

Corporate Headquarters:
33 Park Street
Canton, New York 13617

Maine Office:
386 Fore Street, 4th Floor
Portland, Maine 04101

FINAL DATA COLLECTION REPORT

FOR

**DEFENSE ENVIRONMENTAL RESTORATION
PROGRAM FORMERLY USED DEFENSE SITES
(DERP-FUDS)**

**DEAL TEST SITE
OCEAN TOWNSHIP, NEW JERSEY**

**Contract Number DACW51-97-D-0010
Delivery Order 0007**

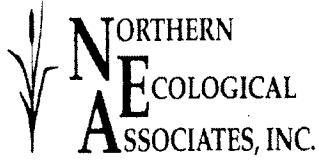
Prepared for:

**U.S. Army Corps of Engineers
New York District
26 Federal Plaza
New York, New York 10278-0090**

Prepared by:

**Roy F. Weston, Inc.
Northern Ecological Associates, Inc.**

March 1998



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ABBREVIATIONS AND ACRONYMS

ATP	Adenosine triphosphate
ATV	All-Terrain Vehicle
BECR	Biological, Environmental, and Cultural Resources
bgs	Below ground surface
DERP	Defense Environmental Restoration Program
DOD	Department of Defense
DOT	Department of Transportation
DQO	Data Quality Objective
ECOM	Electronics Command
FUDS	Formerly Used Defense Sites
HCl	Hydrochloric Acid
mg/kg	Milligrams per kilogram
MS/MSD	Matrix Spike/Matrix Spike Duplicate
NEA	Northern Ecological Associates, Inc.
N.J.A.C.	New Jersey Administrative Code
NJDEP	New Jersey Department of Environmental Protection
NJGWQS	New Jersey Groundwater Quality Standards
O.D.	Outside Diameter
OVM	Organic Vapor Monitor
PAHs	Polycyclic Aromatic Hydrocarbons
PCBs	Polychlorinated Biphenyls
PID	Photoionization Detector
QA/QC	Quality Assurance/Quality Control
RCRA	Resource Conservation and Recovery Act
RRSEP	Relative Risk Site Evaluation Program
SOPs	Standard Operating Procedures
SVOCs	Semivolatile organic compounds
µg/kg	Micrograms per kilogram
µg/L	Micrograms per liter
USACE	United States Army Corps of Engineers
U.S. EPA	United States Environmental Protection Agency
VOCs	Volatile organic compounds

METRIC TO ENGLISH CONVERSION TABLE

TO CONVERT	MULTIPLY BY	TO OBTAIN
Centimeters	3.937×10^{-1}	inches
Meters	3.281	feet
Kilometers	6.214×10^{-1}	miles (statute)
Celsius (degrees)	$9/5 + 32$	Fahrenheit (degrees)
Metric tons/day	1.102	tons (short)/day
Cubic meter	1.308	cubic yards
Cubic meters/second	$3.531 \times 10^{+1}$	cubic feet/second
kilograms	2.2046	pounds
grams	3.527×10^{-2}	ounces (avdp.)
liters	2.642×10^{-1}	gallons (U.S. liquid)

EXECUTIVE SUMMARY

The U.S. Army Corps of Engineers (USACE) investigates potential Department of Defense (DOD) related hazards under the Defense Environmental Restoration Program for Formerly Used Defense Sites (DERP-FUDS) program. USACE currently uses a software program known as the Relative Risk Site Evaluation Program (RRSEP) to evaluate relative human health and ecological risks posed by potential DOD-related hazardous, toxic, and radiological waste at these sites.

The former Deal Test Site (USACE Project No. CO2NJ078200), a sub-installation of Fort Monmouth, New Jersey, is located within Ocean Township, New Jersey. The site consists of an approximately 208-acre tract leased by DOD for use by the U.S. Army Electronics Command (ECOM) during the period from September 1953 to July 1973. At the request of the Huntsville Division, a site survey was conducted in 1987 by the USACE North Atlantic Division with the purpose of assessing the presence of unsafe debris, hazardous or toxic waste contamination, and/or unexploded ordnance at the former facility. The report proposed an investigation of the area identified as a former "lagoon" due to the possible presence of contamination. Subsequently, a 1990 report prepared by USACE under DERP-FUDS stated that the former lagoon area is barren of vegetation, and that the sandy soil is saturated with an unknown substance that may be indicative of contamination.

The primary objective of the present investigation was to collect sufficient analytical data for use in the RRSEP risk model for site evaluation. Data were collected to determine the presence of any soil or groundwater contamination within the shallow depression previously identified as a potential lagoon area, and to determine the presence of contamination in adjacent surface water and sediment. The USACE will use the RRSEP and the information from this report to categorize this site into a high, medium, or low relative risk group based on the contaminants, migration pathways, and receptors.

Five soil borings were installed at the Deal Test Site during the 2-day investigation. Samples were collected at each of the borings from two discrete intervals: 0 to 2 feet below the ground surface (bgs) (surface) and between 2 and 4 feet bgs (subsurface). Three of the borings (A, B, C) were advanced within the former lagoon area, and of the remaining two borings, one was advanced at an upgradient position, and one at a downgradient position. At four of the five soil boring locations, one grab groundwater sample was collected. Surface water and sediment samples were collected at two locations (one upstream and one downstream of the site) from a nearby tributary of Poplar Brook. Each sample was analyzed for volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), pesticides, polychlorinated biphenyls (PCBs), and Resource Conservation and Recovery Act (RCRA) metals.

The results of this investigation, including physical observations of the site and the analytical data, indicate that there is no significant evidence of a lagoon at this location.

The results indicated that the only contaminant of potential concern in surficial soils at the Deal Test Site is arsenic. Arsenic concentrations in surficial soil ranged from 129 to 504 milligrams per kilogram (mg/kg), and exceeded the New Jersey Department of Environmental Protection (NJDEP) soil cleanup criterion (20 mg/kg) at all locations sampled, including the upgradient location. Subsurface concentrations were considerably lower. The highest arsenic concentration detected was in surface soil from sample S-9 (504 mg/kg), collected at the downgradient location. The source of this contamination remains unknown.

Total recoverable groundwater concentrations of arsenic, chromium, and lead exceeded New Jersey Groundwater Quality Standards (NJGWQS) at all four locations sampled, including upgradient and downgradient locations. The soluble concentrations of arsenic in groundwater exceeded the NJGWQS at GW-2 and GW-4, located in the former lagoon area and downgradient, respectively. Soluble arsenic concentrations at these two locations were 55.9 $\mu\text{g/L}$ and 39.4 $\mu\text{g/L}$, respectively, compared to the NJGWQS of 8 $\mu\text{g/L}$. Soluble concentrations of chromium and lead were not detected, indicating that the total metals concentrations are attributable to suspended solids in the samples.

The low concentrations of arsenic detected in the sediment (3.9 to 6.1 mg/kg) of the Poplar Brook tributary relative to surface soil at the Deal Site (129 to 504 mg/kg) suggests that substantial off-site migration of arsenic is not occurring via runoff. Arsenic was undetected (2.4U $\mu\text{g/L}$) in the two surface water samples collected in the stream.

No significant contamination from VOCs, SVOCs, or pesticide/PCB compounds was detected in soil, groundwater, surface water, or sediment collected at the Deal Test Site.

It is recommended that a records review and interviews be conducted to determine whether arsenic-based compounds (*e.g.*, herbicides) were utilized by any current or former owners of the Deal Test Site. Repeated usage of such products over a number of years may explain the concentrations of arsenic detected at the site. Secondly, it is recommended that additional sampling be conducted to confirm the prevalent detections of arsenic in the area, or to determine whether arsenic is limited to the general region of the former lagoon and adjacent areas. Due to recreational use of the Deal Test Site, it is important to determine whether arsenic is present in other areas of the park (*e.g.*, along the dirt roads and in the open fields), as human exposures are possible.

1.0 INTRODUCTION

1.1 PROJECT AUTHORITY AND PURPOSE

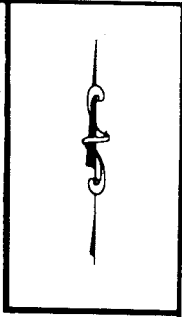
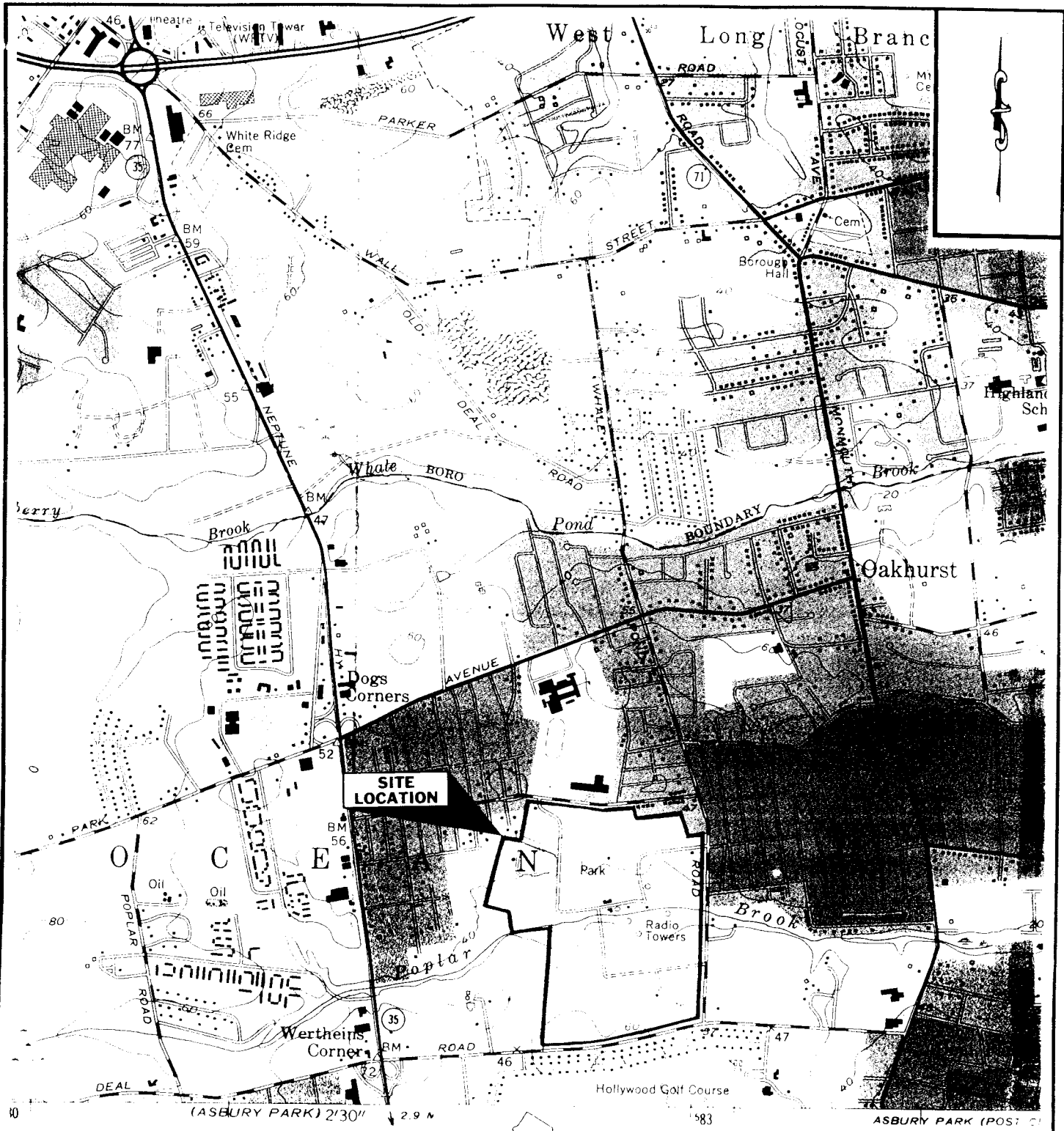
The U.S. Army Corps of Engineers (USACE) investigates potential Department of Defense (DOD) related hazards under the Defense Environmental Restoration Program for Formerly Used Defense Sites (DERP-FUDS) program. USACE currently uses a software program known as the Relative Risk Site Evaluation Program (RRSEP) to evaluate relative human health and ecological risks posed by potential DOD-related hazardous, toxic, and radiological waste at these sites. The Deal Test Site (USACE Project No. CO2NJ078200) is one of several sites for which analytical data are needed to evaluate relative risks. Since the focus of the field investigation is on the former lagoon area and its potential impacts to shallow groundwater and an adjacent stream, samples will be collected for analysis of surficial and subsurface soils, shallow groundwater, surface water, and sediment.

To provide sufficient data to evaluate potential site risks through use of this program, USACE New York District issued Delivery Order 0007 under the Biological, Environmental, and Cultural Resources (BECR) Contract to Northern Ecological Associates, Inc. (NEA) and its subcontractor Roy F. Weston, Inc. (WESTON), in July 1997 to provide technical support to the district. This report provides the results of that investigation, which was conducted in September - October 1997.

1.2 SITE BACKGROUND

The former Deal Test Site, a sub-installation of Fort Monmouth, New Jersey, is located within Ocean Township, New Jersey (Figure 1-1). The site consists of an approximately 208-acre tract leased by DOD for use by the U.S. Army Electronics Command (ECOM) during the period from September 1953 to July 1973. ECOM used the site for a variety of research studies involving radio wave propagation, experiments with waveguides and antennas, field testing of sophisticated communications and surveillance techniques, and other experiments/measurements for DOD agencies.

The site contained nine buildings with a total area of 20,282 square feet, as well as five 185-foot-high steel towers, one of which fell to the ground in 1987. The site also contained six additional storage buildings, a 50-foot-diameter radome, and an area identified in prior documents as a "lagoon" area, the purpose of which is unknown. All of the site buildings and steel towers were apparently constructed prior to DOD use of the site; prior to the DOD lease, the property was leased by Bell Laboratories. Also present on-site is a network of underground power cables and a copper grid network throughout the area for grounding of antennas. Miscellaneous wood poles also are present.



NO. 11901-001-002-0005
 DATE: 03/05/98
 FILE NAME: BORDER.DWG
 DRAWN: BILARBYO.JR

SOURCE: USGS TOPOGRAPHIC SURVEY

QUADRANGLE LOCATION

SCALE 1"=2000'

	PROJECT NAME:	DEAL TEST SITE	
	OCEAN TOWNSHIP, CLIENT NAME:	NEW JERSEY U.S. ARMY CORPS OF ENGINEERS	
	DATE:	MARCH 1998	FIGURE #: 1-1

After DOD terminated its lease of the property in June 1973, the original owner, Walter Scott, sold the property to the Scott Printing Corporation (Walter Scott, Vice President). In July 1973, the property was sold to the Township of Ocean, which currently uses the property for both public recreational as well as nonpublic municipal activities. One of the five radio towers is presently being used by the Township for fire/police transmission activities, and many of the buildings are being used for storage (USACE, undated).

At the request of the Huntsville Division, a site survey was conducted in 1987 by the USACE North Atlantic Division with the purpose of assessing the presence of unsafe debris, hazardous or toxic waste contamination, and/or unexploded ordnance at the former facility. The report proposed an investigation of the area identified as a former lagoon due to the possible presence of contamination. Subsequently, a 1990 report prepared by USACE under DERP-FUDS stated that the former lagoon area is barren of vegetation, and that the sandy soil is saturated with an unknown substance that may be indicative of contamination.

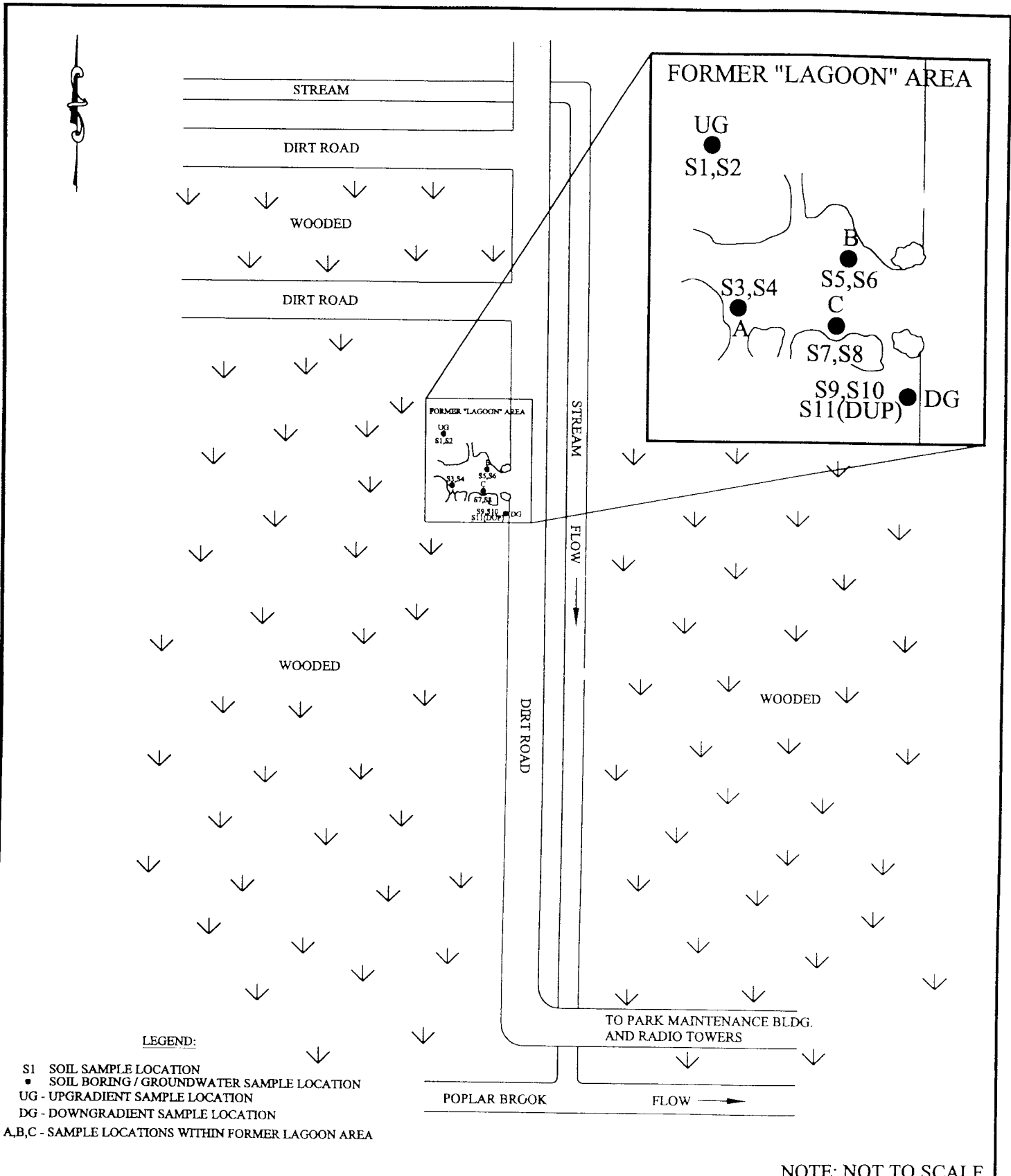
1.3 OBJECTIVES

The primary objective of the present investigation was to collect sufficient analytical data for use in the RRSEP risk model for site evaluation. Data were collected to determine the presence of any soil or groundwater contamination within the shallow depression previously identified as a potential lagoon area, and to determine the presence of contamination in adjacent surface water and sediment. The USACE will use the RRSEP and the information from this report to categorize this site into a high, medium, or low relative risk group based on the contaminants, migration pathways, and receptors.

2.0 METHODOLOGY

2.1 SAMPLING APPROACH

The focus of the field investigation was on the soils in a shallow depression identified previously as a former lagoon area and its potential impacts to shallow groundwater and an adjacent stream. Therefore, samples were collected for analysis of surficial and subsurface soils, shallow groundwater, surface water, and sediment. Figure 2-1 depicts the general site area and the locations of the soil borings and soil samples. Figure 2-2 shows the locations of the groundwater, surface water, and sediment samples. A summary of the samples collected and parameters analyzed by media is provided in Table 2-1. Table 2-2 provides a description of analytical methods used for each parameter analyzed. All sampling followed WESTON Standard Operating Procedures (SOPs). Full details of the Management Plan, Field Sampling Plan, and Quality Assurance Project Plan can be found in the Final Work Plan (WESTON, 1997).



LEGEND:

- S1 SOIL SAMPLE LOCATION
- SOIL BORING / GROUNDWATER SAMPLE LOCATION
- UG - UPGRADIENT SAMPLE LOCATION
- DG - DOWNGRADIENT SAMPLE LOCATION
- A,B,C - SAMPLE LOCATIONS WITHIN FORMER LAGOON AREA

NOTE: NOT TO SCALE

NO. J: 11901-001-003-0001 DATE: 12/18/87
 FILE NAME: DEAL.DWG DRAWN BY: ARROYO, JR.

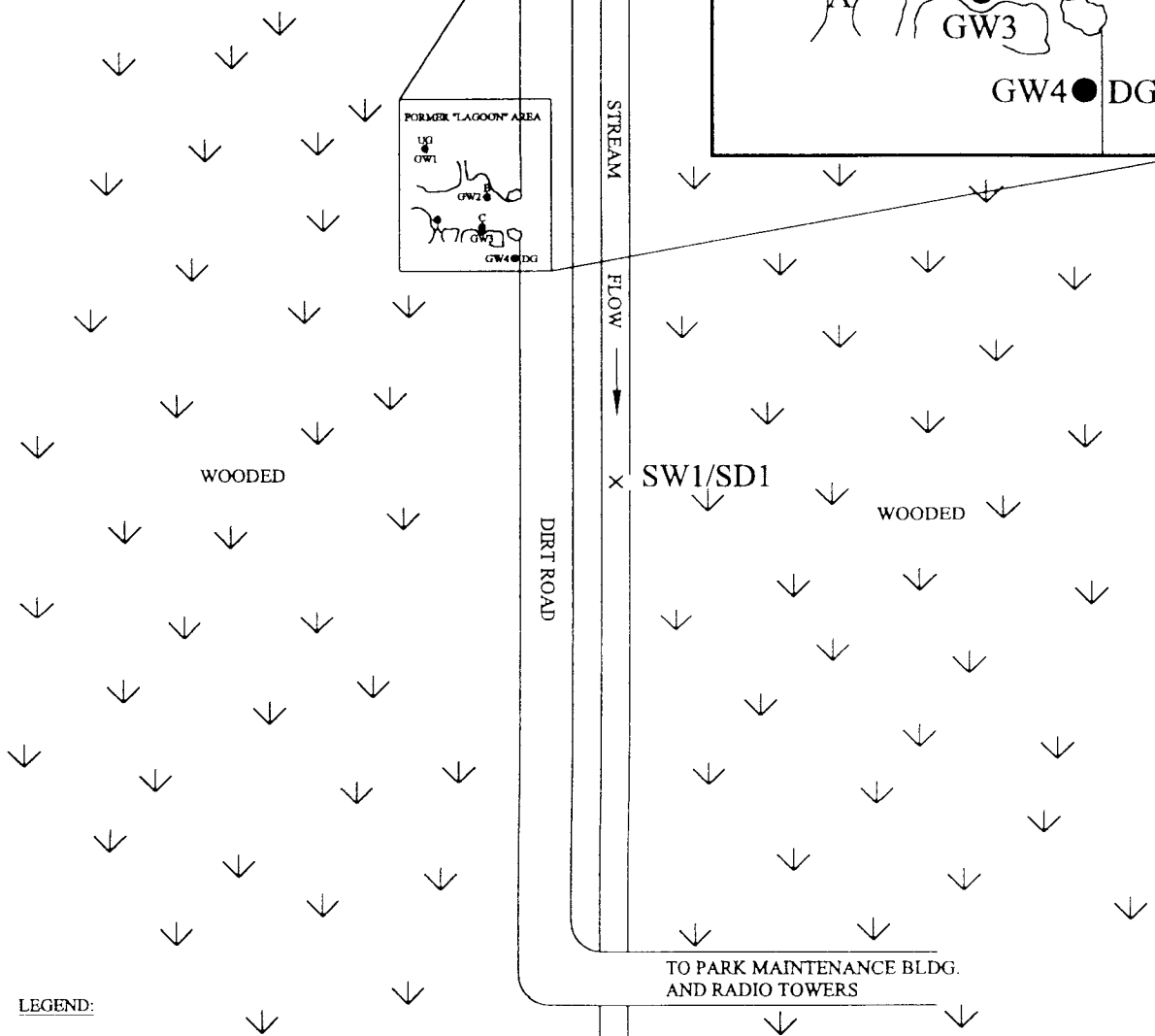
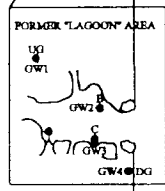
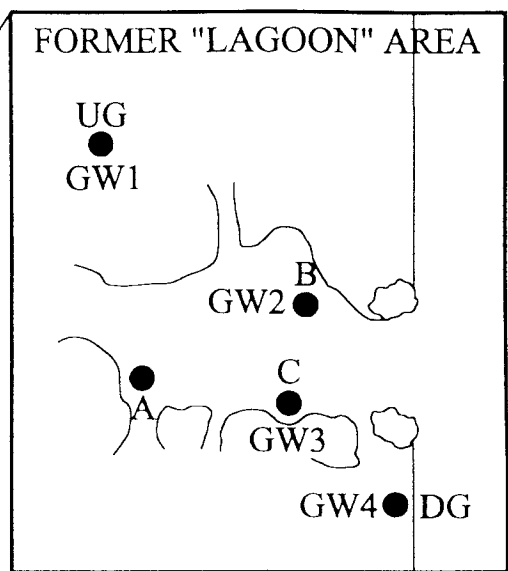
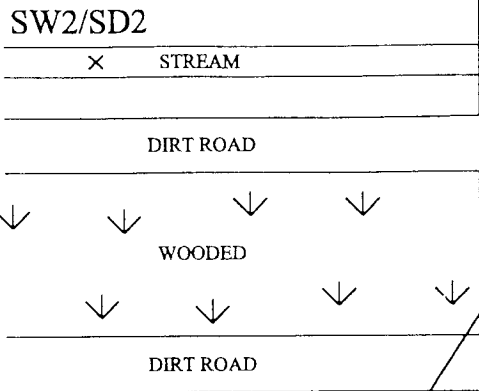


PROJECT NAME:
DEAL TEST SITE
 OCEAN TOWNSHIP, NEW JERSEY
 CLIENT NAME:
U.S. ARMY CORPS OF ENGINEERS

SOIL SAMPLE LOCATIONS

DATE: **MARCH 1998**

FIGURE #: **2-1**



LEGEND:

- SOIL BORING / GROUNDWATER SAMPLE LOCATION
- UG - UPGRADIENT SAMPLE LOCATION
- DG - DOWNGRADIENT SAMPLE LOCATION
- A,B,C - SAMPLE LOCATIONS WITHIN FORMER LAGOON AREA
- GW1 - GRAB GROUNDWATER SAMPLE LOCATION
- X SURFACE WATER / SEDIMENT SAMPLE LOCATION

NOTE: NOT TO SCALE

NO. 111901-001-003-0001 DATE: 12/18/97
 FILE NAME: DEAL.DWG DRAWN: BILABR0701.R



PROJECT NAME:	
DEAL TEST SITE	
OCEAN TOWNSHIP,	NEW JERSEY
CLIENT NAME:	
U.S. ARMY CORPS OF ENGINEERS	

GROUNDWATER, SURFACE WATER AND SEDIMENT SAMPLE LOCATIONS	
DATE:	FIGURE #:
MARCH 1998	2-2

**TABLE 2-1
SUMMARY OF FIELD AND QA/QC SAMPLES¹**

Analytical Parameter	Investigation Samples				QC Samples			
	Soil	Sediment	Groundwater	Surface Water	Field Duplicate ²	Field Blank ³	Trip Blank ⁴	MS/MSD ⁵
Volatiles	10	2	4	2	2	3	2	2
Semivolatiles	10	2	4	2	2	2	--	2
Pesticides/PCBs	10	2	4	2	2	2	--	2
RCRA Metals	10	2	4	2	2	1	--	2
RCRA Metals (Dissolved)	--	--	4	2	--	1	--	--

NOTES

-- Not applicable

¹ QA/QC field samples were submitted for only those parameters presented in this table.

² Field duplicate samples were collected at 10% of the investigative samples for a given analytical parameter. Of the two field duplicate samples collected per parameter, one is for surface water/groundwater, the other for soil/sediment.

³ Field blank samples were submitted at the rate of one per day for a given analytical parameter. One methanol field blank was also analyzed for volatiles.

⁴ One trip blank was submitted for analysis per shipment of investigative samples containing at least one sample for volatiles.

⁵ Extra Matrix Spike/Matrix Spike Duplicate (MS/MSD) analysis for organics and MS/MSD analysis for inorganics were performed at a frequency of 1 each per 20 investigative samples.

**TABLE 2-2
ANALYTICAL METHODS BY MATRIX (SOIL, SEDIMENT, GROUNDWATER, SURFACE WATER)**

PARAMETERS	MATRIX (1)	ANALYSIS METHOD	CONTAINER	PRESERVATION	HOLDING TIME
TCL VOC + 15	S, SD	8260/8240	Two 125-mL amber glass with septum cap and no headspace	None, 4°C	14 days
TCL SVOC/PAH	S, SD	8270	One 250-mL amber glass	None, 4°C	14 days to extract, 40 days to analyze
TCL Pesticides/PCBs	S, SD	8081	One 250-mL amber glass	None, 4°C	14 days to extract, 40 days to analyze
RCRA METALS	S, SD	6010	One 250-mL amber glass	None, 4°C	6 months; 28 days for Hg
TCL VOCs + 15	GW, SW	8260/8240	Three 40-mL glass vial	HCl to pH<2, 4°C	7 days
TCL SVOCs	GW, SW	8270	One 1-L amber glass	None, 4°C	7 days to extract, 40 days to analyze
TCL Pesticides/PCBs	GW, SW	8081	One 1-L amber glass	None, 4°C	7 days to extract, 40 days to analyze
RCRA METALS TOTAL	GW, SW	200.7	One 500-mL polyethylene bottle	HN0 ₃ to pH<2, 4°C	6 months; 28 days for Hg
RCRA METALS FILTERED	GW, SW	200.7	One 500-mL polyethylene bottle	HN0 ₃ to pH<2, 4°C	6 months; 28 days for Hg

NOTE:

(1) S - Soil; SD - Sediment; SW - Surface Water; GW - Groundwater

2.1.1 Soil Sampling

Five soil borings were installed at the Deal Test Site during the 2-day investigation (Figure 2-2). Samples were collected at each of the borings from two discrete intervals: 0 to 2 feet below the ground surface (bgs) (surface) and between 2 and 4 feet bgs (subsurface). Three of the borings (A, B, C) were advanced within the former lagoon area, and of the remaining two borings, one was advanced at an upgradient position, and one at a downgradient position. Surficial soil samples were identified with odd numbers; subsurface samples were identified with even numbers. Samples S1 and S2 were collected upgradient, samples S3 through S8 were collected within the former lagoon area, samples S9 and S10 were collected downgradient, and sample S11 is a duplicate of sample S9.

All of the soil borings were installed by TerraProbe, Inc. of Jamison, Pennsylvania. An all-terrain vehicle (ATV), track-mounted Geoprobe™ rig was used to advance a probe containing an acetate core sleeve, which enabled the collection of a relatively undisturbed 4-foot soil sample. In general, each of the soil borings was sampled continuously to 8 feet (*i.e.*, two 4-foot probes were advanced). This was done in part to observe the nature of the subsurface soil, and to provide an opening in the soil column to insert the slotted screen for grab groundwater samples. Due to the presence of a shallow water table, both the surface and subsurface soil samples were collected from the first (upper) 4-foot core sample. Each boring sample was logged and classified in the field logbook by a qualified geologist. Soil classification included characterization of soil/sediment texture (*i.e.*, gravel, sand, silt, and clay percentages); color; moisture content; and other pertinent information.

In addition to describing the physical characteristics of the soil samples, each sample was screened with an organic vapor monitor (OVM) photoionization detector (PID) for the presence of volatile organic compounds (VOCs). Each boring was also observed for indications of possible contamination such as staining, discoloration, sheen, or odor. Field observations indicating possible contamination were also noted in the field logbook. Upon completion of each soil boring, the boreholes were properly backfilled.

After logging the soil samples, an aliquot was collected and placed into the appropriate sample containers for chemical analysis. The Work Plan stated that samples would be collected from two discrete intervals at each boring location (total of 10 discrete samples). One sample was to be obtained from the surface soil interval (*i.e.*, 0 to 2 feet bgs), and a second subsurface sample (below 2 feet bgs) from the interval exhibiting the highest measurement on the OVM, or from the 6-inch interval above groundwater if no readings above background levels were obtained. However, groundwater was encountered at depths just below 2 feet bgs within the area in which borings were installed. This resulted in the subsurface soil sample being collected between 2 and 4 feet bgs (usually from 2 to 3 feet), with some of the subsurface samples being logged as wet. An attempt was made to collect the VOC aliquot from the driest portion of the subsurface interval sampled.

Each soil sample was analyzed for VOCs, SVOCs, pesticides, polychlorinated biphenyls (PCBs), and Resource Conservation and Recovery Act (RCRA) metals. The soil samples to be analyzed for VOCs were collected using the methanol preservation method recently adopted by the New Jersey Department of Environmental Protection (NJDEP) (New Jersey Administrative Code [N.J.A.C.] 7:26E-2.1(a)4). The portion of the sample for VOC analysis was collected directly from the acetate sleeve prior to homogenization of the remaining sample aliquot for other analytical parameters.

Each sample was identified with a label attached directly to the container. Sample designations identified the soil sample number (*i.e.*, S1 through S11). Sample labels clearly identified the individual sample and included the site name, date and time the sample was collected, preservative, and analyses requested. All of the analyses were performed at RECRA, Inc. laboratory in Lionville, Pennsylvania.

2.1.2 Grab Groundwater Sampling

At four of the five soil boring locations, a grab groundwater sample was collected (Figure 2-2). The four groundwater samples were collected at locations corresponding to the upgradient (GW-1) and downgradient (GW-4) boring locations, and at two of the three locations within the former lagoon area (GW-2 and GW-3). Grab groundwater samples were obtained subsequent to soil sampling using a 0.5-inch outside diameter (O.D.) bailer (for VOC samples), and dedicated, disposable tubing equipped with a check valve (for all other parameters). The sampling devices were lowered into a slotted screen (approximately 1-inch O.D.), which was installed from 4 to 8 feet bgs. Samples for analysis of VOCs were collected first.

The groundwater samples were analyzed for the same parameters as were the soil samples (Table 2-2) with the addition of a filtered sample for dissolved metals analysis. VOC samples were collected into pre-preserved sample vials in the field that contained hydrochloric acid (HCl) so that the pH was lowered to less than 2 units. Samples collected for metals analyses were also collected into pre-preserved sample bottles that contained nitric acid (HNO₃), so that the pH was less than 2.

2.1.3 Surface Water/Sediment Sampling

In addition to the soil and groundwater samples, surface water and sediment samples were collected at two locations (one upstream and one downstream of the site) from a nearby tributary of Poplar Brook. This tributary could potentially be impacted by the former lagoon if groundwater is contaminated. Sampling location SW-1/SD-1 was located approximately 185 feet south of the entrance to the lagoon area. SW-2/SD-2 was located approximately 250 feet west of the dirt road and 300 feet north of the entrance to the lagoon area. Samples were collected at the downstream location (SW-1/SD-1) first with surface water being sampled before sediment. Surface water samples were collected by direct immersion of sample containers while facing upstream, and sediment samples were collected using stainless steel trowels and bowls. All VOC samples were collected prior to the other parameters, and care was taken to avoid

introducing sediment or suspended particles into the surface water sample containers. Sediment was homogenized in the stainless steel bowls after the VOC containers were filled.

The surface water and sediment samples were analyzed for the same parameters as were the soil and groundwater samples, which included both RCRA total metals and dissolved metals for the surface water samples. The VOC and metals samples were collected into pre-preserved sample containers (containing HCl and HNO₃, respectively) to ensure a pH of less than 2 standard units.

2.2 QUALITY ASSURANCE/QUALITY CONTROL SAMPLES

A total of two duplicate samples (one soil sample and one groundwater sample) were collected. Extra volume was collected at the downgradient soil boring location by advancing a collocated sampling probe. Sample S11 was collected as a duplicate sample of surface soil sample S9. Groundwater sample GW-5 was collected at the same location as GW-3 from the southernmost soil boring within the former lagoon area. In addition to the environmental duplicate samples, two field blank (rinsate) samples were collected (one per day) to verify that field decontamination procedures were adequate, and one methanol field blank (ambient) sample was collected while sampling soil samples S7 and S8. A trip blank sample was also sent each day as part of the sample shipment. Extra volumes were also collected to conduct matrix spike/matrix spike duplicate (MS/MSD) analyses.

2.3 SAMPLE SHIPMENT

In summary, the outside of each of the sample bottles was wiped with a clean paper towel to remove excess sample material(s), and each sample container was sealed with a lid outfitted with a Teflon cap. The sample containers were placed in zip-lock plastic bags. They were stored in thermal chests containing ice and packaged in granular absorbent (vermiculite) to ensure sample preservation and integrity during shipment. The chain-of-custody documents were secured to the lid on the inside of the thermal chest. The lids of the thermal chests were secured with tape and sealed with custody seals. The coolers were transported to the laboratory using a common carrier (*i.e.*, Federal Express). Laboratory personnel acknowledged receipt of the shipped samples at the time of their arrival by signing the chain-of-custody form.

All shipping procedures were performed in compliance with Department of Transportation (DOT) regulations governing shipment of hazardous materials.

2.4 SAMPLING EQUIPMENT DECONTAMINATION

Equipment decontamination was conducted upon arrival at the site and subsequent to collecting samples. Decontamination was performed to minimize the potential for cross-contamination of samples caused by transfer of contaminants from sampling equipment. Any equipment used to collect samples that came into contact with the sample matrix was decontaminated in accordance with the NJDEP-approved procedures outlined in the *NJDEP Field Sampling Procedures Manual* (May 1992).

2.5 DATA INTERPRETATION

As a screening measure, contaminant data in soils, surface water, and groundwater were compared to NJDEP regulatory standards. Soil contaminant concentrations were compared to residential direct contact soil cleanup criteria (Appendix A). Surface water and groundwater concentrations were compared to NJDEP standards for those media.

3.0 RESULTS

3.1 FIELD ACTIVITIES/OBSERVATIONS

The former lagoon area was investigated on two occasions. A site reconnaissance was conducted on 31 July 1997, followed by the field sampling on 30 September and 1 October 1997. The former lagoon area was located based on past descriptions and discussions with USACE and Ocean Township employees. Field observations characterized the former lagoon area as a shallow, mostly unvegetated depression, bordered by undergrowth in a forested area. The approximate size of the lagoon area was 60 feet long by 30 feet wide at its longest axes. The general area appeared to be a forested wetland based on qualitative observations. There did not appear to be any conveyance points to this location for lagoon discharge (*i.e.*, no pipes or channels), and the area appears to be a natural depression. The lack of vegetation could, in part, be related to the ponding of water in the depression. Appendix B contains photographs of the lagoon area, as well as photodocumentation of sampling. Field notes and Daily Quality Control Reports are included in Appendix C.

3.1.1 Soil Samples

The soils observed during the investigation were generally consistent throughout the site (Table 3-1). The upper 2 feet consisted of dark brown, fine-grained sand and silt, with abundant organic matter (primarily decomposed leaves). The upgradient and downgradient boring locations (outside the boundaries of the shallow depression area) exhibited slightly more organic matter within this interval, including rootlets. This material had a natural organic odor and appeared indicative of floodplain-type, or wetland deposits comingled with organic matter. The surface of the soils in the lagoon area varied in color in some locations. Most of the surface soils in the area were dark brown in color with a portion of the lagoon area exhibiting shades of green (attributed to algae/plant material) and brownish purple (believed to be natural in origin).

Subsurface soil deposits consisted of blue-green, fine- to medium-grained sand with varying amounts of silt, clay, and coarse sand. The finer-grained material may have been derived from parent material rich in glauconite (a mineral with a blue-green color). Glauconite is a hydrous potassium, aluminum, iron, magnesium silicate found in sedimentary deposits. It is a mineral of marine origin, and is common in marine sands (Mottana et al., 1978). These blue-green sands extended from approximately 2 feet bgs to at least 15 feet bgs, based on observations of core samples collected to 15 feet at soil boring C. Measurements using the OVM did not indicate

TABLE 3-1
SOIL SAMPLING DESCRIPTION

SAMPLE ID	LOCATION	CORE DESCRIPTION	DATE COLLECTED	COLLECTION DEPTH (ft bgs)	SAMPLE DESCRIPTION
S1	Upgradient (surface)	UG	9/30/97	0-2	(0-4') Dark brown Silt*, some fine sand, moist, abundant organic matter (peat).
S2	Upgradient (subsurface)		9/30/97	2-4	(4'-8') Blue-green fine Sand, some silt, some clay, wet. Groundwater at approx. 2 feet bgs in borehole. Collected GW-1 at this location.
S3	SW corner in former lagoon (surface)	A	9/30/97	0-2	(0-2') Dark brown fine Sand and Silt, moist, abundant organic matter (peat).
S4	SW corner in former lagoon (subsurface)		9/30/97	3-4	(2'-8') Blue-green-black medium-fine Sand, little silt, little clay, wet at 3 feet bgs.
S5	NE corner in former lagoon (surface)	B	9/30/97	0-2	(0-1.5') Dark brown fine Sand and Silt, moist, abundant organic matter (peat).
S6	NE corner in former lagoon (subsurface)		9/30/97	2-3	(1.5'-8') Blue-green medium-fine Sand, little silt, trace clay. Saturated at 2.5 feet bgs. Groundwater rose nearly to surface in borehole. Collected GW-2 at this location.
S7	SE corner in former lagoon (surface)	C	10/1/97	0-2	(0-2') Dark brown fine Sand and silt, moist, abundant organic matter (peat).
S8	SE corner in former lagoon (subsurface)		10/1/97	2-3	(2'-13') Blue-green fine-medium Sand, little silt, trace clay. Saturated at 3 feet bgs. (13'-15') Blue-green-black fine-medium Sand, little silt, trace clay, saturated. Collected GW-3 (and duplicate GW-5) at this location.
S9	Downgradient (surface)	DG	10/1/97	0-2	(0-2') Dark brown fine Sand and Silt, trace clay, moist, abundant organic matter.
S10	Downgradient (subsurface)		10/1/97	2-3	(2'-8') Blue-green fine-medium Sand, little silt, trace clay, saturated. Collected GW-4 at this location.
S11	Downgradient (surface duplicate sample of S9)		10/1/97	0-2	(0-2') Dark brown fine Sand and Silt, trace clay, moist, abundant organic matter.

* The most predominant lithologic type is capitalized, according to Burmeister's soil classification.

readings above background for any of the surface or subsurface intervals observed at any of the boring locations.

3.1.2 Groundwater Samples

Groundwater was present at a depth of approximately 2 to 2.5 feet bgs for all samples. The grab groundwater samples were collected from an interval extending 4 to 8 feet bgs. This interval corresponded to the blue-green sand, silt, and clay deposits. Due to the presence of fines in the formation, the lack of a filter pack, and development procedures, the groundwater samples were relatively turbid. At several locations (the upgradient location and GW-3 within the former lagoon), the water appeared to clear up as volume was removed for sample collection. No odors or readings above background on the OVM were noted while collecting the grab groundwater samples.

3.1.3 Surface Water and Sediment Samples

In general, the surface water samples were clear and odorless. Care was taken not to stir up the sediments and the algal-like, iron-oxide deposits that nearly covered the entire streambed. The iron-oxide deposits were rust colored and easily dislodged (into “feathery” clumps) when disturbed. The sediments consisted primarily of brown, fine- to coarse-grained sand with a trace amount of silt. Very little organic matter was observed, and the sediment samples were also odorless. No readings above background on the OVM were noted while collecting the surface water and sediment samples.

3.2 ANALYTICAL RESULTS

Analytical results for detected compounds are presented in Tables 3-2 through 3-13. Field blank and trip blank data (field quality control samples) are presented in Tables 3-14 through 3-17. Appendix D contains analytical results and additional data.

3.2.1 Soil Results

Analytical results indicated that no VOCs were detected (Table 3-2) in site samples. Three compounds were detected in blank samples (*i.e.*, chloromethane, methylene chloride, and acetone). The presence of these compounds in the site soil samples were considered blank contamination, and during data validation all of these compounds were considered not detected (Appendix E).

