg	N	749	B	J	1030			1020			681	B	J									
Vanadium	mg/kg	N	0.44	B	J																		
Zinc	mg/kg	N	46.9			13.1	B	J	21.3	B	J	36.3											
SEMIVOLATILES																							
Acenaphthene	mg/kg	N																0.38		B	0.84		B
Acenaphthylene	mg/kg	N													0.74		B	0.24		B	0.37		B
Fluorene	mg/kg	N													0.018	J	B	0.019		B	0.047		B
Indeno(1,2,3-cd)pyrene	mg/kg	N													0.008	J	B						
Phenanthrene	mg/kg	N													0.099		B	0.032		B	0.017		B

Table 5-9

Summary of Detected Constituents
West Area Red Water Pond - Biotic Samples
Red Water Ponds, PBOW, Sandusky, Ohio

		GROUP_NAME	WARP			WARP			WARP			WARP			WARP			WARP			WARP		
		LOCATION_CODE	WRWP-BI014			WRWP-BI015			WRWP-BI016			WRWP-BI017			WRWP-BI018			WRWP-BI019			WRWP-BI020		
		SAMPLE_NO	AD4014			AD4015			AD4016			AD4017			AD4018			AD4019			AD4020		
		SAMPLE_DATE	28-Nov-00			28-Nov-00			1-Dec-00			1-Dec-00			1-Dec-00			1-Dec-00			1-Dec-00		
		SAMPLE_PURPOSE	REG			REG			REG			REG			REG			REG			REG		
Parameter	Units	Filtered	Result	Qual	ValQual	Result	Qual	ValQual	Result	Qual	ValQual	Result	Qual	ValQual	Result	Qual	ValQual	Result	Qual	ValQual	Result	Qual	ValQual
GEN CHEMISTRY																							
Percent Lipids	Percent	N																					
Phosphorous	mg/kg	N							0.037		B	0.056		B	0.047		B	0.098		B	0.146		B
METALS																							
Aluminum	mg/kg	N							70.1			25.5			17.6	B	J	47.8			17.1	B	J
Antimony	mg/kg	N																					
Arsenic	mg/kg	N							2	B	B	1.5	B	B	2	B	B	2.9	B	B	2.1	B	B
Barium	mg/kg	N							58.9		B	65.8		B	69.1		B	72.8		B	50		B
Cadmium	mg/kg	N							0.05	B	B	0.04	B	B	0.06	B	B	0.05	B	B			
Calcium	mg/kg	N							236		B	170	B	B	182	B	B	205		B	215		B
Chromium	mg/kg	N							0.33	B	B	0.27	B	B	0.28	B	B	0.26	B	B	0.13	B	B
Cobalt	mg/kg	N							0.28	B	B	0.21	B	B	0.18	B	B	0.31	B	B	0.38	B	B
Copper	mg/kg	N							3	*	B	4.5	*	B	2.9	*	B	3.2	*	B	3.7	*	B
Iron	mg/kg	N							824		B	445		B	534		B	694		B	346		B
Lead	mg/kg	N							0.88	B	J	0.31	B	J	0.56	B	J	0.43	B	J	0.25	B	J
Magnesium	mg/kg	N							214		B	168	B	B	171	B	B	189	B	B	149	B	B
Manganese	mg/kg	N							5.4		B	2.4	B	B	3.3	B	B	4	B	B	2.3	B	B
Nickel	mg/kg	N							0.37	B	J	0.45	B	J	0.27	B	J	0.27	B	J	0.29	B	J
Potassium	mg/kg	N							1170		B	1300		B	1230		B	1350		B	821		B
Sodium	mg/kg	N							624	B	B	689	B	B	658	B	B	753	B	B	353	B	B
Vanadium	mg/kg	N							0.33	B	B	0.04	B	B	0.17	B	B	0.15	B	B			
Zinc	mg/kg	N							28.5		B	33.9		B	31		B	35		B	24.5	B	B
SEMIVOLATILES																							
Acenaphthene	mg/kg	N	0.38		B	0.36		B															
Acenaphthylene	mg/kg	N	0.29		B	0.74		B															
Fluorene	mg/kg	N	0.037		B	0.032		B															
Indeno(1,2,3-cd)pyrene	mg/kg	N				0.004	J	B															
Phenanthrene	mg/kg	N	0.016		B	0.048		B															

mg/kg - Milligrams per kilogram.
Qual - Laboratory qualifier.
ValQual - Validation qualifier.

Laboratory Qualifiers

B - Analyte detected in laboratory or field blank at concentration greater than the reporting limit (and greater than zero).
N - Spiked sample recovery not within control limits.
* - Duplicate analysis not within control limits.

Validation Qualifiers

Estimated value.
B - Analyte was detecged in associated method blank.

Table 6-1

Refined Selection of Constituents of Potential Ecological Concern at West Area - Surface Soil[a]
Red Water Ponds, PBOW, Sandusky, Ohio

Chemical	Frequency of Detection	Detected in 2000 Samples	Arithmetic Mean, mg/kg	Range of values, mg/kg Detected	Range of values, mg/kg Nondetected	Statistical Distribution[b]	95% UCL mg/kg[c]	Background Related?[d]	Exclusion Rationale[e]	COPEC?[f]	Source-Term Concentration, mg/kg[g]
SEMIVOLATILE ORGANIC COMPOUNDS AND NITROAROMATICS											
1,3-DINITROBENZENE	1/40 (2.5)	N	0.13	0.3	0.25	U	< 0.25	-	B	N	-
4-AMINO-2,6-DITROTOLUENE	1/40 (2.5)	N	0.13	0.3	0.25	U	< 0.25	-	B	N	-
ANTHRACENE	1/10 (10)	Y	0.20	0.23	0.37 - 0.4	U	< 0.4	N	-	Y	0.2
BENZO(A)ANTHRACENE	1/10 (10)	Y	0.21	0.40	0.37 - 0.4	U	< 0.4	N	-	Y	0.2
BENZO(B)FLUORANTHENE	1/10 (10)	Y	0.20	0.3	0.37 - 0.4	U	< 0.4	N	-	Y	0.2
BENZO(GHI)PERYLENE	1/10 (10)	Y	0.19	0.22	0.37 - 0.4	U	< 0.4	N	-	Y	0.2
BENZO(K)FLUORANTHENE	1/10 (10)	Y	0.21	0.35	0.37 - 0.4	U	< 0.4	N	-	Y	0.2
CHRYSENE	1/10 (10)	Y	0.21	0.42	0.37 - 0.4	U	< 0.4	N	-	Y	0.2
INDENO(1,2,3-CD)PYRENE	1/10 (10)	Y	0.20	0.23	0.37 - 0.4	U	< 0.4	N	-	Y	0.2
PHENANTHRENE	1/10 (10)	Y	0.21	0.36	0.37 - 0.4	U	< 0.4	N	-	Y	0.2

[a] Surface soil is defined as the interval from 0 to 3 feet below the ground surface. Soil samples were classified on the basis of the end depth of the sample. Only risk drivers presented.

[b] Statistical Distribution: N = Normal distribution; L = Lognormal distribution; U = Undetermined distribution.
NA = Distribution not determined if sample size is less than 5.

[c] 95% Upper confidence limit calculated for the indicated distribution. NA = sample size is less than 5 and distribution is not calculated.

[d] Results from Mann-Whitney nonparametric statistical test (see Table 5-6).

[e] Rationale for exclusion of chemical as a contaminant of potential ecological concern (COPEC):
A = within background concentration.
B = detection frequency less than 5% and not detected in recent 2000 sampling event.

[f] N = Chemical is not chosen as a COPEC; Y = Chemical is chosen as COPEC.

[g] For Reasonable Maximum Exposure (RME) scenario, concentration used in risk assessment equal to 95% UCL or maximum value, if maximum value is less than UCL or if no UCL is calculated.
For Central Tendency (CT) scenario, arithmetic mean value used.

Table 6-2

Refined Selection of Constituents of Potential Ecological Concern at West Area - Total Soil[a]
Red Water Ponds, PBOW, Sandusky, Ohio

Chemical	Frequency of Detection	Detected in 2000 Samples	Arithmetic Mean, mg/kg	Range of values, mg/kg Detected	Range of values, mg/kg Nondetected	Statistical Distribution [b]	95% UCL mg/kg [c]	Background Related?[d]	Exclusion Rationale [e]	COPEC? [f]	Source-Term Concentration, mg/kg [g]
SEMIVOLATILE ORGANIC COMPOUNDS AND NITROAROMATICS											
1,3-DINITROBENZENE	5/74 (6.8)	N	0.20	0.3 - 2.4	0.25	U	< 0.25	-	-	Y	0.125
4-AMINO-2,6-DITROTOLUENE	6/74 (8.1)	N	0.15	0.3 - 0.7	0.25	U	< 0.25	-	-	Y	0.125
ANTHRACENE	2/18 (11)	Y	0.19	0.12 - 0.23	0.37 - 0.41	U	< 0.4	N	-	Y	0.2
BENZO(A)ANTHRACENE	2/18 (11)	Y	0.21	0.17 - 0.4	0.37 - 0.41	U	< 0.4	N	-	Y	0.2
BENZO(B)FLUORANTHENE	2/18 (11)	Y	0.20	0.14 - 0.3	0.37 - 0.41	U	< 0.4	N	-	Y	0.2
BENZO(GHI)PERYLENE	2/18 (11)	Y	0.19	0.076 - 0.22	0.37 - 0.41	U	< 0.4	N	-	Y	0.2
BENZO(K)FLUORANTHENE	2/18 (11)	Y	0.20	0.11 - 0.35	0.37 - 0.41	U	< 0.4	N	-	Y	0.2
CHRYSENE	2/18 (11)	Y	0.21	0.17 - 0.42	0.37 - 0.41	U	< 0.4	N	-	Y	0.2
INDENO(1,2,3-CD)PYRENE	2/18 (11)	Y	0.19	0.076 - 0.23	0.37 - 0.41	U	< 0.4	N	-	Y	0.2
PHENANTHRENE	2/18 (11)	Y	0.21	0.25 - 0.36	0.37 - 0.41	U	< 0.4	N	-	Y	0.2

[a] Total soil is defined as the interval from 0 to 6 feet below the ground surface. Soil samples were classified on the basis of the end depth of the sample. Only risk drivers presented.

[b] Statistical Distribution: N = Normal distribution; L = Lognormal distribution; U = Undetermined distribution.
NA = Distribution not determined if sample size is less than 5.

[c] 95% Upper confidence limit calculated for the indicated distribution. NA = sample size is less than 5 and distribution is not calculated.

[d] Results from Mann-Whitney nonparametric statistical test (see Table 5-6).

[e] Rationale for exclusion of chemical as a contaminant of potential ecological concern (COPEC):
A = within background concentration.
B = detection frequency less than 5% and not detected in recent 2000 sampling event.

[f] N = Chemical is not chosen as a COPEC; Y = Chemical is chosen as COPEC.

[g] For Reasonable Maximum Exposure (RME) scenario, concentration used in risk assessment equal to 95% UCL or maximum value, if maximum value is less than UCL or if no UCL is calculated.
For Central Tendency (CT) scenario, arithmetic mean value used.

Table 6-3

Refined Selection of Constituents of Potential Ecological Concern at West Area - Surface Water[a]
Red Water Ponds, PBOW, Sandusky, Ohio

Chemical	Frequency of Detection	Detected in 2000 Samples	Arithmetic Mean, mg/L	Range of values, mg/L Detected	Range of values, mg/L Nondetected	Statistical Distribution [b]	95% UCL mg/L [c]	Background Related?[d]	Exclusion Rationale [e]	COPEC? [f]	Source-Term Concentration mg/L [g]
INORGANICS											
ALUMINUM	3/4 (75)	Y	6.6	0.3 - 13.8	0.20	L	1.4E+12	Y	A	N	-
IRON	4/4 (100)	Y	10.4	0.646 - 21.1	NA	N	23.6	N	-	Y	21.1
LEAD	3/9 (33)	Y	0.021	0.025 - 0.077	0.003 - 0.025	L	0.168	N	-	Y	0.077
MAGNESIUM	4/4 (100)	Y	37	25.8 - 50.7	NA	N	52.8	Y	A	N	-
MANGANESE	9/9 (100)	Y	0.63	0.126 - 1.60	NA	L	1.95	N	-	Y	1.6
VANADIUM	1/4 (25)	N	0.032	0.0522	0.05	U	0.0522	Y	A	N	-

[a] Surface water results from totals. Only risk drivers presented.

[b] Statistical Distribution: N = Normal distribution; L = Lognormal distribution; U = Undetermined distribution.

[c] 95% Upper confidence limit calculated for the indicated distribution.

[d] Results from Mann-Whitney nonparametric statistical test (see Table 5-6).

[e] Rationale for exclusion of chemical as a constituent of potential ecological concern (COPEC):

A = within background concentration.

B = detection frequency less than 5%.

[f] N = Chemical is not chosen as a COPEC; Y = Chemical is chosen as COPEC.

[g] For Reasonable Maximum Exposure (RME) scenario, concentration used in risk assessment equal to 95% UCL or maximum value, if maximum value is less than UCL or if no UCL is calculated.
For Central Tendency (CT) scenario, arithmetic mean value used.

Table 6-4

Refined Selection of Constituents of Potential Ecological Concern at West Area - Sediment[a]
Red Water Ponds, PBOW, Sandusky, Ohio

Chemical	Frequency of Detection	Detected in 2000 Samples	Arithmetic Mean, mg/kg	Range of values, mg/kg Detected	Range of values, mg/kg Nondetected	Statistical Distribution [b]	95% UCL mg/kg [c]	Background Related?[d]	Exclusion Rationale [e]	COPEC? [f]	Source-Term Concentration mg/kg [g]
INORGANICS											
ALUMINUM	4/4 (100)	Y	5,993	3,230 - 9,600	NA	L	16,929	Y	A	N	-
ARSENIC	9/17 (53)	Y	4.6	4.0 - 11.3	3.8 - 4.8	L	6.5	Y	A	N	-
CALCIUM	4/4 (100)	Y	27,428	6,710 - 74,700	NA	L	1,716,875	Y	A	N	-
COPPER	7/17 (41)	Y	5.2	3.2 - 24.5	2.4 - 3.2	U	24.5	Y	A	N	-
IRON	4/4 (100)	Y	18,700	16,000 - 24,300	NA	L	24,565	N	-	Y	24,300
SEMIVOLATILE ORGANIC COMPOUNDS AND NITROARMOMATICS											
2-AMINO-4,6-DINITROTOLUENE	1/13 (8)	N	0.14	0.3	0.25	U	0.3	-	-	Y	0.3
MISCELLANEOUS											
PHOSPHORUS	1/1 (100)	Y	3.1	3.1	NA	NA	NA	Y	A	N	-

[a] Only risk drivers presented.

[b] Statistical Distribution: N = Normal distribution; L = Lognormal distribution; U = Undetermined distribution; NA = Not applicable.

[c] 95% Upper confidence limit calculated for the indicated distribution.

[d] Results from Mann-Whitney nonparametric statistical test (see Table 5-6).

[e] Rationale for exclusion of chemical as a constituent of potential ecological concern (COPEC):
A = within background concentration.
B = detection frequency less than 5%.

[f] N = Chemical is not chosen as a COPEC; Y = Chemical is chosen as COPEC.

[g] For Reasonable Maximum Exposure (RME) scenario, concentration used in risk assessment equal to 95% UCL or maximum value, if maximum value is less than UCL or if no UCL is calculated.
For Central Tendency (CT) scenario, arithmetic mean value used.

Table 6-5

Refined Selection of Constituents of Potential Ecological Concern at Pentolite Road Area - Surface Soil[a]
Red Water Ponds, PBOW, Sandusky, Ohio

Chemical	Frequency of Detection	Detected in 2000 Samples	Arithmetic Mean (mg/kg)	Range of values, mg/kg		Statistical Distribution [b]	95% UCL mg/kg [c]	Background Related?[d]	Exclusion Rationale [e]	COPEC? [f]	Source-Term Concentration mg/kg [g]
				Detected	Nondetected						
SEMIVOLATILE ORGANIC COMPOUNDS											
1,3-DINITROBENZENE	6/50 (12)	N	0.20	0.3 - 1.6	0.25	U	< 0.25	-	-	Y	0.125
1,3,5-TRINITROBENZENE	5/50 (10)	N	0.20	0.4 - 1.7	0.25	U	< 0.25	-	-	Y	0.125
4-AMINO-2,6-DINITROTOLUENE	1/50 (2.0)	N	0.18	2.7	0.25	U	< 0.25	-	B	N	-

[a] Surface soil is defined as the interval from 0 to 3 feet below the ground surface. Soil samples were classified on the basis of the end depth of the sample. Only risk drivers presented.

[b] Statistical Distribution: N = Normal distribution; L = Lognormal distribution; U = Undetermined distribution. NA = distribution not determined if sample size is less than 5.

[c] 95% Upper confidence limit calculated for the indicated distribution. NA = sample size is less than 5 and distribution is not calculated.

[d] Results from Mann-Whitney nonparametric statistical test (see Table 5-6).

[e] Rationale for exclusion of chemical as a constituent of potential ecological concern (COPEC):

A = within background concentration.

B = detection frequency less than 5% and not detected in recent 2000 sampling event.

[f] N = Chemical is not chosen as a COPEC; Y = Chemical is chosen as COPEC.

[g] For Reasonable Maximum Exposure (RME) scenario, concentration used in risk assessment equal to 95% UCL or maximum value, if maximum value is less than UCL or if no UCL is calculated. For Central Tendency (CT) scenario, arithmetic mean value used.

Table 6-6

Refined Selection of Constituents of Potential Ecological Concern At Pentolite Road Area - Total Soil[a]
Red Water Ponds, PBOW, Sandusky, Ohio

Chemical	Frequency of Detection	Detected in 2000 Samples	Arithmetic Mean (mg/kg)	Range of values, mg/kg Detected	Range of values, mg/kg Nondetected	Statistical Distribution [b]	95% UCL mg/kg [c]	Background Related?[d]	Exclusion Rationale [e]	COPEC? [f]	Source-Term Concentration mg/kg [g]
INORGANICS											
ANTIMONY	11/90 (12)	N	3.5	3.6 - 9.3	5.2 - 7.7	U	< 6.8	Y	A	N	-
SEMIVOLATILE ORGANIC COMPOUNDS AND NITROAROMATICS											
1,3-DINITROBENZENE	15/90 (17)	N	0.48	0.3 - 9.3	0.25	U	< 0.25	-	-	Y	0.125
1,3,5-TRINITROBENZENE	17/90 (19)	N	1.8	0.4 - 58	0.25	U	< 0.25	-	-	Y	0.125
4-AMINO-2,6-DINITROTOLUENE	4/90 (4.4)	N	0.28	0.3 - 9.5	0.25 - 2.5	U	< 0.25	-	B	N	-
NITROBENZENE	1/104 (0.96)	N	0.20	1.1	0.25 - 4.2	U	< 0.26	-	B	N	-

[a] Total soil is defined as the interval from 0 to 6 feet below the ground surface. Soil samples were classified on the basis of the end depth of the sample. Only risk drivers presented.

[b] Statistical Distribution: N = Normal distribution; L = Lognormal distribution; U = Undetermined distribution.
NA = distribution not determined if sample size is less than 5.

[c] 95% Upper Confidence Limit calculated for the indicated distribution. NA = sample size is less than 5 and distribution is not calculated.

[d] Results from Mann-Whitney nonparametric statistical test (see Table 5-6).

[e] Rationale for exclusion of chemical as a contaminant of potential ecological concern (COPEC):
A = within background concentration.
B = detection frequency less than 5% and not detected in recent 2000 sampling event.

[f] N = Chemical is not chosen as a COPEC; Y = Chemical is chosen as COPEC.

[g] For Reasonable Maximum Exposure (RME) scenario, concentration used in risk assessment equal to 95% UCL or maximum value, if maximum value is less than UCL or if no UCL is calculated.
For Central Tendency (CT) scenario, arithmetic mean value used.

Table 6-7

Refined Selection of Constituents of Potential Ecological Concern at Pentolite Road Area - Surface Water[a]
Red Water Ponds, PBOW, Sandusky, Ohio

Chemical	Frequency of Detection	Detected in 2000 Samples	Arithmetic Mean, mg/L	Range of values, mg/L Detected	Range of values, mg/L Nondetected	Statistical Distribution [b]	95% UCL mg/L [c]	Background Related?[d]	Exclusion Rationale [e]	COPEC? [f]	Source-Term Concentration mg/L [g]
INORGANICS											
ALUMINUM	2/2 (100)	Y	1.8	0.53 - 3.04	NA	NA	NA	Y	A	N	-
IRON	2/2 (100)	Y	3.4	0.972 - 5.79	NA	NA	NA	Y	A	N	-
LEAD	1/2 (50)	N	0.0051	0.0087	0.003	NA	NA	Y	A	N	-
MANGANESE	2/2 (100)	Y	0.33	0.261 - 0.404	NA	NA	NA	Y	A	N	-

[a] Surface water results from totals. Only risk drivers presented.

[b] Statistical Distribution: N = Normal distribution; L = Lognormal distribution; U = Undetermined distribution; NA = Not applicable.

[c] 95% Upper confidence limit calculated for the indicated distribution.

[d] Results from Mann-Whitney nonparametric statistical test (see Table 5-6).

[e] Rationale for exclusion of chemical as a constituent of potential ecological concern (COPEC):

A = within background concentration.

B = detection frequency less than 5%.

[f] N = Chemical is not chosen as a COPEC; Y = Chemical is chosen as COPEC.

[g] For Reasonable Maximum Exposure (RME) scenario, concentration used in risk assessment equal to 95% UCL or maximum value, if maximum value is less than UCL or if no UCL is calculated.
For Central Tendency (CT) scenario, arithmetic mean value used.

Table 6-8

Refined Selection of Constituents of Potential Ecological Concern at Pentolite Road Area - Sediment[a]
Red Water Ponds, PBOW, Sandusky, Ohio

Chemical	Frequency of Detection	Detected in 2000 Samples	Arithmetic Mean, mg/kg	Range of values, mg/kg Detected	Range of values, mg/kg Nondetected	Statistical Distribution [b]	95% UCL mg/kg [c]	Background Related?[d]	Exclusion Rationale [e]	COPEC? [f]	Source-Term Concentration mg/kg [g]
INORGANICS											
MAGNESIUM	2/2 (100)	Y	16,400	13,500 - 19,300	NA	NA	NA	Y	A	N	-
POTASSIUM	1/2 (50)	Y	678	1,040	631	NA	NA	Y	A	N	-
SEMIVOLATILE ORGANIC COMPOUNDS AND NITROAROMATICS											
CARBAZOLE	1/2 (50)	N	0.23	0.18	0.57	NA	NA	Y	A	N	-

[a] Only risk drivers presented.

[b] Statistical Distribution: N = Normal distribution; L = Lognormal distribution; U = Undetermined distribution; NA = Not applicable.

[c] 95% Upper confidence limit calculated for the indicated distribution.

[d] Results from Mann-Whitney nonparametric statistical test (see Table 5-6).

[e] Rationale for exclusion of chemical as a constituent of potential ecological concern (COPEC):

A = within background concentration.

B = detection frequency less than 5%.

[f] N = Chemical is not chosen as a COPEC; Y = Chemical is chosen as COPEC.

[g] For Reasonable Maximum Exposure (RME) scenario, concentration used in risk assessment equal to 95% UCL or maximum value, if maximum value is less than UCL or if no UCL is calculated. For Central Tendency (CT) scenario, arithmetic mean value used.

Table 6-9

Summary of Site-Specific BCFs for Inorganics in Aquatic Worms and Fish
West Area Red Water Pond
Red Water Ponds, PBOW, Sandusky, Ohio

Inorganic Constituent	Aquatic Worm BCFs		Fish BCFs	
	CT	RME	CT	RME
Aluminum	0.0035	0.0035	15	15
Antimony	- [a]	-	13	18
Arsenic	0.03	0.22	40	40
Barium	0.00031	0.39	87	87
Cadmium	-	-	NA [b]	NA
Calcium	0.001	0.033	302	302
Chromium	0.004	0.009	29	29
Cobalt	0.002	0.013	40	40
Copper	0.02	0.13	102	102
Iron	0.000051	0.015	18	18
Lead	0.025	0.025	23	43
Magnesium	0.0002	0.030	14	14
Manganese	0.000057	0.006	13	13
Nickel	0.018	0.018	15	15
Potassium	0.18	64.6	648	648
Sodium	0.30	0.77	19	19
Vanadium	0.10	0.50	205	205
Zinc	0.0034	0.23	662	662

[a] Dashes indicate constituent was not detected in both tissue and associated media sample(s).
[b] NA = not analyzed.

Notes:

- Central Tendency (CT) and Reasonable Maximum Exposure (RME) approaches used to calculate the biological accumulation factors (BCFs) are discussed in the text.
- BCF calculation details are presented in Appendix F.

Table 6-10

Summary of Site-Specific BCFs for PAHs and Nitroaromatics in Earthworms
Red Water Ponds
Red Water Ponds, PBOW, Sandusky, Ohio

Constituent	Earthworm BCFs			
	West Area		Pentolite Road	
	CT	RME	CT	RME
PAHs				
Naphthalene	- [a]	-	NA [b]	NA
Acenaphthylene	1.7	9.3	NA	NA
Acenaphthene	1.7	4.9	NA	NA
Fluorene	1.5	2.5	NA	NA
Phenanthrene	0.1	0.6	NA	NA
Anthracene	1.1	1.1	NA	NA
Fluoranthene	0.21	0.21	NA	NA
Pyrene	0.45	0.45	NA	NA
Benzo(a)anthracene	0.58	0.58	NA	NA
Chrysene	0.55	0.55	NA	NA
Benzo(b)fluoranthene	0.21	0.21	NA	NA
Benzo(k)fluoranthene	0.47	0.47	NA	NA
Benzo(a)pyrene	0.46	0.46	NA	NA
Dibenzo(a,h)anthracene	1.42	1.42	NA	NA
Benzo(ghi)perylene	0.50	0.50	NA	NA
Indeno(123-cd)pyrene	0.56	0.51	NA	NA
Nitroaromatics				
2,4-Dinitrotoluene	-	-	0.1	0.1

[a] Dash indicates constituent was not detected in both tissue and associated media sample.
[b] NA = not available, as PAHs were not risk drivers in soil at Pentolite Road RWP, thus PAH analyses were not performed for on soil and tissue samples.

Notes:

- Central Tendency (CT) and Reasonable Maximum Exposure (RME) approaches used to calculate the biological accumulation factors (BCFs) are discussed in the text.
- BCF calculation details are presented in Appendix F.
- Constituent is not presented if it was not detected in both the tissue sample and the associated media sample.

Table 6-11

Summary of Site-Specific BCFs for Inorganics in Aquatic Organisms
Multiple Species Results, Central Tendency Approach
Pentolite Road
Red Water Ponds, PBOW, Sandusky, Ohio

Constituent	Calculated Fish Bioconcentration Factor (BCF)			CT BCF (Mean)
	Fathead Minnow	Tadpole	Crayfish	
Aluminum	787	2,876	973	1,545
Antimony	12.5	12.7	12.7	12.7
Arsenic	120	682	120	308
Barium	70.86	288	256	205
Calcium	72.5	84.4	202	120
Chromium	643	1,071	500	738
Cobalt	345	345	345	345
Copper	160	632	6,171	2,321
Iron	786	5,402	1,297	2,495
Lead	84.6	84.6	84.6	84.6
Magnesium	20.4	51.4	24.3	32.0
Manganese	134	568	740	481
Nickel	725	2,750	825	1,433
Phosphorous	1,662	2,172	2,319	2,051
Potassium	1,178	888	1,023	1,030
Sodium	75.4	118	168	121
Vanadium	552	1,143	362	686
Zinc	1,999	1,903	1,413	1,772

Notes

(1) For details on Reasonable Maximum Exposure (RME) and Central Tendency (CT) approaches, see text.

(2) Details in Appendix F.

Table 6-12

Summary of Site-Specific BCFs for Inorganics in Aquatic Organisms- Multiple Species Results
Reasonable Maximum Exposure Approach
Pentolite Road
Red Water Ponds, PBOW, Sandusky, Ohio

Constituent	Calculated Fish Bioconcentration Factor Fathead	Calculated Fish Bioconcentration Factor Tadpole	Calculated Fish Bioconcentration Factor Crayfish	RME BCF (Maximum)
Aluminum	787	2,876	973	2,876
Antimony	29.1	23.6	14.5	29.1
Arsenic	120	682	120	682
Barium	70.9	288	256	288
Calcium	72.5	84.4	202	202
Chromium	643	1,071	500	1,071
Cobalt	345	909	345	909
Copper	160	632	6,171	6,171
Iron	786	5,402	1,297	5,402
Lead	138	538	212	538
Magnesium	20.4	51.4	24.3	51.4
Manganese	134	568	740	740
Nickel	725	2,750	825	2,750
Phosphorous	1,662	2,172	2,319	2,319
Potassium	1,178	888	1,023	1,178
Sodium	75.4	118	168	168
Vanadium	552	1,143	362	1,143
Zinc	1,999	1,903	1,413	1,999

Notes

(1) For details on Reasonable Maximum Exposure (RME) and Central Tendency (CT) approaches, see text.

(2) Details in Appendix F.

Table 6-13

Reference Toxicity Values Used to Derive Wildlife Toxicity Benchmarks for Chemicals of Potential Ecological Concern Red Water Ponds, PBOW, Sandusky, Ohio

COPEC	Mammalian Data						Avian Data					
	Toxicity Value	LOAEL (mg/kg/d)	NOAEL (mg/kg/d)	Test Species	Reference	Body Wt. (kg)	Toxicity Value	LOAEL (mg/kg/d)	NOAEL (mg/kg/d)	Test Species	Reference	Body Wt. (kg)
Organics												
1,3,5-Trinitrobenzene	--	13.31	2.68	rat	IRIS on-line (2001)	0.35	42 (LD_{50})	4.2	0.42	red-winged black bird	1,3-DNB as surrogate	0.077
1,3-Dinitrobenzene (1,3-DNB)	--	1.13	0.113	rat	Talmage et. al (1999)	0.35	42 (LD_{50})	4.2	0.42	red-winged black bird	Talmage et. al. (1999)	0.077
2-Amino-4,6-dinitrotoluene	1394 (LD_{50})	139	13.9	rat	TOMES database	0.35	178 and 7	17.8	0.7	Bobwhite quail	2,4,6-TNT as surrogate	0.19
4-Amino-2,6-dinitrotoluene	959 (LD_{50})	95.9	9.59	rat	TOMES database	0.35	178 and 7	17.8	0.7	Bobwhite quail	2,4,6-TNT as surrogate	0.19
Anthracene	--	10	1.0	mouse	B(a)P as surrogate	0.03	NA	NA	NA	NA	NA	NA
Benzo(a)anthracene	--	10	1.0	mouse	B(a)P as surrogate	0.03	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	--	10	1.0	mouse	B(a)P as surrogate	0.03	NA	NA	NA	NA	NA	NA
Benzo(ghi)perylene	--	10	1.0	mouse	B(a)P as surrogate	0.03	NA	NA	NA	NA	NA	NA
Benzo(k)fluoranthene	--	10	1.0	mouse	B(a)P as surrogate	0.03	NA	NA	NA	NA	NA	NA
Carbazole	200 (LD_{50})	20	2.0	mouse	TOMES database	0.03	NA	NA	NA	NA	NA	NA
Chrysene	--	10	1.0	mouse	B(a)P as surrogate	0.03	NA	NA	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	--	10	1.0	mouse	B(a)P as surrogate	0.03	NA	NA	NA	NA	NA	NA
Nitrobenzene	4.6	2.3	0.23	mouse	IRIS on-line (2001)	0.03	42 (LD_{50})	4.2	0.42	red-winged black bird	1,3-DNB as surrogate	0.077
Phenanthrene	--	10	1.0	mouse	B(a)P as surrogate	0.03	NA	NA	NA	NA	NA	NA
Inorganics												
Aluminum	--	19.3	1.93	mouse	Sample, et al. (1996)	0.03	--	1,100	110	ringed dove	Sample, et al. (1996)	0.155
Arsenic	--		0.126	mouse	Sample, et al. (1996)	0.03	--		5.14	mallard duck	Sample, et al. (1996)	1.0
Antimony	--	1.25	0.125	mouse	Sample, et al. (1996)	0.03	--	NA	NA	NA	NA	NA
Arsenic	--	1.26	0.126	mouse	Sample, et al. (1996)	0.03	--	7.38	2.46	cowbird	Sample, et al. (1996)	0.049

Table 6-13

Reference Toxicity Values Used to Derive Wildlife Toxicity Benchmarks for Chemicals of Potential Ecological Concern Red Water Ponds, PBOW, Sandusky, Ohio

COPEC	Mammalian Data						Avian Data					
	Toxicity Value	LOAEL (mg/kg/d)	NOAEL (mg/kg/d)	Test Species	Reference	Body Wt. (kg)	Toxicity Value	LOAEL (mg/kg/d)	NOAEL (mg/kg/d)	Test Species	Reference	Body Wt. (kg)
Calcium	--	5265	1053	rabbit	(See Appendix)	3.8	--	14165	2833	Japanese quail	(See Appendix)	0.072
Copper	--	15.14	11.7	mink	Sample, et al. (1996)	1.0	--	61.7	47	chicks	Sample, et al. (1996)	0.534
Iron	--	130	26	rabbit	(See Appendix)	3.80	--	250	50	poultry	(See Appendix)	1.6
Lead	--	80	8.0	rat	Sample, et al. (1996)	0.35	--	38.5	3.85	Am. Kestrel	Sample, et al. (1996)	0.13
Magnesium	--	790	158	rabbit	(See Appendix)	3.8	--	750	150	poultry	(See Appendix)	1.6
Manganese	--	284	88	rat	Sample, et al. (1996)	0.35	--	9770	977	Japanese quail	Sample, et al. (1996)	0.072
Phosphorus	--	2630	526	rabbit	(See Appendix)	3.8	--	2000	400	poultry	(See Appendix)	1.6
Potassium	--	7895	1,579	rabbit	(See Appendix)	3.8	--	5000	1,000	poultry	(See Appendix)	1.6
Vanadium	--	2.1	0.2	rat	Sample, et al. (1996)	0.26	--	114	11.4	mallard duck	Sample, et al. (1996)	1.17

Notes:

NA indicates that the information is not available.
NOAELs for selected nutrients are based on mineral dietary requirements (Appendix G).

The following surrogate values were used:
Benzo(a)pyrene for anthracene, benzo(a)anthracene, benzo(b)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, chrysene, indeno(1,2,3-cd)pyrene, and phenanthrene.
2,4,6-TNT for 2-Amino-4,6-dinitrotoluene and 4-Amino-2,6-dinitrotoluene.

LD50 values are from RTECS (1998) as summarized in the TOMES CPC™ System Data Base (1/1/99).
LD50 values were converted to chronic NOAELs by dividing by a factor of 100 and subchronic LOAELs were converted to chronic NOAELs by dividing by a factor of 20, as recommended by Wentsel, et. al. (1996), Tri-Service Procedural Guidelines for Ecological Risk Assessments.
For Nutrients, NOAELs were set at maximum tolerated dose levels (see Appendix G) and multiplied by an uncertainty factor of 5 (rather than 10 used for non-nutrients) to estimate a LOAEL from a NOAEL because additional uncertainty is associated with nutrient toxicity.
For studies that did not report a LOAEL, it was estimated from the NOAEL by multiplication by an uncertainty factor of 10 (except for nutrients, as discussed above).

Red-wing blackbird body weight assumed to be equal to American robin.
2,4,6-TNT RTV values from Johnson and McAtee, 2000.

Only risk drivers are presented.

Table 6-14

Uncertainty Factors [a] for Ecological RTV [b] Extrapolations [c]
Red Water Ponds, PBOW, Sandusky, Ohio

Laboratory Animals (Toxicity Data Base)		Selected Site Receptor Species	
Rat	G: Rattus F: Muridae O: Rodentia	Deer mouse	G: Peromyscus F: Cricetidae O: Rodentia
Mouse	G: Mus F: Muridae O: Rodentia	Eastern cottontail	G: Sylvilagus F: Leporidae O: Lagomorpha
Mink	G: Mustela F: Mustelidae O: Carnivora	Raccoon	G: Procyon F: Procyonidae O: Carnivora
Rabbit: (N. Zealand White)	G: Oryctolagus F: Leporidae O:Lagomorpha	Short-tailed shrew	G: Blarina F: Soricidae O: Insectivora
Ringed dove	G: Streptopelia F: Columbidae O: Columbiformes	White-tailed deer	G: Odocoileus F: Cervidae O: Artiodactyla
Cowbird	G: Molothrus F: Emberizidae O: Passeriformes	Great blue heron	G: Ardea F: Ardeidae O: Ciconiiformes
Chick, Poultry	G: Gallus F: Phasianidae O: Galliformes	Marsh wren	G: Cistothorus F: Troglodytidae O: Passeriformes
Black duck, Mallard	G: Anas F: Anatidae O: Anseriformes		
Japanese quail	G: Coturnix F: Phasianidae O: Galliformes		
American kestrel	G: Falco F: Falconidae O: Falconiformes		

[a] From *Tri-Service Procedural Guidelines for Ecological Risk Assessment* (Wentsel et al. 1996)
[b] RTV = Reference Toxicity Value
[c] Interclass extrapolations not performed; only within bird class or within mammal class.

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 BERA RME food chain model (except for the New Zealand White extrapolated to the cottontail), an uncertainty factor of 8 was used. For the latter, an uncertainty factor of 4 was used.

Table 6-15

Terrestrial Receptors Hazard Index (HI) Summary for West Area[a]
Central Tendency and Reasonable Maximum Exposure
Red Water Ponds, PBOW, Sandusky, Ohio

Media	Terrestrial Receptor					
	Deer Mouse	Cottontail	Shrew	Marsh Wren	Raccoon	Deer
Soil [b] HI	0.006 - 0.5	0.002 - 0.15	0.03 - 2.5	- [c]	0.006 - 0.5	0.0006 - 0.03
Risk Drivers	—	—	100% - PAHs (invertebrate intake)	—	—	—
Surface Water HI	0.003 - 0.3	0.003 - 0.15	0.002 - 0.2	0.01 - 1.0	0.008 - 0.6	0.003 - 0.3
Risk Drivers	—	—	—	—	—	—
Total Receptor HI	0.009 - 0.8	0.005 - 0.3	0.03 - 2.7	0.01 - 1.0	0.01 - 1.2	0.004 - 0.3

[a] Details presented in eco risk assessment spreadsheets in Appendix H. Only risk drivers considered
[b] All receptors exposed to surface soil, except burrowing shrew exposed to surface and subsurface soil via ingestion of soil and ingestion of terrestrial invertebrates, and deer exposed to surface and subsurface soil via ingestion of plants (e.g., tree leaves) that have translocated COPEC via deep feeder roots.
[c] No hazard estimated. COPEC(s) screened out due to background or low frequency of detection, or COPEC(s) toxicity values not available.

Notes :

(1) CT and RME approach assumptions include differences in exposure point concentrations; toxicity values; interclass toxicity uncertainty factor; and method of calculation of site-specific soil-to-invertebrate biological accumulation factor (see text for details).

(2) Red-tailed hawk not presented as SLERA hazards were acceptable.

(3) Risk drivers percentage is based on intake pathway indicated.

Table 6-16

Aquatic Receptor Hazard Index (HI) Summary for West Area[a]
Central Tendency and Reasonable Maximum Exposure
Red Water Ponds, PBOW, Sandusky, Ohio

Media	Aquatic Receptor	
	Great Blue Heron	Raccoon
Sediment HI	0.4 - 26	0.37 - 20
Risk Drivers	100% Iron (Sediment intake, for RME)	100% Iron (Sediment intake, for RME)
Surface Water HI	0.002 - 0.2	0.004 - 0.3
Risk Drivers	—	—
Total Receptor HI	0.4 - 26	0.4 - 21

[a]Details presented in ecological risk assessment spreadsheets (Appendix H), only risk drivers considered.

Note:

(1) Central tendency (CT) and reasonable maximum exposure (RME) approach assumptions include differences in exposure point concentrations; toxicity values; interclass toxicity uncertainty factors; and method of calculation of site-specific surface water-to-fish and sediment-to-invertebrate biological accumulation factors (see text for details).

(2) Risk driver percentage is based on intake pathway indicated.

Table 6-17

Terrestrial Receptors Hazard Index (HI) Summary for Pentolite Road Area[a]
Central Tendency and Reasonable Maximum Exposure
Red Water Ponds, PBOW, Sandusky, Ohio

Media	Terrestrial Receptor					
	Deer Mouse	Cottontail	Shrew	Marsh Wren	Raccoon	Deer
Soil [b] HI	0.06 - 2.7	0.07 - 3.2	0.01 - 0.3	0.01 - 0.5	0.05 - 2.2	0.002 - 0.03
Risk Drivers:	94% 1,3-DNB (plant intake for RME)	94% 1,3-DNB (plant intake for RME)	—	—	94% 1,3-DNB(plant intake for RME)	—
Surface Water HI	—[c]	—	—	—	—	—
Risk Drivers:	—	—	—	—	—	—
Total Receptor HI	0.06 - 2.7	0.07 - 3.2	0.01 - 0.3	0.01 - 0.5	0.05 - 2.2	0.002 - 0.03

[a] Details presented in ecological risk assessment spreadsheets in Appendix H. Only risk drivers considered.
[b] All receptors exposed to surface soil, except burrowing shrew exposed to surface and subsurface soil via ingestion of soil and ingestion of terrestrial invertebrates, and deer exposed to surface and subsurface soil via ingestion of plants (e.g., tree leaves) that have translocated COPEC via deep feeder roots.
[c] No hazard estimate due to COPEC(s) screened out due to background or low frequency of detection, or COPEC(s) toxicity values not available.

Notes :

(1) CT and RME approach assumptions include differences in exposure point concentrations; toxicity values; interclass toxicity uncertainty factor; and method of calculation of site-specific soil- to-invertebrate biological accumulation factor (see text for details).

(2) Red-tailed hawk note presented as SLERA hazards were acceptable.

(3) Risk driver percentage based on intake pathway indicated.

Table 6-18

Surface Water Toxicity and Surface Water Concentration Correlation Results
Red Water Ponds, PBOW, Sandusky, Ohio

Test Species = Fathead Minnow
Toxicity Endpoint = Survival

Constituent	Statistical Correlation Between Minnow Survival and Surface Water Concentration	Correlation Result Suggests the Following:
Aluminum	+ 0.36	Inorganic concentration not related to toxicity
Arsenic	+ 0.86	Inorganic concentration not related to toxicity
Barium	- 0.47	Inorganic concentration not related to toxicity
Calcium	**- 0.93**	Inorganic concentration may be related to toxicity
Chromium	+ 0.27	Inorganic concentration not related to toxicity
Cobalt	+ 0.35	Inorganic concentration not related to toxicity
Copper	+ 0.32	Inorganic concentration not related to toxicity
Iron	+ 0.33	Inorganic concentration not related to toxicity
Lead	+ 0.33	Inorganic concentration not related to toxicity
Magnesium	+ 0.20	Inorganic concentration not related to toxicity
Manganese	+ 0.34	Inorganic concentration not related to toxicity
Nickel	+ 0.39	Inorganic concentration not related to toxicity
Phosphorus	+ 0.68	Inorganic concentration not related to toxicity
Potassium	+ 0.16	Inorganic concentration not related to toxicity
Sodium	+ 0.88	Inorganic concentration not related to toxicity
Zinc	+ 0.37	Inorganic concentration not related to toxicity

Test Species = Water Flea
Toxicity Endpoint = Reproductive Success

Constituent	Statistical Correlation Between Water Flea Offspring Production and Surface Water Concentration	Correlation Result Suggests the Following:
Aluminum	- 0.14	Inorganic concentration not related to toxicity
Arsenic	+ 0.17	Inorganic concentration not related to toxicity
Barium	- 0.43	Inorganic concentration not related to toxicity
Calcium	- 0.29	Inorganic concentration not related to toxicity
Chromium	- 0.24	Inorganic concentration not related to toxicity
Cobalt	- 0.16	Inorganic concentration not related to toxicity
Copper	- 0.10	Inorganic concentration not related to toxicity
Iron	- 0.18	Inorganic concentration not related to toxicity
Lead	- 0.20	Inorganic concentration not related to toxicity
Magnesium	+ 0.45	Inorganic concentration not related to toxicity
Manganese	- 0.18	Inorganic concentration not related to toxicity
Nickel	- 0.13	Inorganic concentration not related to toxicity
Phosphorus	+ 0.64	Inorganic concentration not related to toxicity
Potassium	- 0.14	Inorganic concentration not related to toxicity
Sodium	+ 0.43	Inorganic concentration not related to toxicity
Zinc	- 0.29	Inorganic concentration not related to toxicity

Notes:
- Toxicity test details in Appendix E and surface water data in Section 5.0 and Appendix C.
- If constituent concentration was non detect, one-half of the detection limit was used in the statistical analysis.
- Correlation results may range from + 1.0 to - 1.0, with "+" value indicating positive correlation and "-" value indicating negative correlation. Values near zero suggest poor statistical correlation, whereas values near ± 1.0 suggest good statistical correlation. Constituent-specific significant ($P_{0.05}$) toxicity is indicated in **bold** if elevated negative correlation is found, as toxicity is inversely related to survival and reproductive success. For significant negative correlation, correlation must be ≥0.60, given sample size of 10 and degrees of freedom = 9.

Table 6-19

Sediment Toxicity and Sediment Concentration Correlation Results
Red Water Ponds, PBOW, Sandusky, Ohio

Test Species = Amphipod Crustacean **Toxicity Endpoint = Survival**		
Constituent	**Statistical Correlation Between Amphipod Survival and Sediment Concentration**	**Correlation Result Suggests the Following:**
Aluminum	- 0.46	Inorganic concentration not related to toxicity
Antimony	**- 0.94**	Inorganic concentration may be related to toxicity
Arsenic	- 0.80	Inorganic concentration not related to toxicity
Barium	- 0.45	Inorganic concentration not related to toxicity
Calcium	- 0.33	Inorganic concentration not related to toxicity
Chromium	- 0.58	Inorganic concentration not related to toxicity
Cobalt	- 0.65	Inorganic concentration not related to toxicity
Copper	- 0.43	Inorganic concentration not related to toxicity
Iron	- 0.50	Inorganic concentration not related to toxicity
Lead	- 0.51	Inorganic concentration not related to toxicity
Magnesium	- 0.46	Inorganic concentration not related to toxicity
Manganese	- 0.41	Inorganic concentration not related to toxicity
Nickel	- 0.24	Inorganic concentration not related to toxicity
Phosphorus	+ 0.21	Inorganic concentration not related to toxicity
Potassium	- 0.22	Inorganic concentration not related to toxicity
Sodium	- 0.43	Inorganic concentration not related to toxicity
Zinc	- 0.35	Inorganic concentration not related to toxicity

Notes:

- Toxicity test details in Appendix E and sediment data in Section 5.0 and Appendix C.
- If constituent concentration was non detect, one-half of the detection limit was used in the statistical analysis.
- Correlation results may range from + 1.0 to - 1.0, with "+" value indicating positive correlation and "-" value indicating negative correlation. Values near zero suggest poor statistical correlation, whereas values near ± 1.0 suggest good statistical correlation. Constituent-specific significant ($P_{0.05}$) toxicity is indicated in bold if elevated negative correlation is found, as toxicity is inversely related to survival. For significant negative correlation, correlation must be ≥0.81 given sample size of 5 and degrees of freedom = 4.

Table 6-20

Soil Toxicity and Soil Concentration Correlation Results
Red Water Ponds, PBOW, Sandusky, Ohio

Test Species = Earthworm Toxicity Endpoint = Survival		
Constituent	**Statistical Correlation Between Earthworm Survival and Soil Concentration**	**Correlation Result Suggests the Following:**
Anthracene	**- 1.0**	Organic concentration may be related to toxicity
Benzo(a)anthracene	- 0.23	Organic concentration not related to toxicity
Benzo(a)pyrene	**- 0.99**	Organic concentration may be related to toxicity
Benzo(b)fluoranthene	**- 0.99**	Organic concentration may be related to toxicity
Benzo(ghi)perylene	**- 1.0**	Organic concentration may be related to toxicity
Benzo(k)fluoranthene	**- 1.0**	Organic concentration may be related to toxicity
Chrysene	**- 0.99**	Organic concentration may be related to toxicity
Dibenzo(ah)anthracene	**- 0.99**	Organic concentration may be related to toxicity
Fluoranthene	**- 0.98**	Organic concentration may be related to toxicity
Fluorene	+ 0.53	Organic concentration not related to toxicity
Indeno(123-cd)pyrene	**- 0.99**	Organic concentration may be related to toxicity
Phenanthrene	+ 0.44	Organic concentration not related to toxicity
Pyrene	- 0.16	Organic concentration not related to toxicity

Notes:

- Toxicity test details in Appendix E and soil data in Section 5.0 and Appendix C.
- If constituent concentration was non detect, one-half of the detection limit was used in the statistical analysis.
- Correlation results may range from + 1.0 to - 1.0, with "+" value indicating positive correlation and "-" value indicating negative correlation. Values near zero suggest poor statistical correlation, whereas values near ± 1.0 suggest good statistical correlation. Constituent-specific significant ($P_{0.05}$) toxicity is indicated in **bold** if elevated negative correlation is found, as toxicity is inversely related to survival. For significant negative correlation, correlation must be ≥0.81, given sample size of 5 and degrees of freedom = 4.

Table 6-21

Uncertainty Analysis
Red Water Ponds, PBOW, Sandusky, Ohio

Component	Bias	Magnitude	Ways to Minimize Uncertainty
Refined Food Chain Model			
Use of 95% UCL as source-term concentration in RME approach	Overestimates Risk	Medium	Use central tendency
Assumption that soil depth interval of 0-3 ft is representative of surface soil	Overestimates Risk	Low to Medium	Resample to obtain additional samples 0-0.5 ft. for surface soil characterization
Use of site-specific BCFs calculated using blank-related tissue concentrations	Overestimates Risk	Medium to High	Use site-specific BCFs calculated using associated analytical detection limit for tissue concentrations
Assumption that MDC for COPEC in surface water or sediment is representative	Overestimates Risk	Medium	Evaluate additional surface water and sediment samples for those COPECs with < 5 data points
Use of representative receptor species for site ecological community	Underestimates Risk	Low	Select additional receptor species
Use of average intake values and average body weights	Underestimates Risk	Low	Measure site-specific intake values and species= body weights
Use of conservative foraging factors (i.e., 100%) for all species, except deer	Overestimates Risk	Medium	Use site-specific foraging factors, i.e., less than 100%
Discounting of dermal and inhalation exposure routes	Underestimates Risk	Low	Include dermal and inhalation routes of exposure
Use of safety factors to convert LOAEL and LD_{50} toxicity data to NOAELs	Overestimates Risk	Medium	Obtain COPEC-specific NOAEL data
For the RME approach, use of uncertainty factor of 8 to extrapolate RTVs between most species within the same class	Overestimates Risk	Medium	1) Assume RTVs similar for all species in the same genus, family, or order (default UF = 1)
Assumption that body weight scaling factor = 0 for all bird species = NOAEL toxicity data	Overestimates or Underestimates Risk	Low	Obtain species-specific NOAEL toxicity data
Use of surrogate constituents to estimate toxicity for those COPECs without available toxicity data	Overestimates Risk	Low to Medium	Obtain COPEC-specific toxicity data

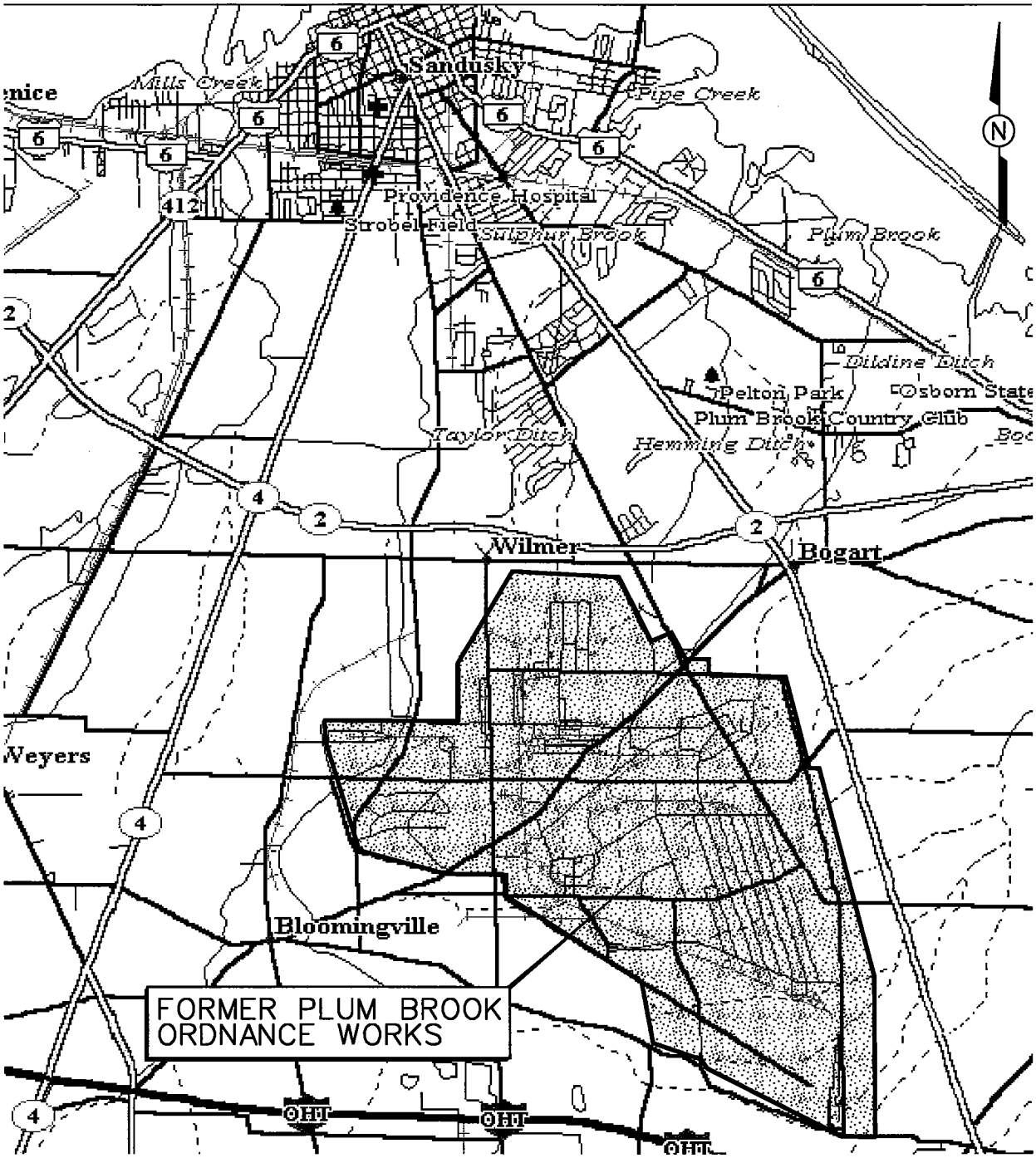
Table 6-21

Uncertainty Analysis
Red Water Ponds, PBOW, Sandusky, Ohio

Component	Bias	Magnitude	Ways to Minimize Uncertainty
Toxicity Tests			
Toxicity tests were run on a limited number of samples, thereby limiting the statistical power of COPEC concentration vs. toxicity result correlations	Overestimates or Underestimates Risk	Medium	Perform additional toxicity testing
Chemical contributing to measured toxicity could not be determined (e.g., in surface water)	Overestimates or Underestimates Risk	Medium	Perform additional toxicity testing and analyze media for all chemicals

BCF - Bioconcentration factor.
COPEC - Constituent of potential ecological concern.
ft. - Foot/feet.
LD_{50} - Median lethal dose.
LOAEL - Lowest observed adverse effects level.
MDC - Maximum detectable concentration.
NOAEL - No observed adverse effects level.
RME - Reasonable maximum exposure.
RTV - Reference toxicity value.
UCL - Upper confidence limit.
UF - Uncertainty factor.

FIGURES



NOT TO SCALE

FIGURE 1-1
VICINITY MAP

FORMER PLUM BROOK ORDNANCE WORKS
SANDUSKY, OHIO

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			DWG. NO.: \773701ES.001
			PROJ. NO.: 773701

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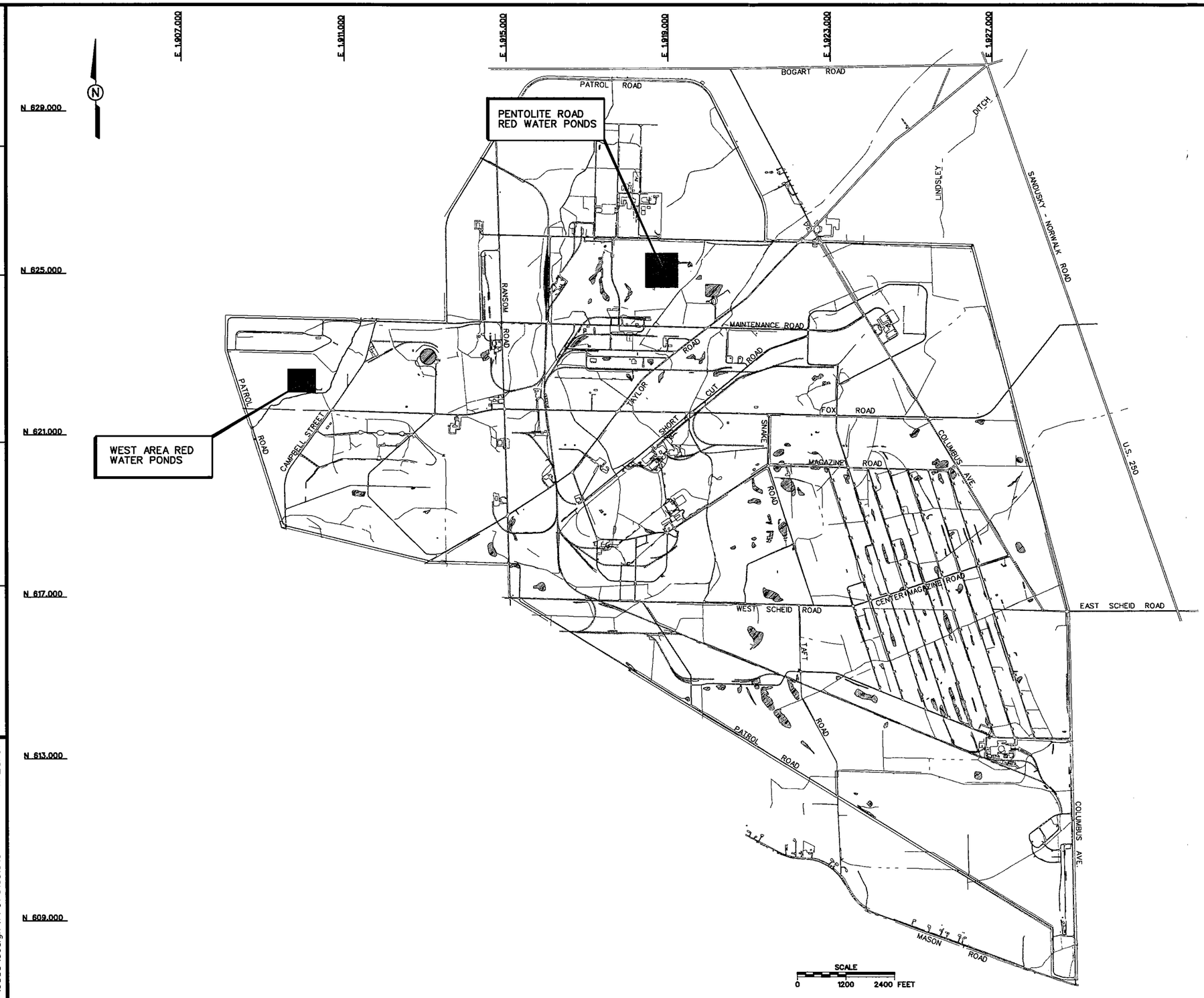

LEGEND:

- AREAS OF CONCERN
- BUILDINGS
- RAILROAD
- SURFACE WATER
- DITCH
- FENCE (PBOW BOUNDARY)

FIGURE 1-2
LOCATIONS OF AREAS OF CONCERN

FORMER PLUM BROOK ORDNANCE WORKS
NASA PLUM BROOK STATION
SANDUSKY, OHIO

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DRAWN BY: D.HALL	DRAWN BY:	ENGR. CHCK. BY: G.YU	PROJ. MGR.: SPANGBERG	PROJ. NO.: 771481

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Figure 2-1

Simplified Terrestrial Food Web Conceptual Site Model (CSM)
Plum Brook Ordnance Works, Ohio

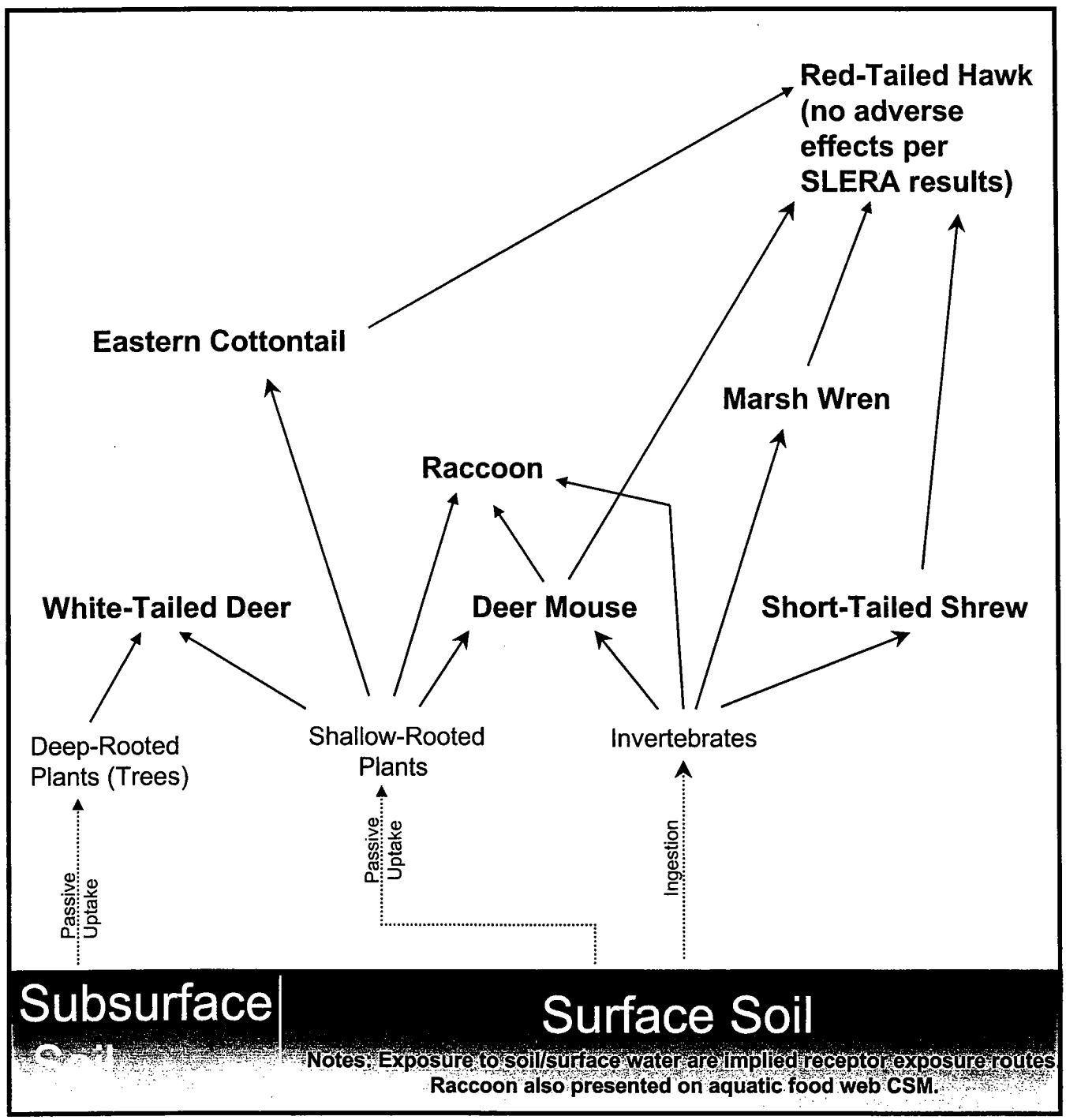
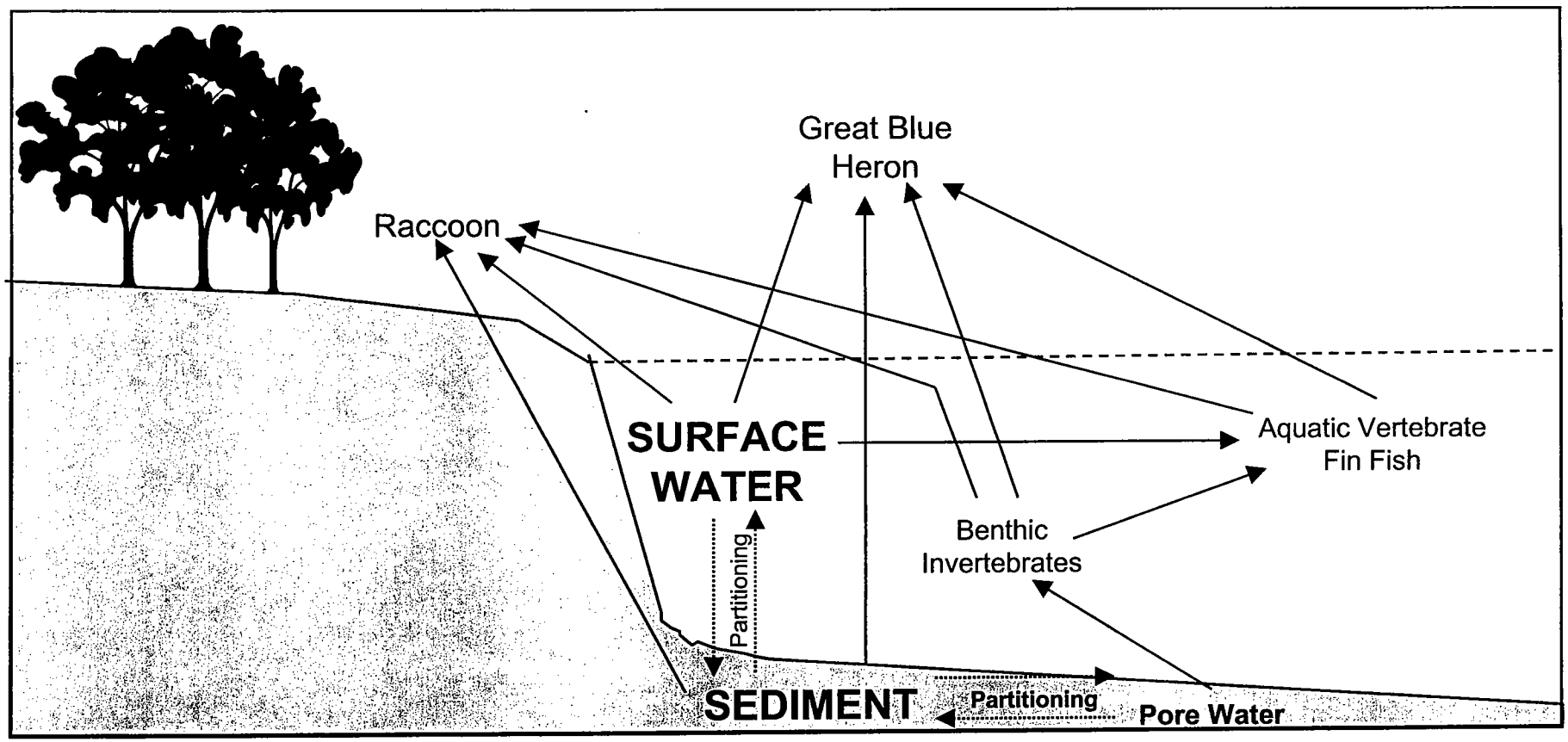
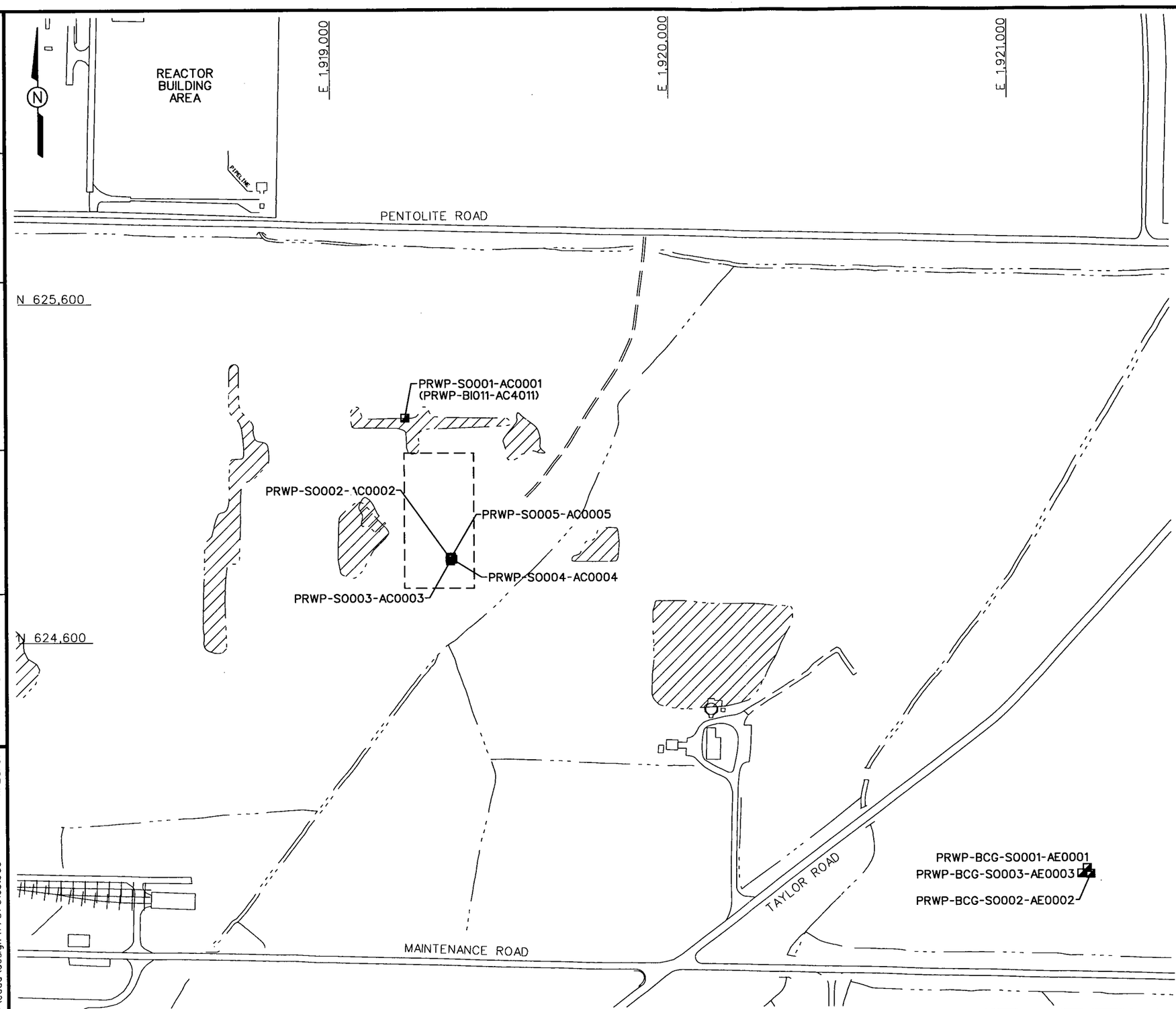


Figure 2-2

Simplified Aquatic Food Web Conceptual Site Model (CSM)
Plum Brook Ordnance Works, Ohio



Note: Raccoon also presented on terrestrial food web CSM.



LEGEND:

	BUILDINGS
	RAILROAD
	SURFACE WATER
	SURFACE WATER DRAINAGE
	APPROXIMATE HISTORICAL LOCATION OF PONDS
	FENCE (PBOW BOUNDARY)
PRWP-S0001-AC0001	SURFACE SOIL SAMPLE LOCATION
(PRWP-BI011-AC4011)	EARTHWORM TISSUE SAMPLE CODE
PRWP-BCG-S0001-AE0001	BACKGROUND SOIL SAMPLE LOCATION

SCALE

0 300 600 FEET

FIGURE 5-1
PENTOLITE ROAD RED WATER PONDS
SURFACE SOIL SAMPLE LOCATIONS

PLUM BROOK ORDNANCE WORKS
NASA PLUM BROOK STATION
SANDUSKY, OHIO

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DATE LAST REV.: | DRAWN BY:
STARTING DATE: 03/28/01 | DRAWN BY: B. VANDERGRIFF
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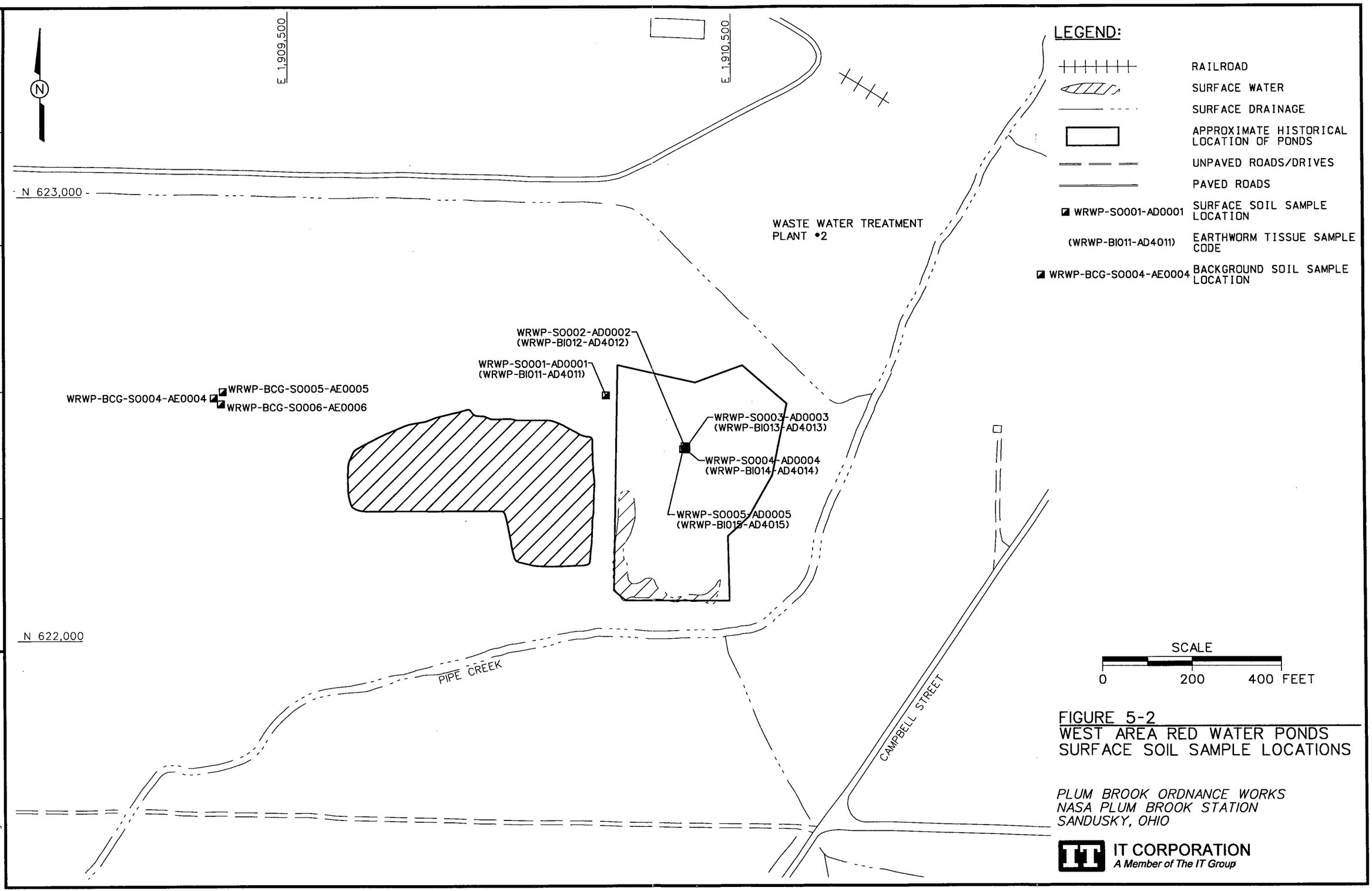

FIGURE 5-2
WEST AREA RED WATER PONDS
SURFACE SOIL SAMPLE LOCATIONS

PLUM BROOK ORDNANCE WORKS
NASA PLUM BROOK STATION
SANDUSKY, OHIO

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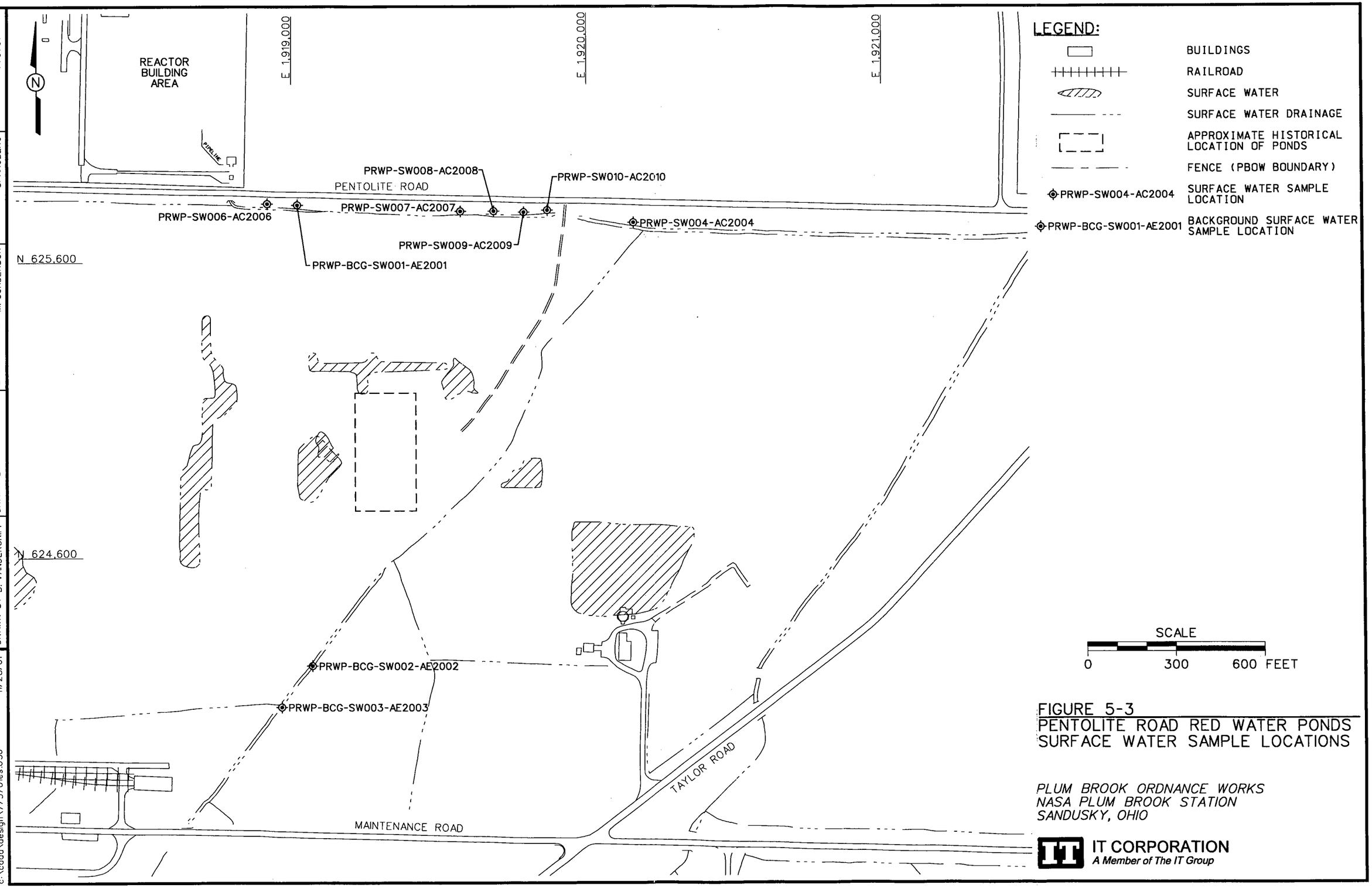


FIGURE 5-3
PENTOLITE ROAD RED WATER PONDS
SURFACE WATER SAMPLE LOCATIONS

PLUM BROOK ORDNANCE WORKS
NASA PLUM BROOK STATION
SANDUSKY, OHIO

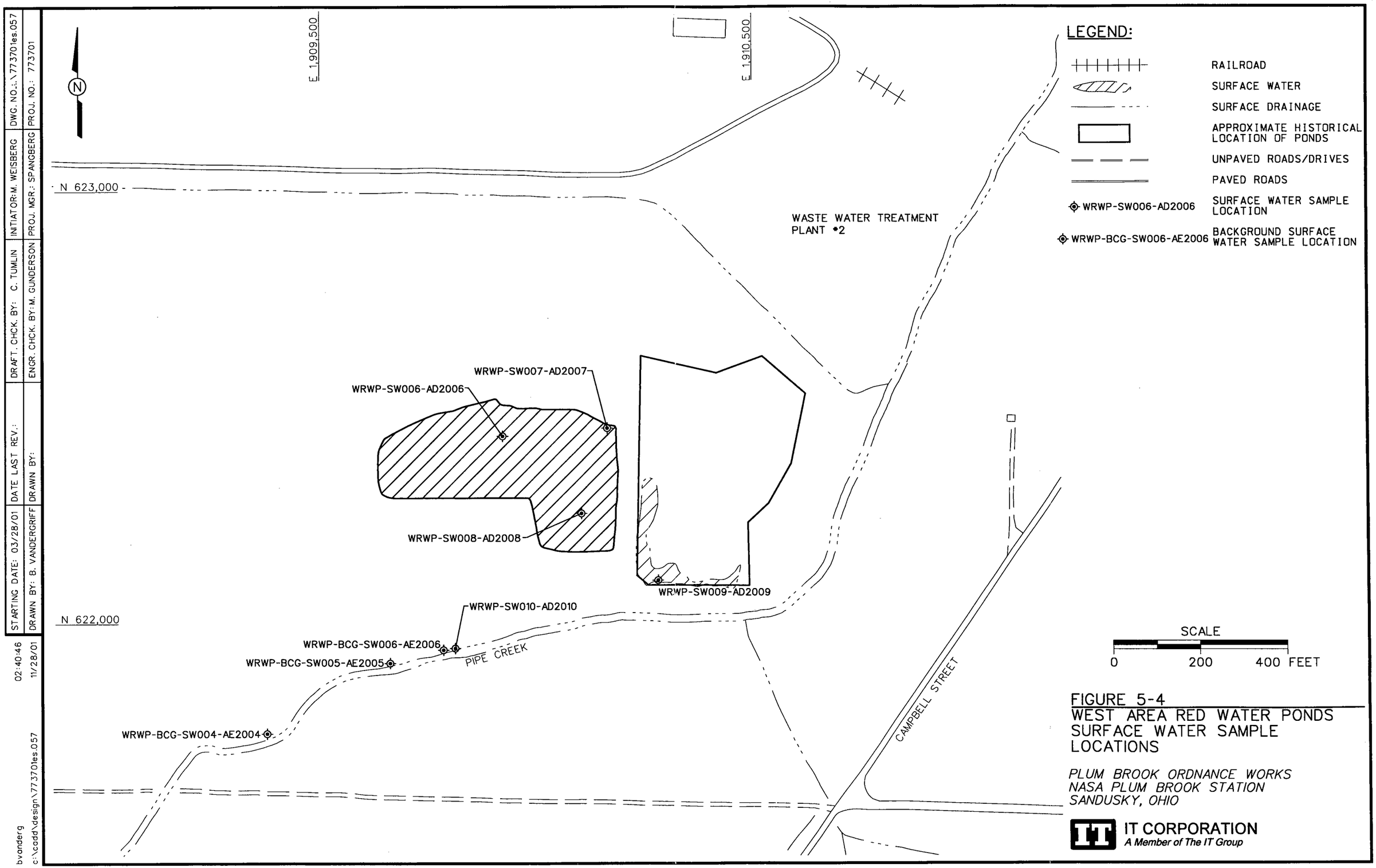
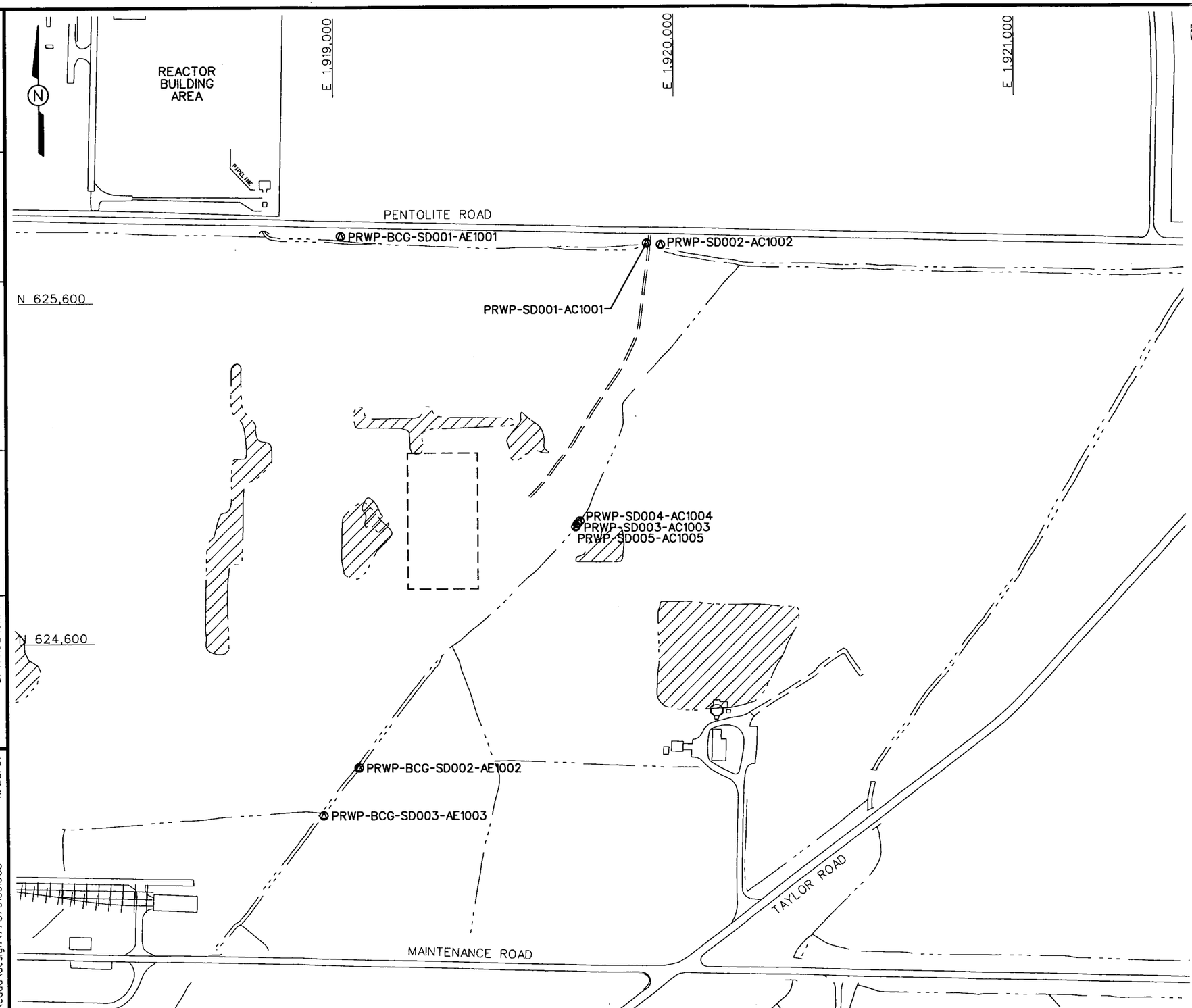


FIGURE 5-4
WEST AREA RED WATER PONDS SURFACE WATER SAMPLE LOCATIONS

PLUM BROOK ORDNANCE WORKS
NASA PLUM BROOK STATION
SANDUSKY, OHIO



LEGEND:

	BUILDINGS
	RAILROAD
	SURFACE WATER
	SURFACE WATER DRAINAGE
	APPROXIMATE HISTORICAL LOCATION OF PONDS
	FENCE (PBOW BOUNDARY)
PRWP-SD001-AC1001	SEDIMENT SAMPLE LOCATION
PRWP-BCG-SD001-AE1001	BACKGROUND SEDIMENT SAMPLE LOCATION

SCALE

0 300 600 FEET

FIGURE 5-5
PENTOLITE ROAD RED WATER PONDS
SEDIMENT SAMPLE LOCATIONS

PLUM BROOK ORDNANCE WORKS
NASA PLUM BROOK STATION
SANDUSKY, OHIO

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DRAFT. CHCK. BY: C. TUMLIN | ENGR. CHCK. BY: M. GUNDERSON
DATE LAST REV.: | DRAWN BY:
STARTING DATE: 03/28/01 | DRAWN BY: B. VANDERGRIFF
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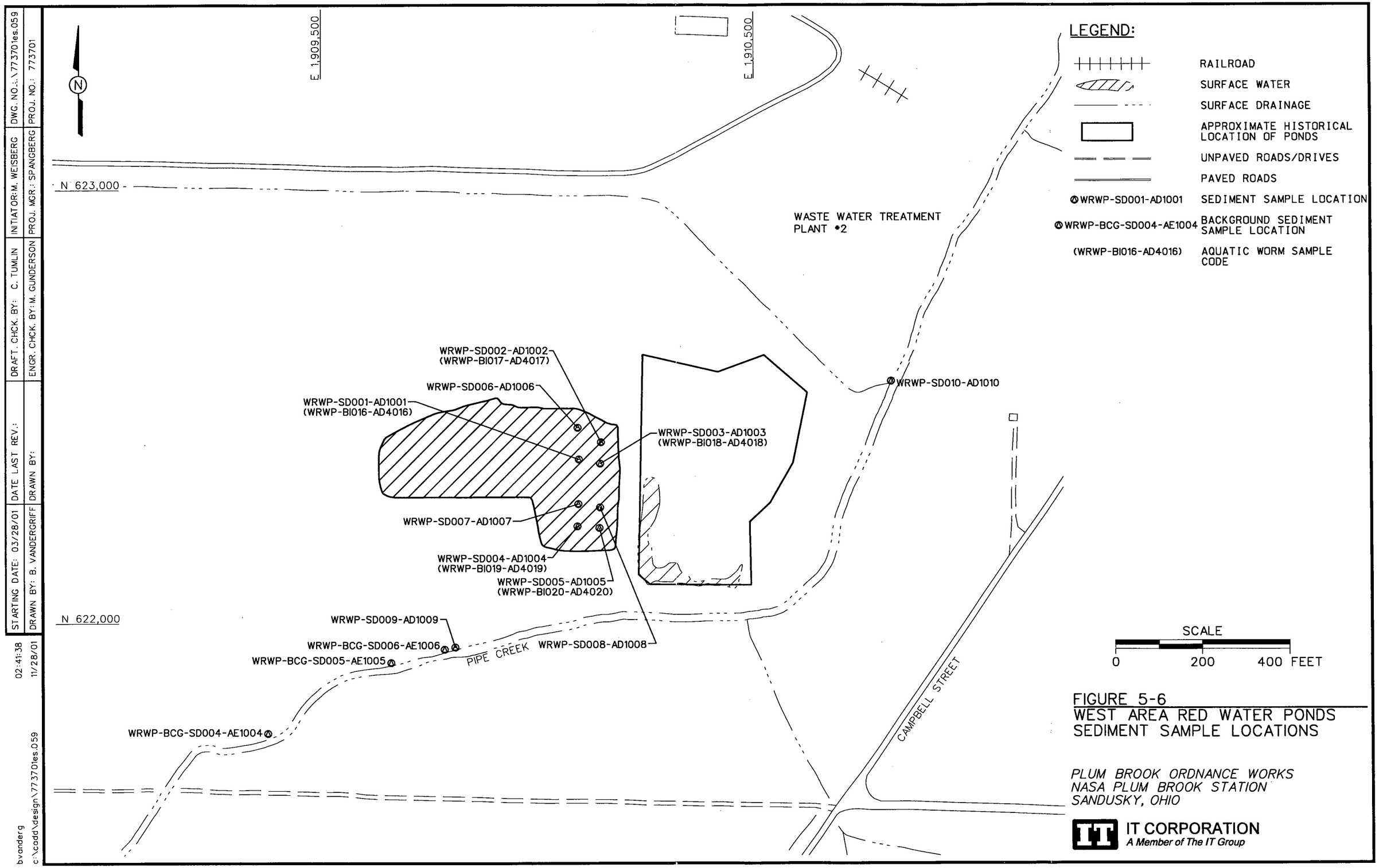
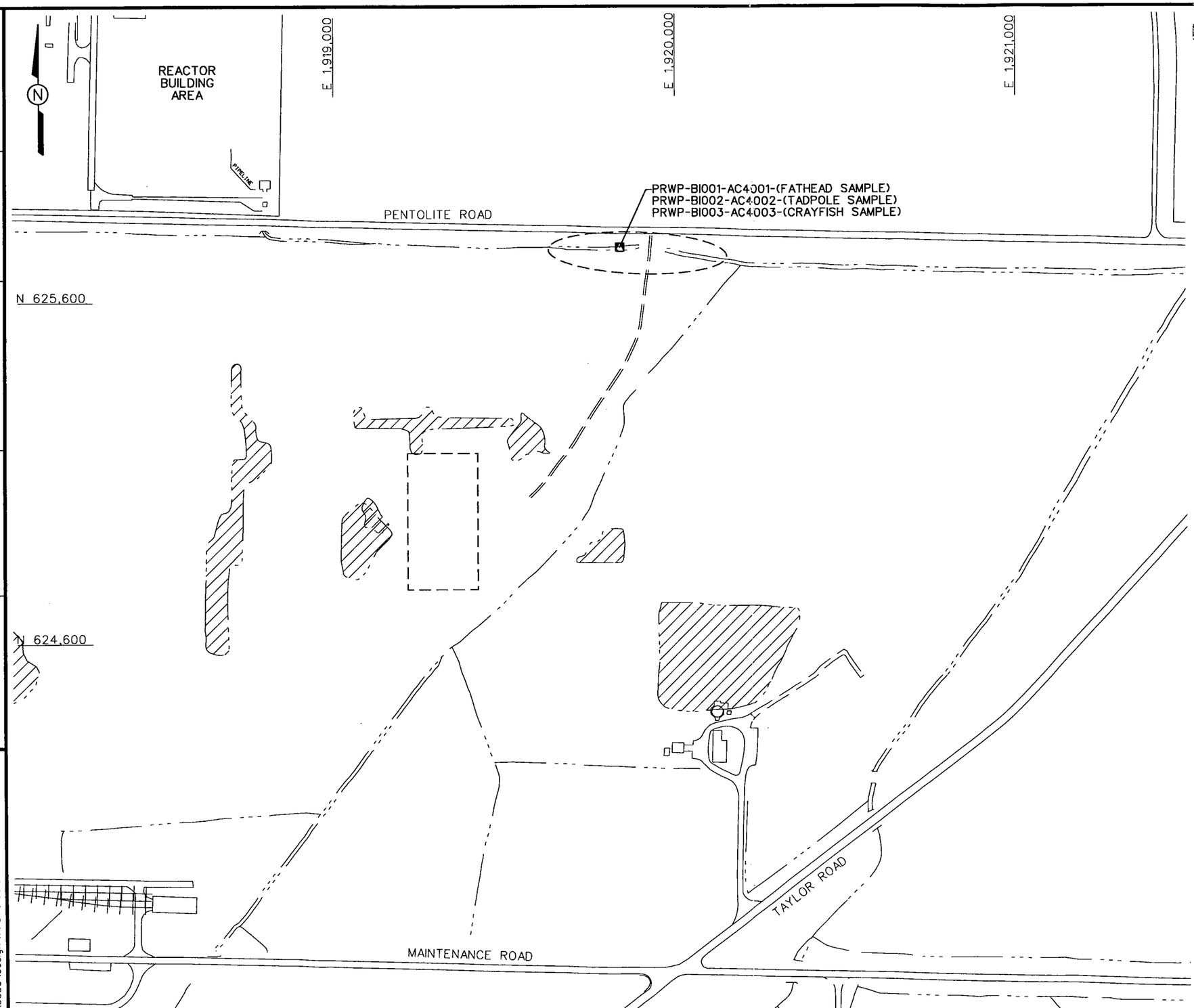


FIGURE 5-6
WEST AREA RED WATER PONDS
SEDIMENT SAMPLE LOCATIONS

PLUM BROOK ORDNANCE WORKS
NASA PLUM BROOK STATION
SANDUSKY, OHIO

STARTING DATE: 03/28/01	DATE LAST REV.:	DRAFT. CHCK. BY: C. TUMLIN	DWG. NO.: \773701es.059
DRAWN BY: B. VANDERGRIFF	DRAWN BY:	ENGR. CHCK. BY: M. GUNDERSON	PROJ. NO.: 773701
11/28/01	02:41:38	PROJ. MGR.: SPANGBERG	INITIATOR: M. WEISBERG
bvanderg	c:\cadd\design\773701es.059		



LEGEND:

- BUILDINGS
- RAILROAD
- SURFACE WATER
- SURFACE WATER DRAINAGE
- APPROXIMATE HISTORICAL LOCATION OF PONDS
- FENCE (PBOW BOUNDARY)
- PRWP-BI001-AC4001 — FISH, CRAYFISH, AND TADPOLE SAMPLE LOCATION
- SAMPLE LOCATION ZONE

NOTES

SAMPLES PRWP-BI001-AC4001 THROUGH PRWP-BI003-AC4003 WERE COLLECTED FROM THE INDICATED ZONE.

SCALE

0 300 600 FEET

FIGURE 5-7
PENTOLITE ROAD RED WATER PONDS FISH, CRAYFISH, AND TADPOLE SAMPLE LOCATIONS

PLUM BROOK ORDNANCE WORKS
NASA PLUM BROOK STATION
SANDUSKY, OHIO

IT CORPORATION
A Member of The IT Group

DWG. NO.: \773701es.060 | PROJ. NO.: 773701
INITIATOR: M. WEISBERG | PROJ. MGR.: SPANGBERG
DRAFT. CHCK. BY: C. TUMLIN | ENGR. CHCK. BY: M. GUNDERSON
DATE LAST REV.: | DRAWN BY:
STARTING DATE: 03/28/01 | DRAWN BY: B. VANDERGRIFF
02:42:07 11/28/01
bvanderg
c:\cadd\design\773701es.060

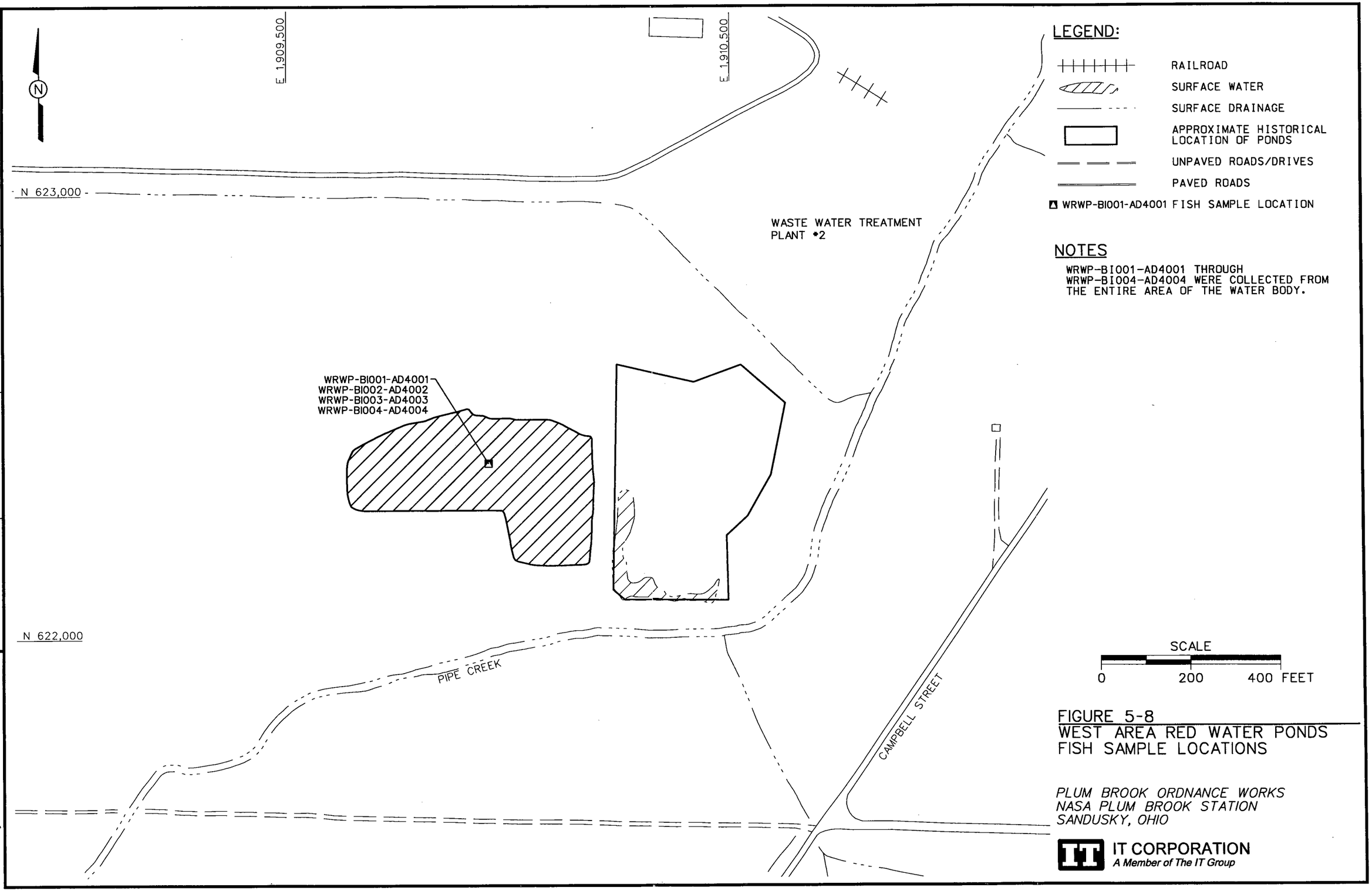


FIGURE 5-8
WEST AREA RED WATER PONDS
FISH SAMPLE LOCATIONS

STARTING DATE: 03/28/01	DATE LAST REV.:	DRAFT. CHCK. BY: C. TUMLIN	INITIATOR: M. WEISBERG
DRAWN BY: B. VANDERGRIFF	DRAWN BY:	ENGR. CHCK. BY: M. GUNDERSON	PROJ. MGR.: SPANGBERG
			DWG. NO.:..\773701es.061
			PROJ. NO.: 773701

02:42:38 11/28/01 bvanderg c:\cadd\design\773701es.061

Figure 6-1

Minnow Survival and Al, As, Ba, Ca Surface Water Concentrations
Red Water Ponds, PBOW, Sandusky, Ohio

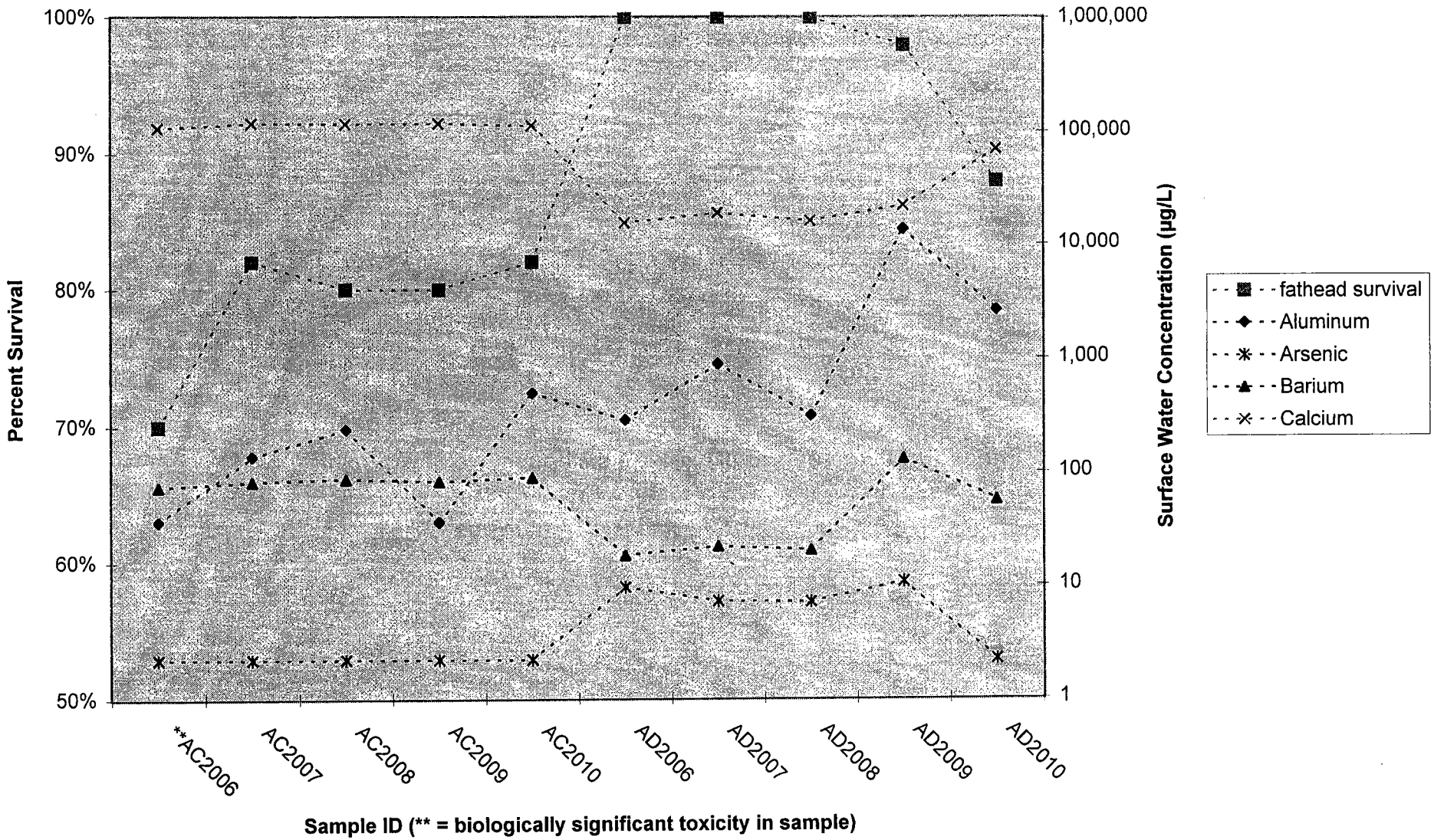
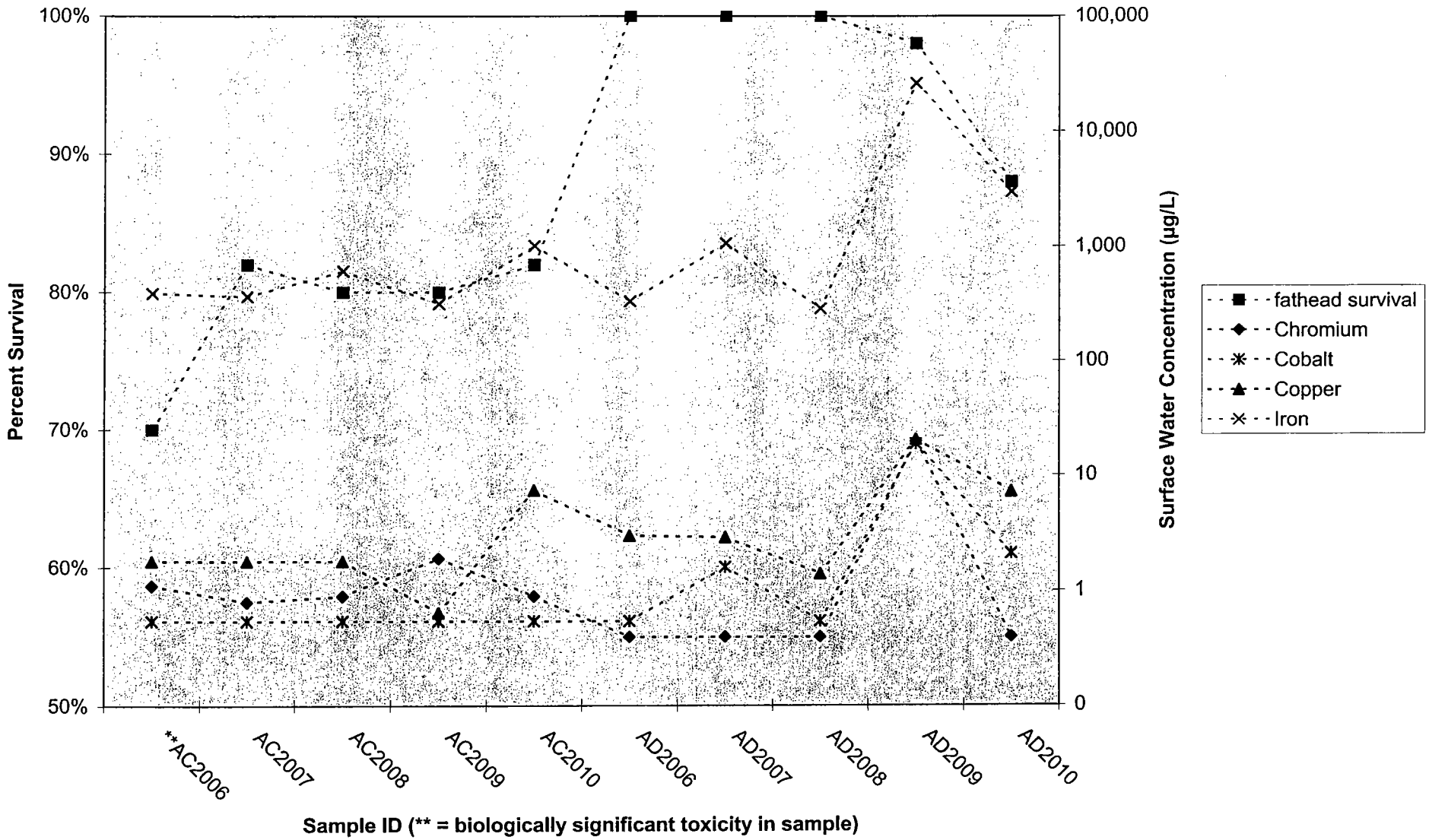


Figure 6-2

Minnow Survival and Cr, Co, Cu, Fe Surface Water Concentrations
Red Water Ponds, PBOW, Sandusky, Ohio



KN\PBOW\Red Water\BERA\Figs 6-1--6-4 Chart 2(Figs 6-1--6-4 Chart 2)\11/27/01(9:39 AM)

Table 6-3

Minnow Survival and Pb, Mg, Mn, Ni Surface Water Concentrations
Red Water Ponds, PBOW, Sandusky, Ohio

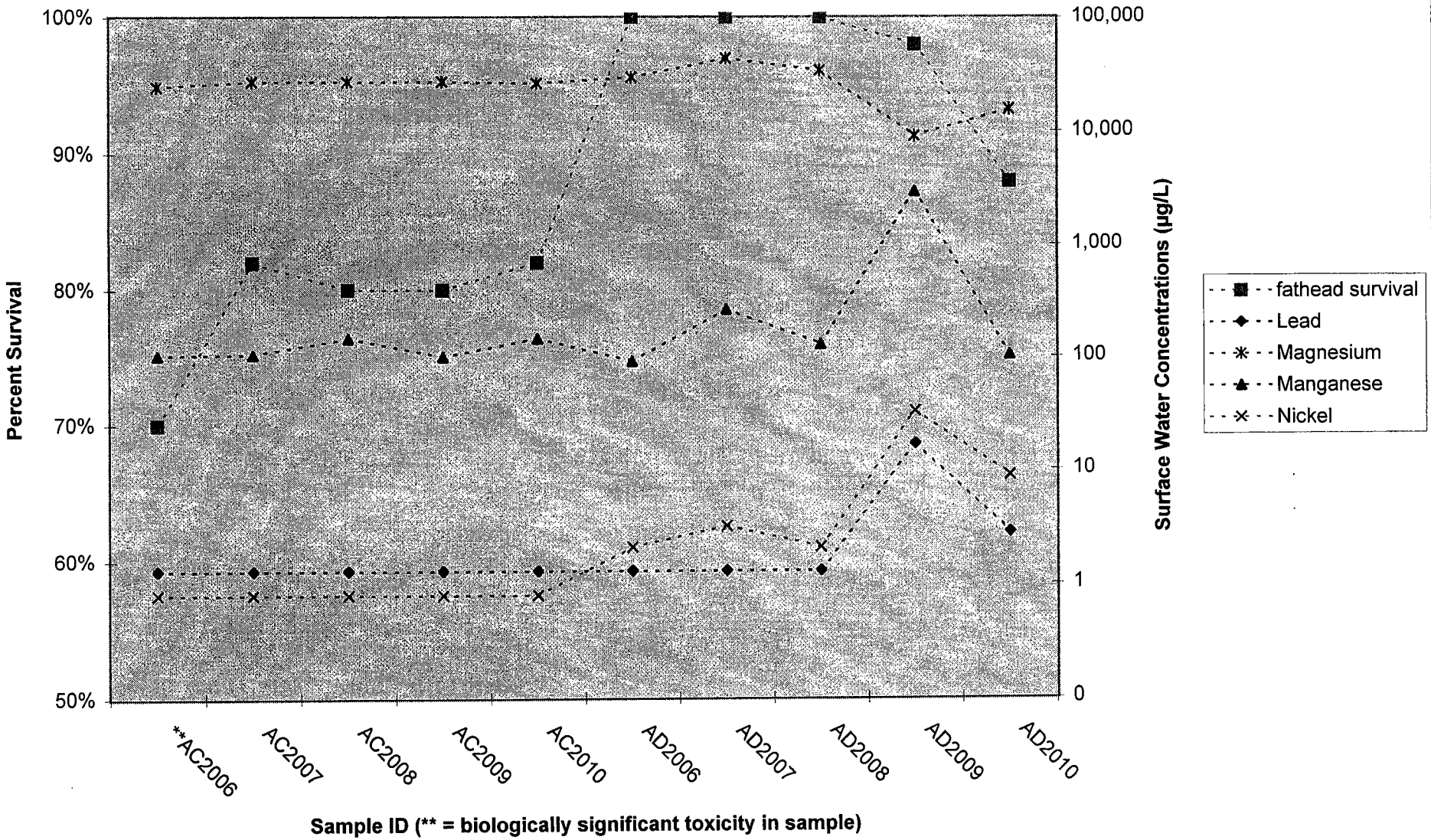


Figure 6-4

Minnow Survival and P, K, Na, Zn Surface Water Concentrations
Red Water Ponds, PBOW, Sandusky, Ohio

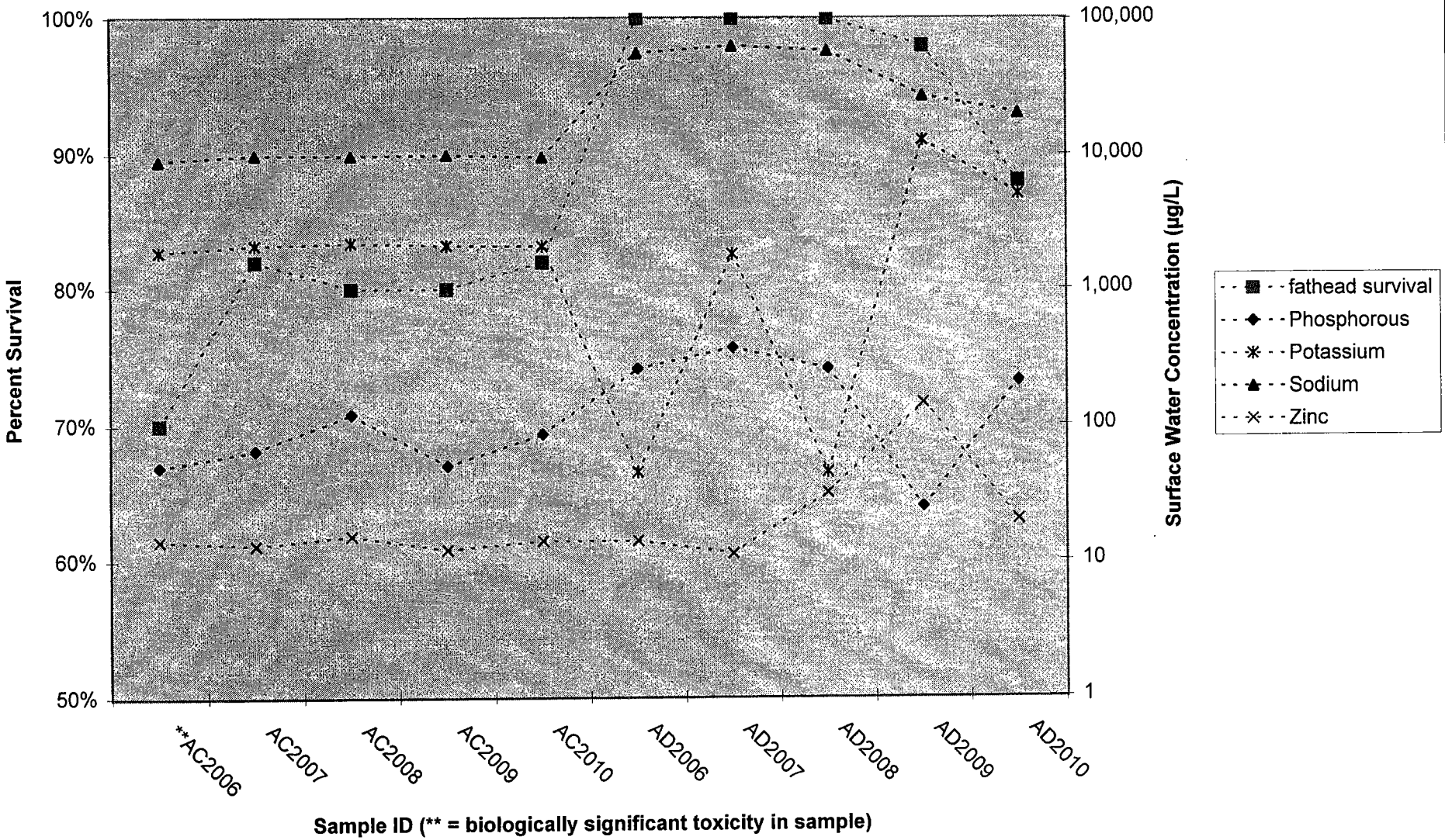


Figure 6-5

Water Flea Reproduction and Al, As, Ba, Ca Surface Water Concentrations
Red Water Ponds, PBOW, Sandusky, Ohio

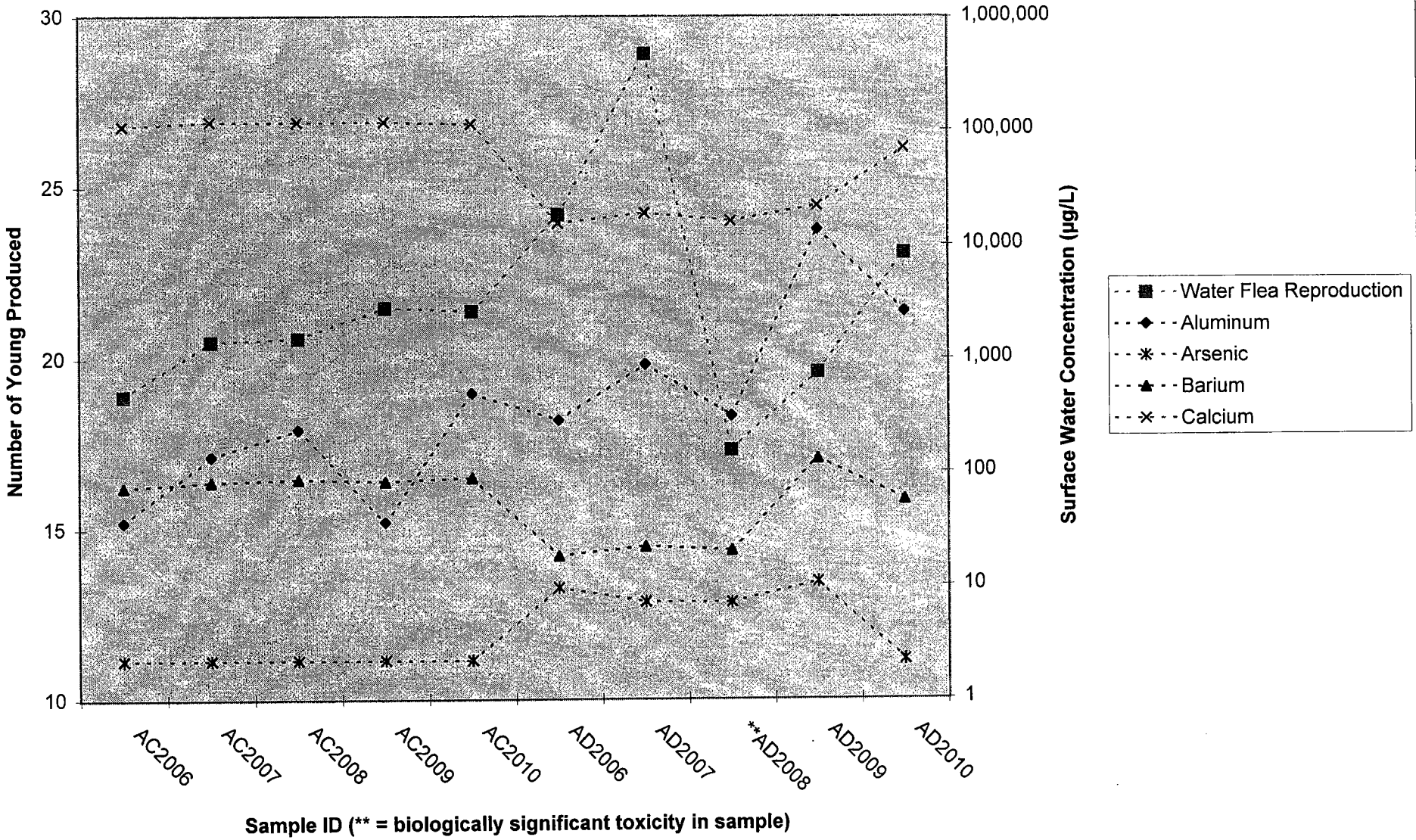


Figure 6-6

Water Flea Reproduction and Cr, Co, Cu, Fe Surface Water Concentrations
Red Water Ponds, PBOW, Sandusky, Ohio

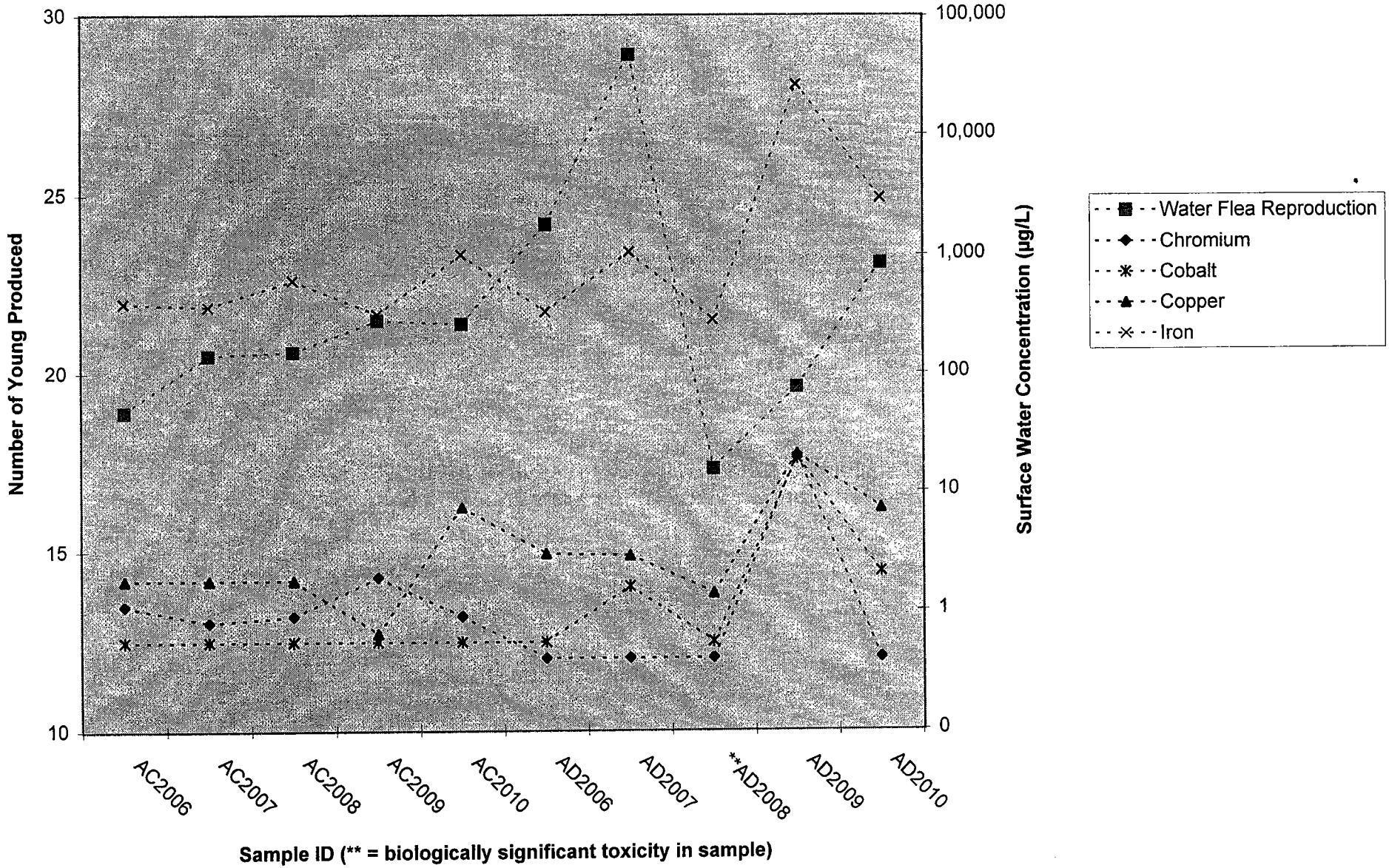


Figure 6-7

Water Flea Reproduction and Pb, Mg, Mn, Ni Surface Water Concentrations
Red Water Ponds, PBOW, Sandusky, Ohio

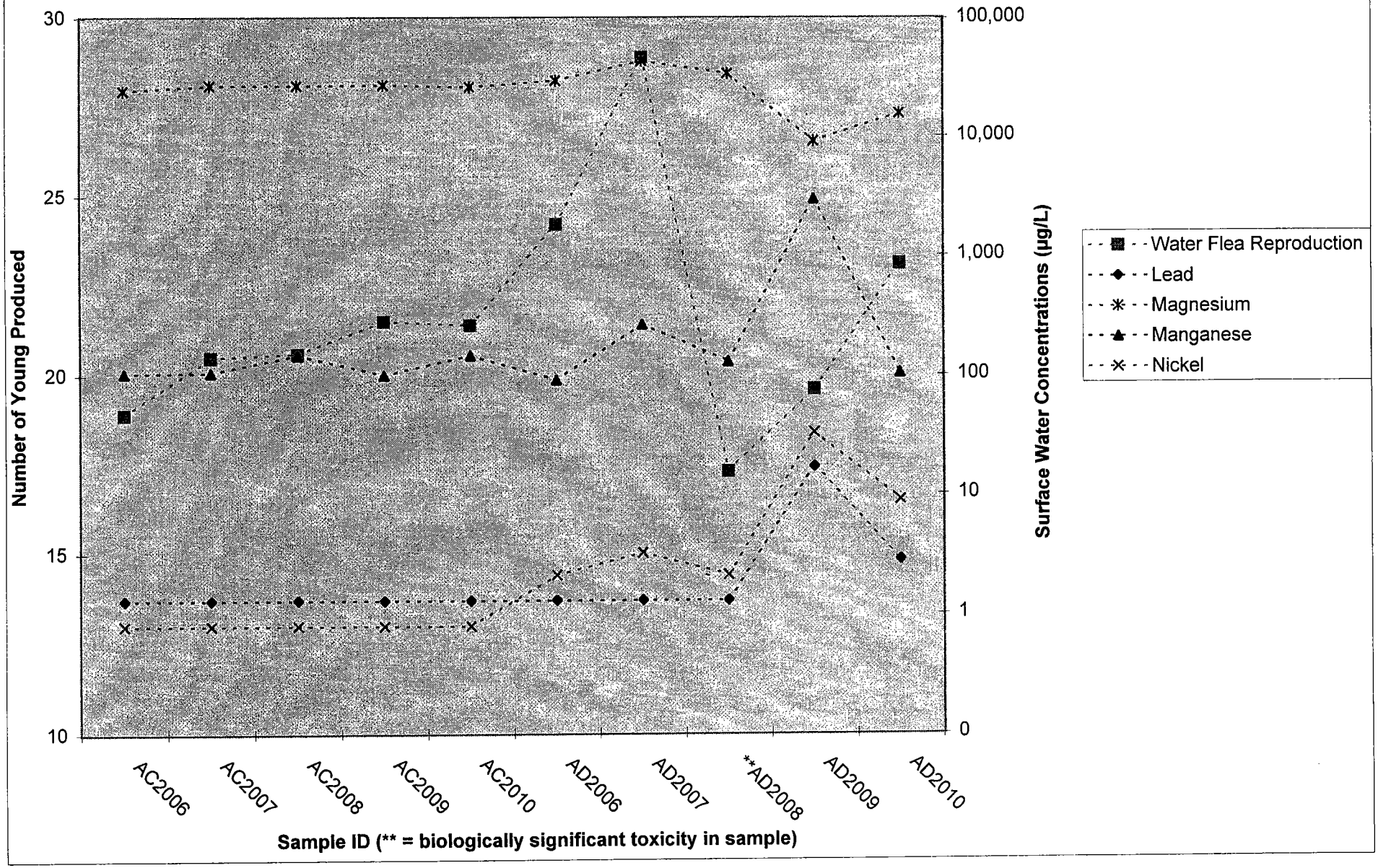


Figure 6-8

Water Flea Reproduction and P, K, Na, Zn Surface Water Concentrations
Red Water Ponds, PBOW, Sandusky, Ohio

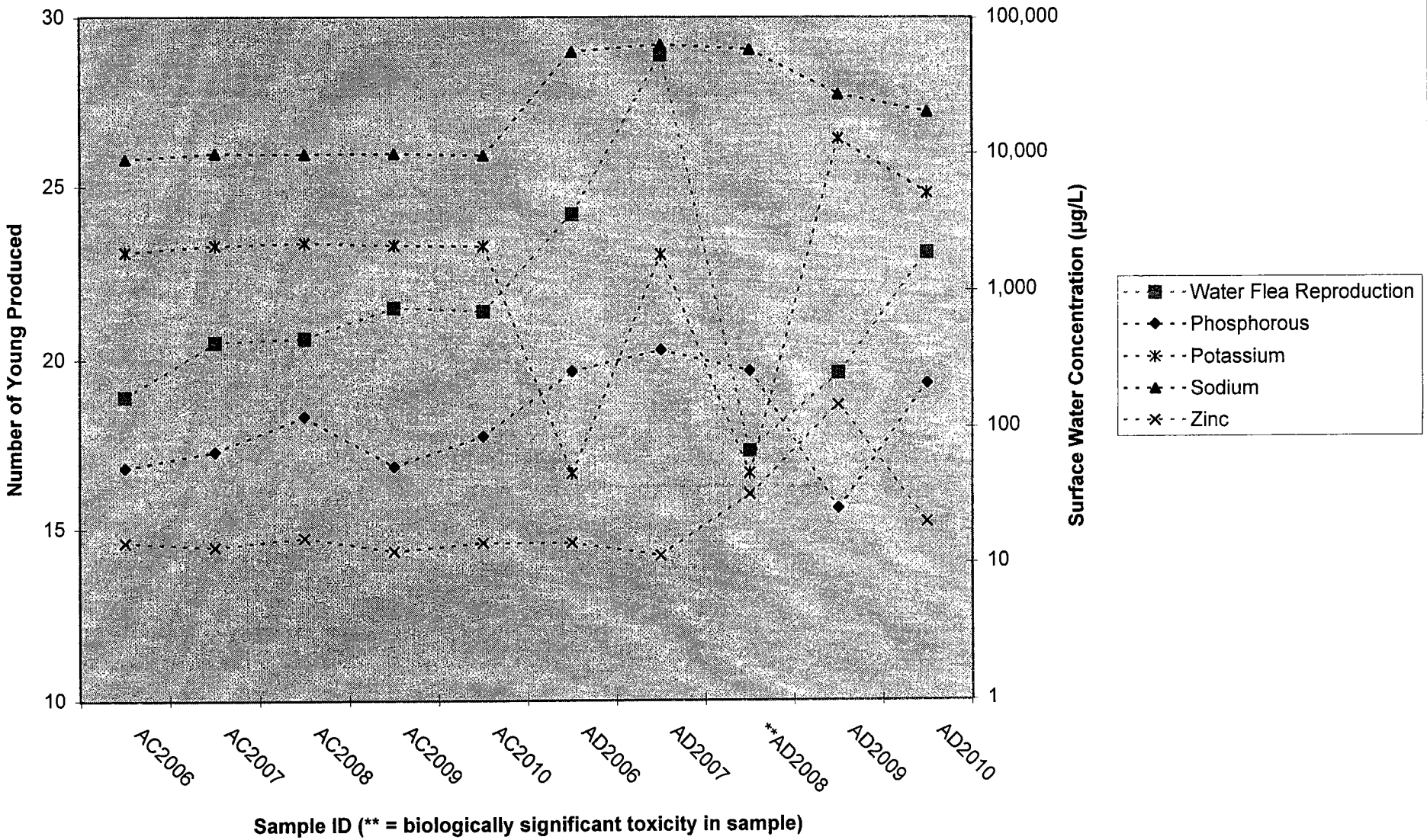


Figure 6-9

Amphipod Survival and Al, Sb, As, Ba Sediment Concentrations
Red Water Ponds, PBOW, Sandusky, Ohio

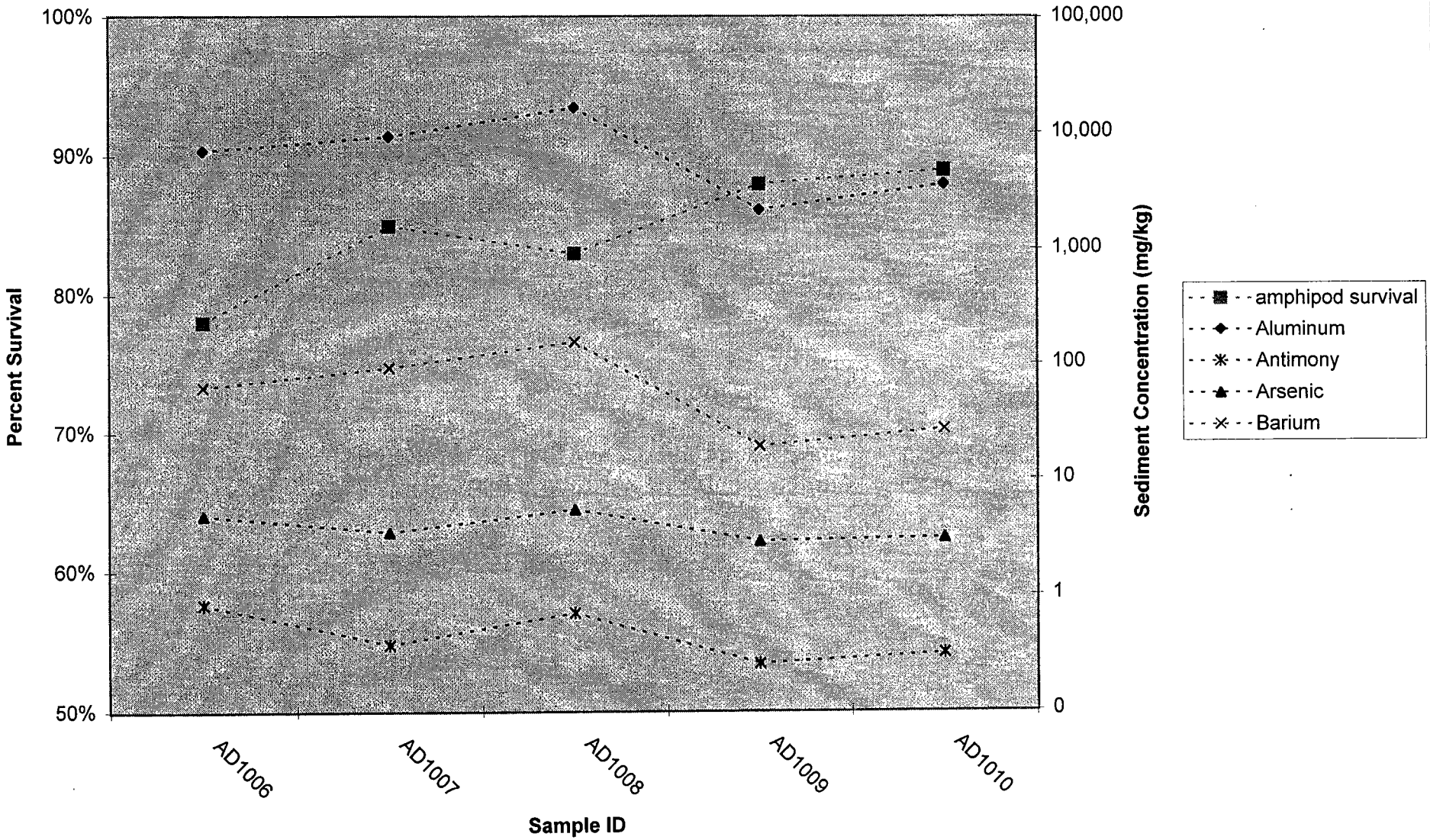
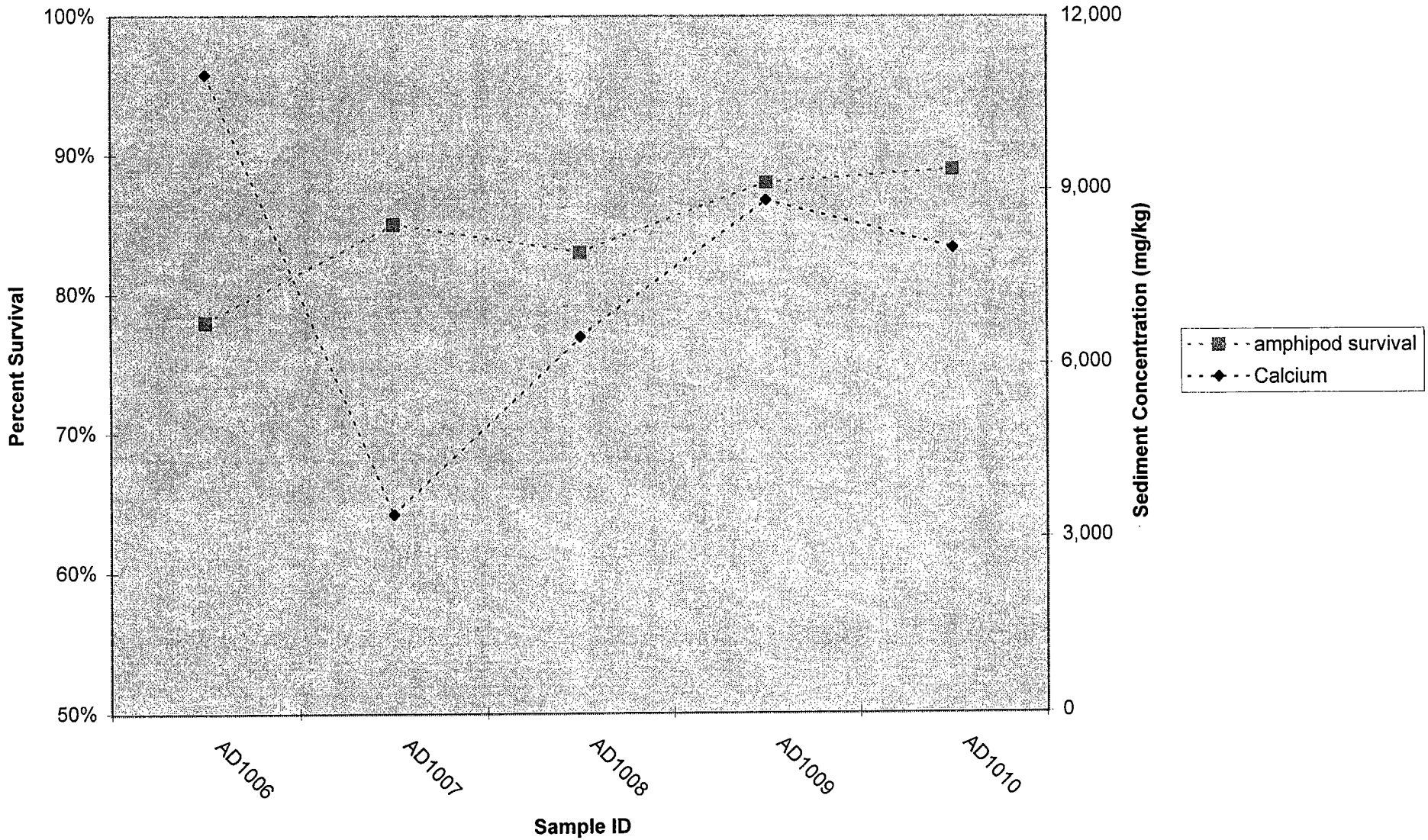


Figure 6-10

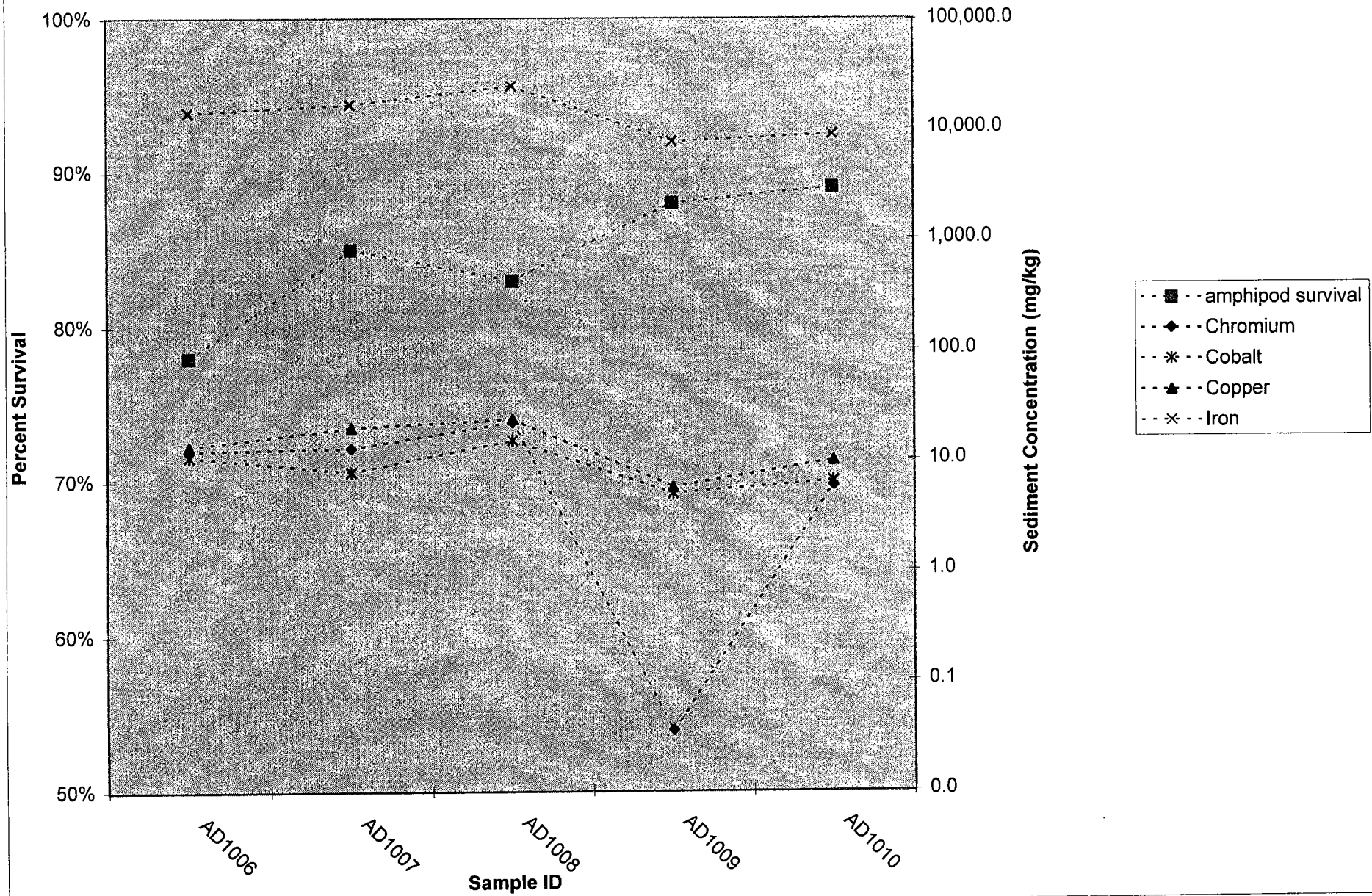
Amphipod Survival and Calcium Sediment Concentrations
Red Water Ponds, PBOW, Sandusky, Ohio



KN\PBOW\Red Water\BERA\Fig 6-10 Chart 1(Fig 6-10 Chart 1)\12/3/01(9:53 AM)

Figure 6-11

Amphipod Survival and Cr, Co, Cu, Fe Sediment Concentrations
Red Water Ponds, PBOW, Sandusky, Ohio



KN\PBOW\Red Water\BERA\Figs 6-9--6-13 Chart 3(Figs 6-9--6-13 Chart 3)\10/19/01(1:55 PM)

Figure 6-12

Amphipod Survival and Pb, Mg, Mn, Ni Sediment Concentrations
Red Water Ponds, PBOW, Sandusky, Ohio

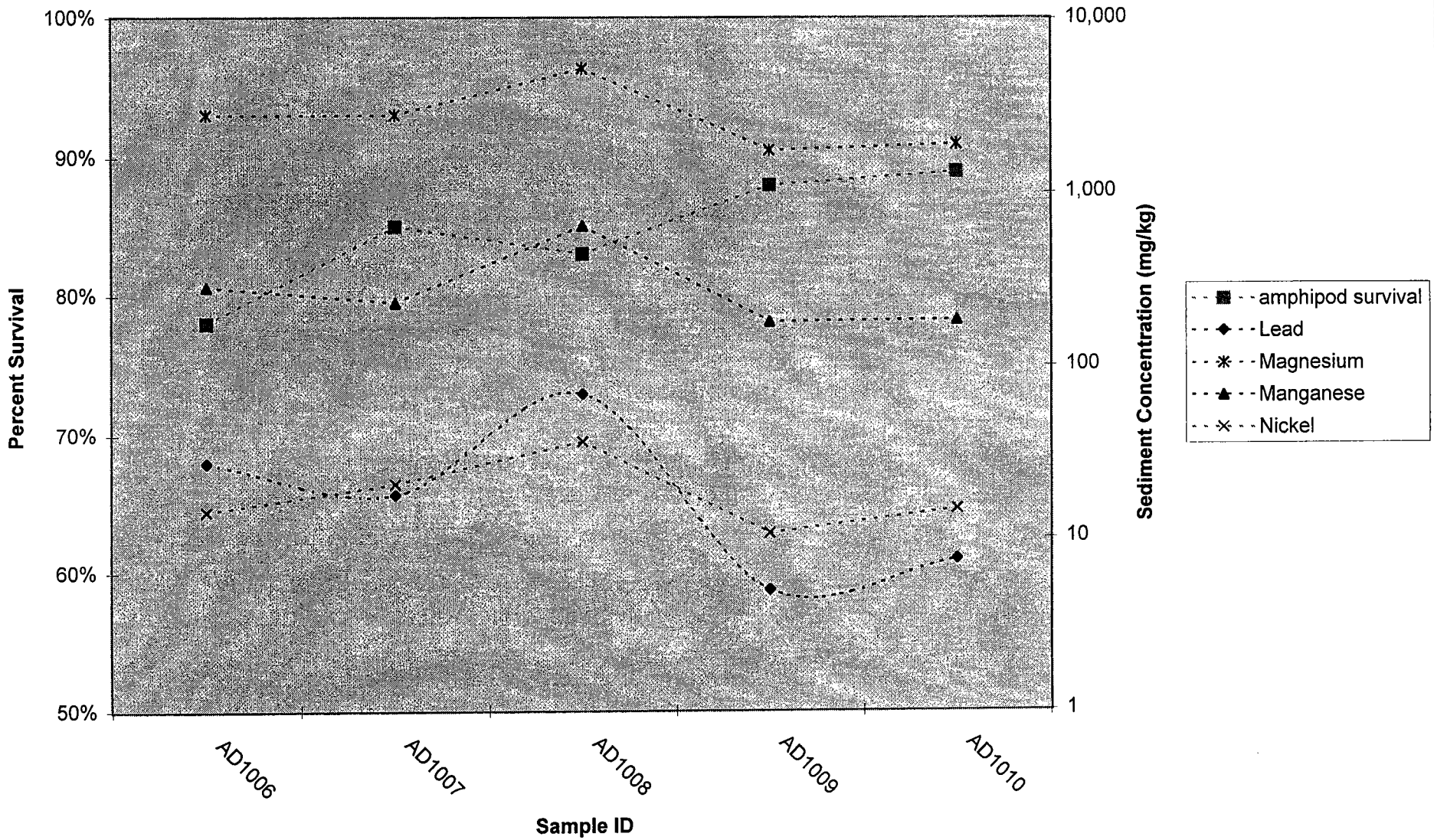


Figure 6-13

Amphipod Survival and P, K, Na, Zn Sediment Concentrations
Red Water Ponds, PBOW, Sandusky, Ohio

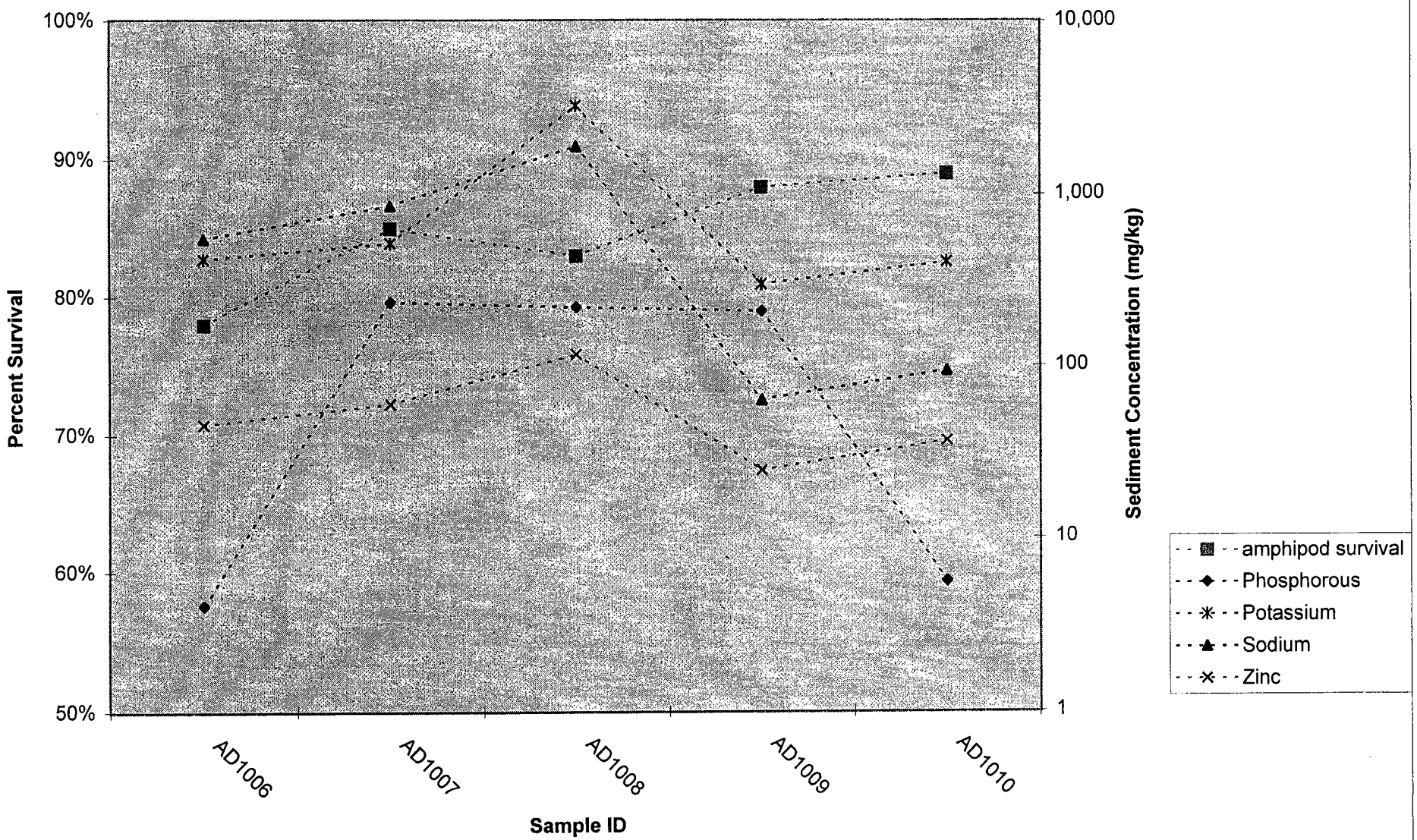


Figure 6-14

Earthworm Survival and Anthracene, B(a)P, B(b)F Soil Concentrations
Red Water Ponds, PBOW, Sandusky, Ohio

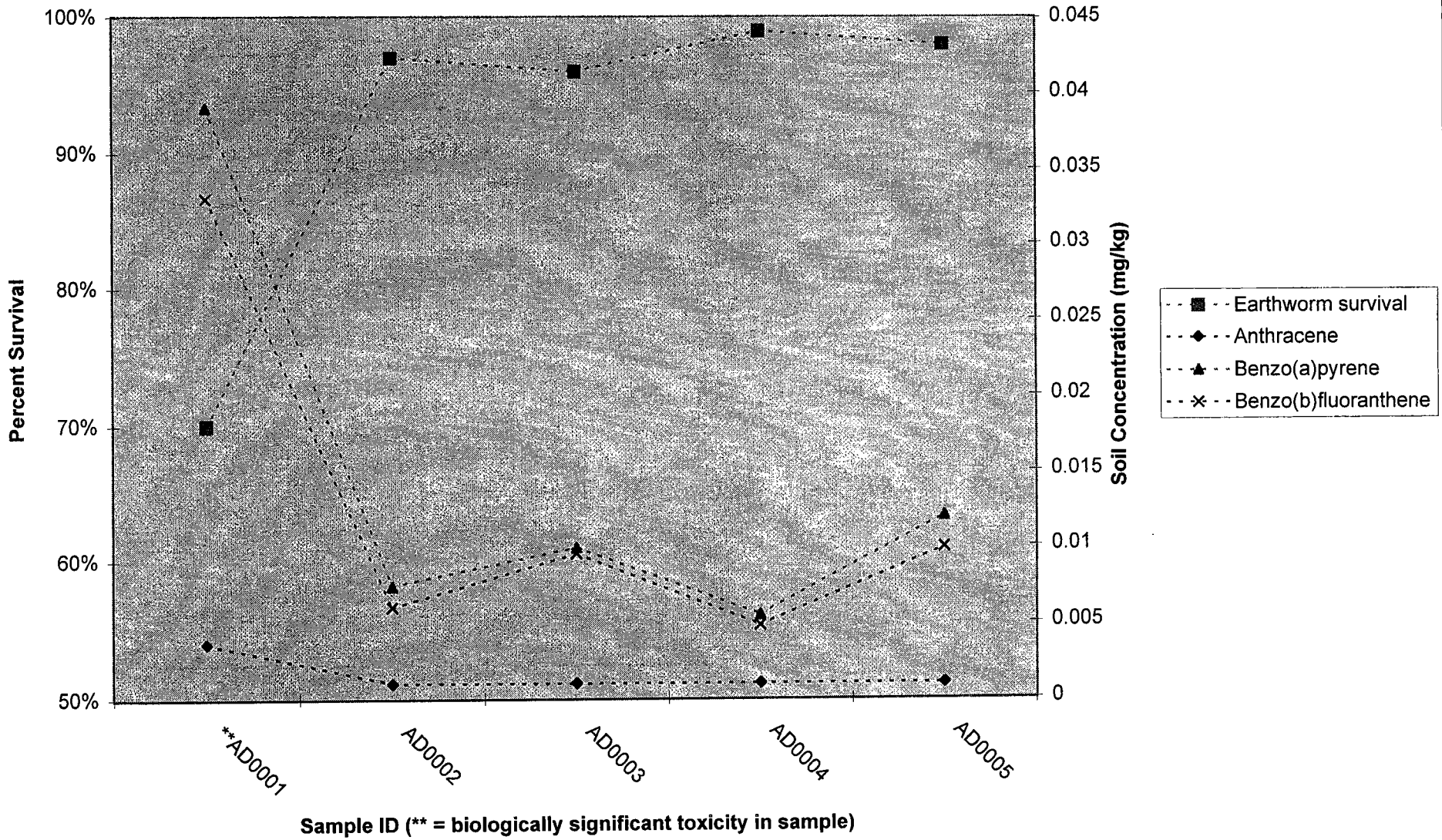
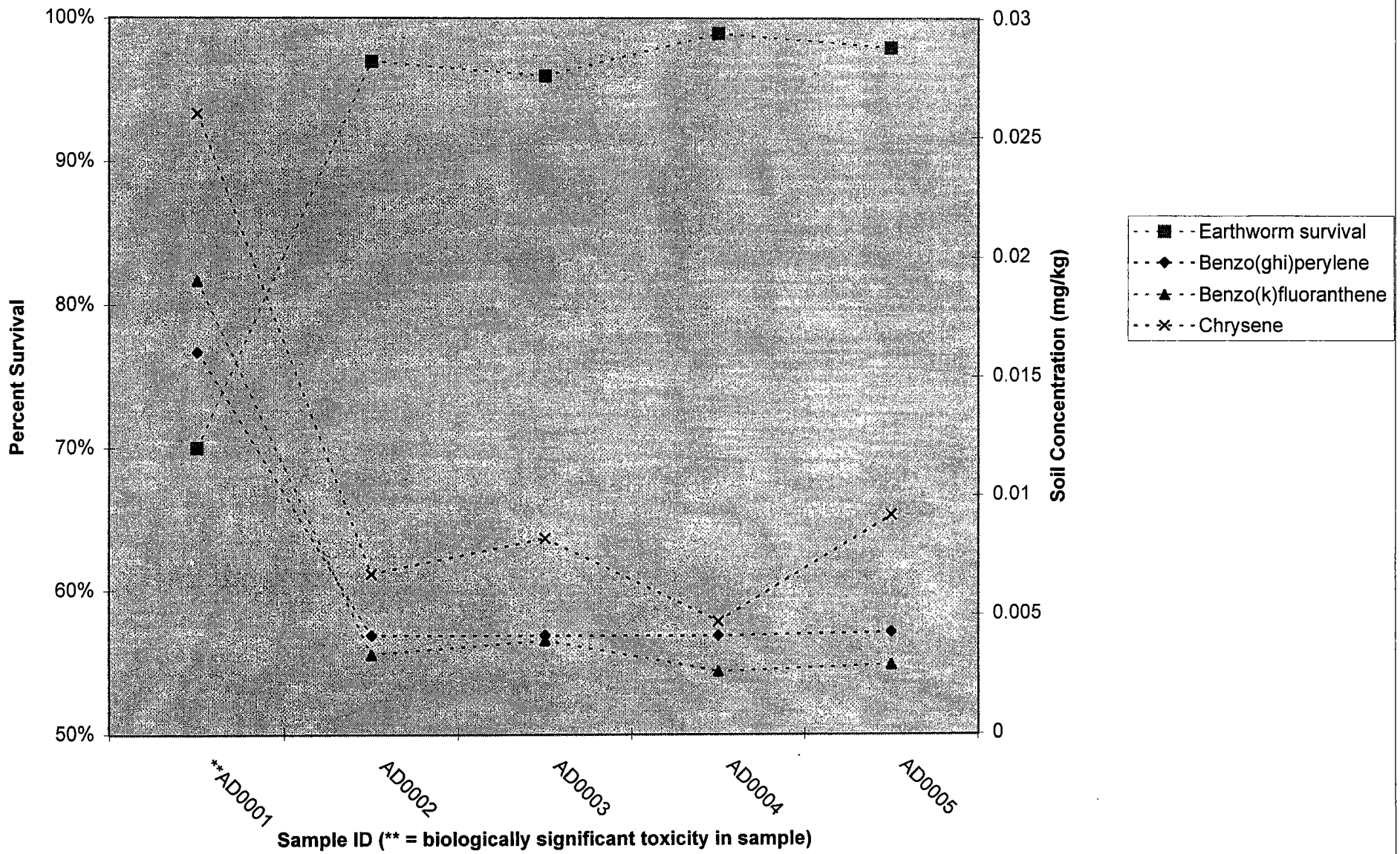


Figure 6-15

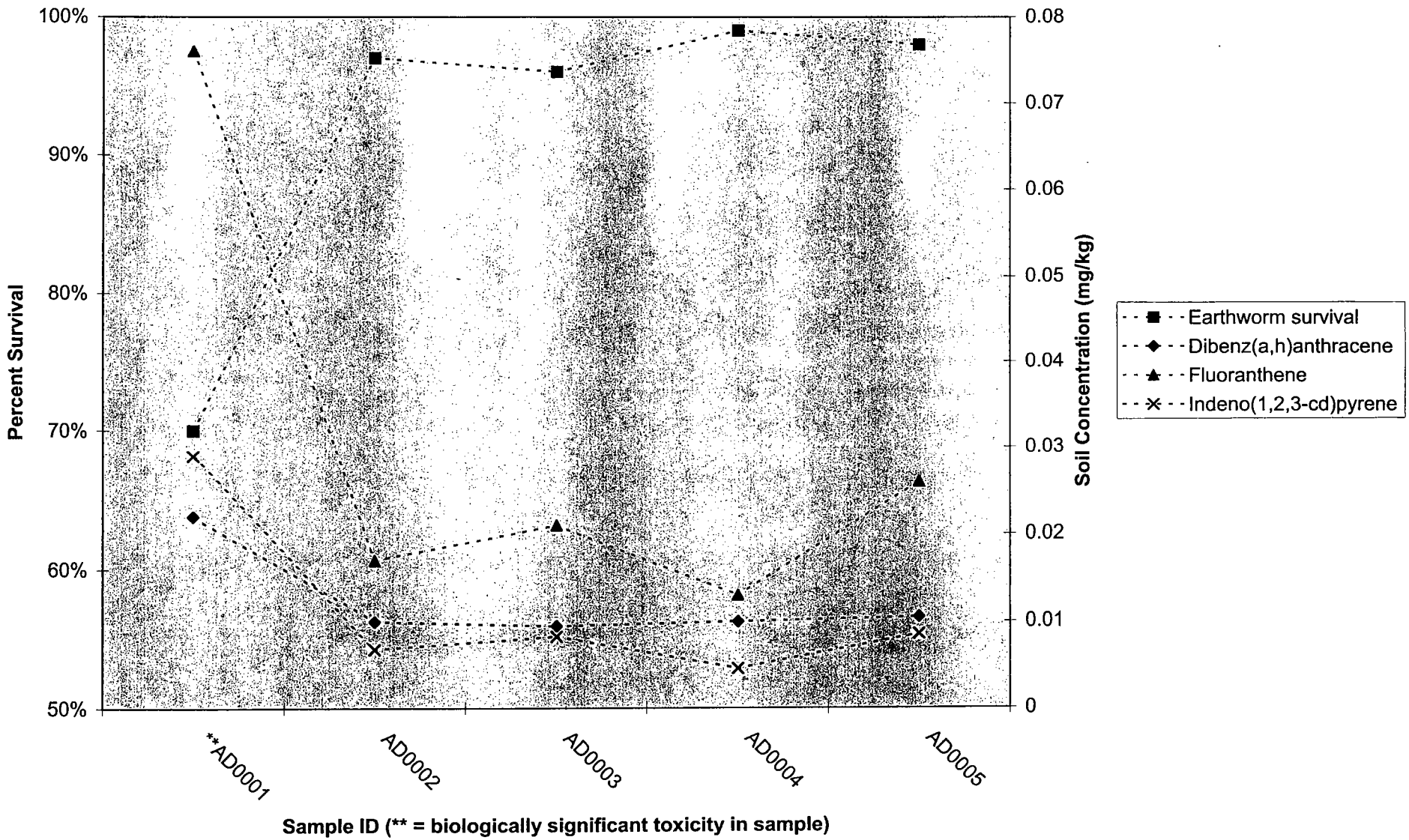
Earthworm Survival and B(ghi)P, B(k)F, Chrysene Soil Concentrations
Red Water Ponds, PBOW, Sandusky, Ohio



KN\PBOW\Red Water\BERA\Figs 6-14--6-16 Chart 2(Figs 6-14--6-16 Chart 2)\10/19/01(1:56 PM)

Figure 6-16

Earthworm Survival and D(ah)A, Fluoranthene, I(1,2,3cd)P Soil Concentrations
Red Water Ponds, PBOW, Sandusky, Ohio



APPENDIX A

FIELD VERIFICATION MEMORANDUM

IT Corporation

Memo

To: Mikael Spangberg, Lannae Long

From: Mark Weisberg

CC: Michael Gunderson, Knoxville Project Files-

Date: 7/18/00

Re: Former Plum Brook Ordnance Works, Red Water Ponds, Phase 2 Ecological Risk Assessment (BERA), Verification Site Visit Conducted June 29-30, 2000

This memo provides a summary of the Field Verification Site Visit for the former Plum Brook Ordnance Works (PBOW), Red Water Ponds (RWPs), Phase 2 Ecological Risk Assessment (ERA). This memo serves as Step 5 of the eight-step ERA process being performed for the sites. IT Corporation (IT) has provided an ecological risk professional (Mr. Weisberg) to the project to verify that methods and sampling efforts as described in Section 4.0 of the ERA Work Plan (IT, 2000) are actually feasible at the RWP sites.