The following semivolatile organic compounds (SVOCs) were detected in soils: fluoranthene, pyrene, benzo(a)anthracene, chrysene, and phenol (Table 3-3). Detections of benzoic acid and bis(2-ethylhexyl)phthalate in the soil samples were considered laboratory contamination and labeled non-detect during data validation. Phenol was detected at one location (S5), but its concentration did not exceed NJDEP soil standards. The remaining compounds were polycyclic aromatic hydrocarbons (PAHs). These compounds were detected at location S1 only, at

TABLE 3-2
SUMMARY OF VOLATILE ORGANIC COMPOUND RESULTS IN SOIL
DEAL TEST SITE
OCEAN TOWNSHIP, NEW JERSEY

SAMPLE NO. SAMPLING DATE UNITS	S1 9/30/97 ug/kg	S2 9/30/97 ug/kg	S3 9/30/97 ug/kg	S4 9/30/97 ug/kg	S5 9/30/97 ug/kg	S6 9/30/97 ug/kg	S7 10/1/97 ug/kg	S8 10/1/97 ug/kg	S9 10/1/97 ug/kg	S10 10/1/97 ug/kg	S11 10/1/97 ug/kg	NJDEP RDCSCC (ug/kg)
Chloromethane	2500 UJ	1600 U	3600 UJ	1200 U	3500 UJ	1500 U	2900 UJ	1400 U	2500 UJ	1500 U	2000 U	520,000
Bromomethane	3300 UJ	1600 U	3600 UJ	1200 U	3500 UJ	1500 U	2900 UJ	1400 U	2500 UJ	1500 U	2000 U	79,000
Vinyl Chloride	3300 UJ	1600 U	3600 UJ	1200 U	3500 UJ	1500 U	2900 UJ	1400 U	2500 UJ	1500 U	2000 U	2,000
Chloroethane	3300 UJ	1600 U	3600 UJ	1200 U	3500 UJ	1500 U	2900 UJ	1400 U	2500 UJ	1500 U	2000 U	NLE
Methylene Chloride	1700 UJ	1200 U	1300 UJ	750 U	2400 UJ	1600 U	1500 UJ	510 U	1300 UJ	730 U	990 U	49,000
Acetone	3300 UJ	1600 U	3600 UJ	1200 U	3500 UJ	1500 U	2900 UJ	1000 U	2500 UJ	1500 U	2000 U	1,000,000
Carbon Disulfide	1600 UJ	790 U	1800 UJ	610 U	1800 UJ	770 U	1500 UJ	690 U	1300 UJ	730 U	990 U	NLE
1,1-Dichloroethene	1600 UJ	790 U	1800 UJ	610 U	1800 UJ	770 U	1500 UJ	690 U	1300 UJ	730 U	990 U	8,000
1,1-Dichloroethane	1600 UJ	790 U	1800 UJ	610 U	1800 UJ	770 U	1500 UJ	690 U	1300 UJ	730 U	990 U	570,000
1,2-Dichloroethene (total)	1600 UJ	790 U	1800 UJ	610 U	1800 UJ	770 U	1500 UJ	690 U	1300 UJ	730 U	990 U	79,000
Chloroform	1600 UJ	790 U	1800 UJ	610 U	1800 UJ	770 U	1500 UJ	690 U	1300 UJ	730 U	990 U	19,000
1,2-Dichloroethane	1600 UJ	790 U	1800 UJ	610 U	1800 UJ	770 U	1500 UJ	690 U	1300 UJ	730 U	990 U	6,000
2-Butanone	3300 UJ	1600 U	3600 UJ	1200 U	3500 UJ	1500 U	2900 UJ	1400 U	2500 UJ	1500 U	2000 U	1,000,000
1,1,1-Trichloroethane	1600 UJ	790 U	1800 UJ	610 U	1800 UJ	770 U	1500 UJ	690 U	1300 UJ	730 U	990 U	210,000
Carbon Tetrachloride	1600 UJ	790 U	1800 UJ	610 U	1800 UJ	770 U	1500 UJ	690 U	1300 UJ	730 U	990 U	2,000
Bromodichloromethane	1600 UJ	790 U	1800 UJ	610 U	1800 UJ	770 U	1500 UJ	690 U	1300 UJ	730 U	990 U	11,000
1,2-Dichloropropane	1600 UJ	790 U	1800 UJ	610 U	1800 UJ	770 U	1500 UJ	690 U	1300 UJ	730 U	990 U	10,000
cis-1,3-Dichloropropene	1600 UJ	790 U	1800 UJ	610 U	1800 UJ	770 U	1500 UJ	690 U	1300 UJ	730 U	990 U	4,000
Trichloroethene	1600 UJ	790 U	1800 UJ	610 U	1800 UJ	770 U	1500 UJ	690 U	1300 UJ	730 U	990 U	23,000
Dibromochloromethane	1600 UJ	790 U	1800 UJ	610 U	1800 UJ	770 U	1500 UJ	690 U	1300 UJ	730 U	990 U	110,000
1,1,2-Trichloroethane	1600 UJ	790 U	1800 UJ	610 U	1800 UJ	770 U	1500 UJ	690 U	1300 UJ	730 U	990 U	22,000
Benzene	1600 UJ	790 U	1800 UJ	610 U	1800 UJ	770 U	1500 UJ	690 U	1300 UJ	730 U	990 U	3,000
Trans-1,3-Dichloropropene	1600 UJ	790 U	1800 UJ	610 U	1800 UJ	770 U	1500 UJ	690 U	1300 UJ	730 U	990 U	4,000
Bromoform	1600 UJ	790 U	1800 UJ	610 U	1800 UJ	770 U	1500 UJ	690 U	1300 UJ	730 U	990 U	86,000
4-Methyl-2-pentanone	3300 UJ	1600 U	3600 UJ	1200 U	3500 UJ	1500 U	2900 UJ	1400 U	2500 UJ	1500 U	2000 U	1,000,000
2-Hexanone	3300 UJ	1600 U	3600 UJ	1200 U	3500 UJ	1500 U	2900 UJ	1400 U	2500 UJ	1500 U	2000 U	NLE

TABLE 3-2 (CONTINUED)
SUMMARY OF VOLATILE ORGANIC COMPOUND RESULTS IN SOIL
DEAL TEST SITE
OCEAN TOWNSHIP, NEW JERSEY

SAMPLE NO. SAMPLING DATE LNHS	S1 9/30/97 ug/kg	S2 9/30/97 ug/kg	S3 9/30/97 ug/kg	S4 9/30/97 ug/kg	S5 9/30/97 ug/kg	S6 9/30/97 ug/kg	S7 10/1/97 ug/kg	S8 10/1/97 ug/kg	S9 10/1/97 ug/kg	S10 10/1/97 ug/kg	S11 10/1/97 ug/kg	NJDEP RDCSCC (ug/kg)
Tetrachloroethene	1600 UJ	790 U	1800 UJ	610 U	1800 UJ	770 U	1500 UJ	690 U	1300 UJ	730 U	990 U	4,000
1,1,2,2-Tetrachloroethane	1600 UJ	790 U	1800 UJ	610 U	1800 UJ	770 U	1500 UJ	690 U	1300 UJ	730 U	990 U	34,000
Toluene	1600 UJ	790 U	1800 UJ	610 U	1800 UJ	770 U	1500 UJ	690 U	1300 UJ	730 U	990 U	1,000,000
Chlorobenzene	1600 UJ	790 U	1800 UJ	610 U	1800 UJ	770 U	1500 UJ	690 U	1300 UJ	730 U	990 U	37,000
Ethylbenzene	1600 UJ	790 U	1800 UJ	610 U	1800 UJ	770 U	1500 UJ	690 U	1300 UJ	730 U	990 U	1,000,000
Styrene	1600 UJ	790 U	1800 UJ	610 U	1800 UJ	770 U	1500 UJ	690 U	1300 UJ	730 U	990 U	23,000
Xylene (total)	1600 UJ	790 U	1800 UJ	610 U	1800 UJ	770 U	1500 UJ	690 U	1300 UJ	730 U	990 U	410,000

NOTES:

U - Not detected at given quantitation limit

J - Estimated values

(1) S11 is a duplicate sample of S9

NLE - No level established

RDCSCC - Residential Direct Contact Soil Cleanup Criteria

TABLE 3-3
SUMMARY OF SEMIVOLATILE ORGANIC COMPOUND RESULTS IN SOIL
DEAL TEST SITE
OCEAN TOWNSHIP, NEW JERSEY

SAMPLE NO. SAMPLING DATE UNITS	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	NJDEP RESIDENTIAL DIRECT CONTACT SOIL CLEANUP CRITERIA (ug/kg)
	9/30/97 ug/kg	9/30/97 ug/kg	9/30/97 ug/kg	9/30/97 ug/kg	9/30/97 ug/kg	9/30/97 ug/kg	9/30/97 ug/kg	10/1/97 ug/kg	10/1/97 ug/kg	10/1/97 ug/kg	10/1/97 ug/kg	
Phenol	810 UJ	440 U	970 UJ	420 U	150 J	470 U	910 UJ	430 U	810 UJ	420 U	620 U	10,000,000
bis(2-Chloroethyl)ether	810 UJ	440 U	970 UJ	420 U	1100 UJ	470 U	910 UJ	430 U	810 UJ	420 U	620 U	660
2-Chlorophenol	810 UJ	440 U	970 UJ	420 U	1100 UJ	470 U	910 UJ	430 U	810 UJ	420 U	620 U	280,000
1,3-Dichlorobenzene	810 UJ	440 U	970 UJ	420 U	1100 UJ	470 U	910 UJ	430 U	810 UJ	420 U	620 U	5,100,000
1,4-Dichlorobenzene	810 UJ	440 U	970 UJ	420 U	1100 UJ	470 U	910 UJ	430 U	810 UJ	420 U	620 U	570,000
Benzyl alcohol	810 UJ	440 U	970 UJ	420 U	1100 UJ	470 U	910 UJ	430 U	810 UJ	420 U	620 U	10,000,000
1,2-Dichlorobenzene	810 UJ	440 U	970 UJ	420 U	1100 UJ	470 U	910 UJ	430 U	810 UJ	420 U	620 U	5,100,000
2-Methylphenol	810 UJ	440 U	970 UJ	420 U	1100 UJ	470 U	910 UJ	430 U	810 UJ	420 U	620 U	2,800,000
bis(2-Chloroisopropyl)ether	810 UJ	440 U	970 UJ	420 U	1100 UJ	470 U	910 UJ	430 U	810 UJ	420 U	620 U	2,300,000
4-Methylphenol	810 UJ	440 U	970 UJ	420 U	1100 UJ	470 U	910 UJ	430 U	810 UJ	420 U	620 U	2,800,000
N-Nitroso-Di-n-propylamine	810 UJ	440 U	970 UJ	420 U	1100 UJ	470 U	910 UJ	430 U	810 UJ	420 U	620 U	660
Hexachloroethane	810 UJ	440 U	970 UJ	420 U	1100 UJ	470 U	910 UJ	430 U	810 UJ	420 U	620 U	6,000
Nitrobenzene	810 UJ	440 U	970 UJ	420 U	1100 UJ	470 U	910 UJ	430 U	810 UJ	420 U	620 U	28,000
Isophorone	810 UJ	440 U	970 UJ	420 U	1100 UJ	470 U	910 UJ	430 U	810 UJ	420 U	620 U	1,100,000
2-Nitrophenol	810 UJ	440 U	970 UJ	420 U	1100 UJ	470 U	910 UJ	430 U	810 UJ	420 U	620 U	NLE
2,4-Dimethylphenol	810 UJ	440 U	970 UJ	420 U	1100 UJ	470 U	910 UJ	430 U	810 UJ	420 U	620 U	1,100,000
Benzoic acid	4000 UJ	2200 U	4900 UJ	2100 U	5300 UJ	2400 U	4600 UJ	2100 U	4000 UJ	2100 U	3100 U	NLE
bis(2-Chloroethoxy)methane	810 UJ	440 U	970 UJ	420 U	1100 UJ	470 U	910 UJ	430 U	810 UJ	420 U	620 U	NLE
2,4-Dichlorophenol	810 UJ	440 U	970 UJ	420 U	1100 UJ	470 U	910 UJ	430 U	810 UJ	420 U	620 U	170,000
1,2,4-Trichlorobenzene	810 UJ	440 U	970 UJ	420 U	1100 UJ	470 U	910 UJ	430 U	810 UJ	420 U	620 U	68,000
Naphthalene	810 UJ	440 U	970 UJ	420 U	1100 UJ	470 U	910 UJ	430 U	810 UJ	420 U	620 U	230,000
4-Chloroaniline	810 UJ	440 U	970 UJ	420 U	1100 UJ	470 U	910 UJ	430 U	810 UJ	420 U	620 U	230,000
Hexachlorobutadiene	810 UJ	440 U	970 UJ	420 U	1100 UJ	470 U	910 UJ	430 U	810 UJ	420 U	620 U	1,000
4-Chloro-3-methylphenol	810 UJ	440 U	970 UJ	420 U	1100 UJ	470 U	910 UJ	430 U	810 UJ	420 U	620 U	10,000,000
2-Methylnaphthalene	810 UJ	440 U	970 UJ	420 U	1100 UJ	470 U	910 UJ	430 U	810 UJ	420 U	620 U	NLE
Hexachlorocyclopentadiene	810 UJ	440 U	970 UJ	420 U	1100 UJ	470 U	910 UJ	430 U	810 UJ	420 U	620 U	400,000
2,4,6-Trichlorophenol	810 UJ	440 U	970 UJ	420 U	1100 UJ	470 U	910 UJ	430 U	810 UJ	420 U	620 U	62,000
2,4,5-Trichlorophenol	4000 UJ	2200 U	4900 UJ	2100 U	5300 UJ	2400 U	4600 UJ	2100 U	4000 UJ	2100 U	3100 U	5,600,000

TABLE 3-3 (CONTINUED)
SUMMARY OF SEMIVOLATILE ORGANIC COMPOUND RESULTS IN SOIL
DEAL TEST SITE
OCEAN TOWNSHIP, NEW JERSEY

SAMPLE NO. SAMPLING DATE UNITS	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	NJDEP RESIDENTIAL DIRECT CONTACT SOIL CLEANUP CRITERIA (ug/kg)
	9/30/97 ug/kg	9/30/97 ug/kg	9/30/97 ug/kg	9/30/97 ug/kg	9/30/97 ug/kg	9/30/97 ug/kg	9/30/97 ug/kg	10/1/97 ug/kg	10/1/97 ug/kg	10/1/97 ug/kg	10/1/97 ug/kg	
2-Chloronaphthalene	810 UJ	440 U	970 UJ	420 U	1100 UJ	470 U	910 UJ	430 U	810 UJ	420 U	620 U	NLE
2-Nitroaniline	4000 UJ	2200 U	4900 UJ	2100 U	5300 UJ	2400 U	4600 UJ	2100 U	4000 UJ	2100 U	3100 U	NLE
Dimethylphthalate	810 UJ	440 U	970 UJ	420 U	1100 UJ	470 U	910 UJ	430 U	810 UJ	420 U	620 U	10,000,000
Acenaphthylene	810 UJ	440 U	970 UJ	420 U	1100 UJ	470 U	910 UJ	430 U	810 UJ	420 U	620 U	NLE
2,6-Dinitrotoluene	810 UJ	440 U	970 UJ	420 U	1100 UJ	470 U	910 UJ	430 U	810 UJ	420 U	620 U	1,000
3-Nitroaniline	4000 UJ	2200 U	4900 UJ	2100 U	5300 UJ	2400 U	4600 UJ	2100 U	4000 UJ	2100 U	3100 U	NLE
Acenaphthene	810 UJ	440 U	970 UJ	420 U	1100 UJ	470 U	910 UJ	430 U	810 UJ	420 U	620 U	3,400,000
2,4-Dinitrophenol	4000 UJ	2200 U	4900 UJ	2100 U	5300 UJ	2400 U	4600 UJ	2100 U	4000 UJ	2100 U	3100 U	110,000
4-Nitrophenol	4000 UJ	2200 U	4900 UJ	2100 U	5300 UJ	2400 U	4600 UJ	2100 U	4000 UJ	2100 U	3100 U	NLE
Dibenzofuran	810 UJ	440 U	970 UJ	420 U	1100 UJ	470 U	910 UJ	430 U	810 UJ	420 U	620 U	NLE
2,4-Dinitrotoluene	810 UJ	440 U	970 UJ	420 U	1100 UJ	470 U	910 UJ	430 U	810 UJ	420 U	620 U	1,000
Diethylphthalate	810 UJ	440 U	970 UJ	420 U	1100 UJ	470 U	910 UJ	430 U	810 UJ	420 U	620 U	10,000,000
4-Chlorophenyl-phenylether	810 UJ	440 U	970 UJ	420 U	1100 UJ	470 U	910 UJ	430 U	810 UJ	420 U	620 U	NLE
Fluorene	810 UJ	440 U	970 UJ	420 U	1100 UJ	470 U	910 UJ	430 U	810 UJ	420 U	620 U	2,300,000
4-Nitroaniline	4000 UJ	2200 U	4900 UJ	2100 U	5300 UJ	2400 U	4600 UJ	2100 U	4000 UJ	2100 U	3100 U	NLE
4,6-Dinitro-2-methylphenol	4000 UJ	2200 U	4900 UJ	2100 U	5300 UJ	2400 U	4600 UJ	2100 U	4000 UJ	2100 U	3100 U	NLE
N-Nitrosodiphenylamine	810 UJ	440 U	970 UJ	420 U	1100 UJ	470 U	910 UJ	430 U	810 UJ	420 U	620 U	140,000
4-Bromophenyl-phenylether	810 UJ	440 U	970 UJ	420 U	1100 UJ	470 U	910 UJ	430 U	810 UJ	420 U	620 U	NLE
Hexachlorobenzene	810 UJ	440 U	970 UJ	420 U	1100 UJ	470 U	910 UJ	430 U	810 UJ	420 U	620 U	660
Pentachlorophenol	4000 UJ	2200 U	4900 UJ	2100 U	5300 UJ	2400 U	4600 UJ	2100 U	4000 UJ	2100 U	3100 U	6,000
Phenanthrene	810 UJ	440 U	970 UJ	420 U	1100 UJ	470 U	910 UJ	430 U	810 UJ	420 U	620 U	NLE
Anthracene	810 UJ	440 U	970 UJ	420 U	1100 UJ	470 U	910 UJ	430 U	810 UJ	420 U	620 U	10,000,000
Di-n-Butylphthalate	810 UJ	440 U	970 UJ	420 U	1100 UJ	470 U	910 UJ	430 U	810 UJ	420 U	620 U	5,700,000
Fluoranthene	100 J	440 U	970 UJ	420 U	1100 UJ	470 U	910 UJ	430 U	810 UJ	420 U	620 U	2,300,000
Pyrene	160 J	440 U	970 UJ	420 U	1100 UJ	470 U	910 UJ	430 U	810 UJ	420 U	620 U	1,700,000
Butylbenzylphthalate	810 UJ	440 U	970 UJ	420 U	1100 UJ	470 U	910 UJ	430 U	810 UJ	420 U	620 U	1,100,000
3,3'-Dichlorobenzidine	1600 UJ	880 U	1900 UJ	840 U	2100 UJ	950 U	1800 UJ	860 U	1600 UJ	830 U	1200 U	2,000
Benzo(a)anthracene	110 J	440 U	970 UJ	420 U	1100 UJ	470 U	910 UJ	430 U	810 UJ	420 U	620 U	900
Chrysene	150 J	440 U	970 UJ	420 U	1100 UJ	470 U	910 UJ	430 U	810 UJ	420 U	620 U	9,000

TABLE 3-3 (CONTINUED)
SUMMARY OF SEMIVOLATILE ORGANIC COMPOUND RESULTS IN SOIL
DEAL TEST SITE
OCEAN TOWNSHIP, NEW JERSEY

SAMPLE NO. SAMPLING DATE UNITS	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	NJDEP RESIDENTIAL DIRECT CONTACT SOIL CLEANUP CRITERIA (ug/kg)
	9/30/97 ug/kg	9/30/97 ug/kg	9/30/97 ug/kg	9/30/97 ug/kg	9/30/97 ug/kg	9/30/97 ug/kg	9/30/97 ug/kg	10/1/97 ug/kg	10/1/97 ug/kg	10/1/97 ug/kg	10/1/97 ug/kg	
Bis(2-ethylhexyl)phthalate	810 UJ	440 U	970 UJ	420 U	1100 UJ	470 U	910 UJ	430 U	810 UJ	420 U	620 U	49,000
Di-n-octyl phthalate	810 UJ	440 U	970 UJ	420 U	1100 UJ	470 U	910 UJ	430 U	810 UJ	420 U	620 U	1,100,000
Benzo(b)fluoranthene	810 UJ	440 U	970 UJ	420 U	1100 UJ	470 U	910 UJ	430 U	810 UJ	420 U	620 U	900
Benzo(k)fluoranthene	810 UJ	440 U	970 UJ	420 U	1100 UJ	470 U	910 UJ	430 U	810 UJ	420 U	620 U	900
Benzo(a)pyrene	810 UJ	440 U	970 UJ	420 U	1100 UJ	470 U	910 UJ	430 U	810 UJ	420 U	620 U	660
Indeno(1,2,3-cd)pyrene	810 UJ	440 U	970 UJ	420 U	1100 UJ	470 U	910 UJ	430 U	810 UJ	420 U	620 U	900
Dibenzo(a,h)anthracene	810 UJ	440 U	970 UJ	420 U	1100 UJ	470 U	910 UJ	430 U	810 UJ	420 U	620 U	660
Benzo(g,h,i)perylene	810 UJ	440 U	970 UJ	420 U	1100 UJ	470 U	910 UJ	430 U	810 UJ	420 U	620 U	NLE
Carbazole	810 UJ	440 U	970 UJ	420 U	1100 UJ	470 U	910 UJ	430 U	810 UJ	420 U	620 U	NLE

NOTES:

U - Not detected at given quantitation limit

J - Estimated values

(1) S11 is a duplicate sample of S9

NLE - No Level Established

concentrations that did not exceed NJDEP soil cleanup criteria. No pesticide/PCB compounds were detected in any of the soil samples (Table 3-4).

Analysis for metals in soil revealed that arsenic, barium, cadmium, chromium, mercury, lead, and selenium were detected. Metals concentrations were significantly higher in surficial soils than in subsurface soils (Table 3-5). Arsenic was the only metal to exceed NJDEP soil cleanup criteria; concentrations ranged from 17.5 milligrams per kilogram (mg/kg) to 504 mg/kg, exceeding the NJDEP residential and non-residential direct contact soil cleanup criterion of 20 mg/kg in 10 of 11 samples collected. However, arsenic concentrations at the upgradient location (samples S1 and S2) were 129 mg/kg and 22 mg/kg, respectively, also exceeding the NJDEP criterion. The maximum concentration of 504 mg/kg was detected in sample S9, a surficial sample located downgradient of the former lagoon adjacent to the dirt road. However, the duplicate sample of S9 (S11) had an arsenic concentration of 157 mg/kg, indicating some arsenic variability in the soil. (The remaining metals were comparable in concentration between S9 and S11.) Generally, arsenic concentrations increased from the upgradient location towards the dirt road (Figure 3-1). One potential explanation for the arsenic concentrations could be the use of arsenic-containing herbicides for roadside spraying. If these types of herbicides were used in the past, arsenic concentrations would be expected to decrease with distance from the road.

Mean concentrations of arsenic in eastern United States soils have been reported as 7.4 mg/kg, with a range of <0.1 to 73 mg/kg (Shacklette and Boerngen, 1984). Therefore, arsenic concentrations in surface soil in the general former lagoon area appear to be elevated above expected background concentrations. In summary, arsenic appears to be the only contaminant of potential concern detected in the soils at this site.

3.2.2 Groundwater Results

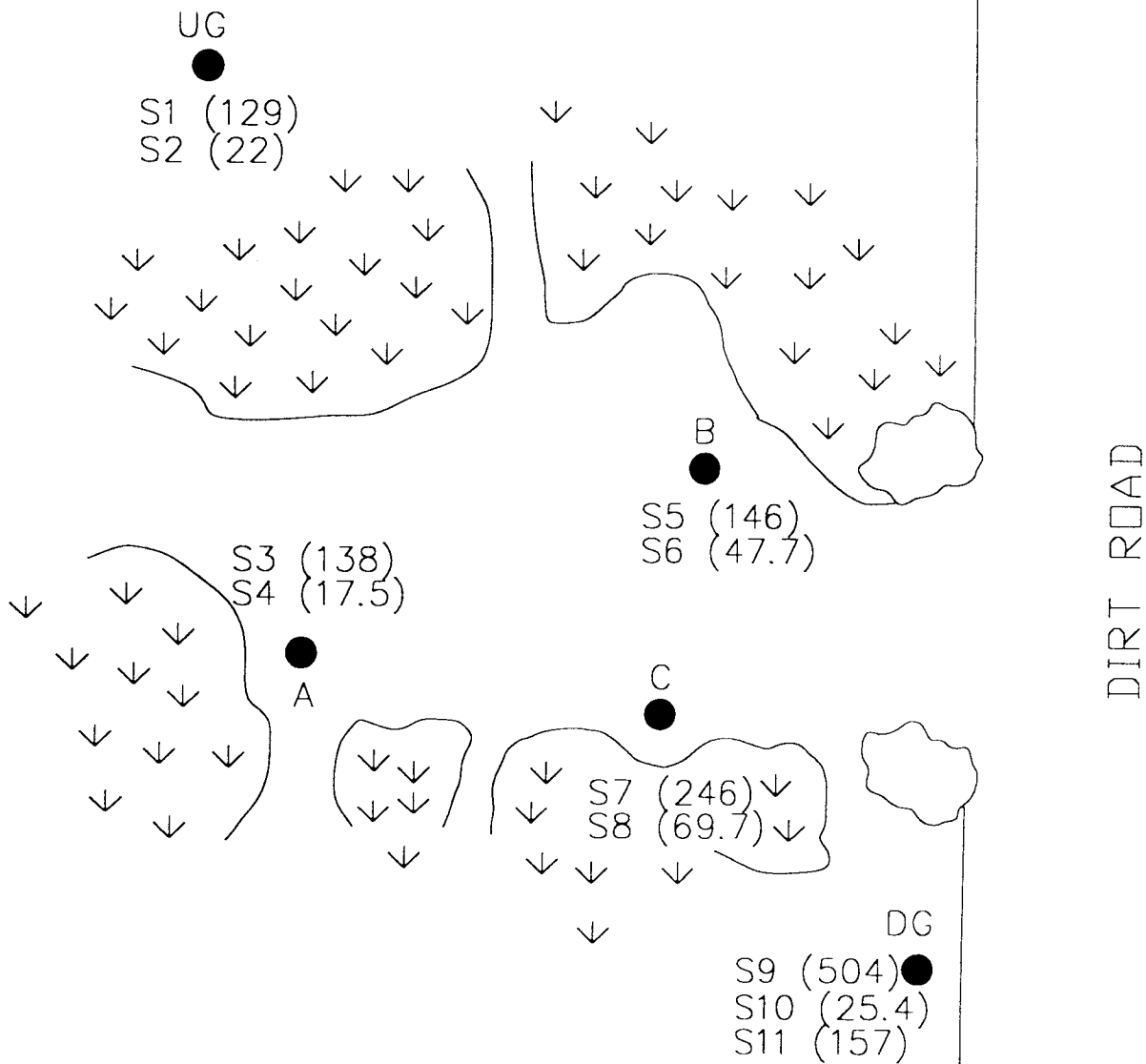
Analysis of VOCs in the four groundwater samples collected (Table 3-6) indicated that only carbon disulfide was detected. Carbon disulfide is a naturally occurring compound, but is also used in manufacturing and as a solvent. Methylene chloride and acetone were detected in the laboratory method blanks, and their presence in site samples was categorized as non-detect during data validation.

No SVOCs detected in groundwater exceeded the New Jersey Groundwater Quality Standards (NJGWQS; Table 3-7). Compounds detected were phenol, benzoic acid, and phthalate compounds, all at trace amounts. No pesticide/PCB compounds were detected in groundwater (Table 3-8).

Total recoverable metals detected in groundwater included arsenic, barium, cadmium, chromium, lead, and selenium. Of these, total recoverable concentrations of arsenic, cadmium, chromium, and lead exceeded their respective NJGWQS (Table 3-9). The soluble, or dissolved concentrations of these metals were generally an order of magnitude lower than the total concentrations. This can be attributed to the high suspended solids present in the total samples as compared to the filtered (dissolved) samples. Metals adsorb strongly to particulate matter (*e.g.*,



FORMER LAGOON AREA



S3 SOIL SAMPLE LOCATION
(138) SOIL CONCENTRATION OF ARSENIC IN MG/KG

NOTE: NOT TO SCALE

WD #: 11901-001-003-0001 DATE: 12/8/97
FILE NAME: DEAL.DWG DRAWN BY: ARROYO, JR.



PROJECT NAME:

DEAL TEST SITE

OCEAN TOWNSHIP,

NEW JERSEY

CLIENT NAME:

U.S. ARMY CORPS OF ENGINEERS

ARSENIC CONCENTRATION
IN SOIL

DATE:

MARCH 1998

FIGURE #:

3-1

TABLE 3-4
SUMMARY OF PESTICIDE/PCB RESULTS IN SOIL
DEAL TEST SITE
OCEAN TOWNSHIP, NEW JERSEY

SAMPLE NO. SAMPLING DATE UNITS	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11 (1)	NJDEP RESIDENTIAL DIRECT CONTACT SOIL CLEANUP CRITERIA (ug/kg)
	9/30/97 ug/kg	9/30/97 ug/kg	9/30/97 ug/kg	9/30/97 ug/kg	9/30/97 ug/kg	9/30/97 ug/kg	10/1/97 ug/kg	10/1/97 ug/kg	10/1/97 ug/kg	10/1/97 ug/kg	10/1/97 ug/kg	
Alpha-BHC	200 UJ	110 U	48 UJ	100 U	260 UJ	120 U	45 UJ	110 U	40 UJ	100 U	31 U	NLE
Beta-BHC	200 UJ	110 U	48 UJ	100 U	260 UJ	120 U	45 UJ	110 U	40 UJ	100 U	31 U	NLE
Delta-BHC	200 UJ	110 U	48 UJ	100 U	260 UJ	120 U	45 UJ	110 U	40 UJ	100 U	31 U	NLE
gamma-BHC (Lindane)	200 UJ	110 U	48 UJ	100 U	260 UJ	120 U	45 UJ	110 U	40 UJ	100 U	31 U	520
Heptachlor	200 UJ	110 U	48 UJ	100 U	260 UJ	120 U	45 UJ	110 U	40 UJ	100 U	31 U	150
Aldrin	200 UJ	110 U	48 UJ	100 U	260 UJ	120 U	45 UJ	110 U	40 UJ	100 U	31 U	40
Heptachlor epoxide	200 UJ	110 U	48 UJ	100 U	260 UJ	120 U	45 UJ	110 U	40 UJ	100 U	31 U	150
Endosulfan I	200 UJ	110 U	48 UJ	100 U	260 UJ	120 U	45 UJ	110 U	40 UJ	100 U	31 U	340,000
Dieldrin	400 UJ	220 U	96 UJ	210 U	530 UJ	240 U	90 UJ	210 U	81 UJ	210 U	62 U	42
4,4'-DDE	400 UJ	220 U	96 UJ	210 U	530 UJ	240 U	90 UJ	210 U	81 UJ	210 U	62 U	2,000
Endrin	400 UJ	220 U	96 UJ	210 U	530 UJ	240 U	90 UJ	210 U	81 UJ	210 U	62 U	17,000
Endosulfan II	400 UJ	220 U	96 UJ	210 U	530 UJ	240 U	90 UJ	210 U	81 UJ	210 U	62 U	340,000
4,4'-DDD	400 UJ	220 U	96 UJ	210 U	530 UJ	240 U	90 UJ	210 U	81 UJ	210 U	62 U	3,000
Endosulfan sulfate	400 UJ	220 U	96 UJ	210 U	530 UJ	240 U	90 UJ	210 U	81 UJ	210 U	62 U	340,000
4,4'-DDT	400 UJ	220 U	96 UJ	210 U	530 UJ	240 U	90 UJ	210 U	81 UJ	210 U	62 U	2,000
Methoxychlor	2000 UJ	1100 U	480 UJ	1000 U	2600 UJ	1200 U	450 UJ	1100 U	400 UJ	1000 U	310 U	280,000
Endrin ketone	400 UJ	220 U	96 UJ	210 U	530 UJ	240 U	90 UJ	210 U	81 UJ	210 U	62 U	17,000
Endrin aldehyde	400 UJ	220 U	96 UJ	210 U	530 UJ	240 U	90 UJ	210 U	81 UJ	210 U	62 U	17,000
alpha-Chlordane	200 UJ	110 U	48 UJ	100 U	260 UJ	120 U	45 UJ	110 U	40 UJ	100 U	31 U	NLE
gamma-Chlordane	200 UJ	110 U	48 UJ	100 U	260 UJ	120 U	45 UJ	110 U	40 UJ	100 U	31 U	NLE
Toxaphene	20000 UJ	11000 U	4800 UJ	10000 U	26000 UJ	12000 U	4500 UJ	11000 U	4000 UJ	10000 U	3100 U	100
Aroclor-1016	4000 UJ	2200 U	960 UJ	2100 U	5300 UJ	2400 U	900 UJ	2100 U	810 UJ	2100 U	620 U	490
Aroclor-1221	8000 UJ	4300 U	1900 UJ	4200 U	11000 UJ	4700 U	1800 UJ	4300 U	1600 UJ	4100 U	1200 U	490
Aroclor-1232	4000 UJ	2200 U	960 UJ	2100 U	5300 UJ	2400 U	900 UJ	2100 U	810 UJ	2100 U	620 U	490
Aroclor-1242	4000 UJ	2200 U	960 UJ	2100 U	5300 UJ	2400 U	900 UJ	2100 U	810 UJ	2100 U	620 U	490
Aroclor-1248	4000 UJ	2200 U	960 UJ	2100 U	5300 UJ	2400 U	900 UJ	2100 U	810 UJ	2100 U	620 U	490
Aroclor-1254	4000 UJ	2200 U	960 UJ	2100 U	5300 UJ	2400 U	900 UJ	2100 U	810 UJ	2100 U	620 U	490
Aroclor-1260	4000 UJ	2200 U	960 UJ	2100 U	5300 UJ	2400 U	900 UJ	2100 U	810 UJ	2100 U	620 U	490

NOTES:

U - Not detected at given quantitation limit

J - Estimated Value

(1) S11 is a duplicate of sample S9

NLE - No level established

**TABLE 3-5
SUMMARY OF METALS RESULTS IN SOIL
DEAL TEST SITE
OCEAN TOWNSHIP, NEW JERSEY**

SAMPLE NO. SAMPLING DATE UNITS	S1 9/30/97 mg/kg	S2 9/30/97 mg/kg	S3 9/30/97 mg/kg	S4 9/30/97 mg/kg	S5 9/30/97 mg/kg	S6 9/30/97 mg/kg	S7 10/1/97 mg/kg	S8 10/1/97 mg/kg	S9 10/1/97 mg/kg	S10 10/1/97 mg/kg	S11 10/1/97 mg/kg	NJDEP RESIDENTIAL DIRECT CONTACT SOIL CLEANUP CRITERIA (mg/L)
Silver, Total	0.19 UJ	0.10 UJ	0.23 UJ	0.10 UJ	0.25 UJ	0.11 UJ	0.22 UJ	0.10 UJ	0.19 UJ	0.10 UJ	0.15 UJ	110
Arsenic, Total	129 J	22	138 J	17.5	146 J	47.7	246 J	69.7 J	504 J	25.4 J	157 J	20
Barium, Total	64.9 J	20.5	72.4 J	17.6	88.4 J	23.2	92.7	35	102	18.6	114	700
Cadmium, Total	0.33 J	0.05	0.12 UJ	0.05 U	0.13 UJ	0.06 U	0.78	0.16	0.1 U	0.1	0.16	1
Chromium, Total	25.3 J	18.3	44.7 J	19.6	35.3 J	18.5	25	30.1	31.2	37	19.1	500
Mercury, Total	0.04 UJ	0.02 U	0.05 UJ	0.02 U	0.05 UJ	0.02 U	0.05 U	0.02 U	0.07	0.02 U	0.12	14
Lead, Total	51.6 J	4.2 J	6 R	3.2 J	27.2 J	2.4 R	24.4 J	3.9 J	26.3 J	4 J	28.9 J	400
Selenium, Total	5.1 J	1	3.8 J	0.68	6.2 J	1.4	6.6 J	0.78	4	0.55 U	3.2	63

NOTES:

U - Not detected at indicated instrument detection limit

J - Estimated value

R - Rejected, concentration less than 5 times the field blank concentration.

TABLE 3-6
SUMMARY OF VOLATILE ORGANIC COMPOUND RESULTS IN GROUNDWATER
DEAL TEST SITE
OCEAN TOWNSHIP, NEW JERSEY

SAMPLE NO. SAMPLING DATE UNITS	GW-1 9/30/97 ug/L	GW-2 9/30/97 ug/L	GW-3 10/1/97 ug/L	GW-4 10/1/97 ug/L	GW-5 10/1/97 ug/L	NJDEP APPROVED GROUNDWATER CLEANUP STANDARDS (1)ug/L
Chloromethane	10 UJ	10 UJ	10 UJ	10 UJ	10 UJ	30
Bromomethane	10 UJ	10 UJ	10 U	10 U	10 UJ	10
Vinyl Chloride	10 UJ	10 UJ	10 U	10 U	10 UJ	5
Chloroethane	10 UJ	10 UJ	10 U	10 U	10 UJ	NLE
Methylene Chloride	5 UJ	5 UJ	9 U	9 U	18 UJ	2
Acetone	10 UJ	12 UJ	10 U	10 U	10 UJ	700
Carbon Disulfide	5 UJ	5 UJ	69	150	170	NLE
1,1-Dichloroethene	5 UJ	5 UJ	5 U	5 U	5 UJ	2
1,1-Dichloroethane	5 UJ	5 UJ	5 U	5 U	5 UJ	70
1,2-Dichloroethene (total)	5 UJ	5 UJ	5 U	5 U	5 UJ	10
Chloroform	5 UJ	5 UJ	5 U	5 U	5 UJ	6
1,2-Dichloroethane	5 UJ	5 UJ	5 U	5 U	5 UJ	2
2-Butanone	10 UJ	10 UJ	10 U	10 U	10 UJ	300
1,1,1-Trichloroethane	5 UJ	5 UJ	5 U	5 U	5 UJ	30
Carbon Tetrachloride	5 UJ	5 UJ	5 U	5 U	5 UJ	2
Bromodichloromethane	5 UJ	5 UJ	5 U	5 U	5 UJ	1
1,2-Dichloropropane	5 UJ	5 UJ	5 U	5 U	5 UJ	1
cis-1,3-Dichloropropene	5 UJ	5 UJ	5 U	5 U	5 UJ	0.2
Trichloroethene	5 UJ	5 UJ	5 U	2 J	5 UJ	1
Dibromochloromethane	5 UJ	5 UJ	5 U	5 U	5 UJ	10
1,1,2-Trichloroethane	5 UJ	5 UJ	5 U	5 U	5 UJ	3
Benzene	5 UJ	5 UJ	5 U	5 U	5 UJ	1
Trans-1,3-Dichloropropene	5 UJ	5 UJ	5 U	5 U	5 UJ	0.2
Bromoform	5 UJ	5 UJ	5 U	5 U	5 UJ	4
4-Methyl-2-pentanone	10 UJ	10 UJ	10 U	10 U	10 UJ	400
2-Hexanone	10 UJ	10 UJ	10 U	10 U	10 UJ	NLE

TABLE 3-6 (CONTINUED)
SUMMARY OF VOLATILE ORGANIC COMPOUND RESULTS IN GROUNDWATER
DEAL TEST SITE
OCEAN TOWNSHIP, NEW JERSEY

SAMPLE NO. SAMPLING DATE UNITS	GW-1 9/30/97 ug/L	GW-2 9/30/97 ug/L	GW-3 10/1/97 ug/L	GW-4 10/1/97 ug/L	GW-5 10/1/97 ug/L	NJDEP APPROVED GROUNDWATER CLEANUP STANDARDS (1)ug/L
Tetrachloroethene	5 UJ	5 UJ	5 U	5 U	5 UJ	1
1,1,2,2-Tetrachloroethane	5 UJ	5 UJ	5 U	5 U	5 UJ	2
Toluene	5 UJ	5 UJ	5 U	5 U	5 UJ	1000
Chlorobenzene	5 UJ	5 UJ	5 U	5 U	5 UJ	4
Ethylbenzene	5 UJ	5 UJ	5 U	5 U	5 UJ	700
Styrene	5 UJ	5 UJ	5 U	5 U	5 UJ	100
Xylene (total)	5 UJ	5 UJ	5 U	5 U	5 UJ	40

NOTES:

U - Not detected above given quantitation limit

J - Estimated values

B- Analyte detected in blank

NLE - No Level Established

(1) Higher of Practical Quantitation Limit or Standard is used.

TABLE 3-7
SUMMARY OF SEMIVOLATILE ORGANIC COMPOUND RESULTS IN GROUNDWATER
DEAL TEST SITE
OCEAN TOWNSHIP, NEW JERSEY

SAMPLE NO. SAMPLING DATE UNITS	GW-1 9/30/97 ug/L	GW-2 9/30/97 ug/L	GW-3 10/1/97 ug/L	GW-4 10/1/97 ug/L	GW-5 10/1/97 ug/L	NJDEP APPROVED GROUNDWATER CLEANUP STANDARDS ug/L
Phenol	10 J	11 U	12 U	3 J	12 U	4000
bis(2-Chloroethyl)ether	11 U	11 U	12 U	12 U	12 U	10
2-Chlorophenol	11 U	11 U	12 U	12 U	12 U	40
1,3-Dichlorobenzene	11 U	11 U	12 U	12 U	12 U	600
1,4-Dichlorobenzene	11 U	11 U	12 U	12 U	12 U	75
Benzyl alcohol	11 U	11 U	12 U	12 U	12 U	2000
1,2-Dichlorobenzene	11 U	11 U	12 U	12 U	12 U	600
2-Methylphenol	11 U	11 U	12 U	12 U	12 U	NLE
bis(2-Chloroisopropyl)ether	11 U	11 U	12 U	12 U	12 U	300
4-Methylphenol	11 U	11 U	12 U	12 U	12 U	NLE
N-Nitroso-Di-n-propylamine	11 U	11 U	12 U	12 U	12 U	20
Hexachloroethane	11 U	11 U	12 U	12 U	12 U	10
Nitrobenzene	11 U	11 U	12 U	12 U	12 U	10
Isophorone	11 U	11 U	12 U	12 U	12 U	100
2-Nitrophenol	11 U	11 U	12 U	12 U	12 U	NLE
2,4-Dimethylphenol	11 U	11 U	12 U	12 U	12 U	100
Benzoic acid	55 U	2 J	60 U	1 J	60 U	NLE
bis(2-Chloroethoxy)methane	11 U	11 U	12 U	12 U	12 U	NLE
2,4-Dichlorophenol	11 U	11 U	12 U	12 U	12 U	20
1,2,4-Trichlorobenzene	11 U	11 U	12 U	12 U	12 U	9
Naphthalene	11 U	11 U	12 U	12 U	12 U	NLE
4-Chloroaniline	11 U	11 U	12 U	12 U	12 U	NLE
Hexachlorobutadiene	11 U	11 U	12 U	12 U	12 U	1
4-Chloro-3-methylphenol	11 U	11 U	12 U	12 U	12 U	NLE
2-Methylnaphthalene	11 U	11 U	12 U	12 U	12 U	NLE
Hexachlorocyclopentadiene	11 U	11 U	12 U	12 U	12 U	50
2,4,6-Trichlorophenol	11 U	11 U	12 U	12 U	12 U	20
2,4,5-Trichlorophenol	55 U	55 U	60 U	60 U	60 U	700
2-Chloronaphthalene	11 U	11 U	12 U	12 U	12 U	NLE

TABLE 3-7 (CONTINUED)
SUMMARY OF SEMIVOLATILE ORGANIC COMPOUND RESULTS IN GROUNDWATER
DEAL TEST SITE
OCEAN TOWNSHIP, NEW JERSEY

SAMPLE NO. SAMPLING DATE UNITS	GW-1 9/30/97 ug/L	GW-2 9/30/97 ug/L	GW-3 10/1/97 ug/L	GW-4 10/1/97 ug/L	GW-5 10/1/97 ug/L	NJDEP APPROVED GROUNDWATER CLEANUP STANDARDS ug/L
2-Nitroaniline	55 U	55 U	60 U	60 U	60 U	NLE
Dimethylphthalate	11 U	11 U	12 U	12 U	12 U	NLE
Acenaphthylene	11 U	11 U	12 U	12 U	12 U	NLE
2,6-Dinitrotoluene	11 U	11 U	12 U	12 U	12 U	NLE
3-Nitroaniline	55 U	55 U	60 U	60 U	60 U	NLE
Acenaphthene	11 U	11 U	12 U	12 U	12 U	400
2,4-Dinitrophenol	55 U	55 U	60 U	60 U	60 U	40
4-Nitrophenol	55 U	55 U	60 U	60 U	60 U	NLE
Dibenzofuran	11 U	11 U	12 U	12 U	12 U	NLE
2,4-Dinitrotoluene	11 U	11 U	12 U	12 U	12 U	10
Diethylphthalate	1 J	11 U	12 U	1 J	12 U	5000
4-Chlorophenyl-phenylether	11 U	11 U	12 U	12 U	12 U	NLE
Fluorene	11 U	11 U	12 U	12 U	12 U	300
4-Nitroaniline	55 U	55 U	60 U	60 U	60 U	NLE
4,6-Dinitro-2-methylphenol	55 U	55 U	60 U	60 U	60 U	NLE
N-Nitrosodiphenylamine	11 U	11 U	12 U	12 U	12 U	20
4-Bromophenyl-phenylether	11 U	11 U	12 U	12 U	12 U	NLE
Hexachlorobenzene	11 U	11 U	12 U	12 U	12 U	10
Pentachlorophenol	55 U	55 U	60 U	60 U	60 U	1
Phenanthrene	11 U	11 U	12 U	12 U	12 U	NLE
Anthracene	11 U	11 U	12 U	12 U	12 U	2000
Di-n-Butylphthalate	1 J	11 U	12 U	12 U	12 U	900
Fluoranthene	11 U	11 U	12 U	12 U	12 U	300
Pyrene	11 U	11 U	12 U	12 U	12 U	200
Butylbenzylphthalate	11 U	11 U	12 U	12 U	12 U	100
3,3'-Dichlorobenzidine	22 U	22 U	24 U	24 U	24 U	60
Benzo(a)anthracene	11 U	11 U	12 U	12 U	12 U	NLE
Chrysene	11 U	11 U	12 U	12 U	12 U	NLE
bis(2-Ethylhexyl)phthalate	1 J	11 U	2 J	12 U	12 U	30

TABLE 3-7 (CONTINUED)
SUMMARY OF SEMIVOLATILE ORGANIC COMPOUND RESULTS IN GROUNDWATER
DEAL TEST SITE
OCEAN TOWNSHIP, NEW JERSEY

SAMPLE NO. SAMPLING DATE UNITS	GW-1 9/30/97 ug/L	GW-2 9/30/97 ug/L	GW-3 10/1/97 ug/L	GW-4 10/1/97 ug/L	GW-5 10/1/97 ug/L	NJDEP APPROVED GROUNDWATER CLEANUP STANDARDS ug/L
Di-n-Octyl phthalate	11 U	11 U	12 U	12 U	12 U	100
Benzo(b)fluoranthene	11 U	11 U	12 U	12 U	12 U	NLE
Benzo(k)fluoranthene	11 U	11 U	12 U	12 U	12 U	NLE
Benzo(a)pyrene	11 U	11 U	12 U	12 U	12 U	NLE
Indeno(1,2,3-cd)pyrene	11 U	11 U	12 U	12 U	12 U	NLE
Dibenzo(a,h)anthracene	11 U	11 U	12 U	12 U	12 U	NLE
Benzo(g,h,i)perylene	11 U	11 U	12 U	12 U	12 U	NLE
Carbazole	11 U	11 U	12 U	12 U	12 U	NLE

NOTES:

U - Not detected above given quantitation limit

J - Estimated values below quantitation limit

NLE - No Level Established

(1) Higher of practical quantitation limit or standard is used.

TABLE 3-8
SUMMARY OF PESTICIDE/PCB RESULTS IN GROUNDWATER
DEAL TEST SITE
OCEAN TOWNSHIP, NEW JERSEY

SAMPLE NO. SAMPLING DATE UNITS	GW-1 9/30/97 ug/L	GW-2 9/30/97 ug/L	GW-3 10/1/97 ug/L	GW-4 10/1/97 ug/L	GW-5 10/1/97 ug/L	NJDEP APPROVED GROUNDWATER CLEANUP STANDARDS ⁽¹⁾ ug/L
Alpha-BHC	0.05 U	0.25 U	0.057 U	0.064 U	0.057 U	0.02
Beta-BHC	0.05 U	0.25 U	0.057 U	0.064 U	0.057 U	0.2
Delta-BHC	0.05 U	0.25 U	0.057 U	0.064 U	0.057 U	NLE
gamma-BHC (Lindane)	0.05 U	0.25 U	0.057 U	0.064 U	0.057 U	0.2
Heptachlor	0.05 U	0.25 U	0.057 U	0.064 U	0.057 U	0.4
Aldrin	0.05 U	0.25 U	0.057 U	0.064 U	0.057 U	0.04
Heptachlor epoxide	0.05 U	0.25 U	0.057 U	0.064 U	0.057 U	0.2
Endosulfan I	0.05 U	0.25 U	0.057 U	0.064 U	0.057 U	0.4
Dieldrin	0.1 U	0.5 U	0.11 U	0.13 U	0.11 U	0.03
4,4'-DDE	0.1 U	0.5 U	0.11 U	0.13 U	0.11 U	0.1
Endrin	0.1 U	0.5 U	0.11 U	0.13 U	0.11 U	2
Endosulfan II	0.1 U	0.5 U	0.11 U	0.13 U	0.11 U	0.4
4,4'-DDD	0.1 U	0.5 U	0.11 U	0.13 U	0.11 U	0.1
Endosulfan sulfate	0.1 U	0.5 U	0.11 U	0.13 U	0.11 U	0.4
4,4'-DDT	0.1 U	0.5 U	0.11 U	0.13 U	0.11 U	0.1
Methoxychlor	0.5 U	2.5 U	0.57 U	0.64 U	0.57 U	40
Endrin ketone	0.1 U	0.5 U	0.11 U	0.13 U	0.11 U	2
Endrin aldehyde	0.1 U	0.5 U	0.11 U	0.13 U	0.11 U	2
alpha-Chlordane	0.05 U	0.25 U	0.057 U	0.064 U	0.057 U	0.5
gamma-Chlordane	0.05 U	0.25 U	0.057 U	0.064 U	0.057 U	0.5
Toxaphene	5 U	25 U	5.7 U	6.4 U	5.7 U	3
Aroclor-1016	1 U	5 U	1.1 U	1.3 U	1.1 U	0.5
Aroclor-1221	2 U	10 U	2.3 U	2.5 U	2.3 U	0.5
Aroclor-1232	1 U	5 U	1.1 U	1.3 U	1.1 U	0.5

TABLE 3-8
SUMMARY OF PESTICIDE/PCB RESULTS IN GROUNDWATER
DEAL TEST SITE
OCEAN TOWNSHIP, NEW JERSEY

SAMPLE NO. SAMPLING DATE UNITS	GW-1 9/30/97 ug/L	GW-2 9/30/97 ug/L	GW-3 10/1/97 ug/L	GW-4 10/1/97 ug/L	GW-5 10/1/97 ug/L	NJDEP APPROVED GROUNDWATER CLEANUP STANDARDS⁽¹⁾ ug/L
Aroclor-1242	1 U	5 U	1.1 U	1.3 U	1.1 U	0.5
Aroclor-1248	1 U	5 U	1.1 U	1.3 U	1.1 U	0.5
Aroclor-1254	1 U	5 U	1.1 U	1.3 U	1.1 U	0.5
Aroclor-1260	1 U	5 U	1.1 U	1.3 U	1.1 U	0.5

NOTES:

U - Not detected above given quantitation limit

(1) Higher of practical quantitation limit or standard is used.

**TABLE 3-9
SUMMARY OF METALS RESULTS IN GROUNDWATER
DEAL TEST SITE
OCEAN TOWNSHIP, NEW JERSEY**

SAMPLE NO. SAMPLING DATE Units	GW-1 9/30/97		GW-2 9/30/97		GW-3 10/1/97		GW-4 10/1/97		GW-5 (1) 10/1/97	NJDEP APPROVED GROUNDWATER CLEANUP STANDARDS (2) ug/L
	ug/L		ug/L		ug/L		ug/L		ug/L	
	Total	Soluble	Total	Soluble	Total	Soluble	Total	Soluble	Total	Total
Silver	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	0.80 U	0.80 U	0.8 U	0.80 U	NLE
Arsenic	135	2.5	747	55.9	53.6	3.3	374	39.4	37.9	8
Barium	195	74.4	833	7.8	84.4	23.6	186	9.7	53.7	2,000
Cadmium	1.3	0.4 U	10.9	0.4 U	0.68	0.4 U	2.7	0.57	0.40 U	4
Chromium	650	0.6 U	1230	5.6 U	474	0.6 U	767	7.7 U	478	100
Mercury	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.10 U	0.1 U	0.10 U	2
Lead	53.2	2.9 U	222	2.9 U	17.7	2.9 U	81.1	2.9 U	12.2	10
Selenium	26.3	5.7	34.7	5.9 U	11.2	4.4 U	24.9	4.4 U	9.8	50

NOTES:

U - Not detected at given quantitation limit

(1) GW-5 is a duplicate sample for GW-3 (total metals)

(2) Higher of Practical Quantitation Limit or Standard is used

NLE - No Level Established

silts and clays), and their presence in the total samples is a reflection of the concentration in the soil. Nevertheless, the soluble concentrations of arsenic exceeded the NJGWQS at two locations (GW-2 and GW-4) within the former lagoon area, and downgradient, respectively. Concentrations at these locations were 55.9 (micrograms per liter) $\mu\text{g/L}$ and 39.4 $\mu\text{g/L}$, respectively, compared to the NJGWQS of 8 $\mu\text{g/L}$ for arsenic. Soluble concentrations of lead and chromium were not detected.

3.2.3 Surface Water and Sediment Results

The stream adjacent to the site is a tributary to Poplar Brook, which discharges to the Atlantic Ocean. Based on New Jersey regulations (N.J.A.C. 7:9B-1.15), the tributary and Poplar Brook would be classified as FW2-NT (freshwater - nontrout). VOCs were not detected in the two surface water or sediment samples (Table 3-10) collected from the tributary. Acetone and methylene chloride were detected in blank samples resulting in non-detect designations for those compounds in samples in which they were detected.

SVOCs were not detected in the surface water samples (Table 3-11). Several SVOCs were detected in the two sediment samples. These compounds consisted primarily of PAHs, and one phthalate. Phenanthrene, fluoranthene, and pyrene were detected in both samples at comparable concentrations. Benzo(a)anthracene and chrysene were detected only at SD-2, the upgradient location, at concentrations below 100 $\mu\text{g/kg}$. Di-n-butylphthalate was also detected only at the upgradient location.

No pesticide or PCB compounds were detected in the surface water or sediment samples (Table 3-12).

The two surface water samples were analyzed for both total recoverable metals and soluble metals (Table 3-13). Barium was the only metal detected, at concentrations well below the NJDEP FW-2 criterion of 2,000 $\mu\text{g/L}$. However, the detection limit for arsenic exceeded the conservative NJDEP FW-2 criterion. The FW-2 arsenic criterion is based upon carcinogenic human health risks, and is very low (0.0017 $\mu\text{g/L}$). This criterion is well below the method detection limit for arsenic.

Arsenic, barium, cadmium, chromium, and lead were detected in both sediment samples. Concentrations of each of these metals were comparable between SD-1 and SD-2, but were slightly higher in the downgradient location (SD1). Metals concentrations were well below concentrations expected in a more impacted environment (*e.g.*, urban sediments), and were lower than metals concentrations in the site soils.

3.3 DATA QUALITY OBJECTIVES/DATA VALIDATION

The results from the laboratory analyses were compared to the data quality objectives (DQOs) for this investigation. Primarily this consisted of a comparison of the indicated laboratory reporting limits (*e.g.*, quantitation or detection limits) against the method reporting limits. In

TABLE 3-10
SUMMARY OF VOLATILE ORGANIC COMPOUND RESULTS IN SURFACE WATER AND SEDIMENT
DEAL TEST SITE
OCEAN TOWNSHIP, NEW JERSEY

SAMPLE NO. Sampling Date Units	SW-1 10/1/97 ug/L	SW-2 10/1/97 ug/L	SD-1 10/1/97 ug/kg	SD-2 10/1/97 ug/kg	NJDEP SURFACE WATER STANDARDS FOR FW2 WATER (ug/L)
Chloromethane	10 U	10 U	12 U	13 U	NLE
Bromomethane	10 U	10 U	12 U	13 U	48.4
Vinyl Chloride	10 U	10 U	12 U	13 U	0.083
Chloroethane	10 U	10 U	12 U	13 U	NLE
Methylene Chloride	11 U	7 U	6 U	6 U	2.49
Acetone	10 U	10 U	12 U	13 U	NLE
Carbon Disulfide	5 U	5 U	6 U	6 U	NLE
1,1-Dichloroethene	5 U	5 U	6 U	6 U	4.81
1,1-Dichloroethane	5 U	5 U	6 U	6 U	NLE
1,2-Dichloroethene (total)	5 U	5 U	6 U	6 U	592
Chloroform	5 U	5 U	6 U	6 U	5.67
1,2-Dichloroethane	5 U	5 U	6 U	6 U	0.291
2-Butanone	10 U	10 U	12 U	13 U	NLE
1,1,1-Trichloroethane	5 U	5 U	6 U	6 U	127
Carbon Tetrachloride	5 U	5 U	6 U	6 U	0.363
Bromodichloromethane	5 U	5 U	6 U	6 U	0.266
1,2-Dichloropropane	5 U	5 U	6 U	6 U	NLE
cis-1,3-Dichloropropene	5 U	5 U	6 U	6 U	0.193
Trichloroethene	5 U	5 U	6 U	6 U	1.09
Dibromochloromethane	5 U	5 U	6 U	6 U	72.6
1,1,2-Trichloroethane	5 U	5 U	6 U	6 U	13.5
Benzene	5 U	5 U	6 U	6 U	0.15
Trans-1,3-Dichloropropene	5 U	5 U	6 U	6 U	0.193

TABLE 3-10 (CONTINUED)
SUMMARY OF VOLATILE ORGANIC COMPOUND RESULTS IN SURFACE WATER AND SEDIMENT
DEAL TEST SITE
OCEAN TOWNSHIP, NEW JERSEY

SAMPLE NO. Sampling Date Units	SW-1 10/1/97 ug/L	SW-2 10/1/97 ug/L	SD-1 10/1/97 ug/kg	SD-2 10/1/97 ug/kg	NJDEP SURFACE WATER STANDARDS FOR FW2 WATER (ug/L)
Bromoform	5 U	5 U	6 U	6 U	4.38
4-Methyl-2-pentanone	10 U	10 U	12 U	13 U	NLE
2-Hexanone	10 U	10 U	12 U	13 U	NLE
Tetrachloroethene	5 U	5 U	6 U	6 U	0.388
1,1,2,2-Tetrachloroethane	5 U	5 U	6 U	6 U	1.72
Toluene	5 U	5 U	6 U	6 U	7,440
Chlorobenzene	5 U	5 U	6 U	6 U	22
Ethylbenzene	5 U	5 U	6 U	6 U	3030
Styrene	5 U	5 U	6 U	6 U	NLE
Xylene (total)	5 U	5 U	6 U	6 U	NLE

NOTES:

SW - Surface Water; SD - Sediment

U - Not detected above given quantitation limit

NLE - No level established

TABLE 3-11
SUMMARY OF SVOC RESULTS IN SURFACE WATER AND SEDIMENT
DEAL TEST SITE
OCEAN TOWNSHIP, NEW JERSEY

SAMPLE NO. SAMPLING DATE UNITS	SW-1 10/1/97 ug/L	SW-2 10/1/97 ug/L	SD-1 10/1/97 ug/kg	SD-2 10/1/97 ug/kg	NJDEP SURFACE WATER STANDARDS FOR FW2 WATER (ug/L)
Phenol	11 U	11 U	440 U	420 U	20900
bis(2-Chloroethyl)ether	11 U	11 U	440 U	420 U	0.0311
2-Chlorophenol	11 U	11 U	440 U	420 U	122
1,3-Dichlorobenzene	11 U	11 U	440 U	420 U	2620
1,4-Dichlorobenzene	11 U	11 U	440 U	420 U	343
Benzyl alcohol	11 U	11 U	440 U	420 U	NLE
1,2-Dichlorobenzene	11 U	11 U	440 U	420 U	2520
2-Methylphenol	11 U	11 U	440 U	420 U	NLE
bis(2-Chloroisopropyl)	11 U	11 U	440 U	420 U	1250
4-Methylphenol	11 U	11 U	440 U	420 U	NLE
N-Nitroso-Di-n-propylamine	11 U	11 U	440 U	420 U	NLE
Hexachloroethane	11 U	11 U	440 U	420 U	2.73
Nitrobenzene	11 U	11 U	440 U	420 U	16
Isophorone	11 U	11 U	440 U	420 U	552
2-Nitrophenol	11 U	11 U	440 U	420 U	NLE
2,4-Dimethylphenol	11 U	11 U	440 U	420 U	NLE
Benzoic acid	55 U	55 U	2200 U	2100 U	NLE
bis(2-Chloroethoxy)methane	11 U	11 U	440 U	420 U	NLE
2,4-Dichlorophenol	11 U	11 U	440 U	420 U	92.7
1,2,4-Trichlorobenzene	11 U	11 U	440 U	420 U	30.6
Naphthalene	11 U	11 U	440 U	420 U	NLE
4-Chloroaniline	11 U	11 U	440 U	420 U	NLE
Hexachlorobutadiene	11 U	11 U	440 U	420 U	6.94
4-Chloro-3-methylphenol	11 U	11 U	440 U	420 U	NLE
2-Methylnaphthalene	11 U	11 U	440 U	420 U	NLE
Hexachlorocyclopentadiene	11 U	11 U	440 U	420 U	245
2,4,6-Trichlorophenol	11 U	11 U	440 U	420 U	2.14
2,4,5-Trichlorophenol	55 U	55 U	2200 U	2100 U	2580
2-Chloronaphthalene	11 U	11 U	440 U	420 U	NLE
2-Nitroaniline	55 U	55 U	2200 U	2100 U	NLE
Dimethylphthalate	11 U	11 U	440 U	420 U	313000
Acenaphthylene	11 U	11 U	440 U	420 U	NLE
2,6-Dinitrotoluene	11 U	11 U	440 U	420 U	NLE
3-Nitroaniline	55 U	55 U	2200 U	2100 U	NLE
Acenaphthene	11 U	11 U	440 U	420 U	NLE
2,4-Dinitrophenol	55 U	55 U	2200 U	2100 U	69.7
4-Nitrophenol	55 U	55 U	2200 U	2100 U	NLE
Dibenzofuran	11 U	11 U	440 U	420 U	NLE
2,4-Dinitrotoluene	11 U	11 U	440 U	420 U	0.11
Diethylphthalate	11 U	11 U	440 U	420 U	21200

TABLE 3-11 (CONTINUED)
SUMMARY OF SVOC RESULTS IN SURFACE WATER AND SEDIMENT
DEAL TEST SITE
OCEAN TOWNSHIP, NEW JERSEY

SAMPLE NO. SAMPLING DATE UNITS	SW-1 10/1/97 ug/L	SW-2 10/1/97 ug/L	SD-1 10/1/97 ug/kg	SD-2 10/1/97 ug/kg	NJDEP SURFACE WATER STANDARDS FOR FW2 WATER (ug/L)
4-Chlorophenyl-phenylether	11 U	11 U	440 U	420 U	NLE
Fluorene	11 U	11 U	440 U	420 U	2361834.75
4-Nitroaniline	55 U	55 U	2200 U	2100 U	NLE
4,6-Dinitro-2-methylphenol	55 U	55 U	2200 U	2100 U	NLE
N-Nitrosodiphenylamine	11 U	11 U	440 U	420 U	4.95
4-Bromophenyl-phenylether	11 U	11 U	440 U	420 U	NLE
Hexachlorobenzene	11 U	11 U	440 U	420 U	0.000748
Pentachlorophenol	55 U	55 U	2200 U	2100 U	0.282
Phenanthrene	11 U	11 U	94 J	55 J	NLE
Anthracene	11 U	11 U	440 U	420 U	9570
Di-n-Butylphthalate	11 U	11 U	440 U	320 J	3530
Fluoranthene	11 U	11 U	150 J	140 J	310
Pyrene	11 U	11 U	130 J	92 J	797
Butylbenzylphthalate	11 U	11 U	440 U	420 U	239
3,3'-Dichlorobenzidine	22 U	22 U	870 U	850 U	0.0386
Benzo(a)anthracene	11 U	11 U	440 U	43 J	0.0028
Chrysene	11 U	11 U	440 U	72 J	0.0028
bis(2-Ethylhexyl)phthalate	11 U	11 U	440 U	420 U	1.76
Di-n-Octyl phthalate	11 U	11 U	440 U	420 U	NLE
Benzo(b)fluoranthene	11 U	11 U	440 U	420 U	NLE
Benzo(k)fluoranthene	11 U	11 U	440 U	420 U	0.0028
Benzo(a)pyrene	11 U	11 U	440 U	420 U	0.0028
Indeno(1,2,3-cd)pyrene	11 U	11 U	440 U	420 U	0.0028
Dibenz(a,h)anthracene	11 U	11 U	440 U	420 U	0.0028
Benzo(g,h,i)perylene	11 U	11 U	440 U	420 U	NLE
Carbazole	11 U	11 U	440 U	420 U	NLE

NOTES:

SW - Surface Water; SD - Sediment
U - Not detected above given quantitation limit
J - Estimated values below quantitation limit
NLE - No level established

TABLE 3-12
SUMMARY OF PESTICIDE/PCB RESULTS IN SURFACE WATER AND SEDIMENT
DEAL TEST SITE
OCEAN TOWNSHIP, NEW JERSEY

SAMPLE NO. SAMPLING DATE UNITS	SW-1 10/1/97 ug/L	SW-2 10/1/97 ug/L	SD-1 10/1/97 ug/kg	SD-2 10/1/97 ug/kg	NJDEP SURFACE WATER STANDARDS FOR FW2 WATER (ug/L)
Alpha-BHC	0.057 U	0.057 U	22 U	21 U	0.00391
Beta-BHC	0.057 U	0.057 U	22 U	21 U	0.137
Delta-BHC	0.057 U	0.057 U	22 U	21 U	NLE
gamma-BHC (Lindane)	0.057 U	0.057 U	22 U	21 U	2
Heptachlor	0.057 U	0.057 U	22 U	21 U	0.52
Aldrin	0.057 U	0.057 U	22 U	21 U	3
Heptachlor epoxide	0.057 U	0.057 U	22 U	21 U	0.52
Endosulfan I	0.057 U	0.057 U	22 U	21 U	0.22
Dieldrin	0.11 U	0.11 U	44 U	42 U	2.5
4,4'-DDE	0.11 U	0.11 U	44 U	42 U	0.000588
Endrin	0.11 U	0.11 U	44 U	42 U	0.629
Endosulfan II	0.11 U	0.11 U	44 U	42 U	0.056
4,4'-DDD	0.11 U	0.11 U	44 U	42 U	0.000832
Endosulfan sulfate	0.11 U	0.11 U	44 U	42 U	0.93
4,4'-DDT	0.11 U	0.11 U	44 U	42 U	1.1
Methoxychlor	0.57 U	0.57 U	220 U	210 U	40
Endrin ketone	0.11 U	0.11 U	44 U	42 U	NLE
Endrin aldehyde	0.11 U	0.11 U	44 U	42 U	0.76
alpha-Chlordane	0.057 U	0.057 U	22 U	21 U	2.4
gamma-Chlordane	0.057 U	0.057 U	22 U	21 U	2.4
Toxaphene	5.7 U	5.7 U	2200 U	2100 U	0.73
Aroclor-1016	1.1 U	1.1 U	440 U	420 U	0.014
Aroclor-1221	2.3 U	2.3 U	870 U	850 U	0.014
Aroclor-1232	1.1 U	1.1 U	440 U	420 U	0.014
Aroclor-1242	1.1 U	1.1 U	440 U	420 U	0.014
Aroclor-1248	1.1 U	1.1 U	440 U	420 U	0.014
Aroclor-1254	1.1 U	1.1 U	440 U	420 U	0.014
Aroclor-1260	1.1 U	1.1 U	440 U	420 U	0.014

NOTES:

SW - Surface Water; SD - Sediment
U - Not detected above given quantitation limit

TABLE 3-13
SUMMARY OF METALS RESULTS IN SURFACE WATER AND SEDIMENT
DEAL TEST SITE
OCEAN TOWNSHIP, NEW JERSEY

SAMPLE NO. SAMPLING DATE UNITS	SW-1 10/1/97 ug/L		SW-2 10/1/97 ug/L		SD-1 10/1/97 mg/kg	SD-2 10/1/97 mg/kg	NJDEP SURFACE WATER STANDARDS FOR FW2 WATER (ug/L)
	TOTAL	SOLUBLE	TOTAL	SOLUBLE	TOTAL	TOTAL	
Silver	0.8 U	0.8 U	0.8 U	0.8 U	0.09 U	0.1 U	164
Arsenic	2.4 U	2.4 U	2.4 U	2.4 U	6.1 J	3.9 J	0.017
Barium	30.9	28.9	42.8	41.1	30.3	20.4	2000
Cadmium	0.4 U	0.4 U	0.4 U	0.4 U	0.17	0.11	10
Chromium	0.6 U	0.6 U	0.62 U	0.64 U	8.5	5.8	160
Mercury	0.1 U	0.1 U	0.1 U	0.1 U	0.02 U	0.02 U	0.144
Lead	2.9 U	2.9 U	2.9 U	2.9 U	17.8	15.7	5
Selenium	4.4 U	4.4 U	4.4 U	4.4 U	0.52 U	0.56 U	10

NOTES:

SW - Surface Water

SD - Sediment

U - Not detected above given quantitation limit

TABLE 3-14
SUMMARY OF VOLATILE ORGANIC COMPOUND RESULTS IN FIELD QUALITY CONTROL SAMPLES
DEAL TEST SITE
OCEAN TOWNSHIP, NEW JERSEY

SAMPLE NO. Sampling Date Units	FB-01 10/1/97 ug/L	FB-02 10/1/97 ug/L	FB-03 10/1/97 ug/Kg	TB-01 10/1/97 ug/L	TB-02 10/1/97 ug/L
Chloromethane	10 U	1200 U	10 U	10 U	10 U
Bromomethane	10 U	1200 U	10 U	10 U	10 U
Vinyl Chloride	10 U	1200 U	10 U	10 U	10 U
Chloroethane	10 U	1200 U	10 U	10 U	10 U
Methylene Chloride	6 B	680 BJ	10 B	9 B	10 B
Acetone	4 BJ	260 BJ	11 B	10 U	10 U
Carbon Disulfide	5 U	620 U	5 U	5 U	5 U
1,1-Dichloroethene	5 U	620 U	5 U	5 U	5 U
1,1-Dichloroethane	5 U	620 U	5 U	5 U	5 U
1,2-Dichloroethene (total)	5 U	620 U	5 U	5 U	5 U
Chloroform	5 U	620 U	5 U	5 U	5 U
1,2-Dichloroethane	5 U	620 U	5 U	5 U	5 U
2-Butanone	10 U	1200 U	10 U	10 U	10 U
1,1,1-Trichloroethane	5 U	620 U	5 U	5 U	5 U
Carbon Tetrachloride	5 U	620 U	5 U	5 U	5 U
Bromodichloromethane	5 U	620 U	5 U	5 U	5 U
1,2-Dichloropropane	5 U	620 U	5 U	5 U	5 U
cis-1,3-Dichloropropene	5 U	620 U	5 U	5 U	5 U
Trichloroethene	5 U	620 U	5 U	5 U	5 U
Dibromochloromethane	5 U	620 U	5 U	5 U	5 U
1,1,2-Trichloroethane	5 U	620 U	5 U	5 U	5 U
Benzene	5 U	620 U	5 U	5 U	5 U
Trans-1,3-Dichloropropene	5 U	620 U	5 U	5 U	5 U

TABLE 3-14 (CONTINUED)
SUMMARY OF VOLATILE ORGANIC COMPOUND RESULTS IN FIELD QUALITY CONTROL SAMPLES
DEAL TEST SITE
OCEAN TOWNSHIP, NEW JERSEY

SAMPLE NO. Sampling Date Units	FB-01 10/1/97 ug/L	FB-02 10/1/97 ug/L	FB-03 10/1/97 ug/Kg	TB-01 10/1/97 ug/L	TB-02 10/1/97 ug/L
Bromoform	5 U	620 U	5 U	5 U	5 U
4-Methyl-2-pentanone	10 U	1200 U	10 U	10 U	10 U
2-Hexanone	10 U	1200 U	10 U	10 U	10 U
Tetrachloroethene	5 U	620 U	5 U	5 U	5 U
1,1,2,2-Tetrachloroethane	5 U	620 U	5 U	5 U	5 U
Toluene	5 U	620 U	5 U	5 U	5 U
Chlorobenzene	5 U	620 U	5 U	5 U	5 U
Ethylbenzene	5 U	620 U	5 U	5 U	5 U
Styrene	5 U	620 U	5 U	5 U	5 U
Xylene (total)	5 U	620 U	5 U	5 U	5 U

NOTES:

- U - Not detected above given quantitation limit
- J - Estimated values below quantitation limit
- B- Analyte detected in blank

TABLE 3-15
SUMMARY OF SEMIVOLATILE ORGANIC COMPOUND RESULTS IN
FIELD QUALITY CONTROL SAMPLES
DEAL TEST SITE
OCEAN TOWNSHIP, NEW JERSEY

SAMPLE NO. SAMPLING DATE UNITS	FB-01 9/30/97 ug/L	FB-03 9/30/97 ug/L
Phenol	10 U	12 U
bis(2-Chloroethyl)ether	10 U	12 U
2-Chlorophenol	10 U	12 U
1,3-Dichlorobenzene	10 U	12 U
1,4-Dichlorobenzene	10 U	12 U
Benzyl alcohol	10 U	12 U
1,2-Dichlorobenzene	10 U	12 U
2-Methylphenol	10 U	12 U
bis(2-Chloroisopropyl)ether	10 U	12 U
4-Methylphenol	10 U	12 U
N-Nitroso-Di-n-propylamine	10 U	12 U
Hexachloroethane	10 U	12 U
Nitrobenzene	10 U	12 U
Isophorone	10 U	12 U
2-Nitrophenol	10 U	12 U
2,4-Dimethylphenol	10 U	12 U
Benzoic acid	50 U	60 U
bis(2-Chloroethoxy)methane	10 U	12 U
2,4-Dichlorophenol	10 U	12 U
1,2,4-Trichlorobenzene	10 U	12 U
Naphthalene	10 U	12 U
4-Chloroaniline	10 U	12 U
Hexachlorobutadiene	10 U	12 U
4-Chloro-3-methylphenol	10 U	12 U
2-Methylnaphthalene	10 U	12 U
Hexachlorocyclopentadiene	10 U	12 U
2,4,6-Trichlorophenol	10 U	12 U
2,4,5-Trichlorophenol	50 U	60 U
2-Chloronaphthalene	10 U	12 U
2-Nitroaniline	50 U	60 U
Dimethylphthalate	10 U	12 U
Acenaphthylene	10 U	12 U
2,6-Dinitrotoluene	10 U	12 U
3-Nitroaniline	50 U	60 U
Acenaphthene	10 U	12 U
2,4-Dinitrophenol	50 U	60 U
4-Nitrophenol	50 U	60 U
Dibenzofuran	10 U	12 U

TABLE 3-15 (CONTINUED)
SUMMARY OF SEMIVOLATILE ORGANIC COMPOUND RESULTS IN
FIELD QUALITY CONTROL SAMPLES
DEAL TEST SITE
OCEAN TOWNSHIP, NEW JERSEY

SAMPLE NO. SAMPLING DATE UNITS	FB-01 9/30/97 ug/L	FB-03 9/30/97 ug/L
2,4-Dinitrotoluene	10 U	12 U
Diethylphthalate	10 U	12 U
4-Chlorophenyl-phenylether	10 U	12 U
Fluorene	10 U	12 U
4-Nitroaniline	50 U	60 U
4,6-Dinitro-2-methylphenol	50 U	60 U
N-Nitrosodiphenylamine (1)	10 U	12 U
4-Bromophenyl-phenylether	10 U	12 U
Hexachlorobenzene	10 U	12 U
Pentachlorophenol	50 U	60 U
Phenanthrene	10 U	12 U
Anthracene	10 U	12 U
Di-n-Butylphthalate	10 U	12 U
Fluoranthene	10 U	12 U
Pyrene	10 U	12 U
Butylbenzylphthalate	10 U	12 U
3,3'-Dichlorobenzidine	20 U	24 U
Benzo(a)anthracene	10 U	12 U
Chrysene	10 U	12 U
bis(2-Ethylhexyl)phthalate	10 U	2 J
Di-n-Octyl phthalate	10 U	12 U
Benzo(b)fluoranthene	10 U	12 U
Benzo(k)fluoranthene	10 U	12 U
Benzo(a)pyrene	10 U	12 U
Indeno(1,2,3-cd)pyrene	10 U	12 U
Dibenzo(a,h)anthracene	10 U	12 U
Benzo(g,h,i)perylene	10 U	12 U
Carbazole	10 U	12 U

NOTES:

U - Not detected at given quantitation limit

J - Estimated values

TABLE 3-16
SUMMARY OF PESTICIDE/PCB RESULTS IN FIELD QUALITY CONTROL SAMPLES
DEAL TEST SITE
OCEAN TOWNSHIP, NEW JERSEY

SAMPLE NO. SAMPLING DATE UNITS	FB-01 9/30/97 ug/kg	FB-03 9/30/97 ug/kg
Alpha-BHC	0.050 U	0.051 U
Beta-BHC	0.050 U	0.051 U
Delta-BHC	0.050 U	0.051 U
gamma-BHC (Lindane)	0.050 U	0.051 U
Heptachlor	0.050 U	0.051 U
Aldrin	0.050 U	0.051 U
Heptachlor epoxide	0.050 U	0.051 U
Endosulfan I	0.050 U	0.051 U
Dieldrin	0.10 U	0.10 U
4,4'-DDE	0.10 U	0.10 U
Endrin	0.10 U	0.10 U
Endosulfan II	0.10 U	0.10 U
4,4'-DDD	0.10 U	0.10 U
Endosulfan sulfate	0.10 U	0.10 U
4,4'-DDT	0.10 U	0.10 U
Methoxychlor	0.50 U	0.51 U
Endrin ketone	0.10 U	0.10 U
Endrin aldehyde	0.10 U	0.10 U
alpha-Chlordane	0.050 U	0.051 U
gamma-Chlordane	0.050 U	0.051 U
Toxaphene	5.0 U	5.1 U
Aroclor-1016	1.0 U	1.0 U
Aroclor-1221	2.0 U	2.0 U
Aroclor-1232	1.0 U	1.0 U
Aroclor-1242	1.0 U	1.0 U
Aroclor-1248	1.0 U	1.0 U
Aroclor-1254	1.0 U	1.0 U
Aroclor-1260	1.0 U	1.0 U

NOTES:

U - Not detected at given quantitation limit

TABLE 3-17
SUMMARY OF METALS RESULTS IN FIELD QUALITY CONTROL SAMPLES
DEAL TEST SITE
OCEAN TOWNSHIP, NEW JERSEY

SAMPLE NO. SAMPLING DATE UNITS	FB-01 9/30/97 ug/L	FB-03 10/1/97 ug/L
	TOTAL	SOLUBLE
Silver	0.80 U	0.80 U
Arsenic	2.4 U	2.4 U
Barium	0.20 U	0.35
Cadmium	0.40 U	0.40 U
Chromium	0.96	1.0
Mercury	0.10 U	0.10 U
Lead	4.3	3.4
Selenium	4.4 U	4.4

NOTES:

U - Not detected at given quantitation limit

addition, the indicated reporting limits were examined in the light of regulatory standards (*e.g.*, NJDEP Soil Cleanup Criteria).

The laboratory reporting limits met the DQOs for all of the metals analyses. The laboratory reporting limits also met the DQOs for SVOCs and VOCs for sediment, groundwater, and surface water. Due to the percent moisture content of some of the soil samples, the laboratory reporting limits were elevated for approximately one-half of the soil VOC and SVOC samples. Both the groundwater and surface water pesticide/PCB analyses met the DQO reporting limits. Sediment pesticide/PCB laboratory reporting limits were somewhat elevated above DQOs, while the soil reporting limits were significantly elevated above the DQOs due to laboratory dilutions of the samples. The laboratory diluted these samples from 10 times to 50 times due to chromatographic anomalies on the instrument.

A comparison of the analytical reporting limits to NJDEP standards (*e.g.*, Soil Cleanup Criteria, Surface Water Standards) indicates that the vast majority of reporting limits were at or below the applicable standards. In some instances the reporting limits were higher than the relevant standard; however, this was usually due to the extremely low values in the standard (*i.e.*, below practical quantitation limits). This was particularly evident with the New Jersey Surface Water Standards, where some values are in the low part-per-trillion range. In a few cases (*e.g.*, PCBs in soil), the reporting limits were elevated above residential soil cleanup criteria. Residential criteria were utilized for comparisons as a conservative measure. The non-residential soil cleanup criteria, in this case, was close to the reporting limits for PCBs in soil.

The laboratory data from this investigation were validated according to the United States Environmental Protection Agency (U.S. EPA) Region II Data Validation SOPs. A summary of the data validation is presented in Appendix E.

In conclusion, the data presented are sufficient to meet the DQOs identified in the project work plan.

3.4 NEARBY POPULATIONS

The site is presently undeveloped, and serves as a township park. It is surrounded mainly by suburban development, and there are residences on four sides of the park. The nearest residences (approximately 900 - 1,000 feet upgradient) are northwest of the former lagoon; additional homes are located to the east (>2,000 feet from the site). The nearest school is located immediately to the north, within 0.25 mile of the site. The principal exposure route for potential contaminants of concern (*e.g.*, arsenic) would be from direct contact with soils and from inhalation of soil particulates by recreational users or maintenance workers, should portions of the site ever be excavated or developed.

According to a township representative (D. Kochel, Pers. Communication, 1997), the following is known about the Deal Test Site. The site is deed restricted to be open space/recreational in perpetuity as it was acquired under the State Green Acres program. The Township of Ocean

draws its water from the public water supply (New Jersey American Water Company), with most of its water coming from surface sources. There are some deep wells that are part of the water system, but none are located in Ocean Township. There is at least one well at the Deal Test Site that is used for irrigation. There are also residents in Ocean Township who draw from private wells (*i.e.*, not connected to the public water system). There may be public wells within a 4-mile radius of the site. Poplar Brook flows into the ocean adjacent to public bathing beaches. The township representative was not aware of any water supply uses of the brook, and it is generally not deep enough for swimming.

According to township employees at the park, a well used for irrigation is present in the northeast corner of the park. This well is located approximately 2,000 feet east-northeast of the former lagoon area, approximately 50-100 feet west of Whale Pond Road, and approximately 50-100 feet south of the residential properties along the northeast border of the park. This well was installed approximately 2 years ago and is used for watering two soccer fields in the direct vicinity of the well (one to the west and one to the south). All other fields (soccer, softball, general park) are irrigated using public supply water.

The workers had no knowledge of pesticide/herbicide use near the former lagoon area.

Township workers do not conduct routine maintenance near the former lagoon area. They do perform very infrequent (one or two times/year) brush clearing activities in the area to keep the roads/fire roads clear.

The area of the former lagoon receives heavy recreational use by the public, according to the workers. Local schools, Boy Scout packs, and Monmouth University all conduct field trips to the area for nature walks, fossil exploration, etc.

The New Jersey American Water Co. indicated that it supplies 100% of the potable water to the area around the park.

The Monmouth County Health Department (Personal Communication, 1998) indicated that some private wells do exist in Ocean Township, but most of the potable wells are located in the Wayside section of the Township. However, there are seven wells within a 0.5-mile radius of the site according to County records. The locations of the wells by type are listed below:

<u>Domestic</u>	<u>Irrigation</u>	<u>Abandoned</u>
18 Dover Street	413 Deal Road	701 Deal Road
150 Idlewood Road	1903 Waverly Road	1626 Melville Road
2100 Picton Road		

All of these wells appear to be upgradient or sidegradient to the site area, assuming that the groundwater flow direction is east or east-southeast (*i.e.*, towards Poplar Brook and the Atlantic Ocean).

Should site groundwater be used as a potable source, the concentrations of arsenic, lead, and chromium could present a potential risk.

3.5 FATE AND TRANSPORT MECHANISMS

The primary contaminants of potential concern at this site are arsenic in soil and groundwater, and (possibly) chromium and lead in groundwater only. Thus, fate and transport mechanisms are only of potential concern for metals. Metals are persistent compounds (*i.e.*, do not degrade), and their fate is related to speciation and physical conditions, as well as adsorption sites (*e.g.*, silts, clays). The principal transport mechanisms of concern at the Deal Test Site for metals are leaching of metals from surficial soils into the groundwater, and transport of metals off-site into Poplar Brook and downstream via overland runoff carrying soil particles. Dust transport may also be a mechanism; however, it appears that the soils in the former lagoon area are wet for portions of the year. This would tend to reduce dust generation during those periods.

Arsenic present in groundwater is likely a result of leaching from surficial soils, since the subsurface soil concentrations were lower at all locations measured. Like many metals, arsenic can be expected to adsorb to clay and silt particles and organic matter in soil. Total recoverable arsenic concentrations were much greater than the soluble component measured in groundwater, indicating that most of the arsenic present in groundwater consists of suspended solids. Concentrations of total recoverable chromium and lead were also elevated in groundwater, but the soluble fraction was not detected.

Arsenic concentrations in sediment collected in the Poplar Brook tributary were significantly lower than concentrations in surficial soil measured at the Deal Test Site, suggesting that little off-site migration of soil particles has occurred via runoff. The concentrations detected in stream sediments (3.9 to 6.1 mg/kg) are far lower than the concentrations measured in surficial soils at the upgradient location S-1 (129 mg/kg). Arsenic was undetected in surface water in the brook. These results collectively indicate that arsenic-contaminated soil is not migrating from the site into the Poplar Brook tributary in significant amounts.

The following summary of fate and effects of arsenic contamination is summarized from Eisler (1988). Arsenic has four valence states (-3, 0, +3, and +5), rarely occurring in its free state in nature. It is usually a component of sulfidic ores, occurring as arsenides and arsenates, along with arsenic trioxide, which is a weathering product of arsenides. Biotransformations may occur, resulting in volatile arsenicals that normally are returned to land where soil adsorption, plant uptake, erosion, leaching, reduction to arsines, and other processes occur. Inorganic arsenic is more mobile than organic arsenic, and thus poses greater problems by leaching into surface waters and groundwater. The trivalent arsenic species (+3) are generally considered to be more toxic, more soluble, and more mobile than As (+5) species (Eisler 1988).

Arsenic in water exists primarily as a dissolved ionic species. Particulates account for less than 1 percent of the total measurable arsenic. Arsenates are more strongly adsorbed to sediments than are other arsenic forms (Eisler 1988).

Eisler (1988) reports that the following points are agreed upon by most investigators: (1) arsenic may be absorbed by ingestion, by inhalation, or through permeation of the skin or mucous membrane; (2) cells accumulate arsenic by using an active transport system normally used in phosphate transport; (3) arsenicals are readily absorbed after ingestion, most being rapidly excreted in the urine during the first few days; (4) the toxicity of arsenicals conforms to the following order from greatest to least toxicity: arsines > inorganic arsenites > organic trivalent compounds (arsenoxides) > inorganic arsenates > organic pentavalent compounds > arsonium compounds > elemental arsenic; (5) solubility in water and body fluids appears to be directly related to toxicity; and (6) the mechanisms of arsenical toxicity differ considerably among arsenic species, although signs of poisoning appear similar for all arsenicals.

The primary mechanism of inorganic trivalent arsenic toxicity is through reaction with sulfhydryl groups of proteins and subsequent enzyme inhibition; inorganic pentavalent arsenic does not react as readily with sulfhydryl groups. Inorganic trivalent arsenic interrupts oxidative metabolic pathways and sometimes cause morphological changes in liver mitochondria. Methylation greatly reduces the toxicity of inorganic arsenic (both trivalent and pentavalent) and is usually the major detoxification mechanism (Eisler 1988).

The mechanism of organic arsenic toxicity begins with its initial metabolism to the trivalent arsenoxide form, followed by its subsequent reaction with sulfhydryl groups of tissue proteins and enzymes, to form an arylblis (organylthio) arsine. This form inhibits oxidative degradation of carbohydrates and decreases cellular adenosine triphosphate (ATP) (Eisler 1988).

4.0 SUMMARY AND RECOMMENDATIONS

The following summary statements and conclusions can be drawn from the results of this investigation.

The results of this investigation, including physical observations of the site and the analytical data, indicate that there is no significant evidence of a lagoon at this location.

The only contaminant of potential concern in surficial soils at the Deal Test Site is arsenic. Arsenic concentrations in surficial soil ranged from 129 to 504 mg/kg, and exceeded the NJDEP soil cleanup criterion (20 mg/kg) at all locations sampled, including the upgradient reference location. Subsurface concentrations were significantly lower. The highest arsenic concentrations detected were in surface soil from sample S-9 (504 mg/kg), collected at the downgradient location. The source of this contamination remains unknown.

Total recoverable groundwater concentrations of arsenic, chromium, and lead exceeded NJGWQS at all four locations sampled, including upgradient and downgradient locations. The soluble concentrations of arsenic in groundwater exceeded the NJGWQS at GW-2 and GW-4, located in the former lagoon area and downgradient, respectively. Soluble arsenic concentrations at these two locations were 55.9 µg/L and 39.4 µg/L, respectively, compared to the NJGWQS of

8 µg/L. Soluble concentrations of chromium and lead were not detected, indicating that the total metals concentrations are attributable to suspended solids in the samples.

The low concentrations of arsenic detected in the sediment (3.9 to 6.1 mg/kg) of the Poplar Brook tributary relative to surface soil at the Deal Site (129 to 504 mg/kg) suggests that significant off-site migration of arsenic is not occurring via runoff. Arsenic was undetected (2.4U µg/L) in the two surface water samples collected in the stream.

No significant contamination from VOCs, SVOCs, or pesticide/PCB compounds was detected in soil, groundwater, surface water, or sediment collected at the Deal Test Site.

A review of nearby populations suggests that the primary potential exposure pathways for arsenic uptake would be from direct contact with soils and from inhalation of soil particulates by recreational users or maintenance workers. This pathway would also exist for contamination detected upgradient of the former lagoon. If groundwater from the site were used as a potable source, a potential risk would exist from ingestion of arsenic-contaminated groundwater pumped from below the former lagoon or immediately downgradient. However, it does not appear that any potable wells are located downgradient of the former lagoon.

It is recommended that a records review and interviews be conducted to determine whether arsenic-based compounds (*e.g.*, herbicides) were utilized by any current or former owners of the Deal Test Site. Repeated usage of such products over a number of years may explain the concentrations of arsenic detected at the site. Secondly, it is recommended that additional sampling be conducted to confirm the prevalent detections of arsenic in the area, or to determine whether arsenic is limited to the general region of the former lagoon and adjacent areas. Due to the recreational use of the Deal Test Site, it is important to determine whether arsenic is present in other areas of the park (*e.g.*, along the dirt roads and in the open fields), as human exposures are possible.

5.0 REFERENCES

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Ocean Township, New Jersey. Contract Number DACW51-97-D-0010, Delivery Order 0007, September 1997.

Appendix A

APPENDIX A

NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION SOIL CLEANUP CRITERIA



State of New Jersey
Department of Environmental Protection and Energy

Robert C. Shinn, Jr.
Commissioner

February 8, 1994

MEMORANDUM

TO: Site Remediation Program Staff
FROM: Lance Miller, Assistant Commissioner
Site Remediation Program
SUBJECT: Revised Soil Cleanup Criteria

Soil Cleanup Criteria (SCC) were initially distributed to Site Remediation Program Staff in January 1993. The SCC were revised in March 1993 and contained in the April 1993 issue of the Site Remediation News. Since that time, there have been toxicity factor changes as well as the identification of computational and typographical errors for several SCC compounds. These changes and corrections have been made resulting in a revised SCC list which is attached.

Thirty eight (38) criteria encompassing 31 compounds are affected. The majority of changes are to the impact to groundwater SCC. Sixteen (16) SCC have increased, 19 SCC have decreased and criteria for 2,4-/2,6-dinitrotoluene (mixture) have been added. Please refer to the footnotes contained in the SCC list for more detail.

It is important to note that SCC for eight (8) compounds have decreased by at least an order of magnitude. These compounds are:

- acrylonitrile (impact to groundwater criterion)
- benzo(b)fluoranthene (impact to groundwater criterion)
- 1,2-dichloroethene (impact to groundwater criterion)
- heptachlor (impact to groundwater criterion)
- hexachlorobutadiene (residential and non-residential direct contact criteria)
- methoxychlor (impact to groundwater criterion)
- methylene chloride (impact to groundwater criterion)
- toxaphene (impact to groundwater criterion)

The purpose and function of the SCC remains the same - to provide guidance in establishing site-specific cleanup levels. Other factors such as environmental impacts, site-specific conditions and background levels may be considered which could result in a site-specific cleanup level which differs from the SCC.

If you have any questions regarding the above or other cleanup standards issues, please bring them to the attention of your Bureau or Element managers. Thank you for your cooperation.

attachment

Soil Cleanup Criteria (mg/kg)
(Last Revised - 2/3/94)

This listing represents the combination of Tables 3-1 and 7-1 from the Department of Environmental Protection and Energy's February 3, 1992 proposed rule entitled Cleanup Standards for Contaminated Sites, N.J.A.C. 7:26D, with noted corrections based upon errors identified by the Department during or subsequent to the comment period as well as new toxicological information obtained since the rule proposal. Please refer to the respective footnotes for more detail. Notwithstanding, where the following criteria are based on human health impacts, the Department shall still consider environmental impacts when establishing site specific cleanup criteria. This along with other site specific factors including background conditions may result in site specific cleanup criteria which differ from the criteria listed below. Therefore, this list shall not be assumed to represent approval by the Department of any remedial action or to represent the Department's opinion that a site requires remediation.

Note: Material bracketed [thus] is deleted and material underlined thus is added

<u>Contaminant</u>	<u>CASRN</u>	Residential Direct Contact Soil Cleanup Criteria(a)(b)	Non Residential Direct Contact Soil Cleanup Criteria(a)(b)	Impact to Ground water Soil Cleanup Criteria(b)
Acenaphthene	83-32-9	3400	10000(c)	100
Acetone	67-64-1	1000(d)	1000(d)	150] <u>100(i)</u>
Acrylonitrile	107-13-1	1	5	(100] <u>1(i)</u>
Aldrin	309-00-2	0.040	0.17	50
Anthracene	120-12-7	10000(c)	10000(c)	(500] <u>100(i)</u>
Antimony	7440-36-0	14	340	(h)
Arsenic	7440-38-2	[2(f)] <u>20(e)</u>	[2(f)] <u>20(e)</u>	(h)
Barium	7440-39-3	700	47000(n)	(h)
Benzene	71-43-2	3	13	1
3,4-Benzofluoranthene (Benzo(b)fluoranthene)	205-99-2	0.9	4	(500] <u>50(i)</u>
Benzo(a)anthracene	56-55-3	0.9	4	500
Benzo(a)pyrene (BaP)	50-32-8	0.66(f)	0.66(f)	100
Benzo(k)fluoranthene	207-08-9	0.9	4	500
Benzyl Alcohol	100-51-6	10000(c)	10000(c)	50
Beryllium	7440-41-7	1(f)	1(f)	(h)
Bis(2-chloroethyl) ether	111-44-4	0.66(f)	3	[1] <u>10(j)</u>
Bis(2-chloroisopropyl) ether	39638-32-9	2300	10000(c)	10
Bis(2-ethylhexyl) phthalate	117-81-7	49	210	100
Bromodichloromethane (Dichlorobromomethane)	75-27-4	[5] <u>11(g)</u>	[22] <u>46(g)</u>	1
Bromoform	75-25-2	86	370	1
Bromomethane	74-83-9	79	1000(d)	1
2-Butanone (MEK)	78-93-3	1000(d)	1000(d)	50
Butylbenzyl phthalate	85-68-7	1100	10000(c)	100
Cadmium	7440-43-9	1	100	(h)

Soil Cleanup Criteria (mg/kg)
(Last Revised - 2/3/94)

Carbon tetrachloride	56-23-5	2(k)	4(k)	1
4-Chloroaniline	106-47-8	230	4200	(r)
Chlorobenzene	108-90-7	37	680	1
Chloroform	67-66-3	19(k)	28(k)	1
4-Chloro-3-methyl phenol (p-Chloro-m-creosol)	59-50-7	10000(c)	10000(c)	100
Chloromethane	74-87-3	520	1000(d)	10
2-Chlorophenol	95-57-8	280	5200	[50] 10(j)
Chrysene	218-01-9	9	40	500
Copper	7440-50-8	600(m)	600(m)	(h)
Cyanide	57-12-5	1100	21000(o)	(h)
4,4'-DDD (p,p'-TDE)	72-54-8	3	12	[100] 50(i)
4,4'-DDE	72-55-9	2	9	[100] 50(i)
4,4'-DDT	50-29-3	2	9	[100] 500(i)
Dibenz(a,h)anthracene	53-70-3	0.66(f)	0.66(f)	[500] 100(j)
Dibromochloromethane (Chlorodibromomethane)	124-48-1	110	1000(d)	1
Di-n-butyl phthalate	84-74-2	5700	10000(c)	100
Di-n-octyl phthalate	117-84-0	1100	10000(c)	100
1,2-Dichlorobenzene	95-50-1	5100	10000(c)	50
1,3-Dichlorobenzene	541-73-1	5100	10000(c)	100
1,4-Dichlorobenzene	106-46-7	570	10000(c)	100
3,3'-Dichlorobenzidine	91-94-1	2	6	100
1,1-Dichloroethane	75-34-3	570	1000(d)	[1] 10(i)
1,2-Dichloroethane	107-06-2	6	24	1
1,1-Dichloroethene	75-35-4	8	150	10
1,2-Dichloroethene (trans)	156-60-5	1000(d)	1000(d)	50
1,2-Dichloroethene (cis)	156-59-2	79	1000(d)	[50] 1(i)
2,4-Dichlorophenol	120-83-2	170	3100	10
1,2-Dichloropropane	78-87-5	10	43	(r)
1,3-Dichloropropene (cis and trans)	542-75-6	4	5(k)	1
Dieldrin	60-57-1	0.042	0.18	50
Diethyl phthalate	84-66-2	10000(c)	10000(c)	50
2,4-Dimethyl phenol	105-67-9	1100	10000(c)	10
Dimethyl phthalate	131-11-3	10000(c)	10000(c)	50
2,4-Dinitrophenol	51-28-5	110	2100	10
<u>Dinitrotoluene (2,4-/2,6- mixture)</u>	<u>25321-14-6</u>	<u>1(i)</u>	<u>4(i)</u>	<u>10(i)</u>
Endosulfan	115-29-7	[3] 340(g)	[52] 6200(g)	50
Endrin	72-20-8	17	310	50
Ethylbenzene	100-41-4	1000(d)	1000(d)	100
Fluoranthene	206-44-0	2300	10000(c)	[500] 100(i)
Fluorene	86-73-7	2300	10000(c)	100
Heptachlor	76-44-8	0.15	0.65	[500] 50(j)
Hexachlorobenzene	118-74-1	0.66(f)	2	[50] 100(i)
Hexachlorobutadiene	87-68-3	[11] 1(g)	[210] 21(g)	[50] 100(g)

Soil Cleanup Criteria (mg/kg)
(Last Revised - 2/3/94)

Hexachlorocyclopentadiene	77-47-4	400	7300	100	
Hexachloroethane	67-72-1	6	100	100	
Indeno(1,2,3-cd)pyrene	193-39-5	0.9	4	500	
Isophorone	78-59-1	1100	10000(c)	[10]	50(i)
Lead	7439-92-1	100(p)	600(g)	(h)	
Lindane	58-89-9	0.52	2.2	[1]	50(i)
2-Methylphenol	95-48-7	2800	10000(c)	(c)	
4-Methylphenol	106-44-5	2800	10000(c)	(c)	
Methoxychlor	72-43-5	280	5200	[500]	50(i)
Mercury	7439-97-6	14	270	(h)	
4-Methyl-2-pentanone(MIBK)	108-10-1	1000(d)	1000(d)	50	
Methylene chloride	75-09-2	49	210	[10]	1(i)
Naphthalene	91-20-3	230	4200	100	
Nickel	7440-02-0	250	2400(k)(n)	(h)	
Nitrobenzene	98-95-3	28	520	[50]	10(i)
N-Nitrosodiphenylamine	86-30-6	140	600	100	
N-Nitrosodi-n-propylamine	621-64-7	0.66(f)	0.66(f)	[1]	10(i)
PCBs (Polychlorinated biphenyls)	1336-36-3	0.49	2	[100]	50(i)
Pentachlorophenol	87-86-5	6	24	100	
Phenol	103-95-2	10000(c)	10000(c)	50	
Pyrene	129-00-0	1700	10000(c)	[500]	100(i)
Selenium	7782-49-2	63	3100(n)	(h)	
Silver	7440-22-4	110	4100(n)	(h)	
Styrene	100-42-5	23	97	100	
1,1,1,2-Tetrachloroethane	630-20-6	170	310	1	
1,1,2,2-Tetrachloroethane	79-34-5	34	70(k)	1	
Tetrachloroethylene	127-18-4	4(k)	6(k)	1	
Thallium	7440-28-0	2(f)	2(f)	(h)	
Toluene	108-88-3	1000(d)	1000(d)	500	
Toxaphene	8001-35-2	0.10(k)	0.2(k)	[100]	50(i)
1,2,4-Trichlorobenzene	120-82-1	68	1200	100	
1,1,1-Trichloroethane	71-53-6	210	1000(d)	50	
1,1,2-Trichloroethane	79-00-5	22	420	1	
Trichloroethene (TCE)	79-01-6	23	54(k)	1	
2,4,5-Trichlorophenol	95-95-4	5600	10000(c)	50	
2,4,6-Trichlorophenol	88-06-2	62	270	[50]	10(i)
Vanadium	7440-62-2	370	7100(n)	(h)	
Vinyl chloride	75-01-4	2	7	[1]	10(i)
Xylenes (Total)	1330-29-7	410	1000(d)	10	
Zinc	7440-66-6	1500(m)	1500(m)	(h)	

Soil Cleanup Criteria (mg/kg)
(Last Revised - 2/3/94)

Footnotes

- (a) criteria are health based using an incidental ingestion exposure pathway except where noted below
- (b) criteria are subject to change based on site specific factors (e.g., aquifer classification, soil type, natural background, environmental impacts, etc.)
- (c) health based criterion exceeds the 10000 mg/kg maximum for total organic contaminants
- (d) health based criterion exceeds the 1000 mg/kg maximum for total volatile organic contaminants
- (e) cleanup standard proposal was based on natural background
- (f) health based criterion is lower than analytical limits; cleanup criterion based on practical quantitation level
- (g) criterion has been recalculated based on new toxicological data
- (h) the impact to ground water values for inorganics will be developed based upon site specific chemical and physical parameters
- (i) original criterion was incorrectly calculated and has been recalculated
- (j) typographical error
- (k) criterion based on inhalation exposure pathway which yielded a more stringent criterion than the incidental ingestion exposure pathway
- (l) new criterion derived using methodology in the basis and background document
- (m) criterion based on ecological (phytotoxicity) effects
- (n) level of the human health based criterion is such that evaluation for potential environmental impacts on a site by site basis is recommended
- (o) level of the criterion is such that evaluation for potential acute exposure hazard is recommended
- (p) criterion based on the goal that children should be exposed to the minimal amount of lead that is practicable and is reflective of natural background as altered by diffuse anthropogenic pollution. Criterion corresponds to both a median value for urban land which has not been impacted by any local point source of lead and a 90th percentile value for similar suburban land
- (q) criteria was derived from a model developed by the Society for Environmental Geochemistry and Health (SEGH) and was designed to be protective for adults in the workplace
- (r) Insufficient information available to calculate impact to ground water criteria

Appendix B

Appendix B

APPENDIX B
PHOTODOCUMENTATION



Photograph 1: Geoprobe sampling at upgradient location northwest of former lagoon area (facing south).



Photograph 2: Entrance into former lagoon area; facing west.



Photograph 3: View of former lagoon area; facing west.



Photograph 4: Ground surface at westernmost portion of former lagoon area.



Photograph 5: View of ATV Geoprobe unit entering former lagoon area (facing east).



Photograph 6: Ground surface in southwest portion of former lagoon area.



Photograph 7: Geogrobe sampling at downgradient location southeast of the former lagoon area (facing south).



Photograph 8: View of soil core (Core A) collected at westernmost location within the former lagoon area.



Photograph 9:

View of soil sample collection for VOC analysis using methanol extraction procedure.



Photograph 10: View of downgradient surface water/sediment sample location (SW1/SD1).



Photograph 11: View of upgradient surface water/sediment sample location (SW2/SD2).

Appendix C

Appendix C

APPENDIX C

DAILY QUALITY CONTROL REPORTS AND FIELD NOTES

ER 1110-1-263
1 August 1990

DATE: 9/30/97

A-E DAILY QUALITY CONTROL REPORT

DAY:	S	M	T	W	TH	F	S
			X	X			

COE PROJECT MANAGER: Allen Ross
 PROJECT: Deal Test Site
 JOB NO.: 11901-001-003-0001-00
 CONTRACT NO.: DAC W51-97-D-0010

WEATHER	Bright Sun	Clear	Overcast	Rain	Snow
TEMP	To 32	32-50	50-70	70-85	85 up
WIND	Still	Moderate	High	Report No.	
HUMIDITY	Dry	Moderate	Humid		

then cleared

SUB-CONTRACTORS ON SITE:
 Terrefprobe (Geoprobe sub): Frank Fendler
 WESTON: Mark Ellis, Rick Setfina

EQUIPMENT ON SITE:
Geoprobe on tracks, OVM, magnetometer, decon equip.

WORK PERFORMED (INCLUDING SAMPLING):
Used Geoprobe operators to collect 6 soil samples (two intervals from three locations) and 2 groundwater samples (two of the three locations).
Collected soil samples by pushing/extracting soil core contained in an acetate liner. Used bailer and tubing fitted w/ a check valve to collect grab gw samples.
Collected a field blank (rinse) sample on field decontaminated soil sampling equipment.
Sample collection and decon procedures were conducted in accordance w/ procedures outlined in the CoE-approved WorkPlan dated 9/97.

PROJECT: Deal Test Site REPORT NO.: _____
JOB NO.: 11901-001-023-0001-02 DATE: 9/30/97

QUALITY CONTROL ACTIVITIES (INCLUDING FIELD CALIBRATIONS):

OVM calibrated

One field blank sample collected

HEALTH AND SAFETY LEVELS AND ACTIVITIES:

*Level D PPE HASP reviewed w/ personnel on site.
All present signed HASP,*

PROBLEMS ENCOUNTERED/CORRECTIVE ACTION TAKEN:

*GW was encountered @ very shallow depths
resulting in subsurface soil samples being
collected @ intervals observed to be wet-saturated.*

*Aliquot for dissolved metals @ GW2 location was not sent
to lab due to problems related to turbidity clogging filters. Sample was
secured for overnight settlement so filtering can be performed tomorrow.*

SPECIAL NOTES:

TOMORROWS'S EXPECTATIONS:

complete remaining soil, gw, SW, + red sample.

BY Mark Ellis TITLE Geologist

PROJECT: Deal Test Site REPORT NO.: _____

JOB NO.: 11901-001-003-0001-00 DATE: 10/1/97

QUALITY CONTROL ACTIVITIES (INCLUDING FIELD CALIBRATIONS):

Calibrated OVM prior to sampling

Collected 2 field blank samples (a rinse + methanol ambient blank) and a trip blank

Also collected a duplicate sample for soil and a duplicate sample for gw matrices.

HEALTH AND SAFETY LEVELS AND ACTIVITIES:

Level D PPE

PROBLEMS ENCOUNTERED/CORRECTIVE ACTION TAKEN:

None

SPECIAL NOTES:

None

TOMORROWS'S EXPECTATIONS:

NA

BY Mark Ellis TITLE Geologist

(2)

1400: Recon area. Find small stream that starts to the west near the N end of access road, crosses road to the E and flows south along E side of access road (opposite side from Tar Pit)

1430: Will go back to Turp garage to inquire further about area. Mark suspect area with a small yellow tri (caution tape).

1500: Speak to Turp employees (landscapers). They know of no other areas that lack vegetation. Inform us that stream on topo is not the small stream we saw but the stream just south of the Turp buildings. Utilities for the bridges run along this stream underground. A swamp area is located behind Bldg 5005; however the area is so overgrown to visually observe.

1530: Performed a complete drive - thru recon including

(3)

areas (roads) where vehicular traffic was prohibited. Most of the area is maintained (landscaped, mowed) by the township crew and used for recreation, exercise stations, etc. No evidence of any former lagoon was observed. A foundation of a former building was noted in a patch of overgrown vegetation, probably a former military building.

* Note: The contact from the township/parks grounds crew stated that he had no memory of an actual lagoon or nearby building in the vicinity that we observed as being the potential former lagoon.

* Recommendation: Historical aerial photo study.