Meeting Attendees
Mr. Mark Weisberg – IT
Ms. Linda Ingram – USACE Nashville
Captain John Osborn – USACE Huntington
Mr. David Kessler – IT
Mr. Keith Peecook – PBS (6/29/00 only)
Mr. John Blakeman – RAB (6/30/00 only)

Not Able to Attend
Ms. Laurie Moore – OEPA
Mr. Ron Nabors – OEPA
Mr. Richard Kunath – PBS

The meeting started at approximately 10:00 AM on June 29, 2000. Calls were placed to OEPA and it was determined that Ms. Moore and Mr. Nabors would not be attending. Mr. Weisberg presented the proposed Phase 2 ERA approach to the group present and answered questions.

It was discussed what should be done if proposed soil sample locations are inundated with surface water during the actual field sampling event (an unlikely but possible situation). The group decided that wet soil could be collected as is with appropriate notations on the sample collection log. Note: if proposed surface water/sediment locations are dry, no sample(s) will be collected.

The option of having the laboratory spike soil or sediment samples with particular chemical constituents was discussed, in the event targeted chemicals of concern (COC) are not detected in these media (see Work Plan Sections 4.2.1 and 6.0). The point was raised that if COCs such as a nitroaromatics could not be found at the resampled historic hotspot, spiking the sample with target COCs could be problematic, especially if bioavailability is artificially elevated compared with *in-situ* COC bioavailability. It should be noted that this relates only to the proposed uptake studies, not to the proposed toxicity studies as the toxicity studies must be started as soon as the samples (i.e., media) are received by the bioassay laboratory, whereas the uptake studies may be started later after the chemical analytical

Site conditions and feasibility of the proposed approach are documented herein and are being sent to CELRN, PBS and OEPA. This memo confirms the proposed Work Plan sampling design.

At the conclusion of ERA Step 5, there is a scientific management decision point (SMDP). IT had assumed that a proposed field conference call would fulfill SMDP 5. However, as OEPA did not attend the site visit, final resolution on this SMDP cannot be made at this time. IT had assumed that this Field Verification Memorandum for the record would be sufficient documentation for this ERA Step. It is now proposed that upon receipt of OEPA comments on the work plan and this memo, this memo will be revised as appropriate, and in its revised form it will serve as sufficient documentation for this ERA Step.

Action Items

- OEPA to provide comments on draft Phase 2 ERA Work Plan.
- OEPA to approve proposed background soil sampling locations.
- OEPA to comment on the recommendation in this memo that it is unnecessary for the bioassay laboratory to spike COCs in collected media (for subsequent uptake studies) if chemical analysis shows target COCs are non detect and the COC has been shown to have an historical frequency of detection of less than 5 percent.

APPENDIX B

SAMPLE COLLECTION LOGS

IT CORPORATION
A ... of The IT Group

Sample Collection Log

Project: 807053 **PLUM BROOK ORDNANCE WK**

Manager: Mike Spangberg

RFA / COC Number:

Site: **Pentolite Road Red Water Ponds**
Location Code: **PRWP-SO001**
Sample Number: **AC0001**
Sample Name: **PBOW-00-SS-PRWP-SO001-AC0001-0000**
Sampling Method: **GRAB**

Collection Date: 9/15/00
Collection Time: 1500

Start Depth: 0.0 ft
End Depth: 1.0 ft

Sample Team: MW TT

QC Partners: _____ *Trip Blank*
_____ *Rinsate*
_____ *Field Blank*

ERPIMS Values:
Sacode:
Lot Control#:
Sample Matrix: SOIL

Containers

Analytical Suite	Flt	Frtn	Qty	Size	Units	Type
BIOACC-SO	N	A	1	3	Gal	BKT
EXPLOSIVES	N	B	1	4	oz	CWM

Comments:

Sketch Location:

80 ft south of DP 09 by pond edge

Logged By / Date: [illegible] 9/15/00 *Reviewed By / Date:*

IT CORPORATION
A Member of The IT Group

Sample Collection Log

Project: 807053 **PLUM BROOK ORDNANCE WK**

Manager: Mike Spangberg

Site: **Pentolite Road Red Water Ponds**
Location Code: **PRWP-SO001**
Sample Number: **AC0001-MS**
Sample Name: **PBOW-00-SS-PRWP-SO001-AC0001-0000**
Sampling Method: **GRAB**

QC Partners: _____ *Trip Blank*
_____ *Rinsate*
_____ *Field Blank*

RFA / COC Number: _____
Collection Date: 9/15/00
Collection Time: 1500
Start Depth: 0.0 ft
End Depth: 1.0 ft
Sample Team: MW, TT

ERPIMS Values:
Sacode: _____
Lot Control#: _____
Sample Matrix: SOIL

Containers

Analytical Suite	Flt	Frtn	Qty	Size	Units	Type
EXPLOSIVES	N	B	1	4	oz	CWM

Comments:

Sketch Location:

~~[illegible] DP-11~~

80 ft South of DP #9 by pond edge

Logged By / Date: Mark Waring 9/15/00 *Reviewed By / Date:*

IT CORPORATION
A ... of The IT Group

Sample Collection Log

Project: 807053 **PLUM BROOK ORDNANCE WK**

Manager: Mike Spangberg

RFA / COC Number:

Site: **Pentolite Road Red Water Ponds**
Location Code: **PRWP-SO001**
Sample Number: **AC0001-MSD**
Sample Name: **PBOW-00-SS-PRWP-SO001-AC0001-0000**
Sampling Method: **GRAB**

Collection Date: 9/15/00
Collection Time: 1500

Start Depth: 0.0 ft
End Depth: 1.0 ft

Sample Team: MW, TT

QC Partners:
Trip Blank
Rinsate
Field Blank

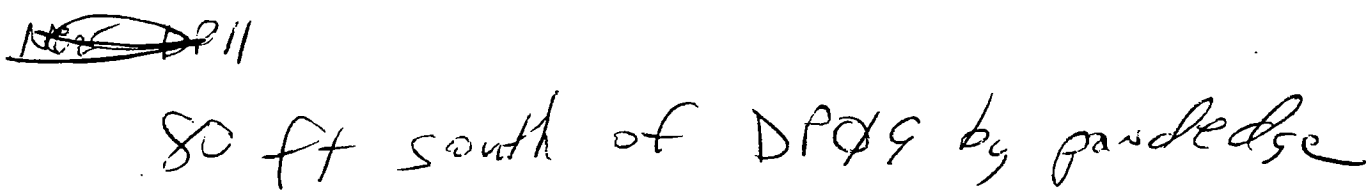
ERPIMS Values:
Sacode:
Lot Control#:
Sample Matrix: SOIL

Containers

Analytical Suite	Flt	Frtn	Qty	Size	Units	Type
EXPLOSIVES	N	B	1	4	oz	CWM

Comments:

Sketch Location:



Logged By / Date: [signature] 9/15/00 *Reviewed By / Date:*

IT CORPORATION
A Member of The IT Group

Sample Collection Log

Project: 807053 **PLUM BROOK ORDNANCE WK**

Manager: Mike Spangberg

RFA / COC Number:

Site: **Pentolite Road Red Water Ponds**

Location Code: **PRWP-SO002**

Sample Number: **AC0002**

Sample Name: **PBOW-00-SS-PRWP-SO002-AC0002-0000**

Sampling Method: **GRAB**

Collection Date: 9/15/00

Collection Time: 1510

Start Depth: 0.0 ft

End Depth: 1.0 ft

Sample Team: MW, TT

QC Partners:

Trip Blank

Rinsate

Field Blank

ERPIMS Values:

Sacode:

Lot Control#:

Sample Matrix: SOIL

Containers

Analytical Suite	Flt	Frtn	Qty	Size	Units	Type
BIOACC-SO	N	A	1	3	Gal	BKT
EXPLOSIVES	N	B	1	4	oz	CWM

Comments:

Sketch Location:

Right NE of DP 11 (1.0 ft NW)

Logged By / Date: [illegible] 9/15/00 *Reviewed By / Date:*

IT CORPORATION
A Member of The IT Group

Sample Collection Log

Project: 807053 **PLUM BROOK ORDNANCE WK**

Manager: Mike Spangberg

RFA / COC Number:

Site: **Pentolite Road Red Water Ponds**

Location Code: **PRWP-SO003**

Sample Number: **AC0003**

Sample Name: **PBOW-00-SS-PRWP-SO003-AC0003-0000**

Sampling Method: **GRAB**

Collection Date: 9/15/00

Collection Time: 1520

Start Depth: 0.0 ft

End Depth: 1.0 ft

Sample Team: MW, TT

QC Partners:

Trip Blank

Rinsate

Field Blank

ERPIMS Values:

Sacode:

Lot Control#:

Sample Matrix: SOIL

Containers

Analytical Suite	Flt	Frtn	Qty	Size	Units	Type
BIOACC-SO	N	A	1	3	Gal	BKT
EXPLOSIVES	N	B	1	4	oz	CWM

Comments:

Sketch Location:

Near DP11 (5 ft south)

Logged By / Date: Mark Dealey 9/15/00 *Reviewed By / Date:*

IT CORPORATION
A Member of The IT Group

Sample Collection Log

Project: 807053 **PLUM BROOK ORDNANCE WK**

Manager: Mike Spangberg

Site: **Pentolite Road Red Water Ponds**
Location Code: **PRWP-SO004**
Sample Number: **AC0004**
Sample Name: **PBOW-00-SS-PRWP-SO004-AC0004-0000**
Sampling Method: **GRAB**

QC Partners: _____ *Trip Blank*
_____ *Rinsate*
_____ *Field Blank*

RFA / COC Number: _____
Collection Date: 9/15/00
Collection Time: 1530
Start Depth: 0.0 ft
End Depth: 1.0 ft
Sample Team: MW, TT

ERPIMS Values:
Sacode: _____
Lot Control#: _____
Sample Matrix: SOIL

Containers

Analytical Suite	Flt	Frtn	Qty	Size	Units	Type
BIOACC-SO	N	A	1	3	Gal	BKT
EXPLOSIVES	N	B	1	4	oz	CWM

Comments:

Sketch Location:

Near DP11 (5ft East)

Logged By / Date: Mark Wesley 9/15/00 *Reviewed By / Date:*

IT CORPORATION
A Member of The IT Group

Sample Collection Log

Project: 807053 **PLUM BROOK ORDNANCE WK**

Manager: Mike Spangberg

Site: **Pentolite Road Red Water Ponds**
Location Code: **PRWP-SO005**
Sample Number: **AC0005**
Sample Name: **PBOW-00-SS-PRWP-SO005-AC0005-0000**
Sampling Method: **GRAB**

QC Partners: _____ *Trip Blank*
_____ *Rinsate*
_____ *Field Blank*

RFA / COC Number: _____
Collection Date: 9/15/00
Collection Time: 1540
Start Depth: 0.0 ft
End Depth: 1.0 ft
Sample Team: MW, TT

ERPIMS Values:
Sacode: _____
Lot Control#: _____
Sample Matrix: SOIL

Containers

Analytical Suite	Flt	Frtn	Qty	Size	Units	Type
BIOACC-SO	N	A	1	3	Gal	BKT
EXPLOSIVES	N	B	1	4	oz	CWM

Comments:

Sketch Location:

Near DP11 (5 ft north)

Logged By / Date: Mark Wendling 9/15/00 *Reviewed By / Date:*

IT CORPORATION
A ... of The IT Group

Sample Collection Log

Project: 807053 **PLUM BROOK ORDNANCE WK**

Manager: Mike Spangberg

RFA / COC Number:

Site: **Pentolite Road Red Water Ponds**

Location Code: **PRWP-SO001** - DUP

Sample Number: **AC0006** - DUP

Sample Name: **PBOW-00-SS-PRWP-SO001-AC0006-0000**

Sampling Method: **GRAB**

QC Partners: _____ *Trip Blank*

_____ *Rinsate*

_____ *Field Blank*

Collection Date: 9/15/00

Collection Time: 1500

Start Depth: 0.0 ft

End Depth: 1.0 ft

Sample Team: MW, TT

ERPIMS Values:

Sacode:

Lot Control#:

Sample Matrix: SOIL

Containers

Analytical Suite	Flt	Frtn	Qty	Size	Units	Type
EXPLOSIVES	N	B	1	4	oz	CWM

Comments:

Sketch Location:

80 ft south of DP09 by pond edge

Logged By / Date: Mike Dewey 9/15/00 *Reviewed By / Date:*

IT CORPORATION
...er of The IT Group

Sample Collection Log

Project: 807053 **PLUM BROOK ORDNANCE WK**

Manager: Mike Spangberg

RFA / COC Number: 090015-EA(Bioass.) 090015STL

Site: **Pentolite Road Red Water Ponds**

Location Code: **PRWP-SD001**

Sample Number: **AC1001**

Sample Name: **PBOW-00-PRWP-SD001-AC1001-0000**

Sampling Method: **GRAB**

Collection Date: 9/15/00

Collection Time: 1000

Start Depth: 0.0 ft

End Depth: 0.5 ft

Sample Team: MW, TT

QC Partners:

Trip Blank

Rinsate

Field Blank

ERPIMS Values:

Sacode:

Lot Control#:

Sample Matrix: Sediment

Containers

Analytical Suite	Flt	Frtn	Qty	Size	Units	Type
SEMIVOLATILES3	N	A	1	4	oz	CWM
METAL-ERA	N	B	1	4	oz	CWM
TOC	N	~~C~~	1	4	oz	CWM
BIOACC-SD	N	D	1	3	Gal	BKT
PHOSPHOROUS	N	E	1	4	oz	CWM

Comments:

Sketch Location: Up and work plan figure, just west of grass road in ditch SW 8-10' wide Mucky sediment / H_2S smell

Logged By / Date: Mark Wesley 9/15/00 *Reviewed By / Date:* Chris Fischer 9/12/00

IT CORPORATION
Member of The IT Group

Sample Collection Log

Project: 807053 **PLUM BROOK ORDNANCE WK**

Manager: Mike Spangberg

090015-EA (Bioassay)

RFA / COC Number: 090015STL

Site: **Pentolite Road Red Water Ponds**

Location Code: **PRWP-SD002**

Sample Number: **AC1002**

Sample Name: **PBOW-00-PRWP-SD002-AC1002-0000**

Sampling Method: **GRAB**

Collection Date: 9/15/00

Collection Time: 1010

Start Depth: 0.0 FT

End Depth: 0.5 ft

Sample Team: MW, TT

QC Partners: _____ *Trip Blank*

_____ *Rinsate*

_____ *Field Blank*

ERPIMS Values:

Sacode: _____

Lot Control#: _____

Sample Matrix: Sediment

Containers

Analytical Suite	Flt	Frtn	Qty	Size	Units	Type
SEMIVOLATILES3	N	A	1	4	oz	CWM
METAL-ERA	N	B	1	4	oz	CWM
TOC	N	~~C~~ B	1	4	oz	CWM
BIOACC-SD	N	D	1	3	Gal	BKT
PHOSPHOROUS	N	E	1	4	oz	CWM

Comments:

Sketch Location: As on work plan Figure, just east of gross road in ditch SW 8-10' wide

Mucky sediment, H_2S smell

Logged By / Date: Mark Wesley 9/15/00 *Reviewed By / Date:* C. Fischer 9/16/00

IT CORPORATION
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Sample Collection Log

Project: 807053 **PLUM BROOK ORDNANCE WK**

Manager: Mike Spangberg

090015-EA(bioassay

RFA / COC Number: 09150015STL

Site: **Pentolite Road Red Water Ponds**

Location Code: **PRWP-SD003**

Sample Number: **AC1003**

Sample Name: **PBOW-00-PRWP-SD003-AC1003-0000**

Sampling Method: **GRAB**

Collection Date: 9/15/00

Collection Time: 1130

Start Depth: 0.0 ft

End Depth: 0.5 ft

Sample Team: MW, TT

QC Partners:

Trip Blank

Rinsate

Field Blank

ERPIMS Values:

Sacode:

Lot Control#:

Sample Matrix: Sediment

Containers

Analytical Suite	Flt	Frtn	Qty	Size	Units	Type
SEMIVOLATILES3	N	A	1	4	oz	CWM
METAL-ERA	N	B	1	4	oz	CWM
TOC	N	~~C~~ B	1	4	oz	CWM
BIOACC-SD	N	D	1	3	Gal	BKT
PHOSPHOROUS	N	E	1	4	oz	CWM

Comments:

Sketch Location:

At historic SW02/SD02 on ravine creek

Fibrous sediment, macrophyte roots

0.5-1.0' water depth

Logged By / Date: [illegible] 9/15/00 *Reviewed By / Date:* [illegible] 09/16/00

IT CORPORATION
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Sample Collection Log

Project: 807053 **PLUM BROOK ORDNANCE WK**

Manager: Mike Spangberg

090015-EA (bioassay)

RFA / COC Number: 090015STL

Site: **Pentolite Road Red Water Ponds**

Location Code: **PRWP-SD004**

Sample Number: **AC1004**

Sample Name: **PBOW-00-PRWP-SD004-AC1004-0000**

Sampling Method: **GRAB**

Collection Date: 9/15/00

Collection Time: 1140

Start Depth: 0.0 ft

End Depth: 0.5 ft

Sample Team: MW, TT

QC Partners: _____ *Trip Blank*

_____ *Rinsate*

_____ *Field Blank*

ERPIMS Values:

Sacode: _____

Lot Control#: _____

Sample Matrix: _____

Containers

Analytical Suite	Flt	Frtn	Qty	Size	Units	Type
SEMIVOLATILES3	N	A	1	4	oz	CWM
METAL-ERA	N	B	1	4	oz	CWM
TOC	N	~~C~~ D	1	4	oz	CWM
✓BIOACC-SD	N	D	1	3	Gal	BKT
PHOSPHOROUS	N	E	1	4	oz	CWM

Comments:

Sketch Location: 10 ft downstream of historic SW02/SD02 in ravine creek

Fibrous sediment, macrophyte roots

0.5 - 1.0 ft water depth

Logged By / Date: Mark Wesby 9/15/00 *Reviewed By / Date:*

IT CORPORATION
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Sample Collection Log

Project: 807053 **PLUM BROOK ORDNANCE WK**

Manager: Mike Spangberg

090015-EA(bioassay)

RFA / COC Number: 090015STL

Site: **Pentolite Road Red Water Ponds**

Location Code: **PRWP-SD005**

Sample Number: **AC1005**

Sample Name: **PBOW-00-PRWP-SD005-AC1005-0000**

Sampling Method: **GRAB**

Collection Date: 9/15/00

Collection Time: 1150

Start Depth: 0.0 ft

End Depth: 0.5 ft

Sample Team: MW, TT

QC Partners: _____ *Trip Blank*

_____ *Rinsate*

_____ *Field Blank*

ERPIMS Values:

Sacode: _____

Lot Control#: _____

Sample Matrix: sediment

Containers

Analytical Suite	Flt	Frtn	Qty	Size	Units	Type
SEMIVOLATILES3	N	A	1	4	oz	CWM
METAL-ERA	N	B	1	4	oz	CWM
TOC	N	~~C~~ B	1	4	oz	CWM
BIOACC-SD	N	D	1	3	Gal	BKT
PHOSPHOROUS	N	E	1	4	oz	CWM

Comments:

Sketch Location: 10 ft. upstream of historic SW02/SD02 in ravine creek.

Fibrous sediment, macrophyte roots

0.5-1.0 ft water depth

Logged By / Date: [illegible] 9/15/00 *Reviewed By / Date:*

IT CORPORATION
...er of The IT Group

Sample Collection Log

Project: 807053 **PLUM BROOK ORDNANCE WK**

Manager: Mike Spangberg

RFA / COC Number: 090015STL

Site: **Pentolite Road Red Water Ponds**

Location Code: **PRWP-SW004**

Sample Number: **AC2004**

Sample Name: **PBOW-00-PRWP-SW004-AC2004-0000**

Sampling Method: **GRAB**

Collection Date: 9/14/00

Collection Time: 1155

Start Depth: —

End Depth: —

QC Partners: _____ *Trip Blank*

_____ *Rinsate*

_____ *Field Blank*

Sample Team: T. Willard

ERPIMS Values:

Sacode:

Lot Control#:

Sample Matrix: water

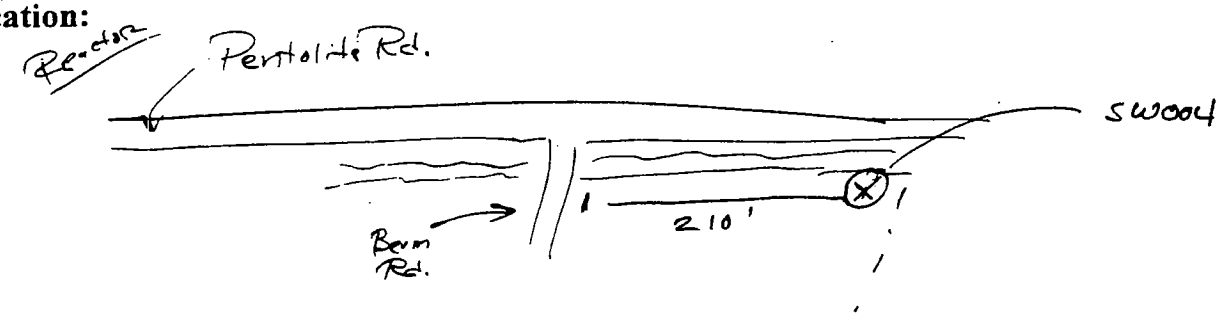
Containers

Analytical Suite	Flt	Frtn	Qty	Size	Units	Type
METAL-ERA	N	A	1	1000	mL	HDPE
PHOSPHOROUS	N	B	1	125	mL	HDPE

Surface Water Parameters:	Eh (mV)	pH (SU)	Conductivity (mS/cm)	Turbidity (NTU)	DissOxygen (ppm)	Temperature (C)
	-41.7	8.06	.942	120	8.6	18.9

Comments: Taken ≈ 210ft. from berm road near intermittent stream. Only SW sample taken at locations associated with fish collection activities. SW001, SW002, SW003, SW005 all not collected. Downgradient sample.

Sketch Location:



Logged By / Date: [signature] 9/14/00

Reviewed By / Date: C. Freshour 9/14/00

IT CORPORATION
The IT Group

Sample Collection Log

Project: 807053 **PLUM BROOK ORDNANCE WK**

Manager: Mike Spangberg

RFA / COC Number: 090015STL 090014EA (toxicity)

Site: **Pentolite Road Red Water Ponds**

Location Code: **PRWP-SW006**

Sample Number: **AC2006**

Sample Name: **PBOW-00-PRWP-SW006-AC2006-0000**

Sampling Method: **GRAB**

QC Partners:

Toxicity Only has already been sent!

Collection Date: 9/14/10

Collection Time: 1050

Start Depth: —

End Depth: —

Sample Team: T. Willard

ERPIMS Values:

Sacode:

Lot Control#:

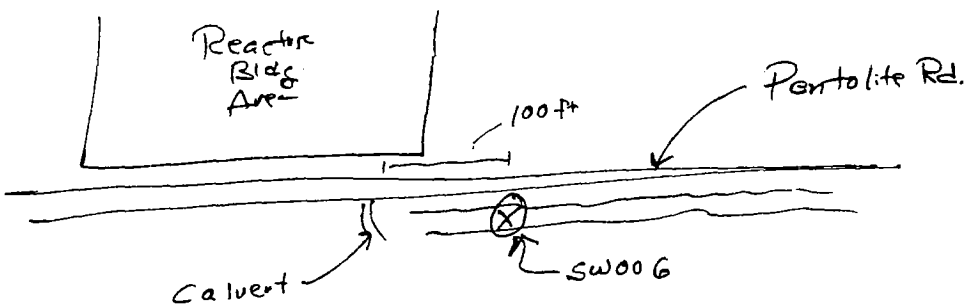
Sample Matrix: Water

Analytical Suite	Flt	Frtn	Qty	Container Size		
METAL-ERA	N	A	1	1000	~~mL~~	HDPE
PHOSPHOROUS	N	B	1	125	mL	HDPE
TOXICITY-SW	N	C	3	1	Gal	HDPE

Surface Water Parameters:	Eh (mV)	pH (SU)	Conductivity (mS/cm)	Turbidity (NTU)	DissOxygen (ppm)	Temperature (C)
	26.3	7.92	.978	10	9.74	17.8

Comments: Background SW sample taken ≈ 100 ft. from culvert across from Reactor bldg. area. ~~SSCAA Am. 00~~

Sketch Location:



Logged By / Date: [signature] 9/14/00

Reviewed By / Date: [signature] 9/14/00

IT CORPORATION
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Sample Collection Log

Project: 807053 **PLUM BROOK ORDNANCE WK**

Manager: Mike Spangberg

RFA / COC Number: 090015-STL 090014EA (toxicity)

Site: **Pentolite Road Red Water Ponds**

Location Code: **PRWP-SW007**

Sample Number: **AC2007**

Sample Name: **PBOW-00-PRWP-SW007-AC2007-0000**

Sampling Method: **GRAB**

Collection Date: 9/14/00

Collection Time: 1020

Start Depth: —

End Depth: —

QC Partners: _____ Trip Blank

_____ Rinsate

_____ Field Blank

Sample Team: T. Willard

ERPIMS Values:

Sacode:

Lot Control#:

Sample Matrix: Water

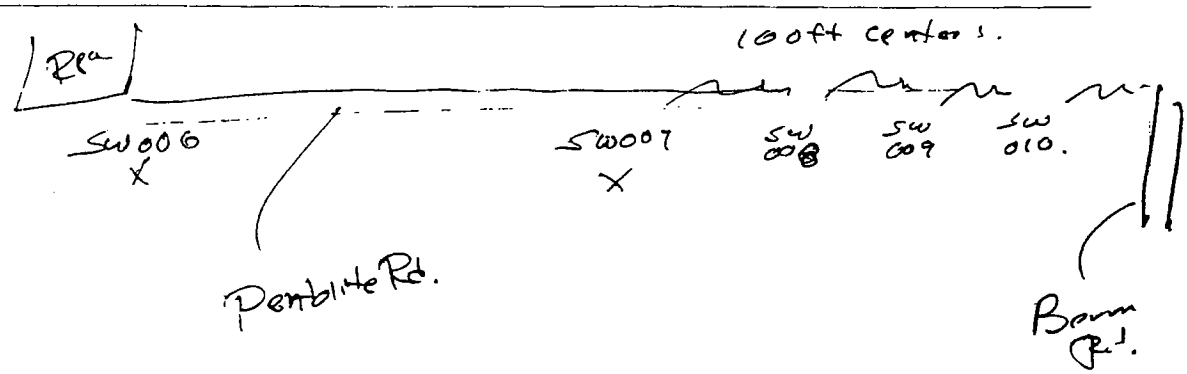
Containers

Analytical Suite	Flt	Frtn	Qty	Size	Units	Type
METAL-ERA	N	A	1	1000	mL	HDPE
PHOSPHOROUS	N	B	1	125	mL	HDPE
✓TOXICITY-SW	N	C	3	1	Gal	HDPE

Surface Water Parameters:	Eh (mV)	pH (SU)	Conductivity (mS/cm)	Turbidity (NTU)	DissOxygen (ppm)	Temperature (C)
	~~.968~~ -37.5	8.06	.968	10	10.1	17.3

Comments: 100ft. from SW006 (downstream of SW006)

Sketch Location:



Logged By / Date: [signature] 9/14/00

Reviewed By / Date: C. Freshour 9/14/00

IT CORPORATION
A (The IT Group

Sample Collection Log

Project: 807053 **PLUM BROOK ORDNANCE WK**

Manager: Mike Spangberg

RFA / COC Number: 0900155TL 0900 14EA (toxicity)

Site: **Pentolite Road Red Water Ponds**
Location Code: **PRWP-SW008**
Sample Number: **AC2008**
Sample Name: **PBOW-00-PRWP-SW008-AC2008-0000**
Sampling Method: **GRAB**

Collection Date: 9/14/00
Collection Time: 1000

Start Depth: —
End Depth: —

Sample Team: T. Willard

QC Partners: _____ *Trip Blank*
_____ *Rinsate*
_____ *Field Blank*

ERPIMS Values:
Sacode:
Lot Control#:
Sample Matrix: Water

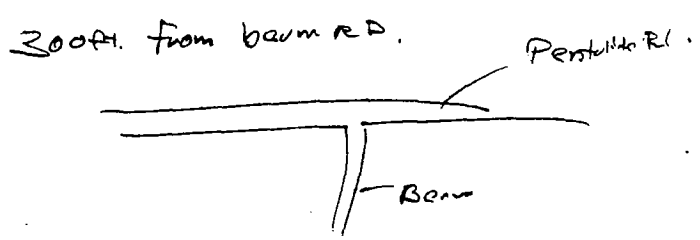
Containers

Analytical Suite	Flt	Frtn	Qty	Size	Units	Type
METAL-ERA	N	A	1	1000	mL	HDPE
PHOSPHOROUS	N	B	1	125	mL	HDPE
✓TOXICITY-SW	N	C	3	1	Gal	HDPE

	Eh (mV)	pH (SU)	Conductivity (mS/cm)	Turbidity (NTU)	DissOxygen (ppm)	Temperature (C)
Surface Water Parameters:	-36.4	7.98	.956	10	9.8	17.3

Comments:

Sketch Location:



Logged By / Date: [signature] 9/14/00

Reviewed By / Date: C. Freshour 9/14/00

IT CORPORATION
Member of The IT Group

Sample Collection Log

Project: 807053 **PLUM BROOK ORDNANCE WK**

Manager: Mike Spangberg

RFA / COC Number: 090015STL 090014EA (toxicity)

Site: **Pentolite Road Red Water Ponds**
Location Code: **PRWP-SW009**
Sample Number: **AC2009**
Sample Name: **PBOW-00-PRWP-SW009-AC2009-0000**
Sampling Method: **GRAB**

Collection Date: 9/14/00
Collection Time: 0940

Start Depth: —
End Depth: —

Sample Team: T. Willard

QC Partners: _____ *Trip Blank*
_____ *Rinsate*
_____ *Field Blank*

ERPIMS Values:
Sacode:
Lot Control#:
Sample Matrix: Water

Containers

Analytical Suite	Flt	Frtn	Qty	Size	Units	Type
METAL-ERA	N	A	1	1000	mL	HDPE
PHOSPHOROUS	N	B	1	125	mL	HDPE
✓TOXICITY-SW	N	C	3	1	Gal	HDPE

	Eh (mV)	pH (SU)	Conductivity (mS/cm)	Turbidity (NTU)	DissOxygen (ppm)	Temperature (C)
Surface Water Parameters:	-38.3	8.03	.956	10	10.1	17.2

Comments:

Sketch Location: 200 ft. from Baum Rd along Pentolite Rd.

Logged By / Date: Thomas J Willard 9/14/00

Reviewed By / Date: C. Freshour 9/14/00

IT CORPORATION
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Sample Collection Log

Project: 807053 **PLUM BROOK ORDNANCE WK**

Manager: Mike Spangberg

RFA / COC Number: 090015STL 090014EA (toxicity)

Site: **Pentolite Road Red Water Ponds**

Location Code: **PRWP-SW010**

Sample Number: **AC2010**

Sample Name: **PBOW-00-PRWP-SW010-AC2010-0000**

Sampling Method: **GRAB**

Collection Date: 9/14/00

Collection Time: 0918

Start Depth: —

End Depth: —

Sample Team: T. Willard

QC Partners: _____ *Trip Blank*

_____ *Rinsate*

_____ *Field Blank*

ERPIMS Values:

Sacode: _____

Lot Control#: _____

Sample Matrix: Water

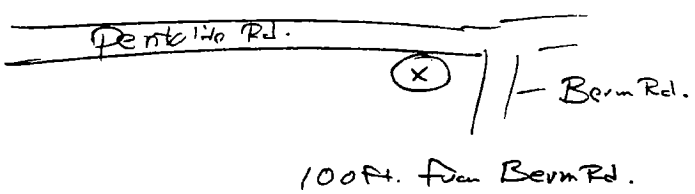
Containers

Analytical Suite	Flt	Frtn	Qty	Size	Units	Type
METAL-ERA	N	A	1	1000	mL	HDPE
PHOSPHOROUS	N	B	1	125	mL	HDPE
✓TOXICITY-SW	N	C	3	1	Gal	HDPE

	Eh (mV)	pH (SU)	Conductivity (mS/cm)	Turbidity (NTU)	DissOxygen (ppm)	Temperature (C)
Surface Water Parameters:	-45.7	7.76	.951	—	9.1	17.8

Comments:

Sketch Location:



Logged By / Date: [signature] 9/14/00

Reviewed By / Date: C. Fredrin 9/14/00

IT CORPORATION
member of The IT Group

Sample Collection Log

Project: 807053 **PLUM BROOK ORDNANCE WK**

Manager: Mike Spangberg

RFA / COC Number: 090015-STL

Site: **Pentolite Road Red Water Ponds**

Location Code: **PRWP-BI001**

Sample Number: **AC4001**

Sample Name: **PBOW-00-BI-PRWP-BI001-AC4001-0000**

Sampling Method: **GRAB**

Collection Date: 9/14/00

Collection Time: 8:30 11:00 AM

Start Depth: NA

End Depth: NA

QC Partners: _____ *Trip Blank*

_____ *Rinsate*

_____ *Field Blank*

Sample Team: M. Weisberg, M. Johns.

ERPIMS Values:

Sacode: _____

Lot Control#: _____

Sample Matrix: Fish

Containers

Analytical Suite	Flt	Frtn	Qty	Size	Units	Type
LIPIDS	N	A	1	0	None	FISH
METAL-ERA	N	A	1	0	None	FISH
PHOSPHOROUS	N	A	1	0	None	FISH

Comments: Run lab dup and MS/MSD and label as AC4001-DUP, AC4001-MS, and AC4001-MSD

Sketch Location:

Electroshock and seine along Pentolite Rd. Ditch Creek, downgradient from PRRWP site.

Logged By / Date: Mark Weisberg 9/14/00

Reviewed By / Date: C. Freeburn 9/15/00

IT CORPORATION
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Sample Collection Log

Project: 807053 **PLUM BROOK ORDNANCE WK**

Manager: Mike Spangberg

RFA / COC Number: 090015-STL

Site: **Pentolite Road Red Water Ponds**

Location Code: **PRWP-BI002**

Sample Number: **AC4002**

Sample Name: **PBOW-00-BI-PRWP-BI002-AC4002-0000**

Sampling Method: **GRAB**

Collection Date: 9/14/00

Collection Time: 5:30 - 11:00 AM

Start Depth: NA

End Depth: NA

QC Partners: _____ *Trip Blank*

_____ *Rinsate*

_____ *Field Blank*

Sample Team: M. Weisberg, M. Johnson

ERPIMS Values:

Sacode:

Lot Control#:

Sample Matrix: Tadpoles

Containers

Analytical Suite	Flt	Frtn	Qty	Size	Units	Type
LIPIDS	N	A	1	0	None	FISH
METAL-ERA	N	A	1	0	None	FISH
PHOSPHOROUS	N	A	1	0	None	FISH

Comments: None

Sketch Location:

Electroshock and seine along Pentolite Rd Ditch Creek, downgradient from PRRWP site

Logged By / Date: Mark Weisberg 9/14/00 *Reviewed By / Date:* C. Freshour 9/15/00

IT CORPORATION
Member of The IT Group

Sample Collection Log

Project: 807053 **PLUM BROOK ORDNANCE WK**

Manager: Mike Spangberg

RFA / COC Number: 090015-STL

Site: **Pentolite Road Red Water Ponds**

Location Code: **PRWP-BI003**

Sample Number: **AC4003**

Sample Name: **PBOW-00-BI-PRWP-BI003-AC4003-0000**

Sampling Method: **GRAB**

Collection Date: 9/14/00

Collection Time: 8:30 - 11:00 AM

Start Depth: NA

End Depth: NA

QC Partners: _____ *Trip Blank*

_____ *Rinsate*

_____ *Field Blank*

Sample Team: M. Weisberg, M. Johns

ERPIMS Values:

Sacode: _____

Lot Control#: _____

Sample Matrix: Crayfish

Containers

Analytical Suite	Flt	Frtn	Qty	Size	Units	Type
LIPIDS	N	A	1	0	None	FISH
METAL-ERA	N	A	1	0	None	FISH
PHOSPHOROUS	N	A	1	0	None	FISH

Comments: None.

Sketch Location:

Electroshock and seine along Pentolite Rd Ditch Creek, downgradient from PRWP site.

Logged By / Date: [illegible] 9/14/00 *Reviewed By / Date:* C. Freeman 9/15/00

IT CORPORATION
...er of The IT Group

Sample Collection Log

Project: 807053 **PLUM BROOK ORDNANCE WK**

Manager: Mike Spangberg

RFA / COC Number: D90015-EA (10 DGSSEY) D900155TL

Site: **West Area Red Water Ponds**

Location Code: **WRWP-SO001**

Sample Number: **AD0001**

Sample Name: **PBOW-00-WRWP-SO001-AD0001-0000**

Sampling Method: **GRAB**

Collection Date: 9.15.2000

Collection Time: 0955

Start Depth: 0'

End Depth: 1.0

Sample Team: WS/TW

QC Partners: _____ *Trip Blank*

_____ *Rinsate*

_____ *Field Blank*

ERPIMS Values:

Sacode: _____

Lot Control#: _____

Sample Matrix: _____

Containers

Analytical Suite	Flt	Frtn	Qty	Size	Units	Type
PAHS	N	A	1	4	oz	CWM
EXPLOSIVES	N	B	1	4	oz	CWM
BIOACC-SO	N	C	1	3	Gal	BKT

Comments:

Sketch Location:

W. Hawkope 9.15.2000
Logged By / Date:

Reviewed By / Date: C. Freshwater 9/16/00

IT CORPORATION
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Sample Collection Log

Project: 807053 PLUM BROOK ORDNANCE WK

Manager: Mike Spangberg

RFA / COC Number: 090015 STL

Site: West Area Red Water Ponds

Location Code: WRWP-SO002

Sample Number: AD0002

Sample Name: PBOW-00-WRWP-SO002-AD0002-0000

Sampling Method: GRAB

Collection Date: 9.15.2000

Collection Time: 0845

Start Depth: 0'

End Depth: 1.0

Sample Team: WS / TW

QC Partners: _____ *Trip Blank*

_____ *Rinsate*

_____ *Field Blank*

ERPIMS Values:

Sacode:

Lot Control#:

Sample Matrix:

Containers

Analytical Suite	Flt	Frtn	Qty	Size	Units	Type
PAHS	N	A	1	4	oz	CWM
EXPLOSIVES	N	B	1	4	oz	CWM
BIOACC-SO	N	C	1	3	Gal	BKT

Comments:

Sketch Location:

W Stanhope 9.15.2000
Logged By / Date:

Reviewed By / Date: C. Franklin 9/16/00

IT CORPORATION
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Sample Collection Log

Project: 807053 **PLUM BROOK ORDNANCE WK**

Manager: Mike Spangberg

RFA / COC Number: 09X0015STL

Site: **West Area Red Water Ponds**

Location Code: **WRWP-SO003**

Sample Number: **AD0003**

Sample Name: **PBOW-00-WRWP-SO003-AD0003-0000**

Sampling Method: **GRAB**

Collection Date: 09.15.2000

Collection Time: 0900

Start Depth: 0'

End Depth: 1.0'

Sample Team: WS / TW

QC Partners: _____ *Trip Blank*

_____ *Rinsate*

_____ *Field Blank*

ERPIMS Values:

Sacode: _____

Lot Control#: _____

Sample Matrix: _____

Containers

Analytical Suite	Flt	Frtn	Qty	Size	Units	Type
PAHS	N	A	1	4	oz	CWM
EXPLOSIVES	N	B	1	4	oz	CWM
BIOACC-SO	N	C	1	3	Gal	BKT

Comments:

Sketch Location:

W Stanhope 9.15.2000
Logged By / Date:

Reviewed By / Date: C. Fleshing

IT CORPORATION
Member of The IT Group

Sample Collection Log

Project: 807053 **PLUM BROOK ORDNANCE WK**

Manager: Mike Spangberg

RFA / COC Number: 090015STL

Site: **West Area Red Water Ponds**

Location Code: **WRWP-SO004**

Sample Number: **AD0004**

Sample Name: **PBOW-00-WRWP-SO004-AD0004-0000**

Sampling Method: **GRAB**

Collection Date: 09.15.2000

Collection Time: 0915

Start Depth: 0'

End Depth: 1.0'

Sample Team: WS / TW

QC Partners: _____ *Trip Blank*

_____ *Rinsate*

_____ *Field Blank*

ERPIMS Values:

Sacode: _____

Lot Control#: _____

Sample Matrix: _____

Containers

Analytical Suite	Flt	Frtn	Qty	Size	Units	Type
PAHS	N	A	1	4	oz	CWM
EXPLOSIVES	N	B	1	4	oz	CWM
BIOACC-SO	N	C	1	3	Gal	BKT

Comments:

Sketch Location:

W. Stanhope 9.15.2000
Logged By / Date:

Reviewed By / Date: C. Fashum 9/16/00

IT CORPORATION
The IT Group

Sample Collection Log

Project: 807053 **PLUM BROOK ORDNANCE WK**

Manager: Mike Spangberg

RFA / COC Number: 090015 STL

Site: **West Area Red Water Ponds**

Location Code: **WRWP-SO005**

Sample Number: **AD0005**

Sample Name: **PBOW-00-WRWP-SO005-AD0005-0000**

Sampling Method: **GRAB**

Collection Date: 09.15.2000

Collection Time: 0930

Start Depth: 0'

End Depth: 1.5

Sample Team: WS / TW

QC Partners: _____ *Trip Blank*

_____ *Rinsate*

_____ *Field Blank*

ERPIMS Values:

Sacode: _____

Lot Control#: _____

Sample Matrix: _____

Containers

Analytical Suite	Flt	Frtn	Qty	Size	Units	Type
PAHS	N	A	1	4	oz	CWM
EXPLOSIVES	N	B	1	4	oz	CWM
BIOACC-SO	N	C	1	3	Gal	BKT

Comments:

Sketch Location:

W Stanhope 9.15.2000

Logged By / Date:

Reviewed By / Date: C. Fosbury 9/16/00

IT CORPORATION
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Sample Collection Log

Project: 807053 **PLUM BROOK ORDNANCE WK**

Manager: Mike Spangberg

RFA / COC Number: 060015 STL

Site: **West Area Red Water Ponds**
Location Code: **WRWP-SD001**
Sample Number: **AD1001**
Sample Name: **PBOW-00-WRWP-SD001-AD1001-0000**
Sampling Method: **GRAB**

Collection Date: 09.14.2000
Collection Time: 1410

Start Depth: 0'
End Depth: 1.0'

Sample Team: WS / TT

QC Partners: None *Trip Blank*
Rinsate
Field Blank

ERPIMS Values:
Sacode:
Lot Control#:
Sample Matrix:

Containers

Analytical Suite	Flt	Frtn	Qty	Size	Units	Type
EXPLOSIVES	N	A	1	4	oz	CWM
METAL-ERA	N	B	1	4	oz	CWM
TOC	N	~~C~~ B	1	4	oz	CWM
BIOACC-SD	N	~~D~~ C	1	3	Gal	BKT
PHOSPHOROUS	N	~~E~~ D	1	4	oz	CWM

Comments: Sediment sample collected 2½ ft. below water surface.

Sketch Location:

W. Starkey 9-14-2000
Logged By / Date:

Reviewed By / Date: C. Fashun 9/16/2000

IT CORPORATION
of The IT Group

Sample Collection Log

Project: 807053 **PLUM BROOK ORDNANCE WK**

Manager: Mike Spangberg

RFA / COC Number: 090015-EA (Bracken) 090015 STL

Site: **West Area Red Water Ponds**

Location Code: **WRWP-SD002**

Sample Number: **AD1002**

Sample Name: **PBOW-00-WRWP-SD002-AD1002-0000**

Sampling Method: **GRAB**

Collection Date: 09.14.2000

Collection Time: 1500

Start Depth: 0'

End Depth: 1.0'

Sample Team: WS / TT

QC Partners: None *Trip Blank*

Rinsate

Field Blank

ERPIMS Values:

Sacode:

Lot Control#:

Sample Matrix:

Containers

Analytical Suite	Flt	Frtn	Qty	Size	Units	Type
EXPLOSIVES	N	A	1	4	oz	CWM
METAL-ERA	N	B	1	4	oz	CWM
TOC	N	~~C~~ B	1	4	oz	CWM
BIOACC-SD	N	D	1	3	Gal	BKT
PHOSPHOROUS	N	E	1	4	oz	CWM

Comments: Sediment Sample collected 2½ ft. below water ~~sample~~ surface

Sketch Location:

W. Atenhoge 9-14-2000
Logged By / Date:

Reviewed By / Date: C. Fashing 9/16/00

IT CORPORATION
...ber of The IT Group

Sample Collection Log

Project: 807053 **PLUM BROOK ORDNANCE WK**

Manager: Mike Spangberg

RFA / COC Number: 090015 STG

Site: **West Area Red Water Ponds**

Location Code: **WRWP-SD00~~1~~2**

Sample Number: **AD100~~1~~2-MS**

Sample Name: **PBOW-00-WRWP-SD00~~1~~2-AD100~~1~~2-MS-0000**

Sampling Method: **GRAB**

Collection Date: 09-14-2000

Collection Time: 1500

Start Depth: 0'

End Depth: 1.0'

Sample Team: WS / TT

QC Partners: None — *Trip Blank*

Rinsate

Field Blank

ERPIMS Values:

Sacode:

Lot Control#:

Sample Matrix:

Containers

Analytical Suite	Flt	Frtn	Qty	Size	Units	Type
EXPLOSIVES	N	A	1	4	oz	CWM
METAL-ERA	N	B	1	4	oz	CWM
TOC	N	~~B~~	1	4	oz	CWM
PHOSPHOROUS	N	E	1	4	oz	CWM

~~BIOACC-SD ND 1 3 Gal BKT~~ WS

Comments: Sediment sample collected 2½ ft. below water surface

Sketch Location:

MS + MSD switched to SD002 + AB100Z-MS AB100Z-MSD

W. Stenberg 9-14-2000
Logged By / Date:

Reviewed By / Date: C. Fuhrer 9/16/00

IT CORPORATION
A of The IT Group

Sample Collection Log

Project: 807053 **PLUM BROOK ORDNANCE WK**

Manager: Mike Spangberg

RFA / COC Number: 090015 STL

Site: **West Area Red Water Ponds**

Location Code: **WRWP-SD00~~1~~2**

Sample Number: **AD100~~1~~2-MSD**

Sample Name: **PBOW-00-WRWP-SD00~~1~~2-AD100~~1~~2-MSD-000**

Sampling Method: **GRAB**

Collection Date: 09.14.2000

Collection Time: 1500

Start Depth: 0'

End Depth: 1.0'

Sample Team: WS / TT

QC Partners: None *Trip Blank*

Rinsate

Field Blank

ERPIMS Values:

Sacode:

Lot Control#:

Sample Matrix:

Containers

Analytical Suite	Flt	Frtn	Qty	Size	Units	Type
EXPLOSIVES	N	A	1	4	oz	CWM
METAL-ERA	N	B	1	4	oz	CWM
TOC	N	~~C~~B	1	4	oz	CWM
PHOSPHOROUS	N	E	1	4	oz	CWM

Comments: Sediment sample collected 2½ ft. below water surface.

Sketch Location:

W. Stankiewicz 9-14-2000

Logged By / Date:

Reviewed By / Date: C. Forlum 9/16/00

IT CORPORATION
A Member of The IT Group

Sample Collection Log

Project: 807053 **PLUM BROOK ORDNANCE WK**

Manager: Mike Spangberg

RFA / COC Number: 090015-EA(bioaccum) 09/5 0015 SIZ

Site: **West Area Red Water Ponds**

Location Code: **WRWP-SD003**

Sample Number: **AD1003**

Sample Name: **PBOW-00-WRWP-SD003-AD1003-0000**

Sampling Method: **GRAB**

Collection Date: ~~1330~~ 09.14 200.

Collection Time: 1330

Start Depth: 0'

End Depth: 1.0'

Sample Team: WS / TT

QC Partners: None *Trip Blank*

Rinsate

Field Blank

ERPIMS Values:

Sacode:

Lot Control#:

Sample Matrix:

Containers

Analytical Suite	Flt	Frtn	Qty	Size	Units	Type
EXPLOSIVES	N	A	1	4	oz	CWM
METAL-ERA	N	B	1	4	oz	CWM
TOC	N	~~C~~ B	1	4	oz	CWM
BIOACC-SD	N	D	1	3	Gal	BKT
PHOSPHOROUS	N	E	1	4	oz	CWM

Comments: Sediment sample collected 2½ ft. below water surface.

Sketch Location:

Logged By / Date: W. Stanhope 9-14-2000

Reviewed By / Date: C. Fusher 9/16/00

IT CORPORATION
of The IT Group

Sample Collection Log

Project: 807053 **PLUM BROOK ORDNANCE WK**

Manager: Mike Spangberg

090015-EA (bioaccum)

RFA / COC Number: 090015 STL

Site: **West Area Red Water Ponds**

Location Code: **WRWP-SD004**

Sample Number: **AD1004**

Sample Name: **PBOW-00-WRWP-SD004-AD1004-0000**

Sampling Method: **GRAB**

Collection Date: 09.14.2000

Collection Time: 1055

Start Depth: 0'

End Depth: 1-0'

Sample Team: WS / TT

QC Partners: None *Trip Blank*

Rinsate

Field Blank

ERPIMS Values:

Sacode:

Lot Control#:

Sample Matrix:

Containers

Analytical Suite	Flt	Frtn	Qty	Size	Units	Type
EXPLOSIVES	N	A	1	4	oz	CWM
METAL-ERA	N	B	1	4	oz	CWM
TOC	N	~~C~~ EB	1	4	oz	CWM
~~BIOACC-SD~~	N	D	1	3	Gal	BKT
PHOSPHOROUS	N	E	1	4	oz	CWM

Comments: Sediment sample collected 2½ ft. below water surface.

Sketch Location:

W. Shrhope 9-14-2000
Logged By / Date:

Reviewed By / Date: C. Fashum 9/15/00

IT CORPORATION
A Member of The IT Group

Sample Collection Log

Project: 807053 **PLUM BROOK ORDNANCE WK**

Manager: Mike Spangberg

090015-EA(bioaccum)

RFA / COC Number: 090015-STL

Site: **West Area Red Water Ponds**

Location Code: **WRWP-SD005**

Sample Number: **AD1005**

Sample Name: **PBOW-00-WRWP-SD005-AD1005-0000**

Sampling Method: **GRAB**

Collection Date: 09.14.2000

Collection Time: 1150

Start Depth: 0'

End Depth: 1.0'

Sample Team: WS / IT

QC Partners: None *Trip Blank*

Rinsate

Field Blank

ERPIMS Values:

Sacode:

Lot Control#:

Sample Matrix:

Containers

Analytical Suite	Flt	Frtn	Qty	Size	Units	Type
EXPLOSIVES	N	A	1	4	oz	CWM
METAL-ERA	N	B	1	4	oz	CWM
TOC	N	~~C~~ B	1	4	oz	CWM
BIOACC-SD	N	D	1	3	Gal	BKT
PHOSPHOROUS	N	E	1	4	oz	CWM

Comments: sediment sample collected 2½ ft. below water surface.

Sketch Location:

W Stanhope 9.14.2000
Logged By / Date:

Reviewed By / Date: C Fahm 9/16/00

IT CORPORATION
A The IT Group

Sample Collection Log

Project: 807053 **PLUM BROOK ORDNANCE WK**

Manager: Mike Spangberg

RFA / COC Number: 09001500EA2 (TOX) 09001500STL

Site: **West Area Red Water Ponds**

Location Code: **WRWP-SD006**

Sample Number: **AD1006**

Sample Name: **PBOW-00-WRWP-SD006-AD1006-0000**

Sampling Method: **GRAB**

Collection Date: 09.13.2000

Collection Time: 1835

Start Depth: 0'

End Depth: 1.0

Sample Team: WS / MJ

QC Partners: None *Trip Blank*

None *Rinsate*

None *Field Blank*

ERPIMS Values:

Sacode:

Lot Control#:

Sample Matrix:

Containers

Analytical Suite	Flt	Frtn	Qty	Size	Units	Type
TOXICITY-SD	N	E	1	3	Gal	BKT
METAL-ERA	N	B	1	4	oz.	CWM
PHOSPHORUS	N		1	4	oz	CWM

Comments:

Sediment sample collected 2½ ft. below water surface.

Sketch Location:

metals + phosphorus added to analy. suite. AD1006-1010

W. Attaway 9.14.2000

Logged By / Date:

Reviewed By / Date: C. Fuchs 9/16/00

IT CORPORATION
A Member of The IT Group

Sample Collection Log

Project: 807053 **PLUM BROOK ORDNANCE WK**

Manager: Mike Spangberg

RFA / COC Number: 09001500EA2 (TOX) 09001 5STL

Site: **West Area Red Water Ponds**
Location Code: **WRWP-SD007**
Sample Number: **AD1007**
Sample Name: **PBOW-00-WRWP-SD007-AD1007-0000**
Sampling Method: **GRAB**

Collection Date: 09.14.2000
Collection Time: 0940
Start Depth: 0'
End Depth: 1.0
Sample Team: WS / TT

QC Partners: None *Trip Blank*
Rinsate
Field Blank

ERPIMS Values:
Sacode:
Lot Control#:
Sample Matrix:

Containers

Analytical Suite	Flt	Frtn	Qty	Size	Units	Type
TOXICITY-SD	N	E	1	3	Gal	BKT
METAL-ERA			1	4	oz	CWM
PHOSDIPORUS			1	4	oz	CWM

Comments:

Sediment sample collected 2½ ft. below water surface.

Sketch Location:

W. Stanhope 9.14.2000
Logged By / Date:

Reviewed By / Date: C. Fuhr 9/16/00

IT CORPORATION
of The IT Group

Sample Collection Log

Project: 807053 **PLUM BROOK ORDNANCE WK**

Manager: Mike Spangberg

09001500E12(TOK)

RFA / COC Number: 090015 STL

Site: **West Area Red Water Ponds**

Location Code: **WRWP-SD008**

Sample Number: **AD1008**

Sample Name: **PBOW-00-WRWP-SD008-AD1008-0000**

Sampling Method: **GRAB**

Collection Date: 09.14.2000

Collection Time: 1240

Start Depth: 0'

End Depth: 1.0'

Sample Team: WS / TT

QC Partners: None *Trip Blank*

Rinsate

Field Blank

ERPIMS Values:

Sacode:

Lot Control#:

Sample Matrix:

Containers

Analytical Suite	Flt	Frtn	Qty	Size	Units	Type
TOXICITY-SD	N	E	1	3	Gal	BKT
METAL-ERA			1	4	oz	CWM
PHOSPHORUS			1	4	oz	CWM

Comments:

Sediment sample collected 2½ ft. below water surface.

Sketch Location:

W. Stanhope 9.14.2000

Logged By / Date:

Reviewed By / Date: C. Fowler 9/16/00

IT CORPORATION
A Subsidiary of The IT Group

Sample Collection Log

Project: 807053 **PLUM BROOK ORDNANCE WK**

Manager: Mike Spangberg

09001500EA2(TX)

RFA / COC Number: 090015STL

Site: **West Area Red Water Ponds**

Location Code: **WRWP-SD009**

Sample Number: **AD1009**

Sample Name: **PBOW-00-WRWP-SD009-AD1009-0000**

Sampling Method: **GRAB**

Collection Date: 09.13.2000

Collection Time: 1825

Start Depth: 0'

End Depth: 1.0'

Sample Team: MW / TW

QC Partners: None *Trip Blank*

Rinsate

Field Blank

ERPIMS Values:

Sacode:

Lot Control#:

Sample Matrix:

Containers

Analytical Suite	Flt	Frtn	Qty	Size	Units	Type
TOXICITY-SD	N	E	1	3	Gal	BKT
METAL-ERA			1	4	oz	CWM
PHOSPHORUS			1	4	oz	CWM

Comments: Sediment samples collected 2½ ft. below water surface.

Sketch Location:

W. Stanhope 9.14.2000
Logged By / Date:

Reviewed By / Date: C. Fuller 9/16/00

IT CORPORATION
r of The IT Group

Sample Collection Log

Project: 807053 **PLUM BROOK ORDNANCE WK**

Manager: Mike Spangberg

RFA / COC Number: 090015 STL

Site: **West Area Red Water Ponds**

Location Code: **WRWP-SD010**

Sample Number: **AD1010**

Sample Name: **PBOW-00-WRWP-SD010-AD1010-0000**

Sampling Method: **GRAB**

Collection Date: 09.13.2000

Collection Time: 1905

Start Depth: 0'

End Depth: 1.0'

Sample Team: MW / TW

QC Partners: None *Trip Blank*

Rinsate

Field Blank

ERPIMS Values:

Sacode:

Lot Control#:

Sample Matrix:

Containers

Analytical Suite	Flt	Frtn	Qty	Size	Units	Type
TOXICITY-SD	N	E	1	3	Gal	BKT
METAL-ERA	1		1	4	oz	CWM
PHOSPHORUS			1	4	oz	CWM

Comments:

Sediment sample collected 2½ ft. below water surface.

Sketch Location:

W. Stanhope 9.14.2000
Logged By / Date:

Reviewed By / Date: C Fowler 9/14/00

IT CORPORATION
Member of The IT Group

Sample Collection Log

Project: 807053 **PLUM BROOK ORDNANCE WK**

Manager: Mike Spangberg

RFA / COC Number: 090015 STL

Site: **West Area Red Water Ponds**

Location Code: **WRWP-SD00~~1~~2**

Sample Number: **AD1011**

Sample Name: **PBOW-00-WRWP-SD00~~1~~3-AD1011-0000**

Sampling Method: **GRAB**

Collection Date: 09.14.2000

Collection Time: 1500

Start Depth: 0'

End Depth: 1.0'

Sample Team: WS / TT

QC Partners: None *Trip Blank*

↓ *Rinsate*

↓ *Field Blank*

ERPIMS Values:

Sacode:

Lot Control#:

Sample Matrix:

Containers

Analytical Suite	Flt	Frtn	Qty	Size	Units	Type
EXPLOSIVES	N	A	1	4	oz	CWM
METAL-ERA	N	B	1	4	oz	CWM
TOC	N	~~C~~B	1	4	oz	CWM
PHOSPHOROUS	N	E	1	4	oz	CWM

Comments: Sediment samples collected 2½ ft. below water surface.

Sketch Location:

W. Stanhope 9.14.2000
Logged By / Date:

Reviewed By / Date: C. Fulton 9/16/00

IT CORPORATION
A Member of The IT Group

Sample Collection Log

Project: 807053 **PLUM BROOK ORDNANCE WK**

Manager: Mike Spangberg

RFA / COC Number: 090015STL

Site: **West Area Red Water Ponds**

Location Code: **WRWP-SW006**

Sample Number: **AD2006**

Sample Name: **PBOW-00-WRWP-SW006-AD2006-0000**

Sampling Method: **GRAB**

Collection Date: 9/13/00

Collection Time: 11:10 a.m.

Start Depth: —

End Depth: —

QC Partners: *Trip Blank* *Rinsate* *Field Blank*

Sample Team: M. Weisburg, T. Willard

ERPIMS Values:

Sacode:

Lot Control#:

Sample Matrix: WATER

Containers

Analytical Suite	Flt	Frtn	Qty	Size	Units	Type
METAL-ERA	N	A	1	1000	mL	HDPE
PHOSPHOROUS	N	B	1	125	mL	HDPE
~~TOXICITY-SW~~	~~N~~	~~C~~	~~3~~	~~1~~	~~Gal~~	~~HDPE~~

	Eh (mV)	pH (SU)	Conductivity (mS/cm)	Turbidity (NTU)	DissOxygen (ppm)	Temperature (C)
Surface Water Parameters:	-119	9.51	0.492	15	7.81	23.0

Comments:

Sketch Location:

See W.P. Fig

Logged By / Date: [signature] 9/14/00 *Reviewed By / Date:* C. Fuller 9/16/00

IT CORPORATION
Member of The IT Group

Sample Collection Log

Project: 807053 PLUM BROOK ORDNANCE WK

Manager: Mike Spangberg

RFA / COC Number: EGED15STR

Site: West Area Red Water Ponds

Location Code: WRWP-SW007

Sample Number: AD2007

Sample Name: PBOW-00-WRWP-SW007-AD2007-0000

Sampling Method: GRAB

Collection Date: 9/13/00

Collection Time: 10:45

Start Depth:

End Depth:

QC Partners: Trip Blank

Rinsate

Field Blank

Sample Team: M. Weisburg, T. Willard

ERPIMS Values:

Sacode:

Lot Control#:

Sample Matrix: WATER

Containers

Analytical Suite	Flt	Frtn	Qty	Size	Units	Type
METAL-ERA	N	A	1	1000	mL	HDPE
PHOSPHOROUS	N	B	1	125	mL	HDPE
~~TOXICITY-SW~~	~~N~~	~~C~~	~~3~~	~~1~~	~~Gal~~	~~HDPE~~

	Eh (mV)	pH (SU)	Conductivity (mS/cm)	Turbidity (NTU)	DissOxygen (ppm)	Temperature (C)
Surface Water Parameters:	-84	8.35	.673	46	8.94	20.0

Comments:

Sketch Location:

See WP figure.

Logged By / Date: [signature] 9/14/00

Reviewed By / Date: [signature] 9/14/00

IT CORPORATION
ber of The IT Group

Sample Collection Log

Project: 807053 PLUM BROOK ORDNANCE WK

Manager: Mike Spangberg

RFA / COC Number: E90015STL

Site: West Area Red Water Ponds

Location Code: WRWP-SW008

Sample Number: AD2008

Sample Name: PBOW-00-WRWP-SW008-AD2008-0000

Sampling Method: GRAB

Collection Date: 9/13/00

Collection Time: 11:33 a.m

Start Depth:

End Depth:

QC Partners: Trip Blank

Rinsate

Field Blank

Sample Team: M. Weisburg, T. Willaud

ERPIMS Values:

Sacode:

Lot Control#:

Sample Matrix: WATER

Containers

Analytical Suite	Flt	Frtn	Qty	Size	Units	Type
METAL-ERA	N	A	1	1000	mL	HDPE
PHOSPHOROUS	N	B	1	125	mL	HDPE
~~TOXICITY-SW~~	~~N~~	~~C~~	~~3~~	~~1~~	~~Gal~~	~~HDPE~~

	Eh (mV)	pH (SU)	Conductivity (mS/cm)	Turbidity (NTU)	DissOxygen (ppm)	Temperature (C)
Surface Water Parameters:	-126	9.54	0.533	23	7.7	23.8

Comments:

Sketch Location:

See W.P. Figure

Logged By / ~~Date:~~ [signature] 9/14/00

Reviewed By / Date: C. Fochem 9/14/00

IT CORPORATION
er of The IT Group

Sample Collection Log

Project: 807053 **PLUM BROOK ORDNANCE WK**

Manager: Mike Spangberg

RFA / COC Number: E9001SSTL

Site: West Area Red Water Ponds

Location Code: WRWP-SW009

Sample Number: AD2009

Sample Name: PBOW-00-WRWP-SW009-AD2009-0000

Sampling Method: GRAB

Collection Date: 9/13/00

Collection Time: 12:30 p.m

Start Depth:

End Depth:

QC Partners: Trip Blank

Rinsate

Field Blank

Sample Team: LW/TJW

ERPIMS Values:

Sacode:

Lot Control#:

Sample Matrix: WATER

Containers

Analytical Suite	Flt	Frtn	Qty	Size	Units	Type
METAL-ERA	N	A	1	1000	mL	HDPE
PHOSPHOROUS	N	B	1	125	mL	HDPE
~~TOXICITY-SW~~	~~N~~	~~C~~	~~3~~	~~1~~	~~Gal~~	~~HDPE~~

Surface Water Parameters:	Eh (mV)	pH (SU)	Conductivity (mS/cm)	Turbidity (NTU)	DissOxygen (ppm)	Temperature (C)
	-7.0	7.68	0.336	—	9.62	20.5

Comments:

Sketch Location:

Same as WP fig.

Logged By / Date: [signature] 9/14/00

Reviewed By / Date: [signature] 9/14/00

IT CORPORATION
r of The IT Group

Sample Collection Log

Project: 807053 PLUM BROOK ORDNANCE WK

Manager: Mike Spangberg

RFA / COC Number: 090015 STL

Site: West Area Red Water Ponds

Location Code: WRWP-SW010

Sample Number: AD2010

Sample Name: PBOW-00-WRWP-SW010-AD2010-0000

Sampling Method: GRAB

Collection Date: 9/12/00

Collection Time: 12:50 p.m

Start Depth:

End Depth:

QC Partners: Trip Blank

Rinsate

Field Blank

Sample Team: LW/TJW

ERPIMS Values:

Sacode:

Lot Control#:

Sample Matrix: WATER

Containers

Analytical Suite	Flt	Frtn	Qty	Size	Units	Type
METAL-ERA	N	A	1	1000	mL	HDPE
PHOSPHOROUS	N	B	1	125	mL	HDPE
~~TOXICITY-SW~~	~~N~~	~~C~~	~~3~~	~~1~~	~~Gal~~	~~HDPE~~

	Eh (mV)	pH (SU)	Conductivity (mS/cm)	Turbidity (NTU)	DissOxygen (ppm)	Temperature (C)
Surface Water Parameters:	-48.7	8.25	0.574	217	9.71	19.5

Comments:

Sketch Location:

See WP Fig

Logged By / Date: [signature] 9/14/00 Reviewed By / Date: C Farlow 9/15/00

IT CORPORATION
ber of The IT Group

Sample Collection Log

Project: 807053 PLUM BROOK ORDNANCE WK

Manager: Mike Spangberg

RFA / COC Number: 090015-~~EX~~ STL

Site: West Area Red Water Ponds

Location Code: WRWP-BI001

Sample Number: AD4001

Sample Name: PBOW-00-WRWP-BI001-AD4001-0000

Sampling Method: GRAB

Collection Date: 9/13/00

Collection Time: 12:30 AM - 3:00 PM

Start Depth: NA

End Depth: NA

QC Partners: Trip Blank

Rinsate

Field Blank

Sample Team: M. Weisberg, M. Johnson

ERPIMS Values:

Sacode:

Lot Control#:

Sample Matrix: Fish

Containers

Analytical Suite	Flt	Frtn	Qty	Size	Units	Type
LIPIDS	N	A	1	0	None	FISH
METAL-ERA	N	A	1	0	None	FISH
PHOSPHOROUS	N	A	1	0	None	FISH

Comments: Run lab dup and MS/MSD.

Sketch Location:

Entire large pond electroshocked.

Logged By / Date: Mark Weisberg 9/14/00

Reviewed By / Date: C. Freshour 9/15/00

IT CORPORATION
Member of The IT Group

Sample Collection Log

Project: 807053 **PLUM BROOK ORDNANCE WK**

Manager: Mike Spangberg

RFA / COC Number: 090015-STL

Site: **West Area Red Water Ponds**

Location Code: **WRWP-BI002**

Sample Number: **AD4002**

Sample Name: **PBOW-00-WRWP-BI002-AD4002-0000**

Sampling Method: **GRAB**

Collection Date: 9/13/00

Collection Time: 12:30 AM - 3:00 PM

Start Depth: NA

End Depth: NA

QC Partners: *Trip Blank* *Rinsate* *Field Blank*

Sample Team: M. Weisberg, M. Johnson

ERPIMS Values:

Sacode:

Lot Control#:

Sample Matrix:

Containers

Analytical Suite	Flt	Frtn	Qty	Size	Units	Type
LIPIDS	N	A	1	0	None	FISH
METAL-ERA	N	A	1	0	None	FISH
PHOSPHOROUS	N	A	1	0	None	FISH

Comments: None

Sketch Location:

Entire large pond electroshocked

Logged By / Date: Mark Weisberg 9/14/00 *Reviewed By / Date:* C. Fraslen 9/14/00

IT CORPORATION
ber of The IT Group

Sample Collection Log

Project: 807053 PLUM BROOK ORDNANCE WK

Manager: Mike Spangberg

RFA / COC Number: 990015-STC

Site: **West Area Red Water Ponds**

Location Code: **WRWP-BI003**

Sample Number: **AD4003**

Sample Name: **PBOW-00-WRWP-BI003-AD4003-0000**

Sampling Method: **GRAB**

Collection Date: 9/13/00

Collection Time: 12:30AM - 3:00 PM

Start Depth: NA

End Depth: NA

QC Partners: *Trip Blank* *Rinsate* *Field Blank*

Sample Team: M. Weisberg, M. Johnson

ERPIMS Values:

Sacode:

Lot Control#:

Sample Matrix: Fish

Containers

Analytical Suite	Flt	Frtn	Qty	Size	Units	Type
LIPIDS	N	A	1	0	None	FISH
METAL-ERA	N	A	1	0	None	FISH
PHOSPHOROUS	N	A	1	0	None	FISH

Comments: None

Sketch Location:

Entire large Pond Electroshocked.

Logged By / Date: Mark Weisberg 9/14/00 *Reviewed By / Date:* C. Freshour 9/15/00

IT CORPORATION
ber of The IT Group

Sample Collection Log

Project: 807053 PLUM BROOK ORDNANCE WK

Manager: Mike Spangberg

RFA / COC Number: 090015-STL

Site: West Area Red Water Ponds

Location Code: WRWP-BI004

Sample Number: AD4004

Sample Name: PBOW-00-WRWP-BI004-AD4004-0000

Sampling Method: GRAB

Collection Date: 9/13/00

Collection Time: 12:30AM - 3:00PM

Start Depth: NA

End Depth: NA

QC Partners: *Trip Blank* *Rinsate* *Field Blank*

Sample Team: M. Weisberg, M. Johnson

ERPIMS Values:

Sacode:

Lot Control#:

Sample Matrix: Fish

Containers

Analytical Suite	Flt	Frtn	Qty	Size	Units	Type
LIPIDS	N	A	1	0	None	FISH
METAL-ERA	N	A	1	0	None	FISH
PHOSPHOROUS	N	A	1	0	None	FISH

Comments: None

Sketch Location:

Entire large pond electroshocked

Logged By / Date: Mark Weisberg 9/14/00 *Reviewed By / Date:* C. Fuslin 9/15/00

IT CORPORATION
member of The IT Group

Sample Collection Log

Project: 807053 **PLUM BROOK ORDNANCE WK**

Manager: Mike Spangberg

RFA / COC Number: 090015572

Site: **Background**

Location Code: **BCG-SO001**

Sample Number: **AE0001**

Sample Name: **PBOW-00-BCG-SO001-AE0001-0000**

Sampling Method: **GRAB**

Collection Date: 9/12/00

Collection Time: 1710

Start Depth: 0.0 ft

End Depth: 1.0 ft

Sample Team: TT

QC Partners:

Trip Blank

Rinsate

Field Blank

ERPIMS Values:

Sacode:

Lot Control#:

Sample Matrix: SOIL

Containers

Analytical Suite	Flt	Frtn	Qty	Size	Units	Type
METAL-ERA	N	A	1	4	oz	CWM
PAHS	N	B	1	4	oz	CWM
PHOSPHOROUS	N	C	1	4	oz	CWM

Comments:

Sketch Location: As per workplan

Parkville Rd.

Logged By / Date: [illegible] 9/14/00

Reviewed By / Date: C. Fanham 9/16/00

IT CORPORATION
er of The IT Group

Sample Collection Log

Project: 807053 **PLUM BROOK ORDNANCE WK**

Manager: Mike Spangberg

RFA / COC Number: D90015STL

Site: **Background**

Collection Date: 9/12/00

Location Code: **BCG-SO001**

Collection Time: 1710

Sample Number: **AE0001-MS**

Sample Name: **PBOW-00-BCG-SO001-AE0001-MS-0000**

Start Depth: 0.0 ft

Sampling Method: **GRAB**

End Depth: 1.0 ft

QC Partners: _____ *Trip Blank*

_____ *Rinsate*

_____ *Field Blank*

Sample Team: TW

ERPIMS Values:

Sacode:

Lot Control#:

Sample Matrix: Soil

Containers

Analytical Suite	Flt	Frtn	Qty	Size	Units	Type
METAL-ERA	N	A	1	4	oz	CWM
PAHS	N	B	1	4	oz	CWM
PHOSPHOROUS	N	C	1	4	oz	CWM

Comments:

Sketch Location:

As per work plan

Fairfield Rd

Logged By / Date: Mark Wesley 9/14/00 *Reviewed By / Date:* C. Fuehrer 9/16/00

IT CORPORATION
ber of The IT Group

Sample Collection Log

Project: 807053 **PLUM BROOK ORDNANCE WK**

Manager: Mike Spangberg

RFA / COC Number: D900155TL

Site: **Background**

Location Code: **BCG-SO001**

Sample Number: **AE0001-MSD**

Sample Name: **PBOW-00-BCG-SO001-AE0001-MSD-0000**

Sampling Method: **GRAB**

Collection Date: 9/12/00

Collection Time: 1710

Start Depth: 0.0 ft

End Depth: 1.0 ft

Sample Team: TT

QC Partners: _____ *Trip Blank*

_____ *Rinsate*

_____ *Field Blank*

ERPIMS Values:

Sacode:

Lot Control#:

Sample Matrix: Soil

Containers

Analytical Suite	Flt	Frtn	Qty	Size	Units	Type
METAL-ERA	N	A	1	4	oz	CWM
PAHS	N	B	1	4	oz	CWM
PHOSPHOROUS	N	C	1	4	oz	CWM

Comments:

Sketch Location:

As per work plan

Parallel Rd

Logged By / Date: Mark Neeley 9/14/00 *Reviewed By / Date:* C. Freshour 9/16/00

IT CORPORATION
ber of The IT Group

Sample Collection Log

Project: 807053 **PLUM BROOK ORDNANCE WK**

Manager: Mike Spangberg

RFA / COC Number: 090015 STC

Site: **Background**

Location Code: **BCG-SO002**

Sample Number: **AE0002**

Sample Name: **PBOW-00-BCG-SO002-AE0002-0000**

Sampling Method: **GRAB**

Collection Date: 9/12/00

Collection Time: 1700

Start Depth: 0.0 ft

End Depth: 1.0 ft

Sample Team: TT

QC Partners: _____ *Trip Blank*

_____ *Rinsate*

_____ *Field Blank*

ERPIMS Values:

Sacode:

Lot Control#:

Sample Matrix: Soil

Containers

Analytical Suite	Flt	Frtn	Qty	Size	Units	Type
METAL-ERA	N	A	1	4	oz	CWM
PAHS	N	B	1	4	oz	CWM
PHOSPHOROUS	N	C	1	4	oz	CWM

Comments:

Sketch Location:

As per work plan

Pitchville Rd

Logged By / Date: Mark Newberry 9/14/00 *Reviewed By / Date:* C. Parker 9/16/00

IT CORPORATION
A Member of The IT Group

Sample Collection Log

Project: 807053 PLUM BROOK ORDNANCE WK

Manager: Mike Spangberg

RFA / COC Number: 0000155TL

Site: **Background**

Location Code: **BCG-SO003**

Sample Number: **AE0003**

Sample Name: **PBOW-00-BCG-SO003-AE0003-0000**

Sampling Method: **GRAB**

Collection Date: 9/12/00

Collection Time: 1700

Start Depth: 0.0 ft

End Depth: 1.0 ft

QC Partners: _____ *Trip Blank*

_____ *Rinsate*

_____ *Field Blank*

Sample Team: MW

ERPIMS Values:

Sacode:

Lot Control#:

Sample Matrix: Soil

Containers

Analytical Suite	Flt	Frtn	Qty	Size	Units	Type
METAL-ERA	N	A	1	4	oz	CWM
PAHS	N	B	1	4	oz	CWM
PHOSPHOROUS	N	C	1	4	oz	CWM

Comments:

Sketch Location: As per work plan

Pettis Rd

Logged By / Date: [signature] 9/14/00

Reviewed By / Date: [signature] 9/16/00

IT CORPORATION
of The IT Group

Sample Collection Log

Project: 807053 **PLUM BROOK ORDNANCE WK**

Manager: Mike Spangberg

RFA / COC Number: 0900015STL

Site: **Background**

Location Code: **BCG-SO004**

Sample Number: **AE0004**

Sample Name: **PBOW-00-BCG-SO004-AE0004-0000**

Sampling Method: **GRAB**

Collection Date: 9/12/00

Collection Time: 1810

Start Depth: 0.0 ft

End Depth: 1.0 ft

Sample Team: TW

QC Partners: _____ *Trip Blank*

_____ *Rinsate*

_____ *Field Blank*

ERPIMS Values:

Sacode: _____

Lot Control#: _____

Sample Matrix: soil

Containers

Analytical Suite	Flt	Frtn	Qty	Size	Units	Type
METAL-ERA	N	A	1	4	oz	CWM
PAHS	N	B	1	4	oz	CWM
PHOSPHOROUS	N	C	1	4	oz	CWM

Comments:

Sketch Location:

As per work plan

West Area

Logged By / Date: Mark Newby 9/14/00

Reviewed By / Date: G Franklin 9/16/00

IT CORPORATION
A Member of The IT Group

Sample Collection Log

Project: 807053 **PLUM BROOK ORDNANCE WK**

Manager: Mike Spangberg

RFA / COC Number: 090015STL

Site: **Background**

Location Code: **BCG-SO005**

Sample Number: **AE0005**

Sample Name: **PBOW-00-BCG-SO005-AE0005-0000**

Sampling Method: **GRAB**

Collection Date: 9/12/00

Collection Time: 1820

Start Depth: 0.0

End Depth: 1.0

Sample Team: TW

QC Partners: _____ *Trip Blank*

_____ *Rinsate*

_____ *Field Blank*

ERPIMS Values:

Sacode:

Lot Control#:

Sample Matrix: Soil

Containers

Analytical Suite	Flt	Frtn	Qty	Size	Units	Type
METAL-ERA	N	A	1	4	oz	CWM
PAHS	N	B	1	4	oz	CWM
PHOSPHOROUS	N	C	1	4	oz	CWM

Comments:

Sketch Location:

As per work plan

West Area

Logged By / Date: Mark Newberg 9/14/00 *Reviewed By / Date:* C. Fruchin 9/11/00

IT CORPORATION
Member of The IT Group

Sample Collection Log

Project: 807053 **PLUM BROOK ORDNANCE WK**

Manager: Mike Spangberg

RFA / COC Number: 090015STL

Site: **Background**

Location Code: **BCG-SO006**

Sample Number: **AE0006**

Sample Name: **PBOW-00-BCG-SO006-AE0006-0000**

Sampling Method: **GRAB**

Collection Date: 9/12/00

Collection Time: 1825

Start Depth: 0.0 ft

End Depth: 1.0 ft

QC Partners: _____ *Trip Blank*

_____ *Rinsate*

_____ *Field Blank*

Sample Team: IT

ERPIMS Values:

Sacode:

Lot Control#:

Sample Matrix: Soil

Containers

Analytical Suite	Flt	Frtn	Qty	Size	Units	Type
METAL-ERA	N	A	1	4	oz	CWM
PAHS	N	B	1	4	oz	CWM
PHOSPHOROUS	N	C	1	4	oz	CWM

Comments:

Sketch Location:

As per work plan

West Area

Logged By / Date: Mark Welsby 9/14/00 *Reviewed By / Date:* C. Fuller 9/11/00

IT CORPORATION
A Member of The IT Group

Sample Collection Log

Project: 807053 **PLUM BROOK ORDNANCE WK**

Manager: Mike Spangberg

RFA / COC Number: 090015 STL

Site: **Background**

Location Code: **BCG-SO001** -FD

Sample Number: **AE0007**

Sample Name: **PBOW-00-BCG-SO001-AE0007-0000**

Sampling Method: **GRAB**

Collection Date: 9/12/00

Collection Time: 1710

Start Depth: 0.0 ft

End Depth: 1.0 ft

Sample Team: TT

QC Partners: _____ *Trip Blank*

_____ *Rinsate*

_____ *Field Blank*

ERPIMS Values:

Sacode:

Lot Control#:

Sample Matrix: Soil

Containers

Analytical Suite	Flt	Frtn	Qty	Size	Units	Type
METAL-ERA	N	A	1	4	oz	CWM
PAHS	N	B	1	4	oz	CWM
PHOSPHOROUS	N	C	1	4	oz	CWM

Comments:

Sketch Location: As per work plan

Forest Area

Logged By / Date: [illegible] 9/14/00

Reviewed By / Date: [illegible]

IT CORPORATION
Member of The IT Group

Sample Collection Log

Project: 807053 **PLUM BROOK ORDNANCE WK**

Manager: Mike Spangberg

RFA / COC Number: 090015STL

Site: **Background**

Location Code: **BCG-SD001**

Sample Number: **AE1001**

Sample Name: **PBOW-00-BCG-SD001-AE1001-0000**

Sampling Method: **GRAB**

Collection Date: 9.15.2000

Collection Time: 1515

Start Depth: 0

End Depth: 1.0

Sample Team: WS / TN

QC Partners: _____ *Trip Blank*

_____ *Rinsate*

_____ *Field Blank*

ERPIMS Values:

Sacode: _____

Lot Control#: _____

Sample Matrix: _____

Containers

Analytical Suite	Flt	Frtn	Qty	Size	Units	Type
METAL-ERA	N	A	1	4	oz	CWM
PHOSPHOROUS	N	B	1	4	oz	CWM

Comments:

Sketch Location:

Pentolite Rd Site

W. Stanhope 9.15.2000
Logged By / Date:

Reviewed By / Date: C. Fuller 9/11/00

IT CORPORATION
A Member of The IT Group

Sample Collection Log

Project: 807053 PLUM BROOK ORDNANCE WK

Manager: Mike Spangberg

RFA / COC Number: 090015STL

Site: **Background**

Location Code: **BCG-SD002**

Sample Number: **AE1002**

Sample Name: **PBOW-00-BCG-SD002-AE1002-0000**

Sampling Method: **GRAB**

Collection Date: 9.15.2000

Collection Time: 1435

Start Depth: 0'

End Depth: 1.0'

Sample Team: WS / TNN

QC Partners: _____ *Trip Blank*

_____ *Rinsate*

_____ *Field Blank*

ERPIMS Values:

Sacode: _____

Lot Control#: _____

Sample Matrix: _____

Containers

Analytical Suite	Flt	Frtn	Qty	Size	Units	Type
METAL-ERA	N	A	1	4	oz	CWM
PHOSPHOROUS	N	B	1	4	oz	CWM

Comments:

Sketch Location:

Bentolite Rd Site

W. Stanhope 9/15/2000
Logged By / Date:

Reviewed By / Date: C. Fuelsen

IT CORPORATION
Member of The IT Group

Sample Collection Log

Project: 807053 PLUM BROOK ORDNANCE WK

Manager: Mike Spangberg

RFA / COC Number: 090015STL

Site: **Background**

Location Code: **BCG-SD003**

Sample Number: **AE1003**

Sample Name: **PBOW-00-BCG-SD003-AE1003-0000**

Sampling Method: **GRAB**

Collection Date: 9.15.2000

Collection Time: 1455

Start Depth: 0

End Depth: 1.0'

Sample Team: WS / TW

QC Partners: _____ *Trip Blank*

_____ *Rinsate*

_____ *Field Blank*

ERPIMS Values:

Sacode: _____

Lot Control#: _____

Sample Matrix: _____

Containers

Analytical Suite	Flt	Frtn	Qty	Size	Units	Type
METAL-ERA	N	A	1	4	oz	CWM
PHOSPHOROUS	N	B	1	4	oz	CWM

Comments:

Sketch Location:

Pentolite Rd Site

W. Stenhope 9.15.2000
Logged By / Date:

Reviewed By / Date: C. Fisher 9/15/00

IT CORPORATION
ber of The IT Group

Sample Collection Log

Project: 807053 **PLUM BROOK ORDNANCE WK**

Manager: Mike Spangberg

RFA / COC Number: 09001557L

Site: **Background**
Location Code: **BCG-SD004**
Sample Number: **AE1004**
Sample Name: **PBOW-00-BCG-SD004-AE1004-0000**
Sampling Method: **GRAB**

Collection Date: 9 15 2000
Collection Time: 1215

Start Depth: 0
End Depth: 0.5'

QC Partners: _____ *Trip Blank*
_____ *Rinsate*
_____ *Field Blank*

Sample Team: _____

ERPIMS Values:
Sacode: _____
Lot Control#: _____
Sample Matrix: _____

Containers

Analytical Suite	Flt	Frtn	Qty	Size	Units	Type
METAL-ERA	N	A	1	4	oz	CWM
PHOSPHOROUS	N	B	1	4	oz	CWM

Comments:

Sketch Location:

West Area RWP

W. Stanhope 9.15.2000
Logged By / Date:

Reviewed By / Date: C. Franklin 9/15/00

IT CORPORATION
ber of The IT Group

Sample Collection Log

Project: 807053 **PLUM BROOK ORDNANCE WK**

Manager: Mike Spangberg

RFA / COC Number: 090015 STL

Site: **Background**

Location Code: **BCG-SD005**

Sample Number: **AE1005**

Sample Name: **PBOW-00-BCG-SD005-AE1005-0000**

Sampling Method: **GRAB**

Collection Date: 9.15.2000

Collection Time: 1150

Start Depth: 0'

End Depth: 0.5'

QC Partners:

_____ *Trip Blank*

_____ *Rinsate*

_____ *Field Blank*

Sample Team: WS / TW

ERPIMS Values:

Sacode:

Lot Control#:

Sample Matrix:

Containers

Analytical Suite	Flt	Frtn	Qty	Size	Units	Type
METAL-ERA	N	A	1	4	oz	CWM
PHOSPHOROUS	N	B	1	4	oz	CWM

Comments: Sediment collected below surface water of approximately 0.5 ft.

Sketch Location:

West Area RWP Site

W. Hardage 9.15.2000

Logged By / Date:

Reviewed By / Date: C Freeman 9/16/00

IT CORPORATION
A Member of The IT Group

Sample Collection Log

Project: 807053 **PLUM BROOK ORDNANCE WK**

Manager: Mike Spangberg

RFA / COC Number: 090015 STL

Site: **Background**

Location Code: **BCG-SD006**

Sample Number: **AE1006**

Sample Name: **PBOW-00-BCG-SD006-AE1006-0000**

Sampling Method: **GRAB**

Collection Date: 09.15.2000

Collection Time: 1130

Start Depth: 0'

End Depth: 0.5'

Sample Team: WS / TW

QC Partners: _____ *Trip Blank*

_____ *Rinsate*

_____ *Field Blank*

ERPIMS Values:

Sacode: _____

Lot Control#: _____

Sample Matrix: _____

Containers

Analytical Suite	Flt	Frtn	Qty	Size	Units	Type
METAL-ERA	N	A	1	4	oz	CWM
PHOSPHOROUS	N	B	1	4	oz	CWM

Comments: Sediment collected below surface water ~~of~~ approx. 0.5 ft

Sketch Location:

West Area RWP Site

W Stanhope 9.15.2000

Logged By / Date:

Reviewed By / Date: C. Fraslin 9/16/00

IT CORPORATION
A Member of The IT Group

Sample Collection Log

Project: 807053 PLUM BROOK ORDNANCE WK

Manager: Mike Spangberg

RFA / COC Number: 090015STL

Site: **Background**

Location Code: **BCG-SW001**

Sample Number: **AE2001**

Sample Name: **PBOW-00-BCG-SW001-AE2001-0000**

Sampling Method: **GRAB**

Collection Date: 9/15/00

Collection Time: 1515

Start Depth: NA

End Depth: NA

Sample Team: WS | TW

QC Partners: _____ *Trip Blank*

_____ *Rinsate*

_____ *Field Blank*

ERPIMS Values:

Sacode: _____

Lot Control#: _____

Sample Matrix: _____

Containers

Analytical Suite	Flt	Frtn	Qty	Size	Units	Type
PHOSPHOROUS	N	A	1	125	mL	HDPE
METAL-ERA	N	B	1	1000	mL	HDPE

Surface Water Parameters:	Eh (mV)	pH (SU)	Conductivity (mS/cm)	Turbidity (NTU)	DissOxygen (ppm)	Temperature (C)
		8.03	0.7	10	11.7	15.6

Comments:

Sketch Location:

Ponpolite RWP Site

W. Stanhope 07.15.2000

Logged By / Date:

Reviewed By / Date: C. Fuselier 9/11/00

IT CORPORATION
member of The IT Group

Sample Collection Log

Project: 807053 **PLUM BROOK ORDNANCE WK**

Manager: Mike Spangberg

RFA / COC Number: 090015STL

Site: **Background**

Location Code: **BCG-SW002**

Sample Number: **AE2002**

Sample Name: **PBOW-00-BCG-SW002-AE2002-0000**

Sampling Method: **GRAB**

Collection Date: 7/15/00

Collection Time: 1435

Start Depth: NA

End Depth: NA

Sample Team: WS / TW

QC Partners:

_____ *Trip Blank*

_____ *Rinsate*

_____ *Field Blank*

ERPIMS Values:

Sacode: _____

Lot Control#: _____

Sample Matrix: _____

Containers

Analytical Suite	Flt	Frtn	Qty	Size	Units	Type
PHOSPHOROUS	N	A	1	125	mL	HDPE
METAL-ERA	N	B	1	1000	mL	HDPE

Surface Water Parameters:	Eh (mV)	pH (SU)	Conductivity (mS/cm)	Turbidity (NTU)	DissOxygen (ppm)	Temperature (C)
		8.18	0.794	114	10.5	17.8

Comments:

Sketch Location:

Pentolite Rd RWP Site.

W. Hanhope 07.15.2000

Logged By / Date:

Reviewed By / Date: C. Freeman 9/16/00

IT CORPORATION
Member of The IT Group

Sample Collection Log

Project: 807053 PLUM BROOK ORDNANCE WK

Manager: Mike Spangberg

RFA / COC Number: 090015 STL

Site: **Background**

Location Code: **BCG-SW003**

Sample Number: **AE2003**

Sample Name: **PBOW-00-BCG-SW003-AE2003-0000**

Sampling Method: **GRAB**

Collection Date: 9/15/00

Collection Time: 1455

Start Depth: NA

End Depth: NA

Sample Team: WS / TW

QC Partners: _____ *Trip Blank*

_____ *Rinsate*

_____ *Field Blank*

ERPIMS Values:

Sacode: _____

Lot Control#: _____

Sample Matrix: _____

Containers

Analytical Suite	Flt	Frtn	Qty	Size	Units	Type
PHOSPHOROUS	N	A	1	125	mL	HDPE
METAL-ERA	N	B	1	1000	mL	HDPE

Surface Water Parameters:	Eh (mV)	pH (SU)	Conductivity (mS/cm)	Turbidity (NTU)	DissOxygen (ppm)	Temperature (C)
		8.27	0.786		10.4	17.5

Comments:

Sketch Location:

Pentolite RWP Site

W. Stuhage / 9.15.2000
Logged By / Date:

Reviewed By / Date: C. Fuselier 9/15/00

IT CORPORATION
A Member of The IT Group

Sample Collection Log

Project: 807053 **PLUM BROOK ORDNANCE WK**

Manager: Mike Spangberg

RFA / COC Number: D00015STL ~~09/15/00~~

Site: **Background**
Location Code: **BCG-SW004**
Sample Number: **AE2004**
Sample Name: **PBOW-00-BCG-SW004-AE2004-0000**
Sampling Method: **GRAB**

Collection Date: 9.15.2000
Collection Time: 1215

Start Depth: NA
End Depth: NA

Sample Team: WS / TW

QC Partners: _____ *Trip Blank*
_____ *Rinsate*
_____ *Field Blank*

ERPIMS Values:
Sacode: _____
Lot Control#: _____
Sample Matrix: _____

Containers

Analytical Suite	Flt	Frtn	Qty	Size	Units	Type
PHOSPHOROUS	N	A	1	125	mL	HDPE
METAL-ERA	N	B	1	1000	mL	HDPE

	Eh (mV)	pH (SU)	Conductivity (mS/cm)	Turbidity (NTU)	DissOxygen (ppm)	Temperature (C)
Surface Water Parameters:						

Comments: conductivity = 0.719 mS/cm Turbidity = 10
DO = 10.2 mg/L Temp = 15.7°C pH = 8.22

Sketch Location:

West Area pump Site

W Stenlage 9.15.2000
Logged By / Date:

Reviewed By / Date: C. Freshwater 9/11/00

IT CORPORATION
member of The IT Group

Sample Collection Log

Project: 807053 **PLUM BROOK ORDNANCE WK**

Manager: Mike Spangberg

RFA / COC Number: 090015STL

Site: **Background**

Location Code: **BCG-SW005**

Sample Number: **AE2005**

Sample Name: **PBOW-00-BCG-SW005-AE2005-0000**

Sampling Method: **GRAB**

Collection Date: 9.15.2000

Collection Time: 1150

Start Depth: NA

End Depth: NA

Sample Team: WS / TW

QC Partners: _____ *Trip Blank*

_____ *Rinsate*

_____ *Field Blank*

ERPIMS Values:

Sacode: _____

Lot Control#: _____

Sample Matrix: _____

Containers

Analytical Suite	Flt	Frtn	Qty	Size	Units	Type
PHOSPHOROUS	N	A	1	125	mL	HDPE
METAL-ERA	N	B	1	1000	mL	HDPE

Surface Water Parameters:	Eh (mV)	pH (SU)	Conductivity (mS/cm)	Turbidity (NTU)	DissOxygen (ppm)	Temperature (C)

Comments: conductivity = 0.719 mS/cm Turbidity = 10
DO = 11.6 mg/L Temp = 15.8°C pH = 8.16

Sketch Location:

West Area RWP Site

W Stanhope 9.15.2000

Logged By / Date:

Reviewed By / Date: C. Fashbaugh 9/15/00

IT CORPORATION
A Member of The IT Group

Sample Collection Log

Project: 807053 **PLUM BROOK ORDNANCE WK**

Manager: Mike Spangberg

RFA / COC Number: 090015 STL

Site: **Background**

Location Code: **BCG-SW006**

Sample Number: **AE2006**

Sample Name: **PBOW-00-BCG-SW006-AE2006-0000**

Sampling Method: **GRAB**

Collection Date: 9.15.2000

Collection Time: 1130

Start Depth: (WS) ~~0'~~ NA

End Depth: (WS) ~~0.5'~~ NA

Sample Team: WS / TW

QC Partners: _____ *Trip Blank*

_____ *Rinsate*

_____ *Field Blank*

ERPIMS Values:

Sacode: _____

Lot Control#: _____

Sample Matrix: _____

Containers

Analytical Suite	Flt	Frtn	Qty	Size	Units	Type
PHOSPHOROUS	N	A	1	125	mL	HDPE
METAL-ERA	N	B	1	1000	mL	HDPE

Surface Water Parameters:	Eh (mV)	pH (SU)	Conductivity (mS/cm)	Turbidity (NTU)	DissOxygen (ppm)	Temperature (C)

Comments: Conductivity = 0.744 mS/cm Turbidity = 10
DO = 11.0 mg/L Temp = 16°C pH = 7.36
~~Sediment sample collected below water (6" depth)~~ (WS)

Sketch Location:

West Area PWP Site

W Stanhope 9.15.2000
Logged By / Date:

Reviewed By / Date: C. Fuslum 9/16/00

Plum Brook Ordnance Works

2000 Survey Data
West Area Redwater Pond
Pentolite Road Redwater Pond

PLUM BROOK ORDNANCE WORKS (OCTOBER 2000): PAGE 1 OF 2

THESE VALUES WERE SCALED TO THE OHIO STATE PLANE COORDINATE SYSTEM (NORTH ZONE). A COMBINED FACTOR OF 0.999927034 WAS USED IN THIS DETERMINATION. THESE COORDINATES A RE NAD 1983 DATUM EXPRESSED IN FEET. VERTICAL DATUM IS NGVD 1929

PENTOLITE ROAD RED WATER PONDS SURFACE WATER AND SEDIMENT SAMPLES

MHS PT #	N(y)	E(x)	ELEV	I.T. #
1248	625790.540	1919025.499	623.51	PRWP-BCG-SW001/SD1
SURFACE WATER ELEAVTION @ 1248			623.81	
1264	624229.532	1919071.931	626.55	PRWP-BCG-SW002/SD2
SURFACE WATER ELEVATION @ 1264			626.85	
1265	624089.637	1918967.757	626.54	PRWP-BCG-SW003/SD3
SURFACE WATER ELEVATION @ 1265			627.04	
1242	625767.936	1919924.681	628.69	PRWP-SD001
1241	625763.998	1919964.861	628.26	PRWP-SD002
1254	624944.167	1919717.818	625.57	PRWP-SD003
SURFACE WATER ELEVATION @ 1254			625.87	
1255	624952.328	1919724.394	625.26	PRWP-SD004
SURFACE WATER ELEVATION @ 1255			625.56	
1253	624935.079	1919712.765	625.39	PRWP-SD005
SURFACE WATER ELEVATION @ 1253			625.69	
1240	625730.245	1920162.969	622.00	PRWP-SW004
SURFACE WATER ELEVATION @ 1240			622.70	
1249	625794.806	1918924.447	622.73	PRWP-SW006
SURFACE WATER ELEVATION @ 1249			623.33	
1247	625769.375	1919576.195	622.81	PRWP-SW007
SURFACE WATER ELEVATION @ 1247			623.31	
1245	625769.731	1919689.439	627.93	PRWP-SW008
SURFACE WATER ELEVATION @ 1245			628.33	
1244	625766.305	1919791.762	621.76	PRWP-SW009
SURFACE WATER ELEVATION @ 1244			622.56	
1243	625772.784	1919871.889	622.06	PRWP-SW010
SURFACE WATER ELEVATION @ 1243			622.76	

PENTOLITE ROAD RED WATER PONDS SOIL SAMPLES

1259	625255.805	1919222.142	631.51	PRWP-SO001
1260	624842.147	1919353.783	631.88	PRWP-SO002
1261	624834.890	1919354.433	631.36	PRWP-SO003
1262	624839.507	1919361.239	631.97	PRWP-SO004
1263	624845.742	1919357.572	631.89	PRWP-SO005
1250	623922.153	1921225.543	631.06	PRWP-BCG-SO001
1251	623905.078	1921235.995	631.04	PRWP-BCG-SO002
1252	623906.444	1921209.533	631.37	PRWP-BCG-SO003

PLUM BROOK ORDNANCE WORKS (OCTOBER 2000): PAGE 2 OF 2

THESE VALUES WERE SCALED TO THE OHIO STATE PLANE COORDINATE SYSTEM (NORTH ZONE). A COMBINED FACTOR OF 0.999927034 WAS USED IN THIS DETERMINATION. THESE COORDINATES A RE NAD 1983 DATUM EXPRESSED IN FEET. VERTICAL DATUM IS NGVD 1929

WEST RED WATER PONDS SURFACE WATER AND SEDIMENT SAMPLES

MHS PT #	N(y)	E(x)	ELEV	I.T. #
1279	621741.791	1909381.587	625.84	WRWP-SW004/SD004
SURFACE WATER ELEVATION @ 1279			626.44	
1278	621904.624	1909665.351	625.44	WRWP-SW005/SD005
SURFACE WATER ELEVATION @ 1278			626.24	
1277	621935.233	1909788.712	626.01	WRWP-SW006/SD006
SURFACE WATER ELEVATION @ 1277			626.31	
1276	621940.318	1909813.281	625.53	WRWP-SD009
SURFACE WATER ELEVATION @ 1276			626.53	
1273	622552.444	1910819.107	623.76	WRWP-SD010
SURFACE WATER ELEVATION @ 1273			624.31	
1274	622096.030	1910284.181	631.25	WRWP-SW009
SURFACE WATER ELEVATION @ 1274			631.40	
1275	621939.163	1909816.278	625.35	WRWP-SW010
SURFACE WATER ELEVATION @ 1275			626.35	

NOTE: THE FOLLOWING **SURFACE WATER AND SEDIM ENT SAMPLES** WERE LOCATED BY INTERSECTING ANGLES. NO E LEVATIONS WERE OBTAINED DUE TO THE INACCESABILITY OF THE POND.

AA1	622373.02	1910098.81	WRWP-SD001
AA2	622412.12	1910149.66	WRWP-SD002
AA3	622363.10	1910147.66	WRWP-SD003
AA4	622219.00	1910095.22	WRWP-SD004
AA5	622215.31	1910145.63	WRWP-SD005
AA6	622445.49	1910096.10	WRWP-SD006
AA7	622270.10	1910097.57	WRWP-SD007
AA8	622262.59	1910147.10	WRWP-SD008
AA9	622428.55	1909926.55	WRWP-SW006
AA10	622446.94	1910167.98	WRWP-SW007
AA11	622250.51	1910107.94	WRWP-SW008

WEST RED WATER PONDS SOIL SAMPLES

1266	622545.636	1910219.243	637.81	WRWP-SO001
1267	622430.464	1910396.226	633.15	WRWP-SO002
1268	622428.070	1910400.060	633.66	WRWP-SO003
1269	622423.734	1910399.044	633.12	WRWP-SO004
1270	622423.901	1910393.033	633.10	WRWP-SO005
1283	622541.020	1909337.954	644.52	WRWP-BCG-SO004
1284	622554.925	1909358.256	643.69	WRWP-BCG-SO005
1285	622527.543	1909353.783	644.92	WRWP-BCG-SO006

APPENDIX C

C-1 CHEMICAL ANALYTICAL DATA
C-2 DATA VALIDATION SUMMARY

GROUP_ NAME	LOCATION_ CODE	SAMPLE_ NO	SAMPLE_ DATE	START_ DEPTH	END_ DEPTH	PARAMETER	CASNO	RESULT	LAB_ QUAL	VAL_ QUAL	UNITS	DETECT_ LIMIT	USER_TEST_ GROUP	SAMPLE_ TYPE	FILTERED	DETECT	SAMPLE_ DELIVERY _GROUP
WARP	WRWP-BI011	AD4011	28-Nov-00	0	0	Acenaphthene	83-32-9	0.2	U	UJ	mg/kg	0.2	SEMIVOLATILES	BI	N	N	200145
WARP	WRWP-BI012	AD4012	28-Nov-00	0	0	Acenaphthene	83-32-9	0.38		B	mg/kg	0.17	SEMIVOLATILES	BI	N	Y	200145
WARP	WRWP-BI013	AD4013	28-Nov-00	0	0	Acenaphthene	83-32-9	0.84		B	mg/kg	0.17	SEMIVOLATILES	BI	N	Y	200145
WARP	WRWP-BI014	AD4014	28-Nov-00	0	0	Acenaphthene	83-32-9	0.38		B	mg/kg	0.17	SEMIVOLATILES	BI	N	Y	200145
WARP	WRWP-BI015	AD4015	28-Nov-00	0	0	Acenaphthene	83-32-9	0.36		B	mg/kg	0.17	SEMIVOLATILES	BI	N	Y	200145
WARP	WRWP-BI011	AD4011	28-Nov-00	0	0	Acenaphthylene	208-96-8	0.74		B	mg/kg	0.098	SEMIVOLATILES	BI	N	Y	200145
WARP	WRWP-BI012	AD4012	28-Nov-00	0	0	Acenaphthylene	208-96-8	0.24		B	mg/kg	0.084	SEMIVOLATILES	BI	N	Y	200145
WARP	WRWP-BI013	AD4013	28-Nov-00	0	0	Acenaphthylene	208-96-8	0.37		B	mg/kg	0.092	SEMIVOLATILES	BI	N	Y	200145
WARP	WRWP-BI014	AD4014	28-Nov-00	0	0	Acenaphthylene	208-96-8	0.29		B	mg/kg	0.09	SEMIVOLATILES	BI	N	Y	200145
WARP	WRWP-BI015	AD4015	28-Nov-00	0	0	Acenaphthylene	208-96-8	0.74		B	mg/kg	0.08	SEMIVOLATILES	BI	N	Y	200145
WARP	WRWP-BI001	AD4001	13-Sep-00			Aluminum	7429-90-5	106	*	J	mg/kg	8.5	METALS	BI	N	Y	1227
WARP	WRWP-BI002	AD4002	13-Sep-00			Aluminum	7429-90-5	25	*	J	mg/kg	8.4	METALS	BI	N	Y	1227
WARP	WRWP-BI003	AD4003	13-Sep-00			Aluminum	7429-90-5	11.8	B*	J	mg/kg	8.5	METALS	BI	N	Y	1227
WARP	WRWP-BI004	AD4004	13-Sep-00			Aluminum	7429-90-5	61.9	*	J	mg/kg	8.5	METALS	BI	N	Y	1227
WARP	WRWP-BI016	AD4016	1-Dec-00	0	0	Aluminum	7429-90-5	70.1			mg/kg	2.2	METALS	BI	N	Y	200144
WARP	WRWP-BI017	AD4017	1-Dec-00	0	0	Aluminum	7429-90-5	25.5			mg/kg	2.2	METALS	BI	N	Y	200144
WARP	WRWP-BI018	AD4018	1-Dec-00	0	0	Aluminum	7429-90-5	17.6	B	J	mg/kg	2.2	METALS	BI	N	Y	200144
WARP	WRWP-BI019	AD4019	1-Dec-00	0	0	Aluminum	7429-90-5	47.8			mg/kg	2.2	METALS	BI	N	Y	200144
WARP	WRWP-BI020	AD4020	1-Dec-00	0	0	Aluminum	7429-90-5	17.1	B	J	mg/kg	2.2	METALS	BI	N	Y	200144
WARP	WRWP-BI011	AD4011	28-Nov-00	0	0	Amino-2,6-dinitrotoluene, 4-	19406-51-0	0.48	U	UJ	mg/kg	0.48	NITROAROMATICS	BI	N	N	200145
WARP	WRWP-BI012	AD4012	28-Nov-00	0	0	Amino-2,6-dinitrotoluene, 4-	19406-51-0	0.53	U	UJ	mg/kg	0.53	NITROAROMATICS	BI	N	N	200145
WARP	WRWP-BI013	AD4013	28-Nov-00	0	0	Amino-2,6-dinitrotoluene, 4-	19406-51-0	0.5	U	UJ	mg/kg	0.5	NITROAROMATICS	BI	N	N	200145
WARP	WRWP-BI014	AD4014	28-Nov-00	0	0	Amino-2,6-dinitrotoluene, 4-	19406-51-0	0.5	U	UJ	mg/kg	0.5	NITROAROMATICS	BI	N	N	200145
WARP	WRWP-BI015	AD4015	28-Nov-00	0	0	Amino-2,6-dinitrotoluene, 4-	19406-51-0	0.48	U	UJ	mg/kg	0.48	NITROAROMATICS	BI	N	N	200145
WARP	WRWP-BI016	AD4016	1-Dec-00	0	0	Amino-2,6-dinitrotoluene, 4-	19406-51-0	0.5	U	UJ	mg/kg	0.5	NITROAROMATICS	BI	N	N	200144
WARP	WRWP-BI017	AD4017	1-Dec-00	0	0	Amino-2,6-dinitrotoluene, 4-	19406-51-0	0.53	U	UJ	mg/kg	0.53	NITROAROMATICS	BI	N	N	200144
WARP	WRWP-BI018	AD4018	1-Dec-00	0	0	Amino-2,6-dinitrotoluene, 4-	19406-51-0	0.5	U	UJ	mg/kg	0.5	NITROAROMATICS	BI	N	N	200144
WARP	WRWP-BI019	AD4019	1-Dec-00	0	0	Amino-2,6-dinitrotoluene, 4-	19406-51-0	0.48	U	UJ	mg/kg	0.48	NITROAROMATICS	BI	N	N	200144
WARP	WRWP-BI020	AD4020	1-Dec-00	0	0	Amino-2,6-dinitrotoluene, 4-	19406-51-0	0.48	U	UJ	mg/kg	0.48	NITROAROMATICS	BI	N	N	200144
WARP	WRWP-BI011	AD4011	28-Nov-00	0	0	Amino-4,6-dinitrotoluene, 2-	35572-78-2	0.48	U	UJ	mg/kg	0.48	NITROAROMATICS	BI	N	N	200145
WARP	WRWP-BI012	AD4012	28-Nov-00	0	0	Amino-4,6-dinitrotoluene, 2-	35572-78-2	0.53	U	UJ	mg/kg	0.53	NITROAROMATICS	BI	N	N	200145
WARP	WRWP-BI013	AD4013	28-Nov-00	0	0	Amino-4,6-dinitrotoluene, 2-	35572-78-2	0.5	U	UJ	mg/kg	0.5	NITROAROMATICS	BI	N	N	200145
WARP	WRWP-BI014	AD4014	28-Nov-00	0	0	Amino-4,6-dinitrotoluene, 2-	35572-78-2	0.5	U	UJ	mg/kg	0.5	NITROAROMATICS	BI	N	N	200145
WARP	WRWP-BI015	AD4015	28-Nov-00	0	0	Amino-4,6-dinitrotoluene, 2-	35572-78-2	0.48	U	UJ	mg/kg	0.48	NITROAROMATICS	BI	N	N	200145
WARP	WRWP-BI016	AD4016	1-Dec-00	0	0	Amino-4,6-dinitrotoluene, 2-	35572-78-2	0.5	U	UJ	mg/kg	0.5	NITROAROMATICS	BI	N	N	200144
WARP	WRWP-BI017	AD4017	1-Dec-00	0	0	Amino-4,6-dinitrotoluene, 2-	35572-78-2	0.53	U	UJ	mg/kg	0.53	NITROAROMATICS	BI	N	N	200144
WARP	WRWP-BI018	AD4018	1-Dec-00	0	0	Amino-4,6-dinitrotoluene, 2-	35572-78-2	0.5	U	UJ	mg/kg	0.5	NITROAROMATICS	BI	N	N	200144
WARP	WRWP-BI019	AD4019	1-Dec-00	0	0	Amino-4,6-dinitrotoluene, 2-	35572-78-2	0.48	U	UJ	mg/kg	0.48	NITROAROMATICS	BI	N	N	200144
WARP	WRWP-BI020	AD4020	1-Dec-00	0	0	Amino-4,6-dinitrotoluene, 2-	35572-78-2	0.48	U	UJ	mg/kg	0.48	NITROAROMATICS	BI	N	N	200144
WARP	WRWP-BI011	AD4011	28-Nov-00	0	0	Anthracene	120-12-7	0.0039	U	UJ	mg/kg	0.0039	SEMIVOLATILES	BI	N	N	200145
WARP	WRWP-BI012	AD4012	28-Nov-00	0	0	Anthracene	120-12-7	0.0034	U	UJ	mg/kg	0.0034	SEMIVOLATILES	BI	N	N	200145
WARP	WRWP-BI013	AD4013	28-Nov-00	0	0	Anthracene	120-12-7	0.0037	U	UJ	mg/kg	0.0037	SEMIVOLATILES	BI	N	N	200145
WARP	WRWP-BI014	AD4014	28-Nov-00	0	0	Anthracene	120-12-7	0.0036	U	UJ	mg/kg	0.0036	SEMIVOLATILES	BI	N	N	200145
WARP	WRWP-BI015	AD4015	28-Nov-00	0	0	Anthracene	120-12-7	0.0032	U	UJ	mg/kg	0.0032	SEMIVOLATILES	BI	N	N	200145
WARP	WRWP-BI001	AD4001	13-Sep-00			Antimony	7440-36-0	0.09	B	B	mg/kg	0.07	METALS	BI	N	Y	1227
WARP	WRWP-BI002	AD4002	13-Sep-00			Antimony	7440-36-0	0.09	B	B	mg/kg	0.07	METALS	BI	N	Y	1227
WARP	WRWP-BI003	AD4003	13-Sep-00			Antimony	7440-36-0	0.1	B	B	mg/kg	0.07	METALS	BI	N	Y	1227
WARP	WRWP-BI004	AD4004	13-Sep-00			Antimony	7440-36-0	0.14	B	B	mg/kg	0.07	METALS	BI	N	Y	1227
WARP	WRWP-BI016	AD4016	1-Dec-00	0	0	Antimony	7440-36-0	0.25	U	U	mg/kg	0.25	METALS	BI	N	N	200144
WARP	WRWP-BI017	AD4017	1-Dec-00	0	0	Antimony	7440-36-0	0.25	U	U	mg/kg	0.25	METALS	BI	N	N	200144

GROUP_ NAME	LOCATION_ CODE	SAMPLE_ NO	SAMPLE_ DATE	START_ DEPTH	END_ DEPTH	PARAMETER	CASNO	RESULT	LAB_ QUAL	VAL_ QUAL	UNITS	DETECT_ LIMIT	USER_TEST_ GROUP	SAMPLE_ TYPE	FILTERED	DETECT	SAMPLE_ DELIVERY _ GROUP
WARP	WRWP-BI018	AD4018	1-Dec-00	0	0	Antimony	7440-36-0	0.25	U	U	mg/kg	0.25	METALS	BI	N	N	200144
WARP	WRWP-BI019	AD4019	1-Dec-00	0	0	Antimony	7440-36-0	0.25	U	U	mg/kg	0.25	METALS	BI	N	N	200144
WARP	WRWP-BI020	AD4020	1-Dec-00	0	0	Antimony	7440-36-0	0.25	U	U	mg/kg	0.25	METALS	BI	N	N	200144
WARP	WRWP-BI001	AD4001	13-Sep-00			Arsenic	7440-38-2	0.53	U	U	mg/kg	0.53	METALS	BI	N	N	1227
WARP	WRWP-BI002	AD4002	13-Sep-00			Arsenic	7440-38-2	0.53	U	U	mg/kg	0.53	METALS	BI	N	N	1227
WARP	WRWP-BI003	AD4003	13-Sep-00			Arsenic	7440-38-2	0.53	U	U	mg/kg	0.53	METALS	BI	N	N	1227
WARP	WRWP-BI004	AD4004	13-Sep-00			Arsenic	7440-38-2	0.53	U	U	mg/kg	0.53	METALS	BI	N	N	1227
WARP	WRWP-BI016	AD4016	1-Dec-00	0	0	Arsenic	7440-38-2	2	B	B	mg/kg	0.28	METALS	BI	N	Y	200144
WARP	WRWP-BI017	AD4017	1-Dec-00	0	0	Arsenic	7440-38-2	1.5	B	B	mg/kg	0.28	METALS	BI	N	Y	200144
WARP	WRWP-BI018	AD4018	1-Dec-00	0	0	Arsenic	7440-38-2	2	B	B	mg/kg	0.28	METALS	BI	N	Y	200144
WARP	WRWP-BI019	AD4019	1-Dec-00	0	0	Arsenic	7440-38-2	2.9	B	B	mg/kg	0.28	METALS	BI	N	Y	200144
WARP	WRWP-BI020	AD4020	1-Dec-00	0	0	Arsenic	7440-38-2	2.1	B	B	mg/kg	0.28	METALS	BI	N	Y	200144
WARP	WRWP-BI001	AD4001	13-Sep-00			Barium	7440-39-3	10.1	B	J	mg/kg	0.59	METALS	BI	N	Y	1227
WARP	WRWP-BI002	AD4002	13-Sep-00			Barium	7440-39-3	1.2	B	J	mg/kg	0.59	METALS	BI	N	Y	1227
WARP	WRWP-BI003	AD4003	13-Sep-00			Barium	7440-39-3	0.59	U	U	mg/kg	0.59	METALS	BI	N	N	1227
WARP	WRWP-BI004	AD4004	13-Sep-00			Barium	7440-39-3	5.7	B	J	mg/kg	0.59	METALS	BI	N	Y	1227
WARP	WRWP-BI016	AD4016	1-Dec-00	0	0	Barium	7440-39-3	58.9		B	mg/kg	0.05	METALS	BI	N	Y	200144
WARP	WRWP-BI017	AD4017	1-Dec-00	0	0	Barium	7440-39-3	65.8		B	mg/kg	0.05	METALS	BI	N	Y	200144
WARP	WRWP-BI018	AD4018	1-Dec-00	0	0	Barium	7440-39-3	69.1		B	mg/kg	0.05	METALS	BI	N	Y	200144
WARP	WRWP-BI019	AD4019	1-Dec-00	0	0	Barium	7440-39-3	72.8		B	mg/kg	0.05	METALS	BI	N	Y	200144
WARP	WRWP-BI020	AD4020	1-Dec-00	0	0	Barium	7440-39-3	50		B	mg/kg	0.05	METALS	BI	N	Y	200144
WARP	WRWP-BI011	AD4011	28-Nov-00	0	0	Benzo(a)anthracene	56-55-3	0.0098	U	UJ	mg/kg	0.0098	SEMIVOLATILES	BI	N	N	200145
WARP	WRWP-BI012	AD4012	28-Nov-00	0	0	Benzo(a)anthracene	56-55-3	0.0084	U	UJ	mg/kg	0.0084	SEMIVOLATILES	BI	N	N	200145
WARP	WRWP-BI013	AD4013	28-Nov-00	0	0	Benzo(a)anthracene	56-55-3	0.0092	U	UJ	mg/kg	0.0092	SEMIVOLATILES	BI	N	N	200145
WARP	WRWP-BI014	AD4014	28-Nov-00	0	0	Benzo(a)anthracene	56-55-3	0.009	U	UJ	mg/kg	0.009	SEMIVOLATILES	BI	N	N	200145
WARP	WRWP-BI015	AD4015	28-Nov-00	0	0	Benzo(a)anthracene	56-55-3	0.008	U	UJ	mg/kg	0.008	SEMIVOLATILES	BI	N	N	200145
WARP	WRWP-BI011	AD4011	28-Nov-00	0	0	Benzo(a)pyrene	50-32-8	0.0098	U	UJ	mg/kg	0.0098	SEMIVOLATILES	BI	N	N	200145
WARP	WRWP-BI012	AD4012	28-Nov-00	0	0	Benzo(a)pyrene	50-32-8	0.0084	U	UJ	mg/kg	0.0084	SEMIVOLATILES	BI	N	N	200145
WARP	WRWP-BI013	AD4013	28-Nov-00	0	0	Benzo(a)pyrene	50-32-8	0.0092	U	UJ	mg/kg	0.0092	SEMIVOLATILES	BI	N	N	200145
WARP	WRWP-BI014	AD4014	28-Nov-00	0	0	Benzo(a)pyrene	50-32-8	0.009	U	UJ	mg/kg	0.009	SEMIVOLATILES	BI	N	N	200145
WARP	WRWP-BI015	AD4015	28-Nov-00	0	0	Benzo(a)pyrene	50-32-8	0.008	U	UJ	mg/kg	0.008	SEMIVOLATILES	BI	N	N	200145
WARP	WRWP-BI011	AD4011	28-Nov-00	0	0	Benzo(b)fluoranthene	205-99-2	0.0039	U	UJ	mg/kg	0.0039	SEMIVOLATILES	BI	N	N	200145
WARP	WRWP-BI012	AD4012	28-Nov-00	0	0	Benzo(b)fluoranthene	205-99-2	0.0034	U	UJ	mg/kg	0.0034	SEMIVOLATILES	BI	N	N	200145
WARP	WRWP-BI013	AD4013	28-Nov-00	0	0	Benzo(b)fluoranthene	205-99-2	0.0037	U	UJ	mg/kg	0.0037	SEMIVOLATILES	BI	N	N	200145
WARP	WRWP-BI014	AD4014	28-Nov-00	0	0	Benzo(b)fluoranthene	205-99-2	0.0036	U	UJ	mg/kg	0.0036	SEMIVOLATILES	BI	N	N	200145
WARP	WRWP-BI015	AD4015	28-Nov-00	0	0	Benzo(b)fluoranthene	205-99-2	0.0032	U	UJ	mg/kg	0.0032	SEMIVOLATILES	BI	N	N	200145
WARP	WRWP-BI011	AD4011	28-Nov-00	0	0	Benzo(ghi)perylene	191-24-2	0.016	U	UJ	mg/kg	0.016	SEMIVOLATILES	BI	N	N	200145
WARP	WRWP-BI012	AD4012	28-Nov-00	0	0	Benzo(ghi)perylene	191-24-2	0.013	U	UJ	mg/kg	0.013	SEMIVOLATILES	BI	N	N	200145
WARP	WRWP-BI013	AD4013	28-Nov-00	0	0	Benzo(ghi)perylene	191-24-2	0.015	U	UJ	mg/kg	0.015	SEMIVOLATILES	BI	N	N	200145
WARP	WRWP-BI014	AD4014	28-Nov-00	0	0	Benzo(ghi)perylene	191-24-2	0.014	U	UJ	mg/kg	0.014	SEMIVOLATILES	BI	N	N	200145
WARP	WRWP-BI015	AD4015	28-Nov-00	0	0	Benzo(ghi)perylene	191-24-2	0.013	U	UJ	mg/kg	0.013	SEMIVOLATILES	BI	N	N	200145
WARP	WRWP-BI011	AD4011	28-Nov-00	0	0	Benzo(k)fluoranthene	207-08-9	0.0039	U	UJ	mg/kg	0.0039	SEMIVOLATILES	BI	N	N	200145
WARP	WRWP-BI012	AD4012	28-Nov-00	0	0	Benzo(k)fluoranthene	207-08-9	0.0034	U	UJ	mg/kg	0.0034	SEMIVOLATILES	BI	N	N	200145
WARP	WRWP-BI013	AD4013	28-Nov-00	0	0	Benzo(k)fluoranthene	207-08-9	0.0037	U	UJ	mg/kg	0.0037	SEMIVOLATILES	BI	N	N	200145
WARP	WRWP-BI014	AD4014	28-Nov-00	0	0	Benzo(k)fluoranthene	207-08-9	0.0036	U	UJ	mg/kg	0.0036	SEMIVOLATILES	BI	N	N	200145
WARP	WRWP-BI015	AD4015	28-Nov-00	0	0	Benzo(k)fluoranthene	207-08-9	0.0032	U	UJ	mg/kg	0.0032	SEMIVOLATILES	BI	N	N	200145
WARP	WRWP-BI016	AD4016	1-Dec-00	0	0	Cadmium	7440-43-9	0.05	B	B	mg/kg	0.04	METALS	BI	N	Y	200144
WARP	WRWP-BI017	AD4017	1-Dec-00	0	0	Cadmium	7440-43-9	0.04	B	B	mg/kg	0.04	METALS	BI	N	Y	200144
WARP	WRWP-BI018	AD4018	1-Dec-00	0	0	Cadmium	7440-43-9	0.06	B	B	mg/kg	0.04	METALS	BI	N	Y	200144
WARP	WRWP-BI019	AD4019	1-Dec-00	0	0	Cadmium	7440-43-9	0.05	B	B	mg/kg	0.04	METALS	BI	N	Y	200144

GROUP_ NAME	LOCATION_ CODE	SAMPLE_ NO	SAMPLE_ DATE	START_ DEPTH	END_ DEPTH	PARAMETER	CASNO	RESULT	LAB_ QUAL	VAL_ QUAL	UNITS	DETECT_ LIMIT	USER_TEST_ GROUP	SAMPLE_ TYPE	FILTERED	DETECT	SAMPLE_ DELIVERY _ GROUP
WARP	WRWP-BI020	AD4020	1-Dec-00	0	0	Cadmium	7440-43-9	0.04	U	U	mg/kg	0.04	METALS	BI	N	N	200144
WARP	WRWP-BI001	AD4001	13-Sep-00			Calcium	7440-70-2	9160			mg/kg	62.4	METALS	BI	N	Y	1227
WARP	WRWP-BI002	AD4002	13-Sep-00			Calcium	7440-70-2	12200			mg/kg	62.2	METALS	BI	N	Y	1227
WARP	WRWP-BI003	AD4003	13-Sep-00			Calcium	7440-70-2	5900			mg/kg	62.2	METALS	BI	N	Y	1227
WARP	WRWP-BI004	AD4004	13-Sep-00			Calcium	7440-70-2	6980			mg/kg	62.4	METALS	BI	N	Y	1227
WARP	WRWP-BI016	AD4016	1-Dec-00	0	0	Calcium	7440-70-2	236		B	mg/kg	4.3	METALS	BI	N	Y	200144
WARP	WRWP-BI017	AD4017	1-Dec-00	0	0	Calcium	7440-70-2	170	B	B	mg/kg	4.3	METALS	BI	N	Y	200144
WARP	WRWP-BI018	AD4018	1-Dec-00	0	0	Calcium	7440-70-2	182	B	B	mg/kg	4.3	METALS	BI	N	Y	200144
WARP	WRWP-BI019	AD4019	1-Dec-00	0	0	Calcium	7440-70-2	205		B	mg/kg	4.3	METALS	BI	N	Y	200144
WARP	WRWP-BI020	AD4020	1-Dec-00	0	0	Calcium	7440-70-2	215		B	mg/kg	4.3	METALS	BI	N	Y	200144
WARP	WRWP-BI001	AD4001	13-Sep-00			Chromium	7440-47-3	0.21	B	J	mg/kg	0.1	METALS	BI	N	Y	1227
WARP	WRWP-BI002	AD4002	13-Sep-00			Chromium	7440-47-3	0.12	B	J	mg/kg	0.099	METALS	BI	N	Y	1227
WARP	WRWP-BI003	AD4003	13-Sep-00			Chromium	7440-47-3	0.1	U	U	mg/kg	0.1	METALS	BI	N	N	1227
WARP	WRWP-BI004	AD4004	13-Sep-00			Chromium	7440-47-3	0.11	B	J	mg/kg	0.1	METALS	BI	N	Y	1227
WARP	WRWP-BI016	AD4016	1-Dec-00	0	0	Chromium	7440-47-3	0.33	B	B	mg/kg	0.13	METALS	BI	N	Y	200144
WARP	WRWP-BI017	AD4017	1-Dec-00	0	0	Chromium	7440-47-3	0.27	B	B	mg/kg	0.13	METALS	BI	N	Y	200144
WARP	WRWP-BI018	AD4018	1-Dec-00	0	0	Chromium	7440-47-3	0.28	B	B	mg/kg	0.13	METALS	BI	N	Y	200144
WARP	WRWP-BI019	AD4019	1-Dec-00	0	0	Chromium	7440-47-3	0.26	B	B	mg/kg	0.13	METALS	BI	N	Y	200144
WARP	WRWP-BI020	AD4020	1-Dec-00	0	0	Chromium	7440-47-3	0.13	B	B	mg/kg	0.13	METALS	BI	N	Y	200144
WARP	WRWP-BI011	AD4011	28-Nov-00	0	0	Chrysene	218-01-9	0.0098	U	UJ	mg/kg	0.0098	SEMIVOLATILES	BI	N	N	200145
WARP	WRWP-BI012	AD4012	28-Nov-00	0	0	Chrysene	218-01-9	0.0084	U	UJ	mg/kg	0.0084	SEMIVOLATILES	BI	N	N	200145
WARP	WRWP-BI013	AD4013	28-Nov-00	0	0	Chrysene	218-01-9	0.0092	U	UJ	mg/kg	0.0092	SEMIVOLATILES	BI	N	N	200145
WARP	WRWP-BI014	AD4014	28-Nov-00	0	0	Chrysene	218-01-9	0.009	U	UJ	mg/kg	0.009	SEMIVOLATILES	BI	N	N	200145
WARP	WRWP-BI015	AD4015	28-Nov-00	0	0	Chrysene	218-01-9	0.008	U	UJ	mg/kg	0.008	SEMIVOLATILES	BI	N	N	200145
WARP	WRWP-BI001	AD4001	13-Sep-00			Cobalt	7440-48-4	0.38	U	U	mg/kg	0.38	METALS	BI	N	N	1227
WARP	WRWP-BI002	AD4002	13-Sep-00			Cobalt	7440-48-4	0.38	U	U	mg/kg	0.38	METALS	BI	N	N	1227
WARP	WRWP-BI003	AD4003	13-Sep-00			Cobalt	7440-48-4	0.38	U	U	mg/kg	0.38	METALS	BI	N	N	1227
WARP	WRWP-BI004	AD4004	13-Sep-00			Cobalt	7440-48-4	0.38	U	U	mg/kg	0.38	METALS	BI	N	N	1227
WARP	WRWP-BI016	AD4016	1-Dec-00	0	0	Cobalt	7440-48-4	0.28	B	B	mg/kg	0.05	METALS	BI	N	Y	200144
WARP	WRWP-BI017	AD4017	1-Dec-00	0	0	Cobalt	7440-48-4	0.21	B	B	mg/kg	0.05	METALS	BI	N	Y	200144
WARP	WRWP-BI018	AD4018	1-Dec-00	0	0	Cobalt	7440-48-4	0.18	B	B	mg/kg	0.05	METALS	BI	N	Y	200144
WARP	WRWP-BI019	AD4019	1-Dec-00	0	0	Cobalt	7440-48-4	0.31	B	B	mg/kg	0.05	METALS	BI	N	Y	200144
WARP	WRWP-BI020	AD4020	1-Dec-00	0	0	Cobalt	7440-48-4	0.38	B	B	mg/kg	0.05	METALS	BI	N	Y	200144
WARP	WRWP-BI001	AD4001	13-Sep-00			Copper	7440-50-8	2			mg/kg	0.42	METALS	BI	N	Y	1227
WARP	WRWP-BI002	AD4002	13-Sep-00			Copper	7440-50-8	0.42	U	U	mg/kg	0.42	METALS	BI	N	N	1227
WARP	WRWP-BI003	AD4003	13-Sep-00			Copper	7440-50-8	0.42	U	U	mg/kg	0.42	METALS	BI	N	N	1227
WARP	WRWP-BI004	AD4004	13-Sep-00			Copper	7440-50-8	0.44	B	J	mg/kg	0.42	METALS	BI	N	Y	1227
WARP	WRWP-BI016	AD4016	1-Dec-00	0	0	Copper	7440-50-8	3	*	B	mg/kg	0.46	METALS	BI	N	Y	200144
WARP	WRWP-BI017	AD4017	1-Dec-00	0	0	Copper	7440-50-8	4.5	*	B	mg/kg	0.46	METALS	BI	N	Y	200144
WARP	WRWP-BI018	AD4018	1-Dec-00	0	0	Copper	7440-50-8	2.9	*	B	mg/kg	0.46	METALS	BI	N	Y	200144
WARP	WRWP-BI019	AD4019	1-Dec-00	0	0	Copper	7440-50-8	3.2	*	B	mg/kg	0.46	METALS	BI	N	Y	200144
WARP	WRWP-BI020	AD4020	1-Dec-00	0	0	Copper	7440-50-8	3.7	*	B	mg/kg	0.46	METALS	BI	N	Y	200144
WARP	WRWP-BI011	AD4011	28-Nov-00	0	0	Dibenz(a,h)anthracene	53-70-3	0.039	U	UJ	mg/kg	0.039	SEMIVOLATILES	BI	N	N	200145
WARP	WRWP-BI012	AD4012	28-Nov-00	0	0	Dibenz(a,h)anthracene	53-70-3	0.034	U	UJ	mg/kg	0.034	SEMIVOLATILES	BI	N	N	200145
WARP	WRWP-BI013	AD4013	28-Nov-00	0	0	Dibenz(a,h)anthracene	53-70-3	0.037	U	UJ	mg/kg	0.037	SEMIVOLATILES	BI	N	N	200145
WARP	WRWP-BI014	AD4014	28-Nov-00	0	0	Dibenz(a,h)anthracene	53-70-3	0.036	U	UJ	mg/kg	0.036	SEMIVOLATILES	BI	N	N	200145
WARP	WRWP-BI015	AD4015	28-Nov-00	0	0	Dibenz(a,h)anthracene	53-70-3	0.032	U	UJ	mg/kg	0.032	SEMIVOLATILES	BI	N	N	200145
WARP	WRWP-BI011	AD4011	28-Nov-00	0	0	Dinitrobenzene, 1,3-	99-65-0	0.24	U	U	mg/kg	0.24	NITROAROMATICS	BI	N	N	200145
WARP	WRWP-BI012	AD4012	28-Nov-00	0	0	Dinitrobenzene, 1,3-	99-65-0	0.26	U	U	mg/kg	0.26	NITROAROMATICS	BI	N	N	200145
WARP	WRWP-BI013	AD4013	28-Nov-00	0	0	Dinitrobenzene, 1,3-	99-65-0	0.25	U	U	mg/kg	0.25	NITROAROMATICS	BI	N	N	200145

GROUP_ NAME	LOCATION_ CODE	SAMPLE_ NO	SAMPLE_ DATE	START_ DEPTH	END_ DEPTH	PARAMETER	CASNO	RESULT	LAB_ QUAL	VAL_ QUAL	UNITS	DETECT_ LIMIT	USER_TEST_ GROUP	SAMPLE_ TYPE	FILTERED	DETECT	SAMPLE_ DELIVERY _GROUP
WARP	WRWP-BI014	AD4014	28-Nov-00	0	0	Dinitrobenzene, 1,3-	99-65-0	0.25	U	U	mg/kg	0.25	NITROAROMATICS	BI	N	N	200145
WARP	WRWP-BI015	AD4015	28-Nov-00	0	0	Dinitrobenzene, 1,3-	99-65-0	0.24	U	U	mg/kg	0.24	NITROAROMATICS	BI	N	N	200145
WARP	WRWP-BI016	AD4016	1-Dec-00	0	0	Dinitrobenzene, 1,3-	99-65-0	0.25	U	U	mg/kg	0.25	NITROAROMATICS	BI	N	N	200144
WARP	WRWP-BI017	AD4017	1-Dec-00	0	0	Dinitrobenzene, 1,3-	99-65-0	0.26	U	U	mg/kg	0.26	NITROAROMATICS	BI	N	N	200144
WARP	WRWP-BI018	AD4018	1-Dec-00	0	0	Dinitrobenzene, 1,3-	99-65-0	0.25	U	U	mg/kg	0.25	NITROAROMATICS	BI	N	N	200144
WARP	WRWP-BI019	AD4019	1-Dec-00	0	0	Dinitrobenzene, 1,3-	99-65-0	0.24	U	U	mg/kg	0.24	NITROAROMATICS	BI	N	N	200144
WARP	WRWP-BI020	AD4020	1-Dec-00	0	0	Dinitrobenzene, 1,3-	99-65-0	0.24	U	U	mg/kg	0.24	NITROAROMATICS	BI	N	N	200144
WARP	WRWP-BI011	AD4011	28-Nov-00	0	0	Dinitrotoluene, 2,4-	121-14-2	0.24	U	U	mg/kg	0.24	NITROAROMATICS	BI	N	N	200145
WARP	WRWP-BI012	AD4012	28-Nov-00	0	0	Dinitrotoluene, 2,4-	121-14-2	0.26	U	U	mg/kg	0.26	NITROAROMATICS	BI	N	N	200145
WARP	WRWP-BI013	AD4013	28-Nov-00	0	0	Dinitrotoluene, 2,4-	121-14-2	0.25	U	U	mg/kg	0.25	NITROAROMATICS	BI	N	N	200145
WARP	WRWP-BI014	AD4014	28-Nov-00	0	0	Dinitrotoluene, 2,4-	121-14-2	0.25	U	U	mg/kg	0.25	NITROAROMATICS	BI	N	N	200145
WARP	WRWP-BI015	AD4015	28-Nov-00	0	0	Dinitrotoluene, 2,4-	121-14-2	0.24	U	U	mg/kg	0.24	NITROAROMATICS	BI	N	N	200145
WARP	WRWP-BI016	AD4016	1-Dec-00	0	0	Dinitrotoluene, 2,4-	121-14-2	0.25	U	U	mg/kg	0.25	NITROAROMATICS	BI	N	N	200144
WARP	WRWP-BI017	AD4017	1-Dec-00	0	0	Dinitrotoluene, 2,4-	121-14-2	0.26	U	U	mg/kg	0.26	NITROAROMATICS	BI	N	N	200144
WARP	WRWP-BI018	AD4018	1-Dec-00	0	0	Dinitrotoluene, 2,4-	121-14-2	0.25	U	U	mg/kg	0.25	NITROAROMATICS	BI	N	N	200144
WARP	WRWP-BI019	AD4019	1-Dec-00	0	0	Dinitrotoluene, 2,4-	121-14-2	0.24	U	U	mg/kg	0.24	NITROAROMATICS	BI	N	N	200144
WARP	WRWP-BI020	AD4020	1-Dec-00	0	0	Dinitrotoluene, 2,4-	121-14-2	0.24	U	U	mg/kg	0.24	NITROAROMATICS	BI	N	N	200144
WARP	WRWP-BI011	AD4011	28-Nov-00	0	0	Dinitrotoluene, 2,6-	606-20-2	0.48	U	U	mg/kg	0.48	NITROAROMATICS	BI	N	N	200145
WARP	WRWP-BI012	AD4012	28-Nov-00	0	0	Dinitrotoluene, 2,6-	606-20-2	0.53	U	U	mg/kg	0.53	NITROAROMATICS	BI	N	N	200145
WARP	WRWP-BI013	AD4013	28-Nov-00	0	0	Dinitrotoluene, 2,6-	606-20-2	0.5	U	U	mg/kg	0.5	NITROAROMATICS	BI	N	N	200145
WARP	WRWP-BI014	AD4014	28-Nov-00	0	0	Dinitrotoluene, 2,6-	606-20-2	0.5	U	U	mg/kg	0.5	NITROAROMATICS	BI	N	N	200145
WARP	WRWP-BI015	AD4015	28-Nov-00	0	0	Dinitrotoluene, 2,6-	606-20-2	0.48	U	U	mg/kg	0.48	NITROAROMATICS	BI	N	N	200145
WARP	WRWP-BI016	AD4016	1-Dec-00	0	0	Dinitrotoluene, 2,6-	606-20-2	0.5	U	U	mg/kg	0.5	NITROAROMATICS	BI	N	N	200144
WARP	WRWP-BI017	AD4017	1-Dec-00	0	0	Dinitrotoluene, 2,6-	606-20-2	0.53	U	U	mg/kg	0.53	NITROAROMATICS	BI	N	N	200144
WARP	WRWP-BI018	AD4018	1-Dec-00	0	0	Dinitrotoluene, 2,6-	606-20-2	0.5	U	U	mg/kg	0.5	NITROAROMATICS	BI	N	N	200144
WARP	WRWP-BI019	AD4019	1-Dec-00	0	0	Dinitrotoluene, 2,6-	606-20-2	0.48	U	U	mg/kg	0.48	NITROAROMATICS	BI	N	N	200144
WARP	WRWP-BI020	AD4020	1-Dec-00	0	0	Dinitrotoluene, 2,6-	606-20-2	0.48	U	U	mg/kg	0.48	NITROAROMATICS	BI	N	N	200144
WARP	WRWP-BI011	AD4011	28-Nov-00	0	0	Fluoranthene	206-44-0	0.0098	U	UJ	mg/kg	0.0098	SEMIVOLATILES	BI	N	N	200145
WARP	WRWP-BI012	AD4012	28-Nov-00	0	0	Fluoranthene	206-44-0	0.0084	U	UJ	mg/kg	0.0084	SEMIVOLATILES	BI	N	N	200145
WARP	WRWP-BI013	AD4013	28-Nov-00	0	0	Fluoranthene	206-44-0	0.0092	U	UJ	mg/kg	0.0092	SEMIVOLATILES	BI	N	N	200145
WARP	WRWP-BI014	AD4014	28-Nov-00	0	0	Fluoranthene	206-44-0	0.009	U	UJ	mg/kg	0.009	SEMIVOLATILES	BI	N	N	200145
WARP	WRWP-BI015	AD4015	28-Nov-00	0	0	Fluoranthene	206-44-0	0.008	U	UJ	mg/kg	0.008	SEMIVOLATILES	BI	N	N	200145
WARP	WRWP-BI011	AD4011	28-Nov-00	0	0	Fluorene	86-73-7	0.018	J	B	mg/kg	0.02	SEMIVOLATILES	BI	N	Y	200145
WARP	WRWP-BI012	AD4012	28-Nov-00	0	0	Fluorene	86-73-7	0.019		B	mg/kg	0.017	SEMIVOLATILES	BI	N	Y	200145
WARP	WRWP-BI013	AD4013	28-Nov-00	0	0	Fluorene	86-73-7	0.047		B	mg/kg	0.018	SEMIVOLATILES	BI	N	Y	200145
WARP	WRWP-BI014	AD4014	28-Nov-00	0	0	Fluorene	86-73-7	0.037		B	mg/kg	0.018	SEMIVOLATILES	BI	N	Y	200145
WARP	WRWP-BI015	AD4015	28-Nov-00	0	0	Fluorene	86-73-7	0.032		B	mg/kg	0.016	SEMIVOLATILES	BI	N	Y	200145
WARP	WRWP-BI011	AD4011	28-Nov-00	0	0	HMX	2691-41-0	0.48	U	UJ	mg/kg	0.48	NITROAROMATICS	BI	N	N	200145
WARP	WRWP-BI012	AD4012	28-Nov-00	0	0	HMX	2691-41-0	0.53	U	UJ	mg/kg	0.53	NITROAROMATICS	BI	N	N	200145
WARP	WRWP-BI013	AD4013	28-Nov-00	0	0	HMX	2691-41-0	0.5	U	UJ	mg/kg	0.5	NITROAROMATICS	BI	N	N	200145
WARP	WRWP-BI014	AD4014	28-Nov-00	0	0	HMX	2691-41-0	0.5	U	UJ	mg/kg	0.5	NITROAROMATICS	BI	N	N	200145
WARP	WRWP-BI015	AD4015	28-Nov-00	0	0	HMX	2691-41-0	0.48	U	UJ	mg/kg	0.48	NITROAROMATICS	BI	N	N	200145
WARP	WRWP-BI016	AD4016	1-Dec-00	0	0	HMX	2691-41-0	0.5	U	UJ	mg/kg	0.5	NITROAROMATICS	BI	N	N	200144
WARP	WRWP-BI017	AD4017	1-Dec-00	0	0	HMX	2691-41-0	0.53	U	UJ	mg/kg	0.53	NITROAROMATICS	BI	N	N	200144
WARP	WRWP-BI018	AD4018	1-Dec-00	0	0	HMX	2691-41-0	0.5	U	UJ	mg/kg	0.5	NITROAROMATICS	BI	N	N	200144
WARP	WRWP-BI019	AD4019	1-Dec-00	0	0	HMX	2691-41-0	0.48	U	UJ	mg/kg	0.48	NITROAROMATICS	BI	N	N	200144
WARP	WRWP-BI020	AD4020	1-Dec-00	0	0	HMX	2691-41-0	0.48	U	UJ	mg/kg	0.48	NITROAROMATICS	BI	N	N	200144
WARP	WRWP-BI011	AD4011	28-Nov-00	0	0	Indeno(1,2,3-cd)pyrene	193-39-5	0.008	J	B	mg/kg	0.0098	SEMIVOLATILES	BI	N	Y	200145
WARP	WRWP-BI012	AD4012	28-Nov-00	0	0	Indeno(1,2,3-cd)pyrene	193-39-5	0.0084	U	UJ	mg/kg	0.0084	SEMIVOLATILES	BI	N	N	200145
WARP	WRWP-BI013	AD4013	28-Nov-00	0	0	Indeno(1,2,3-cd)pyrene	193-39-5	0.0092	U	UJ	mg/kg	0.0092	SEMIVOLATILES	BI	N	N	200145

GROUP_ NAME	LOCATION_ CODE	SAMPLE_ NO	SAMPLE_ DATE	START_ DEPTH	END_ DEPTH	PARAMETER	CASNO	RESULT	LAB_ QUAL	VAL_ QUAL	UNITS	DETECT_ LIMIT	USER_TEST_ GROUP	SAMPLE_ TYPE	FILTERED	DETECT	SAMPLE_ DELIVERY _GROUP
WARP	WRWP-BI014	AD4014	28-Nov-00	0	0	Indeno(1,2,3-cd)pyrene	193-39-5	0.009	U	UJ	mg/kg	0.009	SEMIVOLATILES	BI	N	N	200145
WARP	WRWP-BI015	AD4015	28-Nov-00	0	0	Indeno(1,2,3-cd)pyrene	193-39-5	0.0044	J	B	mg/kg	0.008	SEMIVOLATILES	BI	N	Y	200145
WARP	WRWP-BI001	AD4001	13-Sep-00			Iron	7439-89-6	234	*	J	mg/kg	13.7	METALS	BI	N	Y	1227
WARP	WRWP-BI002	AD4002	13-Sep-00			Iron	7439-89-6	37.6	BN*	J	mg/kg	13.7	METALS	BI	N	Y	1227
WARP	WRWP-BI003	AD4003	13-Sep-00			Iron	7439-89-6	20.8	B*	J	mg/kg	13.7	METALS	BI	N	Y	1227
WARP	WRWP-BI004	AD4004	13-Sep-00			Iron	7439-89-6	144	N*	J	mg/kg	13.7	METALS	BI	N	Y	1227
WARP	WRWP-BI016	AD4016	1-Dec-00	0	0	Iron	7439-89-6	824		B	mg/kg	1.9	METALS	BI	N	Y	200144
WARP	WRWP-BI017	AD4017	1-Dec-00	0	0	Iron	7439-89-6	445		B	mg/kg	2	METALS	BI	N	Y	200144
WARP	WRWP-BI018	AD4018	1-Dec-00	0	0	Iron	7439-89-6	534		B	mg/kg	1.9	METALS	BI	N	Y	200144
WARP	WRWP-BI019	AD4019	1-Dec-00	0	0	Iron	7439-89-6	694		B	mg/kg	1.9	METALS	BI	N	Y	200144
WARP	WRWP-BI020	AD4020	1-Dec-00	0	0	Iron	7439-89-6	346		B	mg/kg	1.9	METALS	BI	N	Y	200144
WARP	WRWP-BI001	AD4001	13-Sep-00			Lead	7439-92-1	0.52	B	B	mg/kg	0.22	METALS	BI	N	Y	1227
WARP	WRWP-BI002	AD4002	13-Sep-00			Lead	7439-92-1	0.22	U	U	mg/kg	0.22	METALS	BI	N	N	1227
WARP	WRWP-BI003	AD4003	13-Sep-00			Lead	7439-92-1	0.29	B	B	mg/kg	0.22	METALS	BI	N	Y	1227
WARP	WRWP-BI004	AD4004	13-Sep-00			Lead	7439-92-1	0.39	B	B	mg/kg	0.22	METALS	BI	N	Y	1227
WARP	WRWP-BI016	AD4016	1-Dec-00	0	0	Lead	7439-92-1	0.88	B	J	mg/kg	0.099	METALS	BI	N	Y	200144
WARP	WRWP-BI017	AD4017	1-Dec-00	0	0	Lead	7439-92-1	0.31	B	J	mg/kg	0.1	METALS	BI	N	Y	200144
WARP	WRWP-BI018	AD4018	1-Dec-00	0	0	Lead	7439-92-1	0.56	B	J	mg/kg	0.099	METALS	BI	N	Y	200144
WARP	WRWP-BI019	AD4019	1-Dec-00	0	0	Lead	7439-92-1	0.43	B	J	mg/kg	0.099	METALS	BI	N	Y	200144
WARP	WRWP-BI020	AD4020	1-Dec-00	0	0	Lead	7439-92-1	0.25	B	J	mg/kg	0.099	METALS	BI	N	Y	200144
WARP	WRWP-BI001	AD4001	13-Sep-00			Magnesium	7439-95-4	456			mg/kg	49.3	METALS	BI	N	Y	1227
WARP	WRWP-BI002	AD4002	13-Sep-00			Magnesium	7439-95-4	411			mg/kg	49.1	METALS	BI	N	Y	1227
WARP	WRWP-BI003	AD4003	13-Sep-00			Magnesium	7439-95-4	277			mg/kg	49.2	METALS	BI	N	Y	1227
WARP	WRWP-BI004	AD4004	13-Sep-00			Magnesium	7439-95-4	377			mg/kg	49.3	METALS	BI	N	Y	1227
WARP	WRWP-BI016	AD4016	1-Dec-00	0	0	Magnesium	7439-95-4	214		B	mg/kg	1.2	METALS	BI	N	Y	200144
WARP	WRWP-BI017	AD4017	1-Dec-00	0	0	Magnesium	7439-95-4	168	B	B	mg/kg	1.2	METALS	BI	N	Y	200144
WARP	WRWP-BI018	AD4018	1-Dec-00	0	0	Magnesium	7439-95-4	171	B	B	mg/kg	1.2	METALS	BI	N	Y	200144
WARP	WRWP-BI019	AD4019	1-Dec-00	0	0	Magnesium	7439-95-4	189	B	B	mg/kg	1.2	METALS	BI	N	Y	200144
WARP	WRWP-BI020	AD4020	1-Dec-00	0	0	Magnesium	7439-95-4	149	B	B	mg/kg	1.2	METALS	BI	N	Y	200144
WARP	WRWP-BI001	AD4001	13-Sep-00			Manganese	7439-96-5	14.7			mg/kg	1	METALS	BI	N	Y	1227
WARP	WRWP-BI002	AD4002	13-Sep-00			Manganese	7439-96-5	6			mg/kg	1	METALS	BI	N	Y	1227
WARP	WRWP-BI003	AD4003	13-Sep-00			Manganese	7439-96-5	4	B	J	mg/kg	1	METALS	BI	N	Y	1227
WARP	WRWP-BI004	AD4004	13-Sep-00			Manganese	7439-96-5	11			mg/kg	1	METALS	BI	N	Y	1227
WARP	WRWP-BI016	AD4016	1-Dec-00	0	0	Manganese	7439-96-5	5.4		B	mg/kg	0.03	METALS	BI	N	Y	200144
WARP	WRWP-BI017	AD4017	1-Dec-00	0	0	Manganese	7439-96-5	2.4	B	B	mg/kg	0.03	METALS	BI	N	Y	200144
WARP	WRWP-BI018	AD4018	1-Dec-00	0	0	Manganese	7439-96-5	3.3	B	B	mg/kg	0.03	METALS	BI	N	Y	200144
WARP	WRWP-BI019	AD4019	1-Dec-00	0	0	Manganese	7439-96-5	4	B	B	mg/kg	0.03	METALS	BI	N	Y	200144
WARP	WRWP-BI020	AD4020	1-Dec-00	0	0	Manganese	7439-96-5	2.3	B	B	mg/kg	0.03	METALS	BI	N	Y	200144
WARP	WRWP-BI011	AD4011	28-Nov-00	0	0	Naphthalene	91-20-3	0.098	U	UJ	mg/kg	0.098	SEMIVOLATILES	BI	N	N	200145
WARP	WRWP-BI012	AD4012	28-Nov-00	0	0	Naphthalene	91-20-3	0.084	U	UJ	mg/kg	0.084	SEMIVOLATILES	BI	N	N	200145
WARP	WRWP-BI013	AD4013	28-Nov-00	0	0	Naphthalene	91-20-3	0.092	U	UJ	mg/kg	0.092	SEMIVOLATILES	BI	N	N	200145
WARP	WRWP-BI014	AD4014	28-Nov-00	0	0	Naphthalene	91-20-3	0.09	U	UJ	mg/kg	0.09	SEMIVOLATILES	BI	N	N	200145
WARP	WRWP-BI015	AD4015	28-Nov-00	0	0	Naphthalene	91-20-3	0.08	U	UJ	mg/kg	0.08	SEMIVOLATILES	BI	N	N	200145
WARP	WRWP-BI001	AD4001	13-Sep-00			Nickel	7440-02-0	0.29	U	U	mg/kg	0.29	METALS	BI	N	N	1227
WARP	WRWP-BI002	AD4002	13-Sep-00			Nickel	7440-02-0	0.29	U	U	mg/kg	0.29	METALS	BI	N	N	1227
WARP	WRWP-BI003	AD4003	13-Sep-00			Nickel	7440-02-0	0.29	U	U	mg/kg	0.29	METALS	BI	N	N	1227
WARP	WRWP-BI004	AD4004	13-Sep-00			Nickel	7440-02-0	0.29	U	U	mg/kg	0.29	METALS	BI	N	N	1227
WARP	WRWP-BI016	AD4016	1-Dec-00	0	0	Nickel	7440-02-0	0.37	B	J	mg/kg	0.19	METALS	BI	N	Y	200144
WARP	WRWP-BI017	AD4017	1-Dec-00	0	0	Nickel	7440-02-0	0.45	B	J	mg/kg	0.19	METALS	BI	N	Y	200144
WARP	WRWP-BI018	AD4018	1-Dec-00	0	0	Nickel	7440-02-0	0.27	B	J	mg/kg	0.19	METALS	BI	N	Y	200144

GROUP_ NAME	LOCATION_ CODE	SAMPLE_ NO	SAMPLE_ DATE	START_ DEPTH	END_ DEPTH	PARAMETER	CASNO	RESULT	LAB_ QUAL	VAL_ QUAL	UNITS	DETECT_ LIMIT	USER_TEST_ GROUP	SAMPLE_ TYPE	FILTERED	DETECT	SAMPLE_ DELIVERY _ GROUP
WARP	WRWP-BI019	AD4019	1-Dec-00	0	0	Nickel	7440-02-0	0.27	B	J	mg/kg	0.19	METALS	BI	N	Y	200144
WARP	WRWP-BI020	AD4020	1-Dec-00	0	0	Nickel	7440-02-0	0.29	B	J	mg/kg	0.19	METALS	BI	N	Y	200144
WARP	WRWP-BI011	AD4011	28-Nov-00	0	0	Nitrobenzene	98-95-3	0.24	U	U	mg/kg	0.24	NITROAROMATICS	BI	N	N	200145
WARP	WRWP-BI012	AD4012	28-Nov-00	0	0	Nitrobenzene	98-95-3	0.26	U	U	mg/kg	0.26	NITROAROMATICS	BI	N	N	200145
WARP	WRWP-BI013	AD4013	28-Nov-00	0	0	Nitrobenzene	98-95-3	0.25	U	U	mg/kg	0.25	NITROAROMATICS	BI	N	N	200145
WARP	WRWP-BI014	AD4014	28-Nov-00	0	0	Nitrobenzene	98-95-3	0.25	U	U	mg/kg	0.25	NITROAROMATICS	BI	N	N	200145
WARP	WRWP-BI015	AD4015	28-Nov-00	0	0	Nitrobenzene	98-95-3	0.24	U	U	mg/kg	0.24	NITROAROMATICS	BI	N	N	200145
WARP	WRWP-BI016	AD4016	1-Dec-00	0	0	Nitrobenzene	98-95-3	0.25	U	U	mg/kg	0.25	NITROAROMATICS	BI	N	N	200144
WARP	WRWP-BI017	AD4017	1-Dec-00	0	0	Nitrobenzene	98-95-3	0.26	U	U	mg/kg	0.26	NITROAROMATICS	BI	N	N	200144
WARP	WRWP-BI018	AD4018	1-Dec-00	0	0	Nitrobenzene	98-95-3	0.25	U	U	mg/kg	0.25	NITROAROMATICS	BI	N	N	200144
WARP	WRWP-BI019	AD4019	1-Dec-00	0	0	Nitrobenzene	98-95-3	0.24	U	U	mg/kg	0.24	NITROAROMATICS	BI	N	N	200144
WARP	WRWP-BI020	AD4020	1-Dec-00	0	0	Nitrobenzene	98-95-3	0.24	U	U	mg/kg	0.24	NITROAROMATICS	BI	N	N	200144
WARP	WRWP-BI011	AD4011	28-Nov-00	0	0	Nitrotoluene, 2-	88-72-2	0.48	U	U	mg/kg	0.48	NITROAROMATICS	BI	N	N	200145
WARP	WRWP-BI012	AD4012	28-Nov-00	0	0	Nitrotoluene, 2-	88-72-2	0.53	U	U	mg/kg	0.53	NITROAROMATICS	BI	N	N	200145
WARP	WRWP-BI013	AD4013	28-Nov-00	0	0	Nitrotoluene, 2-	88-72-2	0.5	U	U	mg/kg	0.5	NITROAROMATICS	BI	N	N	200145
WARP	WRWP-BI014	AD4014	28-Nov-00	0	0	Nitrotoluene, 2-	88-72-2	0.5	U	U	mg/kg	0.5	NITROAROMATICS	BI	N	N	200145
WARP	WRWP-BI015	AD4015	28-Nov-00	0	0	Nitrotoluene, 2-	88-72-2	0.48	U	U	mg/kg	0.48	NITROAROMATICS	BI	N	N	200145
WARP	WRWP-BI016	AD4016	1-Dec-00	0	0	Nitrotoluene, 2-	88-72-2	0.5	U	UJ	mg/kg	0.5	NITROAROMATICS	BI	N	N	200144
WARP	WRWP-BI017	AD4017	1-Dec-00	0	0	Nitrotoluene, 2-	88-72-2	0.53	U	UJ	mg/kg	0.53	NITROAROMATICS	BI	N	N	200144
WARP	WRWP-BI018	AD4018	1-Dec-00	0	0	Nitrotoluene, 2-	88-72-2	0.5	U	UJ	mg/kg	0.5	NITROAROMATICS	BI	N	N	200144
WARP	WRWP-BI019	AD4019	1-Dec-00	0	0	Nitrotoluene, 2-	88-72-2	0.48	U	UJ	mg/kg	0.48	NITROAROMATICS	BI	N	N	200144
WARP	WRWP-BI020	AD4020	1-Dec-00	0	0	Nitrotoluene, 2-	88-72-2	0.48	U	UJ	mg/kg	0.48	NITROAROMATICS	BI	N	N	200144
WARP	WRWP-BI011	AD4011	28-Nov-00	0	0	Nitrotoluene, 3-	99-08-1	0.48	U	U	mg/kg	0.48	NITROAROMATICS	BI	N	N	200145
WARP	WRWP-BI012	AD4012	28-Nov-00	0	0	Nitrotoluene, 3-	99-08-1	0.53	U	U	mg/kg	0.53	NITROAROMATICS	BI	N	N	200145
WARP	WRWP-BI013	AD4013	28-Nov-00	0	0	Nitrotoluene, 3-	99-08-1	0.5	U	U	mg/kg	0.5	NITROAROMATICS	BI	N	N	200145
WARP	WRWP-BI014	AD4014	28-Nov-00	0	0	Nitrotoluene, 3-	99-08-1	0.5	U	U	mg/kg	0.5	NITROAROMATICS	BI	N	N	200145
WARP	WRWP-BI015	AD4015	28-Nov-00	0	0	Nitrotoluene, 3-	99-08-1	0.48	U	U	mg/kg	0.48	NITROAROMATICS	BI	N	N	200145
WARP	WRWP-BI016	AD4016	1-Dec-00	0	0	Nitrotoluene, 3-	99-08-1	0.5	U	U	mg/kg	0.5	NITROAROMATICS	BI	N	N	200144
WARP	WRWP-BI017	AD4017	1-Dec-00	0	0	Nitrotoluene, 3-	99-08-1	0.53	U	U	mg/kg	0.53	NITROAROMATICS	BI	N	N	200144
WARP	WRWP-BI018	AD4018	1-Dec-00	0	0	Nitrotoluene, 3-	99-08-1	0.5	U	U	mg/kg	0.5	NITROAROMATICS	BI	N	N	200144
WARP	WRWP-BI019	AD4019	1-Dec-00	0	0	Nitrotoluene, 3-	99-08-1	0.48	U	U	mg/kg	0.48	NITROAROMATICS	BI	N	N	200144
WARP	WRWP-BI020	AD4020	1-Dec-00	0	0	Nitrotoluene, 3-	99-08-1	0.48	U	U	mg/kg	0.48	NITROAROMATICS	BI	N	N	200144
WARP	WRWP-BI011	AD4011	28-Nov-00	0	0	Nitrotoluene, 4-	99-99-0	0.48	U	U	mg/kg	0.48	NITROAROMATICS	BI	N	N	200145
WARP	WRWP-BI012	AD4012	28-Nov-00	0	0	Nitrotoluene, 4-	99-99-0	0.53	U	U	mg/kg	0.53	NITROAROMATICS	BI	N	N	200145
WARP	WRWP-BI013	AD4013	28-Nov-00	0	0	Nitrotoluene, 4-	99-99-0	0.5	U	U	mg/kg	0.5	NITROAROMATICS	BI	N	N	200145
WARP	WRWP-BI014	AD4014	28-Nov-00	0	0	Nitrotoluene, 4-	99-99-0	0.5	U	U	mg/kg	0.5	NITROAROMATICS	BI	N	N	200145
WARP	WRWP-BI015	AD4015	28-Nov-00	0	0	Nitrotoluene, 4-	99-99-0	0.48	U	U	mg/kg	0.48	NITROAROMATICS	BI	N	N	200145
WARP	WRWP-BI016	AD4016	1-Dec-00	0	0	Nitrotoluene, 4-	99-99-0	0.5	U	UJ	mg/kg	0.5	NITROAROMATICS	BI	N	N	200144
WARP	WRWP-BI017	AD4017	1-Dec-00	0	0	Nitrotoluene, 4-	99-99-0	0.53	U	UJ	mg/kg	0.53	NITROAROMATICS	BI	N	N	200144
WARP	WRWP-BI018	AD4018	1-Dec-00	0	0	Nitrotoluene, 4-	99-99-0	0.5	U	UJ	mg/kg	0.5	NITROAROMATICS	BI	N	N	200144
WARP	WRWP-BI019	AD4019	1-Dec-00	0	0	Nitrotoluene, 4-	99-99-0	0.48	U	UJ	mg/kg	0.48	NITROAROMATICS	BI	N	N	200144
WARP	WRWP-BI020	AD4020	1-Dec-00	0	0	Nitrotoluene, 4-	99-99-0	0.48	U	UJ	mg/kg	0.48	NITROAROMATICS	BI	N	N	200144
WARP	WRWP-BI001	AD4001	13-Sep-00			PERCENT LIPIDS	LIPIDS	1.4			Percent	0.1	GEN CHEMISTRY	BI	N	Y	1227
WARP	WRWP-BI002	AD4002	13-Sep-00			PERCENT LIPIDS	LIPIDS	3.9			Percent	0.1	GEN CHEMISTRY	BI	N	Y	1227
WARP	WRWP-BI003	AD4003	13-Sep-00			PERCENT LIPIDS	LIPIDS	2.5			Percent	0.1	GEN CHEMISTRY	BI	N	Y	1227
WARP	WRWP-BI004	AD4004	13-Sep-00			PERCENT LIPIDS	LIPIDS	1.5			Percent	0.1	GEN CHEMISTRY	BI	N	Y	1227
WARP	WRWP-BI011	AD4011	28-Nov-00	0	0	Phenanthrene	85-01-8	0.099		B	mg/kg	0.0067	SEMIVOLATILES	BI	N	Y	200145
WARP	WRWP-BI012	AD4012	28-Nov-00	0	0	Phenanthrene	85-01-8	0.032		B	mg/kg	0.0067	SEMIVOLATILES	BI	N	Y	200145
WARP	WRWP-BI013	AD4013	28-Nov-00	0	0	Phenanthrene	85-01-8	0.017		B	mg/kg	0.0067	SEMIVOLATILES	BI	N	Y	200145
WARP	WRWP-BI014	AD4014	28-Nov-00	0	0	Phenanthrene	85-01-8	0.016		B	mg/kg	0.0067	SEMIVOLATILES	BI	N	Y	200145