9/30/97

Tuesday

(4)

0800

R. Settlins met Tom Morrow @ site and performed clearing activities.

M. Ellis @ office awaiting arrival of VOA sample containers and finished loading equipment + ice.

1050

M. Ellis departs office

1125

M. Ellis arrives @ site. Tom's sub-contractor + R. Settlins (western) on site.

Commenced setting up equipment and positional Geoprobe @ up gradient location.

Area was cleared using a magnetometer prior to setting up.

1300

Finished labelling jars and setting up.

1310

Began @ up gradient location SI. Monitoring of OVM (RFW 7528) Core #1 (0-4') \approx 2' recovery

Consisting of mainly of organic mat (peat) w/ dk brn silt, some f sand.

(5)

Core #2 (4-8') Full recovery Bl-grn + Sand, some silt, some clay. Wet. Measured water to be @ \approx 2ft bgs

1340+1350

Collected sample S1 from 0-2' bgs and S2 from 2-4'.

Called G. Buchanan to confirm we should collect sample from below water table.

He informed we should particularly @ this location since top 2ft is peat.

1405

Began groundwater sampling process @ up gradient location GW1. Using 2ft (0.5" OD.) bailer (stainless steel) to collect VOA samples and tubing w/ check valve for other parameters. Tubing is 0.25" ID poly.

1425

Finished gw sampling @ GW1. * Preparing to decom and mobilize to second location.

1430

Moved onto second location which was western-most location within former

* GW became less turbid as volume was removed.

(6)

Lagoon area.

1440 Collected samples 53 and 54. We got = 3 ft of recovery for Core #1.

Top 2 ft consisted of dk brn f sand and silt w/ abundant organic matter (peat).

2-3' consisted of Bl-grn-BLK M-f Sand, l. silt to clay. Sample was wet-saturated beginning @ 3ft. Collected 53 from 0-2ft, and 54 from 3-4' in sat. mat'l.

1450 Had driller continue to deeper depths to observe the stratigraphy from within the former lagoon.

Sample 4-8' was similar Bl-grn (glauconitic) f. C sand w/ 20-30% fines (silt + clay). Small 2-3" lenses of coarser sands.

(7)

1510 Collected field blank (rimate of poul + bowl)

1535 Began core collection @ location #3 to collect samples 5 + 6 and GW2.

1540 Core #1 retrieved. Approx. 3' recovery.

0-1.5' dk brn f sand + silt w/ organics (peat).

1.5-3.0' Ditto to previous, spars w/ Bl-grn sands.

Wet @ 2.75' where it becomes very sandy. Water in hole rises to nearly surface level, however peat material is drier (in sample).

1545 Collected sample 55 from 0-2'. Sample from 4-8' ditto to previous location (saturated)

1550 Collected sample 56 from 2-3' 195 (wet sands).

1555 Began collecting GW2 at northern-most location within lagoon.

1610 Finished collecting GW2 samples. Water is very turbid. Same

(8)

Methods were used (i.e. hoses for VOA's and tubing (new) + check valve for other parameters.

* Note: No readings above background were noted on any of the soil cores or gw samples collected thus far.

1630 Let volume of water to be filtered settle, but very little of the suspended solids settled out. Began trying to filter sample.

1645 Filtering going extremely slow. Have used 3 filter bits and only obtained ~50ml thus far.

May need to let sample sit overnight to settle out the fines.

Worked on cleaning up the site area and packaging samples.

1700 Decided we'll need to let

(9)

The filtered metals aliquot of GW2 sit overnight and possibly collect a second sample tomorrow if the turbidity doesn't diminish. Therefore this aliquot (parameter) for GW2 was not sent to the laboratory tonight.

Summary:

Three locations were sampled using a truck-mounted Geoprobe. Two intervals were sampled @ each location for analysis of VOA's, DMA, PCB's + PCB metals in soil. The three locations included one upgradient location outside of the suspected former lagoon and two locations were within the suspected former lagoon (western most proposed location + northern most proposed location). VOA samples were collected in accordance

(10)

w/ recently modified USEP
 methanol extraction field
 procedures. In addition
 to the soil samples, two
 locations were sampled for
 grab gw analyses. Samples were
 submitted for same parameters
 as soil as well as dissolved
 metals. Only GW1 was
 successfully filtered today.
 All decon procedures were
 conducted in accordance
 w/ the work plan and a
 field blank (rinse) was
 collected from a trowel &
 bowl after field deconning.
 Samples packaged in two
 coolers, properly preserved
 w/ ice & sealed, delivered
 to FedEx for delivery to
 RECAP lab.

17x Crew offsite
 Mark E. M.

10/1/97 Wednesday

(11)

0700 M. Etko + R. Settino (WESTON)
 on site & preparing equipment
 and sample containers for
 surface water/sediment sampling.
 0715/
 0720 Collected downgradient subsid
 SW1 & SD1.

Note: OUM was recalibrated
 during equipment prep.
 and no readings above bkgrd
 noted @ SW1/Sed 1.

0740/0745 Collected upgradient SW2 + SD2
 samples. No readings above
 bkgrd on OUM.

0750 E. Buchanan on site delivering
 remaining sample containers
 that didn't arrive yesterday
 morning.

0800 TerraProbe on site and
 setting up equipment for
 remaining sample locations.
 Need to prepare the large bore
 sampler so we can attempt to
 collect cores past 8 ft for
 strat ID.

* Note: Observ during subsid sampling: Streams contain
 abundant iron oxide deposits. Water was
 clear. Sediments were Brn f-C Sand, Fr. Silt.

0830

(12)

Went out to purchase ice
and get water for decon-

0910

Preparing to begin Geoprobe
sampling @ downgradient
location. Soil samples
S9, S10, + S11 (duplicate)^{of S9} are
being collected @ this location.

0920

Finished filtering GW2
collected yesterday. Sample
still has a yellow-brn tint
to it.

0930

Collected cores (2 collocated for
extra dep [S11] volume) from
0-4' bgs.

Cores (0-4'): = 3' recovery
0-2' - DK brn f sand with
w/ abundant organics, moist
2-3' - D1-grn f-M sand, little
silt, tr clay.

0930

Collected S19 sample from the
0-2' interval.

0935

Collected duplicate sample^{of S9}
(S11) from same 0-2' interval.

0945

Collected S10 from 2-3'
interval sands, wet. Probe
was pushed to 8' for placement of screen.
Ditto D1-grn sands as in previous samples @
this depth.

(13)

0955

Began collecting GW4 sample
@ downgradient. Started
collecting a third VOA vial
for aqueous samples today
as per G. Buchanan's request.

1030

Still collecting GW4. Having
some problems w/ recharge.
Check valve getting hung up
in screen interval + therefore
not sampling full length
of interval → less recharge.

1040

Done w/ GW4.
Mobilized to last location
in former lagoon area
where soil samples S7+S8
+ GW3 will be collected.

1050

Collected FB-03 (rinse)
on the boiler.

1100

Two collocated cores collected
@ location S7+S8 in lagoon.
from 0-4ft.

1105

Collected sample S7 from
0-2'. This interval is being
designated the MS/MSD sample.
Extra volume collected for

VOC analysis only (6 vials).
Material cores & identical
to other locations of
0-2' being OK brown peat
of silt + silt

2-3' Bl-grey glauconitic(?)

A.M. sands of little silt, today.

1125 Collected 58 soil sample
from the 2-3' interval.
Had Geoprobe sub try to
continue subsurface sampling
@ the location to observe
stratigraphy.

He was able to collect a
sample @ 8-10' and also
@ 13-15' bgs. Composition
of samples was similar to
sands @ 2-3'.

8-10' - Bl-grey ditto to 2-3'
13-15' - Bl-grey-BLK f-m sand
little silt, to clay. (slightly
darker in color. Both
intervals were saturated,
and no readings above
bgd observed on either

* sample.
Note: Collected methanol
field blank sample FBO2
while soil samples
57 + 58 were being collected.

1140 Preparing to collect GW3
and the duplicate GW5
samples @ last location
within suspected former
lagoon.

1225 Still collecting duplicate
gw sample GW5 (less turbid).
1240 Finished collecting GW5

Began filtering GW3 sample.
1300 Making field measurements
of measuring tape and
began to package samples
+ clean up equipment on
site.

1330 Sub Tenaprobe is cleaning up
the Geoprobe unit. Making
final measurements.

1355 Finished cleaning up site
+ equipment. Crews offsite
Mark M.

Appendix D

APPENDIX D

LABORATORY ANALYTICAL RESULTS



a division of Recra Environmental, Inc.

Virtual Laboratories Everywhere

Recra LabNet Philadelphia Analytical Report

Client : USACE-DEAL TEST SITE
RFW# : 9710L600

W.O. #: 11901-001-003-0001-00
Date Received: 10-02-97

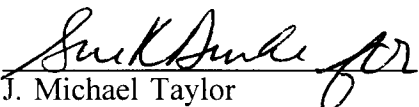
GC/MS VOLATILE

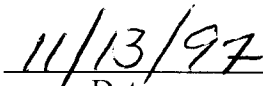
The set of samples consisted of seven (7) water, six (6) methanol-preserved soil, and two (2) soil samples collected on 10-01-97.

The samples were analyzed according to criteria set forth in SW 846 Method 8260A for TCL Volatile target compounds on 10-13,14,15-97.

The following is a summary of the QC results accompanying these sample results and a description of any problems encountered during their analyses:

1. The cooler temperature upon receipt has been recorded on the chain-of-custody.
2. The required holding time for analysis was met.
3. Six (6) of the soil samples were methanol-preserved upon collection; consequently, they have been reported as medium level analyses.
4. Non-target compounds were detected in these samples.
5. Four (4) of seventy-five (75) surrogate recoveries were ^{outside of} ~~within~~ EPA QC limits. Samples S9 and GW5 were diluted and/or re-analyzed on 10-14,15-97 and reported.
6. Matrix spike analyses are associated with RFW lot 9710L573. Soil matrix spikes were not collected, therefore they were not analyzed or reported. A Sample Discrepancy Report has been enclosed.
7. All blank spike recoveries were within EPA QC limits.
8. The method blanks contained the common contaminants Methylene Chloride and Acetone at levels less than 2x the CRQL. The blanks 97LVN335 and 97LVN337 also contained the contaminants chloromethane and bromomethane at levels less than the CRQL.


J. Michael Taylor
Vice President and Laboratory Manager
Lionville Analytical Laboratory


Date

mmz/voa/10-600v.cn

00 001

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 48 pages.

Recra LabNet Philadelphia **Sample Discrepancy Report (SDR)** SDR #: 97NT227

Initiator: B. Rubino RFW Batch: 9710L600 Parameter: MS VCA
 Date: 11/2/97 Samples: MS/MSO Matrix: SOIL
 Client: USACE-DEAL TEST Method: SW846/MCAWW/CLP/ Prep Batch: _____
 SITE

1. Reason for SDR

- a. COC Discrepancy Tech Profile Error Client Request Sampler Error on C-O-C
 Transcription Error Wrong Test Code Other _____
- b. General Discrepancy
 Missing Sample/Extract Container Broken Wrong Sample Pulled Label ID's Illegible
 Hold Time Exceeded Insufficient Sample Preservation Wrong Received Past Hold
 Improper Bottle Type Not Amenable to Analysis

Note: Verified by (Log-In) or (Prep Group) (circle)...signature/date: _____

c. QC Problem (Include all relevant specific results; attach data if necessary)

Specified matrix GC on sample (9710L600-001) ST were not performed due to sample being placed in the incorrect vials in the field. Samples were supposed

2. Known or Probable Causes(s) *to be placed in the vials prepared with spike solution but were not.*

3. Discussion and Proposed Action

Other Description:

- Re-log
 Entire Batch
 Following Samples: _____
 Re-leach
 Re-extract
 Re-digest
 Revise EDD
 Change Test Code to _____
 Place On/Take Off Hold (circle)

Note in narrative.

4. Project Manager Instructions...signature/date: _____

- Concur with Proposed Action
 Disagree with Proposed Action; See Instruction
 Include in Case Narrative
 Client Contacted:
 Date/Person _____
 Add
 Cancel

5. Final Action...signature/date: *[Signature]* 11/2/97

Other Explanation:

- Verified re-[log][leach][extract][digest][analysis] (circle)
 Included in Case Narrative
 Hard Copy COC Revised
 Electronic COC Revised
 EDD Corrections Completed

When Final Action has been recorded, forward original to QA Specialist for distribution and filing.

Route	Distribution of Completed SDR	Route	Distribution of Completed SDR
<u>2</u>	<input checked="" type="checkbox"/> Initiator: <u>B. Rubino</u>	—	<input type="checkbox"/> Metals: Doughty
—	<input checked="" type="checkbox"/> Lab Manager: <u>J. Michael Taylor</u>	—	<input type="checkbox"/> Inorganic: Perrone/Leonards
<u>1</u>	<input checked="" type="checkbox"/> Project Mgr: <u>Mike Young</u>	—	<input type="checkbox"/> GC/LC: Jarvis/Skrzat/Schnell
—	<input checked="" type="checkbox"/> Section Mgr: <u>Siery/Durke/Daniels</u>	—	<input type="checkbox"/> MS: LeMin/McIntyre/Taylor/Kasdras/Steele
—	<input checked="" type="checkbox"/> QA File: <u>Feldman/Racioppi/Basuthakur</u>	—	<input type="checkbox"/> Log-in: Dodson
—	<input type="checkbox"/> Data Management: Miller	—	<input type="checkbox"/> Admin: Brewer/Keehn/Shafar
—	<input type="checkbox"/> Sample Prep: Schnell/Swisher	—	<input type="checkbox"/> Other: _____

GLOSSARY OF VOA DATA

DATA QUALIFIERS

- U** = Compound was analyzed for but not detected. The associated numerical value is the estimated sample quantitation limit which is included and corrected for dilution and percent moisture.
- J** = Indicates an estimated value. This flag is used under the following circumstances: 1) when estimating a concentration for tentatively identified compounds (TICs) where a 1:1 response is assumed; or 2) when the mass spectral data indicate the presence of a compound that meets the identification criteria but the result is less than the specified detection limit but greater than zero. For example, if the limit of detection is 10 ug/L and a concentration of 3 ug/L is calculated, it is reported as 3J.
- B** = This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates possible/probable blank contamination. This flag is also used for a TIC as well as for a positively identified TCL compound.
- E** = Indicates that the compound was detected beyond the calibration range and was subsequently analyzed at a dilution.
- D** = Identifies all compounds identified in an analysis at a secondary dilution factor.
- I** = Interference.
- NQ** = Result qualitatively confirmed but not able to quantify.
- N** = Indicates presumptive evidence of a compound. This flag is only used for tentatively identified compounds (TICs), where the identification is based on a mass spectral library search. It is applied to all TIC results. For generic characterization of a TIC, such as chlorinated hydrocarbon, the N code is not used.
- X** = This flag is used for a TIC compound which is quantified relative to a response factor generated from a daily calibration standard (rather than quantified relative to the closest internal standard).
- Y** = Additional qualifiers used as required are explained in the case narrative.



GLOSSARY OF VOA DATA

ABBREVIATIONS

BS	=	Indicates blank spike in which reagent grade water is spiked with the CLP matrix spike solutions and carried through all the steps in the method. Spike recoveries are reported.
BSD	=	Indicates blank spike duplicate.
MS	=	Indicates matrix spike.
MSD	=	Indicates matrix spike duplicate.
DL	=	Suffix added to sample number to indicate that results are from a diluted analysis.
NA	=	Not Applicable.
DF	=	Dilution Factor.
NR	=	Not Required.
SP, Z	=	Indicates Spiked Compound.



Recra LabNet - Lionville Laboratory

Volatiles by GC/MS, HSL List

Report Date: 11/13/97 17:18

RFW Batch Number: 9710L600

Client: USACE-DEAL TEST SITE

Work Order: 11901001003 Page: 1a

500

Sample Information	Cust ID:	S7	S8	S9	S9	S10	S11
	RFW#:	001	002	003	003	004	005
	Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	D.F.:	0.862	0.855	0.833	0.333	0.935	0.847
	Units:	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
	Level:	MED	MED	MED	MED	MED	MED
					REPREP		
Surrogate Toluene-d8		85 %	101 %	80 * %	71 * %	90 %	90 %
Recovery Bromofluorobenzene		77 %	90 %	74 %	69 * %	90 %	81 %
1,2-Dichloroethane-d4		100 %	118 %	91 %	76 %	114 %	101 %
===== <u>fl</u> ===== <u>fl</u> ===== <u>fl</u> ===== <u>fl</u> ===== <u>fl</u> ===== <u>fl</u> ===== <u>fl</u> ===== <u>fl</u> =====							
Chloromethane		2900 U	1400 U	2500 U	1000 U	1500 U	2000 U
Bromomethane		2900 U	1400 U	2500 U	1000 U	1500 U	2000 U
Vinyl Chloride		2900 U	1400 U	2500 U	1000 U	1500 U	2000 U
Chloroethane		2900 U	1400 U	2500 U	1000 U	1500 U	2000 U
Methylene Chloride		1500 970 BJU	640 500 BJU	800 BJU	940 BJU	570 BJU	350 BJU
Acetone		2400 1000 BJU	1400 380 BJU	700 BJU	590 BJU	320 BJU	440 BJU
Carbon Disulfide		1500 U	690 U	1300 U	510 U	730 U	990 U
1,1-Dichloroethene		1500 U	690 U	1300 U	510 U	730 U	990 U
1,1-Dichloroethane		1500 U	690 U	1300 U	510 U	730 U	990 U
1,2-Dichloroethene (total)		1500 U	690 U	1300 U	510 U	730 U	990 U
Chloroform		1500 U	690 U	1300 U	510 U	730 U	990 U
1,2-Dichloroethane		1500 U	690 U	1300 U	510 U	730 U	990 U
2-Butanone		2900 U	1400 U	2500 U	1000 U	1500 U	2000 U
1,1,1-Trichloroethane		1500 U	690 U	1300 U	510 U	730 U	990 U
Carbon Tetrachloride		1500 U	690 U	1300 U	510 U	730 U	990 U
Bromodichloromethane		1500 U	690 U	1300 U	510 U	730 U	990 U
1,2-Dichloropropane		1500 U	690 U	1300 U	510 U	730 U	990 U
cis-1,3-Dichloropropene		1500 U	690 U	1300 U	510 U	730 U	990 U
Trichloroethene		1500 U	690 U	1300 U	510 U	730 U	990 U
Dibromochloromethane		1500 U	690 U	1300 U	510 U	730 U	990 U
1,1,2-Trichloroethane		1500 U	690 U	1300 U	510 U	730 U	990 U
Benzene		1500 U	690 U	1300 U	510 U	730 U	990 U
Trans-1,3-Dichloropropene		1500 U	690 U	1300 U	510 U	730 U	990 U
Bromoform		1500 U	690 U	1300 U	510 U	730 U	990 U
4-Methyl-2-pentanone		2900 U	1400 U	2500 U	1000 U	1500 U	2000 U
2-Hexanone		2900 U	1400 U	2500 U	1000 U	1500 U	2000 U
Tetrachloroethene		1500 U	690 U	1300 U	510 U	730 U	990 U
1,1,2,2-Tetrachloroethane		1500 U	690 U	1300 U	510 U	730 U	990 U
Toluene		1500 U	690 U	1300 U	510 U	730 U	990 U

*= Outside of EPA CLP QC limits.

Batch Number: 971000 Cust ID: S7 US DEF EST S Wor der 9010003 Page: 11
 RFW#: 001 002 003 003 004 005
 Level: MED MED MED MED MED MED

	1500	U	690	U	1300	U	510	U	730	U	990	U
Chlorobenzene	1500	U	690	U	1300	U	510	U	730	U	990	U
Ethylbenzene	1500	U	690	U	1300	U	510	U	730	U	990	U
Styrene	1500	U	690	U	1300	U	510	U	730	U	990	U
Xylene (total)	1500	U	690	U	1300	U	510	U	730	U	990	U

*= Outside of EPA CLP QC limits.

006

Recra LabNet - Lionville Laboratory

Volatiles by GC/MS, HSL List

Report Date: 11/13/97 17:18

RFW Batch Number: 9710L600

Client: USACE-DEAL TEST SITE

Work Order: 11901001003 Page: 2a

200

Cust ID:	GW3	GW4	GW4	GW5	GW5	FB02
Sample RFW#:	007	008	008 DL	009	009 DL	010
Information Matrix:	WATER	WATER	WATER	WATER	WATER	SOIL
D.F.:	1.00	1.00	2.00	1.00	2.00	1.00
Units:	UG/L	UG/L	UG/L	UG/L	UG/L	UG/KG
Level:	LOW	LOW	LOW	LOW	LOW	MED

Surrogate	Toluene-d8	98 %	99 %	98 %	81 * %	98 %	98 %
Recovery	Bromofluorobenzene	96 %	94 %	96 %	93 %	95 %	96 %
	1,2-Dichloroethane-d4	110 %	102 %	103 %	108 %	101 %	115 %

	fl	fl	fl	fl	fl	fl
Chloromethane	10 U	10 U	NA	10 U	NA	1200 U
Bromomethane	10 U	10 U	NA	10 U	NA	1200 U
Vinyl Chloride	10 U	10 U	NA	10 U	NA	1200 U
Chloroethane	10 U	10 U	NA	10 U	NA	1200 U
Methylene Chloride	9 BU	9 BU	15 BU	18 BU	16 BU	680 BJ
Acetone	10 U	10 U	2016 BU	10 U	NA	260 BJ
Carbon Disulfide	69	E	150	E	170	620 U
1,1-Dichloroethene	5 U	5 U	NA	5 U	NA	620 U
1,1-Dichloroethane	5 U	5 U	NA	5 U	NA	620 U
1,2-Dichloroethene (total)	5 U	5 U	NA	5 U	NA	620 U
Chloroform	5 U	5 U	NA	5 U	NA	620 U
1,2-Dichloroethane	5 U	5 U	NA	5 U	NA	620 U
2-Butanone	10 U	10 U	NA	10 U	NA	1200 U
1,1,1-Trichloroethane	5 U	5 U	NA	5 U	NA	620 U
Carbon Tetrachloride	5 U	5 U	NA	5 U	NA	620 U
Bromodichloromethane	5 U	5 U	NA	5 U	NA	620 U
1,2-Dichloropropane	5 U	5 U	NA	5 U	NA	620 U
cis-1,3-Dichloropropene	5 U	5 U	NA	5 U	NA	620 U
Trichloroethene	5 U	2 J	NA	5 U	NA	620 U
Dibromochloromethane	5 U	5 U	NA	5 U	NA	620 U
1,1,2-Trichloroethane	5 U	5 U	NA	5 U	NA	620 U
Benzene	5 U	5 U	NA	5 U	NA	620 U
Trans-1,3-Dichloropropene	5 U	5 U	NA	5 U	NA	620 U
Bromoform	5 U	5 U	NA	5 U	NA	620 U
4-Methyl-2-pentanone	10 U	10 U	NA	10 U	NA	1200 U
2-Hexanone	10 U	10 U	NA	10 U	NA	1200 U
Tetrachloroethene	5 U	5 U	NA	5 U	NA	620 U
1,1,2,2-Tetrachloroethane	5 U	5 U	NA	5 U	NA	620 U
Toluene	5 U	5 U	NA	5 U	NA	620 U

*= Outside of EPA CLP QC limits.

Cust ID:	GW3	GW4	GW4	GW5	GW5	FB02
RFW#:	007	008	008 DL	009	009 DL	010
Level:	LOW	LOW	LOW	LOW	LOW	MED

Chlorobenzene_____	5 U	5 U	NA	5 U ↑	NA	620 U
Ethylbenzene_____	5 U	5 U	NA	5 U ↓	NA	620 U
Styrene_____	5 U	5 U	NA	5 U ↓	NA	620 U
Xylene (total)_____	5 U	5 U	NA	5 U ↓	NA	620 U

*= Outside of EPA CLP QC limits.

008

Recre LabNet - Lionville Laboratory

Volatiles by GC/MS, HSL List

Report Date: 11/13/97 17:18

RFW Batch Number: 9710L600

Client: USACE-DEAL TEST SITE

Work Order: 11901001003 Page: 3a

600

Sample Information	Cust ID:	FB03	TB2	SW1	SW2	SD1	SD2
	RFW#:	011	012	013	014	015	016
	Matrix:	WATER	WATER	WATER	WATER	SOIL	SOIL
	D.F.:	1.00	1.00	1.00	1.00	0.943	1.02
	Units:	UG/L	UG/L	UG/L	UG/L	UG/KG	UG/KG
	Level:	LOW	LOW	LOW	LOW	LOW	LOW

Surrogate	Recovery	FB03	TB2	SW1	SW2	SD1	SD2
Toluene-d8		97 %	98 %	99 %	96 %	102 %	95 %
Bromofluorobenzene		92 %	95 %	93 %	92 %	86 %	83 %
1,2-Dichloroethane-d4		100 %	102 %	102 %	99 %	108 %	104 %

Compound	FB03	TB2	SW1	SW2	SD1	SD2
Chloromethane	10 U	10 U	10 U	10 U	12 U	13 U
Bromomethane	10 U	10 U	10 U	10 U	12 U	13 U
Vinyl Chloride	10 U	10 U	10 U	10 U	12 U	13 U
Chloroethane	10 U	10 U	10 U	10 U	12 U	13 U
Methylene Chloride	10 B	10 B	11 BU	7 BU	6-5 BU	6-5 BU
Acetone	11 B	10 U	10 U	10 BU	12-7 BU	10-4 BU
Carbon Disulfide	5 U	5 U	5 U	5 U	6 U	6 U
1,1-Dichloroethene	5 U	5 U	5 U	5 U	6 U	6 U
1,1-Dichloroethane	5 U	5 U	5 U	5 U	6 U	6 U
1,2-Dichloroethene (total)	5 U	5 U	5 U	5 U	6 U	6 U
Chloroform	5 U	5 U	5 U	5 U	6 U	6 U
1,2-Dichloroethane	5 U	5 U	5 U	5 U	6 U	6 U
2-Butanone	10 U	10 U	10 U	10 U	12 U	13 U
1,1,1-Trichloroethane	5 U	5 U	5 U	5 U	6 U	6 U
Carbon Tetrachloride	5 U	5 U	5 U	5 U	6 U	6 U
Bromodichloromethane	5 U	5 U	5 U	5 U	6 U	6 U
1,2-Dichloropropane	5 U	5 U	5 U	5 U	6 U	6 U
cis-1,3-Dichloropropene	5 U	5 U	5 U	5 U	6 U	6 U
Trichloroethene	5 U	5 U	5 U	5 U	6 U	6 U
Dibromochloromethane	5 U	5 U	5 U	5 U	6 U	6 U
1,1,2-Trichloroethane	5 U	5 U	5 U	5 U	6 U	6 U
Benzene	5 U	5 U	5 U	5 U	6 U	6 U
Trans-1,3-Dichloropropene	5 U	5 U	5 U	5 U	6 U	6 U
Bromoform	5 U	5 U	5 U	5 U	6 U	6 U
4-Methyl-2-pentanone	10 U	10 U	10 U	10 U	12 U	13 U
2-Hexanone	10 U	10 U	10 U	10 U	12 U	13 U
Tetrachloroethene	5 U	5 U	5 U	5 U	6 U	6 U
1,1,2,2-Tetrachloroethane	5 U	5 U	5 U	5 U	6 U	6 U
Toluene	5 U	5 U	5 U	5 U	6 U	6 U

*= Outside of EPA CLP QC limits.

Cust ID: **FB03** **TB2** **SW1** **SW2** **SD1** **SD2**
 RFW#: **011** **012** **013** **014** **015** **016**
 Level: **LOW** **LOW** **LOW** **LOW** **LOW** **LOW**

	FB03	TB2	SW1	SW2	SD1	SD2
Chlorobenzene	5 U	5 U	5 U	5 U	6 U	6 U
Ethylbenzene	5 U	5 U	5 U	5 U	6 U	6 U
Styrene	5 U	5 U	5 U	5 U	6 U	6 U
Xylene (total)	5 U	5 U	5 U	5 U	6 U	6 U

*= Outside of EPA CLP QC limits.

010

Sample Information	Cust ID: VBLKFS	RFW#: 97LVN335-MB1	VBLKFS BS	97LVN335-MB1	VBLKCT	97LVN337-MB1	VBLKAI	97LVW209-MB1	VBLKAI BS	97LVW209-MB1	VBLKAZ	97LVW211-MB1
	Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL	WATER	WATER	WATER	WATER	WATER	WATER
	D.F.:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
	Units:	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L
	Level:	MED	MED	MED	MED	MED	LOW	LOW	LOW	LOW	LOW	LOW
Surrogate	Toluene-d8	103 %	100 %	95 %	99 %	103 %	97 %					
Recovery	Bromofluorobenzene	100 %	96 %	93 %	96 %	99 %	95 %					
	1,2-Dichloroethane-d4	116 %	121 %	94 %	111 %	107 %	102 %					
=====fl=====fl=====fl=====fl=====fl=====fl=====fl=====												
Chloromethane		260 J	270 JB	130 J	10 U	10 U	10 U					
Bromomethane		780 J	570 JB	500 J	10 U	10 U	10 U					
Vinyl Chloride		1200 U	1200 U	1200 U	10 U	10 U	10 U					
Chloroethane		1200 U	1200 U	1200 U	10 U	10 U	10 U					
Methylene Chloride		780	810 B	440 J	5	10 B	13					
Acetone		340 J	370 JB	200 J	3 J	10 U	31					
Carbon Disulfide		620 U	620 U	620 U	5 U	5 U	5 U					
1,1-Dichloroethene		620 U	109 %	620 U	5 U	102 %	5 U					
1,1-Dichloroethane		620 U	620 U	620 U	5 U	5 U	5 U					
1,2-Dichloroethene (total)		620 U	620 U	620 U	5 U	5 U	5 U					
Chloroform		620 U	620 U	620 U	5 U	5 U	5 U					
1,2-Dichloroethane		620 U	620 U	620 U	5 U	5 U	5 U					
2-Butanone		1200 U	1200 U	1200 U	10 U	10 U	10 U					
1,1,1-Trichloroethane		620 U	620 U	620 U	5 U	5 U	5 U					
Carbon Tetrachloride		620 U	620 U	620 U	5 U	5 U	5 U					
Bromodichloromethane		620 U	620 U	620 U	5 U	5 U	5 U					
1,2-Dichloropropane		620 U	620 U	620 U	5 U	5 U	5 U					
cis-1,3-Dichloropropene		620 U	620 U	620 U	5 U	5 U	5 U					
Trichloroethene		620 U	97 %	620 U	5 U	91 %	5 U					
Dibromochloromethane		620 U	620 U	620 U	5 U	5 U	5 U					
1,1,2-Trichloroethane		620 U	620 U	620 U	5 U	5 U	5 U					
Benzene		620 U	111 %	620 U	5 U	117 %	1 J					
Trans-1,3-Dichloropropene		620 U	620 U	620 U	5 U	5 U	5 U					
Bromoform		620 U	620 U	620 U	5 U	5 U	5 U					
4-Methyl-2-pentanone		1200 U	1200 U	1200 U	10 U	10 U	10 U					
2-Hexanone		1200 U	1200 U	1200 U	10 U	10 U	10 U					
Tetrachloroethene		620 U	620 U	620 U	5 U	5 U	5 U					
1,1,2,2-Tetrachloroethane		620 U	620 U	620 U	5 U	5 U	5 U					
Toluene		620 U	106 %	620 U	5 U	109 %	5 U					

*= Outside of EPA CLP QC limits.

Cust ID: VBLKFS VBLKFS BS VBLKCT VBLKAI VBLKAI BS VBLKAZ

RFW#: 97LVN335-MB1 97LVN335-MB1 97LVN337-MB1 97LVW209-MB1 97LVW209-MB1 97LVW211-MB1
 Level: MED MED MED LOW LOW LOW

	97LVN335-MB1	97LVN335-MB1	97LVN337-MB1	97LVW209-MB1	97LVW209-MB1	97LVW211-MB1
Chlorobenzene	620 U	105 %	620 U	5 U	100 %	5 U
Ethylbenzene	620 U	620 U	620 U	5 U	5 U	5 U
Styrene	620 U	620 U	620 U	5 U	5 U	5 U
Xylene (total)	620 U	620 U	620 U	5 U	5 U	5 U

*= Outside of EPA CLP QC limits.

012

Cust ID: VBLKGB

RFW#: 97LVN338-MB1

Level: LOW

Chlorobenzene	5	U
Ethylbenzene	5	U
Styrene	5	U
Xylene (total)	5	U

*= Outside of EPA CLP QC limits.

2A
WATER VOLATILE SURROGATE RECOVERY

Lab Name: Recra.LabNet

Contract: 1901-01-03

Lab Code: Recra

Case No.: _____

SAS No.: _____

SDG No.: _____

	EPA SAMPLE NO.	S1 (TOL) #	S2 (BFB) #	S3 (DCE) #	OTHER	TOT OUT
01	GW3	98	96	110		0
02	GW4	99	94	102		0
03	GW4DL	98	96	103		0
04	GW5	81 *	93	108		1
05	GW5DL	98	95	101		0
06	FB03	97	92	100		0
07	TB2	98	95	102		0
08	SW1	99	93	102		0
09	SW2	96	92	99		0
10	VBLKAI	99	96	111		0
11	VBLKAI	BS 103	99	107		0
12	VBLKAZ	97	95	102		0

QC LIMITS

S1 (TOL) = Toluene-d8 (88-110)
 S2 (BFB) = Bromofluorobenzene (86-115)
 S3 (DCE) = 1,2-Dichloroethane-d4 (76-114)

Column to be used to flag recovery values
 * Values outside of contract required QC limits
 D Surrogates diluted out

2B
SOIL VOLATILE SURROGATE RECOVERY

Lab Name: Recra.LabNet

Contract: 1901-01-03

Lab Code: Recra

Case No.: _____

SAS No.: _____

SDG No.: _____

	EPA SAMPLE NO.	S1 (TOL) #	S2 (BFB) #	S3 (DCE) #	OTHER	TOT OUT
01	SD1	102	86	108		0
02	SD2	95	83	104		0
03	VBLKGB	95	92	99		0

QC LIMITS

S1 (TOL) = Toluene-d8

(81-117)

S2 (BFB) = Bromofluorobenzene

(74-121)

S3 (DCE) = 1,2-Dichloroethane-d4

(70-121)

Column to be used to flag recovery values

* Values outside of contract required QC limits

D Surrogates diluted out

2B
SOIL VOLATILE SURROGATE RECOVERY

Lab Name: Recra.LabNet

Contract: 1901-01-03

Lab Code: Recra

Case No.: _____

SAS No.: _____

SDG No.: _____

	EPA SAMPLE NO.	S1 (TOL) #	S2 (BFB) #	S3 (DCE) #	OTHER	TOT OUT
01	S7	85	77	100		0
02	S8	101	90	118		0
03	S9	80 *	74	91		1
04	S9RE	71 *	69 *	76		2
05	S10	90	90	114		0
06	S11	90	81	101		0
07	FB02	98	96	115		0
08	VBLKFS	103	100	116		0
09	VBLKFS	BS 100	96	121		0
10	VBLKCT	95	93	94		0

QC LIMITS

S1 (TOL) = Toluene-d8 (81-117)
 S2 (BFB) = Bromofluorobenzene (74-121)
 S3 (DCE) = 1,2-Dichloroethane-d4 (70-121)

Column to be used to flag recovery values
 * Values outside of contract required QC limits
 D Surrogates diluted out

WATER VOLATILE MATRIX SPIKE RECOVERY

Lab Name: Recra.LabNetContract: 1901-01-03Lab Code: Recra

Case No.: _____

SAS No.: _____

SDG No.: _____

MATRIX Spike - EPA Sample No.: VBKAILevel: (low/med) LOW

COMPOUND	SPIKE	SAMPLE	MS	MS	QC
	ADDED	CONCENTRATION	CONCENTRATION	%	LIMITS
	UG/L	UG/L	UG/L	REC #	REC
1,1-Dichloroethene_____	50.0	0	51.0	102	61 -145
Trichloroethene_____	50.0	0	45.6	91	71 -120
Benzene_____	50.0	0	58.6	117	76 -127
Toluene_____	50.0	0	54.7	109	76 -125
Chlorobenzene_____	50.0	0	49.9	100	75 -130

Column to be used to flag recovery value with an asterisk

* Values outside of QC limits

Spike Recovery: 0 out of 5 outside limits

COMMENTS:

SOIL VOLATILE MATRIX SPIKE RECOVERY

Lab Name: Recra.LabNetContract: 1901-01-03Lab Code: Recra

Case No.: _____

SAS No.: _____

SDG No.: _____

MATRIX Spike - EPA Sample No.: VBLKFSLevel: (low/med) MED

COMPOUND	SPIKE	SAMPLE	MS	MS	QC
	ADDED	CONCENTRATION	CONCENTRATION	%	LIMITS
	UG/KG	UG/KG	UG/KG	REC #	REC
1,1-Dichloroethene	6250	0	6830	109	59 -172
Trichloroethene	6250	0	6070	97	62 -137
Benzene	6250	0	6960	111	66 -142
Toluene	6250	0	6600	106	59 -139
Chlorobenzene	6250	0	6580	105	60 -133

Column to be used to flag recovery value with an asterisk

* Values outside of QC limits

Spike Recovery: 0 out of 5 outside limits

COMMENTS:

4A
VOLATILE METHOD BLANK SUMMARY

Lab Name: Recra.LabNet.Philadelphia Contract: 11901-001-003-0001-00
 Lab Code: RECRA Case No.: SAS No.: SDG No.: 10L600
 Lab File ID: W101305 Lab Sample ID: 97LVW209-MB1
 Date Analyzed: 10/13/97 Time Analyzed: 1235
 Matrix: (soil/water) WATER Level: (low/med) LOW
 Instrument ID: 1050W

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS and MSD:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	TIME ANALYZED
	=====	=====	=====	=====
01	VBLKAIBS	97LVW209-MB1S	W101311	1635
02	GW3	9710L600-007	W101313	1822
03	GW4	9710L600-008	W101314	1900
04	GW5	9710L600-009	W101315	1941
05	FB03	9710L600-011	W101316	2021
06	TB2	9710L600-012	W101317	2102
07	SW1	9710L600-013	W101318	2145
08				
09				
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COMMENTS: _____

4A
VOLATILE METHOD BLANK SUMMARY

Lab Name: Recra.LabNet.Philadelphia Contract: 11901-001-003-0001-00
 Lab Code: RECRA Case No.: SAS No.: SDG No.: 10L600
 Lab File ID: W101406 Lab Sample ID: 97LVW211-MB1
 Date Analyzed: 10/14/97 Time Analyzed: 1423
 Matrix: (soil/water) WATER Level: (low/med) LOW
 Instrument ID: 1050W

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS and MSD:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	TIME ANALYZED
	=====	=====	=====	=====
01	SW2	9710L600-014	W101410	1733
02	GW4DL	9710L600-008	W101411	1815
03	GW5DL	9710L600-009	W101412	1857
04				
05				
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COMMENTS: _____

4A
VOLATILE METHOD BLANK SUMMARY

Lab Name: Recra.LabNet.Philadelphia Contract: 11901-001-003-0001-00
 Lab Code: RECRA Case No.: SAS No.: SDG No.: 10L600
 Lab File ID: N101508 Lab Sample ID: 97LVN337-MB1
 Date Analyzed: 10/15/97 Time Analyzed: 1021
 Matrix: (soil/water) SOIL Level: (low/med) MED
 Instrument ID: 5972NN

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS and MSD:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	TIME ANALYZED
	=====	=====	=====	=====
01	S9RE	9710L600-003	N101509	1114
02				
03				
04				
05				
06				
07				
08				
09				
10				
11				
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COMMENTS: _____

4A
VOLATILE METHOD BLANK SUMMARY

Lab Name: Recra.LabNet.Philadelphia Contract: 11901-001-003-0001-00
 Lab Code: RECRA Case No.: SAS No.: SDG No.: 10L600
 Lab File ID: N101405 Lab Sample ID: 97LVN335-MB1
 Date Analyzed: 10/14/97 Time Analyzed: 1013
 Matrix: (soil/water) SOIL Level: (low/med) MED
 Instrument ID: 5972N

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS and MSD:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	TIME ANALYZED
	-----	-----	-----	-----
01	S8	9710L600-002	N101411	1358
02	S7	9710L600-001	N101413	1512
03	S9	9710L600-003	N101414	1551
04	S10	9710L600-004	N101415	1630
05	S11	9710L600-005	N101416	1709
06	FB02	9710L600-010	N101417	1748
07	VBLKFSBS	97LVN335-MB1S	N101418	1827
08				
09				
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COMMENTS: _____

4A
VOLATILE METHOD BLANK SUMMARY

Lab Name: Recra.LabNet.Philadelphia Contract: 11901-001-003-0001-00
 Lab Code: RECRA Case No.: SAS No.: SDG No.: 10L600
 Lab File ID: N101517 Lab Sample ID: 97LVN338-MB1
 Date Analyzed: 10/15/97 Time Analyzed: 1628
 Matrix: (soil/water) SOIL Level: (low/med) LOW
 Instrument ID: 5972N

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS and MSD:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	TIME ANALYZED
	=====	=====	=====	=====
01	SD1	9710L600-015	N101518	1703
02	SD2	9710L600-016	N101519	1738
03				
04				
05				
06				
07				
08				
09				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				
21				
22				
23				
24				
25				
26				
27				
28				
29				
30				

COMMENTS: _____

1E
VOLATILE ORGANICS ANALYSIS SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

Lab Name: Recra.LabNet Work Order: 11901001003

S7

Client: USACE-DEAL TEST SITE

Matrix: SOIL Lab Sample ID: 9710L600-001

Sample wt/vol: 11.6 (g/mL) G Lab File ID: n101413

Level: (low/med) MED Date Received: 10/02/97

% Moisture: not dec. 63 Date Analyzed: 10/14/97

Column: (pack/cap) CAP Dilution Factor: 0.862

Number TICs found: 6 CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	ALKANE	25.405	10000	J
2.	ALKANE	25.622	7000	J
3.	ALKANE	26.392	2000	J
4.	ALKANE	26.451	3000	J
5.	ALKANE	26.530	4000	J
6.	ALKANE	26.964	3000	J

1E
VOLATILE ORGANICS ANALYSIS SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

S8

Lab Name: Recra.LabNet Work Order: 11901001003

Client: USACE-DEAL TEST SITE

Matrix: SOIL Lab Sample ID: 9710L600-002

Sample wt/vol: 11.7 (g/mL) G Lab File ID: n101411

Level: (low/med) MED Date Received: 10/02/97

% Moisture: not dec. 22 Date Analyzed: 10/14/97

Column: (pack/cap) CAP Dilution Factor: 0.855

Number TICs found: 1 CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	SILANE	12.431	900	NJ

1E
VOLATILE ORGANICS ANALYSIS SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

S9

Lab Name: Recra.LabNet Work Order: 11901001003

Client: USACE-DEAL TEST SITE

Matrix: SOIL Lab Sample ID: 9710L600-003

Sample wt/vol: 12.0 (g/mL) G Lab File ID: n101414

Level: (low/med) MED Date Received: 10/02/97

% Moisture: not dec. 59 Date Analyzed: 10/14/97

Column: (pack/cap) CAP Dilution Factor: 0.833

Number TICs found: 1 CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 79209	ACETIC ACID, METHYL ESTER	8.964	1000	NJ

1E
VOLATILE ORGANICS ANALYSIS SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

S10

Lab Name: Recra.LabNet Work Order: 11901001003

Client: USACE-DEAL TEST SITE

Matrix: SOIL Lab Sample ID: 9710L600-004

Sample wt/vol: 10.7 (g/mL) G Lab File ID: n101415

Level: (low/med) MED Date Received: 10/02/97

% Moisture: not dec. 20 Date Analyzed: 10/14/97

Column: (pack/cap) CAP Dilution Factor: 0.935

Number TICs found: 1 CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	SILANE	12.435	800	NJ

1E
VOLATILE ORGANICS ANALYSIS SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

S11

Lab Name: Recra.LabNet Work Order: 11901001003

Client: USACE-DEAL TEST SITE

Matrix: SOIL Lab Sample ID: 9710L600-005

Sample wt/vol: 11.8 (g/mL) G Lab File ID: n101416

Level: (low/med) MED Date Received: 10/02/97

% Moisture: not dec. 47 Date Analyzed: 10/14/97

Column: (pack/cap) CAP Dilution Factor: 0.847

Number TICs found: 1 CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN	5.812	2000	J

1E
 VOLATILE ORGANICS ANALYSIS SHEET
 TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

GW3

Lab Name: Recra.LabNet Work Order: 11901001003

Client: USACE-DEAL TEST SITE

Matrix: WATER Lab Sample ID: 9710L600-007

Sample wt/vol: 5.00 (g/mL) ML Lab File ID: W101313

Level: (low/med) LOW Date Received: 10/02/97

% Moisture: not dec. Date Analyzed: 10/13/97

Column: (pack/cap) CAP Dilution Factor: 1.00

Number TICs found: 0 CONCENTRATION UNITS:
 (ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.				

1E
VOLATILE ORGANICS ANALYSIS SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

GW4

Lab Name: Recra.LabNet Work Order: 11901001003

Client: USACE-DEAL TEST SITE

Matrix: WATER Lab Sample ID: 9710L600-008

Sample wt/vol: 5.00 (g/mL) ML Lab File ID: W101314

Level: (low/med) LOW Date Received: 10/02/97

% Moisture: not dec. Date Analyzed: 10/13/97

Column: (pack/cap) CAP Dilution Factor: 1.00

Number TICs found: 0 CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.				

1E
VOLATILE ORGANICS ANALYSIS SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

GW5

Lab Name: Recra.LabNet Work Order: 11901001003

Client: USACE-DEAL TEST SITE

Matrix: WATER Lab Sample ID: 9710L600-009

Sample wt/vol: 5.00 (g/mL) ML Lab File ID: W101315

Level: (low/med) LOW Date Received: 10/02/97

% Moisture: not dec. _____ Date Analyzed: 10/13/97

Column: (pack/cap) CAP Dilution Factor: 1.00

Number TICs found: 0 CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.				

1E
VOLATILE ORGANICS ANALYSIS SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

FB02

Lab Name: Recra.LabNet Work Order: 11901001003

Client: USACE-DEAL TEST SITE

Matrix: SOIL Lab Sample ID: 9710L600-010

Sample wt/vol: 10.0 (g/mL) G Lab File ID: n101417

Level: (low/med) MED Date Received: 10/02/97

% Moisture: not dec. 100 Date Analyzed: 10/14/97

Column: (pack/cap) CAP Dilution Factor: 1.00

Number TICs found: 0 CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.				

1E
 VOLATILE ORGANICS ANALYSIS SHEET
 TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

Lab Name: Recra.LabNet Work Order: 11901001003

FB03

Client: USACE-DEAL TEST SITE

Matrix: WATER Lab Sample ID: 9710L600-011

Sample wt/vol: 5.00 (g/mL) ML Lab File ID: W101316

Level: (low/med) LOW Date Received: 10/02/97

% Moisture: not dec. Date Analyzed: 10/13/97

Column: (pack/cap) CAP Dilution Factor: 1.00

Number TICs found: 0 CONCENTRATION UNITS:
 (ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.				

1E
VOLATILE ORGANICS ANALYSIS SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

Lab Name: Recra.LabNet Work Order: 11901001003

TB2

Client: USACE-DEAL TEST SITE

Matrix: WATER Lab Sample ID: 9710L600-012

Sample wt/vol: 5.00 (g/mL) ML Lab File ID: W101317

Level: (low/med) LOW Date Received: 10/02/97

% Moisture: not dec. _____ Date Analyzed: 10/13/97

Column: (pack/cap) CAP Dilution Factor: 1.00

Number TICs found: 0 CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.				

1E
VOLATILE ORGANICS ANALYSIS SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

Lab Name: Recra.LabNet Work Order: 11901001003

SW1

Client: USACE-DEAL TEST SITE

Matrix: WATER Lab Sample ID: 9710L600-013

Sample wt/vol: 5.00 (g/mL) ML Lab File ID: W101318

Level: (low/med) LOW Date Received: 10/02/97

% Moisture: not dec. Date Analyzed: 10/13/97

Column: (pack/cap) CAP Dilution Factor: 1.00

Number TICs found: 0 CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.				

1E
VOLATILE ORGANICS ANALYSIS SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

Lab Name: Recra.LabNet Work Order: 11901001003

SW2

Client: USACE-DEAL TEST SITE

Matrix: WATER Lab Sample ID: 9710L600-014

Sample wt/vol: 5.00 (g/mL) ML Lab File ID: W101410

Level: (low/med) LOW Date Received: 10/02/97

% Moisture: not dec. Date Analyzed: 10/14/97

Column: (pack/cap) CAP Dilution Factor: 1.00

Number TICs found: 0 CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.				

1E
VOLATILE ORGANICS ANALYSIS SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

SD1

Lab Name: Recra.LabNet Work Order: 11901001003

Client: USACE-DEAL TEST SITE

Matrix: SOIL Lab Sample ID: 9710L600-015

Sample wt/vol: 5.30 (g/mL) G Lab File ID: n101518

Level: (low/med) LOW Date Received: 10/02/97

% Moisture: not dec. 24 Date Analyzed: 10/15/97

Column: (pack/cap) CAP Dilution Factor: 0.943

Number TICs found: 0 CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.				

1E
VOLATILE ORGANICS ANALYSIS SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

Lab Name: Recra.LabNet Work Order: 11901001003

SD2

Client: USACE-DEAL TEST SITE

Matrix: SOIL Lab Sample ID: 9710L600-016

Sample wt/vol: 4.90 (g/mL) G Lab File ID: n101519

Level: (low/med) LOW Date Received: 10/02/97

% Moisture: not dec. 21 Date Analyzed: 10/15/97

Column: (pack/cap) CAP Dilution Factor: 1.02

Number TICs found: 0 CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.				

1E
VOLATILE ORGANICS ANALYSIS SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

VBLKFS

Lab Name: Recra.LabNet Work Order: 11901001003

Client: USACE-DEAL TEST SITE

Matrix: SOIL Lab Sample ID: 97LVN335-MB1

Sample wt/vol: 10.0 (g/mL) G Lab File ID: n101405

Level: (low/med) MED Date Received: 10/14/97

% Moisture: not dec. 0 Date Analyzed: 10/14/97

Column: (pack/cap) CAP Dilution Factor: 1.00

Number TICs found: 0 CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.				

1E
VOLATILE ORGANICS ANALYSIS SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

VBLKCT

Lab Name: Recra.LabNet Work Order: 11901001003

Client: USACE-DEAL TEST SITE

Matrix: SOIL Lab Sample ID: 97LVN337-MB1

Sample wt/vol: 4.00 (g/mL) G Lab File ID: n101508

Level: (low/med) MED Date Received: 10/15/97

% Moisture: not dec. 0 Date Analyzed: 10/15/97

Column: (pack/cap) CAP Dilution Factor: 1.00

Number TICs found: 0 CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.				

1E
VOLATILE ORGANICS ANALYSIS SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

VBLKAI

Lab Name: Recra.LabNet Work Order: 11901001003

Client: USACE-DEAL TEST SITE

Matrix: WATER

Lab Sample ID: 97LVW209-MB1

Sample wt/vol: 5.00 (g/mL) ML

Lab File ID: W101305

Level: (low/med) LOW

Date Received: 10/13/97

% Moisture: not dec.

Date Analyzed: 10/13/97

Column: (pack/cap) CAP

Dilution Factor: 1.00

Number TICs found: 0 CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.				