GROUP_ NAME	LOCATION_ CODE	SAMPLE_ NO	SAMPLE_ DATE	START_ DEPTH	END_ DEPTH	PARAMETER	CASNO	RESULT	LAB_ QUAL	VAL_ QUAL	UNITS	DETECT_ LIMIT	USER_TEST_ GROUP	SAMPLE_ TYPE	FILTERED	DETECT	SAMPLE_ DELIVERY _GROUP
WARP	WRWP-BI015	AD4015	28-Nov-00	0	0	Phenanthrene	85-01-8	0.048		B	mg/kg	0.0067	SEMIVOLATILES	BI	N	Y	200145
WARP	WRWP-BI001	AD4001	13-Sep-00			Phosphorous	7723-14-0	129		J	mg/kg	5	GEN CHEMISTRY	BI	N	Y	1227
WARP	WRWP-BI002	AD4002	13-Sep-00			Phosphorous	7723-14-0	37.8		J	mg/kg	5	GEN CHEMISTRY	BI	N	Y	1227
WARP	WRWP-BI003	AD4003	13-Sep-00			Phosphorous	7723-14-0	54.6		J	mg/kg	5	GEN CHEMISTRY	BI	N	Y	1227
WARP	WRWP-BI004	AD4004	13-Sep-00			Phosphorous	7723-14-0	152		J	mg/kg	5	GEN CHEMISTRY	BI	N	Y	1227
WARP	WRWP-BI016	AD4016	1-Dec-00	0	0	Phosphorous	7723-14-0	0.037		B	mg/kg	0.0045	GEN CHEMISTRY	BI	N	Y	200144
WARP	WRWP-BI017	AD4017	1-Dec-00	0	0	Phosphorous	7723-14-0	0.056		B	mg/kg	0.0045	GEN CHEMISTRY	BI	N	Y	200144
WARP	WRWP-BI018	AD4018	1-Dec-00	0	0	Phosphorous	7723-14-0	0.047		B	mg/kg	0.0045	GEN CHEMISTRY	BI	N	Y	200144
WARP	WRWP-BI019	AD4019	1-Dec-00	0	0	Phosphorous	7723-14-0	0.098		B	mg/kg	0.0045	GEN CHEMISTRY	BI	N	Y	200144
WARP	WRWP-BI020	AD4020	1-Dec-00	0	0	Phosphorous	7723-14-0	0.146		B	mg/kg	0.0045	GEN CHEMISTRY	BI	N	Y	200144
WARP	WRWP-BI001	AD4001	13-Sep-00			Potassium	2023695	2460			mg/kg	138	METALS	BI	N	Y	1227
WARP	WRWP-BI002	AD4002	13-Sep-00			Potassium	2023695	2800			mg/kg	137	METALS	BI	N	Y	1227
WARP	WRWP-BI003	AD4003	13-Sep-00			Potassium	2023695	2600			mg/kg	137	METALS	BI	N	Y	1227
WARP	WRWP-BI004	AD4004	13-Sep-00			Potassium	2023695	2380			mg/kg	138	METALS	BI	N	Y	1227
WARP	WRWP-BI016	AD4016	1-Dec-00	0	0	Potassium	2023695	1170		B	mg/kg	3.6	METALS	BI	N	Y	200144
WARP	WRWP-BI017	AD4017	1-Dec-00	0	0	Potassium	2023695	1300		B	mg/kg	3.6	METALS	BI	N	Y	200144
WARP	WRWP-BI018	AD4018	1-Dec-00	0	0	Potassium	2023695	1230		B	mg/kg	3.6	METALS	BI	N	Y	200144
WARP	WRWP-BI019	AD4019	1-Dec-00	0	0	Potassium	2023695	1350		B	mg/kg	3.6	METALS	BI	N	Y	200144
WARP	WRWP-BI020	AD4020	1-Dec-00	0	0	Potassium	2023695	821		B	mg/kg	3.6	METALS	BI	N	Y	200144
WARP	WRWP-BI011	AD4011	28-Nov-00	0	0	Pyrene	129-00-0	0.02	U	UJ	mg/kg	0.02	SEMIVOLATILES	BI	N	N	200145
WARP	WRWP-BI012	AD4012	28-Nov-00	0	0	Pyrene	129-00-0	0.017	U	UJ	mg/kg	0.017	SEMIVOLATILES	BI	N	N	200145
WARP	WRWP-BI013	AD4013	28-Nov-00	0	0	Pyrene	129-00-0	0.018	U	UJ	mg/kg	0.018	SEMIVOLATILES	BI	N	N	200145
WARP	WRWP-BI014	AD4014	28-Nov-00	0	0	Pyrene	129-00-0	0.018	U	UJ	mg/kg	0.018	SEMIVOLATILES	BI	N	N	200145
WARP	WRWP-BI015	AD4015	28-Nov-00	0	0	Pyrene	129-00-0	0.016	U	UJ	mg/kg	0.016	SEMIVOLATILES	BI	N	N	200145
WARP	WRWP-BI011	AD4011	28-Nov-00	0	0	RDX	121-82-4	0.48	U	U	mg/kg	0.48	NITROAROMATICS	BI	N	N	200145
WARP	WRWP-BI012	AD4012	28-Nov-00	0	0	RDX	121-82-4	0.53	U	U	mg/kg	0.53	NITROAROMATICS	BI	N	N	200145
WARP	WRWP-BI013	AD4013	28-Nov-00	0	0	RDX	121-82-4	0.5	U	U	mg/kg	0.5	NITROAROMATICS	BI	N	N	200145
WARP	WRWP-BI014	AD4014	28-Nov-00	0	0	RDX	121-82-4	0.5	U	U	mg/kg	0.5	NITROAROMATICS	BI	N	N	200145
WARP	WRWP-BI015	AD4015	28-Nov-00	0	0	RDX	121-82-4	0.48	U	U	mg/kg	0.48	NITROAROMATICS	BI	N	N	200145
WARP	WRWP-BI016	AD4016	1-Dec-00	0	0	RDX	121-82-4	0.5	U	U	mg/kg	0.5	NITROAROMATICS	BI	N	N	200144
WARP	WRWP-BI017	AD4017	1-Dec-00	0	0	RDX	121-82-4	0.53	U	U	mg/kg	0.53	NITROAROMATICS	BI	N	N	200144
WARP	WRWP-BI018	AD4018	1-Dec-00	0	0	RDX	121-82-4	0.5	U	U	mg/kg	0.5	NITROAROMATICS	BI	N	N	200144
WARP	WRWP-BI019	AD4019	1-Dec-00	0	0	RDX	121-82-4	0.48	U	U	mg/kg	0.48	NITROAROMATICS	BI	N	N	200144
WARP	WRWP-BI020	AD4020	1-Dec-00	0	0	RDX	121-82-4	0.48	U	U	mg/kg	0.48	NITROAROMATICS	BI	N	N	200144
WARP	WRWP-BI001	AD4001	13-Sep-00			Sodium	7440-23-5	749	B	J	mg/kg	245	METALS	BI	N	Y	1227
WARP	WRWP-BI002	AD4002	13-Sep-00			Sodium	7440-23-5	1030			mg/kg	243	METALS	BI	N	Y	1227
WARP	WRWP-BI003	AD4003	13-Sep-00			Sodium	7440-23-5	1020			mg/kg	244	METALS	BI	N	Y	1227
WARP	WRWP-BI004	AD4004	13-Sep-00			Sodium	7440-23-5	681	B	J	mg/kg	244	METALS	BI	N	Y	1227
WARP	WRWP-BI016	AD4016	1-Dec-00	0	0	Sodium	7440-23-5	624	B	B	mg/kg	243	METALS	BI	N	Y	200144
WARP	WRWP-BI017	AD4017	1-Dec-00	0	0	Sodium	7440-23-5	689	B	B	mg/kg	244	METALS	BI	N	Y	200144
WARP	WRWP-BI018	AD4018	1-Dec-00	0	0	Sodium	7440-23-5	658	B	B	mg/kg	243	METALS	BI	N	Y	200144
WARP	WRWP-BI019	AD4019	1-Dec-00	0	0	Sodium	7440-23-5	753	B	B	mg/kg	243	METALS	BI	N	Y	200144
WARP	WRWP-BI020	AD4020	1-Dec-00	0	0	Sodium	7440-23-5	353	B	B	mg/kg	243	METALS	BI	N	Y	200144
WARP	WRWP-BI011	AD4011	28-Nov-00	0	0	Tetryl	479-45-8	0.71	U	U	mg/kg	0.71	NITROAROMATICS	BI	N	N	200145
WARP	WRWP-BI012	AD4012	28-Nov-00	0	0	Tetryl	479-45-8	0.79	U	U	mg/kg	0.79	NITROAROMATICS	BI	N	N	200145
WARP	WRWP-BI013	AD4013	28-Nov-00	0	0	Tetryl	479-45-8	0.75	U	U	mg/kg	0.75	NITROAROMATICS	BI	N	N	200145
WARP	WRWP-BI014	AD4014	28-Nov-00	0	0	Tetryl	479-45-8	0.75	U	U	mg/kg	0.75	NITROAROMATICS	BI	N	N	200145
WARP	WRWP-BI015	AD4015	28-Nov-00	0	0	Tetryl	479-45-8	0.71	U	U	mg/kg	0.71	NITROAROMATICS	BI	N	N	200145
WARP	WRWP-BI016	AD4016	1-Dec-00	0	0	Tetryl	479-45-8	0.75	U	U	mg/kg	0.75	NITROAROMATICS	BI	N	N	200144
WARP	WRWP-BI017	AD4017	1-Dec-00	0	0	Tetryl	479-45-8	0.79	U	U	mg/kg	0.79	NITROAROMATICS	BI	N	N	200144

GROUP_ NAME	LOCATION_ CODE	SAMPLE_ NO	SAMPLE_ DATE	START_ DEPTH	END_ DEPTH	PARAMETER	CASNO	RESULT	LAB_ QUAL	VAL_ QUAL	UNITS	DETECT_ LIMIT	USER_TEST_ GROUP	SAMPLE_ TYPE	FILTERED	DETECT	SAMPLE_ DELIVERY _GROUP
WARP	WRWP-BI018	AD4018	1-Dec-00	0	0	Tetryl	479-45-8	0.75	U	U	mg/kg	0.75	NITROAROMATICS	BI	N	N	200144
WARP	WRWP-BI019	AD4019	1-Dec-00	0	0	Tetryl	479-45-8	0.71	U	U	mg/kg	0.71	NITROAROMATICS	BI	N	N	200144
WARP	WRWP-BI020	AD4020	1-Dec-00	0	0	Tetryl	479-45-8	0.71	U	U	mg/kg	0.71	NITROAROMATICS	BI	N	N	200144
WARP	WRWP-BI011	AD4011	28-Nov-00	0	0	Trinitrobenzene, 1,3,5-	99-35-4	0.24	U	U	mg/kg	0.24	NITROAROMATICS	BI	N	N	200145
WARP	WRWP-BI012	AD4012	28-Nov-00	0	0	Trinitrobenzene, 1,3,5-	99-35-4	0.26	U	U	mg/kg	0.26	NITROAROMATICS	BI	N	N	200145
WARP	WRWP-BI013	AD4013	28-Nov-00	0	0	Trinitrobenzene, 1,3,5-	99-35-4	0.25	U	U	mg/kg	0.25	NITROAROMATICS	BI	N	N	200145
WARP	WRWP-BI014	AD4014	28-Nov-00	0	0	Trinitrobenzene, 1,3,5-	99-35-4	0.25	U	U	mg/kg	0.25	NITROAROMATICS	BI	N	N	200145
WARP	WRWP-BI015	AD4015	28-Nov-00	0	0	Trinitrobenzene, 1,3,5-	99-35-4	0.24	U	U	mg/kg	0.24	NITROAROMATICS	BI	N	N	200145
WARP	WRWP-BI016	AD4016	1-Dec-00	0	0	Trinitrobenzene, 1,3,5-	99-35-4	0.25	U	U	mg/kg	0.25	NITROAROMATICS	BI	N	N	200144
WARP	WRWP-BI017	AD4017	1-Dec-00	0	0	Trinitrobenzene, 1,3,5-	99-35-4	0.26	U	U	mg/kg	0.26	NITROAROMATICS	BI	N	N	200144
WARP	WRWP-BI018	AD4018	1-Dec-00	0	0	Trinitrobenzene, 1,3,5-	99-35-4	0.25	U	U	mg/kg	0.25	NITROAROMATICS	BI	N	N	200144
WARP	WRWP-BI019	AD4019	1-Dec-00	0	0	Trinitrobenzene, 1,3,5-	99-35-4	0.24	U	U	mg/kg	0.24	NITROAROMATICS	BI	N	N	200144
WARP	WRWP-BI020	AD4020	1-Dec-00	0	0	Trinitrobenzene, 1,3,5-	99-35-4	0.24	U	U	mg/kg	0.24	NITROAROMATICS	BI	N	N	200144
WARP	WRWP-BI011	AD4011	28-Nov-00	0	0	Trinitrotoluene, 2,4,6-	118-96-7	0.48	U	U	mg/kg	0.48	NITROAROMATICS	BI	N	N	200145
WARP	WRWP-BI012	AD4012	28-Nov-00	0	0	Trinitrotoluene, 2,4,6-	118-96-7	0.53	U	U	mg/kg	0.53	NITROAROMATICS	BI	N	N	200145
WARP	WRWP-BI013	AD4013	28-Nov-00	0	0	Trinitrotoluene, 2,4,6-	118-96-7	0.5	U	U	mg/kg	0.5	NITROAROMATICS	BI	N	N	200145
WARP	WRWP-BI014	AD4014	28-Nov-00	0	0	Trinitrotoluene, 2,4,6-	118-96-7	0.5	U	U	mg/kg	0.5	NITROAROMATICS	BI	N	N	200145
WARP	WRWP-BI015	AD4015	28-Nov-00	0	0	Trinitrotoluene, 2,4,6-	118-96-7	0.48	U	U	mg/kg	0.48	NITROAROMATICS	BI	N	N	200145
WARP	WRWP-BI016	AD4016	1-Dec-00	0	0	Trinitrotoluene, 2,4,6-	118-96-7	0.5	U	U	mg/kg	0.5	NITROAROMATICS	BI	N	N	200144
WARP	WRWP-BI017	AD4017	1-Dec-00	0	0	Trinitrotoluene, 2,4,6-	118-96-7	0.53	U	U	mg/kg	0.53	NITROAROMATICS	BI	N	N	200144
WARP	WRWP-BI018	AD4018	1-Dec-00	0	0	Trinitrotoluene, 2,4,6-	118-96-7	0.5	U	U	mg/kg	0.5	NITROAROMATICS	BI	N	N	200144
WARP	WRWP-BI019	AD4019	1-Dec-00	0	0	Trinitrotoluene, 2,4,6-	118-96-7	0.48	U	U	mg/kg	0.48	NITROAROMATICS	BI	N	N	200144
WARP	WRWP-BI020	AD4020	1-Dec-00	0	0	Trinitrotoluene, 2,4,6-	118-96-7	0.48	U	U	mg/kg	0.48	NITROAROMATICS	BI	N	N	200144
WARP	WRWP-BI001	AD4001	13-Sep-00			Vanadium	7440-62-2	0.44	B	J	mg/kg	0.28	METALS	BI	N	Y	1227
WARP	WRWP-BI002	AD4002	13-Sep-00			Vanadium	7440-62-2	0.28	U	U	mg/kg	0.28	METALS	BI	N	N	1227
WARP	WRWP-BI003	AD4003	13-Sep-00			Vanadium	7440-62-2	0.28	U	U	mg/kg	0.28	METALS	BI	N	N	1227
WARP	WRWP-BI004	AD4004	13-Sep-00			Vanadium	7440-62-2	0.28	U	U	mg/kg	0.28	METALS	BI	N	N	1227
WARP	WRWP-BI016	AD4016	1-Dec-00	0	0	Vanadium	7440-62-2	0.33	B	B	mg/kg	0.03	METALS	BI	N	Y	200144
WARP	WRWP-BI017	AD4017	1-Dec-00	0	0	Vanadium	7440-62-2	0.04	B	B	mg/kg	0.03	METALS	BI	N	Y	200144
WARP	WRWP-BI018	AD4018	1-Dec-00	0	0	Vanadium	7440-62-2	0.17	B	B	mg/kg	0.03	METALS	BI	N	Y	200144
WARP	WRWP-BI019	AD4019	1-Dec-00	0	0	Vanadium	7440-62-2	0.15	B	B	mg/kg	0.03	METALS	BI	N	Y	200144
WARP	WRWP-BI020	AD4020	1-Dec-00	0	0	Vanadium	7440-62-2	0.03	U	U	mg/kg	0.03	METALS	BI	N	N	200144
WARP	WRWP-BI001	AD4001	13-Sep-00			Zinc	7440-66-6	46.9			mg/kg	9.8	METALS	BI	N	Y	1227
WARP	WRWP-BI002	AD4002	13-Sep-00			Zinc	7440-66-6	13.1	B	J	mg/kg	9.8	METALS	BI	N	Y	1227
WARP	WRWP-BI003	AD4003	13-Sep-00			Zinc	7440-66-6	21.3	B	J	mg/kg	9.8	METALS	BI	N	Y	1227
WARP	WRWP-BI004	AD4004	13-Sep-00			Zinc	7440-66-6	36.3			mg/kg	9.7	METALS	BI	N	Y	1227
WARP	WRWP-BI016	AD4016	1-Dec-00	0	0	Zinc	7440-66-6	28.5		B	mg/kg	0.45	METALS	BI	N	Y	200144
WARP	WRWP-BI017	AD4017	1-Dec-00	0	0	Zinc	7440-66-6	33.9		B	mg/kg	0.45	METALS	BI	N	Y	200144
WARP	WRWP-BI018	AD4018	1-Dec-00	0	0	Zinc	7440-66-6	31		B	mg/kg	0.45	METALS	BI	N	Y	200144
WARP	WRWP-BI019	AD4019	1-Dec-00	0	0	Zinc	7440-66-6	35		B	mg/kg	0.45	METALS	BI	N	Y	200144
WARP	WRWP-BI020	AD4020	1-Dec-00	0	0	Zinc	7440-66-6	24.5	B	B	mg/kg	0.45	METALS	BI	N	Y	200144
WARP	WRWP-SD001	AD1001	14-Sep-00	0	1	% Solids	38992	52.2			Percent	0.1	GEN CHEMISTRY	SD	N	Y	9A09G601
WARP	WRWP-SD002	AD1002	14-Sep-00	0	1	% Solids	38992	59.3			Percent	0.1	GEN CHEMISTRY	SD	N	Y	9A09G601
WARP	WRWP-SD003	AD1003	14-Sep-00	0	1	% Solids	38992	52			Percent	0.1	GEN CHEMISTRY	SD	N	Y	9A09G601
WARP	WRWP-SD004	AD1004	14-Sep-00	0	1	% Solids	38992	58.1			Percent	0.1	GEN CHEMISTRY	SD	N	Y	9A09G601
WARP	WRWP-SD005	AD1005	14-Sep-00	0	1	% Solids	38992	47.2			Percent	0.1	GEN CHEMISTRY	SD	N	Y	9A09G601
WARP	WRWP-SD006	AD1006	13-Sep-00	0	1	% Solids	38992	46.4			Percent	0.1	GEN CHEMISTRY	SD	N	Y	9A09G601
WARP	WRWP-SD007	AD1007	14-Sep-00	0	1	% Solids	38992	53.7			Percent	0.1	GEN CHEMISTRY	SD	N	Y	9A09G601
WARP	WRWP-SD008	AD1008	14-Sep-00	0	1	% Solids	38992	31.1			Percent	0.1	GEN CHEMISTRY	SD	N	Y	9A09G601
WARP	WRWP-SD009	AD1009	13-Sep-00	0	1	% Solids	38992	79			Percent	0.1	GEN CHEMISTRY	SD	N	Y	9A09G601

GROUP_ NAME	LOCATION_ CODE	SAMPLE_ NO	SAMPLE_ DATE	START_ DEPTH	END_ DEPTH	PARAMETER	CASNO	RESULT	LAB_ QUAL	VAL_ QUAL	UNITS	DETECT_ LIMIT	USER_TEST_ GROUP	SAMPLE_ TYPE	FILTERED	DETECT	SAMPLE_ DELIVERY _GROUP
WARP	WRWP-SD010	AD1010	13-Sep-00	0	1	% Solids	38992	66.2			Percent	0.1	GEN CHEMISTRY	SD	N	Y	9A09G601
WARP	WRWP-SD001	AD1011	14-Sep-00	0	1	% Solids	38992	58.5			Percent	0.1	GEN CHEMISTRY	SD	N	Y	9A09G601
WARP	WRWP-SD001	AD1001	14-Sep-00	0	1	Aluminum	7429-90-5	9150			mg/kg	10.1	METALS	SD	N	Y	9A09G601
WARP	WRWP-SD002	AD1002	14-Sep-00	0	1	Aluminum	7429-90-5	8690			mg/kg	9.2	METALS	SD	N	Y	9A09G601
WARP	WRWP-SD003	AD1003	14-Sep-00	0	1	Aluminum	7429-90-5	17600			mg/kg	11.2	METALS	SD	N	Y	9A09G601
WARP	WRWP-SD004	AD1004	14-Sep-00	0	1	Aluminum	7429-90-5	10600			mg/kg	9.1	METALS	SD	N	Y	9A09G601
WARP	WRWP-SD005	AD1005	14-Sep-00	0	1	Aluminum	7429-90-5	12300			mg/kg	11.1	METALS	SD	N	Y	9A09G601
WARP	WRWP-SD006	AD1006	13-Sep-00	0	1	Aluminum	7429-90-5	6930			mg/kg	11	METALS	SD	N	Y	9A09G601
WARP	WRWP-SD007	AD1007	14-Sep-00	0	1	Aluminum	7429-90-5	9270			mg/kg	9.9	METALS	SD	N	Y	9A09G601
WARP	WRWP-SD008	AD1008	14-Sep-00	0	1	Aluminum	7429-90-5	16400			mg/kg	18	METALS	SD	N	Y	9A09G601
WARP	WRWP-SD009	AD1009	13-Sep-00	0	1	Aluminum	7429-90-5	2170			mg/kg	6.7	METALS	SD	N	Y	9A09G601
WARP	WRWP-SD010	AD1010	13-Sep-00	0	1	Aluminum	7429-90-5	3630			mg/kg	8.3	METALS	SD	N	Y	9A09G601
WARP	WRWP-SD001	AD1011	14-Sep-00	0	1	Aluminum	7429-90-5	7800			mg/kg	9.3	METALS	SD	N	Y	9A09G601
WARP	WRWP-SD001	AD1001	14-Sep-00	0	1	Amino-2,6-dinitrotoluene, 4-	19406-51-0	0.2	U	U	mg/kg	0.2	NITROAROMATICS	SD	N	N	9A09G601
WARP	WRWP-SD002	AD1002	14-Sep-00	0	1	Amino-2,6-dinitrotoluene, 4-	19406-51-0	0.2	U	U	mg/kg	0.2	NITROAROMATICS	SD	N	N	9A09G601
WARP	WRWP-SD003	AD1003	14-Sep-00	0	1	Amino-2,6-dinitrotoluene, 4-	19406-51-0	0.2	U	U	mg/kg	0.2	NITROAROMATICS	SD	N	N	9A09G601
WARP	WRWP-SD004	AD1004	14-Sep-00	0	1	Amino-2,6-dinitrotoluene, 4-	19406-51-0	0.2	U	U	mg/kg	0.2	NITROAROMATICS	SD	N	N	9A09G601
WARP	WRWP-SD005	AD1005	14-Sep-00	0	1	Amino-2,6-dinitrotoluene, 4-	19406-51-0	0.2	U	U	mg/kg	0.2	NITROAROMATICS	SD	N	N	9A09G601
WARP	WRWP-SD001	AD1011	14-Sep-00	0	1	Amino-2,6-dinitrotoluene, 4-	19406-51-0	0.2	U	U	mg/kg	0.2	NITROAROMATICS	SD	N	N	9A09G601
WARP	WRWP-SD001	AD1001	14-Sep-00	0	1	Amino-4,6-dinitrotoluene, 2-	35572-78-2	0.2	U	U	mg/kg	0.2	NITROAROMATICS	SD	N	N	9A09G601
WARP	WRWP-SD002	AD1002	14-Sep-00	0	1	Amino-4,6-dinitrotoluene, 2-	35572-78-2	0.2	U	U	mg/kg	0.2	NITROAROMATICS	SD	N	N	9A09G601
WARP	WRWP-SD003	AD1003	14-Sep-00	0	1	Amino-4,6-dinitrotoluene, 2-	35572-78-2	0.2	U	U	mg/kg	0.2	NITROAROMATICS	SD	N	N	9A09G601
WARP	WRWP-SD004	AD1004	14-Sep-00	0	1	Amino-4,6-dinitrotoluene, 2-	35572-78-2	0.2	U	U	mg/kg	0.2	NITROAROMATICS	SD	N	N	9A09G601
WARP	WRWP-SD005	AD1005	14-Sep-00	0	1	Amino-4,6-dinitrotoluene, 2-	35572-78-2	0.2	U	U	mg/kg	0.2	NITROAROMATICS	SD	N	N	9A09G601
WARP	WRWP-SD001	AD1011	14-Sep-00	0	1	Amino-4,6-dinitrotoluene, 2-	35572-78-2	0.2	U	U	mg/kg	0.2	NITROAROMATICS	SD	N	N	9A09G601
WARP	WRWP-SD001	AD1001	14-Sep-00	0	1	Antimony	7440-36-0	0.76	U	UJ	mg/kg	0.76	METALS	SD	N	N	9A09G601
WARP	WRWP-SD002	AD1002	14-Sep-00	0	1	Antimony	7440-36-0	0.7	U	UJ	mg/kg	0.7	METALS	SD	N	N	9A09G601
WARP	WRWP-SD003	AD1003	14-Sep-00	0	1	Antimony	7440-36-0	0.85	U	UJ	mg/kg	0.85	METALS	SD	N	N	9A09G601
WARP	WRWP-SD004	AD1004	14-Sep-00	0	1	Antimony	7440-36-0	0.69	U	UJ	mg/kg	0.69	METALS	SD	N	N	9A09G601
WARP	WRWP-SD005	AD1005	14-Sep-00	0	1	Antimony	7440-36-0	0.84	U	UJ	mg/kg	0.84	METALS	SD	N	N	9A09G601
WARP	WRWP-SD006	AD1006	13-Sep-00	0	1	Antimony	7440-36-0	0.83		J	mg/kg	0.83	METALS	SD	N	Y	9A09G601
WARP	WRWP-SD007	AD1007	14-Sep-00	0	1	Antimony	7440-36-0	0.75	U	UJ	mg/kg	0.75	METALS	SD	N	N	9A09G601
WARP	WRWP-SD008	AD1008	14-Sep-00	0	1	Antimony	7440-36-0	1.4	U	UJ	mg/kg	1.4	METALS	SD	N	N	9A09G601
WARP	WRWP-SD009	AD1009	13-Sep-00	0	1	Antimony	7440-36-0	0.51	U	UJ	mg/kg	0.51	METALS	SD	N	N	9A09G601
WARP	WRWP-SD010	AD1010	13-Sep-00	0	1	Antimony	7440-36-0	0.63	U	UJ	mg/kg	0.63	METALS	SD	N	N	9A09G601
WARP	WRWP-SD001	AD1011	14-Sep-00	0	1	Antimony	7440-36-0	0.71	U	UJ	mg/kg	0.71	METALS	SD	N	N	9A09G601
WARP	WRWP-SD001	AD1001	14-Sep-00	0	1	Arsenic	7440-38-2	5.1			mg/kg	0.61	METALS	SD	N	Y	9A09G601
WARP	WRWP-SD002	AD1002	14-Sep-00	0	1	Arsenic	7440-38-2	3.6			mg/kg	0.56	METALS	SD	N	Y	9A09G601
WARP	WRWP-SD003	AD1003	14-Sep-00	0	1	Arsenic	7440-38-2	7.7			mg/kg	0.68	METALS	SD	N	Y	9A09G601
WARP	WRWP-SD004	AD1004	14-Sep-00	0	1	Arsenic	7440-38-2	4.3			mg/kg	0.55	METALS	SD	N	Y	9A09G601
WARP	WRWP-SD005	AD1005	14-Sep-00	0	1	Arsenic	7440-38-2	4.9			mg/kg	0.67	METALS	SD	N	Y	9A09G601
WARP	WRWP-SD006	AD1006	13-Sep-00	0	1	Arsenic	7440-38-2	4.9			mg/kg	0.67	METALS	SD	N	Y	9A09G601
WARP	WRWP-SD007	AD1007	14-Sep-00	0	1	Arsenic	7440-38-2	3.5			mg/kg	0.6	METALS	SD	N	Y	9A09G601
WARP	WRWP-SD008	AD1008	14-Sep-00	0	1	Arsenic	7440-38-2	5.5			mg/kg	1.1	METALS	SD	N	Y	9A09G601
WARP	WRWP-SD009	AD1009	13-Sep-00	0	1	Arsenic	7440-38-2	2.9			mg/kg	0.41	METALS	SD	N	Y	9A09G601
WARP	WRWP-SD010	AD1010	13-Sep-00	0	1	Arsenic	7440-38-2	3.1			mg/kg	0.5	METALS	SD	N	Y	9A09G601
WARP	WRWP-SD001	AD1011	14-Sep-00	0	1	Arsenic	7440-38-2	3.4			mg/kg	0.57	METALS	SD	N	Y	9A09G601
WARP	WRWP-SD001	AD1001	14-Sep-00	0	1	Barium	7440-39-3	83.9			mg/kg	0.04	METALS	SD	N	Y	9A09G601
WARP	WRWP-SD002	AD1002	14-Sep-00	0	1	Barium	7440-39-3	46			mg/kg	0.04	METALS	SD	N	Y	9A09G601
WARP	WRWP-SD003	AD1003	14-Sep-00	0	1	Barium	7440-39-3	126			mg/kg	0.05	METALS	SD	N	Y	9A09G601

GROUP_ NAME	LOCATION_ CODE	SAMPLE_ NO	SAMPLE_ DATE	START_ DEPTH	END_ DEPTH	PARAMETER	CASNO	RESULT	LAB_ QUAL	VAL_ QUAL	UNITS	DETECT_ LIMIT	USER_TEST_ GROUP	SAMPLE_ TYPE	FILTERED	DETECT	SAMPLE_ DELIVERY _GROUP
WARP	WRWP-SD004	AD1004	14-Sep-00	0	1	Barium	7440-39-3	94.4			mg/kg	0.04	METALS	SD	N	Y	9A09G601
WARP	WRWP-SD005	AD1005	14-Sep-00	0	1	Barium	7440-39-3	102			mg/kg	0.05	METALS	SD	N	Y	9A09G601
WARP	WRWP-SD006	AD1006	13-Sep-00	0	1	Barium	7440-39-3	62.5			mg/kg	0.05	METALS	SD	N	Y	9A09G601
WARP	WRWP-SD007	AD1007	14-Sep-00	0	1	Barium	7440-39-3	92.2			mg/kg	0.04	METALS	SD	N	Y	9A09G601
WARP	WRWP-SD008	AD1008	14-Sep-00	0	1	Barium	7440-39-3	154			mg/kg	0.07	METALS	SD	N	Y	9A09G601
WARP	WRWP-SD009	AD1009	13-Sep-00	0	1	Barium	7440-39-3	19.2			mg/kg	0.03	METALS	SD	N	Y	9A09G601
WARP	WRWP-SD010	AD1010	13-Sep-00	0	1	Barium	7440-39-3	26.9			mg/kg	0.03	METALS	SD	N	Y	9A09G601
WARP	WRWP-SD001	AD1011	14-Sep-00	0	1	Barium	7440-39-3	46.1			mg/kg	0.04	METALS	SD	N	Y	9A09G601
WARP	WRWP-SD001	AD1001	14-Sep-00	0	1	Calcium	7440-70-2	3220			mg/kg	10	METALS	SD	N	Y	9A09G601
WARP	WRWP-SD002	AD1002	14-Sep-00	0	1	Calcium	7440-70-2	2710			mg/kg	9.1	METALS	SD	N	Y	9A09G601
WARP	WRWP-SD003	AD1003	14-Sep-00	0	1	Calcium	7440-70-2	2890			mg/kg	11.1	METALS	SD	N	Y	9A09G601
WARP	WRWP-SD004	AD1004	14-Sep-00	0	1	Calcium	7440-70-2	2880			mg/kg	9	METALS	SD	N	Y	9A09G601
WARP	WRWP-SD005	AD1005	14-Sep-00	0	1	Calcium	7440-70-2	3570			mg/kg	11	METALS	SD	N	Y	9A09G601
WARP	WRWP-SD006	AD1006	13-Sep-00	0	1	Calcium	7440-70-2	11000			mg/kg	10.9	METALS	SD	N	Y	9A09G601
WARP	WRWP-SD007	AD1007	14-Sep-00	0	1	Calcium	7440-70-2	3400			mg/kg	9.8	METALS	SD	N	Y	9A09G601
WARP	WRWP-SD008	AD1008	14-Sep-00	0	1	Calcium	7440-70-2	6470			mg/kg	17.8	METALS	SD	N	Y	9A09G601
WARP	WRWP-SD009	AD1009	13-Sep-00	0	1	Calcium	7440-70-2	8810			mg/kg	6.6	METALS	SD	N	Y	9A09G601
WARP	WRWP-SD010	AD1010	13-Sep-00	0	1	Calcium	7440-70-2	7990			mg/kg	8.2	METALS	SD	N	Y	9A09G601
WARP	WRWP-SD001	AD1011	14-Sep-00	0	1	Calcium	7440-70-2	3650			mg/kg	9.2	METALS	SD	N	Y	9A09G601
WARP	WRWP-SD001	AD1001	14-Sep-00	0	1	Chromium	7440-47-3	12.9			mg/kg	0.11	METALS	SD	N	Y	9A09G601
WARP	WRWP-SD002	AD1002	14-Sep-00	0	1	Chromium	7440-47-3	11.7			mg/kg	0.1	METALS	SD	N	Y	9A09G601
WARP	WRWP-SD003	AD1003	14-Sep-00	0	1	Chromium	7440-47-3	22.3			mg/kg	0.12	METALS	SD	N	Y	9A09G601
WARP	WRWP-SD004	AD1004	14-Sep-00	0	1	Chromium	7440-47-3	13.9			mg/kg	0.1	METALS	SD	N	Y	9A09G601
WARP	WRWP-SD005	AD1005	14-Sep-00	0	1	Chromium	7440-47-3	16.5			mg/kg	0.12	METALS	SD	N	Y	9A09G601
WARP	WRWP-SD006	AD1006	13-Sep-00	0	1	Chromium	7440-47-3	12			mg/kg	0.12	METALS	SD	N	Y	9A09G601
WARP	WRWP-SD007	AD1007	14-Sep-00	0	1	Chromium	7440-47-3	12.7			mg/kg	0.11	METALS	SD	N	Y	9A09G601
WARP	WRWP-SD008	AD1008	14-Sep-00	0	1	Chromium	7440-47-3	22			mg/kg	0.2	METALS	SD	N	Y	9A09G601
WARP	WRWP-SD009	AD1009	13-Sep-00	0	1	Chromium	7440-47-3	3.7		B	mg/kg	0.07	METALS	SD	N	Y	9A09G601
WARP	WRWP-SD010	AD1010	13-Sep-00	0	1	Chromium	7440-47-3	5.8			mg/kg	0.09	METALS	SD	N	Y	9A09G601
WARP	WRWP-SD001	AD1011	14-Sep-00	0	1	Chromium	7440-47-3	10.6			mg/kg	0.1	METALS	SD	N	Y	9A09G601
WARP	WRWP-SD001	AD1001	14-Sep-00	0	1	Cobalt	7440-48-4	8.9			mg/kg	0.15	METALS	SD	N	Y	9A09G601
WARP	WRWP-SD002	AD1002	14-Sep-00	0	1	Cobalt	7440-48-4	6.4			mg/kg	0.14	METALS	SD	N	Y	9A09G601
WARP	WRWP-SD003	AD1003	14-Sep-00	0	1	Cobalt	7440-48-4	11.3			mg/kg	0.17	METALS	SD	N	Y	9A09G601
WARP	WRWP-SD004	AD1004	14-Sep-00	0	1	Cobalt	7440-48-4	13.1			mg/kg	0.14	METALS	SD	N	Y	9A09G601
WARP	WRWP-SD005	AD1005	14-Sep-00	0	1	Cobalt	7440-48-4	15.2			mg/kg	0.17	METALS	SD	N	Y	9A09G601
WARP	WRWP-SD006	AD1006	13-Sep-00	0	1	Cobalt	7440-48-4	10.5			mg/kg	0.17	METALS	SD	N	Y	9A09G601
WARP	WRWP-SD007	AD1007	14-Sep-00	0	1	Cobalt	7440-48-4	7.7			mg/kg	0.15	METALS	SD	N	Y	9A09G601
WARP	WRWP-SD008	AD1008	14-Sep-00	0	1	Cobalt	7440-48-4	15			mg/kg	0.27	METALS	SD	N	Y	9A09G601
WARP	WRWP-SD009	AD1009	13-Sep-00	0	1	Cobalt	7440-48-4	4.9			mg/kg	0.1	METALS	SD	N	Y	9A09G601
WARP	WRWP-SD010	AD1010	13-Sep-00	0	1	Cobalt	7440-48-4	6.4			mg/kg	0.13	METALS	SD	N	Y	9A09G601
WARP	WRWP-SD001	AD1011	14-Sep-00	0	1	Cobalt	7440-48-4	5.5			mg/kg	0.14	METALS	SD	N	Y	9A09G601
WARP	WRWP-SD001	AD1001	14-Sep-00	0	1	Copper	7440-50-8	12.5			mg/kg	0.18	METALS	SD	N	Y	9A09G601
WARP	WRWP-SD002	AD1002	14-Sep-00	0	1	Copper	7440-50-8	9.2			mg/kg	0.16	METALS	SD	N	Y	9A09G601
WARP	WRWP-SD003	AD1003	14-Sep-00	0	1	Copper	7440-50-8	18.3			mg/kg	0.2	METALS	SD	N	Y	9A09G601
WARP	WRWP-SD004	AD1004	14-Sep-00	0	1	Copper	7440-50-8	15.5			mg/kg	0.16	METALS	SD	N	Y	9A09G601
WARP	WRWP-SD005	AD1005	14-Sep-00	0	1	Copper	7440-50-8	17.6			mg/kg	0.2	METALS	SD	N	Y	9A09G601
WARP	WRWP-SD006	AD1006	13-Sep-00	0	1	Copper	7440-50-8	13.2			mg/kg	0.2	METALS	SD	N	Y	9A09G601
WARP	WRWP-SD007	AD1007	14-Sep-00	0	1	Copper	7440-50-8	19.7			mg/kg	0.18	METALS	SD	N	Y	9A09G601
WARP	WRWP-SD008	AD1008	14-Sep-00	0	1	Copper	7440-50-8	23.4			mg/kg	0.32	METALS	SD	N	Y	9A09G601
WARP	WRWP-SD009	AD1009	13-Sep-00	0	1	Copper	7440-50-8	5.6			mg/kg	0.12	METALS	SD	N	Y	9A09G601

GROUP_ NAME	LOCATION_ CODE	SAMPLE_ NO	SAMPLE_ DATE	START_ DEPTH	END_ DEPTH	PARAMETER	CASNO	RESULT	LAB_ QUAL	VAL_ QUAL	UNITS	DETECT_ LIMIT	USER_TEST_ GROUP	SAMPLE_ TYPE	FILTERED	DETECT	SAMPLE_ DELIVERY _ GROUP
WARP	WRWP-SD010	AD1010	13-Sep-00	0	1	Copper	7440-50-8	9.8			mg/kg	0.15	METALS	SD	N	Y	9A09G601
WARP	WRWP-SD001	AD1011	14-Sep-00	0	1	Copper	7440-50-8	9.4			mg/kg	0.17	METALS	SD	N	Y	9A09G601
WARP	WRWP-SD001	AD1001	14-Sep-00	0	1	Dinitrobenzene, 1,3-	99-65-0	0.098	U	U	mg/kg	0.098	NITROAROMATICS	SD	N	N	9A09G601
WARP	WRWP-SD002	AD1002	14-Sep-00	0	1	Dinitrobenzene, 1,3-	99-65-0	0.1	U	U	mg/kg	0.1	NITROAROMATICS	SD	N	N	9A09G601
WARP	WRWP-SD003	AD1003	14-Sep-00	0	1	Dinitrobenzene, 1,3-	99-65-0	0.1	U	U	mg/kg	0.1	NITROAROMATICS	SD	N	N	9A09G601
WARP	WRWP-SD004	AD1004	14-Sep-00	0	1	Dinitrobenzene, 1,3-	99-65-0	0.1	U	U	mg/kg	0.1	NITROAROMATICS	SD	N	N	9A09G601
WARP	WRWP-SD005	AD1005	14-Sep-00	0	1	Dinitrobenzene, 1,3-	99-65-0	0.098	U	U	mg/kg	0.098	NITROAROMATICS	SD	N	N	9A09G601
WARP	WRWP-SD001	AD1011	14-Sep-00	0	1	Dinitrobenzene, 1,3-	99-65-0	0.099	U	U	mg/kg	0.099	NITROAROMATICS	SD	N	N	9A09G601
WARP	WRWP-SD001	AD1001	14-Sep-00	0	1	Dinitrotoluene, 2,4-	121-14-2	0.098	U	U	mg/kg	0.098	NITROAROMATICS	SD	N	N	9A09G601
WARP	WRWP-SD002	AD1002	14-Sep-00	0	1	Dinitrotoluene, 2,4-	121-14-2	0.1	U	U	mg/kg	0.1	NITROAROMATICS	SD	N	N	9A09G601
WARP	WRWP-SD003	AD1003	14-Sep-00	0	1	Dinitrotoluene, 2,4-	121-14-2	0.1	U	U	mg/kg	0.1	NITROAROMATICS	SD	N	N	9A09G601
WARP	WRWP-SD004	AD1004	14-Sep-00	0	1	Dinitrotoluene, 2,4-	121-14-2	0.1	U	U	mg/kg	0.1	NITROAROMATICS	SD	N	N	9A09G601
WARP	WRWP-SD005	AD1005	14-Sep-00	0	1	Dinitrotoluene, 2,4-	121-14-2	0.098	U	U	mg/kg	0.098	NITROAROMATICS	SD	N	N	9A09G601
WARP	WRWP-SD001	AD1011	14-Sep-00	0	1	Dinitrotoluene, 2,4-	121-14-2	0.099	U	U	mg/kg	0.099	NITROAROMATICS	SD	N	N	9A09G601
WARP	WRWP-SD001	AD1001	14-Sep-00	0	1	Dinitrotoluene, 2,6-	606-20-2	0.2	U	U	mg/kg	0.2	NITROAROMATICS	SD	N	N	9A09G601
WARP	WRWP-SD002	AD1002	14-Sep-00	0	1	Dinitrotoluene, 2,6-	606-20-2	0.2	U	U	mg/kg	0.2	NITROAROMATICS	SD	N	N	9A09G601
WARP	WRWP-SD003	AD1003	14-Sep-00	0	1	Dinitrotoluene, 2,6-	606-20-2	0.2	U	U	mg/kg	0.2	NITROAROMATICS	SD	N	N	9A09G601
WARP	WRWP-SD004	AD1004	14-Sep-00	0	1	Dinitrotoluene, 2,6-	606-20-2	0.2	U	U	mg/kg	0.2	NITROAROMATICS	SD	N	N	9A09G601
WARP	WRWP-SD005	AD1005	14-Sep-00	0	1	Dinitrotoluene, 2,6-	606-20-2	0.2	U	U	mg/kg	0.2	NITROAROMATICS	SD	N	N	9A09G601
WARP	WRWP-SD001	AD1011	14-Sep-00	0	1	Dinitrotoluene, 2,6-	606-20-2	0.2	U	U	mg/kg	0.2	NITROAROMATICS	SD	N	N	9A09G601
WARP	WRWP-SD001	AD1001	14-Sep-00	0	1	HMX	2691-41-0	0.24	U	U	mg/kg	0.24	NITROAROMATICS	SD	N	N	9A09G601
WARP	WRWP-SD002	AD1002	14-Sep-00	0	1	HMX	2691-41-0	0.25	U	U	mg/kg	0.25	NITROAROMATICS	SD	N	N	9A09G601
WARP	WRWP-SD003	AD1003	14-Sep-00	0	1	HMX	2691-41-0	0.25	U	U	mg/kg	0.25	NITROAROMATICS	SD	N	N	9A09G601
WARP	WRWP-SD004	AD1004	14-Sep-00	0	1	HMX	2691-41-0	0.25	U	U	mg/kg	0.25	NITROAROMATICS	SD	N	N	9A09G601
WARP	WRWP-SD005	AD1005	14-Sep-00	0	1	HMX	2691-41-0	0.24	U	U	mg/kg	0.24	NITROAROMATICS	SD	N	N	9A09G601
WARP	WRWP-SD001	AD1011	14-Sep-00	0	1	HMX	2691-41-0	0.25	U	U	mg/kg	0.25	NITROAROMATICS	SD	N	N	9A09G601
WARP	WRWP-SD001	AD1001	14-Sep-00	0	1	Iron	7439-89-6	18000			mg/kg	3.2	METALS	SD	N	Y	9A09G601
WARP	WRWP-SD002	AD1002	14-Sep-00	0	1	Iron	7439-89-6	14100			mg/kg	3	METALS	SD	N	Y	9A09G601
WARP	WRWP-SD003	AD1003	14-Sep-00	0	1	Iron	7439-89-6	29300			mg/kg	3.6	METALS	SD	N	Y	9A09G601
WARP	WRWP-SD004	AD1004	14-Sep-00	0	1	Iron	7439-89-6	17600			mg/kg	2.9	METALS	SD	N	Y	9A09G601
WARP	WRWP-SD005	AD1005	14-Sep-00	0	1	Iron	7439-89-6	20900			mg/kg	3.6	METALS	SD	N	Y	9A09G601
WARP	WRWP-SD006	AD1006	13-Sep-00	0	1	Iron	7439-89-6	13800			mg/kg	3.5	METALS	SD	N	Y	9A09G601
WARP	WRWP-SD007	AD1007	14-Sep-00	0	1	Iron	7439-89-6	16300			mg/kg	3.2	METALS	SD	N	Y	9A09G601
WARP	WRWP-SD008	AD1008	14-Sep-00	0	1	Iron	7439-89-6	24200			mg/kg	5.8	METALS	SD	N	Y	9A09G601
WARP	WRWP-SD009	AD1009	13-Sep-00	0	1	Iron	7439-89-6	7490			mg/kg	2.2	METALS	SD	N	Y	9A09G601
WARP	WRWP-SD010	AD1010	13-Sep-00	0	1	Iron	7439-89-6	8790			mg/kg	2.7	METALS	SD	N	Y	9A09G601
WARP	WRWP-SD001	AD1011	14-Sep-00	0	1	Iron	7439-89-6	13200			mg/kg	3	METALS	SD	N	Y	9A09G601
WARP	WRWP-SD001	AD1001	14-Sep-00	0	1	Lead	7439-92-1	25		J	mg/kg	0.36	METALS	SD	N	Y	9A09G601
WARP	WRWP-SD002	AD1002	14-Sep-00	0	1	Lead	7439-92-1	14.1		J	mg/kg	0.33	METALS	SD	N	Y	9A09G601
WARP	WRWP-SD003	AD1003	14-Sep-00	0	1	Lead	7439-92-1	23.4		J	mg/kg	0.4	METALS	SD	N	Y	9A09G601
WARP	WRWP-SD004	AD1004	14-Sep-00	0	1	Lead	7439-92-1	14.7		J	mg/kg	0.32	METALS	SD	N	Y	9A09G601
WARP	WRWP-SD005	AD1005	14-Sep-00	0	1	Lead	7439-92-1	19.8		J	mg/kg	0.4	METALS	SD	N	Y	9A09G601
WARP	WRWP-SD006	AD1006	13-Sep-00	0	1	Lead	7439-92-1	27.3		J	mg/kg	0.39	METALS	SD	N	Y	9A09G601
WARP	WRWP-SD007	AD1007	14-Sep-00	0	1	Lead	7439-92-1	18		J	mg/kg	0.35	METALS	SD	N	Y	9A09G601
WARP	WRWP-SD008	AD1008	14-Sep-00	0	1	Lead	7439-92-1	68.5		J	mg/kg	0.64	METALS	SD	N	Y	9A09G601
WARP	WRWP-SD009	AD1009	13-Sep-00	0	1	Lead	7439-92-1	5		J	mg/kg	0.24	METALS	SD	N	Y	9A09G601
WARP	WRWP-SD010	AD1010	13-Sep-00	0	1	Lead	7439-92-1	7.5		J	mg/kg	0.3	METALS	SD	N	Y	9A09G601
WARP	WRWP-SD001	AD1011	14-Sep-00	0	1	Lead	7439-92-1	17			mg/kg	0.33	METALS	SD	N	Y	9A09G601
WARP	WRWP-SD001	AD1001	14-Sep-00	0	1	Magnesium	7439-95-4	2630			mg/kg	10.1	METALS	SD	N	Y	9A09G601
WARP	WRWP-SD002	AD1002	14-Sep-00	0	1	Magnesium	7439-95-4	2390			mg/kg	9.2	METALS	SD	N	Y	9A09G601

GROUP_ NAME	LOCATION_ CODE	SAMPLE_ NO	SAMPLE_ DATE	START_ DEPTH	END_ DEPTH	PARAMETER	CASNO	RESULT	LAB_ QUAL	VAL_ QUAL	UNITS	DETECT_ LIMIT	USER_TEST_ GROUP	SAMPLE_ TYPE	FILTERED	DETECT	SAMPLE_ DELIVERY _ GROUP
WARP	WRWP-SD003	AD1003	14-Sep-00	0	1	Magnesium	7439-95-4	3880			mg/kg	11.2	METALS	SD	N	Y	9A09G601
WARP	WRWP-SD004	AD1004	14-Sep-00	0	1	Magnesium	7439-95-4	2900			mg/kg	9.1	METALS	SD	N	Y	9A09G601
WARP	WRWP-SD005	AD1005	14-Sep-00	0	1	Magnesium	7439-95-4	3460			mg/kg	11.1	METALS	SD	N	Y	9A09G601
WARP	WRWP-SD006	AD1006	13-Sep-00	0	1	Magnesium	7439-95-4	2780			mg/kg	11	METALS	SD	N	Y	9A09G601
WARP	WRWP-SD007	AD1007	14-Sep-00	0	1	Magnesium	7439-95-4	2780			mg/kg	9.9	METALS	SD	N	Y	9A09G601
WARP	WRWP-SD008	AD1008	14-Sep-00	0	1	Magnesium	7439-95-4	5170			mg/kg	18	METALS	SD	N	Y	9A09G601
WARP	WRWP-SD009	AD1009	13-Sep-00	0	1	Magnesium	7439-95-4	1750			mg/kg	6.7	METALS	SD	N	Y	9A09G601
WARP	WRWP-SD010	AD1010	13-Sep-00	0	1	Magnesium	7439-95-4	1900			mg/kg	8.3	METALS	SD	N	Y	9A09G601
WARP	WRWP-SD001	AD1011	14-Sep-00	0	1	Magnesium	7439-95-4	2390			mg/kg	9.4	METALS	SD	N	Y	9A09G601
WARP	WRWP-SD001	AD1001	14-Sep-00	0	1	Manganese	7439-96-5	301			mg/kg	0.19	METALS	SD	N	Y	9A09G601
WARP	WRWP-SD002	AD1002	14-Sep-00	0	1	Manganese	7439-96-5	142			mg/kg	0.18	METALS	SD	N	Y	9A09G601
WARP	WRWP-SD003	AD1003	14-Sep-00	0	1	Manganese	7439-96-5	371			mg/kg	0.22	METALS	SD	N	Y	9A09G601
WARP	WRWP-SD004	AD1004	14-Sep-00	0	1	Manganese	7439-96-5	321			mg/kg	0.17	METALS	SD	N	Y	9A09G601
WARP	WRWP-SD005	AD1005	14-Sep-00	0	1	Manganese	7439-96-5	347			mg/kg	0.21	METALS	SD	N	Y	9A09G601
WARP	WRWP-SD006	AD1006	13-Sep-00	0	1	Manganese	7439-96-5	283			mg/kg	0.21	METALS	SD	N	Y	9A09G601
WARP	WRWP-SD007	AD1007	14-Sep-00	0	1	Manganese	7439-96-5	230			mg/kg	0.19	METALS	SD	N	Y	9A09G601
WARP	WRWP-SD008	AD1008	14-Sep-00	0	1	Manganese	7439-96-5	637			mg/kg	0.35	METALS	SD	N	Y	9A09G601
WARP	WRWP-SD009	AD1009	13-Sep-00	0	1	Manganese	7439-96-5	178			mg/kg	0.13	METALS	SD	N	Y	9A09G601
WARP	WRWP-SD010	AD1010	13-Sep-00	0	1	Manganese	7439-96-5	183			mg/kg	0.16	METALS	SD	N	Y	9A09G601
WARP	WRWP-SD001	AD1011	14-Sep-00	0	1	Manganese	7439-96-5	157			mg/kg	0.18	METALS	SD	N	Y	9A09G601
WARP	WRWP-SD001	AD1001	14-Sep-00	0	1	Nickel	7440-02-0	16.7		J	mg/kg	0.22	METALS	SD	N	Y	9A09G601
WARP	WRWP-SD002	AD1002	14-Sep-00	0	1	Nickel	7440-02-0	12.3		J	mg/kg	0.2	METALS	SD	N	Y	9A09G601
WARP	WRWP-SD003	AD1003	14-Sep-00	0	1	Nickel	7440-02-0	29		J	mg/kg	0.25	METALS	SD	N	Y	9A09G601
WARP	WRWP-SD004	AD1004	14-Sep-00	0	1	Nickel	7440-02-0	23.6		J	mg/kg	0.2	METALS	SD	N	Y	9A09G601
WARP	WRWP-SD005	AD1005	14-Sep-00	0	1	Nickel	7440-02-0	23.6		J	mg/kg	0.24	METALS	SD	N	Y	9A09G601
WARP	WRWP-SD006	AD1006	13-Sep-00	0	1	Nickel	7440-02-0	14.3		J	mg/kg	0.24	METALS	SD	N	Y	9A09G601
WARP	WRWP-SD007	AD1007	14-Sep-00	0	1	Nickel	7440-02-0	20.8		J	mg/kg	0.22	METALS	SD	N	Y	9A09G601
WARP	WRWP-SD008	AD1008	14-Sep-00	0	1	Nickel	7440-02-0	36.5		J	mg/kg	0.4	METALS	SD	N	Y	9A09G601
WARP	WRWP-SD009	AD1009	13-Sep-00	0	1	Nickel	7440-02-0	10.6		J	mg/kg	0.15	METALS	SD	N	Y	9A09G601
WARP	WRWP-SD010	AD1010	13-Sep-00	0	1	Nickel	7440-02-0	14.8		J	mg/kg	0.18	METALS	SD	N	Y	9A09G601
WARP	WRWP-SD001	AD1011	14-Sep-00	0	1	Nickel	7440-02-0	11			mg/kg	0.21	METALS	SD	N	Y	9A09G601
WARP	WRWP-SD001	AD1001	14-Sep-00	0	1	Nitrobenzene	98-95-3	0.098	U	U	mg/kg	0.098	NITROAROMATICS	SD	N	N	9A09G601
WARP	WRWP-SD002	AD1002	14-Sep-00	0	1	Nitrobenzene	98-95-3	0.1	U	U	mg/kg	0.1	NITROAROMATICS	SD	N	N	9A09G601
WARP	WRWP-SD003	AD1003	14-Sep-00	0	1	Nitrobenzene	98-95-3	0.1	U	U	mg/kg	0.1	NITROAROMATICS	SD	N	N	9A09G601
WARP	WRWP-SD004	AD1004	14-Sep-00	0	1	Nitrobenzene	98-95-3	0.1	U	U	mg/kg	0.1	NITROAROMATICS	SD	N	N	9A09G601
WARP	WRWP-SD005	AD1005	14-Sep-00	0	1	Nitrobenzene	98-95-3	0.098	U	U	mg/kg	0.098	NITROAROMATICS	SD	N	N	9A09G601
WARP	WRWP-SD001	AD1011	14-Sep-00	0	1	Nitrobenzene	98-95-3	0.099	U	U	mg/kg	0.099	NITROAROMATICS	SD	N	N	9A09G601
WARP	WRWP-SD001	AD1001	14-Sep-00	0	1	Nitrotoluene, 2-	88-72-2	0.2	U	U	mg/kg	0.2	NITROAROMATICS	SD	N	N	9A09G601
WARP	WRWP-SD002	AD1002	14-Sep-00	0	1	Nitrotoluene, 2-	88-72-2	0.2	U	U	mg/kg	0.2	NITROAROMATICS	SD	N	N	9A09G601
WARP	WRWP-SD003	AD1003	14-Sep-00	0	1	Nitrotoluene, 2-	88-72-2	0.2	U	U	mg/kg	0.2	NITROAROMATICS	SD	N	N	9A09G601
WARP	WRWP-SD004	AD1004	14-Sep-00	0	1	Nitrotoluene, 2-	88-72-2	0.2	U	U	mg/kg	0.2	NITROAROMATICS	SD	N	N	9A09G601
WARP	WRWP-SD005	AD1005	14-Sep-00	0	1	Nitrotoluene, 2-	88-72-2	0.2	U	U	mg/kg	0.2	NITROAROMATICS	SD	N	N	9A09G601
WARP	WRWP-SD001	AD1011	14-Sep-00	0	1	Nitrotoluene, 2-	88-72-2	0.2	U	U	mg/kg	0.2	NITROAROMATICS	SD	N	N	9A09G601
WARP	WRWP-SD001	AD1001	14-Sep-00	0	1	Nitrotoluene, 3-	99-08-1	0.2	U	U	mg/kg	0.2	NITROAROMATICS	SD	N	N	9A09G601
WARP	WRWP-SD002	AD1002	14-Sep-00	0	1	Nitrotoluene, 3-	99-08-1	0.2	U	U	mg/kg	0.2	NITROAROMATICS	SD	N	N	9A09G601
WARP	WRWP-SD003	AD1003	14-Sep-00	0	1	Nitrotoluene, 3-	99-08-1	0.2	U	U	mg/kg	0.2	NITROAROMATICS	SD	N	N	9A09G601
WARP	WRWP-SD004	AD1004	14-Sep-00	0	1	Nitrotoluene, 3-	99-08-1	0.2	U	U	mg/kg	0.2	NITROAROMATICS	SD	N	N	9A09G601
WARP	WRWP-SD005	AD1005	14-Sep-00	0	1	Nitrotoluene, 3-	99-08-1	0.2	U	U	mg/kg	0.2	NITROAROMATICS	SD	N	N	9A09G601
WARP	WRWP-SD001	AD1011	14-Sep-00	0	1	Nitrotoluene, 3-	99-08-1	0.2	U	U	mg/kg	0.2	NITROAROMATICS	SD	N	N	9A09G601
WARP	WRWP-SD001	AD1001	14-Sep-00	0	1	Nitrotoluene, 4-	99-99-0	0.49	U	U	mg/kg	0.49	NITROAROMATICS	SD	N	N	9A09G601

GROUP_ NAME	LOCATION_ CODE	SAMPLE_ NO	SAMPLE_ DATE	START_ DEPTH	END_ DEPTH	PARAMETER	CASNO	RESULT	LAB_ QUAL	VAL_ QUAL	UNITS	DETECT_ LIMIT	USER_TEST_ GROUP	SAMPLE_ TYPE	FILTERED	DETECT	SAMPLE_ DELIVERY _GROUP
WARP	WRWP-SD002	AD1002	14-Sep-00	0	1	Nitrotoluene, 4-	99-99-0	0.5	U	U	mg/kg	0.5	NITROAROMATICS	SD	N	N	9A09G601
WARP	WRWP-SD003	AD1003	14-Sep-00	0	1	Nitrotoluene, 4-	99-99-0	0.5	U	U	mg/kg	0.5	NITROAROMATICS	SD	N	N	9A09G601
WARP	WRWP-SD004	AD1004	14-Sep-00	0	1	Nitrotoluene, 4-	99-99-0	0.5	U	U	mg/kg	0.5	NITROAROMATICS	SD	N	N	9A09G601
WARP	WRWP-SD005	AD1005	14-Sep-00	0	1	Nitrotoluene, 4-	99-99-0	0.49	U	U	mg/kg	0.49	NITROAROMATICS	SD	N	N	9A09G601
WARP	WRWP-SD001	AD1011	14-Sep-00	0	1	Nitrotoluene, 4-	99-99-0	0.5	U	U	mg/kg	0.5	NITROAROMATICS	SD	N	N	9A09G601
WARP	WRWP-SD001	AD1001	14-Sep-00	0	1	Phosphorous	7723-14-0	17.5			mg/kg	8.1	GEN CHEMISTRY	SD	N	Y	9A09G601
WARP	WRWP-SD002	AD1002	14-Sep-00	0	1	Phosphorous	7723-14-0	6.1	U	U	mg/kg	6.1	GEN CHEMISTRY	SD	N	N	9A09G601
WARP	WRWP-SD003	AD1003	14-Sep-00	0	1	Phosphorous	7723-14-0	29.9			mg/kg	8.4	GEN CHEMISTRY	SD	N	Y	9A09G601
WARP	WRWP-SD004	AD1004	14-Sep-00	0	1	Phosphorous	7723-14-0	6.5	U	U	mg/kg	6.5	GEN CHEMISTRY	SD	N	N	9A09G601
WARP	WRWP-SD005	AD1005	14-Sep-00	0	1	Phosphorous	7723-14-0	35.2			mg/kg	8.4	GEN CHEMISTRY	SD	N	Y	9A09G601
WARP	WRWP-SD006	AD1006	13-Sep-00	0	1	Phosphorous	7723-14-0	8.1	U	U	mg/kg	8.1	GEN CHEMISTRY	SD	N	N	9A09G601
WARP	WRWP-SD007	AD1007	14-Sep-00	0	1	Phosphorous	7723-14-0	236			mg/kg	28.4	GEN CHEMISTRY	SD	N	Y	9A09G601
WARP	WRWP-SD008	AD1008	14-Sep-00	0	1	Phosphorous	7723-14-0	221			mg/kg	16.7	GEN CHEMISTRY	SD	N	Y	9A09G601
WARP	WRWP-SD009	AD1009	13-Sep-00	0	1	Phosphorous	7723-14-0	208			mg/kg	39.6	GEN CHEMISTRY	SD	N	Y	9A09G601
WARP	WRWP-SD010	AD1010	13-Sep-00	0	1	Phosphorous	7723-14-0	11.1	U	U	mg/kg	11.1	GEN CHEMISTRY	SD	N	N	9A09G601
WARP	WRWP-SD001	AD1011	14-Sep-00	0	1	Phosphorous	7723-14-0	5	U	U	mg/kg	5	GEN CHEMISTRY	SD	N	N	9A09G601
WARP	WRWP-SD001	AD1001	14-Sep-00	0	1	Potassium	2023695	1070		B	mg/kg	12.7	METALS	SD	N	Y	9A09G601
WARP	WRWP-SD002	AD1002	14-Sep-00	0	1	Potassium	2023695	937		B	mg/kg	11.6	METALS	SD	N	Y	9A09G601
WARP	WRWP-SD003	AD1003	14-Sep-00	0	1	Potassium	2023695	2420		J	mg/kg	14	METALS	SD	N	Y	9A09G601
WARP	WRWP-SD004	AD1004	14-Sep-00	0	1	Potassium	2023695	1490		B	mg/kg	11.4	METALS	SD	N	Y	9A09G601
WARP	WRWP-SD005	AD1005	14-Sep-00	0	1	Potassium	2023695	1880		J	mg/kg	13.9	METALS	SD	N	Y	9A09G601
WARP	WRWP-SD006	AD1006	13-Sep-00	0	1	Potassium	2023695	838		B	mg/kg	13.8	METALS	SD	N	Y	9A09G601
WARP	WRWP-SD007	AD1007	14-Sep-00	0	1	Potassium	2023695	1040		B	mg/kg	12.4	METALS	SD	N	Y	9A09G601
WARP	WRWP-SD008	AD1008	14-Sep-00	0	1	Potassium	2023695	3230		J	mg/kg	22.6	METALS	SD	N	Y	9A09G601
WARP	WRWP-SD009	AD1009	13-Sep-00	0	1	Potassium	2023695	596		B	mg/kg	8.4	METALS	SD	N	Y	9A09G601
WARP	WRWP-SD010	AD1010	13-Sep-00	0	1	Potassium	2023695	804		B	mg/kg	10.4	METALS	SD	N	Y	9A09G601
WARP	WRWP-SD001	AD1011	14-Sep-00	0	1	Potassium	2023695	855			mg/kg	11.7	METALS	SD	N	Y	9A09G601
WARP	WRWP-SD001	AD1001	14-Sep-00	0	1	RDX	121-82-4	0.098	U	U	mg/kg	0.098	NITROAROMATICS	SD	N	N	9A09G601
WARP	WRWP-SD002	AD1002	14-Sep-00	0	1	RDX	121-82-4	0.1	U	U	mg/kg	0.1	NITROAROMATICS	SD	N	N	9A09G601
WARP	WRWP-SD003	AD1003	14-Sep-00	0	1	RDX	121-82-4	0.1	U	U	mg/kg	0.1	NITROAROMATICS	SD	N	N	9A09G601
WARP	WRWP-SD004	AD1004	14-Sep-00	0	1	RDX	121-82-4	0.1	U	U	mg/kg	0.1	NITROAROMATICS	SD	N	N	9A09G601
WARP	WRWP-SD005	AD1005	14-Sep-00	0	1	RDX	121-82-4	0.098	U	U	mg/kg	0.098	NITROAROMATICS	SD	N	N	9A09G601
WARP	WRWP-SD001	AD1011	14-Sep-00	0	1	RDX	121-82-4	0.099	U	U	mg/kg	0.099	NITROAROMATICS	SD	N	N	9A09G601
WARP	WRWP-SD001	AD1001	14-Sep-00	0	1	Sodium	7440-23-5	549			mg/kg	38	METALS	SD	N	Y	9A09G601
WARP	WRWP-SD002	AD1002	14-Sep-00	0	1	Sodium	7440-23-5	268			mg/kg	34.7	METALS	SD	N	Y	9A09G601
WARP	WRWP-SD003	AD1003	14-Sep-00	0	1	Sodium	7440-23-5	488			mg/kg	42.2	METALS	SD	N	Y	9A09G601
WARP	WRWP-SD004	AD1004	14-Sep-00	0	1	Sodium	7440-23-5	420			mg/kg	34.2	METALS	SD	N	Y	9A09G601
WARP	WRWP-SD005	AD1005	14-Sep-00	0	1	Sodium	7440-23-5	426			mg/kg	41.8	METALS	SD	N	Y	9A09G601
WARP	WRWP-SD006	AD1006	13-Sep-00	0	1	Sodium	7440-23-5	553			mg/kg	41.6	METALS	SD	N	Y	9A09G601
WARP	WRWP-SD007	AD1007	14-Sep-00	0	1	Sodium	7440-23-5	860			mg/kg	37.2	METALS	SD	N	Y	9A09G601
WARP	WRWP-SD008	AD1008	14-Sep-00	0	1	Sodium	7440-23-5	1890			mg/kg	67.8	METALS	SD	N	Y	9A09G601
WARP	WRWP-SD009	AD1009	13-Sep-00	0	1	Sodium	7440-23-5	63.5			mg/kg	25.3	METALS	SD	N	Y	9A09G601
WARP	WRWP-SD010	AD1010	13-Sep-00	0	1	Sodium	7440-23-5	93.7			mg/kg	31.4	METALS	SD	N	Y	9A09G601
WARP	WRWP-SD001	AD1011	14-Sep-00	0	1	Sodium	7440-23-5	755			mg/kg	35.2	METALS	SD	N	Y	9A09G601
WARP	WRWP-SD001	AD1001	14-Sep-00	0	1	Tetryl	479-45-8	0.2	U	U	mg/kg	0.2	NITROAROMATICS	SD	N	N	9A09G601
WARP	WRWP-SD002	AD1002	14-Sep-00	0	1	Tetryl	479-45-8	0.2	U	U	mg/kg	0.2	NITROAROMATICS	SD	N	N	9A09G601
WARP	WRWP-SD003	AD1003	14-Sep-00	0	1	Tetryl	479-45-8	0.2	U	U	mg/kg	0.2	NITROAROMATICS	SD	N	N	9A09G601
WARP	WRWP-SD004	AD1004	14-Sep-00	0	1	Tetryl	479-45-8	0.2	U	U	mg/kg	0.2	NITROAROMATICS	SD	N	N	9A09G601
WARP	WRWP-SD005	AD1005	14-Sep-00	0	1	Tetryl	479-45-8	0.2	U	U	mg/kg	0.2	NITROAROMATICS	SD	N	N	9A09G601
WARP	WRWP-SD001	AD1011	14-Sep-00	0	1	Tetryl	479-45-8	0.2	U	U	mg/kg	0.2	NITROAROMATICS	SD	N	N	9A09G601

GROUP_ NAME	LOCATION_ CODE	SAMPLE_ NO	SAMPLE_ DATE	START_ DEPTH	END_ DEPTH	PARAMETER	CASNO	RESULT	LAB_ QUAL	VAL_ QUAL	UNITS	DETECT_ LIMIT	USER_TEST_ GROUP	SAMPLE_ TYPE	FILTERED	DETECT	SAMPLE_ DELIVERY _GROUP
WARP	WRWP-SD001	AD1001	14-Sep-00	0	1	Total organic carbon	10-35-5	17300			mg/kg	1160	GEN CHEMISTRY	SD	N	Y	9A09G601
WARP	WRWP-SD002	AD1002	14-Sep-00	0	1	Total organic carbon	10-35-5	17300			mg/kg	1320	GEN CHEMISTRY	SD	N	Y	9A09G601
WARP	WRWP-SD003	AD1003	14-Sep-00	0	1	Total organic carbon	10-35-5	17100			mg/kg	1370	GEN CHEMISTRY	SD	N	Y	9A09G601
WARP	WRWP-SD004	AD1004	14-Sep-00	0	1	Total organic carbon	10-35-5	36600			mg/kg	4080	GEN CHEMISTRY	SD	N	Y	9A09G601
WARP	WRWP-SD005	AD1005	14-Sep-00	0	1	Total organic carbon	10-35-5	38000			mg/kg	5130	GEN CHEMISTRY	SD	N	Y	9A09G601
WARP	WRWP-SD001	AD1001	14-Sep-00	0	1	Trinitrobenzene, 1,3,5-	99-35-4	0.098	U	U	mg/kg	0.098	NITROAROMATICS	SD	N	N	9A09G601
WARP	WRWP-SD002	AD1002	14-Sep-00	0	1	Trinitrobenzene, 1,3,5-	99-35-4	0.1	U	U	mg/kg	0.1	NITROAROMATICS	SD	N	N	9A09G601
WARP	WRWP-SD003	AD1003	14-Sep-00	0	1	Trinitrobenzene, 1,3,5-	99-35-4	0.1	U	U	mg/kg	0.1	NITROAROMATICS	SD	N	N	9A09G601
WARP	WRWP-SD004	AD1004	14-Sep-00	0	1	Trinitrobenzene, 1,3,5-	99-35-4	0.1	U	U	mg/kg	0.1	NITROAROMATICS	SD	N	N	9A09G601
WARP	WRWP-SD005	AD1005	14-Sep-00	0	1	Trinitrobenzene, 1,3,5-	99-35-4	0.098	U	U	mg/kg	0.098	NITROAROMATICS	SD	N	N	9A09G601
WARP	WRWP-SD001	AD1011	14-Sep-00	0	1	Trinitrobenzene, 1,3,5-	99-35-4	0.099	U	U	mg/kg	0.099	NITROAROMATICS	SD	N	N	9A09G601
WARP	WRWP-SD001	AD1001	14-Sep-00	0	1	Trinitrotoluene, 2,4,6-	118-96-7	0.098	U	U	mg/kg	0.098	NITROAROMATICS	SD	N	N	9A09G601
WARP	WRWP-SD002	AD1002	14-Sep-00	0	1	Trinitrotoluene, 2,4,6-	118-96-7	0.1	U	U	mg/kg	0.1	NITROAROMATICS	SD	N	N	9A09G601
WARP	WRWP-SD003	AD1003	14-Sep-00	0	1	Trinitrotoluene, 2,4,6-	118-96-7	0.1	U	U	mg/kg	0.1	NITROAROMATICS	SD	N	N	9A09G601
WARP	WRWP-SD004	AD1004	14-Sep-00	0	1	Trinitrotoluene, 2,4,6-	118-96-7	0.1	U	U	mg/kg	0.1	NITROAROMATICS	SD	N	N	9A09G601
WARP	WRWP-SD005	AD1005	14-Sep-00	0	1	Trinitrotoluene, 2,4,6-	118-96-7	0.098	U	U	mg/kg	0.098	NITROAROMATICS	SD	N	N	9A09G601
WARP	WRWP-SD001	AD1011	14-Sep-00	0	1	Trinitrotoluene, 2,4,6-	118-96-7	0.099	U	U	mg/kg	0.099	NITROAROMATICS	SD	N	N	9A09G601
WARP	WRWP-SD001	AD1001	14-Sep-00	0	1	Vanadium	7440-62-2	20.2		B	mg/kg	0.29	METALS	SD	N	Y	9A09G601
WARP	WRWP-SD002	AD1002	14-Sep-00	0	1	Vanadium	7440-62-2	18		B	mg/kg	0.27	METALS	SD	N	Y	9A09G601
WARP	WRWP-SD003	AD1003	14-Sep-00	0	1	Vanadium	7440-62-2	36.5		B	mg/kg	0.32	METALS	SD	N	Y	9A09G601
WARP	WRWP-SD004	AD1004	14-Sep-00	0	1	Vanadium	7440-62-2	20.5		B	mg/kg	0.26	METALS	SD	N	Y	9A09G601
WARP	WRWP-SD005	AD1005	14-Sep-00	0	1	Vanadium	7440-62-2	24.8		B	mg/kg	0.32	METALS	SD	N	Y	9A09G601
WARP	WRWP-SD006	AD1006	13-Sep-00	0	1	Vanadium	7440-62-2	15.7		B	mg/kg	0.32	METALS	SD	N	Y	9A09G601
WARP	WRWP-SD007	AD1007	14-Sep-00	0	1	Vanadium	7440-62-2	18.7		B	mg/kg	0.29	METALS	SD	N	Y	9A09G601
WARP	WRWP-SD008	AD1008	14-Sep-00	0	1	Vanadium	7440-62-2	30.1		B	mg/kg	0.52	METALS	SD	N	Y	9A09G601
WARP	WRWP-SD009	AD1009	13-Sep-00	0	1	Vanadium	7440-62-2	6.4		B	mg/kg	0.19	METALS	SD	N	Y	9A09G601
WARP	WRWP-SD010	AD1010	13-Sep-00	0	1	Vanadium	7440-62-2	9.4		B	mg/kg	0.24	METALS	SD	N	Y	9A09G601
WARP	WRWP-SD001	AD1011	14-Sep-00	0	1	Vanadium	7440-62-2	16.6		B	mg/kg	0.27	METALS	SD	N	Y	9A09G601
WARP	WRWP-SD001	AD1001	14-Sep-00	0	1	Zinc	7440-66-6	56.8			mg/kg	0.08	METALS	SD	N	Y	9A09G601
WARP	WRWP-SD002	AD1002	14-Sep-00	0	1	Zinc	7440-66-6	47.2			mg/kg	0.08	METALS	SD	N	Y	9A09G601
WARP	WRWP-SD003	AD1003	14-Sep-00	0	1	Zinc	7440-66-6	94.8			mg/kg	0.09	METALS	SD	N	Y	9A09G601
WARP	WRWP-SD004	AD1004	14-Sep-00	0	1	Zinc	7440-66-6	77.6			mg/kg	0.07	METALS	SD	N	Y	9A09G601
WARP	WRWP-SD005	AD1005	14-Sep-00	0	1	Zinc	7440-66-6	77.2			mg/kg	0.09	METALS	SD	N	Y	9A09G601
WARP	WRWP-SD006	AD1006	13-Sep-00	0	1	Zinc	7440-66-6	45.7			mg/kg	0.09	METALS	SD	N	Y	9A09G601
WARP	WRWP-SD007	AD1007	14-Sep-00	0	1	Zinc	7440-66-6	60.2			mg/kg	0.08	METALS	SD	N	Y	9A09G601
WARP	WRWP-SD008	AD1008	14-Sep-00	0	1	Zinc	7440-66-6	117			mg/kg	0.15	METALS	SD	N	Y	9A09G601
WARP	WRWP-SD009	AD1009	13-Sep-00	0	1	Zinc	7440-66-6	24.7			mg/kg	0.06	METALS	SD	N	Y	9A09G601
WARP	WRWP-SD010	AD1010	13-Sep-00	0	1	Zinc	7440-66-6	36.7			mg/kg	0.07	METALS	SD	N	Y	9A09G601
WARP	WRWP-SD001	AD1011	14-Sep-00	0	1	Zinc	7440-66-6	42.7		J	mg/kg	0.08	METALS	SD	N	Y	9A09G601
WARP	WRWP-SO001	AD0001	15-Sep-00	0	1	% Solids	38992	82.4			Percent	0.1	GEN CHEMISTRY	SO	N	Y	9A09G601
WARP	WRWP-SO002	AD0002	15-Sep-00	0	1	% Solids	38992	80.4			Percent	0.1	GEN CHEMISTRY	SO	N	Y	9A09G601
WARP	WRWP-SO003	AD0003	15-Sep-00	0	1	% Solids	38992	80.5			Percent	0.1	GEN CHEMISTRY	SO	N	Y	9A09G601
WARP	WRWP-SO004	AD0004	15-Sep-00	0	1	% Solids	38992	81			Percent	0.1	GEN CHEMISTRY	SO	N	Y	9A09G601
WARP	WRWP-SO005	AD0005	15-Sep-00	0	1.5	% Solids	38992	77.9			Percent	0.1	GEN CHEMISTRY	SO	N	Y	9A09G601
WARP	WRWP-SO001	AD0001	15-Sep-00	0	1	Acenaphthene	83-32-9	0.099	U	U	mg/kg	0.099	SEMIVOLATILES	SO	N	N	9A09G601
WARP	WRWP-SO002	AD0002	15-Sep-00	0	1	Acenaphthene	83-32-9	0.1	U	U	mg/kg	0.1	SEMIVOLATILES	SO	N	N	9A09G601
WARP	WRWP-SO003	AD0003	15-Sep-00	0	1	Acenaphthene	83-32-9	0.1	U	U	mg/kg	0.1	SEMIVOLATILES	SO	N	N	9A09G601
WARP	WRWP-SO004	AD0004	15-Sep-00	0	1	Acenaphthene	83-32-9	0.1	U	U	mg/kg	0.1	SEMIVOLATILES	SO	N	N	9A09G601
WARP	WRWP-SO005	AD0005	15-Sep-00	0	1.5	Acenaphthene	83-32-9	0.1	U	U	mg/kg	0.1	SEMIVOLATILES	SO	N	N	9A09G601
WARP	WRWP-SO001	AD0001	15-Sep-00	0	1	Acenaphthylene	208-96-8	0.049	U	U	mg/kg	0.049	SEMIVOLATILES	SO	N	N	9A09G601

GROUP_ NAME	LOCATION_ CODE	SAMPLE_ NO	SAMPLE_ DATE	START_ DEPTH	END_ DEPTH	PARAMETER	CASNO	RESULT	LAB_ QUAL	VAL_ QUAL	UNITS	DETECT_ LIMIT	USER_TEST_ GROUP	SAMPLE_ TYPE	FILTERED	DETECT	SAMPLE_ DELIVERY _GROUP
WARP	WRWP-SO002	AD0002	15-Sep-00	0	1	Acenaphthylene	208-96-8	0.051	U	U	mg/kg	0.051	SEMIVOLATILES	SO	N	N	9A09G601
WARP	WRWP-SO003	AD0003	15-Sep-00	0	1	Acenaphthylene	208-96-8	0.051	U	U	mg/kg	0.051	SEMIVOLATILES	SO	N	N	9A09G601
WARP	WRWP-SO004	AD0004	15-Sep-00	0	1	Acenaphthylene	208-96-8	0.051	U	U	mg/kg	0.051	SEMIVOLATILES	SO	N	N	9A09G601
WARP	WRWP-SO005	AD0005	15-Sep-00	0	1.5	Acenaphthylene	208-96-8	0.053	U	U	mg/kg	0.053	SEMIVOLATILES	SO	N	N	9A09G601
WARP	WRWP-SO001	AD0001	15-Sep-00	0	1	Amino-2,6-dinitrotoluene, 4-	19406-51-0	0.2	U	U	mg/kg	0.2	NITROAROMATICS	SO	N	N	9A09G601
WARP	WRWP-SO002	AD0002	15-Sep-00	0	1	Amino-2,6-dinitrotoluene, 4-	19406-51-0	0.2	U	U	mg/kg	0.2	NITROAROMATICS	SO	N	N	9A09G601
WARP	WRWP-SO003	AD0003	15-Sep-00	0	1	Amino-2,6-dinitrotoluene, 4-	19406-51-0	0.2	U	U	mg/kg	0.2	NITROAROMATICS	SO	N	N	9A09G601
WARP	WRWP-SO004	AD0004	15-Sep-00	0	1	Amino-2,6-dinitrotoluene, 4-	19406-51-0	0.2	U	U	mg/kg	0.2	NITROAROMATICS	SO	N	N	9A09G601
WARP	WRWP-SO005	AD0005	15-Sep-00	0	1.5	Amino-2,6-dinitrotoluene, 4-	19406-51-0	0.2	U	U	mg/kg	0.2	NITROAROMATICS	SO	N	N	9A09G601
WARP	WRWP-SO001	AD0001	15-Sep-00	0	1	Amino-4,6-dinitrotoluene, 2-	35572-78-2	0.2	U	U	mg/kg	0.2	NITROAROMATICS	SO	N	N	9A09G601
WARP	WRWP-SO002	AD0002	15-Sep-00	0	1	Amino-4,6-dinitrotoluene, 2-	35572-78-2	0.2	U	U	mg/kg	0.2	NITROAROMATICS	SO	N	N	9A09G601
WARP	WRWP-SO003	AD0003	15-Sep-00	0	1	Amino-4,6-dinitrotoluene, 2-	35572-78-2	0.2	U	U	mg/kg	0.2	NITROAROMATICS	SO	N	N	9A09G601
WARP	WRWP-SO004	AD0004	15-Sep-00	0	1	Amino-4,6-dinitrotoluene, 2-	35572-78-2	0.2	U	U	mg/kg	0.2	NITROAROMATICS	SO	N	N	9A09G601
WARP	WRWP-SO005	AD0005	15-Sep-00	0	1.5	Amino-4,6-dinitrotoluene, 2-	35572-78-2	0.2	U	U	mg/kg	0.2	NITROAROMATICS	SO	N	N	9A09G601
WARP	WRWP-SO001	AD0001	15-Sep-00	0	1	Anthracene	120-12-7	0.0036			mg/kg	0.002	SEMIVOLATILES	SO	N	Y	9A09G601
WARP	WRWP-SO002	AD0002	15-Sep-00	0	1	Anthracene	120-12-7	0.002	U	U	mg/kg	0.002	SEMIVOLATILES	SO	N	N	9A09G601
WARP	WRWP-SO003	AD0003	15-Sep-00	0	1	Anthracene	120-12-7	0.002	U	U	mg/kg	0.002	SEMIVOLATILES	SO	N	N	9A09G601
WARP	WRWP-SO004	AD0004	15-Sep-00	0	1	Anthracene	120-12-7	0.002	U	U	mg/kg	0.002	SEMIVOLATILES	SO	N	N	9A09G601
WARP	WRWP-SO005	AD0005	15-Sep-00	0	1.5	Anthracene	120-12-7	0.001	J	J	mg/kg	0.0021	SEMIVOLATILES	SO	N	Y	9A09G601
WARP	WRWP-SO001	AD0001	15-Sep-00	0	1	Benzo(a)anthracene	56-55-3	0.025			mg/kg	0.0049	SEMIVOLATILES	SO	N	Y	9A09G601
WARP	WRWP-SO002	AD0002	15-Sep-00	0	1	Benzo(a)anthracene	56-55-3	0.049	J	J	mg/kg	0.0051	SEMIVOLATILES	SO	N	Y	9A09G601
WARP	WRWP-SO003	AD0003	15-Sep-00	0	1	Benzo(a)anthracene	56-55-3	0.0059			mg/kg	0.0051	SEMIVOLATILES	SO	N	Y	9A09G601
WARP	WRWP-SO004	AD0004	15-Sep-00	0	1	Benzo(a)anthracene	56-55-3	0.0036	J	J	mg/kg	0.0051	SEMIVOLATILES	SO	N	Y	9A09G601
WARP	WRWP-SO005	AD0005	15-Sep-00	0	1.5	Benzo(a)anthracene	56-55-3	0.0066			mg/kg	0.0053	SEMIVOLATILES	SO	N	Y	9A09G601
WARP	WRWP-SO001	AD0001	15-Sep-00	0	1	Benzo(a)pyrene	50-32-8	0.039			mg/kg	0.0049	SEMIVOLATILES	SO	N	Y	9A09G601
WARP	WRWP-SO002	AD0002	15-Sep-00	0	1	Benzo(a)pyrene	50-32-8	0.0074			mg/kg	0.0051	SEMIVOLATILES	SO	N	Y	9A09G601
WARP	WRWP-SO003	AD0003	15-Sep-00	0	1	Benzo(a)pyrene	50-32-8	0.0099			mg/kg	0.0051	SEMIVOLATILES	SO	N	Y	9A09G601
WARP	WRWP-SO004	AD0004	15-Sep-00	0	1	Benzo(a)pyrene	50-32-8	0.0055			mg/kg	0.0051	SEMIVOLATILES	SO	N	Y	9A09G601
WARP	WRWP-SO005	AD0005	15-Sep-00	0	1.5	Benzo(a)pyrene	50-32-8	0.012			mg/kg	0.0053	SEMIVOLATILES	SO	N	Y	9A09G601
WARP	WRWP-SO001	AD0001	15-Sep-00	0	1	Benzo(b)fluoranthene	205-99-2	0.033			mg/kg	0.002	SEMIVOLATILES	SO	N	Y	9A09G601
WARP	WRWP-SO002	AD0002	15-Sep-00	0	1	Benzo(b)fluoranthene	205-99-2	0.006			mg/kg	0.002	SEMIVOLATILES	SO	N	Y	9A09G601
WARP	WRWP-SO003	AD0003	15-Sep-00	0	1	Benzo(b)fluoranthene	205-99-2	0.0095			mg/kg	0.002	SEMIVOLATILES	SO	N	Y	9A09G601
WARP	WRWP-SO004	AD0004	15-Sep-00	0	1	Benzo(b)fluoranthene	205-99-2	0.0048			mg/kg	0.002	SEMIVOLATILES	SO	N	Y	9A09G601
WARP	WRWP-SO005	AD0005	15-Sep-00	0	1.5	Benzo(b)fluoranthene	205-99-2	0.0099			mg/kg	0.0021	SEMIVOLATILES	SO	N	Y	9A09G601
WARP	WRWP-SO001	AD0001	15-Sep-00	0	1	Benzo(ghi)perylene	191-24-2	0.016			mg/kg	0.0079	SEMIVOLATILES	SO	N	Y	9A09G601
WARP	WRWP-SO002	AD0002	15-Sep-00	0	1	Benzo(ghi)perylene	191-24-2	0.0082	U	U	mg/kg	0.0082	SEMIVOLATILES	SO	N	N	9A09G601
WARP	WRWP-SO003	AD0003	15-Sep-00	0	1	Benzo(ghi)perylene	191-24-2	0.0082	U	U	mg/kg	0.0082	SEMIVOLATILES	SO	N	N	9A09G601
WARP	WRWP-SO004	AD0004	15-Sep-00	0	1	Benzo(ghi)perylene	191-24-2	0.0082	U	U	mg/kg	0.0082	SEMIVOLATILES	SO	N	N	9A09G601
WARP	WRWP-SO005	AD0005	15-Sep-00	0	1.5	Benzo(ghi)perylene	191-24-2	0.0085	U	U	mg/kg	0.0085	SEMIVOLATILES	SO	N	N	9A09G601
WARP	WRWP-SO001	AD0001	15-Sep-00	0	1	Benzo(k)fluoranthene	207-08-9	0.019	D		mg/kg	0.0099	SEMIVOLATILES	SO	N	Y	9A09G601
WARP	WRWP-SO002	AD0002	15-Sep-00	0	1	Benzo(k)fluoranthene	207-08-9	0.0033			mg/kg	0.002	SEMIVOLATILES	SO	N	Y	9A09G601
WARP	WRWP-SO003	AD0003	15-Sep-00	0	1	Benzo(k)fluoranthene	207-08-9	0.0039			mg/kg	0.002	SEMIVOLATILES	SO	N	Y	9A09G601
WARP	WRWP-SO004	AD0004	15-Sep-00	0	1	Benzo(k)fluoranthene	207-08-9	0.0026			mg/kg	0.002	SEMIVOLATILES	SO	N	Y	9A09G601
WARP	WRWP-SO005	AD0005	15-Sep-00	0	1.5	Benzo(k)fluoranthene	207-08-9	0.0029			mg/kg	0.0021	SEMIVOLATILES	SO	N	Y	9A09G601
WARP	WRWP-SO001	AD0001	15-Sep-00	0	1	Chrysene	218-01-9	0.026			mg/kg	0.0049	SEMIVOLATILES	SO	N	Y	9A09G601
WARP	WRWP-SO002	AD0002	15-Sep-00	0	1	Chrysene	218-01-9	0.0067			mg/kg	0.0051	SEMIVOLATILES	SO	N	Y	9A09G601
WARP	WRWP-SO003	AD0003	15-Sep-00	0	1	Chrysene	218-01-9	0.0082			mg/kg	0.0051	SEMIVOLATILES	SO	N	Y	9A09G601
WARP	WRWP-SO004	AD0004	15-Sep-00	0	1	Chrysene	218-01-9	0.0047	J	J	mg/kg	0.0051	SEMIVOLATILES	SO	N	Y	9A09G601
WARP	WRWP-SO005	AD0005	15-Sep-00	0	1.5	Chrysene	218-01-9	0.0092			mg/kg	0.0053	SEMIVOLATILES	SO	N	Y	9A09G601
WARP	WRWP-SO001	AD0001	15-Sep-00	0	1	Dibenz(a,h)anthracene	53-70-3	0.022			mg/kg	0.02	SEMIVOLATILES	SO	N	Y	9A09G601

GROUP_ NAME	LOCATION_ CODE	SAMPLE_ NO	SAMPLE_ DATE	START_ DEPTH	END_ DEPTH	PARAMETER	CASNO	RESULT	LAB_ QUAL	VAL_ QUAL	UNITS	DETECT_ LIMIT	USER_TEST_ GROUP	SAMPLE_ TYPE	FILTERED	DETECT	SAMPLE_ DELIVERY _GROUP
WARP	WRWP-SO002	AD0002	15-Sep-00	0	1	Dibenz(a,h)anthracene	53-70-3	0.02	U	U	mg/kg	0.02	SEMIVOLATILES	SO	N	N	9A09G601
WARP	WRWP-SO003	AD0003	15-Sep-00	0	1	Dibenz(a,h)anthracene	53-70-3	0.0095	J	J	mg/kg	0.02	SEMIVOLATILES	SO	N	Y	9A09G601
WARP	WRWP-SO004	AD0004	15-Sep-00	0	1	Dibenz(a,h)anthracene	53-70-3	0.02	U	U	mg/kg	0.02	SEMIVOLATILES	SO	N	N	9A09G601
WARP	WRWP-SO005	AD0005	15-Sep-00	0	1.5	Dibenz(a,h)anthracene	53-70-3	0.021	U	U	mg/kg	0.021	SEMIVOLATILES	SO	N	N	9A09G601
WARP	WRWP-SO001	AD0001	15-Sep-00	0	1	Dinitrobenzene, 1,3-	99-65-0	0.1	U	U	mg/kg	0.1	NITROAROMATICS	SO	N	N	9A09G601
WARP	WRWP-SO002	AD0002	15-Sep-00	0	1	Dinitrobenzene, 1,3-	99-65-0	0.1	U	U	mg/kg	0.1	NITROAROMATICS	SO	N	N	9A09G601
WARP	WRWP-SO003	AD0003	15-Sep-00	0	1	Dinitrobenzene, 1,3-	99-65-0	0.1	U	U	mg/kg	0.1	NITROAROMATICS	SO	N	N	9A09G601
WARP	WRWP-SO004	AD0004	15-Sep-00	0	1	Dinitrobenzene, 1,3-	99-65-0	0.1	U	U	mg/kg	0.1	NITROAROMATICS	SO	N	N	9A09G601
WARP	WRWP-SO005	AD0005	15-Sep-00	0	1.5	Dinitrobenzene, 1,3-	99-65-0	0.1	U	U	mg/kg	0.1	NITROAROMATICS	SO	N	N	9A09G601
WARP	WRWP-SO001	AD0001	15-Sep-00	0	1	Dinitrotoluene, 2,4-	121-14-2	0.1	U	U	mg/kg	0.1	NITROAROMATICS	SO	N	N	9A09G601
WARP	WRWP-SO002	AD0002	15-Sep-00	0	1	Dinitrotoluene, 2,4-	121-14-2	0.1	U	U	mg/kg	0.1	NITROAROMATICS	SO	N	N	9A09G601
WARP	WRWP-SO003	AD0003	15-Sep-00	0	1	Dinitrotoluene, 2,4-	121-14-2	0.1	U	U	mg/kg	0.1	NITROAROMATICS	SO	N	N	9A09G601
WARP	WRWP-SO004	AD0004	15-Sep-00	0	1	Dinitrotoluene, 2,4-	121-14-2	0.1	U	U	mg/kg	0.1	NITROAROMATICS	SO	N	N	9A09G601
WARP	WRWP-SO005	AD0005	15-Sep-00	0	1.5	Dinitrotoluene, 2,4-	121-14-2	0.1	U	U	mg/kg	0.1	NITROAROMATICS	SO	N	N	9A09G601
WARP	WRWP-SO001	AD0001	15-Sep-00	0	1	Dinitrotoluene, 2,6-	606-20-2	0.2	U	U	mg/kg	0.2	NITROAROMATICS	SO	N	N	9A09G601
WARP	WRWP-SO002	AD0002	15-Sep-00	0	1	Dinitrotoluene, 2,6-	606-20-2	0.2	U	U	mg/kg	0.2	NITROAROMATICS	SO	N	N	9A09G601
WARP	WRWP-SO003	AD0003	15-Sep-00	0	1	Dinitrotoluene, 2,6-	606-20-2	0.2	U	U	mg/kg	0.2	NITROAROMATICS	SO	N	N	9A09G601
WARP	WRWP-SO004	AD0004	15-Sep-00	0	1	Dinitrotoluene, 2,6-	606-20-2	0.2	U	U	mg/kg	0.2	NITROAROMATICS	SO	N	N	9A09G601
WARP	WRWP-SO005	AD0005	15-Sep-00	0	1.5	Dinitrotoluene, 2,6-	606-20-2	0.2	U	U	mg/kg	0.2	NITROAROMATICS	SO	N	N	9A09G601
WARP	WRWP-SO001	AD0001	15-Sep-00	0	1	Fluoranthene	206-44-0	0.076			mg/kg	0.0042	SEMIVOLATILES	SO	N	Y	9A09G601
WARP	WRWP-SO002	AD0002	15-Sep-00	0	1	Fluoranthene	206-44-0	0.017			mg/kg	0.0042	SEMIVOLATILES	SO	N	Y	9A09G601
WARP	WRWP-SO003	AD0003	15-Sep-00	0	1	Fluoranthene	206-44-0	0.021			mg/kg	0.0042	SEMIVOLATILES	SO	N	Y	9A09G601
WARP	WRWP-SO004	AD0004	15-Sep-00	0	1	Fluoranthene	206-44-0	0.013			mg/kg	0.0042	SEMIVOLATILES	SO	N	Y	9A09G601
WARP	WRWP-SO005	AD0005	15-Sep-00	0	1.5	Fluoranthene	206-44-0	0.026			mg/kg	0.0042	SEMIVOLATILES	SO	N	Y	9A09G601
WARP	WRWP-SO001	AD0001	15-Sep-00	0	1	Fluorene	86-73-7	0.0099	U	U	mg/kg	0.0099	SEMIVOLATILES	SO	N	N	9A09G601
WARP	WRWP-SO002	AD0002	15-Sep-00	0	1	Fluorene	86-73-7	0.006	J	J	mg/kg	0.01	SEMIVOLATILES	SO	N	Y	9A09G601
WARP	WRWP-SO003	AD0003	15-Sep-00	0	1	Fluorene	86-73-7	0.0074	J	J	mg/kg	0.01	SEMIVOLATILES	SO	N	Y	9A09G601
WARP	WRWP-SO004	AD0004	15-Sep-00	0	1	Fluorene	86-73-7	0.0069	J	J	mg/kg	0.01	SEMIVOLATILES	SO	N	Y	9A09G601
WARP	WRWP-SO005	AD0005	15-Sep-00	0	1.5	Fluorene	86-73-7	0.01	U	U	mg/kg	0.01	SEMIVOLATILES	SO	N	N	9A09G601
WARP	WRWP-SO001	AD0001	15-Sep-00	0	1	HMX	2691-41-0	0.25	U	U	mg/kg	0.25	NITROAROMATICS	SO	N	N	9A09G601
WARP	WRWP-SO002	AD0002	15-Sep-00	0	1	HMX	2691-41-0	0.25	U	U	mg/kg	0.25	NITROAROMATICS	SO	N	N	9A09G601
WARP	WRWP-SO003	AD0003	15-Sep-00	0	1	HMX	2691-41-0	0.25	U	U	mg/kg	0.25	NITROAROMATICS	SO	N	N	9A09G601
WARP	WRWP-SO004	AD0004	15-Sep-00	0	1	HMX	2691-41-0	0.25	U	U	mg/kg	0.25	NITROAROMATICS	SO	N	N	9A09G601
WARP	WRWP-SO005	AD0005	15-Sep-00	0	1.5	HMX	2691-41-0	0.25	U	U	mg/kg	0.25	NITROAROMATICS	SO	N	N	9A09G601
WARP	WRWP-SO001	AD0001	15-Sep-00	0	1	Indeno(1,2,3-cd)pyrene	193-39-5	0.029			mg/kg	0.0049	SEMIVOLATILES	SO	N	Y	9A09G601
WARP	WRWP-SO002	AD0002	15-Sep-00	0	1	Indeno(1,2,3-cd)pyrene	193-39-5	0.0068			mg/kg	0.0051	SEMIVOLATILES	SO	N	Y	9A09G601
WARP	WRWP-SO003	AD0003	15-Sep-00	0	1	Indeno(1,2,3-cd)pyrene	193-39-5	0.0083			mg/kg	0.0051	SEMIVOLATILES	SO	N	Y	9A09G601
WARP	WRWP-SO004	AD0004	15-Sep-00	0	1	Indeno(1,2,3-cd)pyrene	193-39-5	0.0046	J	J	mg/kg	0.0051	SEMIVOLATILES	SO	N	Y	9A09G601
WARP	WRWP-SO005	AD0005	15-Sep-00	0	1.5	Indeno(1,2,3-cd)pyrene	193-39-5	0.0086			mg/kg	0.0053	SEMIVOLATILES	SO	N	Y	9A09G601
WARP	WRWP-SO001	AD0001	15-Sep-00	0	1	Naphthalene	91-20-3	0.049	U	U	mg/kg	0.049	SEMIVOLATILES	SO	N	N	9A09G601
WARP	WRWP-SO002	AD0002	15-Sep-00	0	1	Naphthalene	91-20-3	0.051	U	U	mg/kg	0.051	SEMIVOLATILES	SO	N	N	9A09G601
WARP	WRWP-SO003	AD0003	15-Sep-00	0	1	Naphthalene	91-20-3	0.051	U	U	mg/kg	0.051	SEMIVOLATILES	SO	N	N	9A09G601
WARP	WRWP-SO004	AD0004	15-Sep-00	0	1	Naphthalene	91-20-3	0.051	U	U	mg/kg	0.051	SEMIVOLATILES	SO	N	N	9A09G601
WARP	WRWP-SO005	AD0005	15-Sep-00	0	1.5	Naphthalene	91-20-3	0.053	U	U	mg/kg	0.053	SEMIVOLATILES	SO	N	N	9A09G601
WARP	WRWP-SO001	AD0001	15-Sep-00	0	1	Nitrobenzene	98-95-3	0.1	U	U	mg/kg	0.1	NITROAROMATICS	SO	N	N	9A09G601
WARP	WRWP-SO002	AD0002	15-Sep-00	0	1	Nitrobenzene	98-95-3	0.1	U	U	mg/kg	0.1	NITROAROMATICS	SO	N	N	9A09G601
WARP	WRWP-SO003	AD0003	15-Sep-00	0	1	Nitrobenzene	98-95-3	0.1	U	U	mg/kg	0.1	NITROAROMATICS	SO	N	N	9A09G601
WARP	WRWP-SO004	AD0004	15-Sep-00	0	1	Nitrobenzene	98-95-3	0.1	U	U	mg/kg	0.1	NITROAROMATICS	SO	N	N	9A09G601
WARP	WRWP-SO005	AD0005	15-Sep-00	0	1.5	Nitrobenzene	98-95-3	0.1	U	U	mg/kg	0.1	NITROAROMATICS	SO	N	N	9A09G601
WARP	WRWP-SO001	AD0001	15-Sep-00	0	1	Nitrotoluene, 2-	88-72-2	0.2	U	U	mg/kg	0.2	NITROAROMATICS	SO	N	N	9A09G601

GROUP_ NAME	LOCATION_ CODE	SAMPLE_ NO	SAMPLE_ DATE	START_ DEPTH	END_ DEPTH	PARAMETER	CASNO	RESULT	LAB_ QUAL	VAL_ QUAL	UNITS	DETECT_ LIMIT	USER_TEST_ GROUP	SAMPLE_ TYPE	FILTERED	DETECT	SAMPLE_ DELIVERY _ GROUP
WARP	WRWP-SO002	AD0002	15-Sep-00	0	1	Nitrotoluene, 2-	88-72-2	0.2	U	U	mg/kg	0.2	NITROAROMATICS	SO	N	N	9A09G601
WARP	WRWP-SO003	AD0003	15-Sep-00	0	1	Nitrotoluene, 2-	88-72-2	0.2	U	U	mg/kg	0.2	NITROAROMATICS	SO	N	N	9A09G601
WARP	WRWP-SO004	AD0004	15-Sep-00	0	1	Nitrotoluene, 2-	88-72-2	0.2	U	U	mg/kg	0.2	NITROAROMATICS	SO	N	N	9A09G601
WARP	WRWP-SO005	AD0005	15-Sep-00	0	1.5	Nitrotoluene, 2-	88-72-2	0.2	U	U	mg/kg	0.2	NITROAROMATICS	SO	N	N	9A09G601
WARP	WRWP-SO001	AD0001	15-Sep-00	0	1	Nitrotoluene, 3-	99-08-1	0.2	U	U	mg/kg	0.2	NITROAROMATICS	SO	N	N	9A09G601
WARP	WRWP-SO002	AD0002	15-Sep-00	0	1	Nitrotoluene, 3-	99-08-1	0.2	U	U	mg/kg	0.2	NITROAROMATICS	SO	N	N	9A09G601
WARP	WRWP-SO003	AD0003	15-Sep-00	0	1	Nitrotoluene, 3-	99-08-1	0.2	U	U	mg/kg	0.2	NITROAROMATICS	SO	N	N	9A09G601
WARP	WRWP-SO004	AD0004	15-Sep-00	0	1	Nitrotoluene, 3-	99-08-1	0.2	U	U	mg/kg	0.2	NITROAROMATICS	SO	N	N	9A09G601
WARP	WRWP-SO005	AD0005	15-Sep-00	0	1.5	Nitrotoluene, 3-	99-08-1	0.2	U	U	mg/kg	0.2	NITROAROMATICS	SO	N	N	9A09G601
WARP	WRWP-SO001	AD0001	15-Sep-00	0	1	Nitrotoluene, 4-	99-99-0	0.5	U	U	mg/kg	0.5	NITROAROMATICS	SO	N	N	9A09G601
WARP	WRWP-SO002	AD0002	15-Sep-00	0	1	Nitrotoluene, 4-	99-99-0	0.5	U	U	mg/kg	0.5	NITROAROMATICS	SO	N	N	9A09G601
WARP	WRWP-SO003	AD0003	15-Sep-00	0	1	Nitrotoluene, 4-	99-99-0	0.5	U	U	mg/kg	0.5	NITROAROMATICS	SO	N	N	9A09G601
WARP	WRWP-SO004	AD0004	15-Sep-00	0	1	Nitrotoluene, 4-	99-99-0	0.5	U	U	mg/kg	0.5	NITROAROMATICS	SO	N	N	9A09G601
WARP	WRWP-SO005	AD0005	15-Sep-00	0	1.5	Nitrotoluene, 4-	99-99-0	0.5	U	U	mg/kg	0.5	NITROAROMATICS	SO	N	N	9A09G601
WARP	WRWP-SO001	AD0001	15-Sep-00	0	1	Phenanthrene	85-01-8	0.032			mg/kg	0.004	SEMIVOLATILES	SO	N	Y	9A09G601
WARP	WRWP-SO002	AD0002	15-Sep-00	0	1	Phenanthrene	85-01-8	0.033			mg/kg	0.0041	SEMIVOLATILES	SO	N	Y	9A09G601
WARP	WRWP-SO003	AD0003	15-Sep-00	0	1	Phenanthrene	85-01-8	0.04			mg/kg	0.0041	SEMIVOLATILES	SO	N	Y	9A09G601
WARP	WRWP-SO004	AD0004	15-Sep-00	0	1	Phenanthrene	85-01-8	0.04			mg/kg	0.0041	SEMIVOLATILES	SO	N	Y	9A09G601
WARP	WRWP-SO005	AD0005	15-Sep-00	0	1.5	Phenanthrene	85-01-8	0.032			mg/kg	0.0042	SEMIVOLATILES	SO	N	Y	9A09G601
WARP	WRWP-SO001	AD0001	15-Sep-00	0	1	Pyrene	129-00-0	0.055			mg/kg	0.0099	SEMIVOLATILES	SO	N	Y	9A09G601
WARP	WRWP-SO002	AD0002	15-Sep-00	0	1	Pyrene	129-00-0	0.12			mg/kg	0.01	SEMIVOLATILES	SO	N	Y	9A09G601
WARP	WRWP-SO003	AD0003	15-Sep-00	0	1	Pyrene	129-00-0	0.015			mg/kg	0.01	SEMIVOLATILES	SO	N	Y	9A09G601
WARP	WRWP-SO004	AD0004	15-Sep-00	0	1	Pyrene	129-00-0	0.009	J	J	mg/kg	0.01	SEMIVOLATILES	SO	N	Y	9A09G601
WARP	WRWP-SO005	AD0005	15-Sep-00	0	1.5	Pyrene	129-00-0	0.02			mg/kg	0.01	SEMIVOLATILES	SO	N	Y	9A09G601
WARP	WRWP-SO001	AD0001	15-Sep-00	0	1	RDX	121-82-4	0.1	U	U	mg/kg	0.1	NITROAROMATICS	SO	N	N	9A09G601
WARP	WRWP-SO002	AD0002	15-Sep-00	0	1	RDX	121-82-4	0.1	U	U	mg/kg	0.1	NITROAROMATICS	SO	N	N	9A09G601
WARP	WRWP-SO003	AD0003	15-Sep-00	0	1	RDX	121-82-4	0.1	U	U	mg/kg	0.1	NITROAROMATICS	SO	N	N	9A09G601
WARP	WRWP-SO004	AD0004	15-Sep-00	0	1	RDX	121-82-4	0.1	U	U	mg/kg	0.1	NITROAROMATICS	SO	N	N	9A09G601
WARP	WRWP-SO005	AD0005	15-Sep-00	0	1.5	RDX	121-82-4	0.1	U	U	mg/kg	0.1	NITROAROMATICS	SO	N	N	9A09G601
WARP	WRWP-SO001	AD0001	15-Sep-00	0	1	Tetryl	479-45-8	0.2	U	U	mg/kg	0.2	NITROAROMATICS	SO	N	N	9A09G601
WARP	WRWP-SO002	AD0002	15-Sep-00	0	1	Tetryl	479-45-8	0.2	U	U	mg/kg	0.2	NITROAROMATICS	SO	N	N	9A09G601
WARP	WRWP-SO003	AD0003	15-Sep-00	0	1	Tetryl	479-45-8	0.2	U	U	mg/kg	0.2	NITROAROMATICS	SO	N	N	9A09G601
WARP	WRWP-SO004	AD0004	15-Sep-00	0	1	Tetryl	479-45-8	0.2	U	U	mg/kg	0.2	NITROAROMATICS	SO	N	N	9A09G601
WARP	WRWP-SO005	AD0005	15-Sep-00	0	1.5	Tetryl	479-45-8	0.2	U	U	mg/kg	0.2	NITROAROMATICS	SO	N	N	9A09G601
WARP	WRWP-SO001	AD0001	15-Sep-00	0	1	Trinitrobenzene, 1,3,5-	99-35-4	0.1	U	U	mg/kg	0.1	NITROAROMATICS	SO	N	N	9A09G601
WARP	WRWP-SO002	AD0002	15-Sep-00	0	1	Trinitrobenzene, 1,3,5-	99-35-4	0.1	U	U	mg/kg	0.1	NITROAROMATICS	SO	N	N	9A09G601
WARP	WRWP-SO003	AD0003	15-Sep-00	0	1	Trinitrobenzene, 1,3,5-	99-35-4	0.1	U	U	mg/kg	0.1	NITROAROMATICS	SO	N	N	9A09G601
WARP	WRWP-SO004	AD0004	15-Sep-00	0	1	Trinitrobenzene, 1,3,5-	99-35-4	0.1	U	U	mg/kg	0.1	NITROAROMATICS	SO	N	N	9A09G601
WARP	WRWP-SO005	AD0005	15-Sep-00	0	1.5	Trinitrobenzene, 1,3,5-	99-35-4	0.1	U	U	mg/kg	0.1	NITROAROMATICS	SO	N	N	9A09G601
WARP	WRWP-SO001	AD0001	15-Sep-00	0	1	Trinitrotoluene, 2,4,6-	118-96-7	0.1	U	U	mg/kg	0.1	NITROAROMATICS	SO	N	N	9A09G601
WARP	WRWP-SO002	AD0002	15-Sep-00	0	1	Trinitrotoluene, 2,4,6-	118-96-7	0.1	U	U	mg/kg	0.1	NITROAROMATICS	SO	N	N	9A09G601
WARP	WRWP-SO003	AD0003	15-Sep-00	0	1	Trinitrotoluene, 2,4,6-	118-96-7	0.1	U	U	mg/kg	0.1	NITROAROMATICS	SO	N	N	9A09G601
WARP	WRWP-SO004	AD0004	15-Sep-00	0	1	Trinitrotoluene, 2,4,6-	118-96-7	0.1	U	U	mg/kg	0.1	NITROAROMATICS	SO	N	N	9A09G601
WARP	WRWP-SO005	AD0005	15-Sep-00	0	1.5	Trinitrotoluene, 2,4,6-	118-96-7	0.1	U	U	mg/kg	0.1	NITROAROMATICS	SO	N	N	9A09G601
WARP	WRWP-SW006	AD2006	13-Sep-00			Aluminum	7429-90-5	286			ug/L	72.7	METALS	SW	N	Y	9A09G602
WARP	WRWP-SW007	AD2007	13-Sep-00			Aluminum	7429-90-5	888			ug/L	72.7	METALS	SW	N	Y	9A09G602
WARP	WRWP-SW008	AD2008	13-Sep-00			Aluminum	7429-90-5	313			ug/L	72.7	METALS	SW	N	Y	9A09G602
WARP	WRWP-SW009	AD2009	13-Sep-00			Aluminum	7429-90-5	13500			ug/L	72.7	METALS	SW	N	Y	9A09G602
WARP	WRWP-SW010	AD2010	13-Sep-00			Aluminum	7429-90-5	2610			ug/L	72.7	METALS	SW	N	Y	9A09G602
WARP	WRWP-SW006	AD2006	13-Sep-00			Antimony	7440-36-0	5.5	U	U	ug/L	5.5	METALS	SW	N	N	9A09G602

GROUP_ NAME	LOCATION_ CODE	SAMPLE_ NO	SAMPLE_ DATE	START_ DEPTH	END_ DEPTH	PARAMETER	CASNO	RESULT	LAB_ QUAL	VAL_ QUAL	UNITS	DETECT_ LIMIT	USER_TEST_ GROUP	SAMPLE_ TYPE	FILTERED	DETECT	SAMPLE_ DELIVERY _ GROUP
WARP	WRWP-SW007	AD2007	13-Sep-00			Antimony	7440-36-0	5.5	U	U	ug/L	5.5	METALS	SW	N	N	9A09G602
WARP	WRWP-SW008	AD2008	13-Sep-00			Antimony	7440-36-0	5.5	U	U	ug/L	5.5	METALS	SW	N	N	9A09G602
WARP	WRWP-SW009	AD2009	13-Sep-00			Antimony	7440-36-0	5.5	U	U	ug/L	5.5	METALS	SW	N	N	9A09G602
WARP	WRWP-SW010	AD2010	13-Sep-00			Antimony	7440-36-0	5.5	U	U	ug/L	5.5	METALS	SW	N	N	9A09G602
WARP	WRWP-SW006	AD2006	13-Sep-00			Arsenic	7440-38-2	9.6			ug/L	4.4	METALS	SW	N	Y	9A09G602
WARP	WRWP-SW007	AD2007	13-Sep-00			Arsenic	7440-38-2	7.2			ug/L	4.4	METALS	SW	N	Y	9A09G602
WARP	WRWP-SW008	AD2008	13-Sep-00			Arsenic	7440-38-2	7.1			ug/L	4.4	METALS	SW	N	Y	9A09G602
WARP	WRWP-SW009	AD2009	13-Sep-00			Arsenic	7440-38-2	10.7			ug/L	4.4	METALS	SW	N	Y	9A09G602
WARP	WRWP-SW010	AD2010	13-Sep-00			Arsenic	7440-38-2	4.4	U	U	ug/L	4.4	METALS	SW	N	N	9A09G602
WARP	WRWP-SW006	AD2006	13-Sep-00			Barium	7440-39-3	18.3			ug/L	0.3	METALS	SW	N	Y	9A09G602
WARP	WRWP-SW007	AD2007	13-Sep-00			Barium	7440-39-3	22			ug/L	0.3	METALS	SW	N	Y	9A09G602
WARP	WRWP-SW008	AD2008	13-Sep-00			Barium	7440-39-3	20.4			ug/L	0.3	METALS	SW	N	Y	9A09G602
WARP	WRWP-SW009	AD2009	13-Sep-00			Barium	7440-39-3	131			ug/L	0.3	METALS	SW	N	Y	9A09G602
WARP	WRWP-SW010	AD2010	13-Sep-00			Barium	7440-39-3	57.1			ug/L	0.3	METALS	SW	N	Y	9A09G602
WARP	WRWP-SW006	AD2006	13-Sep-00			Calcium	7440-70-2	15400			ug/L	71.9	METALS	SW	N	Y	9A09G602
WARP	WRWP-SW007	AD2007	13-Sep-00			Calcium	7440-70-2	18800			ug/L	71.9	METALS	SW	N	Y	9A09G602
WARP	WRWP-SW008	AD2008	13-Sep-00			Calcium	7440-70-2	16000			ug/L	71.9	METALS	SW	N	Y	9A09G602
WARP	WRWP-SW009	AD2009	13-Sep-00			Calcium	7440-70-2	21800			ug/L	71.9	METALS	SW	N	Y	9A09G602
WARP	WRWP-SW010	AD2010	13-Sep-00			Calcium	7440-70-2	69600			ug/L	71.9	METALS	SW	N	Y	9A09G602
WARP	WRWP-SW006	AD2006	13-Sep-00			Chromium	7440-47-3	0.8	U	U	ug/L	0.8	METALS	SW	N	N	9A09G602
WARP	WRWP-SW007	AD2007	13-Sep-00			Chromium	7440-47-3	2.5		B	ug/L	0.8	METALS	SW	N	Y	9A09G602
WARP	WRWP-SW008	AD2008	13-Sep-00			Chromium	7440-47-3	1.2		B	ug/L	0.8	METALS	SW	N	Y	9A09G602
WARP	WRWP-SW009	AD2009	13-Sep-00			Chromium	7440-47-3	19.8			ug/L	0.8	METALS	SW	N	Y	9A09G602
WARP	WRWP-SW010	AD2010	13-Sep-00			Chromium	7440-47-3	3.3		B	ug/L	0.8	METALS	SW	N	Y	9A09G602
WARP	WRWP-SW006	AD2006	13-Sep-00			Cobalt	7440-48-4	1.1	U	U	ug/L	1.1	METALS	SW	N	N	9A09G602
WARP	WRWP-SW007	AD2007	13-Sep-00			Cobalt	7440-48-4	1.6			ug/L	1.1	METALS	SW	N	Y	9A09G602
WARP	WRWP-SW008	AD2008	13-Sep-00			Cobalt	7440-48-4	1.1	U	U	ug/L	1.1	METALS	SW	N	N	9A09G602
WARP	WRWP-SW009	AD2009	13-Sep-00			Cobalt	7440-48-4	18.7			ug/L	1.1	METALS	SW	N	Y	9A09G602
WARP	WRWP-SW010	AD2010	13-Sep-00			Cobalt	7440-48-4	2.1			ug/L	1.1	METALS	SW	N	Y	9A09G602
WARP	WRWP-SW006	AD2006	13-Sep-00			Copper	7440-50-8	3			ug/L	1.3	METALS	SW	N	Y	9A09G602
WARP	WRWP-SW007	AD2007	13-Sep-00			Copper	7440-50-8	2.9			ug/L	1.3	METALS	SW	N	Y	9A09G602
WARP	WRWP-SW008	AD2008	13-Sep-00			Copper	7440-50-8	1.4			ug/L	1.3	METALS	SW	N	Y	9A09G602
WARP	WRWP-SW009	AD2009	13-Sep-00			Copper	7440-50-8	20.5			ug/L	1.3	METALS	SW	N	Y	9A09G602
WARP	WRWP-SW010	AD2010	13-Sep-00			Copper	7440-50-8	7.2			ug/L	1.3	METALS	SW	N	Y	9A09G602
WARP	WRWP-SW006	AD2006	13-Sep-00			Iron	7439-89-6	331			ug/L	23.3	METALS	SW	N	Y	9A09G602
WARP	WRWP-SW007	AD2007	13-Sep-00			Iron	7439-89-6	1060			ug/L	23.3	METALS	SW	N	Y	9A09G602
WARP	WRWP-SW008	AD2008	13-Sep-00			Iron	7439-89-6	284			ug/L	23.3	METALS	SW	N	Y	9A09G602
WARP	WRWP-SW009	AD2009	13-Sep-00			Iron	7439-89-6	26000			ug/L	23.3	METALS	SW	N	Y	9A09G602
WARP	WRWP-SW010	AD2010	13-Sep-00			Iron	7439-89-6	2980			ug/L	23.3	METALS	SW	N	Y	9A09G602
WARP	WRWP-SW006	AD2006	13-Sep-00			Lead	7439-92-1	2.6	U	U	ug/L	2.6	METALS	SW	N	N	9A09G602
WARP	WRWP-SW007	AD2007	13-Sep-00			Lead	7439-92-1	2.6	U	U	ug/L	2.6	METALS	SW	N	N	9A09G602
WARP	WRWP-SW008	AD2008	13-Sep-00			Lead	7439-92-1	2.6	U	U	ug/L	2.6	METALS	SW	N	N	9A09G602
WARP	WRWP-SW009	AD2009	13-Sep-00			Lead	7439-92-1	16.8			ug/L	2.6	METALS	SW	N	Y	9A09G602
WARP	WRWP-SW010	AD2010	13-Sep-00			Lead	7439-92-1	2.8			ug/L	2.6	METALS	SW	N	Y	9A09G602
WARP	WRWP-SW006	AD2006	13-Sep-00			Magnesium	7439-95-4	29700			ug/L	72.8	METALS	SW	N	Y	9A09G602
WARP	WRWP-SW007	AD2007	13-Sep-00			Magnesium	7439-95-4	43600			ug/L	72.8	METALS	SW	N	Y	9A09G602
WARP	WRWP-SW008	AD2008	13-Sep-00			Magnesium	7439-95-4	34000			ug/L	72.8	METALS	SW	N	Y	9A09G602
WARP	WRWP-SW009	AD2009	13-Sep-00			Magnesium	7439-95-4	9040			ug/L	72.8	METALS	SW	N	Y	9A09G602
WARP	WRWP-SW010	AD2010	13-Sep-00			Magnesium	7439-95-4	15500			ug/L	72.8	METALS	SW	N	Y	9A09G602
WARP	WRWP-SW006	AD2006	13-Sep-00			Manganese	7439-96-5	91.3			ug/L	1.4	METALS	SW	N	Y	9A09G602

GROUP_ NAME	LOCATION_ CODE	SAMPLE_ NO	SAMPLE_ DATE	START_ DEPTH	END_ DEPTH	PARAMETER	CASNO	RESULT	LAB_ QUAL	VAL_ QUAL	UNITS	DETECT_ LIMIT	USER_TEST_ GROUP	SAMPLE_ TYPE	FILTERED	DETECT	SAMPLE_ DELIVERY _ GROUP
WARP	WRWP-SW007	AD2007	13-Sep-00			Manganese	7439-96-5	265			ug/L	1.4	METALS	SW	N	Y	9A09G602
WARP	WRWP-SW008	AD2008	13-Sep-00			Manganese	7439-96-5	130			ug/L	1.4	METALS	SW	N	Y	9A09G602
WARP	WRWP-SW009	AD2009	13-Sep-00			Manganese	7439-96-5	2960			ug/L	1.4	METALS	SW	N	Y	9A09G602
WARP	WRWP-SW010	AD2010	13-Sep-00			Manganese	7439-96-5	104			ug/L	1.4	METALS	SW	N	Y	9A09G602
WARP	WRWP-SW006	AD2006	13-Sep-00			Nickel	7440-02-0	2.1			ug/L	1.6	METALS	SW	N	Y	9A09G602
WARP	WRWP-SW007	AD2007	13-Sep-00			Nickel	7440-02-0	3.2			ug/L	1.6	METALS	SW	N	Y	9A09G602
WARP	WRWP-SW008	AD2008	13-Sep-00			Nickel	7440-02-0	2.1			ug/L	1.6	METALS	SW	N	Y	9A09G602
WARP	WRWP-SW009	AD2009	13-Sep-00			Nickel	7440-02-0	32.7			ug/L	1.6	METALS	SW	N	Y	9A09G602
WARP	WRWP-SW010	AD2010	13-Sep-00			Nickel	7440-02-0	8.9			ug/L	1.6	METALS	SW	N	Y	9A09G602
WARP	WRWP-SW006	AD2006	13-Sep-00			Phosphorous	7723-14-0	0.26			mg/L	0.05	GEN CHEMISTRY	SW	N	Y	9A09G602
WARP	WRWP-SW007	AD2007	13-Sep-00			Phosphorous	7723-14-0	0.37			mg/L	0.05	GEN CHEMISTRY	SW	N	Y	9A09G602
WARP	WRWP-SW008	AD2008	13-Sep-00			Phosphorous	7723-14-0	0.26			mg/L	0.05	GEN CHEMISTRY	SW	N	Y	9A09G602
WARP	WRWP-SW009	AD2009	13-Sep-00			Phosphorous	7723-14-0	0.05	U	U	mg/L	0.05	GEN CHEMISTRY	SW	N	N	9A09G602
WARP	WRWP-SW010	AD2010	13-Sep-00			Phosphorous	7723-14-0	0.21			mg/L	0.05	GEN CHEMISTRY	SW	N	Y	9A09G602
WARP	WRWP-SW006	AD2006	13-Sep-00			Potassium	2023695	878		B	ug/L	91.2	METALS	SW	N	Y	9A09G602
WARP	WRWP-SW007	AD2007	13-Sep-00			Potassium	2023695	1810			ug/L	91.2	METALS	SW	N	Y	9A09G602
WARP	WRWP-SW008	AD2008	13-Sep-00			Potassium	2023695	726		B	ug/L	91.2	METALS	SW	N	Y	9A09G602
WARP	WRWP-SW009	AD2009	13-Sep-00			Potassium	2023695	12800			ug/L	91.2	METALS	SW	N	Y	9A09G602
WARP	WRWP-SW010	AD2010	13-Sep-00			Potassium	2023695	5060			ug/L	91.2	METALS	SW	N	Y	9A09G602
WARP	WRWP-SW006	AD2006	13-Sep-00			Sodium	7440-23-5	56000			ug/L	274	METALS	SW	N	Y	9A09G602
WARP	WRWP-SW007	AD2007	13-Sep-00			Sodium	7440-23-5	63200			ug/L	274	METALS	SW	N	Y	9A09G602
WARP	WRWP-SW008	AD2008	13-Sep-00			Sodium	7440-23-5	58400			ug/L	274	METALS	SW	N	Y	9A09G602
WARP	WRWP-SW009	AD2009	13-Sep-00			Sodium	7440-23-5	27100			ug/L	274	METALS	SW	N	Y	9A09G602
WARP	WRWP-SW010	AD2010	13-Sep-00			Sodium	7440-23-5	20100			ug/L	274	METALS	SW	N	Y	9A09G602
WARP	WRWP-SW006	AD2006	13-Sep-00			Vanadium	7440-62-2	7.5		B	ug/L	2.1	METALS	SW	N	Y	9A09G602
WARP	WRWP-SW007	AD2007	13-Sep-00			Vanadium	7440-62-2	9.7		B	ug/L	2.1	METALS	SW	N	Y	9A09G602
WARP	WRWP-SW008	AD2008	13-Sep-00			Vanadium	7440-62-2	7.9		B	ug/L	2.1	METALS	SW	N	Y	9A09G602
WARP	WRWP-SW009	AD2009	13-Sep-00			Vanadium	7440-62-2	32.7		B	ug/L	2.1	METALS	SW	N	Y	9A09G602
WARP	WRWP-SW010	AD2010	13-Sep-00			Vanadium	7440-62-2	7.6		B	ug/L	2.1	METALS	SW	N	Y	9A09G602
WARP	WRWP-SW006	AD2006	13-Sep-00			Zinc	7440-66-6	14			ug/L	0.6	METALS	SW	N	Y	9A09G602
WARP	WRWP-SW007	AD2007	13-Sep-00			Zinc	7440-66-6	11.3			ug/L	0.6	METALS	SW	N	Y	9A09G602
WARP	WRWP-SW008	AD2008	13-Sep-00			Zinc	7440-66-6	31.9			ug/L	0.6	METALS	SW	N	Y	9A09G602
WARP	WRWP-SW009	AD2009	13-Sep-00			Zinc	7440-66-6	145			ug/L	0.6	METALS	SW	N	Y	9A09G602
WARP	WRWP-SW010	AD2010	13-Sep-00			Zinc	7440-66-6	19.9			ug/L	0.6	METALS	SW	N	Y	9A09G602
PRRP	PRWP-BI001	AC4001	14-Sep-00			Aluminum	7429-90-5	148	*	J	mg/kg	8.4	METALS	BI	N	Y	1227
PRRP	PRWP-BI002	AC4002	14-Sep-00			Aluminum	7429-90-5	541	*	J	mg/kg	8.5	METALS	BI	N	Y	1227
PRRP	PRWP-BI003	AC4003	14-Sep-00			Aluminum	7429-90-5	183	*	J	mg/kg	8.4	METALS	BI	N	Y	1227
PRRP	PRWP-BI011	AC4011	28-Nov-00	0	0	Amino-2,6-dinitrotoluene, 4-	19406-51-0	0.5	U	UJ	mg/kg	0.5	NITROAROMATICS	BI	N	N	200145
PRRP	PRWP-BI011	AC4011	28-Nov-00	0	0	Amino-4,6-dinitrotoluene, 2-	35572-78-2	0.5	U	UJ	mg/kg	0.5	NITROAROMATICS	BI	N	N	200145
PRRP	PRWP-BI001	AC4001	14-Sep-00			Antimony	7440-36-0	0.16	B	B	mg/kg	0.069	METALS	BI	N	Y	1227
PRRP	PRWP-BI002	AC4002	14-Sep-00			Antimony	7440-36-0	0.13	B	B	mg/kg	0.07	METALS	BI	N	Y	1227
PRRP	PRWP-BI003	AC4003	14-Sep-00			Antimony	7440-36-0	0.08	B	B	mg/kg	0.07	METALS	BI	N	Y	1227
PRRP	PRWP-BI001	AC4001	14-Sep-00			Arsenic	7440-38-2	0.53	U	U	mg/kg	0.53	METALS	BI	N	N	1227
PRRP	PRWP-BI002	AC4002	14-Sep-00			Arsenic	7440-38-2	1.5	B	J	mg/kg	0.53	METALS	BI	N	Y	1227
PRRP	PRWP-BI003	AC4003	14-Sep-00			Arsenic	7440-38-2	0.53	U	U	mg/kg	0.53	METALS	BI	N	N	1227
PRRP	PRWP-BI001	AC4001	14-Sep-00			Barium	7440-39-3	5.9	B	J	mg/kg	0.59	METALS	BI	N	Y	1227
PRRP	PRWP-BI002	AC4002	14-Sep-00			Barium	7440-39-3	24			mg/kg	0.59	METALS	BI	N	Y	1227
PRRP	PRWP-BI003	AC4003	14-Sep-00			Barium	7440-39-3	21.3			mg/kg	0.59	METALS	BI	N	Y	1227
PRRP	PRWP-BI001	AC4001	14-Sep-00			Calcium	7440-70-2	8310			mg/kg	62.1	METALS	BI	N	Y	1227
PRRP	PRWP-BI002	AC4002	14-Sep-00			Calcium	7440-70-2	9670			mg/kg	62.4	METALS	BI	N	Y	1227

GROUP_ NAME	LOCATION_ CODE	SAMPLE_ NO	SAMPLE_ DATE	START_ DEPTH	END_ DEPTH	PARAMETER	CASNO	RESULT	LAB_ QUAL	VAL_ QUAL	UNITS	DETECT_ LIMIT	USER_TEST_ GROUP	SAMPLE_ TYPE	FILTERED	DETECT	SAMPLE_ DELIVERY _ GROUP
PRRP	PRWP-BI003	AC4003	14-Sep-00			Calcium	7440-70-2	23200			mg/kg	62.2	METALS	BI	N	Y	1227
PRRP	PRWP-BI001	AC4001	14-Sep-00			Chromium	7440-47-3	0.72	B	J	mg/kg	0.099	METALS	BI	N	Y	1227
PRRP	PRWP-BI002	AC4002	14-Sep-00			Chromium	7440-47-3	1.2			mg/kg	0.1	METALS	BI	N	Y	1227
PRRP	PRWP-BI003	AC4003	14-Sep-00			Chromium	7440-47-3	0.56	B	J	mg/kg	0.099	METALS	BI	N	Y	1227
PRRP	PRWP-BI001	AC4001	14-Sep-00			Cobalt	7440-48-4	0.38	U	U	mg/kg	0.38	METALS	BI	N	N	1227
PRRP	PRWP-BI002	AC4002	14-Sep-00			Cobalt	7440-48-4	1	B	B	mg/kg	0.38	METALS	BI	N	Y	1227
PRRP	PRWP-BI003	AC4003	14-Sep-00			Cobalt	7440-48-4	0.38	U	U	mg/kg	0.38	METALS	BI	N	N	1227
PRRP	PRWP-BI001	AC4001	14-Sep-00			Copper	7440-50-8	0.43	B	J	mg/kg	0.42	METALS	BI	N	Y	1227
PRRP	PRWP-BI002	AC4002	14-Sep-00			Copper	7440-50-8	1.7			mg/kg	0.42	METALS	BI	N	Y	1227
PRRP	PRWP-BI003	AC4003	14-Sep-00			Copper	7440-50-8	16.6			mg/kg	0.42	METALS	BI	N	Y	1227
PRRP	PRWP-BI011	AC4011	28-Nov-00	0	0	Dinitrobenzene, 1,3-	99-65-0	0.25	U	U	mg/kg	0.25	NITROAROMATICS	BI	N	N	200145
PRRP	PRWP-BI011	AC4011	28-Nov-00	0	0	Dinitrotoluene, 2,4-	121-14-2	0.25	U	U	mg/kg	0.25	NITROAROMATICS	BI	N	N	200145
PRRP	PRWP-BI011	AC4011	28-Nov-00	0	0	Dinitrotoluene, 2,6-	606-20-2	0.5	U	U	mg/kg	0.5	NITROAROMATICS	BI	N	N	200145
PRRP	PRWP-BI011	AC4011	28-Nov-00	0	0	HMX	2691-41-0	0.5	U	UJ	mg/kg	0.5	NITROAROMATICS	BI	N	N	200145
PRRP	PRWP-BI001	AC4001	14-Sep-00			Iron	7439-89-6	442	N*	J	mg/kg	13.6	METALS	BI	N	Y	1227
PRRP	PRWP-BI002	AC4002	14-Sep-00			Iron	7439-89-6	2900	N*	J	mg/kg	13.7	METALS	BI	N	Y	1227
PRRP	PRWP-BI003	AC4003	14-Sep-00			Iron	7439-89-6	696	N*	J	mg/kg	13.7	METALS	BI	N	Y	1227
PRRP	PRWP-BI001	AC4001	14-Sep-00			Lead	7439-92-1	0.36	B	B	mg/kg	0.22	METALS	BI	N	Y	1227
PRRP	PRWP-BI002	AC4002	14-Sep-00			Lead	7439-92-1	1.4		B	mg/kg	0.22	METALS	BI	N	Y	1227
PRRP	PRWP-BI003	AC4003	14-Sep-00			Lead	7439-92-1	0.55	B	B	mg/kg	0.22	METALS	BI	N	Y	1227
PRRP	PRWP-BI001	AC4001	14-Sep-00			Magnesium	7439-95-4	541			mg/kg	49	METALS	BI	N	Y	1227
PRRP	PRWP-BI002	AC4002	14-Sep-00			Magnesium	7439-95-4	1360			mg/kg	49.3	METALS	BI	N	Y	1227
PRRP	PRWP-BI003	AC4003	14-Sep-00			Magnesium	7439-95-4	642			mg/kg	49.1	METALS	BI	N	Y	1227
PRRP	PRWP-BI001	AC4001	14-Sep-00			Manganese	7439-96-5	16.3			mg/kg	1	METALS	BI	N	Y	1227
PRRP	PRWP-BI002	AC4002	14-Sep-00			Manganese	7439-96-5	68.8			mg/kg	1	METALS	BI	N	Y	1227
PRRP	PRWP-BI003	AC4003	14-Sep-00			Manganese	7439-96-5	89.7			mg/kg	1	METALS	BI	N	Y	1227
PRRP	PRWP-BI001	AC4001	14-Sep-00			Nickel	7440-02-0	0.58	B	J	mg/kg	0.29	METALS	BI	N	Y	1227
PRRP	PRWP-BI002	AC4002	14-Sep-00			Nickel	7440-02-0	2.2			mg/kg	0.29	METALS	BI	N	Y	1227
PRRP	PRWP-BI003	AC4003	14-Sep-00			Nickel	7440-02-0	0.66	B	J	mg/kg	0.29	METALS	BI	N	Y	1227
PRRP	PRWP-BI011	AC4011	28-Nov-00	0	0	Nitrobenzene	98-95-3	0.25	U	U	mg/kg	0.25	NITROAROMATICS	BI	N	N	200145
PRRP	PRWP-BI011	AC4011	28-Nov-00	0	0	Nitrotoluene, 2-	88-72-2	0.5	U	U	mg/kg	0.5	NITROAROMATICS	BI	N	N	200145
PRRP	PRWP-BI011	AC4011	28-Nov-00	0	0	Nitrotoluene, 3-	99-08-1	0.5	U	U	mg/kg	0.5	NITROAROMATICS	BI	N	N	200145
PRRP	PRWP-BI011	AC4011	28-Nov-00	0	0	Nitrotoluene, 4-	99-99-0	0.5	U	U	mg/kg	0.5	NITROAROMATICS	BI	N	N	200145
PRRP	PRWP-BI001	AC4001	14-Sep-00			PERCENT LIPIDS	LIPIDS	1.4			Percent	0.1	GEN CHEMISTRY	BI	N	Y	1227
PRRP	PRWP-BI002	AC4002	14-Sep-00			PERCENT LIPIDS	LIPIDS	1.3			Percent	0.1	GEN CHEMISTRY	BI	N	Y	1227
PRRP	PRWP-BI003	AC4003	14-Sep-00			PERCENT LIPIDS	LIPIDS	0.69			Percent	0.1	GEN CHEMISTRY	BI	N	Y	1227
PRRP	PRWP-BI001	AC4001	14-Sep-00			Phosphorous	7723-14-0	124		J	mg/kg	5	GEN CHEMISTRY	BI	N	Y	1227
PRRP	PRWP-BI002	AC4002	14-Sep-00			Phosphorous	7723-14-0	162		J	mg/kg	5	GEN CHEMISTRY	BI	N	Y	1227
PRRP	PRWP-BI003	AC4003	14-Sep-00			Phosphorous	7723-14-0	173		J	mg/kg	5	GEN CHEMISTRY	BI	N	Y	1227
PRRP	PRWP-BI001	AC4001	14-Sep-00			Potassium	2023695	2440			mg/kg	137	METALS	BI	N	Y	1227
PRRP	PRWP-BI002	AC4002	14-Sep-00			Potassium	2023695	1840			mg/kg	138	METALS	BI	N	Y	1227
PRRP	PRWP-BI003	AC4003	14-Sep-00			Potassium	2023695	2120			mg/kg	137	METALS	BI	N	Y	1227
PRRP	PRWP-BI011	AC4011	28-Nov-00	0	0	RDX	121-82-4	0.5	U	U	mg/kg	0.5	NITROAROMATICS	BI	N	N	200145
PRRP	PRWP-BI001	AC4001	14-Sep-00			Sodium	7440-23-5	727	B	J	mg/kg	243	METALS	BI	N	Y	1227
PRRP	PRWP-BI002	AC4002	14-Sep-00			Sodium	7440-23-5	1140			mg/kg	244	METALS	BI	N	Y	1227
PRRP	PRWP-BI003	AC4003	14-Sep-00			Sodium	7440-23-5	1620			mg/kg	243	METALS	BI	N	Y	1227
PRRP	PRWP-BI011	AC4011	28-Nov-00	0	0	Tetryl	479-45-8	0.75	U	U	mg/kg	0.75	NITROAROMATICS	BI	N	N	200145
PRRP	PRWP-BI011	AC4011	28-Nov-00	0	0	Trinitrobenzene, 1,3,5-	99-35-4	0.25	U	U	mg/kg	0.25	NITROAROMATICS	BI	N	N	200145
PRRP	PRWP-BI011	AC4011	28-Nov-00	0	0	Trinitrotoluene, 2,4,6-	118-96-7	0.5	U	U	mg/kg	0.5	NITROAROMATICS	BI	N	N	200145
PRRP	PRWP-BI001	AC4001	14-Sep-00			Vanadium	7440-62-2	0.58	B	J	mg/kg	0.28	METALS	BI	N	Y	1227

GROUP_ NAME	LOCATION_ CODE	SAMPLE_ NO	SAMPLE_ DATE	START_ DEPTH	END_ DEPTH	PARAMETER	CASNO	RESULT	LAB_ QUAL	VAL_ QUAL	UNITS	DETECT_ LIMIT	USER_TEST_ GROUP	SAMPLE_ TYPE	FILTERED	DETECT	SAMPLE_ DELIVERY _GROUP
PRRP	PRWP-BI002	AC4002	14-Sep-00			Vanadium	7440-62-2	1.2	B	J	mg/kg	0.28	METALS	BI	N	Y	1227
PRRP	PRWP-BI003	AC4003	14-Sep-00			Vanadium	7440-62-2	0.38	B	J	mg/kg	0.28	METALS	BI	N	Y	1227
PRRP	PRWP-BI001	AC4001	14-Sep-00			Zinc	7440-66-6	27.3			mg/kg	9.8	METALS	BI	N	Y	1227
PRRP	PRWP-BI002	AC4002	14-Sep-00			Zinc	7440-66-6	26			mg/kg	9.7	METALS	BI	N	Y	1227
PRRP	PRWP-BI003	AC4003	14-Sep-00			Zinc	7440-66-6	19.3	B	J	mg/kg	9.7	METALS	BI	N	Y	1227
PRRP	PRWP-SD001	AC1001	15-Sep-00	0	0	% Solids	38992	43.6			Percent	0.1	GEN CHEMISTRY	SD	N	Y	9A09G601
PRRP	PRWP-SD002	AC1002	15-Sep-00	0	0.5	% Solids	38992	60			Percent	0.1	GEN CHEMISTRY	SD	N	Y	9A09G601
PRRP	PRWP-SD003	AC1003	15-Sep-00	0	0.5	% Solids	38992	72			Percent	0.1	GEN CHEMISTRY	SD	N	Y	9A09G601
PRRP	PRWP-SD004	AC1004	15-Sep-00	0	0.5	% Solids	38992	74.3			Percent	0.1	GEN CHEMISTRY	SD	N	Y	9A09G601
PRRP	PRWP-SD005	AC1005	15-Sep-00	0	0.5	% Solids	38992	60.7			Percent	0.1	GEN CHEMISTRY	SD	N	Y	9A09G601
PRRP	PRWP-SD001	AC1001	15-Sep-00	0	0	Acenaphthene	83-32-9	0.33	U	U	mg/kg	0.33	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD002	AC1002	15-Sep-00	0	0.5	Acenaphthene	83-32-9	0.55	U	U	mg/kg	0.55	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD003	AC1003	15-Sep-00	0	0.5	Acenaphthene	83-32-9	0.46	U	U	mg/kg	0.46	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD004	AC1004	15-Sep-00	0	0.5	Acenaphthene	83-32-9	0.45	U	U	mg/kg	0.45	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD005	AC1005	15-Sep-00	0	0.5	Acenaphthene	83-32-9	0.54	U	U	mg/kg	0.54	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD001	AC1001	15-Sep-00	0	0	Acenaphthylene	208-96-8	0.33	U	U	mg/kg	0.33	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD002	AC1002	15-Sep-00	0	0.5	Acenaphthylene	208-96-8	0.55	U	U	mg/kg	0.55	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD003	AC1003	15-Sep-00	0	0.5	Acenaphthylene	208-96-8	0.46	U	U	mg/kg	0.46	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD004	AC1004	15-Sep-00	0	0.5	Acenaphthylene	208-96-8	0.45	U	U	mg/kg	0.45	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD005	AC1005	15-Sep-00	0	0.5	Acenaphthylene	208-96-8	0.54	U	U	mg/kg	0.54	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD001	AC1001	15-Sep-00	0	0	Aluminum	7429-90-5	6520			mg/kg	12.7	METALS	SD	N	Y	9A09G601
PRRP	PRWP-SD002	AC1002	15-Sep-00	0	0.5	Aluminum	7429-90-5	5570			mg/kg	9.1	METALS	SD	N	Y	9A09G601
PRRP	PRWP-SD003	AC1003	15-Sep-00	0	0.5	Aluminum	7429-90-5	8420			mg/kg	8.3	METALS	SD	N	Y	9A09G601
PRRP	PRWP-SD004	AC1004	15-Sep-00	0	0.5	Aluminum	7429-90-5	5840			mg/kg	7.4	METALS	SD	N	Y	9A09G601
PRRP	PRWP-SD005	AC1005	15-Sep-00	0	0.5	Aluminum	7429-90-5	6880			mg/kg	9.5	METALS	SD	N	Y	9A09G601
PRRP	PRWP-SD001	AC1001	15-Sep-00	0	0	Anthracene	120-12-7	0.33	U	U	mg/kg	0.33	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD002	AC1002	15-Sep-00	0	0.5	Anthracene	120-12-7	0.55	U	U	mg/kg	0.55	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD003	AC1003	15-Sep-00	0	0.5	Anthracene	120-12-7	0.46	U	U	mg/kg	0.46	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD004	AC1004	15-Sep-00	0	0.5	Anthracene	120-12-7	0.45	U	U	mg/kg	0.45	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD005	AC1005	15-Sep-00	0	0.5	Anthracene	120-12-7	0.54	U	U	mg/kg	0.54	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD001	AC1001	15-Sep-00	0	0	Antimony	7440-36-0	0.96	U	UJ	mg/kg	0.96	METALS	SD	N	N	9A09G601
PRRP	PRWP-SD002	AC1002	15-Sep-00	0	0.5	Antimony	7440-36-0	0.69	U	UJ	mg/kg	0.69	METALS	SD	N	N	9A09G601
PRRP	PRWP-SD003	AC1003	15-Sep-00	0	0.5	Antimony	7440-36-0	0.63	U	UJ	mg/kg	0.63	METALS	SD	N	N	9A09G601
PRRP	PRWP-SD004	AC1004	15-Sep-00	0	0.5	Antimony	7440-36-0	0.56	U	UJ	mg/kg	0.56	METALS	SD	N	N	9A09G601
PRRP	PRWP-SD005	AC1005	15-Sep-00	0	0.5	Antimony	7440-36-0	0.72	U	UJ	mg/kg	0.72	METALS	SD	N	N	9A09G601
PRRP	PRWP-SD001	AC1001	15-Sep-00	0	0	Arsenic	7440-38-2	5.7			mg/kg	0.77	METALS	SD	N	Y	9A09G601
PRRP	PRWP-SD002	AC1002	15-Sep-00	0	0.5	Arsenic	7440-38-2	5.6			mg/kg	0.55	METALS	SD	N	Y	9A09G601
PRRP	PRWP-SD003	AC1003	15-Sep-00	0	0.5	Arsenic	7440-38-2	5			mg/kg	0.51	METALS	SD	N	Y	9A09G601
PRRP	PRWP-SD004	AC1004	15-Sep-00	0	0.5	Arsenic	7440-38-2	6.3			mg/kg	0.45	METALS	SD	N	Y	9A09G601
PRRP	PRWP-SD005	AC1005	15-Sep-00	0	0.5	Arsenic	7440-38-2	7.7			mg/kg	0.58	METALS	SD	N	Y	9A09G601
PRRP	PRWP-SD001	AC1001	15-Sep-00	0	0	Barium	7440-39-3	100			mg/kg	0.05	METALS	SD	N	Y	9A09G601
PRRP	PRWP-SD002	AC1002	15-Sep-00	0	0.5	Barium	7440-39-3	63.3			mg/kg	0.04	METALS	SD	N	Y	9A09G601
PRRP	PRWP-SD003	AC1003	15-Sep-00	0	0.5	Barium	7440-39-3	62.5			mg/kg	0.03	METALS	SD	N	Y	9A09G601
PRRP	PRWP-SD004	AC1004	15-Sep-00	0	0.5	Barium	7440-39-3	55.1			mg/kg	0.03	METALS	SD	N	Y	9A09G601
PRRP	PRWP-SD005	AC1005	15-Sep-00	0	0.5	Barium	7440-39-3	49			mg/kg	0.04	METALS	SD	N	Y	9A09G601
PRRP	PRWP-SD001	AC1001	15-Sep-00	0	0	Benzo(a)anthracene	56-55-3	0.067	J	J	mg/kg	0.33	SEMIVOLATILES	SD	N	Y	9A09G601
PRRP	PRWP-SD002	AC1002	15-Sep-00	0	0.5	Benzo(a)anthracene	56-55-3	0.55	U	U	mg/kg	0.55	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD003	AC1003	15-Sep-00	0	0.5	Benzo(a)anthracene	56-55-3	0.46	U	U	mg/kg	0.46	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD004	AC1004	15-Sep-00	0	0.5	Benzo(a)anthracene	56-55-3	0.45	U	U	mg/kg	0.45	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD005	AC1005	15-Sep-00	0	0.5	Benzo(a)anthracene	56-55-3	0.54	U	U	mg/kg	0.54	SEMIVOLATILES	SD	N	N	9A09G601

GROUP_ NAME	LOCATION_ CODE	SAMPLE_ NO	SAMPLE_ DATE	START_ DEPTH	END_ DEPTH	PARAMETER	CASNO	RESULT	LAB_ QUAL	VAL_ QUAL	UNITS	DETECT_ LIMIT	USER_TEST_ GROUP	SAMPLE_ TYPE	FILTERED	DETECT	SAMPLE_ DELIVERY _GROUP
PRRP	PRWP-SD001	AC1001	15-Sep-00	0	0	Benzo(a)pyrene	50-32-8	0.082	J	J	mg/kg	0.33	SEMIVOLATILES	SD	N	Y	9A09G601
PRRP	PRWP-SD002	AC1002	15-Sep-00	0	0.5	Benzo(a)pyrene	50-32-8	0.55	U	U	mg/kg	0.55	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD003	AC1003	15-Sep-00	0	0.5	Benzo(a)pyrene	50-32-8	0.46	U	U	mg/kg	0.46	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD004	AC1004	15-Sep-00	0	0.5	Benzo(a)pyrene	50-32-8	0.45	U	U	mg/kg	0.45	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD005	AC1005	15-Sep-00	0	0.5	Benzo(a)pyrene	50-32-8	0.54	U	U	mg/kg	0.54	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD001	AC1001	15-Sep-00	0	0	Benzo(b)fluoranthene	205-99-2	0.1	J	J	mg/kg	0.33	SEMIVOLATILES	SD	N	Y	9A09G601
PRRP	PRWP-SD002	AC1002	15-Sep-00	0	0.5	Benzo(b)fluoranthene	205-99-2	0.55	U	U	mg/kg	0.55	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD003	AC1003	15-Sep-00	0	0.5	Benzo(b)fluoranthene	205-99-2	0.46	U	U	mg/kg	0.46	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD004	AC1004	15-Sep-00	0	0.5	Benzo(b)fluoranthene	205-99-2	0.45	U	U	mg/kg	0.45	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD005	AC1005	15-Sep-00	0	0.5	Benzo(b)fluoranthene	205-99-2	0.54	U	U	mg/kg	0.54	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD001	AC1001	15-Sep-00	0	0	Benzo(ghi)perylene	191-24-2	0.33	U	U	mg/kg	0.33	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD002	AC1002	15-Sep-00	0	0.5	Benzo(ghi)perylene	191-24-2	0.55	U	U	mg/kg	0.55	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD003	AC1003	15-Sep-00	0	0.5	Benzo(ghi)perylene	191-24-2	0.46	U	U	mg/kg	0.46	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD004	AC1004	15-Sep-00	0	0.5	Benzo(ghi)perylene	191-24-2	0.45	U	U	mg/kg	0.45	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD005	AC1005	15-Sep-00	0	0.5	Benzo(ghi)perylene	191-24-2	0.54	U	U	mg/kg	0.54	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD001	AC1001	15-Sep-00	0	0	Benzo(k)fluoranthene	207-08-9	0.068	J	J	mg/kg	0.33	SEMIVOLATILES	SD	N	Y	9A09G601
PRRP	PRWP-SD002	AC1002	15-Sep-00	0	0.5	Benzo(k)fluoranthene	207-08-9	0.55	U	U	mg/kg	0.55	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD003	AC1003	15-Sep-00	0	0.5	Benzo(k)fluoranthene	207-08-9	0.46	U	U	mg/kg	0.46	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD004	AC1004	15-Sep-00	0	0.5	Benzo(k)fluoranthene	207-08-9	0.45	U	U	mg/kg	0.45	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD005	AC1005	15-Sep-00	0	0.5	Benzo(k)fluoranthene	207-08-9	0.54	U	U	mg/kg	0.54	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD001	AC1001	15-Sep-00	0	0	Benzoic acid	65-85-0	1.6	U	U	mg/kg	1.6	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD002	AC1002	15-Sep-00	0	0.5	Benzoic acid	65-85-0	2.8	U	U	mg/kg	2.8	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD003	AC1003	15-Sep-00	0	0.5	Benzoic acid	65-85-0	2.3	U	U	mg/kg	2.3	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD004	AC1004	15-Sep-00	0	0.5	Benzoic acid	65-85-0	2.2	U	U	mg/kg	2.2	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD005	AC1005	15-Sep-00	0	0.5	Benzoic acid	65-85-0	2.7	U	U	mg/kg	2.7	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD001	AC1001	15-Sep-00	0	0	Benzyl alcohol	100-51-6	0.33	U	U	mg/kg	0.33	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD002	AC1002	15-Sep-00	0	0.5	Benzyl alcohol	100-51-6	0.55	U	U	mg/kg	0.55	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD003	AC1003	15-Sep-00	0	0.5	Benzyl alcohol	100-51-6	0.46	U	U	mg/kg	0.46	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD004	AC1004	15-Sep-00	0	0.5	Benzyl alcohol	100-51-6	0.45	U	U	mg/kg	0.45	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD005	AC1005	15-Sep-00	0	0.5	Benzyl alcohol	100-51-6	0.54	U	U	mg/kg	0.54	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD001	AC1001	15-Sep-00	0	0	Bis(2-chloroethoxy)methane	111-91-1	0.33	U	U	mg/kg	0.33	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD002	AC1002	15-Sep-00	0	0.5	Bis(2-chloroethoxy)methane	111-91-1	0.55	U	U	mg/kg	0.55	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD003	AC1003	15-Sep-00	0	0.5	Bis(2-chloroethoxy)methane	111-91-1	0.46	U	U	mg/kg	0.46	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD004	AC1004	15-Sep-00	0	0.5	Bis(2-chloroethoxy)methane	111-91-1	0.45	U	U	mg/kg	0.45	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD005	AC1005	15-Sep-00	0	0.5	Bis(2-chloroethoxy)methane	111-91-1	0.54	U	U	mg/kg	0.54	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD001	AC1001	15-Sep-00	0	0	Bis(2-chloroethyl)ether	111-44-4	0.33	U	U	mg/kg	0.33	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD002	AC1002	15-Sep-00	0	0.5	Bis(2-chloroethyl)ether	111-44-4	0.55	U	U	mg/kg	0.55	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD003	AC1003	15-Sep-00	0	0.5	Bis(2-chloroethyl)ether	111-44-4	0.46	U	U	mg/kg	0.46	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD004	AC1004	15-Sep-00	0	0.5	Bis(2-chloroethyl)ether	111-44-4	0.45	U	U	mg/kg	0.45	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD005	AC1005	15-Sep-00	0	0.5	Bis(2-chloroethyl)ether	111-44-4	0.54	U	U	mg/kg	0.54	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD001	AC1001	15-Sep-00	0	0	Bis(2-chloroisopropyl)ether	108-60-1	0.33	U	U	mg/kg	0.33	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD002	AC1002	15-Sep-00	0	0.5	Bis(2-chloroisopropyl)ether	108-60-1	0.55	U	U	mg/kg	0.55	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD003	AC1003	15-Sep-00	0	0.5	Bis(2-chloroisopropyl)ether	108-60-1	0.46	U	U	mg/kg	0.46	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD004	AC1004	15-Sep-00	0	0.5	Bis(2-chloroisopropyl)ether	108-60-1	0.45	U	U	mg/kg	0.45	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD005	AC1005	15-Sep-00	0	0.5	Bis(2-chloroisopropyl)ether	108-60-1	0.54	U	U	mg/kg	0.54	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD001	AC1001	15-Sep-00	0	0	Bis(2-ethylhexyl)phthalate	117-81-7	0.33	U	U	mg/kg	0.33	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD002	AC1002	15-Sep-00	0	0.5	Bis(2-ethylhexyl)phthalate	117-81-7	0.55	U	U	mg/kg	0.55	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD003	AC1003	15-Sep-00	0	0.5	Bis(2-ethylhexyl)phthalate	117-81-7	0.46	U	U	mg/kg	0.46	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD004	AC1004	15-Sep-00	0	0.5	Bis(2-ethylhexyl)phthalate	117-81-7	0.45	U	U	mg/kg	0.45	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD005	AC1005	15-Sep-00	0	0.5	Bis(2-ethylhexyl)phthalate	117-81-7	0.54	U	U	mg/kg	0.54	SEMIVOLATILES	SD	N	N	9A09G601

GROUP_ NAME	LOCATION_ CODE	SAMPLE_ NO	SAMPLE_ DATE	START_ DEPTH	END_ DEPTH	PARAMETER	CASNO	RESULT	LAB_ QUAL	VAL_ QUAL	UNITS	DETECT_ LIMIT	USER_TEST_ GROUP	SAMPLE_ TYPE	FILTERED	DETECT	SAMPLE_ DELIVERY _GROUP
PRRP	PRWP-SD001	AC1001	15-Sep-00	0	0	Bromophenyl phenyl ether, 4-	101-55-3	0.33	U	U	mg/kg	0.33	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD002	AC1002	15-Sep-00	0	0.5	Bromophenyl phenyl ether, 4-	101-55-3	0.55	U	U	mg/kg	0.55	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD003	AC1003	15-Sep-00	0	0.5	Bromophenyl phenyl ether, 4-	101-55-3	0.46	U	U	mg/kg	0.46	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD004	AC1004	15-Sep-00	0	0.5	Bromophenyl phenyl ether, 4-	101-55-3	0.45	U	U	mg/kg	0.45	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD005	AC1005	15-Sep-00	0	0.5	Bromophenyl phenyl ether, 4-	101-55-3	0.54	U	U	mg/kg	0.54	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD001	AC1001	15-Sep-00	0	0	Butyl benzyl phthalate	85-68-7	0.33	U	U	mg/kg	0.33	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD002	AC1002	15-Sep-00	0	0.5	Butyl benzyl phthalate	85-68-7	0.55	U	U	mg/kg	0.55	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD003	AC1003	15-Sep-00	0	0.5	Butyl benzyl phthalate	85-68-7	0.46	U	U	mg/kg	0.46	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD004	AC1004	15-Sep-00	0	0.5	Butyl benzyl phthalate	85-68-7	0.45	U	U	mg/kg	0.45	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD005	AC1005	15-Sep-00	0	0.5	Butyl benzyl phthalate	85-68-7	0.54	U	U	mg/kg	0.54	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD001	AC1001	15-Sep-00	0	0	Calcium	7440-70-2	93400			mg/kg	12.6	METALS	SD	N	Y	9A09G601
PRRP	PRWP-SD002	AC1002	15-Sep-00	0	0.5	Calcium	7440-70-2	44500			mg/kg	9	METALS	SD	N	Y	9A09G601
PRRP	PRWP-SD003	AC1003	15-Sep-00	0	0.5	Calcium	7440-70-2	48700			mg/kg	8.3	METALS	SD	N	Y	9A09G601
PRRP	PRWP-SD004	AC1004	15-Sep-00	0	0.5	Calcium	7440-70-2	39400			mg/kg	7.3	METALS	SD	N	Y	9A09G601
PRRP	PRWP-SD005	AC1005	15-Sep-00	0	0.5	Calcium	7440-70-2	27500			mg/kg	9.4	METALS	SD	N	Y	9A09G601
PRRP	PRWP-SD001	AC1001	15-Sep-00	0	0	Carbazole	86-74-8	0.33	U	U	mg/kg	0.33	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD002	AC1002	15-Sep-00	0	0.5	Carbazole	86-74-8	0.55	U	U	mg/kg	0.55	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD003	AC1003	15-Sep-00	0	0.5	Carbazole	86-74-8	0.46	U	U	mg/kg	0.46	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD004	AC1004	15-Sep-00	0	0.5	Carbazole	86-74-8	0.45	U	U	mg/kg	0.45	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD005	AC1005	15-Sep-00	0	0.5	Carbazole	86-74-8	0.54	U	U	mg/kg	0.54	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD001	AC1001	15-Sep-00	0	0	Chloro-3-methylphenol, 4-	59-50-7	0.33	U	U	mg/kg	0.33	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD002	AC1002	15-Sep-00	0	0.5	Chloro-3-methylphenol, 4-	59-50-7	0.55	U	U	mg/kg	0.55	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD003	AC1003	15-Sep-00	0	0.5	Chloro-3-methylphenol, 4-	59-50-7	0.46	U	U	mg/kg	0.46	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD004	AC1004	15-Sep-00	0	0.5	Chloro-3-methylphenol, 4-	59-50-7	0.45	U	U	mg/kg	0.45	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD005	AC1005	15-Sep-00	0	0.5	Chloro-3-methylphenol, 4-	59-50-7	0.54	U	U	mg/kg	0.54	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD001	AC1001	15-Sep-00	0	0	Chloroaniline, 4-	106-47-8	0.33	U	U	mg/kg	0.33	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD002	AC1002	15-Sep-00	0	0.5	Chloroaniline, 4-	106-47-8	0.55	U	U	mg/kg	0.55	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD003	AC1003	15-Sep-00	0	0.5	Chloroaniline, 4-	106-47-8	0.46	U	U	mg/kg	0.46	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD004	AC1004	15-Sep-00	0	0.5	Chloroaniline, 4-	106-47-8	0.45	U	U	mg/kg	0.45	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD005	AC1005	15-Sep-00	0	0.5	Chloroaniline, 4-	106-47-8	0.54	U	U	mg/kg	0.54	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD001	AC1001	15-Sep-00	0	0	Chloronaphthalene, 2-	91-58-7	0.33	U	U	mg/kg	0.33	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD002	AC1002	15-Sep-00	0	0.5	Chloronaphthalene, 2-	91-58-7	0.55	U	U	mg/kg	0.55	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD003	AC1003	15-Sep-00	0	0.5	Chloronaphthalene, 2-	91-58-7	0.46	U	U	mg/kg	0.46	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD004	AC1004	15-Sep-00	0	0.5	Chloronaphthalene, 2-	91-58-7	0.45	U	U	mg/kg	0.45	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD005	AC1005	15-Sep-00	0	0.5	Chloronaphthalene, 2-	91-58-7	0.54	U	U	mg/kg	0.54	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD001	AC1001	15-Sep-00	0	0	Chlorophenol, 2-	95-57-8	0.33	U	U	mg/kg	0.33	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD002	AC1002	15-Sep-00	0	0.5	Chlorophenol, 2-	95-57-8	0.55	U	U	mg/kg	0.55	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD003	AC1003	15-Sep-00	0	0.5	Chlorophenol, 2-	95-57-8	0.46	U	U	mg/kg	0.46	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD004	AC1004	15-Sep-00	0	0.5	Chlorophenol, 2-	95-57-8	0.45	U	U	mg/kg	0.45	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD005	AC1005	15-Sep-00	0	0.5	Chlorophenol, 2-	95-57-8	0.54	U	U	mg/kg	0.54	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD001	AC1001	15-Sep-00	0	0	Chlorophenyl phenyl ether, 4-	7005-72-3	0.33	U	U	mg/kg	0.33	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD002	AC1002	15-Sep-00	0	0.5	Chlorophenyl phenyl ether, 4-	7005-72-3	0.55	U	U	mg/kg	0.55	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD003	AC1003	15-Sep-00	0	0.5	Chlorophenyl phenyl ether, 4-	7005-72-3	0.46	U	U	mg/kg	0.46	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD004	AC1004	15-Sep-00	0	0.5	Chlorophenyl phenyl ether, 4-	7005-72-3	0.45	U	U	mg/kg	0.45	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD005	AC1005	15-Sep-00	0	0.5	Chlorophenyl phenyl ether, 4-	7005-72-3	0.54	U	U	mg/kg	0.54	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD001	AC1001	15-Sep-00	0	0	Chromium	7440-47-3	12.6			mg/kg	0.14	METALS	SD	N	Y	9A09G601
PRRP	PRWP-SD002	AC1002	15-Sep-00	0	0.5	Chromium	7440-47-3	10.1			mg/kg	0.1	METALS	SD	N	Y	9A09G601
PRRP	PRWP-SD003	AC1003	15-Sep-00	0	0.5	Chromium	7440-47-3	13.8			mg/kg	0.09	METALS	SD	N	Y	9A09G601
PRRP	PRWP-SD004	AC1004	15-Sep-00	0	0.5	Chromium	7440-47-3	10.3			mg/kg	0.08	METALS	SD	N	Y	9A09G601
PRRP	PRWP-SD005	AC1005	15-Sep-00	0	0.5	Chromium	7440-47-3	12.2			mg/kg	0.1	METALS	SD	N	Y	9A09G601

GROUP_ NAME	LOCATION_ CODE	SAMPLE_ NO	SAMPLE_ DATE	START_ DEPTH	END_ DEPTH	PARAMETER	CASNO	RESULT	LAB_ QUAL	VAL_ QUAL	UNITS	DETECT_ LIMIT	USER_TEST_ GROUP	SAMPLE_ TYPE	FILTERED	DETECT	SAMPLE_ DELIVERY _ GROUP
PRRP	PRWP-SD001	AC1001	15-Sep-00	0	0	Chrysene	218-01-9	0.1	J	J	mg/kg	0.33	SEMIVOLATILES	SD	N	Y	9A09G601
PRRP	PRWP-SD002	AC1002	15-Sep-00	0	0.5	Chrysene	218-01-9	0.55	U	U	mg/kg	0.55	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD003	AC1003	15-Sep-00	0	0.5	Chrysene	218-01-9	0.46	U	U	mg/kg	0.46	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD004	AC1004	15-Sep-00	0	0.5	Chrysene	218-01-9	0.45	U	U	mg/kg	0.45	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD005	AC1005	15-Sep-00	0	0.5	Chrysene	218-01-9	0.54	U	U	mg/kg	0.54	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD001	AC1001	15-Sep-00	0	0	Cobalt	7440-48-4	6.7			mg/kg	0.19	METALS	SD	N	Y	9A09G601
PRRP	PRWP-SD002	AC1002	15-Sep-00	0	0.5	Cobalt	7440-48-4	6.2			mg/kg	0.14	METALS	SD	N	Y	9A09G601
PRRP	PRWP-SD003	AC1003	15-Sep-00	0	0.5	Cobalt	7440-48-4	8.8			mg/kg	0.13	METALS	SD	N	Y	9A09G601
PRRP	PRWP-SD004	AC1004	15-Sep-00	0	0.5	Cobalt	7440-48-4	7			mg/kg	0.11	METALS	SD	N	Y	9A09G601
PRRP	PRWP-SD005	AC1005	15-Sep-00	0	0.5	Cobalt	7440-48-4	6.7			mg/kg	0.14	METALS	SD	N	Y	9A09G601
PRRP	PRWP-SD001	AC1001	15-Sep-00	0	0	Copper	7440-50-8	17.2			mg/kg	0.23	METALS	SD	N	Y	9A09G601
PRRP	PRWP-SD002	AC1002	15-Sep-00	0	0.5	Copper	7440-50-8	14.8			mg/kg	0.16	METALS	SD	N	Y	9A09G601
PRRP	PRWP-SD003	AC1003	15-Sep-00	0	0.5	Copper	7440-50-8	19.6			mg/kg	0.15	METALS	SD	N	Y	9A09G601
PRRP	PRWP-SD004	AC1004	15-Sep-00	0	0.5	Copper	7440-50-8	13.9			mg/kg	0.13	METALS	SD	N	Y	9A09G601
PRRP	PRWP-SD005	AC1005	15-Sep-00	0	0.5	Copper	7440-50-8	13.7			mg/kg	0.17	METALS	SD	N	Y	9A09G601
PRRP	PRWP-SD001	AC1001	15-Sep-00	0	0	Dibenz(a,h)anthracene	53-70-3	0.33	U	U	mg/kg	0.33	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD002	AC1002	15-Sep-00	0	0.5	Dibenz(a,h)anthracene	53-70-3	0.55	U	U	mg/kg	0.55	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD003	AC1003	15-Sep-00	0	0.5	Dibenz(a,h)anthracene	53-70-3	0.46	U	U	mg/kg	0.46	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD004	AC1004	15-Sep-00	0	0.5	Dibenz(a,h)anthracene	53-70-3	0.45	U	U	mg/kg	0.45	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD005	AC1005	15-Sep-00	0	0.5	Dibenz(a,h)anthracene	53-70-3	0.54	U	U	mg/kg	0.54	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD001	AC1001	15-Sep-00	0	0	Dibenzofuran	132-64-9	0.33	U	U	mg/kg	0.33	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD002	AC1002	15-Sep-00	0	0.5	Dibenzofuran	132-64-9	0.55	U	U	mg/kg	0.55	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD003	AC1003	15-Sep-00	0	0.5	Dibenzofuran	132-64-9	0.46	U	U	mg/kg	0.46	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD004	AC1004	15-Sep-00	0	0.5	Dibenzofuran	132-64-9	0.45	U	U	mg/kg	0.45	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD005	AC1005	15-Sep-00	0	0.5	Dibenzofuran	132-64-9	0.54	U	U	mg/kg	0.54	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD001	AC1001	15-Sep-00	0	0	Dichlorobenzene, 1,2-	95-50-1	0.33	U	U	mg/kg	0.33	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD002	AC1002	15-Sep-00	0	0.5	Dichlorobenzene, 1,2-	95-50-1	0.55	U	U	mg/kg	0.55	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD003	AC1003	15-Sep-00	0	0.5	Dichlorobenzene, 1,2-	95-50-1	0.46	U	U	mg/kg	0.46	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD004	AC1004	15-Sep-00	0	0.5	Dichlorobenzene, 1,2-	95-50-1	0.45	U	U	mg/kg	0.45	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD005	AC1005	15-Sep-00	0	0.5	Dichlorobenzene, 1,2-	95-50-1	0.54	U	U	mg/kg	0.54	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD001	AC1001	15-Sep-00	0	0	Dichlorobenzene, 1,3-	541-73-1	0.33	U	U	mg/kg	0.33	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD002	AC1002	15-Sep-00	0	0.5	Dichlorobenzene, 1,3-	541-73-1	0.55	U	U	mg/kg	0.55	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD003	AC1003	15-Sep-00	0	0.5	Dichlorobenzene, 1,3-	541-73-1	0.46	U	U	mg/kg	0.46	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD004	AC1004	15-Sep-00	0	0.5	Dichlorobenzene, 1,3-	541-73-1	0.45	U	U	mg/kg	0.45	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD005	AC1005	15-Sep-00	0	0.5	Dichlorobenzene, 1,3-	541-73-1	0.54	U	U	mg/kg	0.54	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD001	AC1001	15-Sep-00	0	0	Dichlorobenzene, 1,4-	106-46-7	0.33	U	U	mg/kg	0.33	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD002	AC1002	15-Sep-00	0	0.5	Dichlorobenzene, 1,4-	106-46-7	0.55	U	U	mg/kg	0.55	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD003	AC1003	15-Sep-00	0	0.5	Dichlorobenzene, 1,4-	106-46-7	0.46	U	U	mg/kg	0.46	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD004	AC1004	15-Sep-00	0	0.5	Dichlorobenzene, 1,4-	106-46-7	0.45	U	U	mg/kg	0.45	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD005	AC1005	15-Sep-00	0	0.5	Dichlorobenzene, 1,4-	106-46-7	0.54	U	U	mg/kg	0.54	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD001	AC1001	15-Sep-00	0	0	Dichlorobenzidine, 3,3'-	91-94-1	0.66	U	U	mg/kg	0.66	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD002	AC1002	15-Sep-00	0	0.5	Dichlorobenzidine, 3,3'-	91-94-1	1.1	U	U	mg/kg	1.1	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD003	AC1003	15-Sep-00	0	0.5	Dichlorobenzidine, 3,3'-	91-94-1	0.92	U	U	mg/kg	0.92	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD004	AC1004	15-Sep-00	0	0.5	Dichlorobenzidine, 3,3'-	91-94-1	0.89	U	U	mg/kg	0.89	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD005	AC1005	15-Sep-00	0	0.5	Dichlorobenzidine, 3,3'-	91-94-1	1.1	U	U	mg/kg	1.1	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD001	AC1001	15-Sep-00	0	0	Dichlorophenol, 2,4-	120-83-2	0.33	U	U	mg/kg	0.33	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD002	AC1002	15-Sep-00	0	0.5	Dichlorophenol, 2,4-	120-83-2	0.55	U	U	mg/kg	0.55	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD003	AC1003	15-Sep-00	0	0.5	Dichlorophenol, 2,4-	120-83-2	0.46	U	U	mg/kg	0.46	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD004	AC1004	15-Sep-00	0	0.5	Dichlorophenol, 2,4-	120-83-2	0.45	U	U	mg/kg	0.45	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD005	AC1005	15-Sep-00	0	0.5	Dichlorophenol, 2,4-	120-83-2	0.54	U	U	mg/kg	0.54	SEMIVOLATILES	SD	N	N	9A09G601