1E
VOLATILE ORGANICS ANALYSIS SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

Lab Name: Recra.LabNet Work Order: 11901001003

VBLKAZ

Client: USACE-DEAL TEST SITE

Matrix: WATER Lab Sample ID: 97LVW211-MB1

Sample wt/vol: 5.00 (g/mL) ML Lab File ID: W101406

Level: (low/med) LOW Date Received: 10/14/97

% Moisture: not dec. Date Analyzed: 10/14/97

Column: (pack/cap) CAP Dilution Factor: 1.00

Number TICs found: 1 CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	SILOXANE	22.700	3	J

1E
VOLATILE ORGANICS ANALYSIS SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

VBLKGB

Lab Name: Recra.LabNet Work Order: 11901001003

Client: USACE-DEAL TEST SITE

Matrix: SOIL Lab Sample ID: 97LVN338-MB1

Sample wt/vol: 5.00 (g/mL) G Lab File ID: n101517

Level: (low/med) LOW Date Received: 10/15/97

% Moisture: not dec. 0 Date Analyzed: 10/15/97

Column: (pack/cap) CAP Dilution Factor: 1.00

Number TICs found: 1 CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	SILANE	12.435	10	NJ

Recra LabNet - Lionville Laboratory
 VOA ANALYTICAL DATA PACKAGE FOR
 USACE-DEAL TEST SITE

DATE RECEIVED: 10/02/97

RFW LOT # :9710L600

CLIENT ID	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS	
S7	001	M1	S	97LVN335	10/01/97	N/A	10/14/97
S8	002	M1	S	97LVN335	10/01/97	N/A	10/14/97
S9	003	M1	S	97LVN335	10/01/97	N/A	10/14/97
S9	003	N1	S	97LVN337	10/01/97	N/A	10/15/97
S10	004	M1	S	97LVN335	10/01/97	N/A	10/14/97
S11	005	M1	S	97LVN335	10/01/97	N/A	10/14/97
GW3	007		W	97LVW209	10/01/97	N/A	10/13/97
GW4	008		W	97LVW209	10/01/97	N/A	10/13/97
GW4	008	D1	W	97LVW211	10/01/97	N/A	10/14/97
GW5	009		W	97LVW209	10/01/97	N/A	10/13/97
GW5	009	D1	W	97LVW211	10/01/97	N/A	10/14/97
FB02	010	M1	S	97LVN335	10/01/97	N/A	10/14/97
FB03	011		W	97LVW209	10/01/97	N/A	10/13/97
TB2	012		W	97LVW209	10/01/97	N/A	10/13/97
SW1	013		W	97LVW209	10/01/97	N/A	10/13/97
SW2	014		W	97LVW211	10/01/97	N/A	10/14/97
SD1	015		S	97LVN338	10/01/97	N/A	10/15/97
SD2	016		S	97LVN338	10/01/97	N/A	10/15/97

LAB QC:

VBLKFS	MB1		S	97LVN335	N/A	N/A	10/14/97
VBLKFS	MB1 BS		S	97LVN335	N/A	N/A	10/14/97
VBLKCT	MB1		S	97LVN337	N/A	N/A	10/15/97
VBLKAI	MB1		W	97LVW209	N/A	N/A	10/13/97
VBLKAI	MB1 BS		W	97LVW209	N/A	N/A	10/13/97
VBLKAZ	MB1		W	97LVW211	N/A	N/A	10/14/97
VBLKGB	MB1		S	97LVN338	N/A	N/A	10/15/97



RECRA LabNet Use Only
9710L600

Custody Transfer Record/Lab Work Request

Client USACE - DEAR TEST SITE
 Est. Final Proj. Sampling Date 10-1-97
 Project # 03986 164 001-0002-00 (L)
 Project Contact/Phone # G. Buchholz - 5832
 RECRA Project Manager M. Young
 QC SL946 Del SPEC TAT 30 DAY
 Date Rec'd 10-2-97 Date Due 11-1-97
 Account # MIS EPM

Refrigerator #	1		2		2													
	Liquid	Solid	Liquid	Solid	Liquid	Solid												
#/Type Container	32	1AM	1AM															
Volume	40ML	1L	1L															
Preservatives	HCL Citric																	

- MATRIX CODES:**
 S - Soil
 SE - Sediment
 SO - Solid
 SL - Sludge
 W - Water
 O - Oil
 A - Air
 DS - Drum
 DL - Drum
 L - EP/TCLP
 Leachate
 WI - Wipe
 X - Other
 F - Fish

Lab ID	Client ID/Description	Matrix QC Chosen (✓)		Matrix	Date Collected	Time Collected	ANALYSES REQUESTED						RECRA LabNet Use Only					
		MS	MSD				VOA	BNA	Pest/PCB	Herb	INORG	Metal	CN	Disposal	MEMO			
001	S7	X	X	S	10-1-97	1105	X	X	X									
002	S8			S		1125	X	X	X									
003	S9			S		0930	X	X	X									
004	S10			S		0945	X	X	X									
005	S11			S		0935	X	X	X									
006	GW2			W	9/30/97	1555	X	X	X									
007	GW3			W	10/1/97	1140	X	X	X									
008	GW4			W		0955	X	X	X									
009	GW5			W		1150	X	X	X									
010	FBO2			EX		1125	X											

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Special Instructions:
 FBO2 is METHANOL BLANK
 Job # = 11901-001-003-0001-00
 Cooler # 007-75^{cc}, #0131-4.3^{cc}

DATE/REVISIONS:
 1. *NO Time collected on VOAs for Sample
 2. 004
 3. *Recra metals bottle for sample #
 4. 016 rec'd broken
 5. only 2 VOA Vials rec'd for samples
 6. 002-005, 010, 012

RECRA LabNet Use Only

Samples were: 1) Shipped <input checked="" type="checkbox"/> or Hand Delivered <input checked="" type="checkbox"/> Airbill # <u>5094273831</u> 2) Ambient or Chilled <input checked="" type="checkbox"/> 3) Received in Good Condition <input checked="" type="checkbox"/> 4) Labels Indicate Properly Preserved <input checked="" type="checkbox"/> 5) Received Within Holding Times <input checked="" type="checkbox"/>	COC Tape was: 1) Present on Outer Package <input checked="" type="checkbox"/> Y or N 2) Unbroken on Outer Package <input checked="" type="checkbox"/> Y or N 3) Present on Sample <input checked="" type="checkbox"/> Y or N 4) Unbroken on Sample <input checked="" type="checkbox"/> Y or N COC Record Present Upon Sample Rec'l <input checked="" type="checkbox"/> Y or N
---	--

Relinquished by	Received by	Date	Time	Relinquished by	Received by	Date	Time
<i>[Signature]</i>	<i>[Signature]</i>	10-1-97	1330				
Fed Ex	<i>[Signature]</i>	10-2-97	0930				

Discrepancies Between Samples Labels and COC Record? Y or N
 NOTES: *



RECRA LabNet

RECRA LabNet Use Only
9710L600

Custody Transfer Record/Lab Work Request

Client <u>USACE - DEMO TEST SITE</u>		Refrigerator #		1	2	2			2	2			
Est. Final Proj. Sampling Date <u>10-1-97</u>		#/Type Container		Liquid	3 CL	1 AM	1 AM						
Project # <u>0384-184-001-0002-0000</u>		Volume		Solid	1 CL	1 AM	1 AM						
Project Contact/Phone # <u>G. BURMAN - 5832</u>		Preservatives		Liquid	40ml	1L	1L						
RECRA Project Manager <u>M. Young</u>		ANALYSES REQUESTED		Solid	125ml	500ml	500ml						
QC _____ Del _____		Date Rec'd <u>10-2-97</u> Date Due <u>10-2-97</u>		VOA	BNA	Pest/PCB	Herb						
Date Rec'd <u>10-2-97</u> Date Due <u>10-2-97</u>		Matrix		ORGANIC				INORG					
Account # _____		Matrix QC Chosen (✓)		RECRA LabNet Use Only				CN					
MATRIX CODES:		MS		MSD		0624H		0625H		0608H		0608H	
S - Soil	SE - Sediment	SO - Solid	SL - Sludge	W - Water	O - Oil	A - Air	DS - Drum Solids	DL - Drum Liquids	L - EP/TCLP Leachate	WI - Wipe	X - Other	F - Fish	
Lab ID	Client ID/Description	Matrix	Date Collected	Time Collected									
011	FB03	W	10-1-97	1050	X	X	X						
012	TB2	W		1320	X								
013	SW1	W		0715	X	X	X						
014	SW2	W		0740	X	X	X						
015	SD1	S		0720	X	X	X						
016	SD2	S		0745	X	X	X						
017	GW2	W	10-1-97	1555									
018	GW3	W		1140									
019	GW4	W		0955									
020	SW1	W		0715									

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Special Instructions:
Job # = 11901-001-003-0001-00

DATE/REVISIONS:

- 1 - only did not receive sample volume
- 2 for sample 006
- 3 - head space in vials for samples
- 4 001-005, 010
- 5
- 6

RECRA LabNet Use Only

Samples were:

1) Shipped _____ or Hand Delivered _____	Airbill # _____	COC Tape was 1) Present on Outer Package Y or N
2) Ambient or Chilled _____	Condition _____	2) Unbroken on Outer Package Y or N
3) Received in Good Condition _____	Preserved _____	3) Present on Sample Y or N
4) Label included _____	5) Received Within Holding Times _____	4) Unbroken on Sample Y or N
5) Received Within Holding Times _____		COC Record Present Upon Sample Rec'l Y or N

Relinquished by	Received by	Date	Time	Relinquished by	Received by	Date	Time
<u>[Signature]</u>	<u>[Signature]</u>	10/1/97	1330				
FedEx	<u>[Signature]</u>	10-2-97	0930				

Discrepancies Between Samples Labels and COC Record? Y or N

NOTES:



**RECRA
LabNet**

a division of Recra Environmental, Inc.

Virtual Laboratories Everywhere

**Recra LabNet Philadelphia
Analytical Report**

Client : USACE-DEAL TEST SITE
RFW# : 9710L573

W.O. #: 11901-001-003-0001-00
Date Received: 10-01-97

GC/MS VOLATILE

The set of samples consisted of four (4) water samples and six (6) soil samples collected on 09-30-97.

The samples were analyzed according to criteria set forth in SW 846 Method 8260A for TCL Volatile target compounds on 10-12,13,14-97.

The following is a summary of the QC results accompanying these sample results and a description of any problems encountered during their analyses:

1. The cooler temperature upon receipt has been recorded on the chain-of-custody.
2. The required holding time for analysis was met.
3. All soil samples were methanol-preserved upon collection; consequently, they have been reported as medium level analyses.
4. A non-target compound was detected in sample S4.
5. All surrogate recoveries were within EPA QC limits.
6. All matrix spike recoveries were within EPA QC limits.
7. All blank spike recoveries were within EPA QC limits.
8. The method blanks contained the common contaminants Methylene Chloride and Acetone at levels less than 2x the CRQL.
9. The pH of samples GW1 and GW2 exceeded 2.0, indicating that they may not have been properly preserved.

J. Michael Taylor
 J. Michael Taylor
 Vice President and Laboratory Manager
 Lionville Analytical Laboratory

11-13-97
 Date

mmz/voa/10-573v.cn

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 41 pages.

GLOSSARY OF VOA DATA

DATA QUALIFIERS

- U** = Compound was analyzed for but not detected. The associated numerical value is the estimated sample quantitation limit which is included and corrected for dilution and percent moisture.
- J** = Indicates an estimated value. This flag is used under the following circumstances: 1) when estimating a concentration for tentatively identified compounds (TICs) where a 1:1 response is assumed; or 2) when the mass spectral data indicate the presence of a compound that meets the identification criteria but the result is less than the specified detection limit but greater than zero. For example, if the limit of detection is 10 ug/L and a concentration of 3 ug/L is calculated, it is reported as 3J.
- B** = This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates possible/probable blank contamination. This flag is also used for a TIC as well as for a positively identified TCL compound.
- E** = Indicates that the compound was detected beyond the calibration range and was subsequently analyzed at a dilution.
- D** = Identifies all compounds identified in an analysis at a secondary dilution factor.
- I** = Interference.
- NQ** = Result qualitatively confirmed but not able to quantify.
- N** = Indicates presumptive evidence of a compound. This flag is only used for tentatively identified compounds (TICs), where the identification is based on a mass spectral library search. It is applied to all TIC results. For generic characterization of a TIC, such as chlorinated hydrocarbon, the N code is not used.
- X** = This flag is used for a TIC compound which is quantified relative to a response factor generated from a daily calibration standard (rather than quantified relative to the closest internal standard).
- Y** = Additional qualifiers used as required are explained in the case narrative.



GLOSSARY OF VOA DATA

ABBREVIATIONS

BS	=	Indicates blank spike in which reagent grade water is spiked with the CLP matrix spike solutions and carried through all the steps in the method. Spike recoveries are reported.
BSD	=	Indicates blank spike duplicate.
MS	=	Indicates matrix spike.
MSD	=	Indicates matrix spike duplicate.
DL	=	Suffix added to sample number to indicate that results are from a diluted analysis.
NA	=	Not Applicable.
DF	=	Dilution Factor.
NR	=	Not Required.
SP, Z	=	Indicates Spiked Compound.



	Cust ID:	S1	S2	S3	S4	S5	S6
	RFW#:	001	002	003	004	005	006
	Level:	MED	MED	MED	MED	MED	MED
Chlorobenzene		1600 U	790 U	1800 U	610 U	1800 U	770 U
Ethylbenzene		1600 U	790 U	1800 U	610 U	1800 U	770 U
Styrene		1600 U	790 U	1800 U	610 U	1800 U	770 U
Xylene (total)		1600 U	790 U	1800 U	610 U	1800 U	770 U

*= Outside of EPA CLP QC limits.

000
005

Sample Information	Cust ID:	GW1	GW2	GW2	GW2	GW2	FB-1	TB-1
	RFW#:	007	008	008 MS	008 MSD	009	010	000
	Matrix:	WATER	WATER	WATER	WATER	WATER	WATER	WATER
	D.F.:	1.00	1.00	1.00	1.00	1.00	1.00	1.00
	Units:	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L
	Level:	LOW	LOW	LOW	LOW	LOW	LOW	LOW
Surrogate	Toluene-d8	103 %	107 %	101 %	100 %	106 %	99 %	
Recovery	Bromofluorobenzene	99 %	103 %	97 %	95 %	101 %	96 %	
	1,2-Dichloroethane-d4	106 %	107 %	111 %	111 %	112 %	102 %	
=====fl=====fl=====fl=====fl=====fl=====fl=====fl=====								
Chloromethane		10 U	10 U	10 U	10 U	10 U	10 U	10 U
Bromomethane		10 U	10 U	10 U	10 U	10 U	10 U	10 U
Vinyl Chloride		10 U	10 U	10 U	10 U	10 U	10 U	10 U
Chloroethane		10 U	10 U	10 U	10 U	10 U	10 U	10 U
Methylene Chloride		5 BU	5 BU	1 BJ	2 BJ	6 B	9 B	
Acetone		10-6 BU	12 BU	12 B	13 B	4 BJ	10 U	
Carbon Disulfide		5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,1-Dichloroethene		5 U	5 U	96 %	93 %	5 U	5 U	5 U
1,1-Dichloroethane		5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,2-Dichloroethene (total)		5 U	5 U	5 U	5 U	5 U	5 U	5 U
Chloroform		5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,2-Dichloroethane		5 U	5 U	5 U	5 U	5 U	5 U	5 U
2-Butanone		10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,1,1-Trichloroethane		5 U	5 U	5 U	5 U	5 U	5 U	5 U
Carbon Tetrachloride		5 U	5 U	5 U	5 U	5 U	5 U	5 U
Bromodichloromethane		5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,2-Dichloropropane		5 U	5 U	5 U	5 U	5 U	5 U	5 U
cis-1,3-Dichloropropene		5 U	5 U	5 U	5 U	5 U	5 U	5 U
Trichloroethene		5 U	5 U	105 %	106 %	5 U	5 U	5 U
Dibromochloromethane		5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,1,2-Trichloroethane		5 U	5 U	5 U	5 U	5 U	5 U	5 U
Benzene		5 U	5 U	107 %	107 %	5 U	5 U	5 U
Trans-1,3-Dichloropropene		5 U	5 U	5 U	5 U	5 U	5 U	5 U
Bromoform		5 U	5 U	5 U	5 U	5 U	5 U	5 U
4-Methyl-2-pentanone		10 U	10 U	10 U	10 U	10 U	10 U	10 U
2-Hexanone		10 U	10 U	10 U	10 U	10 U	10 U	10 U
Tetrachloroethene		5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,1,2,2-Tetrachloroethane		5 U	5 U	5 U	5 U	5 U	5 U	5 U
Toluene		5 U	5 U	111 %	111 %	5 U	5 U	5 U

*= Outside of EPA CLP QC limits.

Cust ID:	GW1	GW2	GW2	GW2	FB-1	TB-1
RFW#:	007	008	008 MS	008 MSD	009	010
Level:	LOW	LOW	LOW	LOW	LOW	LOW

Chlorobenzene	5 U ↓	5 U ↓	106 %	106 %	5 U	5 U
Ethylbenzene	5 U ↓	5 U ↓	5 U	5 U	5 U	5 U
Styrene	5 U ↓	5 U ↓	5 U	5 U	5 U	5 U
Xylene (total)	5 U ↓	5 U ↓	5 U	5 U	5 U	5 U

*= Outside of EPA CLP QC limits.

504

Sample Information	Cust ID: VBLKBO	RFW#: 97LVN334-MB1	VBLKBO BS	97LVN334-MB1	VBLKFS	97LVN335-MB1	VBLKFS BS	97LVN335-MB1	VBLKZY	97LVG207-MB1	VBLKZY BS	97LVG207-MB1
	Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	WATER	WATER		
	D.F.:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		
	Units:	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/L	UG/L		
	Level:	MED	MED	MED	MED	MED	MED	MED	LOW	LOW		

Surrogate	Toluene-d8	103 %	97 %	103 %	100 %	96 %	100 %
Bromofluorobenzene	100 %	98 %	100 %	96 %	102 %	98 %	
Recovery 1,2-Dichloroethane-d4	114 %	101 %	116 %	121 %	107 %	108 %	
=====fl=====fl=====fl=====fl=====fl=====fl=====fl=====							
Chloromethane	700 J	1200 U	260 J	270 JB	10 U	10 U	
Bromomethane	1200 U	1200 U	780 J	570 JB	10 U	10 U	
Vinyl Chloride	1200 U	1200 U	1200 U	1200 U	10 U	10 U	
Chloroethane	1200 U	1200 U	1200 U	1200 U	10 U	10 U	
Methylene Chloride	610 J	1200 B	780	810 B	6	7 B	
Acetone	250 J	430 BJ	340 J	370 JB	5 J	5 BJ	
Carbon Disulfide	620 U	620 U	620 U	620 U	5 U	5 U	
1,1-Dichloroethene	620 U	100 %	620 U	109 %	5 U	88 %	
1,1-Dichloroethane	620 U	620 U	620 U	620 U	5 U	5 U	
1,2-Dichloroethene (total)	620 U	620 U	620 U	620 U	5 U	5 U	
Chloroform	620 U	620 U	620 U	620 U	5 U	5 U	
1,2-Dichloroethane	620 U	620 U	620 U	620 U	5 U	5 U	
2-Butanone	1200 U	1200 U	1200 U	1200 U	10 U	10 U	
1,1,1-Trichloroethane	620 U	620 U	620 U	620 U	5 U	5 U	
Carbon Tetrachloride	620 U	620 U	620 U	620 U	5 U	5 U	
Bromodichloromethane	620 U	620 U	620 U	620 U	5 U	5 U	
1,2-Dichloropropane	620 U	620 U	620 U	620 U	5 U	5 U	
cis-1,3-Dichloropropene	620 U	620 U	620 U	620 U	5 U	5 U	
Trichloroethene	620 U	100 %	620 U	97 %	5 U	96 %	
Dibromochloromethane	620 U	620 U	620 U	620 U	5 U	5 U	
1,1,2-Trichloroethane	620 U	620 U	620 U	620 U	5 U	5 U	
Benzene	620 U	98 %	620 U	111 %	5 U	97 %	
Trans-1,3-Dichloropropene	620 U	620 U	620 U	620 U	5 U	5 U	
Bromoform	620 U	620 U	620 U	620 U	5 U	5 U	
4-Methyl-2-pentanone	1200 U	1200 U	1200 U	1200 U	10 U	10 U	
2-Hexanone	1200 U	1200 U	1200 U	1200 U	10 U	10 U	
Tetrachloroethene	620 U	620 U	620 U	620 U	5 U	5 U	
1,1,2,2-Tetrachloroethane	620 U	620 U	620 U	620 U	5 U	5 U	
Toluene	620 U	93 %	620 U	106 %	5 U	100 %	

*= Outside of EPA CLP QC limits.

Cust ID: VBLKBO VBLKBO RS VBLKFS VBLKFS BS VBLKZY VBLKZY BS

RFW#: 97LVN334-MB1 97LVN334-MB1 97LVN335-MB1 97LVN335-MB1 97LVG207-MB1 97LVG207-MB1
 Level: MED MED MED MED LOW LOW

Compound	VBLKBO	VBLKBO RS	VBLKFS	VBLKFS BS	VBLKZY	VBLKZY BS
Chlorobenzene	620 U	96 %	620 U	105 %	5 U	97
Ethylbenzene	620 U	620 U	620 U	620 U	5 U	5
Styrene	620 U	620 U	620 U	620 U	5 U	5
Xylene (total)	620 U	620 U	620 U	620 U	5 U	5

*= Outside of EPA CLP QC limits.

505

Cust ID: VBLKEW VBLKEW RS VBLKDZ

RFW#: 97LVG211-MB1 97LVG211-MB1 97LVG209-MB1
 Level: LOW LOW LOW

Chlorobenzene	5 U	102 %	5 U
Ethylbenzene	5 U	5 U	5 U
Styrene	5 U	5 U	5 U
Xylene (total)	5 U	5 U	5 U

*= Outside of EPA CLP QC limits.

011

1E
 VOLATILE ORGANICS ANALYSIS SHEET
 TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

S1

Lab Name: Recra.LabNet Contract: 11901001003

Lab Code: Recra Case No.: _____ SAS No.: _____ SDG No.: _____

Matrix: (soil/water) SOIL Lab Sample ID: 9710L573-001

Sample wt/vol: 9.23 (g/mL) G Lab File ID: n101309

Level: (low/med) MED Date Received: 10/01/97

% Moisture: not dec. 59 Date Analyzed: 10/13/97

Column: (pack/cap) CAP Dilution Factor: 1.08

Number TICs found: 0 CONCENTRATION UNITS:
 (ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.				

1E
VOLATILE ORGANICS ANALYSIS SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

S2

Lab Name: Recra.LabNet Contract: 11901001003

Lab Code: Recra Case No.: _____ SAS No.: _____ SDG No.: _____

Matrix: (soil/water) SOIL Lab Sample ID: 9710L573-002

Sample wt/vol: 10.4 (g/mL) G Lab File ID: n101310

Level: (low/med) MED Date Received: 10/01/97

% Moisture: not dec. 24 Date Analyzed: 10/13/97

Column: (pack/cap) CAP Dilution Factor: 0.962

Number TICs found: 0 CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.				

1E
VOLATILE ORGANICS ANALYSIS SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

S3

Lab Name: Recra.LabNet Contract: 11901001003

Lab Code: Recra Case No.: _____ SAS No.: _____ SDG No.: _____

Matrix: (soil/water) SOIL Lab Sample ID: 9710L573-003

Sample wt/vol: 10.2 (g/mL) G Lab File ID: n101407

Level: (low/med) MED Date Received: 10/01/97

% Moisture: not dec. 66 Date Analyzed: 10/14/97

Column: (pack/cap) CAP Dilution Factor: 0.980

Number TICs found: 0 CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.				

1E
VOLATILE ORGANICS ANALYSIS SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

S4

Lab Name: Recra.LabNet Contract: 11901001003

Lab Code: Recra Case No.: _____ SAS No.: _____ SDG No.: _____

Matrix: (soil/water) SOIL Lab Sample ID: 9710L573-004

Sample wt/vol: 12.9 (g/mL) G Lab File ID: n101312

Level: (low/med) MED Date Received: 10/01/97

% Moisture: not dec. 21 Date Analyzed: 10/13/97

Column: (pack/cap) CAP Dilution Factor: 0.775

Number TICs found: 1 CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN	12.432	700	J

1E
VOLATILE ORGANICS ANALYSIS SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

S5

Lab Name: Recra.LabNet Contract: 11901001003

Lab Code: Recra Case No.: _____

SAS No.: _____ SDG No.: _____

Matrix: (soil/water) SOIL

Lab Sample ID: 9710L573-005

Sample wt/vol: 11.3 (g/mL) G

Lab File ID: n101313

Level: (low/med) MED

Date Received: 10/01/97

% Moisture: not dec. 68

Date Analyzed: 10/13/97

Column: (pack/cap) CAP

Dilution Factor: 0.885

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.				

1E
 VOLATILE ORGANICS ANALYSIS SHEET
 TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

S6

Lab Name: Recra.LabNet Contract: 11901001003

Lab Code: Recra Case No.: _____ SAS No.: _____ SDG No.: _____

Matrix: (soil/water) SOIL Lab Sample ID: 9710L573-006

Sample wt/vol: 11.6 (g/mL) G Lab File ID: n101316

Level: (low/med) MED Date Received: 10/01/97

% Moisture: not dec. 30 Date Analyzed: 10/13/97

Column: (pack/cap) CAP Dilution Factor: 0.862

Number TICs found: 0 CONCENTRATION UNITS:
 (ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.				

1E
VOLATILE ORGANICS ANALYSIS SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

GW1

Lab Name: Recra.LabNet Contract: 11901001003

Lab Code: Recra Case No.: _____ SAS No.: _____ SDG No.: _____

Matrix: (soil/water) WATER Lab Sample ID: 9710L573-007

Sample wt/vol: 5.00 (g/mL) ML Lab File ID: q101217

Level: (low/med) LOW Date Received: 10/01/97

% Moisture: not dec. _____ Date Analyzed: 10/12/97

Column: (pack/cap) CAP Dilution Factor: 1.00

Number TICs found: 0 CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.				

1E
VOLATILE ORGANICS ANALYSIS SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

GW2

Lab Name: Recra.LabNet Contract: 11901001003

Lab Code: Recra Case No.: _____ SAS No.: _____ SDG No.: _____

Matrix: (soil/water) WATER Lab Sample ID: 9710L573-008

Sample wt/vol: 5.00 (g/mL) ML Lab File ID: q101218

Level: (low/med) LOW Date Received: 10/01/97

% Moisture: not dec. _____ Date Analyzed: 10/12/97

Column: (pack/cap) CAP Dilution Factor: 1.00

Number TICs found: 0 CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.				

1E
VOLATILE ORGANICS ANALYSIS SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

FB-1

Lab Name: Recra.LabNet Contract: 11901001003

Lab Code: Recra Case No.: _____ SAS No.: _____ SDG No.: _____

Matrix: (soil/water) WATER Lab Sample ID: 9710L573-009

Sample wt/vol: 5.00 (g/mL) ML Lab File ID: q101219

Level: (low/med) LOW Date Received: 10/01/97

% Moisture: not dec. _____ Date Analyzed: 10/12/97

Column: (pack/cap) CAP Dilution Factor: 1.00

Number TICs found: 0 CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.				

1E
 VOLATILE ORGANICS ANALYSIS SHEET
 TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

TB-1

Lab Name: Recra.LabNet Contract: 11901001003

Lab Code: Recra Case No.: _____ SAS No.: _____ SDG No.: _____

Matrix: (soil/water) WATER Lab Sample ID: 9710L573-010

Sample wt/vol: 5.00 (g/mL) ML Lab File ID: q101309

Level: (low/med) LOW Date Received: 10/01/97

% Moisture: not dec. _____ Date Analyzed: 10/13/97

Column: (pack/cap) CAP Dilution Factor: 1.00

Number TICs found: 0 CONCENTRATION UNITS:
 (ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.				

1E
VOLATILE ORGANICS ANALYSIS SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

VBLKBO

Lab Name: Recra.LabNet

Contract: 11901001003

Lab Code: Recra Case No.: _____

SAS No.: _____ SDG No.: _____

Matrix: (soil/water) SOIL

Lab Sample ID: 97LVN334-MB1

Sample wt/vol: 10.0 (g/mL) G

Lab File ID: n101308

Level: (low/med) MED

Date Received: 10/13/97

% Moisture: not dec. 0

Date Analyzed: 10/13/97

Column: (pack/cap) CAP

Dilution Factor: 1.00

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.				

1E
 VOLATILE ORGANICS ANALYSIS SHEET
 TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

VBLKFS

Lab Name: Recra.LabNet

Contract: 11901001003

Lab Code: Recra Case No.: _____

SAS No.: _____ SDG No.: _____

Matrix: (soil/water) SOIL

Lab Sample ID: 97LVN335-MB1

Sample wt/vol: 10.0 (g/mL) G

Lab File ID: n101405

Level: (low/med) MED

Date Received: 10/14/97

% Moisture: not dec. 0

Date Analyzed: 10/14/97

Column: (pack/cap) CAP

Dilution Factor: 1.00

Number TICs found: 0

CONCENTRATION UNITS:
 (ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.				

1E
VOLATILE ORGANICS ANALYSIS SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

VBLKZY

Lab Name: Recra.LabNet Contract: 11901001003

Lab Code: Recra Case No.: _____ SAS No.: _____ SDG No.: _____

Matrix: (soil/water) WATER Lab Sample ID: 97LVG207-MB1

Sample wt/vol: 5.00 (g/mL) ML Lab File ID: q101204

Level: (low/med) LOW Date Received: 10/12/97

% Moisture: not dec. _____ Date Analyzed: 10/12/97

Column: (pack/cap) CAP Dilution Factor: 1.00

Number TICs found: 0 CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.				

1E
VOLATILE ORGANICS ANALYSIS SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

VBLKEW

Lab Name: Recra.LabNet Contract: 11901001003

Lab Code: Recra Case No.: _____ SAS No.: _____ SDG No.: _____

Matrix: (soil/water) WATER Lab Sample ID: 97LVG211-MB1

Sample wt/vol: 5.00 (g/mL) ML Lab File ID: q101404

Level: (low/med) LOW Date Received: 10/14/97

% Moisture: not dec. _____ Date Analyzed: 10/14/97

Column: (pack/cap) CAP Dilution Factor: 1.00

Number TICs found: 0 CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.				

1E
VOLATILE ORGANICS ANALYSIS SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

VBLKDZ

Lab Name: Recra.LabNet Contract: 11901001003

Lab Code: Recra Case No.: _____ SAS No.: _____ SDG No.: _____

Matrix: (soil/water) WATER Lab Sample ID: 97LVG209-MB1

Sample wt/vol: 5.00 (g/mL) ML Lab File ID: q101305

Level: (low/med) LOW Date Received: 10/13/97

% Moisture: not dec. _____ Date Analyzed: 10/13/97

Column: (pack/cap) CAP Dilution Factor: 1.00

Number TICs found: 0 CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.				

2A
WATER VOLATILE SURROGATE RECOVERY

Lab Name: Recra.LabNet

Contract: 1901-01-03

Lab Code: Recra

Case No.: _____

SAS No.: _____

SDG No.: _____

	EPA SAMPLE NO.	S1 (TOL) #	S2 (BFB) #	S3 (DCE) #	OTHER	TOT OUT
01	GW1	103	99	106		0
02	GW2	107	103	107		0
03	GW2MS	101	97	111		0
04	GW2MSD	100	95	111		0
05	FB-1	106	101	112		0
06	TB-1	99	96	102		0
07	VBLKZY	96	102	107		0
08	VBLKZY	BS 100	98	108		0
09	VBLKEW	100	97	106		0
10	VBLKEW	BS 98	94	108		0
11	VBLKDZ	98	95	103		0

QC LIMITS

S1 (TOL) = Toluene-d8 (88-110)
 S2 (BFB) = Bromofluorobenzene (86-115)
 S3 (DCE) = 1,2-Dichloroethane-d4 (76-114)

Column to be used to flag recovery values
 * Values outside of contract required QC limits
 D Surrogates diluted out

2B
SOIL VOLATILE SURROGATE RECOVERY

Lab Name: Recra.LabNet

Contract: 1901-01-03

Lab Code: Recra

Case No.: _____

SAS No.: _____

SDG No.: _____

Level: (low/med) MED

	EPA SAMPLE NO.	S1 (TOL) #	S2 (BFB) #	S3 (DCE) #	OTHER	TOT OUT
01	S1	83	74	94		0
02	S2	96	88	106		0
03	S3	83	78	100		0
04	S4	89	79	103		0
05	S5	85	76	95		0
06	S6	86	83	85		0
07	VBLKBO	103	100	114		0
08	VBLKBO BS	97	98	101		0
09	VBLKFS	103	100	116		0
10	VBLKFS BS	100	96	121		0

QC LIMITS

S1 (TOL) = Toluene-d8

(81-117)

S2 (BFB) = Bromofluorobenzene

(74-121)

S3 (DCE) = 1,2-Dichloroethane-d4

(70-121)

Column to be used to flag recovery values

* Values outside of contract required QC limits

D Surrogates diluted out

WATER VOLATILE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: Recra.LabNetContract: 1901-01-03Lab Code: Recra

Case No.: _____

SAS No.: _____

SDG No.: _____

MATRIX Spike - EPA Sample No.: GW2Level: (low/med) LOW

COMPOUND	SPIKE	SAMPLE	MS	MS	QC
	ADDED	CONCENTRATION	CONCENTRATION	%	LIMITS
	UG/L	UG/L	UG/L	REC #	REC
1,1-Dichloroethene_____	50.0	0	47.8	96	61 -145
Trichloroethene_____	50.0	0	52.4	105	71 -120
Benzene_____	50.0	0	53.5	107	76 -127
Toluene_____	50.0	0	55.4	111	76 -125
Chlorobenzene_____	50.0	0	53.2	106	75 -130

COMPOUND	SPIKE	MSD	MSD	% RPD #	QC LIMITS	
	ADDED	CONCENTRATION	%		RPD	REC
	UG/L	UG/L	REC #			
1,1-Dichloroethene_____	50.0	46.7	93	3	14	61 -145
Trichloroethene_____	50.0	52.8	106	0	14	71 -120
Benzene_____	50.0	53.6	107	0	11	76 -127
Toluene_____	50.0	55.3	111	0	13	76 -125
Chlorobenzene_____	50.0	52.9	106	0	13	75 -130

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

RPD: 0 out of 5 outside limitsSpike Recovery: 0 out of 10 outside limits

COMMENTS:

WATER VOLATILE MATRIX SPIKE RECOVERY

Lab Name: Recra.LabNetContract: 1901-01-03Lab Code: Recra Case No.: _____

SAS No.: _____ SDG No.: _____

MATRIX Spike - EPA Sample No.: VBLKZYLevel: (low/med) LOW

COMPOUND	SPIKE	SAMPLE	MS	MS	QC
	ADDED	CONCENTRATION	CONCENTRATION	%	LIMITS
	UG/L	UG/L	UG/L	REC #	REC
1,1-Dichloroethene	50.0	0	44.1	88	61 -145
Trichloroethene	50.0	0	47.8	96	71 -120
Benzene	50.0	0	48.5	97	76 -127
Toluene	50.0	0	50.2	100	76 -125
Chlorobenzene	50.0	0	48.6	97	75 -130

Column to be used to flag recovery value with an asterisk

* Values outside of QC limits

Spike Recovery: 0 out of 5 outside limits

COMMENTS:

WATER VOLATILE MATRIX SPIKE RECOVERY

Lab Name: Recra.LabNetContract: 1901-01-03Lab Code: Recra Case No.: _____

SAS No.: _____ SDG No.: _____

MATRIX Spike - EPA Sample No.: VBLKEWLevel: (low/med) LOW

COMPOUND	SPIKE	SAMPLE	MS	MS	QC
	ADDED	CONCENTRATION	CONCENTRATION	%	LIMITS
	UG/L	UG/L	UG/L	REC #	REC
1,1-Dichloroethene	50.0	0	47.6	95	61 -145
Trichloroethene	50.0	0	50.4	101	71 -120
Benzene	50.0	0	51.5	103	76 -127
Toluene	50.0	0	53.3	107	76 -125
Chlorobenzene	50.0	0	51.2	102	75 -130

Column to be used to flag recovery value with an asterisk

* Values outside of QC limits

Spike Recovery: 0 out of 5 outside limits

COMMENTS:

SOIL VOLATILE MATRIX SPIKE RECOVERY

Lab Name: Recra.LabNetContract: 1901-01-03Lab Code: Recra Case No.: _____

SAS No.: _____ SDG No.: _____

MATRIX Spike - EPA Sample No.: VBLKBOLevel: (low/med) MED

COMPOUND	SPIKE	SAMPLE	MS	MS	QC
	ADDED	CONCENTRATION	CONCENTRATION	%	LIMITS
	UG/KG	UG/KG	UG/KG	REC #	REC
1,1-Dichloroethene	6250	0	6240	100	59 -172
Trichloroethene	6250	0	6260	100	62 -137
Benzene	6250	0	6110	98	66 -142
Toluene	6250	0	5820	93	59 -139
Chlorobenzene	6250	0	5990	96	60 -133

Column to be used to flag recovery value with an asterisk

* Values outside of QC limits

Spike Recovery: 0 out of 5 outside limits

COMMENTS:

SOIL VOLATILE MATRIX SPIKE RECOVERY

Lab Name: Recra.LabNetContract: 1901-01-03Lab Code: Recra Case No.: _____

SAS No.: _____ SDG No.: _____

MATRIX Spike - EPA Sample No.: VBLKFSLevel: (low/med) MED

COMPOUND	SPIKE	SAMPLE	MS	MS	QC
	ADDED	CONCENTRATION	CONCENTRATION	%	LIMITS
	UG/KG	UG/KG	UG/KG	REC #	REC
1,1-Dichloroethene_____	6250	0	6830	109	59 -172
Trichloroethene_____	6250	0	6070	97	62 -137
Benzene_____	6250	0	6960	111	66 -142
Toluene_____	6250	0	6600	106	59 -139
Chlorobenzene_____	6250	0	6580	105	60 -133

Column to be used to flag recovery value with an asterisk

* Values outside of QC limits

Spike Recovery: 0 out of 5 outside limits

COMMENTS:

4A
VOLATILE METHOD BLANK SUMMARY

Lab Name: Recra.LabNet-Philadelphia Contract: 11901-001-003-0001-00
 Lab Code: RECRA Case No.: SAS No.: SDG No.: 10L573
 Lab File ID: G101204 Lab Sample ID: 97LVG207-MB1
 Date Analyzed: 10/12/97 Time Analyzed: 1347
 Matrix: (soil/water) WATER Level: (low/med) LOW
 Instrument ID: 5972G

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS and MSD:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	TIME ANALYZED
	=====	=====	=====	=====
01	VBLKZYBS	97LVG207-MB1S	G101205	1424
02	GW1	9710L573-007	G101217	2142
03	GW2	9710L573-008	G101218	2219
04	FB-1	9710L573-009	G101219	2256
05				
06				
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COMMENTS: _____

4A
VOLATILE METHOD BLANK SUMMARY

Lab Name: Recra.LabNet-Philadelphia Contract: 11901-001-003-0001-00
 Lab Code: RECRA Case No.: SAS No.: SDG No.: 10L573
 Lab File ID: N101308 Lab Sample ID: 97LVN334-MB1
 Date Analyzed: 10/13/97 Time Analyzed: 1106
 Matrix: (soil/water) SOIL Level: (low/med) MED
 Instrument ID: 5972N

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS and MSD:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	TIME ANALYZED

01	S1	9710L573-001	N101309	1145
02	S2	9710L573-002	N101310	1224
03	S4	9710L573-004	N101312	1343
04	S5	9710L573-005	N101313	1422
05	VBLKBOBS	97LVN334-MB1S	N101315	1558
06	S6	9710L573-006	N101316	1638
07				
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COMMENTS: _____

4A
VOLATILE METHOD BLANK SUMMARY

Lab Name: Recra.LabNet-Philadelphia Contract: 11901-001-003-0001-00
 Lab Code: RECRA Case No.: SAS No.: SDG No.: 10L573
 Lab File ID: G101305 Lab Sample ID: 97LVG209-MB1
 Date Analyzed: 10/13/97 Time Analyzed: 1529
 Matrix: (soil/water) WATER Level: (low/med) LOW
 Instrument ID: 5972G

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS and MSD:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	TIME ANALYZED
	=====	=====	=====	=====
01	TB-1	9710L573-010	G101309	1816
02				
03				
04				
05				
06				
07				
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COMMENTS: _____

4A
VOLATILE METHOD BLANK SUMMARY

Lab Name: Recra.LabNet-Philadelphia Contract: 11901-001-003-0001-00
 Lab Code: RECRA Case No.: SAS No.: SDG No.: 10L573
 Lab File ID: G101404 Lab Sample ID: 97LVG211-MB1
 Date Analyzed: 10/14/97 Time Analyzed: 1154
 Matrix: (soil/water) WATER Level: (low/med) LOW
 Instrument ID: 5972G

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS and MSD:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	TIME ANALYZED
	=====	=====	=====	=====
01	VBLKEWBS	97LVG211-MB1S	G101406	1307
02	GW2MS	9710L573-008S	G101407	1344
03	GW2MSD	9710L573-008T	G101408	1420
04				
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COMMENTS: _____

4A
VOLATILE METHOD BLANK SUMMARY

Lab Name: Recra.LabNet.Philadelphia Contract: 11901-001-003-0001-00
 Lab Code: RECRA Case No.: SAS No.: SDG No.: 10L573
 Lab File ID: N101405 Lab Sample ID: 97LVN335-MB1
 Date Analyzed: 10/14/97 Time Analyzed: 1013
 Matrix: (soil/water) SOIL Level: (low/med) MED
 Instrument ID: 5972N

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS and MSD:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	TIME ANALYZED
	=====	=====	=====	=====
01	S3	9710L573-003	N101407	1130
02	VBLKFSBS	97LVN335-MB1S	N101418	1827
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COMMENTS: _____

Recra LabNet - Lionville Laboratory
 VOA ANALYTICAL DATA PACKAGE FOR
 USACE-DEAL TEST SITE

DATE RECEIVED: 10/01/97

RFW LOT # :9710L573

CLIENT ID	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS	
S1	001	M1	S	97LVN334	09/30/97	N/A	10/13/97
S2	002	M1	S	97LVN334	09/30/97	N/A	10/13/97
S3	003	M1	S	97LVN335	09/30/97	N/A	10/14/97
S4	004	M1	S	97LVN334	09/30/97	N/A	10/13/97
S5	005	M1	S	97LVN334	09/30/97	N/A	10/13/97
S6	006	M1	S	97LVN334	09/30/97	N/A	10/13/97
GW1	007		W	97LVG207	09/30/97	N/A	10/12/97
GW2	008		W	97LVG207	09/30/97	N/A	10/12/97
GW2	008 MS		W	97LVG211	09/30/97	N/A	10/14/97
GW2	008 MSD		W	97LVG211	09/30/97	N/A	10/14/97
FB-1	009		W	97LVG207	09/30/97	N/A	10/12/97
TB-1	010		W	97LVG209	09/30/97	N/A	10/13/97

LAB QC:

VBLKBO	MB1		S	97LVN334	N/A	N/A	10/13/97
VBLKBO	MB1 BS		S	97LVN334	N/A	N/A	10/13/97
VBLKFS	MB1		S	97LVN335	N/A	N/A	10/14/97
VBLKFS	MB1 BS		S	97LVN335	N/A	N/A	10/14/97
VBLKZY	MB1		W	97LVG207	N/A	N/A	10/12/97
VBLKZY	MB1 BS		W	97LVG207	N/A	N/A	10/12/97
VBLKEW	MB1		W	97LVG211	N/A	N/A	10/14/97
VBLKEW	MB1 BS		W	97LVG211	N/A	N/A	10/14/97
VBLKDZ	MB1		W	97LVG209	N/A	N/A	10/13/97

304 3362506

304 0187 805



RECRA LabNet

RECRA LabNet Use Only
97102573

Custody Transfer Record/Lab Work Request

Client USACE - Dead Test Site
 Est. Final Proj. Sampling Date 10/1/97
 Project # 11901-001-003-0001-00
 Project Contact/Phone # GARY BUCHANAN
 RECRA Project Manager M. Young
 QC SW746 Del SPEC TAT 20 DAY

Refrigerator # 1 2
 #/Type Container
 Liquid 266 186
 Solid 266 186
 Volume
 Liquid 40 920
 Solid 40 500
 Preservatives MeOH HCL

Date Rec'd 10-1-97 Date Due 10-31-97
 Account # MIRBPM

ANALYSES REQUESTED →
 ORGANIC: VOA, BNA, Pest/PCB, Herb
 INORG: Metal, CN

MATRIX CODES:	Lab ID	Client ID/Description	Matrix QC Chosen (✓)		Matrix	Date Collected	Time Collected	RECRA LabNet Use Only						
			MS	MSD				VOA	BNA	Pest/PCB	Herb	Metal	CN	
S - Soil	001	S1			S	9-30-97	1340	✓	✓	✓				
SE - Sediment	002	2					1350	✓	✓	✓				
SO - Solid	003	3					1440	✓	✓	✓				
SL - Sludge	004	4					1450	✓	✓	✓				
W - Water	005	5					1545	✓	✓	✓				
O - Oil	006	6					1550	✓	✓	✓				
A - Air	007	GW1			W		1405	✓	✓	✓				
DS - Drum Solids	008	2					1555	✓	✓	✓				
DL - Drum Liquids	009	FB-1					1510	✓	✓	✓				
L - EP/TCLP Leachate	010	TB-1					1610	✓						

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

- DATE/REVISIONS:
- 001-006 VOA'S w/HEAD SPACE
 - 001-008 VOA'S SEDIMENT ON BOTTOM
 - 001-006 SOME AMBER FOR BNA and PEST PCB
 - one BOTTLE for BOTH TESTS
 - OIL IS A DISSOLVED METALS
 - Contains about 500ML

Special Instructions:
 NOTE: STANDARD NJ METHANOL FIELD BLANK NOT INCLUDED DUE TO LACK OF SUFFICIENT NUMBER OF SAMPLE CONTAINERS FOR DAYS ACTIVITIES, VOA VIALS 596 770 AND 596 518 LABELED FB at LAB WERE USED FOR SOIL SAMPLES S6. FB1 is A RINSE BLANK.
 4.30 490 ^{hr} 11/12/97

RECRA LabNet Use Only

Samples were:
 1) Shipped or Hand Delivered
 2) Ambient or Chilled
 3) Received in Good Condition or N
 4) Labels Indicate Properly Preserved or N
 5) Received within Holding Times or N

Airbill See file

COC Tape was:
 1) Present on Outer Package or N
 2) Unbroken on Outer Package or N
 3) Present on Sample Y or N
 4) Unbroken on Sample Y or N
 COC Record Present Upon Sample Rec'd or N

Relinquished by	Received by	Date	Time
Fred Ep	V. Hardy	10-1-97	0545

Relinquished by **ORIGINAL** Received by **ORIGINAL** Time

REWRITTEN

Discrepancies Between Samples Labels and COC Record? Y or N
 NOTES:

RECRA LabNet Use Only
97106573

Custody Transfer Record/Lab Work Request



Client USACE
 Est. Final Proj. Sampling Date 5/22
 Project # PC1
 Project Contact/Phone #
 RECRA Project Manager
 QC TAT Del TAT

Refrigerator #
 #/Type Container Liquid 2 Solid 1
 Volume Liquid 1000 Solid 1
 Preservatives HAD3

Date Rec'd 1 Date Due
 Account #

ANALYSES REQUESTED	ORGANIC					INORG	
	VOA	BNA	Pest/PCB	Hert	Metal	CN	

RECRA LabNet Use Only

MATRIX CODES:	Lab ID	Client ID/Description	Matrix QC Chosen (✓)		Matrix	Date Collected	Time Collected	RECRA LabNet Use Only												
			MS	MSD																
S - Soil SE - Sediment SO - Solid SL - Sludge W - Water O - Oil A - Air DS - Drum Solids DL - Drum Liquids L - EP/TCLP Leachate WI - Wipe X - Other F - Fish	011	GW-1			W	5/20/07	1405													

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Special Instructions:

DATE/REVISIONS:

- _____
- _____
- _____
- _____
- _____
- _____

Relinquished by	Received by	Date	Time	Relinquished by	Received by	Date	Time
Feed Ep	W. King	5/19/07	0945				

Discrepancies Between Samples Labels and COC Record? Y or N
 NOTES:

RECRA LabNet Use Only	
Samples were: 1) Shipped <u>al</u> Hand Delivered <u>Page</u> Airbill # <u>Page</u> 2) Ambient or Chilled <u>or</u> 3) Received in Good Condition <u>or</u> 4) Labels Indicate Property Preserved <u>or</u>	COC Tape was: 1) Present on Outer Package Y or N 2) Unbroken on Outer Package Y or N 3) Present on Sample Y or N 4) Unbroken on Sample Y or N COC Record Present Upon Sample Rec't Y or N 5) Received Within Holding Times Y or N



a division of Recra Environmental, Inc.

Virtual Laboratories Everywhere

Recra LabNet Philadelphia Analytical Report

Client: USACE-DEAL TEST SITE
RFW #: 9710L600

W.O. #: 11901-001-003-0001-00
Date Received: 10-02-97

SEMIVOLATILE

The set of samples consisted of six (6) water samples and seven (7) soil samples collected on 10-01-97.

The samples and their associated QC samples were extracted on 10-04,06-97 and analyzed according to criteria set forth in SW 846 Method 8270 for TCL Semivolatile target compounds on 10-14,25,31-97 and 11-09-97.

The following is a summary of the QC results accompanying the sample results and a description of any problems encountered during their analyses:

1. The cooler temperatures upon receipt have been recorded on the chain-of-custody.
2. All required holding times for extraction and analysis were met.
3. Non-target compounds were detected in these samples.
4. One (1) of one-hundred-twenty (120) surrogate recoveries was outside EPA QC limits; however, EPA CLP surrogate recovery criteria were met (i.e., no more than one outlier per fraction {acid and base neutral} and no recoveries less than 10%).
5. All blank spike recoveries were within EPA QC limits.
6. All matrix spike recoveries were within EPA QC limits.
7. The soil method blank contained the common contaminant bis(2-Ethylhexyl)phthalate and the target compound Benzoic Acid at levels less than the CRQL.

for Bruce C. Taylor unit leader
J. Michael Taylor
Vice President and Laboratory Manager
Lionville Analytical Laboratory

11-13-97

Date

mmz\bna\10-600b.cn

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 37 pages.

GLOSSARY OF BNA DATA

DATA QUALIFIERS

- U** = Compound was analyzed for but not detected. The associated numerical value is the estimated sample quantitation limit which is included and corrected for dilution and percent moisture.
- J** = Indicates an estimated value. This flag is used under the following circumstances: 1) when estimating a concentration for tentatively identified compounds (TICs) where a 1:1 response is assumed; or 2) when the mass spectral data indicate the presence of a compound that meets the identification criteria but the result is less than the specified detection limit but greater than zero. For example, if the limit of detection is 10 ug/L and a concentration of 3 ug/L is calculated, it is reported as 3J.
- B** = This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates possible/probable blank contamination. This flag is also used for a TIC as well as for a positively identified TCL compound.
- E** = Indicates that the compound was detected beyond the calibration range and was subsequently analyzed at a dilution.
- D** = Identifies all compounds identified in an analysis at a secondary dilution factor.
- I** = Interference.
- NQ** = Result qualitatively confirmed but not able to quantify.
- A** = Indicates that a TIC is a suspected aldol-condensation product.
- N** = Indicates presumptive evidence of a compound. This flag is only used for tentatively identified compounds (TICs), where the identification is based on a mass spectral library search. It is applied to all TIC results. For generic characterization of a TIC, such as chlorinated hydrocarbon, the N code is not used.
- X** = This flag is used for a TIC compound which is quantified relative to a response factor generated from a daily calibration standard (rather than quantified relative to the closest internal standard).
- Y** = Additional qualifiers used as required are explained in the case narrative.



GLOSSARY OF BNA DATA

ABBREVIATIONS

BS	=	Indicates blank spike in which reagent grade water is spiked with the CLP matrix spike solutions and carried through all the steps in the method. Spike recoveries are reported.
BSD	=	Indicates blank spike duplicate.
MS	=	Indicates matrix spike.
MSD	=	Indicates matrix spike duplicate.
DL	=	Suffix added to sample number to indicate that results are from a diluted analysis.
NA	=	Not Applicable.
DF	=	Dilution Factor.
NR	=	Not Required.
SP, Z	=	Indicates Spiked Compound.



Cust ID:	S7	S7	S7	S8	S9	S10	
Sample Information	RFW#: 001	001 MS	001 MSD	002	003	004	
	Matrix: SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	
	D.F.: 1.00	1.00	1.00	1.00	1.00	1.00	
	Units: UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	
	Nitrobenzene-d5	40 %	51 %	48 %	66 %	52 %	75 %
Surrogate	2-Fluorobiphenyl	45 %	58 %	54 %	69 %	54 %	76 %
Recovery	p-Terphenyl-d14	49 %	61 %	52 %	85 %	64 %	95 %
	Phenol-d5	43 %	53 %	46 %	71 %	80 %	74 %
	2-Fluorophenol	44 %	54 %	49 %	70 %	73 %	79 %
	2,4,6-Tribromophenol	53 %	66 %	57 %	92 %	76 %	85 %
=====fl=====fl=====fl=====fl=====fl=====fl=====							
Phenol	910 U	52 %	45 %	430 U	810 U	420 U	
bis(2-Chloroethyl) ether	910 U	910 U	910 U	430 U	810 U	420 U	
2-Chlorophenol	910 U	53 %	47 %	430 U	810 U	420 U	
1,3-Dichlorobenzene	910 U	910 U	910 U	430 U	810 U	420 U	
1,4-Dichlorobenzene	910 U	39 %	34 %	430 U	810 U	420 U	
Benzyl alcohol	910 U	910 U	910 U	430 U	810 U	420 U	
1,2-Dichlorobenzene	910 U	910 U	910 U	430 U	810 U	420 U	
2-Methylphenol	910 U	910 U	910 U	430 U	810 U	420 U	
bis(2-Chloroisopropyl) ether	910 U	910 U	910 U	430 U	810 U	420 U	
4-Methylphenol	910 U	910 U	910 U	430 U	810 U	420 U	
N-Nitroso-Di-n-propylamine	910 U	54 %	46 %	430 U	810 U	420 U	
Hexachloroethane	910 U	910 U	910 U	430 U	810 U	420 U	
Nitrobenzene	910 U	910 U	910 U	430 U	810 U	420 U	
Isophorone	910 U	910 U	910 U	430 U	810 U	420 U	
2-Nitrophenol	910 U	910 U	910 U	430 U	810 U	420 U	
2,4-Dimethylphenol	910 U	910 U	910 U	430 U	810 U	420 U	
Benzoic acid	4600 U	250 JB	140 JB	2100 U	750 JB	2100 U	
bis(2-Chloroethoxy)methane	910 U	910 U	910 U	430 U	810 U	420 U	
2,4-Dichlorophenol	910 U	910 U	910 U	430 U	810 U	420 U	
1,2,4-Trichlorobenzene	910 U	50 %	45 %	430 U	810 U	420 U	
Naphthalene	910 U	910 U	910 U	430 U	810 U	420 U	
4-Chloroaniline	910 U	910 U	910 U	430 U	810 U	420 U	
Hexachlorobutadiene	910 U	910 U	910 U	430 U	810 U	420 U	
4-Chloro-3-methylphenol	910 U	57 %	48 %	430 U	810 U	420 U	
2-Methylnaphthalene	910 U	910 U	910 U	430 U	810 U	420 U	
Hexachlorocyclopentadiene	910 U	910 U	910 U	430 U	810 U	420 U	

*= Outside of EPA CLP QC limits.

004

	Cust ID: S7		S7		S7		S8		S9		S10	
	RFW#: 001		001 MS		001 MSD		002		003		004	
2,4,6-Trichlorophenol	910	U	910	U	910	U	430	U	810	U	420	U
2,4,5-Trichlorophenol	4600	U	4600	U	4600	U	2100	U	4000	U	2100	U
2-Chloronaphthalene	910	U	910	U	910	U	430	U	810	U	420	U
2-Nitroaniline	4600	U	4600	U	4600	U	2100	U	4000	U	2100	U
Dimethylphthalate	910	U	910	U	910	U	430	U	810	U	420	U
Acenaphthylene	910	U	910	U	910	U	430	U	810	U	420	U
2,6-Dinitrotoluene	910	U	910	U	910	U	430	U	810	U	420	U
3-Nitroaniline	4600	U	4600	U	4600	U	2100	U	4000	U	2100	U
Acenaphthene	910	U	57	%	52	%	430	U	810	U	420	U
2,4-Dinitrophenol	4600	U	4600	U	4600	U	2100	U	4000	U	2100	U
4-Nitrophenol	4600	U	59	%	51	%	2100	U	4000	U	2100	U
Dibenzofuran	910	U	910	U	910	U	430	U	810	U	420	U
2,4-Dinitrotoluene	910	U	56	%	47	%	430	U	810	U	420	U
Diethylphthalate	910	U	910	U	910	U	430	U	810	U	420	U
4-Chlorophenyl-phenylether	910	U	910	U	910	U	430	U	810	U	420	U
Fluorene	910	U	910	U	910	U	430	U	810	U	420	U
4-Nitroaniline	4600	U	4600	U	4600	U	2100	U	4000	U	2100	U
4,6-Dinitro-2-methylphenol	4600	U	4600	U	4600	U	2100	U	4000	U	2100	U
N-Nitrosodiphenylamine (1)	910	U	910	U	910	U	430	U	810	U	420	U
4-Bromophenyl-phenylether	910	U	910	U	910	U	430	U	810	U	420	U
Hexachlorobenzene	910	U	910	U	910	U	430	U	810	U	420	U
Pentachlorophenol	4600	U	80	%	70	%	2100	U	4000	U	2100	U
Phenanthrene	910	U	910	U	910	U	430	U	810	U	420	U
Anthracene	910	U	910	U	910	U	430	U	810	U	420	U
Di-n-Butylphthalate	910	U	910	U	910	U	430	U	810	U	420	U
Fluoranthene	910	U	910	U	910	U	430	U	810	U	420	U
Pyrene	910	U	55	%	50	%	430	U	810	U	420	U
Butylbenzylphthalate	910	U	910	U	910	U	430	U	810	U	420	U
3,3'-Dichlorobenzidine	1800	U	1800	U	1800	U	860	U	1600	U	830	U
Benzo(a)anthracene	910	U	910	U	910	U	430	U	810	U	420	U
Chrysene	910	U	910	U	910	U	430	U	810	U	420	U
bis(2-Ethylhexyl)phthalate	260	JB	370	JB	390	JB	230	JB	370	JB	290	JB
Di-n-Octyl phthalate	910	U	910	U	910	U	430	U	810	U	420	U
Benzo(b)fluoranthene	910	U	910	U	910	U	430	U	810	U	420	U
Benzo(k)fluoranthene	910	U	910	U	910	U	430	U	810	U	420	U
Benzo(a)pyrene	910	U	910	U	910	U	430	U	810	U	420	U
Indeno(1,2,3-cd)pyrene	910	U	910	U	910	U	430	U	810	U	420	U
Dibenzo(a,h)anthracene	910	U	910	U	910	U	430	U	810	U	420	U
Benzo(g,h,i)perylene	910	U	910	U	910	U	430	U	810	U	420	U
Carbazole	910	U	910	U	910	U	430	U	810	U	420	U

005

(1) - Cannot be separated from Diphenylamine. *= Outside of EPA CLP QC limits.

Sample Information	Cust ID:	S11	GW3	GW4	GW5	FB03	SW1
	RFW#:	005	007	008	009	011	013
	Matrix:	SOIL	WATER	WATER	WATER	WATER	WATER
	D.F.:	1.00	1.00	1.00	1.00	1.00	1.00
	Units:	UG/KG	UG/L	UG/L	UG/L	UG/L	UG/L
Surrogate	Nitrobenzene-d5	55 %	83 %	57 %	66 %	62 %	68 %
Recovery	2-Fluorobiphenyl	58 %	80 %	51 %	62 %	61 %	67 %
	p-Terphenyl-d14	64 %	40 %	17 * %	57 %	78 %	84 %
	Phenol-d5	58 %	86 %	61 %	68 %	62 %	65 %
	2-Fluorophenol	60 %	78 %	54 %	58 %	51 %	52 %
	2,4,6-Tribromophenol	64 %	75 %	62 %	68 %	57 %	54 %
=====fl=====fl=====fl=====fl=====fl=====fl=====fl=====							
Phenol		620 U	12 U	3 J	12 U	12 U	11 U
bis(2-Chloroethyl) ether		620 U	12 U	12 U	12 U	12 U	11 U
2-Chlorophenol		620 U	12 U	12 U	12 U	12 U	11 U
1,3-Dichlorobenzene		620 U	12 U	12 U	12 U	12 U	11 U
1,4-Dichlorobenzene		620 U	12 U	12 U	12 U	12 U	11 U
Benzyl alcohol		620 U	12 U	12 U	12 U	12 U	11 U
1,2-Dichlorobenzene		620 U	12 U	12 U	12 U	12 U	11 U
2-Methylphenol		620 U	12 U	12 U	12 U	12 U	11 U
bis(2-Chloroisopropyl) ether		620 U	12 U	12 U	12 U	12 U	11 U
4-Methylphenol		620 U	12 U	12 U	12 U	12 U	11 U
N-Nitroso-Di-n-propylamine		620 U	12 U	12 U	12 U	12 U	11 U
Hexachloroethane		620 U	12 U	12 U	12 U	12 U	11 U
Nitrobenzene		620 U	12 U	12 U	12 U	12 U	11 U
Isophorone		620 U	12 U	12 U	12 U	12 U	11 U
2-Nitrophenol		620 U	12 U	12 U	12 U	12 U	11 U
2,4-Dimethylphenol		620 U	12 U	12 U	12 U	12 U	11 U
Benzoic acid	300	240 JBU	60 U	1 J	60 U	60 U	55 U
bis(2-Chloroethoxy) methane		620 U	12 U	12 U	12 U	12 U	11 U
2,4-Dichlorophenol		620 U	12 U	12 U	12 U	12 U	11 U
1,2,4-Trichlorobenzene		620 U	12 U	12 U	12 U	12 U	11 U
Naphthalene		620 U	12 U	12 U	12 U	12 U	11 U
4-Chloroaniline		620 U	12 U	12 U	12 U	12 U	11 U
Hexachlorobutadiene		620 U	12 U	12 U	12 U	12 U	11 U
4-Chloro-3-methylphenol		620 U	12 U	12 U	12 U	12 U	11 U
2-Methylnaphthalene		620 U	12 U	12 U	12 U	12 U	11 U
Hexachlorocyclopentadiene		620 U	12 U	12 U	12 U	12 U	11 U

*= Outside of EPA CLP QC limits.

	Cust ID:	S11	GW3	GW4	GW5	FB03	SW1
	RFW#:	005	007	008	009	011	013
2,4,6-Trichlorophenol		620 U	12 U	12 U	12 U	12 U	11 U
2,4,5-Trichlorophenol		3100 U	60 U	60 U	60 U	60 U	55 U
2-Chloronaphthalene		620 U	12 U	12 U	12 U	12 U	11 U
2-Nitroaniline		3100 U	60 U	60 U	60 U	60 U	55 U
Dimethylphthalate		620 U	12 U	12 U	12 U	12 U	11 U
Acenaphthylene		620 U	12 U	12 U	12 U	12 U	11 U
2,6-Dinitrotoluene		620 U	12 U	12 U	12 U	12 U	11 U
3-Nitroaniline		3100 U	60 U	60 U	60 U	60 U	55 U
Acenaphthene		620 U	12 U	12 U	12 U	12 U	11 U
2,4-Dinitrophenol		3100 U	60 U	60 U	60 U	60 U	55 U
4-Nitrophenol		3100 U	60 U	60 U	60 U	60 U	55 U
Dibenzofuran		620 U	12 U	12 U	12 U	12 U	11 U
2,4-Dinitrotoluene		620 U	12 U	12 U	12 U	12 U	11 U
Diethylphthalate		620 U	12 U	1 J	12 U	12 U	11 U
4-Chlorophenyl-phenylether		620 U	12 U	12 U	12 U	12 U	11 U
Fluorene		620 U	12 U	12 U	12 U	12 U	11 U
4-Nitroaniline		3100 U	60 U	60 U	60 U	60 U	55 U
4,6-Dinitro-2-methylphenol		3100 U	60 U	60 U	60 U	60 U	55 U
N-Nitrosodiphenylamine (1)		620 U	12 U	12 U	12 U	12 U	11 U
4-Bromophenyl-phenylether		620 U	12 U	12 U	12 U	12 U	11 U
Hexachlorobenzene		620 U	12 U	12 U	12 U	12 U	11 U
Pentachlorophenol		3100 U	60 U	60 U	60 U	60 U	55 U
Phenanthrene		620 U	12 U	12 U	12 U	12 U	11 U
Anthracene		620 U	12 U	12 U	12 U	12 U	11 U
Di-n-Butylphthalate		620 U	12 U	12 U	12 U	12 U	11 U
Fluoranthene		620 U	12 U	12 U	12 U	12 U	11 U
Pyrene		620 U	12 U	12 U	12 U	12 U	11 U
Butylbenzylphthalate		620 U	12 U	12 U	12 U	12 U	11 U
3,3'-Dichlorobenzidine		1200 U	24 U	24 U	24 U	24 U	22 U
Benzo (a) anthracene		620 U	12 U	12 U	12 U	12 U	11 U
Chrysene		620 U	12 U	12 U	12 U	12 U	11 U
bis (2-Ethylhexyl)phthalate	620	360 JB	2 J	12 U	12 U	2 J	11 U
Di-n-Octyl phthalate		620 U	12 U	12 U	12 U	12 U	11 U
Benzo (b) fluoranthene		620 U	12 U	12 U	12 U	12 U	11 U
Benzo (k) fluoranthene		620 U	12 U	12 U	12 U	12 U	11 U
Benzo (a) pyrene		620 U	12 U	12 U	12 U	12 U	11 U
Indeno (1,2,3-cd) pyrene		620 U	12 U	12 U	12 U	12 U	11 U
Dibenzo (a,h) anthracene		620 U	12 U	12 U	12 U	12 U	11 U
Benzo (g,h,i) perylene		620 U	12 U	12 U	12 U	12 U	11 U
Carbazole		620 U	12 U	12 U	12 U	12 U	11 U

007

(1) - Cannot be separated from Diphenylamine. *= Outside of EPA CLP QC limits.

RFW Batch Number: 9710L600

Client: USACE-DEAL TEST SITE

Work Order: 11901001003 Page: 3a

Sample Information	Cust ID:	SW2	SD1	SD2	SBLKFZ	SBLKFZ BS	SBLKGO
RFW#:	014	015	016	97LE1822-MB1	97LE1822-MB1	97LE1835-MB1	
Matrix:	WATER	SOIL	SOIL	SOIL	SOIL	WATER	
D.F.:	1.00	1.00	1.00	1.00	1.00	1.00	
Units:	UG/L	UG/KG	UG/KG	UG/KG	UG/KG	UG/L	

800

Surrogate Recovery	Nitrobenzene-d5	2-Fluorobiphenyl	p-Terphenyl-d14	Phenol-d5	2-Fluorophenol	2,4,6-Tribromophenol
	60 %	71 %	64 %	87 %	86 %	60 %
	58 %	73 %	71 %	86 %	86 %	50 %
	65 %	93 %	78 %	91 %	89 %	68 %
	54 %	81 %	73 %	85 %	80 %	58 %
	51 %	80 %	75 %	85 %	85 %	59 %
	42 %	86 %	84 %	86 %	88 %	44 %

	fl	fl	fl	fl	fl	fl
Phenol	11 U	440 U	420 U	330 U	77 %	10 U
bis(2-Chloroethyl) ether	11 U	440 U	420 U	330 U	330 U	10 U
2-Chlorophenol	11 U	440 U	420 U	330 U	77 %	10 U
1,3-Dichlorobenzene	11 U	440 U	420 U	330 U	330 U	10 U
1,4-Dichlorobenzene	11 U	440 U	420 U	330 U	79 %	10 U
Benzyl alcohol	11 U	440 U	420 U	330 U	330 U	10 U
1,2-Dichlorobenzene	11 U	440 U	420 U	330 U	330 U	10 U
2-Methylphenol	11 U	440 U	420 U	330 U	330 U	10 U
bis(2-Chloroisopropyl) ether	11 U	440 U	420 U	330 U	330 U	10 U
4-Methylphenol	11 U	440 U	420 U	330 U	330 U	10 U
N-Nitroso-Di-n-propylamine	11 U	440 U	420 U	330 U	86 %	10 U
Hexachloroethane	11 U	440 U	420 U	330 U	330 U	10 U
Nitrobenzene	11 U	440 U	420 U	330 U	330 U	10 U
Isophorone	11 U	440 U	420 U	330 U	330 U	10 U
2-Nitrophenol	11 U	440 U	420 U	330 U	330 U	10 U
2,4-Dimethylphenol	11 U	440 U	420 U	330 U	330 U	10 U
Benzoic acid	55 U	2200 U	2100 U	200 J	160 JB	50 U
bis(2-Chloroethoxy) methane	11 U	440 U	420 U	330 U	330 U	10 U
2,4-Dichlorophenol	11 U	440 U	420 U	330 U	330 U	10 U
1,2,4-Trichlorobenzene	11 U	440 U	420 U	330 U	84 %	10 U
Naphthalene	11 U	440 U	420 U	330 U	330 U	10 U
4-Chloroaniline	11 U	440 U	420 U	330 U	330 U	10 U
Hexachlorobutadiene	11 U	440 U	420 U	330 U	330 U	10 U
4-Chloro-3-methylphenol	11 U	440 U	420 U	330 U	75 %	10 U
2-Methylnaphthalene	11 U	440 U	420 U	330 U	330 U	10 U
Hexachlorocyclopentadiene	11 U	440 U	420 U	330 U	330 U	10 U

*= Outside of EPA CLP QC limits.

Cust ID:	SW2	SD1	SD2	SBLKFZ	SBLKFZ BS	SBLKGO
RFW#:	014	015	016	97LE1822-MB1	97LE1822-MB1	97LE1835-MB1
2,4,6-Trichlorophenol	11 U	440 U	420 U	330 U	330 U	10 U
2,4,5-Trichlorophenol	55 U	2200 U	2100 U	1700 U	1700 U	50 U
2-Chloronaphthalene	11 U	440 U	420 U	330 U	330 U	10 U
2-Nitroaniline	55 U	2200 U	2100 U	1700 U	1700 U	50 U
Dimethylphthalate	11 U	440 U	420 U	330 U	330 U	10 U
Acenaphthylene	11 U	440 U	420 U	330 U	330 U	10 U
2,6-Dinitrotoluene	11 U	440 U	420 U	330 U	330 U	10 U
3-Nitroaniline	55 U	2200 U	2100 U	1700 U	1700 U	50 U
Acenaphthene	11 U	440 U	420 U	330 U	85 %	10 U
2,4-Dinitrophenol	55 U	2200 U	2100 U	1700 U	1700 U	50 U
4-Nitrophenol	55 U	2200 U	2100 U	1700 U	91 %	50 U
Dibenzofuran	11 U	440 U	420 U	330 U	330 U	10 U
2,4-Dinitrotoluene	11 U	440 U	420 U	330 U	83 %	10 U
Diethylphthalate	11 U	440 U	420 U	330 U	330 U	10 U
4-Chlorophenyl-phenylether	11 U	440 U	420 U	330 U	330 U	10 U
Fluorene	11 U	440 U	420 U	330 U	330 U	10 U
4-Nitroaniline	55 U	2200 U	2100 U	1700 U	1700 U	50 U
4,6-Dinitro-2-methylphenol	55 U	2200 U	2100 U	1700 U	1700 U	50 U
N-Nitrosodiphenylamine (1)	11 U	440 U	420 U	330 U	330 U	10 U
4-Bromophenyl-phenylether	11 U	440 U	420 U	330 U	330 U	10 U
Hexachlorobenzene	11 U	440 U	420 U	330 U	330 U	10 U
Pentachlorophenol	55 U	2200 U	2100 U	1700 U	88 %	50 U
Phenanthrene	11 U	94 J	55 J	330 U	330 U	10 U
Anthracene	11 U	440 U	420 U	330 U	330 U	10 U
Di-n-Butylphthalate	11 U	440 U	320 J	330 U	330 U	10 U
Fluoranthene	11 U	150 J	140 J	330 U	330 U	10 U
Pyrene	11 U	130 J	92 J	330 U	86 %	10 U
Butylbenzylphthalate	11 U	440 U	420 U	330 U	330 U	10 U
3,3'-Dichlorobenzidine	22 U	870 U	850 U	670 U	670 U	20 U
Benzo (a) anthracene	11 U	440 U	43 J	330 U	330 U	10 U
Chrysene	11 U	440 U	72 J	330 U	330 U	10 U
bis(2-Ethylhexyl)phthalate	11 U	440 U	420 U	220 J	190 JB	10 U
Di-n-Octyl phthalate	11 U	440 U	420 U	330 U	330 U	10 U
Benzo (b) fluoranthene	11 U	440 U	420 U	330 U	330 U	10 U
Benzo (k) fluoranthene	11 U	440 U	420 U	330 U	330 U	10 U
Benzo (a) pyrene	11 U	440 U	420 U	330 U	330 U	10 U
Indeno (1,2,3-cd) pyrene	11 U	440 U	420 U	330 U	330 U	10 U
Dibenzo (a,h) anthracene	11 U	440 U	420 U	330 U	330 U	10 U
Benzo (g,h,i) perylene	11 U	440 U	420 U	330 U	330 U	10 U
Carbazole	11 U	440 U	420 U	330 U	330 U	10 U

(1) - Cannot be separated from Diphenylamine. *= Outside of EPA CLP QC limits.

Cust ID: SBLKGO BS SBLKGO BSD

RFW#: 97LE1835-MB1 97LE1835-MB1

2,4,6-Trichlorophenol	10	U	10	U
2,4,5-Trichlorophenol	50	U	50	U
2-Chloronaphthalene	10	U	10	U
2-Nitroaniline	50	U	50	U
Dimethylphthalate	10	U	10	U
Acenaphthylene	10	U	10	U
2,6-Dinitrotoluene	10	U	10	U
3-Nitroaniline	50	U	50	U
Acenaphthene	69	%	67	%
2,4-Dinitrophenol	50	U	50	U
4-Nitrophenol	79	%	64	%
Dibenzofuran	10	U	10	U
2,4-Dinitrotoluene	70	%	57	%
Diethylphthalate	10	U	10	U
4-Chlorophenyl-phenylether	10	U	10	U
Fluorene	10	U	10	U
4-Nitroaniline	50	U	50	U
4,6-Dinitro-2-methylphenol	50	U	50	U
N-Nitrosodiphenylamine (1)	10	U	10	U
4-Bromophenyl-phenylether	10	U	10	U
Hexachlorobenzene	10	U	10	U
Pentachlorophenol	41	%	68	%
Phenanthrene	10	U	10	U
Anthracene	10	U	10	U
Di-n-Butylphthalate	10	U	10	U
Fluoranthene	10	U	10	U
Pyrene	88	%	81	%
Butylbenzylphthalate	10	U	10	U
3,3'-Dichlorobenzidine	20	U	20	U
Benzo(a)anthracene	10	U	10	U
Chrysene	10	U	10	U
bis(2-Ethylhexyl)phthalate	10	U	10	U
Di-n-Octyl phthalate	10	U	10	U
Benzo(b)fluoranthene	10	U	10	U
Benzo(k)fluoranthene	10	U	10	U
Benzo(a)pyrene	10	U	10	U
Indeno(1,2,3-cd)pyrene	10	U	10	U
Dibenzo(a,h)anthracene	10	U	10	U
Benzo(g,h,i)perylene	10	U	10	U
Carbazole	10	U	10	U

(1) - Cannot be separated from Diphenylamine. *= Outside of EPA CLP QC limits.

011

1F
SEMIVOLATILE ORGANICS ANALYSIS SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

S7

Lab Name: Recra.LabNet Work Order: 11901001003

Client: USACE-DEAL TEST SITE

Matrix: SOIL Lab Sample ID: 9710L600-001

Sample wt/vol: 30.0 (g/mL) G Lab File ID: E102508

Level: (low/med) LOW Date Received: 10/02/97

% Moisture: not dec. 63 dec. Date Extracted: 10/04/97

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 10/25/97

GPC Cleanup: (Y/N) N pH: 2.6 Dilution Factor: 1.00

Number TICs found: 5 CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN	25.26	5000	J
2.	UNKNOWN	26.55	10000	J
3.	UNKNOWN	28.97	20000	J
4.	ALKANE	30.04	6000	J
5.	UNKNOWN	34.52	6000	J

1F
SEMIVOLATILE ORGANICS ANALYSIS SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

S8

Lab Name: Recra.LabNet Work Order 11901001003

Client: USACE-DEAL TEST SITE

Matrix: SOIL Lab Sample ID: 9710L600-002

Sample wt/vol: 30.0 (g/mL) G Lab File ID: E102511

Level: (low/med) LOW Date Received: 10/02/97

% Moisture: not dec. 22 dec. Date Extracted: 10/04/97

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 10/25/97

GPC Cleanup: (Y/N) N pH: 4.0 Dilution Factor: 1.00

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

Number TICs found: 5

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	ALKANE	27.19	2000	J
2.	UNKNOWN	27.96	1000	J
3.	UNKNOWN	28.90	2000	J
4.	ALKANE	30.03	1000	J
5.	UNKNOWN	30.55	1000	J

1F
SEMIVOLATILE ORGANICS ANALYSIS SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

S9

Lab Name: Recra.LabNet Work Order: 11901001003

Client: USACE-DEAL TEST SITE

Matrix: SOIL Lab Sample ID: 9710L600-003

Sample wt/vol: 30.0 (g/mL) G Lab File ID: E102512

Level: (low/med) LOW Date Received: 10/02/97

% Moisture: not dec. 59 dec. Date Extracted: 10/04/97

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 10/25/97

GPC Cleanup: (Y/N) N pH: 2.6 Dilution Factor: 1.00

Number TICs found: 5 CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	ALKANE	27.20	7000	J
2.	ALKANE	30.04	20000	J
3.	UNKNOWN	30.57	9000	J
4.	ALKANE	34.16	10000	J
5.	UNKNOWN	34.51	9000	J

1F
SEMIVOLATILE ORGANICS ANALYSIS SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

S10

Lab Name: Recra.LabNet Work Order: 11901001003

Client: USACE-DEAL TEST SITE

Matrix: SOIL Lab Sample ID: 9710L600-004

Sample wt/vol: 30.0 (g/mL) G Lab File ID: E102513

Level: (low/med) LOW Date Received: 10/02/97

% Moisture: not dec. 20 dec. Date Extracted: 10/04/97

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 10/25/97

GPC Cleanup: (Y/N) N pH: 3.5 Dilution Factor: 1.00

Number TICs found: 5 CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	ALDOL CONDENSATE	9.13	500	JAB
2.	UNKNOWN	25.25	800	J
3.	ALKANE	27.20	500	J
4.	UNKNOWN	27.95	1000	J
5.	ALKANE	30.02	700	J

1F
SEMIVOLATILE ORGANICS ANALYSIS SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

S11

Lab Name: Recra.LabNet Work Order: 11901001003

Client: USACE-DEAL TEST SITE

Matrix: SOIL Lab Sample ID: 9710L600-005

Sample wt/vol: 30.0 (g/mL) G Lab File ID: E102514

Level: (low/med) LOW Date Received: 10/02/97

% Moisture: not dec. 47 dec. Date Extracted: 10/04/97

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 10/25/97

GPC Cleanup: (Y/N) N pH: 2.6 Dilution Factor: 1.00

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

Number TICs found: 5

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN	25.25	4000	J
2.	ALKANE	30.03	6000	J
3.	ALKANE	34.15	4000	J
4.	UNKNOWN	34.51	3000	J
5.	UNKNOWN	35.79	3000	J

1F
SEMIVOLATILE ORGANICS ANALYSIS SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

GW3

Lab Name: Recra.LabNet Work Order: 11901001003

Client: USACE-DEAL TEST SITE

Matrix: WATER Lab Sample ID: 9710L600-007

Sample wt/vol: 850 (g/mL) ML Lab File ID: E110819

Level: (low/med) LOW Date Received: 10/02/97

% Moisture: not dec. _____ dec. Date Extracted: 10/06/97

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 11/09/97

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 1.00

CONCENTRATION UNITS:

Number TICs found: 1 (ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 95-16-9	BENZOTHIAZOLE	14.72	20	JN

1F
SEMIVOLATILE ORGANICS ANALYSIS SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

GW4

Lab Name: Recra.LabNet Work Order: 11901001002

Client: USACE-DEAL TEST SITE

Matrix: WATER Lab Sample ID: 9710L600-008

Sample wt/vol: 850 (g/mL) ML Lab File ID: E110820

Level: (low/med) LOW Date Received: 10/02/97

% Moisture: not dec. dec. Date Extracted: 10/06/97

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 11/09/97

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 1.00

Number TICs found: 4 CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN	9.70	10	J
2. 95-16-9	BENZOTHAZOLE	14.71	8	JN
3. 149-30-4	2-MERCAPTOBENZOTHAZOLE	22.44	6	JN
4.	UNKNOWN	24.60	20	J

1F
SEMIVOLATILE ORGANICS ANALYSIS SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

GW5

Lab Name: Recra.LabNet Work Order: 11901001003

Client: USACE-DEAL TEST SITE

Matrix: WATER Lab Sample ID: 9710L600-009

Sample wt/vol: 850 (g/mL) ML Lab File ID: E110821

Level: (low/med) LOW Date Received: 10/02/97

% Moisture: not dec. dec. Date Extracted: 10/06/97

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 11/09/97

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 1.00

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

Number TICs found: 0

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.				

1F
SEMIVOLATILE ORGANICS ANALYSIS SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

FB03

Lab Name: Recra.LabNet Work Order: 11901001003

Client: USACE-DEAL TEST SITE

Matrix: WATER Lab Sample ID: 9710L600-011

Sample wt/vol: 850 (g/mL) ML Lab File ID: E110822

Level: (low/med) LOW Date Received: 10/02/97

% Moisture: not dec. dec. Date Extracted: 10/06/97

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 11/09/97

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 1.00

Number TICs found: 3 CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN	9.36	6	J
2.	UNKNOWN	10.99	9	J
3.	UNKNOWN	16.12	20	J

1F
SEMIVOLATILE ORGANICS ANALYSIS SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

SW1

Lab Name: Recra.LabNet Work Order: 11901001003

Client: USACE-DEAL TEST SITE

Matrix: WATER Lab Sample ID: 9710L600-013

Sample wt/vol: 900 (g/mL) ML Lab File ID: E110823

Level: (low/med) LOW Date Received: 10/02/97

% Moisture: not dec. dec. Date Extracted: 10/06/97

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 11/09/97

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 1.00

Number TICs found: 0 CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.				

1F
SEMIVOLATILE ORGANICS ANALYSIS SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

SW2

Lab Name: Recra.LabNet Work Order: 11901001003

Client: USACE-DEAL TEST SITE

Matrix: WATER Lab Sample ID: 9710L600-014

Sample wt/vol: 950 (g/mL) ML Lab File ID: E110824

Level: (low/med) LOW Date Received: 10/02/97

% Moisture: not dec. dec. Date Extracted: 10/06/97

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 11/09/97

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 1.00

Number TICs found: 1 CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN	9.46	5	J

1F
SEMIVOLATILE ORGANICS ANALYSIS SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

SD1

Lab Name: Recra.LabNet Work Order: 11901001003

Client: USACE-DEAL TEST SITE

Matrix: SOIL Lab Sample ID: 9710L600-015

Sample wt/vol: 30.0 (g/mL) G Lab File ID: E102515

Level: (low/med) LOW Date Received: 10/02/97

% Moisture: not dec. 24 dec. Date Extracted: 10/04/97

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 10/25/97

GPC Cleanup: (Y/N) N pH: 6.3 Dilution Factor: 1.00

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

Number TICs found: 5

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN	8.77	500	JB
2.	ALDOL CONDENSATE	9.13	600	JAB
3.	UNKNOWN	25.26	700	J
4.	UNKNOWN	27.96	1000	J
5.	UNKNOWN	28.92	400	J

1F
SEMIVOLATILE ORGANICS ANALYSIS SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

SD2

Lab Name: Recra.LabNet Work Order: 11901001003

Client: USACE-DEAL TEST SITE

Matrix: SOIL Lab Sample ID: 9710L600-016

Sample wt/vol: 30.0 (g/mL) G Lab File ID: E110825

Level: (low/med) LOW Date Received: 10/02/97

% Moisture: not dec. 21 dec. Date Extracted: 10/04/97

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 11/09/97

GPC Cleanup: (Y/N) N pH: 5.9 Dilution Factor: 1.00

Number TICs found: 4 CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN	9.05	400	JB
2.	ALDOL CONDENSATE	9.42	800	JAB
3.	ALDOL CONDENSATE	10.60	300	JA
4.	UNKNOWN	25.60	400	J

1F
SEMIVOLATILE ORGANICS ANALYSIS SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

SBLKFZ

Lab Name: Recra.LabNet Work Order: 11201001003

Client: USACE-DEAL TEST SITE

Matrix: SOIL Lab Sample ID: 97LE1822-MB1

Sample wt/vol: 30.0 (g/mL) G Lab File ID: E101412

Level: (low/med) LOW Date Received: 10/04/97

% Moisture: not dec. 0 dec. Date Extracted: 10/04/97

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 10/14/97

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 1.00

Number TICs found: 2 CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN	7.04	800	J
2.	ALDOL CONDENSATE	7.32	1000	JA

1F
SEMIVOLATILE ORGANICS ANALYSIS SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

SBLKGO

Lab Name: Recra.LabNet Work Order: 11901001003

Client: USACE-DEAL TEST SITE

Matrix: WATER Lab Sample ID: 97LE1835-MB1

Sample wt/vol: 1000 (g/mL) ML Lab File ID: A103120

Level: (low/med) LOW Date Received: 10/06/97

% Moisture: not dec. dec. Date Extracted: 10/06/97

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 10/31/97

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 1.00

Number TICs found: 2 CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN	8.66	5	J
2.	UNKNOWN	8.98	10	J

2C
WATER SEMIVOLATILE SURROGATE RECOVERY

Lab Name: Recra.LabNet

Contract: 1901-01-03

Case No.: USACE-DEAL TEST SITE

RFW Lot No.: 9710L600

	CLIENT SAMPLE NO.	S1 (NBZ) #	S2 (FBP) #	S3 (TPH) #	S4 (PHL) #	S5 (2FP) #	S6 (TBP) #	OTHER	TOT OUT
01	GW3	83	80	40	86	78	75		0
02	GW4	57	51	17 *	61	54	62		1
03	GW5	66	62	57	68	58	68		0
04	FB03	62	61	78	62	51	57		0
05	SW1	68	67	84	65	52	54		0
06	SW2	60	58	65	54	51	42		0
07	SBLKGOLE1835-MB1	63	54	60	55	49	41		0
08	SBLKGOLE1835-MB1 BS	52	52	57	53	45	44		0
09	SBLKGOLE1835-MB1 BSD	48	44	42	45	47	40		0

QC LIMITS

S1 (NBZ) = Nitrobenzene-d5	(35-114)
S2 (FBP) = 2-Fluorobiphenyl	(43-116)
S3 (TPH) = p-Terphenyl-d14	(33-141)
S4 (PHL) = Phenol-d5	(10- 94)
S5 (2FP) = 2-Fluorophenol	(21-100)
S6 (TBP) = 2,4,6-Tribromophenol	(10-123)

Column to be used to flag recovery values

* Values outside of QC limits

D Surrogates diluted out

2D
SOIL SEMIVOLATILE SURROGATE RECOVERY

Lab Name: Recra.LabNet

Contract: 1901-01-03

Case No.: USACE-DEAL TEST SITE

RFW Lot No.: 9710L600

	CLIENT SAMPLE NO.	S1 (NBZ) #	S2 (FBP) #	S3 (TPH) #	S4 (PHL) #	S5 (2FP) #	S6 (TBP) #	OTHER	TOT OUT
01	S7	40	45	49	43	44	53		0
02	S7MS	51	58	61	53	54	66		0
03	S7MSD	48	54	52	46	49	57		0
04	S8	66	69	85	71	70	92		0
05	S9	52	54	64	80	73	76		0
06	S10	75	76	95	74	79	85		0
07	S11	55	58	64	58	60	64		0
08	SD1	71	73	93	81	80	86		0
09	SD2	64	71	78	73	75	84		0
10	SBLKFZLE1822-MB1	87	86	91	85	85	86		0
11	SBLKFZLE1822-MB1 BS	86	86	89	80	85	88		0

QC LIMITS

S1 (NBZ) = Nitrobenzene-d5 (23-120)
 S2 (FBP) = 2-Fluorobiphenyl (30-115)
 S3 (TPH) = p-Terphenyl-d14 (18-137)
 S4 (PHL) = Phenol-d5 (24-113)
 S5 (2FP) = 2-Fluorophenol (25-121)
 S6 (TBP) = 2,4,6-Tribromophenol (19-122)

Column to be used to flag recovery values
 * Values outside of QC limits
 D Surrogates diluted out

SOIL SEMIVOLATILE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: Recra.LabNetContract: 1901-01-03Case No.: USACE-DEAL TEST SITERFW Lot No.: 9710L600-001MATRIX Spike - Sample No.: S7Level: (low/med) LOW

COMPOUND	SPIKE ADDED UG/KG	SAMPLE CONCENTRATION UG/KG	MS CONCENTRATION UG/KG	MS % REC #	QC LIMITS REC
Phenol	9110	0	4700	52	26 - 90
2-Chlorophenol	9110	0	4860	53	25 -102
1,4-Dichlorobenzene	4560	0	1780	39	28 -104
N-Nitroso-Di-n-propylamine	4560	0	2480	54	41 -126
1,2,4-Trichlorobenzene	4560	0	2260	50	38 -107
4-Chloro-3-methylphenol	9110	0	5190	57	26 -103
Acenaphthene	4560	0	2600	57	31 -137
4-Nitrophenol	9110	0	5360	59	11 -114
2,4-Dinitrotoluene	4560	0	2530	56	28 - 89
Pentachlorophenol	9110	0	7320	80	17 -109
Pyrene	4560	0	2520	55	35 -142

COMPOUND	SPIKE ADDED UG/KG	MSD CONCENTRATION UG/KG	MSD % REC #	% RPD #	QC LIMITS RPD REC
Phenol	9110	4060	45	14	35 26 - 90
2-Chlorophenol	9110	4320	47	12	50 25 -102
1,4-Dichlorobenzene	4560	1550	34	13	27 28 -104
N-Nitroso-Di-n-propylamine	4560	2110	46	16	38 41 -126
1,2,4-Trichlorobenzene	4560	2070	45	10	23 38 -107
4-Chloro-3-methylphenol	9110	4360	48	17	33 26 -103
Acenaphthene	4560	2350	52	9	19 31 -137
4-Nitrophenol	9110	4620	51	14	50 11 -114
2,4-Dinitrotoluene	4560	2130	47	17	47 28 - 89
Pentachlorophenol	9110	6340	70	13	47 17 -109
Pyrene	4560	2280	50	9	36 35 -142

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

RPD: 0 out of 11 outside limitsSpike Recovery: 0 out of 22 outside limits

COMMENTS:

3D
SOIL SEMIVOLATILE BLANK SPIKE RECOVERY

Lab Name: Recra.LabNet

Contract: 1901-01-03

Case No.: USACE-DEAL TEST SITE

RFW Lot No.: 9710L600

BLANK Spike - Sample No.: SBLKFZLE1822-MB1

Level: (low/med) LOW

COMPOUND	SPIKE	SAMPLE	BS	BS	QC
	ADDED	CONCENTRATION	CONCENTRATION	%	LIMITS
	UG/KG	UG/KG	UG/KG	REC #	REC
Phenol	3330	0	2570	77	26 - 90
2-Chlorophenol	3330	0	2570	77	25 -102
1,4-Dichlorobenzene	1660	0	1320	79	28 -104
N-Nitroso-Di-n-propylamine	1660	0	1430	86	41 -126
1,2,4-Trichlorobenzene	1660	0	1400	84	38 -107
4-Chloro-3-methylphenol	3330	0	2510	75	26 -103
Acenaphthene	1660	0	1410	85	31 -137
4-Nitrophenol	3330	0	3040	91	11 -114
2,4-Dinitrotoluene	1660	0	1380	83	28 - 89
Pentachlorophenol	3330	0	2940	88	17 -109
Pyrene	1660	0	1430	86	35 -142

Column to be used to flag recovery value with an asterisk

* Values outside of QC limits

Spike Recovery: 0 out of 11 outside limits

COMMENTS:

WATER SEMIVOLATILE BLANK SPIKE/BLANK SPIKE DUPLICATE RECOVERY

Lab Name: Recra.LabNetContract: 1901-01-03Case No.: USACE-DEAL TEST SITERFW Lot No.: 9710L600BLANK Spike - Sample No.: SBLKGOLE1835-MB1Level: (low/med) LOW

COMPOUND	SPIKE	SAMPLE	BS	BS	QC
	ADDED	CONCENTRATION	CONCENTRATION	%	LIMITS
	UG/L	UG/L	UG/L	REC #	REC
Phenol	100	0	66.9	67	12 - 89
2-Chlorophenol	100	0	71.4	71	27 -123
1,4-Dichlorobenzene	50.0	0	24.7	49	36 - 97
N-Nitroso-Di-n-propylamine	50.0	0	41.9	84	41 -116
1,2,4-Trichlorobenzene	50.0	0	23.8	48	39 - 98
4-Chloro-3-methylphenol	100	0	58.7	59	23 - 97
Acenaphthene	50.0	0	32.0	64	46 -118
4-Nitrophenol	100	0	73.5	74	10 - 80
2,4-Dinitrotoluene	50.0	0	35.3	71	24 - 96
Pentachlorophenol	100	0	41.3	41	9 -103
Pyrene	50.0	0	38.0	76	26 -127

COMPOUND	SPIKE	BSD	BSD		QC LIMITS	
	ADDED	CONCENTRATION	%	%	RPD	REC
	UG/L	UG/L	REC #	RPD #		
Phenol	100	71.7	72	7	42	12 - 89
2-Chlorophenol	100	74.4	74	4	40	27 -123
1,4-Dichlorobenzene	50.0	28.5	57	15	28	36 - 97
N-Nitroso-Di-n-propylamine	50.0	34.6	69	19	38	41 -116
1,2,4-Trichlorobenzene	50.0	27.2	54	11	28	39 - 98
4-Chloro-3-methylphenol	100	68.9	69	15	42	23 - 97
Acenaphthene	50.0	31.1	62	3	31	46 -118
4-Nitrophenol	100	58.9	59	22	50	10 - 80
2,4-Dinitrotoluene	50.0	29.1	58	20	38	24 - 96
Pentachlorophenol	100	68.0	68	50	50	9 -103
Pyrene	50.0	35.0	70	8	31	26 -127

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

RPD: 0 out of 11 outside limitsSpike Recovery: 0 out of 22 outside limits

COMMENTS:

4B
SEMIVOLATILE METHOD BLANK SUMMARY

Lab Name: Recra.LabNet Contract: 1901-01-03
 Case No.: USACE-DEAL TEST SITE
 Lab File ID: E101412 Lab Sample ID: 97LE1822-MB1
 Date Extracted: 10/04/97 Extraction: (SepF/Cont/Sonc) SONC
 Date Analyzed: 10/14/97 Time Analyzed: 2039
 Matrix: (Soil/Water) SOIL Level: (low/med) LOW
 Instrument ID: 5972e

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS AND MSD:

	CLIENT SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
	=====	=====	=====	=====
01	SBLKFZLE1822-MB1 BS	97LE1822-MB1S	E101411	10/14/97
02	S7	9710L600-001	E102508	10/25/97
03	S7MS	9710L600-001S	E102509	10/25/97
04	S7MSD	9710L600-001T	E102510	10/25/97
05	S8	9710L600-002	E102511	10/25/97
06	S9	9710L600-003	E102512	10/25/97
07	S10	9710L600-004	E102513	10/25/97
08	S11	9710L600-005	E102514	10/25/97
09	SD1	9710L600-015	E102515	10/25/97
10	SD2	9710L600-016	E110825	11/09/97

COMMENTS:

SEMIVOLATILE METHOD BLANK SUMMARY

Lab Name: Recra.LabNetContract: 1901-01-03Case No.: USACE-DEAL TEST SITELab File ID: A103120Lab Sample ID: 97LE1835-MB1Date Extracted: 10/06/97Extraction: (SepF/Cont/Sonc) CONTDate Analyzed: 10/31/97Time Analyzed: 1615Matrix: (Soil/Water) WATERLevel: (low/med) LOWInstrument ID: 5971a

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS AND MSD:

	CLIENT SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
	=====	=====	=====	=====
01	SBLKGOLE1835-MB1 BS	97LE1835-MB1S	A103107	10/31/97
02	SBLKGOLE1835-MB1 BSD	97LE1835-MB1T	A103108	10/31/97
03	GW3	9710L600-007	E110819	11/09/97
04	GW4	9710L600-008	E110820	11/09/97
05	GW5	9710L600-009	E110821	11/09/97
06	FB03	9710L600-011	E110822	11/09/97
07	SW1	9710L600-013	E110823	11/09/97
08	SW2	9710L600-014	E110824	11/09/97

COMMENTS:

Recra LabNet - Lionville Laboratory
 BNA ANALYTICAL DATA PACKAGE FOR
 USACE-DEAL TEST SITE

DATE RECEIVED: 10/02/97

RFW LOT # :9710L600

CLIENT ID	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
S7	001	S	97LE1822	10/01/97	10/04/97	10/25/97
S7	001 MS	S	97LE1822	10/01/97	10/04/97	10/25/97
S7	001 MSD	S	97LE1822	10/01/97	10/04/97	10/25/97
S8	002	S	97LE1822	10/01/97	10/04/97	10/25/97
S9	003	S	97LE1822	10/01/97	10/04/97	10/25/97
S10	004	S	97LE1822	10/01/97	10/04/97	10/25/97
S11	005	S	97LE1822	10/01/97	10/04/97	10/25/97
GW3	007	W	97LE1835	10/01/97	10/06/97	11/09/97
GW4	008	W	97LE1835	10/01/97	10/06/97	11/09/97
GW5	009	W	97LE1835	10/01/97	10/06/97	11/09/97
FB03	011	W	97LE1835	10/01/97	10/06/97	11/09/97
SW1	013	W	97LE1835	10/01/97	10/06/97	11/09/97
SW2	014	W	97LE1835	10/01/97	10/06/97	11/09/97
SD1	015	S	97LE1822	10/01/97	10/04/97	10/25/97
SD2	016	S	97LE1822	10/01/97	10/04/97	11/09/97

LAB QC:

SBLKFZ	MB1	S	97LE1822	N/A	10/04/97	10/14/97
SBLKFZ	MB1 BS	S	97LE1822	N/A	10/04/97	10/14/97
SBLKGO	MB1	W	97LE1835	N/A	10/06/97	10/31/97
SBLKGO	MB1 BS	W	97LE1835	N/A	10/06/97	10/31/97
SBLKGO	MB1 BSD	W	97LE1835	N/A	10/06/97	10/31/97

RECRA LabNet Use Only
9710L600

Custody Transfer Record/Lab Work Request



Client <u>USACE - DEAR TEST SITE</u>				Refrigerator #											
Est. Final Proj. Sampling Date <u>10-1-97</u>				#/Type Container											
Project # <u>03906 164 001-0002-00 (LAD)</u>				Liquid											
Project Contact/Phone # <u>G. B... - 5832</u>				Solid											
RECRA Project Manager <u>M. Young</u>				Volume											
QC <u>SL946 Del Spec TAT 30 DAY</u>				Liquid											
Date Rec'd <u>10-2-97</u> Date Due <u>11-2-97</u>				Solid											
Account # <u>MISCPM</u>				Preservatives											
ANALYSES REQUESTED →				ORGANIC						INORG					
				VOA	BNA	Pes/PCB	Herb	Metal	PCB	CN	DI-SOLUBLE	METALS			
MATRIX CODES:				RECRA LabNet Use Only											
S - Soil				↓											
SE - Sediment				↓											
SO - Solid				↓											
SL - Sludge				↓											
W - Water				↓											
O - Oil				↓											
A - Air				↓											
DS - Drum Solids				↓											
DL - Drum Liquids				↓											
L - EP/TCLP Leachate				↓											
WI - Wipe				↓											
X - Other				↓											
F - Fish				↓											
Lab ID	Client ID/Description	Matrix QC Chosen (✓)	Matrix	Date Collected	Time Collected	VOA	BNA	Pes/PCB	Herb	Metal	PCB	CN	DI-SOLUBLE	METALS	
		MS MSD													
001	S7	X X	S	10-1-97	1105	X	X	X		X					
002	S8		S		1125	X	X	X		X					
003	S9		S		0930	X	X	X		X					
004	S10		S		0945	X	X	X		X					
005	S11		S		0935	X	X	X		X					
006	GW2		W	9/30/97	1555	X	X	X		X					
007	GW3		W	10/1/97	1140	X	X	X		X					
008	GW4		W		0955	X	X	X		X					
009	GW5		W		1150	X	X	X		X					
010	FB02		W		1125	X				X					

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Special Instructions:
 FB02 is METANOL BLANK
 Job# = 11901-001-003-0001-00
 Cooler #0017-75^{cc}, #0131-8.3^{oc}

DATE/REVISIONS:
 1. NO Time collected on VOAs for Sample
 2. 004
 3. Recra metals bottle for sample
 4. 006 rec'd broken
 5. Only 2 VOA vials rec'd for samples
 6. 002, 005, 010, 012

RECRA LabNet Use Only	
Samples were:	COC Tape was:
1) Shipped <input checked="" type="checkbox"/> or Hand Delivered <input checked="" type="checkbox"/>	1) Present on Outer Package <input checked="" type="checkbox"/> Y or N
Airbill # <u>3094225831</u>	2) Unbroken on Outer Package <input checked="" type="checkbox"/> Y or N
2) Ambient or <input checked="" type="checkbox"/> Chilled	3) Present on Sample Y or <input checked="" type="checkbox"/> N
3) Received in Good Condition <input checked="" type="checkbox"/> Y or <input checked="" type="checkbox"/> N	4) Unbroken on Sample Y or <input checked="" type="checkbox"/> N
4) Labels Indicate Properly Preserved <input checked="" type="checkbox"/> Y or N	COC Record Present Upon Sample Rec'l <input checked="" type="checkbox"/> Y or N
5) Received Within Holding Times <input checked="" type="checkbox"/> Y or N	

Relinquished by	Received by	Date	Time	Relinquished by	Received by	Date	Time
<i>[Signature]</i>	<i>[Signature]</i>	10-1-97	1330				
Fed Ex	<i>[Signature]</i>	10-2-97	0930				

Discrepancies Between Samples Labels and COC Record Y or N
 NOTES: *

RECRA LabNet Use Only

9710 L600

Custody Transfer Record/Lab Work Request



Client USACE - DEM TEST SITE		Refrigerator #		1		2		2		2		2		030		
Est. Final Proj. Sampling Date 10-1-97		#/Type Container		Liquid	3 LL	1 AM	1 AM				1 BAY	1 BAY				
Project # 11901-001-003-0001-00		Volume		Solid	4 LL	1 AM	1 AM				1 AM	1 L				
Project Contact/Phone # G. BUCHANAN - 5832		Preservatives		Liquid	4 AM	1 L	1 L				1 L	1 L				
RECRA Project Manager M. YOUNG		ANALYSES REQUESTED		Solid	4 AM	50 ML	50 ML				8 OZ					
QC _____ Del _____		Date Rec'd 10-2-97 Date Due 10-2-97		ORGANIC			INORG									
Account # _____				VOA	BNA	Pest/PCB	Herb	RECRA LabNet Use Only								

MATRIX CODES: S - Soil SE - Sediment SO - Solid SL - Sludge W - Water O - Oil A - Air DS - Drum Solids DL - Drum Liquids L - EP/TCLP Leachate WI - Wipe X - Other F - Fish	Lab ID	Client ID/Description	Matrix QC Chosen (✓)		Matrix	Date Collected	Time Collected	RECRA LabNet Use Only																						
			MS	MSD				0624H	0629H	0609H	0630H	0635H	0640H	0645H	0650H	0655H	0700H	0705H												
			↓																											
	011	FB03			W	10-1-97	1050	X	X	X																				
	012	TB2			W		1320	X																						
	013	SW1			W		0715	X	X	X																				
	014	SW2			W		0740	X	X	X																				
	015	SD1			S		0720	X	X	X																				
	016	SD2			S		0745	X	X	X																				
	017	GW2			W	10-1-97	1555																							
	018	GW3			W		1140																							
	019	GW4			W		0955																							
	020	SW1			W		075																							

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS			DATE/REVISIONS: 10-2-97		
Special Instructions: Job # = 11901-001-003-0001-00			<ol style="list-style-type: none"> - only did not receive sample volume - for sample 006 - head space in vials for samples 001-005, 010 		
			RECRA LabNet Use Only Samples were: _____ or _____ Hand Delivered _____ Airbill # _____ 2) Ambient or Chilled _____ 3) Received in Good Condition _____ 4) Labels Indecipherable _____ 5) Received Within Holding Times _____		

Relinquished by	Received by	Date	Time	Relinquished by	Received by	Date	Time
<i>[Signature]</i>	<i>[Signature]</i>	10/1/97	1330				
<i>[Signature]</i>	<i>[Signature]</i>	10-2-97	0930				

Discrepancies Between Samples Labels and COC Record? Y or N

NOTES:

COC Tape was: _____	1) Present on Outer Package Y or N
2) Unbroken on Outer Package Y or N	3) Present on Sample Y or N
4) Unbroken on Sample Y or N	COC Record Present Upon Sample Rec'd Y or N

97106600

Custody Transfer Record/Lab Work Request



Client <u>USACE-Deer Test Site</u>	Refrigerator #																			
Est. Final Proj. Sampling Date	#/Type Container	Liquid																		
Project # <u>Page 1</u>	Solid																			
Project Contact/Phone	Volume	Liquid																		
RECRA Project Manager <u>10-2-97</u>	Solid																			
QC Del TAT	Preservatives																			

Date Rec'd <u>10-2-97</u>	Date Due																			
Account #	ANALYSES REQUESTED	ORGANIC																		

MATRIX CODES: S - Soil SE - Sediment SO - Solid SL - Sludge W - Water O - Oil A - Air DS - Drum Solids DL - Drum Liquids L - EP/TCLP Leachate WI - Wipe X - Other F - Fish	Lab ID	Client ID/Description	Matrix QC Chosen (✓)		Matrix	Date Collected	Time Collected	RECRA LabNet Use Only													
			MS	MSD				VOA	BNA	Pest/PCB	Herb	INORG									
	<u>021</u>	<u>SW2</u>			<u>W</u>	<u>10-1-97</u>	<u>0740</u>														

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Special Instructions:

- DATE/REVISIONS:
- _____ 1 _____
 - _____ 2 _____
 - _____ 3 _____
 - _____ 4 _____
 - _____ 5 _____
 - _____ 6 _____

RECRA LabNet Use Only	
Samples were: 1) Shipped <input type="checkbox"/> or Hand Delivered <input type="checkbox"/> Airbill # _____	COC Tape was: N Present on Outer Package Y or N 2) Ambient or Chilled <input type="checkbox"/> Package Y or N 3) Received in Good Condition? Y or N 4) Unbroken on Sample Y or N 5) Received Within Holding Times Y or N
6) Labels Indicate Properly Presented Y or N	7) Unbroken on COC Record Present Upon Sample Rec'd Y or N

Relinquished by	Received by	Date	Time	Relinquished by	Received by	Date	Time
<u>Fed Ex</u>	<u>[Signature]</u>	<u>10-29-97</u>	<u>1445</u>				

Discrepancies Between Samples Lables and COC Record? Y or N
NOTES



**Recra LabNet Philadelphia
Analytical Report**

Client: USACE-DEAL TEST SITE
RFW #: 9710L573

W.O. #: 11901-001-003-0001-00
Date Received: 10-01-97


SEMIVOLATILE

The set of samples consisted of three (3) water samples and six (6) soil samples collected on 09-30-97.