GROUP_ NAME	LOCATION_ CODE	SAMPLE_ NO	SAMPLE_ DATE	START_ DEPTH	END_ DEPTH	PARAMETER	CASNO	RESULT	LAB_ QUAL	VAL_ QUAL	UNITS	DETECT_ LIMIT	USER_TEST_ GROUP	SAMPLE_ TYPE	FILTERED	DETECT	SAMPLE_ DELIVERY _GROUP
PRRP	PRWP-SD001	AC1001	15-Sep-00	0	0	Diethyl phthalate	84-66-2	0.33	U	U	mg/kg	0.33	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD002	AC1002	15-Sep-00	0	0.5	Diethyl phthalate	84-66-2	0.55	U	U	mg/kg	0.55	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD003	AC1003	15-Sep-00	0	0.5	Diethyl phthalate	84-66-2	0.46	U	U	mg/kg	0.46	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD004	AC1004	15-Sep-00	0	0.5	Diethyl phthalate	84-66-2	0.45	U	U	mg/kg	0.45	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD005	AC1005	15-Sep-00	0	0.5	Diethyl phthalate	84-66-2	0.54	U	U	mg/kg	0.54	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD001	AC1001	15-Sep-00	0	0	Dimethyl phthalate	131-11-3	0.33	U	U	mg/kg	0.33	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD002	AC1002	15-Sep-00	0	0.5	Dimethyl phthalate	131-11-3	0.55	U	U	mg/kg	0.55	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD003	AC1003	15-Sep-00	0	0.5	Dimethyl phthalate	131-11-3	0.46	U	U	mg/kg	0.46	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD004	AC1004	15-Sep-00	0	0.5	Dimethyl phthalate	131-11-3	0.45	U	U	mg/kg	0.45	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD005	AC1005	15-Sep-00	0	0.5	Dimethyl phthalate	131-11-3	0.54	U	U	mg/kg	0.54	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD001	AC1001	15-Sep-00	0	0	Dimethylphenol, 2,4-	105-67-9	0.33	U	U	mg/kg	0.33	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD002	AC1002	15-Sep-00	0	0.5	Dimethylphenol, 2,4-	105-67-9	0.55	U	U	mg/kg	0.55	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD003	AC1003	15-Sep-00	0	0.5	Dimethylphenol, 2,4-	105-67-9	0.46	U	U	mg/kg	0.46	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD004	AC1004	15-Sep-00	0	0.5	Dimethylphenol, 2,4-	105-67-9	0.45	U	U	mg/kg	0.45	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD005	AC1005	15-Sep-00	0	0.5	Dimethylphenol, 2,4-	105-67-9	0.54	U	U	mg/kg	0.54	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD001	AC1001	15-Sep-00	0	0	Di-n-butyl phthalate	84-74-2	0.33	U	U	mg/kg	0.33	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD002	AC1002	15-Sep-00	0	0.5	Di-n-butyl phthalate	84-74-2	0.55	U	U	mg/kg	0.55	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD003	AC1003	15-Sep-00	0	0.5	Di-n-butyl phthalate	84-74-2	0.46	U	U	mg/kg	0.46	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD004	AC1004	15-Sep-00	0	0.5	Di-n-butyl phthalate	84-74-2	0.45	U	U	mg/kg	0.45	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD005	AC1005	15-Sep-00	0	0.5	Di-n-butyl phthalate	84-74-2	0.54	U	U	mg/kg	0.54	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD001	AC1001	15-Sep-00	0	0	Dinitro-2-methylphenol, 4,6-	534-52-1	1.6	U	U	mg/kg	1.6	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD002	AC1002	15-Sep-00	0	0.5	Dinitro-2-methylphenol, 4,6-	534-52-1	2.8	U	U	mg/kg	2.8	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD003	AC1003	15-Sep-00	0	0.5	Dinitro-2-methylphenol, 4,6-	534-52-1	2.3	U	U	mg/kg	2.3	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD004	AC1004	15-Sep-00	0	0.5	Dinitro-2-methylphenol, 4,6-	534-52-1	2.2	U	U	mg/kg	2.2	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD005	AC1005	15-Sep-00	0	0.5	Dinitro-2-methylphenol, 4,6-	534-52-1	2.7	U	U	mg/kg	2.7	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD001	AC1001	15-Sep-00	0	0	Dinitrophenol, 2,4-	51-28-5	1.6	U	U	mg/kg	1.6	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD002	AC1002	15-Sep-00	0	0.5	Dinitrophenol, 2,4-	51-28-5	2.8	U	U	mg/kg	2.8	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD003	AC1003	15-Sep-00	0	0.5	Dinitrophenol, 2,4-	51-28-5	2.3	U	U	mg/kg	2.3	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD004	AC1004	15-Sep-00	0	0.5	Dinitrophenol, 2,4-	51-28-5	2.2	U	U	mg/kg	2.2	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD005	AC1005	15-Sep-00	0	0.5	Dinitrophenol, 2,4-	51-28-5	2.7	U	U	mg/kg	2.7	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD001	AC1001	15-Sep-00	0	0	Dinitrotoluene, 2,4-	121-14-2	0.33	U	U	mg/kg	0.33	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD002	AC1002	15-Sep-00	0	0.5	Dinitrotoluene, 2,4-	121-14-2	0.55	U	U	mg/kg	0.55	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD003	AC1003	15-Sep-00	0	0.5	Dinitrotoluene, 2,4-	121-14-2	0.46	U	U	mg/kg	0.46	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD004	AC1004	15-Sep-00	0	0.5	Dinitrotoluene, 2,4-	121-14-2	0.45	U	U	mg/kg	0.45	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD005	AC1005	15-Sep-00	0	0.5	Dinitrotoluene, 2,4-	121-14-2	0.54	U	U	mg/kg	0.54	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD001	AC1001	15-Sep-00	0	0	Dinitrotoluene, 2,6-	606-20-2	0.33	U	U	mg/kg	0.33	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD002	AC1002	15-Sep-00	0	0.5	Dinitrotoluene, 2,6-	606-20-2	0.55	U	U	mg/kg	0.55	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD003	AC1003	15-Sep-00	0	0.5	Dinitrotoluene, 2,6-	606-20-2	0.46	U	U	mg/kg	0.46	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD004	AC1004	15-Sep-00	0	0.5	Dinitrotoluene, 2,6-	606-20-2	0.45	U	U	mg/kg	0.45	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD005	AC1005	15-Sep-00	0	0.5	Dinitrotoluene, 2,6-	606-20-2	0.54	U	U	mg/kg	0.54	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD001	AC1001	15-Sep-00	0	0	Di-n-octyl phthalate	117-84-0	0.33	U	U	mg/kg	0.33	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD002	AC1002	15-Sep-00	0	0.5	Di-n-octyl phthalate	117-84-0	0.55	U	U	mg/kg	0.55	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD003	AC1003	15-Sep-00	0	0.5	Di-n-octyl phthalate	117-84-0	0.46	U	U	mg/kg	0.46	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD004	AC1004	15-Sep-00	0	0.5	Di-n-octyl phthalate	117-84-0	0.45	U	U	mg/kg	0.45	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD005	AC1005	15-Sep-00	0	0.5	Di-n-octyl phthalate	117-84-0	0.54	U	U	mg/kg	0.54	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD001	AC1001	15-Sep-00	0	0	Fluoranthene	206-44-0	0.14	J	J	mg/kg	0.33	SEMIVOLATILES	SD	N	Y	9A09G601
PRRP	PRWP-SD002	AC1002	15-Sep-00	0	0.5	Fluoranthene	206-44-0	0.55	U	U	mg/kg	0.55	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD003	AC1003	15-Sep-00	0	0.5	Fluoranthene	206-44-0	0.46	U	U	mg/kg	0.46	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD004	AC1004	15-Sep-00	0	0.5	Fluoranthene	206-44-0	0.45	U	U	mg/kg	0.45	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD005	AC1005	15-Sep-00	0	0.5	Fluoranthene	206-44-0	0.54	U	U	mg/kg	0.54	SEMIVOLATILES	SD	N	N	9A09G601

GROUP_ NAME	LOCATION_ CODE	SAMPLE_ NO	SAMPLE_ DATE	START_ DEPTH	END_ DEPTH	PARAMETER	CASNO	RESULT	LAB_ QUAL	VAL_ QUAL	UNITS	DETECT_ LIMIT	USER_TEST_ GROUP	SAMPLE_ TYPE	FILTERED	DETECT	SAMPLE_ DELIVERY _ GROUP
PRRP	PRWP-SD001	AC1001	15-Sep-00	0	0	Fluorene	86-73-7	0.33	U	U	mg/kg	0.33	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD002	AC1002	15-Sep-00	0	0.5	Fluorene	86-73-7	0.55	U	U	mg/kg	0.55	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD003	AC1003	15-Sep-00	0	0.5	Fluorene	86-73-7	0.46	U	U	mg/kg	0.46	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD004	AC1004	15-Sep-00	0	0.5	Fluorene	86-73-7	0.45	U	U	mg/kg	0.45	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD005	AC1005	15-Sep-00	0	0.5	Fluorene	86-73-7	0.54	U	U	mg/kg	0.54	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD001	AC1001	15-Sep-00	0	0	Hexachlorobenzene	118-74-1	0.33	U	U	mg/kg	0.33	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD002	AC1002	15-Sep-00	0	0.5	Hexachlorobenzene	118-74-1	0.55	U	U	mg/kg	0.55	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD003	AC1003	15-Sep-00	0	0.5	Hexachlorobenzene	118-74-1	0.46	U	U	mg/kg	0.46	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD004	AC1004	15-Sep-00	0	0.5	Hexachlorobenzene	118-74-1	0.45	U	U	mg/kg	0.45	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD005	AC1005	15-Sep-00	0	0.5	Hexachlorobenzene	118-74-1	0.54	U	U	mg/kg	0.54	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD001	AC1001	15-Sep-00	0	0	Hexachlorobutadiene	87-68-3	0.33	U	U	mg/kg	0.33	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD002	AC1002	15-Sep-00	0	0.5	Hexachlorobutadiene	87-68-3	0.55	U	U	mg/kg	0.55	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD003	AC1003	15-Sep-00	0	0.5	Hexachlorobutadiene	87-68-3	0.46	U	U	mg/kg	0.46	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD004	AC1004	15-Sep-00	0	0.5	Hexachlorobutadiene	87-68-3	0.45	U	U	mg/kg	0.45	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD005	AC1005	15-Sep-00	0	0.5	Hexachlorobutadiene	87-68-3	0.54	U	U	mg/kg	0.54	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD001	AC1001	15-Sep-00	0	0	Hexachlorocyclopentadiene	77-47-4	0.33	U	U	mg/kg	0.33	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD002	AC1002	15-Sep-00	0	0.5	Hexachlorocyclopentadiene	77-47-4	0.55	U	U	mg/kg	0.55	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD003	AC1003	15-Sep-00	0	0.5	Hexachlorocyclopentadiene	77-47-4	0.46	U	U	mg/kg	0.46	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD004	AC1004	15-Sep-00	0	0.5	Hexachlorocyclopentadiene	77-47-4	0.45	U	U	mg/kg	0.45	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD005	AC1005	15-Sep-00	0	0.5	Hexachlorocyclopentadiene	77-47-4	0.54	U	U	mg/kg	0.54	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD001	AC1001	15-Sep-00	0	0	Hexachloroethane	67-72-1	0.33	U	U	mg/kg	0.33	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD002	AC1002	15-Sep-00	0	0.5	Hexachloroethane	67-72-1	0.55	U	U	mg/kg	0.55	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD003	AC1003	15-Sep-00	0	0.5	Hexachloroethane	67-72-1	0.46	U	U	mg/kg	0.46	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD004	AC1004	15-Sep-00	0	0.5	Hexachloroethane	67-72-1	0.45	U	U	mg/kg	0.45	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD005	AC1005	15-Sep-00	0	0.5	Hexachloroethane	67-72-1	0.54	U	U	mg/kg	0.54	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD001	AC1001	15-Sep-00	0	0	Indeno(1,2,3-cd)pyrene	193-39-5	0.33	U	U	mg/kg	0.33	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD002	AC1002	15-Sep-00	0	0.5	Indeno(1,2,3-cd)pyrene	193-39-5	0.55	U	U	mg/kg	0.55	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD003	AC1003	15-Sep-00	0	0.5	Indeno(1,2,3-cd)pyrene	193-39-5	0.46	U	U	mg/kg	0.46	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD004	AC1004	15-Sep-00	0	0.5	Indeno(1,2,3-cd)pyrene	193-39-5	0.45	U	U	mg/kg	0.45	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD005	AC1005	15-Sep-00	0	0.5	Indeno(1,2,3-cd)pyrene	193-39-5	0.54	U	U	mg/kg	0.54	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD001	AC1001	15-Sep-00	0	0	Iron	7439-89-6	15500			mg/kg	4.1	METALS	SD	N	Y	9A09G601
PRRP	PRWP-SD002	AC1002	15-Sep-00	0	0.5	Iron	7439-89-6	13700			mg/kg	2.9	METALS	SD	N	Y	9A09G601
PRRP	PRWP-SD003	AC1003	15-Sep-00	0	0.5	Iron	7439-89-6	19800			mg/kg	2.7	METALS	SD	N	Y	9A09G601
PRRP	PRWP-SD004	AC1004	15-Sep-00	0	0.5	Iron	7439-89-6	15800			mg/kg	2.4	METALS	SD	N	Y	9A09G601
PRRP	PRWP-SD005	AC1005	15-Sep-00	0	0.5	Iron	7439-89-6	18100			mg/kg	3	METALS	SD	N	Y	9A09G601
PRRP	PRWP-SD001	AC1001	15-Sep-00	0	0	Isophorone	78-59-1	0.33	U	U	mg/kg	0.33	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD002	AC1002	15-Sep-00	0	0.5	Isophorone	78-59-1	0.55	U	U	mg/kg	0.55	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD003	AC1003	15-Sep-00	0	0.5	Isophorone	78-59-1	0.46	U	U	mg/kg	0.46	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD004	AC1004	15-Sep-00	0	0.5	Isophorone	78-59-1	0.45	U	U	mg/kg	0.45	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD005	AC1005	15-Sep-00	0	0.5	Isophorone	78-59-1	0.54	U	U	mg/kg	0.54	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD001	AC1001	15-Sep-00	0	0	Lead	7439-92-1	9.8		J	mg/kg	0.46	METALS	SD	N	Y	9A09G601
PRRP	PRWP-SD002	AC1002	15-Sep-00	0	0.5	Lead	7439-92-1	9.4		J	mg/kg	0.33	METALS	SD	N	Y	9A09G601
PRRP	PRWP-SD003	AC1003	15-Sep-00	0	0.5	Lead	7439-92-1	9.5		J	mg/kg	0.3	METALS	SD	N	Y	9A09G601
PRRP	PRWP-SD004	AC1004	15-Sep-00	0	0.5	Lead	7439-92-1	7.2		J	mg/kg	0.26	METALS	SD	N	Y	9A09G601
PRRP	PRWP-SD005	AC1005	15-Sep-00	0	0.5	Lead	7439-92-1	9		J	mg/kg	0.34	METALS	SD	N	Y	9A09G601
PRRP	PRWP-SD001	AC1001	15-Sep-00	0	0	Magnesium	7439-95-4	11200			mg/kg	12.7	METALS	SD	N	Y	9A09G601
PRRP	PRWP-SD002	AC1002	15-Sep-00	0	0.5	Magnesium	7439-95-4	9140			mg/kg	9.1	METALS	SD	N	Y	9A09G601
PRRP	PRWP-SD003	AC1003	15-Sep-00	0	0.5	Magnesium	7439-95-4	15900			mg/kg	8.4	METALS	SD	N	Y	9A09G601
PRRP	PRWP-SD004	AC1004	15-Sep-00	0	0.5	Magnesium	7439-95-4	12400			mg/kg	7.4	METALS	SD	N	Y	9A09G601
PRRP	PRWP-SD005	AC1005	15-Sep-00	0	0.5	Magnesium	7439-95-4	6920			mg/kg	9.5	METALS	SD	N	Y	9A09G601

GROUP_ NAME	LOCATION_ CODE	SAMPLE_ NO	SAMPLE_ DATE	START_ DEPTH	END_ DEPTH	PARAMETER	CASNO	RESULT	LAB_ QUAL	VAL_ QUAL	UNITS	DETECT_ LIMIT	USER_TEST_ GROUP	SAMPLE_ TYPE	FILTERED	DETECT	SAMPLE_ DELIVERY _ GROUP
PRRP	PRWP-SD001	AC1001	15-Sep-00	0	0	Manganese	7439-96-5	491			mg/kg	0.25	METALS	SD	N	Y	9A09G601
PRRP	PRWP-SD002	AC1002	15-Sep-00	0	0.5	Manganese	7439-96-5	310			mg/kg	0.18	METALS	SD	N	Y	9A09G601
PRRP	PRWP-SD003	AC1003	15-Sep-00	0	0.5	Manganese	7439-96-5	461			mg/kg	0.16	METALS	SD	N	Y	9A09G601
PRRP	PRWP-SD004	AC1004	15-Sep-00	0	0.5	Manganese	7439-96-5	361			mg/kg	0.14	METALS	SD	N	Y	9A09G601
PRRP	PRWP-SD005	AC1005	15-Sep-00	0	0.5	Manganese	7439-96-5	1050			mg/kg	0.18	METALS	SD	N	Y	9A09G601
PRRP	PRWP-SD001	AC1001	15-Sep-00	0	0	Methylnaphthalene, 2-	91-57-6	0.33	U	U	mg/kg	0.33	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD002	AC1002	15-Sep-00	0	0.5	Methylnaphthalene, 2-	91-57-6	0.55	U	U	mg/kg	0.55	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD003	AC1003	15-Sep-00	0	0.5	Methylnaphthalene, 2-	91-57-6	0.46	U	U	mg/kg	0.46	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD004	AC1004	15-Sep-00	0	0.5	Methylnaphthalene, 2-	91-57-6	0.45	U	U	mg/kg	0.45	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD005	AC1005	15-Sep-00	0	0.5	Methylnaphthalene, 2-	91-57-6	0.54	U	U	mg/kg	0.54	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD001	AC1001	15-Sep-00	0	0	Methylphenol, 2-	95-48-7	0.33	U	U	mg/kg	0.33	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD002	AC1002	15-Sep-00	0	0.5	Methylphenol, 2-	95-48-7	0.55	U	U	mg/kg	0.55	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD003	AC1003	15-Sep-00	0	0.5	Methylphenol, 2-	95-48-7	0.46	U	U	mg/kg	0.46	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD004	AC1004	15-Sep-00	0	0.5	Methylphenol, 2-	95-48-7	0.45	U	U	mg/kg	0.45	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD005	AC1005	15-Sep-00	0	0.5	Methylphenol, 2-	95-48-7	0.54	U	U	mg/kg	0.54	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD001	AC1001	15-Sep-00	0	0	Methylphenol, 4-	106-44-5	0.33	U	U	mg/kg	0.33	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD002	AC1002	15-Sep-00	0	0.5	Methylphenol, 4-	106-44-5	0.55	U	U	mg/kg	0.55	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD003	AC1003	15-Sep-00	0	0.5	Methylphenol, 4-	106-44-5	0.46	U	U	mg/kg	0.46	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD004	AC1004	15-Sep-00	0	0.5	Methylphenol, 4-	106-44-5	0.45	U	U	mg/kg	0.45	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD005	AC1005	15-Sep-00	0	0.5	Methylphenol, 4-	106-44-5	0.54	U	U	mg/kg	0.54	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD001	AC1001	15-Sep-00	0	0	Naphthalene	91-20-3	0.33	U	U	mg/kg	0.33	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD002	AC1002	15-Sep-00	0	0.5	Naphthalene	91-20-3	0.55	U	U	mg/kg	0.55	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD003	AC1003	15-Sep-00	0	0.5	Naphthalene	91-20-3	0.46	U	U	mg/kg	0.46	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD004	AC1004	15-Sep-00	0	0.5	Naphthalene	91-20-3	0.45	U	U	mg/kg	0.45	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD005	AC1005	15-Sep-00	0	0.5	Naphthalene	91-20-3	0.54	U	U	mg/kg	0.54	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD001	AC1001	15-Sep-00	0	0	Nickel	7440-02-0	16.2		J	mg/kg	0.28	METALS	SD	N	Y	9A09G601
PRRP	PRWP-SD002	AC1002	15-Sep-00	0	0.5	Nickel	7440-02-0	15.1		J	mg/kg	0.2	METALS	SD	N	Y	9A09G601
PRRP	PRWP-SD003	AC1003	15-Sep-00	0	0.5	Nickel	7440-02-0	22.9		J	mg/kg	0.18	METALS	SD	N	Y	9A09G601
PRRP	PRWP-SD004	AC1004	15-Sep-00	0	0.5	Nickel	7440-02-0	17.1		J	mg/kg	0.16	METALS	SD	N	Y	9A09G601
PRRP	PRWP-SD005	AC1005	15-Sep-00	0	0.5	Nickel	7440-02-0	16.6		J	mg/kg	0.21	METALS	SD	N	Y	9A09G601
PRRP	PRWP-SD001	AC1001	15-Sep-00	0	0	Nitroaniline, 2-	88-74-4	1.6	U	U	mg/kg	1.6	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD002	AC1002	15-Sep-00	0	0.5	Nitroaniline, 2-	88-74-4	2.8	U	U	mg/kg	2.8	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD003	AC1003	15-Sep-00	0	0.5	Nitroaniline, 2-	88-74-4	2.3	U	U	mg/kg	2.3	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD004	AC1004	15-Sep-00	0	0.5	Nitroaniline, 2-	88-74-4	2.2	U	U	mg/kg	2.2	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD005	AC1005	15-Sep-00	0	0.5	Nitroaniline, 2-	88-74-4	2.7	U	U	mg/kg	2.7	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD001	AC1001	15-Sep-00	0	0	Nitroaniline, 3-	99-09-2	1.6	U	U	mg/kg	1.6	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD002	AC1002	15-Sep-00	0	0.5	Nitroaniline, 3-	99-09-2	2.8	U	U	mg/kg	2.8	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD003	AC1003	15-Sep-00	0	0.5	Nitroaniline, 3-	99-09-2	2.3	U	U	mg/kg	2.3	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD004	AC1004	15-Sep-00	0	0.5	Nitroaniline, 3-	99-09-2	2.2	U	U	mg/kg	2.2	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD005	AC1005	15-Sep-00	0	0.5	Nitroaniline, 3-	99-09-2	2.7	U	U	mg/kg	2.7	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD001	AC1001	15-Sep-00	0	0	Nitroaniline, 4-	100-01-6	1.6	U	U	mg/kg	1.6	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD002	AC1002	15-Sep-00	0	0.5	Nitroaniline, 4-	100-01-6	2.8	U	U	mg/kg	2.8	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD003	AC1003	15-Sep-00	0	0.5	Nitroaniline, 4-	100-01-6	2.3	U	U	mg/kg	2.3	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD004	AC1004	15-Sep-00	0	0.5	Nitroaniline, 4-	100-01-6	2.2	U	U	mg/kg	2.2	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD005	AC1005	15-Sep-00	0	0.5	Nitroaniline, 4-	100-01-6	2.7	U	U	mg/kg	2.7	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD001	AC1001	15-Sep-00	0	0	Nitrobenzene	98-95-3	0.33	U	U	mg/kg	0.33	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD002	AC1002	15-Sep-00	0	0.5	Nitrobenzene	98-95-3	0.55	U	U	mg/kg	0.55	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD003	AC1003	15-Sep-00	0	0.5	Nitrobenzene	98-95-3	0.46	U	U	mg/kg	0.46	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD004	AC1004	15-Sep-00	0	0.5	Nitrobenzene	98-95-3	0.45	U	U	mg/kg	0.45	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD005	AC1005	15-Sep-00	0	0.5	Nitrobenzene	98-95-3	0.54	U	U	mg/kg	0.54	SEMIVOLATILES	SD	N	N	9A09G601

GROUP_ NAME	LOCATION_ CODE	SAMPLE_ NO	SAMPLE_ DATE	START_ DEPTH	END_ DEPTH	PARAMETER	CASNO	RESULT	LAB_ QUAL	VAL_ QUAL	UNITS	DETECT_ LIMIT	USER_TEST_ GROUP	SAMPLE_ TYPE	FILTERED	DETECT	SAMPLE_ DELIVERY _ GROUP
PRRP	PRWP-SD001	AC1001	15-Sep-00	0	0	Nitrophenol, 2-	88-75-5	0.33	U	U	mg/kg	0.33	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD002	AC1002	15-Sep-00	0	0.5	Nitrophenol, 2-	88-75-5	0.55	U	U	mg/kg	0.55	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD003	AC1003	15-Sep-00	0	0.5	Nitrophenol, 2-	88-75-5	0.46	U	U	mg/kg	0.46	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD004	AC1004	15-Sep-00	0	0.5	Nitrophenol, 2-	88-75-5	0.45	U	U	mg/kg	0.45	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD005	AC1005	15-Sep-00	0	0.5	Nitrophenol, 2-	88-75-5	0.54	U	U	mg/kg	0.54	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD001	AC1001	15-Sep-00	0	0	Nitrophenol, 4-	100-02-7	1.6	U	U	mg/kg	1.6	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD002	AC1002	15-Sep-00	0	0.5	Nitrophenol, 4-	100-02-7	2.8	U	U	mg/kg	2.8	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD003	AC1003	15-Sep-00	0	0.5	Nitrophenol, 4-	100-02-7	2.3	U	U	mg/kg	2.3	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD004	AC1004	15-Sep-00	0	0.5	Nitrophenol, 4-	100-02-7	2.2	U	U	mg/kg	2.2	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD005	AC1005	15-Sep-00	0	0.5	Nitrophenol, 4-	100-02-7	2.7	U	U	mg/kg	2.7	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD001	AC1001	15-Sep-00	0	0	n-Nitroso-di-n-propylamine	621-64-7	0.33	U	U	mg/kg	0.33	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD002	AC1002	15-Sep-00	0	0.5	n-Nitroso-di-n-propylamine	621-64-7	0.55	U	U	mg/kg	0.55	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD003	AC1003	15-Sep-00	0	0.5	n-Nitroso-di-n-propylamine	621-64-7	0.46	U	U	mg/kg	0.46	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD004	AC1004	15-Sep-00	0	0.5	n-Nitroso-di-n-propylamine	621-64-7	0.45	U	U	mg/kg	0.45	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD005	AC1005	15-Sep-00	0	0.5	n-Nitroso-di-n-propylamine	621-64-7	0.54	U	U	mg/kg	0.54	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD001	AC1001	15-Sep-00	0	0	n-Nitrosodiphenylamine	86-30-6	0.33	U	U	mg/kg	0.33	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD002	AC1002	15-Sep-00	0	0.5	n-Nitrosodiphenylamine	86-30-6	0.55	U	U	mg/kg	0.55	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD003	AC1003	15-Sep-00	0	0.5	n-Nitrosodiphenylamine	86-30-6	0.46	U	U	mg/kg	0.46	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD004	AC1004	15-Sep-00	0	0.5	n-Nitrosodiphenylamine	86-30-6	0.45	U	U	mg/kg	0.45	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD005	AC1005	15-Sep-00	0	0.5	n-Nitrosodiphenylamine	86-30-6	0.54	U	U	mg/kg	0.54	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD001	AC1001	15-Sep-00	0	0	Pentachlorophenol	87-86-5	1.6	U	U	mg/kg	1.6	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD002	AC1002	15-Sep-00	0	0.5	Pentachlorophenol	87-86-5	2.8	U	U	mg/kg	2.8	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD003	AC1003	15-Sep-00	0	0.5	Pentachlorophenol	87-86-5	2.3	U	U	mg/kg	2.3	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD004	AC1004	15-Sep-00	0	0.5	Pentachlorophenol	87-86-5	2.2	U	U	mg/kg	2.2	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD005	AC1005	15-Sep-00	0	0.5	Pentachlorophenol	87-86-5	2.7	U	U	mg/kg	2.7	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD001	AC1001	15-Sep-00	0	0	Phenanthrene	85-01-8	0.096	J	J	mg/kg	0.33	SEMIVOLATILES	SD	N	Y	9A09G601
PRRP	PRWP-SD002	AC1002	15-Sep-00	0	0.5	Phenanthrene	85-01-8	0.55	U	U	mg/kg	0.55	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD003	AC1003	15-Sep-00	0	0.5	Phenanthrene	85-01-8	0.46	U	U	mg/kg	0.46	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD004	AC1004	15-Sep-00	0	0.5	Phenanthrene	85-01-8	0.45	U	U	mg/kg	0.45	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD005	AC1005	15-Sep-00	0	0.5	Phenanthrene	85-01-8	0.54	U	U	mg/kg	0.54	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD001	AC1001	15-Sep-00	0	0	Phenol	108-95-2	0.33	U	U	mg/kg	0.33	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD002	AC1002	15-Sep-00	0	0.5	Phenol	108-95-2	0.55	U	U	mg/kg	0.55	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD003	AC1003	15-Sep-00	0	0.5	Phenol	108-95-2	0.46	U	U	mg/kg	0.46	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD004	AC1004	15-Sep-00	0	0.5	Phenol	108-95-2	0.45	U	U	mg/kg	0.45	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD005	AC1005	15-Sep-00	0	0.5	Phenol	108-95-2	0.54	U	U	mg/kg	0.54	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD001	AC1001	15-Sep-00	0	0	Phosphorous	7723-14-0	138			mg/kg	9.4	GEN CHEMISTRY	SD	N	Y	9A09G601
PRRP	PRWP-SD002	AC1002	15-Sep-00	0	0.5	Phosphorous	7723-14-0	7.3	U	U	mg/kg	7.3	GEN CHEMISTRY	SD	N	N	9A09G601
PRRP	PRWP-SD003	AC1003	15-Sep-00	0	0.5	Phosphorous	7723-14-0	4.9	U	U	mg/kg	4.9	GEN CHEMISTRY	SD	N	N	9A09G601
PRRP	PRWP-SD004	AC1004	15-Sep-00	0	0.5	Phosphorous	7723-14-0	3.7	U	U	mg/kg	3.7	GEN CHEMISTRY	SD	N	N	9A09G601
PRRP	PRWP-SD005	AC1005	15-Sep-00	0	0.5	Phosphorous	7723-14-0	87.4			mg/kg	4.7	GEN CHEMISTRY	SD	N	Y	9A09G601
PRRP	PRWP-SD001	AC1001	15-Sep-00	0	0	Potassium	2023695	1530		B	mg/kg	16	METALS	SD	N	Y	9A09G601
PRRP	PRWP-SD002	AC1002	15-Sep-00	0	0.5	Potassium	2023695	1170		B	mg/kg	11.4	METALS	SD	N	Y	9A09G601
PRRP	PRWP-SD003	AC1003	15-Sep-00	0	0.5	Potassium	2023695	2480		J	mg/kg	10.5	METALS	SD	N	Y	9A09G601
PRRP	PRWP-SD004	AC1004	15-Sep-00	0	0.5	Potassium	2023695	1650		J	mg/kg	9.2	METALS	SD	N	Y	9A09G601
PRRP	PRWP-SD005	AC1005	15-Sep-00	0	0.5	Potassium	2023695	1520		B	mg/kg	11.9	METALS	SD	N	Y	9A09G601
PRRP	PRWP-SD001	AC1001	15-Sep-00	0	0	Pyrene	129-00-0	0.19	J	J	mg/kg	0.33	SEMIVOLATILES	SD	N	Y	9A09G601
PRRP	PRWP-SD002	AC1002	15-Sep-00	0	0.5	Pyrene	129-00-0	0.55	U	U	mg/kg	0.55	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD003	AC1003	15-Sep-00	0	0.5	Pyrene	129-00-0	0.46	U	U	mg/kg	0.46	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD004	AC1004	15-Sep-00	0	0.5	Pyrene	129-00-0	0.45	U	U	mg/kg	0.45	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD005	AC1005	15-Sep-00	0	0.5	Pyrene	129-00-0	0.54	U	U	mg/kg	0.54	SEMIVOLATILES	SD	N	N	9A09G601

GROUP_ NAME	LOCATION_ CODE	SAMPLE_ NO	SAMPLE_ DATE	START_ DEPTH	END_ DEPTH	PARAMETER	CASNO	RESULT	LAB_ QUAL	VAL_ QUAL	UNITS	DETECT_ LIMIT	USER_TEST_ GROUP	SAMPLE_ TYPE	FILTERED	DETECT	SAMPLE_ DELIVERY _ GROUP
PRRP	PRWP-SD001	AC1001	15-Sep-00	0	0	Sodium	7440-23-5	158			mg/kg	48	METALS	SD	N	Y	9A09G601
PRRP	PRWP-SD002	AC1002	15-Sep-00	0	0.5	Sodium	7440-23-5	113			mg/kg	34.3	METALS	SD	N	Y	9A09G601
PRRP	PRWP-SD003	AC1003	15-Sep-00	0	0.5	Sodium	7440-23-5	174			mg/kg	31.4	METALS	SD	N	Y	9A09G601
PRRP	PRWP-SD004	AC1004	15-Sep-00	0	0.5	Sodium	7440-23-5	138			mg/kg	27.7	METALS	SD	N	Y	9A09G601
PRRP	PRWP-SD005	AC1005	15-Sep-00	0	0.5	Sodium	7440-23-5	118			mg/kg	35.8	METALS	SD	N	Y	9A09G601
PRRP	PRWP-SD001	AC1001	15-Sep-00	0	0	Total organic carbon	10-35-5	24800			mg/kg	1980	GEN CHEMISTRY	SD	N	Y	9A09G601
PRRP	PRWP-SD002	AC1002	15-Sep-00	0	0.5	Total organic carbon	10-35-5	25900			mg/kg	2780	GEN CHEMISTRY	SD	N	Y	9A09G601
PRRP	PRWP-SD003	AC1003	15-Sep-00	0	0.5	Total organic carbon	10-35-5	9040			mg/kg	2600	GEN CHEMISTRY	SD	N	Y	9A09G601
PRRP	PRWP-SD004	AC1004	15-Sep-00	0	0.5	Total organic carbon	10-35-5	5190			mg/kg	2000	GEN CHEMISTRY	SD	N	Y	9A09G601
PRRP	PRWP-SD005	AC1005	15-Sep-00	0	0.5	Total organic carbon	10-35-5	10400			mg/kg	1000	GEN CHEMISTRY	SD	N	Y	9A09G601
PRRP	PRWP-SD001	AC1001	15-Sep-00	0	0	Trichlorobenzene, 1,2,4-	120-82-1	0.33	U	U	mg/kg	0.33	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD002	AC1002	15-Sep-00	0	0.5	Trichlorobenzene, 1,2,4-	120-82-1	0.55	U	U	mg/kg	0.55	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD003	AC1003	15-Sep-00	0	0.5	Trichlorobenzene, 1,2,4-	120-82-1	0.46	U	U	mg/kg	0.46	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD004	AC1004	15-Sep-00	0	0.5	Trichlorobenzene, 1,2,4-	120-82-1	0.45	U	U	mg/kg	0.45	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD005	AC1005	15-Sep-00	0	0.5	Trichlorobenzene, 1,2,4-	120-82-1	0.54	U	U	mg/kg	0.54	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD001	AC1001	15-Sep-00	0	0	Trichlorophenol, 2,4,5-	95-95-4	1.6	U	U	mg/kg	1.6	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD002	AC1002	15-Sep-00	0	0.5	Trichlorophenol, 2,4,5-	95-95-4	2.8	U	U	mg/kg	2.8	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD003	AC1003	15-Sep-00	0	0.5	Trichlorophenol, 2,4,5-	95-95-4	2.3	U	U	mg/kg	2.3	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD004	AC1004	15-Sep-00	0	0.5	Trichlorophenol, 2,4,5-	95-95-4	2.2	U	U	mg/kg	2.2	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD005	AC1005	15-Sep-00	0	0.5	Trichlorophenol, 2,4,5-	95-95-4	2.7	U	U	mg/kg	2.7	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD001	AC1001	15-Sep-00	0	0	Trichlorophenol, 2,4,6-	88-06-2	0.33	U	U	mg/kg	0.33	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD002	AC1002	15-Sep-00	0	0.5	Trichlorophenol, 2,4,6-	88-06-2	0.55	U	U	mg/kg	0.55	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD003	AC1003	15-Sep-00	0	0.5	Trichlorophenol, 2,4,6-	88-06-2	0.46	U	U	mg/kg	0.46	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD004	AC1004	15-Sep-00	0	0.5	Trichlorophenol, 2,4,6-	88-06-2	0.45	U	U	mg/kg	0.45	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD005	AC1005	15-Sep-00	0	0.5	Trichlorophenol, 2,4,6-	88-06-2	0.54	U	U	mg/kg	0.54	SEMIVOLATILES	SD	N	N	9A09G601
PRRP	PRWP-SD001	AC1001	15-Sep-00	0	0	Vanadium	7440-62-2	19.3		B	mg/kg	0.37	METALS	SD	N	Y	9A09G601
PRRP	PRWP-SD002	AC1002	15-Sep-00	0	0.5	Vanadium	7440-62-2	16.5		B	mg/kg	0.26	METALS	SD	N	Y	9A09G601
PRRP	PRWP-SD003	AC1003	15-Sep-00	0	0.5	Vanadium	7440-62-2	23.5		B	mg/kg	0.24	METALS	SD	N	Y	9A09G601
PRRP	PRWP-SD004	AC1004	15-Sep-00	0	0.5	Vanadium	7440-62-2	19.9		B	mg/kg	0.21	METALS	SD	N	Y	9A09G601
PRRP	PRWP-SD005	AC1005	15-Sep-00	0	0.5	Vanadium	7440-62-2	22.3		B	mg/kg	0.27	METALS	SD	N	Y	9A09G601
PRRP	PRWP-SD001	AC1001	15-Sep-00	0	0	Zinc	7440-66-6	130			mg/kg	0.11	METALS	SD	N	Y	9A09G601
PRRP	PRWP-SD002	AC1002	15-Sep-00	0	0.5	Zinc	7440-66-6	135			mg/kg	0.08	METALS	SD	N	Y	9A09G601
PRRP	PRWP-SD003	AC1003	15-Sep-00	0	0.5	Zinc	7440-66-6	47.8			mg/kg	0.07	METALS	SD	N	Y	9A09G601
PRRP	PRWP-SD004	AC1004	15-Sep-00	0	0.5	Zinc	7440-66-6	36.2			mg/kg	0.06	METALS	SD	N	Y	9A09G601
PRRP	PRWP-SD005	AC1005	15-Sep-00	0	0.5	Zinc	7440-66-6	50.5			mg/kg	0.08	METALS	SD	N	Y	9A09G601
PRRP	PRWP-SO001	AC0001	15-Sep-00	0	1	Amino-2,6-dinitrotoluene, 4-	19406-51-0	0.2	U	U	mg/kg	0.2	NITROAROMATICS	SO	N	N	9A09G609
PRRP	PRWP-SO002	AC0002	15-Sep-00	0	1	Amino-2,6-dinitrotoluene, 4-	19406-51-0	0.2	U	U	mg/kg	0.2	NITROAROMATICS	SO	N	N	9A09G609
PRRP	PRWP-SO003	AC0003	15-Sep-00	0	1	Amino-2,6-dinitrotoluene, 4-	19406-51-0	0.2	U	U	mg/kg	0.2	NITROAROMATICS	SO	N	N	9A09G609
PRRP	PRWP-SO004	AC0004	15-Sep-00	0	1	Amino-2,6-dinitrotoluene, 4-	19406-51-0	0.2	U	U	mg/kg	0.2	NITROAROMATICS	SO	N	N	9A09G609
PRRP	PRWP-SO005	AC0005	15-Sep-00	0	1	Amino-2,6-dinitrotoluene, 4-	19406-51-0	0.2	U	U	mg/kg	0.2	NITROAROMATICS	SO	N	N	9A09G609
PRRP	PRWP-SO001	AC0006	15-Sep-00	0	1	Amino-2,6-dinitrotoluene, 4-	19406-51-0	0.2	U	U	mg/kg	0.2	NITROAROMATICS	SO	N	N	9A09G609
PRRP	PRWP-SO001	AC0001	15-Sep-00	0	1	Amino-4,6-dinitrotoluene, 2-	35572-78-2	0.2	U	U	mg/kg	0.099	NITROAROMATICS	SO	N	N	9A09G609
PRRP	PRWP-SO002	AC0002	15-Sep-00	0	1	Amino-4,6-dinitrotoluene, 2-	35572-78-2	0.098	U	U	mg/kg	0.098	NITROAROMATICS	SO	N	N	9A09G609
PRRP	PRWP-SO003	AC0003	15-Sep-00	0	1	Amino-4,6-dinitrotoluene, 2-	35572-78-2	0.098	U	U	mg/kg	0.098	NITROAROMATICS	SO	N	N	9A09G609
PRRP	PRWP-SO004	AC0004	15-Sep-00	0	1	Amino-4,6-dinitrotoluene, 2-	35572-78-2	0.1	U	U	mg/kg	0.1	NITROAROMATICS	SO	N	N	9A09G609
PRRP	PRWP-SO005	AC0005	15-Sep-00	0	1	Amino-4,6-dinitrotoluene, 2-	35572-78-2	0.1	U	U	mg/kg	0.1	NITROAROMATICS	SO	N	N	9A09G609
PRRP	PRWP-SO001	AC0006	15-Sep-00	0	1	Amino-4,6-dinitrotoluene, 2-	35572-78-2	0.2	U	U	mg/kg	0.1	NITROAROMATICS	SO	N	N	9A09G609
PRRP	PRWP-SO001	AC0001	15-Sep-00	0	1	Dinitrobenzene, 1,3-	99-65-0	0.099	U	U	mg/kg	0.099	NITROAROMATICS	SO	N	N	9A09G609
PRRP	PRWP-SO002	AC0002	15-Sep-00	0	1	Dinitrobenzene, 1,3-	99-65-0	0.098	U	U	mg/kg	0.098	NITROAROMATICS	SO	N	N	9A09G609
PRRP	PRWP-SO003	AC0003	15-Sep-00	0	1	Dinitrobenzene, 1,3-	99-65-0	0.098	U	U	mg/kg	0.098	NITROAROMATICS	SO	N	N	9A09G609

GROUP_ NAME	LOCATION_ CODE	SAMPLE_ NO	SAMPLE_ DATE	START_ DEPTH	END_ DEPTH	PARAMETER	CASNO	RESULT	LAB_ QUAL	VAL_ QUAL	UNITS	DETECT_ LIMIT	USER_TEST_ GROUP	SAMPLE_ TYPE	FILTERED	DETECT	SAMPLE_ DELIVERY _ GROUP
PRRP	PRWP-SO004	AC0004	15-Sep-00	0	1	Dinitrobenzene, 1,3-	99-65-0	0.1	U	U	mg/kg	0.1	NITROAROMATICS	SO	N	N	9A09G609
PRRP	PRWP-SO005	AC0005	15-Sep-00	0	1	Dinitrobenzene, 1,3-	99-65-0	0.1	U	U	mg/kg	0.1	NITROAROMATICS	SO	N	N	9A09G609
PRRP	PRWP-SO001	AC0006	15-Sep-00	0	1	Dinitrobenzene, 1,3-	99-65-0	0.1	U	U	mg/kg	0.1	NITROAROMATICS	SO	N	N	9A09G609
PRRP	PRWP-SO001	AC0001	15-Sep-00	0	1	Dinitrotoluene, 2,4-	121-14-2	1.2			mg/kg	0.2	NITROAROMATICS	SO	N	Y	9A09G609
PRRP	PRWP-SO002	AC0002	15-Sep-00	0	1	Dinitrotoluene, 2,4-	121-14-2	0.2	U	U	mg/kg	0.2	NITROAROMATICS	SO	N	N	9A09G609
PRRP	PRWP-SO003	AC0003	15-Sep-00	0	1	Dinitrotoluene, 2,4-	121-14-2	0.2	U	U	mg/kg	0.2	NITROAROMATICS	SO	N	N	9A09G609
PRRP	PRWP-SO004	AC0004	15-Sep-00	0	1	Dinitrotoluene, 2,4-	121-14-2	0.2	U	U	mg/kg	0.2	NITROAROMATICS	SO	N	N	9A09G609
PRRP	PRWP-SO005	AC0005	15-Sep-00	0	1	Dinitrotoluene, 2,4-	121-14-2	0.2	U	U	mg/kg	0.2	NITROAROMATICS	SO	N	N	9A09G609
PRRP	PRWP-SO001	AC0006	15-Sep-00	0	1	Dinitrotoluene, 2,4-	121-14-2	0.68			mg/kg	0.2	NITROAROMATICS	SO	N	Y	9A09G609
PRRP	PRWP-SO001	AC0001	15-Sep-00	0	1	Dinitrotoluene, 2,6-	606-20-2	0.2	U	U	mg/kg	0.2	NITROAROMATICS	SO	N	N	9A09G609
PRRP	PRWP-SO002	AC0002	15-Sep-00	0	1	Dinitrotoluene, 2,6-	606-20-2	0.2	U	U	mg/kg	0.2	NITROAROMATICS	SO	N	N	9A09G609
PRRP	PRWP-SO003	AC0003	15-Sep-00	0	1	Dinitrotoluene, 2,6-	606-20-2	0.2	U	U	mg/kg	0.2	NITROAROMATICS	SO	N	N	9A09G609
PRRP	PRWP-SO004	AC0004	15-Sep-00	0	1	Dinitrotoluene, 2,6-	606-20-2	0.2	U	U	mg/kg	0.2	NITROAROMATICS	SO	N	N	9A09G609
PRRP	PRWP-SO005	AC0005	15-Sep-00	0	1	Dinitrotoluene, 2,6-	606-20-2	0.2	U	U	mg/kg	0.2	NITROAROMATICS	SO	N	N	9A09G609
PRRP	PRWP-SO001	AC0006	15-Sep-00	0	1	Dinitrotoluene, 2,6-	606-20-2	0.2	U	U	mg/kg	0.2	NITROAROMATICS	SO	N	N	9A09G609
PRRP	PRWP-SO001	AC0001	15-Sep-00	0	1	HMX	2691-41-0	0.25	U	U	mg/kg	0.25	NITROAROMATICS	SO	N	N	9A09G609
PRRP	PRWP-SO002	AC0002	15-Sep-00	0	1	HMX	2691-41-0	0.24	U	U	mg/kg	0.24	NITROAROMATICS	SO	N	N	9A09G609
PRRP	PRWP-SO003	AC0003	15-Sep-00	0	1	HMX	2691-41-0	0.25	U	U	mg/kg	0.25	NITROAROMATICS	SO	N	N	9A09G609
PRRP	PRWP-SO004	AC0004	15-Sep-00	0	1	HMX	2691-41-0	0.25	U	U	mg/kg	0.25	NITROAROMATICS	SO	N	N	9A09G609
PRRP	PRWP-SO005	AC0005	15-Sep-00	0	1	HMX	2691-41-0	0.25	U	U	mg/kg	0.25	NITROAROMATICS	SO	N	N	9A09G609
PRRP	PRWP-SO001	AC0006	15-Sep-00	0	1	HMX	2691-41-0	0.25	U	U	mg/kg	0.25	NITROAROMATICS	SO	N	N	9A09G609
PRRP	PRWP-SO001	AC0001	15-Sep-00	0	1	Nitrobenzene	98-95-3	0.099	U	U	mg/kg	0.099	NITROAROMATICS	SO	N	N	9A09G609
PRRP	PRWP-SO002	AC0002	15-Sep-00	0	1	Nitrobenzene	98-95-3	0.098	U	U	mg/kg	0.098	NITROAROMATICS	SO	N	N	9A09G609
PRRP	PRWP-SO003	AC0003	15-Sep-00	0	1	Nitrobenzene	98-95-3	0.098	U	U	mg/kg	0.098	NITROAROMATICS	SO	N	N	9A09G609
PRRP	PRWP-SO004	AC0004	15-Sep-00	0	1	Nitrobenzene	98-95-3	0.1	U	U	mg/kg	0.1	NITROAROMATICS	SO	N	N	9A09G609
PRRP	PRWP-SO005	AC0005	15-Sep-00	0	1	Nitrobenzene	98-95-3	0.1	U	U	mg/kg	0.1	NITROAROMATICS	SO	N	N	9A09G609
PRRP	PRWP-SO001	AC0006	15-Sep-00	0	1	Nitrobenzene	98-95-3	0.1	U	U	mg/kg	0.1	NITROAROMATICS	SO	N	N	9A09G609
PRRP	PRWP-SO001	AC0001	15-Sep-00	0	1	Nitrotoluene, 2-	88-72-2	0.2	U	U	mg/kg	0.2	NITROAROMATICS	SO	N	N	9A09G609
PRRP	PRWP-SO002	AC0002	15-Sep-00	0	1	Nitrotoluene, 2-	88-72-2	0.2	U	U	mg/kg	0.2	NITROAROMATICS	SO	N	N	9A09G609
PRRP	PRWP-SO003	AC0003	15-Sep-00	0	1	Nitrotoluene, 2-	88-72-2	0.2	U	U	mg/kg	0.2	NITROAROMATICS	SO	N	N	9A09G609
PRRP	PRWP-SO004	AC0004	15-Sep-00	0	1	Nitrotoluene, 2-	88-72-2	0.2	U	U	mg/kg	0.2	NITROAROMATICS	SO	N	N	9A09G609
PRRP	PRWP-SO005	AC0005	15-Sep-00	0	1	Nitrotoluene, 2-	88-72-2	0.2	U	U	mg/kg	0.2	NITROAROMATICS	SO	N	N	9A09G609
PRRP	PRWP-SO001	AC0006	15-Sep-00	0	1	Nitrotoluene, 2-	88-72-2	0.2	U	U	mg/kg	0.2	NITROAROMATICS	SO	N	N	9A09G609
PRRP	PRWP-SO001	AC0001	15-Sep-00	0	1	Nitrotoluene, 3-	99-08-1	0.2	U	U	mg/kg	0.2	NITROAROMATICS	SO	N	N	9A09G609
PRRP	PRWP-SO002	AC0002	15-Sep-00	0	1	Nitrotoluene, 3-	99-08-1	0.2	U	U	mg/kg	0.2	NITROAROMATICS	SO	N	N	9A09G609
PRRP	PRWP-SO003	AC0003	15-Sep-00	0	1	Nitrotoluene, 3-	99-08-1	0.2	U	U	mg/kg	0.2	NITROAROMATICS	SO	N	N	9A09G609
PRRP	PRWP-SO004	AC0004	15-Sep-00	0	1	Nitrotoluene, 3-	99-08-1	0.2	U	U	mg/kg	0.2	NITROAROMATICS	SO	N	N	9A09G609
PRRP	PRWP-SO005	AC0005	15-Sep-00	0	1	Nitrotoluene, 3-	99-08-1	0.2	U	U	mg/kg	0.2	NITROAROMATICS	SO	N	N	9A09G609
PRRP	PRWP-SO001	AC0006	15-Sep-00	0	1	Nitrotoluene, 3-	99-08-1	0.2	U	U	mg/kg	0.2	NITROAROMATICS	SO	N	N	9A09G609
PRRP	PRWP-SO001	AC0001	15-Sep-00	0	1	Nitrotoluene, 4-	99-99-0	0.5	U	U	mg/kg	0.5	NITROAROMATICS	SO	N	N	9A09G609
PRRP	PRWP-SO002	AC0002	15-Sep-00	0	1	Nitrotoluene, 4-	99-99-0	0.49	U	U	mg/kg	0.49	NITROAROMATICS	SO	N	N	9A09G609
PRRP	PRWP-SO003	AC0003	15-Sep-00	0	1	Nitrotoluene, 4-	99-99-0	0.49	U	U	mg/kg	0.49	NITROAROMATICS	SO	N	N	9A09G609
PRRP	PRWP-SO004	AC0004	15-Sep-00	0	1	Nitrotoluene, 4-	99-99-0	0.5	U	U	mg/kg	0.5	NITROAROMATICS	SO	N	N	9A09G609
PRRP	PRWP-SO005	AC0005	15-Sep-00	0	1	Nitrotoluene, 4-	99-99-0	0.5	U	U	mg/kg	0.5	NITROAROMATICS	SO	N	N	9A09G609
PRRP	PRWP-SO001	AC0006	15-Sep-00	0	1	Nitrotoluene, 4-	99-99-0	0.5	U	U	mg/kg	0.5	NITROAROMATICS	SO	N	N	9A09G609
PRRP	PRWP-SO001	AC0001	15-Sep-00	0	1	RDX	121-82-4	0.099	U	U	mg/kg	0.099	NITROAROMATICS	SO	N	N	9A09G609
PRRP	PRWP-SO002	AC0002	15-Sep-00	0	1	RDX	121-82-4	0.098	U	U	mg/kg	0.098	NITROAROMATICS	SO	N	N	9A09G609
PRRP	PRWP-SO003	AC0003	15-Sep-00	0	1	RDX	121-82-4	0.098	U	U	mg/kg	0.098	NITROAROMATICS	SO	N	N	9A09G609
PRRP	PRWP-SO004	AC0004	15-Sep-00	0	1	RDX	121-82-4	0.1	U	U	mg/kg	0.1	NITROAROMATICS	SO	N	N	9A09G609
PRRP	PRWP-SO005	AC0005	15-Sep-00	0	1	RDX	121-82-4	0.1	U	U	mg/kg	0.1	NITROAROMATICS	SO	N	N	9A09G609

GROUP_ NAME	LOCATION_ CODE	SAMPLE_ NO	SAMPLE_ DATE	START_ DEPTH	END_ DEPTH	PARAMETER	CASNO	RESULT	LAB_ QUAL	VAL_ QUAL	UNITS	DETECT_ LIMIT	USER_TEST_ GROUP	SAMPLE_ TYPE	FILTERED	DETECT	SAMPLE_ DELIVERY _GROUP
PRRP	PRWP-SO001	AC0006	15-Sep-00	0	1	RDX	121-82-4	0.1	U	U	mg/kg	0.1	NITROAROMATICS	SO	N	N	9A09G609
PRRP	PRWP-SO001	AC0001	15-Sep-00	0	1	Tetryl	479-45-8	0.099	U	U	mg/kg	0.099	NITROAROMATICS	SO	N	N	9A09G609
PRRP	PRWP-SO002	AC0002	15-Sep-00	0	1	Tetryl	479-45-8	0.098	U	U	mg/kg	0.098	NITROAROMATICS	SO	N	N	9A09G609
PRRP	PRWP-SO003	AC0003	15-Sep-00	0	1	Tetryl	479-45-8	0.098	U	U	mg/kg	0.098	NITROAROMATICS	SO	N	N	9A09G609
PRRP	PRWP-SO004	AC0004	15-Sep-00	0	1	Tetryl	479-45-8	0.1	U	U	mg/kg	0.1	NITROAROMATICS	SO	N	N	9A09G609
PRRP	PRWP-SO005	AC0005	15-Sep-00	0	1	Tetryl	479-45-8	0.1	U	U	mg/kg	0.1	NITROAROMATICS	SO	N	N	9A09G609
PRRP	PRWP-SO001	AC0006	15-Sep-00	0	1	Tetryl	479-45-8	0.1	U	U	mg/kg	0.1	NITROAROMATICS	SO	N	N	9A09G609
PRRP	PRWP-SO001	AC0001	15-Sep-00	0	1	Trinitrobenzene, 1,3,5-	99-35-4	0.099	U	U	mg/kg	0.099	NITROAROMATICS	SO	N	N	9A09G609
PRRP	PRWP-SO002	AC0002	15-Sep-00	0	1	Trinitrobenzene, 1,3,5-	99-35-4	0.098	U	U	mg/kg	0.098	NITROAROMATICS	SO	N	N	9A09G609
PRRP	PRWP-SO003	AC0003	15-Sep-00	0	1	Trinitrobenzene, 1,3,5-	99-35-4	0.098	U	U	mg/kg	0.098	NITROAROMATICS	SO	N	N	9A09G609
PRRP	PRWP-SO004	AC0004	15-Sep-00	0	1	Trinitrobenzene, 1,3,5-	99-35-4	0.1	U	U	mg/kg	0.1	NITROAROMATICS	SO	N	N	9A09G609
PRRP	PRWP-SO005	AC0005	15-Sep-00	0	1	Trinitrobenzene, 1,3,5-	99-35-4	0.1	U	U	mg/kg	0.1	NITROAROMATICS	SO	N	N	9A09G609
PRRP	PRWP-SO001	AC0006	15-Sep-00	0	1	Trinitrobenzene, 1,3,5-	99-35-4	0.1	U	U	mg/kg	0.1	NITROAROMATICS	SO	N	N	9A09G609
PRRP	PRWP-SO001	AC0001	15-Sep-00	0	1	Trinitrotoluene, 2,4,6-	118-96-7	0.2	U	U	mg/kg	0.2	NITROAROMATICS	SO	N	N	9A09G609
PRRP	PRWP-SO002	AC0002	15-Sep-00	0	1	Trinitrotoluene, 2,4,6-	118-96-7	0.2	U	U	mg/kg	0.2	NITROAROMATICS	SO	N	N	9A09G609
PRRP	PRWP-SO003	AC0003	15-Sep-00	0	1	Trinitrotoluene, 2,4,6-	118-96-7	0.2	U	U	mg/kg	0.2	NITROAROMATICS	SO	N	N	9A09G609
PRRP	PRWP-SO004	AC0004	15-Sep-00	0	1	Trinitrotoluene, 2,4,6-	118-96-7	0.2	U	U	mg/kg	0.2	NITROAROMATICS	SO	N	N	9A09G609
PRRP	PRWP-SO005	AC0005	15-Sep-00	0	1	Trinitrotoluene, 2,4,6-	118-96-7	0.2	U	U	mg/kg	0.2	NITROAROMATICS	SO	N	N	9A09G609
PRRP	PRWP-SO001	AC0006	15-Sep-00	0	1	Trinitrotoluene, 2,4,6-	118-96-7	0.2	U	U	mg/kg	0.2	NITROAROMATICS	SO	N	N	9A09G609
PRRP	PRWP-SW004	AC2004	14-Sep-00			Aluminum	7429-90-5	712			ug/L	72.7	METALS	SW	N	Y	9A09G601
PRRP	PRWP-SW006	AC2006	14-Sep-00			Aluminum	7429-90-5	72.7	U	U	ug/L	72.7	METALS	SW	N	N	9A09G601
PRRP	PRWP-SW007	AC2007	14-Sep-00			Aluminum	7429-90-5	137			ug/L	72.7	METALS	SW	N	Y	9A09G601
PRRP	PRWP-SW008	AC2008	14-Sep-00			Aluminum	7429-90-5	237			ug/L	72.7	METALS	SW	N	Y	9A09G601
PRRP	PRWP-SW009	AC2009	14-Sep-00			Aluminum	7429-90-5	72.7	U	U	ug/L	72.7	METALS	SW	N	N	9A09G601
PRRP	PRWP-SW010	AC2010	14-Sep-00			Aluminum	7429-90-5	494			ug/L	72.7	METALS	SW	N	Y	9A09G601
PRRP	PRWP-SW004	AC2004	14-Sep-00			Antimony	7440-36-0	5.5	U	U	ug/L	5.5	METALS	SW	N	N	9A09G601
PRRP	PRWP-SW006	AC2006	14-Sep-00			Antimony	7440-36-0	5.5	U	U	ug/L	5.5	METALS	SW	N	N	9A09G601
PRRP	PRWP-SW007	AC2007	14-Sep-00			Antimony	7440-36-0	5.5	U	U	ug/L	5.5	METALS	SW	N	N	9A09G601
PRRP	PRWP-SW008	AC2008	14-Sep-00			Antimony	7440-36-0	5.5	U	U	ug/L	5.5	METALS	SW	N	N	9A09G601
PRRP	PRWP-SW009	AC2009	14-Sep-00			Antimony	7440-36-0	5.5	U	U	ug/L	5.5	METALS	SW	N	N	9A09G601
PRRP	PRWP-SW010	AC2010	14-Sep-00			Antimony	7440-36-0	5.5	U	U	ug/L	5.5	METALS	SW	N	N	9A09G601
PRRP	PRWP-SW004	AC2004	14-Sep-00			Arsenic	7440-38-2	4.4	U	U	ug/L	4.4	METALS	SW	N	N	9A09G601
PRRP	PRWP-SW006	AC2006	14-Sep-00			Arsenic	7440-38-2	4.4	U	U	ug/L	4.4	METALS	SW	N	N	9A09G601
PRRP	PRWP-SW007	AC2007	14-Sep-00			Arsenic	7440-38-2	4.4	U	U	ug/L	4.4	METALS	SW	N	N	9A09G601
PRRP	PRWP-SW008	AC2008	14-Sep-00			Arsenic	7440-38-2	4.4	U	U	ug/L	4.4	METALS	SW	N	N	9A09G601
PRRP	PRWP-SW009	AC2009	14-Sep-00			Arsenic	7440-38-2	4.4	U	U	ug/L	4.4	METALS	SW	N	N	9A09G601
PRRP	PRWP-SW010	AC2010	14-Sep-00			Arsenic	7440-38-2	4.4	U	U	ug/L	4.4	METALS	SW	N	N	9A09G601
PRRP	PRWP-SW004	AC2004	14-Sep-00			Barium	7440-39-3	88.6			ug/L	0.3	METALS	SW	N	Y	9A09G601
PRRP	PRWP-SW006	AC2006	14-Sep-00			Barium	7440-39-3	74.1			ug/L	0.3	METALS	SW	N	Y	9A09G601
PRRP	PRWP-SW007	AC2007	14-Sep-00			Barium	7440-39-3	82.5			ug/L	0.3	METALS	SW	N	Y	9A09G601
PRRP	PRWP-SW008	AC2008	14-Sep-00			Barium	7440-39-3	86.9			ug/L	0.3	METALS	SW	N	Y	9A09G601
PRRP	PRWP-SW009	AC2009	14-Sep-00			Barium	7440-39-3	83.1			ug/L	0.3	METALS	SW	N	Y	9A09G601
PRRP	PRWP-SW010	AC2010	14-Sep-00			Barium	7440-39-3	89.7			ug/L	0.3	METALS	SW	N	Y	9A09G601
PRRP	PRWP-SW004	AC2004	14-Sep-00			Calcium	7440-70-2	109000			ug/L	71.9	METALS	SW	N	Y	9A09G601
PRRP	PRWP-SW006	AC2006	14-Sep-00			Calcium	7440-70-2	107000			ug/L	71.9	METALS	SW	N	Y	9A09G601
PRRP	PRWP-SW007	AC2007	14-Sep-00			Calcium	7440-70-2	118000			ug/L	71.9	METALS	SW	N	Y	9A09G601
PRRP	PRWP-SW008	AC2008	14-Sep-00			Calcium	7440-70-2	117000			ug/L	71.9	METALS	SW	N	Y	9A09G601
PRRP	PRWP-SW009	AC2009	14-Sep-00			Calcium	7440-70-2	118000			ug/L	71.9	METALS	SW	N	Y	9A09G601
PRRP	PRWP-SW010	AC2010	14-Sep-00			Calcium	7440-70-2	113000			ug/L	71.9	METALS	SW	N	Y	9A09G601
PRRP	PRWP-SW004	AC2004	14-Sep-00			Chromium	7440-47-3	1.2			ug/L	0.8	METALS	SW	N	Y	9A09G601

GROUP_ NAME	LOCATION_ CODE	SAMPLE_ NO	SAMPLE_ DATE	START_ DEPTH	END_ DEPTH	PARAMETER	CASNO	RESULT	LAB_ QUAL	VAL_ QUAL	UNITS	DETECT_ LIMIT	USER_TEST_ GROUP	SAMPLE_ TYPE	FILTERED	DETECT	SAMPLE_ DELIVERY _ GROUP
PRRP	PRWP-SW006	AC2006	14-Sep-00			Chromium	7440-47-3	1.1			ug/L	0.8	METALS	SW	N	Y	9A09G601
PRRP	PRWP-SW007	AC2007	14-Sep-00			Chromium	7440-47-3	0.8			ug/L	0.8	METALS	SW	N	Y	9A09G601
PRRP	PRWP-SW008	AC2008	14-Sep-00			Chromium	7440-47-3	0.9			ug/L	0.8	METALS	SW	N	Y	9A09G601
PRRP	PRWP-SW009	AC2009	14-Sep-00			Chromium	7440-47-3	1.9			ug/L	0.8	METALS	SW	N	Y	9A09G601
PRRP	PRWP-SW010	AC2010	14-Sep-00			Chromium	7440-47-3	0.9			ug/L	0.8	METALS	SW	N	Y	9A09G601
PRRP	PRWP-SW004	AC2004	14-Sep-00			Cobalt	7440-48-4	1.8			ug/L	1.1	METALS	SW	N	Y	9A09G601
PRRP	PRWP-SW006	AC2006	14-Sep-00			Cobalt	7440-48-4	1.1	U	U	ug/L	1.1	METALS	SW	N	N	9A09G601
PRRP	PRWP-SW007	AC2007	14-Sep-00			Cobalt	7440-48-4	1.1	U	U	ug/L	1.1	METALS	SW	N	N	9A09G601
PRRP	PRWP-SW008	AC2008	14-Sep-00			Cobalt	7440-48-4	1.1	U	U	ug/L	1.1	METALS	SW	N	N	9A09G601
PRRP	PRWP-SW009	AC2009	14-Sep-00			Cobalt	7440-48-4	1.1	U	U	ug/L	1.1	METALS	SW	N	N	9A09G601
PRRP	PRWP-SW010	AC2010	14-Sep-00			Cobalt	7440-48-4	1.1	U	U	ug/L	1.1	METALS	SW	N	N	9A09G601
PRRP	PRWP-SW004	AC2004	14-Sep-00			Copper	7440-50-8	2.4			ug/L	1.3	METALS	SW	N	Y	9A09G601
PRRP	PRWP-SW006	AC2006	14-Sep-00			Copper	7440-50-8	1.8			ug/L	1.3	METALS	SW	N	Y	9A09G601
PRRP	PRWP-SW007	AC2007	14-Sep-00			Copper	7440-50-8	1.8			ug/L	1.3	METALS	SW	N	Y	9A09G601
PRRP	PRWP-SW008	AC2008	14-Sep-00			Copper	7440-50-8	1.8			ug/L	1.3	METALS	SW	N	Y	9A09G601
PRRP	PRWP-SW009	AC2009	14-Sep-00			Copper	7440-50-8	1.3	U	U	ug/L	1.3	METALS	SW	N	N	9A09G601
PRRP	PRWP-SW010	AC2010	14-Sep-00			Copper	7440-50-8	7.4			ug/L	1.3	METALS	SW	N	Y	9A09G601
PRRP	PRWP-SW004	AC2004	14-Sep-00			Iron	7439-89-6	1220			ug/L	23.3	METALS	SW	N	Y	9A09G601
PRRP	PRWP-SW006	AC2006	14-Sep-00			Iron	7439-89-6	388			ug/L	23.3	METALS	SW	N	Y	9A09G601
PRRP	PRWP-SW007	AC2007	14-Sep-00			Iron	7439-89-6	364			ug/L	23.3	METALS	SW	N	Y	9A09G601
PRRP	PRWP-SW008	AC2008	14-Sep-00			Iron	7439-89-6	608			ug/L	23.3	METALS	SW	N	Y	9A09G601
PRRP	PRWP-SW009	AC2009	14-Sep-00			Iron	7439-89-6	314			ug/L	23.3	METALS	SW	N	Y	9A09G601
PRRP	PRWP-SW010	AC2010	14-Sep-00			Iron	7439-89-6	1010			ug/L	23.3	METALS	SW	N	Y	9A09G601
PRRP	PRWP-SW004	AC2004	14-Sep-00			Lead	7439-92-1	2.6	U	U	ug/L	2.6	METALS	SW	N	N	9A09G601
PRRP	PRWP-SW006	AC2006	14-Sep-00			Lead	7439-92-1	2.6	U	U	ug/L	2.6	METALS	SW	N	N	9A09G601
PRRP	PRWP-SW007	AC2007	14-Sep-00			Lead	7439-92-1	2.6	U	U	ug/L	2.6	METALS	SW	N	N	9A09G601
PRRP	PRWP-SW008	AC2008	14-Sep-00			Lead	7439-92-1	2.6	U	U	ug/L	2.6	METALS	SW	N	N	9A09G601
PRRP	PRWP-SW009	AC2009	14-Sep-00			Lead	7439-92-1	2.6	U	U	ug/L	2.6	METALS	SW	N	N	9A09G601
PRRP	PRWP-SW010	AC2010	14-Sep-00			Lead	7439-92-1	2.6	U	U	ug/L	2.6	METALS	SW	N	N	9A09G601
PRRP	PRWP-SW004	AC2004	14-Sep-00			Magnesium	7439-95-4	26000			ug/L	72.8	METALS	SW	N	Y	9A09G601
PRRP	PRWP-SW006	AC2006	14-Sep-00			Magnesium	7439-95-4	24400			ug/L	72.8	METALS	SW	N	Y	9A09G601
PRRP	PRWP-SW007	AC2007	14-Sep-00			Magnesium	7439-95-4	27100			ug/L	72.8	METALS	SW	N	Y	9A09G601
PRRP	PRWP-SW008	AC2008	14-Sep-00			Magnesium	7439-95-4	27100			ug/L	72.8	METALS	SW	N	Y	9A09G601
PRRP	PRWP-SW009	AC2009	14-Sep-00			Magnesium	7439-95-4	27300			ug/L	72.8	METALS	SW	N	Y	9A09G601
PRRP	PRWP-SW010	AC2010	14-Sep-00			Magnesium	7439-95-4	26400			ug/L	72.8	METALS	SW	N	Y	9A09G601
PRRP	PRWP-SW004	AC2004	14-Sep-00			Manganese	7439-96-5	149			ug/L	1.4	METALS	SW	N	Y	9A09G601
PRRP	PRWP-SW006	AC2006	14-Sep-00			Manganese	7439-96-5	104			ug/L	1.4	METALS	SW	N	Y	9A09G601
PRRP	PRWP-SW007	AC2007	14-Sep-00			Manganese	7439-96-5	106			ug/L	1.4	METALS	SW	N	Y	9A09G601
PRRP	PRWP-SW008	AC2008	14-Sep-00			Manganese	7439-96-5	148			ug/L	1.4	METALS	SW	N	Y	9A09G601
PRRP	PRWP-SW009	AC2009	14-Sep-00			Manganese	7439-96-5	101			ug/L	1.4	METALS	SW	N	Y	9A09G601
PRRP	PRWP-SW010	AC2010	14-Sep-00			Manganese	7439-96-5	147			ug/L	1.4	METALS	SW	N	Y	9A09G601
PRRP	PRWP-SW004	AC2004	14-Sep-00			Nickel	7440-02-0	1.7			ug/L	1.6	METALS	SW	N	Y	9A09G601
PRRP	PRWP-SW006	AC2006	14-Sep-00			Nickel	7440-02-0	1.6	U	U	ug/L	1.6	METALS	SW	N	N	9A09G601
PRRP	PRWP-SW007	AC2007	14-Sep-00			Nickel	7440-02-0	1.6	U	U	ug/L	1.6	METALS	SW	N	N	9A09G601
PRRP	PRWP-SW008	AC2008	14-Sep-00			Nickel	7440-02-0	1.6	U	U	ug/L	1.6	METALS	SW	N	N	9A09G601
PRRP	PRWP-SW009	AC2009	14-Sep-00			Nickel	7440-02-0	1.6	U	U	ug/L	1.6	METALS	SW	N	N	9A09G601
PRRP	PRWP-SW010	AC2010	14-Sep-00			Nickel	7440-02-0	1.6	U	U	ug/L	1.6	METALS	SW	N	N	9A09G601
PRRP	PRWP-SW004	AC2004	14-Sep-00			Phosphorous	7723-14-0	0.05	U	U	mg/L	0.05	GEN CHEMISTRY	SW	N	N	9A09G601
PRRP	PRWP-SW006	AC2006	14-Sep-00			Phosphorous	7723-14-0	0.05			mg/L	0.05	GEN CHEMISTRY	SW	N	Y	9A09G601
PRRP	PRWP-SW007	AC2007	14-Sep-00			Phosphorous	7723-14-0	0.066			mg/L	0.05	GEN CHEMISTRY	SW	N	Y	9A09G601

GROUP_ NAME	LOCATION_ CODE	SAMPLE_ NO	SAMPLE_ DATE	START_ DEPTH	END_ DEPTH	PARAMETER	CASNO	RESULT	LAB_ QUAL	VAL_ QUAL	UNITS	DETECT_ LIMIT	USER_TEST_ GROUP	SAMPLE_ TYPE	FILTERED	DETECT	SAMPLE_ DELIVERY _ GROUP
PRRP	PRWP-SW008	AC2008	14-Sep-00			Phosphorous	7723-14-0	0.12			mg/L	0.05	GEN CHEMISTRY	SW	N	Y	9A09G601
PRRP	PRWP-SW009	AC2009	14-Sep-00			Phosphorous	7723-14-0	0.051			mg/L	0.05	GEN CHEMISTRY	SW	N	Y	9A09G601
PRRP	PRWP-SW010	AC2010	14-Sep-00			Phosphorous	7723-14-0	0.086			mg/L	0.05	GEN CHEMISTRY	SW	N	Y	9A09G601
PRRP	PRWP-SW004	AC2004	14-Sep-00			Potassium	2023695	2330			ug/L	91.2	METALS	SW	N	Y	9A09G601
PRRP	PRWP-SW006	AC2006	14-Sep-00			Potassium	2023695	1870			ug/L	91.2	METALS	SW	N	Y	9A09G601
PRRP	PRWP-SW007	AC2007	14-Sep-00			Potassium	2023695	2100			ug/L	91.2	METALS	SW	N	Y	9A09G601
PRRP	PRWP-SW008	AC2008	14-Sep-00			Potassium	2023695	2190			ug/L	91.2	METALS	SW	N	Y	9A09G601
PRRP	PRWP-SW009	AC2009	14-Sep-00			Potassium	2023695	2110			ug/L	91.2	METALS	SW	N	Y	9A09G601
PRRP	PRWP-SW010	AC2010	14-Sep-00			Potassium	2023695	2090			ug/L	91.2	METALS	SW	N	Y	9A09G601
PRRP	PRWP-SW004	AC2004	14-Sep-00			Sodium	7440-23-5	9510			ug/L	274	METALS	SW	N	Y	9A09G601
PRRP	PRWP-SW006	AC2006	14-Sep-00			Sodium	7440-23-5	8950			ug/L	274	METALS	SW	N	Y	9A09G601
PRRP	PRWP-SW007	AC2007	14-Sep-00			Sodium	7440-23-5	9910			ug/L	274	METALS	SW	N	Y	9A09G601
PRRP	PRWP-SW008	AC2008	14-Sep-00			Sodium	7440-23-5	9790			ug/L	274	METALS	SW	N	Y	9A09G601
PRRP	PRWP-SW009	AC2009	14-Sep-00			Sodium	7440-23-5	9920			ug/L	274	METALS	SW	N	Y	9A09G601
PRRP	PRWP-SW010	AC2010	14-Sep-00			Sodium	7440-23-5	9620			ug/L	274	METALS	SW	N	Y	9A09G601
PRRP	PRWP-SW004	AC2004	14-Sep-00			Vanadium	7440-62-2	7.2		B	ug/L	2.1	METALS	SW	N	Y	9A09G601
PRRP	PRWP-SW006	AC2006	14-Sep-00			Vanadium	7440-62-2	3.6		B	ug/L	2.1	METALS	SW	N	Y	9A09G601
PRRP	PRWP-SW007	AC2007	14-Sep-00			Vanadium	7440-62-2	4.1		B	ug/L	2.1	METALS	SW	N	Y	9A09G601
PRRP	PRWP-SW008	AC2008	14-Sep-00			Vanadium	7440-62-2	5		B	ug/L	2.1	METALS	SW	N	Y	9A09G601
PRRP	PRWP-SW009	AC2009	14-Sep-00			Vanadium	7440-62-2	4.4		B	ug/L	2.1	METALS	SW	N	Y	9A09G601
PRRP	PRWP-SW010	AC2010	14-Sep-00			Vanadium	7440-62-2	4.3		B	ug/L	2.1	METALS	SW	N	Y	9A09G601
PRRP	PRWP-SW004	AC2004	14-Sep-00			Zinc	7440-66-6	54.3		J	ug/L	0.6	METALS	SW	N	Y	9A09G601
PRRP	PRWP-SW006	AC2006	14-Sep-00			Zinc	7440-66-6	14		J	ug/L	0.6	METALS	SW	N	Y	9A09G601
PRRP	PRWP-SW007	AC2007	14-Sep-00			Zinc	7440-66-6	13		J	ug/L	0.6	METALS	SW	N	Y	9A09G601
PRRP	PRWP-SW008	AC2008	14-Sep-00			Zinc	7440-66-6	15.2		J	ug/L	0.6	METALS	SW	N	Y	9A09G601
PRRP	PRWP-SW009	AC2009	14-Sep-00			Zinc	7440-66-6	12.1		J	ug/L	0.6	METALS	SW	N	Y	9A09G601
PRRP	PRWP-SW010	AC2010	14-Sep-00			Zinc	7440-66-6	14		J	ug/L	0.6	METALS	SW	N	Y	9A09G601
BCG	BCG-SD001	AE1001	15-Sep-00	0	1	% Solids	38992	40.9			Percent	0.1	GEN CHEMISTRY	SD	N	Y	9A09G602
BCG	BCG-SD002	AE1002	15-Sep-00	0	1	% Solids	38992	14.8			Percent	0.1	GEN CHEMISTRY	SD	N	Y	9A09G602
BCG	BCG-SD003	AE1003	15-Sep-00	0	1	% Solids	38992	39.5			Percent	0.1	GEN CHEMISTRY	SD	N	Y	9A09G602
BCG	BCG-SD004	AE1004	15-Sep-00	0	0.5	% Solids	38992	63.1			Percent	0.1	GEN CHEMISTRY	SD	N	Y	9A09G602
BCG	BCG-SD005	AE1005	15-Sep-00	0	0.5	% Solids	38992	60.8			Percent	0.1	GEN CHEMISTRY	SD	N	Y	9A09G602
BCG	BCG-SD006	AE1006	15-Sep-00	0	0.5	% Solids	38992	71			Percent	0.1	GEN CHEMISTRY	SD	N	Y	9A09G602
BCG	BCG-SD001	AE1001	15-Sep-00	0	1	Aluminum	7429-90-5	6190		J	mg/kg	9.5	METALS	SD	N	Y	9A09G602
BCG	BCG-SD002	AE1002	15-Sep-00	0	1	Aluminum	7429-90-5	11400		J	mg/kg	27.3	METALS	SD	N	Y	9A09G602
BCG	BCG-SD003	AE1003	15-Sep-00	0	1	Aluminum	7429-90-5	10400		J	mg/kg	9.6	METALS	SD	N	Y	9A09G602
BCG	BCG-SD004	AE1004	15-Sep-00	0	0.5	Aluminum	7429-90-5	4920		J	mg/kg	7.1	METALS	SD	N	Y	9A09G602
BCG	BCG-SD005	AE1005	15-Sep-00	0	0.5	Aluminum	7429-90-5	7680		J	mg/kg	6.4	METALS	SD	N	Y	9A09G602
BCG	BCG-SD006	AE1006	15-Sep-00	0	0.5	Aluminum	7429-90-5	6260		J	mg/kg	6.4	METALS	SD	N	Y	9A09G602
BCG	BCG-SD001	AE1001	15-Sep-00	0	1	Antimony	7440-36-0	0.72	U	UJ	mg/kg	0.72	METALS	SD	N	N	9A09G602
BCG	BCG-SD002	AE1002	15-Sep-00	0	1	Antimony	7440-36-0	2.1	U	UJ	mg/kg	2.1	METALS	SD	N	N	9A09G602
BCG	BCG-SD003	AE1003	15-Sep-00	0	1	Antimony	7440-36-0	0.73	U	UJ	mg/kg	0.73	METALS	SD	N	N	9A09G602
BCG	BCG-SD004	AE1004	15-Sep-00	0	0.5	Antimony	7440-36-0	0.53	U	UJ	mg/kg	0.53	METALS	SD	N	N	9A09G602
BCG	BCG-SD005	AE1005	15-Sep-00	0	0.5	Antimony	7440-36-0	0.48	U	UJ	mg/kg	0.48	METALS	SD	N	N	9A09G602
BCG	BCG-SD006	AE1006	15-Sep-00	0	0.5	Antimony	7440-36-0	0.48	U	UJ	mg/kg	0.48	METALS	SD	N	N	9A09G602
BCG	BCG-SD001	AE1001	15-Sep-00	0	1	Arsenic	7440-38-2	7.4		J	mg/kg	0.57	METALS	SD	N	Y	9A09G602
BCG	BCG-SD002	AE1002	15-Sep-00	0	1	Arsenic	7440-38-2	3.4		J	mg/kg	1.7	METALS	SD	N	Y	9A09G602
BCG	BCG-SD003	AE1003	15-Sep-00	0	1	Arsenic	7440-38-2	6.1		J	mg/kg	0.58	METALS	SD	N	Y	9A09G602
BCG	BCG-SD004	AE1004	15-Sep-00	0	0.5	Arsenic	7440-38-2	3.9		J	mg/kg	0.43	METALS	SD	N	Y	9A09G602
BCG	BCG-SD005	AE1005	15-Sep-00	0	0.5	Arsenic	7440-38-2	5.2		J	mg/kg	0.39	METALS	SD	N	Y	9A09G602

GROUP_ NAME	LOCATION_ CODE	SAMPLE_ NO	SAMPLE_ DATE	START_ DEPTH	END_ DEPTH	PARAMETER	CASNO	RESULT	LAB_ QUAL	VAL_ QUAL	UNITS	DETECT_ LIMIT	USER_TEST_ GROUP	SAMPLE_ TYPE	FILTERED	DETECT	SAMPLE_ DELIVERY _GROUP
BCG	BCG-SD006	AE1006	15-Sep-00	0	0.5	Arsenic	7440-38-2	3.5		J	mg/kg	0.39	METALS	SD	N	Y	9A09G602
BCG	BCG-SD001	AE1001	15-Sep-00	0	1	Barium	7440-39-3	51.5		J	mg/kg	0.04	METALS	SD	N	Y	9A09G602
BCG	BCG-SD002	AE1002	15-Sep-00	0	1	Barium	7440-39-3	86.2		J	mg/kg	0.11	METALS	SD	N	Y	9A09G602
BCG	BCG-SD003	AE1003	15-Sep-00	0	1	Barium	7440-39-3	58.3		J	mg/kg	0.04	METALS	SD	N	Y	9A09G602
BCG	BCG-SD004	AE1004	15-Sep-00	0	0.5	Barium	7440-39-3	40		J	mg/kg	0.03	METALS	SD	N	Y	9A09G602
BCG	BCG-SD005	AE1005	15-Sep-00	0	0.5	Barium	7440-39-3	48		J	mg/kg	0.03	METALS	SD	N	Y	9A09G602
BCG	BCG-SD006	AE1006	15-Sep-00	0	0.5	Barium	7440-39-3	40		J	mg/kg	0.03	METALS	SD	N	Y	9A09G602
BCG	BCG-SD001	AE1001	15-Sep-00	0	1	Calcium	7440-70-2	34500		J	mg/kg	9.4	METALS	SD	N	Y	9A09G602
BCG	BCG-SD002	AE1002	15-Sep-00	0	1	Calcium	7440-70-2	79100		J	mg/kg	27	METALS	SD	N	Y	9A09G602
BCG	BCG-SD003	AE1003	15-Sep-00	0	1	Calcium	7440-70-2	47900		J	mg/kg	9.5	METALS	SD	N	Y	9A09G602
BCG	BCG-SD004	AE1004	15-Sep-00	0	0.5	Calcium	7440-70-2	10900		J	mg/kg	7	METALS	SD	N	Y	9A09G602
BCG	BCG-SD005	AE1005	15-Sep-00	0	0.5	Calcium	7440-70-2	9750		J	mg/kg	6.3	METALS	SD	N	Y	9A09G602
BCG	BCG-SD006	AE1006	15-Sep-00	0	0.5	Calcium	7440-70-2	8190		J	mg/kg	6.3	METALS	SD	N	Y	9A09G602
BCG	BCG-SD001	AE1001	15-Sep-00	0	1	Chromium	7440-47-3	13.7		J	mg/kg	0.1	METALS	SD	N	Y	9A09G602
BCG	BCG-SD002	AE1002	15-Sep-00	0	1	Chromium	7440-47-3	17.1		J	mg/kg	0.3	METALS	SD	N	Y	9A09G602
BCG	BCG-SD003	AE1003	15-Sep-00	0	1	Chromium	7440-47-3	15.5		J	mg/kg	0.11	METALS	SD	N	Y	9A09G602
BCG	BCG-SD004	AE1004	15-Sep-00	0	0.5	Chromium	7440-47-3	7.4		J	mg/kg	0.08	METALS	SD	N	Y	9A09G602
BCG	BCG-SD005	AE1005	15-Sep-00	0	0.5	Chromium	7440-47-3	10.5		J	mg/kg	0.07	METALS	SD	N	Y	9A09G602
BCG	BCG-SD006	AE1006	15-Sep-00	0	0.5	Chromium	7440-47-3	8.7		J	mg/kg	0.07	METALS	SD	N	Y	9A09G602
BCG	BCG-SD001	AE1001	15-Sep-00	0	1	Cobalt	7440-48-4	6.6		J	mg/kg	0.14	METALS	SD	N	Y	9A09G602
BCG	BCG-SD002	AE1002	15-Sep-00	0	1	Cobalt	7440-48-4	8.1		J	mg/kg	0.41	METALS	SD	N	Y	9A09G602
BCG	BCG-SD003	AE1003	15-Sep-00	0	1	Cobalt	7440-48-4	9.5		J	mg/kg	0.15	METALS	SD	N	Y	9A09G602
BCG	BCG-SD004	AE1004	15-Sep-00	0	0.5	Cobalt	7440-48-4	8.2		J	mg/kg	0.11	METALS	SD	N	Y	9A09G602
BCG	BCG-SD005	AE1005	15-Sep-00	0	0.5	Cobalt	7440-48-4	9.3		J	mg/kg	0.1	METALS	SD	N	Y	9A09G602
BCG	BCG-SD006	AE1006	15-Sep-00	0	0.5	Cobalt	7440-48-4	7.6		J	mg/kg	0.1	METALS	SD	N	Y	9A09G602
BCG	BCG-SD001	AE1001	15-Sep-00	0	1	Copper	7440-50-8	16.9			mg/kg	0.17	METALS	SD	N	Y	9A09G602
BCG	BCG-SD002	AE1002	15-Sep-00	0	1	Copper	7440-50-8	21			mg/kg	0.49	METALS	SD	N	Y	9A09G602
BCG	BCG-SD003	AE1003	15-Sep-00	0	1	Copper	7440-50-8	20.3			mg/kg	0.17	METALS	SD	N	Y	9A09G602
BCG	BCG-SD004	AE1004	15-Sep-00	0	0.5	Copper	7440-50-8	12.1			mg/kg	0.13	METALS	SD	N	Y	9A09G602
BCG	BCG-SD005	AE1005	15-Sep-00	0	0.5	Copper	7440-50-8	13.6			mg/kg	0.11	METALS	SD	N	Y	9A09G602
BCG	BCG-SD006	AE1006	15-Sep-00	0	0.5	Copper	7440-50-8	11.6			mg/kg	0.11	METALS	SD	N	Y	9A09G602
BCG	BCG-SD001	AE1001	15-Sep-00	0	1	Iron	7439-89-6	14100		J	mg/kg	3	METALS	SD	N	Y	9A09G602
BCG	BCG-SD002	AE1002	15-Sep-00	0	1	Iron	7439-89-6	20900		J	mg/kg	8.7	METALS	SD	N	Y	9A09G602
BCG	BCG-SD003	AE1003	15-Sep-00	0	1	Iron	7439-89-6	19500		J	mg/kg	3.1	METALS	SD	N	Y	9A09G602
BCG	BCG-SD004	AE1004	15-Sep-00	0	0.5	Iron	7439-89-6	11400		J	mg/kg	2.3	METALS	SD	N	Y	9A09G602
BCG	BCG-SD005	AE1005	15-Sep-00	0	0.5	Iron	7439-89-6	14700		J	mg/kg	2	METALS	SD	N	Y	9A09G602
BCG	BCG-SD006	AE1006	15-Sep-00	0	0.5	Iron	7439-89-6	11700		J	mg/kg	2.1	METALS	SD	N	Y	9A09G602
BCG	BCG-SD001	AE1001	15-Sep-00	0	1	Lead	7439-92-1	13.1		J	mg/kg	0.34	METALS	SD	N	Y	9A09G602
BCG	BCG-SD002	AE1002	15-Sep-00	0	1	Lead	7439-92-1	18.9		J	mg/kg	0.98	METALS	SD	N	Y	9A09G602
BCG	BCG-SD003	AE1003	15-Sep-00	0	1	Lead	7439-92-1	15		J	mg/kg	0.34	METALS	SD	N	Y	9A09G602
BCG	BCG-SD004	AE1004	15-Sep-00	0	0.5	Lead	7439-92-1	9.1		J	mg/kg	0.25	METALS	SD	N	Y	9A09G602
BCG	BCG-SD005	AE1005	15-Sep-00	0	0.5	Lead	7439-92-1	12.2		J	mg/kg	0.23	METALS	SD	N	Y	9A09G602
BCG	BCG-SD006	AE1006	15-Sep-00	0	0.5	Lead	7439-92-1	9.9		J	mg/kg	0.23	METALS	SD	N	Y	9A09G602
BCG	BCG-SD001	AE1001	15-Sep-00	0	1	Magnesium	7439-95-4	10300		J	mg/kg	9.5	METALS	SD	N	Y	9A09G602
BCG	BCG-SD002	AE1002	15-Sep-00	0	1	Magnesium	7439-95-4	7940		J	mg/kg	27.3	METALS	SD	N	Y	9A09G602
BCG	BCG-SD003	AE1003	15-Sep-00	0	1	Magnesium	7439-95-4	8480		J	mg/kg	9.6	METALS	SD	N	Y	9A09G602
BCG	BCG-SD004	AE1004	15-Sep-00	0	0.5	Magnesium	7439-95-4	2200		J	mg/kg	7.1	METALS	SD	N	Y	9A09G602
BCG	BCG-SD005	AE1005	15-Sep-00	0	0.5	Magnesium	7439-95-4	3070		J	mg/kg	6.4	METALS	SD	N	Y	9A09G602
BCG	BCG-SD006	AE1006	15-Sep-00	0	0.5	Magnesium	7439-95-4	2340		J	mg/kg	6.4	METALS	SD	N	Y	9A09G602
BCG	BCG-SD001	AE1001	15-Sep-00	0	1	Manganese	7439-96-5	275		J	mg/kg	0.18	METALS	SD	N	Y	9A09G602

GROUP_ NAME	LOCATION_ CODE	SAMPLE_ NO	SAMPLE_ DATE	START_ DEPTH	END_ DEPTH	PARAMETER	CASNO	RESULT	LAB_ QUAL	VAL_ QUAL	UNITS	DETECT_ LIMIT	USER_TEST_ GROUP	SAMPLE_ TYPE	FILTERED	DETECT	SAMPLE_ DELIVERY _ GROUP
BCG	BCG-SD002	AE1002	15-Sep-00	0	1	Manganese	7439-96-5	1330		J	mg/kg	0.53	METALS	SD	N	Y	9A09G602
BCG	BCG-SD003	AE1003	15-Sep-00	0	1	Manganese	7439-96-5	575		J	mg/kg	0.19	METALS	SD	N	Y	9A09G602
BCG	BCG-SD004	AE1004	15-Sep-00	0	0.5	Manganese	7439-96-5	390		J	mg/kg	0.14	METALS	SD	N	Y	9A09G602
BCG	BCG-SD005	AE1005	15-Sep-00	0	0.5	Manganese	7439-96-5	321		J	mg/kg	0.12	METALS	SD	N	Y	9A09G602
BCG	BCG-SD006	AE1006	15-Sep-00	0	0.5	Manganese	7439-96-5	279		J	mg/kg	0.12	METALS	SD	N	Y	9A09G602
BCG	BCG-SD001	AE1001	15-Sep-00	0	1	Nickel	7440-02-0	16.2		J	mg/kg	0.21	METALS	SD	N	Y	9A09G602
BCG	BCG-SD002	AE1002	15-Sep-00	0	1	Nickel	7440-02-0	22.5		J	mg/kg	0.6	METALS	SD	N	Y	9A09G602
BCG	BCG-SD003	AE1003	15-Sep-00	0	1	Nickel	7440-02-0	23		J	mg/kg	0.21	METALS	SD	N	Y	9A09G602
BCG	BCG-SD004	AE1004	15-Sep-00	0	0.5	Nickel	7440-02-0	20.2		J	mg/kg	0.16	METALS	SD	N	Y	9A09G602
BCG	BCG-SD005	AE1005	15-Sep-00	0	0.5	Nickel	7440-02-0	21.7		J	mg/kg	0.14	METALS	SD	N	Y	9A09G602
BCG	BCG-SD006	AE1006	15-Sep-00	0	0.5	Nickel	7440-02-0	17.6		J	mg/kg	0.14	METALS	SD	N	Y	9A09G602
BCG	BCG-SD001	AE1001	15-Sep-00	0	1	Phosphorous	7723-14-0	12.1	U	U	mg/kg	12.1	GEN CHEMISTRY	SD	N	N	9A09G602
BCG	BCG-SD002	AE1002	15-Sep-00	0	1	Phosphorous	7723-14-0	530			mg/kg	48.9	GEN CHEMISTRY	SD	N	Y	9A09G602
BCG	BCG-SD003	AE1003	15-Sep-00	0	1	Phosphorous	7723-14-0	7.3	U	U	mg/kg	7.3	GEN CHEMISTRY	SD	N	N	9A09G602
BCG	BCG-SD004	AE1004	15-Sep-00	0	0.5	Phosphorous	7723-14-0	5.2	U	U	mg/kg	5.2	GEN CHEMISTRY	SD	N	N	9A09G602
BCG	BCG-SD005	AE1005	15-Sep-00	0	0.5	Phosphorous	7723-14-0	12.3			mg/kg	7.3	GEN CHEMISTRY	SD	N	Y	9A09G602
BCG	BCG-SD006	AE1006	15-Sep-00	0	0.5	Phosphorous	7723-14-0	5.5	U	U	mg/kg	5.5	GEN CHEMISTRY	SD	N	N	9A09G602
BCG	BCG-SD001	AE1001	15-Sep-00	0	1	Potassium	2023695	1210		J	mg/kg	11.9	METALS	SD	N	Y	9A09G602
BCG	BCG-SD002	AE1002	15-Sep-00	0	1	Potassium	2023695	3240		J	mg/kg	34.2	METALS	SD	N	Y	9A09G602
BCG	BCG-SD003	AE1003	15-Sep-00	0	1	Potassium	2023695	2110		J	mg/kg	12.1	METALS	SD	N	Y	9A09G602
BCG	BCG-SD004	AE1004	15-Sep-00	0	0.5	Potassium	2023695	916		J	mg/kg	8.9	METALS	SD	N	Y	9A09G602
BCG	BCG-SD005	AE1005	15-Sep-00	0	0.5	Potassium	2023695	1440		J	mg/kg	8	METALS	SD	N	Y	9A09G602
BCG	BCG-SD006	AE1006	15-Sep-00	0	0.5	Potassium	2023695	1140		J	mg/kg	8	METALS	SD	N	Y	9A09G602
BCG	BCG-SD001	AE1001	15-Sep-00	0	1	Sodium	7440-23-5	776			mg/kg	35.6	METALS	SD	N	Y	9A09G602
BCG	BCG-SD002	AE1002	15-Sep-00	0	1	Sodium	7440-23-5	1060			mg/kg	103	METALS	SD	N	Y	9A09G602
BCG	BCG-SD003	AE1003	15-Sep-00	0	1	Sodium	7440-23-5	955			mg/kg	36.3	METALS	SD	N	Y	9A09G602
BCG	BCG-SD004	AE1004	15-Sep-00	0	0.5	Sodium	7440-23-5	513			mg/kg	26.6	METALS	SD	N	Y	9A09G602
BCG	BCG-SD005	AE1005	15-Sep-00	0	0.5	Sodium	7440-23-5	744			mg/kg	24.1	METALS	SD	N	Y	9A09G602
BCG	BCG-SD006	AE1006	15-Sep-00	0	0.5	Sodium	7440-23-5	605			mg/kg	24.1	METALS	SD	N	Y	9A09G602
BCG	BCG-SD001	AE1001	15-Sep-00	0	1	Vanadium	7440-62-2	18.9		J	mg/kg	0.27	METALS	SD	N	Y	9A09G602
BCG	BCG-SD002	AE1002	15-Sep-00	0	1	Vanadium	7440-62-2	26.2		J	mg/kg	0.79	METALS	SD	N	Y	9A09G602
BCG	BCG-SD003	AE1003	15-Sep-00	0	1	Vanadium	7440-62-2	26.4		J	mg/kg	0.28	METALS	SD	N	Y	9A09G602
BCG	BCG-SD004	AE1004	15-Sep-00	0	0.5	Vanadium	7440-62-2	11.2		J	mg/kg	0.2	METALS	SD	N	Y	9A09G602
BCG	BCG-SD005	AE1005	15-Sep-00	0	0.5	Vanadium	7440-62-2	17		J	mg/kg	0.18	METALS	SD	N	Y	9A09G602
BCG	BCG-SD006	AE1006	15-Sep-00	0	0.5	Vanadium	7440-62-2	14.2		J	mg/kg	0.18	METALS	SD	N	Y	9A09G602
BCG	BCG-SD001	AE1001	15-Sep-00	0	1	Zinc	7440-66-6	96		J	mg/kg	0.08	METALS	SD	N	Y	9A09G602
BCG	BCG-SD002	AE1002	15-Sep-00	0	1	Zinc	7440-66-6	118		J	mg/kg	0.23	METALS	SD	N	Y	9A09G602
BCG	BCG-SD003	AE1003	15-Sep-00	0	1	Zinc	7440-66-6	66		J	mg/kg	0.08	METALS	SD	N	Y	9A09G602
BCG	BCG-SD004	AE1004	15-Sep-00	0	0.5	Zinc	7440-66-6	45.6		J	mg/kg	0.06	METALS	SD	N	Y	9A09G602
BCG	BCG-SD005	AE1005	15-Sep-00	0	0.5	Zinc	7440-66-6	56.3		J	mg/kg	0.05	METALS	SD	N	Y	9A09G602
BCG	BCG-SD006	AE1006	15-Sep-00	0	0.5	Zinc	7440-66-6	44.3		J	mg/kg	0.05	METALS	SD	N	Y	9A09G602
BCG	BCG-SO001	AE0001	12-Sep-00	0	1	% Solids	38992	72.4			Percent	0.1	GEN CHEMISTRY	SO	N	Y	9A09G602
BCG	BCG-SO002	AE0002	12-Sep-00	0	1	% Solids	38992	75			Percent	0.1	GEN CHEMISTRY	SO	N	Y	9A09G602
BCG	BCG-SO003	AE0003	12-Sep-00	0	1	% Solids	38992	66.8			Percent	0.1	GEN CHEMISTRY	SO	N	Y	9A09G602
BCG	BCG-SO004	AE0004	12-Sep-00	0	1	% Solids	38992	80.8			Percent	0.1	GEN CHEMISTRY	SO	N	Y	9A09G602
BCG	BCG-SO005	AE0005	12-Sep-00	0	1	% Solids	38992	79.7			Percent	0.1	GEN CHEMISTRY	SO	N	Y	9A09G602
BCG	BCG-SO006	AE0006	12-Sep-00	0	1	% Solids	38992	80.8			Percent	0.1	GEN CHEMISTRY	SO	N	Y	9A09G602
BCG	BCG-SO001	AE0001	12-Sep-00	0	1	Acenaphthene	83-32-9	0.11	U	U	mg/kg	0.11	SEMIVOLATILES	SO	N	N	9A09G602
BCG	BCG-SO002	AE0002	12-Sep-00	0	1	Acenaphthene	83-32-9	0.11	U	U	mg/kg	0.11	SEMIVOLATILES	SO	N	N	9A09G602
BCG	BCG-SO003	AE0003	12-Sep-00	0	1	Acenaphthene	83-32-9	0.12	U	U	mg/kg	0.12	SEMIVOLATILES	SO	N	N	9A09G602

GROUP_ NAME	LOCATION_ CODE	SAMPLE_ NO	SAMPLE_ DATE	START_ DEPTH	END_ DEPTH	PARAMETER	CASNO	RESULT	LAB_ QUAL	VAL_ QUAL	UNITS	DETECT_ LIMIT	USER_TEST_ GROUP	SAMPLE_ TYPE	FILTERED	DETECT	SAMPLE_ DELIVERY _GROUP
BCG	BCG-SO004	AE0004	12-Sep-00	0	1	Acenaphthene	83-32-9	0.1	U	U	mg/kg	0.1	SEMIVOLATILES	SO	N	N	9A09G602
BCG	BCG-SO005	AE0005	12-Sep-00	0	1	Acenaphthene	83-32-9	0.1	U	U	mg/kg	0.1	SEMIVOLATILES	SO	N	N	9A09G602
BCG	BCG-SO006	AE0006	12-Sep-00	0	1	Acenaphthene	83-32-9	0.1	U	U	mg/kg	0.1	SEMIVOLATILES	SO	N	N	9A09G602
BCG	BCG-SO001	AE0001	12-Sep-00	0	1	Acenaphthylene	208-96-8	0.057	U	U	mg/kg	0.057	SEMIVOLATILES	SO	N	N	9A09G602
BCG	BCG-SO002	AE0002	12-Sep-00	0	1	Acenaphthylene	208-96-8	0.054	U	U	mg/kg	0.054	SEMIVOLATILES	SO	N	N	9A09G602
BCG	BCG-SO003	AE0003	12-Sep-00	0	1	Acenaphthylene	208-96-8	0.062	U	U	mg/kg	0.062	SEMIVOLATILES	SO	N	N	9A09G602
BCG	BCG-SO004	AE0004	12-Sep-00	0	1	Acenaphthylene	208-96-8	0.05	U	U	mg/kg	0.05	SEMIVOLATILES	SO	N	N	9A09G602
BCG	BCG-SO005	AE0005	12-Sep-00	0	1	Acenaphthylene	208-96-8	0.05	U	U	mg/kg	0.05	SEMIVOLATILES	SO	N	N	9A09G602
BCG	BCG-SO006	AE0006	12-Sep-00	0	1	Acenaphthylene	208-96-8	0.05	U	U	mg/kg	0.05	SEMIVOLATILES	SO	N	N	9A09G602
BCG	BCG-SO001	AE0001	12-Sep-00	0	1	Aluminum	7429-90-5	10600		J	mg/kg	5.7	METALS	SO	N	Y	9A09G602
BCG	BCG-SO002	AE0002	12-Sep-00	0	1	Aluminum	7429-90-5	10400		J	mg/kg	5.3	METALS	SO	N	Y	9A09G602
BCG	BCG-SO003	AE0003	12-Sep-00	0	1	Aluminum	7429-90-5	7900		J	mg/kg	7.1	METALS	SO	N	Y	9A09G602
BCG	BCG-SO004	AE0004	12-Sep-00	0	1	Aluminum	7429-90-5	8280		J	mg/kg	5.8	METALS	SO	N	Y	9A09G602
BCG	BCG-SO005	AE0005	12-Sep-00	0	1	Aluminum	7429-90-5	6970		J	mg/kg	5.9	METALS	SO	N	Y	9A09G602
BCG	BCG-SO006	AE0006	12-Sep-00	0	1	Aluminum	7429-90-5	6330		J	mg/kg	5.9	METALS	SO	N	Y	9A09G602
BCG	BCG-SO001	AE0001	12-Sep-00	0	1	Anthracene	120-12-7	0.0023	U	U	mg/kg	0.0023	SEMIVOLATILES	SO	N	N	9A09G602
BCG	BCG-SO002	AE0002	12-Sep-00	0	1	Anthracene	120-12-7	0.00087	J	J	mg/kg	0.0022	SEMIVOLATILES	SO	N	Y	9A09G602
BCG	BCG-SO003	AE0003	12-Sep-00	0	1	Anthracene	120-12-7	0.001	J	J	mg/kg	0.0025	SEMIVOLATILES	SO	N	Y	9A09G602
BCG	BCG-SO004	AE0004	12-Sep-00	0	1	Anthracene	120-12-7	0.002	U	U	mg/kg	0.002	SEMIVOLATILES	SO	N	N	9A09G602
BCG	BCG-SO005	AE0005	12-Sep-00	0	1	Anthracene	120-12-7	0.002	U	U	mg/kg	0.002	SEMIVOLATILES	SO	N	N	9A09G602
BCG	BCG-SO006	AE0006	12-Sep-00	0	1	Anthracene	120-12-7	0.002	U	U	mg/kg	0.002	SEMIVOLATILES	SO	N	N	9A09G602
BCG	BCG-SO001	AE0001	12-Sep-00	0	1	Antimony	7440-36-0	0.43	U	UJ	mg/kg	0.43	METALS	SO	N	N	9A09G602
BCG	BCG-SO002	AE0002	12-Sep-00	0	1	Antimony	7440-36-0	0.4	U	UJ	mg/kg	0.4	METALS	SO	N	N	9A09G602
BCG	BCG-SO003	AE0003	12-Sep-00	0	1	Antimony	7440-36-0	0.53	U	UJ	mg/kg	0.53	METALS	SO	N	N	9A09G602
BCG	BCG-SO004	AE0004	12-Sep-00	0	1	Antimony	7440-36-0	0.44	U	UJ	mg/kg	0.44	METALS	SO	N	N	9A09G602
BCG	BCG-SO005	AE0005	12-Sep-00	0	1	Antimony	7440-36-0	0.45	U	UJ	mg/kg	0.45	METALS	SO	N	N	9A09G602
BCG	BCG-SO006	AE0006	12-Sep-00	0	1	Antimony	7440-36-0	0.45	U	UJ	mg/kg	0.45	METALS	SO	N	N	9A09G602
BCG	BCG-SO001	AE0001	12-Sep-00	0	1	Arsenic	7440-38-2	9.3		J	mg/kg	0.35	METALS	SO	N	Y	9A09G602
BCG	BCG-SO002	AE0002	12-Sep-00	0	1	Arsenic	7440-38-2	4.5		J	mg/kg	0.32	METALS	SO	N	Y	9A09G602
BCG	BCG-SO003	AE0003	12-Sep-00	0	1	Arsenic	7440-38-2	5.1		J	mg/kg	0.43	METALS	SO	N	Y	9A09G602
BCG	BCG-SO004	AE0004	12-Sep-00	0	1	Arsenic	7440-38-2	2.3		J	mg/kg	0.35	METALS	SO	N	Y	9A09G602
BCG	BCG-SO005	AE0005	12-Sep-00	0	1	Arsenic	7440-38-2	2.6		J	mg/kg	0.36	METALS	SO	N	Y	9A09G602
BCG	BCG-SO006	AE0006	12-Sep-00	0	1	Arsenic	7440-38-2	2		J	mg/kg	0.36	METALS	SO	N	Y	9A09G602
BCG	BCG-SO001	AE0001	12-Sep-00	0	1	Barium	7440-39-3	104		J	mg/kg	0.02	METALS	SO	N	Y	9A09G602
BCG	BCG-SO002	AE0002	12-Sep-00	0	1	Barium	7440-39-3	48.8		J	mg/kg	0.02	METALS	SO	N	Y	9A09G602
BCG	BCG-SO003	AE0003	12-Sep-00	0	1	Barium	7440-39-3	110		J	mg/kg	0.03	METALS	SO	N	Y	9A09G602
BCG	BCG-SO004	AE0004	12-Sep-00	0	1	Barium	7440-39-3	39.2		J	mg/kg	0.02	METALS	SO	N	Y	9A09G602
BCG	BCG-SO005	AE0005	12-Sep-00	0	1	Barium	7440-39-3	34.4		J	mg/kg	0.02	METALS	SO	N	Y	9A09G602
BCG	BCG-SO006	AE0006	12-Sep-00	0	1	Barium	7440-39-3	44.3		J	mg/kg	0.02	METALS	SO	N	Y	9A09G602
BCG	BCG-SO001	AE0001	12-Sep-00	0	1	Benzo(a)anthracene	56-55-3	0.0071			mg/kg	0.0057	SEMIVOLATILES	SO	N	Y	9A09G602
BCG	BCG-SO002	AE0002	12-Sep-00	0	1	Benzo(a)anthracene	56-55-3	0.0059			mg/kg	0.0054	SEMIVOLATILES	SO	N	Y	9A09G602
BCG	BCG-SO003	AE0003	12-Sep-00	0	1	Benzo(a)anthracene	56-55-3	0.01			mg/kg	0.0062	SEMIVOLATILES	SO	N	Y	9A09G602
BCG	BCG-SO004	AE0004	12-Sep-00	0	1	Benzo(a)anthracene	56-55-3	0.005	U	U	mg/kg	0.005	SEMIVOLATILES	SO	N	N	9A09G602
BCG	BCG-SO005	AE0005	12-Sep-00	0	1	Benzo(a)anthracene	56-55-3	0.0049	J	J	mg/kg	0.005	SEMIVOLATILES	SO	N	Y	9A09G602
BCG	BCG-SO006	AE0006	12-Sep-00	0	1	Benzo(a)anthracene	56-55-3	0.0048	J	J	mg/kg	0.005	SEMIVOLATILES	SO	N	Y	9A09G602
BCG	BCG-SO001	AE0001	12-Sep-00	0	1	Benzo(a)pyrene	50-32-8	0.01			mg/kg	0.0057	SEMIVOLATILES	SO	N	Y	9A09G602
BCG	BCG-SO002	AE0002	12-Sep-00	0	1	Benzo(a)pyrene	50-32-8	0.0087			mg/kg	0.0054	SEMIVOLATILES	SO	N	Y	9A09G602
BCG	BCG-SO003	AE0003	12-Sep-00	0	1	Benzo(a)pyrene	50-32-8	0.016			mg/kg	0.0062	SEMIVOLATILES	SO	N	Y	9A09G602
BCG	BCG-SO004	AE0004	12-Sep-00	0	1	Benzo(a)pyrene	50-32-8	0.0038	J	J	mg/kg	0.005	SEMIVOLATILES	SO	N	Y	9A09G602
BCG	BCG-SO005	AE0005	12-Sep-00	0	1	Benzo(a)pyrene	50-32-8	0.0078			mg/kg	0.005	SEMIVOLATILES	SO	N	Y	9A09G602

GROUP_ NAME	LOCATION_ CODE	SAMPLE_ NO	SAMPLE_ DATE	START_ DEPTH	END_ DEPTH	PARAMETER	CASNO	RESULT	LAB_ QUAL	VAL_ QUAL	UNITS	DETECT_ LIMIT	USER_TEST_ GROUP	SAMPLE_ TYPE	FILTERED	DETECT	SAMPLE_ DELIVERY _ GROUP
BCG	BCG-SO006	AE0006	12-Sep-00	0	1	Benzo(a)pyrene	50-32-8	0.0078			mg/kg	0.005	SEMIVOLATILES	SO	N	Y	9A09G602
BCG	BCG-SO001	AE0001	12-Sep-00	0	1	Benzo(b)fluoranthene	205-99-2	0.01			mg/kg	0.0023	SEMIVOLATILES	SO	N	Y	9A09G602
BCG	BCG-SO002	AE0002	12-Sep-00	0	1	Benzo(b)fluoranthene	205-99-2	0.0081			mg/kg	0.0022	SEMIVOLATILES	SO	N	Y	9A09G602
BCG	BCG-SO003	AE0003	12-Sep-00	0	1	Benzo(b)fluoranthene	205-99-2	0.0078			mg/kg	0.0025	SEMIVOLATILES	SO	N	Y	9A09G602
BCG	BCG-SO004	AE0004	12-Sep-00	0	1	Benzo(b)fluoranthene	205-99-2	0.0036			mg/kg	0.002	SEMIVOLATILES	SO	N	Y	9A09G602
BCG	BCG-SO005	AE0005	12-Sep-00	0	1	Benzo(b)fluoranthene	205-99-2	0.0078			mg/kg	0.002	SEMIVOLATILES	SO	N	Y	9A09G602
BCG	BCG-SO006	AE0006	12-Sep-00	0	1	Benzo(b)fluoranthene	205-99-2	0.0074			mg/kg	0.002	SEMIVOLATILES	SO	N	Y	9A09G602
BCG	BCG-SO001	AE0001	12-Sep-00	0	1	Benzo(ghi)perylene	191-24-2	0.0091	U	U	mg/kg	0.0091	SEMIVOLATILES	SO	N	N	9A09G602
BCG	BCG-SO002	AE0002	12-Sep-00	0	1	Benzo(ghi)perylene	191-24-2	0.0086	U	U	mg/kg	0.0086	SEMIVOLATILES	SO	N	N	9A09G602
BCG	BCG-SO003	AE0003	12-Sep-00	0	1	Benzo(ghi)perylene	191-24-2	0.0099	U	U	mg/kg	0.0099	SEMIVOLATILES	SO	N	N	9A09G602
BCG	BCG-SO004	AE0004	12-Sep-00	0	1	Benzo(ghi)perylene	191-24-2	0.008	U	U	mg/kg	0.008	SEMIVOLATILES	SO	N	N	9A09G602
BCG	BCG-SO005	AE0005	12-Sep-00	0	1	Benzo(ghi)perylene	191-24-2	0.0081	U	U	mg/kg	0.0081	SEMIVOLATILES	SO	N	N	9A09G602
BCG	BCG-SO006	AE0006	12-Sep-00	0	1	Benzo(ghi)perylene	191-24-2	0.0081	U	U	mg/kg	0.0081	SEMIVOLATILES	SO	N	N	9A09G602
BCG	BCG-SO001	AE0001	12-Sep-00	0	1	Benzo(k)fluoranthene	207-08-9	0.004			mg/kg	0.0023	SEMIVOLATILES	SO	N	Y	9A09G602
BCG	BCG-SO002	AE0002	12-Sep-00	0	1	Benzo(k)fluoranthene	207-08-9	0.0038			mg/kg	0.0022	SEMIVOLATILES	SO	N	Y	9A09G602
BCG	BCG-SO003	AE0003	12-Sep-00	0	1	Benzo(k)fluoranthene	207-08-9	0.0062			mg/kg	0.0025	SEMIVOLATILES	SO	N	Y	9A09G602
BCG	BCG-SO004	AE0004	12-Sep-00	0	1	Benzo(k)fluoranthene	207-08-9	0.0018	J	J	mg/kg	0.002	SEMIVOLATILES	SO	N	Y	9A09G602
BCG	BCG-SO005	AE0005	12-Sep-00	0	1	Benzo(k)fluoranthene	207-08-9	0.0035			mg/kg	0.002	SEMIVOLATILES	SO	N	Y	9A09G602
BCG	BCG-SO006	AE0006	12-Sep-00	0	1	Benzo(k)fluoranthene	207-08-9	0.0038			mg/kg	0.002	SEMIVOLATILES	SO	N	Y	9A09G602
BCG	BCG-SO001	AE0001	12-Sep-00	0	1	Calcium	7440-70-2	5740		J	mg/kg	5.6	METALS	SO	N	Y	9A09G602
BCG	BCG-SO002	AE0002	12-Sep-00	0	1	Calcium	7440-70-2	4550		J	mg/kg	5.3	METALS	SO	N	Y	9A09G602
BCG	BCG-SO003	AE0003	12-Sep-00	0	1	Calcium	7440-70-2	5930		J	mg/kg	7	METALS	SO	N	Y	9A09G602
BCG	BCG-SO004	AE0004	12-Sep-00	0	1	Calcium	7440-70-2	1350		J	mg/kg	5.8	METALS	SO	N	Y	9A09G602
BCG	BCG-SO005	AE0005	12-Sep-00	0	1	Calcium	7440-70-2	2300		J	mg/kg	5.9	METALS	SO	N	Y	9A09G602
BCG	BCG-SO006	AE0006	12-Sep-00	0	1	Calcium	7440-70-2	2830		J	mg/kg	5.9	METALS	SO	N	Y	9A09G602
BCG	BCG-SO001	AE0001	12-Sep-00	0	1	Chromium	7440-47-3	14.8		J	mg/kg	0.06	METALS	SO	N	Y	9A09G602
BCG	BCG-SO002	AE0002	12-Sep-00	0	1	Chromium	7440-47-3	14.2		J	mg/kg	0.06	METALS	SO	N	Y	9A09G602
BCG	BCG-SO003	AE0003	12-Sep-00	0	1	Chromium	7440-47-3	12.1		J	mg/kg	0.08	METALS	SO	N	Y	9A09G602
BCG	BCG-SO004	AE0004	12-Sep-00	0	1	Chromium	7440-47-3	8.4		J	mg/kg	0.06	METALS	SO	N	Y	9A09G602
BCG	BCG-SO005	AE0005	12-Sep-00	0	1	Chromium	7440-47-3	8.1		J	mg/kg	0.07	METALS	SO	N	Y	9A09G602
BCG	BCG-SO006	AE0006	12-Sep-00	0	1	Chromium	7440-47-3	6.3		J	mg/kg	0.07	METALS	SO	N	Y	9A09G602
BCG	BCG-SO001	AE0001	12-Sep-00	0	1	Chrysene	218-01-9	0.01			mg/kg	0.0057	SEMIVOLATILES	SO	N	Y	9A09G602
BCG	BCG-SO002	AE0002	12-Sep-00	0	1	Chrysene	218-01-9	0.009			mg/kg	0.0054	SEMIVOLATILES	SO	N	Y	9A09G602
BCG	BCG-SO003	AE0003	12-Sep-00	0	1	Chrysene	218-01-9	0.012			mg/kg	0.0062	SEMIVOLATILES	SO	N	Y	9A09G602
BCG	BCG-SO004	AE0004	12-Sep-00	0	1	Chrysene	218-01-9	0.0032	J	J	mg/kg	0.005	SEMIVOLATILES	SO	N	Y	9A09G602
BCG	BCG-SO005	AE0005	12-Sep-00	0	1	Chrysene	218-01-9	0.0062			mg/kg	0.005	SEMIVOLATILES	SO	N	Y	9A09G602
BCG	BCG-SO006	AE0006	12-Sep-00	0	1	Chrysene	218-01-9	0.0063			mg/kg	0.005	SEMIVOLATILES	SO	N	Y	9A09G602
BCG	BCG-SO001	AE0001	12-Sep-00	0	1	Cobalt	7440-48-4	7.1		J	mg/kg	0.09	METALS	SO	N	Y	9A09G602
BCG	BCG-SO002	AE0002	12-Sep-00	0	1	Cobalt	7440-48-4	4.3		J	mg/kg	0.08	METALS	SO	N	Y	9A09G602
BCG	BCG-SO003	AE0003	12-Sep-00	0	1	Cobalt	7440-48-4	4.8		J	mg/kg	0.11	METALS	SO	N	Y	9A09G602
BCG	BCG-SO004	AE0004	12-Sep-00	0	1	Cobalt	7440-48-4	2.5		J	mg/kg	0.09	METALS	SO	N	Y	9A09G602
BCG	BCG-SO005	AE0005	12-Sep-00	0	1	Cobalt	7440-48-4	2.5		J	mg/kg	0.09	METALS	SO	N	Y	9A09G602
BCG	BCG-SO006	AE0006	12-Sep-00	0	1	Cobalt	7440-48-4	2.3		J	mg/kg	0.09	METALS	SO	N	Y	9A09G602
BCG	BCG-SO001	AE0001	12-Sep-00	0	1	Copper	7440-50-8	14.2			mg/kg	0.1	METALS	SO	N	Y	9A09G602
BCG	BCG-SO002	AE0002	12-Sep-00	0	1	Copper	7440-50-8	12.4			mg/kg	0.1	METALS	SO	N	Y	9A09G602
BCG	BCG-SO003	AE0003	12-Sep-00	0	1	Copper	7440-50-8	10.9			mg/kg	0.13	METALS	SO	N	Y	9A09G602
BCG	BCG-SO004	AE0004	12-Sep-00	0	1	Copper	7440-50-8	4.7		B	mg/kg	0.1	METALS	SO	N	Y	9A09G602
BCG	BCG-SO005	AE0005	12-Sep-00	0	1	Copper	7440-50-8	5.5		B	mg/kg	0.11	METALS	SO	N	Y	9A09G602
BCG	BCG-SO006	AE0006	12-Sep-00	0	1	Copper	7440-50-8	8.4		B	mg/kg	0.11	METALS	SO	N	Y	9A09G602
BCG	BCG-SO001	AE0001	12-Sep-00	0	1	Dibenz(a,h)anthracene	53-70-3	0.023	U	U	mg/kg	0.023	SEMIVOLATILES	SO	N	N	9A09G602

GROUP_ NAME	LOCATION_ CODE	SAMPLE_ NO	SAMPLE_ DATE	START_ DEPTH	END_ DEPTH	PARAMETER	CASNO	RESULT	LAB_ QUAL	VAL_ QUAL	UNITS	DETECT_ LIMIT	USER_TEST_ GROUP	SAMPLE_ TYPE	FILTERED	DETECT	SAMPLE_ DELIVERY _GROUP
BCG	BCG-SO002	AE0002	12-Sep-00	0	1	Dibenz(a,h)anthracene	53-70-3	0.022	U	U	mg/kg	0.022	SEMIVOLATILES	SO	N	N	9A09G602
BCG	BCG-SO003	AE0003	12-Sep-00	0	1	Dibenz(a,h)anthracene	53-70-3	0.025	U	U	mg/kg	0.025	SEMIVOLATILES	SO	N	N	9A09G602
BCG	BCG-SO004	AE0004	12-Sep-00	0	1	Dibenz(a,h)anthracene	53-70-3	0.02	U	U	mg/kg	0.02	SEMIVOLATILES	SO	N	N	9A09G602
BCG	BCG-SO005	AE0005	12-Sep-00	0	1	Dibenz(a,h)anthracene	53-70-3	0.02	U	U	mg/kg	0.02	SEMIVOLATILES	SO	N	N	9A09G602
BCG	BCG-SO006	AE0006	12-Sep-00	0	1	Dibenz(a,h)anthracene	53-70-3	0.02	U	U	mg/kg	0.02	SEMIVOLATILES	SO	N	N	9A09G602
BCG	BCG-SO001	AE0001	12-Sep-00	0	1	Fluoranthene	206-44-0	0.023			mg/kg	0.0042	SEMIVOLATILES	SO	N	Y	9A09G602
BCG	BCG-SO002	AE0002	12-Sep-00	0	1	Fluoranthene	206-44-0	0.021			mg/kg	0.0042	SEMIVOLATILES	SO	N	Y	9A09G602
BCG	BCG-SO003	AE0003	12-Sep-00	0	1	Fluoranthene	206-44-0	0.032			mg/kg	0.0042	SEMIVOLATILES	SO	N	Y	9A09G602
BCG	BCG-SO004	AE0004	12-Sep-00	0	1	Fluoranthene	206-44-0	0.0085			mg/kg	0.0042	SEMIVOLATILES	SO	N	Y	9A09G602
BCG	BCG-SO005	AE0005	12-Sep-00	0	1	Fluoranthene	206-44-0	0.016			mg/kg	0.0042	SEMIVOLATILES	SO	N	Y	9A09G602
BCG	BCG-SO006	AE0006	12-Sep-00	0	1	Fluoranthene	206-44-0	0.017			mg/kg	0.0042	SEMIVOLATILES	SO	N	Y	9A09G602
BCG	BCG-SO001	AE0001	12-Sep-00	0	1	Fluorene	86-73-7	0.011	U	U	mg/kg	0.011	SEMIVOLATILES	SO	N	N	9A09G602
BCG	BCG-SO002	AE0002	12-Sep-00	0	1	Fluorene	86-73-7	0.011	U	U	mg/kg	0.011	SEMIVOLATILES	SO	N	N	9A09G602
BCG	BCG-SO003	AE0003	12-Sep-00	0	1	Fluorene	86-73-7	0.012	U	U	mg/kg	0.012	SEMIVOLATILES	SO	N	N	9A09G602
BCG	BCG-SO004	AE0004	12-Sep-00	0	1	Fluorene	86-73-7	0.01	U	U	mg/kg	0.01	SEMIVOLATILES	SO	N	N	9A09G602
BCG	BCG-SO005	AE0005	12-Sep-00	0	1	Fluorene	86-73-7	0.01	U	U	mg/kg	0.01	SEMIVOLATILES	SO	N	N	9A09G602
BCG	BCG-SO006	AE0006	12-Sep-00	0	1	Fluorene	86-73-7	0.01	U	U	mg/kg	0.01	SEMIVOLATILES	SO	N	N	9A09G602
BCG	BCG-SO001	AE0001	12-Sep-00	0	1	Indeno(1,2,3-cd)pyrene	193-39-5	0.0084			mg/kg	0.0057	SEMIVOLATILES	SO	N	Y	9A09G602
BCG	BCG-SO002	AE0002	12-Sep-00	0	1	Indeno(1,2,3-cd)pyrene	193-39-5	0.0058			mg/kg	0.0054	SEMIVOLATILES	SO	N	Y	9A09G602
BCG	BCG-SO003	AE0003	12-Sep-00	0	1	Indeno(1,2,3-cd)pyrene	193-39-5	0.028			mg/kg	0.0062	SEMIVOLATILES	SO	N	Y	9A09G602
BCG	BCG-SO004	AE0004	12-Sep-00	0	1	Indeno(1,2,3-cd)pyrene	193-39-5	0.0022	J	J	mg/kg	0.005	SEMIVOLATILES	SO	N	Y	9A09G602
BCG	BCG-SO005	AE0005	12-Sep-00	0	1	Indeno(1,2,3-cd)pyrene	193-39-5	0.0074			mg/kg	0.005	SEMIVOLATILES	SO	N	Y	9A09G602
BCG	BCG-SO006	AE0006	12-Sep-00	0	1	Indeno(1,2,3-cd)pyrene	193-39-5	0.0048	J	J	mg/kg	0.005	SEMIVOLATILES	SO	N	Y	9A09G602
BCG	BCG-SO001	AE0001	12-Sep-00	0	1	Iron	7439-89-6	26200		J	mg/kg	1.8	METALS	SO	N	Y	9A09G602
BCG	BCG-SO002	AE0002	12-Sep-00	0	1	Iron	7439-89-6	14700		J	mg/kg	1.7	METALS	SO	N	Y	9A09G602
BCG	BCG-SO003	AE0003	12-Sep-00	0	1	Iron	7439-89-6	17900		J	mg/kg	2.3	METALS	SO	N	Y	9A09G602
BCG	BCG-SO004	AE0004	12-Sep-00	0	1	Iron	7439-89-6	10600		J	mg/kg	1.9	METALS	SO	N	Y	9A09G602
BCG	BCG-SO005	AE0005	12-Sep-00	0	1	Iron	7439-89-6	9890		J	mg/kg	1.9	METALS	SO	N	Y	9A09G602
BCG	BCG-SO006	AE0006	12-Sep-00	0	1	Iron	7439-89-6	8230		J	mg/kg	1.9	METALS	SO	N	Y	9A09G602
BCG	BCG-SO001	AE0001	12-Sep-00	0	1	Lead	7439-92-1	12.8		J	mg/kg	0.2	METALS	SO	N	Y	9A09G602
BCG	BCG-SO002	AE0002	12-Sep-00	0	1	Lead	7439-92-1	11.6		J	mg/kg	0.19	METALS	SO	N	Y	9A09G602
BCG	BCG-SO003	AE0003	12-Sep-00	0	1	Lead	7439-92-1	12.8		J	mg/kg	0.25	METALS	SO	N	Y	9A09G602
BCG	BCG-SO004	AE0004	12-Sep-00	0	1	Lead	7439-92-1	7		J	mg/kg	0.21	METALS	SO	N	Y	9A09G602
BCG	BCG-SO005	AE0005	12-Sep-00	0	1	Lead	7439-92-1	10.4		J	mg/kg	0.21	METALS	SO	N	Y	9A09G602
BCG	BCG-SO006	AE0006	12-Sep-00	0	1	Lead	7439-92-1	8.3		J	mg/kg	0.21	METALS	SO	N	Y	9A09G602
BCG	BCG-SO001	AE0001	12-Sep-00	0	1	Magnesium	7439-95-4	2320		J	mg/kg	5.7	METALS	SO	N	Y	9A09G602
BCG	BCG-SO002	AE0002	12-Sep-00	0	1	Magnesium	7439-95-4	2180		J	mg/kg	5.3	METALS	SO	N	Y	9A09G602
BCG	BCG-SO003	AE0003	12-Sep-00	0	1	Magnesium	7439-95-4	1540		J	mg/kg	7.1	METALS	SO	N	Y	9A09G602
BCG	BCG-SO004	AE0004	12-Sep-00	0	1	Magnesium	7439-95-4	949		J	mg/kg	5.9	METALS	SO	N	Y	9A09G602
BCG	BCG-SO005	AE0005	12-Sep-00	0	1	Magnesium	7439-95-4	904		J	mg/kg	5.9	METALS	SO	N	Y	9A09G602
BCG	BCG-SO006	AE0006	12-Sep-00	0	1	Magnesium	7439-95-4	832		J	mg/kg	5.9	METALS	SO	N	Y	9A09G602
BCG	BCG-SO001	AE0001	12-Sep-00	0	1	Manganese	7439-96-5	465		J	mg/kg	0.11	METALS	SO	N	Y	9A09G602
BCG	BCG-SO002	AE0002	12-Sep-00	0	1	Manganese	7439-96-5	152		J	mg/kg	0.1	METALS	SO	N	Y	9A09G602
BCG	BCG-SO003	AE0003	12-Sep-00	0	1	Manganese	7439-96-5	605		J	mg/kg	0.14	METALS	SO	N	Y	9A09G602
BCG	BCG-SO004	AE0004	12-Sep-00	0	1	Manganese	7439-96-5	242		J	mg/kg	0.11	METALS	SO	N	Y	9A09G602
BCG	BCG-SO005	AE0005	12-Sep-00	0	1	Manganese	7439-96-5	216		J	mg/kg	0.11	METALS	SO	N	Y	9A09G602
BCG	BCG-SO006	AE0006	12-Sep-00	0	1	Manganese	7439-96-5	277		J	mg/kg	0.11	METALS	SO	N	Y	9A09G602
BCG	BCG-SO001	AE0001	12-Sep-00	0	1	Naphthalene	91-20-3	0.057	U	U	mg/kg	0.057	SEMIVOLATILES	SO	N	N	9A09G602
BCG	BCG-SO002	AE0002	12-Sep-00	0	1	Naphthalene	91-20-3	0.054	U	U	mg/kg	0.054	SEMIVOLATILES	SO	N	N	9A09G602
BCG	BCG-SO003	AE0003	12-Sep-00	0	1	Naphthalene	91-20-3	0.062	U	U	mg/kg	0.062	SEMIVOLATILES	SO	N	N	9A09G602

GROUP_ NAME	LOCATION_ CODE	SAMPLE_ NO	SAMPLE_ DATE	START_ DEPTH	END_ DEPTH	PARAMETER	CASNO	RESULT	LAB_ QUAL	VAL_ QUAL	UNITS	DETECT_ LIMIT	USER_TEST_ GROUP	SAMPLE_ TYPE	FILTERED	DETECT	SAMPLE_ DELIVERY _GROUP
BCG	BCG-SO004	AE0004	12-Sep-00	0	1	Naphthalene	91-20-3	0.05	U	U	mg/kg	0.05	SEMIVOLATILES	SO	N	N	9A09G602
BCG	BCG-SO005	AE0005	12-Sep-00	0	1	Naphthalene	91-20-3	0.05	U	U	mg/kg	0.05	SEMIVOLATILES	SO	N	N	9A09G602
BCG	BCG-SO006	AE0006	12-Sep-00	0	1	Naphthalene	91-20-3	0.05	U	U	mg/kg	0.05	SEMIVOLATILES	SO	N	N	9A09G602
BCG	BCG-SO001	AE0001	12-Sep-00	0	1	Nickel	7440-02-0	17.4		J	mg/kg	0.13	METALS	SO	N	Y	9A09G602
BCG	BCG-SO002	AE0002	12-Sep-00	0	1	Nickel	7440-02-0	14.8		J	mg/kg	0.12	METALS	SO	N	Y	9A09G602
BCG	BCG-SO003	AE0003	12-Sep-00	0	1	Nickel	7440-02-0	13.1		J	mg/kg	0.16	METALS	SO	N	Y	9A09G602
BCG	BCG-SO004	AE0004	12-Sep-00	0	1	Nickel	7440-02-0	7.5		J	mg/kg	0.13	METALS	SO	N	Y	9A09G602
BCG	BCG-SO005	AE0005	12-Sep-00	0	1	Nickel	7440-02-0	6.8		J	mg/kg	0.13	METALS	SO	N	Y	9A09G602
BCG	BCG-SO006	AE0006	12-Sep-00	0	1	Nickel	7440-02-0	5.8		J	mg/kg	0.13	METALS	SO	N	Y	9A09G602
BCG	BCG-SO001	AE0001	12-Sep-00	0	1	Phenanthrene	85-01-8	0.0098			mg/kg	0.0045	SEMIVOLATILES	SO	N	Y	9A09G602
BCG	BCG-SO002	AE0002	12-Sep-00	0	1	Phenanthrene	85-01-8	0.01			mg/kg	0.0043	SEMIVOLATILES	SO	N	Y	9A09G602
BCG	BCG-SO003	AE0003	12-Sep-00	0	1	Phenanthrene	85-01-8	0.017			mg/kg	0.005	SEMIVOLATILES	SO	N	Y	9A09G602
BCG	BCG-SO004	AE0004	12-Sep-00	0	1	Phenanthrene	85-01-8	0.056			mg/kg	0.004	SEMIVOLATILES	SO	N	Y	9A09G602
BCG	BCG-SO005	AE0005	12-Sep-00	0	1	Phenanthrene	85-01-8	0.068			mg/kg	0.004	SEMIVOLATILES	SO	N	Y	9A09G602
BCG	BCG-SO006	AE0006	12-Sep-00	0	1	Phenanthrene	85-01-8	0.13	D		mg/kg	0.02	SEMIVOLATILES	SO	N	Y	9A09G602
BCG	BCG-SO001	AE0001	12-Sep-00	0	1	Phosphorous	7723-14-0	6.3	U	U	mg/kg	6.3	GEN CHEMISTRY	SO	N	N	9A09G602
BCG	BCG-SO002	AE0002	12-Sep-00	0	1	Phosphorous	7723-14-0	10.7			mg/kg	6.2	GEN CHEMISTRY	SO	N	Y	9A09G602
BCG	BCG-SO003	AE0003	12-Sep-00	0	1	Phosphorous	7723-14-0	141			mg/kg	12.3	GEN CHEMISTRY	SO	N	Y	9A09G602
BCG	BCG-SO004	AE0004	12-Sep-00	0	1	Phosphorous	7723-14-0	9.1			mg/kg	5.2	GEN CHEMISTRY	SO	N	Y	9A09G602
BCG	BCG-SO005	AE0005	12-Sep-00	0	1	Phosphorous	7723-14-0	29.5			mg/kg	5.8	GEN CHEMISTRY	SO	N	Y	9A09G602
BCG	BCG-SO006	AE0006	12-Sep-00	0	1	Phosphorous	7723-14-0	6.1	U	U	mg/kg	6.1	GEN CHEMISTRY	SO	N	N	9A09G602
BCG	BCG-SO001	AE0001	12-Sep-00	0	1	Potassium	2023695	1010		J	mg/kg	7.2	METALS	SO	N	Y	9A09G602
BCG	BCG-SO002	AE0002	12-Sep-00	0	1	Potassium	2023695	1250		J	mg/kg	6.7	METALS	SO	N	Y	9A09G602
BCG	BCG-SO003	AE0003	12-Sep-00	0	1	Potassium	2023695	683		J	mg/kg	8.9	METALS	SO	N	Y	9A09G602
BCG	BCG-SO004	AE0004	12-Sep-00	0	1	Potassium	2023695	430		B	mg/kg	7.3	METALS	SO	N	Y	9A09G602
BCG	BCG-SO005	AE0005	12-Sep-00	0	1	Potassium	2023695	384		J	mg/kg	7.4	METALS	SO	N	Y	9A09G602
BCG	BCG-SO006	AE0006	12-Sep-00	0	1	Potassium	2023695	381		B	mg/kg	7.4	METALS	SO	N	Y	9A09G602
BCG	BCG-SO001	AE0001	12-Sep-00	0	1	Pyrene	129-00-0	0.017			mg/kg	0.011	SEMIVOLATILES	SO	N	Y	9A09G602
BCG	BCG-SO002	AE0002	12-Sep-00	0	1	Pyrene	129-00-0	0.016			mg/kg	0.011	SEMIVOLATILES	SO	N	Y	9A09G602
BCG	BCG-SO003	AE0003	12-Sep-00	0	1	Pyrene	129-00-0	0.025			mg/kg	0.012	SEMIVOLATILES	SO	N	Y	9A09G602
BCG	BCG-SO004	AE0004	12-Sep-00	0	1	Pyrene	129-00-0	0.0058	J	J	mg/kg	0.01	SEMIVOLATILES	SO	N	Y	9A09G602
BCG	BCG-SO005	AE0005	12-Sep-00	0	1	Pyrene	129-00-0	0.012			mg/kg	0.01	SEMIVOLATILES	SO	N	Y	9A09G602
BCG	BCG-SO006	AE0006	12-Sep-00	0	1	Pyrene	129-00-0	0.012			mg/kg	0.01	SEMIVOLATILES	SO	N	Y	9A09G602
BCG	BCG-SO001	AE0001	12-Sep-00	0	1	Sodium	7440-23-5	774			mg/kg	21.5	METALS	SO	N	Y	9A09G602
BCG	BCG-SO002	AE0002	12-Sep-00	0	1	Sodium	7440-23-5	732			mg/kg	20.1	METALS	SO	N	Y	9A09G602
BCG	BCG-SO003	AE0003	12-Sep-00	0	1	Sodium	7440-23-5	686			mg/kg	26.6	METALS	SO	N	Y	9A09G602
BCG	BCG-SO004	AE0004	12-Sep-00	0	1	Sodium	7440-23-5	548			mg/kg	22	METALS	SO	N	Y	9A09G602
BCG	BCG-SO005	AE0005	12-Sep-00	0	1	Sodium	7440-23-5	469			mg/kg	22.3	METALS	SO	N	Y	9A09G602
BCG	BCG-SO006	AE0006	12-Sep-00	0	1	Sodium	7440-23-5	436			mg/kg	22.3	METALS	SO	N	Y	9A09G602
BCG	BCG-SO001	AE0001	12-Sep-00	0	1	Vanadium	7440-62-2	28.9		J	mg/kg	0.16	METALS	SO	N	Y	9A09G602
BCG	BCG-SO002	AE0002	12-Sep-00	0	1	Vanadium	7440-62-2	21.7		J	mg/kg	0.15	METALS	SO	N	Y	9A09G602
BCG	BCG-SO003	AE0003	12-Sep-00	0	1	Vanadium	7440-62-2	22.1		J	mg/kg	0.2	METALS	SO	N	Y	9A09G602
BCG	BCG-SO004	AE0004	12-Sep-00	0	1	Vanadium	7440-62-2	18.3		J	mg/kg	0.17	METALS	SO	N	Y	9A09G602
BCG	BCG-SO005	AE0005	12-Sep-00	0	1	Vanadium	7440-62-2	17.5		J	mg/kg	0.17	METALS	SO	N	Y	9A09G602
BCG	BCG-SO006	AE0006	12-Sep-00	0	1	Vanadium	7440-62-2	12.5		J	mg/kg	0.17	METALS	SO	N	Y	9A09G602
BCG	BCG-SO001	AE0001	12-Sep-00	0	1	Zinc	7440-66-6	46.8		J	mg/kg	0.05	METALS	SO	N	Y	9A09G602
BCG	BCG-SO002	AE0002	12-Sep-00	0	1	Zinc	7440-66-6	38.2		J	mg/kg	0.04	METALS	SO	N	Y	9A09G602
BCG	BCG-SO003	AE0003	12-Sep-00	0	1	Zinc	7440-66-6	32.1		J	mg/kg	0.06	METALS	SO	N	Y	9A09G602
BCG	BCG-SO004	AE0004	12-Sep-00	0	1	Zinc	7440-66-6	97.9		J	mg/kg	0.05	METALS	SO	N	Y	9A09G602
BCG	BCG-SO005	AE0005	12-Sep-00	0	1	Zinc	7440-66-6	34.4		J	mg/kg	0.05	METALS	SO	N	Y	9A09G602

GROUP_ NAME	LOCATION_ CODE	SAMPLE_ NO	SAMPLE_ DATE	START_ DEPTH	END_ DEPTH	PARAMETER	CASNO	RESULT	LAB_ QUAL	VAL_ QUAL	UNITS	DETECT_ LIMIT	USER_TEST_ GROUP	SAMPLE_ TYPE	FILTERED	DETECT	SAMPLE_ DELIVERY _ GROUP
BCG	BCG-SO006	AE0006	12-Sep-00	0	1	Zinc	7440-66-6	33.4		J	mg/kg	0.05	METALS	SO	N	Y	9A09G602
BCG	BCG-SW001	AE2001	15-Sep-00			Aluminum	7429-90-5	270			ug/L	72.7	METALS	SW	N	Y	9A09G602
BCG	BCG-SW002	AE2002	15-Sep-00			Aluminum	7429-90-5	435			ug/L	72.7	METALS	SW	N	Y	9A09G602
BCG	BCG-SW003	AE2003	15-Sep-00			Aluminum	7429-90-5	72.7	U	U	ug/L	72.7	METALS	SW	N	N	9A09G602
BCG	BCG-SW004	AE2004	15-Sep-00			Aluminum	7429-90-5	478			ug/L	72.7	METALS	SW	N	Y	9A09G602
BCG	BCG-SW005	AE2005	15-Sep-00			Aluminum	7429-90-5	361			ug/L	72.7	METALS	SW	N	Y	9A09G602
BCG	BCG-SW006	AE2006	15-Sep-00			Aluminum	7429-90-5	182			ug/L	72.7	METALS	SW	N	Y	9A09G602
BCG	BCG-SW001	AE2001	15-Sep-00			Antimony	7440-36-0	5.5	U	U	ug/L	5.5	METALS	SW	N	N	9A09G602
BCG	BCG-SW002	AE2002	15-Sep-00			Antimony	7440-36-0	5.5	U	U	ug/L	5.5	METALS	SW	N	N	9A09G602
BCG	BCG-SW003	AE2003	15-Sep-00			Antimony	7440-36-0	5.5	U	U	ug/L	5.5	METALS	SW	N	N	9A09G602
BCG	BCG-SW004	AE2004	15-Sep-00			Antimony	7440-36-0	5.5	U	U	ug/L	5.5	METALS	SW	N	N	9A09G602
BCG	BCG-SW005	AE2005	15-Sep-00			Antimony	7440-36-0	5.5	U	U	ug/L	5.5	METALS	SW	N	N	9A09G602
BCG	BCG-SW006	AE2006	15-Sep-00			Antimony	7440-36-0	5.5	U	U	ug/L	5.5	METALS	SW	N	N	9A09G602
BCG	BCG-SW001	AE2001	15-Sep-00			Arsenic	7440-38-2	4.4	U	U	ug/L	4.4	METALS	SW	N	N	9A09G602
BCG	BCG-SW002	AE2002	15-Sep-00			Arsenic	7440-38-2	4.4	U	U	ug/L	4.4	METALS	SW	N	N	9A09G602
BCG	BCG-SW003	AE2003	15-Sep-00			Arsenic	7440-38-2	4.4	U	U	ug/L	4.4	METALS	SW	N	N	9A09G602
BCG	BCG-SW004	AE2004	15-Sep-00			Arsenic	7440-38-2	4.4	U	U	ug/L	4.4	METALS	SW	N	N	9A09G602
BCG	BCG-SW005	AE2005	15-Sep-00			Arsenic	7440-38-2	4.4	U	U	ug/L	4.4	METALS	SW	N	N	9A09G602
BCG	BCG-SW006	AE2006	15-Sep-00			Arsenic	7440-38-2	4.4	U	U	ug/L	4.4	METALS	SW	N	N	9A09G602
BCG	BCG-SW001	AE2001	15-Sep-00			Barium	7440-39-3	77.2			ug/L	0.3	METALS	SW	N	Y	9A09G602
BCG	BCG-SW002	AE2002	15-Sep-00			Barium	7440-39-3	37.4			ug/L	0.3	METALS	SW	N	Y	9A09G602
BCG	BCG-SW003	AE2003	15-Sep-00			Barium	7440-39-3	32.7			ug/L	0.3	METALS	SW	N	Y	9A09G602
BCG	BCG-SW004	AE2004	15-Sep-00			Barium	7440-39-3	49.9			ug/L	0.3	METALS	SW	N	Y	9A09G602
BCG	BCG-SW005	AE2005	15-Sep-00			Barium	7440-39-3	50.8			ug/L	0.3	METALS	SW	N	Y	9A09G602
BCG	BCG-SW006	AE2006	15-Sep-00			Barium	7440-39-3	52			ug/L	0.3	METALS	SW	N	Y	9A09G602
BCG	BCG-SW001	AE2001	15-Sep-00			Calcium	7440-70-2	105000			ug/L	71.9	METALS	SW	N	Y	9A09G602
BCG	BCG-SW002	AE2002	15-Sep-00			Calcium	7440-70-2	109000			ug/L	71.9	METALS	SW	N	Y	9A09G602
BCG	BCG-SW003	AE2003	15-Sep-00			Calcium	7440-70-2	113000			ug/L	71.9	METALS	SW	N	Y	9A09G602
BCG	BCG-SW004	AE2004	15-Sep-00			Calcium	7440-70-2	85000			ug/L	71.9	METALS	SW	N	Y	9A09G602
BCG	BCG-SW005	AE2005	15-Sep-00			Calcium	7440-70-2	87700			ug/L	71.9	METALS	SW	N	Y	9A09G602
BCG	BCG-SW006	AE2006	15-Sep-00			Calcium	7440-70-2	90400			ug/L	71.9	METALS	SW	N	Y	9A09G602
BCG	BCG-SW001	AE2001	15-Sep-00			Chromium	7440-47-3	0.9		B	ug/L	0.8	METALS	SW	N	Y	9A09G602
BCG	BCG-SW002	AE2002	15-Sep-00			Chromium	7440-47-3	1.1		B	ug/L	0.8	METALS	SW	N	Y	9A09G602
BCG	BCG-SW003	AE2003	15-Sep-00			Chromium	7440-47-3	1.1		B	ug/L	0.8	METALS	SW	N	Y	9A09G602
BCG	BCG-SW004	AE2004	15-Sep-00			Chromium	7440-47-3	1.6		B	ug/L	0.8	METALS	SW	N	Y	9A09G602
BCG	BCG-SW005	AE2005	15-Sep-00			Chromium	7440-47-3	0.8		B	ug/L	0.8	METALS	SW	N	Y	9A09G602
BCG	BCG-SW006	AE2006	15-Sep-00			Chromium	7440-47-3	1		B	ug/L	0.8	METALS	SW	N	Y	9A09G602
BCG	BCG-SW001	AE2001	15-Sep-00			Cobalt	7440-48-4	1.1	U	U	ug/L	1.1	METALS	SW	N	N	9A09G602
BCG	BCG-SW002	AE2002	15-Sep-00			Cobalt	7440-48-4	1.1	U	U	ug/L	1.1	METALS	SW	N	N	9A09G602
BCG	BCG-SW003	AE2003	15-Sep-00			Cobalt	7440-48-4	1.1	U	U	ug/L	1.1	METALS	SW	N	N	9A09G602
BCG	BCG-SW004	AE2004	15-Sep-00			Cobalt	7440-48-4	1.1	U	U	ug/L	1.1	METALS	SW	N	N	9A09G602
BCG	BCG-SW005	AE2005	15-Sep-00			Cobalt	7440-48-4	1.1			ug/L	1.1	METALS	SW	N	Y	9A09G602
BCG	BCG-SW006	AE2006	15-Sep-00			Cobalt	7440-48-4	1.1	U	U	ug/L	1.1	METALS	SW	N	N	9A09G602
BCG	BCG-SW001	AE2001	15-Sep-00			Copper	7440-50-8	2.3			ug/L	1.3	METALS	SW	N	Y	9A09G602
BCG	BCG-SW002	AE2002	15-Sep-00			Copper	7440-50-8	2.2			ug/L	1.3	METALS	SW	N	Y	9A09G602
BCG	BCG-SW003	AE2003	15-Sep-00			Copper	7440-50-8	1.7			ug/L	1.3	METALS	SW	N	Y	9A09G602
BCG	BCG-SW004	AE2004	15-Sep-00			Copper	7440-50-8	3.2			ug/L	1.3	METALS	SW	N	Y	9A09G602
BCG	BCG-SW005	AE2005	15-Sep-00			Copper	7440-50-8	2.6			ug/L	1.3	METALS	SW	N	Y	9A09G602
BCG	BCG-SW006	AE2006	15-Sep-00			Copper	7440-50-8	6.7			ug/L	1.3	METALS	SW	N	Y	9A09G602
BCG	BCG-SW001	AE2001	15-Sep-00			Iron	7439-89-6	717			ug/L	23.3	METALS	SW	N	Y	9A09G602

GROUP_ NAME	LOCATION_ CODE	SAMPLE_ NO	SAMPLE_ DATE	START_ DEPTH	END_ DEPTH	PARAMETER	CASNO	RESULT	LAB_ QUAL	VAL_ QUAL	UNITS	DETECT_ LIMIT	USER_TEST_ GROUP	SAMPLE_ TYPE	FILTERED	DETECT	SAMPLE_ DELIVERY _GROUP
BCG	BCG-SW002	AE2002	15-Sep-00			Iron	7439-89-6	1070			ug/L	23.3	METALS	SW	N	Y	9A09G602
BCG	BCG-SW003	AE2003	15-Sep-00			Iron	7439-89-6	618			ug/L	23.3	METALS	SW	N	Y	9A09G602
BCG	BCG-SW004	AE2004	15-Sep-00			Iron	7439-89-6	457			ug/L	23.3	METALS	SW	N	Y	9A09G602
BCG	BCG-SW005	AE2005	15-Sep-00			Iron	7439-89-6	362			ug/L	23.3	METALS	SW	N	Y	9A09G602
BCG	BCG-SW006	AE2006	15-Sep-00			Iron	7439-89-6	201			ug/L	23.3	METALS	SW	N	Y	9A09G602
BCG	BCG-SW001	AE2001	15-Sep-00			Lead	7439-92-1	2.6	U	U	ug/L	2.6	METALS	SW	N	N	9A09G602
BCG	BCG-SW002	AE2002	15-Sep-00			Lead	7439-92-1	2.6	U	U	ug/L	2.6	METALS	SW	N	N	9A09G602
BCG	BCG-SW003	AE2003	15-Sep-00			Lead	7439-92-1	2.6	U	U	ug/L	2.6	METALS	SW	N	N	9A09G602
BCG	BCG-SW004	AE2004	15-Sep-00			Lead	7439-92-1	2.6	U	U	ug/L	2.6	METALS	SW	N	N	9A09G602
BCG	BCG-SW005	AE2005	15-Sep-00			Lead	7439-92-1	2.6	U	U	ug/L	2.6	METALS	SW	N	N	9A09G602
BCG	BCG-SW006	AE2006	15-Sep-00			Lead	7439-92-1	2.6	U	U	ug/L	2.6	METALS	SW	N	N	9A09G602
BCG	BCG-SW001	AE2001	15-Sep-00			Magnesium	7439-95-4	24800			ug/L	72.8	METALS	SW	N	Y	9A09G602
BCG	BCG-SW002	AE2002	15-Sep-00			Magnesium	7439-95-4	22700			ug/L	72.8	METALS	SW	N	Y	9A09G602
BCG	BCG-SW003	AE2003	15-Sep-00			Magnesium	7439-95-4	23100			ug/L	72.8	METALS	SW	N	Y	9A09G602
BCG	BCG-SW004	AE2004	15-Sep-00			Magnesium	7439-95-4	18200			ug/L	72.8	METALS	SW	N	Y	9A09G602
BCG	BCG-SW005	AE2005	15-Sep-00			Magnesium	7439-95-4	18800			ug/L	72.8	METALS	SW	N	Y	9A09G602
BCG	BCG-SW006	AE2006	15-Sep-00			Magnesium	7439-95-4	19300			ug/L	72.8	METALS	SW	N	Y	9A09G602
BCG	BCG-SW001	AE2001	15-Sep-00			Manganese	7439-96-5	109			ug/L	1.4	METALS	SW	N	Y	9A09G602
BCG	BCG-SW002	AE2002	15-Sep-00			Manganese	7439-96-5	357			ug/L	1.4	METALS	SW	N	Y	9A09G602
BCG	BCG-SW003	AE2003	15-Sep-00			Manganese	7439-96-5	332			ug/L	1.4	METALS	SW	N	Y	9A09G602
BCG	BCG-SW004	AE2004	15-Sep-00			Manganese	7439-96-5	19.9			ug/L	1.4	METALS	SW	N	Y	9A09G602
BCG	BCG-SW005	AE2005	15-Sep-00			Manganese	7439-96-5	19.3			ug/L	1.4	METALS	SW	N	Y	9A09G602
BCG	BCG-SW006	AE2006	15-Sep-00			Manganese	7439-96-5	20.4			ug/L	1.4	METALS	SW	N	Y	9A09G602
BCG	BCG-SW001	AE2001	15-Sep-00			Nickel	7440-02-0	1.6	U	U	ug/L	1.6	METALS	SW	N	N	9A09G602
BCG	BCG-SW002	AE2002	15-Sep-00			Nickel	7440-02-0	1.6			ug/L	1.6	METALS	SW	N	Y	9A09G602
BCG	BCG-SW003	AE2003	15-Sep-00			Nickel	7440-02-0	1.6	U	U	ug/L	1.6	METALS	SW	N	N	9A09G602
BCG	BCG-SW004	AE2004	15-Sep-00			Nickel	7440-02-0	4.4			ug/L	1.6	METALS	SW	N	Y	9A09G602
BCG	BCG-SW005	AE2005	15-Sep-00			Nickel	7440-02-0	4.3			ug/L	1.6	METALS	SW	N	Y	9A09G602
BCG	BCG-SW006	AE2006	15-Sep-00			Nickel	7440-02-0	4.4			ug/L	1.6	METALS	SW	N	Y	9A09G602
BCG	BCG-SW001	AE2001	15-Sep-00			Phosphorous	7723-14-0	0.11			mg/L	0.05	GEN CHEMISTRY	SW	N	Y	9A09G602
BCG	BCG-SW002	AE2002	15-Sep-00			Phosphorous	7723-14-0	0.084			mg/L	0.05	GEN CHEMISTRY	SW	N	Y	9A09G602
BCG	BCG-SW003	AE2003	15-Sep-00			Phosphorous	7723-14-0	0.05	U	U	mg/L	0.05	GEN CHEMISTRY	SW	N	N	9A09G602
BCG	BCG-SW004	AE2004	15-Sep-00			Phosphorous	7723-14-0	0.074			mg/L	0.05	GEN CHEMISTRY	SW	N	Y	9A09G602
BCG	BCG-SW005	AE2005	15-Sep-00			Phosphorous	7723-14-0	0.073			mg/L	0.05	GEN CHEMISTRY	SW	N	Y	9A09G602
BCG	BCG-SW006	AE2006	15-Sep-00			Phosphorous	7723-14-0	0.085			mg/L	0.05	GEN CHEMISTRY	SW	N	Y	9A09G602
BCG	BCG-SW001	AE2001	15-Sep-00			Potassium	2023695	2050			ug/L	91.2	METALS	SW	N	Y	9A09G602
BCG	BCG-SW002	AE2002	15-Sep-00			Potassium	2023695	3050			ug/L	91.2	METALS	SW	N	Y	9A09G602
BCG	BCG-SW003	AE2003	15-Sep-00			Potassium	2023695	2990			ug/L	91.2	METALS	SW	N	Y	9A09G602
BCG	BCG-SW004	AE2004	15-Sep-00			Potassium	2023695	4890			ug/L	91.2	METALS	SW	N	Y	9A09G602
BCG	BCG-SW005	AE2005	15-Sep-00			Potassium	2023695	5030			ug/L	91.2	METALS	SW	N	Y	9A09G602
BCG	BCG-SW006	AE2006	15-Sep-00			Potassium	2023695	5070			ug/L	91.2	METALS	SW	N	Y	9A09G602
BCG	BCG-SW001	AE2001	15-Sep-00			Sodium	7440-23-5	9660			ug/L	274	METALS	SW	N	Y	9A09G602
BCG	BCG-SW002	AE2002	15-Sep-00			Sodium	7440-23-5	24600			ug/L	274	METALS	SW	N	Y	9A09G602
BCG	BCG-SW003	AE2003	15-Sep-00			Sodium	7440-23-5	21200			ug/L	274	METALS	SW	N	Y	9A09G602
BCG	BCG-SW004	AE2004	15-Sep-00			Sodium	7440-23-5	28000			ug/L	274	METALS	SW	N	Y	9A09G602
BCG	BCG-SW005	AE2005	15-Sep-00			Sodium	7440-23-5	28200			ug/L	274	METALS	SW	N	Y	9A09G602
BCG	BCG-SW006	AE2006	15-Sep-00			Sodium	7440-23-5	29000			ug/L	274	METALS	SW	N	Y	9A09G602
BCG	BCG-SW001	AE2001	15-Sep-00			Vanadium	7440-62-2	4.5		B	ug/L	2.1	METALS	SW	N	Y	9A09G602
BCG	BCG-SW002	AE2002	15-Sep-00			Vanadium	7440-62-2	4.7		B	ug/L	2.1	METALS	SW	N	Y	9A09G602
BCG	BCG-SW003	AE2003	15-Sep-00			Vanadium	7440-62-2	5.2		B	ug/L	2.1	METALS	SW	N	Y	9A09G602

GROUP_ NAME	LOCATION_ CODE	SAMPLE_ NO	SAMPLE_ DATE	START_ DEPTH	END_ DEPTH	PARAMETER	CASNO	RESULT	LAB_ QUAL	VAL_ QUAL	UNITS	DETECT_ LIMIT	USER_TEST_ GROUP	SAMPLE_ TYPE	FILTERED	DETECT	SAMPLE_ DELIVERY _GROUP
BCG	BCG-SW004	AE2004	15-Sep-00			Vanadium	7440-62-2	4.7		B	ug/L	2.1	METALS	SW	N	Y	9A09G602
BCG	BCG-SW005	AE2005	15-Sep-00			Vanadium	7440-62-2	4.9		B	ug/L	2.1	METALS	SW	N	Y	9A09G602
BCG	BCG-SW006	AE2006	15-Sep-00			Vanadium	7440-62-2	3.9		B	ug/L	2.1	METALS	SW	N	Y	9A09G602
BCG	BCG-SW001	AE2001	15-Sep-00			Zinc	7440-66-6	45.9			ug/L	0.6	METALS	SW	N	Y	9A09G602
BCG	BCG-SW002	AE2002	15-Sep-00			Zinc	7440-66-6	11			ug/L	0.6	METALS	SW	N	Y	9A09G602
BCG	BCG-SW003	AE2003	15-Sep-00			Zinc	7440-66-6	4.4		B	ug/L	0.6	METALS	SW	N	Y	9A09G602
BCG	BCG-SW004	AE2004	15-Sep-00			Zinc	7440-66-6	8			ug/L	0.6	METALS	SW	N	Y	9A09G602
BCG	BCG-SW005	AE2005	15-Sep-00			Zinc	7440-66-6	6.1			ug/L	0.6	METALS	SW	N	Y	9A09G602
BCG	BCG-SW006	AE2006	15-Sep-00			Zinc	7440-66-6	6.1			ug/L	0.6	METALS	SW	N	Y	9A09G602

Red Water Ponds Ecological Risk Assessment
Validation Addendum

Changes were made in the validation qualifiers in fish and worm tissue samples. An evaluation of qualifiers associated with blank contamination showed that the lab used clam tissue as a preparation blank for the metals analyses. DataChek used the clam tissue data to qualify fish and worm tissue. Since clam tissue is not an appropriate preparation blank for non-clam samples, the validation qualifiers do not apply. The qualifiers that were present because of clam tissue contamination were removed. The qualifiers resulting from blank contamination present in calibration and reagent blanks were used. Additionally, the worm pretest samples (bioaccumulation control samples) were used as field blanks. Samples associated with the pretest worms were qualified according to the contamination in the pretest worms.

IT Corporation performed additional validation for blank contamination in tissue samples only.

Explosives: No qualification due to blank contamination.

Metals: Five worm tissue samples in SDG 200144 were qualified for contamination in the associated pretest worm. Analytes qualified "B" in samples AD4016, AD4017, AD4018, AD4019, and AD4020 include arsenic, barium, cadmium, calcium, chromium, copper, iron, magnesium, manganese, potassium, sodium, vanadium, and zinc. Antimony, cobalt, and lead were detected in the reagent blank associated with samples in SDG 001227. Antimony and lead were qualified "B" in samples AC4001, AC4002, AC4003, AD4001, AD4002, AD4003, and AD4004. Cobalt was qualified "B" in AC4002.

PAHs: Acenaphthene, acenaphthalene, chrysene, fluorene, indeno(1,2,3-cd)pyrene, and phenanthrene were detected in the pretest worm associated with SDG 200145. Samples AD4011, AD4012, AD4013, AD4014, and AD4015 were qualified "B" for those compounds.

Phosphorous: Phosphorous was qualified "B" in worm tissue samples in SDG 200144. Samples AD4016, AD4017, AD4018, AD4019, and AD4020 were qualified because of contamination in the associated pretest worm.

Datachek
318 Caswell Beach Rd.
Oak Island, NC 28465

March 4, 2001

Maureen McMyler
IT Corporation
312 Directors Drive
Knoxville, TN 37923

Re: PBOW: Red Water Ponds

Dear Maureen:

Enclosed are the validated Form Is for the tissue samples associated with the Red Water Ponds, with qualifiers and codes added as required. In addition to the Form Is we have included: 1) the data validation summary report that highlights the data usability and reasons for qualifying the results; 2) the sample summary report that has the total number of samples validated for the site; and 3) the invoices to be sent to the Knoxville accounts payable department.

One technical note, all the values for metals that fall below the reporting limit and are qualified as "B" by the laboratory were given "J" qualifiers by the reviewer to match the organic compounds that are qualified as "J" if they are below reporting limits. Also, we have discussed the variation in samples numbers on the Form Is and as per your direction I have not changed any of the numbers.

The original invoice for the accounts payable department is also enclosed. I have used the PO number I already have for the Red Water Ponds. If you would check off the invoice and take it to the right people in accounts payable, I would appreciate it. Thanks for your help.

If you should have any questions please don't hesitate to call (910-278-4653) or e-mail (kitch@bcinet.net).

Sincerely,

Tom

Tom Kitchings

Phone: (910) 278-4653 Fax: (910) 278-7604 e-mail: kitch@bcinet.net

DATA VALIDATION SUMMARY REPORT
PLUMBROOK ORDNANCE WORKS: RED WATER PONDS
March, 2001

Tissue data collected and analyzed in December 2000 to support the Red Water Pond risk assessment, were validated 100% at Level III. Validation was conducted according to the EPA National Functional Guidelines for Organic and Inorganic Data Review. Region III guidelines were used for validation of data affected by blank contamination. The samples collected and analyzed during the investigation of the Red Water Pond sites included six for metals, thirteen for explosives, six for PAH, and six for total phosphate. Overall data was of acceptable results as qualified.

PAH: All sample results were qualified as "UJ/J" due to low surrogate recoveries and low recoveries in the LCS analysis. Also, a high CCAL %D resulted in a "UJ" qualifier added to dibenzo(ah)anthracene.

Metals: Contamination in the preparation blank and continuing calibration blanks resulted in "UB" qualifiers for Ca, Cr, Mg, Mn, Na, K, V, and Zn in all six samples; Co and Ni in five; Al in three; and As in two. Cu was qualified as "J" in all six samples as a result of a high RPD in the duplicate analysis. A low recovery for the CRDL resulted in "J" qualifiers added to the Pb results in five of the six samples in SDG 200144

Explosives: High %Ds for the CCALs associated with both SDGs resulted in "UJ" qualifiers for 4-amino-2,dnt, 2-amino-4,dnt and HMX in all thirteen samples. Also, 2-nitrotoluene and 4-nitrotoluene were qualified as "UJ" in the six samples in SDG 200144 due to high CCAL %Ds.

Total Phosphate: No qualifiers required. Results acceptable as reported.

DATACHEK
318 CASWELL BEACH RD.
OAK ISLAND, NC 28465

December 5, 2000

Maureen McMyler
IT Corporation
312 Directors Drive
Knoxville, TN 37923

Re: PBOW: Sites TNTA, TNTC and Red Water Ponds

Dear Maureen:

Enclosed are the validated Form Is for the Plumbrook, TNTA, TNTC and Red Water Ponds, with qualifiers and codes added as required. This, along with the two previous shipments, completes all the data we received. In addition to the Form Is we have included: 1) the data validation summary report that highlights the data usability and reasons for qualifying the results; 2) the sample summary report that has the total number of samples validated for the site; and 3) the invoices to be sent to the Knoxville accounts payable department.

One technical note, all the values for metals that fall below the reporting limit and are qualified as "B" by the laboratory were given "J" qualifiers by the reviewer to match the organic compounds that are qualified as "J" if they are below reporting limits.

The original invoice for the accounts payable department is also enclosed. If you would add the P.O. numbers when they are issued, check off the invoice and take it to the right people in accounts payable, I would appreciate it. Thanks for your help.

If you should have any questions please don't hesitate to call (910-278-4653) or e-mail (kitch@bcinet.net).

Sincerely,

Tom

Tom Kitchings

PHONE: (910) 278-4653 FAX: (910) 278-7604 E-MAIL: KITCH@BCINET.NET

DATA VALIDATION SUMMARY REPORT
PLUMBROOK ORDNANCE WORKS
December, 2000

Data collected and analyzed from September, October and November, 2000, were validated 100% at Level III. Validation was conducted according to the EPA National Functional Guidelines for Organic and Inorganic Data Review. Region III guidelines were used for validation of data affected by blank contamination. Data were from sites at the Plumbrook Ordnance Works and were grouped into three sections:

I. Site TNTA
II. Site TNTC
III. Red Water Ponds

Data validation results are discussed below for each of the sections. The analyte groups and number of samples for each is also identified. Overall data was of acceptable results.