The samples and their associated QC samples were extracted on 10-03,04-97 and analyzed according to criteria set forth in SW 846 Method 8270 for TCL Semivolatile target compounds on 10-09,10,14,24,25-97.

The following is a summary of the QC results accompanying the sample results and a description of any problems encountered during their analyses:

1. The cooler temperatures upon receipt have been recorded on the chain-of-custody.
2. All required holding times for extraction and analysis were met.
3. Non-target compounds were detected in these samples.
4. Two (2) of eighty-four (84) surrogate recoveries were outside EPA QC limits; however, EPA CLP surrogate recovery criteria were met (i.e., no more than one outlier per fraction {acid and base neutral} and no recoveries less than 10%).
5. All blank spike recoveries were within EPA QC limits.
6. The soil method blank contained the common contaminant bis(2-Ethylhexyl)phthalate and the target compound Benzoic Acid at a level less than the CRQL.

for 
J. Michael Taylor

Vice President and Laboratory Manager
Lionville Analytical Laboratory

11-13-97
Date

mmz\bna\10-573b.cn

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 29 pages.

GLOSSARY OF BNA DATA

DATA QUALIFIERS

- U** = Compound was analyzed for but not detected. The associated numerical value is the estimated sample quantitation limit which is included and corrected for dilution and percent moisture.
- J** = Indicates an estimated value. This flag is used under the following circumstances: 1) when estimating a concentration for tentatively identified compounds (TICs) where a 1:1 response is assumed; or 2) when the mass spectral data indicate the presence of a compound that meets the identification criteria but the result is less than the specified detection limit but greater than zero. For example, if the limit of detection is 10 ug/L and a concentration of 3 ug/L is calculated, it is reported as 3J.
- B** = This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates possible/probable blank contamination. This flag is also used for a TIC as well as for a positively identified TCL compound.
- E** = Indicates that the compound was detected beyond the calibration range and was subsequently analyzed at a dilution.
- D** = Identifies all compounds identified in an analysis at a secondary dilution factor.
- I** = Interference.
- NQ** = Result qualitatively confirmed but not able to quantify.
- A** = Indicates that a TIC is a suspected aldol-condensation product.
- N** = Indicates presumptive evidence of a compound. This flag is only used for tentatively identified compounds (TICs), where the identification is based on a mass spectral library search. It is applied to all TIC results. For generic characterization of a TIC, such as chlorinated hydrocarbon, the N code is not used.
- X** = This flag is used for a TIC compound which is quantified relative to a response factor generated from a daily calibration standard (rather than quantified relative to the closest internal standard).
- Y** = Additional qualifiers used as required are explained in the case narrative.



GLOSSARY OF BNA DATA

ABBREVIATIONS

- BS** = Indicates blank spike in which reagent grade water is spiked with the CLP matrix spike solutions and carried through all the steps in the method. Spike recoveries are reported.
- BSD** = Indicates blank spike duplicate.
- MS** = Indicates matrix spike.
- MSD** = Indicates matrix spike duplicate.
- DL** = Suffix added to sample number to indicate that results are from a diluted analysis.
- NA** = Not Applicable.
- DF** = Dilution Factor.
- NR** = Not Required.
- SP, Z** = Indicates Spiked Compound.



Cust ID:	S1	S2	S3	S4	S5	S6
Sample RFW#:	001	002	003	004	005	006
Information Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
D.F.:	1.00	1.00	1.00	1.00	1.00	1.00
Units:	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
=====fl=====fl=====fl=====fl=====fl=====fl=====fl=====						
Surrogate Nitrobenzene-d5	44 %	60 %	49 %	74 %	63 %	58 %
2-Fluorobiphenyl	49 %	61 %	53 %	75 %	70 %	61 %
Recovery /p-Terphenyl-d14	50 %	82 %	59 %	85 %	84 %	79 %
Phenol-d5	46 %	65 %	51 %	73 %	74 %	65 %
2-Fluorophenol	48 %	65 %	53 %	74 %	72 %	65 %
2,4,6-Tribromophenol	58 %	79 %	62 %	98 %	95 %	75 %
=====fl=====fl=====fl=====fl=====fl=====fl=====fl=====						
Phenol	810 U	440 U	970 U	420 U	150 J	470 U
bis(2-Chloroethyl) ether	810 U	440 U	970 U	420 U	1100 U	470 U
2-Chlorophenol	810 U	440 U	970 U	420 U	1100 U	470 U
1,3-Dichlorobenzene	810 U	440 U	970 U	420 U	1100 U	470 U
1,4-Dichlorobenzene	810 U	440 U	970 U	420 U	1100 U	470 U
Benzyl alcohol	810 U	440 U	970 U	420 U	1100 U	470 U
1,2-Dichlorobenzene	810 U	440 U	970 U	420 U	1100 U	470 U
2-Methylphenol	810 U	440 U	970 U	420 U	1100 U	470 U
bis(2-Chloroisopropyl) ether	810 U	440 U	970 U	420 U	1100 U	470 U
4-Methylphenol	810 U	440 U	970 U	420 U	1100 U	470 U
N-Nitroso-Di-n-propylamine	810 U	440 U	970 U	420 U	1100 U	470 U
Hexachloroethane	810 U	440 U	970 U	420 U	1100 U	470 U
Nitrobenzene	810 U	440 U	970 U	420 U	1100 U	470 U
Isophorone	810 U	440 U	970 U	420 U	1100 U	470 U
2-Nitrophenol	810 U	440 U	970 U	420 U	1100 U	470 U
2,4-Dimethylphenol	810 U	440 U	970 U	420 U	1100 U	470 U
Benzoic acid	400 560 JBU	2200 U	4100 400 JBU	2100 U	5300 430 JBU	2400 U
bis(2-Chloroethoxy) methane	810 U	440 U	970 U	420 U	1100 U	470 U
2,4-Dichlorophenol	810 U	440 U	970 U	420 U	1100 U	470 U
1,2,4-Trichlorobenzene	810 U	440 U	970 U	420 U	1100 U	470 U
Naphthalene	810 U	440 U	970 U	420 U	1100 U	470 U
4-Chloroaniline	810 U	440 U	970 U	420 U	1100 U	470 U
Hexachlorobutadiene	810 U	440 U	970 U	420 U	1100 U	470 U
4-Chloro-3-methylphenol	810 U	440 U	970 U	420 U	1100 U	470 U
2-Methylnaphthalene	810 U	440 U	970 U	420 U	1100 U	470 U
Hexachlorocyclopentadiene	810 U	440 U	970 U	420 U	1100 U	470 U

*= Outside of EPA CLP QC limits.

004

Cust ID:	S1	S2	S3	S4	S5	S6
RFW#:	001	002	003	004	005	006
2,4,6-Trichlorophenol	810 U	440 U	970 U	420 U	1100 U	470 U
2,4,5-Trichlorophenol	4000 U	2200 U	4900 U	2100 U	5300 U	2400 U
2-Chloronaphthalene	810 U	440 U	970 U	420 U	1100 U	470 U
2-Nitroaniline	4000 U	2200 U	4900 U	2100 U	5300 U	2400 U
Dimethylphthalate	810 U	440 U	970 U	420 U	1100 U	470 U
Acenaphthylene	810 U	440 U	970 U	420 U	1100 U	470 U
2,6-Dinitrotoluene	810 U	440 U	970 U	420 U	1100 U	470 U
3-Nitroaniline	4000 U	2200 U	4900 U	2100 U	5300 U	2400 U
Acenaphthene	810 U	440 U	970 U	420 U	1100 U	470 U
2,4-Dinitrophenol	4000 U	2200 U	4900 U	2100 U	5300 U	2400 U
4-Nitrophenol	4000 U	2200 U	4900 U	2100 U	5300 U	2400 U
Dibenzofuran	810 U	440 U	970 U	420 U	1100 U	470 U
2,4-Dinitrotoluene	810 U	440 U	970 U	420 U	1100 U	470 U
Diethylphthalate	810 U	440 U	970 U	420 U	1100 U	470 U
4-Chlorophenyl-phenylether	810 U	440 U	970 U	420 U	1100 U	470 U
Fluorene	810 U	440 U	970 U	420 U	1100 U	470 U
4-Nitroaniline	4000 U	2200 U	4900 U	2100 U	5300 U	2400 U
4,6-Dinitro-2-methylphenol	4000 U	2200 U	4900 U	2100 U	5300 U	2400 U
N-Nitrosodiphenylamine (1)	810 U	440 U	970 U	420 U	1100 U	470 U
4-Bromophenyl-phenylether	810 U	440 U	970 U	420 U	1100 U	470 U
Hexachlorobenzene	810 U	440 U	970 U	420 U	1100 U	470 U
Pentachlorophenol	4000 U	2200 U	4900 U	2100 U	5300 U	2400 U
Phenanthrene	810 U	440 U	970 U	420 U	1100 U	470 U
Anthracene	810 U	440 U	970 U	420 U	1100 U	470 U
Di-n-Butylphthalate	810 U	440 U	970 U	420 U	1100 U	470 U
Fluoranthene	100 J	440 U	970 U	420 U	1100 U	470 U
Pyrene	160 J	440 U	970 U	420 U	1100 U	470 U
Butylbenzylphthalate	810 U	440 U	970 U	420 U	1100 U	470 U
3,3'-Dichlorobenzidine	1600 U	880 U	1900 U	840 U	2100 U	950 U
Benzo (a) anthracene	110 J	440 U	970 U	420 U	1100 U	470 U
Chrysene	150 J	440 U	970 U	420 U	1100 U	470 U
bis(2-Ethylhexyl)phthalate	810 U	440 U	970 U	420 U	1100 U	470 U
Di-n-Octyl phthalate	810 U	440 U	970 U	420 U	1100 U	470 U
Benzo (b) fluoranthene	810 U	440 U	970 U	420 U	1100 U	470 U
Benzo (k) fluoranthene	810 U	440 U	970 U	420 U	1100 U	470 U
Benzo (a) pyrene	810 U	440 U	970 U	420 U	1100 U	470 U
Indeno (1,2,3-cd) pyrene	810 U	440 U	970 U	420 U	1100 U	470 U
Dibenzo (a,h) anthracene	810 U	440 U	970 U	420 U	1100 U	470 U
Benzo (g,h,i) perylene	810 U	440 U	970 U	420 U	1100 U	470 U
Carbazole	810 U	440 U	970 U	420 U	1100 U	470 U

500

(1) - Cannot be separated from Diphenylamine. *= Outside of EPA CLP QC limits.

Sample Information	Cust ID:	GW1	GW2	FB-1	SBLKFZ	SBLKFZ BS	SBLKGH
	RFW#:	007	008	009	97LE1822-MB1	97LE1822-MB1	97LE1817-MB1
	Matrix:	WATER	WATER	WATER	SOIL	SOIL	WATER
	D.F.:	1.00	1.00	1.00	1.00	1.00	1.00
	Units:	UG/L	UG/L	UG/L	UG/KG	UG/KG	UG/L

Surrogate Recovery	Compound	GW1 %	GW2 %	FB-1 %	SBLKFZ %	SBLKFZ BS %	SBLKGH %
	Nitrobenzene-d5	79 %	83 %	87 %	87 %	86 %	89 %
	2-Fluorobiphenyl	73 %	58 %	74 %	86 %	86 %	86 %
	p-Terphenyl-d14	27 * %	13 * %	93 %	91 %	89 %	98 %
	Phenol-d5	82 %	80 %	79 %	85 %	80 %	80 %
	2-Fluorophenol	79 %	77 %	75 %	85 %	85 %	76 %
	2,4,6-Tribromophenol	83 %	63 %	68 %	86 %	88 %	80 %

Compound	GW1	GW2	FB-1	SBLKFZ	SBLKFZ BS	SBLKGH
Phenol	10 J	11 U	10 U	330 U	77 %	10 U
bis(2-Chloroethyl) ether	11 U	11 U	10 U	330 U	330 U	10 U
2-Chlorophenol	11 U	11 U	10 U	330 U	77 %	10 U
1,3-Dichlorobenzene	11 U	11 U	10 U	330 U	330 U	10 U
1,4-Dichlorobenzene	11 U	11 U	10 U	330 U	330 U	10 U
Benzyl alcohol	11 U	11 U	10 U	330 U	79 %	10 U
1,2-Dichlorobenzene	11 U	11 U	10 U	330 U	330 U	10 U
2-Methylphenol	11 U	11 U	10 U	330 U	330 U	10 U
bis(2-Chloroisopropyl) ether	11 U	11 U	10 U	330 U	330 U	10 U
4-Methylphenol	11 U	11 U	10 U	330 U	330 U	10 U
N-Nitroso-Di-n-propylamine	11 U	11 U	10 U	330 U	330 U	10 U
Hexachloroethane	11 U	11 U	10 U	330 U	86 %	10 U
Nitrobenzene	11 U	11 U	10 U	330 U	330 U	10 U
Isophorone	11 U	11 U	10 U	330 U	330 U	10 U
2-Nitrophenol	11 U	11 U	10 U	330 U	330 U	10 U
2,4-Dimethylphenol	11 U	11 U	10 U	330 U	330 U	10 U
Benzoic acid	55 U	2 J	50 U	200 J	160 JB	50 U
bis(2-Chloroethoxy) methane	11 U	11 U	10 U	330 U	330 U	10 U
2,4-Dichlorophenol	11 U	11 U	10 U	330 U	330 U	10 U
1,2,4-Trichlorobenzene	11 U	11 U	10 U	330 U	84 %	10 U
Naphthalene	11 U	11 U	10 U	330 U	330 U	10 U
4-Chloroaniline	11 U	11 U	10 U	330 U	330 U	10 U
Hexachlorobutadiene	11 U	11 U	10 U	330 U	330 U	10 U
4-Chloro-3-methylphenol	11 U	11 U	10 U	330 U	75 %	10 U
2-Methylnaphthalene	11 U	11 U	10 U	330 U	330 U	10 U
Hexachlorocyclopentadiene	11 U	11 U	10 U	330 U	330 U	10 U

*= Outside of EPA CLP QC limits.

Cust ID:	GW1	GW2	FB-1	SBLKPFZ	SBLKPFZ BS	SBLKGH
RFW#:	007	008	009	97LE1822-MB1	97LE1822-MB1	97LE1817-MB1

2,4,6-Trichlorophenol	11 U	11 U	10 U	330 U	330 U	10 U
2,4,5-Trichlorophenol	55 U	55 U	50 U	1700 U	1700 U	50 U
2-Chloronaphthalene	11 U	11 U	10 U	330 U	330 U	10 U
2-Nitroaniline	55 U	55 U	50 U	1700 U	1700 U	50 U
Dimethylphthalate	11 U	11 U	10 U	330 U	330 U	10 U
Acenaphthylene	11 U	11 U	10 U	330 U	330 U	10 U
2,6-Dinitrotoluene	11 U	11 U	10 U	330 U	330 U	10 U
3-Nitroaniline	55 U	55 U	50 U	1700 U	1700 U	50 U
Acenaphthene	11 U	11 U	10 U	330 U	85 %	10 U
2,4-Dinitrophenol	55 U	55 U	50 U	1700 U	1700 U	50 U
4-Nitrophenol	55 U	55 U	50 U	1700 U	91 %	50 U
Dibenzofuran	11 U	11 U	10 U	330 U	330 U	10 U
2,4-Dinitrotoluene	11 U	11 U	10 U	330 U	83 %	10 U
Diethylphthalate	1 J	11 U	10 U	330 U	330 U	10 U
4-Chlorophenyl-phenylether	11 U	11 U	10 U	330 U	330 U	10 U
Fluorene	11 U	11 U	10 U	330 U	330 U	10 U
4-Nitroaniline	55 U	55 U	50 U	1700 U	1700 U	50 U
4,6-Dinitro-2-methylphenol	55 U	55 U	50 U	1700 U	1700 U	50 U
N-Nitrosodiphenylamine (1)	11 U	11 U	10 U	330 U	330 U	10 U
4-Bromophenyl-phenylether	11 U	11 U	10 U	330 U	330 U	10 U
Hexachlorobenzene	11 U	11 U	10 U	330 U	330 U	10 U
Pentachlorophenol	55 U	55 U	50 U	1700 U	88 %	50 U
Phenanthrene	11 U	11 U	10 U	330 U	330 U	10 U
Anthracene	11 U	11 U	10 U	330 U	330 U	10 U
Di-n-Butylphthalate	1 J	11 U	10 U	330 U	330 U	10 U
Fluoranthene	11 U	11 U	10 U	330 U	330 U	10 U
Pyrene	11 U	11 U	10 U	330 U	86 %	10 U
Butylbenzylphthalate	11 U	11 U	10 U	330 U	330 U	10 U
3,3'-Dichlorobenzidine	22 U	22 U	20 U	670 U	670 U	20 U
Benzo(a)anthracene	11 U	11 U	10 U	330 U	330 U	10 U
Chrysene	11 U	11 U	10 U	330 U	330 U	10 U
bis(2-Ethylhexyl)phthalate	1 J	11 U	10 U	220 J	190 JB	10 U
Di-n-Octyl phthalate	11 U	11 U	10 U	330 U	330 U	10 U
Benzo(b)fluoranthene	11 U	11 U	10 U	330 U	330 U	10 U
Benzo(k)fluoranthene	11 U	11 U	10 U	330 U	330 U	10 U
Benzo(a)pyrene	11 U	11 U	10 U	330 U	330 U	10 U
Indeno(1,2,3-cd)pyrene	11 U	11 U	10 U	330 U	330 U	10 U
Dibenzo(a,h)anthracene	11 U	11 U	10 U	330 U	330 U	10 U
Benzo(g,h,i)perylene	11 U	11 U	10 U	330 U	330 U	10 U
Carbazole	11 U	11 U	10 U	330 U	330 U	10 U

(1) - Cannot be separated from Diphenylamine. *= Outside of EPA CLP QC limits.

200

Cust ID: SBLKGH BS SBLKGH BSD

Sample Information
 RFW#: 97LE1817-MB1 97LE1817-MB1
 Matrix: WATER WATER
 D.F.: 1.00 1.00
 Units: UG/L UG/L

800

Surrogate	Nitrobenzene-d5	84 %	83 %
Recovery	2-Fluorobiphenyl	79 %	80 %
	p-Terphenyl-d14	84 %	82 %
	Phenol-d5	75 %	73 %
	2-Fluorophenol	77 %	70 %
	2,4,6-Tribromophenol	83 %	79 %

Phenol	72 %	67 %
bis(2-Chloroethyl) ether	10 U	10 U
2-Chlorophenol	73 %	71 %
1,3-Dichlorobenzene	10 U	10 U
1,4-Dichlorobenzene	64 %	71 %
Benzyl alcohol	10 U	10 U
1,2-Dichlorobenzene	10 U	10 U
2-Methylphenol	10 U	10 U
bis(2-Chloroisopropyl) ether	10 U	10 U
4-Methylphenol	10 U	10 U
N-Nitroso-Di-n-propylamine	78 %	79 %
Hexachloroethane	10 U	10 U
Nitrobenzene	10 U	10 U
Isophorone	10 U	10 U
2-Nitrophenol	10 U	10 U
2,4-Dimethylphenol	10 U	10 U
Benzoic acid	50 U	50 U
bis(2-Chloroethoxy) methane	10 U	10 U
2,4-Dichlorophenol	10 U	10 U
1,2,4-Trichlorobenzene	68 %	74 %
Naphthalene	10 U	10 U
4-Chloroaniline	10 U	10 U
Hexachlorobutadiene	10 U	10 U
4-Chloro-3-methylphenol	72 %	69 %
2-Methylnaphthalene	10 U	10 U
Hexachlorocyclopentadiene	10 U	10 U

*= Outside of EPA CLP QC limits.

Cust ID: SBLKGH BS

SBLKGH BSD

RFW#: 97LE1817-MB1

97LE1817-MB1

2,4,6-Trichlorophenol	10	U	10	U
2,4,5-Trichlorophenol	50	U	50	U
2-Chloronaphthalene	10	U	10	U
2-Nitroaniline	50	U	50	U
Dimethylphthalate	10	U	10	U
Acenaphthylene	10	U	10	U
2,6-Dinitrotoluene	10	U	10	U
3-Nitroaniline	50	U	50	U
Acenaphthene	77	%	79	%
2,4-Dinitrophenol	50	U	50	U
4-Nitrophenol	73	%	75	%
Dibenzofuran	10	U	10	U
2,4-Dinitrotoluene	74	%	74	%
Diethylphthalate	10	U	10	U
4-Chlorophenyl-phenylether	10	U	10	U
Fluorene	10	U	10	U
4-Nitroaniline	50	U	50	U
4,6-Dinitro-2-methylphenol	50	U	50	U
N-Nitrosodiphenylamine (1)	10	U	10	U
4-Bromophenyl-phenylether	10	U	10	U
Hexachlorobenzene	10	U	10	U
Pentachlorophenol	79	%	67	%
Phenanthrene	10	U	10	U
Anthracene	10	U	10	U
Di-n-Butylphthalate	10	U	10	U
Fluoranthene	10	U	10	U
Pyrene	72	%	77	%
Butylbenzylphthalate	10	U	10	U
3,3'-Dichlorobenzidine	20	U	20	U
Benzo(a)anthracene	10	U	10	U
Chrysene	10	U	10	U
bis(2-Ethylhexyl)phthalate	10	U	10	U
Di-n-Octyl phthalate	10	U	10	U
Benzo(b)fluoranthene	10	U	10	U
Benzo(k)fluoranthene	10	U	10	U
Benzo(a)pyrene	10	U	10	U
Indeno(1,2,3-cd)pyrene	10	U	10	U
Dibenzo(a,h)anthracene	10	U	10	U
Benzo(g,h,i)perylene	10	U	10	U
Carbazole	10	U	10	U

(1) - Cannot be separated from Diphenylamine. *= Outside of EPA CLP QC limits.

600

1F
SEMIVOLATILE ORGANICS ANALYSIS SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

S1

Lab Name: Recra.LabNet Work Order: 11901001003

Client: USACE-DEAL TEST SITE

Matrix: SOIL Lab Sample ID: 9710L573-001

Sample wt/vol: 30.0 (g/mL) G Lab File ID: E102504

Level: (low/med) LOW Date Received: 10/01/97

% Moisture: not dec. 59 dec. Date Extracted: 10/04/97

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 10/25/97

GPC Cleanup: (Y/N) N pH: 2.7 Dilution Factor: 1.00

Number TICs found: 5 CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN	25.27	3000	J
2.	ALKANE	30.04	5000	J
3.	UNKNOWN	34.54	6000	J
4.	UNKNOWN	35.80	4000	J
5.	UNKNOWN	35.98	4000	J

1F
SEMIVOLATILE ORGANICS ANALYSIS SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

S2

Lab Name: Recra.LabNet Work Order: 11901001003

Client: USACE-DEAL TEST SITE

Matrix: SOIL Lab Sample ID: 9710L573-002

Sample wt/vol: 30.0 (g/mL) G Lab File ID: E102422

Level: (low/med) LOW Date Received: 10/01/97

% Moisture: not dec. 24 dec. Date Extracted: 10/04/97

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 10/24/97

GPC Cleanup: (Y/N) N pH: 4.3 Dilution Factor: 1.00

CONCENTRATION UNITS:

Number TICs found: 6 (ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	ALDOL CONDENSATE	9.12	600	JAB R
2.	UNKNOWN	21.70	400	J
3.	UNKNOWN	25.25	700	J
4.	UNKNOWN	26.54	500	J
5.	ALKANE	27.19	400	J
6.	UNKNOWN	29.96	600	J

1F
SEMIVOLATILE ORGANICS ANALYSIS SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

S3

Lab Name: Recra.LabNet Work Order: 11901001003

Client: USACE-DEAL TEST SITE

Matrix: SOIL Lab Sample ID: 9710L573-003

Sample wt/vol: 30.0 (g/mL) G Lab File ID: E102505

Level: (low/med) LOW Date Received: 10/01/97

% Moisture: not dec. 66 dec. Date Extracted: 10/04/97

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 10/25/97

GPC Cleanup: (Y/N) N pH: 2.8 Dilution Factor: 1.00

Number TICs found: 5 CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN	25.25	4000	J
2.	ALKANE	27.19	4000	J
3.	UNKNOWN	29.93	6000	J
4.	ALKANE	34.12	6000	J
5.	UNKNOWN	34.49	6000	J

1F
SEMIVOLATILE ORGANICS ANALYSIS SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

S4

Lab Name: Recra.LabNet Work Order: 11901001003

Client: USACE-DEAL TEST SITE

Matrix: SOIL Lab Sample ID: 9710L573-004

Sample wt/vol: 30.0 (g/mL) G Lab File ID: E102506

Level: (low/med) LOW Date Received: 10/01/97

% Moisture: not dec. 21 dec. Date Extracted: 10/04/97

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 10/25/97

GPC Cleanup: (Y/N) N pH: 4.3 Dilution Factor: 1.00

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

Number TICs found: 5

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	ALDOL CONDENSATE	9.12	700	JAB R
2.	UNKNOWN	25.24	1000	J
3.	UNKNOWN	26.53	1000	J
4.	ALKANE	27.18	700	J
5.	UNKNOWN	28.90	3000	J

1F
SEMIVOLATILE ORGANICS ANALYSIS SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

S5

Lab Name: Recra.LabNet Work Order: 11901001003

Client: USACE-DEAL TEST SITE

Matrix: SOIL Lab Sample ID: 9710L573-005

Sample wt/vol: 30.0 (g/mL) G Lab File ID: E102507

Level: (low/med) LOW Date Received: 10/01/97

% Moisture: not dec. 68 dec. Date Extracted: 10/04/97

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 10/25/97

GPC Cleanup: (Y/N) N pH: 2.7 Dilution Factor: 1.00

Number TICs found: 5 CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN	22.44	5000	J
2.	UNKNOWN	26.56	30000	J
3.	UNKNOWN	29.97	5000	J
4.	UNKNOWN	30.57	7000	J
5.	UNKNOWN	35.96	5000	J

1F
SEMIVOLATILE ORGANICS ANALYSIS SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

S6

Lab Name: Recra.LabNet Work Order: 11901001003

Client: USACE-DEAL TEST SITE

Matrix: SOIL Lab Sample ID: 9710L573-006

Sample wt/vol: 30.0 (g/mL) G Lab File ID: E102426

Level: (low/med) LOW Date Received: 10/01/97

% Moisture: not dec. 30 dec. Date Extracted: 10/04/97

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 10/25/97

GPC Cleanup: (Y/N) N pH: 5.3 Dilution Factor: 1.00

Number TICs found: 5

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN	25.25	1000	J
2.	UNKNOWN	26.55	4000	J
3.	UNKNOWN	26.93	1000	J
4.	UNKNOWN	29.96	1000	J
5.	UNKNOWN	30.56	1000	J

1F
SEMIVOLATILE ORGANICS ANALYSIS SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

GW1

Lab Name: Recra.LabNet Work Order: 11901001003

Client: USACE-DEAL TEST SITE

Matrix: WATER

Lab Sample ID: 9710L573-007

Sample wt/vol: 920 (g/mL) ML

Lab File ID: E101009

Level: (low/med) LOW

Date Received: 10/01/97

% Moisture: not dec. dec.

Date Extracted: 10/03/97

Extraction: (SepF/Cont/Sonc) CONT

Date Analyzed: 10/10/97

GPC Cleanup: (Y/N) N pH: 7.0

Dilution Factor: 1.00

Number TICs found: 6 CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN	7.85	20	JB K
2.	UNKNOWN	8.94	7	J
3.	UNKNOWN	10.31	10	J
4. 95-16-9	BENZOTHIAZOLE	12.55	8	JN
5.	UNKNOWN	12.65	9	J
6.	UNKNOWN	22.61	30	J

1F
SEMIVOLATILE ORGANICS ANALYSIS SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

GW2

Lab Name: Recra.LabNet Work Order: 11901001003

Client: USACE-DEAL TEST SITE

Matrix: WATER Lab Sample ID: 9710L573-008

Sample wt/vol: 900 (g/mL) ML Lab File ID: E101010

Level: (low/med) LOW Date Received: 10/01/97

% Moisture: not dec. dec. Date Extracted: 10/03/97

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 10/10/97

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 1.00

Number TICs found: 7 CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN	7.86	9	JB K
2. 289-16-7	1,2,4-TRITHIOLANE	10.47	6	JN
3.	UNKNOWN	19.30	6	J
4.	UNKNOWN	21.09	10	J
5.	ALKANE	24.72	10	J
6.	ALKANE	26.58	10	J
7.	UNKNOWN	26.92	10	J

1F
SEMIVOLATILE ORGANICS ANALYSIS SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

FB-1

Lab Name: Recra.LabNet Work Order: 11901001003

Client: USACE-DEAL TEST SITE

Matrix: WATER Lab Sample ID: 9710L573-009

Sample wt/vol: 960 (g/mL) ML Lab File ID: E101008

Level: (low/med) LOW Date Received: 10/01/97

% Moisture: not dec. dec. Date Extracted: 10/03/97

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 10/10/97

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 1.00

Number TICs found: 0 CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.				

1F
SEMIVOLATILE ORGANICS ANALYSIS SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

Lab Name: Recra.LabNet Work Order: 11901001003

SBLKFZ

Client: USACE-DEAL TEST SITE

Matrix: SOIL Lab Sample ID: 97LE1822-MB1

Sample wt/vol: 30.0 (g/mL) G Lab File ID: E101412

Level: (low/med) LOW Date Received: 10/04/97

% Moisture: not dec. 0 dec. Date Extracted: 10/04/97

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 10/14/97

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 1.00

Number TICs found: 2 CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN	7.04	800	J
2.	ALDOL CONDENSATE	7.32	1000	JA

1F
SEMIVOLATILE ORGANICS ANALYSIS SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

SBLKGH

Lab Name: Recra.LabNet Work Order: 11901001003

Client: USACE-DEAL TEST SITE

Matrix: WATER Lab Sample ID: 97LE1817-MB1

Sample wt/vol: 1000 (g/mL) ML Lab File ID: E100907

Level: (low/med) LOW Date Received: 10/03/97

% Moisture: not dec. dec. Date Extracted: 10/03/97

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 10/09/97

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 1.00

CONCENTRATION UNITS:

Number TICs found: 1 (ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN	7.87	4	J

2C
WATER SEMIVOLATILE SURROGATE RECOVERY

Lab Name: Recra.LabNet

Contract: 1901-01-03

Case No.: USACE-DEAL TEST SITE

RFW Lot No.: 9710L573

	CLIENT SAMPLE NO.	S1 (NBZ) #	S2 (FBP) #	S3 (TPH) #	S4 (PHL) #	S5 (2FP) #	S6 (TBP) #	OTHER	TOT OUT
01	GW1	79	73	27 *	82	79	83		1
02	GW2	83	58	13 *	80	77	63		1
03	FB-1	87	74	93	79	75	68		0
04	SBLKGHLE1817-MB1	89	86	98	80	76	80		0
05	SBLKGHLE1817-MB1 BS	84	79	84	75	77	83		0
06	SBLKGHLE1817-MB1 BSD	83	80	82	73	70	79		0

QC LIMITS

S1 (NBZ) = Nitrobenzene-d5	(35-114)
S2 (FBP) = 2-Fluorobiphenyl	(43-116)
S3 (TPH) = p-Terphenyl-d14	(33-141)
S4 (PHL) = Phenol-d5	(10- 94)
S5 (2FP) = 2-Fluorophenol	(21-100)
S6 (TBP) = 2,4,6-Tribromophenol	(10-123)

Column to be used to flag recovery values
* Values outside of QC limits
D Surrogates diluted out

2D
SOIL SEMIVOLATILE SURROGATE RECOVERY

Lab Name: Recra.LabNet

Contract: 1901-01-03

Case No.: USACE-DEAL TEST SITE

RFW Lot No.: 9710L573

	CLIENT SAMPLE NO.	S1 (NBZ) #	S2 (FBP) #	S3 (TPH) #	S4 (PHL) #	S5 (2FP) #	S6 (TBP) #	OTHER	TOT OUT
01	S1	44	49	50	46	48	58		0
02	S2	60	61	82	65	65	79		0
03	S3	49	53	59	51	53	62		0
04	S4	74	75	85	73	74	98		0
05	S5	63	70	84	74	72	95		0
06	S6	58	61	79	65	65	75		0
07	SBLKFZLE1822-MB1	87	86	91	85	85	86		0
08	SBLKFZLE1822-MB1 BS	86	86	89	80	85	88		0

QC LIMITS

S1 (NBZ) = Nitrobenzene-d5 (23-120)
 S2 (FBP) = 2-Fluorobiphenyl (30-115)
 S3 (TPH) = p-Terphenyl-d14 (18-137)
 S4 (PHL) = Phenol-d5 (24-113)
 S5 (2FP) = 2-Fluorophenol (25-121)
 S6 (TBP) = 2,4,6-Tribromophenol (19-122)

Column to be used to flag recovery values
 * Values outside of QC limits
 D Surrogates diluted out

3D
SOIL SEMIVOLATILE BLANK SPIKE RECOVERY

Lab Name: Recra.LabNet

Contract: 1901-01-03

Case No.: USACE-DEAL TEST SITE

RFW Lot No.: 9710L573

BLANK Spike - Sample No.: SBLKFZLE1822-MB1

Level: (low/med) LOW

COMPOUND	SPIKE	SAMPLE	BS	BS	QC
	ADDED	CONCENTRATION	CONCENTRATION	%	LIMITS
	UG/KG	UG/KG	UG/KG	REC #	REC
Phenol	3330	0	2570	77	26 - 90
2-Chlorophenol	3330	0	2570	77	25 -102
1,4-Dichlorobenzene	1660	0	1320	79	28 -104
N-Nitroso-Di-n-propylamine	1660	0	1430	86	41 -126
1,2,4-Trichlorobenzene	1660	0	1400	84	38 -107
4-Chloro-3-methylphenol	3330	0	2510	75	26 -103
Acenaphthene	1660	0	1410	85	31 -137
4-Nitrophenol	3330	0	3040	91	11 -114
2,4-Dinitrotoluene	1660	0	1380	83	28 - 89
Pentachlorophenol	3330	0	2940	88	17 -109
Pyrene	1660	0	1430	86	35 -142

Column to be used to flag recovery value with an asterisk

* Values outside of QC limits

Spike Recovery: 0 out of 11 outside limits

COMMENTS:

30
WATER SEMIVOLATILE BLANK SPIKE/BLANK SPIKE DUPLICATE RECOVERY

Lab Name: Recra.LabNet

Contract: 1901-01-03

Case No.: USACE-DEAL TEST SITE

RFW Lot No.: 9710L573

BLANK Spike - Sample No.: SBLKGHLE1817-MB1

Level: (low/med) LOW

COMPOUND	SPIKE	SAMPLE	BS	BS	QC
	ADDED	CONCENTRATION	CONCENTRATION	%	LIMITS
	UG/L	UG/L	UG/L	REC #	REC
Phenol	100	0	71.6	72	12 - 89
2-Chlorophenol	100	0	73.4	73	27 -123
1,4-Dichlorobenzene	50.0	0	32.2	64	36 - 97
N-Nitroso-Di-n-propylamine	50.0	0	39.2	78	41 -116
1,2,4-Trichlorobenzene	50.0	0	33.8	68	39 - 98
4-Chloro-3-methylphenol	100	0	72.4	72	23 - 97
Acenaphthene	50.0	0	38.3	77	46 -118
4-Nitrophenol	100	0	73.3	73	10 - 80
2,4-Dinitrotoluene	50.0	0	36.8	74	24 - 96
Pentachlorophenol	100	0	78.7	79	9 -103
Pyrene	50.0	0	36.2	72	26 -127

COMPOUND	SPIKE	BSD	BSD	%	QC LIMITS	
	ADDED	CONCENTRATION	%	RPD #	RPD	REC
	UG/L	UG/L	REC #	RPD #		
Phenol	100	67.0	67	7	42	12 - 89
2-Chlorophenol	100	70.9	71	2	40	27 -123
1,4-Dichlorobenzene	50.0	35.6	71	10	28	36 - 97
N-Nitroso-Di-n-propylamine	50.0	39.4	79	1	38	41 -116
1,2,4-Trichlorobenzene	50.0	37.1	74	8	28	39 - 98
4-Chloro-3-methylphenol	100	69.1	69	4	42	23 - 97
Acenaphthene	50.0	39.6	79	2	31	46 -118
4-Nitrophenol	100	75.3	75	2	50	10 - 80
2,4-Dinitrotoluene	50.0	37.1	74	0	38	24 - 96
Pentachlorophenol	100	67.0	67	16	50	9 -103
Pyrene	50.0	38.7	77	6	31	26 -127

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

RPD: 0 out of 11 outside limits

Spike Recovery: 0 out of 22 outside limits

COMMENTS:

4B
SEMIVOLATILE METHOD BLANK SUMMARY

Lab Name: Recra.LabNet Contract: 1901-01-03
 Case No.: USACE-DEAL TEST SITE
 Lab File ID: E100907 Lab Sample ID: 97LE1817-MB1
 Date Extracted: 10/03/97 Extraction: (SepF/Cont/Sonc) CONT
 Date Analyzed: 10/09/97 Time Analyzed: 2218
 Matrix: (Soil/Water) WATER Level: (low/med) LOW
 Instrument ID: 5972e

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS AND MSD:

	CLIENT SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
=====				
01	SBLKGHLE1817-MB1 BS	97LE1817-MB1S	E100917	10/10/97
02	SBLKGHLE1817-MB1 BSD	97LE1817-MB1T	E100918	10/10/97
03	FB-1	9710L573-009	E101008	10/10/97
04	GW1	9710L573-007	E101009	10/10/97
05	GW2	9710L573-008	E101010	10/10/97

COMMENTS:

4B
SEMIVOLATILE METHOD BLANK SUMMARY

Lab Name: Recra.LabNet Contract: 1901-01-03
 Case No.: USACE-DEAL TEST SITE
 Lab File ID: E101412 Lab Sample ID: 97LE1822-MB1
 Date Extracted: 10/04/97 Extraction: (SepF/Cont/Sonc) SONC
 Date Analyzed: 10/14/97 Time Analyzed: 2039
 Matrix: (Soil/Water) SOIL Level: (low/med) LOW
 Instrument ID: 5972e

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS AND MSD:

	CLIENT SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
	=====	=====	=====	=====
01	SBLKFZLE1822-MB1 BS	97LE1822-MB1S	E101411	10/14/97
02	S2	9710L573-002	E102422	10/24/97
03	S6	9710L573-006	E102426	10/25/97
04	S1	9710L573-001	E102504	10/25/97
05	S3	9710L573-003	E102505	10/25/97
06	S4	9710L573-004	E102506	10/25/97
07	S5	9710L573-005	E102507	10/25/97

COMMENTS:

Recra LabNet - Lionville Laboratory
 BNA ANALYTICAL DATA PACKAGE FOR
 USACE-DEAL TEST SITE

DATE RECEIVED: 10/01/97

RFW LOT # :9710L573

CLIENT ID	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
S1	001	S	97LE1822	09/30/97	10/04/97	10/25/97
S2	002	S	97LE1822	09/30/97	10/04/97	10/24/97
S3	003	S	97LE1822	09/30/97	10/04/97	10/25/97
S4	004	S	97LE1822	09/30/97	10/04/97	10/25/97
S5	005	S	97LE1822	09/30/97	10/04/97	10/25/97
S6	006	S	97LE1822	09/30/97	10/04/97	10/25/97
GW1	007	W	97LE1817	09/30/97	10/03/97	10/10/97
GW2	008	W	97LE1817	09/30/97	10/03/97	10/10/97
FB-1	009	W	97LE1817	09/30/97	10/03/97	10/10/97

LAB QC:

SBLKFZ	MB1	S	97LE1822	N/A	10/04/97	10/14/97
SBLKFZ	MB1 BS	S	97LE1822	N/A	10/04/97	10/14/97
SBLKGH	MB1	W	97LE1817	N/A	10/03/97	10/09/97
SBLKGH	MB1 BS	W	97LE1817	N/A	10/03/97	10/10/97
SBLKGH	MB1 BSD	W	97LE1817	N/A	10/03/97	10/10/97

304 3362506

304 0187805



RECRA
LabNet

RECRA LabNet Use Only
9710L573

Custody Transfer Record/Lab Work Request

Client USACE - Deel Test Site
 Est. Final Proj. Sampling Date 10/1/97
 Project # 11921-001-003-0001-00
 Project Contact/Phone # GARY BUCHANAN
 RECRA Project Manager M. Young
 QC SW946 Del SPEC TAT ZOOAY
 Refrigerator # 1 2
 #/Type Container Liquid 26L 16G Solid 26L 16G
 Volume Liquid 40 950 Solid 40 500
 Preservatives MeOH HCl
 Date Rec'd 10-1-97 Date Due 10-31-97
 Account # MIRBPM

MATRIX CODES: S - Soil SE - Sediment SO - Solid SL - Sludge W - Water O - Oil A - Air DS - Drum Solids DL - Drum Liquids L - EPC/LP Leachate WI - Wipe X - Other F - Fish	Lab ID	Client ID/Description	Matrix QC Chosen (✓)		Matrix	Date Collected	Time Collected	ANALYSES REQUESTED					INORG		
			MS	MSD				VOA	BNA	Pest/PCB	Herb	Metal	CN		
														RECRA LabNet Use Only	
	001	S 1			S	9-30-97	1340	✓	✓	✓	✓	✓	✓		
	002	I 2			I		1350	✓	✓	✓	✓	✓	✓		
	003	I 3			I		1440	✓	✓	✓	✓	✓	✓		
	004	I 4			I		1450	✓	✓	✓	✓	✓	✓		
	005	I 5			I		1545	✓	✓	✓	✓	✓	✓		
	006	I 6			I		1550	✓	✓	✓	✓	✓	✓		
	007	GW 1			W		1405	✓	✓	✓	✓	✓	✓		
	008	I 2			I		1555	✓	✓	✓	✓	✓	✓		
	009	FB-1			I		1510	✓	✓	✓	✓	✓	✓		
	010	TB-1			I		1610	✓							

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Special Instructions:
 NOTE: STANDARD NT METHANOL FIELD BLANK NOT INCLUDED DUE TO LACK OF SUFFICIENT NUMBER OF SAMPLE CONTAINERS FOR DAYS ACTIVITIES, VOA VIALS 596 770 AND 596 518 LABELED FB w/ LAB WERE USED FOR SOIL SAMPLES S 6. FB 1 IS A RINSE BLANK.
 4.3° 4.9° ^{mt} 11/12/97

DATE/REVISIONS:

- 001-006 VOA'S w/ HEAD SPACE
- 001-008 VOA'S SEDIMENT on BOTTOM
- 001-006 500ML AMBER FOR BNA and PEST PCB
- one BOTTLE for BOTH TESTS.
- OIL IS A DISSOLVED METALS.
- Contains about 500ML

RECRA LabNet Use Only

Samples were: 1) Shipped <input checked="" type="checkbox"/> or Hand Delivered <input type="checkbox"/> Arbill <i>see file</i>	COC Tape was: 1) Present on Outer Package <input checked="" type="checkbox"/> or N 2) Unbroken on Outer Package <input checked="" type="checkbox"/> or N 3) Present on Sample Y or N 4) Unbroken on Sample Y or <input checked="" type="checkbox"/> COC Record Present Upon Sample Rec: <input checked="" type="checkbox"/> or N
--	---

5) Received within Holding Times or N

Relinquished by	Received by	Date	Time	Relinquished by	Received by	Date	Time
Fed Ep	V. Hardy	10-1-97	0545				

ORIGINAL

REWRITTEN

Discrepancies Between Samples Labels and COC Record? Y or N

NOTES:

RECRA LabNet Use Only
97106573

Custody Transfer Record/Lab Work Request



Client <u>USACE</u>		Refrigerator #																				
Est. Final Proj. Sampling Date		#/Type Container		Liquid														12				
Project # <u>322</u>		Volume		Solid														1000				
Project Contact/Phone # <u>(911)</u>		Preservatives		Liquid																		
RECRA Project Manager				Solid																		
QC <u>TAT</u> Del		ANALYSES REQUESTED		ORGANIC					INORG													
Date Rec'd		Date Due		VOA	BNA	Pest/PCB	Herb						Diss. Metal	CN								
Account #				RECRA LabNet Use Only																		
MATRIX CODES: S - Soil SE - Sediment SO - Solid SL - Sludge W - Water O - Oil A - Air DS - Drum Solids DL - Drum Liquids L - EP/TCLP Leachate WI - Wipe X - Other F - Fish	Lab ID	Client ID/Description	Matrix QC Chosen (✓)		Matrix	Date Collected	Time Collected															
			MS	MSD																		
		011	GWI			W	9/20/07	1405														

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

DATE/REVISIONS:

- _____
- _____
- _____
- _____
- _____
- _____

Special Instructions:

RECRA LabNet Use Only	
Samples were: 1) Shipped <u>Yes</u> Hand Delivered _____ Airbill # _____ 2) Ambient or Chilled _____ 3) Received in Good Condition <u>Yes</u> 4) Labels Indicate Properly Preserved _____	COC Tape was: 1) Present on Outer Package Y or N 2) Unbroken on Outer Package Y or N 3) Present on Sample _____ Y or N 4) Unbroken on Sample Y or N COC Record Present Upon Sample Rec'l _____ Y or N 5) Received Within Holding Times _____ Y or N

Relinquished by	Received by	Date	Time	Relinquished by	Received by	Date	Time
Fred Esp	R. King	9/19/07	0945				

Discrepancies Between Samples Labels and COC Record? Y or N
NOTES:



a division of Recra Environmental, Inc.

Virtual Laboratories Everywhere

Recra LabNet Philadelphia Analytical Report

Client : USACE-DEAL TEST SITE

RFW# : 9710L573

W.O. #: 11901-001-003-0001-00

Date Received: 10-01-97

PESTICIDE/PCB

1. The set of samples consisted of three (3) water samples and six (6) soil samples collected on 09-30-97.
2. The samples and their associated QC samples were extracted on 10-06-97 and analyzed based on SW846, 3rd Edition, procedures on 10-12,13,17,21,22,23,24-97. The extraction procedure used was based on Methods 3520 and 3540 and the extracts were analyzed based on Method 8081.
3. The cooler temperatures upon receipt have been recorded on the chain-of-custody.
4. All required holding times for extraction and analysis were met.
5. The soil samples and their associated QC samples received a sulfur cleanup for sulfur.
6. The method blank was below the reporting limits for all target compounds.
7. All obtainable surrogate recoveries were within acceptance.
8. All blank spike recoveries were within acceptance criteria.
9. All matrix spike recoveries were within acceptance criteria.
10. The following samples required instrument dilutions due to chromatographic anomalies:

<u>Sample ID</u>	<u>Dilution Factor</u>
S1	50
S2	50
S3	10
S4	50
S4MS	50
S4MSD	50
S5	50
S6	50
GW2	5

Reporting limits have been adjusted to reflect the necessary dilutions. A copy of the Sample Discrepancy Report (SDR) has been enclosed.