I. Site TNTA

This site was composed of 80 samples that were analyzed for volatile organic compounds, 79 for semi-volatiles, 83 for metals, 79 for explosives compounds, and 79 for PCBs. Overall, 59 soil samples and 24 water samples were distributed across eleven SDGs.

Volatile Organics: Methylene chloride was present in the associated method blanks and was qualified as "B" in 54 of the 80 samples. Contamination in the trip blanks resulted in "B" qualifiers being added to methylene chloride in fourteen samples. High and/or low surrogate recoveries resulted in "UJ/J" qualifiers for the six samples in SDGs 10121, 9180 and 9164. High percent differences (%D) in the continuing calibrations (CCALS) resulted in "J" qualifiers for acetone and methylene chloride in five soil samples in SDG 9154, and for acetone in one sample from SDG 9164. In SDG 10121, a single sample was qualified as "UJ/J" since the holding times were exceeded. Low RRFs in the ICAL and CCAL resulted in acetone being rejected, "R", in 16 water samples and "J" in two water and nine soil samples. Likewise, 2-butanone was rejected (R) in 22 water samples. Also, 2-hexanone was qualified as "R" in the five water samples in SDG 10063.

Semivolatiles: Method blank contamination resulted in "B" qualifiers being added to di-n-butylphthalate in four samples from SDG 10063. Hexachlorocyclopentadiene had high %Ds in the CCALs associated with five samples in two of the SDGs and was qualified as "UJ". In addition, 4-nitroaniline was qualified as "UJ" in three samples, 2-methylphenol in two, and 3,3'-dichlorobenzidine in two samples. Low surrogate recoveries for two samples in SDG 10063 resulted in "UJ/J" qualifiers for all the compounds. Finally, the single water sample from SDG 9169 had 2,4-dinitrotoluene qualified as "J" due to a low LCS recovery.

PCBs: A high percent difference (%D) between the results from the primary column and those from the confirmation column resulted in "J" qualifiers added to the Aroclor 1260

results in thirty samples across all SDGs. A low surrogate recovery for one sample in SDG 9164 and a high recovery for one in 9188 resulted in "UJ" and "J" qualifiers, respectively. Also, a high %D in the CCAL in SDG 9126 resulted in the Aroclor 1260 being qualified as "J".

Metals: Contamination in the preparation, ICAL and CCAL blanks resulted in fourteen elements being qualified as "B" with sodium the most often in 32 samples, with cadmium and antimony in seven each, and the others in lesser numbers. High and low recoveries in the matrix spike required "UJ/J" qualifiers for seventeen elements in samples across all the SDGs. Antimony in 51 samples, aluminum in 34 and lead in 30 were the most often qualified. High %Ds in the duplicate analysis associated with six SDGs resulted in "J" qualifiers for nine elements, with lead in 32 samples, arsenic in 20, and copper and manganese in 17 each. Finally, "J" qualifiers were needed for chromium in seven samples from SDGs 10057 and 9141 based on %Ds in the serial dilution analysis that exceeded the 25% QC limit.

Explosives: The 79samples analyzed for explosives were acceptable as reported with one sample (AA3010) having 2,4-dinitrotoluene exceeding the instrument calibration limit. A dilution was analyzed.

II. Site TNTC:

This site was composed of 84 samples that were analyzed for volatile organic compounds, 79 for semi-volatiles, 58 for metals, 82 for explosives compounds, and 84 for PCBs. Overall, 59 soil samples and 24 water samples were distributed across eleven SDGs.

Volatile Organics: Methylene chloride was present in the associated method blanks and was qualified as "B" in 58 of the 84 samples. Contamination in the trip blanks resulted in "B" qualifiers being added to methylene chloride in two samples. Acetone also was qualified as "B" in six samples. High and/or low surrogate recoveries resulted in "UJ/J" qualifiers for the nine samples in SDGs 10052, 9180, 10063 and 9188. High percent differences (%D) in the continuing calibrations (CCALS) resulted in "J" qualifiers for acetone in two soil samples in SDG 9169. Low RRFs in the ICAL and CCAL resulted in acetone being rejected, "R", in fourteen water samples and seven soils, and "J" in three water and fifteen soil samples. Likewise, 2-butanone was rejected (R) in twenty water samples.

Semivolatiles: Method blank contamination resulted in "B" qualifiers being added to diethylphthalate in six samples from SDG 10063. Hexachlorocyclopentadiene had high %Ds in the CCALs associated with twelve samples in two of the SDGs and was qualified as "UJ". In addition, 4-nitroaniline was qualified as "UJ" in nine samples, 2,4-dinitrophenol in five, 4-nitroaniline in nine, and 3,3'-dichlorobenzidine in nine samples. Low surrogate recoveries for one sample in SDG 9126 resulted in "UJ/J" qualifiers for all the compounds.

PCBs: A high percent difference (%D) between the results from the primary column and those from the confirmation column resulted in "J" qualifiers added to the Aroclor 1260 results in eighteen samples across all SDGs. A high surrogate recovery for three samples in SDG 10052 resulted in "J" qualifiers. Also, a high %D in the CCAL in SDG 9126 and 9122 resulted in the Aroclor 1260 being qualified as "J" in seventeen samples.

Metals: Contamination in the preparation, ICAL and CCAL blanks resulted in twelve elements being qualified as "B" with sodium the most often in 24 samples, copper in twelve, and the others in lesser numbers. High and low recoveries in the matrix spike required "UJ/J" qualifiers for nine elements in samples across all the SDGs. Antimony in 48 samples, aluminum in 37 and potassium in 31 were the most often qualified. High %Ds in the duplicate analysis associated with all SDGs resulted in "J" qualifiers for eight elements, with Ca in 46 samples and Zn in 50 being the most commonly qualified. Finally, "J" qualifiers were needed for chromium in seven samples from SDGs 10057 based on %Ds in the serial dilution analysis that exceeded the 25% QC limit.

Explosives: A low surrogate recovery for one water sample in SDG 9126 had all compounds qualified as "UJ".

III. Red Water Ponds:

The samples collected and analyzed during the investigation of the Red Water Pond sites included five for semivolatiles, forty-five for metals, seventeen for explosives, eleven for PAH, and forty-five for phosphorous.

Semivolatiles: None of the five samples in SDG 9A09G601 required qualifications.

PAH: All sample results were acceptable as reported with no qualifiers required.

Metals: Contamination in the method blank resulted in copper, chromium, potassium and venadium being qualified as "B" in three, eleven, fourteen and thirty-three samples, respectively. High and low recoveries in the matrix spike required "UJ/J" qualifiers for antimony in twenty-eight samples in both SDGs 9A09G601 and 9A09G602, and As, Ba, and Co in the twelve soil samples from 9A09G602. High %Ds in the duplicate analysis associated with both SDGs resulted in "J" qualifiers for As, Ba, Co, Fe, Mn, and K in the twelve soil samples from SDG 9A09G602 and for Sb, and Pb in the sixteen soil samples and for Zn in the six water samples from SDG 9A09G601. Finally, based on a high %D in the serial dilution analysis eleven elements in the soil samples from SDG 9A09G602 required "J" qualifiers. In SDG 9A09G601, Ni, K and Zn in the soils and Zn in the water samples required "J" qualifiers.

Explosives: All results were acceptable as reported with no qualifiers required.

Phosphorous: No qualifiers required. Results acceptable as reported.

APPENDIX D

BACKGROUND STATISTICS DETAILS

Mann-Whitney Rank Info for As CONCEN
Grouping Variable: LOCATION

	Count	Sum Ranks	Mean Rank
Background	5	62.500	12.500
Onsite	17	190.500	11.206

Mann-Whitney U for Ca CONCEN
Grouping Variable: LOCATION

U	6.000
U Prime	14.000
Z-Value	-.980
P-Value	.3272
Tied Z-Value	-.980
Tied P-Value	.3272
# Ties	0

13 cases were omitted due to missing values.

Mann-Whitney Rank Info for Ca CONCEN
Grouping Variable: LOCATION

	Count	Sum Ranks	Mean Rank
Background	5	21.000	4.200
Onsite	4	24.000	6.000

13 cases were omitted due to missing values.

lann-Whitney U for Cu CONCEN
Grouping Variable: LOCATION

U	16.000
U Prime	69.000
Z-Value	-2.076
P-Value	.0379
Tied Z-Value	-2.079
Tied P-Value	.0376
# Ties	5

Mann-Whitney Rank Info for Cu CONCEN
Grouping Variable: LOCATION

	Count	Sum Ranks	Mean Rank
Background	5	84.000	16.800
Onsite	17	169.000	9.941

Mann-Whitney U for P CONCEN
Grouping Variable: LOCATION

U	1.000
U Prime	2.000
Z-Value	-.447
P-Value	.6547
Tied Z-Value	-.447
Tied P-Value	.6547
# Ties	0

18 cases were omitted due to missing values.

Mann-Whitney Rank Info for P CONCEN
Grouping Variable: LOCATION

	Count	Sum Ranks	Mean Rank
Background	3	7.000	2.333
Onsite	1	3.000	3.000

18 cases were omitted due to missing values.

West Area ... iment Data

LOCATION	UNITS	SAMP_NO	SITE-ID	DETECT	Al CONCEN	SAMP_NO	SITE-ID	DETECT	Fe CONCEN
Background	mg/kg	AE1004	BCG-SD004	Y	4920	AE1004	BCG-SD004	Y	11400
Background	mg/kg	AE1005	BCG-SD005	Y	7680	AE1005	BCG-SD005	Y	14700
Background	mg/kg	AE1006	BCG-SD006	Y	6260	AE1006	BCG-SD006	Y	11700
Background	mg/kg	11100	WARP-SD01	Y	3170	11100	WARP-SD01	Y	14900
Background	mg/kg	11110	WARP-SD02	Y	2450	11110	WARP-SD02	Y	9900
Onsite	mg/kg	11130	WARP-SD04	Y	3230	11140	WARP-SD05	Y	16000
Onsite	mg/kg	11120	WARP-SD03	Y	4260	11120	WARP-SD03	Y	16500
Onsite	mg/kg	11140	WARP-SD05	Y	6880	11150	WARP-SD06	Y	18000
Onsite	mg/kg	11150	WARP-SD06	Y	9600	11130	WARP-SD04	Y	24300
Onsite	mg/kg								
Onsite	mg/kg								
Onsite	mg/kg								
Onsite	mg/kg								
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Onsite	mg/kg								

SAMP_NO	CHEM_NAME	DETECT	As CONCEN
AE1004	BCG-SD004	Y	3.9
AE1005	BCG-SD005	Y	5.2
AE1006	BCG-SD006	Y	3.5
11100	WARP-SD01	Y	5.4
11110	WARP-SD02	Y	3.5
PB-WA-SED1-1.7/2.5	PB-RWP-SED1	N	1.9
PB-WA-SED6-1.3/1.7	PB-RWP-SED6	N	1.9
PB-WA-SED3-0.2/1.0	PB-RWP-SED3	N	1.95
PB-WA-SED1-0.2/1.7	PB-RWP-SED1	N	2.05
PB-WA-SED4-0.2/0.5	PB-RWP-SED4	N	2.05
PB-WA-SED6-0.2/1.3	PB-RWP-SED6	N	2.05
PB-WA-SED2-0.2/1.0	PB-RWP-SED2	N	2.4
PB-WA-SED7-0.2/1.0	PB-RWP-SED7	N	2.4
PB-WA-SED4-0.5/1.5	PB-RWP-SED4	Y	4.00
PB-WA-SED5-0.2/0.5	PB-RWP-SED5	Y	4.20
11140	WARP-SD05	Y	4.60
PB-WA-SED3-1.0/2.0	PB-RWP-SED3	Y	5.20
PB-WA-SED5-0.5/1.5	PB-RWP-SED5	Y	7.20
11120	WARP-SD03	Y	7.30
11130	WARP-SD04	Y	8.60
11150	WARP-SD06	Y	8.70
PB-WA-SED2-1/2	PB-RWP-SED2	Y	11.30

SAMP_NO	CHEM_NAME	DETECT	Ca CONCEN
AE1004	BCG-SD004	Y	10900
AE1005	BCG-SD005	Y	9750
AE1006	BCG-SD006	Y	8190
11100	WARP-SD01	Y	10800
11110	WARP-SD02	Y	13900
11140	WARP-SD05	Y	6710
11120	WARP-SD03	Y	12300
11130	WARP-SD04	Y	16000
11150	WARP-SD06	Y	74700

SAMP_NO	CHEM_NAME	DETECT	Cu CONCEN
AE1004	BCG-SD004	Y	12.1
AE1005	BCG-SD005	Y	13.6
AE1006	BCG-SD006	Y	11.6
11100	WARP-SD01	Y	13.7
11110	WARP-SD02	Y	8.8
PB-WA-SED3-1.0/2.0	PB-RWP-SED3	N	1.2
PB-WA-SED5-0.5/1.5	PB-RWP-SED5	N	1.2
PB-WA-SED6-1.3/1.7	PB-RWP-SED6	N	1.25
PB-WA-SED1-1.7/2.5	PB-RWP-SED1	N	1.3
PB-WA-SED3-0.2/1.0	PB-RWP-SED3	N	1.3
PB-WA-SED1-0.2/1.7	PB-RWP-SED1	N	1.35
PB-WA-SED6-0.2/1.3	PB-RWP-SED6	N	1.35
PB-WA-SED5-0.2/0.5	PB-RWP-SED5	N	1.4
PB-WA-SED2-0.2/1.0	PB-RWP-SED2	N	1.6
PB-WA-SED7-0.2/1.0	PB-RWP-SED7	N	1.6
PB-WA-SED2-1/2	PB-RWP-SED2	Y	3.2
PB-WA-SED4-0.2/0.5	PB-RWP-SED4	Y	3.9
PB-WA-SED4-0.5/1.5	PB-RWP-SED4	Y	3.9
11130	WARP-SD04	Y	9.8
11120	WARP-SD03	Y	15.0
11140	WARP-SD05	Y	15.2
11150	WARP-SD06	Y	24.5

SAMP_NO	CHEM_NAME	DETECT	P CONCEN
AE1004	BCG-SD004	N	2.6
AE1005	BCG-SD005	Y	12.3
AE1006	BCG-SD006	N	2.75
PB-WA-SED1-0.2/1.7	PB-RWP-SED1	Y	3.10

Mann-Whitney U for Al CONCEN
Grouping Variable: LOCATION

West Area Surface Water Results

U	7.500
U Prime	12.500
Z-Value	-.612
P-Value	.5403
Tied Z-Value	-.615
Tied P-Value	.5386
# Ties	1

5 cases were omitted due to missing values.

Mann-Whitney Rank Info for Al CONCEN
Grouping Variable: LOCATION

	Count	Sum Ranks	Mean Rank
Background	5	22.500	4.500
Onsite	4	22.500	5.625

5 cases were omitted due to missing values.

Mann-Whitney U for Fe CONCEN
Grouping Variable: LOCATION

U	2.000
U Prime	18.000
Z-Value	-1.960
P-Value	.0500
Tied Z-Value	-1.960
Tied P-Value	.0500
# Ties	0

5 cases were omitted due to missing values.

Mann-Whitney Rank Info for Fe CONCEN
Grouping Variable: LOCATION

	Count	Sum Ranks	Mean Rank
Background	5	17.000	3.400
Onsite	4	28.000	7.000

5 cases were omitted due to missing values.

Mann-Whitney U for Pb CONCEN
Grouping Variable: LOCATION

U	2.000
U Prime	43.000
Z-Value	-2.733
P-Value	.0063
Tied Z-Value	-2.808
Tied P-Value	.0050
# Ties	3

Mann-Whitney Rank Info for Pb CONCEN
Grouping Variable: LOCATION

	Count	Sum Ranks	Mean Rank
Background	5	17.000	3.400
Onsite	9	88.000	9.778

Mann-Whitney U for Mg CONCEN
Grouping Variable: LOCATION

U	3.000
U Prime	17.000
Z-Value	-1.715
P-Value	.0864
Tied Z-Value	-1.715
Tied P-Value	.0864
# Ties	0

5 cases were omitted due to missing values.

Mann-Whitney Rank Info for Mg CONCEN
Grouping Variable: LOCATION

	Count	Sum Ranks	Mean Rank
Background	5	18.000	3.600
Onsite	4	27.000	6.750

5 cases were omitted due to missing values.

Mann-Whitney U for Mn CONCEN
Grouping Variable: LOCATION

U	6.000
U Prime	39.000
Z-Value	-2.200
P-Value	.0278
Tied Z-Value	-2.202
Tied P-Value	.0276
# Ties	1

Mann-Whitney Rank Info for Mn CONCEN
Grouping Variable: LOCATION

	Count	Sum Ranks	Mean Rank
Background	5	21.000	4.200
Onsite	9	84.000	9.333

Mann-Whitney U for V CONCEN
Grouping Variable: LOCATION

U	3.000
U Prime	17.000
Z-Value	-1.715
P-Value	.0864
Tied Z-Value	-1.917
Tied P-Value	.0552
# Ties	2

5 cases were omitted due to missing values.

Mann-Whitney Rank Info for V CONCEN
Grouping Variable: LOCATION

	Count	Sum Ranks	Mean Rank
Background	5	18.000	3.600
Onsite	4	27.000	6.750

5 cases were omitted due to missing values.

West Area Surface Water Data

LOCATION	UNITS	SAMP_NO	SITE-ID	DETECT	Al CONCEN	SAMP_NO	SITE-ID	DETECT	Fe CONCEN
Background	ug/L	AE2004	BCG-SW004	Y	478	AE2004	BCG-SW004	Y	457
Background	ug/L	AE2005	BCG-SW005	Y	361	AE2005	BCG-SW005	Y	362
Background	ug/L	AE2006	BCG-SW006	Y	182	AE2006	BCG-SW006	Y	201
Background	ug/L	12100	WARP-SW01	Y	631	12100	WARP-SW01	Y	1300
Background	ug/L	12110	WARP-SW02	N	100	12110	WARP-SW02	Y	126
Onsite	ug/L	12130	WARP-SW04	N	100	12130	WARP-SW04	Y	646
Onsite	ug/L	12120	WARP-SW03	Y	300	12120	WARP-SW03	Y	747
Onsite	ug/L	12150	WARP-SW06	Y	12400	12150	WARP-SW06	Y	19000
Onsite	ug/L	12140	WARP-SW05	Y	13800	12140	WARP-SW05	Y	21100
Onsite	ug/L								
Onsite	ug/L								
Onsite	ug/L								
Onsite	ug/L								
Onsite	ug/L								

** fixed this value to be 1/2 of the DL because value was "B" qualified.

SAMP_NO	SITE-ID	DETECT	Pb CONCEN
AE2004	BCG-SW004	N	1.3
AE2005	BCG-SW005	N	1.3
AE2006	BCG-SW006	N	1.3
12100	WARP-SW01	N	1.5
12110	WARP-SW02	N	1.5
12120	WARP-SW03	N	1.5
12130	WARP-SW04	N	1.5
PB-WA-SW1	PB-RWP-SW1	N	12.5
PB-WA-SW2	PB-RWP-SW2	N	12.5
PB-WA-SW4	PB-RWP-SW4	N	12.5
PB-WA-SW5	PB-RWP-SW5	N	12.5
12140	WARP-SW05	Y	25
12150	WARP-SW06	Y	32.9
PB-WA-SW3	PB-RWP-SW3	Y	77

SAMP_NO	SITE-ID	DETECT	Mg CONCEN
AE2004	BCG-SW004	Y	18200
AE2005	BCG-SW005	Y	18800
AE2006	BCG-SW006	Y	19300
12100	WARP-SW01	Y	26000
12110	WARP-SW02	Y	26500
12130	WARP-SW04	Y	25800
12120	WARP-SW03	Y	26200
12140	WARP-SW05	Y	46500
12150	WARP-SW06	Y	50700

SAMP_NO	SITE-ID	DETECT	Mn CONCEN
AE2004	BCG-SW004	Y	19.9
AE2005	BCG-SW005	Y	19.3
AE2006	BCG-SW006	Y	20.4
12100	WARP-SW01	Y	890
12110	WARP-SW02	Y	30.6
12130	WARP-SW04	Y	126
PB-WA-SW1	PB-RWP-SW1	Y	190
PB-WA-SW3	PB-RWP-SW3	Y	230
PB-WA-SW2	PB-RWP-SW2	Y	260
PB-WA-SW4	PB-RWP-SW4	Y	260
12120	WARP-SW03	Y	261
12140	WARP-SW05	Y	1150
12150	WARP-SW06	Y	1550
PB-WA-SW5	PB-RWP-SW5	Y	1600

SAMP_NO	SITE-ID	DETECT	V CONCEN
AE2004	BCG-SW004	N	1.05 **
AE2005	BCG-SW005	N	1.05 **
AE2006	BCG-SW006	N	1.05 **
12100	WARP-SW01	N	25.0
12110	WARP-SW02	N	25.0
12120	WARP-SW03	N	25.0
12130	WARP-SW04	N	25.0
12140	WARP-SW05	N	25.0
12150	WARP-SW06	Y	52.2

Mann-Whitney U for Anthracene CONCEN
Grouping Variable: LOCATION

U	0.000
U Prime	54.000
Z-Value	-2.714
P-Value	.0067
Tied Z-Value	-2.750
Tied P-Value	.0060
# Ties	6

Mann-Whitney Rank Info for Anthracene CONCEN
Grouping Variable: LOCATION

	Count	Sum Ranks	Mean Rank
Background	3	6.000	2.000
Onsite	18	225.000	12.500

Mann-Whitney U for B(a)A CONCEN
Grouping Variable: LOCATION

U	0.000
U Prime	54.000
Z-Value	-2.714
P-Value	.0067
Tied Z-Value	-2.746
Tied P-Value	.0060
# Ties	5

Mann-Whitney Rank Info for B(a)A CONCEN
Grouping Variable: LOCATION

	Count	Sum Ranks	Mean Rank
Background	3	6.000	2.000
Onsite	18	225.000	12.500

Mann-Whitney U for B(a)P CONCEN
Grouping Variable: LOCATION

U	0.000
U Prime	54.000
Z-Value	-2.714
P-Value	.0067
Tied Z-Value	-2.747
Tied P-Value	.0060
# Ties	6

Mann-Whitney Rank Info for B(a)P CONCEN
Grouping Variable: LOCATION

	Count	Sum Ranks	Mean Rank
Background	3	6.000	2.000
Onsite	18	225.000	12.500

Mann-Whitney U for B(b)F CONCEN
Grouping Variable: LOCATION

U	0.000
U Prime	54.000
Z-Value	-2.714
P-Value	.0067
Tied Z-Value	-2.746
Tied P-Value	.0060
# Ties	5

Mann-Whitney Rank Info for B(b)F CONCEN
Grouping Variable: LOCATION

	Count	Sum Ranks	Mean Rank
Background	3	6.000	2.000
Onsite	18	225.000	12.500

Mann-Whitney U for B(ghi)P CONCEN
Grouping Variable: LOCATION

U	0.000
U Prime	54.000
Z-Value	-2.714
P-Value	.0067
Tied Z-Value	-2.747
Tied P-Value	.0060
# Ties	6

Mann-Whitney Rank Info for B(ghi)P CONCEN
Grouping Variable: LOCATION

	Count	Sum Ranks	Mean Rank
Background	3	6.000	2.000
Onsite	18	225.000	12.500

Mann-Whitney U for B(k)F CONCEN
Grouping Variable: LOCATION

U	0.000
U Prime	54.000
Z-Value	-2.714
P-Value	.0067
Tied Z-Value	-2.746
Tied P-Value	.0060
# Ties	5

Mann-Whitney Rank Info for B(k)F CONCEN
Grouping Variable: LOCATION

	Count	Sum Ranks	Mean Rank
Background	3	6.000	2.000
Onsite	18	225.000	12.500

Mann-Whitney U for Chrysene CONCEN
Grouping Variable: LOCATION

U	0.000
U Prime	54.000
Z-Value	-2.714
P-Value	.0067
Tied Z-Value	-2.746
Tied P-Value	.0060
# Ties	5

Mann-Whitney Rank Info for Chrysene CONCEN
Grouping Variable: LOCATION

	Count	Sum Ranks	Mean Rank
Background	3	6.000	2.000
Onsite	18	225.000	12.500

Mann-Whitney U for I(123-cd)P CONCEN
Grouping Variable: LOCATION

U	0.000
U Prime	54.000
Z-Value	-2.714
P-Value	.0067
Tied Z-Value	-2.746
Tied P-Value	.0060
# Ties	5

Mann-Whitney Rank Info for I(123-cd)P CONCEN
Grouping Variable: LOCATION

	Count	Sum Ranks	Mean Rank
Background	3	6.000	2.000
Onsite	18	225.000	12.500

Mann-Whitney U for Phenanthrene CONCEN
Grouping Variable: LOCATION

U	0.000
U Prime	54.000
Z-Value	-2.714
P-Value	.0067
Tied Z-Value	-2.746
Tied P-Value	.0060
# Ties	5

Mann-Whitney Rank Info for Phenanthrene CONCEN
Grouping Variable: LOCATION

	Count	Sum Ranks	Mean Rank
Background	3	6.000	2.000
Onsite	18	225.000	12.500

West Area Soil Background Data

LOCATION	UNITS	SAMP_NO	SITE-ID	DETECT	Anthracene CONCEN	SAMP_NO	CHEM_NAME	DETECT	B(a)A CONCEN
Onsite	mg/kg	8870	WARP-DP20	Y	0.12	8870	WARP-DP20	Y	0.17
Onsite	mg/kg	8300	WARP-DP06	N	0.185	8300	WARP-DP06	N	0.185
Onsite	mg/kg	8780	WARP-DP18	N	0.185	8780	WARP-DP18	N	0.185
Onsite	mg/kg	8820	WARP-DP19	N	0.185	8820	WARP-DP19	N	0.185
Onsite	mg/kg	8380	WARP-DP08	N	0.19	8380	WARP-DP08	N	0.19
Onsite	mg/kg	8460	WARP-DP10	N	0.19	8460	WARP-DP10	N	0.19
Onsite	mg/kg	8350	WARP-DP07	N	0.195	8350	WARP-DP07	N	0.195
Onsite	mg/kg	8430	WARP-DP09	N	0.195	8430	WARP-DP09	N	0.195
Onsite	mg/kg	8670	WARP-DP15	N	0.195	8670	WARP-DP15	N	0.195
Onsite	mg/kg	8180	WARP-DP03	N	0.195	8180	WARP-DP03	N	0.195
Onsite	mg/kg	8500	WARP-DP11	N	0.195	8500	WARP-DP11	N	0.195
Onsite	mg/kg	8270	WARP-DP05	N	0.2	8270	WARP-DP05	N	0.2
Onsite	mg/kg	8750	WARP-DP17	N	0.2	8750	WARP-DP17	N	0.2
Onsite	mg/kg	8140	WARP-DP02	N	0.2	8140	WARP-DP02	N	0.2
Onsite	mg/kg	8700	WARP-DP16	N	0.2	8700	WARP-DP16	N	0.2
Onsite	mg/kg	8110	WARP-DP01	N	0.205	8110	WARP-DP01	N	0.205
Onsite	mg/kg	8550	WARP-DP12	N	0.205	8550	WARP-DP12	N	0.205
Onsite	mg/kg	8580	WARP-DP13	Y	0.23	8580	WARP-DP13	Y	0.40
Background	mg/kg	AE0004	BCG-SO004	N	0.001	AE0004	BCG-SO004	N	0.0025
Background	mg/kg	AE0005	BCG-SO005	N	0.001	AE0005	BCG-SO005	Y	0.0049
Background	mg/kg	AE0006	BCG-SO006	N	0.001	AE0006	BCG-SO006	Y	0.0048

SAMP_NO	CHEM_NAME	DETECT	B(a)P CONCEN
8870	WARP-DP20	Y	0.14
8300	WARP-DP06	N	0.185
8780	WARP-DP18	N	0.185
8820	WARP-DP19	N	0.185
8380	WARP-DP08	N	0.19
8460	WARP-DP10	N	0.19
8350	WARP-DP07	N	0.195
8430	WARP-DP09	N	0.195
8670	WARP-DP15	N	0.195
8180	WARP-DP03	N	0.195
8500	WARP-DP11	N	0.195
8270	WARP-DP05	N	0.2
8750	WARP-DP17	N	0.2
8140	WARP-DP02	N	0.2
8700	WARP-DP16	N	0.2
8110	WARP-DP01	N	0.205
8550	WARP-DP12	N	0.205
8580	WARP-DP13	Y	0.39
AE0004	BCG-SO004	Y	0.0038
AE0005	BCG-SO005	Y	0.0078
AE0006	BCG-SO006	Y	0.0078

SAMP_NO	CHEM_NAME	DETECT	B(b)F CONCEN
8870	WARP-DP20	Y	0.14
8300	WARP-DP06	N	0.185
8780	WARP-DP18	N	0.185
8820	WARP-DP19	N	0.185
8380	WARP-DP08	N	0.19
8460	WARP-DP10	N	0.19
8350	WARP-DP07	N	0.195
8430	WARP-DP09	N	0.195
8670	WARP-DP15	N	0.195
8180	WARP-DP03	N	0.195
8500	WARP-DP11	N	0.195
8270	WARP-DP05	N	0.2
8750	WARP-DP17	N	0.2
8140	WARP-DP02	N	0.2
8700	WARP-DP16	N	0.2
8110	WARP-DP01	N	0.205
8550	WARP-DP12	N	0.205
8580	WARP-DP13	Y	0.3
AE0004	BCG-SO004	Y	0.0036
AE0005	BCG-SO005	Y	0.0078
AE0006	BCG-SO006	Y	0.0074

SAMP_NO	CHEM_NAME	DETECT	B(ghi)P CONCEN
8870	WARP-DP20	Y	0.076
8300	WARP-DP06	N	0.185
8780	WARP-DP18	N	0.185
8820	WARP-DP19	N	0.185
8380	WARP-DP08	N	0.19
8460	WARP-DP10	N	0.19
8350	WARP-DP07	N	0.195
8430	WARP-DP09	N	0.195
8670	WARP-DP15	N	0.195
8180	WARP-DP03	N	0.195
8500	WARP-DP11	N	0.195
8270	WARP-DP05	N	0.2
8750	WARP-DP17	N	0.2
8140	WARP-DP02	N	0.2
8700	WARP-DP16	N	0.2
8110	WARP-DP01	N	0.205
8550	WARP-DP12	N	0.205
8580	WARP-DP13	Y	0.22
AE0004	BCG-SO004	N	0.004
AE0005	BCG-SO005	N	0.00405
AE0006	BCG-SO006	N	0.00405

SAMP_NO	CHEM_NAME	DETECT	B(k)F CONCEN
8870	WARP-DP20	Y	0.11
8300	WARP-DP06	N	0.185
8780	WARP-DP18	N	0.185
8820	WARP-DP19	N	0.185
8380	WARP-DP08	N	0.19
8460	WARP-DP10	N	0.19
8350	WARP-DP07	N	0.195
8430	WARP-DP09	N	0.195
8670	WARP-DP15	N	0.195
8180	WARP-DP03	N	0.195
8500	WARP-DP11	N	0.195
8270	WARP-DP05	N	0.2
8750	WARP-DP17	N	0.2
8140	WARP-DP02	N	0.2
8700	WARP-DP16	N	0.2
8110	WARP-DP01	N	0.205
8550	WARP-DP12	N	0.205
8580	WARP-DP13	Y	0.35
AE0004	BCG-SO004	Y	0.0018
AE0005	BCG-SO005	Y	0.0035
AE0006	BCG-SO006	Y	0.0038

SAMP_NO	CHEM_NAME	DETECT	Chrysene CONCEN
8870	WARP-DP20	Y	0.17
8300	WARP-DP06	N	0.185
8780	WARP-DP18	N	0.185
8820	WARP-DP19	N	0.185
8380	WARP-DP08	N	0.19
8460	WARP-DP10	N	0.19
8350	WARP-DP07	N	0.195
8430	WARP-DP09	N	0.195
8670	WARP-DP15	N	0.195
8180	WARP-DP03	N	0.195
8500	WARP-DP11	N	0.195
8270	WARP-DP05	N	0.2
8750	WARP-DP17	N	0.2
8140	WARP-DP02	N	0.2
8700	WARP-DP16	N	0.2
8110	WARP-DP01	N	0.205
8550	WARP-DP12	N	0.205
8580	WARP-DP13	Y	0.42
AE0004	BCG-SO004	Y	0.0032
AE0005	BCG-SO005	Y	0.0062
AE0006	BCG-SO006	Y	0.0063

SAMP_NO	CHEM_NAME	DETECT	I(123-cd)P CONCEN
8870	WARP-DP20	Y	0.076
8300	WARP-DP06	N	0.185
8780	WARP-DP18	N	0.185
8820	WARP-DP19	N	0.185
8380	WARP-DP08	N	0.19
8460	WARP-DP10	N	0.19
8350	WARP-DP07	N	0.195
8430	WARP-DP09	N	0.195
8670	WARP-DP15	N	0.195
8180	WARP-DP03	N	0.195
8500	WARP-DP11	N	0.195
8270	WARP-DP05	N	0.2
8750	WARP-DP17	N	0.2
8140	WARP-DP02	N	0.2
8700	WARP-DP16	N	0.2
8110	WARP-DP01	N	0.205
8550	WARP-DP12	N	0.205
8580	WARP-DP13	Y	0.23
AE0004	BCG-SO004	Y	0.0022
AE0005	BCG-SO005	Y	0.0074
AE0006	BCG-SO006	Y	0.0048

SAMP_NO	CHEM_NAME	DETECT	Phenanthrene CONCEN
8300	WARP-DP06	N	0.185
8780	WARP-DP18	N	0.185
8820	WARP-DP19	N	0.185
8380	WARP-DP08	N	0.19
8460	WARP-DP10	N	0.19
8350	WARP-DP07	N	0.195
8430	WARP-DP09	N	0.195
8670	WARP-DP15	N	0.195
8180	WARP-DP03	N	0.195
8500	WARP-DP11	N	0.195
8270	WARP-DP05	N	0.2
8750	WARP-DP17	N	0.2
8140	WARP-DP02	N	0.2
8700	WARP-DP16	N	0.2
8110	WARP-DP01	N	0.205
8550	WARP-DP12	N	0.205
8870	WARP-DP20	Y	0.25
8580	WARP-DP13	Y	0.36
AE0004	BCG-SO004	Y	0.056
AE0005	BCG-SO005	Y	0.068
AE0006	BCG-SO006	Y	0.13

Pentolite Road Sediment Results

Mann-Whitney U for Mg CONCEN
Grouping Variable: LOCATION

U	6.000
U Prime	29.000
Z-Value	-1.868
P-Value	.0618
Tied Z-Value	-1.868
Tied P-Value	.0618
# Ties	0

Mann-Whitney Rank Info for Mg CONCEN
Grouping Variable: LOCATION

	Count	Sum Ranks	Mean Rank
Background	5	21.000	4.200
On-site	7	57.000	8.143

Mann-Whitney U for K CONCEN
Grouping Variable: LOCATION

U	9.000
U Prime	26.000
Z-Value	-1.380
P-Value	.1675
Tied Z-Value	-1.380
Tied P-Value	.1675
# Ties	0

ann-Whitney Rank Info for K CONCEN
Grouping Variable: LOCATION

	Count	Sum Ranks	Mean Rank
Background	5	41.000	8.200
On-site	7	37.000	5.286

Mann-Whitney U for Carbazole CONCEN
Grouping Variable: LOCATION

U	2.000
U Prime	12.000
Z-Value	-1.464
P-Value	.1432
Tied Z-Value	-1.470
Tied P-Value	.1416
# Ties	1

3 cases were omitted due to missing values.

Mann-Whitney Rank Info for Carbazole CONCEN
Grouping Variable: LOCATION

	Count	Sum Ranks	Mean Rank
Background	2	5.000	2.500
On-site	7	40.000	5.714

cases were omitted due to missing values.

Pentolite Road Sediment Data

SAMP_NO	SITE-ID	LOCATION	UNITS	*Magnesium*	*DETECT*	*Mg CONCEN*	*Potassium*	*DETECT*	*K CONCEN*
AE1001	BCG-SD001	Background	mg/kg	***Magnesium***	***Y***	***10300***	***Potassium***	***Y***	***1210***
AE1002	BCG-SD002	Background	mg/kg	***Magnesium***	***Y***	***7940***	***Potassium***	***Y***	***3240***
AE1003	BCG-SD003	Background	mg/kg	***Magnesium***	***Y***	***8480***	***Potassium***	***Y***	***2110***
11160	PRRP-SD01	Background	mg/kg	***Magnesium***	***Y***	***10700***	***Potassium***	***N***	***655***
11170	PRRP-SD02	On-site	mg/kg	***Magnesium***	***Y***	***19300***	***Potassium***	***N***	***315.5***
11180	PRRP-SD03	On-site	mg/kg	***Magnesium***	***Y***	***13500***	***Potassium***	***Y***	***1040***
11190	PRRP-SD04	Background	mg/kg	***Magnesium***	***Y***	***2710***	***Potassium***	***N***	***332***
AC1001	PRWP-SD001	On-site	mg/kg	***Magnesium***	***Y***	***11200***	***Potassium***	***N***	***8***
AC1002	PRWP-SD002	On-site	mg/kg	***Magnesium***	***Y***	***9140***	***Potassium***	***N***	***5.7***
AC1003	PRWP-SD003	On-site	mg/kg	***Magnesium***	***Y***	***15900***	***Potassium***	***Y***	***2480***
AC1004	PRWP-SD004	On-site	mg/kg	***Magnesium***	***Y***	***12400***	***Potassium***	***Y***	***1650***
AC1005	PRWP-SD005	On-site	mg/kg	***Magnesium***	***Y***	***6920***	***Potassium***	***N***	***5.95***

SAMP_NO	SITE-ID	LOCATION	UNITS	Carbazole	DETECT	Carbazole CONCEN
AE1001	BCG-SD001	Background	mg/kg	Carbazole		
AE1002	BCG-SD002	Background	mg/kg	Carbazole		
AE1003	BCG-SD003	Background	mg/kg	Carbazole		
11160	PRRP-SD01	Background	mg/kg	Carbazole	N	0.215
11170	PRRP-SD02	On-site	mg/kg	Carbazole	Y	0.18
11180	PRRP-SD03	On-site	mg/kg	Carbazole	N	0.285
11190	PRRP-SD04	Background	mg/kg	Carbazole	N	0.11
AC1001	PRWP-SD001	On-site	mg/kg	Carbazole	N	0.17
AC1002	PRWP-SD002	On-site	mg/kg	Carbazole	N	0.28
AC1003	PRWP-SD003	On-site	mg/kg	Carbazole	N	0.23
AC1004	PRWP-SD004	On-site	mg/kg	Carbazole	N	0.23
AC1005	PRWP-SD005	On-site	mg/kg	Carbazole	N	0.27

Mann-Whitney U for Al CONCEN
Grouping Variable: LOCATION

U	18.000
U Prime	22.000
Z-Value	-.293
P-Value	.7697
Tied Z-Value	-.294
Tied P-Value	.7685
# Ties	1

Mann-Whitney Rank Info for Al CONCEN
Grouping Variable: LOCATION

	Count	Sum Ranks	Mean Rank
Background	5	33.000	6.600
On-site	8	58.000	7.250

Mann-Whitney U for Fe CONCEN
Grouping Variable: LOCATION

U	15.000
U Prime	25.000
Z-Value	-.732
P-Value	.4642
Tied Z-Value	-.732
Tied P-Value	.4642
# Ties	0

Mann-Whitney Rank Info for Fe CONCEN
Grouping Variable: LOCATION

	Count	Sum Ranks	Mean Rank
Background	5	40.000	8.000
On-site	8	51.000	6.375

Mann-Whitney U for Mn CONCEN
Grouping Variable: LOCATION

U	17.000
U Prime	23.000
Z-Value	-.439
P-Value	.6605
Tied Z-Value	-.439
Tied P-Value	.6605
# Ties	0

Mann-Whitney Rank Info for Mn CONCEN
Grouping Variable: LOCATION

	Count	Sum Ranks	Mean Rank
Background	5	38.000	7.600
On-site	8	53.000	6.625

Pentolite Road Surface Water Background Data

SAMP_NO	SITE-ID	LOCATION	UNITS	*Aluminum*	*DETECT*	*Al CONCEN*	*Iron*	*DETECT*	*Fe CONCEN*
AE2001	BCG-SW001	Background	ug/L	***Aluminum***	***Y***	***270***	***Iron***	***Y***	***717***
AE2002	BCG-SW002	Background	ug/L	***Aluminum***	***Y***	***435***	***Iron***	***Y***	***1070***
AE2003	BCG-SW003	Background	ug/L	***Aluminum***	***N***	***36.35***	***Iron***	***Y***	***618***
12160	PRRP-SW01	Background	ug/L	***Aluminum***	***Y***	***778***	***Iron***	***Y***	***1420***
12170	PRRP-SW02	On-site	ug/L	***Aluminum***	***Y***	***530***	***Iron***	***Y***	***972***
12180	PRRP-SW03	On-site	ug/L	***Aluminum***	***Y***	***3040***	***Iron***	***Y***	***5790***
12190	PRRP-SW04	Background	ug/L	***Aluminum***	***N***	***100***	***Iron***	***Y***	***948***
AC2004	PRWP-SW004	On-site	ug/L	***Aluminum***	***Y***	***712***	***Iron***	***Y***	***1220***
AC2006	PRWP-SW006	On-site	ug/L	***Aluminum***	***N***	***36.35***	***Iron***	***Y***	***388***
AC2007	PRWP-SW007	On-site	ug/L	***Aluminum***	***Y***	***137***	***Iron***	***Y***	***364***
AC2008	PRWP-SW008	On-site	ug/L	***Aluminum***	***Y***	***237***	***Iron***	***Y***	***608***
AC2009	PRWP-SW009	On-site	ug/L	***Aluminum***	***N***	***36.35***	***Iron***	***Y***	***314***
AC2010	PRWP-SW010	On-site	ug/L	***Aluminum***	***Y***	***494***	***Iron***	***Y***	***1010***

Pentolite Road Surface Water Background Data

SAMP_NO	SITE-ID	LOCATION	UNITS	Manganese	DETECT	Mn CONCEN
AE2001	BCG-SW001	Background	ug/L	Manganese	Y	109
AE2002	BCG-SW002	Background	ug/L	Manganese	Y	357
AE2003	BCG-SW003	Background	ug/L	Manganese	Y	332
12160	PRRP-SW01	Background	ug/L	Manganese	Y	245
12170	PRRP-SW02	On-site	ug/L	Manganese	Y	261
12180	PRRP-SW03	On-site	ug/L	Manganese	Y	404
12190	PRRP-SW04	Background	ug/L	Manganese	Y	67.1
AC2004	PRWP-SW004	On-site	ug/L	Manganese	Y	149
AC2006	PRWP-SW006	On-site	ug/L	Manganese	Y	104
AC2007	PRWP-SW007	On-site	ug/L	Manganese	Y	106
AC2008	PRWP-SW008	On-site	ug/L	Manganese	Y	148
AC2009	PRWP-SW009	On-site	ug/L	Manganese	Y	101
AC2010	PRWP-SW010	On-site	ug/L	Manganese	Y	147

Pentolite Road Surfac. ater Background Data

SAMP_NO	SITE-ID	LOCATION	UNITS	Lead	DETECT	Pb CONCEN
AE2001	BCG-SW001	Background	ug/L	Lead	N	1.3
AE2002	BCG-SW002	Background	ug/L	Lead	N	1.3
AE2003	BCG-SW003	Background	ug/L	Lead	N	1.3
12160	PRRP-SW01	Background	ug/L	Lead	N	1.5
12170	PRRP-SW02	On-site	ug/L	Lead	N	1.5
12180	PRRP-SW03	On-site	ug/L	Lead	Y	8.7
12190	PRRP-SW04	Background	ug/L	Lead	N	1.5
AC2004	PRWP-SW004	On-site	ug/L	Lead	N	1.3
AC2006	PRWP-SW006	On-site	ug/L	Lead	N	1.3
AC2007	PRWP-SW007	On-site	ug/L	Lead	N	1.3
AC2008	PRWP-SW008	On-site	ug/L	Lead	N	1.3
AC2009	PRWP-SW009	On-site	ug/L	Lead	N	1.3
AC2010	PRWP-SW010	On-site	ug/L	Lead	N	1.3

Mann-Whitney U for Pb CONCEN
Grouping Variable: LOCATION

Pentolite Road Surface Water

U	18.000
U Prime	22.000
Z-Value	-.293
P-Value	.7697
Tied Z-Value	-.361
Tied P-Value	.7184
# Ties	2

Mann-Whitney Rank Info for Pb CONCEN
Grouping Variable: LOCATION

	Count	Sum Ranks	Mean Rank
Background	5	37.000	7.400
On-site	8	54.000	6.750

Mann-Whitney U for Sb CONCEN
Grouping Variable: LOCATION

~~Pentolite Road Soil Results~~

U	371.000
U Prime	2239.000
Z-Value	-5.781
P-Value	<.0001
Tied Z-Value	-5.785
Tied P-Value	<.0001
# Ties	29

Mann-Whitney Rank Info for Sb CONCEN
Grouping Variable: LOCATION

	Count	Sum Ranks	Mean Rank
Background	29	2674.000	92.207
Onsite	90	4466.000	49.622

Pentolite Road Soil Background Data

SAMP_NO	SITE-ID	LOCATION	UNITS	Antimony	DETECT	Sb CONCEN
6990	BCG-SB01	Background	mg/kg	Antimony	N	74
7000	BCG-SB01	Background	mg/kg	Antimony	N	6.8
7010	BCG-SB02	Background	mg/kg	Antimony	N	7.4
7020	BCG-SB02	Background	mg/kg	Antimony	Y	7.8
7030	BCG-SB03	Background	mg/kg	Antimony	N	7.4
7040	BCG-SB03	Background	mg/kg	Antimony	Y	7.9
7050	BCG-SB04	Background	mg/kg	Antimony	Y	9.3
7060	BCG-SB04	Background	mg/kg	Antimony	N	8
7070	BCG-SB05	Background	mg/kg	Antimony	N	7.2
7080	BCG-SB05	Background	mg/kg	Antimony	N	7.4
7090	BCG-SB06	Background	mg/kg	Antimony	N	7
7100	BCG-SB06	Background	mg/kg	Antimony	N	6.8
BG-S1	0.5-3.0	Background	mg/kg	Antimony	N	5.4
BG-S1	3.0-5.0	Background	mg/kg	Antimony	N	5.7
BG-S2	0.5-3.0	Background	mg/kg	Antimony	Y	6.3
BG-S2	3.0-5.0	Background	mg/kg	Antimony	N	5.8
BG-S3	0.5-3.0	Background	mg/kg	Antimony	N	5.4
BG-S3	3.0-4.0	Background	mg/kg	Antimony	N	5.5
BG-S4	0.5-3.0	Background	mg/kg	Antimony	Y	7.6
BG-S5	0.5-3.0	Background	mg/kg	Antimony	Y	6.7
BG-S5	3.0-5.0	Background	mg/kg	Antimony	Y	5.9
BG-S6	0.5-3.0	Background	mg/kg	Antimony	Y	6.4
BG-S6	3.0-4.5	Background	mg/kg	Antimony	N	5.7
BG-S7	0.5-3.0	Background	mg/kg	Antimony	Y	7.5
BG-S9	0.5-3.0	Background	mg/kg	Antimony	N	5.6
BG-S9	3.0-5.0	Background	mg/kg	Antimony	N	6.1
PB-PR-S8-0.0/2.0	PB-RWP-PR-S8	Onsite	mg/kg	Antimony	N	2.6
PB-PR-S8-2.0/5.0	PB-RWP-PR-S8	Onsite	mg/kg	Antimony	N	2.6
PB-PR-S1-0.0/2.0	PB-RWP-9PR-S1	Onsite	mg/kg	Antimony	N	2.65
PB-PR-S3-0.0/2.0	PB-RWP-PR-S3	Onsite	mg/kg	Antimony	N	2.65
PB-PR-S14-0.0/3.0	PB-RWP-PR-S14	Onsite	mg/kg	Antimony	N	2.65
PB-PR-S30-0.0/0.5	PB-RWP-PR-S30	Onsite	mg/kg	Antimony	N	2.65
PB-PR-S16-0.0/3.0	PB-RWP-PR-S16	Onsite	mg/kg	Antimony	N	2.7
PB-PR-S19-0.0/3.0	PB-RWP-PR-S19	Onsite	mg/kg	Antimony	N	2.7
PB-PR-S21-0.0/0.5	PB-RWP-PR-S21	Onsite	mg/kg	Antimony	N	2.7
PB-PR-S17-0.0/2.0	PB-RWP-PR-S17	Onsite	mg/kg	Antimony	N	2.75
PB-PR-S20-0.0/2.0	PB-RWP-PR-S20	Onsite	mg/kg	Antimony	N	2.75
PB-PR-S11-0.0/3.0	PB-RWP-PR-S11	Onsite	mg/kg	Antimony	N	2.75
PB-PR-S15-0.0/3.0	PB-RWP-PR-S15	Onsite	mg/kg	Antimony	N	2.75
PB-PR-S15-3.0/5.0	PB-RWP-PR-S15	Onsite	mg/kg	Antimony	N	2.75
PB-PR-S18-0.0/2.0	PB-RWP-PR-S18	Onsite	mg/kg	Antimony	N	2.8
PB-PR-S2-0.0/3.0	PB-RWP-PR-S2	Onsite	mg/kg	Antimony	N	2.8
PB-PR-S5-0.0/3.0	PB-RWP-PR-S5	Onsite	mg/kg	Antimony	N	2.8
PB-PR-S6-0.0/3.0	PB-RWP-PR-S6	Onsite	mg/kg	Antimony	N	2.8
PR-PR-S9-0.0/3.0	PB-RWP-PR-S9	Onsite	mg/kg	Antimony	N	2.8
PB-PR-S22-0.0/0.5	PB-RWP-PR-S22	Onsite	mg/kg	Antimony	N	2.8
PB-PR-S24-0.0/0.5	PB-RWP-PR-S24	Onsite	mg/kg	Antimony	N	2.8

Pentolite Road Soil Background Data

SAMP_NO	SITE-ID	LOCATION	UNITS	Antimony	DETECT	Sb CONCEN
PB-PR-S13-3.0/5.0	PB-RWP-PR-S13	Onsite	mg/kg	Antimony	N	2.8
PB-PR-S14-3.0/5.0	PB-RWP-PR-S14	Onsite	mg/kg	Antimony	N	2.8
PB-PR-S13-0.0/3.0	PB-RWP-PR-S13	Onsite	mg/kg	Antimony	N	2.85
PB-PR-S7-0.0/3.0	PB-RWP-PR-S7	Onsite	mg/kg	Antimony	N	2.85
PB-PR-S23-0.0/0.5	PB-RWP-PR-S23	Onsite	mg/kg	Antimony	N	2.85
PB-PR-S1-2.0/5.0	PB-RWP-PR-S1	Onsite	mg/kg	Antimony	N	2.85
PB-PR-S4-0.0/3.0	PB-RWP-PR-S4	Onsite	mg/kg	Antimony	N	2.9
PB-PR-S8-0.0/0.5	PB-RWP-PR-S8	Onsite	mg/kg	Antimony	N	2.9
PB-PR-S10-0.0/3.0	PB-RWP-PR-S10	Onsite	mg/kg	Antimony	N	2.95
PB-PR-S12-0.0/3.0	PB-RWP-PR-S12	Onsite	mg/kg	Antimony	N	3
PB-PR-S14-0.0/0.5	PB-RWP-PR-S14	Onsite	mg/kg	Antimony	N	3
PB-PR-S10-3.0/5.0	PB-RWP-PR-S10	Onsite	mg/kg	Antimony	N	3
PB-PR-S18-2.0/5.0	PB-RWP-PR-S18	Onsite	mg/kg	Antimony	N	3
PB-PR-S3-2.0/5.0	PB-RWP-PR-S3	Onsite	mg/kg	Antimony	N	3
PB-PR-S12-3.0/5.0	PB-RWP-PR-S12	Onsite	mg/kg	Antimony	N	3.05
PB-PR-S6-3.0/5.0	PB-RWP-PR-S6	Onsite	mg/kg	Antimony	N	3.05
PB-PR-S17-0.0/0.5	PB-RWP-PR-S17	Onsite	mg/kg	Antimony	N	3.1
PB-PR-S4-3.0/5.0	PB-RWP-PR-S4	Onsite	mg/kg	Antimony	N	3.1
PB-PR-S5-3.0/5.0	PB-RWP-PR-S5	Onsite	mg/kg	Antimony	N	3.1
PB-PR-S7-3.0/5.0	PB-RWP-PR-S7	Onsite	mg/kg	Antimony	N	3.1
PB-PR-S9-3.0/5.0	PB-RWP-PR-S9	Onsite	mg/kg	Antimony	N	3.1
PB-PR-S13-0.0/0.5	PB-RWP-PR-S13	Onsite	mg/kg	Antimony	N	3.15
PB-PR-S19-0.0/0.5	PB-RWP-PR-S19	Onsite	mg/kg	Antimony	N	3.15
7440	PRRP-DP07	Onsite	mg/kg	Antimony	N	3.2
7280	PRRP-DP03	Onsite	mg/kg	Antimony	N	3.3
7840	PRRP-DP17	Onsite	mg/kg	Antimony	N	3.3
7920	PRRP-DP19	Onsite	mg/kg	Antimony	N	3.3
7810	PRRP-DP16	Onsite	mg/kg	Antimony	N	3.3
7560	PRRP-DP10	Onsite	mg/kg	Antimony	N	3.35
7680	PRRP-DP13	Onsite	mg/kg	Antimony	N	3.35
7360R	PRRP-DP05	Onsite	mg/kg	Antimony	N	3.4
7520R	PRRP-DP09	Onsite	mg/kg	Antimony	N	3.4
7640	PRRP-DP12	Onsite	mg/kg	Antimony	N	3.4
7240R	PRRP-DP02	Onsite	mg/kg	Antimony	N	3.45
7480	PRRP-DP08	Onsite	mg/kg	Antimony	N	3.45
7600	PRRP-DP11	Onsite	mg/kg	Antimony	N	3.45
7760	PRRP-DP15	Onsite	mg/kg	Antimony	N	3.45
7880	PRRP-DP18	Onsite	mg/kg	Antimony	N	3.45
7960	PRRP-DP20	Onsite	mg/kg	Antimony	N	3.45
7400	PRRP-DP06	Onsite	mg/kg	Antimony	N	3.55
7320	PRRP-DP04	Onsite	mg/kg	Antimony	N	3.6
7610	PRRP-DP11	Onsite	mg/kg	Antimony	N	3.6
7690	PRRP-DP13	Onsite	mg/kg	Antimony	N	3.6
7930	PRRP-DP19	Onsite	mg/kg	Antimony	N	3.6
7850	PRRP-DP17	Onsite	mg/kg	Antimony	Y	3.6
7730	PRRP-DP14	Onsite	mg/kg	Antimony	N	3.65
7970	PRRP-DP20	Onsite	mg/kg	Antimony	N	3.65

Pentolite Road Soil Background Data

SAMP_NO	SITE-ID	LOCATION	UNITS	Antimony	DETECT	Sb CONCEN
7200	PRRP-DP01	Onsite	mg/kg	Antimony	N	3.7
7720	PRRP-DP14	Onsite	mg/kg	Antimony	N	3.7
7800	PRRP-DP16	Onsite	mg/kg	Antimony	N	3.7
7250	PRRP-DP02	Onsite	mg/kg	Antimony	N	3.7
7410	PRRP-DP06	Onsite	mg/kg	Antimony	N	3.7
7450	PRRP-DP07	Onsite	mg/kg	Antimony	N	3.7
7490	PRRP-DP08	Onsite	mg/kg	Antimony	N	3.7
7770	PRRP-DP15	Onsite	mg/kg	Antimony	N	3.7
7530R	PRRP-DP09	Onsite	mg/kg	Antimony	N	3.75
7650	PRRP-DP12	Onsite	mg/kg	Antimony	Y	3.75
7290	PRRP-DP03	Onsite	mg/kg	Antimony	N	3.8
7330	PRRP-DP04	Onsite	mg/kg	Antimony	N	3.8
7570	PRRP-DP10	Onsite	mg/kg	Antimony	N	3.85
7890	PRRP-DP18	Onsite	mg/kg	Antimony	Y	3.85
PB-PR-S16-3.0/5.0	PB-RWP-PR-S16	Onsite	mg/kg	Antimony	Y	5.6
PB-PR-S20-2.0/5.0	PB-RWP-PR-S20	Onsite	mg/kg	Antimony	Y	5.7
PB-PR-S19-3.0/5.0	PB-RWP-PR-S19	Onsite	mg/kg	Antimony	Y	6
PB-PR-S17-2.0/5.0	PB-RWP-PR-S17	Onsite	mg/kg	Antimony	Y	6.1
PB-PR-S2-3.0/5.0	PB-RWP-PR-S2	Onsite	mg/kg	Antimony	Y	6.8
PB-PR-S11-3.0/5.0	PB-RWP-PR-S11	Onsite	mg/kg	Antimony	Y	7.3
7210	PRRP-DP01	Onsite	mg/kg	Antimony	Y	7.9
7370	PRRP-DP05	Onsite	mg/kg	Antimony	Y	9.3
AE0001	BGC-SO001	Background	mg/kg	Antimony	N	0.215
AE0002	BGC-SO002	Background	mg/kg	Antimony	N	0.2
AE0003	BGC-SO003	Background	mg/kg	Antimony	N	0.265

APPENDIX E

RESULTS OF TOXICITY TESTING ON SURFACE WATER, SOIL, AND SEDIMENTS FROM PLUM BROOK ORDNANCE WORKS, EA ENGINEERING, SCIENCE, AND TECHNOLOGY, INC. JANUARY 2001

RESULTS OF TOXICITY TESTING ON SURFACE WATERS, SOILS, AND SEDIMENTS FROM PLUM BROOK ORDNANCE WORKS

Prepared for:

IT Corporation
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Knoxville, Tennessee 37923

Prepared by:

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January 2001

EA Project 70003.10

Report Number 3535

RESULTS OF TOXICITY TESTING ON SURFACE WATERS, SOILS, AND SEDIMENTS FROM PLUM BROOK ORDNANCE WORKS

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Wayne L. McCulloch
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25 January 2001
Date

William L. Goodfellow, Jr.
Senior Scientist

25 January 2001
Date

January 2001

Report Number 3535

1. INTRODUCTION

At the request of IT Corporation, EA Engineering, Science, and Technology performed toxicity testing on surface water, soil, and sediment samples collected from Plum Brook Ordnance Works, Red Water Ponds Area (Sandusky, Ohio). The samples were evaluated for toxicity using selected freshwater invertebrate and vertebrate test species. Chronic toxicity tests with *Ceriodaphnia dubia* (water flea) and *Pimephales promelas* (fathead minnow) were conducted on undiluted surface water samples. The freshwater amphipod *Hyalella azteca* was exposed to whole sediments in 10-day toxicity tests. Bioaccumulation testing was performed on soil and sediment samples using the terrestrial red worm *Eisenia foetida* and the aquatic oligochaete *Lumbriculus variegatus*. The objective of the toxicity testing was to assess the toxicity of the water and sediment samples to the test organisms by determining the effects upon specific endpoints (e.g., survival, reproduction, and growth) of the organisms exposed to the samples, as compared to the organisms exposed to a laboratory control water or sediment. The testing with *Eisenia foetida* and *Lumbriculus variegatus* evaluated the bioaccumulation characteristics of the soil and sediment samples.

2. METHODS AND MATERIALS

2.1 SAMPLE DESCRIPTIONS

Surface waters, soils, and sediments were collected from two sites, identified as West Area and Pentolite Road, within the Red Water Ponds Area of Plum Brook Ordnance Works (Sandusky, Ohio). A total of five surface waters and five soils were collected from each site. For the sediments, ten samples were collected from West Area and five samples were collected from Pentolite Road.

The samples were collected by IT Corporation on 13, 14, and 15 September 2000. The samples were packed on wet ice and shipped by overnight courier to EA's Ecotoxicology Laboratory in Sparks, Maryland. Upon receipt at EA, the samples were logged in and assigned laboratory accession numbers. Table 1 summarizes the collection, receipt, and sample identification data for the water, soil, and sediment samples. Temperature, pH, alkalinity, hardness, and conductivity were measured on the water samples, and the results of these analyses are presented in Table 2. All samples were stored in the dark at 4°C when not in use. Prior to use in toxicity testing, the surface water samples were screened through 250 μm Nitex mesh to remove debris.

Due to an error by the courier service, the Pentolite Road surface water samples did not arrive at EA in time to initiate toxicity testing within 36 hours of sample collection. All surface waters were used for toxicity testing within 56 hours of sample collection. The sediments for the *H. azteca* toxicity testing were used within 10 days of sample collection. The soil and sediment samples for bioaccumulation testing were tested within 60 days of collection.

2.2 TEST ORGANISMS

The *Ceriodaphnia dubia* (water fleas) were obtained from EA's Culture Facility in Sparks, Maryland. The *C. dubia* were cultured in moderately hard synthetic fresh water, and the

cultures were kept in an environmentally controlled room at 25°C with a 16-hour light/8-hour dark photoperiod. Organisms were fed daily a suspension of yeast/cereal leaves/trout chow supplemented with the algae *Selenastrum capricornutum* as described in US EPA (1989). Adults were maintained in individual 30-ml plastic cups (one brood female per culture cup) with a 15-ml volume. Gravid adults were reisolated the evening before the initiation of toxicity testing to ensure that neonates (young) produced were less than 24 hours old for test initiation. For use in the chronic toxicity testing, the less than 24-hour old neonates were released from broods of eight or more within an 8-hour period from the time of reisolation.

The *Pimephales promelas* (fathead minnows) were obtained from EA's culture facility in Sparks, Maryland. Brood organisms were maintained in recirculating dechlorinated tap water at 25°C in 20-gallon aquaria. Eggs produced from the brood system were removed from the brood aquaria and placed into culture water at 25°C for the incubation period. Newly hatched larvae, less than 24 hours old, were used in the chronic toxicity testing.

The *Hyalella azteca* (freshwater amphipods) were also obtained from EA's culture facility (Sparks, Maryland). The amphipods were cultured at 20°C in 10-gallon glass aquaria with a substrate of hardwood leaves and overlying water of dechlorinated municipal tap water. Prior to introduction into the aquaria, the leaves were pre-soaked or boiled to remove tannins. The cultures were fed Tetramin-B flake food weekly in addition to the hardwood leaves. For use in testing, 7-14 day old organisms were collected from the cultures and gradually acclimated to the test temperature (23°C).

The adult *Eisenia foetida* (red worm) were acquired from Smith Worms, Inc. (Boston, Georgia). Upon receipt at EA on 31 October 2000, the worms were held at 20°C in the supplied bedding material until used the same day in the bioaccumulation tests. The approximate wet weight of the adult worms was 317 mg/worm.

The adult *Lumbriculus variegatus* were received at EA on 2 November 2000 from Aquatic Biosystems (Ft. Collins, Colorado). The organisms were acclimated to test temperature (23°C) prior to use in testing the same day.

2.3 CONTROL WATERS, SOIL, AND SEDIMENT

Each toxicity test utilized a control water, soil, or sediment for use in statistical comparisons with the test samples. The surface water testing included two control waters: a laboratory control water of moderately hard synthetic fresh water (80-100 mg/L $CaCO_3$ hardness), and a hardness control water of synthetic fresh water adjusted to match the hardness of the test waters (260 mg/L $CaCO_3$ hardness for the West Area Red Water Pond samples and 340 mg/L $CaCO_3$ hardness for the Pentolite Road Red Water Pond samples). Both control waters were prepared based on US EPA's synthetic freshwater recipe (1989) using reagent grade chemicals and deionized water. Batches of synthetic water were prepared at least 24 hours prior to use and kept under gentle aeration.

The *H. azteca* toxicity testing and the *L. variegatus* bioaccumulation testing included a control sediment collected from the Magothy River, Maryland. Sediment collected from this location has historically been non-toxic and is routinely utilized as a control sediment in EA's toxicity tests. The overlying water in the *H. azteca* and *L. variegatus* tests was synthetic laboratory freshwater (US EPA 1989) adjusted to match the hardness of the site water (410 mg/L $CaCO_3$ hardness).

For the red worm toxicity testing, an artificial soil was prepared by combining 10 percent sphagnum moss, 20 percent kaolinite clay, and 70 percent silica sand on a dry weight basis (Harris, et. al. 1990). The pH of the artificial soil was adjusted to pH 6-7 with the addition of calcium carbonate prior to use in testing. The artificial soil was hydrated to 39 percent moisture with the addition of deionized water.

2.4 TOXICITY TEST OPERATIONS AND PERFORMANCE

Toxicity testing was conducted in accordance with US EPA (1989 and 2000), ASTM (1997), and Linder et al. (1992) guidance. Test methodologies followed EA's standard toxicity testing protocols (EA 1996) which are included in Attachment I. Copies of the original data sheets and statistical analyses are provided in Attachment II for the *C. dubia* testing, Attachment III for the *P. promelas* testing, Attachment IV for the *H. azteca* testing, Attachment V for the *E. foetida* bioaccumulation testing, and Attachment VI for the *L. variegatus* bioaccumulation testing. Copies of the chain-of-custody records are included as Attachment VII, and the Report Quality Assurance Record is included as Attachment VIII.

Prior to use in testing, the surface waters, soils, and sediments were warmed to the appropriate test temperature. The samples were evaluated as 100 percent treatments (whole, undiluted samples). A single sample was used for initiation and subsequent renewals in all surface water testing.

2.4.1 *Ceriodaphnia dubia* Chronic Toxicity Testing

Chronic toxicity tests with *C. dubia* were conducted on five West Area surface waters (AD2006, AD2007, AD2008, AD2009, and AD2010) and five Pentolite Road surface water samples (AC2006, AC2007, AC2008, AC2009, and AC2010). Testing with the West Area surface water samples was initiated on 14 September 2000, and testing with the Pentolite Road samples was initiated on 16 September 2000.

The *C. dubia* chronic toxicity tests were conducted in 30-ml plastic cups with 15 ml of test solution per cup. Each test concentration had ten replicate cups with one organism per cup. To initiate the chronic toxicity test, one brood of eight of more *C. dubia* neonates was used per test row according to US EPA (1989) known parentage blocking technique. The organisms were fed daily during testing with 0.2 ml suspension of yeast/cereal leaves/trout chow supplemented with algae (*Selenastrum capricornutum*). The tests were maintained at

25±1°C with a 16-hour light/8-hour dark photoperiod.

Daily renewals of test solution were performed by carefully transferring the test organism from each test cup into a new cup containing freshly prepared test solution. During the daily transfer process, observations of mortality were recorded along with the number of neonates produced per organism. Temperature, pH, dissolved oxygen, and conductivity measurements were recorded on each concentration at test initiation and termination, and daily on the test solutions before and after renewal. A summary of the water quality measurements is presented in Table 3. The chronic toxicity tests were terminated when at least 60 percent of the surviving control organisms had produced three broods, with a mean of at least 15 neonates per control organism.

The results of the *C. dubia* chronic toxicity tests were statistically analyzed according to US EPA (1989) guidance to determine if any surface water sample was significantly different ($p=0.05$) from the hardness adjusted control water with respect to survival or reproduction. If the data from each individual comparison were normally distributed, then an ANOVA followed by a homoscedastic or heteroscedastic (depending on equality of variances) t-Test were performed to detect statistically significant differences between one sediment and another. If the data from a comparison were not normally distributed, then a Wilcoxon's Rank Sum Test was used to compare the group means. The Shapiro Wilk's Test and the F-Test were used to test the normality assumption and the homogeneity of variance assumption, respectively. Tables 5 and 6 present the results of the *C. dubia* chronic toxicity testing.

2.4.2 *Pimephales promelas* Chronic Toxicity Testing

Chronic toxicity tests with *P. promelas* were conducted on five West Area surface waters (AD2006, AD2007, AD2008, AD2009, and AD2010) and five Pentolite Road surface water samples (AC2006, AC2007, AC2008, AC2009, and AC2010). Testing with the West Area surface water samples was initiated on 14 September 2000, and testing with the Pentolite Road samples was initiated on 16 September 2000.

The *P. promelas* chronic toxicity tests were conducted in 1-L polypropylene beakers with each beaker containing 250 ml test solution. Each test water had five replicates of ten organisms, for a total of 50 organisms exposed per test water and control. The *P. promelas* larvae were fed 0.15 to 0.25 ml (ration increased with age) of a 0.05 g/ml suspension of newly hatched brine shrimp nauplii (*Artemia* sp., less than 24 hours old) three times daily. The test solution in each beaker was renewed (replaced) daily. The daily solution renewals were performed by siphoning 80 percent of the old test solution from each test chamber taking care to remove debris from the bottom of the chamber, and then slowly siphoning new test solution into the chamber.

The tests were performed at 25±1°C with a 16-hour light/8-hour dark photoperiod. Observations of mortality were recorded daily. Temperature, pH, dissolved oxygen, and conductivity measurements were recorded on one replicate of each concentration at test initiation and termination, and daily on the test solutions before and after solution renewal. Table 6 summarizes the water quality measurements from the *P. promelas* testing.

At the end of the 7-day exposure period, the surviving larvae were placed in pre-weighed, oven-dried aluminum pans (one pan per replicate) and dried at 100°C for a minimum of six hours. The total organism dry weight per replicate was divided by the number of surviving organisms to obtain a mean dry weight for each replicate.

Following US EPA (1989) guidance, the survival and dry weight data were statistically analyzed by a t-Test or Wilcoxon's Rank Sum Test to determine if any test sediment was significantly different ($p=0.05$) from the control sediment. Tables 7 and 8 present the results of the *P. promelas* chronic toxicity testing.

2.4.3 *Hyalella azteca* Toxicity Testing

Five sediment samples from the West Area, identified as AD1006, AD1007, AD1008, AD1009, and AD1010, were evaluated in 10-day *H. azteca* toxicity tests. The *H. azteca* toxicity tests were initiated on 22 September 2000.

The *H. azteca* sediment toxicity tests were conducted in 300-ml lipless glass beakers each containing 100 ml of sediment and 175 ml of overlying water. The tests were performed with eight replicates per sediment sample. The sediment and overlying water were added to the chambers 24 hours prior to introduction of the test organisms. The beakers were left undisturbed overnight so as to allow any suspended sediment particles in the water column to settle. Ten organisms were randomly introduced into each replicate beaker. The introduction of the test organisms to the test chambers marked the initiation of the toxicity tests. The test chambers were placed in a water bath and maintained at 23±1°C with a 16-hour light/8-hour dark photoperiod. The *H. azteca* were fed 1 ml/replicate of YCT (a suspension of yeast, ground cereal leaves, and trout chow) daily.

The overlying water in the exposure chambers was renewed twice daily using a water delivery system (Zumwalt et al. 1994). Fresh overlying water was slowly added to each replicate, displacing the water already in the beaker through a notch cut into the top of the beaker. The notch was sealed with fine mesh screen to prevent any organisms from being flushed out of the test chamber. Temperature, pH, dissolved oxygen, and conductivity measurements were recorded daily on the overlying water in one replicate of each sediment. The ammonia of the overlying water of each sample was measured at test initiation (Day 0) and test completion (Day 10). These water quality measurements are summarized in Table 9.

At the end of the 10-day exposure period, the surviving organisms from each replicate were retrieved by screening through a 250 μm sieve. The number of surviving *H. azteca* from each replicate was recorded, and the organisms of each replicate were placed in a dried, pre-weighed tin and placed in a drying oven at 100°C for at least six hours. The tins were then removed from the oven, placed in a desiccator to cool, and each pan was weighed to the nearest 0.01 mg to determine a mean dry weight per replicate.

The survival and dry weight data were statistically analyzed by a t-Test or Wilcoxon's Rank Sum Test to determine if any test sediment was significantly different ($p=0.05$) from the control sediment. The results of the *H. azteca* toxicity testing are presented in Table 10.

2.4.4 *Eisenia foetida* Bioaccumulation Testing

Six soil samples were evaluated in *Eisenia foetida* bioaccumulation testing. These six samples included one soil, AC0001, from the Pentolite Road site and five soils (AD0001, AD0002, AD0003, AD0004, and AD0005) from the West Area site. The soils were loaded into the test chambers the day before the worms were introduced to allow the temperature of the soils to equilibrate to the testing temperature. The bioaccumulation testing with *E. foetida* was initiated on 31 October 2000.

The *E. foetida* bioaccumulation tests were performed in 2-L wide-mouth glass jars equipped with screw-top lids with a screened hole for air exchange. Each jar contained 1,500 g of soil and 60 organisms. There were five replicate jars per concentration. The test chambers were placed in an environmentally controlled chamber and maintained at 23±1°C for the 28-day exposure period. Because earthworms burrow into the soil to avoid light, the photoperiod for these tests was continuous illumination in order to maximize organism contact with the soil. Daily observations were made on all test chambers, and any organisms not in contact with the sample were gently placed back onto the surface of the soil. The worms were not fed during the testing period. Temperature in the chamber was recorded daily on a surrogate vessel containing soil. In addition, pH and percent moisture was measured on each soil at test initiation. The temperature, pH, and percent moisture measurements are summarized in Table 11.

The number of surviving worms was recorded on Day 28. Death was defined by a lack of response to a gentle prod with a glass rod. Since earthworms decompose rapidly in soil, those organisms not found were presumed and recorded as dead. The surviving worms were then placed onto moist paper to depurate for six hours. After the depuration period, the worms were collected for chemical analyses. Table 12 presents the survival data from the *E. foetida* bioaccumulation testing.

2.4.5 *Lumbriculus variegatus* Bioaccumulation Testing

Bioaccumulation testing with *L. variegatus* was conducted on five West Area sediment samples (AD1001, AD1002, AD1003, AD1004, and AD1005). The *L. variegatus* testing was conducted in 2-L beakers containing 1.1 L sediment and 1 L overlying water (such that the ratio of total organic carbon in sediment to organism dry weight was at least 50:1). The sediment and overlying water were added to the test chambers 24 hours before the introduction of the test organisms to allow the suspended sediments to settle out. Five grams of organisms were added to each replicate on 2 November 2000 marking the initiation of the bioaccumulation testing. The *L. variegatus* were not fed during the 28-day exposure period.

The test chambers were kept at 23±1°C with a 16-hour light/8-hour dark photoperiod. The overlying water in each test chamber was renewed twice daily. Water quality (temperature, pH, dissolved oxygen, and conductivity) was monitored daily on the overlying water in one replicate of each sediment. Alkalinity and hardness were measured on the overlying water of each sample at test initiation (Day 0), test completion (Day 28), and weekly on Days 7, 14, and 21. Table 13 summarizes these water quality measurements. Due to low dissolved oxygen levels (<2.5 mg/L) in the overlying water, each test chamber was aerated through a glass pipet submerged beneath the surface of the overlying water. The aeration pipet was positioned in the water column well above the sediment surface so as not to re-suspend the sediment.

After 28 days of exposure, the surviving organisms from each replicate were retrieved and placed into clean laboratory water to depurate for six hours. At the end of the depuration period, the organisms were collected for chemical analyses.

2.5 REFERENCE TOXICANT TESTS

In conformance with EA's quality assurance/quality control program, reference toxicant tests were performed on the in-house cultured organisms (*C. dubia*, *P. promelas*, and *H. azteca*)

and on the acquired organism stocks (*E. foetida* and *L. variegatus*). The results of each reference toxicant test were compared to EA's established control chart limits. The reference toxicants used were sodium chloride (NaCl) for *C. dubia*, cadmium chloride ($CdCl_2$) for *P. promelas*, copper sulfate ($CuSO_4$) for *H. azteca*, 2-chloroacetamide for *E. foetida*, and copper chloride ($CuCl_2$) for *L. variegatus*. The results of the reference toxicant testing are summarized in Table 14.

2.6 ARCHIVES

Original data sheets, records, memoranda, notes, and computer printouts are archived at EA's Baltimore Office in Sparks, Maryland. These data will be retained for a period of 5 years unless a longer period of time is requested by IT Corporation.

3. RESULTS AND DISCUSSION

3.1 *Ceriodaphnia dubia* CHRONIC TOXICITY TESTING

The results of the *C. dubia* chronic toxicity tests are presented in Tables 4 (West Area) and 5 (Pentolite Road). Two of the ten surface water samples, identified as sample numbers AD2008 and AD2009 from the West Area site, were chronically toxic to *C. dubia* based on a significant ($p=0.05$) decrease in young production as compared to the Hardness Control. The Hardness Control had a mean of 23.3 neonates/organism, while samples AD2008 and AD2009 had means of 17.3 and 19.6 neonates/organism, respectively.

For the remaining three surface waters from the West Area (AD2006, AD2007, and AD2010) and the five surface waters from the Pentolite Road (AC2006, AC2007, AC2008, AC2009, and AC2010), there was no signficant ($p=0.05$) difference in survival or reproduction as compared to the Hardness Control, indicating that these eight samples were not chronically toxic to *C. dubia*.

3.2 *Pimephales promelas* CHRONIC TOXICITY TESTING

The *P. promelas* chronic toxicity test results are summarized in Table 7 for the West Area samples and Table 8 for the Pentolite Road samples. The five surface water samples from the West Area (AD2006, AD2007, AD2008, AD2009, and AD2010) were not chronically toxic to *P. promelas*.

Two of the Pentolite Road surface water samples, AC2006 and AC2008, were chronically toxic to *P. promelas* based on significantly ($p=0.05$) lower survival than the Hardness Control. Sample AC2006 had 70 percent survival and sample AC2008 had 80 percent survival, compared to the Hardness Control which had 94 percent survival. It should be noted that the acceptable control performance criterion for this test method is ≥80 percent survival; thus, the decreased survival observed in the AC2008 sample could potentially be considered

not biologically significant. Sample AC2009 of the Pentolite Road site also had 80 percent survival; however, this sample was marginally not statistically less than the Hardness Control due to a higher coefficient of variation (CV) between these replicates than sample AC2008 (18.4% CV versus 8.2% CV). Samples AC2007, AC2009, and AC2010 of the Pentolite Road site were not chronically toxic to *P. promelas*.

3.3 *Hyalella azteca* TOXICITY TESTING

The results of the *H. azteca* toxicity testing are presented in Table 10. Two of the five West Area sediment samples, AD1006 and AD1008, had significantly (p=0.05) lower survival than the Hardness Control, indicating that these two sediment samples were toxic to *H. azteca*. Sample AD1006 had 78 percent survival and sample AD1008 had 83 percent survival, compared to the Hardness Control which had 94 percent survival. The remaining three sediments from the West Area site (AD1007, AD1009, and AD1010) were not toxic to *H. azteca*.

3.4 *Eisenia foetida* BIOACCUMULATION TESTING

The survival data from the *E. foetida* bioaccumulation testing are presented in Table 12. After 28 days of exposure, there was 99.7 percent survival in the control. Of the six test soils, the West Area sample AD0001 had the lowest survival (70 percent) and was significantly (p=0.05) different from the control survival. The remaining soils (West Area samples AD0002, AD0003, AD0004, and AD0005 and Pentolite Road sample AC0001) had survival ranging from 94 to 99 percent. As a result of the very high control survival, sample AD0005 with 98 percent survival and sample AC0001 with 94 percent survival had significantly (p=0.05) lower survival than the control. However, these survival rates (98 and 94 percent) are above the acceptable control criterion of 80 percent survival for this test method, and do not represent a biologically significant reduction in survival.

Following the depuration period, the *E. foetida* organism tissues were submitted to Severn Trent Laboratories (Baltimore, Maryland) for chemical analyses. The results of the chemical analyses will be submitted directly to IT Corporation, and therefore are not included in this report.

3.5 *Lumbriculus variegatus* BIOACCUMULATION TESTING

The *L. variegatus* organism tissues were submitted to Severn Trent Laboratories (Baltimore, Maryland) for chemical analyses following the depuration period. The results of the chemical analyses will be submitted directly to IT Corporation, and therefore are not included in this report.

4. REFERENCES

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TABLE 1 SUMMARY OF SAMPLE INFORMATION FOR WATER, SOIL, AND SEDIMENT SAMPLES FROM PLUM BROOK ORDNANCE WORKS

Sample Location	Sample Description	Sample Number	EA Accession Number	Collection Time and Date	Receipt Time and Date
Surface Waters:					
West Area Red Water Pond	PBOW-00-WRWP-SW006	AD2006	AT0-709	1115, 13 SEP 00	0955, 14 SEP 00
West Area Red Water Pond	PBOW-00-WRWP-SW007	AD2007	AT0-710	1100, 13 SEP 00	0955, 14 SEP 00
West Area Red Water Pond	PBOW-00-WRWP-SW008	AD2008	AT0-711	1145, 13 SEP 00	0955, 14 SEP 00
West Area Red Water Pond	PBOW-00-WRWP-SW009	AD2009	AT0-712	1220, 13 SEP 00	0955, 14 SEP 00
West Area Red Water Pond	PBOW-00-WRWP-SW010	AD2010	AT0-713	1240, 13 SEP 00	0955, 14 SEP 00
Pentolite Road Red Water Pond	PBOW-00-PRWP-SW006	AC2006	AT0-728	1050, 14 SEP 00	1200, 16 SEP 00
Pentolite Road Red Water Pond	PBOW-00-PRWP-SW007	AC2007	AT0-724	1020, 14 SEP 00	1720, 15 SEP 00
Pentolite Road Red Water Pond	PBOW-00-PRWP-SW008	AC2008	AT0-729	1000, 14 SEP 00	1200, 16 SEP 00
Pentolite Road Red Water Pond	PBOW-00-PRWP-SW009	AC2009	AT0-730	0940, 14 SEP 00	1200, 16 SEP 00
Pentolite Road Red Water Pond	PBOW-00-PRWP-SW010	AC2010	AT0-725	0918, 14 SEP 00	1720, 15 SEP 00
Soils:					
West Area Red Water Pond	PBOW-00-WRWP-SO001	AD0001	AT0-735	0955, 15 SEP 00	1115, 16 SEP 00
West Area Red Water Pond	PBOW-00-WRWP-SO002	AD0002	AT0-736	0845, 15 SEP 00	1115, 16 SEP 00
West Area Red Water Pond	PBOW-00-WRWP-SO003	AD0003	AT0-737	0900, 15 SEP 00	1115, 16 SEP 00
West Area Red Water Pond	PBOW-00-WRWP-SO004	AD0004	AT0-738	0915, 15 SEP 00	1115, 16 SEP 00
West Area Red Water Pond	PBOW-00-WRWP-SO005	AD0005	AT0-739	0930, 15 SEP 00	1115, 16 SEP 00
Pentolite Road Red Water Pond	PBOW-00-PRWP-SO001	AC0001	AT0-758	1500, 15 SEP 00	1330, 19 SEP 00
Pentolite Road Red Water Pond	PBOW-00-PRWP-SO002	AC0002	AT0-759	1510, 15 SEP 00	1330, 19 SEP 00
Pentolite Road Red Water Pond	PBOW-00-PRWP-SO003	AC0003	AT0-760	1520, 15 SEP 00	1330, 19 SEP 00
Pentolite Road Red Water Pond	PBOW-00-PRWP-SO004	AC0004	AT0-761	1530, 15 SEP 00	1330, 19 SEP 00
Pentolite Road Red Water Pond	PBOW-00-PRWP-SO005	AC0005	AT0-762	1540, 15 SEP 00	1330, 19 SEP 00

TABLE 1 (continued)

Sample Location	Sample Description	Sample Number	EA Accession Number	Collection Time and Date	Receipt Time and Date
Sediments:					
West Area Red Water Pond	PBOW-00-WRWP-SD001	AD1001	AT0-745	1410, 14 SEP 00	1115, 16 SEP 00
West Area Red Water Pond	PBOW-00-WRWP-SD002	AD1002	AT0-746	1500, 14 SEP 00	1115, 16 SEP 00
West Area Red Water Pond	PBOW-00-WRWP-SD003	AD1003	AT0-747	1330, 14 SEP 00	1115, 16 SEP 00
West Area Red Water Pond	PBOW-00-WRWP-SD004	AD1004	AT0-748	1055, 14 SEP 00	1115, 16 SEP 00
West Area Red Water Pond	PBOW-00-WRWP-SD005	AD1005	AT0-749	1150, 14 SEP 00	1115, 16 SEP 00
West Area Red Water Pond	PBOW-00-WRWP-SD006	AD1006	AT0-740	1835, 13 SEP 00	1115, 16 SEP 00
West Area Red Water Pond	PBOW-00-WRWP-SD007	AD1007	AT0-741	0940, 14 SEP 00	1115, 16 SEP 00
West Area Red Water Pond	PBOW-00-WRWP-SD008	AD1008	AT0-742	1240, 14 SEP 00	1115, 16 SEP 00
West Area Red Water Pond	PBOW-00-WRWP-SD009	AD1009	AT0-743	1825, 13 SEP 00	1115, 16 SEP 00
West Area Red Water Pond	PBOW-00-WRWP-SD010	AD1010	AT0-744	1905, 13 SEP 00	1115, 16 SEP 00
Pentolite Road Red Water Pond	PBOW-00-PRWP-SD001	AC1001	AT0-750	1000, 15 SEP 00	1115, 16 SEP 00
Pentolite Road Red Water Pond	PBOW-00-PRWP-SD002	AC1002	AT0-751	1010, 15 SEP 00	1115, 16 SEP 00
Pentolite Road Red Water Pond	PBOW-00-PRWP-SD003	AC1003	AT0-752	1130, 15 SEP 00	1115, 16 SEP 00
Pentolite Road Red Water Pond	PBOW-00-PRWP-SD004	AC1004	AT0-753	1140, 15 SEP 00	1115, 16 SEP 00
Pentolite Road Red Water Pond	PBOW-00-PRWP-SD005	AC1005	AT0-754	1150, 15 SEP 00	1115, 16 SEP 00

TABLE 2 SUMMARY OF WATER QUALITY PARAMETERS MEASURED UPON RECEIPT ON SURFACE WATER SAMPLES FROM PLUM BROOK ORDNANCE WORKS

Sample Location	Sample Description	Sample Number	EA Accession Number	Temperature (°C)	pH	Alkalinity (mg/L as $CaCO_3$)	Hardness (mg/L as $CaCO_3$)	Conductivity (µS/cm)
West Area Red Water Pond	PBOW-00-WRWP-SW006	AD2006	AT0-709	2.5	9.4	250	188	543
West Area Red Water Pond	PBOW-00-WRWP-SW007	AD2007	AT0-710	3.9	8.3	306	232	631
West Area Red Water Pond	PBOW-00-WRWP-SW008	AD2008	AT0-711	1.8	8.0	256	184	533
West Area Red Water Pond	PBOW-00-WRWP-SW009	AD2009	AT0-712	4.3[a]	7.7	112	64	252
West Area Red Water Pond	PBOW-00-WRWP-SW010	AD2010	AT0-713	1.9	8.0	168	260	574
Pentolite Road Red Water Pond	PBOW-00-PRWP-SW006	AC2006	AT0-728	2.7	7.7	290	420	658
Pentolite Road Red Water Pond	PBOW-00-PRWP-SW007	AC2007	AT0-724	3.3	7.7	332	396	1,140
Pentolite Road Red Water Pond	PBOW-00-PRWP-SW008	AC2008	AT0-729	2.2	7.8	326	412	681
Pentolite Road Red Water Pond	PBOW-00-PRWP-SW009	AC2009	AT0-730	2.7	7.8	324	420	646
Pentolite Road Red Water Pond	PBOW-00-PRWP-SW010	AC2010	AT0-725	3.1	7.7	326	404	638

(a) Temp[illegible]re of sample upon receipt at EA was slightly above the recommended [illegible]ing temperature of 0-4°C. Sample was received at EA on ice.

TABLE 3 WATER QUALITY MEASUREMENTS[a] RECORDED DURING *Ceriodaphnia dubia* CHRONIC TOXICITY TESTING

Sample Description	Sample Number	EA Accession Number	Temperature (°C)	pH	Dissolved Oxygen (mg/L)	Conductivity (µS/cm)
Test Number: TN-00-618 (West Area Red Water Pond)						
PBOW-00-WRWP-SW006	AD2006	AT0-709	24.0-25.1 24.3 (±0.4)	8.4-9.0 8.8 (±0.2)	7.1-8.5 7.8 (±0.4)	467-591 519 (±34)
PBOW-00-WRWP-SW007	AD2007	AT0-710	24.1-24.9 24.3 (±0.3)	8.4-8.8 8.6 (±0.1)	7.2-8.3 7.8 (±0.4)	542-710 621 (±48)
PBOW-00-WRWP-SW008	AD2008	AT0-711	24.1-24.9 24.4 (±0.3)	8.2-9.2 8.7 (±0.3)	7.3-8.5 7.8 (±0.3)	502-598 540 (±32)
PBOW-00-WRWP-SW009	AD2009	AT0-712	24.1-25.4 24.5 (±0.4)	8.0-8.8 8.4 (±0.3)	7.3-8.2 7.7 (±0.3)	231-390 279 (±57)
PBOW-00-WRWP-SW010	AD2010	AT0-713	24.0-25.0 24.4 (±0.4)	8.1-8.6 8.3 (±0.2)	7.2-8.4 7.7 (±0.3)	517-611 561 (±32)
Hardness Control (260 mg/L)	--	--	24.1-25.0 24.4 (±0.3)	7.7-8.7 8.3 (±0.3)	7.0-8.3 7.8 (±0.4)	708-790 753 (±30)
Laboratory Control	--	--	24.1-25.9 24.7 (±0.6)	7.3-8.7 7.9 (±0.4)	7.0-8.3 7.6 (±0.4)	304-408 332 (±30)

(a) Range and mean (± standard deviation).

TABLE 3 (continued)

Sample Description	Sample Number	EA Accession Number	Temperature (°C)	pH	Dissolved Oxygen (mg/L)	Conductivity (µS/cm)
Test Number: TN-00-623 (Pentolite Road Red Water Pond)						
PBOW-00-PRWP-SW006	AC2006	AT0-728	24.0-25.3 24.6 (±0.4)	8.0-8.4 8.2 (±0.1)	7.6-8.6 7.9 (±0.3)	440-690 533 (±76)
PBOW-00-PRWP-SW007	AC2007	AT0-724	24.0-25.1 24.5 (±0.5)	7.9-8.3 8.1 (±0.1)	7.6-8.2 7.9 (±0.2)	446-646 537 (±64)
PBOW-00-PRWP-SW008	AC2008	AT0-729	24.0-25.5 24.6 (±0.5)	8.0-8.3 8.2 (±0.1)	7.5-8.4 7.9 (±0.3)	436-681 526 (±77)
PBOW-00-PRWP-SW009	AC2009	AT0-730	24.0-25.5 24.6 (±0.5)	7.8-8.4 8.2 (±0.2)	7.3-8.2 7.8 (±0.3)	449-720 540 (±88)
PBOW-00-PRWP-SW010	AC2010	AT0-725	24.0-25.2 24.5 (±0.5)	8.0-8.3 8.2 (±0.1)	7.7-8.5 8.0 (±0.2)	425-637 508 (±61)
Hardness Control (340 mg/L)	--	--	24.0-25.7 24.7 (±0.6)	8.1-8.5 8.3 (±0.1)	6.4-8.6 7.9 (±0.6)	981-1,157 1,063 (±51)
Laboratory Control	--	--	24.0-25.9 25.1 (±0.6)	7.6-8.6 8.1 (±0.3)	6.4-8.3 7.7 (±0.5)	285-347 315 (±20)

TABLE 4 RESULTS OF *Ceriodaphnia dubia* CHRONIC TOXICITY TESTING ON SURFACE WATERS FROM PLUM BROOK ORDNANCE WORKS

Test Species:	*Ceriodaphnia dubia* (water flea)
Sample Location:	West Area Red Water Pond
Sample Dates:	13 September 2000
EA Test Number:	TN-00-618
Test Initiation Time and Date:	1220, 14 September 2000
Test Termination Time and Date:	1215, 20 September 2000

Sample Description	Sample Number	EA Accession Number	6-Day Percent Survival	Mean Young Production as Neonates/Organism (±SD)
PBOW-00-WRWP-SW006	AD2006	AT0-709	100	24.2 (±2.3)
PBOW-00-WRWP-SW007	AD2007	AT0-710	100	28.9 (±2.6)
PBOW-00-WRWP-SW008	AD2008	AT0-711	100	17.3 (±3.4)[a]
PBOW-00-WRWP-SW009	AD2009	AT0-712	100	19.6 (±4.4)[a]
PBOW-00-WRWP-SW010	AD2010	AT0-713	90	23.1 (±8.8)
Hardness Control (260 mg/L)	--	--	100	23.3 (±3.8)
Laboratory Control	--	--	100	25.3 (±2.8)

(a) Sample was significantly different (p=0.05) from the Hardness Control based on mean young production.

TABLE 5 RESULTS OF *Ceriodaphnia dubia* CHRONIC TOXICITY TESTING ON SURFACE WATERS FROM PLUM BROOK ORDNANCE WORKS

Test Species:	*Ceriodaphnia dubia* (water flea)
Sample Location:	Pentolite Road Red Water Pond
Sample Dates:	14 September 2000
EA Test Number:	TN-00-623
Test Initiation Time and Date:	1540, 16 September 2000
Test Termination Time and Date:	1530, 22 September 2000

Sample Description	Sample Number	EA Accession Number	6-Day Percent Survival	Mean Young Production as Neonates/Organism (±SD)
PBOW-00-PRWP-SW006	AC2006	AT0-728	90	18.9 (±9.0)
PBOW-00-PRWP-SW007	AC2007	AT0-724	90	20.5 (±4.8)
PBOW-00-PRWP-SW008	AC2008	AT0-729	100	20.6 (±5.2)
PBOW-00-PRWP-SW009	AC2009	AT0-730	100	21.5 (±3.1)
PBOW-00-PRWP-SW010	AC2010	AT0-725	100	21.4 (±3.0)
Hardness Control (340 mg/L)	--	--	100	16.8 (±6.8)
Laboratory Control	--	--	100	18.6 (±5.2)

TABLE 6 WATER QUALITY MEASUREMENTS[a] RECORDED DURING *Pimephales promelas* CHRONIC TOXICITY TESTING

Sample Description	Sample Number	EA Accession Number	Temperature (°C)	pH	Dissolved Oxygen (mg/L)	Conductivity (µS/cm)
Test Number: TN-00-619 (West Area Red Water Pond)						
PBOW-00-WRWP-SW006	AD2006	AT0-709	24.0-25.9 24.7 (±0.5)	8.0-9.0 8.7 (±0.3)	6.4-8.5 7.4 (±0.6)	467-556 500 (±25)
PBOW-00-WRWP-SW007	AD2007	AT0-710	24.1-25.2 24.5 (±0.4)	8.3-8.7 8.5 (±0.1)	6.0-8.3 7.3 (±0.7)	542-643 601 (±28)
PBOW-00-WRWP-SW008	AD2008	AT0-711	24.1-25.3 24.6 (±0.4)	8.3-9.2 8.7 (±0.3)	6.4-8.5 7.4 (±0.7)	486-547 521 (±18)
PBOW-00-WRWP-SW009	AD2009	AT0-712	24.1-25.3 24.6 (±0.4)	7.8-8.8 8.2 (±0.3)	6.2-8.2 7.2 (±0.7)	231-279 247 (±12)
PBOW-00-WRWP-SW010	AD2010	AT0-713	24.0-25.3 24.6 (±0.5)	8.0-8.4 8.2 (±0.1)	6.6-8.4 7.4 (±0.7)	481-596 550 (±31)
Hardness Control (260 mg/L)	--	--	24.0-25.9 24.6 (±0.5)	7.5-8.7 8.3 (±0.3)	6.5-8.6 7.6 (±0.7)	735-825 776 (±25)
Laboratory Control	--	--	24.0-25.8 24.7 (±0.5)	7.0-8.7 7.9 (±0.4)	6.5-8.1 7.3 (±0.5)	290-347 317 (±18)

(a) Range and mean (± standard deviation).

TABLE 6 (continued)

Sample Description	Sample Number	EA Accession Number	Temperature (°C)	pH	Dissolved Oxygen (mg/L)	Conductivity (µS/cm)
Test Number: TN-00-622 (Pentolite Road Red Water Pond)						
PBOW-00-PRWP-SW006	AC2006	AT0-728	24.0-25.6 24.7 (±0.5)	8.0-8.4 8.2 (±0.1)	5.8-8.6 7.3 (±0.9)	458-690 541 (±66)
PBOW-00-PRWP-SW007	AC2007	AT0-724	24.0-25.7 24.8 (±0.5)	8.0-8.3 8.2 (±0.1)	6.4-8.1 7.3 (±0.6)	449-646 531 (±53)
PBOW-00-PRWP-SW008	AC2008	AT0-729	24.0-25.9 24.7 (±0.6)	8.0-8.4 8.2 (±0.1)	6.5-8.4 7.5 (±0.6)	452-681 536 (±62)
PBOW-00-PRWP-SW009	AC2009	AT0-730	24.0-25.8 24.7 (±0.6)	7.8-8.4 8.1 (±0.2)	6.2-8.2 7.4 (±0.6)	450-720 548 (±75)
PBOW-00-PRWP-SW010	AC2010	AT0-725	24.0-25.9 24.8 (±0.7)	8.0-8.3 8.1 (±0.1)	6.8-8.5 7.5 (±0.5)	440-637 518 (±48)
Hardness Control (340 mg/L)	--	--	24.0-25.6 24.7 (±0.5)	8.1-8.8 8.4 (±0.2)	6.4-8.6 7.5 (±0.8)	992-1,249 1,084 (±71)
Laboratory Control	--	--	24.0-25.9 25.1 (±0.7)	7.7-8.6 8.0 (±0.2)	6.5-7.9 7.2 (±0.4)	272-374 314 (±27)

TABLE 7 RESULTS OF *Pimephales promelas* CHRONIC TOXICITY TESTING ON SURFACE WATERS FROM PLUM BROOK ORDNANCE WORKS

Test Species:	*Pimephales promelas* (fathead minnow)
Sample Location:	West Area Red Water Pond
Sample Dates:	13 September 2000
EA Test Number:	TN-00-619
Test Initiation Time and Date:	1550, 14 September 2000
Test Termination Time and Date:	1515, 21 September 2000

Sample Description	Sample Number	EA Accession Number	7-Day Percent Survival	Mean Dry Weight as mg/Surviving Organism (±SD)
PBOW-00-WRWP-SW006	AD2006	AT0-709	100	0.490 (±0.039)
PBOW-00-WRWP-SW007	AD2007	AT0-710	100	0.521 (±0.033)
PBOW-00-WRWP-SW008	AD2008	AT0-711	100	0.508 (±0.033)
PBOW-00-WRWP-SW009	AD2009	AT0-712	98	0.528 (±0.047)
PBOW-00-WRWP-SW010	AD2010	AT0-713	88	0.477 (±0.086)
Hardness Control (260 mg/L)	--	--	96	0.496 (±0.042)
Laboratory Control	--	--	98	0.464 (±0.033)

TABLE 8 RESULTS OF *Pimephales promelas* CHRONIC TOXICITY TESTING ON SURFACE WATERS FROM PLUM BROOK ORDNANCE WORKS

Test Species:	*Pimephales promelas* (fathead minnow)
Sample Location:	Pentolite Road Red Water Pond
Sample Dates:	14 September 2000
EA Test Number:	TN-00-622
Test Initiation Time and Date:	1625, 16 September 2000
Test Termination Time and Date:	1600, 23 September 2000

Sample Description	Sample Number	EA Accession Number	7-Day Percent Survival	Mean Dry Weight as mg/Surviving Organism (±SD)
PBOW-00-PRWP-SW006	AC2006	AT0-728	70[a]	0.359 (±0.016)[b]
PBOW-00-PRWP-SW007	AC2007	AT0-724	82	0.463 (±0.108)
PBOW-00-PRWP-SW008	AC2008	AT0-729	80[a]	0.420 (±0.046)[b]
PBOW-00-PRWP-SW009	AC2009	AT0-730	80	0.400 (±0.024)
PBOW-00-PRWP-SW010	AC2010	AT0-725	82	0.412 (±0.077)
Hardness Control (340 mg/L)	--	--	94	0.413 (±0.029)
Laboratory Control	--	--	86	0.405 (±0.031)

(a) Sample was significantly different (p=0.05) from the Hardness Control based on percent survival.
(b) A sample which has significantly lower survival than the Hardness Control is not included in statistical analyses for mean dry weight (US EPA 1989).

TABLE 9 WATER QUALITY MEASUREMENTS[a] RECORDED DURING *Hyalella azteca* SEDIMENT TOXICITY TESTING

Sample Description	Sample Number	EA Accession Number	Temperature (°C)	pH	Dissolved Oxygen (mg/L)	Conductivity (µS/cm)	Ammonia (mg/L NH_3-N) Day 0	Ammonia (mg/L NH_3-N) Day 10
Test Number: TN-00-644 (West Area Red Water Pond)								
PBOW-00-WRWP-SD006	AD1006	AT0-740	22.2-23.7 22.8 (±0.5)	7.9-8.6 8.2 (±0.2)	4.1-7.8 5.3 (±1.2)	961-1,280 1,134 (±102)	6.93	0.17
PBOW-00-WRWP-SD007	AD1007	AT0-741	22.3-23.8 22.8 (±0.5)	7.9-8.6 8.2 (±0.2)	3.7-7.8 5.5 (±1.2)	978-1,267 1,115 (±88)	6.48	0.43
PBOW-00-WRWP-SD008	AD1008	AT0-742	22.4-23.8 22.8 (±0.5)	7.9-8.6 8.1 (±0.2)	3.3-7.9 5.3 (±1.4)	973-1,291 1,127 (±101)	11.20	0.57
PBOW-00-WRWP-SD009	AD1009	AT0-743	22.0-23.4 22.7 (±0.4)	8.1-8.6 8.3 (±0.2)	3.7-8.0 5.5 (±1.3)	966-1,224 1,104 (±81)	1.69	0.26
PBOW-00-WRWP-SD010	AD1010	AT0-744	22.2-23.5 22.9 (±0.4)	8.0-8.6 8.2 (±0.2)	3.5-7.9 5.2 (±1.3)	964-1,237 1,107 (±86)	3.03	0.29
Control	--	--	22.1-23.5 22.8 (±0.4)	8.0-8.5 8.2 (±0.2)	4.4-8.0 5.9 (±1.0)	1,079-1,849 1,423 (±285)	--	0.49

(a) Range and mean (± standard deviation).

TABLE 10 RESULTS OF *Hyalella azteca* TOXICITY TESTING ON SEDIMENTS FROM PLUM BROOK ORDNANCE WORKS

Test Species:	*Hyalella azteca* (amphipod)
Sample Location:	West Area Red Water Pond
Sample Dates:	13-14 September 2000
EA Test Number:	TN-00-644
Test Initiation Time and Date:	1700, 22 September 2000
Test Termination Time and Date:	1500, 2 October 2000

Sample Description	Sample Number	EA Accession Number	10-Day Percent Survival	Mean Dry Weight as mg/Surviving Organism (±SD)
PBOW-00-WRWP-SD006	AD1006	AT0-740	78[a]	0.240 (±0.044)[b]
PBOW-00-WRWP-SD007	AD1007	AT0-741	85	0.223 (±0.047)
PBOW-00-WRWP-SD008	AD1008	AT0-742	83[a]	0.214 (±0.022)[b]
PBOW-00-WRWP-SD009	AD1009	AT0-743	88	0.248 (±0.033)
PBOW-00-WRWP-SD010	AD1010	AT0-744	89	0.192 (±0.028)
Control	--	--	94	0.216 (±0.036)

(a) Sample was significantly different (p=0.05) from the control based on percent survival.
(b) A sample which has significantly lower survival than the control is not included in statistical analyses for mean dry weight (US EPA 1989).

TABLE 11 ENVIRONMENTAL MEASUREMENTS RECORDED DURING *Eisenia foetida* BIOACCUMULATION TESTING

Sample Description	Sample Number	EA Accession Number	Soil pH	Soil Moisture Content (%)	Temperature (°C)[a]
Test Number: TN-00-742					
PBOW-00-WRWP-SO001	AD0001	AT0-735	7.8	23.44	Range: 22.0-24.0 Mean (±SD): 23.0 (±0.4)
PBOW-00-WRWP-SO002	AD0002	AT0-736	6.5	26.72	
PBOW-00-WRWP-SO003	AD0003	AT0-737	6.7	25.31	
PBOW-00-WRWP-SO004	AD0004	AT0-738	6.2	26.63	
PBOW-00-WRWP-SO005	AD0005	AT0-739	7.2	30.02	
PBOW-00-PRWP-SO001	AC0001	AT0-758	7.9	21.44	
Control	--	--	--	39.02	

(a) Temperature was measured daily on a surrogate soil chamber.

TABLE 12 SURVIVAL RESULTS FROM *Eisenia foetida* BIOACCUMULATION TESTING ON SEDIMENTS FROM PLUM BROOK ORDNANCE WORKS

Test Species:	*Eisenia foetida* (red worm)
Sample Location:	West Area and Pentolite Road Red Water Pond
Sample Date:	15 September 2000
EA Test Number:	TN-00-742
Test Initiation Time and Date:	1500, 31 October 2000
Test Termination Time and Date:	1200, 28 November 2000

Sample Description	Sample Number	EA Accession Number	28-Day Percent Survival
PBOW-00-WRWP-SO001	AD0001	AT0-735	70[a]
PBOW-00-WRWP-SO002	AD0002	AT0-736	97
PBOW-00-WRWP-SO003	AD0003	AT0-737	96
PBOW-00-WRWP-SO004	AD0004	AT0-738	99
PBOW-00-WRWP-SO005	AD0005	AT0-739	98[a][b]
PBOW-00-PRWP-SO001	AC0001	AT0-758	94[a][b]
Control	--	--	99.7

(a) Soil had significantly lower survival than the control (p=0.05).
(b) Survival was above the acceptable control criterion (see text, page 13).

TABLE 13 WATER QUALITY PARAMETERS MEASURED DURING *Lumbriculus variegatus* BIOACCUMULATION TESTING

Sample Description	Sample Number	EA Accession Number	Temperature (°C)	pH	Dissolved Oxygen (mg/L)	Conductivity (µS/cm)	Alkalinity (mg/L $CaCO_3$)	Hardness (mg/L $CaCO_3$)
Test Number: TN-00-745 (West Area Red Water Pond)								
PBOW-00-WRWP-SD001	AD1001	AT0-745	21.2-23.6[a] 22.5 (±0.6)	7.5-8.5 8.2 (±0.2)	6.9-8.2 7.6 (±0.4)	911-1,301 1,181 (±82)	186-254 201 (±30)	340-404 354 (±28)
PBOW-00-WRWP-SD002	AD1002	AT0-746	21.4-23.4[a] 22.5 (±0.5)	8.0-8.5 8.2 (±0.2)	4.9-8.5 7.8 (±0.7)	917-1,294 1,172 (±84)	186-246 207 (±24)	328-528 385 (±82)
PBOW-00-WRWP-SD003	AD1003	AT0-747	21.8-24.0[a] 22.7 (±0.5)	8.1-8.5 8.3 (±0.1)	6.7-8.5 7.9 (±0.4)	915-1,301 1,163 (±83)	178-266 210 (±34)	328-484 369 (±66)
PBOW-00-WRWP-SD004	AD1004	AT0-748	21.5-23.7[a] 22.5 (±0.5)	7.9-8.4 8.2 (±0.1)	6.5-8.5 7.7 (±0.4)	904-1,294 1,165 (±84)	178-252 195 (±32)	324-568 402 (±104)
PBOW-00-WRWP-SD005	AD1005	AT0-749	21.8-23.9[a] 22.7 (±0.5)	7.7-8.4 8.1 (±0.2)	6.5-8.3 7.6 (±0.5)	873-1,291 1,158 (±89)	164-306 208 (±56)	328-460 367 (±57)
Control	--	--	21.3-23.3[a] 22.5 (±0.5)	7.8-8.5 8.2 (±0.2)	6.1-8.2 7.8 (±0.4)	1,120-1,737 1,353 (±143)	186-250 204 (±26)	352-448 388 (±50)

(a) Temperatures of several replicates were below the target range of 23±1°C on Days 13, 18, 19, and 26; however, the daily mean temperatures were within 23±1°C.

TABLE 14 RESULTS OF REFERENCE TOXICANT TESTING FOR ALL TEST SPECIES

Test Species	Reference Toxicant	EA Test Number	Endpoint		Acceptable Control Chart Limits
Ceriodaphnia dubia	Sodium chloride (NaCl)	RT-00-111	NOEC:	600 mg/L NaCl	300-1,200 mg/L NaCl
Pimephales promelas	Cadmium chloride ($CdCl_2$)	RT-00-106	NOEC:	18 µg/L Cd	7.5-42 µg/L Cd
Hyalella azteca	Copper sulfate ($CuSO_4$)	RT-00-166	96-Hour LC50:	232 mg/L Cu	73-448 mg/L Cu
Eisenia foetida	2-chloroacetamide	RT-00-149	48-Hour LC50:	203 mg/L	11-396 mg/L
Lumbriculus variegatus	Copper chloride ($CuCl_2$)	RT-00-154	48-Hour LC50:	0.12 mg/L Cu	0-0.37 mg/L Cu

ATTACHMENT I

EA Toxicity Testing Protocols

SURVIVAL AND REPRODUCTION TEST WITH CLADOCERAN (*Ceriodaphnia dubia*)

1. TEST OBJECTIVE

To assess the toxicity of a test material to *Ceriodaphnia dubia* and determine the effects on reproductive potential and survival of test organisms compared to controls.

2. TEST ARTICLE

2.1 Description/Identification

Unless otherwise specified, the test material is supplied by the client. Adequate chemical specifications with special reference to hazardous properties and storage conditions are also supplied by the client.

2.2 Methods of Synthesis

In most cases, the test article is an effluent sample. Information on the methods of synthesis, stability, and composition or other characteristics which define the test article are on file with the client.

3. EXPERIMENTAL DESIGN

3.1 Test Organisms

3.1.1 Species

The test species is the water flea, *Ceriodaphnia dubia*.

3.1.2 Source

C. dubia used for toxicity tests are obtained from stock cultures maintained at EA's Culture Facility.

3.1.3 Culturing and Holding Conditions

C. dubia cultures are maintained at 25±2°C and a 16-hour light, 8-hour dark photoperiod cycle

in an environmentally controlled laboratory. Test organisms are maintained in 18.9-L all glass aquaria (as backup cultures) or 1-L culture bowls, or individually in 30-ml plastic portion cups in brood boards and fed algae and a trout chow/yeast/cerophyll suspension (US EPA 1994). New cultures are initiated on a routine basis to ensure healthy, productive populations. Organisms from cultures producing ephippia are not used for toxicity tests. Certain regulatory or project specific objectives may require organism acclimation to the dilution water when it is different from the holding/culture water.

3.1.4 Age of Test Organisms at Test Initiation

Neonates of known age (i.e., less than 24 hours old) are obtained for testing from the individually cultured females in the brood board system. On the day before or the day of the test, neonates are segregated from the parent organisms. All organisms used for testing are released within one 8-hour period and are taken from broods of eight or more.

3.2 Dilution Water

Twenty percent dilute mineral water (US EPA 1994) is used for culturing and testing. Alternatively, moderately hard reconstituted water is prepared using MILLIPORE MILLI-Q^{R} or equivalent deionized water with addition of reagent grade chemicals. Receiving water can be used as dilution water if specified by the client.

3.3 Test Concentration Series

The test concentration series consists of a minimum of five dilutions (e.g., 6.25, 12.5, 25, 50, and 100 percent effluent plus a control) and may be determined from a prior screening of the test material. Rangefinding assays utilize more widely spaced test concentrations and a control. Ambient water or effluent samples may also be evaluated as single concentrations and compared to a control.

3.4 Test Concentration Preparation

Test concentrations are prepared in 250-ml graduated cylinders, and 15 ml of test solution are delivered to each individual test chamber.

3.5 Test Vessels and Test Volume

Test vessels are 30-ml portion cups or beakers; the final test volume is 15 ml.

3.6 Test Organism Number

Tests are conducted using ten replicates per concentration, with one organism per container. Neonates are randomly assigned to each replicate test container. More replicates can be added, if appropriate.

3.7 Test Environment

The test vessels are maintained in an environmentally controlled laboratory with a 16-hour light, 8-hour dark photoperiod. Temperature within the environmental room is monitored continuously using temperature recorders and test vessels are maintained at 25±1°C (unless a different project-specific temperature is required).

3.8 Analysis of Test Concentrations for Test Article

If required, test solutions may be analyzed for verification of chemical concentrations. The analytical method and number of analyses are determined after consultation with the client. When chemical analyses are necessary, both nominal and actual measured test concentrations are reported.

3.9 Test Observations

Each test day, test organisms are observed to record the number of surviving organisms and the number of neonates produced. Dead organisms are removed when observed. The study terminates after 60 percent of the control females have produced three broods with a minimum of 15 neonates per surviving female. However, test duration will not exceed 8 days of exposure to the test material.

Each effluent or receiving water sample received is analyzed for temperature, conductivity, alkalinity, hardness, and total residual chlorine. Aliquots of effluent and receiving water may be gently aerated (100 bubbles/min) prior to test initiation if dissolved oxygen is less than 4 mg/L or greater than 100 percent saturation. Water quality measurements recorded daily on old and new test solutions include dissolved oxygen, pH, temperature, and conductivity from a minimum of one replicate of every concentration. Analytical determinations are conducted according to APHA et al. (1995) and US EPA (1979).

3.10 Solution Renewal

The test solutions are renewed daily. New solutions are prepared on the day of renewal. After

the new solutions have reached test temperature, the test organisms are transferred from the old test vessels to the new test vessels using a pipet or glass tube. The offspring are counted and the number is recorded. Caution is given not to stress the test organisms during transfer. After neonates are counted and water quality measurements (temperature, pH, dissolved oxygen, and conductivity) are completed, the old solution is discarded.

3.11 Data Analysis

Statistical analyses are performed on percent survival and young production. Fisher's Exact Test is used to determine statistical significance of the survival data. Analysis of variance (ANOVA) and either Bonferroni's T-test or Dunnett's Mean Comparison test are used to analyze the young production data for significance of effects. Depending on the distributional characteristics of the data generated, it may be necessary to use Steele's Many-One Rank Test or the Wilcoxon Rank Sum Test instead (US EPA 1994). The Shapiro-Wilks test (for datasets with ≤50 datapoints) or the Chi-Square test is used to test for normality of the reproduction data. Bartlett's test is used to test for homogeneity of variance of the reproduction data. If requested before the initiation of the study, the young production data will be analyzed using EPA's ICp program to determine an IC50 and/or IC25. Although not standard practice, an LC50 may be calculated using the probit, moving average, and binomial methods as described by Stephan (1977). Depending on the nature of the data other methods may be used, including the probit approximation method of Litchfield and Wilcoxon (1949), SAS probit analysis (SAS Institute 1985) or graphical interpolation using the log concentration vs. percent lethality as described by APHA et al. (1995). The methods used are specified in the final report.

3.12 Test Acceptability

An individual test may be conditionally acceptable if temperature, dissolved oxygen, and other specified conditions fall outside specifications, depending on the degree of the departure and the objectives of the tests.

4. FINAL REPORT

The final report is prepared to contain, at a minimum, the following information:

- Objectives and procedures stated in the approved protocol, including any changes made to the original protocol
- Identity of the test article(s) by name or code number and their strength (i.e., quality/purity), and a description of any pretreatment

- Source of the dilution water, its chemical characteristics, and a description of any pretreatment
- Test concentration series used and duration of the assay
- Water quality characteristics (pH, dissolved oxygen, temperature, etc.) of dilution water and selected test concentrations during testing
- Any unforeseen circumstances that may have affected the quality or integrity of the study
- Signature of the project manager, senior technical reviewer, and quality control officer authorizing release of the report
- Location of all archived data and the original copy of the final report at EA

Items of data to be included in the report consist of experimental design and test performance, effects on general appearance of test organisms (if applicable), morbidity and mortality, presentation of water quality characteristics, survival and reproduction data.

5. QUALITY ASSURANCE

5.1 Amendments to Protocol

Amendments to the authorized protocol established by EA or by the client are made only after proper authorization. Such authorization is achieved by completion of the Protocol Amendment Form by EA after consultation with the client.

5.2 Standard Operating Procedures

Unless otherwise specified, all procedures given in the protocol are subject to detailed Standard Operating Procedures (SOPs) which are contained in the SOP manuals of the participating departments. These SOPs and protocols generally follow the types of requirements outlined in the U.S. EPA's Good Laboratory Practice Standards (GLPs) (US EPA 1989).

5.3 Reference Toxicant

A reference toxicant test, utilizing sodium dodecyl sulfate (SDS), cadmium chloride, NaCl, or another appropriate chemical is used as an internal quality check of the sensitivity of the test organisms. Testing is conducted at least once monthly on organisms that are cultured in-house. The results of each test are compared with historical, species-specific toxicological information from reference toxicant tests performed at EA, to determine if the results are within acceptable limits. Limits are established using the control charts outlined in US EPA (1994).

5.4 Quality Assurance Evaluation

Studies conducted under this protocol may be subject to internal audit by EA's Quality Assurance Unit. A quality control officer is responsible for monitoring each study to assure the client that the facilities, equipment, personnel, methods, practices, records, and controls are in conformance with EA's QC program and, if applicable, EPA's GLPs.

5.5 Inspection by Regulatory Authorities

In the event of an inspection of EA by an outside authority during the course of the study, the client whose study is being inspected will be consulted before examiners are permitted access to any of the project records or the experimental areas.

5.6 Archives

Copies of project-specific records shall be transferred to the client promptly after the project is completed or as negotiated and budgeted. Original primary data are retained at EA for 5 years. Primary data include chain-of-custody records, laboratory data sheets, records, memoranda, notes, photographs, microfilm, and computer printouts that are a result of the original observations and activities of the study and which are necessary for the reconstruction and evaluation of the study report.

5.7 Location

Studies are conducted at the Ecotoxicology Laboratory of EA Engineering, Science, and Technology, Inc. at the Loveton Office in Sparks, Maryland.

6. SPECIFICATIONS OF THE *Ceriodaphnia dubia* SURVIVAL AND REPRODUCTIVE POTENTIAL TEST

6.1 Basic References

American Public Health Association (APHA) American Water Works Association, Water Environment Federation. 1995. Standard Methods for Examination of Water and Wastewater, 19th or most recent version. APHA, Washington, D.C.

EA. 1996. Quality Control and Standard Operating Procedures Manual for EA's Ecotoxicology Laboratory. Fifth Revision. EA Manual ATS-102. Internal document prepared by EA's Ecotoxicology Laboratory, EA Engineering, Science, and Technology, Inc., Sparks, Maryland.

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Stephan, C.E. 1977. Methods of Calculating an LC50 in Aquatic Toxicology and Hazard Evaluation (F.L. Mayer and J.L. Hamlink, Eds.), pp. 65-84. ASTM STP 634, ASTM, Philadelphia, Pennsylvania.

US EPA. 1979. Methods for Chemical Analysis of Water and Wastes. EPA/600/4-79/020. U.S. Environmental Protection Agency, Washington, D.C.

US EPA. 1989. Toxic Substances Control Act (TSCA); Good Laboratory Practice Standards. Title 40 CFR Part 792. Fed. Regist. 54(158): 34034-34074.

US EPA. 1989. Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms. Second Edition. EPA/600/4-89/001. U.S. Environmental Protection Agency, Cincinnati, Ohio.

US EPA. 1994. Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms. Third Edition. EPA/600/4-91/002. U.S. Environmental Protection Agency, Environmental Monitoring Systems Laboratory, Cincinnati, Ohio.

6.2 Test Specifications

Test organism:	Water flea (*Ceriodaphnia dubia*)
Temperature:	Target: 25±1°C
Age:	<24 hours and all released within an 8-hour window
Aeration:	None
Light quality:	Wide-spectrum fluorescent light
Light intensity:	50-100 f.c.
Photoperiod:	16-hour light, 8-hour dark
Dilution water:	20 percent dilute mineral water, dechlorinated municipal tap water, reconstituted fresh water, or appropriate receiving water
Test containers:	30-ml plastic portion cups or beakers
Test volume:	15 ml per replicate
No. of concentrations:	Definitive assay - Minimum of five test concentrations and a control Screening assay - Single test concentration and a control
No. of replicates:	10
No. organisms per replicate:	1
Feeding regime:	200 μl of 5 g/L food solution (YCT and algae mixed) daily in each replicate (according to US EPA 1994)

Test type and duration:	Static renewal with daily replacement of test solutions. The test duration is determined when 60 percent of the control females have three broods; however, not exceeding 8 days.
Endpoints:	Survival of females used to initate test and number of young produced per female over the exposure period
Test acceptability:	80 percent or greater survival and an average of 15 or more young/surviving female in the control solution

LARVAL SURVIVAL AND GROWTH TEST WITH FATHEAD MINNOWS (*Pimephales promelas*)

1. TEST OBJECTIVE

To assess the toxicity of a test material to *Pimephales promelas* and determine the effects on survival and growth (as determined by dry weight) of test animals compared to controls.

2. TEST ARTICLE

2.1 Description/Identification

Unless otherwise specified, the test material is supplied by the client. Adequate chemical specifications with special reference to hazardous properties and storage conditions are also supplied by the client.

2.2 Methods of Synthesis

In most cases, the test article is an effluent sample. Information on the methods of synthesis, stability, and composition or other characteristics which define the test article are on file with the client.

3. EXPERIMENTAL DESIGN

3.1 Test Organisms

3.1.1 Species

The test species is the fathead minnow, *Pimephales promelas*.

3.1.2 Source

P. promelas used for toxicity tests are usually obtained from stock cultures maintained at EA's Culture Facility. However, organisms may be obtained from a scientific organism vendor, if necessary.

3.1.3 Culturing and Holding Conditions

P. promelas brood stock are maintained at 25±2°C and a 16-hour light, 8-hour dark photoperiod cycle in an environmentally controlled laboratory. Brood organisms are maintained in all glass aquaria in a recirculating system of dechlorinated municipal tap water. The eggs are held at 25±2°C throughout hatching. If eggs are obtained from a scientific vendor, the eggs, upon receipt, are transferred to static recirculating holding tanks of an appropriate size containing dechlorinated tap water at the temperature (±2°C) of the water in which the organisms were shipped. The eggs are slowly elevated to 25±2°C and examined regularly. Dead eggs, or those which appear unusually colored or malformed, are removed as observed, and recorded on appropriate log sheets. Certain regulatory or project specific objectives may require organism acclimation to the dilution water when it is different from the holding/culture water.

3.1.4 Age of Test Organisms at Test Initiation

Fathead minnow larvae (<24 hours old) are used for chronic toxicity testing. Under special circumstances (e.g., if eggs must be obtained from a scientific vendor), larvae used for chronic testing may be <48 hours old all hatched within a 24-hour window.

3.2 Dilution Water

The source of dechlorinated tap water is the City of Baltimore municipal water system. Upon entry to the laboratory, the water passes through a high-capacity, activated carbon filtration system to remove chlorine and other possible organic contaminants. This water source has proven safe for aquatic organism toxicity testing at EA, as evidenced by maintenance of multigeneration *Daphnia* sp. and fathead minnow cultures with no evident loss of fecundity. Reconstituted fresh water or other dilution water may be used depending on study requirements.

3.3 Test Concentration Series

The test concentration series consists of a minimum of five dilutions (e.g., 6.25, 12.5, 25, 50, and 100 percent effluent plus a control) and may be determined from a prior screening of the test material. Rangefinding assays utilize more widely spaced test concentrations and a control. Ambient water or effluent samples may also be evaluated as single concentrations and compared to a control.

3.4 Test Concentration Preparation

Test concentrations are prepared with Class A glassware.

3.5 Test Vessels and Test Volume

Test vessels are 1-L beakers; the final test volume is 250 ml. Other test vessels may be used depending on the study's requirements.

3.6 Test Organism Number

Tests are conducted using a minimum of three replicates, and as a standard practice four replicates, per concentration, with 10 organisms per container. Fish are randomly assigned to each replicate test container. More replicates can be added, if appropriate.

3.7 Test Environment

The test vessels are maintained in an environmentally controlled laboratory with a 16-hour light, 8-hour dark photoperiod. Temperature within the environmental room is monitored continuously using temperature recorders and is maintained at 25±1°C (unless a different project--specific temperature is required).

3.8 Analysis of Test Concentrations for Test Article

If required, test solutions may be analyzed for verification of chemical concentrations. The analytical method and number of analyses are determined after consultation with the client. When chemical analyses are necessary, both nominal and actual measured test concentrations are reported.

3.9 Test Observations

Each test day, test organisms are observed to record the number of surviving organisms. Dead organisms are removed when observed. The study terminates after 7 days. The study may be extended, however, at the request of the client.

Each effluent or receiving water sample received is analyzed for temperature, conductivity, alkalinity, hardness, and total residual chlorine. Aliquots of effluent and receiving water may be gently aerated (100 bubbles/min) prior to test initiation if dissolved oxygen is less than 4 mg/L or greater than 100 percent saturation. After test initiation, if the dissolved oxygen in

any test chamber is less than 4 mg/L, all test chambers are gently aerated or other corrective action is taken. Water quality measurements recorded daily on old and new test solutions include dissolved oxygen, pH, temperature, and conductivity from a minimum of one replicate of every concentration. Analytical determinations are conducted according to APHA et al. (1995) and US EPA (1979).

At the end of the test period, surviving fish are rinsed and placed in pre-weighed, oven dried aluminum pans (one replicate per pan). Fish are oven dried for a minimum of 6 hours at 100°C after which each pan is weighed to determine the mean dry weight of the fish. Mean dry weights are calculated based on the number of surviving organisms (per EPA guidance EPA/600/4-89/001), or based on the original number of exposed organisms (per EPA guidance EPA/600/4-91/002).

3.10 Solution Renewal (When Applicable)

The test solution is renewed daily. New solutions are prepared on the day of renewal. After the new solutions have reached test temperature and water quality measurements (temperature, pH, dissolved oxygen, and conductivity) are completed, the solution renewal may be performed by transferring the organisms from one test chamber to another or by replacing the test solution. If the test solution replacement method is used, caution must be given not to stress the test organisms while the test chamber is siphoned. Usually 75 percent of the old solution is removed and replaced; however, the amount is dependent on the size of the test organisms. The larvae in each test chamber are fed 0.1 ml (approximately 700 to 1,000) of a concentrated suspension of newly hatched (<24 hours old) brine shrimp nauplii (*Artemia sp.*) three times daily (morning, early afternoon, and the end of the work day). The nauplii are rinsed with dechlorinated tap water before feeding.

3.11 Data Analysis

Statistical analyses are performed on percent survival and mean dry weight data. Analysis of variance (ANOVA) and either Bonferroni's T-test or Dunnett's Mean Comparison test are used to analyze the survival and mean weight data for significance of effects. Depending on the distributional characteristics of the data generated, it may be necessary to use Steele's Many-One Rank Test or the Wilcoxon Rank Sum Test instead (US EPA 1994). The Shapiro-Wilks test (for datasets with ≤50 datapoints) or the Chi-Square test is used to test for normality of the reproduction data. Bartlett's test is used to test for homogeneity of variance of the reproduction data. If requested before the initiation of the study, growth data will be analyzed using EPA's ICp program to determine an IC50 and/or IC25. Although not standard practice, an LC50 may be calculated using the probit, moving average, and binomial methods as

described by Stephan (1977). Depending on the nature of the data, other methods may be used, including the probit approximation method of Litchfield and Wilcoxon (1949), SAS probit analysis (SAS Institute 1985) or graphical interpolation using the log concentration vs. percent lethality as described by APHA et al. (1995). The methods used are specified in the final report.

3.12 Test Acceptability

An individual test may be conditionally acceptable if temperature, dissolved oxygen, and other specified conditions fall outside specifications, depending on the degree of the departure and the objectives of the tests.

4. FINAL REPORT

The final report is prepared to contain, at a minimum, the following information:

- Objectives and procedures stated in the approved protocol, including any changes made to the original protocol
- Identity of the test article(s) by name or code number and their strength (i.e., quality/purity), and a description of any pretreatment
- Source of the dilution water, its chemical characteristics, and a description of any pretreatment
- Test concentration series used and duration of the assay
- Mean dry weights of test fish with the respective standard deviations
- Water quality characteristics (pH, dissolved oxygen, temperature, etc.) of dilution water and selected test concentrations during testing
- Any unforeseen circumstances that may have affected the quality or integrity of the study
- Signature of the project manager, senior technical reviewer, and quality control officer authorizing release of the report
- Location of all archived data and the original copy of the final report at EA

Items of data to be included in the report consist of experimental design and test performance, effects on general appearance of test organisms (if applicable), morbidity and mortality, presentation of water quality characteristics, survival and growth data.

5. QUALITY ASSURANCE

5.1 Amendments to Protocol

Amendments to the authorized protocol established by EA or by the client are made only after proper authorization. Such authorization is achieved by completion of the Protocol Amendment Form by EA after consultation with the client.

5.2 Standard Operating Procedures

Unless otherwise specified, all procedures given in the protocol are subject to detailed Standard Operating Procedures (SOPs) which are contained in the SOP manuals of the participating departments. These SOPs and protocols generally follow the types of requirements outlined in the U.S. EPA's Good Laboratory Practice Standards (GLPs) (US EPA 1989).

5.3 Reference Toxicant

A reference toxicant test, utilizing sodium dodecyl sulfate (SDS), cadmium chloride, or another appropriate chemical is used as an internal quality check of the sensitivity of the test organisms. Testing is conducted at least once monthly on organisms which are cultured in-house, and on each population of organisms purchased for testing from an outside source if reference toxicant data are not available from the supplier on the acquired lot. The results of each test are compared with historical, species-specific toxicological information from reference toxicant tests performed at EA to determine if the results are within acceptable limits. Limits are established using the control charts outlined in US EPA (1994).

5.4 Quality Assurance Evaluation

Studies conducted under this protocol may be subject to internal audit by EA's Quality Assurance Unit. A quality control officer is responsible for monitoring each study to assure the client that the facilities, equipment, personnel, methods, practices, records, and controls are in conformance with EA's QC program and, if applicable, EPA's GLPs.

5.5 Inspection by Regulatory Authorities

In the event of an inspection of EA by an outside authority during the course of the study, the client whose study is being inspected will be consulted before examiners are permitted access to any of the project records or the experimental areas.

5.6 Archives

Copies of project-specific records shall be transferred to the client promptly after the project is completed or as negotiated and budgeted. Original primary data are retained at EA for 5 years. Primary data include chain-of-custody records, laboratory data sheets, records, memoranda, notes, photographs, microfilm, and computer printouts that are a result of the original observations and activities of the study and which are necessary for the reconstruction and evaluation of the study report.

5.7 Location

Studies are conducted at the Ecotoxicology Laboratory of EA Engineering, Science, and Technology, Inc. at the Loveton Office in Sparks, Maryland.

6. SPECIFICATIONS OF THE FATHEAD MINNOW SURVIVAL AND GROWTH TOXICITY TEST

6.1 Basic References

American Public Health Association (APHA), American Waterworks Association, Water Environment Federation. 1995. Standard Methods for Examination of Water and Wastewater, 19th or most recent version. APHA, Washington, D.C.

EA. 1996. Quality Control and Standard Operating Procedures Manual for EA's Ecotoxicology Laboratory. Fifth Revision. EA Manual ATS-102. Internal document prepared by EA's Ecotoxicology Laboratory, EA Engineering, Science, and Technology, Inc., Sparks, Maryland.

Litchfield, J.T., and F. Wilcoxon. 1949. A simplified method of Evaluating Dose/Effect Experiments. J. Pharmacol. Exp. Ther. 96:99-113.

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US EPA. 1979. Methods for Chemical Analysis of Water and Wastes. EPA/600/4-79/020. U.S. Environmental Protection Agency, Washington, D.C.

US EPA. 1989. Toxic Substances Control Act (TSCA); Good Laboratory Practice Standards. Title 40 CFR Part 792. Fed. Regist. 54(158): 34034-34074.

US EPA. 1989. Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms. Second Edition. EPA/600/4-89/001. U.S. Environmental Protection Agency, Environmental Monitoring Systems Laboratory, Cincinnati, Ohio.

US EPA. 1994. Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms. Third Edition. EPA/600/4-91/002. U.S. Environmental Protection Agency, Environmental Monitoring Systems Laboratory, Cincinnati, Ohio.

6.2 Test Specifications

Test organism:	Fathead minnow (*Pimephales promelas*)
Temperature:	25±1°C
Organism age:	Preferably <24 hours old. If eggs are obtained from scientific vendor, larvae may be <48 hours old (24-hour window) at test initiation
Aeration:	None, unless dissolved oxygen falls below 4 mg/L
Light quality:	Wide-spectrum fluorescent light
Light intensity:	50-100 f.c.
Photoperiod:	16-hour light, 8-hour dark

Dilution water:	Dechlorinated municipal tap water, reconstituted fresh water, or appropriate receiving water
Test containers:	1-L beaker
Test volume:	250 ml per replicate
No. of concentrations:	Definitive assay - Minimum of five test concentrations and a control Screening assay - Single test concentration and a control
No. of replicates:	4 (minimum of 3)
No. organisms per replicate:	10
Feeding regime:	Feed 0.1 ml newly hatched (<24-hour old) brine shrimp nauplii three times daily (morning, afternoon, evening).
Test type and duration:	Static renewal, test duration 7 days
Endpoints:	Survival and growth
Test acceptability:	80 percent or greater survival in the control solution; average dry weight of surviving controls equals or exceeds 0.25 mg.

SEDIMENT TOXICITY TEST (DAILY RENEWAL) WITH *Hyalella azteca*

1. TEST OBJECTIVE

To assess the toxicity of a whole sediment sample to *Hyalella azteca* and determine the effects on survival (growth optional) of the test organisms compared to controls.

2. TEST ARTICLE

2.1 Description/Identification

Unless otherwise specified, the test material is supplied by the client. Adequate chemical specifications with special reference to hazardous properties and storage conditions are also supplied by the client.

2.2 Methods of Synthesis

Test article is a whole sediment sample. Information on the methods of synthesis, stability, and composition or other characteristics which define the test article are on the file with the client.

2.3 Sample Preparation

Depending upon the project, the sediment may be screened through a suitably sized sieve to remove large particles and indigenous organisms, and homogenized before being placed in the test chambers. Sediment and overlying water should be added to test vessels one day prior to introduction of test organisms in order to allow suspended sediments to settle.

3. EXPERIMENTAL DESIGN

3.1 Test Organisms

3.1.1 Species

The test species is the amphipod, *Hyalella azteca*.

3.1.2 Source

H. azteca used for toxicity tests are obtained from EA cultures or from a scientific organism vendor as specified in the report.

3.1.3 Culturing and Holding Conditions

Stocks obtained from a scientific vendor are transferred into recirculating holding tanks containing hardwood leaves which have been presoaked or boiled to remove tannins. The organisms are gradually acclimated to testing conditions and to the overlying water used in testing. During the holding period, the *H. azteca* are fed Tetramin flake food weekly in addition to the hardwood leaves. Dead organisms or these displaying abnormal behavior, discoloration, or pronounced lethargy are removed as observed, and recorded on appropriate log sheets as part of the quality control program. Certain regulatory or project specific objectives may require organism acclimation to the dilution water when it is different from the holding/culture water.

3.1.4 Age of Test Organisms at Test Initiation

Juvenile organisms, 7 to 14 days old at test initiaion, are used for the toxicity testing. If growth is used as a test endpoint, then pre-test length or weight should be measured on a subset of at least 20 organisms of the same age as those used to start the test.

3.2 Test Concentration Series

H. azteca are exposed in replicate chambers to sediment samples and to a laboratory or reference sediment control. Screening assays may be conducted on whole sediment samples. Alternatively, a definitive (multi-concentration test) may be conducted on a sample using a laboratory or reference sediment to prepare the test concentrations.

3.3 Overlying Water

The overlying water is typically dechlorinated tap water. The source of dechlorinated tap water is the City of Baltimore municipal water system. Upon entry to the laboratory, the water passes through a high-capacity, activated-carbon filtration system to remove chlorine and other possible organic contaminants. This water source has proven safe for aquatic organism toxicity testing at EA, as evidenced by maintenance of the multigeneration *Daphnia* and *Pimephales promelas* cultures, with no evident loss of fecundity. Reconstituted fresh water or other dilution water (e.g. site water) may be used depending on study requirements.

3.4 Test Vessels and Test Volume

Test vessels are typically 300-ml high-form lipless beakers, each containing 100 ml volume of sediment and 175 ml volume of overlying water. The size of the test vessels, and the volume of sediment and overlying water may be changed depending upon the study requirements.

3.5 Test Organism Number

The number of replicate chambers per treatment depends on the test objective. Five to eight replicates are recommended for routine testing. Each replicate test chamber has 10 organisms. To introduce the test organisms into the test chambers, ten *H. azteca* are randomly assigned to 30-ml portion cups. One cup of 10 organisms is then randomly added to each replicate. Prior to organism transfer, the volume of each transfer portion cup is reduced.

3.6 Test Environment

The test vessels are maintained in an environmentally controlled laboratory with a 16-hour light, 8-hour dark photoperiod. Temperature within the environmental room is monitored continuously using temperature recorders and is maintained at 23±1°C (unless a different project-specific temperature is required). The instantaneous temperature must always be within ±3°C of the desired temperature, and the daily mean temperature must be within ±1°C of the desired temperature.

3.7 Test Observations

The overlying water is renewed daily, either continuously or intermittently, at a rate of at least 1-2 volume additions/day.

Test organisms are fed a suspension of yeast/cereal leaves/trout chow (YCT) during the exposure period. However, the amount of food added to the test chambers is kept to a minimum to avoid fungal or bacterial growth on the sediment surface. A typical feeding rate is 1.0 to 1.5 ml YCT daily per replicate. If the dissolved oxygen concentration drops below 40 percent of saturation in the overlying water of a replicate, then feeding should be suspended in all replicates until the dissolved oxygen concentration increases to ≥40 percent.

Samples of overlying water from the test sediment and control or reference sediment are analyzed for conductivity, alkalinity, hardness, pH, and ammonia at test initiation and termination. Water samples from the replicates of a treatment may be pooled for analysis. Measurements of water quality are taken daily thereafter for dissolved oxygen and temperature

from a minimum of one replicate of each sediment, reference, and control treatment. The overlying water may be gently aerated, if necessary, to maintain dissolved oxygen levels at or above 40 percent of saturation. Analytical determinations are conducted according to APHA et al. (1995) and US EPA (1979).

The study terminates after 10 days of exposure to the sediment sample. At test termination, test organisms are observed to record the number of surviving *H. azteca* in each replicate. If growth is used as an endpoint, surviving *H. azteca* at the end of the test period may be placed into pre-weighed, oven-dried aluminum pans (one replicate per pan). Organisms are oven dried for a minimum of six hours at 100°C after which each pan is weighed. Mean dry weight of the *H. azteca* (weight of pan and organisms minus weight of pan/number of organisms) is calculated.

3.8 Data Analysis

Statistical analyses are performed on percent survival and mean dry weight data. For screening tests, a t-test is conducted to determine if a single test sample is significantly different from the control. For definitive assays, an analysis of variance (ANOVA) and either Bonferroni's T-Test or Dunnett's Mean Comparison Test are used to analyze significance of effects. Depending on the distributional characteristics of the data generated, it may be necessary to use Steel's Many-One Rank Test or the Wilcoxon Rank Sum Test instead (US EPA 2000). An LC50 and/or EC50 may be calculated from a definitive test using the probit, moving average, and binomial methods as described by Stephan (1977). Depending on the nature of the data, other methods may be used including the Trimmed Spearman-Karber method, the probit approximation method of Litchfield and Wilcoxon (1949), SAS probit analysis (SAS Institute 1985), or graphical interpolation using the log concentration vs. percent mortality and/or percent affected as described by APHA et al. (1995). The statistical methods are specified in the final report.

4. FINAL REPORT

The final report is prepared to contain, at a minimum, the following information:

- Objectives and procedures stated in the approved protocol, including any changes made to the original protocol
- Identity of the test article(s) by name or code number and their strength (i.e., quality/purity), and a description of any pretreatment

- Source of the overlying water, its chemical characteristics, and a description of any pretreatment
- Test concentration series used and duration of the assay
- Mean dry weights of test organisms with the respective standard deviations
- Water quality characteristics (pH, dissolved oxygen, temperature, etc.) of overlying water from reference, control, and test sediment treatments
- Any unforeseen circumstances that may have affected the quality or integrity of the study
- Signature of the project manager, senior technical reviewer, and quality control officer authorizing release of the report
- Location of all archived data and the original copy of the final report at EA

Items of data to be included in the report consist of experimental design and test performance, effects on general appearance of test organisms (if applicable), morbidity and mortality, presentation of water quality characteristics, and survival and weight data.

5. QUALITY ASSURANCE

5.1 Amendments to Protocol

Amendments to the authorized protocol established by EA or by the client are made only after proper authorization. Such authorization is achieved by completion of the Protocol Amendment Form by EA after consultation with the client.

5.2 Standard Operating Procedures

Unless otherwise specified, all procedures given in the protocol are subject to detailed Standard Operating Procedures (SOPs) which are contained in the SOP manuals of the participating departments. These SOPs and protocols generally follow the type of requirements in the U.S. EPA's Good Laboratory Practice Standards (GLPs) (US EPA 1989).

5.3 Reference Toxicant

A reference toxicant test, utilizing potassium chloride (KCl), copper sulfate, or another appropriate chemical, is used as an internal quality check of the sensitivity of the test organisms. Testing is conducted periodically (at least semiannually) on organisms which are cultured in-house, and on each population of organisms purchased for testing from an outside source (if reference toxicant data are not available from the organism supplier). The results of each test are compared with historical, species-specific toxicological information from reference toxicant tests performed at EA, to determine if the results are within acceptable limits. Limits are established using the control charts outlined in US EPA (1993).

5.4 Quality Assurance Evaluation

Studies conducted under this protocol may be subject to internal audit by EA's Quality Assurance Unit. A quality control officer is responsible for monitoring each study to assure the client that the facilities, equipment, personnel, methods, practices, records, and controls are in conformance with EA's QC program and, if applicable, EPA's GLPs.

5.5 Inspection by Regulatory Authorities

In the event of an inspection of EA by an outside authority during the course of the study, the client whose study is being inspected will be consulted before examiners are permitted access to any of the project records or the experimental areas.

5.6 Archives

Copies of project-specific records shall be transferred to the client promptly after the project is completed or as negotiated and budgeted. Original primary data are retained at EA for 5 years. Primary data include chain-of-custody records, laboratory data sheets, records, memoranda, notes, photographs, microfilm, and computer printouts that are a result of the original observations and activities of the study and which are necessary for the reconstruction and evaluation of the study report.

5.7 Location

Studies are conducted at the Ecotoxicology Laboratory of EA Engineering, Science, and Technology, Inc. at the Loveton Office in Sparks, Maryland.

6. SPECIFICATIONS OF THE *Hyalella azteca* SEDIMENT TOXICITY TEST

6.1 Basic References

American Public Health Association (APHA) American Water Works Association, Water Envrionment Federation. 1995. Standard Methods for Examination of Water and Wastewater, 19th or most recent version. APHA, Washington, D.C.

American Society for Testing and Materials (ASTM). 1991. Standard Practice for Conducting Acute Tests with Fishes, Macroinvertebrates, and Amphibians. ASTM Designation: E729-80, Philadelphia, Pennsylvania.

American Socity for Testing and Materials (ASTM). 1991. Standard Guide for Conducting Sediment Toxicity Tests with Freshwater Invertebrates. ASTM Designation: E1383-90, Philadelphia, Pennsylvania

American Society for Testing and Materials (ASTM). 1995. Standard Test Methods for Measuring the Toxicity of Sediment-Associated Contaminants with Freshwater Invertebrates. ASTM Designation: E1706-95, Philadelphia, Pennsylvania.

EA. 1996. Quality Control and Standard Operating Procedures Manual for EA's Ecotoxicology Laboratory. Fifth Revision. EA Manual ATS-102. Internal document prepared by EA's Ecotoxicology Laboratory, EA Engineering, Science, and Technology, Inc., Sparks, Maryland.

US EPA. 1979. Methods for Chemical Analysis of Water and Wastes. EPA/600/4-79/020. U.S. Environmental Protection Agency, Washington, D.C.

US EPA. 1989. Toxic Substances Control Act (TSCA); Good Laboratory Practice Standards. Title 40 CFR Part 792. Fed. Regist. 54(158): 34034-34074.

US EPA. 1993. Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms. Fourth Edition. EPA/600/4-90/027F. U.S. Environmental Protection Agency, Environmental Monitoring Systems Laboratory, Cincinnati, Ohio.

US EPA. 1994. Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms. Third Edition. EPA/600/4-91/002. U.S. Environmental Protection Agency, Environmental Monitoring Systems Laboratory, Cincinnati, Ohio.

US EPA. 2000. Methods for Measuring the Toxicity and Bioaccumulation of Sediment-Associated Contaminants with Freshwater Invertebrates. Second Edition. EPA/600/R-99/064. U.S. Environmental Protection Agency, Office of Research and Development, Duluth, Minnesota.

6.2 Test Specifications

Test organism:	*Hyalella azteca*
Organism age:	Juvenile (7-14 days old at start of test)
Aeration:	None, unless dissolved oxygen falls below 40% saturation; gentle aeration should be provided through a 1-ml glass pipet, placed no closer than 2 cm above the sediment surface.
Temperature:	23±1°C
Light quality:	Wide-spectrum fluorescent light
Light intensity:	10-100 f.c.
Photoperiod:	16-hour light, 8-hour dark
Overlying water:	Dechlorinated municipal tap water, reconstituted fresh water, or appropriate receiving water
Test container:	300-ml beaker
Test volume:	100 ml sediment with 175 ml overlying water
No. of replicates:	5 to 8
No. organisms per replicate:	10

Feeding regime:	1.0 to 1.5 ml YCT daily per replicate
Test duration:	10 days
Endpoints:	Survival (growth optional)
Test acceptability:	≥80 percent survival in the control sediment

BIOACCUMULATION TEST FOR SOIL AND SEDIMENT USING *Eisenia* sp.

1. TEST OBJECTIVE

To assess the toxicity and bioaccumulative effects of a soil and/or sediment sample to *Eisenia foetida* (red worm) or other earthworm species.

2. TEST ARTICLE

2.1 Description/Identification

Unless otherwise specified, the test material is supplied by the client. The test article is a soil and/or sediment sample. Adequate chemical and/or biological specifications with special reference to hazardous properties and storage conditions are also supplied by the client. When available, information on the stability, composition, or other characteristics which define the test article are on the file with the client.

2.2 Sample Preparation

Minimal manipulation of the samples is performed in order to evaluate the samples in as close to in situ conditions as possible. Samples can be sieved, if necessary, to remove stones and rocks and then homogenized. Percent moisture of each sample is evaluated using ASTM (D421) standard guide. The percent moisture of the samples may be adjusted as appropriate to meet study objectives (e.g., 35-45% moisture or 75% of water holding capacity). The pH of the samples is determined and may be adjusted (depending on project requirements) using calcium carbonate and dilute mineral acid (HCl) and base (NaOH) if outside the pH range of ≥ 4 but ≤ 10.

An artificial soil/sediment or appropriate project specific reference site soil/sediment is used to evaluate the effect of the test samples to the worms. An artificial soil can be used as the control soil (laboratory control) following the formulation presented in EPA Region IV Standard Operating Procedures for the Toxicity Testing Hazardous Waste Assessment (Harris, et al. 1990). The following constituents are mixed together on a dry weight basis to produce the artificial soil: 10 percent sphagnum peat moss; 20 percent kaolinite clay; and 70 percent grade 70 silica sand. Addition of calcium carbonate (approximately 0.4 percent) is added to adjust to the pH range of 6.5 ± 0.5.

3. EXPERIMENTAL DESIGN

3.1 Test Organisms

3.1.1 Species

The test species is the red worm *Eisenia foetida* or other earthworm species.

3.1.2 Source

E. foetida or other earthworm species used for toxicity tests are obtained from an organism vendor as specified in the report.

3.1.3 Culturing and Holding Conditions

E. foetida used in testing are purchased commercially. Organisms are gradually acclimated to testing temperature in an environmentally controlled laboratory at 20±2°C, with a 16-hour light, 8-hour dark photoperiod. If the organisms need to be held for several days, the cultures can be fed manure and/or baby food *ad libitum*.

3.1.4 Age of Test Organisms at Test Initiation

Adult worms used to initiate testing should be >300 mg (wet weight).

3.2 Test Concentration Series

E. foetida are exposed in replicate chambers to whole soil or sediment samples and to a laboratory control and/or reference sample.

3.3 Test Vessels and Test Volume

Test vessels are typically 10-gal glass aquaria containing approximately 1-gal of sample. The size of the test vessels and the volume of sediment may be changed depending on the study requirements.

3.4 Test Organism Number

The number of organisms exposed per sample should provide enough tissue at the end of the exposure period for the selected chemical analyses. Tests are typically conducted using a

minimum of three replicates per sample with 100 organisms randomly assigned per chamber. A standard loading ratio not to be exceeded is 100 worms per 2,000 g dry weight of sample. The number of replicates and the total number of organisms exposed per sample may be changed depending on the study requirements.

3.5 Test Environment

The test vessels are securely covered (e.g., with plexiglass covers) and are maintained in an environmentally controlled laboratory with continuous lighting. Temperature within the environmental room is monitored continuously using temperature recorders and is maintained at 20±1°C for the 28-day exposure period (unless a different project-specific temperature is required).

3.6 Test Observations

The samples are loaded into the test chambers the day before the worms are introduced to allow the temperature of the samples to equilibrate to the testing temperature. The introduction of the organisms on the following day marks the initiation of the bioaccumulation test. The organisms are observed daily thereafter and observations of non-burial are recorded. Any organisms which have crawled up the side of the exposure chamber are gently placed back onto the surface of the sample. The organisms are not fed during testing.

The study terminates after 28 days of exposure. At test termination, the number of surviving test organisms in each replicate is recorded. Death is defined by a lack of response to a gentle prod to the anterior of the test animal. Worms decompose rapidly in soil, and those organisms not found are presumed dead. The surviving organisms per replicate are then processed accordingly for chemical analyses.

3.7 Data Analysis

Statistical analyses can be performed on percent survival and on chemical concentrations analyzed in each sample. An analysis of variance (ANOVA) and t-Test are used to analyze significance of effects between the control sediment and a single test sediment (US EPA 1994). Alternatively, Tukey's Test may be performed to check the difference between all pairs of treatments. Other appropriate statistical analyses may be performed. The statistical methods used are specified in the final report.

4. FINAL REPORT

The final report is prepared to contain, at a minimum, the following information:

- Objectives and procedures stated in the approved protocol, including any changes made to the original protocol
- Identity of the test article(s) by name or code number and a description of any pretreatment
- Duration of the assay
- Survival observations recorded during the test
- Any unforeseen circumstances that may have affected the quality or integrity of the study
- Signature of the project manager, senior technical reviewer, and quality control officer authorizing release of the report
- Location of all archived data and the original copy of the final report at EA

Items of data to be included in the report consist of experimental design and test performance, effects on general appearance of test organisms (if applicable), morbidity and mortality, survival data, and percent moisture and pH of test samples.

5. QUALITY ASSURANCE

5.1 Amendments to Protocol

Amendments to the authorized protocol established by EA or by the client are made only after proper authorization. Such authorization is achieved by completion of the Protocol Amendment Form by EA after consultation with the client.

5.2 Standard Operating Procedures

Unless otherwise specified, all procedures given in the protocol are subject to detailed Standard Operating Procedures (SOPs) which are contained in the SOP manuals of the participating departments. These SOPs and protocols generally follow the type of requirements in the U.S.

EPA's Good Laboratory Practice Standards (GLPs) (US EPA 1989).

5.3 Reference Toxicant

A reference toxicant test, utilizing 2-Chloroacetamide, or another appropriate chemical is used as an internal quality check of the sensitivity of the test organisms. Testing is conducted on each population of organisms purchased for testing from an outside source if reference toxicant data are not available from the supplier on the acquired lot. The tests are performed as a 48-hour filter paper contact test. The results of each test are compared with historical, species-specific toxicological information from reference toxicant tests performed at EA, to determine if the results are within acceptable limits. Limits are established using the control charts outlined in US EPA (1993).

5.4 Quality Assurance Evaluation

Studies conducted under this protocol may be subject to internal audit by EA's Quality Assurance Unit. A quality control officer is responsible for monitoring each study to assure the client that the facilities, equipment, personnel, methods, practices, records, and controls are in conformance with EA's QC program and, if applicable, EPA's GLPs.

5.5 Inspection by Regulatory Authorities

In the event of an inspection of EA by an outside authority during the course of the study, the client whose study is being inspected will be consulted before examiners are permitted access to any of the project records or the experimental areas.

5.6 Archives

Copies of project-specific records shall be transferred to the client promptly after the project is completed or as negotiated and budgeted. Original primary data are retained at EA for 5 years. Primary data include chain-of-custody records, laboratory data sheets, records, memoranda, notes, photographs, microfilm, and computer printouts that are a result of the original observations and activities of the study and which are necessary for the reconstruction and evaluation of the study report.

5.7 Location

Studies are conducted at the Ecotoxicology Laboratory of EA Engineering, Science, and Technology, Inc. at the Loveton Office in Sparks, Maryland.

6. SPECIFICATIONS OF THE *Eisenia* sp. BIOACCUMULATION TEST

6.1 Basic References

American Public Health Association (APHA), American Water Works Association, Water Environment Federation. 1995. Standard Methods for Examination of Water and Wastewater, 19th or most recent version. APHA, Washington, D.C.

American Society for Testing and Materials (ASTM). 1995. Standard Guide for Conducting a Laboratory Soil Toxicity Test with Lumbricid Earthworm *Eisenia foetida*. ASTM Designation: E1670-95, Philadelphia, Pennsylvania.

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Green, J.C., C.L. Bartels, W.J. Warren-Hicks, B.R. Parkhurst, G.L. Linder, S.A. Peterson, and W.E. Miller. 1989. Protocols for the Short-Term Screening of Hazardous Waste Sites. EPA 600/3-88/029.

Harris, T., J. Glover, and J. Maudsley. 1990. Region IV Standard Operating Procedure for Toxicity Testing Hazardous Waste Assessments. U.S.EPA. Region IV, Athens, Georgia.

Litchfield, J.T., Jr. and F. Wilcoxon. 1949. A simplified method of evaluating dose-effect experiments. J. Pharm. Exp. Ther. 96:99-113.

Peltier, W.H., and C.I. Weber. 1985. Methods for Measuring the Acute Toxicity of Effluents to Freshwater and Marine Organisms. EPA/600/4-85/013. U.S. Environmental Protection Agency. Cincinnati, Ohio.

SAS Institute Inc. 1985. SAS® User's Guide: Basics, Version 5 Edition. Cary, NC: SAS Institute Inc. 1290 pp.

Stephan, C.E. 1977. Methods for calculating an LC50, in Aquatic Toxicology and Hazard Evaluation (F.L. Mayer and J.L. Hamelink, eds.), pp. 65-84. ASTM STP 634. American Society for Testing and Materials, Philadelphia, Pennsylvania.

US EPA. 1989. Toxic Substances Control Act (TSCA); Good Laboratory Practice Standards. Title 40 CFR Part 792. Fed. Regist. 54(158): 34034-34074.

US EPA. 1989. Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms. Second Edition. EPA/600/4-89/001.
U.S. Environmental Protection Agency, Environmental Monitoring Systems Laboratory, Cincinnati, Ohio.

US EPA. 1991. Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms. Fourth Edition. EPA/600/4-90/027. U.S. Environmental Protection Agency, Environmental Monitoring Systems Laboratory, Cincinnati, Ohio.

US EPA. 1993. Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms. Fourth Edition. EPA/600/4-90/027F. U.S. Environmental Protection Agency, Environmental Monitoring Systems Laboratory, Cincinnati, Ohio.

US EPA. 1994. Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms. Third Edition. EPA/600/4-91/002. U.S. Environmental Protection Agency, Environmental Monitoring Systems Laboratory, Cincinnati, Ohio.

6.2 Test Specifications

Test organism: *Eisenia foetida* or other earthworm

Organism age:	Adult (>300 mg wet weight)
Test Type:	Static
Temperature:	20±1°C
Light quality:	Wide-spectrum fluorescent light
Light intensity:	50-100 f.c.
Photoperiod:	24-hour light/0-hour dark
Test container:	10-gal glass aquaria
Sample volume:	approximately 1-gal per replicate
Test soil pH:	≥4 but ≤10 (s.u.)
Artificial soil laboratory control (% weight):	10% sphagnum peat, 20% colloidal clay, 70% silica sand
No. of replicates:	A minimum of 3 replicates
No. organisms per container:	100, not to exceed 100 worms per 2,000 g dry weight of sample
Feeding regime:	Organisms not fed during testing
Test duration:	28 days
Endpoints:	Survival and bioaccumulated concentration of selected chemical parameters
Test acceptability:	≥80 percent survival in control sample

SEDIMENT BIOACCUMULATION TEST WITH AN AQUATIC OLIGOCHAETE SPECIES

1. TEST OBJECTIVE

To assess the toxicity and bioaccumulative effects of a whole sediment sample to an aquatic oligochaete species.

2. TEST ARTICLE

2.1 Description/Identification

Unless otherwise specified, the test material is supplied by the client. The test article is a soil and/or sediment sample. Adequate chemical and/or biological specifications with special reference to hazardous properties and storage conditions are also supplied by the client. When available, information on the stability, composition, or other characteristics which define the test article are on the file with the client.

2.2 Methods of Synthesis

The test article is a whole sediment sample. Information on the methods of synthesis, stability, and composition or other characteristics which define the test article are on the file with the client.

2.3 Sample Preparation

Depending upon the project, the sediment may be screened through a suitably sized sieve to remove large particles and indigenous organisms, and homogenized before being placed in the test chambers. Sediment and overlying water should be added to test vessels 24 hours prior to introduction of test organisms in order to allow suspended sediments to settle.

3. EXPERIMENTAL DESIGN

3.1 Test Organisms

3.1.1 Species

The test species is an aquatic oligochaete species, as specified by the project study plan. A

commonly tested oligochaete species is *Lumbriculus variegatus*. Selection of test species is dependent on project-specific requirements.

3.1.2 Source

The oligochaete organisms used for toxicity tests are obtained from a biological supplier or from in-house laboratory cultures as specified in the final report.

3.1.3 Holding Conditions

Acquired organisms are transferred to holding tanks of fresh water upon receipt at EA's Culture Facility. Prior to use in testing, organisms are held in the laboratory a minimum of 24 hours and are gradually acclimated to testing conditions. During the holding period, dead or unhealthy organisms are removed as observed and recorded on appropriate log sheets as part of the quality control program. Certain regulatory or project specific objectives may require organism acclimation to the dilution water when it is different from the holding/culture water.

3.2 Test Concentration Series

The oligochaete species is exposed in replicate chambers to whole sediment samples. A reference and/or laboratory sediment may also be evaluated.

3.3 Overlying Water

Overlying water for sediment tests is either dechlorinated tap water, moderately hard synthetic fresh water, or an appropriate receiving water. Batches of synthetic fresh water are prepared using the formulation in US EPA (1993).

The source of the dechlorinated tap water is the City of Baltimore municipal water system. Upon entry to the laboratory, the water passes through a high-capacity, activated carbon filtration system to remove chlorine and possible organic contaminants. This water source has proven safe for aquatic organism toxicity testing at EA, as evidenced by maintenance of multigeneration *Daphnia* sp. and fathead minnow cultures with no evident loss of fecundity. The dechlorinated tap water or deionized tap water is mixed with commercially available synthetic sea salts to a salinity specified by the project study plan.

3.4 Test Vessels and Test Volume

Test chambers can range from 1-L beakers to 5-gallon aquaria, depending on the tissue requirement of each specific study, which contain enough sediment to provide an even layer of approximately 2-5 cm on the bottom of each chamber. Overlying water is added to each replicate to bring the total volume to at least ½ to ⅔ the total chamber volume.

3.5 Test Organism Size and Number

Test organisms should be approximately equal in size and should provide enough tissue per replicate for the selected chemical analyses after the test exposure period. The toxicity test is typically conducted with five replicates per test sediment and reference or laboratory sediment, with at least 5 grams of organism tissue per replicate.

3.6 Test Environment

The test vessels are maintained in an environmentally controlled laboratory with a 16-hour light, 8-hour dark photoperiod. Temperature within the environmental room is monitored continuously using temperature recorders and is maintained at 23±1°C (unless a different project-specific temperature is required).

3.7 Test Procedures and Observations

Test organisms are randomly distributed into the test chambers 24 hours after addition of the sediment and overlying water to the test vessels. The ratio of total organic carbon in sediment to dry weight of organisms at the start of the test should be no less than 50:1. Test organisms may be fed Tetramin flake food for the duration of the test; however, test chambers should be examined daily for the formation of fungus or the accumulation of excess food on the sediment surface. Gentle aeration should be initiated in all replicates if the dissolved oxygen level in any replicate drops below 60 percent saturation. Test chambers are examined daily for general organism appearance and behavior and obvious organism mortality.

Depending on project-specific requirements, the overlying water may be renewed during the test. Renewals are accomplished by siphoning the overlying water from each tank to a level approximately 2 cm above the sediment surface. Fresh overlying water is then slowly introduced to each tank so as not to disturb the sediment surface. Alternatively, the test may be conducted under a continuous flow-through system if required by the project.

Samples of overlying water from each test sediment and reference or laboratory sediment may be analyzed for conductivity, alkalinity, hardness, ammonia, and total residual chlorine. Measurements of water quality are taken at test initiation and daily thereafter for dissolved oxygen, pH, temperature, and conductivity from a minimum of one replicate of each test sediment and reference or laboratory sediment. Analytical determinations are conducted according to APHA et al. (1998) and US EPA (1979). Aliquots of overlying water may be gently aerated, if necessary, to maintain dissolved oxygen levels at or above 60 percent saturation.

The toxicity test terminates after the 28 day exposure period. The test duration may be extended at the request of the client. Test organisms are recovered from the test chambers, transferred to clean freshwater chambers (one chamber per replicate), and held at least 24 hours to purge the digestive tracts. The organisms are not fed during the purge period and any organisms that die during this time are recorded and removed if possible. Organisms are then removed from the holding tanks and processed accordingly for the chemical analyses.

3.8 Data Analysis

Statistical analyses can be performed on chemical concentrations analyzed in each sediment sample. An analysis of variance (ANOVA) and t-Test are used to analyze significance of effects between the control sediment and a single test sediment (US EPA 1994). Alternatively, Tukey's Test may be performed to check the difference between all pairs of treatments. Other appropriate statistical analyses may be performed. The statistical methods used are specified in the final report.

4. FINAL REPORT

The final report is prepared to contain, at a minimum, the following information:

- Objectives and procedures stated in the approved protocol, including any changes made to the original protocol
- Identity of the test article(s) by name or code number and their strength (i.e., quality/purity), and a description of any pretreatment
- Source of the overlying water, its chemical characteristics, and a description of any pretreatment
- Test treatments used and duration of the assay

- Organism tissue mass per replicate
- Water quality characteristics (pH, dissolved oxygen, temperature, etc.) of overlying water from reference, control, and test sediment treatments
- Any unforeseen circumstances that may have affected the quality or integrity of the study
- Signature of the project manager, senior technical reviewer, and quality control officer authorizing release of the report
- Location of all archived data and the original copy of the final report at EA

Items of data to be included in the report consist of experimental design and test performance, effects on general appearance of test organisms (if applicable), morbidity and mortality, and presentation of water quality characteristics.

5. QUALITY ASSURANCE

5.1 Amendments to Protocol

Amendments to the authorized protocol established by EA or by the client are made only after proper authorization. Such authorization is achieved by completion of the Protocol Amendment Form by EA after consultation with the client.

5.2 Standard Operating Procedures

Unless otherwise specified, all procedures given in the protocol are subject to detailed Standard Operating Procedures (SOPs) which are contained in the SOP manuals of the participating departments. These SOPs and protocols generally follow the type of requirements in the U.S. EPA's Good Laboratory Practice Standards (GLPs) (US EPA 1989).

5.3 Reference Toxicant

A reference toxicant test, utilizing sodium dodecyl sulfate (SDS), copper sulfate, or another appropriate chemical is used as an internal quality check of the sensitivity of the test organisms. Testing is conducted on each population of organisms purchased for testing from

an outside source if reference toxicant data are not available from the supplier on the acquired lot. The results of each test are compared with historical, species-specific toxicological information from reference toxicant tests performed at EA, to determine if the results are within acceptable limits. Limits are established using the control charts outlined in US EPA (1993).

5.4 Quality Assurance Evaluation

Studies conducted under this protocol may be subject to internal audit by EA's Quality Assurance Unit. A quality control officer is responsible for monitoring each study to assure the client that the facilities, equipment, personnel, methods, practices, records, and controls are in conformance with EA's QC program and, if applicable, EPA's GLPs.

5.5 Inspection by Regulatory Authorities

In the event of an inspection of EA by an outside authority during the course of the study, the client whose study is being inspected will be consulted before examiners are permitted access to any of the project records or the experimental areas.

5.6 Archives

Copies of project-specific records shall be transferred to the client promptly after the project is completed or as negotiated and budgeted. Original primary data are retained at EA for 5 years. Primary data include chain-of-custody records, laboratory data sheets, records, memoranda, notes, photographs, microfilm, and computer printouts that are a result of the original observations and activities of the study and which are necessary for the reconstruction and evaluation of the study report.

5.7 Location

Studies are conducted at the Ecotoxicology Laboratory of EA Engineering, Science, and Technology, Inc. at the Loveton Office in Sparks, Maryland.

6. SPECIFICATIONS OF THE SEDIMENT BIOACCUMULATION TEST WITH AN AQUATIC OLIGOCHAETE SPECIES

6.1 Basic References

American Public Health Association (APHA) American Water Works Association, Water Envrionment Federation. 1998. Standard Methods for Examination of Water and Wastewater, 20th or most recent version. APHA, Washington, D.C.

American Society for Testing and Materials (ASTM). 1991. Standard Practice for Conducting Acute Tests with Fishes, Macroinvertebrates, and Amphibians. ASTM Designation: E729-80, Philadelphia, Pennsylvania.

American Society for Testing and Materials (ASTM). 1995. Standard Guide for Conducting Sediment Toxicity Tests with Freshwater Invertebrates. ASTM Designation: E1383-94, Philadelphia, Pennsylvania.

EA. 1996. Quality Control and Standard Operating Procedures Manual for EA's Ecotoxicology Laboratory. Fifth Revision. EA Manual ATS-102. Internal document prepared by EA's Ecotoxicology Laboratory, EA Engineering, Science, and Technology, Inc., Sparks, Maryland.

US EPA. 1979. Methods for Chemical Analysis of Water and Wastes. EPA/600/4-79/020. U.S. Environmental Protection Agency, Washington, D.C.

US EPA. 1989. Toxic Substances Control Act (TSCA); Good Laboratory Practice Standards. Title 40 CFR Part 792. Fed. Regist. 54(158): 34034-34074.

US EPA. 1989. Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms. Second Edition. EPA/600/4-89/001. U.S. Environmental Protection Agency, Environmental Monitoring Systems Laboratory, Cincinnati, Ohio.

US EPA. 1991. Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms. Fourth Edition. EPA/600/4-90/027. U.S. Environmental Protection Agency, Environmental Monitoring Systems Laboratory, Cincinnati, Ohio.

US EPA. 1993. Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms. Fourth Edition. EPA/600/4-90/027F. U.S. Environmental Protection Agency, Environmental Monitoring Systems Laboratory, Cincinnati, Ohio.

US EPA. 1994a. Methods for Measuring the Toxiciyt and Bioaccumulation of Sediment-associated Contaminants with Freshwater Invertebrates. EPA/600/R-94/024. U.S. Environmental Protection Agency, Office of Research and Development, Duluth, Minnesota.

US EPA. 1994b. Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms. Third Edition. EPA/600/4-91/002. U.S. Environmental Protection Agency, Environmental Monitoring Systems Laboratory, Cincinnati, Ohio.

6.2 Test Specifications

Test organism:	An aquatic oligochaete species, e.g., *Lumbriculus variegatus*, as specified by the project study plan
Temperature:	23±1°C
Light quality:	Wide-spectrum fluorescent light
Light intensity:	50-100 f.c.
Photoperiod:	16-hour light, 8-hour dark
Overlying water:	Laboratory fresh water or appropriate receiving water
Aeration:	Gentle aeration may be provided through a 1-ml glass pipet, placed no closer than 2 cm above the sediment surface
Test vessel:	Depends on project requirements
Test volume:	Approximate 2-5 cm layer of sediment with overlying water

No. of replicates:	5
No. organisms per replicate:	Approximately 5 grams of organism tissue
Feeding regime:	None, unless determined necessary
Test duration:	28 days
Endpoints:	Survival and bioaccumulated concentrations of selected chemical parameters
Test acceptability:	Sufficient biomass at end of the test to conduct analyses

ATTACHMENT II

Ceriodaphnia dubia Chronic Toxicity Testing
Data Sheets

C. dubia CHRONIC TOXICITY TEST DATA SHEET

Beginning Date: 9/14/00 Time: 1220

Project Number: 700003.10 Ending Date: 9/20/00 Time: 1215

Client: IT

QC Test Number: TN-00-618 Adults Isolated Date: 9/13/00 Time: 1224

Test Material: Surface waters Neonates Pulled Date: 9/13/00 Time: 1725

Accession Number: MD-709 to 713 Age of Neonates: <24 hrs Brood Size: 8+

Dilution Water: N/A Source: EA

Accession Number: ~~MD~~ — Culture Water Temperature: 25.1 °C

TEST SET-UP

TEST INITIATION				CONCENTRATION SERIES		
Date	Time	Initials	Activity	Test Concentration	Volume Test Material	Final Volume
9/14/00	1145	OR	Dilutions Made	Lab control	Ø	200ml
9/14/00	1145	OR	Test Vessels Filled			
9/14/00	1220	OR	Organisms Transferred	Hardness control	Ø	
9-14-00	1230	MW	Head Counts			

Comments:

INTERMEDIATE DILUTION PREPARATION AND FEEDING

DILUTION PREPARATION					FEEDING				
					Food: YCT + *Selenastrum capricornutum*				
Day	Date	Time	Initials	Sample / Diluent	Day	Date	Time	Initials	Amount
0	OR 9/14/00	1205	OR	LDO-393 (Lab) LDO-396 (Hard)	0	9/14/00	1230	AS	200ulo
1	MSL 9/15/00	0950	MSL	LDO-396 (Hard) LDO-397 (Lab)	1	9/15/00	1115	MSL	200uls
2	WLM 9/16/00	0850	WLM	(HARD) LDO 396 (LAB) LDO-397	2	9/16/00	1047	RD	200uls
3	9/17/00	0830	CS	(Hard) LDO-396 (Lab) LDO-397	3	9/17/00	1345	CS	200uls
4	9/18/00	0830	CS	(Hard) LDO-396 (Lab) LDO-402	4	9/18/00	1600	D	200uls
5	9/19/00	1017	RD	(Lab) LDO-402 (Hard) LDO-396	5	9/19/00	1125	RD	200uls
6					6				

C. dubia CHRONIC TOXICITY TEST DATA SHEET

Project Number: 70000310
Client: IT OD
QC Test Number: TN-~~00~~-618
Test Material: Surface waters
Accession Number: ATO-709 to 713
Dilution Water: N/A
Accession Number: —

Beginning Date: ~~9/20~~ 9/14/00 Time: 1220
Ending Date: 9/20/00 Time: 1215
Adults Isolated Date: 9/13/00 Time: 1224
Neonates Pulled Date: 9/13/00 Time: 1725
Age of Neonates: <24 hrs Brood Size: 8+
Source: EA
Culture Water Temperature: 25.1 °C

TEST SET-UP

TEST INITIATION

Date	Time	Initials	Activity
9/14/00	1145	OV	Dilutions Made
9/14/00	1145	OV	Test Vessels Filled
9-14-00	~~1230~~ 1220	OV ~~VM~~	Organisms Transferred
	1230	VM	Head Counts

CONCENTRATION SERIES

100% Test Concentration	Volume Test Material	Final Volume
ATO-709	200ml	200ml
ATO-710	↓	↓
ATO-711		
ATO-712		
ATO-713		

Comments:

INTERMEDIATE DILUTION PREPARATION AND FEEDING

DILUTION PREPARATION

Day	Date	Time	Initials	Sample / Diluent
0	9/14/00	1205	OV	ATO-709→713
1	9/15/00	0950	RCL	ATO-709-713
2	9/16/00	0850	WLM	ATO 709-713
3	9/17/00	0830	LS	ATO-709-713
4	9/18/00	0830	CS	ATO-709-713
5	9/19/00	1031	AN	ATO-709-713
6				

FEEDING

Food: YCT + *Selenastrum capricornutum*

Day	Date	Time	Initials	Amount
0	9/14/00	1230	LS	200 µls
1	9/15/00	1115	RCL	200 µl
2	9/16/00	1031	AN	200 µls
3	9/17/00	1345	CS	100 µls
4	9/18/00	1600	CS	200 µls
5	9/19/00	1107	AN	200 µl
6				

QC Test Number: TN-02-618

First column = # neonates ; Second column = 0 (female), 1 (dead female), 2 (male), 3 (dead male), 9 (lost replicate)

Lab Control

Concentration	Day	1	2	3	4	5	6	7	8	9	10	Time/Initials
	1	0	0	0	0	0	0	0	0	0	0	1100 RLL
	2	0	0	0	0	0	0	0	0	0	0	1045/MD
	3	4 0	5 0	3 0	5 0	4 0	3 0	3 0	4 0	3 0	2 0	1320
	4	6 0	12 0	9 0	6 0	9 0	6 0	8 0	8 0	8 0	9 0	1520
	5	0 0	0 0	0 0	0 0	0 0	1 0	0 0	0 0	1 0	0 0	M/1121
10/10	6	15 0	14 0	16 0	14 0	11 0	11 0	13 0	15 0	12 0	13 0	1245 M
	7											
Total # Neonates:		25	31	28	25	24	21	24	27	24	24	

Hardness Control

Concentration	Day	1	2	3	4	5	6	7	8	9	10	Time/Initials
	1	0	0	0	0	0	0	0	0	0	0	RLL
	2	0	0	0	0	0	0	0	0	0	0	MP
	3	3 0	4 0	5 0	5 0	3 0	3 0	3 0	5 0	4 0	5 0	
	4	6 0	6 0	8 0	7 0	9 0	8 0	8 0	9 0	9 0	7 0	JS
	5	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	MP
10/10	6	6 0	8 0	12 0	15 0	13 0	12 0	13 0	11 0	12 0	14 0	M
	7											
Total # Neonates:		15	18	25	27	25	23	24	25	25	26	

Concentration	Day	1	2	3	4	5	6	7	8	9	10	Time/Initials
	1											
	2											
	3											
	4											
	5											
	6											
	7											
Total # Neonates:												

Concentration	Day	1	2	3	4	5	6	7	8	9	10	Time/Initials
	1											
	2											
	3											
	4											
	5											
	6											
	7											
Total # Neonates:												

Concentration	Day	1	2	3	4	5	6	7	8	9	10	Time/Initial
	1											
	2											
	3											
	4											
	5											
	6											
	7											
Total # Neonates:												

Concentration	Day	1	2	3	4	5	6	7	8	9	10	Time/Initia
	1											
	2											
	3											
	4											
	5											
	6											
	7											
Total # Neonates:												

Neonate totals checked (date, initials): 1/11/01 MW

AT
03/C

Ceriodaphnia dubia CHRONIC TOXICITY TEST QC Test Number: TN-00-618

First column = # neonates ; Second column = 0 (female), 1 (dead female), 2 (male), 3 (dead male), 9 (lost replicate)

Concentration	Day	1	2	3	4	5	6	7	8	9	10	Time/Initials
ATO	1	0	0	0	0	0	0	0	0	0	0	1100 RCH
	2	0	0	0	0	0	0	0	0	0	0	1025 AC
709	3	30	30	40	60	60	50	30	40	20	40	85 / 1355
	4	100	80	70	60	90	80	80	70	110	70	1550
	5	20	00	00	00	00	00	00	00	00	00	MN / 1155
10/10	6	90	110	110	150	140	130	110	140	100	120	1200
	7											
Total # Neonates:		24	22	22	26	29	26	22	25	23	23	

Concentration	Day	1	2	3	4	5	6	7	8	9	10	Time/Initials
ATO	1	0	0	0	0	0	0	0	0	0	0	1100 RCH
	2	0	0	0	0	0	0	0	0	0	0	MN
710	3	30	40	50	40	50	40	60	50	40	50	AS
	4	110	100	130	100	100	90	100	110	110	100	AS
	5	00	00	00	00	00	00	00	00	00	00	MN
10/10	6	130	130	140	130	170	110	140	120	150	160	AC
	7											
Total # Neonates:		27	28	32	27	32	24	30	28	30	31	

Concentration	Day	1	2	3	4	5	6	7	8	9	10	Time/Initials
ATO	1	0	0	0	0	0	0	0	0	0	0	RCH
	2	0	0	0	0	0	0	0	0	0	0	MN
711	3	40	40	40	30	50	30	50	40	40	30	AS
	4	110	60	70	60	60	70	110	90	120	100	D
	5	00	00	00	00	00	00	00	00	00	00	MN
10/10	6	90	40	50	60	50	50	50	30	50	20	AC
	7											
Total # Neonates:		24	14	16	15	16	15	21	16	21	15	

Concentration	Day	1	2	3	4	5	6	7	8	9	10	Time/Initials
ATO	1	0	0	0	0	0	0	0	0	0	0	RCH
	2	0	0	0	0	0	0	0	0	0	0	MN
712	3	40	40	30	30	20	30	30	30	30	30	AS
	4	80	90	130	80	100	100	80	80	100	80	D
	5	00	00	00	00	00	00	00	00	00	00	MN
10/10	6	20	120	80	60	120	60	100	50	100	20	AC
	7											
Total # Neonates:		14	25	24	17	24	19	21	16	23	13	

Concentration	Day	1	2	3	4	5	6	7	8	9	10	Time/Initials
ATO	1	0	0	0	0	0	0	0	0	0	0	RCH
	2	0	0	0	0	0	unit 8	0	0	0	0	MN
713	3	30	30	40	30	30		40	40	50	40	AS
	4	80	100	110	90	100		90	100	110	110	D
	5	00	00	00	00	00		00	70	00	00	MN
9/10	6	160	110	140	110	90		120	60	130	160	AC
	7											
Total # Neonates:		27	24	29	23	22	0	25	21	29	31	

Concentration	Day	1	2	3	4	5	6	7	8	9	10	Time/Initials
	1											
	2											
	3											
	4											
	5											
	6											
	7											
Total # Neonates:												

Neonate totals checked (date, initials): 1-11-01 MW

ATS-T4
03/01/00

TOXICITY TEST WATER QUALITY DATA SHEET - NEW SOLUTIONS

Project Number: 70003.10
Client: IT
QC Test Number: TN-00-1018

TEST ORGANISM
Common Name: Water flea
Scientific Name: C. dubia

Beginning Date: 9/14/00 Time: 1220
Ending Date: 9/20/00 Time: 1215

TARGET VALUES Temp: 25±1 °C pH: 6.0 - 9.0 DO: ≥4.0 mg/L Salinity: — ppt

Test Conc	Rep	Temperature (°C) 0	1	2	3	4	5	6	pH 0	1	2	3	4	5	6	Dissolved Oxygen (mg/L) 0	1	2	3	4	5	6	Conductivity (µS/cm) ~~Salinity (ppt)~~ 0	1	2	3	4	5	6
Lab Control		24.4	24.8	24.9	25.9	25.2	25.8		7.5	8.1	8.7	7.9	8.1	8.1		7.8	7.5	7.1	8.2	7.6	7.4		347	307	330	358	310	304	
Hardness Control		24.1	24.3	24.5	25.0	24.7	24.2		8.7	8.4	8.6	8.3	8.4	8.7		7.6	7.8	~~8.6~~ 7.5	8.2	8.1	~~8.7~~ 8.3		776	770	771	783	774	713	
Meter Number		10/106	92/106	73/101	10/103	57	12/103		10/106	92/106	73/101	10/103	73/103	12/103		57	57	57	59	57	57		12/921	12/921	14/921	73/921	73/924	12/921	
Time		1146	0935	0951	1110	1117	1155		1146	0935	0951	1110	1110	1156		1201	0940	1144	1145	1158	1158		1200	0947	0953	1145	1140	1200	
Initials		OV	MLL	MN	MAS	LS	JL		OV	MLL	MN	MAS	LS	JL		OV	MLL	MN	MAS	JL	JL		OV	MLL	MN	MAS	LS	JL	

MN

ATS-T13
03/01/00

TOXICITY TEST WATER QUALITY DATA SHEET - NEW SOLUTIONS

Project Number: 70003.10
Client: IT
QC Test Number: TN-00-618

TEST ORGANISM
Common Name: Waterflea
Scientific Name: C. dubia

Beginning Date: 9/14/00 Time: 1220
Ending Date: 9/20/00 Time: 1215

TARGET VALUES Temp: 25±1 °C pH: 6.0 - 9.0 DO: ≥4.0 mg/L Salinity: — ppt

Test Conc	Rep	Temperature (°C) 0	1	2	3	4	5	6	pH 0	1	2	3	4	5	6	Dissolved Oxygen (mg/L) 0	1	2	3	4	5	6	Conductivity (µS/cm) ~~Salinity (ppt)~~ 0	1	2	3	4	5	6
ATD-709		24.1	24.2	25.0	24.0	24.9	25.1		9.0	9.0	9.0	8.9	9.0	8.9		8.3	7.4	7.5	8.5	7.7	7.9		539	500	467	487	492	489	
ATD-710		24.1	24.2	24.9	24.2	24.7	24.9		8.5	8.5	8.7	8.4	8.5	8.6		8.3	7.6	7.5	8.3	7.6	8.0		643	612	542	590	596	593	
ATD-711		24.1	24.5	24.9	24.1	24.7	24.8		9.2	9.0	9.1	8.9	8.2	8.8		8.1	7.6	7.6	8.5	7.5	7.9		530	525	505	502	517	521	
ATD-712		24.1	24.5	24.9	24.4	24.7	24.8		8.3	8.4	8.8	8.0	8.2	8.3		8.2	7.4	7.4	8.2	7.6	7.9		274	244	248	237	231	232	
ATD-713		24.0	24.4	25.0	24.2	24.8	24.9		8.1	8.1	8.4	8.1	8.3	8.4		8.2	7.6	7.5	8.4	7.8	7.9		576	576	538	534	594	596	
Meter Number		10/106	92/100	72/164	10/103	72/103	72/116		10/106	92/100	72/164	10/103	72/103	72/116		57	57	57	57	57	57		12/421	12/421	12/421	72/921	72/910	11/920	
Time		1148	0935	0951	1010	1442	1016		1148	0935	0951	1010	1442	1016		1201	0940	1001	1145	1445	1005		1200	0945	0953	1145	1440	1000	
Initials		JN	MA	MJ	MAS	LS	JN		JN	MA	MJ	MAS	LS	JN		JN	MA	MJ	MAS	LS	ND		JN	MA	MJ	MAS	LS	JN	

ATS-T13
03/01/00

TOXICITY TEST WATER QUALITY DATA SHEET - OLD SOLUTIONS

Project Number: 70003.10
Client: IT
QC Test Number: TN-00-618

TEST ORGANISM
Common Name: Water flea
Scientific Name: C. dubia

Beginning Date: 9/14/00 Time: 1220
Ending Date: 9/20/00 Time: 1215

TARGET VALUES Temp: 25±1 °C pH: 6.0 - 9.0 DO: ≥ 4.0 mg/L Salinity: — ppt

Test Conc	Rep	Temperature (°C) 1	2	3	4	5	6	7	pH 1	2	3	4	5	6	7	Dissolved Oxygen (mg/L) 1	2	3	4	5	6	7	Conductivity (µS/cm) ~~Salinity (ppt)~~ 1	2	3	4	5	6	7
Lab control		24.1	24.1	24.4	24.4	24.1	24.3		7.9	7.3	7.6	7.9	8.3	7.3		8.1	7.5	7.6	8.0	7.0	7.6		308	330	339	408	343	310	
Hardness control		24.1	24.1	24.4	24.4	24.5	24.4		8.0	7.7	8.0	8.1	8.4	8.0		8.1	7.6	7.5	8.1	7.0	7.8		708	715	744	784	750	732	
Meter Number		92/106	11/106	61/103	14/104	12/103	11/104		92/106	11/106	61/103	14/104	12/103	11/104		57	57	57	57	57	57		11/420	10/421	73/424	73/424	11/420	73/424	
Time		1025	1040	1040	1045	1112	1150		1025	1040	1040	1045	1112	1150		1135	1055	1330	1555	1131	1148		1120	1052	1334	1600	1129	1210	
Initials		MH	MN	D	D	MN	DN		MH	MN	D	D	D	DN		MH	MN	RS	D	MN	DN		MH	MN	RS	D	MN	DN	

ATS-T14
03/01/00

TOXICITY TEST WATER QUALITY DATA SHEET - OLD SOLUTIONS

Project Number: 70003.10
Client: IT
QC Test Number: TN-00-618

TEST ORGANISM
Common Name: Water flea
Scientific Name: C. dubia

Beginning Date: 9/14/00 Time: 1220
Ending Date: 9/20/00 Time: 1215

TARGET VALUES Temp: 25±1 °C pH: 6.0 - 9.0 DO: ≥4.0 mg/L Salinity: — ppt

Test Conc	Rep	Temperature (°C) 1	2	3	4	5	6	7	pH 1	2	3	4	5	6	7	Dissolved Oxygen (mg/L) 1	2	3	4	5	6	7	Conductivity (µS/cm) ~~Salinity (ppt)~~ 1	2	3	4	5	6	7
ATD 709		24.2	24.1	24.1	24.1	24.0	24.1		8.5	8.7	8.5	7.9 8.5	8.4 8.7	8.4		8.0	7.6	7.1	8.4	7.7	7.8		531	535	522	591	536	538	
~~ATD~~																7.1													
ATD 710		24.3	24.1	24.1	24.4	24.1	24.1		8.5	8.8	8.6	8.5	8.5 8.8	8.5		7.4	7.5	7.2	8.3	8.0	7.9		644	594	600	704	710	619	
ATD 711		24.4	24.3	24.3	24.4	24.1	24.2		8.5	8.8	8.5	8.5	8.5 8.8	8.5		7.5	7.5	7.3	8.0	7.9	7.7		574	540	542	590	598	530	
ATD 712		25.4	24.1	24.1	24.4	24.1	24.3		8.3	8.8	8.8	8.6	8.7	8.1		7.4	7.5	7.3	7.8	7.8	7.7		327	286	244	381	340	253	
ATD 713		24.3	24.1	24.1	24.3	24.0	24.3		8.2	8.6	8.3	8.5	8.5	8.2		7.4	7.5	7.2	7.8	7.7	7.6		542	531	530	600	611	517	
Meter Number		92/106	73/104	19/103	14/104	12/103	11/104		92/106	73/104	19/103	14/104	12/103	11/104		57	57	57	57	57	57		11/120	10/101	73/121	73/121	10/121	73/121	
Time		1025	1015	1340	1525	1050	1151		1025	1015	1340	1525	1050	1151		1135	1055	1446	1556	1103	1218		1120	1052	1410	1556	1100	1220	
Initials		RK	MD	AS	D	MD	M		RK	MD	AS	D	MD	M		RK	MD	AS	D	MD	M		RK	MD	AS	D	MD	M	

ATS-T14
03/01/00

TOXICOLOGY LABORATORY BENCH SHEET

Project Number: 7000310

Client: IT

QC Test Number: TN-00-618/619

Date/Time/Initials	Comments/Activity
9/14/0	
or ATO- 709	4.7 ml x 40 = 188 mg/L
-710	5.8 ml = 232 mg/L
-711	4.6 ml = 184 mg/L
-712	1.6 ml = 64 mg/L
-713	6.5 ml = 260 mg/L
	Hardness
LDO - 396	6.5 ml x 40 = 260 mg/L
9/14/00	3.9 L of Superhard H_2O (668 mg/L) + 6.1 L DI
or	10 L of 260 mg/L H_2O — Hardness Control

~~9/16/00~~
~~ATO-~~

9/14/00 RD (AM) Samples screened through Nitex to remove daphnids and duckweed prior to testing.

STATISTICS FOR WATER QUALITY

QC Test: TN-00-618 IT (LAB CONTROL)

	Temperature		pH		DO		Conductivity/Salinity	
	New	Old	New	Old	New	Old	New	Old
1	24.4	24.1	7.5	7.9	7.8	8.1	347.0	308.0
2	24.8	24.1	8.1	7.3	7.5	7.5	307.0	330.0
3	24.9	24.4	8.7	7.6	7.1	7.6	330.0	319.0
4	25.9	24.4	7.9	7.9	8.2	8.3	358.0	408.0
5	25.2	24.1	8.1	8.3	7.6	7.0	320.0	343.0
6	25.8	24.3	8.1	7.3	7.4	7.6	304.0	310.0
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N	6	6	6	6	6	6	6.0	6.0
Min.	24.4	24.1	7.5	7.3	7.1	7.0	304.0	308.0
Max.	25.9	24.4	8.7	8.3	8.2	8.3	358.0	408.0
Mean	25.2	24.2	8.1	7.7	7.6	7.7	327.7	336.3
S.D.	0.59	0.15	0.39	0.39	0.37	0.46	21.7	37.5
N		12		12		12		12.0
Min.		24.1		7.3		7.0		304.0
Max.		25.9		8.7		8.3		408.0
Mean		24.7		7.9		7.6		332.0
S.D.		0.64		0.41		0.40		29.5

1-11-01
W

10/16/2000 11:45 AM

STATISTICS FOR WATER QUALITY

QC Test: TN-00-618 IT (HARDNESS CONTROL)

	Temperature		pH		DO		Conductivity/Salinity	
	New	Old	New	Old	New	Old	New	Old
1	24.1	24.1	8.7	8.0	7.6	8.1	776.0	708.0
2	24.3	24.1	8.4	7.7	7.8	7.6	790.0	715.0
3	24.5	24.7	8.6	8.0	7.5	7.5	771.0	744.0
4	25.0	24.4	8.3	8.1	8.2	8.1	783.0	784.0
5	24.7	24.5	8.4	8.4	8.1	7.0	774.0	750.0
6	24.2	24.4	8.7	8.0	8.3	7.8	713.0	732.0
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N	6	6	6	6	6	6	6.0	6.0
Min.	24.1	24.1	8.3	7.7	7.5	7.0	713.0	708.0
Max.	25.0	24.7	8.7	8.4	8.3	8.1	790.0	784.0
Mean	24.5	24.4	8.5	8.0	7.9	7.7	767.8	738.8
S.D.	0.34	0.23	0.17	0.23	0.33	0.42	27.7	27.4
N		12		12		12		12.0
Min.		24.1		7.7		7.0		708.0
Max.		25.0		8.7		8.3		790.0
Mean		24.4		8.3		7.8		753.3
S.D.		0.28		0.32		0.38		30.3

WW
11/11/01

10/16/2000 11:46 AM

STATISTICS FOR WATER QUALITY

QC Test: TN-00-618 IT (AT0-709)

	Temperature		pH		DO		Conductivity/Salinity	
	New	Old	New	Old	New	Old	New	Old
1	24.1	24.2	9.0	8.5	8.3	8.0	539.0	531.0
2	24.2	24.1	9.0	8.7	7.4	7.6	500.0	535.0
3	25.0	24.1	9.0	8.5	7.5	7.1	467.0	522.0
4	24.0	24.1	8.9	8.5	8.5	8.4	487.0	591.0
5	24.9	24.0	9.0	8.7	7.7	7.7	492.0	536.0
6	25.1	24.1	8.9	8.4	7.9	7.8	489.0	538.0
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N	6	6	6	6	6	6	6.0	6.0
Min.	24.0	24.0	8.9	8.4	7.4	7.1	467.0	522.0
Max.	25.1	24.2	9.0	8.7	8.5	8.4	539.0	591.0
Mean	24.6	24.1	9.0	8.6	7.9	7.8	495.7	542.2
S.D.	0.50	0.06	0.05	0.12	0.44	0.43	23.9	24.6
N		12		12		12		12.0
Min.		24.0		8.4		7.1		467.0
Max.		25.1		9.0		8.5		591.0
Mean		24.3		8.8		7.8		518.9
S.D.		0.41		0.24		0.42		33.5

WW
1-11-01

10/16/2000 11:48 AM

STATISTICS FOR WATER QUALITY

QC Test: TN-00-618 IT (AT0-710)

	Temperature		pH		DO		Conductivity/Salinity	
	New	Old	New	Old	New	Old	New	Old
1	24.1	24.3	8.5	8.5	8.3	7.4	643.0	644.0
2	24.2	24.1	8.5	8.8	7.6	7.5	612.0	594.0
3	24.9	24.1	8.7	8.6	7.5	7.2	542.0	600.0
4	24.2	24.4	8.4	8.5	8.3	8.3	590.0	704.0
5	24.7	24.1	8.5	8.8	7.6	8.0	596.0	710.0
6	24.9	24.1	8.6	8.5	8.0	7.9	593.0	619.0
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N	6	6	6	6	6	6	6.0	6.0
Min.	24.1	24.1	8.4	8.5	7.5	7.2	542.0	594.0
Max.	24.9	24.4	8.7	8.8	8.3	8.3	643.0	710.0
Mean	24.5	24.2	8.5	8.6	7.9	7.7	596.0	645.2
S.D.	0.37	0.13	0.10	0.15	0.37	0.42	32.9	51.0
N		12		12		12		12.0
Min.		24.1		8.4		7.2		542.0
Max.		24.9		8.8		8.3		710.0
Mean		24.3		8.6		7.8		620.6
S.D.		0.31		0.13		0.38		48.3

10-11-01
MM

10/16/2000 11:50 AM

STATISTICS FOR WATER QUALITY

QC Test: TN-00-618 IT (AT0-711)

	Temperature		pH		DO		Conductivity/Salinity	
	New	Old	New	Old	New	Old	New	Old
1	24.1	24.4	9.2	8.5	8.1	7.5	530.0	574.0
2	24.5	24.3	9.0	8.8	7.6	7.5	525.0	540.0
3	24.9	24.3	9.1	8.5	7.6	7.3	505.0	542.0
4	24.1	24.4	8.9	8.5	8.5	8.0	502.0	590.0
5	24.7	24.1	8.2	8.8	7.5	7.9	517.0	598.0
6	24.8	24.2	8.8	8.5	7.9	7.7	521.0	530.0
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N	6	6	6	6	6	6	6.0	6.0
Min.	24.1	24.1	8.2	8.5	7.5	7.3	502.0	530.0
Max.	24.9	24.4	9.2	8.8	8.5	8.0	530.0	598.0
Mean	24.5	24.3	8.9	8.6	7.9	7.7	516.7	562.3
S.D.	0.35	0.12	0.36	0.15	0.38	0.27	11.1	28.7
N		12		12		12		12.0
Min.		24.1		8.2		7.3		502.0
Max.		24.9		9.2		8.5		598.0
Mean		24.4		8.7		7.8		539.5
S.D.		0.28		0.30		0.33		31.6

10-11-01

10/16/2000 11:51 AM

STATISTICS FOR WATER QUALITY

QC Test: TN-00-618 IT (AT0-712)

	Temperature		pH		DO		Conductivity/Salinity	
	New	Old	New	Old	New	Old	New	Old
1	24.1	25.4	8.3	8.3	8.2	7.4	274.0	327.0
2	24.5	24.1	8.4	8.8	7.4	7.5	244.0	286.0
3	24.9	24.1	8.8	8.8	7.4	7.3	248.0	244.0
4	24.4	24.4	8.0	8.6	8.2	7.8	237.0	381.0
5	24.7	24.1	8.2	8.7	7.6	7.8	231.0	390.0
6	24.8	24.3	8.3	8.1	7.9	7.7	232.0	253.0
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N	6	6	6	6	6	6	6.0	6.0
Min.	24.1	24.1	8.0	8.1	7.4	7.3	231.0	244.0
Max.	24.9	25.4	8.8	8.8	8.2	7.8	274.0	390.0
Mean	24.6	24.4	8.3	8.6	7.8	7.6	244.3	313.5
S.D.	0.29	0.51	0.27	0.29	0.37	0.21	16.0	63.0
N		12		12		12		12.0
Min.		24.1		8.0		7.3		231.0
Max.		25.4		8.8		8.2		390.0
Mean		24.5		8.4		7.7		278.9
S.D.		0.40		0.29		0.31		56.8

1-11-01
MW

10/16/2000 11:53 AM

STATISTICS FOR WATER QUALITY

QC Test: TN-00-618 IT (AT0-713)

	Temperature		pH		DO		Conductivity/Salinity	
	New	Old	New	Old	New	Old	New	Old
1	24.0	24.3	8.1	8.2	8.2	7.4	576.0	542.0
2	24.4	24.1	8.1	8.6	7.6	7.5	556.0	531.0
3	25.0	24.1	8.4	8.3	7.5	7.2	538.0	536.0
4	24.2	24.3	8.1	8.5	8.4	7.8	536.0	600.0
5	24.8	24.0	8.3	8.5	7.8	7.7	594.0	611.0
6	24.9	24.3	8.4	8.2	7.9	7.6	596.0	517.0
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N	6	6	6	6	6	6	6.0	6.0
Min.	24.0	24.0	8.1	8.2	7.5	7.2	536.0	517.0
Max.	25.0	24.3	8.4	8.6	8.4	7.8	596.0	611.0
Mean	24.6	24.2	8.2	8.4	7.9	7.5	566.0	556.2
S.D.	0.41	0.13	0.15	0.17	0.35	0.22	26.7	39.3
N		12		12		12		12.0
Min.		24.0		8.1		7.2		517.0
Max.		25.0		8.6		8.4		611.0
Mean		24.4		8.3		7.7		561.1
S.D.		0.35		0.17		0.34		32.4

1-11-01
W

10/16/2000 11:54 AM

Ceriodaphnia Survival and Reproduction Test-6-Day Survival

Start Date:	Test ID: TN-00-618	Sample ID:	
End Date:	Lab ID:	Sample Type:	
Sample Date:	Protocol: EPAF 91-EPA Freshwater	Test Species:	CD-Ceriodaphnia dubia
Comments: IT CORPORATION			

Conc-%	1	2	3	4	5	6	7	8	9	10
HARD. CONT.	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
AT0-709	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
AT0-710	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
AT0-711	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
AT0-712	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
AT0-713	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	1.0000	1.0000	1.0000	1.0000
LAB CONT.	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000

Conc-%	Mean	N-Mean	Resp	Not Resp	Total	N	Fisher's Exact P	1-Tailed Critical
HARD. CONT.	1.0000	1.0000	0	10	10	10		
AT0-709	1.0000	1.0000	0	10	10	10		
AT0-710	1.0000	1.0000	0	10	10	10		
AT0-711	1.0000	1.0000	0	10	10	10		
AT0-712	1.0000	1.0000	0	10	10	10		
AT0-713	0.9000	0.9000	1	9	10	10	0.5000	0.0500
LAB CONT.	1.0000	1.0000	0	10	10	10		

Hypothesis Test (1-tail, 0.05)

ToxCalc v5.0.23

Reviewed by: 1-11-01

Ceriodaphnia Survival and Reproduction Test-Reproduction

Start Date:	Test ID: TN-00-618	Sample ID:	
End Date:	Lab ID:	Sample Type:	
Sample Date:	Protocol: EPAF 91-EPA Freshwater	Test Species:	CD-Ceriodaphnia dubia
Comments: IT CORPORATION			

Conc-%	1	2	3	4	5	6	7	8	9	10	Std. Dev.
HARD. CONT.	15.000	18.000	25.000	27.000	25.000	23.000	24.000	25.000	25.000	26.000	3.80205
AT0-709	24.000	22.000	22.000	26.000	29.000	26.000	22.000	25.000	23.000	23.000	2.29976
AT0-710	27.000	28.000	32.000	27.000	32.000	24.000	30.000	28.000	30.000	31.000	2.55821
AT0-711	24.000	14.000	16.000	15.000	16.000	15.000	21.000	16.000	21.000	15.000	3.40098
AT0-712	14.000	25.000	24.000	17.000	24.000	19.000	21.000	16.000	23.000	13.000	4.42719
AT0-713	27.000	24.000	29.000	23.000	22.000	0.000	25.000	21.000	29.000	31.000	8.76166
LAB CONT.	25.000	31.000	28.000	25.000	24.000	21.000	24.000	27.000	24.000	24.000	2.75076

			Transform: Untransformed						1-Tailed	
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD
HARD. CONT.	23.300	1.0000	23.300	15.000	27.000	16.318	10			
AT0-709	24.200	1.0386	24.200	22.000	29.000	9.503	10			
AT0-710	28.900	1.2403	28.900	24.000	32.000	8.852	10			
*AT0-711	17.300	0.7425	17.300	14.000	24.000	19.659	10	3.719	1.734	2.797
AT0-712	19.600	0.8412	19.600	13.000	25.000	22.588	10			
AT0-713	23.100	0.9914	23.100	0.000	31.000	37.929	10			
LAB CONT.	25.300	1.0858	25.300	21.000	31.000	10.873	10			

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.01)	0.96994	0.868	-0.4153	0.45942
F-Test indicates equal variances (p = 0.75)	1.24976	6.54109		

Hypothesis Test (1-tail, 0.05)	MSDu	MSDp	MSB	MSE	F-Prob	df
Homoscedastic t Test indicates significant differences	2.79729	0.12006	180	13.0111	0.00157	1, 18

AT0-711 versus Hardness Control

ToxCalc v5.0.23

Reviewed by: 1-11-01 WW

Ceriodaphnia Survival and Reproduction Test-Reproduction

Start Date:	Test ID: TN-00-618	Sample ID:	
End Date:	Lab ID:	Sample Type:	
Sample Date:	Protocol: EPAF 91-EPA Freshwater	Test Species:	CD-Ceriodaphnia dubia
Comments: IT CORPORATION			

Conc-%	1	2	3	4	5	6	7	8	9	10
H ARD. CONT.	15.000	18.000	25.000	27.000	25.000	23.000	24.000	25.000	25.000	26.000
AT0-709	24.000	22.000	22.000	26.000	29.000	26.000	22.000	25.000	23.000	23.000
AT0-710	27.000	28.000	32.000	27.000	32.000	24.000	30.000	28.000	30.000	31.000
AT0-711	24.000	14.000	16.000	15.000	16.000	15.000	21.000	16.000	21.000	15.000
AT0-712	14.000	25.000	24.000	17.000	24.000	19.000	21.000	16.000	23.000	13.000
AT0-713	27.000	24.000	29.000	23.000	22.000	0.000	25.000	21.000	29.000	31.000
LAB CONT.	25.000	31.000	28.000	25.000	24.000	21.000	24.000	27.000	24.000	24.000

			Transform: Untransformed						1-Tailed	
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD
H ARD. CONT.	23.300	1.0000	23.300	15.000	27.000	16.318	10			
AT0-709	24.200	1.0386	24.200	22.000	29.000	9.503	10			
AT0-710	28.900	1.2403	28.900	24.000	32.000	8.852	10			
AT0-711	17.300	0.7425	17.300	14.000	24.000	19.659	10			
*AT0-712	19.600	0.8412	19.600	13.000	25.000	22.588	10	2.005	1.734	3.200
AT0-713	23.100	0.9914	23.100	0.000	31.000	37.929	10			
LAB CONT.	25.300	1.0858	25.300	21.000	31.000	10.873	10			

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.01)	0.91734	0.868	-0.7113	-0.5852
F-Test indicates equal variances (p = 0.66)	1.35588	6.54109		

Hypothesis Test (1-tail, 0.05)	MSDu	MSDp	MSB	MSE	F-Prob	df
Homoscedastic t Test indicates significant differences	3.20007	0.13734	68.45	17.0278	0.06024	1, 18

AT0-712 versus Hardness Control

ToxCalc v5.0.23

Reviewed by: 1-11-01

Ceriodaphnia Survival and Reproduction Test-Reproduction

Start Date:	Test ID: TN-00-618	Sample ID:	
End Date:	Lab ID:	Sample Type:	
Sample Date:	Protocol: EPAF 91-EPA Freshwater	Test Species:	CD-Ceriodaphnia dubia
Comments: IT CORPORATION			

Conc-%	1	2	3	4	5	6	7	8	9	10
HARD. CONT.	15.000	18.000	25.000	27.000	25.000	23.000	24.000	25.000	25.000	26.000
AT0-709	24.000	22.000	22.000	26.000	29.000	26.000	22.000	25.000	23.000	23.000
AT0-710	27.000	28.000	32.000	27.000	32.000	24.000	30.000	28.000	30.000	31.000
AT0-711	24.000	14.000	16.000	15.000	16.000	15.000	21.000	16.000	21.000	15.000
AT0-712	14.000	25.000	24.000	17.000	24.000	19.000	21.000	16.000	23.000	13.000
AT0-713	27.000	24.000	29.000	23.000	22.000	0.000	25.000	21.000	29.000	31.000
LAB CONT.	25.000	31.000	28.000	25.000	24.000	21.000	24.000	27.000	24.000	24.000

			Transform: Untransformed					Rank	1-Tailed
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	Sum	Critical
HARD. CONT.	23.300	1.0000	23.300	15.000	27.000	16.318	10		
AT0-709	24.200	1.0386	24.200	22.000	29.000	9.503	10		
AT0-710	28.900	1.2403	28.900	24.000	32.000	8.852	10		
AT0-711	17.300	0.7425	17.300	14.000	24.000	19.659	10		
AT0-712	19.600	0.8412	19.600	13.000	25.000	22.588	10		
AT0-713	23.100	0.9914	23.100	0.000	31.000	37.929	10	110.50	82.00
LAB CONT.	25.300	1.0858	25.300	21.000	31.000	10.873	10		

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates non-normal distribution (p <= 0.01)	0.75372	0.868	-2.4699	7.95677
F-Test indicates equal variances (p = 0.02)	5.31053	6.54109		

Hypothesis Test (1-tail, 0.05)

Wilcoxon Two-Sample Test indicates no significant differences

AT0-713 versus Hardness control

ToxCalc v5.0.23

Reviewed by: 1-11-01

C. dubia CHRONIC TOXICITY TEST DATA SHEET

Project Number: 7000310
Client: IT
QC Test Number: IN-00-623
Test Material: Surface waters
Accession Number: ATD-724, 725, 728 → 730
Dilution Water: N/A
Accession Number: N/A

Beginning Date: 9/16/00 Time: 1540
Ending Date: 9/22/00 Time: 1530
Adults Isolated Date: 9/15/00 Time: ~~1600~~ 1600 hr
Neonates Pulled Date: 9/15/00 Time: 1900
Age of Neonates: <24 hrs Brood Size: 8+
Source: EA
Culture Water Temperature: _____ °C

TEST SET-UP

TEST INITIATION

Date	Time	Initials	Activity
9/16/00	1350	RD	Dilutions Made
	1351	RD	Test Vessels Filled
	1540	RD	Organisms Transferred
	1603	OR	Head Counts

CONCENTRATION SERIES

Test Concentration	Volume Test Material	Final Volume
Lab control	0	1500 mls
Hardness control	0	

Comments:

INTERMEDIATE DILUTION PREPARATION AND FEEDING

DILUTION PREPARATION

Day	Date	Time	Initials	Sample / Diluent
0	9/16/00	1350	RD	(Lab) LDO-397 (Hard) LDO-400
1	9/17/00	1305	OR	(Lab) LDO-398 (Hard) LDO-400
2	9/18/00	1501	OR	(Lab) LDO-402 (Hd) LDO-400
3	9/19/00	1030	OR	(Lab) LDO 402 (Hd) LDO-400
4	9/20/00	1319	RD	(Lab) LDO-402 (Hd) LDO-400
5	9/21/00	945	LS	LDO-404 (Lab) LDO-400 (Hd)
6				

FEEDING

Food: YCT + *Selenastrum capricornutum*

Day	Date	Time	Initials	Amount
0	9/16/00	1605	OR	200 mls
1	9/17/00	1535	OR	200 mls
2	9/18/00	1520	OR	200 mls
3	9/19/00	1130	OR	200 mls
4	9/20/00	1338	RD	200 mls
5	9/21/00	0955	LS	200 mls
6				

C. dubia CHRONIC TOXICITY TEST DATA SHEET

Beginning Date: 9/16/00 Time: 1540

Project Number: 70003.10 Ending Date: 9/22/00 Time: 1530

Client: IT

QC Test Number: IN-00-623 Adults Isolated Date: 9/15/00 Time: ~~1300~~ 1600 LA

Test Material: surface waters Neonates Pulled Date: 9/15/00 Time: 1900

Accession Number: ATO-724, 725, 728-730 Age of Neonates: <24 hrs Brood Size: 8+

Dilution Water: N/A Source: EA

Accession Number: N/A Culture Water Temperature: _____ °C

TEST SET-UP

TEST INITIATION				CONCENTRATION SERIES		
Date	Time	Initials	Activity	100% Test Concentration	Volume Test Material	Final Volume
9/16/00	1351	NP	Dilutions Made	ATO-724	1500 ml	1500 ml
	1351	NP	Test Vessels Filled	ATO-725		
	1540	NP	Organisms Transferred	ATO-728		
	1603	D	Head Counts	ATO-729		
				ATO-730		

Comments:

INTERMEDIATE DILUTION PREPARATION AND FEEDING

DILUTION PREPARATION					FEEDING (Food: YCT + *Selenastrum capricornutum*)				
Day	Date	Time	Initials	Sample / Diluent	Day	Date	Time	Initials	Amount
0	9/16/00	1351	NP	ATO-724, 725, 728, 729, 730	0	9/16/00	1605	D	200 mls
1	9/17/00	1300	OV	ATO-724, 725, 728, 729, 730	1	9/17/00	1325	OV	200 mls
2	9/18/00	1406	OV	ATO-724, 725, 728, 729, 730	2	9/18/00	1445	OV	200 mls
3	9/19/00	1030	DJ	ATO-724, 725, 728, 729, 730	3	9/19/00	1108	DJ	200 mls
4	9/20/00	1319	NP	ATO-724, 725, 728, 729, 730	4	9/20/00	1425	NP	200 mls
5	9/21/00	945	LS	ATO-724, 725, 728, 729, 730	5	9/21/00	0955	LS	200 mls
6					6				

Ceriodaphnia dubia CHRONIC TOXICITY TEST QC Test Number: TN-00-623

First column = # neonates ; Second column = 0 (female), 1 (dead female), 2 (male), 3 (dead male), 9 (lost replicate)

Lab Control

Concentration	Day	1	2	3	4	5	6	7	8	9	10	Time/Initials
	1	0	0	0	0	0	0	0	0	0	0	1335 JN
	2	0	0	0	0	0	0	0	0	0	0	1507 OV
	3	0 0	5 0	6 0	4 0	5 0	3 0	2 0	0 0	2 0	4 0	1130 JZ
	4	0 0	7 0	2 0	0 0	7 0	0 0	4 0	7 0	0 0	5 0	1331 / MN
	5	6 0	0 0	6 0	8 0	0 0	0 0	0 0	0 0	6 0	0 0	945 BS
	6	10 0	12 0	13 0	7 0	11 0	8 0	6 0	13 0	7 0	10 0	1536 JZ
10/10	7											
Total # Neonates:		16	24	27	19	23	11	12	20	15	19	

Hardness Control

Concentration	Day	1	2	3	4	5	6	7	8	9	10	Time/Initials
	1	0	0	0	0	0	0	0	0	0	0	OV
	2	0	0	0	0	0	0	0	0	0	0	OV
	3	3 0	3 0	5 0	5 0	0 0	0 0	4 0	5 0	3 0	3 0	JZ
	4	7 0	8 0	8 0	6 0	4 0	0 0	5 0	5 0	4 0	8 0	MN
	5	0 0	0 0	0 0	0 0	0 0	7 0	0 0	0 0	0 0	0 0	BS
	6	14 ~~10~~ 0	11 0	12 0	0 0	0 0	12 0	9 0	0 0	7 0	10 0	JZ
10/10	7											
Total # Neonates:		24	22	25	11	4	19	18	10	14	21	

Concentration	Day	1	2	3	4	5	6	7	8	9	10	Time/Initials
	1											
	2											
	3											
	4											
	5											
	6											
	7											
Total # Neonates:												

Concentration	Day	1	2	3	4	5	6	7	8	9	10	Time/Initials
	1											
	2											
	3											
	4											
	5											
	6											
	7											
Total # Neonates:												

Concentration	Day	1	2	3	4	5	6	7	8	9	10	Time/Initials
	1											
	2											
	3											
	4											
	5											
	6											
	7											
Total # Neonates:												

Concentration	Day	1	2	3	4	5	6	7	8	9	10	Time/Initials
	1											
	2											
	3											
	4											
	5											
	6											
	7											
Total # Neonates:												

Neonate totals checked (date, initials): 1-11-01 MN

ATS-T4
03/01/00

EA

Ceriodaphnia dubia CHRONIC TOXICITY TEST

QC Test Number: TN00-623

First column = # neonates ; Second column = 0 (female), 1 (dead female), 2 (male), 3 (dead male), 9 (lost replicate)

Concentration	Day	1	2	3	4	5	6	7	8	9	10	Time/Initials
ATO-724	1	0	0	0	0	0	0	0	0	0	0	OR/1320
	2	0	0	0	0	0	0	0	0	0	0	[illegible]
	3	0 0	3 0	4 0	0 0	0 0	0 0	6 0	0 0	5 0	6 0	1055
	4	0 0	6 0	5 0	7 0	4 0	5 0	4 0	3 0	0 0	0 0	1411 RD
	5	4 0	0 0	0 0	0 0	5 0	0 0	0 0	5 0	10 0	9 0	1025 RS
9/10	6	12 0	15 0	11 0	11 0	12 0	12 0	4 1	12 0	15 0	10 0	1530 JZ
	7											
Total # Neonates:		16	24	20	18	21	17	14	20	30	25	

Concentration	Day	1	2	3	4	5	6	7	8	9	10	Time/Initials
ATO-725	1	0	0	0	0	0	0	0	9	0	0	OR
	2	0	0	0	0	0	0	0		0	0	OR
	3	0 0	5 0	3 0	0 0	0 0	0 0	5 0		0 0	5 0	JZ
	4	4 0	8 0	2 0	4 0	2 0	6 0	7 0		6 0	5 0	RD
	5	4 0	0 0	8 0	0 0	8 0	0 0	2 0		0 0	0 0	RS
9/9	6	9 0	11 0	13 0	14 0	14 0	13 0	10 0		~~0 0~~ 12 0	13 0	JZ
	7											
Total # Neonates:		19	24	26	18	24	19	22	MR	18	23	

Concentration	Day	1	2	3	4	5	6	7	8	9	10	Time/Initials
ATO-728	1	0	0	0	0	0	0	0	0	0	0	OR
	2	0	0	10	0	0	0	0	0	0	0	OR
	3	0 0	4 0		6 0	0 0	0 0	5 0	0 0	4 0	3 0	JZ
	4	2 0	4 0		8 0	3 0	3 0	8 0	2 0	4 0	5 0	RD
	5	6 0	0 0		0 0	0 0	8 0	0 0	6 0	0 0	1 0	RS
9/10	6	0 0	12 0		15 0	16 0	14 0	14 0	9 0	10 0	11 0	JZ
	7											
Total # Neonates:		8	20	0	29	25	25	27	17	18	20	

Concentration	Day	1	2	3	4	5	6	7	8	9	10	Time/Initials
ATO-729	1	0	0	0	0	0	0	0	0	0	0	OR
	2	0	0	0	0	0	0	0	0	0	0	OR
	3	0 0	5 0	4 0	4 0	4 0	0 0	0 0	4 0	0 0	4 0	JZ
	4	5 0	7 0	3 0	5 0	6 0	2 0	4 0	8 0	4 0	6 0	RD
	5	4 0	0 0	0 0	0 0	0 0	9 0	0 0	0 0	8 0	0 0	RS
10/10	6	8 ~~00~~	15 ~~00~~	13 ~~0~~	11 ~~0~~	11 ~~0~~	13 0	13 0	15 0	9 0	10 0	JZ
	7	06	45	45	45							
Total # Neonates:		9	27	20	20	21	24	17	27	21	20	

Concentration	Day	1	2	3	4	5	6	7	8	9	10	Time/Initials
ATO-730	1	0	0	0	0	0	0	0	0	0	0	OR
	2	0	0	0	0	0	0	0	0	0	0	OR
	3	0 0	2 0	5 0	5 0	0 0	0 0	3 0	0 0	5 0	5 0	JZ
	4	0 0	5 0	7 0	5 0	2 0	3 0	6 0	3 0	8 0	5 0	RD
	5	4 0	0 0	2 0	0 0	4 0	6 0	0 0	4 0	0 0	0 0	RS
10/10	6	13 0	12 0	13 0	10 0	13 0	11 0	14 0	12 0	13 0	13 0	JZ
	7											
Total # Neonates:		19	19	27	20	19	20	23	19	26	23	

Concentration	Day	1	2	3	4	5	6	7	8	9	10	Time/Initials
	1					~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	RD
	2											
	3											
	4											
	5											
	6											
	7											
Total # Neonates:												

Neonate totals checked (date, initials): 1-11-01 MW

TOXICITY TEST WATER QUALITY DATA SHEET - NEW SOLUTIONS

Project Number: 70003.10
Client: IT
QC Test Number: JN-00-623

TEST ORGANISM
Common Name: Water flea
Scientific Name: C. dubia

Beginning Date: 9/16/00 Time: 1540
Ending Date: 9/22/00 Time: 1530

TARGET VALUES Temp: 25±1 °C pH: 6.0 - 9.0 DO: ≥4.0 mg/L Salinity: — ppt

Test Conc	Rep	Temperature (°C) 0	1	2	3	4	5	6	pH 0	1	2	3	4	5	6	Dissolved Oxygen (mg/L) 0	1	2	3	4	5	6	Conductivity (µS/cm) ~~Salinity (ppt)~~ 0	1	2	3	4	5	6
Lab Control		25.4	25.2	25.1	25.8	25.8	25.8		8.3	8.3	8.2	8.1	8.6 / 7.9	8.6		7.3	8.3	7.6	7.4	7.9 / 7.4	7.9		343	347	320	364	291 / 296	291	
Hard Control		24.0	25.1	24.9	24.8	24.0	25.3		8.5	8.4	8.4	8.4	8.3	8.5		7.2	8.3	8.3	8.6	8.3 / 8.5	8.3		1050	1091	1119	1014	157 / 1054	157	
Meter Number		12/103	10/103	73/103	12/103	11/101	55		12/103	10/103	73/103	12/103	10/103	10/103		57	57	57	57	57 / 55	55		11/920	73/921	11/920	12/921	73/920	12/920	
Time		1512	1120	1429	1155	945	920		1512	1120	1429	1155	935	930		1515	1040	1419	1200	945 / 1020	0920		1513	1135	1420	1200	940 / 1015	940	
Initials		MM	MAS	OL	SS	RS	RS		MM	MAS	OL	SS	RS	RS		MM	MAS	OL	SS	RS	RS		MM	MAS	OL	SS	RS	RS	

ATS-T13
03/01/00

TOXICITY TEST WATER QUALITY DATA SHEET - NEW SOLUTIONS

Project Number: 700053.10
Client: IT
QC Test Number: TN-00623

TEST ORGANISM
Common Name: Water flea
Scientific Name: C. dubia

Beginning Date: 9/16/00 Time: 1540
Ending Date: 9/22/00 Time: 1530

TARGET VALUES Temp: 25±1 °C pH: 6.0 - 9.0 DO: ≥4.0 mg/L Salinity: — ppt

Test Conc	Rep	Temperature (°C) 0	1	2	3	4	5	6	pH 0	1	2	3	4	5	6	Dissolved Oxygen (mg/L) 0	1	2	3	4	5	6	Conductivity (µS/cm) ~~Salinity (ppt)~~ 0	1	2	3	4	5	6
AID-724		25.1	24.0	25.1	24.0	26.0	25.1		8.1	8.2	8.1	8.1	8.1	8.3		8.0	7.7	7.6	7.7	7.6	8.1		646	~~654~~ 640	564	584	513	559	
AID-725		25.1	24.0	25.2	24.0	26.0	24.3		8.1	8.1	8.1	8.1	8.1	8.3		7.8	8.5	7.7	7.8	7.7	8.1		637	535	547	553	520	554	
AID-728		25.0	24.0	25.2	24.1	24.4	24.5		8.1	8.3	8.2	8.3	8.2	8.4		7.7	8.6	7.7	7.8	8.0	8.1		690	632	578	582	553	536	
AID-729		25.1	24.2	25.4	24.0	24.3	24.2		8.2	8.3	8.1	8.2	8.2	8.3		7.6	8.4	7.7	7.9	8.0	8.2		681	620	567	573	533	517	
AID-730		24.4	24.2	25.4	24.0	24.9	24.6		7.8	7.9	8.1	8.3	8.2	8.4		8.1	7.3	7.7	7.8	7.7	8.2		720	665	574	571	546	586	
Meter Number		57	19/103	73/103	73/104	19/108	55		73/16	19/103	73/103	73/104	19/105	19/103		57	57	57	57	57	55		11/120	73/921	11/920	11/920	73/921	11/920	
Time		1315	1120	1429	1030	1035	920		1317	1120	1429	1030	1035	920		1315	1040	1419	0952	1020	920		1323	1135	1424	1020	1026	925	
Initials		nn	VAS	OL	ND	RS	RS		nn	VAS	OL	ND	RS	RS		nn	VAS	OL	ND	RS	RS		nn	VAS	OL	ND	RS	RS	

ATS-T13
03/01/00

TOXICITY TEST WATER QUALITY DATA SHEET - OLD SOLUTIONS

Project Number: 70003.10
Client: IT
QC Test Number: TN-00-623

TEST ORGANISM
Common Name: Water flea
Scientific Name: C. dubia

Beginning Date: 9/16/00 Time: 1540
Ending Date: 9/22/00 Time: 1530

TARGET VALUES Temp: 25±1 °C pH: 6.0 - 9.0 DO: ≥4.0 mg/L Salinity: — ppt

Test Conc	Rep	Temperature (°C) 1	2	3	4	5	6	7	pH 1	2	3	4	5	6	7	Dissolved Oxygen (mg/L) 1	2	3	4	5	6	7	Conductivity (µS/cm) ~~Salinity (ppt)~~ 1	2	3	4	5	6	7
Lab Control		25.4	25.2	24.0	24.3	26.0	24.3		8.2	8.1	8.2	7.6	8.2	~~10.9~~ 7.9 unit		7.7	7.6	8.2	6.4	8.1	7.9		322	336	313	310	265	310	
Hard Control		25.4	25.1	24.0	24.3	26.7	24.3		8.3	8.2	8.3	8.1	8.2	8.4		7.5	7.6	8.0	6.4	7.0	7.7		1012	1057	1090	1027	981	~~1180~~ 1110	82
Meter Number		L2/104	12/104	73/104	10/103	19/103	10/103		12/104	12/104	73/104	10/15	19/103	10/103		57	57	57	57	55			73/921	11/920	11/920	12/920	12/920	73/921	
Time		1531	1430	1120	1325	930	1508		1330	1430	1120	1325	930	1508		1341	1518	1130	1340	1555			1337	1511	1130	1344	955	1550	
Initials		OV	OV	DZ	DZ	RS	DZ		OV	OV	DZ	DZ	RS	DZ		OV	OV	DZ	DZ	DZ			OV	OV	DZ	DZ	RS	DZ	

ATS-T14
03/01/00

TOXICITY TEST WATER QUALITY DATA SHEET - OLD SOLUTIONS

Project Number: 70003.10
Client: IT
QC Test Number: TN-00-1023

TEST ORGANISM
Common Name: Water flea
Scientific Name: C. dubia

Beginning Date: 9/16/00 Time: 1540
Ending Date: 9/22/00 Time: 1530

TARGET VALUES Temp: 25±1 °C pH: 6.0 - 9.0 DO: ≥4.0 mg/L Salinity: — ppt

Test Conc	Rep	Temperature (°C) 1	2	3	4	5	6	7	pH 1	2	3	4	5	6	7	Dissolved Oxygen (mg/L) 1	2	3	4	5	6	7	Conductivity (µS/cm) ~~Salinity (ppt)~~ 1	2	3	4	5	6	7
ATD-724		24.5	24.4	24.0	24.0	24.2	24.3		7.9	8.1	8.2	8.1	8.3	8.2		8.1	8.1	8.2	7.9	8.0	8.0		499	446	506	503	483	467	
ATD-725		24.5	24.7	24.0	24.1	24.1	24.3		8.0	8.2	8.3	8.2	8.3	8.2		8.1	8.2	8.1	7.8	7.9	7.9		475	425	486	477	460	430	
ATD-728		24.6	24.8	24.0	24.4	24.3	24.3		8.0	8.2	8.3	8.2	8.3	8.2		8.1	8.2	7.9	7.7	7.6	7.7		485	459	496	476	472	440	
ATD-729		24.7	24.9	24.0	24.4	24.5	24.3		8.0	8.1	8.2	8.2	8.3	8.2		8.1	8.2	7.9	7.8	7.5	7.7		472	448	483	463	465	436	
ATD-730		24.3	24.7	24.0	24.6	24.5	24.3		8.0	8.2	8.3	8.2	8.3	8.2		8.1	8.1	8.0	7.8	7.4	7.6		495	449	480	468	468	453	
Meter Number		12/104	12/104	12/103	14/103	10/103	10/103		12/104	12/104	12/103	14/103	10/103	10/103		57	57	57	57	55	55		73/421	11/420	18/421	12/420	12/420	73/421	
Time		1307	1424	1045	1356	0935	1508		1307	1424	1045	1356	0935	1508		1311	1418	1112	1431	1040	1555		1337	1514	1110	1429	1035	1550	
Initials		ON	ON	DT	AN	RS	DT		ON	ON	DT	AN	RS	DT		ON	ON	DT	AN	RS	DT		ON	ON	DT	AN	RS	DT	

ATS-T14
03/01/00

TOXICOLOGY LABORATORY BENCH SHEET

Project Number: 70003.10

Client: IT

QC Test Number: TN-00-623

Date/Time/Initials		Comments/Activity: Hardness (mg/L)
9/16/00	ATO-724	~~36~~ 396
WEM	-725	404
(CAH)	-728	420
	-729	412
	-730	420

5.66 L of SuperHard H_2O (668 mg/L) + 3.34 L DI ⇒ 9 L of Hardness Contr (420 mg/L)

LDO-400 = 340 mg/L Hardness
(no SuperHard water remained to "bump up" hardness)

STATISTICS FOR WATER QUALITY

QC Test: TN-00-623 IT (LAB CONTROL)

	Temperature		pH		DO		Conductivity/Salinity	
	New	Old	New	Old	New	Old	New	Old
1	25.4	25.4	8.3	8.2	7.3	7.7	343.0	322.0
2	25.2	25.2	8.3	8.1	8.3	7.6	347.0	336.0
3	25.1	24.0	8.2	8.2	7.6	8.2	320.0	313.0
4	25.8	24.3	8.1	7.6	7.4	6.4	304.0	310.0
5	25.8	25.0	7.9	8.2	7.4	8.1	296.0	285.0
6	25.9	24.3	8.6	7.9	7.9	7.9	291.0	310.0
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N	6	6	6	6	6	6	6.0	6.0
Min.	25.1	24.0	7.9	7.6	7.3	6.4	291.0	285.0
Max.	25.9	25.4	8.6	8.2	8.3	8.2	347.0	336.0
Mean	25.5	24.7	8.2	8.0	7.7	7.7	316.8	312.7
S.D.	0.34	0.57	0.23	0.24	0.38	0.65	24.0	16.8
N		12		12		12		12.0
Min.		24.0		7.6		6.4		285.0
Max.		25.9		8.6		8.3		347.0
Mean		25.1		8.1		7.7		314.8
S.D.		0.63		0.25		0.51		19.9

171-01
MW

10/16/2000 1:37 PM

STATISTICS FOR WATER QUALITY

QC Test: TN-00-623 IT (HARDNESS CONTROL)

	Temperature		pH		DO		Conductivity/Salinity	
	New	Old	New	Old	New	Old	New	Old
1	24.0	25.4	8.5	8.3	7.2	7.5	1050.0	1012.0
2	25.1	25.1	8.4	8.2	8.3	7.6	1091.0	1055.0
3	24.9	24.0	8.4	8.3	8.3	8.0	1119.0	1090.0
4	24.8	24.3	8.4	8.1	8.6	6.4	1014.0	1027.0
5	24.0	25.7	8.3	8.2	8.5	7.8	1054.0	981.0
6	25.3	24.3	8.5	8.4	8.3	7.7	1157.0	1110.0
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N	6	6	6	6	6	6	6.0	6.0
Min.	24.0	24.0	8.3	8.1	7.2	6.4	1014.0	981.0
Max.	25.3	25.7	8.5	8.4	8.6	8.0	1157.0	1110.0
Mean	24.7	24.8	8.4	8.3	8.2	7.5	1080.8	1045.8
S.D.	0.56	0.69	0.08	0.10	0.51	0.57	52.0	48.7
N		12		12		12		12.0
Min.		24.0		8.1		6.4		981.0
Max.		25.7		8.5		8.6		1157.0
Mean		24.7		8.3		7.9		1063.3
S.D.		0.60		0.12		0.63		51.4

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STATISTICS FOR WATER QUALITY

QC Test: TN-00-623 IT (AT0-724)

	Temperature		pH		DO		Conductivity/Salinity	
	New	Old	New	Old	New	Old	New	Old
1	25.1	24.5	8.1	7.9	8.0	8.1	646.0	499.0
2	24.0	24.4	8.2	8.1	7.7	8.1	640.0	446.0
3	25.1	24.0	8.1	8.2	7.6	8.2	564.0	506.0
4	24.0	24.0	8.1	8.1	7.7	7.9	584.0	503.0
5	25.0	24.2	8.1	8.3	7.6	8.0	543.0	483.0
6	25.1	24.3	8.3	8.2	8.1	8.0	559.0	467.0
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N	6	6	6	6	6	6	6.0	6.0
Min.	24.0	24.0	8.1	7.9	7.6	7.9	543.0	446.0
Max.	25.1	24.5	8.3	8.3	8.1	8.2	646.0	506.0
Mean	24.7	24.2	8.2	8.1	7.8	8.1	589.3	484.0
S.D.	0.56	0.21	0.08	0.14	0.21	0.10	43.6	23.7
N		12		12		12		12.0
Min.		24.0		7.9		7.6		446.0
Max.		25.1		8.3		8.2		646.0
Mean		24.5		8.1		7.9		536.7
S.D.		0.47		0.11		0.21		64.4

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STATISTICS FOR WATER QUALITY
QC Test: TN-00-623 IT (AT0-725)

	Temperature		pH		DO		Conductivity/Salinity	
	New	Old	New	Old	New	Old	New	Old
1	25.1	24.5	8.1	8.0	7.8	8.1	637.0	475.0
2	24.0	24.7	8.1	8.2	8.5	8.2	535.0	425.0
3	25.2	24.0	8.1	8.3	7.7	8.1	547.0	486.0
4	24.0	24.1	8.1	8.2	7.8	7.8	553.0	477.0
5	25.0	24.9	8.1	8.3	7.7	7.9	520.0	460.0
6	24.3	24.3	8.3	8.2	8.1	7.9	554.0	430.0
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N	6	6	6	6	6	6	6.0	6.0
Min.	24.0	24.0	8.1	8.0	7.7	7.8	520.0	425.0
Max.	25.2	24.9	8.3	8.3	8.5	8.2	637.0	486.0
Mean	24.6	24.4	8.1	8.2	7.9	8.0	557.7	458.8
S.D.	0.56	0.35	0.08	0.11	0.31	0.15	40.9	25.7
N		12		12		12		12.0
Min.		24.0		8.0		7.7		425.0
Max.		25.2		8.3		8.5		637.0
Mean		24.5		8.2		8.0		508.3
S.D.		0.46		0.10		0.24		61.0

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STATISTICS FOR WATER QUALITY

QC Test: TN-00-623 IT (AT0-728)

	Temperature		pH		DO		Conductivity/Salinity	
	New	Old	New	Old	New	Old	New	Old
1	25.0	24.6	8.1	8.0	7.7	8.1	690.0	485.0
2	24.0	24.8	8.3	8.2	8.6	8.2	632.0	459.0
3	25.2	24.0	8.2	8.3	7.7	7.9	578.0	496.0
4	24.1	24.4	8.3	8.2	7.8	7.7	582.0	476.0
5	24.4	25.3	8.2	8.3	8.0	7.6	553.0	472.0
6	24.5	24.3	8.4	8.2	8.1	7.7	538.0	440.0
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N	6	6	6	6	6	6	6.0	6.0
Min.	24.0	24.0	8.1	8.0	7.7	7.6	538.0	440.0
Max.	25.2	25.3	8.4	8.3	8.6	8.2	690.0	496.0
Mean	24.5	24.6	8.3	8.2	8.0	7.9	595.5	471.3
S.D.	0.48	0.45	0.10	0.11	0.34	0.24	56.3	19.8
N		12		12		12		12.0
Min.		24.0		8.0		7.6		440.0
Max.		25.3		8.4		8.6		690.0
Mean		24.6		8.2		7.9		533.4
S.D.		0.44		0.11		0.29		76.3

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STATISTICS FOR WATER QUALITY
QC Test: TN-00-623 IT (AT0-729)

	Temperature		pH		DO		Conductivity/Salinity	
	New	Old	New	Old	New	Old	New	Old
1	25.1	24.7	8.2	8.0	7.6	8.1	681.0	472.0
2	24.2	24.9	8.3	8.1	8.4	8.2	620.0	448.0
3	25.4	24.0	8.1	8.2	7.7	7.9	567.0	483.0
4	24.0	24.4	8.2	8.2	7.9	7.8	573.0	463.0
5	24.3	25.5	8.2	8.3	8.0	7.5	533.0	465.0
6	24.2	24.3	8.3	8.2	8.2	7.7	567.0	436.0
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N	6	6	6	6	6	6	6.0	6.0
Min.	24.0	24.0	8.1	8.0	7.6	7.5	533.0	436.0
Max.	25.4	25.5	8.3	8.3	8.4	8.2	681.0	483.0
Mean	24.5	24.6	8.2	8.2	8.0	7.9	590.2	461.2
S.D.	0.57	0.53	0.08	0.10	0.30	0.26	52.5	16.8
N		12		12		12		12.0
Min.		24.0		8.0		7.5		436.0
Max.		25.5		8.3		8.4		681.0
Mean		24.6		8.2		7.9		525.7
S.D.		0.53		0.09		0.27		76.9

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STATISTICS FOR WATER QUALITY
QC Test: TN-00-623 IT (AT0-730)

	Temperature		pH		DO		Conductivity/Salinity	
	New	Old	New	Old	New	Old	New	Old
1	24.4	24.3	7.8	8.0	8.1	8.1	720.0	495.0
2	24.2	24.7	7.9	8.2	7.3	8.1	665.0	449.0
3	25.4	24.0	8.1	8.3	7.7	8.0	574.0	480.0
4	24.0	24.6	8.3	8.2	7.8	7.8	571.0	468.0
5	24.9	25.5	8.2	8.3	7.7	7.4	546.0	468.0
6	24.6	24.3	8.4	8.2	8.2	7.6	586.0	453.0
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N	6	6	6	6	6	6	6.0	6.0
Min.	24.0	24.0	7.8	8.0	7.3	7.4	546.0	449.0
Max.	25.4	25.5	8.4	8.3	8.2	8.1	720.0	495.0
Mean	24.6	24.6	8.1	8.2	7.8	7.8	610.3	468.8
S.D.	0.51	0.52	0.23	0.11	0.32	0.29	67.3	17.1
N		12		12		12		12.0
Min.		24.0		7.8		7.3		449.0
Max.		25.5		8.4		8.2		720.0
Mean		24.6		8.2		7.8		539.6
S.D.		0.49		0.18		0.29		87.5

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Ceriodaphnia Survival and Reproduction Test-6-Day Survival

Start Date:		Test ID:	TN-00-623	Sample ID:	
End Date:		Lab ID:		Sample Type:	
Sample Date:		Protocol:	EPAF 91-EPA Freshwater	Test Species:	CD-Ceriodaphnia dubia
Comments:	IT CORPORATION				

Conc-%	1	2	3	4	5	6	7	8	9	10
HARD. CONT.	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
AT0-724	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	1.0000	1.0000	1.0000
AT0-725	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	
AT0-728	1.0000	1.0000	0.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
AT0-729	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
AT0-730	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
LAB CONT.	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000

Conc-%	Mean	N-Mean	Resp	Not Resp	Total	N	Fisher's Exact P	1-Tailed Critical
HARD. CONT.	1.0000	1.0000	0	10	10	10		
AT0-724	0.9000	0.9000	1	9	10	10	0.5000	0.0500
AT0-725	1.0000	1.0000	0	9	9	9		
AT0-728	0.9000	0.9000	1	9	10	10	0.5000	0.0500
AT0-729	1.0000	1.0000	0	10	10	10		
AT0-730	1.0000	1.0000	0	10	10	10		
LAB CONT.	1.0000	1.0000	0	10	10	10		

Hypothesis Test (1-tail, 0.05)

AT0-724 versus Hardness Control
AT0-728 versus Hardness Control

1-11-01
VW

ToxCalc v5.0.23

Reviewed by:_____

Ceriodaphnia Survival and Reproduction Test-Reproduction

Start Date:	Test ID: TN-00-623	Sample ID:	
End Date:	Lab ID:	Sample Type:	
Sample Date:	Protocol: EPAF 91-EPA Freshwater	Test Species:	CD-Ceriodaphnia dubia
Comments: IT CORPORATION			

Conc-%	1	2	3	4	5	6	7	8	9	10	Std. Dev.
HARD. CONT.	24.000	22.000	25.000	11.000	4.000	19.000	18.000	10.000	14.000	21.000	6.8443
AT0-724	16.000	24.000	20.000	18.000	21.000	17.000	14.000	20.000	30.000	25.000	4.76678
AT0-725	19.000	24.000	26.000	18.000	24.000	19.000	22.000	18.000	23.000		3.00463
AT0-728	8.000	20.000	0.000	29.000	25.000	25.000	27.000	17.000	18.000	20.000	8.97466
AT0-729	9.000	27.000	20.000	20.000	21.000	24.000	17.000	27.000	21.000	20.000	5.18973
AT0-730	19.000	19.000	27.000	20.000	19.000	20.000	23.000	19.000	26.000	23.000	3.06413
LAB CONT.	16.000	24.000	27.000	19.000	23.000	11.000	12.000	20.000	15.000	19.000	5.18973

			Transform: Untransformed				
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N
HARD. CONT.	16.800	1.0000	16.800	4.000	25.000	40.740	10
AT0-724	20.500	1.2202	20.500	14.000	30.000	23.253	10
AT0-725	21.444	1.2765	21.444	18.000	26.000	14.011	9
AT0-728	18.900	1.1250	18.900	0.000	29.000	47.485	10
AT0-729	20.600	1.2262	20.600	9.000	27.000	25.193	10
AT0-730	21.500	1.2798	21.500	19.000	27.000	14.252	10
LAB CONT.	18.600	1.1071	18.600	11.000	27.000	27.902	10

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Kolmogorov D Test indicates normal distribution (p > 0.01)	0.90777	1.035	-0.7377	1.43799
Bartlett's Test indicates equal variances (p = 0.02)	15.2162	16.8119		

Reviewed by: WJ 1-11-01

ATTACHMENT III

Pimephales promelas Chronic Toxicity Testing
Data Sheets

TOXICITY TEST OBSERVATION DATA SHEET

Project Number: 700023.10
Client: IT
QC Test Number: TN-00-619
Test Material: surface waters
Accession Number: ATO-709 to 713
Dilution Water: N/A
Accession Number: —

TEST ORGANISM
Common Name: fat head minnow
Scientific Name: P. promelas

Beginning Date: 9/14/00 Time: 1550
Ending Date: 9-21-00 Time: 1515

TEST TYPE: (Static) / Flowthrough
(Renewal) / Non-renewal

Test Container: 1-L beaker
Test Volume: 250 MLS
Test Duration: 7 days

Concentration	Rep	Number of Surviving Organisms							
		Day 0 Date 9/14	Day 1 Date 9/15	Day 2 Date 9/16	Day 3 Date 9/17	Day 4 Date 9/18	Day 5 Date 9/19	Day 6 Date 9/20	Day 7 Date 9/21
Lab control	A	10	10	10	10	10	10	10	10
	B	10	10	10	10	10	10	10	10
	C	10	10	10	10	10	10	10	10
	D	10	10	10	10	10	10	10	10
	E	10	10	10	10	10	10	9	9
Hardness control	A	RAT 9 10	9	9	9	9	9	9	9
	B	10	10	10	10	10	10	10	10
	C	10	RAT 9 (A) 10	9 (A)	9	9	9	9	9
	D	10	10	10	9	9	9	9	9
	E	10	10	10	10	10	10	10	10
Time / Initials		1140 [illegible]	1055 JL 1140 WM	1055 WM	1525 [illegible]	1530 MAS	1155 [illegible]	1108 NO	1515 WW

(A) one missing organism

ATS-T10
03/01/00

TOXICITY TEST OBSERVATION DATA SHEET

Project Number: 70DDD3.10
Client: IT
QC Test Number: TN-00-619
Test Material: surface waters
Accession Number: ATD-709 to 713
Dilution Water: N/A
Accession Number: —

TEST ORGANISM
Common Name: fat head minnow
Scientific Name: P. promelas

Beginning Date: 9/14/00 Time: 1550
Ending Date: 9-21-00 Time: 1515

TEST TYPE: (Static) / Flowthrough
(Renewal) / Non-renewal

Test Container: 1-L beaker
Test Volume: 250 MLS
Test Duration: 7 days

Concentration	Rep	Number of Surviving Organisms							
		Day 0 Date 9/14	Day 1 Date 9/15	Day 2 Date 9/16	Day 3 Date 9/17	Day 4 Date 9/18	Day 5 Date 9/19	Day 6 Date 9/20	Day 7 Date 9/21
ATD-709	A	10	10	10	10	10	10	10	10
	B	10	10	10	10	10	10	10	10
	C	10	10	10	10	10	10	10	10
	D	10	10	10	10	10	10	10	10
	E	10	10	10	10	10	10	10	10
ATD-710	A	10	10	10	10	10	10	10	10
	B	10	10	10	10	10	10	10	10
	C	10	10	10	10	10	10	10	10
	D	10	10	10	10	10	10	10	10
	E	10	10	10	11	11	11	11	11
ATD-711	A	10	10	10	10	10	10	10	10
	B	10	10	10	10	10	10	10	10
	C	10	10	10	10	10	10	10	10
	D	10	10	10	10	10	10	10	10
Time / Initials		~~1140~~ ~~JC~~	1140 JC	1120 WM	1525 JV	1530 MAS	1155 MW	1108 /no	1515 MW

ATS-T10
03/01/00

TOXICITY TEST OBSERVATION DATA SHEET

Project Number: 700003.10
Client: IT
QC Test Number: TN-00-619
Test Material: surface waters
Accession Number: ATD-709 to 713
Dilution Water: N/A
Accession Number: –

TEST ORGANISM
Common Name: fat head minnow
Scientific Name: P. promelas

TEST TYPE: (Static) / Flowthrough
(Renewal) / Non-renewal

Beginning Date: 9/14/00 Time: 1550
Ending Date: 9-21-00 Time: 1515

Test Container: 1-L beaker
Test Volume: 250 mls
Test Duration: 7 days

Concentration	Rep	Number of Surviving Organisms							
		Day 0 Date 9/14	Day 1 Date 9/15	Day 2 Date 9/16	Day 3 Date 9/17	Day 4 Date 9/18	Day 5 Date 9/19	Day 6 Date 9/20	Day 7 Date 9/21
ATD-711 cont.	E	10	10	10	10	10	10	10	10
ATD-712	A	10	10	10	10	10	10	10	10
	B	10	10	10	10	9	9	9	9
	C	10	10	10	10	10	10	10	10
	D	10	10	10	10	10	10	10	10
	E	10	10	10	10	10	10	10	10
ATD-713	A	10	10	10	8	8	8	7	7
	B	10	10	9	9	9	9	9	9
	C	10	10	10	10	10	10	10	10
	D	10	10	10	10	10	10	10	10
	E	10	10	10	9	8	8	8	8
Time / Initials		~~1110~~ ~~AJ~~	1140 SL	1150 WM	1525 [illegible]	1530 VAS	1155 [illegible]	1108/nn	1515 MW

ATS-T10
03/01/00

EA

WEIGHT DATA (Test Species: P. promelas)

Project Number: 70003.10

Client: IT

QC Test Number: TN-00-619

Tin Lot: 27 Green Oven Temp (°C): 100°C

	Date	Time	Initials
Loaded tins placed in oven:	9-21-00	1535	VW
Loaded tins removed from oven:	10/4/00	1035	VND
Loaded tins weighed:	10/4/00	1038	VND

Test Concentration	Rep	Tin #	A Weight of Tin (mg)	B Weight of Tin and Dried Organisms (mg)	B-A Total Dry Organism Weight (mg)	C Number of Organisms Weighed	(B-A)/C Mean Dry Organism Weight (mg)	(if applicable) Mean Biomass (mg/exposed org.)
Lab Control	A	61	27.63	32.38	4.75	10	0.475	
	B	107	26.00	30.28	4.28	10	0.428	
	C	62	26.99	31.64	4.65	10	0.465	
	D	56	28.47	32.87	4.40	10	0.440	
	E	81	28.05	32.67	4.62	9	0.513	
Hardness Control	A	69	27.44	32.32	4.88	9	0.542	
	B	92	27.82	32.70	4.88	10	0.488	
	C	125	27.40	32.04	4.64	9	0.516	
	D	115	29.55	34.10	4.55	9	0.506	
	E	106	27.32	31.62	4.30	10	0.430	

Dry wt. calculations checked (date, initials): 10/4/00 VND
10/12/00 LAH

Biomass calculations checked (date, initials):

ATS-T46
/01/00

WEIGHT DATA (Test Species: P. promelas)

Project Number: 70003.10

Client: It

QC Test Number: TN-00-619

Tin Lot: 27 Green Oven Temp (°C): 100°C

	Date	Time	Initials
Loaded tins placed in oven:	9-21-00	1535	MW
Loaded tins removed from oven:	10/4/00	1035	UND
Loaded tins weighed:	10/4/00	1038	UND

Test Concentration	Rep	Tin #	A Weight of Tin (mg)	B Weight of Tin and Dried Organisms (mg)	B-A Total Dry Organism Weight (mg)	C Number of Organisms Weighed	(B-A)/C Mean Dry Organism Weight (mg)	(if applicable) Mean Biomass (mg/exposed org.)
ATO-709	A	95	27.30	31.79	4.49	10	0.449	
	B	26	26.09	31.06	4.97	10	0.497	
	C	103	27.68	32.28	4.60	10	0.460	
	D	32	28.46	33.41	4.95	10	0.495	
	E	11	27.32	32.80	5.48	10	0.548	
ATO-710	A	38	28.64	33.97	5.33	10	0.533	
	B	18	27.36	32.79	5.43	10	0.543	
	C	60	28.37	33.63	5.26	10	0.526	
	D	88	27.40	32.02	4.62	10	0.462	
	E	82	29.39	35.32	5.93	11	0.539	

Dry wt. calculations checked (date, initials): 10/4/00 UND 10/12/00 LAH

Biomass calculations checked (date, initials): _____

ATS-T46
03/01/00

WEIGHT DATA (Test Species: P. promelas)

Project Number: 70003.10

Client: IT

QC Test Number: TN-00-619

Tin Lot: 27 Green Oven Temp (°C): 100°C

	Date	Time	Initials
Loaded tins placed in oven:	9-21-00	1535	MW
Loaded tins removed from oven:	10/4/00	1035	YND
Loaded tins weighed:	10/4/00	1038	YND

Test Concentration	Rep	Tin #	A Weight of Tin (mg)	B Weight of Tin and Dried Organisms (mg)	B-A Total Dry Organism Weight (mg)	C Number of Organisms Weighed	(B-A)/C Mean Dry Organism Weight (mg)	(if applicable) Mean Biomass (mg/exposed org.)
ATO-711	A	16	27.58	32.75	5.17	10	0.517	
	B	84	27.93	33.05	5.12	10	0.512	
	C	65	27.54	32.84	5.30	10	0.530	
	D	72	27.32	32.61	5.29	10	0.529	
	E	19	28.64	33.15	4.51	10	0.451	
ATO-712	A	50	28.17	33.71	5.54	10	0.554	
	B	57	26.90	31.73	4.83	9	0.537	
	C	131	27.30	33.04	5.74	10	0.574	
	D	25	29.36	33.86	4.50	10	0.450	
	E	75	27.56	32.79	5.23	10	0.523	

Dry wt. calculations checked (date, initials): 10/4/00 YND 10/12/00 LAH

Biomass calculations checked (date, initials): _____

ATS-T46
03/01/00

WEIGHT DATA (Test Species: P. promelas)

Project Number: 70003.10

Client: JT

QC Test Number: ~~70~~ WW TN-00-619

Tin Lot: 27 Green Oven Temp (°C): 100°C

	Date	Time	Initials
Loaded tins placed in oven:	9-21-00	1535	MW
Loaded tins removed from oven:	10/4/00	1035	MD
Loaded tins weighed:	10/4/00	1038	MD

Test Concentration	Rep	Tin #	A Weight of Tin (mg)	B Weight of Tin and Dried Organisms (mg)	B-A Total Dry Organism Weight (mg)	C Number of Organisms Weighed	(B-A)/C Mean Dry Organism Weight (mg)	(if applicable) Mean Biomass (mg/exposed org.)
ATD-713	A	42	25.68	29.91	4.23	7	0.604	
	B	109	28.23	31.73	3.50	9	0.389	
	C	117	27.93	33.09	5.16	10	0.516	
	D	36	28.07	32.67	4.60	10	0.460	
	E	110	27.98	31.32	3.34	8	0.418	

Dry wt. calculations checked (date, initials): 10/4/00 MD 10/12/00 LAT

Biomass calculations checked (date, initials):

ATS-T46
03/01/00

TOXICITY TEST WATER QUALITY DATA SHEET - NEW SOLUTIONS

Project Number: 70223.10
Client: IT
QC Test Number: TN-00-1619

TEST ORGANISM
Common Name: fat head minnow
Scientific Name: P. promelas

Beginning Date: 9/14/00 Time: 1550
Ending Date: 9/21/00 Time: 1575

TARGET VALUES Temp: 25±1 °C pH: 6.0 - 9.0 DO: ≥4.0 mg/L Salinity: — ppt

Test Conc	Rep	Temperature (°C) 0	1	2	3	4	5	6	pH 0	1	2	3	4	5	6	Dissolved Oxygen (mg/L) 0	1	2	3	4	5	6	Conductivity (µS/cm) ~~Salinity (ppt)~~ 0	1	2	3	4	5	6
Lab control		24.4	24.8	24.9	25.1	25.2	24.5	25.8	7.5	8.1	8.7	8.4	8.1	7.5	7.4	7.8	7.5	7.1	8.1	7.6	8.1	7.4	347	307	330	332	320	290	296
Hard. control		24.1	24.3	24.5	25.0	24.7	24.1	24.2	8.7	8.4	8.6	8.3	8.4	8.3	8.3	7.6	7.8	7.5	8.7	8.1	8.5	8.6	776	790	771	783	774	782	738
Meter Number		10/106	92/106	74/104	10/103	57	73/104	10/103	10/106	92/106	74/104	10/103	73/103	73/104	10/103	57	57	57	57	57	57	57	12/921	12/921	12/921	23/921	24/920	10/920	12/921
Time		1146	0935	0951	1110	1440	1420	1014	1146	0935	0951	1110	1500	1420	1014	1201	0940	1001	1145	1440	1420	1021	1211	0945	0953	1145	1440	1000	1011
Initials		JN	MCL	RD	VAS	RS	VD	MP	JN	MCL	RD	VAS	RS	VD	MP	JN	MCL	RD	VAS	RS	VD	MP	JN	MCL	RD	VAS	RS	OW	MP

TOXICITY TEST WATER QUALITY DATA SHEET - NEW SOLUTIONS

Project Number: 70003.10
Client: IT
QC Test Number: TN-00-619

TEST ORGANISM
Common Name: fat head minnow
Scientific Name: P. promelas

Beginning Date: 9/14/00 Time: 1550
Ending Date: 9/21/00 Time: 1515

TARGET VALUES Temp: 25±1 °C pH: 6.0 - 9.0 DO: ≥4.0 mg/L Salinity: — ppt

Test Conc	Rep	Temperature (°C) 0	1	2	3	4	5	6	pH 0	1	2	3	4	5	6	Dissolved Oxygen (mg/L) 0	1	2	3	4	5	6	Conductivity (µS/cm) ~~Salinity (ppt)~~ 0	1	2	3	4	5	6
AD-709		24.1	24.2	25.0	24.0	24.9	25.1	24.2	9.0	9.0	9.0	8.9	9.0	8.9	8.8	8.3	7.4	7.5	8.5	7.7	7.9	7.8	539	500	467	487	492	480	491
AD-710		24.1	24.2	24.9	24.2	24.7	24.9	24.2	8.5	8.5	8.7	8.4	8.5	8.6	8.5	8.3	7.6	7.5	8.3	7.6	8.0	7.9	543	612	542	590	596	593	571
AD-711		24.1	24.5	24.9	24.1	24.7	24.8	24.4	9.2	9.0	9.1	8.9	8.3	8.8	8.9	8.1	7.6	7.6	8.5	7.5	7.9 8.0	8.1	530	525	505	502	517	521	486
AD-712		24.1	24.5	24.9	24.4	24.7	24.8	24.1	8.3	8.4	8.8	8.0	8.2	8.3	8.2	8.2	7.4	7.4	8.2	7.6	7.9	7.8	279	244	248	237	231	232	246
AD-713		24.0	24.4	25.0	24.2	24.8	24.9	24.0	8.1	8.1	8.4	8.1	8.3	8.4	8.2	8.2	7.6	7.5	8.4	7.8	7.9	8.3	576	556	536	536	514	516	487
Meter Number		10/106	92/106	72/109	10/103	57	92/106	14/103	10/106	92/106	72/109	10/103	94/100	92/100	14/103	57	57	57	57	57	57	57	12/121	12/121	12/94	23/121	11/920	11/920	13/121
Time		1143	0931	0951	1110 1110	1440	1616	1044	1142	0935	0951	1110 1010	1500	1610	1014	1201	0940	1001	1145	1440	1005	1021	1200	0945	0953	1145	1440	1000	1029
Initials		JN	RCV	RD	MS	AS	JN	nr	JN	MS	RD	MS	AS	JN	nr	JN	MS	RD	MS	AS	ND	nr	JN	MS	RD	MS	AS	JN	nr

ATS-T13
03/01/00

TOXICITY TEST WATER QUALITY DATA SHEET - OLD SOLUTIONS

Project Number: 70003.10
Client: IT
QC Test Number: TN-00-619

TEST ORGANISM
Common Name: fathead minnow
Scientific Name: P. promelas

Beginning Date: 9/14/00 Time: 1550
Ending Date: 9/21/00 Time: 1515

TARGET VALUES Temp: 25±1 °C pH: 6.0 - 9.0 DO: ≥4.0 mg/L Salinity: — ppt

Test Conc	Rep	Temperature (°C) 1	2	3	4	5	6	7	pH 1	2	3	4	5	6	7	Dissolved Oxygen (mg/L) 1	2	3	4	5	6	7	Conductivity (µS/cm) ~~Salinity (ppt)~~ 1	2	3	4	5	6	7
Lab Control		24.0	24.4	24.5	25.4	24.6	24.3	24.1	7.6	7.0	7.8	7.8	7.9	8.0	8.0	7.4	6.9	7.1	7.1	6.8	6.7	6.5	318	334	325	331	290	309	308
Hard Control		24.0	24.8	24.9	25.9	24.4	24.4	24.4	8.3	7.5	8.2	8.2	8.2	8.2	7.9	7.5	6.7	7.1	6.9	7.1	7.7	6.5	785	765	750	808	735	783	825
Replicate		A	B	C	D	E	A	B																					
Meter Number		92/106	73/104	12/104	12/104	73/104	11/104	11/104	92/106	73/104	12/104	9/104	73/104	11/104	4/104	57	57	57	57	57	57	55	12/821	10/921	73/821	11/890	10/821	73/821	12/821
Time		1115	1010	1023	1130	1040	1030	1430	1115	1020	1023	1130	1040	1030	1430	1115	1035	1029	1125	1050	1045	1431	1120	1038	1040	1130	1045	1135	1435
Initials		DZ	WM	MAS	LB	KD	MD	MW	DZ	WM	MAS	JS	KD	MD	MW	DZ	WM	JS	JS	KD	MD	MW	DZ	WM	JS	JS	KD	MD	MW

ATS-T14
03/01/00

TOXICITY TEST WATER QUALITY DATA SHEET - OLD SOLUTIONS

Project Number: 70003.10
Client: IT
QC Test Number: IN-00-619

TEST ORGANISM
Common Name: fat head minnow
Scientific Name: P. promelas

Beginning Date: 9/14/00 Time: 1550
Ending Date: 9/21/00 Time: 1575

TARGET VALUES Temp: 25±1 °C pH: 6.0 - 9.0 DO: ≥4.0 mg/L Salinity: — ppt

Test Conc	Rep	Temperature (°C) 1	2	3	4	5	6	7	pH 1	2	3	4	5	6	7
ATD-709		24.2	24.9	24.8	25.9	24.8	24.9	24.9	8.6	8.5	8.5	8.5 ~~7.6~~ LS	8.4	8.3	8.0
ATD-710		24.1	25.2	24.4	25.1	24.3	24.7	24.2 ~~8.0~~ WW	8.5	8.5	8.6	8.5	8.4	8.4	8.3
ATD-711		24.1	25.1	24.6	25.3	24.9	24.4	24.3	8.7	8.5	8.5	8.5	8.4	8.4	8.3
ATD-712		24.1	25.1	24.8	25.3	24.7	24.7	24.1	8.0	8.2	8.0	8.5	7.8	8.2	8.3
ATD-713		24.0	25.3	24.7	25.3	24.7	25.0	24.5	8.2	8.3	8.2	8.2	8.1	8.2	8.0 ~~24.~~ WW
Replicate		A	B	C	D	E	A	B							
Meter Number		92/100	73/104	12/104	73/104	73/104	11/104	11/104	92/100	73/104	12/104	12/104	73/104	11/104	11/104
Time		1115	1028	1028	1040	1040	1030	1430	1115	1028	1028	1130	1040	1120	1430
Initials		gd	wm	MAS	12/104 1130 LS	MD	RD	WW	gd	wm	MAS	RS	MD	m	WW

Test Conc	Rep	Dissolved Oxygen (mg/L) 1	2	3	4	5	6	7	Conductivity (µS/cm) / Salinity (ppt) 1	2	3	4	5	6	7
ATD-709		7.4	6.8	7.2 ~~7.1~~ RS	6.8	6.6	6.8	6.4	505	507	474	525 ~~55~~ 523	481	495	530
ATD-710		7.3 ~~7.5~~ WW	7.1	7.1	6.6	6.5	6.7	6.0	628	635	620	620	580	586	593
ATD-711		7.4	7.0	6.9	6.6	6.4	6.7	6.6	540	536	530	517	500	514	531
ATD-712		7.3	6.8	7.1	6.3	6.5	6.6	6.2	251	248	245	249	245	262	241
ATD-713		7.2	6.7	6.8	6.8	6.7	6.7	6.6	565	559	534	551	520 ~~534~~ RS	526	561
Replicate															
Meter Number		57	57	57	57	57	57	55	12/521	12/521	73/521	15/520	12/521	73/521	12/521
Time		1118	1035	1029	1125	1050	1115	1431	1120	1038	1040	1130	1045	1035	1425
Initials		gd	wm	RS	RS	MD	RD	WW	gd	wm	RS	RS	MD	m	WW

ATS-T14
03/01/00

TOXICITY TEST SET-UP BENCH SHEET

Project Number: 70DD310

Client: IT

QC Test Number: TN-00-619

TEST ORGANISM INFORMATION

Common Name: fat head minnow

Scientific Name: P. promelas

Lot Number: ~~FH0-9/14-15 unr~~ 0-9/13-14

Source: EA

Adults Isolated (Time, Date): —

Neonates Pulled (Time, Date): —

Acclimation: —

Age: <24 hrs

Culture Water (T)S/: _____ °C — ppt

TEST SET-UP

TEST INITIATION

Date	Time	Initials	Activity
9/14/00	1456	RD	Dilutions Made
	1456	RD	Test Vessels Filled
	1550	JL/JL RD	Organisms Transferred
			Head Counts

CONCENTRATION SERIES

Test Concentration	Volume Test Material	Final Volume
Lab Control	0	~~0 1500~~ LS 1300ml
Hardness Control	0	

Comments:

INTERMEDIATE DILUTION PREPARATION AND FEEDING

DILUTION PREPARATION

Day	Date	Time	Initials	Sample / Diluent
0	RD	9/14/00	1456	LDO-393 (Lab) LDO-396 (Hard)
1	9/15/00	0950	RSH	LDO-397 (Lab) LDO-396 (Hard)
2		0850 9/16/00	WLM	(HARD) LDO-396 (LAB) LDO-397
3	1100	9/17/00	OL	(Lab) LDO-398 (Hard) LDO-396
4	9/18/00 ~~9/19/00~~ RD	0830 1415 RD	LB RD	lab ~~LDO-402~~ hard ~~LDO-396~~ RD
5	9/19/00	1415 RD	RD	(lab) LDO-402 (Hard) LDO-396
6	9/20/00	1108	RD	(Lab) LDO-402 (Hard) LDO-396

FEEDING

Food: Artemia, 3x/day

Day	Time, Initials, Amount	Time, Initials, Amount	Time, Initials, Amount
0	X	X	1647 3 drops OW
1	0820 3 drops OW	1215 3 drops OW	1630 3 drops OW
2	0915 3 drops	1308 3 drops	1925 3 RD
3	0900 4 OL	1200 4 OL	1615 4 OL
4	0830 5 OL	1200 5 OL	1655 5 OL
5	0830 5 OL	1203 5 OL	1638 5 OL
6	0858 5 OL	1310 5 OL	1638 5 OL

TOXICITY TEST SET-UP BENCH SHEET

Project Number: 70003.10

Client: IT

QC Test Number: TN-DO-619

TEST ORGANISM INFORMATION

Common Name: fat head minnow

Scientific Name: P. promelas

Lot Number: Ft ~~0-9/14-15 Am~~ 0-9/13-14

Source: EA

Adults Isolated (Time, Date): —

Neonates Pulled (Time, Date): —

Acclimation: —

Age: <24 hrs.

Culture Water (Tap): °C — ppt

TEST SET-UP

TEST INITIATION				CONCENTRATION SERIES		
Date	Time	Initials	Activity	100% Test Concentration	Volume Test Material	Final Volume
9/14/00	1505	MN	Dilutions Made	ATD-709	1300 ml	1300 ml
9/14/00	1522	MN	Test Vessels Filled	ATD-710	↓	↓
				ATD-711		
9/14/00	1550	GR/JL RD	Organisms Transferred	ATD-712		
			Head Counts	ATD-713		

Comments:

INTERMEDIATE DILUTION PREPARATION AND FEEDING

DILUTION PREPARATION					FEEDING			
					Food: Artemia, 3x/day			
Day	Date	Time	Initials	Sample / Diluent	Day	Time, Initials, Amount	Time, Initials, Amount	Time, Initials, Amount
0	9/14/00	1505	MN	ATD-709→713	0	X	X	1647 3 ml
1	9/15/00	0950	RCK	ATD-709→713	1	0820 3 ml	1315 3 ml	1630 3 ml
2	9/16/00	0850	WLM	ATD-709→713	2	0915 3 ml	1303 3 ml	1725 3 ml
3	9/17/00	1100	JN	ATD-709→713	3	0900 4 ml	1200 JN 4 drops	1615 JN 4 drops
4	9/18/00	0830	LS	ATD-709→713	4	0830 5 ml	1200 5 ml	1655 5 ml
5	9/19/00	1415	NB	ATD-709→713	5	0830 5 ml	1203 5 ml	1630 5 ml
6	9/20/00	1102	AD	ATD-709→713	6	0850 5 ml	1310 5 ml	1630 5 ml

STATISTICS FOR WATER QUALITY

QC Test: TN-00-619 IT (LAB CONTROL)

	Temperature		pH		DO		Conductivity/Salinity	
	New	Old	New	Old	New	Old	New	Old
1	24.4	24.0	7.5	7.6	7.8	7.4	347.0	318.0
2	24.8	24.4	8.1	7.0	7.5	6.9	307.0	334.0
3	24.9	24.5	8.7	7.8	7.1	7.1	330.0	325.0
4	25.1	25.4	8.4	7.8	8.1	7.1	333.0	331.0
5	25.2	24.6	8.1	7.9	7.6	6.8	320.0	290.0
6	24.5	24.3	7.5	8.0	8.1	6.7	290.0	309.0
7	25.8	24.1	7.7	8.0	7.4	6.5	296.0	308.0
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N	7	7	7	7	7	7	7.0	7.0
Min.	24.4	24.0	7.5	7.0	7.1	6.5	290.0	290.0
Max.	25.8	25.4	8.7	8.0	8.1	7.4	347.0	334.0
Mean	25.0	24.5	8.0	7.7	7.7	6.9	317.6	316.4
S.D.	0.47	0.46	0.46	0.35	0.37	0.30	20.8	15.4
N		14		14		14		14.0
Min.		24.0		7.0		6.5		290.0
Max.		25.8		8.7		8.1		347.0
Mean		24.7		7.9		7.3		317.0
S.D.		0.51		0.42		0.50		17.6

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STATISTICS FOR WATER QUALITY

QC Test: TN-00-619 IT (HARDNESS CONTROL)

	Temperature		pH		DO		Conductivity/Salinity	
	New	Old	New	Old	New	Old	New	Old
1	24.1	24.0	8.7	8.3	7.6	7.5	776.0	785.0
2	24.3	24.8	8.4	7.5	7.8	6.7	790.0	765.0
3	24.5	24.9	8.6	8.2	7.5	7.1	771.0	750.0
4	25.0	25.9	8.3	8.2	8.2	6.9	783.0	808.0
5	24.7	24.4	8.4	8.2	8.1	7.1	774.0	735.0
6	24.1	24.4	8.3	8.2	8.5	7.7	782.0	783.0
7	24.2	24.4	8.3	7.9	8.6	6.5	738.0	825.0
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N	7	7	7	7	7	7	7.0	7.0
Min.	24.1	24.0	8.3	7.5	7.5	6.5	738.0	735.0
Max.	25.0	25.9	8.7	8.3	8.6	7.7	790.0	825.0
Mean	24.4	24.7	8.4	8.1	8.0	7.1	773.4	778.7
S.D.	0.34	0.61	0.16	0.28	0.43	0.42	16.9	31.6
N		14		14		14		14.0
Min.		24.0		7.5		6.5		735.0
Max.		25.9		8.7		8.6		825.0
Mean		24.6		8.3		7.6		776.1
S.D.		0.50		0.29		0.65		24.5

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STATISTICS FOR WATER QUALITY
QC Test: TN-00-619 IT (AT0-709)

	Temperature		pH		DO		Conductivity/Salinity	
	New	Old	New	Old	New	Old	New	Old
1	24.1	24.2	9.0	8.6	8.3	7.4	539.0	505.0
2	24.2	24.9	9.0	8.5	7.4	6.8	500.0	507.0
3	25.0	24.8	9.0	8.5	7.5	7.2	467.0	474.0
4	24.0	25.9	8.9	8.5	8.5	6.8	487.0	523.0
5	24.9	24.8	9.0	8.4	7.7	6.6	492.0	481.0
6	25.1	24.9	8.9	8.3	7.9	6.8	489.0	495.0
7	24.2	24.8	8.8	8.0	7.8	6.4	491.0	556.0
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N	7	7	7	7	7	7	7.0	7.0
Min.	24.0	24.2	8.8	8.0	7.4	6.4	467.0	474.0
Max.	25.1	25.9	9.0	8.6	8.5	7.4	539.0	556.0
Mean	24.5	24.9	8.9	8.4	7.9	6.9	495.0	505.9
S.D.	0.48	0.50	0.08	0.20	0.40	0.34	21.9	27.6
N		14		14		14		14.0
Min.		24.0		8.0		6.4		467.0
Max.		25.9		9.0		8.5		556.0
Mean		24.7		8.7		7.4		500.4
S.D.		0.51		0.32		0.64		24.6

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10/16/2000 3:26 PM

STATISTICS FOR WATER QUALITY
QC Test: TN-00-619 IT (AT0-710)

	Temperature		pH		DO		Conductivity/Salinity	
	New	Old	New	Old	New	Old	New	Old
1	24.1	24.1	8.5	8.5	8.3	7.3	643.0	628.0
2	24.2	25.2	8.5	8.5	7.6	7.1	612.0	635.0
3	24.9	24.4	8.7	8.6	7.5	7.1	542.0	620.0
4	24.2	25.1	8.4	8.5	8.3	6.6	590.0	620.0
5	24.7	24.3	8.5	8.4	7.6	6.5	596.0	580.0
6	24.9	24.7	8.6	8.4	8.0	6.7	593.0	586.0
7	24.2	24.2	8.5	8.3	7.9	6.0	571.0	593.0
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N	7	7	7	7	7	7	7.0	7.0
Min.	24.1	24.1	8.4	8.3	7.5	6.0	542.0	580.0
Max.	24.9	25.2	8.7	8.6	8.3	7.3	643.0	635.0
Mean	24.5	24.6	8.5	8.5	7.9	6.8	592.4	608.9
S.D.	0.36	0.44	0.10	0.10	0.33	0.45	31.5	22.0
N		14		14		14		14.0
Min.		24.1		8.3		6.0		542.0
Max.		25.2		8.7		8.3		643.0
Mean		24.5		8.5		7.3		600.6
S.D.		0.39		0.10		0.70		27.5

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STATISTICS FOR WATER QUALITY

QC Test: TN-00-619 IT (AT0-711)

	Temperature		pH		DO		Conductivity/Salinity	
	New	Old	New	Old	New	Old	New	Old
1	24.1	24.1	9.2	8.7	8.1	7.4	530.0	540.0
2	24.5	25.1	9.0	8.5	7.6	7.0	525.0	536.0
3	24.9	24.6	9.1	8.5	7.6	6.9	505.0	530.0
4	24.1	25.3	8.9	8.5	8.5	6.6	502.0	547.0
5	24.7	24.9	8.3	8.4	7.5	6.4	517.0	500.0
6	24.8	24.4	8.8	8.4	7.9	6.7	521.0	514.0
7	24.4	24.3	8.9	8.3	8.1	6.6	486.0	539.0
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N	7	7	7	7	7	7	7.0	7.0
Min.	24.1	24.1	8.3	8.3	7.5	6.4	486.0	500.0
Max.	24.9	25.3	9.2	8.7	8.5	7.4	530.0	547.0
Mean	24.5	24.7	8.9	8.5	7.9	6.8	512.3	529.4
S.D.	0.32	0.44	0.29	0.13	0.36	0.33	15.4	16.6
N		14		14		14		14.0
Min.		24.1		8.3		6.4		486.0
Max.		25.3		9.2		8.5		547.0
Mean		24.6		8.7		7.4		520.9
S.D.		0.38		0.30		0.66		17.8

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10/16/2000 3:35 PM

STATISTICS FOR WATER QUALITY

QC Test: TN-00-619 IT (AT0-712)

	Temperature		pH		DO		Conductivity/Salinity	
	New	Old	New	Old	New	Old	New	Old
1	24.1	24.1	8.3	8.0	8.2	7.3	279.0	251.0
2	24.5	25.1	8.4	8.2	7.4	6.8	244.0	248.0
3	24.9	24.8	8.8	8.0	7.4	7.1	248.0	245.0
4	24.4	25.3	8.0	8.5	8.2	6.3	237.0	249.0
5	24.7	24.7	8.2	7.8	7.6	6.5	231.0	245.0
6	24.8	24.7	8.3	8.2	7.9	6.6	232.0	262.0
7	24.1	24.1	8.2	8.3	7.8	6.2	240.0	241.0
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N	7	7	7	7	7	7	7.0	7.0
Min.	24.1	24.1	8.0	7.8	7.4	6.2	231.0	241.0
Max.	24.9	25.3	8.8	8.5	8.2	7.3	279.0	262.0
Mean	24.5	24.7	8.3	8.1	7.8	6.7	244.4	248.7
S.D.	0.32	0.46	0.25	0.23	0.34	0.41	16.4	6.7
N		14		14		14		14.0
Min.		24.1		7.8		6.2		231.0
Max.		25.3		8.8		8.2		279.0
Mean		24.6		8.2		7.2		246.6
S.D.		0.39		0.25		0.67		12.3

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STATISTICS FOR WATER QUALITY
QC Test: TN-00-619 IT (AT0-713)

	Temperature		pH		DO		Conductivity/Salinity	
	New	Old	New	Old	New	Old	New	Old
1	24.0	24.0	8.1	8.2	8.2	7.2	576.0	565.0
2	24.4	25.3	8.1	8.3	7.6	6.7	556.0	559.0
3	25.0	24.7	8.4	8.2	7.5	6.8	538.0	534.0
4	24.2	25.3	8.1	8.2	8.4	6.8	536.0	551.0
5	24.8	24.7	8.3	8.1	7.8	6.7	594.0	520.0
6	24.9	25.0	8.4	8.2	7.9	6.7	596.0	526.0
7	24.0	24.5	8.2	8.0	8.3	6.6	481.0	569.0
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N	7	7	7	7	7	7	7.0	7.0
Min.	24.0	24.0	8.1	8.0	7.5	6.6	481.0	520.0
Max.	25.0	25.3	8.4	8.3	8.4	7.2	596.0	569.0
Mean	24.5	24.8	8.2	8.2	8.0	6.8	553.9	546.3
S.D.	0.43	0.46	0.14	0.10	0.35	0.20	40.3	19.6
N		14		14		14		14.0
Min.		24.0		8.0		6.6		481.0
Max.		25.3		8.4		8.4		596.0
Mean		24.6		8.2		7.4		550.1
S.D.		0.46		0.12		0.67		30.7

10/16/2000 3:39 PM

Larval Fish Growth and Survival Test-7 Day Survival

Start Date:		Test ID:	TN-00-619	Sample ID:	
End Date:		Lab ID:		Sample Type:	
Sample Date:		Protocol:	EPAF 91-EPA Freshwater	Test Species:	PP-Pimephales promelas
Comments:	IT CORPORATION				

Conc-%	1	2	3	4	5
HARD. CONT.	0.9000	1.0000	1.0000	0.9000	1.0000
AT0-709	1.0000	1.0000	1.0000	1.0000	1.0000
AT0-710	1.0000	1.0000	1.0000	1.0000	1.0000
AT0-711	1.0000	1.0000	1.0000	1.0000	1.0000
AT0-712	1.0000	0.9000	1.0000	1.0000	1.0000
AT0-713	0.7000	0.9000	1.0000	1.0000	0.8000
LAB CONT.	1.0000	1.0000	1.0000	1.0000	0.9000

			Transform: Arcsin Square Root						1-Tailed	
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD
HARD. CONT.	0.9600	1.0000	1.3451	1.2490	1.4120	6.524	5			
AT0-709	1.0000	1.0417	1.4120	1.4120	1.4120	0.000	5			
AT0-710	1.0000	1.0417	1.4135	1.4120	1.4195	0.236	5			
AT0-711	1.0000	1.0417	1.4120	1.4120	1.4120	0.000	5			
AT0-712	0.9800	1.0208	1.3794	1.2490	1.4120	5.284	5			
AT0-713	0.8800	0.9167	1.2343	0.9912	1.4120	15.085	5	1.204	1.860	0.1712
LAB CONT.	0.9800	1.0208	1.3794	1.2490	1.4120	5.284	5			

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.01)	0.93675	0.781	-0.3315	-0.6628
F-Test indicates equal variances (p = 0.17)	4.50208	23.1539		

Hypothesis Test (1-tail, 0.05)	MSDu	MSDp	MSB	MSE	F-Prob	df
Homoscedastic t Test indicates no significant differences	0.09933	0.10457	0.0307	0.02118	0.26305	1, 8

AT0-713 vs. ~~Co~~ Hardness Control

ToxCalc v5.0.23

Reviewed by: 1-11-01 CLAH

Larval Fish Growth and Survival Test-7 Day Growth

Start Date:	Test ID: TN-00-619	Sample ID:	
End Date:	Lab ID:	Sample Type:	
Sample Date:	Protocol: EPAF 91-EPA Freshwater	Test Species:	PP-Pimephales promelas
Comments: IT CORPORATION			

Conc-%	1	2	3	4	5	Std. Dev.
HARD. CONT.	0.5422	0.4880	0.5156	0.5056	0.4300	0.04192
AT0-709	0.4490	0.4970	0.4600	0.4950	0.5480	0.03879
AT0-710	0.5330	0.5430	0.5260	0.4620	0.5391	0.03339
AT0-711	0.5170	0.5120	0.5300	0.5290	0.4510	0.03268
AT0-712	0.5540	0.5367	0.5740	0.4500	0.5230	0.04737
AT0-713	0.6043	0.3889	0.5160	0.4600	0.4175	0.08561
LAB CONT.	0.4750	0.4280	0.4650	0.4400	0.5133	0.03327

			Transform: Untransformed						1-Tailed	
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD
HARD. CONT.	0.4963	1.0000	0.4963	0.4300	0.5422	8.448	5			
AT0-709	0.4898	0.9870	0.4898	0.4490	0.5480	7.920	5	0.253	1.860	0.0475
AT0-710	0.5206	1.0491	0.5206	0.4620	0.5430	6.414	5			
AT0-711	0.5078	1.0232	0.5078	0.4510	0.5300	6.435	5			
AT0-712	0.5275	1.0630	0.5275	0.4500	0.5740	8.979	5			
AT0-713	0.4773	0.9619	0.4773	0.3889	0.6043	17.935	5			
LAB CONT.	0.4643	0.9355	0.4643	0.4280	0.5133	7.166	5			

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.01)	0.97374	0.781	-0.2095	-0.2972
F-Test indicates equal variances (p = 0.88)	1.16798	23.1539		

Hypothesis Test (1-tail, 0.05)	MSDu	MSDp	MSB	MSE	F-Prob	df
Homoscedastic t Test indicates no significant differences	0.0475	0.09571	0.0001	0.00163	0.80652	1, 8

AT0-709 versus Hardness Control

F-11-01
W

ToxCalc v5.0.23

Reviewed by:_____

Larval Fish Growth and Survival Test-7 Day Growth

Start Date:	Test ID: TN-00-619	Sample ID:	
End Date:	Lab ID:	Sample Type:	
Sample Date:	Protocol: EPAF 91-EPA Freshwater	Test Species:	PP-Pimephales promelas
Comments: IT CORPORATION			

Conc-%	1	2	3	4	5
HARD. CONT.	0.5422	0.4880	0.5156	0.5056	0.4300
AT0-709	0.4490	0.4970	0.4600	0.4950	0.5480
AT0-710	0.5330	0.5430	0.5260	0.4620	0.5391
AT0-711	0.5170	0.5120	0.5300	0.5290	0.4510
AT0-712	0.5540	0.5367	0.5740	0.4500	0.5230
AT0-713	0.6043	0.3889	0.5160	0.4600	0.4175
LAB CONT.	0.4750	0.4280	0.4650	0.4400	0.5133

			Transform: Untransformed						1-Tailed	
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD
HARD. CONT.	0.4963	1.0000	0.4963	0.4300	0.5422	8.448	5			
AT0-709	0.4898	0.9870	0.4898	0.4490	0.5480	7.920	5			
AT0-710	0.5206	1.0491	0.5206	0.4620	0.5430	6.414	5			
AT0-711	0.5078	1.0232	0.5078	0.4510	0.5300	6.435	5			
AT0-712	0.5275	1.0630	0.5275	0.4500	0.5740	8.979	5			
AT0-713	0.4773	0.9619	0.4773	0.3889	0.6043	17.935	5	0.444	1.860	0.0793
LAB CONT.	0.4643	0.9355	0.4643	0.4280	0.5133	7.166	5			

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.01)	0.9603	0.781	0.54444	0.47835
F-Test indicates equal variances (p = 0.20)	4.17005	23.1539		

Hypothesis Test (1-tail, 0.05)	MSDu	MSDp	MSB	MSE	F-Prob	df
Homoscedastic t Test indicates no significant differences	0.07927	0.15973	0.0009	0.00454	0.66873	1, 8

AT0-713 versus Hardness Control

1-11-91 WW

ToxCalc v5.0.23

Reviewed by:_____

TOXICITY TEST OBSERVATION DATA SHEET

Project Number: 70003.10
Client: IT
QC Test Number: TN-00-622
Test Material: Surface waters
Accession Number: A10-724, 725, 728 to 730
Dilution Water: N/A
Accession Number: N/A

TEST ORGANISM
Common Name: Fathead minnow
Scientific Name: P. promelas

TEST TYPE: (Static) / Flowthrough
(Renewal) / Non-renewal

Beginning Date: 9/16/00 Time: ~~1540~~ 1625
Ending Date: 9/23/00 Time: 1600

Test Container: 1L Beaker
Test Volume: 250 mls
Test Duration: 7 days

Concentration	Rep	Number of Surviving Organisms							
		Day 0 Date 9/16	Day 1 Date 9/17	Day 2 Date 9/18	Day 3 Date 9/19	Day 4 Date 9/20	Day 5 Date 9/21	Day 6 Date 9/22	Day 7 Date 9/23
Lab Control	A	10	10	10	10	10	8	8	8
	B	10	10	10	10	10	10	10	10
	C	10	10	10	10	10	10	10	10
	D	10	10	10	10	9	9	8	7
	E	10	10	10	10	8	8	8	8
Hardness Control	A	10	10	10	10	10	10	10	10
	B	10	10	10	10	10	10	10	10
	C	10	10	10	9	9	9	9	9
	D	10	10	10	10	10	9	9	9
	E	10	10	10	9	9	9	9	9
Time / Initials		1712 MR	15 ~~1450~~ 1530 RS	1600 RS	1430 RS	1215 MR	1025 MR	1140 MR	1600 RS

ATS-T10
03/01/00

TOXICITY TEST OBSERVATION DATA SHEET

Project Number: 70003.10
Client: IT
QC Test Number: TN-00-622
Test Material: surface waters
Accession Number: ATO-724, 725, 728 & 730
Dilution Water: N/A
Accession Number: N/A

TEST ORGANISM
Common Name: Fathead minnow
Scientific Name: P. promelas

TEST TYPE: (Static) / Flowthrough
(Renewal) / Non-renewal

Beginning Date: 9/16/00 Time: ~~1540~~ 1625
Ending Date: 9/23/00 Time: 1600

Test Container: 1L Beaker
Test Volume: 250mls
Test Duration: 7days

Concentration	Rep	Number of Surviving Organisms							
		Day 0 Date 9/16	Day 1 Date 9/17	Day 2 Date 9/18	Day 3 Date 9/19	Day 4 Date 9/20	Day 5 Date 9/21	Day 6 Date 9/22	Day 7 Date 9/23
ATO- 725	A	10	~~8~~ 8	8	8	8	8	8	8
	B	10	9	9	9	9	9	9	9
	C	10	10	10	10	10	7	7	5
	D	10	10	9	9	9	9	9	9
	E	10	10	10	10	10	10	10	10
ATO- 728	A	10	9	9	9	7	7	7	7
	B	10	10	10	9	8	7	7	7
	C	10	10	10	10	8	6	6	6
	D	10	10	9 1 missing	9	9	9	9	8
	E	10	9	9	9	9	8	6	6
ATO- 730	A	10	10	9	9	9	9	9	9
	B	10	10	10	10	10	10	10	10
	C	10	10	9	9	9	9	9	9
	D	10	10	7	6	5	5	5	5
Time / Initials		1712/M	1830 DS	1600	1430 DS	1215 MD	1025 MD	1140 MD	1600 DS

ATS-T10
03/01/00

TOXICITY TEST OBSERVATION DATA SHEET

Project Number: 70003.10
Client: IT
QC Test Number: TN-00-622
Test Material: Surface waters
Accession Number: ATO-724, 725, 728 to 730
Dilution Water: N/A
Accession Number: N/A

TEST ORGANISM
Common Name: Fathead minnow
Scientific Name: P. promelas

TEST TYPE: (Static) / Flowthrough
(Renewal) / Non-renewal

Beginning Date: 9/16/00 Time: ~~1540~~ 1625
Ending Date: 9/23/00 Time: 1600

Test Container: 1L Beaker
Test Volume: 250 mls
Test Duration: 7 days

Concentration	Rep	Number of Surviving Organisms							
		Day 0 Date 9/16	Day 1 Date 9/17	Day 2 Date 9/18	Day 3 Date 9/19	Day 4 Date 9/20	Day 5 Date 9/21	Day 6 Date 9/22	Day 7 Date 9/23
ATO- 724	E	10	10	9	8	8	8	8	8
ATO- 730	A	10	10	9	7	7	7	6	6
	B	10	10	9	9	8	8	8	8
	C	10	10	10	10	9	9	9	9
	D	10	10	9	9	9	7	7	7
	E	10	10	10	10	10	10	10	10
ATO- 729	A	10	9	8	8	8	8	8	8
	B	10	9	9	7	7	7	7	7
	C	10	9	9	9	9	9	8	8
	D	10	9	9	9	9	9	9	9
	E	10	10	9	9	8	8	8	8
Time / Initials		1712 / MN	AS 1530	1600 a	1430 SZ	1215 MN	1025 MN	1140 MN	1600 SZ

ATS-T10
03/01/00

WEIGHT DATA (Test Species: P. promelas)

Project Number: 70003.10

Client: IT

QC Test Number: TN-00-622

Tin Lot: 29 RED Oven Temp (°C): 100°C

	Date	Time	Initials
Loaded tins placed in oven:	9/23/00	1610	SD
Loaded tins removed from oven:	10/4/00	1110	YRD
Loaded tins weighed:	10/4/00	1114	YRD

Test Concentration	Rep	Tin #	A Weight of Tin (mg)	B Weight of Tin and Dried Organisms (mg)	B-A Total Dry Organism Weight (mg)	C Number of Organisms Weighed	(B-A)/C Mean Dry Organism Weight (mg)	(if applicable) Mean Biomass (mg/exposed org.)
Lab control	A	40	29.96	33.42	3.46	8	0.433	
	B	94	27.48	31.20	3.72	10	0.372	
	C	6	28.42	32.81	4.39	10	0.439	
	D	53	27.12	29.76	2.64	7	0.377	
	E	3	26.67	29.89	3.22	8	0.403	
Hardness Control	A	66	27.56	31.74	4.18	10	0.418	
	B	38	27.39	31.02	3.63	10	0.363	
	C	12	24.14	28.03	3.89	9	0.432	
	D	58	27.85	31.71	3.86	9	0.429	
	E	102	29.09	32.90	3.81	9	0.423	

Dry wt. calculations checked (date, initials): 10/12/00 LAH

Biomass calculations checked (date, initials):

ATS-T46
03/01/00

WEIGHT DATA (Test Species: P. promelas)

Project Number: 70003.10

Client: IT

QC Test Number: TN-00-622

Tin Lot: 29 RED Oven Temp (°C): 100°C

	Date	Time	Initials
Loaded tins placed in oven:	9/23/00	1610	8D
Loaded tins removed from oven:	10/4/00	1110	4D
Loaded tins weighed:	10/4/00	1114	4D

Test Concentration	Rep	Tin #	A Weight of Tin (mg)	B Weight of Tin and Dried Organisms (mg)	B-A Total Dry Organism Weight (mg)	C Number of Organisms Weighed	(B-A)/C Mean Dry Organism Weight (mg)	(if applicable) Mean Biomass (mg/exposed org.)
ATO-725	A	93	27.93	31.00	3.07	8	0.384	
	B	70	25.56	28.81	3.25	9	0.361	
	C	1	28.23	30.97	2.74	5	0.548	
	D	81	28.17	31.63	3.46	9	0.384	
	E	68	28.35	32.17	3.82	10	0.382	
ATO-728	A	28	29.40	31.87	2.47	7	0.353	
	B	99	26.47	28.90	2.43	7	0.347	
	C	26	26.02	28.24	2.22	6	0.370	
	D	96	27.62	30.67	3.05	8	~~0.381~~	0.381
	E	45	28.48	30.55	2.07	6	0.345	
ATO-724	A	31	27.63	31.52	3.89	9	0.432	
	B	120	29.18	33.57	4.39	10	0.439	
	C	2	26.00	29.84	3.84	9	0.427	
	D	84	28.94	32.19	3.25	5	0.650	

Dry wt. calculations checked (date, initials): 10/12/00 LAT

Biomass calculations checked (date, initials):

WEIGHT DATA (Test Species: P. promelas)

Project Number: 70003.10

Client: IT

QC Test Number: TN-00-622

Tin Lot: 29 RED Oven Temp (°C): 100 °C

	Date	Time	Initials
Loaded tins placed in oven:	9/23/00	1610	8Z
Loaded tins removed from oven:	10/4/00	1110	4ND
Loaded tins weighed:	10/4/00	1114	4ND

Test Concentration	Rep	Tin #	A Weight of Tin (mg)	B Weight of Tin and Dried Organisms (mg)	B-A Total Dry Organism Weight (mg)	C Number of Organisms Weighed	(B-A)/C Mean Dry Organism Weight (mg)	(if applicable) Mean Biomass (mg/exposed org.)
ATO-724	E	51	27.57	30.51	2.94	8	0.368	
ATO-730	A	41	26.22	28.81	2.59	6	0.432	
	B	65	28.63	31.88	3.25	8	0.406	
	C	14	25.41	29.10	3.69	9	0.410	
	D	85	27.85	30.51	2.66	7	0.380	
	E	7	28.06	31.79	3.73	10	0.373	
ATO-729	A	107	28.61	32.07	3.46	8	0.433	
	B	110	29.70	33.17	3.47	7	0.496	
	C	9	26.12	29.24	3.12	8	0.390	
	D	75	29.41	32.86	3.45	9	0.383	
	E	72	25.54	28.73	3.19	8	0.399	

Dry wt. calculations checked (date, initials): 10/12/00 MK

Biomass calculations checked (date, initials):

ATS-T46
03/01/00

TOXICITY TEST WATER QUALITY DATA SHEET - NEW SOLUTIONS

Project Number: 70003.10
Client: IT
QC Test Number: TN-00-622

TEST ORGANISM
Common Name: Fathead minnow
Scientific Name: P. promelas

Beginning Date: 9/16/00 Time: ~~1640~~ 1625
Ending Date: 9/23/00 Time: 1600

TARGET VALUES Temp: 25±1 °C pH: 6.0 - 9.0 DO: 24.0 mg/L Salinity: — ppt

Test Conc	Rep	Temperature (°C) 0	1	2	3	4	5	6	pH 0	1	2	3	4	5	6	Dissolved Oxygen (mg/L) 0	1	2	3	4	5	6	Conductivity (µS/cm) ~~Salinity (ppt)~~ 0	1	2	3	4	5	6
Lab Control		25.8	25.8	25.1	25.8	25.8	25.9	25.9	8.2	7.9	8.2	8.1	7.9	8.6	8.0	7.2	7.5	7.6	7.4	7.4	7.9	7.4	320	330 331	320	304	276	291	272
Hard Control		24.0	25.1	24.9	24.8	24.0	25.3	24.9	8.5	8.4	8.4	8.4	8.3	8.5	8.7	7.2	8.3	8.3	8.6	8.5	8.5	8.2	1050	1091	1119	1014	1054	1157	1085
Meter Number		12/103	10/103	73/103	12/103	11/104	55	11/103	12/103	10/103	73/103	12/103	11/104	19/103	11/103	57	57	57	57	57	55	57	11/920	73/921	11/920	10/921	73/921	12/920	12/920
Time		1529	1120	1429	1155	1126	920	1005	1529	1120	1429	1155	1126	920	1005	1529	1040	1419	1200	1020	920	0955	1529	1135	1420	1200	1025	925	1010
Initials		[illegible]	VMS	[illegible]	[illegible]	[illegible]	RS	[illegible]	[illegible]	VMS	[illegible]	[illegible]	[illegible]	RS	[illegible]	[illegible]	VMS	[illegible]	[illegible]	[illegible]	RS	[illegible]	[illegible]	VMS	[illegible]	[illegible]	[illegible]	RS	[illegible]

ATS-T13
03/01/00

TOXICITY TEST WATER QUALITY DATA SHEET - NEW SOLUTIONS

Project Number: 70003.10
Client: IT
QC Test Number: TN-00-622

TEST ORGANISM
Common Name: Fathead minnow
Scientific Name: P. promelas

Beginning Date: 9/16/00 Time: 1625
Ending Date: 9/23/00 Time: 1600

TARGET VALUES Temp: 25±1 °C pH: 6.0 - 9.0 DO: ≥4.0 mg/L Salinity: — ppt

Test Conc	Rep	Temperature (°C) 0	1	2	3	4	5	6	pH 0	1	2	3	4	5	6
ATO-724	mr	~~25.1~~ 25.1	24.0	25.1	24.0	25.0	25.1	24.3	8.1	8.2	8.1	8.1	8.1	8.3	8.3
ATO-725		25.1	24.0	25.2	24.0	25.0	24.3	24.0	8.1	8.1	8.1	8.1	8.1	8.3	8.3
ATO-728		25.0	24.0	25.2	24.1	24.4	24.5	24.1	8.1	8.3	8.2	8.3	8.2	8.4	8.4
ATO-729		25.1	24.2	25.4	24.0	24.3	24.2	24.1	8.2	8.3	8.1	8.2	~~8.2~~ 8.2	8.3	8.4
ATO-730		24.4	24.2	25.4	24.0	24.9	24.6	24.3	7.8	7.9	8.1	8.3	8.2	8.4	8.3
Meter Number		57	10/103	73/103	73/120	10/103	55	10/103	73/107	10/103	73/100	73/104	10/103	9/103	10/103
Time		1315	1120	1429	1030	1035	930	1005	1317	1120	1429	1030	1035	930	1005
Initials		nn	MAS	a	MD	MD	RS	MD	nn	MAS	a	MD	MD	RS	MD

Test Conc	Rep	Dissolved Oxygen (mg/L) 0	1	2	3	4	5	6	Conductivity (µS/cm) ~~Salinity (ppt)~~ 0	1	2	3	4	5	6
ATO-724	mr	8.0	~~8.6~~ 7.7 mr	7.6	7.7	~~7.8~~ 8	~~8.4~~ 8.1 mr	8.0	646	540	564	584	543	~~557~~	571
ATO-725		7.8	8.5	7.7	7.8	7.7	8.1	8.2	637	535	547	553	520	~~554~~	518
ATO-728		7.7	8.6	7.7	7.8	8.0	8.1	8.2	690	632	578	582	553	~~558~~	517
ATO-729		7.6	8.4	7.7	7.9	8.0	8.2	8.2	681	620	567	573	533	~~567~~	530
ATO-730		8.1	7.3	7.7	7.8	7.7	8.2	8.2	720	665	574	571	546	~~586~~	535
Meter Number		57	57	57	57	57	55	57	11/120	73/121	11/120	11/120	73/121	12/120	12/120
Time		1315	1040	1429	0953	1020	930	0955	1323	1135	1424	1020	1025	925	1010
Initials		nn	MAS	a	MD	MD	RS	MD	nn	MAS	a	MD	MD	RS	MD

TOXICITY TEST WATER QUALITY DATA SHEET - OLD SOLUTIONS

Project Number: 70003.10
Client: IT
QC Test Number: TN-00-622

TEST ORGANISM
Common Name: Fathead minnow
Scientific Name: P. promelas

Beginning Date: 9/16/00 Time: ~~1510~~ 1625 OL
Ending Date: 9/23/00 Time: 1600

TARGET VALUES Temp: 25±1 °C pH: 6.0 - 9.0 DO: ≥4.0 mg/L Salinity: — ppt

Test Conc	Rep	Temperature (°C) 1	2	3	4	5	6	7	pH 1	2	3	4	5	6	7	Dissolved Oxygen (mg/L) 1	2	3	4	5	6	7	Conductivity (µS/cm) ~~Salinity (ppt)~~ 1	2	3	4	5	6	7
Lab Control		24.5	24.8	24.0	24.4	25.0	24.9	24.1	8.1	7.9	8.1	7.8	7.7	7.9	7.8	7.2	6.5	6.9	~~6.2~~ 7.0 ND	6.9	6.9	7.0	300	357	374	304	293	305	327
																7.1													
Hard Control		24.5	24.4	24.7	24.4	25.0	25.0	25.5	8.1	8.8	8.1	8.2	8.4	8.3	8.4		6.4	6.8	~~5.9~~ 6.7 ND	7.0	6.9	7.1	992	1113	1160	1011	1035	1049	~~1247~~ 1249
Replicate		A	B	C	D	E	A	B																					
Meter Number		12/104	13/103	13/104	10/103	10/103	10/103	11/104	12/104	13/103	13/104	10/103	10/103	10/103	11/104	57	57	55	57	56	57	57	73/921	11/920	12/921	13/921	12/920	12/920	12/920
Time		1040	1450	1410	1110	0920	1025	1535	2040	1450	1410	1110	0920	1025	1535	1055	1453	1413	1105	0925	1015	1535	1050	1442	1410	1125	0935	1030	1535
Initials		MS	OV	[illegible]	ND	ND	ND	[illegible]	TAS	OV	[illegible]	ND	ND	ND	[illegible]	JS	OV	[illegible]	ND	ND	ND	[illegible]	MS	OV	[illegible]	ND	ND	ND	[illegible]

ATS-T14
03/01/00

TOXICITY TEST WATER QUALITY DATA SHEET - OLD SOLUTIONS

Project Number: 70003.10
Client: IT
QC Test Number: TN-00-622

TEST ORGANISM
Common Name: Fathead minnow
Scientific Name: P. promelas

Beginning Date: 9/16/00 Time: ~~1540~~ 1625
Ending Date: 9/23/00 Time: 1600

TARGET VALUES Temp: 25±1 °C pH: 6.0 - 9.0 DO: ≥4.0 mg/L Salinity: — ppt

Test Conc	Rep	Temperature (°C) 1	2	3	4	5	6	7	pH 1	2	3	4	5	6	7
ATO-724		25.1	24.6	24.5	24.0	25.7	25.2	25.2	8.2	8.1	8.0	8.1	8.2	8.2	8.1
ATO-725		25.0	24.7	24.5	24.1	25.8	25.9	25.4	8.1	8.1	8.0	8.2	8.2	8.1	8.1
ATO-728		24.7	25.2	24.7	24.3	25.1	25.2	25.3	8.1	8.0	8.0	8.1	8.1	8.2	8.1
ATO-729		24.7	24.9	24.5	24.4	25.9	25.0	25.4	8.1	8.1	8.0	8.1	8.2	8.2	8.1
ATO-730		24.6	24.5	24.7	24.2	25.8	24.9	25.4	8.1	8.1	8.0	8.1	8.1	8.1	8.1
Replicate		A	B	C	D	E	A	B							
Meter Number		12/104	73/103	73/104	10/103	10/103	10/103	11/104	12/104	73/103	73/104	10/103	10/103	10/103	11/104
Time		1045	1450	1435	1110	0920	1025	1535	1045	1450	1435	1110	0925	1025	1535
Initials		MAS	✓	✓	MD	MD	MD	✓	MAS	✓	✓	MD	MD	MD	✓

Test Conc	Rep	Dissolved Oxygen (mg/L) 1	2	3	4	5	6	7	Conductivity (µS/cm) ~~Salinity (ppt)~~ 1	2	3	4	5	6	7
ATO-724		7.2 / 7.1	6.7	6.9	6.0 / 6.8 MD	6.8	6.4	7.0	306 / 516 MAS	504	449	500	456	488	522
ATO-725		7.1 / 7.1	6.8	7.0	6.5 / 7.3 MD	7.0	7.2	7.2	501	486	512	460	440	489	496
ATO-728		7.2	5.9	6.2	6.1 / 6.9 MD	6.6	5.8	7.6	547	560	487	493	458	469	475
ATO-729		7.1	6.8	6.6	5.7 / 6.5 MD	6.9	7.3	7.2	531	521	478	490	452	467	498
ATO-730		7.3	6.6	6.2	6.1 / 6.9	6.8	7.2	7.2	550	535	510	472	450	467	484
Replicate															
Meter Number		57	57	55	57	55	57	57	73/421	11/920	10/921	73/921	7/920	12/920	12/920
Time		1055	1433	1435	1105	0925	1015	1535	1060	1442	1435	1125	0935	1030	1535
Initials		RS	✓	✓	MD	MD	MD	✓	MAS	✓	✓	MD	MD	MD	✓

ATS-T14
03/01/00

TOXICITY TEST SET-UP BENCH SHEET

Project Number: 70003.10

Client: IT

QC Test Number: TN-00-622

TEST ORGANISM INFORMATION

Common Name: Fat head minnow

Scientific Name: P. promelas

Lot Number: FH-0-9/15/6

Source: EA

Adults Isolated (Time, Date): —

Neonates Pulled (Time, Date): —

Acclimation: —

Age: <24 hrs.

Culture Water (T/S): 23.3 °C — ppt

TEST SET-UP

TEST INITIATION				CONCENTRATION SERIES		
Date	Time	Initials	Activity	Test Concentration	Volume Test Material	Final Volume
9/16/00	1500	RD	Dilutions Made	Lab Control	1500 ml	1500 ml
	1540	OR	Test Vessels Filled			
	1625	OR/RSH	Organisms Transferred	Hardness Control		
	1712	NP	Head Counts			

Comments:

INTERMEDIATE DILUTION PREPARATION AND FEEDING

DILUTION PREPARATION					FEEDING			
					Food: Artemia, 3x/day			
Day	Date	Time	Initials	Sample / Diluent	Day	Time, Initials, Amount	Time, Initials, Amount	Time, Initials, Amount
0	9/16/00	1540	OR	(lab) LDO-398 (HW) LDO-400	0	X	X	1724 3 OR
1	9/17/00	1300	JN	(lab) LDO-398 (HW) LDO-400	1	0905 3 OR	1200 JN 3 drops	1615 JN 3 drops
2	9/18/00	1400	JN	(lab) LDO-402 (HW) LDO-400	2	0837 4 OR	1200 4 OR	1710 4 OR
3	9/19/00	1030	NR	(lab) LDO-402 (HW) LDO-400	3	0832 4 OR	1205 4 OR	1639 4 OR
4	9/20/00	1035	NR	(hard) LDO-400 (lab) LDO-404	4	0850 5 OR	1310 5 OR	1630 5 OR
5	~~9/21~~ 9/21/00	0945	LS	(HW) LDO-400 (lab) LDO-404	5	0852 5 OR	1155 5 OR	1647 5 OR
6	9/22/00	1050	NR	(lab) LDO-407 (hard) LDO-411	6	1130 5 drops KO	1320 5 drops KO	1705 5 drops KO

ATS-T27
03/01/00

TOXICITY TEST SET-UP BENCH SHEET

Project Number: 70003.10

Client: IT

QC Test Number: TN-00-622

TEST ORGANISM INFORMATION

Common Name: Fathead minnow

Scientific Name: P. promelas

Lot Number: FHO-9/15-16

Source: EA (Lab)

Adults Isolated (Time, Date): —

Neonates Pulled (Time, Date): —

Acclimation: —

Age: <24 hrs.

Culture Water (T)/S: 23.3 °C — ppt

TEST SET-UP

TEST INITIATION

Date	Time	Initials	Activity
9/16/00	1500	RD	Dilutions Made
	1540	OL	Test Vessels Filled
	1625	OL/RSH	Organisms Transferred
	1712	RD	Head Counts

CONCENTRATION SERIES

100% Test Concentration	Volume Test Material	Final Volume
ATO-724	1500 ml	1500 ml
ATO-725		
ATO-728		
ATO-729		
ATO-730		

Comments:

INTERMEDIATE DILUTION PREPARATION AND FEEDING

DILUTION PREPARATION

Day	Date	Time	Initials	Sample / Diluent
0	9/16/00	1540	OL	ATO-724, 725 728, 729, 730
1	9/17/00	1300	ON	ATO-724, 725, 728, 729, 730
2	9/18/00	1400	ON	ATO-724, 725, 728, 729, 730
3	9/19/00	1030	UNO	ATO-724, 725, 728, 729, 730
4	9/20/00	1035	UNO	ATO-724, 725, 728, 729, 730
5	9/21/00	0945	LS	ATO-724, 725, 728, 729, 730
6	9/22/00	1010	UNO	ATO-724, 725 728, 729, 730

FEEDING

Food: Artemia, 3x/day

Day	Time, Initials, Amount	Time, Initials, Amount	Time, Initials, Amount
0	X	X	1724 RD 3 drops
1	0905 3 OL	1200 OL 3	1615 3 OL
2	0837 4 OL	1200 4 OL	1710 4 OL
3	0830 4 OL	1205 4 OL	1630 4 OL
4	0850 5 OL	1310 5 OL	1630 5 OL
5	0852 5 OL	1155 5 OL	~~1700 5 OL~~
6	1130 5 mL	1320 5 mL	5 1705 mL

ATS-T27
03/01/00

STATISTICS FOR WATER QUALITY

QC Test: TN-00-622 IT (LAB CONTROL)

	Temperature		pH		DO		Conductivity/Salinity	
	New	Old	New	Old	New	Old	New	Old
1	25.8	24.5	8.2	8.1	7.2	7.2	320.0	300.0
2	25.8	24.8	7.9	7.9	7.5	6.5	331.0	357.0
3	25.1	24.0	8.2	8.1	7.6	6.9	320.0	374.0
4	25.8	24.4	8.1	7.8	7.4	7.0	304.0	304.0
5	25.8	25.0	7.9	7.7	7.4	6.9	296.0	293.0
6	25.9	24.9	8.6	7.9	7.9	6.9	291.0	305.0
7	25.9	24.1	8.0	7.8	7.4	7.0	272.0	327.0
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N	7	7	7	7	7	7	7.0	7.0
Min.	25.1	24.0	7.9	7.7	7.2	6.5	272.0	293.0
Max.	25.9	25.0	8.6	8.1	7.9	7.2	331.0	374.0
Mean	25.7	24.5	8.1	7.9	7.5	6.9	304.9	322.9
S.D.	0.28	0.39	0.24	0.15	0.22	0.21	20.4	31.3
N		14		14		14		14.0
Min.		24.0		7.7		6.5		272.0
Max.		25.9		8.6		7.9		374.0
Mean		25.1		8.0		7.2		313.9
S.D.		0.70		0.23		0.36		27.1

1-11-01

10/16/2000 4:05 PM

STATISTICS FOR WATER QUALITY

QC Test: TN-00-622 IT (HARDNESS CONTROL)

	Temperature		pH		DO		Conductivity/Salinity	
	New	Old	New	Old	New	Old	New	Old
1	24.0	24.5	8.5	8.1	7.2	7.1	1050.0	992.0
2	25.1	24.4	8.4	8.8	8.3	6.4	1091.0	1113.0
3	24.9	24.7	8.4	8.1	8.3	6.8	1119.0	1160.0
4	24.8	24.4	8.4	8.2	8.6	6.7	1014.0	1011.0
5	24.0	25.6	8.3	8.4	8.5	7.0	1054.0	1035.0
6	25.3	25.0	8.5	8.3	8.3	6.9	1157.0	1049.0
7	24.0	25.5	8.7	8.4	8.2	7.1	1085.0	1249.0
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N	7	7	7	7	7	7	7.0	7.0
Min.	24.0	24.4	8.3	8.1	7.2	6.4	1014.0	992.0
Max.	25.3	25.6	8.7	8.8	8.6	7.1	1157.0	1249.0
Mean	24.6	24.9	8.5	8.3	8.2	6.9	1081.4	1087.0
S.D.	0.57	0.51	0.13	0.24	0.46	0.25	47.5	92.4
N		14		14		14		14.0
Min.		24.0		8.1		6.4		992.0
Max.		25.6		8.8		8.6		1249.0
Mean		24.7		8.4		7.5		1084.2
S.D.		0.54		0.20		0.78		70.6

10-11-01

10/16/2000 4:08 PM

STATISTICS FOR WATER QUALITY
QC Test: TN-00-622 IT (AT0-724)

	Temperature		pH		DO		Conductivity/Salinity	
	New	Old	New	Old	New	Old	New	Old
1	25.1	25.1	8.1	8.2	8.0	7.1	646.0	516.0
2	24.0	24.6	8.2	8.1	7.7	6.7	540.0	504.0
3	25.1	24.5	8.1	8.0	7.6	6.9	564.0	449.0
4	24.0	24.0	8.1	8.1	7.7	6.8	584.0	500.0
5	25.0	25.7	8.1	8.2	7.6	6.8	543.0	456.0
6	25.1	25.2	8.3	8.2	8.1	6.4	559.0	483.0
7	24.3	25.2	8.3	8.1	8.0	7.0	571.0	522.0
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N	7	7	7	7	7	7	7.0	7.0
Min.	24.0	24.0	8.1	8.0	7.6	6.4	540.0	449.0
Max.	25.1	25.7	8.3	8.2	8.1	7.1	646.0	522.0
Mean	24.7	24.9	8.2	8.1	7.8	6.8	572.4	490.0
S.D.	0.53	0.57	0.10	0.08	0.21	0.23	35.9	28.5
N		14		14		14		14.0
Min.		24.0		8.0		6.4		449.0
Max.		25.7		8.3		8.1		646.0
Mean		24.8		8.2		7.3		531.2
S.D.		0.54		0.09		0.56		52.9

1-11-01
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10/16/2000 4:10 PM

STATISTICS FOR WATER QUALITY

QC Test: TN-00-622 IT (AT0-725)

	Temperature		pH		DO		Conductivity/Salinity	
	New	Old	New	Old	New	Old	New	Old
1	25.1	25.0	8.1	8.1	7.8	7.1	637.0	501.0
2	24.0	24.7	8.1	8.1	8.5	6.8	535.0	486.0
3	25.2	24.5	8.1	8.0	7.7	7.0	547.0	512.0
4	24.0	24.1	8.1	8.2	7.8	7.3	553.0	460.0
5	25.0	25.8	8.1	8.2	7.7	7.0	520.0	440.0
6	24.3	25.9	8.3	8.1	8.1	7.2	554.0	489.0
7	24.0	25.4	8.3	8.1	8.2	7.2	518.0	496.0
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N	7	7	7	7	7	7	7.0	7.0
Min.	24.0	24.1	8.1	8.0	7.7	6.8	518.0	440.0
Max.	25.2	25.9	8.3	8.2	8.5	7.3	637.0	512.0
Mean	24.5	25.1	8.2	8.1	8.0	7.1	552.0	483.4
S.D.	0.56	0.68	0.10	0.07	0.30	0.17	40.3	25.0
N		14		14		14		14.0
Min.		24.0		8.0		6.8		440.0
Max.		25.9		8.3		8.5		637.0
Mean		24.8		8.1		7.5		517.7
S.D.		0.66		0.08		0.52		48.0

1-11-01
WW

10/16/2000 4:12 PM

STATISTICS FOR WATER QUALITY

QC Test: TN-00-622 IT (AT0-728)

	Temperature		pH		DO		Conductivity/Salinity	
	New	Old	New	Old	New	Old	New	Old
1	25.0	24.7	8.1	8.1	7.7	7.2	690.0	547.0
2	24.0	25.2	8.3	8.0	8.6	5.9	632.0	560.0
3	25.2	24.7	8.2	8.0	7.7	6.2	578.0	487.0
4	24.1	24.3	8.3	8.1	7.8	6.9	582.0	493.0
5	24.4	25.6	8.2	8.1	8.0	6.6	553.0	458.0
6	24.5	25.2	8.4	8.2	8.1	5.8	538.0	469.0
7	24.1	25.3	8.4	8.1	8.2	7.6	517.0	475.0
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N	7	7	7	7	7	7	7.0	7.0
Min.	24.0	24.3	8.1	8.0	7.7	5.8	517.0	458.0
Max.	25.2	25.6	8.4	8.2	8.6	7.6	690.0	560.0
Mean	24.5	25.0	8.3	8.1	8.0	6.6	584.3	498.4
S.D.	0.47	0.45	0.11	0.07	0.32	0.68	59.4	39.5
N		14		14		14		14.0
Min.		24.0		8.0		5.8		458.0
Max.		25.6		8.4		8.6		690.0
Mean		24.7		8.2		7.3		541.4
S.D.		0.52		0.13		0.89		65.8

1-11-01
WW

10/16/2000 4:13 PM

STATISTICS FOR WATER QUALITY
QC Test: TN-00-622 IT (AT0-729)

	Temperature		pH		DO		Conductivity/Salinity	
	New	Old	New	Old	New	Old	New	Old
1	25.1	24.7	8.2	8.1	7.6	7.1	681.0	531.0
2	24.2	24.9	8.3	8.1	8.4	6.8	620.0	521.0
3	25.4	24.5	8.1	8.0	7.7	6.6	567.0	478.0
4	24.0	24.4	8.2	8.1	7.9	6.5	573.0	490.0
5	24.3	25.9	8.2	8.2	8.0	6.9	533.0	452.0
6	24.2	25.0	8.3	8.2	8.2	7.3	567.0	467.0
7	24.1	25.4	8.4	8.1	8.2	7.2	530.0	498.0
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N	7	7	7	7	7	7	7.0	7.0
Min.	24.0	24.4	8.1	8.0	7.6	6.5	530.0	452.0
Max.	25.4	25.9	8.4	8.2	8.4	7.3	681.0	531.0
Mean	24.5	25.0	8.2	8.1	8.0	6.9	581.6	491.0
S.D.	0.55	0.53	0.10	0.07	0.29	0.30	53.0	28.3
N		14		14		14		14.0
Min.		24.0		8.0		6.5		452.0
Max.		25.9		8.4		8.4		681.0
Mean		24.7		8.2		7.5		536.3
S.D.		0.58		0.11		0.63		62.3

1-11-01
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10/16/2000 4:15 PM

STATISTICS FOR WATER QUALITY

QC Test: TN-00-622 IT (AT0-730)

	Temperature		pH		DO		Conductivity/Salinity	
	New	Old	New	Old	New	Old	New	Old
1	24.4	24.6	7.8	8.1	8.1	7.3	720.0	550.0
2	24.2	24.5	7.9	8.1	7.3	6.6	665.0	535.0
3	25.4	24.7	8.1	8.0	7.7	6.2	574.0	510.0
4	24.0	24.2	8.3	8.1	7.8	6.9	571.0	472.0
5	24.9	25.8	8.2	8.1	7.7	6.8	546.0	450.0
6	24.6	24.9	8.4	8.1	8.2	7.2	586.0	467.0
7	24.3	25.6	8.3	8.1	8.2	7.2	535.0	484.0
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N	7	7	7	7	7	7	7.0	7.0
Min.	24.0	24.2	7.8	8.0	7.3	6.2	535.0	450.0
Max.	25.4	25.8	8.4	8.1	8.2	7.3	720.0	550.0
Mean	24.5	24.9	8.1	8.1	7.9	6.9	599.6	495.4
S.D.	0.48	0.59	0.22	0.04	0.33	0.39	67.7	37.2
N		14		14		14		14.0
Min.		24.0		7.8		6.2		450.0
Max.		25.8		8.4		8.2		720.0
Mean		24.7		8.1		7.4		547.5
S.D.		0.55		0.16		0.61		75.3

1-11-01
W

10/16/2000 4:16 PM

Larval Fish Growth and Survival Test-7 Day Survival

Start Date:		Test ID:	TN-00-622	Sample ID:	
End Date:		Lab ID:		Sample Type:	
Sample Date:		Protocol:	EPAF 91-EPA Freshwater	Test Species:	PP-Pimephales promelas
Comments:	IT CORPORATION				

Conc-%	1	2	3	4	5
HARD. CONT.	1.0000	1.0000	0.9000	0.9000	0.9000
AT0-724	0.9000	1.0000	0.9000	0.5000	0.8000
AT0-725	0.8000	0.9000	0.5000	0.9000	1.0000
AT0-728	0.7000	0.7000	0.6000	0.8889	0.6000
AT0-729	0.8000	0.7000	0.8000	0.9000	0.8000
AT0-730	0.6000	0.8000	0.9000	0.7000	1.0000
LAB CONT.	0.8000	1.0000	1.0000	0.7000	0.8000

			Transform: Arcsin Square Root						1-Tailed	
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD
HARD. CONT.	0.9400	1.0000	1.3142	1.2490	1.4120	6.792	5			
AT0-724	0.8200	0.8723	1.1605	0.7854	1.4120	20.322	5	1.363	1.860	0.2097
AT0-725	0.8200	0.8723	1.1605	0.7854	1.4120	20.322	5			
AT0-728	0.6978	0.7423	0.9971	0.8861	1.2310	14.131	5			
AT0-729	0.8000	0.8511	1.1123	0.9912	1.2490	8.222	5			
AT0-730	0.8000	0.8511	1.1291	0.8861	1.4120	18.419	5			
LAB CONT.	0.8600	0.9149	1.2059	0.9912	1.4120	16.090	5			

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.01)	0.87815	0.781	-1.0118	2.26534
F-Test indicates equal variances (p = 0.09)	6.98087	23.1539		

Hypothesis Test (1-tail, 0.05)	MSDu	MSDp	MSB	MSE	F-Prob	df
Homoscedastic t Test indicates no significant differences	0.13771	0.14719	0.05906	0.0318	0.21003	1, 8

AT0-724 vs. Control (Hardness)

ToxCalc v5.0.23

Reviewed by: 1-11-01 VW (LAH)

Larval Fish Growth and Survival Test-7 Day Survival

Start Date:		Test ID:	TN-00-622	Sample ID:	
End Date:		Lab ID:		Sample Type:	
Sample Date:		Protocol:	EPAF 91-EPA Freshwater	Test Species:	PP-Pimephales promelas
Comments:	IT CORPORATION				

Conc-%	1	2	3	4	5
HARD. CONT.	1.0000	1.0000	0.9000	0.9000	0.9000
AT0-724	0.9000	1.0000	0.9000	0.5000	0.8000
AT0-725	0.8000	0.9000	0.5000	0.9000	1.0000
AT0-728	0.7000	0.7000	0.6000	0.8889	0.6000
AT0-729	0.8000	0.7000	0.8000	0.9000	0.8000
AT0-730	0.6000	0.8000	0.9000	0.7000	1.0000
LAB CONT.	0.8000	1.0000	1.0000	0.7000	0.8000

			Transform: Arcsin Square Root						1-Tailed	
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD
HARD. CONT.	0.9400	1.0000	1.3142	1.2490	1.4120	6.792	5			
AT0-724	0.8200	0.8723	1.1605	0.7854	1.4120	20.322	5			
AT0-725	0.8200	0.8723	1.1605	0.7854	1.4120	20.322	5	1.363	1.860	0.2097
AT0-728	0.6978	0.7423	0.9971	0.8861	1.2310	14.131	5			
AT0-729	0.8000	0.8511	1.1123	0.9912	1.2490	8.222	5			
AT0-730	0.8000	0.8511	1.1291	0.8861	1.4120	18.419	5			
LAB CONT.	0.8600	0.9149	1.2059	0.9912	1.4120	16.090	5			

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.01)	0.87815	0.781	-1.0118	2.26534
F-Test indicates equal variances (p = 0.09)	6.98087	23.1539		

Hypothesis Test (1-tail, 0.05)	MSDu	MSDp	MSB	MSE	F-Prob	df
Homoscedastic t Test indicates no significant differences	0.13771	0.14719	0.05906	0.0318	0.21003	1, [illegible]

AT0-725 vs. Hardness Control

ToxCalc v5.0.23

Reviewed by: 11-01 [illegible]

Larval Fish Growth and Survival Test-7 Day Survival

Start Date:		Test ID:	TN-00-622	Sample ID:	
End Date:		Lab ID:		Sample Type:	
Sample Date:		Protocol:	EPAF 91-EPA Freshwater	Test Species:	PP-Pimephales promelas
Comments:	IT CORPORATION				

Conc-%	1	2	3	4	5
HARD. CONT.	1.0000	1.0000	0.9000	0.9000	0.9000
AT0-724	0.9000	1.0000	0.9000	0.5000	0.8000
AT0-725	0.8000	0.9000	0.5000	0.9000	1.0000
AT0-728	0.7000	0.7000	0.6000	0.8889	0.6000
AT0-729	0.8000	0.7000	0.8000	0.9000	0.8000
AT0-730	0.6000	0.8000	0.9000	0.7000	1.0000
LAB CONT.	0.8000	1.0000	1.0000	0.7000	0.8000

			Transform: Arcsin Square Root						1-Tailed	
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD
HARD. CONT.	0.9400	1.0000	1.3142	1.2490	1.4120	6.792	5			
AT0-724	0.8200	0.8723	1.1605	0.7854	1.4120	20.322	5			
AT0-725	0.8200	0.8723	1.1605	0.7854	1.4120	20.322	5			
*AT0-728	0.6978	0.7423	0.9971	0.8861	1.2310	14.131	5	4.252	1.860	0.1387
AT0-729	0.8000	0.8511	1.1123	0.9912	1.2490	8.222	5			
AT0-730	0.8000	0.8511	1.1291	0.8861	1.4120	18.419	5			
LAB CONT.	0.8600	0.9149	1.2059	0.9912	1.4120	16.090	5			

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.01)	0.86998	0.781	1.12072	0.70339
F-Test indicates equal variances (p = 0.40)	2.49169	23.1539		

Hypothesis Test (1-tail, 0.05)	MSDu	MSDp	MSB	MSE	F-Prob	df
Homoscedastic t Test indicates significant differences	0.08388	0.08965	0.25146	0.01391	0.00279	1, 8

AT0-728 vs. Hardness Control

ToxCalc v5.0.23

Reviewed by: 1-11-01 WW CLA

Larval Fish Growth and Survival Test-7 Day Survival

Start Date:		Test ID:	TN-00-622	Sample ID:	
End Date:		Lab ID:		Sample Type:	
Sample Date:		Protocol:	EPAF 91-EPA Freshwater	Test Species:	PP-Pimephales promelas
Comments:	IT CORPORATION				

Conc-%	1	2	3	4	5
HARD. CONT.	1.0000	1.0000	0.9000	0.9000	0.9000
AT0-724	0.9000	1.0000	0.9000	0.5000	0.8000
AT0-725	0.8000	0.9000	0.5000	0.9000	1.0000
AT0-728	0.7000	0.7000	0.6000	0.8889	0.6000
AT0-729	0.8000	0.7000	0.8000	0.9000	0.8000
AT0-730	0.6000	0.8000	0.9000	0.7000	1.0000
LAB CONT.	0.8000	1.0000	1.0000	0.7000	0.8000

			Transform: Arcsin Square Root						1-Tailed	
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD
HARD. CONT.	0.9400	1.0000	1.3142	1.2490	1.4120	6.792	5			
AT0-724	0.8200	0.8723	1.1605	0.7854	1.4120	20.322	5			
AT0-725	0.8200	0.8723	1.1605	0.7854	1.4120	20.322	5			
AT0-728	0.6978	0.7423	0.9971	0.8861	1.2310	14.131	5			
*AT0-729	0.8000	0.8511	1.1123	0.9912	1.2490	8.222	5	3.533	1.860	0.1063
AT0-730	0.8000	0.8511	1.1291	0.8861	1.4120	18.419	5			
LAB CONT.	0.8600	0.9149	1.2059	0.9912	1.4120	16.090	5			

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.01)	0.91042	0.781	0.40756	-1.017
F-Test indicates equal variances (p = 0.96)	1.04969	23.1539		

Hypothesis Test (1-tail, 0.05)	MSDu	MSDp	MSB	MSE	F-Prob	df
Homoscedastic t Test indicates significant differences	0.06158	0.06582	0.10191	0.00817	0.0077	1, 8

AT0-729 vs. Hardness Control

ToxCalc v5.0.23

Reviewed by: 1-11-01 JW CLM

Larval Fish Growth and Survival Test-7 Day Survival

Start Date:		Test ID:	TN-00-622	Sample ID:	
End Date:		Lab ID:		Sample Type:	
Sample Date:		Protocol:	EPAF 91-EPA Freshwater	Test Species:	PP-Pimephales promelas
Comments:	IT CORPORATION				

Conc-%	1	2	3	4	5
HARD. CONT.	1.0000	1.0000	0.9000	0.9000	0.9000
AT0-724	0.9000	1.0000	0.9000	0.5000	0.8000
AT0-725	0.8000	0.9000	0.5000	0.9000	1.0000
AT0-728	0.7000	0.7000	0.6000	0.8889	0.6000
AT0-729	0.8000	0.7000	0.8000	0.9000	0.8000
AT0-730	0.6000	0.8000	0.9000	0.7000	1.0000
LAB CONT.	0.8000	1.0000	1.0000	0.7000	0.8000

			Transform: Arcsin Square Root						1-Tailed	
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD
HARD. CONT.	0.9400	1.0000	1.3142	1.2490	1.4120	6.792	5			
AT0-724	0.8200	0.8723	1.1605	0.7854	1.4120	20.322	5			
AT0-725	0.8200	0.8723	1.1605	0.7854	1.4120	20.322	5			
AT0-728	0.6978	0.7423	0.9971	0.8861	1.2310	14.131	5			
AT0-729	0.8000	0.8511	1.1123	0.9912	1.2490	8.222	5			
AT0-730	0.8000	0.8511	1.1291	0.8861	1.4120	18.419	5	1.829	1.860	0.1882
LAB CONT.	0.8600	0.9149	1.2059	0.9912	1.4120	16.090	5			

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.01)	0.9591	0.781	0.34079	0.16816
F-Test indicates equal variances (p = 0.13)	5.42806	23.1539		

Hypothesis Test (1-tail, 0.05)	MSDu	MSDp	MSB	MSE	F-Prob	df
Homoscedastic t Test indicates no significant differences	0.12072	0.12903	0.0857	0.02561	0.10475	1, 8

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AT0-730 vs. Hardness Control

ToxCalc v5.0.23

Reviewed by: 1-11-01 VW (LMA)

Larval Fish Growth and Survival Test-7 Day Growth

Start Date:	Test ID: TN-00-622	Sample ID:	
End Date:	Lab ID:	Sample Type:	
Sample Date:	Protocol: EPAF 91-EPA Freshwater	Test Species:	PP-Pimephales promelas
Comments: IT CORPORATION			

Conc-%	1	2	3	4	5	Std. Dev.
HARD. CONT.	0.4180	0.3630	0.4322	0.4289	0.4233	0.02852
AT0-724	0.4322	0.4390	0.4267	0.6500	0.3675	0.10832
AT0-725	0.3838	0.3611	0.5480	0.3844	0.3820	0.07672
AT0-728	0.3529	0.3471	0.3700	0.3813	0.3450	0.01573
AT0-729	0.4325	0.4957	0.3900	0.3833	0.3988	0.04633
AT0-730	0.4317	0.4063	0.4100	0.3800	0.3730	0.02383
LAB CONT.	0.4325	0.3720	0.4390	0.3771	0.4025	0.03075

			Transform: Untransformed						1-Tailed	
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD
HARD. CONT.	0.4131	1.0000	0.4131	0.3630	0.4322	6.904	5			
AT0-724	0.4631	1.1210	0.4631	0.3675	0.6500	23.391	5			
AT0-725	0.4119	0.9970	0.4119	0.3611	0.5480	18.627	5	0.034	1.860	0.0681
AT0-728	0.3593	0.8697	0.3593	0.3450	0.3813	4.379	5			
AT0-729	0.4201	1.0169	0.4201	0.3833	0.4957	11.029	5			
AT0-730	0.4002	0.9688	0.4002	0.3730	0.4317	5.954	5			
LAB CONT.	0.4046	0.9795	0.4046	0.3720	0.4390	7.600	5			

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.01)	0.79326	0.781	1.88887	4.48996
F-Test indicates equal variances (p = 0.08)	7.23577	23.1539		

Hypothesis Test (1-tail, 0.05)	MSDu	MSDp	MSB	MSE	F-Prob	df
Homoscedastic t Test indicates no significant differences	0.06807	0.16477	3.8E-06	0.00335	0.97406	1, 8

AT0-725 versus Hardness Control

ToxCalc v5.0.23

Reviewed by: 1-11-01 W

Larval Fish Growth and Survival Test-7 Day Growth

Start Date:	Test ID: TN-00-622	Sample ID:	
End Date:	Lab ID:	Sample Type:	
Sample Date:	Protocol: EPAF 91-EPA Freshwater	Test Species:	PP-Pimephales promelas
Comments: IT CORPORATION			

Conc-%	1	2	3	4	5
HARD. CONT.	0.4180	0.3630	0.4322	0.4289	0.4233
AT0-724	0.4322	0.4390	0.4267	0.6500	0.3675
AT0-725	0.3838	0.3611	0.5480	0.3844	0.3820
AT0-728	0.3529	0.3471	0.3700	0.3813	0.3450
AT0-729	0.4325	0.4957	0.3900	0.3833	0.3988
AT0-730	0.4317	0.4063	0.4100	0.3800	0.3730
LAB CONT.	0.4325	0.3720	0.4390	0.3771	0.4025

			Transform: Untransformed						1-Tailed	
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD
HARD. CONT.	0.4131	1.0000	0.4131	0.3630	0.4322	6.904	5			
AT0-724	0.4631	1.1210	0.4631	0.3675	0.6500	23.391	5			
AT0-725	0.4119	0.9970	0.4119	0.3611	0.5480	18.627	5			
AT0-728	0.3593	0.8697	0.3593	0.3450	0.3813	4.379	5			
AT0-729	0.4201	1.0169	0.4201	0.3833	0.4957	11.029	5			
AT0-730	0.4002	0.9688	0.4002	0.3730	0.4317	5.954	5	0.777	1.860	0.0309
LAB CONT.	0.4046	0.9795	0.4046	0.3720	0.4390	7.600	5			

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.01)	0.90132	0.781	-0.9997	0.41515
F-Test indicates equal variances (p = 0.74)	1.43292	23.1539		

Hypothesis Test (1-tail, 0.05)	MSDu	MSDp	MSB	MSE	F-Prob	df
Homoscedastic t Test indicates no significant differences	0.03091	0.07482	0.00042	0.00069	0.45978	1, 8

AT0-730 versus Hardness Control

ToxCalc v5.0.23

Reviewed by: 1-11-01 WW

ATTACHMENT IV

Hyalella azteca Toxicity Testing
Data Sheets

TOXICITY TEST OBSERVATION DATA SHEET

Project Number: 70003.10
Client: IT Corporation
QC Test Number: TN-644
Test Material: Sediment
Accession Number: ATO-740 to 744
Dilution Water: very hard water
Accession Number: ~~LDD~~ –

TEST ORGANISM
Common Name: amphipod
Scientific Name: H. azteca

TEST TYPE: (Static) / Flowthrough
(Renewal) / Non-renewal

Beginning Date: 9/22/00 Time: 1700
Ending Date: ~~9/2~~ 10/2/00 Time: 1500

Test Container: 300ml lipless beaker
Test Volume: 275 ml (100 ml sediment / 175 ml water)
Test Duration: 10 days

Concentration	Rep	Number of Surviving Organisms										
		Day 0 Date 9/22	Day 1 Date	Day 2 Date	Day 3 Date	Day 4 Date	Day 5 Date	Day 6 Date	Day 7 Date	Day 8 Date	Day 9 Date	Day 10 Date 10/2
Control	A	10										9
	B	10										10
	C	10										10
	D	10										9
	E	10										8 (1 dead)
	F	10										9
	G	10										10
	H	10										10
ATO-740	A	10										9
	B	10										10
	C	10										10
	D	10										5
	E	10										8 (2 dead)
	F	10										8
Time / Initials		NM 1700										1500 AH, PAT, KL

ATS-T11
03/01/00

TOXICITY TEST OBSERVATION DATA SHEET

Project Number: 70003.10
Client: IT Corporation
QC Test Number: TN-644
Test Material: Sediment
Accession Number: ATO-740-747
Dilution Water: very hard water
Accession Number: ~~LDD~~ LMr

TEST ORGANISM
Common Name: amphipod
Scientific Name: H. azteca

TEST TYPE: (Static) / Flowthrough
(Renewal) / Non-renewal

Beginning Date: 9/22/00 Time: 1700
Ending Date: 10/2/00 Time: 1500

Test Container: 300 ml Lipless beaker
Test Volume: 275 ml (100 ml sediment / 175 ml water)
Test Duration: 10 days

Concentration	Rep	Number of Surviving Organisms										
		Day 0 Date 9/22	~~Day 1~~ Date	~~Day 2~~ Date	~~Day 3~~ Date	~~Day 4~~ Date	~~Day 5~~ Date	~~Day 6~~ Date	~~Day 7~~ Date	~~Day 8~~ Date	~~Day 9~~ Date	Day 10 Date 10/2
ATO-740	G	10										5 (2 dead)
	H	10										7
ATO-741	A	10										~~KA~~ 7
	B	10										8
	C	10										9
	D	10										10
	E	10										7
	F	10										10
	G	10										8
	H	10										9
ATO-742	A	10										9
	B	10										10
	C	10										7
	D	10										8
Time / Initials		1700 KA										1500 LMr, RSM, KL

ATS-T11
03/01/00

TOXICITY TEST OBSERVATION DATA SHEET

Project Number: 70003.10
Client: IT Corporation
QC Test Number: TN-644
Test Material: Sediment
Accession Number: ATO-740-744
Dilution Water: Very hard water
Accession Number: ~~100~~ 1

TEST ORGANISM
Common Name: amphipod
Scientific Name: H. azteca

TEST TYPE: Static / Flowthrough
Renewal / Non-renewal

Beginning Date: 9/22/00 Time: 1700
Ending Date: 10/2/00 Time: 1500

Test Container: 300 ml lipless beaker
Test Volume: 275 ml (100 ml sediment, 175 ml water)
Test Duration: 10 days

Concentration	Rep	Number of Surviving Organisms										
		Day 0 Date 9/22	Day 1 Date	Day 2 Date	Day 3 Date	Day 4 Date	Day 5 Date	Day 6 Date	Day 7 Date	Day 8 Date	Day 9 Date	Day 10 Date 10/2
ATO-742	E	10										9
	F	10										6
	G	10										10
	H	10										7
ATO-743	A	10										9
	B	10										8
	C	10										7
	D	10										10
	E	10										9
	F	10										8
	G	10										9
	H	10										10
ATO-744	A	10										8
	B	10										7
Time / Initials		1700 MH										1500 LAH, RSH, KL

ATS-T11
03/01/00

TOXICITY TEST OBSERVATION DATA SHEET

Project Number: 70003.10
Client: IT corporation
QC Test Number: TN-644
Test Material: sediment
Accession Number: ATO-740-744
Dilution Water: very hard water
Accession Number: ~~100~~ 1m

TEST ORGANISM
Common Name: amphipod
Scientific Name: H. azteca

TEST TYPE: Static / Flowthrough
Renewal / Non-renewal

Beginning Date: 9/22/00 Time: 1700
Ending Date: 10/2/00 Time: 1500

Test Container: 300 ml lipless beaker
Test Volume: 275 ml (100 ml sediment 175 ml water)
Test Duration: 10 days

Concentration	Rep	Number of Surviving Organisms										
		Day 0 Date 9/22	Day 1 Date	Day 2 Date	Day 3 Date	Day 4 Date	Day 5 Date	Day 6 Date	Day 7 Date	Day 8 Date	Day 9 Date	Day 10 Date 10/2
ATO-744	C	10										10
	D	10										10
	E	10										9
	F	10										9
	G	10										9
	H	10										9
Time / Initials		1700 pcl										1500 LAW, RDT

ATS-T11
03/01/00

WEIGHT DATA (Test Species: H. azteca)

Project Number: 700003.10

Client: IT Corporation

QC Test Number: TN-644

Tin Lot: 29 Red Oven Temp (°C): 100

	Date	Time	Initials
Loaded tins placed in oven:	10/2/00	1710	LAH
Loaded tins removed from oven:	10/3/00	1030	SZ
Loaded tins weighed:	10/3/00	1100	SZ

Test Concentration	Rep	Tin #	A Weight of Tin (mg)	B Weight of Tin and Dried Organisms (mg)	B-A Total Dry Organism Weight (mg)	C Number of Organisms Weighed	(B-A)/C Mean Dry Organism Weight (mg)	(if applicable) Mean Biomass (mg/exposed org.)
Control	A	114	28.94	31.34	2.40	9	0.267	
	B	17	24.92	27.29	2.37	10	LAH ~~0.240~~ 0.237	
	C	113	29.61	31.54	1.93	10	0.193	
	D	104	27.42	29.42	2.00	9	0.222	
	E	74	26.90	28.12	1.22	8	0.153	
	F	57	26.49	28.24	1.75	9	0.194	
	G	116	28.74	31.24	2.50	10	0.250	
	H	60	26.67	28.82	2.15	10	0.2~~2~~15 LAH	
ATO-740	A	50	27.06	28.67	1.61	9	LAH ~~0.178~~ 0.179	
	B	5	25.84	28.02	2.18	10	LAH ~~0.218~~ 0.218	
	C	37	28.84	31.56	2.72	10	0.~~28~~272 LAH	
	D	87	28.77	30.37	1.60	5	0.320	
	E	24	27.01	28.63	1.62	8	0.203	
	F	103	27.47	29.26	1.79	8	0.224	

Dry wt. calculations checked (date, initials): 10/18/00 LAH

Biomass calculations checked (date, initials): _____

ATS-T46
03/01/00

WEIGHT DATA (Test Species: H. azteca)

Project Number: 7000310

Client: II Corporation

QC Test Number: TN-644

Tin Lot: 29 Red Oven Temp (°C): 100

	Date	Time	Initials
Loaded tins placed in oven:	10/2/00	1710	[illegible]
Loaded tins removed from oven:	10/3/00	1030	[illegible]
Loaded tins weighed:	10/3/00	1100	[illegible]

Test Concentration	Rep	Tin #	A Weight of Tin (mg)	B Weight of Tin and Dried Organisms (mg)	B-A Total Dry Organism Weight (mg)	C Number of Organisms Weighed	(B-A)/C Mean Dry Organism Weight (mg)	(if applicable) Mean Biomass (mg/exposed org.)
ATO-740	G	92	27.70	28.96	1.26	5	0.252	
	H	117	27.60	29.36	1.76	7	0.251	
ATO-741	A	11	27.80	29.52	1.72	7	~~0.250~~ 0.246	
	B	80	28.72	30.38	1.66	8	0.208	
	C	16	29.53	32.14	2.61	9	0.290	
	D	88	27.17	29.53	2.36	10	~~0.240~~ 0.233	
	E	15	26.94	28.20	1.26	7	0.180	
	F	32	27.64	30.28	2.64	10	0.264	
	G	97	27.45	29.18	1.73	8	~~0.220~~ 0.216	
	H	44	27.82	29.09	1.27	9	0.141	
ATO-742	A	73	28.29	~~30.25~~ 30.25	1.96	9	~~0.220~~ 0.218	
	B	119	28.08	29.96	1.88	10	0.188	
	C	79	28.15	29.79	1.64	7	0.234	
	D	34	26.64	28.28	1.64	8	0.205	

Dry wt. calculations checked (date, initials): 10/18/00 [illegible] Biomass calculations checked (date, initials): _____

WEIGHT DATA (Test Species: H. azteca)

Project Number: 70003.10

Client: IT corporation

QC Test Number: TN-644

Tin Lot: 29 Red Oven Temp (°C): 100

	Date	Time	Initials
Loaded tins placed in oven:	10/2/00	1710	LAH
Loaded tins removed from oven:	10/3/00	1030	gz
Loaded tins weighed:	10/3/00	1100	gz

Test Concentration	Rep	Tin #	A Weight of Tin (mg)	B Weight of Tin and Dried Organisms (mg)	B-A Total Dry Organism Weight (mg)	C Number of Organisms Weighed	(B-A)/C Mean Dry Organism Weight (mg)	(if applicable) Mean Biomass (mg/exposed org.)
ATO-742	E	25	29.85	31.60	1.75	9	0.194	
	F	18	27.90	29.16	1.26	6	0.210	
	G	111	28.12	30.17	2.05	10	0.205	
	H	4	28.45	30.25	1.80	7	~~LAH 0.260~~ 0.257	
ATO-743	A	109	29.14	31.19	2.05	9	0.228	
	B	63	28.09	29.66	1.57	8	~~LAH 0.20~~ 0.196	
	C	54	27.75	29.93	2.18	7	0.311	
	D	36	26.54	28.92	2.38	10	~~LAH 0.240~~ 0.238	
	E	67	26.64	28.81	2.17	9	0.241	
	F	86	26.81	28.98	2.17	8	0.271	
	G	21	27.16	29.41	2.25	9	0.250	
	H	76	25.55	28.00	2.45	10	~~LAH 0.25~~ 0.245	
ATO-744	A	90	29.36	~~30.84~~ 92 30.65	1.29	8	0.161	
	B	95	28.12	29.72	1.60	7	~~LAH 0.230~~ 0.229	

Dry wt. calculations checked (date, initials): 10/18/00 LAH Biomass calculations checked (date, initials): _____

ATS-T46
03/01/00

WEIGHT DATA (Test Species: H. azteca)

Project Number: 70003.10

Client: IT corporation

QC Test Number: TN-644

Tin Lot: 29 Red Oven Temp (°C): 100

	Date	Time	Initials
Loaded tins placed in oven:	10/2/00	1710	LAH
Loaded tins removed from oven:	10/3/00	1030	[illegible]
Loaded tins weighed:	10/3/00	1100	[illegible]

Test Concentration	Rep	Tin #	A Weight of Tin (mg)	B Weight of Tin and Dried Organisms (mg)	B-A Total Dry Organism Weight (mg)	C Number of Organisms Weighed	(B-A)/C Mean Dry Organism Weight (mg)	(if applicable) Mean Biomass (mg/exposed org.)
ATO-744	C	10	26.71	28.78	2.07	10	0.207	
	D	106	26.06	28.23	2.17	10	~~0.220~~ 0.217	
	E	20	27.91	29.27	1.36	9	0.151	
	F	71	27.41	29.12	1.71	9	0.190	
	G	39	27.29	28.81	1.52	9	~~0.17~~ 0.169	
	H	100	27.58	29.47	1.89	9	0.210	

Dry wt. calculations checked (date, initials): 10/18/00 LAH

Biomass calculations checked (date, initials):

TS-T46
/01/00

TOXICITY TEST WATER QUALITY DATA SHEET - NEW SOLUTIONS

Project Number: 70003.10
Client: IT Corporation
QC Test Number: TN-00-644

TEST ORGANISM
Common Name: amphipod
Scientific Name: H. azteca

Beginning Date: 9/22/00 Time: 1700
Ending Date: 10/2/00 Time: 1500

TARGET VALUES Temp: 23±1 °C pH: 6.0 - 9.0 DO: ≥ ~~4.0~~ 2.5 mg/L Salinity: — ppt

Test Conc	Rep	Temperature (°C) 0	1	2	3	4	5	6	pH 0	1	2	3	4	5	6	Dissolved Oxygen (mg/L) 0	1	2	3	4	5	6	Conductivity (µS/cm) ~~Salinity (ppt)~~ 0	1	2	3	4	5	6
Control		22.7							8.5							8.0							1344						
ATO-740		22.7							8.6							7.8							1093						
ATO-741		22.7							8.6							7.8							1084						
ATO-742		22.8							8.6							7.9							1081						
ATO-743		23.0							8.6							8.0							1059						
ATO-744		23.1							8.6							7.9							1047						
Meter Number		11/104							11/104							55							12/920						
Time		1500							1500							1505							1500						
Initials		KSH							KSH							KSH							KSH						

Data transcribed 10/17/00 LAH

ATS-T13
03/01/00

TOXICITY TEST WATER QUALITY DATA SHEET - OLD SOLUTIONS

Project Number: 70003110 | TEST ORGANISM | Beginning Date: 9/22/00 | Time: 1700

Client: IT Corporation | Common Name: amphipod | Ending Date: 10/2/00 | Time: 1500

QC Test Number: ~~TN-644~~ TN-00-644 | Scientific Name: H. azteca

TARGET VALUES Temp: 23±1 °C | pH: 6.0 - 9.0 | DO: ~~≥4.0~~ ≥4.0-2.5 mg/L | Salinity: — ppt

Test Conc	Rep	Temperature (°C) 1	2	3	4	5	6	7	pH 1	2	3	4	5	6	7
Control	A														
	B	22.8							8.4						
	C		22.8							8.3					
	D			22.8							8.4				
	E				22.1							8.2			
	F					22.5							8.3		
	G						22.5							8.3	
	H							23.3							8.0
MTD-740	A														
	B	22.6							8.3						
	C		22.7							8.0					
	D			22.8							8.3				
	E				22.2							8.1			
	F					22.4							8.3		
Meter Number		56	57	10/104	12/104	57	17/103	10/103	10/103	12/104	10/104	9/104	12/103	17/103	10/103
Time		1437	950	1005	1040	0955	1045	1300	1431	1000	1005	1040	1000	1045	1300
Initials		nn	RS	RS	MD	RS	nn	KL	nn	RS	RS	MD	RS	nn	KL

Test Conc	Rep	Dissolved Oxygen (mg/L) 1	2	3	4	5	6	7	Conductivity (µS/cm) ~~Salinity (ppt)~~ 1	2	3	4	5	6	7
Control	A														
	B	6.1							1868						
	C		5.9							1847					
	D			5.7							1836				
	E				6.0							1485			
	F					6.9	6.4						1315		
	G						~~6.4~~	4.6						1382	
	H							~~4.7~~							1234
MTD-740	A														
	B	6.0							1237						
	C		4.5							1182					
	D			4.2							1230				
	E				5.1							1208			
	F					6.8							1209		
Meter Number		55	57	55	57	57	56	56	12/120	11/120	12/121	12/120	73/120	14/120	12/121
Time		1437	950	1010	1045	0955	1051	1305	1445	955	1020	1055	1005	100	1255
Initials		nn	RS	RS	MD	RS	nn	KL	nn	RS	RS	MD	RS	nn	KL

TOXICITY TEST WATER QUALITY DATA SHEET - OLD SOLUTIONS

Project Number: 70003.10
Client: IT Corporation
QC Test Number: ~~TN-00-644~~ TN-00-644

TEST ORGANISM
Common Name: amphipod
Scientific Name: H. azteca

Beginning Date: 9/22/00 Time: 1700
Ending Date: 10/2/00 Time: 1500

TARGET VALUES Temp: 23±1 °C pH: 6.0 - 9.0 DO: ≥~~24.0~~ 2.5 ~~24.0~~ mg/L Salinity: — ppt

Test Conc	Rep	Temperature (°C) 1	2	3	4	5	6	7	pH 1	2	3	4	5	6	7	Dissolved Oxygen (mg/L) 1	2	3	4	5	6	7	Conductivity (µS/cm) ~~Salinity (ppt)~~ 1	2	3	4	5	6	7
ATO-740	G					22.7	22.7							8.3							6.2	4.7	1156					1156	
	H							23.7							8.1							4.7							1097
ATO-741	A																					4.6							
	B	22.5							8.2							6.2							1172						
	C		22.6							8.0							5.3							1172					
	D			22.6							8.2							4.0							1264				
	E				22.3							8.1							5.2							1166			
	F					22.5							8.3							6.8							1122		
	G						22.8							8.2							6.4	4.7						1156	
	H							23.8							8.1														1088
ATO-742	A																												
	B	22.5							8.3							6.1							1187						
	C		22.7							8.0							4.7							1223					
	D			23.0							8.1							4.5							1291				
Meter Number		95	57	19/104	92/104	57	12/103	10/103	16/103	12/104	10/101	92/104	12/103	12/104	10/103	55	57	55	57	57	56	57	16/126	19/120	12/121	12/120	73/120	10/121	12/121
Time		1137	0950	1005	1040	0955	1045	1300	1137	1000	1005	1040	1000	1045	1300	1137	0950	1010	1045	0955	1051	1305	1445	0955	1000	1055	1005	1100	1255
Initials		nn	AS	AS	CD	DT	nn	KL	nn	AS	AS	CD	DT	nn	KL	nn	AS	AS	CD	DT	nn	KL	nn	AS	AS	CD	DT	nn	KL

TOXICITY TEST WATER QUALITY DATA SHEET - OLD SOLUTIONS

Project Number: 70003.10 | TEST ORGANISM | Beginning Date: 9/22/00 Time: 1700

Client: IT Corporation | Common Name: amphipod | Ending Date: 10/2/00 Time: 1500

QC Test Number: ~~TN-0444~~ TN-00-644 | Scientific Name: H. azteca

TARGET VALUES Temp: 23± °C pH: 6.0 - 9.0 DO: ~~≥4.0~~ ≥2.5 mg/L Salinity: — ppt

Test Conc	Rep	Temperature (°C) 1	2	3	4	5	6	7	pH 1	2	3	4	5	6	7	Dissolved Oxygen (mg/L) 1	2	3	4	5	6	7	Conductivity (µS/cm) ~~Salinity (ppt)~~ 1	2	3	4	5	6	7
ATO-742	E				8.0 22.4							8.0							4.7							1217			
	F					22.5							8.3							6.9							1142		
	G						22.6							8.3							7.1							1143	
	H							23.8							8.0							4.5							1095
ATO-743	A																												
	B	22.6							8.3							6.0	5						1136						
	C		22.6							8.1							~~6.1~~							1160					
	D			22.8							8.3							5.1							1224				
	E				22.0							8.3							~~4.0~~ ND 6.0							1162			
	F					22.5							8.4							7.0							1140		
	G						22.7							8.2							6.7							1173	
	H							23.4							8.2							4.8							1093
ATO-744	A																												
	B	22.8							8.2							5.5							1136						
Meter Number		55	57	19/104	92/104	57	12/103	10/03	6/03	12/104	18/104	92/104	12/103	12/103	10/03	55	57	55	57	57	56	56	12/102	11/110	12/124	12/120	73/120	16/100	12/124
Time		1437	950	1005	1040	0955	1045	1300	1434	1000	1005	1040	1000	1045	1300	1459	950	1010	1045	0955	1051	1305	1445	955	1020	1055	1005	1100	1255
Initials		kn	RS	RS	[illegible]	[illegible]	nn	W	kn	RS	RS	[illegible]	[illegible]	nn	W	nn	RS	RS	[illegible]	[illegible]	nn	W	nn	RS	RS	[illegible]	[illegible]	nn	W

ATS-T14
03/01/00

TOXICITY TEST WATER QUALITY DATA SHEET - OLD SOLUTIONS

Project Number: 700031.10
Client: IT Corporation
QC Test Number: ~~FN 6644~~ TN-00-644

TEST ORGANISM
Common Name: amphipod
Scientific Name: H. azteca

Beginning Date: 9/22/00 Time: 1750
Ending Date: 10/2/00 Time: 1500

TARGET VALUES Temp: 23±1 °C pH: 6.0 - 9.0 DO: ~~3.9-12~~ ≥4.0-2.5 mg/L Salinity: — ppt

Test Conc	Rep	Temperature (°C) 1	2	3	4	5	6	7	pH 1	2	3	4	5	6	7	Dissolved Oxygen (mg/L) 1	2	3	4	5	6	7	Conductivity (µS/cm) ~~Salinity (ppt)~~ 1	2	3	4	5	6	7
ATD-74.4	C		22.6							8.1							4.7							1168					
	D			22.8							8.3							3.8							1237				
	E				22.2							8.1							4.4							1197			
	F					22.5							8.4							6.8							1130		
	G						22.8							8.3							6.2	5.2						1160	
	H							23.5							8.2							~~5.4~~							1101
Meter Number		15	57	10/104	12/104	57	12/103	10/103	10/103	12/104	10/104	12/104	12/103	12/103	10/103	65	57	55	57	57	56	56	12/920	1/920	12/920	12/920	13/920	10/920	12/920
Time		1437	950	1005	1040	0955	1045	1305	1434	1000	1005	1040	1000	1045	1300	1437	950	1010	1045	0955	1051	1305	1435	955	1020	1055	1005	1100	1255
Initials		m	RS	RS	MD	BT	nn	KL	nn	RS	RS	MD	BT	m	KL	nn	RS	RS	MD	BT	nn	KL	nn	RS	RS	MD	BT	nn	KL

ATS-T14
03/01/00

TOXICITY TEST WATER QUALITY DATA SHEET - OLD SOLUTIONS

Project Number: 70003.10
Client: IT Corporation
QC Test Number: ~~TN-0644~~ TN00-644

TEST ORGANISM
Common Name: amphipod
Scientific Name: H. azteca

Beginning Date: 9/22/00 Time: 1700
Ending Date: 10/2/00 Time: 1500

TARGET VALUES Temp: 23±1 °C pH: 6.0 - 9.0 DO: ~~≥9.0~~ ≥4.0-2.5 mg/L Salinity: — ppt

Test Conc	Rep	Temperature (°C) 8	9	10	11	12	13	14	pH 8	9	10	11	12	13	14	Dissolved Oxygen (mg/L) 8	9	10	11	12	13	14	Conductivity (µS/cm) ~~Salinity (ppt)~~ 8	9	10	11	12	13	14
control	A	22.8							8.0	~~8.6~~						5.3							1175						
	B		23.5							8.0							4.4							1079					
	C			23.4							~~7.9~~ 7.1							~~4.0~~							1145				
	D										8.2							5.6											
	E																												
	F																												
	G																												
	H																												
ATO-740	A	22.7							7.9							4.4							1061						
	B		23.6							8.2							4.1							991					
	C			23.2							~~7.6~~							4.9							961				
	D										8.2																		
	E																												
	F																												
Meter Number		10/103	11/921	57					10/103	10/103	10/104					56	57	57					12/921	11/921	11/920				
Time		1200	1450	0954					1202	1450	0957					1155	1450	0954					1147	1450	0950				
als		MD	KL	DV					MD	KL	DV					MD	KL	DV					MD	KL	DV				

TOXICITY TEST WATER QUALITY DATA SHEET - OLD SOLUTIONS

Project Number: 700003.10
Client: IT Corporation
QC Test Number: ~~TN-0044~~ TN-00-644

TEST ORGANISM
Common Name: amphipod
Scientific Name: H. azteca

Beginning Date: 9/22/00 Time: 1700
Ending Date: 10/2/00 Time: 1500

TARGET VALUES Temp: 23±1 °C pH: 6.0 - 9.0 DO: ~~≥4.0~~ ≥4.0 2.5 mg/L Salinity: — ppt

Test Conc	Rep	Temperature (°C) 8	9	10	11	12	13	14	pH 8	9	10	11	12	13	14	Dissolved Oxygen (mg/L) 8	9	10	11	12	13	14	Conductivity (µS/cm) ~~Salinity (ppt)~~ 8	9	10	11	12	13	14
ATO-740	G																												
	H																												
ATO-741	A	22.5							8.0							5.1							1047						
	B		23.3							7.9							3.7							991					
	C			(a)							~~7.6~~ 8.2							4.9							978				
	D																												
	E																												
	F																												
	G																												
	H																												
ATO-742	A	22.6							7.9							4.8	3.3						1071	KU					
	B		~~23.5~~ 23.5	(a)						7.9								4.3						975					
	C										~~7.5~~ 8.2														973				
	D																												
Meter Number		10/103	10/103	57					10/103	10/103	10/114					56	51	57					12/921	11/921	11/920				
Time		1200	1455	0954					1200	1455	0951					1155	1455	0954					1147	1455	0950				
Initials		MB	KU	on					MB	KU	on					MB	KU	on					MB	KU	on				

(a) temperature not recorded (mistakenly)

TOXICITY TEST WATER QUALITY DATA SHEET - OLD SOLUTIONS

Project Number: 7000310
Client: IT Corporation
QC Test Number: ~~TN-1644~~ TN-00644 LHH

TEST ORGANISM
Common Name: amphipod
Scientific Name: H. azteca

Beginning Date: 9/22/00 Time: 1700
Ending Date: 10/2/00 Time: 1500

TARGET VALUES Temp: 23±1 °C pH: 6.0 - 9.0 DO: ~~7.0~~ 2.5 mg/L Salinity: — ppt

Test Conc	Rep	Temperature (°C) 8	9	10	11	12	13	14	pH 8	9	10	11	12	13	14	Dissolved Oxygen (mg/L) 8	9	10	11	12	13	14	Conductivity (µS/cm) ~~Salinity (ppt)~~ 8	9	10	11	12	13	14
ATO-742	E																												
	F																												
	G																												
	H																												
ATO-743	A	22.5							8.1							4.5							1035						
	B		22.9							8.1							3.7							999					
	C			(a)							~~7.7~~ 8.2							4.2							966				
	D																												
	E																												
	F																												
	G																												
	H																												
ATO-744	A	22.5							8.0							4.4							1031						
	B		23.5							8.1							3.5							1001					
Meter Number		10/103	11/921	57					10/103	10/103	10/104					56	57	57					12/921	11/921	H/210				
Time		1200	1458	0954					1200	1458	0951					1155	1458	0954					1147	1458	0950				
Initials		MD	KW	ON					MD	KW	ON					MD	KW	ON					MD	KW	ON				

(a) temperature mistakenly not recorded.

TOXICITY TEST WATER QUALITY DATA SHEET - OLD SOLUTIONS

Project Number: 70003.10
Client: IT Corporation
QC Test Number: ~~TN 644~~ TN 00.644

TEST ORGANISM
Common Name: amphipod
Scientific Name: H. azteca

Beginning Date: 9/22/00 Time: 1700
Ending Date: 10/2/00 Time: 1500

TARGET VALUES Temp: 23±1 °C pH: 6.0 - 9.0 DO: ~~≥9.0~~ ≥4.0 2.5 mg/L Salinity: — ppt

Test Conc	Rep	Temperature (°C) 8	9	10	11	12	13	14	pH 8	9	10	11	12	13	14	Dissolved Oxygen (mg/L) 8	9	10	11	12	13	14	Conductivity (µS/cm) ~~Salinity (ppt)~~ 8	9	10	11	12	13	14
ATD-744	C			23.1							7.9 8.2							4.7							964				
	D																												
	E																												
	F																												
	G																												
	H																												
Meter Number		10/103	10/103	K7					10/103	10/103	10/104					56	51	57					12/921	11/921	11/920				
Time		1200	1455	0954					1200	1455	0951					1155	1455	0954					1147	1455	0950				
Initials		MR	KL	JN					MR	KL	JN					MR	KL	JN					MR	KL	JN				

SEDIMENT TOXICITY TEST SET-UP BENCH SHEET

Project Number: 70003 ID

Client: IT Corporation

QC Test Number: TN-00-644

TEST ORGANISM INFORMATION

Common Name:	amphipod	Adults Isolated (Time, Date):	—
Scientific Name:	H. azteca	Neonates Pulled (Time, Date):	—
Lot Number:	—	Acclimation: —	Age: 7-14 days
Source:	EA	Culture Water (T/S): — °C	— ppt

TEST INITIATION

Date	Time	Initials	Activity
9/21/00	1500	BL, RD, JL, EV	Sediment Added to Chambers
↓	↓	↓	Overlying Water Added to Chambers
9/22/00	1700	RSH, RD	Organisms Transferred

TEST SET-UP

Sample Number(s): ATO-740, 741, 742, 743, 744

Overlying Water Number: Very Hard Recon. Water

Treatment	Volume Test Sediment	Volume Overlying Water
Control	~~175~~ 100 ml sediment	~~100~~ 175 ml water
ATO-740	↓	↓
ATO-741		
ATO-742		
ATO-743		
ATO-744		

TOXICOLOGY LABORATORY BENCH SHEET - RENEWAL RECORD

Project Number: 70003.10

Client: IT Corporation

QC Test Number: ~~TN-644~~ TN-00-644

Day	Date	Time		Initials
0	9/22/00	AM	—	—
		PM	1500	RM
1	9/23/00	AM	1027	RD
		PM	1511	RD
2	9/24/00	AM	945	LS
		PM	1530	LS
3	9/25	AM	1045	LS
		PM	1630	KL/LS
4	9/26	AM	1100	UND
		PM	1600	UND
5	9/27/00	AM	0920	DZ
		PM	1530	W
6	9/28/00	AM	0915	RD
		PM	1545	KL
7	9/29/00	AM	1037	RD
		PM	1557	RD
8	9/30/00	AM	1018	RD
		PM	1403	RD
9	10/1/00	AM	0840	KL
		PM		
10	10/2/00	AM	1130	OL
		PM	—	—

* 8.4L. total for renewal *

* 4.2L. each tub *

TOXICOLOGY LABORATORY BENCH SHEET - FEEDING RECORD

Project Number: 7000310

Client: IT Corporation

QC Test Number: TN-00-644

Food: YCT (1.0 ml/replicate daily)

Day	Date	Time	Initials
0	9/22/00	1730	RSH
1	9/23/00	1530	NP
2	9/24/00	1530	SAS
3	9/25/00	1530	SS
4	9/26/00	1300	CMD
5	9/27/00	1012	[illegible]
6	9/28/00	1600	KL
7	9/29/00	1043	NP
8	9/30/00	1025	NP
9	10/1/00	0910	KL
10			
11			
12			
13			
14			
15			
16			
17			
18			
19			
20			
21			
22			
23			
24			
25			
26			
27			
28			

STATISTICS FOR WATER QUALITY
QC Test: TN-00-644 IT (CONTROL)

	Temperature		pH		DO		Conductivity/Salinity	
	New	Old	New	Old	New	Old	New	Old
1	22.7	22.8	8.5	8.4	8.0	6.1	1344.0	1803.0
2		22.8		8.3		5.9		1849.0
3		22.8		8.4		5.7		1836.0
4		22.1		8.2		6.0		1485.0
5		22.5		8.3		6.9		1315.0
6		22.5		8.3		6.4		1382.0
7		23.3		8.0		4.6		1234.0
8		22.8		8.0		5.3		1175.0
9		23.5		8.0		4.4		1079.0
10		23.4		8.2		5.6		1145.0
11								
12								
13								
14								
15								
16								
17								
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19								
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40								
41								
42								
43								
44								
45								
46								
47								
48								
N	1	10	1	10	1	10	1.0	10.0
Min.	22.7	22.1	8.5	8.0	8.0	4.4	1344.0	1079.0
Max.	22.7	23.5	8.5	8.4	8.0	6.9	1344.0	1849.0
Mean	22.7	22.9	8.5	8.2	8.0	5.7	1344.0	1430.3
S.D.	#DIV/0!	0.44	#DIV/0!	0.16	#DIV/0!	0.77	#DIV/0!	299.2
N		11		11		11		11.0
Min.		22.1		8.0		4.4		1079.0
Max.		23.5		8.5		8.0		1849.0
Mean		22.8		8.2		5.9		1422.5
S.D.		0.42		0.17		1.01		285.1

1-11-01
MW

10/18/2000 10:15 AM

STATISTICS FOR WATER QUALITY

QC Test: TN-00-644 IT (AT0-740)

	Temperature		pH		DO		Conductivity/Salinity	
	New	Old	New	Old	New	Old	New	Old
1	22.7	22.6	8.6	8.3	7.8	6.0	1093.0	1237.0
2		22.7		8.0		4.5		1182.0
3		22.8		8.3		4.2		1280.0
4		22.2		8.1		5.1		1208.0
5		22.4		8.3		6.8		1209.0
6		22.7		8.3		6.2		1156.0
7		23.7		8.1		4.6		1097.0
8		22.7		7.9		4.4		1061.0
9		23.6		8.2		4.1		991.0
10		23.2		8.2		4.9		961.0
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48								
N	1	10	1	10	1	10	1.0	10.0
Min.	22.7	22.2	8.6	7.9	7.8	4.1	1093.0	961.0
Max.	22.7	23.7	8.6	8.3	7.8	6.8	1093.0	1280.0
Mean	22.7	22.9	8.6	8.2	7.8	5.1	1093.0	1138.2
S.D.	#DIV/0!	0.49	#DIV/0!	0.14	#DIV/0!	0.93	#DIV/0!	106.8
N		11		11		11		11.0
Min.		22.2		7.9		4.1		961.0
Max.		23.7		8.6		7.8		1280.0
Mean		22.8		8.2		5.3		1134.1
S.D.		0.47		0.19		1.21		102.3

1-11-01

10/18/2000 10:23 AM

STATISTICS FOR WATER QUALITY
QC Test: TN-00-644 IT (AT0-741)

	Temperature		pH		DO		Conductivity/Salinity	
	New	Old	New	Old	New	Old	New	Old
1	22.7	22.5	8.6	8.2	7.8	6.2	1084.0	1172.0
2		22.6		8.0		5.3		1192.0
3		22.8		8.2		4.0		1267.0
4		22.3		8.1		5.2		1166.0
5		22.5		8.3		6.8		1122.0
6		22.8		8.2		6.4		1156.0
7		23.8		8.1		4.7		1089.0
8		22.5		8.0		5.1		1047.0
9		23.3		7.9		3.7		991.0
10				8.2		4.9		978.0
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47								
48								
N	1	9	1	10	1	10	1.0	10.0
Min.	22.7	22.3	8.6	7.9	7.8	3.7	1084.0	978.0
Max.	22.7	23.8	8.6	8.3	7.8	6.8	1084.0	1267.0
Mean	22.7	22.8	8.6	8.1	7.8	5.2	1084.0	1118.0
S.D.	#DIV/0!	0.48	#DIV/0!	0.12	#DIV/0!	1.00	#DIV/0!	91.9
N		10		11		11		11.0
Min.		22.3		7.9		3.7		978.0
Max.		23.8		8.6		7.8		1267.0
Mean		22.8		8.2		5.5		1114.9
S.D.		0.45		0.19		1.23		87.8

1-11-01
MW

10/18/2000 10:25 AM

STATISTICS FOR WATER QUALITY
QC Test: TN-00-644 IT (AT0-742)

	Temperature		pH		DO		Conductivity/Salinity	
	New	Old	New	Old	New	Old	New	Old
1	22.8	22.5	8.6	8.3	7.9	6.1	1081.0	1187.0
2		22.7		8.0		4.7		1223.0
3		23.0		8.1		4.5		1291.0
4		22.4		8.0		4.7		1217.0
5		22.5		8.3		6.9		1142.0
6		22.6		8.3		7.1		1143.0
7		23.8		8.0		4.5		1095.0
8		22.6		7.9		4.8		1071.0
9		23.5		7.9		3.3		975.0
10				8.2		4.3		973.0
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N	1	9	1	10	1	10	1.0	10.0
Min.	22.8	22.4	8.6	7.9	7.9	3.3	1081.0	973.0
Max.	22.8	23.8	8.6	8.3	7.9	7.1	1081.0	1291.0
Mean	22.8	22.8	8.6	8.1	7.9	5.1	1081.0	1131.7
S.D.	#DIV/0!	0.49	#DIV/0!	0.16	#DIV/0!	1.21	#DIV/0!	104.9
N		10		11		11		11.0
Min.		22.4		7.9		3.3		973.0
Max.		23.8		8.6		7.9		1291.0
Mean		22.8		8.1		5.3		1127.1
S.D.		0.46		0.22		1.43		100.7

10-11-01
MW

10/18/2000 10:26 AM

STATISTICS FOR WATER QUALITY

QC Test: TN-00-644 IT (AT0-743)

	Temperature		pH		DO		Conductivity/Salinity	
	New	Old	New	Old	New	Old	New	Old
1	23.0	22.6	8.6	8.3	8.0	6.0	1059.0	1136.0
2		22.8		8.1		4.7		1160.0
3		22.8		8.3		5.1		1224.0
4		22.0		8.3		6.0		1162.0
5		22.5		8.4		7.0		1140.0
6		22.7		8.2		6.7		1173.0
7		23.4		8.2		4.8		1093.0
8		22.5		8.1		4.5		1035.0
9		22.9		8.1		3.7		999.0
10				8.2		4.2		966.0
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N	1	9	1	10	1	10	1.0	10.0
Min.	23.0	22.0	8.6	8.1	8.0	3.7	1059.0	966.0
Max.	23.0	23.4	8.6	8.4	8.0	7.0	1059.0	1224.0
Mean	23.0	22.7	8.6	8.2	8.0	5.3	1059.0	1108.8
S.D.	#DIV/0!	0.38	#DIV/0!	0.10	#DIV/0!	1.10	#DIV/0!	83.5
N		10		11		11		11.0
Min.		22.0		8.1		3.7		966.0
Max.		23.4		8.6		8.0		1224.0
Mean		22.7		8.3		5.5		1104.3
S.D.		0.37		0.15		1.33		80.6

1-11-01
WJ

10/18/2000 10:29 AM

STATISTICS FOR WATER QUALITY
QC Test: TN-00-644 IT (AT0-744)

	Temperature		pH		DO		Conductivity/Salinity	
	New	Old	New	Old	New	Old	New	Old
1	23.1	22.8	8.6	8.2	7.9	5.5	1047.0	1136.0
2		22.6		8.1		4.7		1168.0
3		22.8		8.3		3.8		1237.0
4		22.2		8.1		4.4		1197.0
5		22.5		8.4		6.8		1130.0
6		22.8		8.3		6.2		1160.0
7		23.5		8.2		5.2		1101.0
8		22.5		8.0		4.4		1031.0
9		23.5		8.1		3.5		1001.0
10		23.1		8.2		4.7		964.0
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N	1	10	1	10	1	10	1.0	10.0
Min.	23.1	22.2	8.6	8.0	7.9	3.5	1047.0	964.0
Max.	23.1	23.5	8.6	8.4	7.9	6.8	1047.0	1237.0
Mean	23.1	22.8	8.6	8.2	7.9	4.9	1047.0	1112.5
S.D.	#DIV/0!	0.43	#DIV/0!	0.12	#DIV/0!	1.03	#DIV/0!	88.3
N		11		11		11		11.0
Min.		22.2		8.0		3.5		964.0
Max.		23.5		8.6		7.9		1237.0
Mean		22.9		8.2		5.2		1106.5
S.D.		0.41		0.17		1.33		86.0

1-11-01
MW

10/18/2000 10:30 AM

~~Larval Fish Growth and Survival Test 7-Day Survival~~ SURVIVAL 10-DAY

Start Date:	Test ID: TN-00-644	Sample ID:	
End Date:	Lab ID:	Sample Type:	Hyalella azteca
Sample Date:	Protocol: ~~EPAF-91-EPA Freshwater~~	Test Species:	~~PP-Pimephales promelas~~
Comments: IT CORPORATION			

Conc-%	1	2	3	4	5	6	7	8
CONTROL	0.9000	1.0000	1.0000	0.9000	0.8000	0.9000	1.0000	1.0000
AT0-740	0.9000	1.0000	1.0000	0.5000	0.8000	0.8000	0.5000	0.7000
AT0-741	0.7000	0.8000	0.9000	1.0000	0.7000	1.0000	0.8000	0.9000
AT0-742	0.9000	1.0000	0.7000	0.8000	0.9000	0.6000	1.0000	0.7000
AT0-743	0.9000	0.8000	0.7000	1.0000	0.9000	0.8000	0.9000	1.0000
AT0-744	0.8000	0.7000	1.0000	1.0000	0.9000	0.9000	0.9000	0.9000

			Transform: Arcsin Square Root						1-Tailed	
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD
CONTROL	0.9375	1.0000	1.3128	1.1071	1.4120	8.821	8			
*AT0-740	0.7750	0.8267	1.1062	0.7854	1.4120	22.315	8	2.143	1.761	0.1698
AT0-741	0.8500	0.9067	1.1898	0.9912	1.4120	14.148	8			
AT0-742	0.8250	0.8800	1.1622	0.8861	1.4120	17.137	8			
AT0-743	0.8750	0.9333	1.2221	0.9912	1.4120	12.140	8			
AT0-744	0.8875	0.9467	1.2398	0.9912	1.4120	11.369	8			

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.01)	0.94702	0.844	-0.1528	-0.2739
F-Test indicates equal variances (p = 0.06)	4.5441	8.88531		

Hypothesis Test (1-tail, 0.05)	MSDu	MSDp	MSB	MSE	F-Prob	df
Homoscedastic t Test indicates significant differences	0.10701	0.11446	0.17078	0.03717	0.05012	1, 14

AT0-740 vs. Control

1-11-01
WW

ToxCalc v5.0.23

Reviewed by:_____

~~Larval Fish Growth and Survival Test-7 Day Survival~~ 10-DAY SURVIVAL

Start Date:	Test ID: TN-00-644	Sample ID:	
End Date:	Lab ID:	Sample Type:	Hyalella azteca
Sample Date:	Protocol: ~~EPAF-01-EPA Freshwater~~	Test Species:	~~PP-Pimephales promelas~~
Comments: IT CORPORATION			

Conc-%	1	2	3	4	5	6	7	8
CONTROL	0.9000	1.0000	1.0000	0.9000	0.8000	0.9000	1.0000	1.0000
AT0-740	0.9000	1.0000	1.0000	0.5000	0.8000	0.8000	0.5000	0.7000
AT0-741	0.7000	0.8000	0.9000	1.0000	0.7000	1.0000	0.8000	0.9000
AT0-742	0.9000	1.0000	0.7000	0.8000	0.9000	0.6000	1.0000	0.7000
AT0-743	0.9000	0.8000	0.7000	1.0000	0.9000	0.8000	0.9000	1.0000
AT0-744	0.8000	0.7000	1.0000	1.0000	0.9000	0.9000	0.9000	0.9000

			Transform: Arcsin Square Root						1-Tailed	
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD
CONTROL	0.9375	1.0000	1.3128	1.1071	1.4120	8.821	8			
AT0-740	0.7750	0.8267	1.1062	0.7854	1.4120	22.315	8			
AT0-741	0.8500	0.9067	1.1898	0.9912	1.4120	14.148	8	1.702	1.761	0.1272
AT0-742	0.8250	0.8800	1.1622	0.8861	1.4120	17.137	8			
AT0-743	0.8750	0.9333	1.2221	0.9912	1.4120	12.140	8			
AT0-744	0.8875	0.9467	1.2398	0.9912	1.4120	11.369	8			

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.01)	0.91661	0.844	-0.001	-0.996
F-Test indicates equal variances (p = 0.34)	2.11333	8.88531		

Hypothesis Test (1-tail, 0.05)	MSDu	MSDp	MSB	MSE	F-Prob	df
Homoscedastic t Test indicates no significant differences	0.07611	0.08141	0.06047	0.02087	0.11084	1, 14

AT0-741 vs. Control

10-11-01

 ToxCalc v5.0.23 Reviewed by:_____

~~Larval Fish Growth and Survival Test-7 Day Survival~~ 10-DAY SURVIVAL

Start Date:	Test ID: TN-00-644	Sample ID:	
End Date:	Lab ID:	Sample Type:	Hyalella azteca
Sample Date:	Protocol: ~~EPAF-91-EPA Freshwater~~	Test Species:	~~PP-Pimephales promelas~~
Comments: IT CORPORATION			

Conc-%	1	2	3	4	5	6	7	8
CONTROL	0.9000	1.0000	1.0000	0.9000	0.8000	0.9000	1.0000	1.0000
AT0-740	0.9000	1.0000	1.0000	0.5000	0.8000	0.8000	0.5000	0.7000
AT0-741	0.7000	0.8000	0.9000	1.0000	0.7000	1.0000	0.8000	0.9000
AT0-742	0.9000	1.0000	0.7000	0.8000	0.9000	0.6000	1.0000	0.7000
AT0-743	0.9000	0.8000	0.7000	1.0000	0.9000	0.8000	0.9000	1.0000
AT0-744	0.8000	0.7000	1.0000	1.0000	0.9000	0.9000	0.9000	0.9000

			Transform: Arcsin Square Root						1-Tailed	
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD
CONTROL	0.9375	1.0000	1.3128	1.1071	1.4120	8.821	8			
AT0-740	0.7750	0.8267	1.1062	0.7854	1.4120	22.315	8			
AT0-741	0.8500	0.9067	1.1898	0.9912	1.4120	14.148	8			
*AT0-742	0.8250	0.8800	1.1622	0.8861	1.4120	17.137	8	1.849	1.761	0.1435
AT0-743	0.8750	0.9333	1.2221	0.9912	1.4120	12.140	8			
AT0-744	0.8875	0.9467	1.2398	0.9912	1.4120	11.369	8			

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.01)	0.93046	0.844	-0.0842	-0.8405
F-Test indicates equal variances (p = 0.18)	2.95847	8.88531		

Hypothesis Test (1-tail, 0.05)	MSDu	MSDp	MSB	MSE	F-Prob	df
Homoscedastic t Test indicates significant differences	0.0876	0.0937	0.0907	0.02654	0.08573	1, 14

AT0-742 vs. Control

10-11-01 MW

ToxCalc v5.0.23

Reviewed by:_____

~~Larval Fish Growth and Survival Test-7 Day Survival~~ 10-DAY SURVIVAL

Start Date:	Test ID: TN-00-644	Sample ID:	
End Date:	Lab ID:	Sample Type:	Hyalella azteca
Sample Date:	Protocol: ~~EPAF 91-EPA Freshwater~~	Test Species:	~~PP-Pimephales promelas~~
Comments: IT CORPORATION			

Conc-%	1	2	3	4	5	6	7	8
CONTROL	0.9000	1.0000	1.0000	0.9000	0.8000	0.9000	1.0000	1.0000
AT0-740	0.9000	1.0000	1.0000	0.5000	0.8000	0.8000	0.5000	0.7000
AT0-741	0.7000	0.8000	0.9000	1.0000	0.7000	1.0000	0.8000	0.9000
AT0-742	0.9000	1.0000	0.7000	0.8000	0.9000	0.6000	1.0000	0.7000
AT0-743	0.9000	0.8000	0.7000	1.0000	0.9000	0.8000	0.9000	1.0000
AT0-744	0.8000	0.7000	1.0000	1.0000	0.9000	0.9000	0.9000	0.9000

			Transform: Arcsin Square Root						1-Tailed	
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD
CONTROL	0.9375	1.0000	1.3128	1.1071	1.4120	8.821	8			
AT0-740	0.7750	0.8267	1.1062	0.7854	1.4120	22.315	8			
AT0-741	0.8500	0.9067	1.1898	0.9912	1.4120	14.148	8			
AT0-742	0.8250	0.8800	1.1622	0.8861	1.4120	17.137	8			
AT0-743	0.8750	0.9333	1.2221	0.9912	1.4120	12.140	8	1.363	1.761	0.1172
AT0-744	0.8875	0.9467	1.2398	0.9912	1.4120	11.369	8			

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.01)	0.94397	0.844	-0.2565	-0.7831
F-Test indicates equal variances (p = 0.53)	1.64153	8.88531		

Hypothesis Test (1-tail, 0.05)	MSDu	MSDp	MSB	MSE	F-Prob	df
Homoscedastic t Test indicates no significant differences	0.06919	0.07401	0.03292	0.01771	0.1943	1, 1·

AT0-743 vs. Control

ToxCalc v5.0.23

Reviewed by: MW 10-11-01

~~Larval Fish Growth and Survival Test-7 Day Survival~~ 10-DAY SURVIVAL

Start Date:	Test ID: TN-00-644	Sample ID:	
End Date:	Lab ID:	Sample Type:	Hyalella azteca
Sample Date:	Protocol: ~~EPAF-01-EPA Freshwater~~	Test Species:	~~PP-Pimephales promelas~~
Comments: IT CORPORATION			

Conc-%	1	2	3	4	5	6	7	8
CONTROL	0.9000	1.0000	1.0000	0.9000	0.8000	0.9000	1.0000	1.0000
AT0-740	0.9000	1.0000	1.0000	0.5000	0.8000	0.8000	0.5000	0.7000
AT0-741	0.7000	0.8000	0.9000	1.0000	0.7000	1.0000	0.8000	0.9000
AT0-742	0.9000	1.0000	0.7000	0.8000	0.9000	0.6000	1.0000	0.7000
AT0-743	0.9000	0.8000	0.7000	1.0000	0.9000	0.8000	0.9000	1.0000
AT0-744	0.8000	0.7000	1.0000	1.0000	0.9000	0.9000	0.9000	0.9000

			Transform: Arcsin Square Root						1-Tailed	
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD
CONTROL	0.9375	1.0000	1.3128	1.1071	1.4120	8.821	8			
AT0-740	0.7750	0.8267	1.1062	0.7854	1.4120	22.315	8			
AT0-741	0.8500	0.9067	1.1898	0.9912	1.4120	14.148	8			
AT0-742	0.8250	0.8800	1.1622	0.8861	1.4120	17.137	8			
AT0-743	0.8750	0.9333	1.2221	0.9912	1.4120	12.140	8			
AT0-744	0.8875	0.9467	1.2398	0.9912	1.4120	11.369	8	1.132	1.761	0.1136

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.01)	0.93672	0.844	-0.5142	-0.3552
F-Test indicates equal variances (p = 0.62)	1.48174	8.88531		

Hypothesis Test (1-tail, 0.05)	MSDu	MSDp	MSB	MSE	F-Prob	df
Homoscedastic t Test indicates no significant differences	0.06674	0.07139	0.0213	0.01664	0.27684	1, 14

ATO-744 vs. Control

ToxCalc v5.0.23

Reviewed by: 10-7-01

~~Larval Fish Growth and Survival Test 7 Day Growth~~ GROWTH

Start Date:	Test ID: TN-00-644	Sample ID:	
End Date:	Lab ID:	Sample Type:	Hyalella azteca
Sample Date:	Protocol: ~~EPAF-01-EPA Freshwater~~	Test Species:	~~PP Pimephales promelas~~
Comments: IT CORPORATION			

Conc-%	1	2	3	4	5	6	7	8	Std. Dev.
CONTROL	0.2667	0.2370	0.1930	0.2222	0.1525	0.1944	0.2500	0.2150	0.03631
AT0-740	0.1789	0.2180	0.2720	0.3200	0.2025	0.2238	0.2520	0.2514	0.044057
AT0-741	0.2457	0.2075	0.2900	0.2360	0.1800	0.2640	0.2163	0.1411	0.04735
AT0-742	0.2178	0.1880	0.2343	0.2050	0.1944	0.2100	0.2050	0.2571	0.022436
AT0-743	0.2278	0.1963	0.3114	0.2380	0.2411	0.2713	0.2500	0.2450	0.033402
AT0-744	0.1613	0.2286	0.2070	0.2170	0.1511	0.1900	0.1689	0.2100	0.028452

			Transform: Untransformed						1-Tailed	
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD
CONTROL	0.2164	1.0000	0.2164	0.1525	0.2667	16.782	8			
AT0-740	0.2398	1.1085	0.2398	0.1789	0.3200	18.371	8			
AT0-741	0.2226	1.0287	0.2226	0.1411	0.2900	21.274	8			
AT0-742	0.2140	0.9889	0.2140	0.1880	0.2571	10.486	8			
AT0-743	0.2476	1.1444	0.2476	0.1963	0.3114	13.490	8			
AT0-744	0.1917	0.8862	0.1917	0.1511	0.2286	14.840	8	1.510	1.761	0.0287

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.01)	0.971297	0.844	-0.34229	-0.54643
F-Test indicates equal variances (p = 0.54)	1.628655	8.885308		

Hypothesis Test (1-tail, 0.05)	MSDu	MSDp	MSB	MSE	F-Prob	
Homoscedastic t Test indicates no significant differences	0.028725	0.13277	0.002426	0.001064	0.153283	1, 14

AT0-744 vs. Control

1-11-01
MW

 ToxCalc v5.0.23 Reviewed by:_____

ATTACHMENT V

Eisenia foetida Bioaccumulation Testing
Data Sheets

~~SEDIMENT~~ SOIL TOXICITY TEST OBSERVATION DATA SHEET

Project Number: 70003.10
Client: IT Corporation
QC Test Number: TN-00-742
Test Material(s): Soils
Accession Number(s): ATO-735 to 739, 758
Overlying Water: —
Accession Number: —

TEST ORGANISM
Common Name: red worm
Scientific Name: Eisenia foetida

TEST TYPE: (Static) / Flowthrough
Renewal / (Non-renewal)

Beginning Date: 10/31/00 Time: 1500
Ending Date: 11/28/00 Time: 1200

Test Container: 2-L jar
Test Volume: 1,500 g (dry weight)
Test Duration: 28 days

Treatment	Rep	Number of Surviving Organisms										
		Day 0 Date 10/31	Day Date 11-0	Day Date	Day 28 Date 11/28	Day Date	Day ~~14~~ Date	Day Date	Day Date	Day Date	Day Date	Day ~~28~~ Date
Control	A	60			60							
	B	60			59							
	C	60			60							
	D	60			60 ~~58~~ VAS							
	E	60			60							
ATO-735	A	60	9*		47							
	B	60			48							
	C	60			37							
	D	60	10*		34							
	E	60			43							
Time / Initials		1500 SB	0820 VAS JB		SM RM KL RSH VAS							

* - # of dead removed

ATS-T12
03/01/00

~~SEDIMENT~~ SOIL TOXICITY TEST OBSERVATION DATA SHEET

Project Number: 70003.10
Client: IT Corporation
QC Test Number: TN-00-742
Test Material(s): Soils
Accession Number(s): ATO-735 to 739, 758
Overlying Water: —
Accession Number: —

TEST ORGANISM
Common Name: red worm
Scientific Name: Eisenia foetida

TEST TYPE: (Static) / Flowthrough
Renewal / (Non-renewal)

Beginning Date: 10/31/00 Time: 1500
Ending Date: 11/28/00 Time: 1200

Test Container: 2-L jar
Test Volume: 1,500 g (dry weight)
Test Duration: 28 days

Treatment	Rep	Number of Surviving Organisms										
		Day 0 Date MAS	Day Date	Day Date	Day 28 Date 11/28	Day Date	Day ~~14~~ Date	Day Date	Day Date	Day Date	Day Date	Day ~~28~~ Date
ATO-736	A	~~60~~ 60			59							
	B	~~60~~ 60			60							
	C	~~60~~ 60			59							
	D	~~30~~ 60			60							
	E	~~30~~ 60			54							
ATO-737	A	~~30~~ 60			58							
	B	~~30~~ 60			59							
	C	~~30~~ 60			59							
	D	~~30~~ 60			51							
	E	~~30~~ 60			100							
Time / Initials		1500 SB			SM, RM, VS KL, BSH MAS							

ATS-T12
03/01/00

SEDIMENT TOXICITY TEST OBSERVATION DATA SHEET

Project Number: 70003.10
Client: IT Corporation
QC Test Number: TN-00-742
Test Material(s): Soils
Accession Number(s): ATO-735 to 739, 758
Overlying Water: —
Accession Number: —

TEST ORGANISM
Common Name: redworm
Scientific Name: Eisenia foetida

TEST TYPE: (Static) / Flowthrough
Renewal / (Non-renewal)

Beginning Date: 10/31/00 Time: 1500
Ending Date: 11/28/00 Time: 1200

Test Container: 2-L jar
Test Volume: 1,500 g (dry weight)
Test Duration: 28 days

Treatment	Rep	Number of Surviving Organisms										
		Day 0 Date 10/31	Day Date	Day Date	Day 28 Date 11/28	Day Date	Day ~~14~~ Date	Day Date	Day Date	Day Date	Day Date	Day ~~28~~ Date
ATO-738	A	60			60							
	B	60			60							
	C	60			60							
	D	60			58							
	E	60			60							
ATO-739	A	60			58							
	B	60			58							
	C	60			59							
	D	60			60							
	E	60			59							
Time / Initials		1500/SS			SM, RM, KL, RSH, MAS							

ATS-T12
03/01/00

SEDIMENT TOXICITY TEST OBSERVATION DATA SHEET

Project Number: 70003.10
Client: IT Corporation
QC Test Number: TN-00-742
Test Material(s): soils
Accession Number(s): ATD-735 to 739, 758
Overlying Water: —
Accession Number: —

TEST ORGANISM
Common Name: red worm
Scientific Name: Eisenia foetida

TEST TYPE: (Static) / Flowthrough
Renewal (Non-renewal)

Beginning Date: 10/31/00 Time: 1500
Ending Date: 11/28/00 Time: 1200
Test Container: 2-L jar
Test Volume: 1,500 g (dry weight)
Test Duration: 28 days

Treatment	Rep	Number of Surviving Organisms										
		Day 0 Date 10/31	Day Date	Day Date	Day 28 Date 11/28	Day Date	Day ~~14~~ Date	Day Date	Day Date	Day Date	Day Date	Day ~~28~~ Date
ATD-758	A	60	59		59							
	B	60	51		51							
	C	60	58		58							
	D	60	56		56							
	E	60	59		59							
			Dnt									
Time / Initials		1500 JB			SM, RM KL RSH, LS MAS							

ATS-T12
03/01/00

~~SEDIMENT~~ SOIL TOXICITY TEST SET-UP BENCH SHEET

Project Number: 70003.10

Client: IT Corporation

QC Test Number: TN-00-742

TEST ORGANISM INFORMATION

Common Name: red worm

Scientific Name: Eisenia foetida

Lot Number: EF-017

Source: Smith Worms

Adults Isolated (Time, Date): —

Neonates Pulled (Time, Date): —

Acclimation: <24 hrs. Age: adult

Culture Water (T/S): — °C — ppt

TEST INITIATION

Date	Time	Initials	Activity
10/30/00	1500	LAH, WS, WLM	~~Sediment~~ Soil Added to Chambers
			~~Overlying Water Added to Chambers~~
10/31/00	1500	JB, WLM, WS, RSH	Organisms Transferred

TEST SET-UP

Sample Number(s): ATO-735, 736, 737, 738, 739, 758

Overyling Water Number: —

Treatment	Volume Test ~~Sediment~~ Soil	~~Volume Overlying Water~~
Control	1,500 g (dry weight)	
ATO-735		
ATO-736		
ATO-737		
ATO-738		
ATO-739		
ATO-758		

TOXICOLOGY LABORATORY BENCH SHEET - TEMPERATURE RECORD

Project Number: 70003.10

Client: IT Corporation

QC Test Number: TN-00-742

Day	Date	Time	Initials	Temperature (°C)
0	10/31/00	1640	WAS	22.0
1	11/01/00	1602	LAH	23.1
2	11/02/00	0815	WLW	23.4
3	11/03/00	1622	WAS	23.5
4	11/04/00	1255	MD	23.2
5	11/5/00	1245	KL	23.0
6	11/6/00	1532	RSA	23.1
7	11/7/00	1255	RSA	23.1
8	11/8/00	1445	RSA	23.5
9	11/9/00	1420	EV	23.0
10	11/10/00	1103	[illegible]	23.2
11	~~LS~~ 11/11/00	~~LS~~	~~LS~~	~~LS~~ ~~24.0~~ (a)
12	11/12/00	900	LS	24.0
13	11/13/00	1000	LS	23.1
14	11/14/00	1510	LS	~~23~~ 23.0
15	11/15/00	0914	KL	23.0
16	11/16/00	0900	WAS	23.0
17	11/17/00	0900	WAS	23.0
18	11/18/00			(a)
19	11/19/00			(a)
20	11/20/00	1800	WAS	22.5
21	11/21/00	0855	KL	22.9
22	11/22/00	1140	OV	22.4
23	11/23/00	0933	[illegible]	22.9
24	11/24/00	1000	LS	23.5
25	11/25/00	1400	[illegible]	22.5
26	11/26/00	0857	KL	23.1
27	11/27/00	1510	KL	23.0
28	11/28/00	0900	WAS	23.1

(a) not recorded

PERCENT MOISTURE ANALYSIS (SOILS)

Project Number: 70003.10 Client: IT Corporation QC Test Number: TN-00-742

Oven Temp. (°C): 100 Drying Duration (hours): 17 hours

Wet Weights Measured (date/time/initials): 10/30/00 WAS 1522 Dry Weights Measured (date/time/initials): ~~0825~~ 0825 LAH 10/31/00 RSH

Sample ID	Tin #	A Weight of Tin (g)	B Wt. of Tin & Wet Sample (g)	C=B-A Total Wet Sample Wt. (g)	D Wt. of Tin & Dry Sample (g)	E=D-A Total Dry Sample Wt. (g)	(C-E)100 / C Moisture Content (%)
Control	W1	1.00	21.66	~~20.25~~ 20.66 LAH	13.44	12.44	~~51.52~~ 39.79 LAH
ATO-735	W2	0.99	22.36	21.37	17.35	16.36	23.44
ATO-736	W3	0.99	21.57	20.58	16.07	15.08	26.72
ATO-737	W4	0.99	21.26	20.27	16.13	15.14	25.31
ATO-738	W5	0.99	23.56	22.57	17.55	16.56	26.63
ATO-739	W6	1.00	22.85	21.85	16.29	15.29	30.02
ATO-758	W7	1.00	20.50	19.50	16.32	15.32	21.44
Wet Weights Measured 10/31/00 WAS				Dry Weights Measured		11/1/00 WAS	
Control	W8	0.99	21.62	20.63	13.57	12.58	39.02

ATS-T35
03/01/00

TOXICOLOGY LABORATORY BENCH SHEET

Project Number: 70003.10

Client: IT

QC Test Number: TN-00-742

Date/Time/Initials	Comments/Activity	
10/31/00 1530	Did initial wet weights of *Eisenia Foetida*	WLM

Pan #1 5 worms = 1.66 g (.332 g/worm)
Pan #2 5 worms = 1.51 g (.302 g/worm) $\bar{x}$ = 0.317 g/worm

NOTE: These were the medium large worms at the beginning of the loading period.

VAS (LAH) Soil pH's

Control = not recorded
ATO-735 = 7.8
736 = 6.5
737 = 6.7
738 = 6.2
739 = 7.2
758 = 7.9

STATISTICS FOR WATER QUALITY
QC Test: TN-00-742 IT (EISENIA)

	Temperature		pH		DO		Conductivity/Salinity	
	New	Old	New	Old	New	Old	New	Old
1		22.0						
2		23.1						
3		23.4						
4		23.5						
5		23.2						
6		23.0						
7		23.1						
8		23.1						
9		23.5						
10		23.0						
11		23.2						
12		24.0						
13		23.1						
14		23.0						
15		23.0						
16		23.0						
17		23.0						
18		22.5						
19		22.9						
20		22.4						
21		22.9						
22		23.5						
23		22.5						
24		23.1						
25		23.0						
26		23.1						
27								
28								
29								
30								
31								
32								
33								
34								
35								
36								
37								
38								
39								
40								
41								
42								
43								
44								
45								
46								
47								
48								
N	0	26	0	0	0	0	0.0	0.0
Min.	0.0	22.0	0.0	0.0	0.0	0.0	0.0	0.0
Max.	0.0	24.0	0.0	0.0	0.0	0.0	0.0	0.0
Mean	#DIV/0!	23.0	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
S.D.	#DIV/0!	0.39	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
N		26		0		0		0.0
Min.		22.0		0.0		0.0		0.0
Max.		24.0		0.0		0.0		0.0
Mean		23.0		#DIV/0!		#DIV/0!		#DIV/0!
S.D.		0.39		#DIV/0!		#DIV/0!		#DIV/0!

QCd
1/17/01
LMT

1/17/2001 10:15 AM

28-day

Acute Survival Test-~~96-Hr~~ Survival

Start Date:		Test ID:	TN-00-742	Sample ID:	
End Date:		Lab ID:		Sample Type:	
Sample Date:		Protocol:	EPAA 91-EPA Acute	Test Species:	EF-Eisenia foetida
Comments:	IT CORPORATION				

Conc-%	1	2	3	4	5
CONTROL	1.0000	0.9833	1.0000	1.0000	1.0000
AT0-735	0.7833	0.8000	0.6167	0.5667	0.7167
AT0-736	0.9833	1.0000	0.9833	1.0000	0.9000
AT0-737	0.9667	0.9833	0.9833	0.8500	1.0000
AT0-738	1.0000	1.0000	1.0000	0.9667	1.0000
AT0-739	0.9667	0.9667	0.9833	1.0000	0.9833
AT0-758	0.9833	0.8500	0.9667	0.9167	0.9833

			Transform: Arcsin Square Root						1-Tailed	
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD
CONTROL	0.9967	1.0000	1.4932	1.4413	1.5062	1.943	5			
*AT0-735	0.6967	0.6990	0.9917	0.8523	1.1071	11.267	5	9.714	1.860	0.0960
AT0-736	0.9733	0.9766	1.4288	1.2490	1.5062	7.391	5			
AT0-737	0.9567	0.9599	1.3898	1.1731	1.5062	9.230	5			
AT0-738	0.9933	0.9967	1.4824	1.3872	1.5062	3.590	5			
AT0-739	0.9800	0.9833	1.4327	1.3872	1.5062	3.436	5			
AT0-758	0.9400	0.9431	1.3442	1.1731	1.4413	8.675	5			

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.01)	0.921	0.781	-0.348	0.05284
F-Test indicates equal variances (p = 0.02)	14.836	23.1539		

Hypothesis Test (1-tail, 0.05)	MSDu	MSDp	MSB	MSE	F-Prob	df
Homoscedastic t Test indicates significant differences	0.02382	0.02396	0.62874	0.00666	1.1E-05	1, 8

AT0-735 vs. Control

ToxCalc v5.0.23

Reviewed by: RAC 1/23/

28-Day

Acute Survival Test-~~96 Hr~~ Survival

Start Date:		Test ID:	TN-00-742	Sample ID:	
End Date:		Lab ID:		Sample Type:	
Sample Date:		Protocol:	EPAA 91-EPA Acute	Test Species:	EF-Eisenia foetida
Comments:	IT CORPORATION				

Conc-%	1	2	3	4	5
CONTROL	1.0000	0.9833	1.0000	1.0000	1.0000
AT0-735	0.7833	0.8000	0.6167	0.5667	0.7167
AT0-736	0.9833	1.0000	0.9833	1.0000	0.9000
AT0-737	0.9667	0.9833	0.9833	0.8500	1.0000
AT0-738	1.0000	1.0000	1.0000	0.9667	1.0000
AT0-739	0.9667	0.9667	0.9833	1.0000	0.9833
AT0-758	0.9833	0.8500	0.9667	0.9167	0.9833

			Transform: Arcsin Square Root					Rank	1-Tailed
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	Sum	Critical
CONTROL	0.9967	1.0000	1.4932	1.4413	1.5062	1.943	5		
AT0-735	0.6967	0.6990	0.9917	0.8523	1.1071	11.267	5		
AT0-736	0.9733	0.9766	1.4288	1.2490	1.5062	7.391	5	22.00	19.00
AT0-737	0.9567	0.9599	1.3898	1.1731	1.5062	9.230	5		
AT0-738	0.9933	0.9967	1.4824	1.3872	1.5062	3.590	5		
AT0-739	0.9800	0.9833	1.4327	1.3872	1.5062	3.436	5		
AT0-758	0.9400	0.9431	1.3442	1.1731	1.4413	8.675	5		

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates non-normal distribution (p <= 0.01)	0.75471	0.781	-1.7883	4.29226
F-Test indicates equal variances (p = 0.03)	13.2521	23.1539		

Hypothesis Test (1-tail, 0.05)

Wilcoxon Two-Sample Test indicates no significant differences

AT0-736 vs. Control

ToxCalc v5.0.23

Reviewed by: RAC 1/23/

28 Day

Acute Survival Test-96 Hr Survival

Start Date:	Test ID: TN-00-742	Sample ID:	
End Date:	Lab ID:	Sample Type:	
Sample Date:	Protocol: EPAA 91-EPA Acute	Test Species:	EF-Eisenia foetida
Comments: IT CORPORATION			

Conc-%	1	2	3	4	5
CONTROL	1.0000	0.9833	1.0000	1.0000	1.0000
AT0-735	0.7833	0.8000	0.6167	0.5667	0.7167
AT0-736	0.9833	1.0000	0.9833	1.0000	0.9000
AT0-737	0.9667	0.9833	0.9833	0.8500	1.0000
AT0-738	1.0000	1.0000	1.0000	0.9667	1.0000
AT0-739	0.9667	0.9667	0.9833	1.0000	0.9833
AT0-758	0.9833	0.8500	0.9667	0.9167	0.9833

			Transform: Arcsin Square Root						1-Tailed	
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD
CONTROL	0.9967	1.0000	1.4932	1.4413	1.5062	1.943	5			
AT0-735	0.6967	0.6990	0.9917	0.8523	1.1071	11.267	5			
AT0-736	0.9733	0.9766	1.4288	1.2490	1.5062	7.391	5			
AT0-737	0.9567	0.9599	1.3898	1.1731	1.5062	9.230	5	1.758	1.860	0.1094
AT0-738	0.9933	0.9967	1.4824	1.3872	1.5062	3.590	5			
AT0-739	0.9800	0.9833	1.4327	1.3872	1.5062	3.436	5			
AT0-758	0.9400	0.9431	1.3442	1.1731	1.4413	8.675	5			

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.01)	0.81031	0.781	-1.7436	4.56452
F-Test indicates equal variances (p = 0.01)	19.5563	23.1539		

Hypothesis Test (1-tail, 0.05)	MSDu	MSDp	MSB	MSE	F-Prob	df
Homoscedastic t Test indicates no significant differences	0.02854	0.02871	0.02673	0.00865	0.11683	1,

AT0-737 vs. Control

ToxCalc v5.0.23

Reviewed by: RAC 1/23

28-Day

Acute Survival Test-~~96 Hr~~ Survival

Start Date:		Test ID:	TN-00-742	Sample ID:	
End Date:		Lab ID:		Sample Type:	
Sample Date:		Protocol:	EPAA 91-EPA Acute	Test Species:	EF-Eisenia foetida
Comments:	IT CORPORATION				

Conc-%	1	2	3	4	5
CONTROL	1.0000	0.9833	1.0000	1.0000	1.0000
AT0-735	0.7833	0.8000	0.6167	0.5667	0.7167
AT0-736	0.9833	1.0000	0.9833	1.0000	0.9000
AT0-737	0.9667	0.9833	0.9833	0.8500	1.0000
AT0-738	1.0000	1.0000	1.0000	0.9667	1.0000
AT0-739	0.9667	0.9667	0.9833	1.0000	0.9833
AT0-758	0.9833	0.8500	0.9667	0.9167	0.9833

			Transform: Arcsin Square Root					Rank	1-Tailed
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	Sum	Critical
CONTROL	0.9967	1.0000	1.4932	1.4413	1.5062	1.943	5		
AT0-735	0.6967	0.6990	0.9917	0.8523	1.1071	11.267	5		
AT0-736	0.9733	0.9766	1.4288	1.2490	1.5062	7.391	5		
AT0-737	0.9567	0.9599	1.3898	1.1731	1.5062	9.230	5		
AT0-738	0.9933	0.9967	1.4824	1.3872	1.5062	3.590	5	27.00	19.00
AT0-739	0.9800	0.9833	1.4327	1.3872	1.5062	3.436	5		
AT0-758	0.9400	0.9431	1.3442	1.1731	1.4413	8.675	5		

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates non-normal distribution (p <= 0.01)	0.63829	0.781	-1.9786	3.09361
F-Test indicates equal variances (p = 0.27)	3.36609	23.1539		

Hypothesis Test (1-tail, 0.05)

Wilcoxon Two-Sample Test indicates no significant differences

=

AT0-738 vs. Control

ToxCalc v5.0.23

Reviewed by: Roe 1/23/

28-Day

Acute Survival Test-~~96 Hr~~ Survival

Start Date:		Test ID:	TN-00-742	Sample ID:	
End Date:		Lab ID:		Sample Type:	
Sample Date:		Protocol:	EPAA 91-EPA Acute	Test Species:	EF-Eisenia foetida
Comments:	IT CORPORATION				

Conc-%	1	2	3	4	5
CONTROL	1.0000	0.9833	1.0000	1.0000	1.0000
AT0-735	0.7833	0.8000	0.6167	0.5667	0.7167
AT0-736	0.9833	1.0000	0.9833	1.0000	0.9000
AT0-737	0.9667	0.9833	0.9833	0.8500	1.0000
AT0-738	1.0000	1.0000	1.0000	0.9667	1.0000
AT0-739	0.9667	0.9667	0.9833	1.0000	0.9833
AT0-758	0.9833	0.8500	0.9667	0.9167	0.9833

			Transform: Arcsin Square Root						1-Tailed	
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD
CONTROL	0.9967	1.0000	1.4932	1.4413	1.5062	1.943	5			
AT0-735	0.6967	0.6990	0.9917	0.8523	1.1071	11.267	5			
AT0-736	0.9733	0.9766	1.4288	1.2490	1.5062	7.391	5			
AT0-737	0.9567	0.9599	1.3898	1.1731	1.5062	9.230	5			
AT0-738	0.9933	0.9967	1.4824	1.3872	1.5062	3.590	5			
*AT0-739	0.9800	0.9833	1.4327	1.3872	1.5062	3.436	5	2.371	1.860	0.0475
AT0-758	0.9400	0.9431	1.3442	1.1731	1.4413	8.675	5			

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.01)	0.83504	0.781	0.20176	0.34396
F-Test indicates equal variances (p = 0.33)	2.87976	23.1539		

Hypothesis Test (1-tail, 0.05)	MSDu	MSDp	MSB	MSE	F-Prob	df
Homoscedastic t Test indicates significant differences	0.00956	0.00962	0.00917	0.00163	0.0452	1, 8

AT0-739 vs. Control

ToxCalc v5.0.23

Reviewed by: RAC 1/23/01

28-Day

Acute Survival Test-~~96 Hr~~ Survival

Start Date:		Test ID:	TN-00-742	Sample ID:	
End Date:		Lab ID:		Sample Type:	
Sample Date:		Protocol:	EPAA 91-EPA Acute	Test Species:	EF-Eisenia foetida
Comments:	IT CORPORATION				

Conc-%	1	2	3	4	5
CONTROL	1.0000	0.9833	1.0000	1.0000	1.0000
AT0-735	0.7833	0.8000	0.6167	0.5667	0.7167
AT0-736	0.9833	1.0000	0.9833	1.0000	0.9000
AT0-737	0.9667	0.9833	0.9833	0.8500	1.0000
AT0-738	1.0000	1.0000	1.0000	0.9667	1.0000
AT0-739	0.9667	0.9667	0.9833	1.0000	0.9833
AT0-758	0.9833	0.8500	0.9667	0.9167	0.9833

			Transform: Arcsin Square Root						1-Tailed	
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD
CONTROL	0.9967	1.0000	1.4932	1.4413	1.5062	1.943	5			
AT0-735	0.6967	0.6990	0.9917	0.8523	1.1071	11.267	5			
AT0-736	0.9733	0.9766	1.4288	1.2490	1.5062	7.391	5			
AT0-737	0.9567	0.9599	1.3898	1.1731	1.5062	9.230	5			
AT0-738	0.9933	0.9967	1.4824	1.3872	1.5062	3.590	5			
AT0-739	0.9800	0.9833	1.4327	1.3872	1.5062	3.436	5			
*AT0-758	0.9400	0.9431	1.3442	1.1731	1.4413	8.675	5	2.774	1.860	0.0999

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.01)	0.90039	0.781	-0.95	1.30588
F-Test indicates equal variances (p = 0.02)	16.1564	23.1539		

Hypothesis Test (1-tail, 0.05)	MSDu	MSDp	MSB	MSE	F-Prob	df
Homoscedastic t Test indicates significant differences	0.02517	0.02532	0.05554	0.00722	0.02416	1, 8

AT0-758 vs. Control

ToxCalc v5.0.23

Reviewed by RAE 1/25/01

ATTACHMENT VI

Lumbriculus variegatus Bioaccumulation Testing
Data Sheets

TOXICITY TEST WATER QUALITY DATA SHEET - NEW SOLUTIONS

Project Number: 7000310
Client: IT Corporation
QC Test Number: TN-00-745

TEST ORGANISM
Common Name: oligochaete
Scientific Name: Lumbriculus variegatus

Beginning Date: 11/2/00 Time: 1500
Ending Date: 11/30/00 Time: 1300

TARGET VALUES Temp: 23 ±1 °C pH: 6.0 - 9.0 DO: ≥2.5 mg/L Salinity: — ppt

Test Conc	Rep	Temperature (°C) 0	1	2	3	4	5	6	pH 0	1	2	3	4	5	6	Dissolved Oxygen (mg/L) 0	1	2	3	4	5	6	Conductivity (µS/cm) ~~Salinity (ppt)~~ 0	1	2	3	4	5	6
Control	(A)	22.5							8.3							8.1							1591						
ATO-745	(A)	22.7							8.2							7.2							1239						
ATO-746	(A)	22.6							8.1							7.1							1229						
ATO-747	(A)	22.7							8.1							7.0							1231						
ATO-748	(A)	22.8							8.1							7.1							1237						
ATO-749	(A)	22.9							8.0							6.6							1226						
Meter Number		10/04							10/04							5.6							11/971						
Time		1406							1406							1409							1404						
Initials		WW JN							WW JN							WW JN							WW JN						

ATS-T13
03/01/00

TOXICITY TEST WATER QUALITY DATA SHEET - OLD SOLUTIONS

Project Number: 7000310
Client: IT Corporation
QC Test Number: TN-00-745

TEST ORGANISM
Common Name: oligochaete
Scientific Name: Lumbriculus variegatus

Beginning Date: 11/2/00 Time: 1500
Ending Date: 11/30/00 Time: 1300

TARGET VALUES Temp: 23±1 °C pH: 6.0 - 9.0 DO: ≥2.5 mg/L Salinity: — ppt

Test Conc	Rep	Temperature (°C) 1	2	3	4	5	6	7	pH 1	2	3	4	5	6	7	Dissolved Oxygen (mg/L) 1	2	3	4	5	6	7	Conductivity (µS/cm) ~~Salinity (ppt)~~ 1	2	3	4	5	6	7
Control		22.9	23.3	22.7	22.7	22.5	22.8	23.1	8.1	8.4	8.4	8.3	7.8	8.0	8.3	7.3	7.7	7.1	7.7	7.7	8.0	7.8	507	1737	1120	1625	1409	1335	1191
ATO-745		22.8	22.9	22.5	22.7	23.0	22.2	22.6	8.0	8.3	8.3	8.2	8.0	7.5	8.1	7.3	7.5	7.1	7.6	8.0	7.5	7.3	1098	1301	911	1160	1173	1190	1160
ATO-746		22.8	22.6	22.7	22.7	22.7	22.4	22.7	8.1	8.3	8.3	8.1	8.0	7.9 / 8.4	8.1	7.7	8.0	7.2	7.8	8.0	7.9	7.7	1094	1247	917	1106	1165	1174	1062
ATO-747		22.6	22.7	22.9	22.5	23.3	22.3	22.7	8.1	8.3	8.3	8.1	8.1	8.3	8.2	7.8	7.9	7.1	7.7	8.0	8.4	7.1	1127	1243	915	1087	1161	1170	1072
ATO-748		22.4	22.8	22.7	22.7	22.7	22.6	22.4	7.9	8.3	8.3	8.0	8.0	8.2	8.2	7.4	8.0	7.1	7.4	7.6	7.7	8.5	1155	1233	904	1088	1156	1190	1096
ATO-749		22.7	23.4	22.8	22.7	22.7	22.4	22.5	7.9	8.2	8.2	8.1	8.0	8.1	8.1	7.4	7.6	7.0	7.5	7.2	7.7	8.0	1138	1227	873	1077	1154	1174	1093
Replicate		B	C	D	E	A	B	C																					
Meter Number		11/103	56	56	11/104	14/104	12/104	56	11/103	11/104	12/104	11/104	14/104	12/104	13/104	56	56	56	56	56	56	56	92/921	92/921	92/921	92/921	11/921	11/921	11/921
Time		1352	1430	1402	1500	1310	1405	1420	1352	1430	1405	1500	1310	1405	1410	1355	1430	1402	1500	1322	1410	1430	1358	1430	1400	1500	1310	1435	1435
Initials		RD	RD	RD	KL	RD	LS	LS	RD	RD	RD	KL	RD	LS	LS	RD	RD	RD	KL	RD	LS	LS	RD	RD	RD	KL	RD	LS	LS

TOXICITY TEST WATER QUALITY DATA SHEET - OLD SOLUTIONS

Project Number: 70000310
Client: IT Corporation
QC Test Number: TN-00-745

TEST ORGANISM
Common Name: oligochaete
Scientific Name: Lumbriculus variegatus

Beginning Date: 11/2/00 Time: 1500
Ending Date: 11/30/00 Time: 1300

TARGET VALUES Temp: 23±1 °C pH: 6.0 - 9.0 DO: ≥2.5 mg/L Salinity: — ppt

Test Conc	Rep	Temperature (°C) 8	9	10	11	12	13	14	pH 8	9	10	11	12	13	14	Dissolved Oxygen (mg/L) 8	9	10	11	12	13	14	Conductivity (µS/cm) ~~Salinity (ppt)~~ 8	9	10	11	12	13	14
Control		~~22.5~~ 22.1	22.1	22.1	22.3	22.4	22.1	22.2	8.3	8.4	8.5	7.9	8.3	8.1	8.3	7.6	7.9	8.2	7.6	7.8	7.9	8.0	1280	1332	1326	1430	1435	1327	1370
ATO-745		22.4	22.2	22.1	22.0	22.2	22.2	22.3	8.2	8.4	8.5	7.9	8.1	8.1	8.2	7.5	6.9	8.2	7.7	7.4	7.8	7.7	1159	1178	1107	1288	1267	1173	1160
ATO-746		~~22.9~~ 22.5	22.3	22.1	22.1	22.2	21.8	22.5	8.3	8.4	8.5	8.1	8.2	8.1	8.1	7.9	6.8	8.1	8.0	7.7	8.0	7.8	1170	1172	1103	1281	1257	1187	1163
ATO-747		23.2	23.0	22.5	22.7	22.2	22.2	23.0	8.3	8.4	8.5	8.1	8.2	8.1	8.2	7.8	6.7	8.3	7.8	7.7	7.8	7.7	1151	1168	1089	1262	1263	1189	1163
ATO-748		23.0	22.9	22.3	22.3	22.2	22.3	22.6	8.1	8.3	8.3	8.0	8.2	8.1	8.1	7.5	6.5	7.8	7.5	7.6	7.8	7.5	1160	1138	1102	1255	1266	1190	1160
ATO-749		23.4	22.7	22.2	22.8	22.8	22.3	23.0	8.1	8.3	8.4	8.0	8.1	8.1	8.1	7.3	6.5	8.0	7.7	7.4	7.8	7.1	1157	1122	1091	1257	1250	1173	1165
Replicate		D	E	A	B	C	D	E																					
Meter Number		56	56	10/103	12/104	92/103	13/104	10/103	10/103	12/104	10/103	12/104	92/103	13/104	10/103	56	56	56	56	56	54	56	10/921	10/921	73/121	92/121	10/921	L	L
Time		1125	1511	1220	1350	1425	1450	1350	1125	1510	1220	1350	1425	1450	1350	1125	1511	1220	1355	1428	1451	1355	1125	1510	1230	1352	1420	1446	1400
Initials		SG	nn	LS	KL	ND	WW	ND	SG	nn	LS	KL	ND	WW	ND	SG	nn	LS	KL	ND	WW	ND	SG	nn	LS	KL	ND	WW	ND

ATS-T16
03/01/00

TOXICITY TEST WATER QUALITY DATA SHEET - OLD SOLUTIONS

Project Number: 7000310
Client: IT Corporation
QC Test Number: TN-00-745

TEST ORGANISM
Common Name: oligochaete
Scientific Name: Lumbriculus variegatus

Beginning Date: 11/2/00 Time: 1500
Ending Date: 11/30/00 Time: 1300

TARGET VALUES Temp: 23±1 °C pH: 6.0 - 9.0 DO: ≥2.5 mg/L Salinity: — ppt

Test Conc	Rep	Temperature (°C) 15	16	17	18	19	20	21	pH 15	16	17	18	19	20	21	Dissolved Oxygen (mg/L) 15	16	17	18	19	20	21	Conductivity (uS/cm) ~~Salinity (ppt)~~ 15	16	17	18	19	20	21
Control		22.0	22.2	22.1	22.0	21.3	22.2	23.1	8.4	8.3	8.0	8.1	8.3	7.9	8.2	8.1	7.6	8.1	8.0	7.9	7.8	8.2	1411	1428	1391	1531	1249	1261	1275
ATU-	745	22.6	22.1	22.0	21.5	21.2	23.1	23.0	8.4	8.1	8.4	8.1	8.3	8.1	8.1	8.0	6.9	7.8	8.2	7.9	7.7	7.8 / 7.6	1275	1260	1234	1243	1134	1090	1123
ATU-	746	22.0	22.0	22.1	21.4	21.4	23.0	22.6	8.3	8.4	8.4	8.2	8.3	8.0	8.0	8.1	8.1	7.9	8.2	8.0	4.9	8.3	1243	1260	1202	1229	1131	1137	1032
ATU-	747	22.5	22.3 / 22.4	22.4	22.1	21.8	23.2	22.9	8.4	8.4	8.5	8.2	8.3	8.2	8.1	8.1	8.2	8.2	8.0	8.1	7.6	8.4	1243	1259	209	1204	1121	1075	1066
ATU-	748	22.1	22.0	22.1	21.9	21.7	22.6	22.9	8.2	8.1	8.4	8.1	8.2	8.1	8.2	7.4	7.3	8.3	7.8	7.6	7.4	7.9	1240	1278	1200	1211	1114	1083	1059
ATU-	749	22.0	22.5	22.2	22.3	21.8	22.5	23.4	8.3	7.7	8.4	8.0	8.2	8.1	8.2	7.9	29.4 / 7.6	8.2	8.2	7.4	7.8	7.9	1249	1269	1190	1210	1115	1086	1021
Replicate		A	B	C	D	E	A	B																					
Meter Number		57	10/103	12/103	12/104	12/103	57	57	10/103	10/103	12/108	12/104	12/108	12/104	11/101	57	57	57	56	56	57	57	11/121	11/121	11/121	11/121	11/121	11/121	11/121
Time		1148	1400	1130	1325	1340	1310	1303	1145	1400	1130	1325	1340	1315	1306	1142	1405	1120	1335	1315	1310	1303	1154	1402	1125	1330	1310	1305	1307
Initials		RM	KL	LS	LS	LS	LS	RM	RM	KL	LS	LS	LS	LS	RM	RM	KL	LS	LS	LS	LS	RM	RM	KL	LS	LS	LS	LS	RM

TOXICITY TEST WATER QUALITY DATA SHEET - OLD SOLUTIONS

Project Number: 7000310
Client: IT Corporation
QC Test Number: TN-00-745

TEST ORGANISM
Common Name: oligochaete
Scientific Name: Lumbriculus variegatus

Beginning Date: 11/2/00 Time: 1500
Ending Date: 11/30/00 Time: 1300

TARGET VALUES Temp: 23±1 °C pH: 6.0 - 9.0 DO: ≥2.5 mg/L Salinity: — ppt

Test Conc	Rep	Temperature (°C) 22	23	24	25	26	27	28	pH 22	23	24	25	26	27	28	Dissolved Oxygen (mg/L) 22	23	24	25	26	27	28	Conductivity (µS/cm) ~~Salinity (ppt)~~ 22	23	24	25	26	27	28
Control		23.1	22.7	23.1	22.8	22.0	22.9	22.8	7.8	8.3	8.0	8.3	8.3	8.0	8.4	8.0	7.8	6.0 6.1	7.9	8.2	8.0	8.0	1190	1222	1163	1305	1220	1288	1319
ATU-745		22.5	22.1	23.0	23.4	21.6	23.1	23.4	8.2	8.2	8.2	8.2	8.3	8.1	8.2	7.4	7.5	7.6	7.9	8.2	8.0	7.5	1167	1120	1092	1255	1229	1281	1182
ATU-746		22.5	22.2	23.9	23.1	22.1	23.4	23.1	8.2	8.4	8.3	8.1	8.4	8.1	8.4	7.9	8.3	7.8	7.5	8.5	8.0	7.7	1097	1137	1094	1250	1257	1294	1232
ATU-747		22.8	22.2	23.3	23.7	22.5	23.2	24.0	8.2	8.4	8.4	8.3	8.4	8.2	8.3	8.2	8.2	7.8	7.8	8.5	8.0	7.5	1094	1123	1082	1248	1231	1301	1173
ATU-748		22.7	22.5	22.8	23.3	21.5	23.3	23.7	8.3	8.2	8.3	8.2	8.2	8.2	8.2	8.2	7.7	7.7	7.3	8.3	8.2	8.2	1100	1122	1084	1245	1228	1294	1205
ATU-749		23.2	22.7	23.1	23.1	22.2	23.1	23.9	8.3	8.2	8.3	8.2	8.2	8.2	8.2	8.1	7.7	7.5	7.6	8.2	8.3	7.8	1090	1120	1078	1248	1226	1291	1191
Replicate		C	D	E	A	B	C	D																					
Meter Number		12/104	11/103	12/104	12/104	12/103	12/104	56	12/104	11/103	12/104	12/104	12/103	12/104	12/104	57	56	56	57	56	56	56	10/A24	11/921	12/921	11/921	11/921	11/921	11/921
Time		1145	1217	1232	1335	1402	1404	0850	1145	1217	1232	1335	1402	1404	0850	1150	1200	1210	1337	1412	1407	0850	1155	1210	1230	1331	1407	1405	0850
Initials		LS	WW	KL	KL	KL	WW	SM	LS	WW	KL	KL	KL	WW	SM	LS	WW	KL	KL	KL	WW	SM	LS	WW	KL	KL	KL	WW	SM

SEDIMENT TOXICITY TEST SET-UP BENCH SHEET

Project Number: 7000310

Client: IT Corporation

QC Test Number: TN-00-745

TEST ORGANISM INFORMATION

Common Name: oligochaete

Scientific Name: Lumbriculus variegatus

Lot Number: LV-006

Source: ABS

Adults Isolated (Time, Date): —

Neonates Pulled (Time, Date): —

Acclimation: <24hrs. Age: adult

Culture Water (T/S): 22.7 °C _____ ppt

TEST INITIATION

Date	Time	Initials	Activity
11/1/00	1045	M/JN	Sediment Added to Chambers
11/1/00 (11/2/00)	1430 (1000)	[illegible]	Overlying Water Added to Chambers
11/2/00	1500	[illegible]	Organisms Transferred

TEST SET-UP

Sample Number(s): ATO-745, 746, 747, 748, 749

Overlying Water Number: Very Hard Water (410 mg/L hardness)

Treatment	Volume Test Sediment	Volume Overlying Water
Control	1.1 L	1 L
ATO-745	↓	↓
ATO-746		
ATO-747		
ATO-748		
ATO-749		

TOXICOLOGY LABORATORY BENCH SHEET - RENEWAL RECORD

Project Number: 7000310

Client: IT Corporation

QC Test Number: TN-00-745

Day	Date	Time		Initials
0	11-2-00	AM	1000	[illegible]
		PM	—	—
1	11/3/00	AM	1130	LAH
		PM	1600	RP
2	11/4/00	AM	0930	UND
		PM	1515	UND
3	11/5/00	AM	0940	[illegible]
		PM	1445	[illegible]
4	11/6/00	AM	0930	EV
		PM	1530	[illegible]
5	11/7/00	AM	0900	UND
		PM	1500	LS
6	11/8/00	AM	1000	EV
		PM	1435	LS
7	11/9/00	AM	1000	EV
		PM	1430	LS
8	11/10/00	AM	0900	SM
		PM	1500	JG
9	11/11/00	AM	0925	UND
		PM	1600	UND
10	11/12	AM	900	LS
		PM	1300	LS

TOXICOLOGY LABORATORY BENCH SHEET - RENEWAL RECORD

Project Number: 7000310

Client: IT Corporation

QC Test Number: TN-00-745

Day	Date	Time		Initials
~~0~~ 11	11/13	AM	0935	KL
		PM	1400	KL
~~1~~ 12	11/14/00	AM	0840	VW
		PM	1500	UD
~~2~~ 13	11/15/00	AM	0855	KL
		PM	1510	VW
~~3~~ 14	11/16/00	AM	0850	UD
		PM	1500	UD
~~4~~ 15	11/17/00	AM	0930	RM
		PM	1600	SM
~~5~~ 16	11/18/00	AM	0900	VW
		PM	1500	KL
~~6~~ 17	11/19/00	AM	815	LS
		PM	1400	LS
~~7~~ 18	11/20/00	AM	830	LS
		PM	1600	LS
~~8~~ 19	11/21/00	AM	0850	UD
		PM	~~8K~~ 1500	LS
~~9~~ 20	11/22/00	AM	815	KL
		PM	~~KL 1600~~ 1400	KL
~~10~~ 21	11/23/00	AM	0930	RM
		PM	1412	RM

TOXICOLOGY LABORATORY BENCH SHEET - RENEWAL RECORD

Project Number: 7000310

Client: IT Corporation

QC Test Number: TN-00-745

Day	Date	Time		Initials
~~0~~ 22	11/24/00	AM	0930	EV
		PM	1200	LS
~~1~~ 23	11/25/00	AM	0800	WW
		PM	1535 WW	WW
~~2~~ 24	11/26/00	AM	0910	K
		PM	1308	K
~~3~~ 25	11/27/00	AM	0900	EV
		PM	1350	K
~~4~~ 26	11/28/00	AM	0850	WW
		PM	1430	KL/WW
~~5~~ 27	11/29/00	AM	0900	EV/SM
		PM	1430	WW
~~6~~		AM		
		PM		
~~7~~		AM		
		PM		
~~8~~		AM		
		PM		
~~9~~		AM		
		PM		
~~10~~		AM		
		PM		

TOXICOLOGY LABORATORY BENCH SHEET

Project Number: 7000310

Client: IT Corporation

QC Test Number: TN-00-745

Date/Time/Initials	Comments/Activity
11/3/00, 0945 (LAH)	Control, conductivity = 2,760 µS/cm DO = 2.7 to 4.5 mg/L
	ATO-745, DO = 2.0 mg/L — 1,362 µS/cm
	ATO-746, DO = 2.0 mg/L — 1,340 µS/cm
	ATO-747, DO = 2.3 mg/L — 1,350 µS/cm
	ATO-748, DO = 2.0 mg/L — 1,305 µS/cm
	ATO-749, DO = 1.9 mg/L — 1,319 µS/cm
11/3/00 1000	Test chambers put on air due to low DO. levels. — WM/LAH
11/20/00	Test was cold due to night time temp's outside dropping into the 20's. The room temp was bumped up a degree to fix problem
LS 11/21/00	

TOXICOLOGY LABORATORY BENCH SHEET

Project Number: 70003.10

Client: IT Corporation

QC Test Number: TN-00-745

Date/Time/Initials	Comments/Activity

Very Hard Water @ 410 mg/L hardness (±10%)
[369–451 mg/L]

$NaHCO_3$ = 88.704 g
$CaSO_4 \cdot 2H_2O$ = 55.44 g
$MgSO_4$ = 55.44 g
KCl = 3.696 g

① Fill blue barrel to 450-gal mark with DI water.
LAH ~~② Remove ~5 gal + discard (want final volume of 45 gal) ← mark 45 gal line~~
③ Remove 10 gal into tank – dissolve $NaHCO_3$, $MgSO_4$, + KCl
④ Dissolve $CaSO_4$ in remaining 35 gal of DI in barrel.

TOXICOLOGY LABORATORY BENCH SHEET

Project Number: 7000310

Client: IT Corporation

QC Test Number: TN-00-745

Date/Time/Initials Comments/Activity

Reserve composite aliquot of overlying water from each sediment for A/H/C.

Day	Date	Initials	6 Samples Taken (✓)
Day 0	11-2-00	JNW	✓
Day 7	11-9-00	EV	✓
Day 14	11/16/00	UW	✓
Day 21	11/13/00	RP	✓
Day 28	11-30-00	UW	✓

STATISTICS FOR WATER QUALITY

QC Test: TN-00-745 IT (CONTROL)

	Temperature		pH		DO		Conductivity/Salinity	
	New	Old	New	Old	New	Old	New	Old
1	22.5	22.9	8.3	8.1	8.1	7.3	1591.0	1507.0
2		23.3		8.4		7.7		1737.0
3		22.7		8.4		7.1		1120.0
4		22.7		8.3		7.7		1605.0
5		22.5		7.8		7.7		1409.0
6		22.8		8.0		8.0		1339.0
7		23.1		8.3		7.8		1191.0
8		22.1		8.3		7.6		1280.0
9		22.1		8.4		7.9		1332.0
10		22.1		8.5		8.2		1326.0
11		22.3		7.9		7.6		1430.0
12		22.4		8.3		7.8		1435.0
13		22.1		8.1		7.9		1329.0
14		22.2		8.3		8.0		1390.0
15		22.0		8.4		8.1		1411.0
16		22.2		8.3		7.6		1420.0
17		22.1		8.0		8.1		1391.0
18		22.0		8.1		8.0		1534.0
19		21.3		8.3		7.9		1269.0
20		22.2		7.9		7.8		1261.0
21		23.1		8.2		7.8		1226.0
22		23.1		7.8		8.0		1190.0
23		22.7		8.3		7.8		1222.0
24		23.1		8.0		6.1		1163.0
25		22.8		8.3		7.9		1309.0
26		22.0		8.3		8.2		1220.0
27		22.9		8.0		8.0		1280.0
28		22.8		8.4		8.0		1319.0
29								
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42								
43								
44								
45								
46								
47								
48								
N	1	28	1	28	1	28	1.0	28.0
Min.	22.5	21.3	8.3	7.8	8.1	6.1	1591.0	1120.0
Max.	22.5	23.3	8.3	8.5	8.1	8.2	1591.0	1737.0
Mean	22.5	22.5	8.3	8.2	8.1	7.8	1591.0	1344.5
S.D.	#DIV/0!	0.48	#DIV/0!	0.20	#DIV/0!	0.41	#DIV/0!	138.4
N		29		29		29		29.0
Min.		21.3		7.8		6.1		1120.0
Max.		23.3		8.5		8.2		1737.0
Mean		22.5		8.2		7.8		1353.0
S.D.		0.47		0.20		0.41		143.4

1/17/2001 9:36 AM

STATISTICS FOR WATER QUALITY

QC Test: TN-00-745 IT (AT0-745)

	Temperature		pH		DO		Conductivity/Salinity	
	New	Old	New	Old	New	Old	New	Old
1	22.7	22.8	8.2	8.0	7.2	7.3	1239.0	1098.0
2		22.9		8.3		7.5		1301.0
3		22.5		8.3		7.1		911.0
4		22.7		8.2		7.6		1160.0
5		23.0		8.0		8.0		1178.0
6		22.2		7.5		7.5		1190.0
7		22.6		8.1		7.3		1161.0
8		22.4		8.2		7.5		1150.0
9		22.2		8.4		6.9		1178.0
10		22.1		8.5		8.2		1107.0
11		22.0		7.9		7.7		1288.0
12		22.2		8.1		7.4		1267.0
13		22.2		8.1		7.8		1173.0
14		22.3		8.2		7.7		1160.0
15		22.6		8.4		8.0		1275.0
16		22.1		8.1		6.9		1260.0
17		22.0		8.4		7.8		1234.0
18		21.5		8.1		8.2		1243.0
19		21.2		8.3		7.9		1134.0
20		23.1		8.1		7.7		1090.0
21		23.0		8.1		7.6		1123.0
22		22.5		8.2		7.4		1167.0
23		22.1		8.2		7.5		1120.0
24		23.0		8.2		7.6		1092.0
25		23.4		8.2		7.9		1255.0
26		21.6		8.3		8.2		1229.0
27		23.1		8.1		8.0		1281.0
28		23.6		8.2		7.5		1182.0
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43								
44								
45								
46								
47								
48								
N	1	28	1	28	1	28	1.0	28.0
Min.	22.7	21.2	8.2	7.5	7.2	6.9	1239.0	911.0
Max.	22.7	23.6	8.2	8.5	7.2	8.2	1239.0	1301.0
Mean	22.7	22.5	8.2	8.2	7.2	7.6	1239.0	1178.8
S.D.	#DIV/0!	0.57	#DIV/0!	0.19	#DIV/0!	0.35	#DIV/0!	83.0
N		29		29		29		29.0
Min.		21.2		7.5		6.9		911.0
Max.		23.6		8.5		8.2		1301.0
Mean		22.5		8.2		7.6		1180.9
S.D.		0.56		0.19		0.36		82.3

1/17/2001 9:48 AM

STATISTICS FOR WATER QUALITY
QC Test: TN-00-745 IT (AT0-746)

	Temperature		pH		DO		Conductivity/Salinity	
	New	Old	New	Old	New	Old	New	Old
1	22.6	22.8	8.1	8.1	7.1	7.7	1229.0	1094.0
2		22.6		8.3		8.0		1247.0
3		22.7		8.3		7.2		917.0
4		22.7		8.1		7.8		1106.0
5		22.7		8.0		8.0		1165.0
6		22.4		8.4		7.9		1176.0
7		22.7		8.1		7.7		1062.0
8		22.5		8.3		7.9		1170.0
9		22.3		8.4		6.8		1177.0
10		22.1		8.5		8.1		1103.0
11		22.1		8.1		8.0		1281.0
12		22.2		8.2		7.7		1257.0
13		21.8		8.1		8.0		1187.0
14		22.5		8.1		7.8		1163.0
15		22.0		8.3		8.1		1243.0
16		22.0		8.4		8.1		1266.0
17		22.7		8.4		7.9		1202.0
18		21.4		8.2		8.2		1229.0
19		21.4		8.3		8.0		1131.0
20		23.0		8.0		4.9		1137.0
21		22.6		8.0		8.3		1082.0
22		22.5		8.2		7.9		1091.0
23		22.2		8.4		8.3		1137.0
24		23.0		8.3		7.8		1094.0
25		23.1		8.1		7.5		1250.0
26		22.1		8.4		8.5		1257.0
27		23.4		8.1		8.0		1294.0
28		23.1		8.4		7.7		1230.0
29								
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47								
48								
N	1	28	1	28	1	28	1.0	28.0
Min.	22.6	21.4	8.1	8.0	7.1	4.9	1229.0	917.0
Max.	22.6	23.4	8.1	8.5	7.1	8.5	1229.0	1294.0
Mean	22.6	22.5	8.1	8.2	7.1	7.8	1229.0	1169.6
S.D.	#DIV/0!	0.49	#DIV/0!	0.15	#DIV/0!	0.66	#DIV/0!	84.3
N		29		29		29		29.0
Min.		21.4		8.0		4.9		917.0
Max.		23.4		8.5		8.5		1294.0
Mean		22.5		8.2		7.8		1171.6
S.D.		0.48		0.15		0.66		83.5

1/17/2001 9:55 AM

STATISTICS FOR WATER QUALITY

QC Test: TN-00-745 IT (AT0-747)

	Temperature		pH		DO		Conductivity/Salinity	
	New	Old	New	Old	New	Old	New	Old
1	22.7	22.6	8.1	8.1	7.0	7.8	1231.0	1127.0
2		22.7		8.3		7.9		1243.0
3		22.9		8.3		7.1		915.0
4		22.5		8.1		7.7		1087.0
5		23.3		8.1		8.0		1161.0
6		22.3		8.3		8.4		1170.0
7		22.7		8.2		7.7		1092.0
8		23.2		8.3		7.8		1151.0
9		23.0		8.4		6.7		1168.0
10		22.5		8.5		8.3		1089.0
11		22.2		8.1		7.8		1262.0
12		22.2		8.2		7.7		1263.0
13		22.2		8.1		7.8		1189.0
14		23.0		8.2		7.7		1163.0
15		22.5		8.4		8.1		1243.0
16		22.3		8.4		8.2		1259.0
17		22.4		8.5		8.2		1209.0
18		22.1		8.2		8.0		1204.0
19		21.8		8.3		8.1		1121.0
20		23.2		8.2		7.6		1075.0
21		22.9		8.1		8.4		1066.0
22		22.8		8.2		8.2		1094.0
23		22.2		8.4		8.2		1123.0
24		23.3		8.4		7.8		1082.0
25		23.7		8.3		7.8		1248.0
26		22.5		8.4		8.5		1231.0
27		23.2		8.2		8.0		1301.0
28		24.0		8.3		7.5		1173.0
29								
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34								
35								
36								
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41								
42								
43								
44								
45								
46								
47								
48								
N	1	28	1	28	1	28	1.0	28.0
Min.	22.7	21.8	8.1	8.1	7.0	6.7	1231.0	915.0
Max.	22.7	24.0	8.1	8.5	7.0	8.5	1231.0	1301.0
Mean	22.7	22.7	8.1	8.3	7.0	7.9	1231.0	1161.0
S.D.	#DIV/0!	0.52	#DIV/0!	0.12	#DIV/0!	0.39	#DIV/0!	83.5
N		29		29		29		29.0
Min.		21.8		8.1		6.7		915.0
Max.		24.0		8.5		8.5		1301.0
Mean		22.7		8.3		7.9		1163.4
S.D.		0.51		0.13		0.41		83.0

STATISTICS FOR WATER QUALITY

QC Test: TN-00-745 IT (AT0-748)

	Temperature		pH		DO		Conductivity/Salinity	
	New	Old	New	Old	New	Old	New	Old
1	22.8	22.4	8.1	7.9	7.1	7.4	1237.0	1155.0
2		22.8		8.3		8.0		1233.0
3		22.7		8.3		7.1		904.0
4		22.7		8.0		7.4		1088.0
5		22.7		8.0		7.6		1156.0
6		22.6		8.2		7.7		1190.0
7		22.4		8.2		8.5		1098.0
8		23.0		8.1		7.5		1160.0
9		22.9		8.3		6.5		1138.0
10		22.3		8.3		7.8		1102.0
11		22.3		8.0		7.5		1255.0
12		22.2		8.2		7.6		1266.0
13		22.3		8.1		7.8		1190.0
14		22.6		8.1		7.5		1160.0
15		22.1		8.2		7.4		1240.0
16		22.0		8.1		7.3		1278.0
17		22.1		8.4		8.3		1200.0
18		21.9		8.1		7.8		1211.0
19		21.7		8.2		7.8		1114.0
20		22.6		8.1		7.4		1083.0
21		22.9		8.2		7.9		1059.0
22		22.7		8.3		8.2		1100.0
23		22.5		8.2		7.7		1122.0
24		22.8		8.3		7.7		1084.0
25		23.3		8.2		7.3		1245.0
26		21.5		8.2		8.3		1228.0
27		23.3		8.2		8.2		1294.0
28		23.7		8.2		8.2		1205.0
29								
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33								
34								
35								
36								
37								
38								
39								
40								
41								
42								
43								
44								
45								
46								
47								
48								
N	1	28	1	28	1	28	1.0	28.0
Min.	22.8	21.5	8.1	7.9	7.1	6.5	1237.0	904.0
Max.	22.8	23.7	8.1	8.4	7.1	8.5	1237.0	1294.0
Mean	22.8	22.5	8.1	8.2	7.1	7.7	1237.0	1162.8
S.D.	#DIV/0!	0.49	#DIV/0!	0.11	#DIV/0!	0.43	#DIV/0!	84.1
N		29		29		29		29.0
Min.		21.5		7.9		6.5		904.0
Max.		23.7		8.4		8.5		1294.0
Mean		22.5		8.2		7.7		1165.3
S.D.		0.48		0.11		0.43		83.7

1/17/2001 10:04 AM

STATISTICS FOR WATER QUALITY

QC Test: TN-00-745 IT (AT0-749)

	Temperature		pH		DO		Conductivity/Salinity	
	New	Old	New	Old	New	Old	New	Old
1	22.9	22.7	8.0	7.9	6.6	7.4	1226.0	1138.0
2		23.4		8.2		7.6		1227.0
3		22.8		8.2		7.0		873.0
4		22.7		8.1		7.5		1077.0
5		22.7		8.0		7.7		1154.0
6		22.4		8.1		7.7		1194.0
7		22.5		8.1		8.2		1093.0
8		23.6		8.1		7.3		1157.0
9		22.7		8.3		6.5		1122.0
10		22.2		8.4		8.0		1097.0
11		22.8		8.0		7.7		1257.0
12		22.8		8.1		7.4		1250.0
13		22.3		8.1		7.8		1173.0
14		23.0		8.1		7.1		1165.0
15		22.0		8.3		7.9		1244.0
16		22.5		7.7		7.6		1269.0
17		22.2		8.4		8.2		1190.0
18		22.3		8.0		8.2		1210.0
19		21.8		8.2		7.4		1115.0
20		22.5		8.1		7.8		1085.0
21		23.4		8.2		7.9		1021.0
22		23.2		8.3		8.1		1090.0
23		22.7		8.2		7.7		1120.0
24		23.1		8.3		7.5		1078.0
25		23.1		8.2		7.6		1248.0
26		22.2		8.2		8.2		1226.0
27		23.1		8.2		8.3		1291.0
28		23.9		8.2		7.8		1194.0
29								
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31								
32								
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42								
43								
44								
45								
46								
47								
48								
N	1	28	1	28	1	28	1.0	28.0
Min.	22.9	21.8	8.0	7.7	6.6	6.5	1226.0	873.0
Max.	22.9	23.9	8.0	8.4	6.6	8.3	1226.0	1291.0
Mean	22.9	22.7	8.0	8.2	6.6	7.7	1226.0	1155.6
S.D.	#DIV/0!	0.50	#DIV/0!	0.15	#DIV/0!	0.41	#DIV/0!	89.3
N		29		29		29		29.0
Min.		21.8		7.7		6.5		873.0
Max.		23.9		8.4		8.3		1291.0
Mean		22.7		8.1		7.6		1158.1
S.D.		0.49		0.15		0.45		88.7

1/17/2001 10:10 AM

ATTACHMENT VII

Chain-of-Custody Records

09132000EAE

INTERNATIONAL TECHNOLOGY CORPORATION

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD*

Reference Document No. ~~[illegible]~~
Page 1 of ____

Project Name/No. [1] Plum Brook Ordnance Works 807053
Sample Team Members [2] M Weisbourn, T. Willard
Profit Center No. [3] 3489210
Project Manager [4] Mike Spengberg
Purchase Order No. [6] call for PO
Required Report Date [11] with tox data

Samples Shipment Date [7] 9/13/00
Lab Destination [8] EA Engineering, Science, + Tech
Lab Contact [9] Wayne McCullock
Project Contact/Phone [12] Maureen McMylen / 865-690-3211
Carrier/Waybill No. [13] 822780516359

Bill to: [5] Accounts Receivable
312 Directors Dr
Knoxville, TN 37923

Report to: [10] Maureen McMylen
IT Corp
312 Directors Drive
Knoxville, TN 37923

ONE CONTAINER PER LINE

Sample Number [14]	Sample Description/Type [15]	Date/Time Collected [16]	Container Type [17]	Sample Volume [18]	Pre-servative [19]	Requested Testing Program [20]	Condition on Receipt [21]	Disposal Record No. [22]
AD2006-0000	/SW006 PBOW-00-SW-WRWP	9/13/00 - 11:15	1 gallon jug	3 gallon	Ice	Chronic Toxicity - P. Promelas - C. Dubia		ATO-709
AD2007-0000	/SW007 PBOW-00-SW-WRWP	9/13/00 - 11:00	1 gallon jug	3 gallons	Ice	"	FOR LAB USE ONLY	ATO-716
AD2008-0000	PBOW-00-SW-WRWP/ SW008	9/13/00 - 11:45	1 gallon jug	3 gallons	Ice	"		ATO-711
AD2009-0000	PBOW-00-SW-WRWP SW009	9/13/00 - 12:20	1 gallon jug	3 gallons	Ice	"		ATO-712
AD2010-0000	PBOW-00-SW-WRWP SW010	9/13/00 - 12:40	1 gallon jug	3 gallons	Ice	"	FOR LAB USE ONLY	ATO-713

Special Instructions: [23] START Testing immediately upon receipt

Possible Hazard Identification: [24]
Non-hazard ☒ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐

Sample Disposal: [25]
Return to Client ☐ Disposal by Lab ☒ Archive ____ (mos.)

Turnaround Time Required: [26]
Normal ☒ Rush ☐

QC Level: [27]
I. ☐ II. ☐ III. ☐ Project Specific (specify): Project Specific

1. Relinquished by [28] (Signature/Affiliation)	Date: Time:	1. Received by [28] (Signature/Affiliation) Victoria J Williamson	Date: 9-14-00 Time: 0955
2. Relinquished by (Signature/Affiliation)	Date: Time:	2. Received by (Signature/Affiliation)	Date: Time:
3. Relinquished by (Signature/Affiliation)	Date: Time:	3. Received by (Signature/Affiliation)	Date: Time:

Comments: [29]

White: To accompany samples
Yellow: Field copy
*See back of form for special instructions.

SAMPLE CHECK-IN
FOR GENERAL TESTING

Client: JT

EA Accession Number: ATO-709

Parameter	Acceptable Range	Measurement*	Date	Time	Initials
Temperature (°C)	≤4	2.5	9/14	1025	MW
Is ice present?	---	yes			
pH	6.0-9.0	9.4			
TRC (mg/L)	<0.01	<0.01		1040	MW

*If outside acceptable range, contact project manager.

OTHER PARAMETERS IF REQUIRED (SEE STUDY PLAN):

Parameter	Acceptable Range	(✔)	Date	Time	Initials
Ammonia (preserve aliquot)	--	X			

SAMPLE CHECK-IN
FOR GENERAL TESTING

Client: JH

EA Accession Number: AB-7ID

Parameter	Acceptable Range	Measurement*	Date	Time	Initials
Temperature (°C)	≤4	3.9	9/14	1005	VW
Is ice present?	---	yes			
pH	6.0-9.0	8.3			
TRC (mg/L)	<0.01	<0.01		1040	MS

*If outside acceptable range, contact project manager.

OTHER PARAMETERS IF REQUIRED (SEE STUDY PLAN):

Parameter	Acceptable Range	(✔)	Date	Time	Initials
Ammonia (preserve aliquot)	--	X			

SAMPLE CHECK-IN
FOR GENERAL TESTING

Client: LT

EA Accession Number: ATO-711

Parameter	Acceptable Range	Measurement*	Date	Time	Initials
Temperature (°C)	≤4	1.8	9/14	1030	WW
Is ice present?	---	yes			
pH	6.0-9.0	8.0			
TRC (mg/L)	<0.01	<0.01			

***If outside acceptable range, contact project manager.**

OTHER PARAMETERS IF REQUIRED (SEE STUDY PLAN):

Parameter	Acceptable Range	(✔)	Date	Time	Initials
Ammonia (preserve aliquot)	--	X			

SAMPLE CHECK-IN
FOR GENERAL TESTING

Client: Jt

EA Accession Number: ATO-712

Parameter	Acceptable Range	Measurement*	Date	Time	Initials
Temperature (°C)	≤4	4.3	7/14	1001	VW
Is ice present?	---	yes			
pH	6.0-9.0	7.7			
TRC (mg/L)	<0.01	<0.01		1040	nn

*If outside acceptable range, contact project manager.

OTHER PARAMETERS IF REQUIRED (SEE STUDY PLAN):

Parameter	Acceptable Range	(✔)	Date	Time	Initials
Ammonia (preserve aliquot)	--	X			

SAMPLE CHECK-IN
FOR GENERAL TESTING

Client: ~~IDD~~ IT

EA Accession Number: ATC-713

Parameter	Acceptable Range	Measurement*	Date	Time	Initials
Temperature (°C)	≤4	1.9	9/14	1021	VW
Is ice present?	---	yes			
pH	6.0-9.0	8.0			
TRC (mg/L)	<0.01	<0.01		1040	nn

*If outside acceptable range, contact project manager.

OTHER PARAMETERS IF REQUIRED (SEE STUDY PLAN):

Parameter	Acceptable Range	(✔)	Date	Time	Initials
Ammonia (preserve aliquot)	--	X			

IT CORPORATION
A Member of The IT Group

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD

Reference Document No: 090014EA

Project Number: 807053
Samples Shipment Date: 14 SEP 2000
Project Name: PLUM BROOK ORDNANCE WKS
ab Destination: EA ENGINEERING
Sample Coordinator: Chis Freshour
Lab Contact: Wayne McCulloch
Turnaround Time:
Project Contact: Maureen McMyler
Carrier/Waybill No.: Fed Ex/822780516348

Bill To: Accounts Receivable
312 Directors Drive
Knoxville TN 37923

Report To: Maureen McMyler
312 Directors Drive
Knoxville TN 37923

Special Instructions: 36 HOUR TAT

Possible Hazard Indentification:
Non-hazard [ ] Flammable [ ] Skin Irritant [ ] Poison B [ ] Unknown [X]

Sample Disposal:
Return to Client [ ] Disposal by Lab [X] Archive (mos.)

1. Relinquished By (Signature/Affiliation) Chris Freshour Date: 9/14/00 Time: 16:00
2. Relinquished By (Signature/Affiliation) Date: Time:
3. Relinquished By (Signature/Affiliation) Date: Time:

1. Received By (Signature/Affiliation) Lynda Hartzell Date: 9/15/00 Time: 1720
2. Received By (Signature/Affiliation) Date: Time:
3. Received By (Signature/Affiliation) Date: Time:

Comments:

Sample No	Sample Name	Sample Date	Sample Time	Container	Ctr Qty	Preservative	Requested Testing Program	Fil	CID	Condition On Receipt
AC2006	PBOW-00-PRWP-SW006-AC2006-0000	14 SEP 2000	10:50	1 Gal HDPE	3	None except cool to 4 C	Toxicity in surface water (Weber 1989)	N		
AC2007 A70-724	PBOW-00-PRWP-SW007-AC2007-0000	14 SEP 2000	10:20	1 Gal HDPE	3	None except cool to 4 C	Toxicity in surface water (Weber 1989)	N	X	recd. 9/15/00
AC2008	PBOW-00-PRWP-SW008-AC2008-0000	14 SEP 2000	10:00	1 Gal HDPE	3	None except cool to 4 C	Toxicity in surface water (Weber 1989)	N		
AC2009	PBOW-00-PRWP-SW009-AC2009-0000	14 SEP 2000	09:40	1 Gal HDPE	3	None except cool to 4 C	Toxicity in surface water (Weber 1989)	N		
AC2010 A70-725	PBOW-00-PRWP-SW010-AC2010-0000	14 SEP 2000	09:18	1 Gal HDPE	3	None except cool to 4 C	Toxicity in surface water (Weber 1989)	N	X	recd. 9/15/00

SAMPLE CHECK-IN
FOR GENERAL TESTING

Client: IT

EA Accession Number: ATO-724

Parameter	Acceptable Range	Measurement*	Date	Time	Initials
Temperature (°C)	≤4	3.3	9/15/00	1720	LAH MSH
Is ice present?	---	Yes	↓	↓	↓
pH	6.0-9.0	7.7	↓	↓	↓
TRC (mg/L)	<0.01	NA	↓	↓	↓

***If outside acceptable range, contact project manager.**

OTHER PARAMETERS IF REQUIRED (SEE STUDY PLAN):

Parameter	Acceptable Range	(✔)	Date	Time	Initials
Ammonia (preserve aliquot)	--	NA			

SAMPLE CHECK-IN
FOR GENERAL TESTING

Client: IT

EA Accession Number: ATO-725

Parameter	Acceptable Range	Measurement*	Date	Time	Initials
Temperature (°C)	≤4	3.1	9/15/00	1720	LAA, [illegible]
Is ice present?	---	Yes	✓	✓	✓
pH	6.0-9.0	7.7	✓	✓	✓
TRC (mg/L)	<0.01	NA	✓	✓	✓

***If outside acceptable range, contact project manager.**

OTHER PARAMETERS IF REQUIRED (SEE STUDY PLAN):

Parameter	Acceptable Range	(✔)	Date	Time	Initials
Ammonia (preserve aliquot)	--	NA			

IT CORPORATION
A Member of The IT Group

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD

Reference Document No: 090014EA
Page 1 of 1

Project Number: 807053
Samples Shipment Date: 14 SEP 2000
Project Name: PLUM BROOK ORDNANCE WKS
ab Destination: EA ENGINEERING
Sample Coordinator: Chis Freshour
Lab Contact: Wayne McCulloch
Turnaround Time:
Project Contact: Maureen McMyler
Carrier/Waybill No.: Fed Ex/822780516348

Bill To: Accounts Receivable
312 Directors Drive
Knoxville TN 37923

Report To: Maureen McMyler
312 Directors Drive
Knoxville TN 37923

Special Instructions: 36 HOUR TAT

Possible Hazard Indentification:
Non-hazard [ ] Flammable [ ] Skin Irritant [ ] Poison B [ ] Unknown [X]

1. Relinquished By (Signature/Affiliation) Chris Freshour — Date: 9/14/00 Time: 16:00
2. Relinquished By (Signature/Affiliation) — Date: Time:
3. Relinquished By (Signature/Affiliation) — Date: Time:

Sample Disposal:
Return to Client [ ] Disposal by Lab [X] Archive (mos.)

1. Received By (Signature/Affiliation) — Date: 9/16/00 Time: 1200
2. Received By (Signature/Affiliation) — Date: Time:
3. Received By (Signature/Affiliation) — Date: Time:

Comments:

Sample No	Sample Name	Sample Date	Sample Time	Container	Ctr Qty	Preservative	Requested Testing Program	Fil	CID	Condition On Receipt
AC2006	PBOW-00-PRWP-SW006-AC2006-0000	14 SEP 2000	10:50	1 Gal HDPE	3	None except cool to 4 C	Toxicity in surface water (Weber 1989)	N	X	ATO-728
AC2007	PBOW-00-PRWP-SW007-AC2007-0000	14 SEP 2000	10:20	1 Gal HDPE	3	None except cool to 4 C	Toxicity in surface water (Weber 1989)	N		
AC2008	PBOW-00-PRWP-SW008-AC2008-0000	14 SEP 2000	10:00	1 Gal HDPE	3	None except cool to 4 C	Toxicity in surface water (Weber 1989)	N	X	ATO-729
AC2009	PBOW-00-PRWP-SW009-AC2009-0000	14 SEP 2000	09:40	1 Gal HDPE	3	None except cool to 4 C	Toxicity in surface water (Weber 1989)	N	X	ATO-730
AC2010	PBOW-00-PRWP-SW010-AC2010-0000	14 SEP 2000	09:18	1 Gal HDPE	3	None except cool to 4 C	Toxicity in surface water (Weber 1989)	N		

recvd. 9/16/00

SAMPLE CHECK-IN
FOR GENERAL TESTING

Client: ~~AT~~ LAH ~~XE~~ IT

EA Accession Number: ATO-728

Parameter	Acceptable Range	Measurement*	Date	Time	Initials
Temperature (°C)	≤4	2.7	9/16	1140	nn
Is ice present?	---	Yes	↓	1140	nn
pH	6.0-9.0	7.7	↓	1140	nn
TRC (mg/L)	<0.01	N/A	↓		

***If outside acceptable range, contact project manager.**

OTHER PARAMETERS IF REQUIRED (SEE STUDY PLAN):

Parameter	Acceptable Range	(✔)	Date	Time	Initials
Ammonia (preserve aliquot)	--	N/A			

EA

SAMPLE CHECK-IN
FOR GENERAL TESTING

Client: JT

EA Accession Number: ATU-729

Parameter	Acceptable Range	Measurement*	Date	Time	Initials
Temperature (°C)	≤4	2.2	9/16	1140	nn
Is ice present?	---	Yes	↓	1140	nn
pH	6.0-9.0	7.8	↓	1140	nn
TRC (mg/L)	<0.01	N/A	↓		

***If outside acceptable range, contact project manager.**

OTHER PARAMETERS IF REQUIRED (SEE STUDY PLAN):

Parameter	Acceptable Range	(✔)	Date	Time	Initials
Ammonia (preserve aliquot)	--	NA			

EA

SAMPLE CHECK-IN
FOR GENERAL TESTING

Client: It

EA Accession Number: ATU-730

Parameter	Acceptable Range	Measurement*	Date	Time	Initials
Temperature (°C)	≤4	2.7	9/16	1140	ND
Is ice present?	---	Yes	↓	1140	ND
pH	6.0-9.0	7.8	↓	1140	ND
TRC (mg/L)	<0.01	N/A	↓		

***If outside acceptable range, contact project manager.**

OTHER PARAMETERS IF REQUIRED (SEE STUDY PLAN):

Parameter	Acceptable Range	(✔)	Date	Time	Initials
Ammonia (preserve aliquot)	--	NA			

IT CORPORATION
A Member of The IT Group

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD

Reference Document No: 09001500EA2
Page 1 of 1

Project Number: 807053
Samples Shipment Date: 15 SEP 2000
Project Name: PLUM BROOK ORDNANCE WKS
ab Destination: EA ENGINEERING
Sample Coordinator: Chis Freshour
Lab Contact: Wayne McCulloch
Turnaround Time:
Project Contact: Maureen McMyler
Carrier/Waybill No.: Fed Ex/8217 4420 6918

Bill To: Accounts Receivable
312 Directors Drive
Knoxville TN 37923

Report To: Maureen McMyler
312 Directors Drive
Knoxville TN 37923

Special Instructions:

Possible Hazard Indentification:

Non-hazard | | Flammable | | Skin Irritant | | Poison B | | Unknown | X

1. Relinquished By (Signature/Affiliation) Chris Freshour Date: 9/15/00 Time: 18:00
2. Relinquished By (Signature/Affiliation) Date: Time:
3. Relinquished By (Signature/Affiliation) Date: Time:

Sample Disposal:

Return to Client | | Disposal by Lab | X | Archive (mos.)

1. Received By (Signature/Affiliation) Wayne McCulloch Date: 9/16/00 Time: 1115
2. Received By (Signature/Affiliation) Date: Time: (2.7°C)
3. Received By (Signature/Affiliation) Date: Time:

Comments:

Sample No	Sample Name	Sample Date	Sample Time	Container	Ctr Qty	Preservative	Requested Testing Program	Fil	CID	Condition On Receipt
AD1006	PBOW-00-WRWP-SD006-AD1006-0000	13 SEP 2000	18:35	~~8~~ Gal BKT 2x2L	1	None except cool to 4 C	Toxicity in sediment (USEPA 2000)	N	X	ATD-740
AD1007	PBOW-00-WRWP-SD007-AD1007-0000	14 SEP 2000	09:40	~~8~~ Gal BKT	1	None except cool to 4 C	Toxicity in sediment (USEPA 2000)	N	X	ATD-741
AD1008	PBOW-00-WRWP-SD008-AD1008-0000	14 SEP 2000	12:40	~~8~~ Gal BKT	1	None except cool to 4 C	Toxicity in sediment (USEPA 2000)	N	X	ATD-742
AD1009	PBOW-00-WRWP-SD009-AD1009-0000	13 SEP 2000	18:25	~~8~~ Gal BKT	1	None except cool to 4 C	Toxicity in sediment (USEPA 2000)	N	X	ATD-743
AD1010	PBOW-00-WRWP-SD010-AD1010-0000	13 SEP 2000	19:05	~~8~~ Gal BKT	1	None except cool to 4 C	Toxicity in sediment (USEPA 2000)	N	X	ATD-744

IT CORPORATION
A Member of The IT Group

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD

Reference Document No: 090015-EA

Project Number: 807053
Samples Shipment Date: 15 SEP 2000
Project Name: PLUM BROOK ORDNANCE WKS
ab Destination: EA ENGINEERING
Sample Coordinator: Chis Freshour
Lab Contact: Wayne McCulloch
Turnaround Time:
Project Contact: Maureen McMyler
Carrier/Waybill No.: Fed Ex/821744206930

Bill To: Accounts Receivable
312 Directors Drive
Knoxville TN 37923

Report To: Maureen McMyler
312 Directors Drive
Knoxville TN 37923

Special Instructions:

Possible Hazard Indentification:
Non-hazard [ ] Flammable [ ] Skin Irritant [ ] Poison B [ ] Unknown [X]

Sample Disposal:
Return to Client [ ] Disposal by Lab [X] Archive (mos.)

1. Relinquished By (Signature/Affiliation) Chris Freshour Date: 9/15/00 Time: 17:00
2. Relinquished By (Signature/Affiliation) Date: Time:
3. Relinquished By (Signature/Affiliation) Date: Time:

1. Received By (Signature/Affiliation) Wayne McCulloch Date: 9/16/00 Time: 1115
2. Received By (Signature/Affiliation) Date: Time: (2.7°C)
3. Received By (Signature/Affiliation) Date: Time:

Comments:

Sample No	Sample Name	Sample Date	Sample Time	Container	Ctr Qty	Preservative	Requested Testing Program	Fil	CID	Condition On Receipt
AC1001	PBOW-00-PRWP-SD001-AC1001-0000	15 SEP 2000	10:00	3 Gal BKT	1	None except cool to 4 C	Bioaccumulation in sediment (USEPA 2000)	N	X	ATD-750
AC1002	PBOW-00-PRWP-SD002-AC1002-0000	15 SEP 2000	10:10	3 Gal BKT	1	None except cool to 4 C	Bioaccumulation in sediment (USEPA 2000)	N	X	ATD-751
AC1003	PBOW-00-PRWP-SD003-AC1003-0000	15 SEP 2000	11:30	3 Gal BKT	1	None except cool to 4 C	Bioaccumulation in sediment (USEPA 2000)	N	X	ATD-752
AC1004	PBOW-00-PRWP-SD004-AC1004-0000	15 SEP 2000	11:40	3 Gal BKT	1	None except cool to 4 C	Bioaccumulation in sediment (USEPA 2000)	N	X	ATD-753
AC1005	PBOW-00-PRWP-SD005-AC1005-0000	15 SEP 2000	11:50	3 Gal BKT	1	None except cool to 4 C	Bioaccumulation in sediment (USEPA 2000)	N	X	ATD-754

IT CORPORATION
A Member of The IT Group

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD

Reference Document No: 090015-EA

Sample No	Sample Name	Sample Date	Sample Time	Container		Preservative	Requested Testing Program	Fil	CID	Condition On Receipt
AD0001	PBOW-00-WRWP-SD001-AD0001-0000	15 SEP 2000	09:55	~~2~~ 5 gal Gal BKT	1	None except cool to 4 C	Bioaccumulation in soil (Linder 1992)	N	X	ATO-735
AD0002	PBOW-00-WRWP-SD002-AD0002-0000	15 SEP 2000	08:45	~~2~~ Gal BKT	1	None except cool to 4 C	Bioaccumulation in soil (Linder 1992)	N	X	ATO-736
AD0003	PBOW-00-WRWP-SD003-AD0003-0000	15 SEP 2000	09:00	~~2~~ Gal BKT	1	None except cool to 4 C	Bioaccumulation in soil (Linder 1992)	N	X	ATO-737
AD0004	PBOW-00-WRWP-SD004-AD0004-0000	15 SEP 2000	09:15	~~2~~ Gal BKT	1	None except cool to 4 C	Bioaccumulation in soil (Linder 1992)	N	X	ATO-738
AD0005	PBOW-00-WRWP-SD005-AD0005-0000	15 SEP 2000	09:30	~~2~~ Gal BKT	1	None except cool to 4 C	Bioaccumulation in soil (Linder 1992)	N	X	ATO-739
AD1001	PBOW-00-WRWP-SD001-AD1001-0000	14 SEP 2000	14:10	3 Gal BKT	1	None except cool to 4 C	Bioaccumulation in sediment (USEPA 2000)	N	X	ATO-744-745
AD1002	PBOW-00-WRWP-SD002-AD1002-0000	14 SEP 2000	15:00	3 Gal BKT	1	None except cool to 4 C	Bioaccumulation in sediment (USEPA 2000)	N	X	ATO-745-746
AD1003	PBOW-00-WRWP-SD003-AD1003-0000	14 SEP 2000	13:30	3 Gal BKT	1	None except cool to 4 C	Bioaccumulation in sediment (USEPA 2000)	N	X	ATO-746-747
AD1004	PBOW-00-WRWP-SD004-AD1004-0000	14 SEP 2000	10:55	3 Gal BKT	1	None except cool to 4 C	Bioaccumulation in sediment (USEPA 2000)	N	X	ATO-747-748
AD1005	PBOW-00-WRWP-SD005-AD1005-0000	14 SEP 2000	11:50	3 Gal BKT	1	None except cool to 4 C	Bioaccumulation in sediment (USEPA 2000)	N	X	ATO-748-749

IT CORPORATION
A Member of The IT Group

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD

Reference Document No: 090018-EA
Page 1 of 1

Project Number: 807053
Samples Shipment Date: 18 SEP 2000
Project Name: PLUM BROOK ORDNANCE WKS
ab Destination: EA ENGINEERING
Sample Coordinator: Chis Freshour
Lab Contact: Wayne McCulloch
Turnaround Time:
Project Contact: Maureen McMyler
Carrier/Waybill No.: Fed Ex/8217 4420 6907

Bill To: Accounts Receivable
312 Directors Drive
Knoxville TN 37923

Report To: Maureen McMyler
312 Directors Drive
Knoxville TN 37923

Special Instructions: 2 WEEK TAT

Possible Hazard Indentification:
Non-hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☒

Sample Disposal:
Return to Client ☐ Disposal by Lab ☒ Archive (mos.)

1. Relinquished By (Signature/Affiliation) Chris Freshour	Date: 9/18/00 Time: 17:00	1. Received By (Signature/Affiliation) Lynda Hatzell	Date: 9/19/00 Time: 1330
2. Relinquished By (Signature/Affiliation)	Date: Time:	2. Received By (Signature/Affiliation)	Date: Time: (5.3°C)
3. Relinquished By (Signature/Affiliation)	Date: Time:	3. Received By (Signature/Affiliation)	Date: Time:

Comments:

Sample No	Sample Name	Sample Date	Sample Time	Container	Ctr Qty	Preservative	Requested Testing Program	Fil	CID	Condition On Receipt
AC0001	PBOW-00-SS-PRWP-SO001-AC0001-0000	15 SEP 2000	15:00	3 Gal BKT	1	None except cool to 4 C	Bioaccumulation in soil (Linder 1992)	N	X	ATD-758
AC0002	PBOW-00-SS-PRWP-SO002-AC0002-0000	15 SEP 2000	15:10	3 Gal BKT	1	None except cool to 4 C	Bioaccumulation in soil (Linder 1992)	N	X	ATD-759
AC0003	PBOW-00-SS-PRWP-SO003-AC0003-0000	15 SEP 2000	15:20	3 Gal BKT	1	None except cool to 4 C	Bioaccumulation in soil (Linder 1992)	N	X	ATD-760
AC0004	PBOW-00-SS-PRWP-SO004-AC0004-0000	15 SEP 2000	15:30	3 Gal BKT	1	None except cool to 4 C	Bioaccumulation in soil (Linder 1992)	N	X	ATD-761
AC0005	PBOW-00-SS-PRWP-SO005-AC0005-0000	15 SEP 2000	15:40	3 Gal BKT	1	None except cool to 4 C	Bioaccumulation in soil (Linder 1992)	N	X	ATD-762

ATTACHMENT VIII

Report Quality Assurance Record

REPORT QUALITY ASSURANCE RECORD

Client: IT Corporation

EA Report Number: 3535

Project Number: 70003.10

Type Analysis: toxicity + bioaccumulatio

Author: L. Hartzell

Test Organisms: C. dubia, P. promelas, H. azteca, E. foetida, L. variegatus

REPORT CHECKLIST

QA/QC ITEM	REVIEWER	DATE
1. Samples collected, transported, and received according to study plan requirements.	Lynda Hartzell	1/17/01
2. Samples prepared and processed according to study plan requirements.	Lynda Hartzell	1/17/01
3. Data collected using calibrated equipment.	Lynda Hartzell	1/17/01
4. Calculations checked:		
- Hand calculations checked	Lynda Hartzell	1/17/01
- Documented and verified statistical procedure used.	Lynda Hartzell	1/17/01
5. Data input/statistical analyses complete and correct.	Richard A. Connelly	1/24/01
6. Reported results and facts checked against original sources.	Richard A. Connelly	1/24/01
7. Data presented in figures and tables correct and in agreement with text.	Richard A. Connelly	1/24/01
8. Results reviewed for compliance with study plan requirements.	Wayne McCulloch	1/21/01

	AUTHOR	DATE
9. Commentary reviewed and resolved.	Lynda Hartzell	1/25/01

10. All study plan and quality assurance/control requirements have been met and the report is approved:

Wayne McCulloch — PROJECT MANAGER — 25 January 2001 — DATE

Richard A. Connelly — QUALITY CONTROL OFFICER — 1/24/01 — DATE

[illegible] — SENIOR TECHNICAL REVIEWER — 1/25/01 — DATE

ATS-Q8
03/01/00

APPENDIX F

SITE-SPECIFIC BIOACCUMULATION FACTOR CALCULATION DETAILS

Table F- 1

Calculation of Bioconcentration Factors for Bioaccumulation of PAH Constituents in Earthworm Tissue
Central Tendency
West Area
PBOW Sandusky, Ohio

Constituent	Analytical Result for Earthworm Tissue (ug/kg)	Earthworm Tissue Concentration Utilized	Analytical Result for Soil (ug/kg)	Soil Concentration Utilized	Calculated Earthworm Bioconcentration Factor
Naphthalene	ND 98	NA	ND 49	NA	NA
	ND 84	NA	ND 51	NA	NA
	ND 92	NA	ND 51	NA	NA
	ND 90	NA	ND 51	NA	NA
	ND 80	NA	ND 53	NA	NA
	Final Average Bioconcentration Factor				**NA**
Acenaphthylene	740 B	49	ND 49	24.5	2.0
	240 B	42	ND 51	25.5	1.6
	370 B	46	ND 51	25.5	1.8
	290 B	45	ND 51	25.5	1.8
	740 B	40	ND 53	26.5	1.5
	Final Average Bioconcentration Factor				**1.7**
Acenaphthene	ND 200	NA	ND 99	NA	NA
	380 B	85	ND 100	50	1.7
	840 B	85	ND 100	50	1.7
	380 B	85	ND 100	50	1.7
	360 B	85	ND 100	50	1.7
	Final Average Bioconcentration Factor				**1.7**
Fluorene	18 B	10	ND 9.9	4.95	2.0
	19 B	8.5	6 J	6	1.4
	47 B	9	7.4 J	7.4	1.2
	37 B	9	6.9 J	6.9	1.3
	32 B	8	ND 10	5	1.6
	Final Average Bioconcentration Factor				**1.5**
Phenanthrene	99 B	3.35	32	32	0.1
	32 B	3.35	33	33	0.1
	17 B	3.35	40	40	0.1
	16 B	3.35	40	40	0.1
	48 B	3.35	32	32	0.1
	Final Average Bioconcentration Factor				**0.1**
Anthracene	ND 3.9	1.95	3.6	3.6	0.54
	ND 3.4	NA	ND 2	NA	NA
	ND 3.7	NA	ND 2	NA	NA
	ND 3.6	NA	ND 2	NA	NA
	ND 3.2	1.6	1 J	1	1.6
	Final Average Bioconcentration Factor				**1.07**

Table F- 1

Calculation of Bioconcentration Factors for Bioaccumulation of PAH Constituents in Earthworm Tissue
Central Tendency
West Area
PBOW Sandusky, Ohio

Constituent	Analytical Result for Earthworm Tissue (ug/kg)	Earthworm Tissue Concentration Utilized	Analytical Result for Soil (ug/kg)	Soil Concentration Utilized	Calculated Earthworm Bioconcentration Factor
Fluoranthene	ND 9.8	4.9	76	76	0.06
	ND 8.4	4.2	17	17	0.25
	ND 9.2	4.6	21	21	0.22
	ND 9	4.5	13	13	0.35
	ND 8	4	26	26	0.15
	Final Average Bioconcentration Factor				**0.21**
Pyrene	ND 20	10	55	55	0.18
	ND 17	8.5	120	120	0.07
	ND 18	9	15	15	0.60
	ND 18	9	9 J	9	1.00
	ND 16	8	20	20	0.40
	Final Average Bioconcentration Factor				**0.45**
Benzo(a)anthracene	ND 9.8	4.9	25	25	0.20
	ND 8.4	4.2	49 J	49	0.09
	ND 9.2	4.6	5.9	5.9	0.78
	ND 9	4.5	3.6 J	3.6	1.25
	ND 8	4	6.6	6.6	0.61
	Final Average Bioconcentration Factor				**0.58**
Chrysene	ND 9.8	4.9	26	26	0.19
	ND 8.4	4.2	6.7	6.7	0.63
	ND 9.2	4.6	8.2	8.2	0.56
	ND 9	4.5	4.7 J	4.7	0.96
	ND 8	4	9.2	9.2	0.43
	Final Average Bioconcentration Factor				**0.55**
Benzo(b)fluoranthene	ND 3.9	1.95	33	33	0.06
	ND 3.4	1.7	6	6	0.28
	ND 3.7	1.85	9.5	9.5	0.19
	ND 3.6	1.8	4.8	4.8	0.38
	ND 3.2	1.6	9.9	9.9	0.16
	Final Average Bioconcentration Factor				**0.21**
Benzo(k)fluoranthene	ND 3.9	1.95	19	19	0.10
	ND 3.4	1.7	3.3	3.3	0.52
	ND 3.7	1.85	3.9	3.9	0.47
	ND 3.6	1.8	2.6	2.6	0.69
	ND 3.2	1.6	2.9	2.9	0.55
	Final Average Bioconcentration Factor				**0.47**

Table F- 1

Calculation of Bioconcentration Factors for Bioaccumulation of PAH Constituents in Earthworm Tissue
Central Tendency
West Area
PBOW Sandusky, Ohio

Constituent	Analytical Result for Earthworm Tissue (ug/kg)	Earthworm Tissue Concentration Utilized	Analytical Result for Soil (ug/kg)	Soil Concentration Utilized	Calculated Earthworm Bioconcentration Factor
Benzo(a)pyrene	ND 9.8	4.9	39	39	0.13
	ND 8.4	4.2	7.4	7.4	0.57
	ND 9.2	4.6	9.9	9.9	0.46
	ND 9	4.5	5.5	5.5	0.82
	ND 8	4	12	12	0.33
	Final Average Bioconcentration Factor				**0.46**
Dibenz(a,h)anthracene	ND 39	19.5	22	22	0.89
	ND 34	NA	ND 20	NA	NA
	ND 37	18.5	9.5 J	9.5	1.95
	ND 36	NA	ND 20	NA	NA
	ND 32	NA	ND 21	NA	NA
	Final Average Bioconcentration Factor				**1.42**
Benzo(g,h,I)perylene	ND 16	8	16	16	0.50
	ND 13	NA	ND 8.2	NA	NA
	ND 15	NA	ND 8.2	NA	NA
	ND 14	NA	ND 8.2	NA	NA
	ND 13	NA	ND 8.5	NA	NA
	Final Average Bioconcentration Factor				**0.50**
Indeno(1,2,3-cd)pyrene	8 B	4.9	29	29	0.17
	ND 8.4	4.2	6.8	6.8	0.62
	ND 9.2	4.6	8.3	8.3	0.55
	ND 9	4.5	4.6 J	4.6	0.98
	4.4 B	4	8.6	8.6	0.47
	Final Average Bioconcentration Factor				**0.56**

Table F- 2

Calculation of Bioconcentration Factors for Bioaccumulation of PAH Constituents in Earthworm Tissue
Reasonable Maximum Exposure
West Area
PBOW Sandusky, Ohio

Constituent	Analytical Result for Earthworm Tissue (ug/kg)	Earthworm Tissue Concentration Utilized	Analytical Result for Soil (ug/kg)	Soil Concentration Utilized	Calculated Earthworm Bioconcentration Factor
Naphthalene	ND 98	NA	ND 49	NA	NA
	ND 84	NA	ND 51	NA	NA
	ND 92	NA	ND 51	NA	NA
	ND 90	NA	ND 51	NA	NA
	ND 80	NA	ND 53	NA	NA
	Final Average Bioconcentration Factor				**NA**
Acenaphthylene	740 B	370	ND 49	24.5	15.1
	240 B	120	ND 51	25.5	4.7
	370 B	185	ND 51	25.5	7.3
	290 B	145	ND 51	25.5	5.7
	740 B	370	ND 53	26.5	14.0
	Final Average Bioconcentration Factor				**9.3**
Acenaphthene	ND 200	NA	ND 99	NA	NA
	380 B	190	ND 100	50	3.8
	840 B	420	ND 100	50	8.4
	380 B	190	ND 100	50	3.8
	360 B	180	ND 100	50	3.6
	Final Average Bioconcentration Factor				**4.9**
Fluorene	18 B	9	ND 9.9	4.95	1.8
	19 B	9.5	6 J	6	1.6
	47 B	23.5	7.4 J	7.4	3.2
	37 B	18.5	6.9 J	6.9	2.7
	32 B	16	ND 10	5	3.2
	Final Average Bioconcentration Factor				**2.5**
Phenanthrene	99 B	49.5	32	32	1.5
	32 B	16	33	33	0.5
	17 B	8.5	40	40	0.2
	16 B	8	40	40	0.2
	48 B	24	32	32	0.8
	Final Average Bioconcentration Factor				**0.6**
Anthracene	ND 3.9	1.95	3.6	3.6	0.54
	ND 3.4	NA	ND 2	NA	NA
	ND 3.7	NA	ND 2	NA	NA
	ND 3.6	NA	ND 2	NA	NA
	ND 3.2	1.6	1 J	1	1.6
	Final Average Bioconcentration Factor				**1.07**

Table F- 2

Calculation of Bioconcentration Factors for Bioaccumulation of PAH Constituents in Earthworm Tissue
Reasonable Maximum Exposure
West Area
PBOW Sandusky, Ohio

Constituent	Analytical Result for Earthworm Tissue	Earthworm Tissue Concentration Utilized	Analytical Result for Soil	Soil Concentration Utilized	Calculated Earthworm Bioconcentration Factor
Fluoranthene	ND 9.8	4.9	76	76	0.06
	ND 8.4	4.2	17	17	0.25
	ND 9.2	4.6	21	21	0.22
	ND 9	4.5	13	13	0.35
	ND 8	4	26	26	0.15
	Final Average Bioconcentration Factor				**0.21**
Pyrene	ND 20	10	55	55	0.18
	ND 17	8.5	120	120	0.07
	ND 18	9	15	15	0.60
	ND 18	9	9 J	9	1.00
	ND 16	8	20	20	0.40
	Final Average Bioconcentration Factor				**0.45**
Benzo(a)anthracene	ND 9.8	4.9	25	25	0.20
	ND 8.4	4.2	49 J	49	0.09
	ND 9.2	4.6	5.9	5.9	0.78
	ND 9	4.5	3.6 J	3.6	1.25
	ND 8	4	6.6	6.6	0.61
	Final Average Bioconcentration Factor				**0.58**
Chrysene	ND 9.8	4.9	26	26	0.19
	ND 8.4	4.2	6.7	6.7	0.63
	ND 9.2	4.6	8.2	8.2	0.56
	ND 9	4.5	4.7 J	4.7	0.96
	ND 8	4	9.2	9.2	0.43
	Final Average Bioconcentration Factor				**0.55**
Benzo(b)fluoranthene	ND 3.9	1.95	33	33	0.06
	ND 3.4	1.7	6	6	0.28
	ND 3.7	1.85	9.5	9.5	0.19
	ND 3.6	1.8	4.8	4.8	0.38
	ND 3.2	1.6	9.9	9.9	0.16
	Final Average Bioconcentration Factor				**0.21**
Benzo(k)fluoranthene	ND 3.9	1.95	19	19	0.10
	ND 3.4	1.7	3.3	3.3	0.52
	ND 3.7	1.85	3.9	3.9	0.47
	ND 3.6	1.8	2.6	2.6	0.69
	ND 3.2	1.6	2.9	2.9	0.55
	Final Average Bioconcentration Factor				**0.47**

Table F- 2

Calculation of Bioconcentration Factors for Bioaccumulation of PAH Constituents in Earthworm Tissue
Reasonable Maximum Exposure
West Area
PBOW Sandusky, Ohio

(Page 3 of 3)

Constituent	Analytical Result for Earthworm Tissue	Earthworm Tissue Concentration Utilized	Analytical Result for Soil	Soil Concentration Utilized	Calculated Earthworm Bioconcentration Factor
Benzo(a)pyrene	ND 9.8	4.9	39	39	0.13
	ND 8.4	4.2	7.4	7.4	0.57
	ND 9.2	4.6	9.9	9.9	0.46
	ND 9	4.5	5.5	5.5	0.82
	ND 8	4	12	12	0.33
	Final Average Bioconcentration Factor				**0.46**
Dibenz(a,h)anthracene	ND 39	19.5	22	22	0.89
	ND 34	NA	ND 20	NA	NA
	ND 37	18.5	9.5 J	9.5	1.95
	ND 36	NA	ND 20	NA	NA
	ND 32	NA	ND 21	NA	NA
	Final Average Bioconcentration Factor				**1.42**
Benzo(g,h,I)perylene	ND 16	8	16	16	0.50
	ND 13	NA	ND 8.2	NA	NA
	ND 15	NA	ND 8.2	NA	NA
	ND 14	NA	ND 8.2	NA	NA
	ND 13	NA	ND 8.5	NA	NA
	Final Average Bioconcentration Factor				**0.50**
Indeno(1,2,3-cd)pyrene	8 B	4	29	29	0.14
	ND 8.4	4.2	6.8	6.8	0.62
	ND 9.2	4.6	8.3	8.3	0.55
	ND 9	4.6	4.6 J	4.6	1.00
	4.4 B	2.2	8.6	8.6	0.26
	Final Average Bioconcentration Factor				**0.51**

Table F- 3

Calculation of Bioconcentration Factors for Bioaccumulation of Nitroaromatic Constituents in Earthworm Tissue
Central Tendency
West Area
PBOW Sandusky, Ohio

Constituent	Analytical Result for Earthworm Tissue (ug/kg)	Earthworm Tissue Concentration Utilized	Analytical Result for Soil (ug/kg)	Soil Concentration Utilized	Calculated Earthworm Bioconcentration Factor
HMX	ND 480	NA	ND 250	NA	NA
	ND 530	NA	ND 250	NA	NA
	ND 500	NA	ND 250	NA	NA
	ND 500	NA	ND 250	NA	NA
	ND 480	NA	ND 250	NA	NA
	Final Average Bioconcentration Factor				**NA**
RDX	ND 480	NA	ND 100	NA	NA
	ND 530	NA	ND 100	NA	NA
	ND 500	NA	ND 100	NA	NA
	ND 500	NA	ND 100	NA	NA
	ND 480	NA	ND 100	NA	NA
	Final Average Bioconcentration Factor				**NA**
1,3,5-Trinitrobenzene	ND 240	NA	ND 100	NA	NA
	ND 260	NA	ND 100	NA	NA
	ND 250	NA	ND 100	NA	NA
	ND 250	NA	ND 100	NA	NA
	ND 240	NA	ND 100	NA	NA
	Final Average Bioconcentration Factor				**NA**
1,3-Dinitrobenzene	ND 240	NA	ND 100	NA	NA
	ND 260	NA	ND 100	NA	NA
	ND 250	NA	ND 100	NA	NA
	ND 250	NA	ND 100	NA	NA
	ND 240	NA	ND 100	NA	NA
	Final Average Bioconcentration Factor				**NA**
Nitrobenzene	ND 240	NA	ND 100	NA	NA
	ND 260	NA	ND 100	NA	NA
	ND 250	NA	ND 100	NA	NA
	ND 250	NA	ND 100	NA	NA
	ND 240	NA	ND 100	NA	NA
	Final Average Bioconcentration Factor				**NA**
Tetryl	ND 710	NA	ND 200	NA	NA
	ND 790	NA	ND 200	NA	NA
	ND 750	NA	ND 200	NA	NA
	ND 750	NA	ND 200	NA	NA
	ND 710	NA	ND 200	NA	NA
	Final Average Bioconcentration Factor				**NA**

Table F- 3

Calculation of Bioconcentration Factors for Bioaccumulation of Nitroaromatic Constituents in Earthworm Tissue
Central Tendency
West Area
PBOW Sandusky, Ohio

Constituent	Analytical Result for Earthworm Tissue (ug/kg)	Earthworm Tissue Concentration Utilized	Analytical Result for Soil (ug/kg)	Soil Concentration Utilized	Calculated Earthworm Bioconcentration Factor
4-Amino-2,6-DNT	ND 480	NA	ND 200	NA	NA
	ND 530	NA	ND 200	NA	NA
	ND 500	NA	ND 200	NA	NA
	ND 500	NA	ND 200	NA	NA
	ND 480	NA	ND 200	NA	NA
	Final Average Bioconcentration Factor				**NA**
2-Amino-4,6-DNT	ND 480	NA	ND 200	NA	NA
	ND 530	NA	ND 200	NA	NA
	ND 500	NA	ND 200	NA	NA
	ND 500	NA	ND 200	NA	NA
	ND 480	NA	ND 200	NA	NA
	Final Average Bioconcentration Factor				**NA**
2,4,6-Trinitrotoluene	ND 480	NA	ND 100	NA	NA
	ND 530	NA	ND 100	NA	NA
	ND 500	NA	ND 100	NA	NA
	ND 500	NA	ND 100	NA	NA
	ND 480	NA	ND 100	NA	NA
	Final Average Bioconcentration Factor				**NA**
2,6-Dinitrotoluene	ND 480	NA	ND 200	NA	NA
	ND 530	NA	ND 200	NA	NA
	ND 500	NA	ND 200	NA	NA
	ND 500	NA	ND 200	NA	NA
	ND 480	NA	ND 200	NA	NA
	Final Average Bioconcentration Factor				**NA**
2,4-Dinitrotoluene	ND 240	NA	ND 100	NA	NA
	ND 260	NA	ND 100	NA	NA
	ND 250	NA	ND 100	NA	NA
	ND 250	NA	ND 100	NA	NA
	ND 240	NA	ND 100	NA	NA
	Final Average Bioconcentration Factor				**NA**
2-Nitrotoluene	ND 480	NA	ND 200	NA	NA
	ND 530	NA	ND 200	NA	NA
	ND 500	NA	ND 200	NA	NA
	ND 500	NA	ND 200	NA	NA
	ND 480	NA	ND 200	NA	NA
	Final Average Bioconcentration Factor				**NA**

Table F- 3

Calculation of Bioconcentration Factors for Bioaccumulation of Nitroaromatic Constituents in Earthworm Tissue
Central Tendency
West Area
PBOW Sandusky, Ohio

Constituent	Analytical Result for Earthworm Tissue (ug/kg)	Earthworm Tissue Concentration Utilized	Analytical Result for Soil (ug/kg)	Soil Concentration Utilized	Calculated Earthworm Bioconcentration Factor
3-Nitrotoluene	ND 480	NA	ND 200	NA	NA
	ND 530	NA	ND 200	NA	NA
	ND 500	NA	ND 200	NA	NA
	ND 500	NA	ND 200	NA	NA
	ND 480	NA	ND 200	NA	NA
	Final Average Bioconcentration Factor				**NA**
4-Nitrotoluene	ND 480	NA	ND 500	NA	NA
	ND 530	NA	ND 500	NA	NA
	ND 500	NA	ND 500	NA	NA
	ND 500	NA	ND 500	NA	NA
	ND 480	NA	ND 500	NA	NA
	Final Average Bioconcentration Factor				**NA**

Table F- 4

Calculation of Bioconcentration Factors for Bioaccumulation of Nitroaromatic Constituents in Earthworm Tissue
Reasonable Maximum Exposure
West Area
PBOW Sandusky, Ohio

Constituent	Analytical Result for Earthworm Tissue (ug/kg)	Earthworm Tissue Concentration Utilized	Analytical Result for Soil (ug/kg)	Soil Concentration Utilized	Calculated Earthworm Bioconcentration Factor
HMX	ND 480	NA	ND 250	NA	NA
	ND 530	NA	ND 250	NA	NA
	ND 500	NA	ND 250	NA	NA
	ND 500	NA	ND 250	NA	NA
	ND 480	NA	ND 250	NA	NA
	Final Average Bioconcentration Factor				**NA**
RDX	ND 480	NA	ND 100	NA	NA
	ND 530	NA	ND 100	NA	NA
	ND 500	NA	ND 100	NA	NA
	ND 500	NA	ND 100	NA	NA
	ND 480	NA	ND 100	NA	NA
	Final Average Bioconcentration Factor				**NA**
1,3,5-Trinitrobenzene	ND 240	NA	ND 100	NA	NA
	ND 260	NA	ND 100	NA	NA
	ND 250	NA	ND 100	NA	NA
	ND 250	NA	ND 100	NA	NA
	ND 240	NA	ND 100	NA	NA
	Final Average Bioconcentration Factor				**NA**
1,3-Dinitrobenzene	ND 240	NA	ND 100	NA	NA
	ND 260	NA	ND 100	NA	NA
	ND 250	NA	ND 100	NA	NA
	ND 250	NA	ND 100	NA	NA
	ND 240	NA	ND 100	NA	NA
	Final Average Bioconcentration Factor				**NA**
Nitrobenzene	ND 240	NA	ND 100	NA	NA
	ND 260	NA	ND 100	NA	NA
	ND 250	NA	ND 100	NA	NA
	ND 250	NA	ND 100	NA	NA
	ND 240	NA	ND 100	NA	NA
	Final Average Bioconcentration Factor				**NA**
Tetryl	ND 710	NA	ND 200	NA	NA
	ND 790	NA	ND 200	NA	NA
	ND 750	NA	ND 200	NA	NA
	ND 750	NA	ND 200	NA	NA
	ND 710	NA	ND 200	NA	NA
	Final Average Bioconcentration Factor				**NA**

Table F- 4

Calculation of Bioconcentration Factors for Bioaccumulation of Nitroaromatic Constituents in Earthworm Tissue
Reasonable Maximum Exposure
West Area
PBOW Sandusky, Ohio

Constituent	Analytical Result for Earthworm Tissue (ug/kg)	Earthworm Tissue Concentration Utilized	Analytical Result for Soil (ug/kg)	Soil Concentration Utilized	Calculated Earthworm Bioconcentration Factor
4-Amino-2,6-DNT	ND 480	NA	ND 200	NA	NA
	ND 530	NA	ND 200	NA	NA
	ND 500	NA	ND 200	NA	NA
	ND 500	NA	ND 200	NA	NA
	ND 480	NA	ND 200	NA	NA
	Final Average Bioconcentration Factor				**NA**
2-Amino-4,6-DNT	ND 480	NA	ND 200	NA	NA
	ND 530	NA	ND 200	NA	NA
	ND 500	NA	ND 200	NA	NA
	ND 500	NA	ND 200	NA	NA
	ND 480	NA	ND 200	NA	NA
	Final Average Bioconcentration Factor				**NA**
2,4,6-Trinitrotoluene	ND 480	NA	ND 100	NA	NA
	ND 530	NA	ND 100	NA	NA
	ND 500	NA	ND 100	NA	NA
	ND 500	NA	ND 100	NA	NA
	ND 480	NA	ND 100	NA	NA
	Final Average Bioconcentration Factor				**NA**
2,6-Dinitrotoluene	ND 480	NA	ND 200	NA	NA
	ND 530	NA	ND 200	NA	NA
	ND 500	NA	ND 200	NA	NA
	ND 500	NA	ND 200	NA	NA
	ND 480	NA	ND 200	NA	NA
	Final Average Bioconcentration Factor				**NA**
2,4-Dinitrotoluene	ND 240	NA	ND 100	NA	NA
	ND 260	NA	ND 100	NA	NA
	ND 250	NA	ND 100	NA	NA
	ND 250	NA	ND 100	NA	NA
	ND 240	NA	ND 100	NA	NA
	Final Average Bioconcentration Factor				**NA**
2-Nitrotoluene	ND 480	NA	ND 200	NA	NA
	ND 530	NA	ND 200	NA	NA
	ND 500	NA	ND 200	NA	NA
	ND 500	NA	ND 200	NA	NA
	ND 480	NA	ND 200	NA	NA
	Final Average Bioconcentration Factor				**NA**

Table F- 4

Calculation of Bioconcentration Factors for Bioaccumulation of Nitroaromatic Constituents in Earthworm Tissue
Reasonable Maximum Exposure
West Area
PBOW Sandusky, Ohio

Constituent	Analytical Result for Earthworm Tissue (ug/kg)	Earthworm Tissue Concentration Utilized	Analytical Result for Soil (ug/kg)	Soil Concentration Utilized	Calculated Earthworm Bioconcentration Factor
3-Nitrotoluene	ND 480	NA	ND 200	NA	NA
	ND 530	NA	ND 200	NA	NA
	ND 500	NA	ND 200	NA	NA
	ND 500	NA	ND 200	NA	NA
	ND 480	NA	ND 200	NA	NA
	Final Average Bioconcentration Factor				**NA**
4-Nitrotoluene	ND 480	NA	ND 500	NA	NA
	ND 530	NA	ND 500	NA	NA
	ND 500	NA	ND 500	NA	NA
	ND 500	NA	ND 500	NA	NA
	ND 480	NA	ND 500	NA	NA
	Final Average Bioconcentration Factor				**NA**

Table F- 5

Calculation of Bioconcentration Factors for Bioaccumulation of Nitroaromatic Constituents in Earthworm Tissue
Central Tendency
Pentolite Road
PBOW Sandusky, Ohio

Constituent	Analytical Result for Earthworm Tissue (ug/kg)	Earthworm Tissue Concentration Utilized	Analytical Result for Soil (ug/kg)	Soil Concentration Utilized	Calculated Earthworm Bioconcentration Factor
HMX	ND 500	NA	ND 250	NA	NA
	Final Average Bioconcentration Factor				**NA**
RDX	ND 500	NA	ND 99	NA	NA
	Final Average Bioconcentration Factor				**NA**
1,3,5-Trinitrobenzene	ND 250	NA	ND 99	NA	NA
	Final Average Bioconcentration Factor				**NA**
1,3-Dinitrobenzene	ND 250	NA	ND 99	NA	NA
	Final Average Bioconcentration Factor				**NA**
Nitrobenzene	ND 250	NA	ND 99	NA	NA
	Final Average Bioconcentration Factor				**NA**
Tetryl	ND 750	NA	ND 99	NA	NA
	Final Average Bioconcentration Factor				**NA**
4-Amino-2,6-DNT	ND 500	NA	ND 200	NA	NA
	Final Average Bioconcentration Factor				**NA**
2-Amino-4,6-DNT	ND 500	NA	ND 200	NA	NA
	Final Average Bioconcentration Factor				**NA**
2,4,6-Trinitrotoluene	ND 500	NA	ND 200	NA	NA
	Final Average Bioconcentration Factor				**NA**
2,6-Dinitrotoluene	ND 500	NA	ND 200	NA	NA
	Final Average Bioconcentration Factor				**NA**
2,4-Dinitrotoluene	ND 250	125	1200	1200	0.10
	Final Average Bioconcentration Factor				**0.1**
2-Nitrotoluene	ND 500	NA	ND 200	NA	NA
	Final Average Bioconcentration Factor				**NA**
3-Nitrotoluene	ND 500	NA	ND 200	NA	NA
	Final Average Bioconcentration Factor				**NA**
4-Nitrotoluene	ND 500	NA	ND 500	NA	NA
	Final Average Bioconcentration Factor				**NA**

Table F- 5

Calculation of Bioconcentration Factors for Bioaccumulation of Nitroaromatic Constituents in Earthworm Tissue
Central Tendency
Pentolite Road
PBOW Sandusky, Ohio

Constituent	Analytical Result for Earthworm Tissue (ug/kg)	Earthworm Tissue Concentration Utilized	Analytical Result for Soil (ug/kg)	Soil Concentration Utilized	Calculated Earthworm Bioconcentration Factor
HMX	ND 500	NA	ND 250	NA	NA
	Final Average Bioconcentration Factor				**NA**
RDX	ND 500	NA	ND 99	NA	NA
	Final Average Bioconcentration Factor				**NA**
1,3,5-Trinitrobenzene	ND 250	NA	ND 99	NA	NA
	Final Average Bioconcentration Factor				**NA**
1,3-Dinitrobenzene	ND 250	NA	ND 99	NA	NA
	Final Average Bioconcentration Factor				**NA**
Nitrobenzene	ND 250	NA	ND 99	NA	NA
	Final Average Bioconcentration Factor				**NA**
Tetryl	ND 750	NA	ND 99	NA	NA
	Final Average Bioconcentration Factor				**NA**
4-Amino-2,6-DNT	ND 500	NA	ND 200	NA	NA
	Final Average Bioconcentration Factor				**NA**
2-Amino-4,6-DNT	ND 500	NA	ND 200	NA	NA
	Final Average Bioconcentration Factor				**NA**
2,4,6-Trinitrotoluene	ND 500	NA	ND 200	NA	NA
	Final Average Bioconcentration Factor				**NA**
2,6-Dinitrotoluene	ND 500	NA	ND 200	NA	NA
	Final Average Bioconcentration Factor				**NA**
2,4-Dinitrotoluene	ND 250	125	1200	1200	0.10
	Final Average Bioconcentration Factor				**0.1**
2-Nitrotoluene	ND 500	NA	ND 200	NA	NA
	Final Average Bioconcentration Factor				**NA**
3-Nitrotoluene	ND 500	NA	ND 200	NA	NA
	Final Average Bioconcentration Factor				**NA**
4-Nitrotoluene	ND 500	NA	ND 500	NA	NA
	Final Average Bioconcentration Factor				**NA**

Table F- 6

Calculation of Bioconcentration Factors for Bioaccumulation of Nitroaromatic Constituents in Earthworm Tissue
Reasonable Maximum Exposure
Pentolite Road
PBOW Sandusky, Ohio

Constituent	Analytical Result for Earthworm Tissue (ug/kg)	Earthworm Tissue Concentration Utilized	Analytical Result for Soil (ug/kg)	Soil Concentration Utilized	Calculated Earthworm Bioconcentration Factor
HMX	ND 500	NA	ND 250	NA	NA
	Final Average Bioconcentration Factor				**NA**
RDX	ND 500	NA	ND 99	NA	NA
	Final Average Bioconcentration Factor				**NA**
1,3,5-Trinitrobenzene	ND 250	NA	ND 99	NA	NA
	Final Average Bioconcentration Factor				**NA**
1,3-Dinitrobenzene	ND 250	NA	ND 99	NA	NA
	Final Average Bioconcentration Factor				**NA**
Nitrobenzene	ND 250	NA	ND 99	NA	NA
	Final Average Bioconcentration Factor				**NA**
Tetryl	ND 750	NA	ND 99	NA	NA
	Final Average Bioconcentration Factor				**NA**
4-Amino-2,6-DNT	ND 500	NA	ND 200	NA	NA
	Final Average Bioconcentration Factor				**NA**
2-Amino-4,6-DNT	ND 500	NA	ND 200	NA	NA
	Final Average Bioconcentration Factor				**NA**
2,4,6-Trinitrotoluene	ND 500	NA	ND 200	NA	NA
	Final Average Bioconcentration Factor				**NA**
2,6-Dinitrotoluene	ND 500	NA	ND 200	NA	NA
	Final Average Bioconcentration Factor				**NA**
2,4-Dinitrotoluene	ND 250	125	1200	1200	0.10
	Final Average Bioconcentration Factor				**0.1**
2-Nitrotoluene	ND 500	NA	ND 200	NA	NA
	Final Average Bioconcentration Factor				**NA**
3-Nitrotoluene	ND 500	NA	ND 200	NA	NA
	Final Average Bioconcentration Factor				**NA**
4-Nitrotoluene	ND 500	NA	ND 500	NA	NA
	Final Average Bioconcentration Factor				**NA**

Table F- 7

Calculation of Bioconcentration Factors for Bioaccumulation of Nitroaromatic Constituents in Aquatic Worm Tissue
Central Tendency
West Area
PBOW Sandusky, Ohio

Constituent	Analytical Result for Aquatic Worm Tissue (ug/kg)	Aquatic Worm Tissue Concentration Utilized	Analytical Result for Sediment (ug/kg)	Sediment Concentration Utilized	Calculated Aquatic Worm Bioconcentration Factor
HMX	ND 500	NA	ND 240	NA	NA
	ND 530	NA	ND 250	NA	NA
	ND 500	NA	ND 250	NA	NA
	ND 480	NA	ND 250	NA	NA
	ND 480	NA	ND 240	NA	NA
	Final Average Bioconcentration Factor				**NA**
RDX	ND 500	NA	ND 98	NA	NA
	ND 530	NA	ND 100	NA	NA
	ND 500	NA	ND 100	NA	NA
	ND 480	NA	ND 100	NA	NA
	ND 480	NA	ND 98	NA	NA
	Final Average Bioconcentration Factor				**NA**
1,3,5-Trinitrobenzene	ND 250	NA	ND 98	NA	NA
	ND 260	NA	ND 100	NA	NA
	ND 250	NA	ND 100	NA	NA
	ND 240	NA	ND 100	NA	NA
	ND 240	NA	ND 98	NA	NA
	Final Average Bioconcentration Factor				**NA**
1,3-Dinitrobenzene	ND 250	NA	ND 98	NA	NA
	ND 260	NA	ND 100	NA	NA
	ND 250	NA	ND 100	NA	NA
	ND 240	NA	ND 100	NA	NA
	ND 240	NA	ND 98	NA	NA
	Final Average Bioconcentration Factor				**NA**
Nitrobenzene	ND 250	NA	ND 98	NA	NA
	ND 260	NA	ND 100	NA	NA
	ND 250	NA	ND 100	NA	NA
	ND 240	NA	ND 100	NA	NA
	ND 240	NA	ND 98	NA	NA
	Final Average Bioconcentration Factor				**NA**
Tetryl	ND 750	NA	ND 200	NA	NA
	ND 790	NA	ND 200	NA	NA
	ND 750	NA	ND 200	NA	NA
	ND 710	NA	ND 200	NA	NA
	ND 710	NA	ND 200	NA	NA
	Final Average Bioconcentration Factor				**NA**

Table F- 7

Calculation of Bioconcentration Factors for Bioaccumulation of Nitroaromatic Constituents in Aquatic Worm Tissue
Central Tendency
West Area
PBOW Sandusky, Ohio

Constituent	Analytical Result for Aquatic Worm Tissue (ug/kg)	Aquatic Worm Tissue Concentration Utilized	Analytical Result for Sediment (ug/kg)	Sediment Concentration Utilized	Calculated Aquatic Worm Bioconcentration Factor
4-Amino-2,6-DNT	ND 500	NA	ND 200	NA	NA
	ND 530	NA	ND 200	NA	NA
	ND 500	NA	ND 200	NA	NA
	ND 480	NA	ND 200	NA	NA
	ND 480	NA	ND 200	NA	NA
	Final Average Bioconcentration Factor				**NA**
2-Amino-4,6-DNT	ND 500	NA	ND 200	NA	NA
	ND 530	NA	ND 200	NA	NA
	ND 500	NA	ND 200	NA	NA
	ND 480	NA	ND 200	NA	NA
	ND 480	NA	ND 200	NA	NA
	Final Average Bioconcentration Factor				**NA**
2,4,6-Trinitrotoluene	ND 500	NA	ND 98	NA	NA
	ND 530	NA	ND 100	NA	NA
	ND 500	NA	ND 100	NA	NA
	ND 480	NA	ND 100	NA	NA
	ND 480	NA	ND 98	NA	NA
	Final Average Bioconcentration Factor				**NA**
2,6-Dinitrotoluene	ND 500	NA	ND 200	NA	NA
	ND 530	NA	ND 200	NA	NA
	ND 500	NA	ND 200	NA	NA
	ND 480	NA	ND 200	NA	NA
	ND 480	NA	ND 200	NA	NA
	Final Average Bioconcentration Factor				**NA**
2,4-Dinitrotoluene	ND 250	NA	ND 98	NA	NA
	ND 260	NA	ND 100	NA	NA
	ND 250	NA	ND 100	NA	NA
	ND 240	NA	ND 100	NA	NA
	ND 240	NA	ND 98	NA	NA
	Final Average Bioconcentration Factor				**NA**
2-Nitrotoluene	ND 500	NA	ND 200	NA	NA
	ND 530	NA	ND 200	NA	NA
	ND 500	NA	ND 200	NA	NA
	ND 480	NA	ND 200	NA	NA
	ND 480	NA	ND 200	NA	NA
	Final Average Bioconcentration Factor				**NA**

Table F- 7

Calculation of Bioconcentration Factors for Bioaccumulation of Nitroaromatic Constituents in Aquatic Worm Tissue
Central Tendency
West Area
PBOW Sandusky, Ohio

Constituent	Analytical Result for Aquatic Worm Tissue (ug/kg)	Aquatic Worm Tissue Concentration Utilized	Analytical Result for Sediment (ug/kg)	Sediment Concentration Utilized	Calculated Aquatic Worm Bioconcentration Factor
3-Nitrotoluene	ND 500	NA	ND 200	NA	NA
	ND 530	NA	ND 200	NA	NA
	ND 500	NA	ND 200	NA	NA
	ND 480	NA	ND 200	NA	NA
	ND 480	NA	ND 200	NA	NA
	Final Average Bioconcentration Factor				**NA**
4-Nitrotoluene	ND 500	NA	ND 490	NA	NA
	ND 530	NA	ND 500	NA	NA
	ND 500	NA	ND 500	NA	NA
	ND 480	NA	ND 500	NA	NA
	ND 480	NA	ND 490	NA	NA
	Final Average Bioconcentration Factor				**NA**

Table F- 8

Calculation of Bioconcentration Factors for Bioaccumulation of Nitroaromatic Constituents in Aquatic Worm Tissue
Reasonable Maximum Exposure
West Area
PBOW Sandusky, Ohio

Constituent	Analytical Result for Aquatic Worm Tissue (ug/kg)	Aquatic Worm Tissue Concentration Utilized	Analytical Result for Sediment (ug/kg)	Sediment Concentration Utilized	Calculated Aquatic Worm Bioconcentration Factor
HMX	ND 500	NA	ND 240	NA	NA
	ND 530	NA	ND 250	NA	NA
	ND 500	NA	ND 250	NA	NA
	ND 480	NA	ND 250	NA	NA
	ND 480	NA	ND 240	NA	NA
	Final Average Bioconcentration Factor				**NA**
RDX	ND 500	NA	ND 98	NA	NA
	ND 530	NA	ND 100	NA	NA
	ND 500	NA	ND 100	NA	NA
	ND 480	NA	ND 100	NA	NA
	ND 480	NA	ND 98	NA	NA
	Final Average Bioconcentration Factor				**NA**
1,3,5-Trinitrobenzene	ND 250	NA	ND 98	NA	NA
	ND 260	NA	ND 100	NA	NA
	ND 250	NA	ND 100	NA	NA
	ND 240	NA	ND 100	NA	NA
	ND 240	NA	ND 98	NA	NA
	Final Average Bioconcentration Factor				**NA**
1,3-Dinitrobenzene	ND 250	NA	ND 98	NA	NA
	ND 260	NA	ND 100	NA	NA
	ND 250	NA	ND 100	NA	NA
	ND 240	NA	ND 100	NA	NA
	ND 240	NA	ND 98	NA	NA
	Final Average Bioconcentration Factor				**NA**
Nitrobenzene	ND 250	NA	ND 98	NA	NA
	ND 260	NA	ND 100	NA	NA
	ND 250	NA	ND 100	NA	NA
	ND 240	NA	ND 100	NA	NA
	ND 240	NA	ND 98	NA	NA
	Final Average Bioconcentration Factor				**NA**
Tetryl	ND 750	NA	ND 200	NA	NA
	ND 790	NA	ND 200	NA	NA
	ND 750	NA	ND 200	NA	NA
	ND 710	NA	ND 200	NA	NA
	ND 710	NA	ND 200	NA	NA
	Final Average Bioconcentration Factor				**NA**

Table F- 8

Calculation of Bioconcentration Factors for Bioaccumulation of Nitroaromatic Constituents in Aquatic Worm Tissue
Reasonable Maximum Exposure
West Area
PBOW Sandusky, Ohio

Constituent	Analytical Result for Aquatic Worm Tissue (ug/kg)	Aquatic Worm Tissue Concentration Utilized	Analytical Result for Sediment (ug/kg)	Sediment Concentration Utilized	Calculated Aquatic Worm Bioconcentration Factor
4-Amino-2,6-DNT	ND 500	NA	ND 200	NA	NA
	ND 530	NA	ND 200	NA	NA
	ND 500	NA	ND 200	NA	NA
	ND 480	NA	ND 200	NA	NA
	ND 480	NA	ND 200	NA	NA
	Final Average Bioconcentration Factor				**NA**
2-Amino-4,6-DNT	ND 500	NA	ND 200	NA	NA
	ND 530	NA	ND 200	NA	NA
	ND 500	NA	ND 200	NA	NA
	ND 480	NA	ND 200	NA	NA
	ND 480	NA	ND 200	NA	NA
	Final Average Bioconcentration Factor				**NA**
2,4,6-Trinitrotoluene	ND 500	NA	ND 98	NA	NA
	ND 530	NA	ND 100	NA	NA
	ND 500	NA	ND 100	NA	NA
	ND 480	NA	ND 100	NA	NA
	ND 480	NA	ND 98	NA	NA
	Final Average Bioconcentration Factor				**NA**
2,6-Dinitrotoluene	ND 500	NA	ND 200	NA	NA
	ND 530	NA	ND 200	NA	NA
	ND 500	NA	ND 200	NA	NA
	ND 480	NA	ND 200	NA	NA
	ND 480	NA	ND 200	NA	NA
	Final Average Bioconcentration Factor				**NA**
2,4-Dinitrotoluene	ND 250	NA	ND 98	NA	NA
	ND 260	NA	ND 100	NA	NA
	ND 250	NA	ND 100	NA	NA
	ND 240	NA	ND 100	NA	NA
	ND 240	NA	ND 98	NA	NA
	Final Average Bioconcentration Factor				**NA**
2-Nitrotoluene	ND 500	NA	ND 200	NA	NA
	ND 530	NA	ND 200	NA	NA
	ND 500	NA	ND 200	NA	NA
	ND 480	NA	ND 200	NA	NA
	ND 480	NA	ND 200	NA	NA
	Final Average Bioconcentration Factor				**NA**

Table F- 8

Calculation of Bioconcentration Factors for Bioaccumulation of Nitroaromatic Constituents in Aquatic Worm Tissue
Reasonable Maximum Exposure
West Area
PBOW Sandusky, Ohio

Constituent	Analytical Result for Aquatic Worm Tissue (ug/kg)	Aquatic Worm Tissue Concentration Utilized	Analytical Result for Sediment (ug/kg)	Sediment Concentration Utilized	Calculated Aquatic Worm Bioconcentration Factor
3-Nitrotoluene	ND 500	NA	ND 200	NA	NA
	ND 530	NA	ND 200	NA	NA
	ND 500	NA	ND 200	NA	NA
	ND 480	NA	ND 200	NA	NA
	ND 480	NA	ND 200	NA	NA
	Final Average Bioconcentration Factor				**NA**
4-Nitrotoluene	ND 500	NA	ND 490	NA	NA
	ND 530	NA	ND 500	NA	NA
	ND 500	NA	ND 500	NA	NA
	ND 480	NA	ND 500	NA	NA
	ND 480	NA	ND 490	NA	NA
	Final Average Bioconcentration Factor				**NA**

Table F- 9

Calculation of Bioconcentration Factors for Bioaccumulation of Metal Constituents in Aquatic Worm Tissue
Central Tendency
West Area
PBOW Sandusky, Ohio

Constituent	Analytical Result for Aquatic Worm Tissue (mg/kg)		Aquatic Worm Tissue Concentration Utilized	Analytical Result for Sediment (mg/kg)	Sediment Concentration Utilized	Calculated Aquatic Worm Bioconcentration Factor
Aluminum	70.1		70.1	9150	9150	0.0077
	25.5		25.5	8690	8690	0.0029
	17.6	J	17.6	17600	17600	0.0010
	47.8		47.8	10600	10600	0.0045
	17.1	J	17.1	12300	12300	0.0014
	Final Average Bioconcentration Factor					**0.0035**
Antimony	ND 0.25		NA	ND 0.76	NA	NA
	ND 0.25		NA	ND 0.70	NA	NA
	ND 0.25		NA	ND 0.85	NA	NA
	ND 0.25		NA	ND 0.69	NA	NA
	ND 0.25		NA	ND 0.84	NA	NA
	Final Average Bioconcentration Factor					**NA**
Arsenic	2	B	0.14	5.1	5.1	0.03
	1.5	B	0.14	3.6	3.6	0.04
	2	B	0.14	7.7	7.7	0.02
	2.9	B	0.14	4.3	4.3	0.03
	2.1	B	0.14	4.9	4.9	0.03
	Final Average Bioconcentration Factor					**0.03**
Barium	58.9	B	0.025	83.9	83.9	0.00030
	65.8	B	0.025	46	46	0.00054
	69.1	B	0.025	126	126	0.00020
	72.8	B	0.025	94.4	94.4	0.00026
	50	B	0.025	102	102	0.00025
	Final Average Bioconcentration Factor					**0.00031**
Cadmium	0.05	B	NA	NA	NA	NA
	0.04	B	NA	NA	NA	NA
	0.06	B	NA	NA	NA	NA
	0.05	B	NA	NA	NA	NA
	ND 0.04		NA	NA	NA	NA
	Final Average Bioconcentration Factor					**NA**
Calcium	236	B	2.15	3220	3220	0.001
	170	B	2.15	2710	2710	0.001
	182	B	2.15	2890	2890	0.001
	205	B	2.15	2880	2880	0.001
	215	B	2.15	3570	3570	0.001
	Final Average Bioconcentration Factor					**0.001**

Table F- 9

Calculation of Bioconcentration Factors for Bioaccumulation of Metal Constituents in Aquatic Worm Tissue
Central Tendency
West Area
PBOW Sandusky, Ohio

Constituent	Analytical Result for Aquatic Worm Tissue		Aquatic Worm Tissue Concentration Utilized	Analytical Result for Sediment		Sediment Concentration Utilized	Calculated Aquatic Worm Bioconcentration Factor
Chromium	0.33	B	0.065	12.9		12.9	0.005
	0.27	B	0.065	11.7		11.7	0.006
	0.28	B	0.065	22.3		22.3	0.003
	0.26	B	0.065	13.9		13.9	0.005
	0.13	B	0.065	16.5		16.5	0.004
	Final Average Bioconcentration Factor						**0.004**
Cobalt	0.28	B	0.025	8.9		8.9	0.003
	0.21	B	0.025	6.4		6.4	0.004
	0.18	B	0.025	11.3		11.3	0.002
	0.31	B	0.025	13.1		13.1	0.002
	0.38	B	0.025	15.2		15.2	0.002
	Final Average Bioconcentration Factor						**0.002**
Copper	3	B	0.23	12.5		12.5	0.02
	4.5	B	0.23	9.2		9.2	0.03
	2.9	B	0.23	18.3		18.3	0.01
	3.2	B	0.23	15.5		15.5	0.01
	3.7	B	0.23	17.6		17.6	0.01
	Final Average Bioconcentration Factor						**0.02**
Iron	824	B	0.95	18000		18000	0.000053
	445	B	1	14100		14100	0.000071
	534	B	0.95	29300		29300	0.000032
	694	B	0.95	17600		17600	0.000054
	346	B	0.95	20900		20900	0.000045
	Final Average Bioconcentration Factor						**0.000051**
Lead	0.88	J	0.88	25	J	25	0.035
	0.31	J	0.31	14.1	J	14.1	0.022
	0.56	J	0.56	23.4	J	23.4	0.024
	0.43	J	0.43	14.7	J	14.7	0.029
	0.25	J	0.25	19.8	J	19.8	0.013
	Final Average Bioconcentration Factor						**0.025**
Magnesium	214	B	0.6	2630		2630	0.00023
	168	B	0.6	2390		2390	0.00025
	171	B	0.6	3880		3880	0.00015
	189	B	0.6	2900		2900	0.00021
	149	B	0.6	3460		3460	0.00017
	Final Average Bioconcentration Factor						**0.00020**

Table F- 9

Calculation of Bioconcentration Factors for Bioaccumulation of Metal Constituents in Aquatic Worm Tissue
Central Tendency
West Area
PBOW Sandusky, Ohio

Constituent	Analytical Result for Aquatic Worm Tissue		Aquatic Worm Tissue Concentration Utilized	Analytical Result for Sediment		Sediment Concentration Utilized	Calculated Aquatic Worm Bioconcentration Factor
Manganese	5.4	B	0.015	301		301	0.000050
	2.4	B	0.015	142		142	0.000106
	3.3	B	0.015	371		371	0.000040
	4	B	0.015	321		321	0.000047
	2.3	B	0.015	347		347	0.000043
	Final Average Bioconcentration Factor						**0.000057**
Nickel	0.37	J	0.37	16.7	J	16.7	0.022
	0.45	J	0.45	12.3	J	12.3	0.037
	0.27	J	0.27	29	J	29	0.009
	0.27	J	0.27	23.6	J	23.6	0.011
	0.29	J	0.29	23.6	J	23.6	0.012
	Final Average Bioconcentration Factor						**0.018**
Potassium	1170	B	1.8	1070	B	6.35	0.28
	1300	B	1.8	937	B	5.8	0.31
	1230	B	1.8	2420	J	2420	0.0007
	1350	B	1.8	1490	B	5.7	0.32
	821	B	1.8	1880	J	1880	0.0010
	Final Average Bioconcentration Factor						**0.1823**
Sodium	624	B	121.5	549		549	0.22
	689	B	122	268		268	0.46
	658	B	121.5	488		488	0.25
	753	B	121.5	420		420	0.29
	353	B	121.5	426		426	0.29
	Final Average Bioconcentration Factor						**0.30**
Vanadium	0.33	B	0.015	20.2	B	0.145	0.103
	0.04	B	0.015	18	B	0.135	0.1111
	0.17	B	0.015	36.5	B	0.16	0.0938
	0.15	B	0.015	20.5	B	0.13	0.1154
	ND 0.03		0.015	24.8	B	0.16	0.0938
	Final Average Bioconcentration Factor						**0.1035**
Zinc	28.5	B	0.225	56.8		56.8	0.0040
	33.9	B	0.225	47.2		47.2	0.0048
	31	B	0.225	94.8		94.8	0.0024
	35	B	0.225	77.6		77.6	0.0029
	24.5	B	0.225	77.2		77.2	0.0029
	Final Average Bioconcentration Factor						**0.0034**

Table F-10

Calculation of Bioconcentration Factors for Bioaccumulation of Metal Constituents in Aquatic Worm Tissue
Reasonable Maximum Exposure
West Area
PBOW Sandusky, Ohio

Constituent	Analytical Result for Aquatic Worm Tissue (mg/kg)		Aquatic Worm Tissue Concentration Utilized	Analytical Result for Sediment (mg/kg)	Sediment Concentration Utilized	Calculated Aquatic Worm Bioconcentration Factor
Aluminum	70.1		70.1	9150	9150	0.0077
	25.5		25.5	8690	8690	0.0029
	17.6	J	17.6	17600	17600	0.0010
	47.8		47.8	10600	10600	0.0045
	17.1	J	17.1	12300	12300	0.0014
	Final Average Bioconcentration Factor					**0.0035**
Antimony	ND 0.25		NA	ND 0.76	NA	NA
	ND 0.25		NA	ND 0.70	NA	NA
	ND 0.25		NA	ND 0.85	NA	NA
	ND 0.25		NA	ND 0.69	NA	NA
	ND 0.25		NA	ND 0.84	NA	NA
	Final Average Bioconcentration Factor					**NA**
Arsenic	2	B	1	5.1	5.1	0.20
	1.5	B	0.75	3.6	3.6	0.21
	2	B	1	7.7	7.7	0.13
	2.9	B	1.45	4.3	4.3	0.34
	2.1	B	1.05	4.9	4.9	0.21
	Final Average Bioconcentration Factor					**0.22**
Barium	58.9	B	29.45	83.9	83.9	0.35
	65.8	B	32.9	46	46	0.72
	69.1	B	34.55	126	126	0.27
	72.8	B	36.4	94.4	94.4	0.39
	50	B	25	102	102	0.25
	Final Average Bioconcentration Factor					**0.39**
Cadmium	0.05	B	NA	NA	NA	NA
	0.04	B	NA	NA	NA	NA
	0.06	B	NA	NA	NA	NA
	0.05	B	NA	NA	NA	NA
	ND 0.04		NA	NA	NA	NA
	Final Average Bioconcentration Factor					**NA**
Calcium	236	B	118	3220	3220	0.037
	170	B	85	2710	2710	0.031
	182	B	91	2890	2890	0.031
	205	B	102.5	2880	2880	0.036
	215	B	107.5	3570	3570	0.030
	Final Average Bioconcentration Factor					**0.033**

Table F-10

Calculation of Bioconcentration Factors for Bioaccumulation of Metal Constituents in Aquatic Worm Tissue
Reasonable Maximum Exposure
West Area
PBOW Sandusky, Ohio

Constituent	Analytical Result for Aquatic Worm Tissue (mg/kg)		Aquatic Worm Tissue Concentration Utilized	Analytical Result for Sediment (mg/kg)		Sediment Concentration Utilized	Calculated Aquatic Worm Bioconcentration Factor
Chromium	0.33	B	0.165	12.9		12.9	0.013
	0.27	B	0.135	11.7		11.7	0.012
	0.28	B	0.14	22.3		22.3	0.006
	0.26	B	0.13	13.9		13.9	0.009
	0.13	B	0.065	16.5		16.5	0.004
	Final Average Bioconcentration Factor						**0.009**
Cobalt	0.28	B	0.14	8.9		8.9	0.016
	0.21	B	0.105	6.4		6.4	0.016
	0.18	B	0.09	11.3		11.3	0.008
	0.31	B	0.155	13.1		13.1	0.012
	0.38	B	0.19	15.2		15.2	0.013
	Final Average Bioconcentration Factor						**0.013**
Copper	3	B	1.5	12.5		12.5	0.12
	4.5	B	2.25	9.2		9.2	0.24
	2.9	B	1.45	18.3		18.3	0.08
	3.2	B	1.6	15.5		15.5	0.10
	3.7	B	1.85	17.6		17.6	0.11
	Final Average Bioconcentration Factor						**0.13**
Iron	824	B	412	18000		18000	0.023
	445	B	222.5	14100		14100	0.016
	534	B	267	29300		29300	0.009
	694	B	347	17600		17600	0.020
	346	B	173	20900		20900	0.008
	Final Average Bioconcentration Factor						**0.015**
Lead	0.88	J	0.88	25	J	25	0.035
	0.31	J	0.31	14.1	J	14.1	0.022
	0.56	J	0.56	23.4	J	23.4	0.024
	0.43	J	0.43	14.7	J	14.7	0.029
	0.25	J	0.25	19.8	J	19.8	0.013
	Final Average Bioconcentration Factor						**0.025**
Magnesium	214	B	107	2630		2630	0.041
	168	B	84	2390		2390	0.035
	171	B	85.5	3880		3880	0.022
	189	B	94.5	2900		2900	0.033
	149	B	74.5	3460		3460	0.022
	Final Average Bioconcentration Factor						**0.030**
Manganese	5.4	B	2.7	301		301	0.009
	2.4	B	1.2	142		142	0.008
	3.3	B	1.65	371		371	0.004
	4	B	2	321		321	0.006
	2.3	B	1.15	347		347	0.003
	Final Average Bioconcentration Factor						**0.006**

Table F-10

Calculation of Bioconcentration Factors for Bioaccumulation of Metal Constituents in Aquatic Worm Tissue
Reasonable Maximum Exposure
West Area
PBOW Sandusky, Ohio

Constituent	Analytical Result for Aquatic Worm Tissue (mg/kg)		Aquatic Worm Tissue Concentration Utilized	Analytical Result for Sediment (mg/kg)		Sediment Concentration Utilized	Calculated Aquatic Worm Bioconcentration Factor
Nickel	0.37	J	0.37	16.7	J	16.7	0.022
	0.45	J	0.45	12.3	J	12.3	0.037
	0.27	J	0.27	29	J	29	0.009
	0.27	J	0.27	23.6	J	23.6	0.011
	0.29	J	0.29	23.6	J	23.6	0.012
	Final Average Bioconcentration Factor						**0.018**
Potassium	1170	B	585	1070	B	6.35	92.13
	1300	B	650	937	B	5.8	112.07
	1230	B	615	2420	J	2420	0.25
	1350	B	675	1490	B	5.7	118.42
	821	B	410.5	1880	J	1880	0.22
	Final Average Bioconcentration Factor						**64.62**
Sodium	624	B	312	549		549	0.57
	689	B	344.5	268		268	1.29
	658	B	329	488		488	0.67
	753	B	376.5	420		420	0.90
	353	B	176.5	426		426	0.41
	Final Average Bioconcentration Factor						**0.77**
Vanadium	0.33	B	0.165	20.2	B	0.145	1.138
	0.04	B	0.02	18	B	0.135	0.1481
	0.17	B	0.085	36.5	B	0.16	0.5313
	0.15	B	0.075	20.5	B	0.13	0.5769
	ND 0.03		0.015	24.8	B	0.16	0.0938
	Final Average Bioconcentration Factor						**0.4976**
Zinc	28.5	B	14.25	56.8		56.8	0.25
	33.9	B	16.95	47.2		47.2	0.36
	31	B	15.5	94.8		94.8	0.16
	35	B	17.5	77.6		77.6	0.23
	24.5	B	12.25	77.2		77.2	0.16
	Final Average Bioconcentration Factor						**0.23**

Table F- 11

Calculation of Bioconcentration Factors for Bioaccumulation of Metal Constituents in Fish Tissue
Central Tendency
West Area
PBOW Sandusky, Ohio

Constituent	Analytical Result for Fish Tissue (mg/kg)		Fish Tissue Concentration Utilized (ppm)	Analytical Result for Surface Water (ppm)	Surface Water Concentration Utilized (ppm)	Calculated Fish Bioconcentration Factor (ppm)
Aluminum	106	J	106	0.286	0.286	30
	25	J	25	0.888	0.888	7.1
	11.8	J	11.8	0.313	0.313	3.4
	61.9	J	61.9	13.5	13.5	17.6
				2.61	2.61	
	Average Surface Water Concentration				**3.52**	
	Final Average Bioconcentration Factor					**15**
Antimony	0.09	B	0.035	ND 0.0055	0.00275	12.7
	0.09	B	0.035	ND 0.0055	0.00275	12.7
	0.1	B	0.035	ND 0.0055	0.00275	12.7
	0.14	B	0.035	ND 0.0055	0.00275	12.7
				ND 0.0055	0.00275	
	Average Surface Water Concentration				**0.0028**	
	Final Average Bioconcentration Factor					**13**
Arsenic	ND 0.53		0.265	0.0096	0.0096	39.8
	ND 0.53		0.265	0.0072	0.0072	39.8
	ND 0.53		0.265	0.0072	0.0072	39.8
	ND 0.53		0.265	0.0071	0.0071	39.8
				ND 0.0044	0.0022	
	Average Surface Water Concentration				**0.0067**	
	Final Average Bioconcentration Factor					**40**
Barium	10.1	J	10.1	0.0183	0.0183	203
	1.2	J	1.2	0.022	0.022	24.1
	ND 0.59		0.295	0.0204	0.0204	5.9
	5.7	J	5.7	0.131	0.131	115
				0.0571	0.0571	
	Average Surface Water Concentration				**0.050**	
	Final Average Bioconcentration Factor					**87**
Calcium	9160		9160	15.4	15.4	323
	12200		12200	18.8	18.8	431
	5900		5900	16	16	208
	6980		6980	21.8	21.8	246
				69.6	69.6	
	Average Surface Water Concentration				**28.3**	
	Final Average Bioconcentration Factor					**302**

Table F- 11

Calculation of Bioconcentration Factors for Bioaccumulation of Metal Constituents in Fish Tissue
Central Tendency
West Area
PBOW Sandusky, Ohio

Constituent	Analytical Result for Fish Tissue (mg/kg)	Fish Tissue Concentration Utilized (ppm)	Analytical Result for Surface Water (ppm)	Surface Water Concentration Utilized (ppm)	Calculated Fish Bioconcentration Factor (ppm)
Chromium	0.21 J	0.21	ND 0.0008	0.0004	49
	0.12 J	0.12	0.0025 B	0.0004	28
	ND 0.1	0.05	0.0012 B	0.0004	12
	0.11 J	0.11	0.0198	0.0198	25.7
			0.0033 B	0.0004	
	Average Surface Water Concentration			**0.0043**	
	Final Average Bioconcentration Factor				**29**
Cobalt	ND 0.38	NA	ND .0011	0.00055	NA
	ND 0.38	0.19	0.0016	0.0016	40
	ND 0.38	NA	ND 0.0011	0.00055	NA
	ND 0.38	0.19	0.0187	0.0187	40.4
			0.0021	0.0021	
	Average Surface Water Concentration			**0.0047**	
	Final Average Bioconcentration Factor				**40**
Copper	2	2	0.003	0.003	286
	ND 0.42	0.21	0.0029	0.0029	30.0
	ND 0.42	0.21	0.0014	0.0014	30
	0.44 J	0.44	0.0205	0.0205	62.9
			0.0072	0.0072	
	Average Surface Water Concentration			**0.007**	
	Final Average Bioconcentration Factor				**102**
Iron	234 J	234	0.331	0.331	38
	37.6 J	37.6	1.06	1.06	6.1
	20.8 J	20.8	0.284	0.284	3.4
	144 J	144	26	26	23.5
			2.98	2.98	
	Average Surface Water Concentration			**6.13**	
	Final Average Bioconcentration Factor				**18**
Lead	0.52 B	0.11	ND 0.0026	0.0013	23.4
	ND 0.22	NA	ND 0.0026	0.0013	NA
	0.29 B	0.11	ND 0.0026	0.0013	23.4
	0.39 B	0.11	0.0168	0.0168	23.4
			0.0028	0.0028	
	Average Surface Water Concentration			**0.0047**	
	Final Average Bioconcentration Factor				**23**

Table F- 11

Calculation of Bioconcentration Factors for Bioaccumulation of Metal Constituents in Fish Tissue
Central Tendency
West Area
PBOW Sandusky, Ohio

Constituent	Analytical Result for Fish Tissue (mg/kg)	Fish Tissue Concentration Utilized (ppm)	Analytical Result for Surface Water (ppm)	Surface Water Concentration Utilized (ppm)	Calculated Fish Bioconcentration Factor (ppm)
Magnesium	456	456	29.7	29.7	17.3
	411	411	43.6	43.6	15.587
	277	277	34	34	10.505
	377	377	9.04	9.04	14.3
			15.5	15.5	
	Average Surface Water Concentration			**26.4**	
	Final Average Bioconcentration Factor				**14**
Manganese	14.7	14.7	0.0913	0.0913	21
	6	6	0.265	0.265	8.4
	4 J	4	0.13	0.13	5.6
	11	11	2.96	2.96	15.49
			0.104	0.104	
	Average Surface Water Concentration			**0.71**	
	Final Average Bioconcentration Factor				**13**
Nickel	ND 0.29	0.145	0.0021	0.0021	14.8
	ND 0.29	0.145	0.0032	0.0032	14.8
	ND 0.29	0.145	0.0021	0.0021	14.8
	ND 0.29	0.145	0.0327	0.0327	14.80
			0.0089	0.0089	
	Average Surface Water Concentration			**0.0098**	
	Final Average Bioconcentration Factor				**15**
Potassium	2460	2460	0.878 B	0.0456	622
	2800	2800	1.81	1.81	708
	2600	2600	0.726 B	0.0456	658
	2380	2380	12.8	12.8	602
			5.06	5.06	
	Average Surface Water Concentration			**3.95**	
	Final Average Bioconcentration Factor				**648**
Sodium	749 J	749	56	56	16.7
	1030	1030	63.2	63.2	22.9
	1020	1020	58.4	58.4	22.7
	681 J	681	27.1	27.1	15.1
			20.1	20.1	
	Average Surface Water Concentration			**45.0**	
	Final Average Bioconcentration Factor				**19**
Vanadium	0.44 J	0.44	0.0075 B	0.00105	419
	ND 0.28	0.14	0.0097 B	0.00105	133
	ND 0.28	0.14	0.0079 B	0.00105	133
	ND 0.28	0.14	0.0327 B	0.00105	133
			0.0076 B	0.00105	
	Average Surface Water Concentration			**0.0011**	
	Final Average Bioconcentration Factor				**205**

Table F- 11

Calculation of Bioconcentration Factors for Bioaccumulation of Metal Constituents in Fish Tissue
Central Tendency
West Area
PBOW Sandusky, Ohio

Constituent	Analytical Result for Fish Tissue (mg/kg)	Fish Tissue Concentration Utilized (ppm)	Analytical Result for Surface Water (ppm)	Surface Water Concentration Utilized (ppm)	Calculated Fish Bioconcentration Factor (ppm)
Zinc	46.9	46.9	0.014	0.014	1056
	13.1 J	13.1	0.0113	0.0113	295
	21.3 J	21.3	0.0319	0.0319	480
	36.3	36.3	0.145	0.145	817
			0.0199	0.0199	
	Average Surface Water Concentration			**0.044**	
	Final Average Bioconcentration Factor				**662**

Table F- 12

Calculation of Bioconcentration Factors for Bioaccumulation of Metal Constituents in Fish Tissue
Reasonable Maximum Exposure
West Area
PBOW Sandusky, Ohio

Constituent	Analytical Result for Fish Tissue (mg/kg)		Fish Tissue Concentration Utilized (ppm)	Analytical Result for Surface Water (ppm)	Surface Water Concentration Utilized (ppm)	Calculated Fish Bioconcentration Factor (ppm)
Aluminum	106	J	106	0.286	0.286	30
	25	J	25	0.888	0.888	7.1
	11.8	J	11.8	0.313	0.313	3.4
	61.9	J	61.9	13.5	13.5	17.59
				2.61	2.61	
	Average Surface Water Concentration				**3.52**	
	Final Average Bioconcentration Factor					**15**
Antimony	0.09	B	0.045	ND 0.0055	0.00275	16.4
	0.09	B	0.045	ND 0.0055	0.00275	16.4
	0.1	B	0.05	ND 0.0055	0.00275	18.2
	0.14	B	0.07	ND 0.0055	0.00275	25.5
				ND 0.0055	0.00275	
	Average Surface Water Concentration				**0.0028**	
	Final Average Bioconcentration Factor					**18**
Arsenic	ND 0.53		0.265	0.0096	0.0096	39.9
	ND 0.53		0.265	0.0072	0.0072	39.9
	ND 0.53		0.265	0.0071	0.0071	39.9
	ND 0.53		0.265	0.0071	0.0071	39.9
				ND 0.0044	0.0022	
	Average Surface Water Concentration				**0.0066**	
	Final Average Bioconcentration Factor					**40**
Barium	10.1	J	10.1	0.0183	0.0183	203
	1.2	J	1.2	0.022	0.022	24.1
	ND 0.59		0.295	0.0204	0.0204	5.9
	5.7	J	5.7	0.131	0.131	114.5
				0.0571	0.0571	
	Average Surface Water Concentration				**0.050**	
	Final Average Bioconcentration Factor					**87**
Calcium	9160		9160	15.4	15.4	323
	12200		12200	18.8	18.8	431
	5900		5900	16	16	208
	6980		6980	21.8	21.8	246
				69.6	69.6	
	Average Surface Water Concentration				**28.3**	
	Final Average Bioconcentration Factor					**302**

Table F- 12

Calculation of Bioconcentration Factors for Bioaccumulation of Metal Constituents in Fish Tissue
Reasonable Maximum Exposure
West Area
PBOW Sandusky, Ohio

Constituent	Analytical Result for Fish Tissue (mg/kg)	Fish Tissue Concentration Utilized (ppm)	Analytical Result for Surface Water (ppm)	Surface Water Concentration Utilized (ppm)	Calculated Fish Bioconcentration Factor (ppm)
Chromium	0.21 J	0.21	ND 0.0008	0.0004	49
	0.12 J	0.12	0.0025 B	0.0004	28.0
	ND 0.1	0.05	0.0012 B	0.0004	11.7
	0.11 J	0.11	0.0198	0.0198	25.70
			0.0033 B	0.0004	
	Average Surface Water Concentration			**0.0043**	
			Final Average Bioconcentration Factor		**29**
Cobalt	ND 0.38	NA	ND .0011	0.00055	NA
	ND 0.38	0.19	0.0016	0.0016	40
	ND 0.38	NA	ND 0.0011	0.00055	NA
	ND 0.38	0.19	0.0187	0.0187	40.4
			0.0021	0.0021	
	Average Surface Water Concentration			**0.0047**	
			Final Average Bioconcentration Factor		**40**
Copper	2	2	0.003	0.003	286
	ND 0.42	0.21	0.0029	0.0029	30.0
	ND 0.42	0.21	0.0014	0.0014	30
	0.44 J	0.44	0.0205	0.0205	62.9
			0.0072	0.0072	
	Average Surface Water Concentration			**0.007**	
			Final Average Bioconcentration Factor		**102**
Iron	234 J	234	0.331	0.331	38
	37.6 J	37.6	1.06	1.06	6.1
	20.8 J	20.8	0.284	0.284	3.4
	144 J	144	26	26	23.49
			2.98	2.98	
	Average Surface Water Concentration			**6.13**	
			Final Average Bioconcentration Factor		**18**
Lead	0.52 B	0.26	ND 0.0026	0.0013	55
	ND 0.22	NA	ND 0.0026	0.0013	NA
	0.29 B	0.145	ND 0.0026	0.0013	31
	0.39 B	0.195	0.0168	0.0168	41.5
			0.0028	0.0028	
	Average Surface Water Concentration			**0.0047**	
			Final Average Bioconcentration Factor		**43**

Table F- 12

Calculation of Bioconcentration Factors for Bioaccumulation of Metal Constituents in Fish Tissue
Reasonable Maximum Exposure
West Area
PBOW Sandusky, Ohio

Constituent	Analytical Result for Fish Tissue (mg/kg)	Fish Tissue Concentration Utilized (ppm)	Analytical Result for Surface Water (ppm)	Surface Water Concentration Utilized (ppm)	Calculated Fish Bioconcentration Factor (ppm)
Magnesium	456	456	29.7	29.7	17.3
	411	411	43.6	43.6	15.59
	277	277	34	34	10.51
	377	377	9.04	9.04	14.3
			15.5	15.5	
	Average Surface Water Concentration			**26.4**	
	Final Average Bioconcentration Factor				**14**
Manganese	14.7	14.7	0.0913	0.0913	21
	6	6	0.265	0.265	8.4
	4 J	4	0.13	0.13	5.6
	11	11	2.96	2.96	15.49
			0.104	0.104	
	Average Surface Water Concentration			**0.71**	
	Final Average Bioconcentration Factor				**13**
Nickel	ND 0.29	0.145	0.0021	0.0021	14.8
	ND 0.29	0.145	0.0032	0.0032	14.8
	ND 0.29	0.145	0.0021	0.0021	14.8
	ND 0.29	0.145	0.0327	0.0327	14.80
			0.0089	0.0089	
	Average Surface Water Concentration			**0.0098**	
	Final Average Bioconcentration Factor				**15**
Potassium	2460	2460	0.878 B	0.0456	622
	2800	2800	1.81	1.81	708
	2600	2600	0.726 B	0.0456	658
	2380	2380	12.8	12.8	602
			5.06	5.06	
	Average Surface Water Concentration			**3.95**	
	Final Average Bioconcentration Factor				**648**
Sodium	749 J	749	56	56	16.7
	1030	1030	63.2	63.2	22.9
	1020	1020	58.4	58.4	22.7
	681 J	681	27.1	27.1	15.1
			20.1	20.1	
	Average Surface Water Concentration			**45.0**	
	Final Average Bioconcentration Factor				**19**
Vanadium	0.44 J	0.44	0.0075 B	0.00105	419.0
	ND 0.28	0.14	0.0097 B	0.00105	133.3
	ND 0.28	0.14	0.0079 B	0.00105	133.3
	ND 0.28	0.14	0.0327 B	0.00105	133.33
			0.0076 B	0.00105	
	Average Surface Water Concentration			**0.0011**	
	Final Average Bioconcentration Factor				**205**
Zinc	46.9	46.9	0.014	0.014	1056
	13.1 J	13.1	0.0113	0.0113	295
	21.3 J	21.3	0.0319	0.0319	480

Table F- 12

Calculation of Bioconcentration Factors for Bioaccumulation of Metal Constituents in Fish Tissue
Reasonable Maximum Exposure
West Area
PBOW Sandusky, Ohio

Constituent	Analytical Result for Fish Tissue (mg/kg)	Fish Tissue Concentration Utilized (ppm)	Analytical Result for Surface Water (ppm)	Surface Water Concentration Utilized (ppm)	Calculated Fish Bioconcentration Factor (ppm)
	36.3	36.3	0.145	0.145	817
			0.0199	0.0199	
	Average Surface Water Concentration			**0.044**	
	Final Average Bioconcentration Factor				**662**

Table F- 13

Calculation of Bioconcentration Factors for Bioaccumulation of Metal Constituents in Fathead Tissue
Central Tendency
Pentolite Road
PBOW Sandusky, Ohio

Constituent	Analytical Result for Fatheads Tissue (mg/kg)		Fatheads Tissue Concentration Utilized (ppm)	Average Analytical Result for Surface Water (ppb)	Average Surface Water Concentration Utilized (ppb)	Calculated Fish Bioconcentration Factor
Aluminum	148	J	148	188.14	188.14	786.65
					Final Average Bioconcentration Factor	**786.65**
Antimony	0.16	B	0.0345	2.75	2.75	12.55
					Final Average Bioconcentration Factor	**12.55**
Arsenic	ND 0.53		0.265	2.2	2.2	120.45
					Final Average Bioconcentration Factor	**120.45**
Barium	5.9	J	5.9	83.26	83.26	70.86
					Final Average Bioconcentration Factor	**70.86**
Calcium	8310		8310	114600	114600	72.51
					Final Average Bioconcentration Factor	**72.51**
Chromium	0.72	J	0.72	1.12	1.12	642.86
					Final Average Bioconcentration Factor	**642.86**
Cobalt	ND 0.38		0.19	0.55	0.55	345.45
					Final Average Bioconcentration Factor	**345.45**
Copper	0.43	J	0.43	2.69	2.69	159.85
					Final Average Bioconcentration Factor	**159.85**
Iron	422	J	422	536.8	536.8	786.14
					Final Average Bioconcentration Factor	**786.14**
Lead	0.36	B	0.11	1.3	1.3	84.62
					Final Average Bioconcentration Factor	**84.62**
Magnesium	541		541	26460	26460	20.45
					Final Average Bioconcentration Factor	**20.45**
Manganese	16.3		16.3	121.2	121.2	134.49
					Final Average Bioconcentration Factor	**134.49**
Nickel	0.58	J	0.58	0.8	0.8	725.00
					Final Average Bioconcentration Factor	**725.00**
Phosphorous	124	J	124	74.6	74.6	1662.20
					Final Average Bioconcentration Factor	**1662.20**
Potassium	2440		2440	2072	2072	1177.61
					Final Average Bioconcentration Factor	**1177.61**
Sodium	727	J	727	9638	9638	75.43
					Final Average Bioconcentration Factor	**75.43**
Vanadium	0.58	J	0.58	1.05	1.05	552.38
					Final Average Bioconcentration Factor	**552.38**
Zinc	27.3		27.3	13.66	13.66	1998.54
					Final Average Bioconcentration Factor	**1998.54**

Table F- 14

Calculation of Bioconcentration Factors for Bioaccumulation of Metal Constituents in Fathead Fish Tissue
Reasonable Maximum Exposure
Pentolite Road
PBOW Sandusky, Ohio

Constituent	Analytical Result for Fatheads Tissue (mg/kg)		Fatheads Tissue Concentration Utilized (ppm)	Average Analytical Result for Surface Water (ppb)	Average Surface Water Concentration Utilized (ppb)	Calculated Fish Bioconcentration Factor
Aluminum	148	J	148	188.14	188.14	786.65
	Final Average Bioconcentration Factor					**786.65**
Antimony	0.16	B	0.08	2.75	2.75	29.09
	Final Average Bioconcentration Factor					**29.09**
Arsenic	ND 0.53		0.265	2.2	2.2	120.45
	Final Average Bioconcentration Factor					**120.45**
Barium	5.9	J	5.9	83.26	83.26	70.86
	Final Average Bioconcentration Factor					**70.86**
Calcium	8310		8310	114600	114600	72.51
	Final Average Bioconcentration Factor					**72.51**
Chromium	0.72	J	0.72	1.12	1.12	642.86
	Final Average Bioconcentration Factor					**642.86**
Cobalt	ND 0.38		0.19	0.55	0.55	345.45
	Final Average Bioconcentration Factor					**345.45**
Copper	0.43	J	0.43	2.69	2.69	159.85
	Final Average Bioconcentration Factor					**159.85**
Iron	422	J	422	536.8	536.8	786.14
	Final Average Bioconcentration Factor					**786.14**
Lead	0.36	B	0.18	1.3	1.3	138.46
	Final Average Bioconcentration Factor					**138.46**
Magnesium	541		541	26460	26460	20.45
	Final Average Bioconcentration Factor					**20.45**
Manganese	16.3		16.3	121.2	121.2	134.49
	Final Average Bioconcentration Factor					**134.49**
Nickel	0.58	J	0.58	0.8	0.8	725.00
	Final Average Bioconcentration Factor					**725.00**
Phosphorous	124	J	124	74.6	74.6	1662.20
	Final Average Bioconcentration Factor					**1662.20**
Potassium	2440		2440	2072	2072	1177.61
	Final Average Bioconcentration Factor					**1177.61**
Sodium	727	J	727	9638	9638	75.43
	Final Average Bioconcentration Factor					**75.43**
Vanadium	0.58	J	0.58	1.05	1.05	552.38
	Final Average Bioconcentration Factor					**552.38**
Zinc	27.3		27.3	13.66	13.66	1998.54
	Final Average Bioconcentration Factor					**1998.54**

Table F- 15

Calculation of Bioconcentration Factors for Bioaccumulation of Metal Constituents in Tadpole Tissue
Central Tendency
Pentolite Road
PBOW Sandusky, Ohio

Constituent	Analytical Result for Tadpoles Tissue (mg/kg)		Tadpoles Tissue Concentration Utilized (ppm)	Average Analytical Result for Surface Water (ppb)	Average Surface Water Concentration Utilized (ppb)	Calculated Fish Bioconcentration Factor
Aluminum	541	J	541	188.14	188.14	2875.52
					Final Average Bioconcentration Factor	**2875.52**
Antimony	0.13	B	0.035	2.75	2.75	12.73
					Final Average Bioconcentration Factor	**12.73**
Arsenic	1.5	J	1.5	2.2	2.2	681.82
					Final Average Bioconcentration Factor	**681.82**
Barium	24		24	83.26	83.26	288.25
					Final Average Bioconcentration Factor	**288.25**
Calcium	9670		9670	114600	114600	84.38
					Final Average Bioconcentration Factor	**84.38**
Chromium	1.2		1.2	1.12	1.12	1071.43
					Final Average Bioconcentration Factor	**1071.43**
Cobalt	1	B	0.19	0.55	0.55	345.45
					Final Average Bioconcentration Factor	**345.45**
Copper	1.7		1.7	2.69	2.69	631.97
					Final Average Bioconcentration Factor	**631.97**
Iron	2900	J	2900	536.8	536.8	5402.38
					Final Average Bioconcentration Factor	**5402.38**
Lead	1.4	B	0.11	1.3	1.3	84.62
					Final Average Bioconcentration Factor	**84.62**
Magnesium	1360		1360	26460	26460	51.40
					Final Average Bioconcentration Factor	**51.40**
Manganese	68.8		68.8	121.2	121.2	567.66
					Final Average Bioconcentration Factor	**567.66**
Nickel	2.2		2.2	0.8	0.8	2750.00
					Final Average Bioconcentration Factor	**2750.00**
Phosphorous	162	J	162	74.6	74.6	2171.58
					Final Average Bioconcentration Factor	**2171.58**
Potassium	1840		1840	2072	2072	888.03
					Final Average Bioconcentration Factor	**888.03**
Sodium	1140		1140	9638	9638	118.28
					Final Average Bioconcentration Factor	**118.28**
Vanadium	1.2	J	1.2	1.05	1.05	1142.86
					Final Average Bioconcentration Factor	**1142.86**
Zinc	26		26	13.66	13.66	1903.37
					Final Average Bioconcentration Factor	**1903.37**

Table F- 16

Calculation of Bioconcentration Factors for Bioaccumulation of Metal Constituents in Tadpole Tissue
Reasonable Maximum Exposure
Pentolite Road
PBOW Sandusky, Ohio

Constituent	Analytical Result for Tadpoles Tissue (mg/kg)		Tadpoles Tissue Concentration Utilized (ppm)	Average Analytical Result for Surface Water (ppb)	Average Surface Water Concentration Utilized (ppb)	Calculated Fish Bioconcentration Factor
Aluminum	541	J	541	188.14	188.14	2875.52
					Final Average Bioconcentration Factor	**2875.52**
Antimony	0.13	B	0.065	2.75	2.75	23.64
					Final Average Bioconcentration Factor	**23.64**
Arsenic	1.5	J	1.5	2.2	2.2	681.82
					Final Average Bioconcentration Factor	**681.82**
Barium	24		24	83.26	83.26	288.25
					Final Average Bioconcentration Factor	**288.25**
Calcium	9670		9670	114600	114600	84.38
					Final Average Bioconcentration Factor	**84.38**
Chromium	1.2		1.2	1.12	1.12	1071.43
					Final Average Bioconcentration Factor	**1071.43**
Cobalt	1	B	0.5	0.55	0.55	909.09
					Final Average Bioconcentration Factor	**909.09**
Copper	1.7		1.7	2.69	2.69	631.97
					Final Average Bioconcentration Factor	**631.97**
Iron	2900	J	2900	536.8	536.8	5402.38
					Final Average Bioconcentration Factor	**5402.38**
Lead	1.4	B	0.7	1.3	1.3	538.46
					Final Average Bioconcentration Factor	**538.46**
Magnesium	1360		1360	26460	26460	51.40
					Final Average Bioconcentration Factor	**51.40**
Manganese	68.8		68.8	121.2	121.2	567.66
					Final Average Bioconcentration Factor	**567.66**
Nickel	2.2		2.2	0.8	0.8	2750.00
					Final Average Bioconcentration Factor	**2750.00**
Phosphorous	162	J	162	74.6	74.6	2171.58
					Final Average Bioconcentration Factor	**2171.58**
Potassium	1840		1840	2072	2072	888.03
					Final Average Bioconcentration Factor	**888.03**
Sodium	1140		1140	9638	9638	118.28
					Final Average Bioconcentration Factor	**118.28**
Vanadium	1.2	J	1.2	1.05	1.05	1142.86
					Final Average Bioconcentration Factor	**1142.86**
Zinc	26		26	13.66	13.66	1903.37
					Final Average Bioconcentration Factor	**1903.37**

Table F- 17

Calculation of Bioconcentration Factors for Bioaccumulation of Metal Constituents in Crayfish Tissue
Central Tendency
Pentolite Road
PBOW Sandusky, Ohio

Constituent	Analytical Result for Crayfish Tissue (mg/kg)	Crayfish Tissue Concentration Utilized (ppm)	Average Analytical Result for Surface Water (ppb)	Average Surface Water Concentration Utilized (ppb)	Calculated Fish Bioconcentration Factor
Aluminum	183 J	183	188.14	188.14	972.68
				Final Average Bioconcentration Factor	**972.68**
Antimony	0.08 B	0.035	2.75	2.75	12.73
				Final Average Bioconcentration Factor	**12.73**
Arsenic	ND 0.53	0.265	2.2	2.2	120.45
				Final Average Bioconcentration Factor	**120.45**
Barium	21.3	21.3	83.26	83.26	255.83
				Final Average Bioconcentration Factor	**255.83**
Calcium	23200	23200	114600	114600	202.44
				Final Average Bioconcentration Factor	**202.44**
Chromium	0.56 J	0.56	1.12	1.12	500.00
				Final Average Bioconcentration Factor	**500.00**
Cobalt	ND 0.38	0.19	0.55	0.55	345.45
				Final Average Bioconcentration Factor	**345.45**
Copper	16.6	16.6	2.69	2.69	6171.00
				Final Average Bioconcentration Factor	**6171.00**
Iron	696 J	696	536.8	536.8	1296.57
				Final Average Bioconcentration Factor	**1296.57**
Lead	0.55 B	0.11	1.3	1.3	84.62
				Final Average Bioconcentration Factor	**84.62**
Magnesium	642	642	26460	26460	24.26
				Final Average Bioconcentration Factor	**24.26**
Manganese	89.7	89.7	121.2	121.2	740.10
				Final Average Bioconcentration Factor	**740.10**
Nickel	0.66 J	0.66	0.8	0.8	825.00
				Final Average Bioconcentration Factor	**825.00**
Phosphorous	173 J	173	74.6	74.6	2319.03
				Final Average Bioconcentration Factor	**2319.03**
Potassium	2120	2120	2072	2072	1023.17
				Final Average Bioconcentration Factor	**1023.17**
Sodium	1620	1620	9638	9638	168.08
				Final Average Bioconcentration Factor	**168.08**
Vanadium	0.38 J	0.38	1.05	1.05	361.90
				Final Average Bioconcentration Factor	**361.90**
Zinc	19.3 J	19.3	13.66	13.66	1412.88
				Final Average Bioconcentration Factor	**1412.88**

Table F-18

Calculation of Bioconcentration Factors for Bioaccumulation of Metal Constituents in Crayfish Tissue
Reasonable Maximum Exposure
Pentolite Road
PBOW Sandusky, Ohio

Constituent	Analytical Result for Crayfish Tissue (mg/kg)		Crayfish Tissue Concentration Utilized (ppm)	Average Analytical Result for Surface Water (ppb)	Average Surface Water Concentration Utilized (ppb)	Calculated Fish Bioconcentration Factor
Aluminum	183	J	183	188.14	188.14	972.68
					Final Average Bioconcentration Factor	**972.68**
Antimony	0.08	B	0.04	2.75	2.75	14.55
					Final Average Bioconcentration Factor	**14.55**
Arsenic	ND 0.53		0.265	2.2	2.2	120.45
					Final Average Bioconcentration Factor	**120.45**
Barium	21.3		21.3	83.26	83.26	255.83
					Final Average Bioconcentration Factor	**255.83**
Calcium	23200		23200	114600	114600	202.44
					Final Average Bioconcentration Factor	**202.44**
Chromium	0.56	J	0.56	1.12	1.12	500.00
					Final Average Bioconcentration Factor	**500.00**
Cobalt	ND 0.38		0.19	0.55	0.55	345.45
					Final Average Bioconcentration Factor	**345.45**
Copper	16.6		16.6	2.69	2.69	6171.00
					Final Average Bioconcentration Factor	**6171.00**
Iron	696	J	696	536.8	536.8	1296.57
					Final Average Bioconcentration Factor	**1296.57**
Lead	0.55	B	0.275	1.3	1.3	211.54
					Final Average Bioconcentration Factor	**211.54**
Magnesium	642		642	26460	26460	24.26
					Final Average Bioconcentration Factor	**24.26**
Manganese	89.7		89.7	121.2	121.2	740.10
					Final Average Bioconcentration Factor	**740.10**
Nickel	0.66	J	0.66	0.8	0.8	825.00
					Final Average Bioconcentration Factor	**825.00**
Phosphorous	173	J	173	74.6	74.6	2319.03
					Final Average Bioconcentration Factor	**2319.03**
Potassium	2120		2120	2072	2072	1023.17
					Final Average Bioconcentration Factor	**1023.17**
Sodium	1620		1620	9638	9638	168.08
					Final Average Bioconcentration Factor	**168.08**
Vanadium	0.38	J	0.38	1.05	1.05	361.90
					Final Average Bioconcentration Factor	**361.90**
Zinc	19.3	J	19.3	13.66	13.66	1412.88
					Final Average Bioconcentration Factor	**1412.88**

APPENDIX G

APPLICATION OF ESSENTIAL NUTRIENTS IN ECOLOGICAL RISK ASSESSMENT

G.1.0 Introduction

All forms of living matter require inorganic elements, or minerals, for their normal life processes. All animal tissues and feeds contain inorganic or mineral elements in widely varying amounts and proportions. Minerals that are needed in relatively large amounts are referred to as major or macrominerals; those that are needed in very small amounts are referred to as trace minerals or microminerals. These terms represent quantity designations of the amounts required in an animal's diet and their generally low or trace concentrations in tissues. The major minerals are required in concentrations of greater than 100 parts per million (ppm) and are often reported as a percentage of diet, while trace elements are required at less than 100 ppm and are sometimes reported at the ppb level. Table G-1 presents twenty-four elements known to be required by at least some animal species (McDowell, 1992).

Table G-1
General Macro and Microminerals

Major or Macrominerals	Trace or Microminerals		
Calcium (Ca)	Arsenic (As)*	Iodine (I)	Nickel (Ni)*
Chlorine (Cl)	Boron (B)*	Iron (Fe)	Selenium (Se)
Magnesium (Mg)	Chromium (Cr)	Lead (Pb)*	Silicon (Si)*
Phosphorus (P)	Cobalt (Co)	Lithium (Li)*	Tin (Sn)*
Potassium (K)	Copper (Cu)	Manganese (Mn)	Vanadium (V)*
Sodium (Na)	Fluorine (F)	Molybdenum (Mo)	Zinc (Zn)
Sulfur (S)			

* These elements have not been shown to be essential for livestock or humans consuming typical diets.

The listing of some of the trace elements as essential (e.g., lead, arsenic, tin, vanadium, lithium, and fluorine) is difficult and sometimes tentative, and rests on experiments with only one or more species. In these experiments, diets adequate in all nutrients except the mineral in question produced clinical signs that were prevented or overcome by adding that mineral to the diets (pages 352, 352, 376, 377, 371, and 336 in McDowell [1992], respectively, for Pb, As, Sn, V, Li, and F).

Unlike other nutrients mineral elements cannot be synthesized by living organisms. Minerals act as (1) structural components of body organs and tissues, (2) constituents of body fluids and tissues as electrolytes, and (3) catalysts in enzyme and hormone systems. The most obvious function of mineral elements in the body is to provide structural support (skeleton) for the body.

Ca, P, Mg, F, and Si in bones and teeth all contribute to mechanical stability. Birds use Ca to produce egg shells, and P and S are found in muscle proteins. Minerals are interrelated and balanced against each other, and most often cannot be considered as single elements with independent and self-sufficient roles in the organized bodily processes. The definite relationship of Ca and P in the formation of bones and teeth and the interrelationships of Fe, Cu, and Co (in vitamin B_{12}) in hemoglobin synthesis and red blood cell formation are examples. Sodium, K, Ca, P, and Cl serve individually and collectively in the body fluids. A number of trace elements (i.e., Cu, Zn, Fe, and Se) in addition to certain vitamins (i.e., A, D, E, B_6, and folacin) and other nutrients, are strongly related to adequate immune response (McDowell, 1992).

G.2.0 Mineral Requirements

A series of "safe" dietary levels of potentially toxic elements has been established on the extent to which other elements that affect their absorption and retention are present (McDowell, 1992). Table G-2 presents some of these "safe" dietary levels or mineral requirements for selected species.

Table G-2
Mineral Requirements for Selected Species

Species	Mineral (mg/kg of feed)									
	Ca	Mg	K	Na	Cu	Fe	Mn	P	Se	Zn
Japanese Quail	25,000	500	4,000	1,500	6	100	70	5,000	0.2	50
Rat	5,000	400	3,600	500	5	35	50	4,000	0.10	0.25
Mouse	4,000	500	2000	---	4.5	25	44	4,000	---	30
Cat	8,000	400	4,000	500	5	80	5	6,000	0.1	50
Mink	6,000	440	3,000	---	6	80	44	5,500	0.1	66

To determine whether concentrations of these minerals in the environment exceed safe dietary levels, the mineral requirements were converted to dietary doses using the following equation:

$$\text{Dose (mg/kg-day)} = \text{Diet (mg/kg)} \times \text{FI (kg/day)} \times 1/\text{BW (kg)}$$

where:

Diet (mg/kg) = Mineral requirement for each nutrient;
FI (kg/day) = Food ingestion rate; and
BW (kg/day) = Body weight.

Variables for the species are shown in Table G-3.

Table G-3
Food Ingestion and Body Weights

Species	Food Ingestion (FI) (kg/day)	Body Weight (Kg)
Japanese Quail	0.017 derived from FI(kg/day) = 0.0582*BW(kg)$^{0.651}$ [b]	0.15[a]
Rat	0.08[a]	0.35[a]
Mouse	0.0055[a]	0.03[a]
Cat	0.24 derived from FI(kg/day)=0.0687*BW(kg)$^{0.822}$ [b]	4.5 derived from 10lbs*0.4535923 conversion factor.[c]
Mink	0.137[a]	1.0[a]

a - ORNL, 1996.
b - USEPA, 1993.
c - IT, 1999.

Table G-4 presents the mineral requirements calculated as dietary doses for selected species presented in Table G-3.

Table G-4
Mineral Requirements as a Dietary Dose for Selected Species

Species	Mineral Dose (mg/kg-day)									
	Ca	Mg	K	Na	Cu	Fe	Mn	P	Se	Zn
Japanese Quail	2,833	56.7	453	170	0.7	11.3	7.9	567	0.02	5.7
Rat	1,143	91.4	823	114	1.1	8	11.4	914	0.02	0.06
Mouse	733	92	367	---	0.8	4.6	8.1	733	---	5.5
Cat	427	21	213	26.7	0.3	4.3	0.3	320	0.01	2.7
Mink	822	60	411	---	0.8	11	6	753	0.01	9

G.3.0 Maximum Tolerance Levels

Information concerning the toxicity or tolerance of minerals is incomplete. According to available information, the toxic level of most major minerals is about 10 times the recommended level for young, growing livestock. The toxic levels of trace minerals appear to be highly variable, ranging between 10 and 1,500 times the recommended level. The National Research Council (NRC) publishes maximum tolerance levels for domestic animals. The maximum tolerance level is defined as that dietary level that, when fed for a limited period, will not impair animal performance and should not produce unsafe residues in human food derived from animals. The levels listed in Table G-5 were derived from toxicity data on the designated species. Tolerance levels vary with the species, adaptation, duration of receiving the toxicants, age, physical condition of the animal, and many other factors (McDowell, 1992).

Table G-5
Maximum Tolerance Levels for Domestic Animals

Species	Maximum Tolerance Levels of Dietary Minerals (ppm)									
	Ca[a]	Mg	K	Na (as NaCl)	Cu	Fe	Mn	P	Se	Zn
Poultry	40,000[b] 12,000[c]	(3,000)	(20,000)	20,000	300	1,000	2,000	8,000	20,000	1,000
Rabbits	20,000	(3,000)	(30,000)	(30,000)	200	(500)	(400)	10,000	(20,000)	(500)

Source: McDowell, 1992.

The levels in parentheses were derived by interspecific species extrapolation.

a - Ratio of calcium to phosphorus is important.
b - Laying hen.
c - Other poultry.

Using the same procedure described in Section 2.0, the maximum tolerance levels are converted into dietary doses to determine whether concentrations of these minerals in the environment exceed safe dietary levels. Variables for the domestic animals are shown in Table G-6.

Table G-6
Food Ingestion and Body Weights for Domestic Animals

Species	Food Ingestion (FI) (kg/day)	Body Weight (Kg)
Poultry	0.08 derived from FI(kg/day) = 0.0582*BW(kg)$^{0.651}$ [a]	1.6 (mean weight of male and female chicken) [b]
Rabbits	0.2 derived from FI(kg/day)=0.0687*BW(kg)$^{0.822}$ [a]	3.8 [b]

a - USEPA, 1993.
b - ORNL, 1996.

Table G-7 presents the calculated dietary doses for selected species presented in Table G-6.

Table G-7
Maximum Tolerance Level as a Dietary Dose for Domestic Animals

Species	Dietary Doses (mg/kg-day)									
	Ca	Mg	K	Na (as NaCl)	Cu	Fe	Mn	P	Se	Zn
Poultry	600	150	1,000	1,000	15	50	100	400	1,000	50
Rabbits	1,053	158	1,579	1,579	11	26	21	526	1,053	26

G.4.0 Data Use

Mineral requirements or maximum tolerance levels will be used in ecological risk assessments, as appropriate.

G.5.0 References

IT, 1999. Best professional judgment for cats (*Felis domesticus*) body weight being 10 lbs.

Oak Ridge National Laboratory (ORNL) 1996. *Toxicological Benchmarks for Wildlife: 1996 Revision*. B.E. Sample, D. M. Opresko, G. W. Suter II. ES/ER/TM-86/R3. June 1996.

U.S. Environmental Protection Agency (USEPA). 1993. *Wildlife Exposure Factors Handbook.* EPA/600/R-93/187a, December.

McDowell, L.R. 1992. *Minerals in Animal and Human Nutrition.* Academic Press, Inc. San Diego.

APPENDIX H

RISK CHARACTERIZATION SPREADSHEETS

Plum Brook Ordnance Works
West Area Red Water Ponds

Chemical Data

Chemical Name	Surface Soil Conc. (mg/kg)	Total Soil Conc. (mg/kg)	Water Conc. (mg/L)	log Kow (organics)	Soil-to-Plant TF	Shallow-rooted Plant Conc. (mg/kgdw)	Deep-rooted Plant Conc. (mg/kgdw)	Soil-to-Invert. BAF	Invert. Conc. (mg/kgdw)	Food-to-Muscle TF
Organics										
1,3-DNB		2.00E-01		1.49E+00	5.33E+00	0.00E+00	1.07E+00	1.00E-01	0.00E+00	6.37E-07
4-Amino-2,6-DNT		1.50E-01		2.00E+00	2.70E+00	0.00E+00	4.06E-01	1.00E-01	0.00E+00	2.14E-06
Anthracene	2.00E-01	1.90E-01		4.45E+00	1.04E-01	2.07E-02	1.97E-02	1.07E+00	2.14E-01	7.28E-04
Benzo(a)anthracene	2.10E-01	2.10E-01		5.61E+00	2.22E-02	4.65E-03	4.65E-03	5.80E-01	1.22E-01	1.15E-02
Benzo(b)fluoranthene	2.00E-01	2.00E-01		6.06E+00	1.22E-02	2.43E-03	2.43E-03	2.10E-01	4.20E-02	3.35E-02
Benzo(g,h,i)perylene	1.90E-01	1.90E-01		6.51E+00	6.69E-03	1.27E-03	1.27E-03	5.00E-01	9.50E-02	9.77E-02
Benzo(k)fluoranthene	2.10E-01	2.00E-01		6.06E+00	1.22E-02	2.56E-03	2.43E-03	4.70E-01	9.87E-02	3.35E-02
Chrysene	2.10E-01	2.10E-01		5.61E+00	2.22E-02	4.65E-03	4.65E-03	5.50E-01	1.16E-01	1.15E-02
Indeno(1,2,3-cd)pyrene	2.00E-01	1.90E-01		6.51E+00	6.69E-03	1.34E-03	1.27E-03	5.60E-01	1.12E-01	9.77E-02
Phenanthrene	2.10E-01	2.10E-01		4.45E+00	1.04E-01	2.18E-02	2.18E-02	1.00E-01	2.10E-02	7.28E-04
Inorganics										
Iron			1.04E+01	---	NA	0.00E+00	0.00E+00	NA	0.00E+00	NA
Lead			2.10E-02	---	NA	0.00E+00	0.00E+00	NA	0.00E+00	NA
Manganese			6.30E-01	---	NA	0.00E+00	0.00E+00	NA	0.00E+00	NA

Plum Brook Ordnance Works
West Area Red Water Ponds

Toxicity Data

Chemical Name	Mammals			Birds		
	LOAEL (mg/kg/d)	Test Species	Body Wt. (kg)	LOAEL (mg/kg/d)	Test Species	Body Wt. (kg)
Organics						
1,3-DNB	1.13E+00	rat	0.35	4.20E+00	red-wing	0.077
4-Amino-2,6-DNT	9.59E+01	rat	0.35	1.78E+01	bobwhite quail	0.19
Anthracene	1.00E+01	mouse	0.03	--	--	--
Benzo(a)anthracene	1.00E+01	mouse	0.03	--	--	--
Benzo(b)fluoranthene	1.00E+01	mouse	0.03	--	--	--
Benzo(g,h,i)perylene	1.00E+01	mouse	0.03	--	--	--
Benzo(k)fluoranthene	1.00E+01	mouse	0.03	--	--	--
Chrysene	1.00E+01	mouse	0.03	--	--	--
Indeno(1,2,3-cd)pyrene	1.00E+01	mouse	0.03	--	--	--
Phenanthrene	1.00E+01	mouse	0.03	--	--	--
Inorganics						
Iron	1.30E+02	rabbit	3.8	2.50E+02	poultry	1.6
Lead	8.00E+01	rat	0.35	3.85E+01	Am. Kestrel	0.13
Manganese	2.84E+02	rat	0.35	9.77E+03	Jap. Quail	0.072

Plum Brook Ordnance Site
West Area Red Water Ponds

Omnivorous Rodent: **Deer mouse *(Peromyscus manicalatus)***

Chemical Name	LOAEL	Uncertainty Factor	Adjusted LOAEL	Foraging Factor (soil)	Foraging Factor (sw)	Soil Intake (mg/kg-d)	Soil Intake Hazard Quotient	Plant Intake (mg/kg-d)	Plant Intake Hazard Quotient	Invert. Intake (mg/kg-d)	Invert. Intake Hazard Quotient	Soil/Plant/Invert. Hazard Quotient	Water Intake (mg/kg-d)	Water Hazard Quotient	Overall Hazard Index	Tissue Conc. mg/kg(dw)
Organics																
1,3-DNB	2.49E+00	1.00E+00	2.49E+00	1.00E+00	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
4-Amino-2,6-DNT	2.11E+02	1.00E+00	2.11E+02	1.00E+00	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Anthracene	1.19E+01	1.00E+00	1.19E+01	1.00E+00	1.00E+00	7.70E-04	6.46E-05	2.39E-03	2.01E-04	1.58E-02	1.32E-03	1.59E-03	0.00E+00	0.00E+00	1.59E-03	1.62E-04
Benzo(a)anthracene	1.19E+01	1.00E+00	1.19E+01	1.00E+00	1.00E+00	8.09E-04	6.78E-05	5.37E-04	4.50E-05	8.99E-03	7.53E-04	8.66E-04	0.00E+00	0.00E+00	8.66E-04	1.39E-03
Benzo(b)fluoranthene	1.19E+01	1.00E+00	1.19E+01	1.00E+00	1.00E+00	7.70E-04	6.46E-05	2.81E-04	2.35E-05	3.10E-03	2.60E-04	3.48E-04	0.00E+00	0.00E+00	3.48E-04	1.63E-03
Benzo(g,h,i)perylene	1.19E+01	1.00E+00	1.19E+01	1.00E+00	1.00E+00	7.32E-04	6.13E-05	1.47E-04	1.23E-05	7.01E-03	5.87E-04	6.61E-04	0.00E+00	0.00E+00	6.61E-04	9.02E-03
Benzo(k)fluoranthene	1.19E+01	1.00E+00	1.19E+01	1.00E+00	1.00E+00	8.09E-04	6.78E-05	2.95E-04	2.47E-05	7.28E-03	6.10E-04	7.03E-04	0.00E+00	0.00E+00	7.03E-04	3.29E-03
Chrysene	1.19E+01	1.00E+00	1.19E+01	1.00E+00	1.00E+00	8.09E-04	6.78E-05	5.37E-04	4.50E-05	8.52E-03	7.14E-04	8.27E-04	0.00E+00	0.00E+00	8.27E-04	1.33E-03
Indeno(1,2,3-cd)pyrene	1.19E+01	1.00E+00	1.19E+01	1.00E+00	1.00E+00	7.70E-04	6.46E-05	1.54E-04	1.29E-05	8.26E-03	6.93E-04	7.70E-04	0.00E+00	0.00E+00	7.70E-04	1.05E-02
Phenanthrene	1.19E+01	1.00E+00	1.19E+01	1.00E+00	1.00E+00	8.09E-04	6.78E-05	2.51E-03	2.11E-04	1.55E-03	1.30E-04	4.08E-04	0.00E+00	0.00E+00	4.08E-04	4.15E-05
Inorganics																
Iron	5.20E+02	1.00E+00	5.20E+02	1.00E+00	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.55E+00	2.97E-03	2.97E-03	0.00E+00
Lead	1.76E+02	1.00E+00	1.76E+02	1.00E+00	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.12E-03	1.77E-05	1.77E-05	0.00E+00
Manganese	6.26E+02	1.00E+00	6.26E+02	1.00E+00	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.36E-02	1.50E-04	1.50E-04	0.00E+00
TOTAL							**5.26E-04**		**5.75E-04**		**5.07E-03**	**6.17E-03**		**3.14E-03**	**9.31E-03**	

Body Weight (kg)	0.0148
Water intake (L/d)	0.0022
Food intake (kg(dw)/d)	0.0028
Soil intake (kg/d)	0.000057
Plant intake (kg(dw)/d) -- 61% of diet	0.001708
Invertebrate intake (kg(dw)/d) -- 39% of diet	0.001092

Plum Brook Ordnance Works
West Area Red Water Ponds

Opportunistic Omnivore: **Raccoon *(Procyon lotor)***

Chemical Name	LOAEL	Uncertainty Factor	Adjusted LOAEL	Foraging Factor (soil)	Foraging Factor (sw)	Soil Intake (mg/kg-d)	Soil Intake Hazard Quotient	Plant Intake (mg/kg-d)	Plant Intake Hazard Quotient	Invert. Intake (mg/kg-d)	Invert. Intake Hazard Quotient	Mouse Intake (mg/kg-d)	Mouse Intake Hazard Quotient	Total Intake Hazard Quotient	Water Intake (mg/kg-d)	Water Hazard Quotient	Overall Hazard Index
Organics																	
1,3-DNB	5.78E-01	1.00E+00	5.78E-01	1.00E+00	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
4-Amino-2,6-DNT	4.91E+01	1.00E+00	4.91E+01	1.00E+00	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Anthracene	2.77E+00	1.00E+00	2.77E+00	1.00E+00	1.00E+00	4.71E-04	1.70E-04	4.44E-04	1.60E-04	3.27E-03	1.18E-03	4.12E-07	1.49E-07	1.51E-03	0.00E+00	0.00E+00	1.51E-03
Benzo(a)anthracene	2.77E+00	1.00E+00	2.77E+00	1.00E+00	1.00E+00	4.94E-04	1.78E-04	9.96E-05	3.60E-05	1.86E-03	6.73E-04	3.54E-06	1.28E-06	8.88E-04	0.00E+00	0.00E+00	8.88E-04
Benzo(b)fluoranthene	2.77E+00	1.00E+00	2.77E+00	1.00E+00	1.00E+00	4.71E-04	1.70E-04	5.21E-05	1.88E-05	6.42E-04	2.32E-04	4.15E-06	1.50E-06	4.22E-04	0.00E+00	0.00E+00	4.22E-04
Benzo(g,h,i)perylene	2.77E+00	1.00E+00	2.77E+00	1.00E+00	1.00E+00	4.47E-04	1.61E-04	2.72E-05	9.82E-06	1.45E-03	5.25E-04	2.30E-05	8.31E-06	7.04E-04	0.00E+00	0.00E+00	7.04E-04
Benzo(k)fluoranthene	2.77E+00	1.00E+00	2.77E+00	1.00E+00	1.00E+00	4.94E-04	1.78E-04	5.47E-05	1.98E-05	1.51E-03	5.45E-04	8.39E-06	3.03E-06	7.46E-04	0.00E+00	0.00E+00	7.46E-04
Chrysene	2.77E+00	1.00E+00	2.77E+00	1.00E+00	1.00E+00	4.94E-04	1.78E-04	9.96E-05	3.60E-05	1.77E-03	6.38E-04	3.38E-06	1.22E-06	8.53E-04	0.00E+00	0.00E+00	8.53E-04
Indeno(1,2,3-cd)pyrene	2.77E+00	1.00E+00	2.77E+00	1.00E+00	1.00E+00	4.71E-04	1.70E-04	2.86E-05	1.03E-05	1.71E-03	6.19E-04	2.68E-05	9.68E-06	8.08E-04	0.00E+00	0.00E+00	8.08E-04
Phenanthrene	2.77E+00	1.00E+00	2.77E+00	1.00E+00	1.00E+00	4.94E-04	1.78E-04	4.66E-04	1.68E-04	3.21E-04	1.16E-04	1.06E-07	3.82E-08	4.63E-04	0.00E+00	0.00E+00	4.63E-04
Inorganics																	
Iron	1.21E+02	1.00E+00	1.21E+02	1.00E+00	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.77E-01	7.26E-03	7.26E-03
Lead	4.09E+01	1.00E+00	4.09E+01	1.00E+00	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.77E-03	4.32E-05	4.32E-05
Manganese	1.45E+02	1.00E+00	1.45E+02	1.00E+00	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.31E-02	3.65E-04	3.65E-04
TOTAL							**1.38E-03**		**4.59E-04**		**4.53E-03**		**2.52E-05**	**6.40E-03**		**7.67E-03**	**1.41E-02**

Body Weight (kg)	5.1
Water intake (L/d)	0.43
Food intake (kg(dw)/d)	0.26
Soil intake (kg/d)	0.012
Mouse Intake (kg(dw)/d) -- 5 % of diet	0.013
Plant intake (kg(dw)/d) -- 42% of diet	0.1092
Invertebrate intake (kg(dw)/d) -- 30% of diet	0.078

Plum Brook Ordnance Works
West Area Red Water Ponds

Herbivorous Rodent: **Eastern Cottontail *(Sylvilagus floridanus)***

Chemical Name	LOAEL	Uncertainty Factor	Adjusted LOAEL	Foraging Factor (soil)	Foraging Factor (sw)	Soil Intake (mg/kg-d)	Soil Intake Hazard Quotient	Plant Intake (mg/kg-d)	Plant Hazard Quotient	Soil/Plant Hazard Quotient	Water Intake (mg/kg-d)	Water Hazard Quotient	Overall Hazard Index	Tissue Conc. mg/kg(dw)
Organics														
1,3-DNB	1.51E+00	1.00E+00	1.51E+00	1.00E+00	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
4-Amino-2,6-DNT	1.28E+02	1.00E+00	1.28E+02	1.00E+00	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Anthracene	7.23E+00	1.00E+00	7.23E+00	1.00E+00	1.00E+00	1.06E-03	1.47E-04	1.76E-03	2.43E-04	3.90E-04	0.00E+00	0.00E+00	3.90E-04	7.11E-05
Benzo(a)anthracene	7.23E+00	1.00E+00	7.23E+00	1.00E+00	1.00E+00	1.11E-03	1.54E-04	3.95E-04	5.46E-05	2.09E-04	0.00E+00	0.00E+00	2.09E-04	6.00E-04
Benzo(b)fluoranthene	7.23E+00	1.00E+00	7.23E+00	1.00E+00	1.00E+00	1.06E-03	1.47E-04	2.06E-04	2.86E-05	1.75E-04	0.00E+00	0.00E+00	1.75E-04	1.47E-03
Benzo(g,h,i)perylene	7.23E+00	1.00E+00	7.23E+00	1.00E+00	1.00E+00	1.01E-03	1.39E-04	1.08E-04	1.49E-05	1.54E-04	0.00E+00	0.00E+00	1.54E-04	3.78E-03
Benzo(k)fluoranthene	7.23E+00	1.00E+00	7.23E+00	1.00E+00	1.00E+00	1.11E-03	1.54E-04	2.17E-04	3.00E-05	1.84E-04	0.00E+00	0.00E+00	1.84E-04	1.54E-03
Chrysene	7.23E+00	1.00E+00	7.23E+00	1.00E+00	1.00E+00	1.11E-03	1.54E-04	3.95E-04	5.46E-05	2.09E-04	0.00E+00	0.00E+00	2.09E-04	6.00E-04
Indeno(1,2,3-cd)pyrene	7.23E+00	1.00E+00	7.23E+00	1.00E+00	1.00E+00	1.06E-03	1.47E-04	1.13E-04	1.57E-05	1.62E-04	0.00E+00	0.00E+00	1.62E-04	3.98E-03
Phenanthrene	7.23E+00	1.00E+00	7.23E+00	1.00E+00	1.00E+00	1.11E-03	1.54E-04	1.85E-03	2.56E-04	4.10E-04	0.00E+00	0.00E+00	4.10E-04	7.47E-05
Inorganics														
Iron	3.15E+02	1.00E+00	3.15E+02	1.00E+00	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.01E+00	3.21E-03	3.21E-03	0.00E+00
Lead	1.07E+02	1.00E+00	1.07E+02	1.00E+00	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.04E-03	1.91E-05	1.91E-05	0.00E+00
Manganese	3.79E+02	1.00E+00	3.79E+02	1.00E+00	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.12E-02	1.61E-04	1.61E-04	0.00E+00
TOTAL							**1.20E-03**		**6.97E-04**	**1.89E-03**		**3.39E-03**	**5.28E-03**	

Body Weight (kg)	1.132
Water intake (L/d)	0.11
Food intake (kg(dw)/d)	0.096
Soil intake (kg/d)	0.006
Plant intake (kg(dw)/d) -- 100% of diet	0.096

Plum Brook Ordnance Works
West Area Red Water Ponds

Insectivorous mammal: **Short-tailed shrew *(Blarina brevicauda)***

Chemical Name	LOAEL	Uncertainty Factor	Adjusted LOAEL	Foraging Factor (soil)	Foraging Factor (sw)	Soil Intake (mg/kg-d)	Soil Intake Hazard Quotient	Invert. Intake (mg/kg-d)	Invert. Intake Hazard Quotient	Soil/Invert. Hazard Quotient	Water Intake (mg/kg-d)	Water Hazard Quotient	Overall Hazard Index	Tissue Conc. mg/kg(dw)
Organics														
1,3-DNB	3.97E+00	1.00E+00	3.97E+00	1.00E+00	1.00E+00	1.11E-02	2.79E-03	0.00E+00	0.00E+00	2.79E-03	0.00E+00	0.00E+00	2.79E-03	3.74E-08
4-Amino-2,6-DNT	3.37E+02	1.00E+00	3.37E+02	1.00E+00	1.00E+00	8.30E-03	2.46E-05	0.00E+00	0.00E+00	2.46E-05	0.00E+00	0.00E+00	2.46E-05	9.44E-08
Anthracene	1.90E+01	1.00E+00	1.90E+01	1.00E+00	1.00E+00	1.05E-02	5.53E-04	1.14E-01	6.01E-03	6.56E-03	0.00E+00	0.00E+00	6.56E-03	4.81E-04
Benzo(a)anthracene	1.90E+01	1.00E+00	1.90E+01	1.00E+00	1.00E+00	1.16E-02	6.11E-04	6.50E-02	3.42E-03	4.03E-03	0.00E+00	0.00E+00	4.03E-03	4.67E-03
Benzo(b)fluoranthene	1.90E+01	1.00E+00	1.90E+01	1.00E+00	1.00E+00	1.11E-02	5.82E-04	2.24E-02	1.18E-03	1.76E-03	0.00E+00	0.00E+00	1.76E-03	5.95E-03
Benzo(g,h,i)perylene	1.90E+01	1.00E+00	1.90E+01	1.00E+00	1.00E+00	1.05E-02	5.53E-04	5.07E-02	2.67E-03	3.22E-03	0.00E+00	0.00E+00	3.22E-03	3.17E-02
Benzo(k)fluoranthene	1.90E+01	1.00E+00	1.90E+01	1.00E+00	1.00E+00	1.11E-02	5.82E-04	5.26E-02	2.77E-03	3.35E-03	0.00E+00	0.00E+00	3.35E-03	1.13E-02
Chrysene	1.90E+01	1.00E+00	1.90E+01	1.00E+00	1.00E+00	1.16E-02	6.11E-04	6.16E-02	3.24E-03	3.85E-03	0.00E+00	0.00E+00	3.85E-03	4.46E-03
Indeno(1,2,3-cd)pyrene	1.90E+01	1.00E+00	1.90E+01	1.00E+00	1.00E+00	1.05E-02	5.53E-04	5.97E-02	3.14E-03	3.70E-03	0.00E+00	0.00E+00	3.70E-03	3.64E-02
Phenanthrene	1.90E+01	1.00E+00	1.90E+01	1.00E+00	1.00E+00	1.16E-02	6.11E-04	1.12E-02	5.89E-04	1.20E-03	0.00E+00	0.00E+00	1.20E-03	8.81E-05
Inorganics														
Iron	8.29E+02	1.00E+00	8.29E+02	1.00E+00	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.59E+00	1.92E-03	1.92E-03	0.00E+00
Lead	2.81E+02	1.00E+00	2.81E+02	1.00E+00	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.22E-03	1.15E-05	1.15E-05	0.00E+00
Manganese	9.97E+02	1.00E+00	9.97E+02	1.00E+00	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.66E-02	9.68E-05	9.68E-05	0.00E+00
TOTAL							**7.47E-03**		**2.30E-02**	**3.05E-02**		**2.03E-03**	**3.25E-02**	

Body Weight (kg)	0.015
Water intake (L/d)	0.0023
Food intake (kg(dw)/d)	0.008
Soil intake (kg/d)	0.00083
Invertebrate intake (kg(dw)/d)--100% of diet	0.008

Plum Brook Ordnance Works
West Area Red Water Ponds

Herbivorous Mammal: **White-tailed deer *(Odocoileus virginianus)***

Chemical Name	LOAEL	Uncertainty Factor	Adjusted LOAEL	Foraging Factor (soil)	Foraging Factor (sw)	Soil Intake (mg/kg-d)	Soil Intake Hazard Quotient	Plant Intake (mg/kg-d)	Plant Intake Hazard Quotient	Soil/Plant Hazard Quotient	Water Intake (mg/kg-d)	Water Hazard Quotient	Overall Hazard Index
Organics													
1,3-DNB	6.15E-01	1.00E+00	6.15E-01	1.00E-02	1.00E-02	0.00E+00	0.00E+00	3.50E-04	5.69E-04	5.69E-04	0.00E+00	0.00E+00	5.69E-04
4-Amino-2,6-DNT	5.22E+01	1.00E+00	5.22E+01	1.00E-02	1.00E-02	0.00E+00	0.00E+00	1.33E-04	2.55E-06	2.55E-06	0.00E+00	0.00E+00	2.55E-06
Anthracene	2.94E+00	1.00E+00	2.94E+00	1.00E-02	1.00E-02	1.31E-06	4.46E-07	6.46E-06	2.20E-06	2.64E-06	0.00E+00	0.00E+00	2.64E-06
Benzo(a)anthracene	2.94E+00	1.00E+00	2.94E+00	1.00E-02	1.00E-02	1.38E-06	4.68E-07	1.53E-06	5.18E-07	9.86E-07	0.00E+00	0.00E+00	9.86E-07
Benzo(b)fluoranthene	2.94E+00	1.00E+00	2.94E+00	1.00E-02	1.00E-02	1.31E-06	4.46E-07	7.98E-07	2.71E-07	7.17E-07	0.00E+00	0.00E+00	7.17E-07
Benzo(g,h,i)perylene	2.94E+00	1.00E+00	2.94E+00	1.00E-02	1.00E-02	1.25E-06	4.23E-07	4.17E-07	1.42E-07	5.65E-07	0.00E+00	0.00E+00	5.65E-07
Benzo(k)fluoranthene	2.94E+00	1.00E+00	2.94E+00	1.00E-02	1.00E-02	1.38E-06	4.68E-07	7.98E-07	2.71E-07	7.39E-07	0.00E+00	0.00E+00	7.39E-07
Chrysene	2.94E+00	1.00E+00	2.94E+00	1.00E-02	1.00E-02	1.38E-06	4.68E-07	1.53E-06	5.18E-07	9.86E-07	0.00E+00	0.00E+00	9.86E-07
Indeno(1,2,3-cd)pyrene	2.94E+00	1.00E+00	2.94E+00	1.00E-02	1.00E-02	1.31E-06	4.46E-07	4.17E-07	1.42E-07	5.87E-07	0.00E+00	0.00E+00	5.87E-07
Phenanthrene	2.94E+00	1.00E+00	2.94E+00	1.00E-02	1.00E-02	1.38E-06	4.68E-07	7.14E-06	2.43E-06	2.89E-06	0.00E+00	0.00E+00	2.89E-06
Inorganics													
Iron	1.28E+02	1.00E+00	1.28E+02	1.00E-02	1.00E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.16E-01	3.24E-03	3.24E-03
Lead	4.35E+01	1.00E+00	4.35E+01	1.00E-02	1.00E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.40E-04	1.93E-05	1.93E-05
Manganese	1.54E+02	1.00E+00	1.54E+02	1.00E-02	1.00E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.52E-02	1.63E-04	1.63E-04
TOTAL							**3.63E-06**		**5.78E-04**	**5.81E-04**		**3.42E-03**	**4.01E-03**

Body Weight (kg)	61
Water intake (L/d)	4
Food intake (kg(dw)/d)	2
Soil intake (kg/d)	0.04
Plant intake (kg(dw)/d) -- 100% of diet	2

Plum Brook Ordnance Works
West Area Red Water Ponds

Insectivorous Bird: **Marsh wren *(Cistothorus palustris)***

Chemical Name	LOAEL	Uncertainty Factor	Adjusted LOAEL	Foraging Factor (soil)	Foraging Factor (sw)	Soil Intake (mg/kg-d)	Soil Intake Hazard Quotient	Invert. Intake (mg/kg-d)	Invert. Intake Hazard Quotient	Soil/Invert. Hazard Quotient	Water Intake (mg/kg-d)	Water Hazard Quotient	Overall Hazard Index	Tissue Conc. mg/kg(dw)
Organics														
1,3-DNB	4.20E+00	1.00E+00	4.20E+00	1.00E+00	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
4-Amino-2,6-DNT	1.78E+01	1.00E+00	1.78E+01	1.00E+00	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Anthracene	0.00E+00	1.00E+00	0.00E+00	1.00E+00	1.00E+00	3.80E-03	0.00E+00	2.03E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.86E-04
Benzo(a)anthracene	0.00E+00	1.00E+00	0.00E+00	1.00E+00	1.00E+00	3.99E-03	0.00E+00	1.16E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.43E-03
Benzo(b)fluoranthene	0.00E+00	1.00E+00	0.00E+00	1.00E+00	1.00E+00	3.80E-03	0.00E+00	3.99E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.72E-03
Benzo(g,h,i)perylene	0.00E+00	1.00E+00	0.00E+00	1.00E+00	1.00E+00	3.61E-03	0.00E+00	9.03E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.96E-02
Benzo(k)fluoranthene	0.00E+00	1.00E+00	0.00E+00	1.00E+00	1.00E+00	3.99E-03	0.00E+00	9.38E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.06E-02
Chrysene	0.00E+00	1.00E+00	0.00E+00	1.00E+00	1.00E+00	3.99E-03	0.00E+00	1.10E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.21E-03
Indeno(1,2,3-cd)pyrene	0.00E+00	1.00E+00	0.00E+00	1.00E+00	1.00E+00	3.80E-03	0.00E+00	1.06E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.47E-02
Phenanthrene	0.00E+00	1.00E+00	0.00E+00	1.00E+00	1.00E+00	3.99E-03	0.00E+00	2.00E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.62E-05
Inorganics														
Iron	2.50E+02	1.00E+00	2.50E+02	1.00E+00	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.81E+00	1.12E-02	1.12E-02	0.00E+00
Lead	3.85E+01	1.00E+00	3.85E+01	1.00E+00	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.67E-03	1.47E-04	1.47E-04	0.00E+00
Manganese	9.77E+03	1.00E+00	9.77E+03	1.00E+00	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.70E-01	1.74E-05	1.74E-05	0.00E+00
TOTAL							**0.00E+00**		**0.00E+00**	**0.00E+00**		**1.14E-02**	**1.14E-02**	

Body Weight (kg)	0.01
Water intake (L/d)	0.0027
Food intake (kg(dw)/d)	0.0095
Soil intake (kg/d)	0.00019
Plant intake (kg(dw)/d) -- 0% of diet	0
Invertebrate intake (kg(dw)/d) -- 100% of diet	0.0095

Plum Brook Ordnance Works
West Area Red Water Ponds

Chemical Data

Chemical Name	Surface Soil Conc. (mg/kg)	Total Soil Conc. (mg/kg)	Water Conc. (mg/L)	log Kow (organics)	Soil-to-Plant TF	Shallow-rooted Plant Conc. (mg/kgdw)	Deep-rooted Plant Conc. (mg/kgdw)	Soil-to-Invert. BAF	Invert. Conc. (mg/kgdw)	Food-to-Muscle TF
Organics										
1,3-DNB		1.25E-01		1.49E+00	5.33E+00	0.00E+00	6.66E-01	1.00E-01	0.00E+00	6.37E-07
4-Amino-2,6-DNT		1.25E-01		2.00E+00	2.70E+00	0.00E+00	3.38E-01	1.00E-01	0.00E+00	2.14E-06
Anthracene	2.00E-01	2.00E-01		4.45E+00	1.04E-01	2.07E-02	2.07E-02	1.07E+00	2.14E-01	7.28E-04
Benzo(a)anthracene	2.00E-01	2.00E-01		5.61E+00	2.22E-02	4.43E-03	4.43E-03	5.80E-01	1.16E-01	1.15E-02
Benzo(b)fluoranthene	2.00E-01	2.00E-01		6.06E+00	1.22E-02	2.43E-03	2.43E-03	2.10E-01	4.20E-02	3.35E-02
Benzo(g,h,i)perylene	2.00E-01	2.00E-01		6.51E+00	6.69E-03	1.34E-03	1.34E-03	5.00E-01	1.00E-01	9.77E-02
Benzo(k)fluoranthene	2.00E-01	2.00E-01		6.06E+00	1.22E-02	2.43E-03	2.43E-03	4.70E-01	9.40E-02	3.35E-02
Chrysene	2.00E-01	2.00E-01		5.61E+00	2.22E-02	4.43E-03	4.43E-03	5.50E-01	1.10E-01	1.15E-02
Indeno(1,2,3-cd)pyrene	2.00E-01	2.00E-01		6.51E+00	6.69E-03	1.34E-03	1.34E-03	5.10E-01	1.02E-01	9.77E-02
Phenanthrene	2.00E-01	2.00E-01		4.45E+00	1.04E-01	2.07E-02	2.07E-02	6.00E-01	1.20E-01	7.28E-04
Inorganics										
Iron			2.11E+01	---	NA	0.00E+00	0.00E+00	NA	0.00E+00	NA
Lead			7.70E-02	---	NA	0.00E+00	0.00E+00	NA	0.00E+00	NA
Manganese			1.60E+00	---	NA	0.00E+00	0.00E+00	NA	0.00E+00	NA

Plum Brook Ordnance Works
West Area Red Water Ponds

Toxicity Data

Chemical Name	Mammals			Birds		
	NOAEL (mg/kg/d)	Test Species	Body Wt. (kg)	NOAEL (mg/kg/d)	Test Species	Body Wt. (kg)
Organics						
1,3-DNB	1.13E-01	rat	0.35	4.20E-01	red-wing	0.077
4-Amino-2,6-DNT	9.59E+00	rat	0.35	7.00E-01	bobwhite quail	0.19
Anthracene	1.00E+00	mouse	0.03	--	--	--
Benzo(a)anthracene	1.00E+00	mouse	0.03	--	--	--
Benzo(b)fluoranthene	1.00E+00	mouse	0.03	--	--	--
Benzo(g,h,i)perylene	1.00E+00	mouse	0.03	--	--	--
Benzo(k)fluoranthene	1.00E+00	mouse	0.03	--	--	--
Chrysene	1.00E+00	mouse	0.03	--	--	--
Indeno(1,2,3-cd)pyrene	1.00E+00	mouse	0.03	--	--	--
Phenanthrene	1.00E+00	mouse	0.03	--	--	--
Inorganics						
Iron	2.60E+01	rabbit	3.8	5.00E+01	poultry	1.6
Lead	8.00E+00	rat	0.35	3.85E+00	Am. Kestrel	0.13
Manganese	8.80E+01	rat	0.35	9.77E+02	Jap. Quail	0.072

Plum Brook Ordnance Site
West Area Red Water Ponds

Omnivorous Rodent: **Deer mouse *(Peromyscus manicalatus)***

Chemical Name	NOAEL	Uncertainty Factor	Adjusted NOAEL	Foraging Factor (soil)	Foraging Factor (sw)	Soil Intake (mg/kg-d)	Soil Intake Hazard Quotient	Plant Intake (mg/kg-d)	Plant Intake Hazard Quotient	Invert. Intake (mg/kg-d)	Invert. Intake Hazard Quotient	Soil/Plant/Invert. Hazard Quotient	Water Intake (mg/kg-d)	Water Hazard Quotient	Overall Hazard Index	Tissue Conc. mg/kg(dw)
Organics																
1,3-DNB	2.49E-01	8.00E+00	3.11E-02	1.00E+00	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
4-Amino-2,6-DNT	2.11E+01	8.00E+00	2.64E+00	1.00E+00	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Anthracene	1.19E+00	8.00E+00	1.49E-01	1.00E+00	1.00E+00	7.70E-04	5.16E-03	2.39E-03	1.61E-02	1.58E-02	1.06E-01	1.27E-01	0.00E+00	0.00E+00	1.27E-01	1.62E-04
Benzo(a)anthracene	1.19E+00	8.00E+00	1.49E-01	1.00E+00	1.00E+00	7.70E-04	5.16E-03	5.11E-04	3.43E-03	8.56E-03	5.74E-02	6.60E-02	0.00E+00	0.00E+00	6.60E-02	1.32E-03
Benzo(b)fluoranthene	1.19E+00	8.00E+00	1.49E-01	1.00E+00	1.00E+00	7.70E-04	5.16E-03	2.81E-04	1.88E-03	3.10E-03	2.08E-02	2.78E-02	0.00E+00	0.00E+00	2.78E-02	1.63E-03
Benzo(g,h,i)perylene	1.19E+00	8.00E+00	1.49E-01	1.00E+00	1.00E+00	7.70E-04	5.16E-03	1.54E-04	1.03E-03	7.38E-03	4.95E-02	5.57E-02	0.00E+00	0.00E+00	5.57E-02	9.50E-03
Benzo(k)fluoranthene	1.19E+00	8.00E+00	1.49E-01	1.00E+00	1.00E+00	7.70E-04	5.16E-03	2.81E-04	1.88E-03	6.94E-03	4.65E-02	5.35E-02	0.00E+00	0.00E+00	5.35E-02	3.13E-03
Chrysene	1.19E+00	8.00E+00	1.49E-01	1.00E+00	1.00E+00	7.70E-04	5.16E-03	5.11E-04	3.43E-03	8.12E-03	5.44E-02	6.30E-02	0.00E+00	0.00E+00	6.30E-02	1.26E-03
Indeno(1,2,3-cd)pyrene	1.19E+00	8.00E+00	1.49E-01	1.00E+00	1.00E+00	7.70E-04	5.16E-03	1.54E-04	1.03E-03	7.53E-03	5.05E-02	5.67E-02	0.00E+00	0.00E+00	5.67E-02	9.67E-03
Phenanthrene	1.19E+00	8.00E+00	1.49E-01	1.00E+00	1.00E+00	7.70E-04	5.16E-03	2.39E-03	1.61E-02	8.85E-03	5.94E-02	8.06E-02	0.00E+00	0.00E+00	8.06E-02	1.02E-04
Inorganics																
Iron	1.04E+02	8.00E+00	1.30E+01	1.00E+00	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.14E+00	2.41E-01	2.41E-01	0.00E+00
Lead	1.76E+01	8.00E+00	2.21E+00	1.00E+00	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.14E-02	5.19E-03	5.19E-03	0.00E+00
Manganese	1.94E+02	8.00E+00	2.43E+01	1.00E+00	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.38E-01	9.80E-03	9.80E-03	0.00E+00
TOTAL							**4.13E-02**		**4.48E-02**		**4.44E-01**	**5.30E-01**		**2.56E-01**	**7.86E-01**	

Body Weight (kg)	0.0148
Water intake (L/d)	0.0022
Food intake (kg(dw)/d)	0.0028
Soil intake (kg/d)	0.000057
Plant intake (kg(dw)/d) -- 61% of diet	0.001708
Invertebrate intake (kg(dw)/d) -- 39% of diet	0.001092

Plum Brook Ordnance Works
West Area Red Water Ponds

Opportunistic Omnivore: **Raccoon *(Procyon lotor)***

Chemical Name	NOAEL	Uncertainty Factor	Adjusted NOAEL	Foraging Factor (soil)	Foraging Factor (sw)	Soil Intake (mg/kg-d)	Soil Intake Hazard Quotient	Plant Intake (mg/kg-d)	Plant Intake Hazard Quotient	Invert. Intake (mg/kg-d)	Invert. Intake Hazard Quotient	Mouse Intake (mg/kg-d)	Mouse Intake Hazard Quotient	Total Intake Hazard Quotient	Water Intake (mg/kg-d)	Water Hazard Quotient	Overall Hazard Index
Organics																	
1,3-DNB	5.78E-02	8.00E+00	7.23E-03	1.00E+00	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
4-Amino-2,6-DNT	4.91E+00	8.00E+00	6.14E-01	1.00E+00	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Anthracene	2.77E-01	8.00E+00	3.46E-02	1.00E+00	1.00E+00	4.71E-04	1.36E-02	4.44E-04	1.28E-02	3.27E-03	9.45E-02	4.12E-07	1.19E-05	1.21E-01	0.00E+00	0.00E+00	1.21E-01
Benzo(a)anthracene	2.77E-01	8.00E+00	3.46E-02	1.00E+00	1.00E+00	4.71E-04	1.36E-02	9.49E-05	2.74E-03	1.77E-03	5.12E-02	3.37E-06	9.75E-05	6.77E-02	0.00E+00	0.00E+00	6.77E-02
Benzo(b)fluoranthene	2.77E-01	8.00E+00	3.46E-02	1.00E+00	1.00E+00	4.71E-04	1.36E-02	5.21E-05	1.51E-03	6.42E-04	1.86E-02	4.15E-06	1.20E-04	3.38E-02	0.00E+00	0.00E+00	3.38E-02
Benzo(g,h,i)perylene	2.77E-01	8.00E+00	3.46E-02	1.00E+00	1.00E+00	4.71E-04	1.36E-02	2.86E-05	8.27E-04	1.53E-03	4.42E-02	2.42E-05	6.99E-04	5.93E-02	0.00E+00	0.00E+00	5.93E-02
Benzo(k)fluoranthene	2.77E-01	8.00E+00	3.46E-02	1.00E+00	1.00E+00	4.71E-04	1.36E-02	5.21E-05	1.51E-03	1.44E-03	4.15E-02	7.99E-06	2.31E-04	5.69E-02	0.00E+00	0.00E+00	5.69E-02
Chrysene	2.77E-01	8.00E+00	3.46E-02	1.00E+00	1.00E+00	4.71E-04	1.36E-02	9.49E-05	2.74E-03	1.68E-03	4.86E-02	3.22E-06	9.31E-05	6.50E-02	0.00E+00	0.00E+00	6.50E-02
Indeno(1,2,3-cd)pyrene	2.77E-01	8.00E+00	3.46E-02	1.00E+00	1.00E+00	4.71E-04	1.36E-02	2.86E-05	8.27E-04	1.56E-03	4.51E-02	2.46E-05	7.12E-04	6.02E-02	0.00E+00	0.00E+00	6.02E-02
Phenanthrene	2.77E-01	8.00E+00	3.46E-02	1.00E+00	1.00E+00	4.71E-04	1.36E-02	4.44E-04	1.28E-02	1.84E-03	5.30E-02	2.61E-07	7.54E-06	7.94E-02	0.00E+00	0.00E+00	7.94E-02
Inorganics																	
Iron	2.42E+01	8.00E+00	3.02E+00	1.00E+00	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.78E+00	5.89E-01	5.89E-01
Lead	4.09E+00	8.00E+00	5.12E-01	1.00E+00	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.49E-03	1.27E-02	1.27E-02
Manganese	4.50E+01	8.00E+00	5.63E+00	1.00E+00	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.35E-01	2.40E-02	2.40E-02
TOTAL							**1.09E-01**		**3.58E-02**		**3.97E-01**		**1.97E-03**	**5.43E-01**		**6.26E-01**	**1.17E+00**

Body Weight (kg)	5.1
Water intake (L/d)	0.43
Food intake (kg(dw)/d)	0.26
Soil intake (kg/d)	0.012
Mouse Intake (kg(dw)/d) -- 5 % of diet	0.013
Plant intake (kg(dw)/d) -- 42% of diet	0.1092
Invertebrate intake (kg(dw)/d) -- 30% of diet	0.078

Plum Brook Ordnance Works
West Area Red Water Ponds

Herbivorous Rodent: **Eastern Cottontail *(Sylvilagus floridanus)***

Chemical Name	NOAEL	Uncertainty Factor	Adjusted NOAEL	Foraging Factor (soil)	Foraging Factor (sw)	Soil Intake (mg/kg-d)	Soil Intake Hazard Quotient	Plant Intake (mg/kg-d)	Plant Hazard Quotient	Soil/Plant Hazard Quotient	Water Intake (mg/kg-d)	Water Hazard Quotient	Overall Hazard Index	Tissue Conc. mg/kg(dw)
Organics														
1,3-DNB	1.51E-01	8.00E+00	1.89E-02	1.00E+00	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
4-Amino-2,6-DNT	1.28E+01	8.00E+00	1.60E+00	1.00E+00	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Anthracene	7.23E-01	8.00E+00	9.03E-02	1.00E+00	1.00E+00	1.06E-03	1.17E-02	1.76E-03	1.95E-02	3.12E-02	0.00E+00	0.00E+00	3.12E-02	7.11E-05
Benzo(a)anthracene	7.23E-01	8.00E+00	9.03E-02	1.00E+00	1.00E+00	1.06E-03	1.17E-02	3.76E-04	4.16E-03	1.59E-02	0.00E+00	0.00E+00	1.59E-02	5.72E-04
Benzo(b)fluoranthene	7.23E-01	8.00E+00	9.03E-02	1.00E+00	1.00E+00	1.06E-03	1.17E-02	2.06E-04	2.29E-03	1.40E-02	0.00E+00	0.00E+00	1.40E-02	1.47E-03
Benzo(g,h,i)perylene	7.23E-01	8.00E+00	9.03E-02	1.00E+00	1.00E+00	1.06E-03	1.17E-02	1.13E-04	1.26E-03	1.30E-02	0.00E+00	0.00E+00	1.30E-02	3.98E-03
Benzo(k)fluoranthene	7.23E-01	8.00E+00	9.03E-02	1.00E+00	1.00E+00	1.06E-03	1.17E-02	2.06E-04	2.29E-03	1.40E-02	0.00E+00	0.00E+00	1.40E-02	1.47E-03
Chrysene	7.23E-01	8.00E+00	9.03E-02	1.00E+00	1.00E+00	1.06E-03	1.17E-02	3.76E-04	4.16E-03	1.59E-02	0.00E+00	0.00E+00	1.59E-02	5.72E-04
Indeno(1,2,3-cd)pyrene	7.23E-01	8.00E+00	9.03E-02	1.00E+00	1.00E+00	1.06E-03	1.17E-02	1.13E-04	1.26E-03	1.30E-02	0.00E+00	0.00E+00	1.30E-02	3.98E-03
Phenanthrene	7.23E-01	8.00E+00	9.03E-02	1.00E+00	1.00E+00	1.06E-03	1.17E-02	1.76E-03	1.95E-02	3.12E-02	0.00E+00	0.00E+00	3.12E-02	7.11E-05
Inorganics														
Iron	6.30E+01	4.00E+00	1.58E+01	1.00E+00	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.05E+00	1.30E-01	1.30E-01	0.00E+00
Lead	1.07E+01	8.00E+00	1.34E+00	1.00E+00	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.48E-03	5.60E-03	5.60E-03	0.00E+00
Manganese	1.18E+02	8.00E+00	1.47E+01	1.00E+00	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.55E-01	1.06E-02	1.06E-02	0.00E+00
TOTAL							**9.39E-02**		**5.44E-02**	**1.48E-01**		**1.46E-01**	**2.95E-01**	

Body Weight (kg)	1.132
Water intake (L/d)	0.11
Food intake (kg(dw)/d)	0.096
Soil intake (kg/d)	0.006
Plant intake (kg(dw)/d) -- 100% of diet	0.096

Plum Brook Ordnance Works
West Area Red Water Ponds

Insectivorous mammal: **Short-tailed shrew *(Blarina brevicauda)***

Chemical Name	NOAEL	Uncertainty Factor	Adjusted NOAEL	Foraging Factor (soil)	Foraging Factor (sw)	Soil Intake (mg/kg-d)	Soil Intake Hazard Quotient	Invert. Intake (mg/kg-d)	Invert. Intake Hazard Quotient	Soil/Invert. Hazard Quotient	Water Intake (mg/kg-d)	Water Hazard Quotient	Overall Hazard Index	Tissue Conc. mg/kg(dw)
Organics														
1,3-DNB	3.97E-01	8.00E+00	4.96E-02	1.00E+00	1.00E+00	6.92E-03	1.39E-01	0.00E+00	0.00E+00	1.39E-01	0.00E+00	0.00E+00	1.39E-01	2.34E-08
4-Amino-2,6-DNT	3.37E+01	8.00E+00	4.21E+00	1.00E+00	1.00E+00	6.92E-03	1.64E-03	0.00E+00	0.00E+00	1.64E-03	0.00E+00	0.00E+00	1.64E-03	7.87E-08
Anthracene	1.90E+00	8.00E+00	2.38E-01	1.00E+00	1.00E+00	1.11E-02	4.66E-02	1.14E-01	4.80E-01	5.27E-01	0.00E+00	0.00E+00	5.27E-01	4.84E-04
Benzo(a)anthracene	1.90E+00	8.00E+00	2.38E-01	1.00E+00	1.00E+00	1.11E-02	4.66E-02	6.19E-02	2.60E-01	3.07E-01	0.00E+00	0.00E+00	3.07E-01	4.45E-03
Benzo(b)fluoranthene	1.90E+00	8.00E+00	2.38E-01	1.00E+00	1.00E+00	1.11E-02	4.66E-02	2.24E-02	9.43E-02	1.41E-01	0.00E+00	0.00E+00	1.41E-01	5.95E-03
Benzo(g,h,i)perylene	1.90E+00	8.00E+00	2.38E-01	1.00E+00	1.00E+00	1.11E-02	4.66E-02	5.33E-02	2.25E-01	2.71E-01	0.00E+00	0.00E+00	2.71E-01	3.34E-02
Benzo(k)fluoranthene	1.90E+00	8.00E+00	2.38E-01	1.00E+00	1.00E+00	1.11E-02	4.66E-02	5.01E-02	2.11E-01	2.58E-01	0.00E+00	0.00E+00	2.58E-01	1.09E-02
Chrysene	1.90E+00	8.00E+00	2.38E-01	1.00E+00	1.00E+00	1.11E-02	4.66E-02	5.87E-02	2.47E-01	2.94E-01	0.00E+00	0.00E+00	2.94E-01	4.25E-03
Indeno(1,2,3-cd)pyrene	1.90E+00	8.00E+00	2.38E-01	1.00E+00	1.00E+00	1.11E-02	4.66E-02	5.44E-02	2.29E-01	2.76E-01	0.00E+00	0.00E+00	2.76E-01	3.39E-02
Phenanthrene	1.90E+00	8.00E+00	2.38E-01	1.00E+00	1.00E+00	1.11E-02	4.66E-02	6.40E-02	2.69E-01	3.16E-01	0.00E+00	0.00E+00	3.16E-01	2.90E-04
Inorganics														
Iron	1.66E+02	8.00E+00	2.07E+01	1.00E+00	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.24E+00	1.56E-01	1.56E-01	0.00E+00
Lead	2.81E+01	8.00E+00	3.51E+00	1.00E+00	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.18E-02	3.36E-03	3.36E-03	0.00E+00
Manganese	3.09E+02	8.00E+00	3.86E+01	1.00E+00	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.45E-01	6.35E-03	6.35E-03	0.00E+00
TOTAL							**5.14E-01**		**2.02E+00**	**2.53E+00**		**1.66E-01**	**2.70E+00**	

Body Weight (kg)	0.015
Water intake (L/d)	0.0023
Food intake (kg(dw)/d)	0.008
Soil intake (kg/d)	0.00083
Invertebrate intake (kg(dw)/d)--100% of diet	0.008

Plum Brook Ordnance Works
West Area Red Water Ponds

Herbivorous Mammal: **White-tailed deer *(Odocoileus virginianus)***

Chemical Name	NOAEL	Uncertainty Factor	Adjusted NOAEL	Foraging Factor (soil)	Foraging Factor (sw)	Soil Intake (mg/kg-d)	Soil Intake Hazard Quotient	Plant Intake (mg/kg-d)	Plant Intake Hazard Quotient	Soil/Plant Hazard Quotient	Water Intake (mg/kg-d)	Water Hazard Quotient	Overall Hazard Index
Organics													
1,3-DNB	6.15E-02	8.00E+00	7.68E-03	1.00E-02	1.00E-02	0.00E+00	0.00E+00	2.18E-04	2.84E-02	2.84E-02	0.00E+00	0.00E+00	2.84E-02
4-Amino-2,6-DNT	5.22E+00	8.00E+00	6.52E-01	1.00E-02	1.00E-02	0.00E+00	0.00E+00	1.11E-04	1.70E-04	1.70E-04	0.00E+00	0.00E+00	1.70E-04
Anthracene	2.94E-01	8.00E+00	3.68E-02	1.00E-02	1.00E-02	1.31E-06	3.57E-05	6.80E-06	1.85E-04	2.21E-04	0.00E+00	0.00E+00	2.21E-04
Benzo(a)anthracene	2.94E-01	8.00E+00	3.68E-02	1.00E-02	1.00E-02	1.31E-06	3.57E-05	1.45E-06	3.95E-05	7.51E-05	0.00E+00	0.00E+00	7.51E-05
Benzo(b)fluoranthene	2.94E-01	8.00E+00	3.68E-02	1.00E-02	1.00E-02	1.31E-06	3.57E-05	7.98E-07	2.17E-05	5.73E-05	0.00E+00	0.00E+00	5.73E-05
Benzo(g,h,i)perylene	2.94E-01	8.00E+00	3.68E-02	1.00E-02	1.00E-02	1.31E-06	3.57E-05	4.38E-07	1.19E-05	4.76E-05	0.00E+00	0.00E+00	4.76E-05
Benzo(k)fluoranthene	2.94E-01	8.00E+00	3.68E-02	1.00E-02	1.00E-02	1.31E-06	3.57E-05	7.98E-07	2.17E-05	5.73E-05	0.00E+00	0.00E+00	5.73E-05
Chrysene	2.94E-01	8.00E+00	3.68E-02	1.00E-02	1.00E-02	1.31E-06	3.57E-05	1.45E-06	3.95E-05	7.51E-05	0.00E+00	0.00E+00	7.51E-05
Indeno(1,2,3-cd)pyrene	2.94E-01	8.00E+00	3.68E-02	1.00E-02	1.00E-02	1.31E-06	3.57E-05	4.38E-07	1.19E-05	4.76E-05	0.00E+00	0.00E+00	4.76E-05
Phenanthrene	2.94E-01	8.00E+00	3.68E-02	1.00E-02	1.00E-02	1.31E-06	3.57E-05	6.80E-06	1.85E-04	2.21E-04	0.00E+00	0.00E+00	2.21E-04
Inorganics													
Iron	2.57E+01	8.00E+00	3.21E+00	1.00E-02	1.00E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.44E-01	2.63E-01	2.63E-01
Lead	4.35E+00	8.00E+00	5.44E-01	1.00E-02	1.00E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.08E-03	5.66E-03	5.66E-03
Manganese	4.79E+01	8.00E+00	5.98E+00	1.00E-02	1.00E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.40E-02	1.07E-02	1.07E-02
TOTAL							**2.85E-04**		**2.91E-02**	**2.94E-02**		**2.79E-01**	**3.09E-01**

Body Weight (kg)	61
Water intake (L/d)	4
Food intake (kg(dw)/d)	2
Soil intake (kg/d)	0.04
Plant intake (kg(dw)/d) -- 100% of diet	2

Plum Brook Ordnance Works
West Area Red Water Ponds

Insectivorous Bird: **Marsh wren *(Cistothorus palustris)***

Chemical Name	NOAEL	Uncertainty Factor	Adjusted NOAEL	Foraging Factor (soil)	Foraging Factor (sw)	Soil Intake (mg/kg-d)	Soil Intake Hazard Quotient	Invert. Intake (mg/kg-d)	Invert. Intake Hazard Quotient	Soil/Invert. Hazard Quotient	Water Intake (mg/kg-d)	Water Hazard Quotient	Overall Hazard Index	Tissue Conc. mg/kg(dw)
Organics														
1,3-DNB	4.20E-01	8.00E+00	5.25E-02	1.00E+00	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
4-Amino-2,6-DNT	7.00E-01	8.00E+00	8.75E-02	1.00E+00	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Anthracene	0.00E+00	8.00E+00	0.00E+00	1.00E+00	1.00E+00	3.80E-03	0.00E+00	2.03E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.86E-04
Benzo(a)anthracene	0.00E+00	8.00E+00	0.00E+00	1.00E+00	1.00E+00	3.80E-03	0.00E+00	1.10E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.22E-03
Benzo(b)fluoranthene	0.00E+00	8.00E+00	0.00E+00	1.00E+00	1.00E+00	3.80E-03	0.00E+00	3.99E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.72E-03
Benzo(g,h,i)perylene	0.00E+00	8.00E+00	0.00E+00	1.00E+00	1.00E+00	3.80E-03	0.00E+00	9.50E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.11E-02
Benzo(k)fluoranthene	0.00E+00	8.00E+00	0.00E+00	1.00E+00	1.00E+00	3.80E-03	0.00E+00	8.93E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.01E-02
Chrysene	0.00E+00	8.00E+00	0.00E+00	1.00E+00	1.00E+00	3.80E-03	0.00E+00	1.05E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.01E-03
Indeno(1,2,3-cd)pyrene	0.00E+00	8.00E+00	0.00E+00	1.00E+00	1.00E+00	3.80E-03	0.00E+00	9.69E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.17E-02
Phenanthrene	0.00E+00	8.00E+00	0.00E+00	1.00E+00	1.00E+00	3.80E-03	0.00E+00	1.14E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.76E-04
Inorganics														
Iron	5.00E+01	8.00E+00	6.25E+00	1.00E+00	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.70E+00	9.12E-01	9.12E-01	0.00E+00
Lead	3.85E+00	8.00E+00	4.81E-01	1.00E+00	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.08E-02	4.32E-02	4.32E-02	0.00E+00
Manganese	9.77E+02	8.00E+00	1.22E+02	1.00E+00	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.32E-01	3.54E-03	3.54E-03	0.00E+00
TOTAL							**0.00E+00**		**0.00E+00**	**0.00E+00**		**9.58E-01**	**9.58E-01**	

Body Weight (kg)	0.01
Water intake (L/d)	0.0027
Food intake (kg(dw)/d)	0.0095
Soil intake (kg/d)	0.00019
Plant intake (kg(dw)/d) -- 0% of diet	0
Invertebrate intake (kg(dw)/d) -- 100% of diet	0.0095

Plum Brook Ordnance Works
West Area Red Water Ponds
Central Tendency

Chemical Data

Chemical Name	Sediment Conc. (mg/kg)	Water Conc. (mg/L)	log Kow (organics)	Kow (organics)	log Koc (organics) (mL/g)	Koc (organics) (mL/g)	Kd (inorganics) (mL/g)	Foc	Water-to-Fish BCF	Food Chain Multiplier	Water-to-Fish BAF	Fish Conc. (mg/kgww)	Fish Conc. (mg/kgdw)	Sediment-to-Invertebrate BCF	Invert. Conc. (mg/kgww)	Invert Conc. (mg/kgdw)	Food-to-Muscle TF
Organics																	
2-Amino-4,6-Dinitrotoluene	1.40E-01		2.00E+00	1.00E+02	1.97E+00	9.25E+01	---	6.70E-02	1.00E+02	1.00E+00	1.00E+02	0.00E+00	0.00E+00	4.84E-02	4.84E+00	1.94E+01	2.14E-06
Inorganics																	
Aluminum			---	---	---	---			1.50E+01	1.00E+00	1.50E+01	-	0.00E+00	3.50E-03	-	0.00E+00	NA
Arsenic			---	---	---	---			4.00E+01	1.00E+00	4.00E+01	-	0.00E+00	3.00E-02	-	0.00E+00	4.00E-03
Calcium			---	---	---	---			3.02E+02	1.00E+00	3.02E+02	-	0.00E+00	1.00E-03	-	0.00E+00	2.00E-03
Copper			---	---	---	---			1.02E+02	1.00E+00	1.02E+02	-	0.00E+00	2.00E-02	-	0.00E+00	NA
Iron	1.87E+04	1.04E+01	---	---	---	---			1.80E+01	1.00E+00	1.80E+01	-	1.87E+02	5.10E-05	-	9.54E-01	NA
Lead		2.10E-02	---	---	---	---			2.30E+01	1.00E+00	2.30E+01	-	4.83E-01	2.50E-02	-	0.00E+00	NA
Manganese		6.30E-01	---	---	---	---			1.30E+01	1.00E+00	1.30E+01	-	8.19E+00	5.70E-05	-	0.00E+00	NA
Phosphorus			---	---	---	---			NA	1.00E+00	0.00E+00	-	0.00E+00	NA	-	0.00E+00	NA

Plum Brook Ordnance Works
West Area Red Water Ponds

Toxicity Data

Chemical Name	Mammals			Birds		
	LOAEL (mg/kg/d)	Test Species	Body Wt. (kg)	LOAEL (mg/kg/d)	Test Species	Body Wt. (kg)
Organics						
2-Amino-4,6-Dinitrotoluene	1.39E+02	rat	0.35	1.78E+01	bobwhite quail	0.19
Inorganics						
Aluminum	1.93E+01	mouse	0.03	1.10E+03	ringed dove	0.155
Arsenic	1.26E+00	mouse	0.03	7.38E+00	cowbird	0.049
Calcium	5.27E+03	rabbit	3.8	1.42E+04	Jap. Quail	0.072
Copper	1.51E+01	mink	1	6.17E+01	chicks	0.534
Iron	1.30E+02	rabbit	3.8	2.50E+02	poultry	1.6
Lead	8.00E+01	rat	0.35	3.85E+01	Am. Kestrel	0.13
Manganese	2.84E+02	rat	0.35	9.77E+03	Jap. Quail	0.072
Phosphorus	2.63E+03	rabbit	3.8	2.00E+03	poultry	1.6

Piscivorous Bird: **Great Blue Heron *(Ardea herodias)***

Chemical Name	LOAEL	Uncertainty Factor	Adjusted LOAEL	Foraging Factor (sed./sw.)	Sediment Intake (mg/kg-d)	Sediment Hazard Quotient	Fish Intake (mg/kg-d)	Fish Hazard Quotient	Macroinvert Intake (mg/kg-d)	Macroinvert Hazard Quotient	Total Intake Hazard Quotient	Water Intake (mg/kg-d)	Water Hazard Quotient	Overall Hazard Index
Organics														
2-Amino-4,6-Dinitrotoluene	1.78E+01	1.00E+00	1.78E+01	1.00E+00	5.02E-04	2.82E-05	0.00E+00	0.00E+00	1.41E-01	7.90E-03	7.92E-03	0.00E+00	0.00E+00	7.92E-03
Inorganics														
Aluminum	1.10E+03	1.00E+00	1.10E+03	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Arsenic	7.38E+00	1.00E+00	7.38E+00	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Calcium	1.42E+04	1.00E+00	1.42E+04	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Copper	6.17E+01	1.00E+00	6.17E+01	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Iron	2.50E+02	1.00E+00	2.50E+02	1.00E+00	6.70E+01	2.68E-01	3.26E+01	1.30E-01	6.92E-03	2.77E-05	3.99E-01	4.72E-01	1.89E-03	4.00E-01
Lead	3.85E+01	1.00E+00	3.85E+01	1.00E+00	0.00E+00	0.00E+00	8.42E-02	2.19E-03	0.00E+00	0.00E+00	2.19E-03	9.53E-04	2.47E-05	2.21E-03
Manganese	9.77E+03	1.00E+00	9.77E+03	1.00E+00	0.00E+00	0.00E+00	1.43E+00	1.46E-04	0.00E+00	0.00E+00	1.46E-04	2.86E-02	2.93E-06	1.49E-04
Phosphorus	2.00E+03	1.00E+00	2.00E+03	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TOTAL						**2.68E-01**		**1.33E-01**		**2.77E-05**	**4.01E-01**		**1.92E-03**	**4.03E-01**

Body Weight (kg)	2.204
Water intake (L/d)	0.1
Food intake (kg(dw)/d)	0.4
Sediment intake (kg/d)	0.0079
Fish intake (kg(dw)/d) -- 96% of diet	0.384
Macroinvert intake (kg(dw)/d) -- 4% of diet	0.016

Plum Brook Ordnance Works
West Area Red Water Ponds

Omnivorous mammal: **Raccoon *(Procyon lotor)***

Chemical Name	LOAEL	Uncertainty Factor	Adjusted LOAEL	Foraging Factor (sed./sw.)	Sediment Intake (mg/kg-d)	Sediment Hazard Quotient	Aq. Invert. Intake (mg/kg-d)	Aq. Invert. Hazard Quotient	Fish Intake (mg/kg-d)	Fish Hazard Quotient	Total Intake Hazard Quotient	Water Intake (mg/kg-d)	Water Hazard Quotient	Overall Hazard Index
Organics														
2-Amino-4,6-Dinitrotoluene	7.11E+01	1.00E+00	7.11E+01	1.00E+00	3.29E-04	4.63E-06	2.07E-01	2.91E-03	0.00E+00	0.00E+00	2.92E-03	0.00E+00	0.00E+00	2.92E-03
Inorganics														
Aluminum	5.34E+00	1.00E+00	5.34E+00	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Arsenic	3.49E-01	1.00E+00	3.49E-01	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Calcium	4.89E+03	1.00E+00	4.89E+03	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Copper	1.01E+01	1.00E+00	1.01E+01	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Iron	1.21E+02	1.00E+00	1.21E+02	1.00E+00	4.40E+01	3.64E-01	1.02E-02	8.45E-05	1.91E-01	1.58E-03	3.66E-01	4.38E-01	3.63E-03	3.70E-01
Lead	4.09E+01	1.00E+00	4.09E+01	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.92E-04	1.20E-05	1.20E-05	8.85E-04	2.16E-05	3.36E-05
Manganese	1.45E+02	1.00E+00	1.45E+02	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.35E-03	5.74E-05	5.74E-05	2.66E-02	1.83E-04	2.40E-04
Phosphorus	2.44E+03	1.00E+00	2.44E+03	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TOTAL						**3.64E-01**		**8.45E-05**		**1.65E-03**	**3.66E-01**		**3.83E-03**	**3.70E-01**

Body Weight (kg)	5.1
Water intake (L/d)	0.215
Food intake (kg(dw)/d)	0.26
Sediment intake (kg/d)	0.012
Aquatic Invert. Intake (kg(dw)/d – 21% of diet	0.0546
Fish intake (kg(dw)/d) -- 2% of diet	0.0052

Plum Brook Ordnance Works
West Area Red Water Ponds
Reasonable Maximum Exposure

Chemical Data

Chemical Name	Sediment Conc. (mg/kg)	Water Conc. (mg/L)	log Kow (organics)	Kow (organics)	log Koc (organics) (mL/g)	Koc (organics) (mL/g)	Kd (inorganics) (mL/g)	Foc	Water-to-Fish BCF	Food Chain Multiplier	Water-to-Fish BAF	Fish Conc. (mg/kgww)	Fish Conc. (mg/kgdw)	Sediment-to-Invertebrate BCF	Invert. Conc. (mg/kgww)	Invert Conc. (mg/kgdw)	Food-to-Muscle TF
Organics																	
2-Amino-4,6-Dinitrotoluene	3.00E-01		2.00E+00	1.00E+02	1.97E+00	9.25E+01	---	6.70E-02	1.00E+02	1.00E+00	1.00E+02	0.00E+00	0.00E+00	4.84E-02	4.84E+00	1.94E+01	2.14E-06
Inorganics																	
Aluminum			---	---	---	---	1.50E+03	6.70E-02	1.50E+01	1.00E+00	1.50E+01	-	0.00E+00	3.50E-03	-	0.00E+00	NA
Arsenic			---	---	---	---	2.00E+02	6.70E-02	4.00E+01	1.00E+00	4.00E+01	-	0.00E+00	2.20E-01	-	0.00E+00	4.00E-03
Calcium			---	---	---	---	4.10E+00	6.70E-02	3.02E+02	1.00E+00	3.02E+02	-	0.00E+00	3.30E-02	-	0.00E+00	2.00E-03
Copper			---	---	---	---	3.50E+01	6.70E-02	1.02E+02	1.00E+00	1.02E+02	-	0.00E+00	1.30E-01	-	0.00E+00	NA
Iron	2.43E+04	2.11E+01	---	---	---	---	5.00E+03	6.70E-02	1.80E+01	1.00E+00	1.80E+01	-	3.80E+02	1.50E-02	-	3.65E+02	NA
Lead		7.70E-02	---	---	---	---	4.00E+02	6.70E-02	3.60E+01	1.00E+00	4.30E+01	-	3.31E+00	2.50E-02	-	0.00E+00	NA
Manganese		1.60E+00	---	---	---	---	1.00E+03	6.70E-02	1.30E+01	1.00E+00	1.30E+01	-	2.08E+01	6.00E-03	-	0.00E+00	NA
Phosphorus			---	---	---	---	3.50E+00	6.70E-02	NA	1.00E+00	0.00E+00	-	0.00E+00	0.00E+00	-	0.00E+00	NA

Plum Brook Ordnance Works
West Area Red Water Ponds

Toxicity Data

Chemical Name	Mammals			Birds		
	NOAEL (mg/kg/d)	Test Species	Body Wt. (kg)	NOAEL (mg/kg/d)	Test Species	Body Wt. (kg)
Organics						
2-Amino-4,6-Dinitrotoluene	1.39E+01	rat	0.35	7.00E-01	Bobwhite quail	0.19
Inorganics						
Aluminum	1.93E+00	mouse	0.03	1.10E+02	ringed dove	0.155
Arsenic	1.26E-01	mouse	0.03	2.46E+00	cowbird	0.049
Calcium	1.05E+03	rabbit	3.8	2.83E+03	Jap. Quail	0.072
Copper	1.17E+01	mink	1	4.70E+01	chicks	0.534
Iron	2.60E+01	rabbit	3.8	5.00E+01	poultry	1.6
Lead	8.00E+00	rat	0.35	3.85E+00	Am. Kestrel	0.13
Manganese	8.80E+01	rat	0.35	9.77E+02	Jap. Quail	0.072
Phosphorus	5.26E+02	rabbit	3.8	4.00E+02	poultry	1.6

Piscivorous Bird: **Great Blue Heron *(Ardea herodias)***

Chemical Name	NOAEL	Uncertainty Factor	Adjusted NOAEL	Foraging Factor (sed./sw.)	Sediment Intake (mg/kg-d)	Sediment Hazard Quotient	Fish Intake (mg/kg-d)	Fish Hazard Quotient	Macroinvert Intake (mg/kg-d)	Macroinvert Hazard Quotient	Total Intake Hazard Quotient	Water Intake (mg/kg-d)	Water Hazard Quotient	Overall Hazard Index
Organics														
2-Amino-4,6-Dinitrotoluene	7.00E-01	8.00E+00	8.75E-02	1.00E+00	1.08E-03	1.23E-02	0.00E+00	0.00E+00	1.41E-01	1.61E+00	1.62E+00	0.00E+00	0.00E+00	1.62E+00
Inorganics														
Aluminum	1.10E+02	8.00E+00	1.38E+01	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Arsenic	2.46E+00	8.00E+00	3.08E-01	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Calcium	2.83E+03	8.00E+00	3.54E+02	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Copper	4.70E+01	8.00E+00	5.88E+00	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Iron	5.00E+01	8.00E+00	6.25E+00	1.00E+00	8.71E+01	1.39E+01	6.62E+01	1.06E+01	2.65E+00	4.23E-01	2.49E+01	9.57E-01	1.53E-01	2.51E+01
Lead	3.85E+00	8.00E+00	4.81E-01	1.00E+00	0.00E+00	0.00E+00	5.77E-01	1.20E+00	0.00E+00	0.00E+00	1.20E+00	3.49E-03	7.26E-03	1.21E+00
Manganese	9.77E+02	8.00E+00	1.22E+02	1.00E+00	0.00E+00	0.00E+00	3.62E+00	2.97E-02	0.00E+00	0.00E+00	2.97E-02	7.26E-02	5.94E-04	3.03E-02
Phosphorus	4.00E+02	8.00E+00	5.00E+01	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TOTAL						**1.39E+01**		**1.18E+01**		**4.23E-01**	**2.62E+01**		**1.61E-01**	**2.63E+01**

Body Weight (kg)	2.204
Water intake (L/d)	0.1
Food intake (kg(dw)/d)	0.4
Sediment intake (kg/d)	0.0079
Fish intake (kg(dw)/d) -- 96% of diet	0.384
Macroinvert intake (kg(dw)/d) -- 4% of diet	0.016

Plum Brook Ordnance Works
West Area Red Water Ponds

Omnivorous mammal: **Raccoon *(Procyon lotor)***

Chemical Name	NOAEL	Uncertainty Factor	Adjusted NOAEL	Foraging Factor (sed./sw.)	Sediment Intake (mg/kg-d)	Sediment Hazard Quotient	Aq. Invert. Intake (mg/kg-d)	Aq. Invert. Hazard Quotient	Fish Intake (mg/kg-d)	Fish Hazard Quotient	Total Intake Hazard Quotient	Water Intake (mg/kg-d)	Water Hazard Quotient	Overall Hazard Index
Organics														
2-Amino-4,6-Dinitrotoluene	7.11E+00	8.00E+00	8.89E-01	1.00E+00	7.06E-04	7.94E-04	2.07E-01	2.33E-01	0.00E+00	0.00E+00	2.34E-01	0.00E+00	0.00E+00	2.34E-01
Inorganics														
Aluminum	5.34E-01	8.00E+00	6.68E-02	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Arsenic	3.49E-02	8.00E+00	4.36E-03	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Calcium	9.78E+02	8.00E+00	1.22E+02	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Copper	7.79E+00	8.00E+00	9.73E-01	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Iron	2.42E+01	8.00E+00	3.02E+00	1.00E+00	5.72E+01	1.89E+01	3.90E+00	1.29E+00	3.87E-01	1.28E-01	2.04E+01	8.90E-01	2.95E-01	2.07E+01
Lead	4.09E+00	8.00E+00	5.12E-01	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.38E-03	6.60E-03	6.60E-03	3.25E-03	6.34E-03	1.29E-02
Manganese	4.50E+01	8.00E+00	5.63E+00	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.12E-02	3.77E-03	3.77E-03	6.75E-02	1.20E-02	1.57E-02
Phosphorus	4.89E+02	8.00E+00	6.11E+01	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TOTAL						**1.89E+01**		**1.29E+00**		**1.39E-01**	**2.04E+01**		**3.13E-01**	**2.07E+01**

Body Weight (kg)	5.1
Water intake (L/d)	0.215
Food intake (kg(dw)/d)	0.26
Sediment intake (kg/d)	0.012
Aquatic Invert. Intake (kg(dw)/d -- 21% of diet	0.0546
Fish intake (kg(dw)/d) -- 2% of diet	0.0052

Plum Brook Ordnance Works
Pentolite Road Red Water Ponds

Chemical Data

Chemical Name	Surface Soil Conc. (mg/kg)	Total Soil Conc. (mg/kg)	Water Conc. (mg/L)	log Kow (organics)	Soil-to-Plant TF	Shallow-rooted Plant Conc. (mg/kgdw)	Deep-rooted Plant Conc. (mg/kgdw)	Soil-to-Invert. BAF	Invert. Conc. (mg/kgdw)	Food-to-Muscle TF
Organics										
1,3-DNB	2.00E-01	4.80E-01		1.49E+00	5.33E+00	1.07E+00	2.56E+00	1.00E-01	2.00E-02	6.37E-07
4-Amino-2,6-DNT				2.00E+00	2.70E+00	0.00E+00	0.00E+00	1.00E-01	0.00E+00	2.14E-06
Nitrobenzene				1.87E+00	3.21E+00	0.00E+00	0.00E+00	1.00E-01	0.00E+00	1.57E-06
1,3,5-TNB	2.00E-01	1.80E+00		1.18E+00	8.05E+00	1.61E+00	1.45E+01	1.00E-01	2.00E-02	3.05E-07
Inorganics										
Aluminum				---	NA	0.00E+00	0.00E+00	NA	0.00E+00	NA
Antimony				---	5.60E-04	0.00E+00	0.00E+00	1.00E+00	0.00E+00	4.00E-05
Iron				---	NA	0.00E+00	0.00E+00	NA	0.00E+00	NA
Magnesium				---	7.80E-01	0.00E+00	0.00E+00	1.00E+00	0.00E+00	2.00E-02
Manganese				---	NA	0.00E+00	0.00E+00	NA	0.00E+00	NA
Potassium				---	7.80E-01	0.00E+00	0.00E+00	1.00E+00	0.00E+00	2.00E-02

Plum Brook Ordnance Works
Pentolite Road Red Water Ponds

Toxicity Data

Chemical Name	Mammals			Birds		
	LOAEL (mg/kg/d)	Test Species	Body Wt. (kg)	LOAEL (mg/kg/d)	Test Species	Body Wt. (kg)
Organics						
1,3-DNB	1.13E+00	rat	0.35	4.20E+00	red winged black bird	0.077
4-Amino-2,6-DNT	9.59E+01	rat	0.35	1.78E+01	Bobwhite quail	0.19
Nitrobenzene	2.30E+00	rat	0.03	4.20E+00	red winged black bird	0.077
1,3,5-TNB	1.33E+01	rat	0.35	4.20E+00	red winged black bird	0.077
Inorganics						
Aluminum	1.93E+01	mouse	0.03	1.10E+03	ringed dove	0.155
Antimony	1.25E+00	mouse	0.03	--	--	--
Iron	1.30E+02	rabbit	3.8	2.50E+02	poultry	1.6
Magnesium	7.90E+02	rabbit	3.8	7.50E+02	poultry	1.6
Manganese	2.84E+02	rat	0.35	9.77E+03	Jap. Quail	0.072
Potassium	7.90E+03	rabbit	3.8	5.00E+03	poultry	1.6

Plum Brook Ordnance Site
Pentolite Road Red Water Ponds

Omnivorous Rodent: **Deer mouse *(Peromyscus manicalatus)***

Chemical Name	LOAEL	Uncertainty Factor	Adjusted LOAEL	Foraging Factor (soil)	Foraging Factor (sw)	Soil Intake (mg/kg-d)	Soil Intake Hazard Quotient	Plant Intake (mg/kg-d)	Plant Intake Hazard Quotient	Invert. Intake (mg/kg-d)	Invert. Intake Hazard Quotient	Soil/Plant/Invert. Hazard Quotient	Water Intake (mg/kg-d)	Water Hazard Quotient	Overall Hazard Index	Tissue Conc. mg/kg(dw)
Organics																
1,3-DNB	2.49E+00	1.00E+00	2.49E+00	1.00E+00	1.00E+00	7.70E-04	3.09E-04	1.23E-01	4.94E-02	1.48E-03	5.92E-04	5.03E-02	0.00E+00	0.00E+00	5.03E-02	9.35E-07
4-Amino-2,6-DNT	2.11E+02	1.00E+00	2.11E+02	1.00E+00	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nitrobenzene	2.74E+00	1.00E+00	2.74E+00	1.00E+00	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1,3,5-TNB	2.94E+01	1.00E+00	2.94E+01	1.00E+00	1.00E+00	7.70E-04	2.62E-05	1.86E-01	6.33E-03	1.48E-03	5.03E-05	6.41E-03	0.00E+00	0.00E+00	6.41E-03	6.71E-07
Inorganics																
Aluminum	2.30E+01	1.00E+00	2.30E+01	1.00E+00	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Antimony	1.49E+00	1.00E+00	1.49E+00	1.00E+00	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Iron	5.20E+02	1.00E+00	5.20E+02	1.00E+00	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Magnesium	3.16E+03	1.00E+00	3.16E+03	1.00E+00	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Manganese	6.26E+02	1.00E+00	6.26E+02	1.00E+00	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Potassium	3.16E+04	1.00E+00	3.16E+04	1.00E+00	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TOTAL							**3.35E-04**		**5.57E-02**		**6.42E-04**	**5.67E-02**		**0.00E+00**	**5.67E-02**	

Body Weight (kg)	0.0148
Water intake (L/d)	0.0022
Food intake (kg(dw)/d)	0.0028
Soil intake (kg/d)	0.000057
Plant intake (kg(dw)/d) -- 61% of diet	0.001708
Invertebrate intake (kg(dw)/d) -- 39% of diet	0.001092

Plum Brook Ordnance Works
Pentolite Road Red Water Ponds

Opportunistic Omnivore: **Raccoon *(Procyon lotor)***

Chemical Name	LOAEL	Uncertainty Factor	Adjusted LOAEL	Foraging Factor (soil)	Foraging Factor (sw)	Soil Intake (mg/kg-d)	Soil Intake Hazard Quotient	Plant Intake (mg/kg-d)	Plant Intake Hazard Quotient	Invert. Intake (mg/kg-d)	Invert. Intake Hazard Quotient	Mouse Intake (mg/kg-d)	Mouse Intake Hazard Quotient	Total Intake Hazard Quotient	Water Intake (mg/kg-d)	Water Hazard Quotient	Overall Hazard Index
Organics																	
1,3-DNB	5.78E-01	1.00E+00	5.78E-01	1.00E+00	1.00E+00	4.71E-04	8.14E-04	2.28E-02	3.95E-02	3.06E-04	5.29E-04	2.38E-09	4.12E-09	4.08E-02	0.00E+00	0.00E+00	4.08E-02
4-Amino-2,6-DNT	4.91E+01	1.00E+00	4.91E+01	1.00E+00	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nitrobenzene	6.37E-01	1.00E+00	6.37E-01	1.00E+00	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1,3,5-TNB	6.81E+00	1.00E+00	6.81E+00	1.00E+00	1.00E+00	4.71E-04	6.91E-05	3.45E-02	5.06E-03	3.06E-04	4.49E-05	1.71E-09	2.51E-10	5.18E-03	0.00E+00	0.00E+00	5.18E-03
Inorganics																	
Aluminum	5.34E+00	1.00E+00	5.34E+00	1.00E+00	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Antimony	3.46E-01	1.00E+00	3.46E-01	1.00E+00	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Iron	1.21E+02	1.00E+00	1.21E+02	1.00E+00	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Magnesium	7.34E+02	1.00E+00	7.34E+02	1.00E+00	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Manganese	1.45E+02	1.00E+00	1.45E+02	1.00E+00	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Potassium	7.34E+03	1.00E+00	7.34E+03	1.00E+00	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TOTAL							**8.83E-04**		**4.45E-02**		**5.74E-04**		**4.37E-09**	**4.60E-02**		**0.00E+00**	**4.60E-02**

Body Weight (kg)	5.1
Water intake (L/d)	0.43
Food intake (kg(dw)/d)	0.26
Soil intake (kg/d)	0.012
Mouse Intake (kg(dw)/d) -- 5 % of diet	0.013
Plant intake (kg(dw)/d) -- 42% of diet	0.1092
Invertebrate intake (kg(dw)/d) -- 30% of diet	0.078

Plum Brook Ordnance Works
Pentolite Road Red Water Ponds

Herbivorous Rodent: **Eastern Cottontail *(Sylvilagus floridanus)***

Chemical Name	LOAEL	Uncertainty Factor	Adjusted LOAEL	Foraging Factor (soil)	Foraging Factor (sw)	Soil Intake (mg/kg-d)	Soil Intake Hazard Quotient	Plant Intake (mg/kg-d)	Plant Hazard Quotient	Soil/Plant Hazard Quotient	Water Intake (mg/kg-d)	Water Hazard Quotient	Overall Hazard Index	Tissue Conc. mg/kg(dw)
Organics														
1,3-DNB	1.51E+00	1.00E+00	1.51E+00	1.00E+00	1.00E+00	1.06E-03	7.02E-04	9.04E-02	5.99E-02	6.06E-02	0.00E+00	0.00E+00	6.06E-02	2.02E-06
4-Amino-2,6-DNT	1.28E+02	1.00E+00	1.28E+02	1.00E+00	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nitrobenzene	1.66E+00	1.00E+00	1.66E+00	1.00E+00	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1,3,5-TNB	1.78E+01	1.00E+00	1.78E+01	1.00E+00	1.00E+00	1.06E-03	5.96E-05	1.37E-01	7.68E-03	7.74E-03	0.00E+00	0.00E+00	7.74E-03	1.45E-06
Inorganics														
Aluminum	1.39E+01	1.00E+00	1.39E+01	1.00E+00	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Antimony	9.03E-01	1.00E+00	9.03E-01	1.00E+00	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Iron	3.15E+02	1.00E+00	3.15E+02	1.00E+00	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Magnesium	1.92E+03	1.00E+00	1.92E+03	1.00E+00	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Manganese	3.79E+02	1.00E+00	3.79E+02	1.00E+00	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Potassium	1.91E+04	1.00E+00	1.91E+04	1.00E+00	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TOTAL							**7.62E-04**		**6.76E-02**	**6.84E-02**		**0.00E+00**	**6.84E-02**	

Body Weight (kg)	1.132
Water intake (L/d)	0.11
Food intake (kg(dw)/d)	0.096
Soil intake (kg/d)	0.006
Plant intake (kg(dw)/d) -- 100% of diet	0.096

Plum Brook Ordnance Works
Pentolite Road Red Water Ponds

Insectivorous mammal: **Short-tailed shrew *(Blarina brevicauda)***

Chemical Name	LOAEL	Uncertainty Factor	Adjusted LOAEL	Foraging Factor (soil)	Foraging Factor (sw)	Soil Intake (mg/kg-d)	Soil Intake Hazard Quotient	Invert. Intake (mg/kg-d)	Invert. Intake Hazard Quotient	Soil/Invert. Hazard Quotient	Water Intake (mg/kg-d)	Water Hazard Quotient	Overall Hazard Index	Tissue Conc. mg/kg(dw)
Organics														
1,3-DNB	3.97E+00	1.00E+00	3.97E+00	1.00E+00	1.00E+00	2.66E-02	6.69E-03	1.07E-02	2.69E-03	9.38E-03	0.00E+00	0.00E+00	9.38E-03	1.26E-07
4-Amino-2,6-DNT	3.37E+02	1.00E+00	3.37E+02	1.00E+00	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nitrobenzene	4.37E+00	1.00E+00	4.37E+00	1.00E+00	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1,3,5-TNB	4.67E+01	1.00E+00	4.67E+01	1.00E+00	1.00E+00	9.96E-02	2.13E-03	1.07E-02	2.28E-04	2.36E-03	0.00E+00	0.00E+00	2.36E-03	1.78E-07
Inorganics														
Aluminum	3.67E+01	1.00E+00	3.67E+01	1.00E+00	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Antimony	2.38E+00	1.00E+00	2.38E+00	1.00E+00	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Iron	8.29E+02	1.00E+00	8.29E+02	1.00E+00	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Magnesium	5.04E+03	1.00E+00	5.04E+03	1.00E+00	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Manganese	9.97E+02	1.00E+00	9.97E+02	1.00E+00	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Potassium	5.03E+04	1.00E+00	5.03E+04	1.00E+00	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TOTAL							**8.82E-03**		**2.92E-03**	**1.17E-02**		**0.00E+00**	**1.17E-02**	

Body Weight (kg)	0.015
Water intake (L/d)	0.0023
Food intake (kg(dw)/d)	0.008
Soil intake (kg/d)	0.00083
Invertebrate intake (kg(dw)/d)--100% of diet	0.008

Plum Brook Ordnance Works
Pentolite Road Red Water Ponds

Herbivorous Mammal: **White-tailed deer *(Odocoileus virginianus)***

Chemical Name	LOAEL	Uncertainty Factor	Adjusted LOAEL	Foraging Factor (soil)	Foraging Factor (sw)	Soil Intake (mg/kg-d)	Soil Intake Hazard Quotient	Plant Intake (mg/kg-d)	Plant Intake Hazard Quotient	Soil/Plant Hazard Quotient	Water Intake (mg/kg-d)	Water Hazard Quotient	Overall Hazard Index
Organics													
1,3-DNB	6.15E-01	1.00E+00	6.15E-01	1.00E-02	1.00E-02	1.31E-06	2.13E-06	8.39E-04	1.37E-03	1.37E-03	0.00E+00	0.00E+00	1.37E-03
4-Amino-2,6-DNT	5.22E+01	1.00E+00	5.22E+01	1.00E-02	1.00E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nitrobenzene	6.77E-01	1.00E+00	6.77E-01	1.00E-02	1.00E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1,3,5-TNB	7.24E+00	1.00E+00	7.24E+00	1.00E-02	1.00E-02	1.31E-06	1.81E-07	4.75E-03	6.57E-04	6.57E-04	0.00E+00	0.00E+00	6.57E-04
Inorganics													
Aluminum	5.68E+00	1.00E+00	5.68E+00	1.00E-02	1.00E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Antimony	3.68E-01	1.00E+00	3.68E-01	1.00E-02	1.00E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Iron	1.28E+02	1.00E+00	1.28E+02	1.00E-02	1.00E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Magnesium	7.80E+02	1.00E+00	7.80E+02	1.00E-02	1.00E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Manganese	1.54E+02	1.00E+00	1.54E+02	1.00E-02	1.00E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Potassium	7.79E+03	1.00E+00	7.79E+03	1.00E-02	1.00E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TOTAL							**2.32E-06**		**2.02E-03**	**2.02E-03**		**0.00E+00**	**2.02E-03**

Body Weight (kg)	61
Water intake (L/d)	4
Food intake (kg(dw)/d)	2
Soil intake (kg/d)	0.04
Plant intake (kg(dw)/d) -- 100% of diet	2

Plum Brook Ordnance Works
Pentolite Road Red Water Ponds

Insectivorous Bird: **Marsh wren *(Cistothorus palustris)***

Chemical Name	LOAEL	Uncertainty Factor	Adjusted LOAEL	Foraging Factor (soil)	Foraging Factor (sw)	Soil Intake (mg/kg-d)	Soil Intake Hazard Quotient	Invert. Intake (mg/kg-d)	Invert. Intake Hazard Quotient	Soil/Invert. Hazard Quotient	Water Intake (mg/kg-d)	Water Hazard Quotient	Overall Hazard Index	Tissue Conc. mg/kg(dw)
Organics														
1,3-DNB	4.20E+00	1.00E+00	4.20E+00	1.00E+00	1.00E+00	3.80E-03	9.05E-04	1.90E-02	4.52E-03	5.43E-03	0.00E+00	0.00E+00	5.43E-03	4.68E-08
4-Amino-2,6-DNT	1.78E+01	1.00E+00	1.78E+01	1.00E+00	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nitrobenzene	4.20E+00	1.00E+00	4.20E+00	1.00E+00	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1,3,5-TNB	4.20E+00	1.00E+00	4.20E+00	1.00E+00	1.00E+00	3.80E-03	9.05E-04	1.90E-02	4.52E-03	5.43E-03	0.00E+00	0.00E+00	5.43E-03	2.24E-08
Inorganics														
Aluminum	1.10E+03	1.00E+00	1.10E+03	1.00E+00	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Antimony	0.00E+00	1.00E+00	0.00E+00	1.00E+00	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Iron	2.50E+02	1.00E+00	2.50E+02	1.00E+00	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Magnesium	7.50E+02	1.00E+00	7.50E+02	1.00E+00	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Manganese	9.77E+03	1.00E+00	9.77E+03	1.00E+00	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Potassium	5.00E+03	1.00E+00	5.00E+03	1.00E+00	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TOTAL							**1.81E-03**		**9.05E-03**	**1.09E-02**		**0.00E+00**	**1.09E-02**	

Body Weight (kg)	0.01
Water intake (L/d)	0.0027
Food intake (kg(dw)/d)	0.0095
Soil intake (kg/d)	0.00019
Plant intake (kg(dw)/d) -- 0% of diet	0
Invertebrate intake (kg(dw)/d) -- 100% of die	0.0095

Plum Brook Ordnance Works
Pentolite Road Red Water Ponds

Chemical Data

Chemical Name	Surface Soil Conc. (mg/kg)	Total Soil Conc. (mg/kg)	Water Conc. (mg/L)	log Kow (organics)	Soil-to-Plant TF	Shallow-rooted Plant Conc. (mg/kgdw)	Deep-rooted Plant Conc. (mg/kgdw)	Soil-to-Invert. BAF	Invert. Conc. (mg/kgdw)	Food-to-Muscle TF
Organics										
1,3-DNB	1.25E-01	1.25E-01		1.49E+00	5.33E+00	6.66E-01	6.66E-01	1.00E-01	1.25E-02	6.37E-07
4-Amino-2,6-DNT				2.00E+00	2.70E+00	0.00E+00	0.00E+00	1.00E-01	0.00E+00	2.14E-06
Nitrobenzene				1.87E+00	3.21E+00	0.00E+00	0.00E+00	1.00E-01	0.00E+00	1.57E-06
1,3,5-TNB	1.25E-01	1.25E-01		1.18E+00	8.05E+00	1.01E+00	1.01E+00	1.00E-01	1.25E-02	3.05E-07
Inorganics										
Aluminum				---	NA	0.00E+00	0.00E+00	NA	0.00E+00	NA
Antimony				---	5.60E-04	0.00E+00	0.00E+00	1.00E+00	0.00E+00	4.00E-05
Iron				---	NA	0.00E+00	0.00E+00	NA	0.00E+00	NA
Magnesium				---	7.80E-01	0.00E+00	0.00E+00	1.00E+00	0.00E+00	2.00E-02
Manganese				---	NA	0.00E+00	0.00E+00	NA	0.00E+00	NA
Potassium				---	7.80E-01	0.00E+00	0.00E+00	1.00E+00	0.00E+00	2.00E-02

Plum Brook Ordnance Works
Pentolite Road Red Water Ponds

Toxicity Data

Chemical Name	Mammals NOAEL (mg/kg/d)	Mammals Test Species	Mammals Body Wt. (kg)	Birds NOAEL (mg/kg/d)	Birds Test Species	Birds Body Wt. (kg)
Organics						
1,3-DNB	1.13E-01	rat	0.35	4.20E-01	red winged black bird	0.077
4-Amino-2,6-DNT	9.59E+00	rat	0.35	7.00E-01	Bobwhite quail	0.19
Nitrobenzene	2.30E-01	rat	0.35	4.20E-01	red winged black bird	0.077
1,3,5-TNB	2.68E+00	rat	0.35	4.20E-01	red winged black bird	0.077
Inorganics						
Aluminum	1.93E+00	mouse	0.03	1.10E+02	ringed dove	0.155
Antimony	1.25E-01	mouse	0.03	--	--	--
Iron	2.60E+01	rabbit	3.8	5.00E+01	poultry	1.6
Magnesium	1.58E+02	rabbit	3.8	1.50E+02	poultry	1.6
Manganese	8.80E+01	rat	0.35	9.77E+02	Jap. Quail	0.072
Potassium	1.58E+03	rabbit	3.8	1.00E+03	poultry	1.6

Plum Brook Ordnance Site
Pentolite Road Red Water Ponds

Omnivorous Rodent: **Deer mouse *(Peromyscus manicalatus)***

Chemical Name	NOAEL	Uncertainty Factor	Adjusted NOAEL	Foraging Factor (soil)	Foraging Factor (sw)	Soil Intake (mg/kg-d)	Soil Intake Hazard Quotient	Plant Intake (mg/kg-d)	Plant Intake Hazard Quotient	Invert. Intake (mg/kg-d)	Invert. Intake Hazard Quotient	Soil/Plant/Invert. Hazard Quotient	Water Intake (mg/kg-d)	Water Hazard Quotient	Overall Hazard Index	Tissue Conc. mg/kg(dw)
Organics																
1,3-DNB	2.49E-01	8.00E+00	3.11E-02	1.00E+00	1.00E+00	4.81E-04	1.55E-02	7.69E-02	2.47E+00	9.22E-04	2.96E-02	2.51E+00	0.00E+00	0.00E+00	2.51E+00	5.84E-07
4-Amino-2,6-DNT	2.11E+01	8.00E+00	2.64E+00	1.00E+00	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nitrobenzene	5.07E-01	8.00E+00	6.34E-02	1.00E+00	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1,3,5-TNB	5.91E+00	8.00E+00	7.39E-01	1.00E+00	1.00E+00	4.81E-04	6.52E-04	1.16E-01	1.57E-01	9.22E-04	1.25E-03	1.59E-01	0.00E+00	0.00E+00	1.59E-01	4.20E-07
Inorganics																
Aluminum	2.30E+00	8.00E+00	2.88E-01	1.00E+00	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Antimony	1.49E-01	8.00E+00	1.86E-02	1.00E+00	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Iron	1.04E+02	8.00E+00	1.30E+01	1.00E+00	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Magnesium	6.32E+02	8.00E+00	7.91E+01	1.00E+00	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Manganese	1.94E+02	8.00E+00	2.43E+01	1.00E+00	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Potassium	6.32E+03	8.00E+00	7.90E+02	1.00E+00	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TOTAL							**1.61E-02**		**2.63E+00**		**3.09E-02**	**2.67E+00**		**0.00E+00**	**2.67E+00**	

Body Weight (kg)	0.0148
Water intake (L/d)	0.0022
Food intake (kg(dw)/d)	0.0028
Soil intake (kg/d)	0.000057
Plant intake (kg(dw)/d) -- 61% of diet	0.001708
Invertebrate intake (kg(dw)/d) -- 39% of diet	0.001092

Plum Brook Ordnance Works
Pentolite Road Red Water Ponds

Opportunistic Omnivore: **Raccoon *(Procyon lotor)***

Chemical Name	NOAEL	Uncertainty Factor	Adjusted NOAEL	Foraging Factor (soil)	Foraging Factor (sw)	Soil Intake (mg/kg-d)	Soil Intake Hazard Quotient	Plant Intake (mg/kg-d)	Plant Intake Hazard Quotient	Invert. Intake (mg/kg-d)	Invert. Intake Hazard Quotient	Mouse Intake (mg/kg-d)	Mouse Intake Hazard Quotient	Total Intake Hazard Quotient	Water Intake (mg/kg-d)	Water Hazard Quotient	Overall Hazard Index
Organics																	
1,3-DNB	5.78E-02	8.00E+00	7.23E-03	1.00E+00	1.00E+00	2.94E-04	4.07E-02	1.43E-02	1.97E+00	1.91E-04	2.64E-02	1.49E-09	2.06E-07	2.04E+00	0.00E+00	0.00E+00	2.04E+00
4-Amino-2,6-DNT	4.91E+00	8.00E+00	6.14E-01	1.00E+00	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nitrobenzene	1.18E-01	8.00E+00	1.47E-02	1.00E+00	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1,3,5-TNB	1.37E+00	8.00E+00	1.71E-01	1.00E+00	1.00E+00	2.94E-04	1.72E-03	2.16E-02	1.26E-01	1.91E-04	1.11E-03	1.07E-09	6.24E-09	1.29E-01	0.00E+00	0.00E+00	1.29E-01
Inorganics																	
Aluminum	5.34E-01	8.00E+00	6.68E-02	1.00E+00	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Antimony	3.46E-02	8.00E+00	4.33E-03	1.00E+00	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Iron	2.42E+01	8.00E+00	3.02E+00	1.00E+00	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Magnesium	1.47E+02	8.00E+00	1.83E+01	1.00E+00	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Manganese	4.50E+01	8.00E+00	5.63E+00	1.00E+00	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Potassium	1.47E+03	8.00E+00	1.83E+02	1.00E+00	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TOTAL							**4.24E-02**		**2.10E+00**		**2.76E-02**		**2.12E-07**	**2.17E+00**		**0.00E+00**	**2.17E+00**

Body Weight (kg)	5.1
Water intake (L/d)	0.43
Food intake (kg(dw)/d)	0.26
Soil intake (kg/d)	0.012
Mouse Intake (kg(dw)/d) -- 5 % of diet	0.013
Plant Intake (kg(dw)/d) -- 42% of diet	0.1092
Invertebrate intake (kg(dw)/d) -- 30% of diet	0.078

Plum Brook Or_ _ice Works
Pentolite Road Red Water Ponds

Herbivorous Rodent: **Eastern Cottontail *(Sylvilagus floridanus)***

Chemical Name	NOAEL	Uncertainty Factor	Adjusted NOAEL	Foraging Factor (soil)	Foraging Factor (sw)	Soil Intake (mg/kg-d)	Soil Intake Hazard Quotient	Plant Intake (mg/kg-d)	Plant Hazard Quotient	Soil/Plant Hazard Quotient	Water Intake (mg/kg-d)	Water Hazard Quotient	Overall Hazard Index	Tissue Conc. mg/kg(dw)
Organics														
1,3-DNB	1.51E-01	8.00E+00	1.89E-02	1.00E+00	1.00E+00	6.63E-04	3.51E-02	5.65E-02	3.00E+00	3.03E+00	0.00E+00	0.00E+00	3.03E+00	1.26E-06
4-Amino-2,6-DNT	1.28E+01	8.00E+00	1.60E+00	1.00E+00	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nitrobenzene	3.07E-01	8.00E+00	3.84E-02	1.00E+00	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1,3,5-TNB	3.58E+00	8.00E+00	4.47E-01	1.00E+00	1.00E+00	6.63E-04	1.48E-03	8.54E-02	1.91E-01	1.92E-01	0.00E+00	0.00E+00	1.92E-01	9.09E-07
Inorganics														
Aluminum	1.39E+00	8.00E+00	1.74E-01	1.00E+00	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Antimony	9.03E-02	8.00E+00	1.13E-02	1.00E+00	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Iron	6.30E+01	4.00E+00	1.58E+01	1.00E+00	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Magnesium	3.83E+02	4.00E+00	9.58E+01	1.00E+00	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Manganese	1.18E+02	8.00E+00	1.47E+01	1.00E+00	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Potassium	3.83E+03	4.00E+00	9.57E+02	1.00E+00	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TOTAL							**3.66E-02**		**3.19E+00**	**3.22E+00**		**0.00E+00**	**3.22E+00**	

Body Weight (kg)	1.132
Water intake (L/d)	0.11
Food intake (kg(dw)/d)	0.096
Soil intake (kg/d)	0.006
Plant intake (kg(dw)/d) -- 100% of diet	0.096

Plum Brook Ordnance Works
Pentolite Road Red Water Ponds

Insectivorous mammal: **Short-tailed shrew *(Blarina brevicauda)***

Chemical Name	NOAEL	Uncertainty Factor	Adjusted NOAEL	Foraging Factor (soil)	Foraging Factor (sw)	Soil Intake (mg/kg-d)	Soil Intake Hazard Quotient	Invert. Intake (mg/kg-d)	Invert. Intake Hazard Quotient	Soil/Invert. Hazard Quotient	Water Intake (mg/kg-d)	Water Hazard Quotient	Overall Hazard Index	Tissue Conc. mg/kg(dw)
Organics														
1,3-DNB	3.97E-01	8.00E+00	4.96E-02	1.00E+00	1.00E+00	6.92E-03	1.39E-01	6.67E-03	1.34E-01	2.74E-01	0.00E+00	0.00E+00	2.74E-01	4.59E-08
4-Amino-2,6-DNT	3.37E+01	8.00E+00	4.21E+00	1.00E+00	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nitrobenzene	8.08E-01	8.00E+00	1.01E-01	1.00E+00	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1,3,5-TNB	9.41E+00	8.00E+00	1.18E+00	1.00E+00	1.00E+00	6.92E-03	5.88E-03	6.67E-03	5.67E-03	1.15E-02	0.00E+00	0.00E+00	1.15E-02	2.20E-08
Inorganics														
Aluminum	3.67E+00	8.00E+00	4.58E-01	1.00E+00	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Antimony	2.38E-01	8.00E+00	2.97E-02	1.00E+00	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Iron	1.66E+02	8.00E+00	2.07E+01	1.00E+00	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Magnesium	1.01E+03	8.00E+00	1.26E+02	1.00E+00	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Manganese	3.09E+02	8.00E+00	3.86E+01	1.00E+00	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Potassium	1.01E+04	8.00E+00	1.26E+03	1.00E+00	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TOTAL							**1.45E-01**		**1.40E-01**	**2.85E-01**		**0.00E+00**	**2.85E-01**	

Body Weight (kg)	0.015
Water intake (L/d)	0.0023
Food intake (kg(dw)/d)	0.008
Soil intake (kg/d)	0.00083
Invertebrate intake (kg(dw)/d)--100% of diet	0.008

Plum Brook Or... ...nce Works
Pentolite Road Red Water Ponds

Herbivorous Mammal: **White-tailed deer *(Odocoileus virginianus)***

Chemical Name	NOAEL	Uncertainty Factor	Adjusted NOAEL	Foraging Factor (soil)	Foraging Factor (sw)	Soil Intake (mg/kg-d)	Soil Intake Hazard Quotient	Plant Intake (mg/kg-d)	Plant Intake Hazard Quotient	Soil/Plant Hazard Quotient	Water Intake (mg/kg-d)	Water Hazard Quotient	Overall Hazard Index
Organics													
1,3-DNB	6.15E-02	8.00E+00	7.68E-03	1.00E-02	1.00E-02	8.20E-07	1.07E-04	2.18E-04	2.84E-02	2.85E-02	0.00E+00	0.00E+00	2.85E-02
4-Amino-2,6-DNT	5.22E+00	8.00E+00	6.52E-01	1.00E-02	1.00E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nitrobenzene	1.25E-01	8.00E+00	1.56E-02	1.00E-02	1.00E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1,3,5-TNB	1.46E+00	8.00E+00	1.82E-01	1.00E-02	1.00E-02	8.20E-07	4.50E-06	3.30E-04	1.81E-03	1.82E-03	0.00E+00	0.00E+00	1.82E-03
Inorganics													
Aluminum	5.68E-01	8.00E+00	7.10E-02	1.00E-02	1.00E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Antimony	3.68E-02	8.00E+00	4.60E-03	1.00E-02	1.00E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Iron	2.57E+01	8.00E+00	3.21E+00	1.00E-02	1.00E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Magnesium	1.56E+02	8.00E+00	1.95E+01	1.00E-02	1.00E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Manganese	4.79E+01	8.00E+00	5.98E+00	1.00E-02	1.00E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Potassium	1.56E+03	8.00E+00	1.95E+02	1.00E-02	1.00E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TOTAL							**1.11E-04**		**3.02E-02**	**3.04E-02**		**0.00E+00**	**3.04E-02**

Body Weight (kg)	61
Water intake (L/d)	4
Food intake (kg(dw)/d)	2
Soil intake (kg/d)	0.04
Plant intake (kg(dw)/d) -- 100% of diet	2

Plum Brook Ordnance Works
Pentolite Road Red Water Ponds

Insectivorous Bird: **Marsh wren *(Cistothorus palustris)***

Chemical Name	NOAEL	Uncertainty Factor	Adjusted NOAEL	Foraging Factor (soil)	Foraging Factor (sw)	Soil Intake (mg/kg-d)	Soil Intake Hazard Quotient	Invert. Intake (mg/kg-d)	Invert. Intake Hazard Quotient	Soil/Invert. Hazard Quotient	Water Intake (mg/kg-d)	Water Hazard Quotient	Overall Hazard Index	Tissue Conc. mg/kg(dw)
Organics														
1,3-DNB	4.20E-01	8.00E+00	5.25E-02	1.00E+00	1.00E+00	2.38E-03	4.52E-02	1.19E-02	2.26E-01	2.71E-01	0.00E+00	0.00E+00	2.71E-01	2.93E-08
4-Amino-2,6-DNT	7.00E-01	8.00E+00	8.75E-02	1.00E+00	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nitrobenzene	4.20E-01	8.00E+00	5.25E-02	1.00E+00	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1,3,5-TNB	4.20E-01	8.00E+00	5.25E-02	1.00E+00	1.00E+00	2.38E-03	4.52E-02	1.19E-02	2.26E-01	2.71E-01	0.00E+00	0.00E+00	2.71E-01	1.40E-08
Inorganics														
Aluminum	1.10E+02	8.00E+00	1.38E+01	1.00E+00	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Antimony	0.00E+00	8.00E+00	0.00E+00	1.00E+00	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Iron	5.00E+01	8.00E+00	6.25E+00	1.00E+00	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Magnesium	1.50E+02	8.00E+00	1.88E+01	1.00E+00	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Manganese	9.77E+02	8.00E+00	1.22E+02	1.00E+00	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Potassium	1.00E+03	8.00E+00	1.25E+02	1.00E+00	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TOTAL							**9.05E-02**		**4.52E-01**	**5.43E-01**		**0.00E+00**	**5.43E-01**	

Body Weight (kg)	0.01
Water intake (L/d)	0.0027
Food intake (kg(dw)/d)	0.0095
Soil intake (kg/d)	0.00019
Plant intake (kg(dw)/d) – 0% of diet	0
Invertebrate intake (kg(dw)/d) -- 100% of die	0.0095