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 18 pages.

001

9. All initial calibrations associated with this data set were within acceptance criteria.
10. All continuing calibration standards analyzed prior to sample extracts were within acceptance criteria, with the exception of target compound delta-BHC analyzed on 10-20-97 @ 0910 on the primary and secondary columns. The data reflected an increase in instrument response, so the ability to identify delta-BHC was not impaired. Since quantitation was not required, the data should not be impacted. A copy of the Sample Discrepancy Report (SDR) has been enclosed.

for Bruce C. Taylor
J. Michael Taylor
Vice President and Laboratory Manager
Lionville Analytical Laboratory

jeh\pcb\10-573.608

11-13-97
Date



GLOSSARY OF PESTICIDE/PCB DATA

DATA QUALIFIERS

- U** = Indicates that the compound was analyzed for but not detected. The minimum detection limit for the sample (not the method detection limit) is reported with the U (e.g., 10U).
- J** = Indicates an estimated value. This flag is used in cases where a target analyte is detected at a level less than the lower quantification level. If the limit of quantification is 10 ug/L and a concentration of 3 ug/L is calculated, it is reported as 3J.
- B** = This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates possible/probable blank contamination.
- E** = Indicates that the compound was detected beyond the calibration range and was subsequently analyzed at a dilution.
- I** = Interference.

ABBREVIATIONS

- BS** = Indicates blank spike in which reagent grade water is spiked with the CLP matrix spiking solutions and carried through all the steps in the method. Spike recoveries are reported.
- BSD** = Indicates blank spike duplicate.
- MS** = Indicates matrix spike.
- MSD** = Indicates matrix spike duplicate.
- DL** = Indicates that recoveries were not obtained because the extract had to be diluted for analysis.
- NA** = Not Applicable.
- DF** = Dilution Factor.
- NR** = Not Required.
- SP** = Indicates Spiked Compound.

GLOSSARY OF PESTICIDE/PCB DATA

- P** = This flag is used for a pesticide/Aroclor target analyte when there is greater than 25% difference for detected concentrations between the two GC columns (see Form X). The lower of the two values is reported on Form I and flagged with a "P".
- D** = This flag identifies all compounds identified in an analysis at a secondary dilution factor.
- C** = This flag applies to a compound that has been confirmed by GC/MS.

Recra LabNet Philadelphia Sample Discrepancy Report (SDR) SDR #:

976027

Initiator: Deb Kasdras RFW Batch: 97101513, 600
 Date: 10/27/97 Samples: - all 800s
 Client: USACE-DEAD Method: SW846MCAWW/CLP/

Parameter: 0608H
 Matrix: soil
 Prep Batch: 97LE1832

1. Reason for SDR

a. COC Discrepancy Tech Profile Error Client Request Sampler Error on C-O-C
 Transcription Error Wrong Test Code Other _____

b. General Discrepancy

Missing Sample/Extract Container Broken Wrong Sample Pulled Label ID's Illegible
 Hold Time Exceeded Insufficient Sample Preservation Wrong Received Past hold
 Improper Bottle Type Not Amenable to Analysis

Note: Verified by [Log-In] or [Prep Group] (circle)...signature/date: _____

c. QC Problem (Include all relevant specific results; attach data if necessary)

fyi - Samples had to be run at detection of 10x or 50x due to chromatographic anomalies

2. Known or Probable Causes(s)

3. Discussion and Proposed Action

Other Description:

- Re-log
- Entire Batch
- Following Samples: _____
- Re-leach
- Re-extract
- Re-digest
- Revise EDD
- Change Test Code to _____
- Place On/Take Off Hold (circle)

note in narrative

4. Project Manager Instructions...signature/date:

- Concur with Proposed Action
- Disagree with Proposed Action; See Instruction
- Include in Case Narrative
- Client Contacted:
- Date/Person _____
- Add
- Cancel

[Signature] 10/27/97

5. Final Action...signature/date:

Deborah Kasdras

Other Explanation:

- Verified re-[log][leach][extract][digest][analysis] (circle) *10/29/97*
- Included in Case Narrative
- Hard Copy COC Revised
- Electronic COC Revised
- EDD Corrections Completed

When Final Action has been recorded, forward original to QA Specialist for distribution and filing.

Route Distribution of Completed SDR

- Initiator *Deb Kasdras*
- Lab Manager: *J. Michael Taylor*
- Project Mgr: *Mike Jones*
- Section Mgr: *Siery/Durke/Danels*
- QA File: *Feldman/Racioppi/Basuthakur*
- Data Management: *Miller*
- Sample Prep: *Schnell/Swisher*

Route Distribution of Completed SDR

- Metals: *Doughty*
- Inorganic: *Perrone/Leonards*
- GC/LC: *Jarvis/Skrzat/Schnell*
- MS: *LeMin/McIntyre/Taylor/Kasdras/Steele*
- Log-in: *Dodson*
- Admin: *Brewer/Keehn/Shafer*
- Other: _____

Recra LabNet - Lionville Laboratory

Pesticide/PCBs by GC, CLP List

Report Date: 10/28/97 13:12

RFW Batch Number: 9710L573

Client: USACE-DEAL TEST SITE

Work Order: 11901001003 Page: 2

200

Sample Information	Cust ID:	S5	S6	GW1	GW2	FB-1	PBLKBD					
RFW#:	005	006	007	008	009	97LE1832-MB1						
Matrix:	SOIL	SOIL	WATER	WATER	WATER	SOIL						
D.F.:	50.0	50.0	1.00	5.00	1.00	1.00						
Units:	UG/KG	UG/KG	UG/L	UG/L	UG/L	UG/KG						
Surrogate: Decachlorobiphenyl	D	%	D	%	77	%	D	%	92	%	94	%
Tetrachloro-m-xylene	D	%	D	%	80	%	D	%	88	%	80	%
=====fl=====fl=====fl=====fl=====fl=====fl=====fl=====												
Alpha-BHC	260	U	120	U	0.050	U	0.25	U	0.050	U	1.7	U
Beta-BHC	260	U	120	U	0.050	U	0.25	U	0.050	U	1.7	U
Delta-BHC	260	U	120	U	0.050	U	0.25	U	0.050	U	1.7	U
gamma-BHC (Lindane)	260	U	120	U	0.050	U	0.25	U	0.050	U	1.7	U
Heptachlor	260	U	120	U	0.050	U	0.25	U	0.050	U	1.7	U
Aldrin	260	U	120	U	0.050	U	0.25	U	0.050	U	1.7	U
Heptachlor epoxide	260	U	120	U	0.050	U	0.25	U	0.050	U	1.7	U
Endosulfan I	260	U	120	U	0.050	U	0.25	U	0.050	U	1.7	U
Dieldrin	530	U	240	U	0.10	U	0.50	U	0.10	U	3.3	U
4,4'-DDE	530	U	240	U	0.10	U	0.50	U	0.10	U	3.3	U
Endrin	530	U	240	U	0.10	U	0.50	U	0.10	U	3.3	U
Endosulfan II	530	U	240	U	0.10	U	0.50	U	0.10	U	3.3	U
4,4'-DDD	530	U	240	U	0.10	U	0.50	U	0.10	U	3.3	U
Endosulfan sulfate	530	U	240	U	0.10	U	0.50	U	0.10	U	3.3	U
4,4'-DDT	530	U	240	U	0.10	U	0.50	U	0.10	U	3.3	U
Methoxychlor	2600	U	1200	U	0.50	U	2.5	U	0.50	U	17	U
Endrin ketone	530	U	240	U	0.10	U	0.50	U	0.10	U	3.3	U
Endrin aldehyde	530	U	240	U	0.10	U	0.50	U	0.10	U	3.3	U
alpha-Chlordane	260	U	120	U	0.050	U	0.25	U	0.050	U	1.7	U
gamma-Chlordane	260	U	120	U	0.050	U	0.25	U	0.050	U	1.7	U
Toxaphene	26000	U	12000	U	5.0	U	25	U	5.0	U	170	U
Aroclor-1016	5300	U	2400	U	1.0	U	5.0	U	1.0	U	33	U
Aroclor-1221	11000	U	4700	U	2.0	U	10	U	2.0	U	67	U
Aroclor-1232	5300	U	2400	U	1.0	U	5.0	U	1.0	U	33	U
Aroclor-1242	5300	U	2400	U	1.0	U	5.0	U	1.0	U	33	U
Aroclor-1248	5300	U	2400	U	1.0	U	5.0	U	1.0	U	33	U
Aroclor-1254	5300	U	2400	U	1.0	U	5.0	U	1.0	U	33	U
Aroclor-1260	5300	U	2400	U	1.0	U	5.0	U	1.0	U	33	U

U= Analyzed, not detected. J= Present below detection limit. B= Present in blank. NR= Not reported. NS= Not spiked.
 %= Percent recovery. D= Diluted out. I= Interference. NA= Not Applicable. *= Outside of EPA CLP QC

AM 11/2/97

008

Cust ID: PBLKBD BS PBLKAA PBLKAA BS PBLKAA BSD

Sample RFW#: 97LE1832-MB1 97LE1828-MB1 97LE1828-MB1 97LE1828-MB1
 Information Matrix: SOIL WATER WATER WATER
 D.F.: 1.00 1.00 1.00 1.00
 Units: UG/KG UG/L UG/L UG/L

Surrogate:	Decachlorobiphenyl	99 %	88 %	99 %	98 %
	Tetrachloro-m-xylene	85 %	65 %	55 %	68 %
Alpha-BHC	1.7 U	0.050 U	0.050 U	0.050 U	0.050 U
Beta-BHC	1.7 U	0.050 U	0.050 U	0.050 U	0.050 U
Delta-BHC	1.7 U	0.050 U	0.050 U	0.050 U	0.050 U
gamma-BHC (Lindane)	95 %	0.050 U	90 %	90 %	
Heptachlor	100 %	0.050 U	80 %	75 %	
Aldrin	100 %	0.050 U	80 %	85 %	
Heptachlor epoxide	1.7 U	0.050 U	0.050 U	0.050 U	0.050 U
Endosulfan I	1.7 U	0.050 U	0.050 U	0.050 U	0.050 U
Dieldrin	102 %	0.10 U	96 %	96 %	
4,4'-DDE	3.3 U	0.10 U	0.10 U	0.10 U	0.10 U
Enarin	106 %	0.10 U	96 %	96 %	
Endosulfan II	3.3 U	0.10 U	0.10 U	0.10 U	0.10 U
4,4'-DDD	3.3 U	0.10 U	0.10 U	0.10 U	0.10 U
Endosulfan sulfate	3.3 U	0.10 U	0.10 U	0.10 U	0.10 U
4,4'-DDT	102 %	0.10 U	94 %	94 %	
Methoxychlor	17 U	0.50 U	0.50 U	0.50 U	0.50 U
Endrin ketone	3.3 U	0.10 U	0.10 U	0.10 U	0.10 U
Endrin aldehyde	3.3 U	0.10 U	0.10 U	0.10 U	0.10 U
alpha-Chlordane	1.7 U	0.050 U	0.050 U	0.050 U	0.050 U
gamma-Chlordane	1.7 U	0.050 U	0.050 U	0.050 U	0.050 U
Toxaphene	170 U	5.0 U	5.0 U	5.0 U	5.0 U
Aroclor-1016	33 U	1.0 U	1.0 U	1.0 U	1.0 U
Aroclor-1221	67 U	2.0 U	2.0 U	2.0 U	2.0 U
Aroclor-1232	33 U	1.0 U	1.0 U	1.0 U	1.0 U
Aroclor-1242	33 U	1.0 U	1.0 U	1.0 U	1.0 U
Aroclor-1248	33 U	1.0 U	1.0 U	1.0 U	1.0 U
Aroclor-1254	33 U	1.0 U	1.0 U	1.0 U	1.0 U
Aroclor-1260	33 U	1.0 U	1.0 U	1.0 U	1.0 U

U= Analyzed, not detected. J= Present below detection limit. B= Present in blank. NR= Not reported. NS= Not spiked.
 %= Percent recovery. D= Diluted out. I= Interference. NA= Not Applicable. *= Outside of EPA CLP QC

gm 11/2/97

Recra LabNet - Lionville Laboratory
 PEST/PCB ANALYTICAL DATA PACKAGE FOR
 USACE-DEAL TEST SITE

DATE RECEIVED: 10/01/97

RFW LOT # :9710L573

CLIENT ID	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
S1	001	S	97LE1832	09/30/97	10/06/97	10/23/97
S2	002	S	97LE1832	09/30/97	10/06/97	10/23/97
S3	003	S	97LE1832	09/30/97	10/06/97	10/22/97
S4	004	S	97LE1832	09/30/97	10/06/97	10/23/97
S4	004 MS	S	97LE1832	09/30/97	10/06/97	10/23/97
S4	004 MSD	S	97LE1832	09/30/97	10/06/97	10/23/97
S5	005	S	97LE1832	09/30/97	10/06/97	10/23/97
S6	006	S	97LE1832	09/30/97	10/06/97	10/24/97
GW1	007	W	97LE1828	09/30/97	10/05/97	10/13/97
GW2	008	W	97LE1828	09/30/97	10/05/97	10/17/97
FB-1	009	W	97LE1828	09/30/97	10/05/97	10/13/97

LAB QC:

PBLKBD	MB1	S	97LE1832	N/A	10/06/97	10/21/97
PBLKBD	MB1 BS	S	97LE1832	N/A	10/06/97	10/21/97
PBLKAA	MB1	W	97LE1828	N/A	10/05/97	10/12/97
PBLKAA	MB1 BS	W	97LE1828	N/A	10/05/97	10/12/97
PBLKAA	MB1 BSD	W	97LE1828	N/A	10/05/97	10/12/97

mm
11/2/97

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RECRA LabNet 010

RECRA LabNet Use Only

97102573

Custody Transfer Record/Lab Work Request

Client <u>USACE - Dead Test Site</u>		Refrigerator #	1	2																
Est. Final Proj. Sampling Date <u>10/1/97</u>		#/Type Container	Liquid	<u>266</u>	<u>186</u>															
Project # <u>11901-001-003-001-00</u>			Solid	<u>266</u>	<u>186</u>															
Project Contact/Phone # <u>GARY BUCHANAN</u>		Volume	Liquid	<u>40</u>	<u>950</u>															
RECRA Project Manager <u>M. Young</u>			Solid	<u>40</u>	<u>500</u>															
QC <u>SNP46</u> Del <u>5/EC</u> TAT <u>30 DAY</u>		Preservatives	<u>MeOH</u>	<u>HCl</u>	<u>-</u>															
Date Rec'd <u>10-1-97</u> Date Due <u>10-31-97</u>		ANALYSES REQUESTED →	ORGANIC					INORG												
Account # <u>MIRBPM</u>			VOA	BNA	Pest/PCB	Herb					Metal	CN								

MATRIX CODES: S - Soil SE - Sediment SO - Solid SL - Sludge W - Water O - Oil A - Air DS - Drum Solids DL - Drum Liquids L - EP/TCLP Leachate WI - Wipe X - Other F - Fish	Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS MSD	Matrix	Date Collected	Time Collected	RECRA LabNet Use Only														
							062744	062571	060884												
	001	S1		S	9-30-97	1340	✓	✓	✓												
	002	2				1350	✓	✓	✓												
	003	3				1440	✓	✓	✓												
	004	4				1450	✓	✓	✓												
	005	5				1545	✓	✓	✓												
	006	6				1550	✓	✓	✓												
	007	GW1		W		1405	✓	✓	✓												
	008	2				1555	✓	✓	✓												
	009	FB-1				1510	✓	✓	✓												
	010	TB-1				1610	✓														

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Special Instructions:
 NOTE: STANDARD NOT METHANOL FIELD BLANK NOT INCLUDED DUE TO LACK OF SUFFICIENT NUMBER OF SAMPLE CONTAINERS FOR DAYS ACTIVITIES, VOA VIALS 596 770 AND 596 518 LABELED FB, LAB WERE USED FOR SOIL SAMPLES S6. FB1 IS A RINSE BLANK.
 4.3°C + 4.9°C

DATE/REVISIONS:

- 001-006 VOA'S W/HEAD SPACE
- 001-008 VOA'S SEDIMENT ON BOTTOM
- 001-006 500ML AMPER FOR BNA and PEST ROD
- one BOTTLE FOR BOTH TESTS.
- oil is a DISSOLVED METALS.
- Contains about 500ML

RECRA LabNet Use Only

Samples were:	COC Tape was:
1) Shipped <input checked="" type="checkbox"/> or Hand Delivered <input checked="" type="checkbox"/>	1) Present on Outer Package <input checked="" type="checkbox"/> or N
Airbill <input checked="" type="checkbox"/>	2) Unbroken on Outer Package <input checked="" type="checkbox"/> or N
2) Ambient or <input checked="" type="checkbox"/> Cold	3) Present on Sample Y or N
3) Received in Good Condition <input checked="" type="checkbox"/> or N	4) Unbroken on Sample Y or N
4) Labels Indicate Properly Preserved <input checked="" type="checkbox"/> or N	COC Record Present Upon Sample Rec't <input checked="" type="checkbox"/> or N
5) Received v. thin Holding Times <input checked="" type="checkbox"/> or N	

Relinquished by	Received by	Date	Time
<u>Lead Ep</u>	<u>V. Hardy</u>	<u>10-1-97</u>	<u>0545</u>

Relinquished by **ORIGINAL** Date _____ Time _____
 Relinquished by **REWRITTEN** Date _____ Time _____

Discrepancies Between Samples Labels and COC Record? Y or N
 NOTES:



RECRA LabNet Use Only
97106573

Custody Transfer Record/Lab Work Request

Client <u>USACE</u>			Refrigerator #														
Est. Final Proj. Sampling Date <u>SEE</u>			#/Type Container		Liquid												
Project # <u>041</u>			Volume		Solid												
Project Contact/Phone #			Preservatives		Liquid												
RECRA Project Manager			ANALYSES REQUESTED		Solid												
QC Del <u>TAT</u>			ORGANIC														
Date Rec'd			INORG														
Account #			Metal														
			CN														
RECRA LabNet Use Only																	
MATRIX CODES: S - Soil SE - Sediment SO - Solid SL - Sludge W - Water O - Oil A - Air DS - Drum Solids DL - Drum Liquids L - EP/TCLP Leachate WI - Wipe X - Other F - Fish	Lab ID	Client ID/Description	Matrix QC Chosen (✓)		Matrix	Date Collected	Time Collected										
			MS	MSD													
	<u>011</u>	<u>GWJ</u>			<u>W</u>	<u>8/20/05</u>	<u>1405</u>										

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Special Instructions:

DATE/REVISIONS:

- _____
- _____
- _____
- _____
- _____
- _____

RECRA LabNet Use Only

Samples were: See

1) Shipped See OOC Tape was:

Hand Delivered See 1) Present on Outer Package Y or N

Airbill # See 2) Unbroken on Outer Package Y or N

2) Ambient or Chilled See 3) Present on Sample Condition Y or N

3) Received in Good Condition See Y or N

4) Labels Indicate Property Preserved See Y or N

4) Unbroken on Sample Y or N

5) Received Within Holding Times See Y or N

COC Record Present Upon Sample Rec't Y or N

Relinquished by	Received by	Date	Time	Relinquished by	Received by	Date	Time
	<u>J</u>	<u>8/19/05</u>	<u>0945</u>				

Discrepancies Between Samples Labels and COC Record? Y or N

NOTES:

2E
WATER PESTICIDE SURROGATE RECOVERY

Lab Name: Recra.LabNet

Contract: 1901-01-03

Case No.: USACE-DEAL TEST SITE

RFW Lot No.: 9710L573

	CLIENT SAMPLE NO.	S1 (DCB) #	OTHER TCX
01	GW1	77	80
02	GW2	D	D
03	FB-1	92	88
04	PBLKAALE1828-MB1	88	65
05	PBLKAALE1828-MB1 BS	99	55
06	PBLKAALE1828-MB1 BSD	98	68

ADVISORY
QC LIMITS
(22-126)
(27-129)

S1 (DCB) = Decachlorobiphenyl
S2 (TCX) = Tetrachloro-m-xylene

Column to be used to flag recovery values
* Values outside of QC limits
D Surrogates diluted out

Jm
11/2/97

2F
SOIL PESTICIDE SURROGATE RECOVERY

Lab Name: Recra.LabNet

Contract: 1901-01-03

Case No.: USACE-DEAL TEST SITE

RFW Lot No.: 9710L573

	CLIENT SAMPLE NO.	S1 (DCB)#	OTHER TCX
01	S1	D	D
02	S2	D	D
03	S3	D	D
04	S4	D	D
05	S4MS	D	D
06	S4MSD	D	D
07	S5	D	D
08	S6	D	D
09	PBLKBDLE1832-MB1	94	80
10	PBLKBDLE1832-MB1 BS	99	85

ADVISORY
QC LIMITS
(38-122)
(28-118)

S1 (DCB) = Decachlorobiphenyl
S2 (TCX) = Tetrachloro-m-xylene

Column to be used to flag recovery values
* Values outside of QC limits
D Surrogates diluted out

*Jim
H
11/2/91*

SOIL PESTICIDE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: Recra.LabNet

Contract: 1901-01-03

Case No.: USACE-DEAL TEST SITE

RFW Lot No.: 9710L573-004

MATRIX Spike - Sample No.: S4

Level: (low/med) LOW

COMPOUND	SPIKE	SAMPLE	MS	MS	QC
	ADDED	CONCENTRATION	CONCENTRATION	%	LIMITS
	UG/KG	UG/KG	UG/KG	REC #	REC
gamma-BHC (Lindane)	8.39	0	26.00	D	30 -125
Heptachlor	8.39	0	13.80	D	37 -126
Aldrin	8.39	0	23.90	D	27 -133
Dieldrin	21.0	0	7.130	D	40 -125
Endrin	21.0	0	0	D	45 -130
4,4'-DDT	21.0	0	25.60	D	33 -123

gm 11/3/97

COMPOUND	SPIKE	MSD	MSD	%	QC LIMITS	
	ADDED	CONCENTRATION	%	%	RPD	REC
	UG/KG	UG/KG	REC #	RPD #		
gamma-BHC (Lindane)	8.31	27.00	D	0	50	30 -125
Heptachlor	8.31	10.40	D	0	31	37 -126
Aldrin	8.31	24.90	D	0	43	27 -133
Dieldrin	20.8	9.14	D	0	38	40 -125
Endrin	20.8	0	D	0	45	45 -130
4,4'-DDT	20.8	26.60	D	0	50	33 -123

gm 11/3/97

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

RPD: 0 out of 6 outside limits

Spike Recovery: 0 out of 12 outside limits

COMMENTS:

gm 10/2/97

3F
SOIL PESTICIDE MATRIX SPIKE RECOVERY

Lab Name: Recra.LabNet

Contract: 1901-01-03

Case No.: USACE-DEAL TEST SITE

RFW Lot No.: 9710L573

MATRIX Spike - Sample No.: PBLKBDLE1832-MB1

Level: (low/med) LOW

COMPOUND	SPIKE	SAMPLE	MS	MS	QC
	ADDED	CONCENTRATION	CONCENTRATION	%	LIMITS
	UG/KG	UG/KG	UG/KG	REC #	REC
gamma-BHC (Lindane)	6.67	0	6.33	95	30 -125
Heptachlor	6.67	0	6.67	100	37 -126
Aldrin	6.67	0	6.67	100	27 -133
Dieldrin	16.7	0	17.0	102	40 -125
Endrin	16.7	0	17.7	106	45 -130
4,4'-DDT	16.7	0	17.0	102	33 -123

Column to be used to flag recovery value with an asterisk

* Values outside of QC limits

Spike Recovery: 0 out of 6 outside limits

COMMENTS:

M
11/2/97

WATER PESTICIDE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: Recra.LabNetContract: 1901-01-03Case No.: USACE-DEAL TEST SITERFW Lot No.: 9710L573MATRIX Spike - Sample No.: PBLKAALE1828-MB1Level: (low/med) LOW

COMPOUND	SPIKE	SAMPLE	MS	MS	QC
	ADDED	CONCENTRATION	CONCENTRATION	%	LIMITS
	UG/L	UG/L	UG/L	REC #	REC
gamma-BHC (Lindane)	0.200	0	0.180	90	56 -127
Heptachlor	0.200	0	0.160	80	50 -129
Aldrin	0.200	0	0.160	80	48 -133
Dieldrin	0.500	0	0.480	96	57 -131
Endrin	0.500	0	0.480	96	46 -150
4,4'-DDT	0.500	0	0.470	94	38 -138

COMPOUND	SPIKE	MSD	MSD	%	QC LIMITS	
	ADDED	CONCENTRATION	%	RPD #	RPD	REC
	UG/L	UG/L	REC #	RPD #		
gamma-BHC (Lindane)	0.200	0.180	90	0	15	56 -127
Heptachlor	0.200	0.150	75	6	20	50 -129
Aldrin	0.200	0.170	85	6	22	48 -133
Dieldrin	0.500	0.480	96	0	18	57 -131
Endrin	0.500	0.480	96	0	21	46 -150
4,4'-DDT	0.500	0.470	94	0	27	38 -138

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

RPD: 0 out of 6 outside limitsSpike Recovery: 0 out of 12 outside limits

COMMENTS:

M
11/2/97

PESTICIDE METHOD BLANK SUMMARY

Name: Recra.LabNet Contract: 1901-01-03
 Site No.: USACE-DEAL TEST SITE
 Lab Sample ID: 97LE1832-MB1 Lab File ID: 10209709 .32
 Matrix:(Soil/Water) SOIL Level:(low/med) LOW
 Date Extracted: 10/06/97 Extraction:(SepF/Cont/Sonc) SONC
 Date Analyzed (1): 10/21/97 Date Analyzed (2): 10/21/97
 Time Analyzed (1): 1526 Time Analyzed (2): 1526
 Instrument ID (1): 09 Instrument ID (2): 10
 GC Column ID (1): DB608 GC Column ID (2): RTX1701

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS AND MSD:

	CLIENT SAMPLE NO.	LAB SAMPLE ID	DATE ANALYZED 1	DATE ANALYZED 2
01	S1	9710L573-001	10/23/97	10/23/97
02	S2	9710L573-002	10/23/97	10/23/97
03	S3	9710L573-003	10/22/97	10/22/97
04	S4	9710L573-004	10/23/97	10/23/97
05	S4MS	9710L573-004S	10/23/97	10/23/97
06	S4MSD	9710L573-004T	10/23/97	10/23/97
07	S5	9710L573-005	10/23/97	10/23/97
08	S6	9710L573-006	10/24/97	10/24/97
09	PBLKBDLE1832-MB1 BS	97LE1832-MB1S	10/21/97	10/21/97

COMMENTS:

gm
11/2/97

PESTICIDE METHOD BLANK SUMMARY

Lab Name: Recra.LabNetContract: 1901-01-03Case No.: USACE-DEAL TEST SITELab Sample ID: 97LE1828-MB1Lab File ID: 10119709 .35Matrix: (Soil/Water) WATERLevel: (low/med) LOWDate Extracted: 10/05/97Extraction: (SepF/Cont/Sonc) CONTDate Analyzed (1): 10/12/97Date Analyzed (2): 10/12/97Time Analyzed (1): 1705Time Analyzed (2): 1705Instrument ID (1): 09Instrument ID (2): 10GC Column ID (1): DB608GC Column ID (2): RTX1701

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS AND MSD:

	CLIENT SAMPLE NO.	LAB SAMPLE ID	DATE ANALYZED 1	DATE ANALYZED 2
01	GW1	9710L573-007	10/13/97	10/13/97
02	GW2	9710L573-008	10/17/97	10/17/97
03	FB-1	9710L573-009	10/13/97	10/13/97
04	PBLKAALE1828-MB1 BS	97LE1828-MB1S	10/12/97	10/12/97
05	PBLKAALE1828-MB1 BSD	97LE1828-MB1T	10/12/97	10/12/97

COMMENTS:

m
11/2/97



a division of Recra Environmental, Inc.

Virtual Laboratories Everywhere

Recra LabNet Philadelphia Analytical Report

Client : USACE-DEAL TEST SITE
RFW# : 9710L600

W.O. #: 11901-001-003-0001-00
Date Received: 10-02-97

PESTICIDE/PCB

1. The set of samples consisted of six (6) water samples and seven (7) soil samples collected on 10-01-97.
2. The samples and their associated QC samples were extracted on 10-06,07-97 and analyzed based on SW846, 3rd Edition, procedures on 10-21,22,24,28-97. The extraction procedure used was based on Methods 3520 and 3540 and the extracts were analyzed based on Method 8081.
3. The cooler temperature upon receipt has been recorded on the chain-of-custody.
4. All required holding times for extraction and analysis were met.
5. The soil samples and their associated QC samples received a sulfur cleanup.
6. The method blank was below the reporting limits for all target compounds.
7. One (1) of twenty-two (22) obtainable surrogate recoveries were outside QC limits; however, the surrogate recovery acceptance criteria were met (i.e., no more than one outlier per sample).
8. All blank spike recoveries were within acceptance criteria.
9. Matrix spike analyses for the soil samples are associated with RFW lot 9710L573. Matrix spike recoveries were unobtainable for these samples, due to the dilutions required for analyses. A copy of the Sample Discrepancy Report (SDR) has been enclosed.
10. The following samples required instrument dilutions due to chromatographic anomalies:

<u>Sample ID</u>	<u>Dilution Factor</u>
S7	10
S8	50
S9	10
S10	50
S11	10
SD1	10
SD2	10

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 19 pages.

9. All initial calibrations associated with this data set were within acceptance criteria.
10. All continuing calibration standards analyzed prior to sample extracts were within acceptance criteria, with the exception of target compound delta-BHC analyzed on 10-21,24-97 on the primary and secondary columns. The data reflected an increase in instrument response, so the ability to identify delta-BHC was not impaired. Since quantitation was not required, the data should not be impacted. A copy of the Sample Discrepancy Report (SDR) has been enclosed.

FOR *Bruce C. Miller unit leader*
J. Michael Taylor
Vice President and Laboratory Manager
Lionville Analytical Laboratory

jeh\pcb\10-600.608

11-13-97
Date

002



GLOSSARY OF PESTICIDE/PCB DATA

DATA QUALIFIERS

- U** = Indicates that the compound was analyzed for but not detected. The minimum detection limit for the sample (not the method detection limit) is reported with the U (e.g., 10U).
- J** = Indicates an estimated value. This flag is used in cases where a target analyte is detected at a level less than the lower quantification level. If the limit of quantification is 10 ug/L and a concentration of 3 ug/L is calculated, it is reported as 3J.
- B** = This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates possible/probable blank contamination.
- E** = Indicates that the compound was detected beyond the calibration range and was subsequently analyzed at a dilution.
- I** = Interference.

ABBREVIATIONS

- BS** = Indicates blank spike in which reagent grade water is spiked with the CLP matrix spiking solutions and carried through all the steps in the method. Spike recoveries are reported.
- BSD** = Indicates blank spike duplicate.
- MS** = Indicates matrix spike.
- MSD** = Indicates matrix spike duplicate.
- DL** = Indicates that recoveries were not obtained because the extract had to be diluted for analysis.
- NA** = Not Applicable.
- DF** = Dilution Factor.
- NR** = Not Required.
- SP** = Indicates Spiked Compound.

GLOSSARY OF PESTICIDE/PCB DATA

- P** = This flag is used for a pesticide/Aroclor target analyte when there is greater than 25% difference for detected concentrations between the two GC columns (see Form X). The lower of the two values is reported on Form I and flagged with a "P".
- D** = This flag identifies all compounds identified in an analysis at a secondary dilution factor.
- C** = This flag applies to a compound that has been confirmed by GC/MS.

Recra LabNet Philadelphia Sample Discrepancy Report (SDR) SDR #: 976C27

Initiator: Deb Kasdras RFW Batch: 9710L573, 600 Parameter: DL08H
 Date: 10/27/97 Samples: -101 runs Matrix: soil
 Client: USACE-DEAW Method: SW846/MCAWW/CLP/ Prep Batch: 97LE1832

1. Reason for SDR

a. COC Discrepancy Tech Profile Error Client Request Sampler Error on C-O-C
 Transcription Error Wrong Test Code Other _____

b. General Discrepancy

Missing Sample/Extract Container Broken Wrong Sample Pulled Label ID's Illegible
 Hold Time Exceeded Insufficient Sample Preservation Wrong Received Past hold
 Improper Bottle Type Not Amenable to Analysis

Note: Verified by [Log-In] or [Prep Group] (circle)...signature/date: _____

c. QC Problem (Include all relevant specific results; attach data if necessary)

fyi - Samples had to be run at detection of 10x or 50x due to chromatographic anomalies

2. Known or Probable Causes(s)

3. Discussion and Proposed Action

Other Description:

- Re-log
- Entire Batch
- Following Samples: _____
- Re-leach
- Re-extract
- Re-digest
- Revise EDD
- Change Test Code to _____
- Place On/Take Off Hold (circle)

note in narrative

4. Project Manager Instructions...signature/date: _____

- Concur with Proposed Action
- Disagree with Proposed Action; See Instruction
- Include in Case Narrative
- Client Contacted:
- Date/Person _____
- Add
- Cancel

[Signature] 10/27/97

5. Final Action...signature/date: Deborah Kasdras

Other Explanation:

- Verified re-[log][leach][extract][digest][analysis] (circle) 10/29/97
- Included in Case Narrative
- Hard Copy COC Revised
- Electronic COC Revised
- EDD Corrections Completed

When Final Action has been recorded, forward original to QA Specialist for distribution and filing.

Route	Distribution of Completed SDR	Route	Distribution of Completed SDR
<input checked="" type="checkbox"/>	Initiator <u>Deb Kasdras</u>	<input type="checkbox"/>	Metals: Doughty
<input checked="" type="checkbox"/>	Lab Manager: J. Michael Taylor	<input type="checkbox"/>	Inorganic: Perrone/Leonards
<input checked="" type="checkbox"/>	Project Mgr: <u>Mike Young</u>	<input type="checkbox"/>	GC/LC: Jarvis/Skrzat/Schnell
<input checked="" type="checkbox"/>	Section Mgr: <u>Siery/Durke/Daniels</u>	<input type="checkbox"/>	MS: LeMin/McIntyre/Taylor/Kasdras/Steele
<input type="checkbox"/>	QA File: Feldman/Racioppi/Basuthakur	<input type="checkbox"/>	Log-in: Dodson
<input type="checkbox"/>	Data Management: Miller	<input type="checkbox"/>	Admin: Brewer/Keehn/Shafer
<input type="checkbox"/>	Sample Prep: Schnell/Swisher	<input type="checkbox"/>	Other: _____

Initiator: Deb Kasdras RFW Batch: 97104600
 Date: 10/31/97 Samples: -001
 Client: USACE-Deal Method: SW846/MCAWW/CLP/
Test Site -

Parameter: 0608H
 Matrix: Soil
 Prep Batch: 97UE1832

1. Reason for SDR

- a. COC Discrepancy Tech Profile Error Client Request Sampler Error on C-O-C
 Transcription Error Wrong Test Code Other _____
- b. General Discrepancy
 Missing Sample/Extract Container Broken Wrong Sample Pulled Label ID's Illegible
 Hold Time Exceeded Insufficient Sample Preservation Wrong Received Past Hold
 Improper Bottle Type Not Amenable to Analysis

Note: Verified by [Log-In] or [Prep Group] (circle)...signature/date: _____

c. QC Problem (Include all relevant specific results; attach data if necessary)

The client specified that there was to be an MS, MSD on sample -001 and none was extracted

2. Known or Probable Causes(s)

~~_____~~
~~_____~~
 Scheduling error.

3. Discussion and Proposed Action

- Re-log
 Entire Batch
 Following Samples: _____
 Re-leach
 Re-extract
 Re-digest
 Revise EDD
 Change Test Code to _____
 Place On/Take Off Hold (circle)

Other Description:

note in narrative - no useful information would have come from it anyway - -001 had to be diluted 1:10 and no spikes would have been recovered at this level.

4. Project Manager Instructions...signature/date: _____

- Concur with Proposed Action
 Disagree with Proposed Action; See Instruction
 Include in Case Narrative
 Client Contacted:
 Date/Person _____
 Add
 Cancel

[Signature] 10/31/97

5. Final Action...signature/date: Deborah A. Kasdra

- Verified re-[log][leach][extract][digest][analysis] (circle)
 Included in Case Narrative
 Hard Copy COC Revised
 Electronic COC Revised
 EDD Corrections Completed

Other Explanation:

10/21/97

When Final Action has been recorded, forward original to QA Specialist for distribution and filing.

Route	Distribution of Completed SDR	Route	Distribution of Completed SDR
<input checked="" type="checkbox"/>	X Initiator <u>Deb Kasdras</u>	<input type="checkbox"/>	Metals: Doughty
<input checked="" type="checkbox"/>	X Lab Manager: <u>J. Michael Taylor</u>	<input type="checkbox"/>	Inorganic: Perrone/Leonards
<input checked="" type="checkbox"/>	X Project Mgr: <u>[Signature]</u>	<input type="checkbox"/>	GC/LC: Jarvis/Skrzat/Schnell
<input checked="" type="checkbox"/>	X Section Mgr: <u>Siery/Durke/Daniels</u>	<input type="checkbox"/>	MS: LeMin/McIntyre/Taylor/Kasdras/Steele
<input checked="" type="checkbox"/>	X QA File: <u>Feldman/Racioppi/Basuthakur</u>	<input type="checkbox"/>	Log-in: Dodson
<input type="checkbox"/>	Data Management: <u>Miller</u>	<input type="checkbox"/>	Admin: Brewer/Keehn/Shafer
<input type="checkbox"/>	Sample Prep: <u>Schnell/Swisher</u>	<input type="checkbox"/>	Other: _____

Recra LabNet - Lionville Laboratory

Pesticide/PCBs by GC, CLP List

Report Date: 10/31/97 11:23

RFW Batch Number: 9710L600

Client: USACE-DEAL TEST SITE

Work Order: 11901001003 Page: 1

Cust ID:	S7	S8	S9	S10	S11	GW3	
Sample Information	RFW#: 001	002	003	004	005	007	
	Matrix: SOIL	SOIL	SOIL	SOIL	SOIL	WATER	
	D.F.: 10.0	50.0	10.0	50.0	10.0	1.00	
	Units: UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/L	
Surrogate:	Decachlorobiphenyl	D %	D %	D %	D %	D %	49 %
	Tetrachloro-m-xylene	D %	D %	D %	D %	D %	38 %
=====fl=====fl=====fl=====fl=====fl=====fl=====fl=====							
Alpha-BHC	45 U	110 U	40 U	100 U	31 U	0.057 U	
Beta-BHC	45 U	110 U	40 U	100 U	31 U	0.057 U	
Delta-BHC	45 U	110 U	40 U	100 U	31 U	0.057 U	
gamma-BHC (Lindane)	45 U	110 U	40 U	100 U	31 U	0.057 U	
Heptachlor	45 U	110 U	40 U	100 U	31 U	0.057 U	
Aldrin	45 U	110 U	40 U	100 U	31 U	0.057 U	
Heptachlor epoxide	45 U	110 U	40 U	100 U	31 U	0.057 U	
Endosulfan I	45 U	110 U	40 U	100 U	31 U	0.057 U	
Dieldrin	90 U	210 U	81 U	210 U	62 U	0.11 U	
4,4'-DDE	90 U	210 U	81 U	210 U	62 U	0.11 U	
Endrin	90 U	210 U	81 U	210 U	62 U	0.11 U	
Endosulfan II	90 U	210 U	81 U	210 U	62 U	0.11 U	
4,4'-DDD	90 U	210 U	81 U	210 U	62 U	0.11 U	
Endosulfan sulfate	90 U	210 U	81 U	210 U	62 U	0.11 U	
4,4'-DDT	90 U	210 U	81 U	210 U	62 U	0.11 U	
Methoxychlor	450 U	1100 U	400 U	1000 U	310 U	0.57 U	
Endrin ketone	90 U	210 U	81 U	210 U	62 U	0.11 U	
Endrin aldehyde	90 U	210 U	81 U	210 U	62 U	0.11 U	
alpha-Chlordane	45 U	110 U	40 U	100 U	31 U	0.057 U	
gamma-Chlordane	45 U	110 U	40 U	100 U	31 U	0.057 U	
Toxaphene	4500 U	11000 U	4000 U	10000 U	3100 U	5.7 U	
Aroclor-1016	900 U	2100 U	810 U	2100 U	620 U	1.1 U	
Aroclor-1221	1800 U	4300 U	1600 U	4100 U	1200 U	2.3 U	
Aroclor-1232	900 U	2100 U	810 U	2100 U	620 U	1.1 U	
Aroclor-1242	900 U	2100 U	810 U	2100 U	620 U	1.1 U	
Aroclor-1248	900 U	2100 U	810 U	2100 U	620 U	1.1 U	
Aroclor-1254	900 U	2100 U	810 U	2100 U	620 U	1.1 U	
Aroclor-1260	900 U	2100 U	810 U	2100 U	620 U	1.1 U	

U= Analyzed, not detected. J= Present below detection limit. B= Present in blank. NR= Not reported. NS= Not spiked.
 %= Percent recovery. D= Diluted out. I= Interference. NA= Not Applicable. *= Outside of EPA CLP QC

Handwritten: 9/11-05-97

1007

Cust ID:	GW4	GW5	FB03	SW1	SW2	SD1	
Sample Information	RFW#: 008	009	011	013	014	015	
	Matrix: WATER	WATER	WATER	WATER	WATER	SOIL	
	D.F.: 1.00	1.00	1.00	1.00	1.00	10.0	
	Units: UG/L	UG/L	UG/L	UG/L	UG/L	UG/KG	
Surrogate:	Decachlorobiphenyl	52 %	58 %	61 %	76 %	78 %	D %
	Tetrachloro-m-xylene	22 * %	42 %	58 %	35 %	27 %	D %
=====fl=====fl=====fl=====fl=====fl=====fl=====fl=====							
Alpha-BHC	0.064 U	0.057 U	0.051 U	0.057 U	0.057 U	0.057 U	22 U
Beta-BHC	0.064 U	0.057 U	0.051 U	0.057 U	0.057 U	0.057 U	22 U
Delta-BHC	0.064 U	0.057 U	0.051 U	0.057 U	0.057 U	0.057 U	22 U
gamma-BHC (Lindane)	0.064 U	0.057 U	0.051 U	0.057 U	0.057 U	0.057 U	22 U
Heptachlor	0.064 U	0.057 U	0.051 U	0.057 U	0.057 U	0.057 U	22 U
Aldrin	0.064 U	0.057 U	0.051 U	0.057 U	0.057 U	0.057 U	22 U
Heptachlor epoxide	0.064 U	0.057 U	0.051 U	0.057 U	0.057 U	0.057 U	22 U
Endosulfan I	0.064 U	0.057 U	0.051 U	0.057 U	0.057 U	0.057 U	22 U
Dieldrin	0.13 U	0.11 U	0.10 U	0.11 U	0.11 U	0.11 U	44 U
4,4'-DDE	0.13 U	0.11 U	0.10 U	0.11 U	0.11 U	0.11 U	44 U
Endrin	0.13 U	0.11 U	0.10 U	0.11 U	0.11 U	0.11 U	44 U
Endosulfan II	0.13 U	0.11 U	0.10 U	0.11 U	0.11 U	0.11 U	44 U
4,4'-DDD	0.13 U	0.11 U	0.10 U	0.11 U	0.11 U	0.11 U	44 U
Endosulfan sulfate	0.13 U	0.11 U	0.10 U	0.11 U	0.11 U	0.11 U	44 U
4,4'-DDT	0.13 U	0.11 U	0.10 U	0.11 U	0.11 U	0.11 U	44 U
Methoxychlor	0.64 U	0.57 U	0.51 U	0.57 U	0.57 U	0.57 U	220 U
Endrin ketone	0.13 U	0.11 U	0.10 U	0.11 U	0.11 U	0.11 U	44 U
Endrin aldehyde	0.13 U	0.11 U	0.10 U	0.11 U	0.11 U	0.11 U	44 U
alpha-Chlordane	0.064 U	0.057 U	0.051 U	0.057 U	0.057 U	0.057 U	22 U
gamma-Chlordane	0.064 U	0.057 U	0.051 U	0.057 U	0.057 U	0.057 U	22 U
Toxaphene	6.4 U	5.7 U	5.1 U	5.7 U	5.7 U	5.7 U	2200 U
Aroclor-1016	1.3 U	1.1 U	1.0 U	1.1 U	1.1 U	1.1 U	440 U
Aroclor-1221	2.5 U	2.3 U	2.0 U	2.3 U	2.3 U	2.3 U	870 U
Aroclor-1232	1.3 U	1.1 U	1.0 U	1.1 U	1.1 U	1.1 U	440 U
Aroclor-1242	1.3 U	1.1 U	1.0 U	1.1 U	1.1 U	1.1 U	440 U
Aroclor-1248	1.3 U	1.1 U	1.0 U	1.1 U	1.1 U	1.1 U	440 U
Aroclor-1254	1.3 U	1.1 U	1.0 U	1.1 U	1.1 U	1.1 U	440 U
Aroclor-1260	1.3 U	1.1 U	1.0 U	1.1 U	1.1 U	1.1 U	440 U

U= Analyzed, not detected. J= Present below detection limit. B= Present in blank. NR= Not reported. NS= Not spiked.
 %= Percent recovery. D= Diluted out. I= Interference. NA= Not Applicable. *= Outside of EPA CLP QC

Handwritten signature and date: 11-05-97

800

Recra LabNet - Lionville Laboratory

Pesticide/PCBs by GC, CLP List

Report Date: 10/31/97 11:23

RFW Batch Number: 9710L600

Client: USACE-DEAL TEST SITE

Work Order: 11901001003 Page: 3

Sample Information	Cust ID:	SD2	PBLKBD	PBLKBD BS	PBLKAN	PBLKAN BS	PBLKAN BSD							
RFW#:	016	97LE1832-MB1	97LE1832-MB1	97LE1851-MB1	97LE1851-MB1	97LE1851-MB1	97LE1851-MB1							
Matrix:	SOIL	SOIL	SOIL	WATER	WATER	WATER								
D.F.:	10.0	1.00	1.00	1.00	1.00	1.00	1.00							
Units:	UG/KG	UG/KG	UG/KG	UG/L	UG/L	UG/L	UG/L							
Surrogate:	Decachlorobiphenyl	D	%	94	%	99	%	76	%	73	%	75	%	
	Tetrachloro-m-xylene	D	%	80	%	85	%	40	%	42	%	45	%	
=====fl=====fl=====fl=====fl=====fl=====fl=====fl=====														
Alpha-BHC	21	U	1.7	U	1.7	U	0.050	U	0.050	U	0.050	U	0.050	U
Beta-BHC	21	U	1.7	U	1.7	U	0.050	U	0.050	U	0.050	U	0.050	U
Delta-BHC	21	U	1.7	U	1.7	U	0.050	U	0.050	U	0.050	U	0.050	U
gamma-BHC (Lindane)	21	U	1.7	U	95	%	0.050	U	85	%	85	%	85	%
Heptachlor	21	U	1.7	U	100	%	0.050	U	65	%	65	%	65	%
Aldrin	21	U	1.7	U	100	%	0.050	U	60	%	60	%	60	%
Heptachlor epoxide	21	U	1.7	U	1.7	U	0.050	U	0.050	U	0.050	U	0.050	U
Endosulfan I	21	U	1.7	U	1.7	U	0.050	U	0.050	U	0.050	U	0.050	U
Dieldrin	42	U	3.3	U	102	%	0.10	U	92	%	92	%	92	%
4,4'-DDE	42	U	3.3	U	3.3	U	0.10	U	0.10	U	0.10	U	0.10	U
Endrin	42	U	3.3	U	106	%	0.10	U	96	%	92	%	92	%
Endosulfan II	42	U	3.3	U	3.3	U	0.10	U	0.10	U	0.10	U	0.10	U
4,4'-DDD	42	U	3.3	U	3.3	U	0.10	U	0.10	U	0.10	U	0.10	U
Endosulfan sulfate	42	U	3.3	U	3.3	U	0.10	U	0.10	U	0.10	U	0.10	U
4,4'-DDT	42	U	3.3	U	102	%	0.10	U	100	%	90	%	90	%
Methoxychlor	210	U	17	U	17	U	0.50	U	0.50	U	0.50	U	0.50	U
Endrin ketone	42	U	3.3	U	3.3	U	0.10	U	0.10	U	0.10	U	0.10	U
Endrin aldehyde	42	U	3.3	U	3.3	U	0.10	U	0.10	U	0.10	U	0.10	U
alpha-Chlordane	21	U	1.7	U	1.7	U	0.050	U	0.050	U	0.050	U	0.050	U
gamma-Chlordane	21	U	1.7	U	1.7	U	0.050	U	0.050	U	0.050	U	0.050	U
Toxaphene	2100	U	170	U	170	U	5.0	U	5.0	U	5.0	U	5.0	U
Aroclor-1016	420	U	33	U	33	U	1.0	U	1.0	U	1.0	U	1.0	U
Aroclor-1221	850	U	67	U	67	U	2.0	U	2.0	U	2.0	U	2.0	U
Aroclor-1232	420	U	33	U	33	U	1.0	U	1.0	U	1.0	U	1.0	U
Aroclor-1242	420	U	33	U	33	U	1.0	U	1.0	U	1.0	U	1.0	U
Aroclor-1248	420	U	33	U	33	U	1.0	U	1.0	U	1.0	U	1.0	U
Aroclor-1254	420	U	33	U	33	U	1.0	U	1.0	U	1.0	U	1.0	U
Aroclor-1260	420	U	33	U	33	U	1.0	U	1.0	U	1.0	U	1.0	U

U= Analyzed, not detected. J= Present below detection limit. B= Present in blank. NR= Not reported. NS= Not spiked.
 %= Percent recovery. D= Diluted out. I= Interference. NA= Not Applicable. *= Outside of EPA CLP QC

Handwritten signature and date:
 RW
 11-05-97

600

Recra LabNet - Lionville Laboratory
 PEST/PCB ANALYTICAL DATA PACKAGE FOR
 USACE-DEAL TEST SITE

DATE RECEIVED: 10/02/97

RFW LOT # :9710L600

CLIENT ID	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
S7	001	S	97LE1832	10/01/97	10/06/97	10/22/97
S8	002	S	97LE1832	10/01/97	10/06/97	10/24/97
S9	003	S	97LE1832	10/01/97	10/06/97	10/22/97
S10	004	S	97LE1832	10/01/97	10/06/97	10/28/97
S11	005	S	97LE1832	10/01/97	10/06/97	10/22/97
GW3	007	W	97LE1851	10/01/97	10/07/97	10/22/97
GW4	008	W	97LE1851	10/01/97	10/07/97	10/22/97
GW5	009	W	97LE1851	10/01/97	10/07/97	10/22/97
FB03	011	W	97LE1851	10/01/97	10/07/97	10/22/97
SW1	013	W	97LE1851	10/01/97	10/07/97	10/22/97
SW2	014	W	97LE1851	10/01/97	10/07/97	10/22/97
SD1	015	S	97LE1832	10/01/97	10/06/97	10/22/97
SD2	016	S	97LE1832	10/01/97	10/06/97	10/22/97

LAB QC:

PBLKBD	MB1	S	97LE1832	N/A	10/06/97	10/21/97
PBLKBD	MB1 BS	S	97LE1832	N/A	10/06/97	10/21/97
PBLKAN	MB1	W	97LE1851	N/A	10/07/97	10/22/97
PBLKAN	MB1 BS	W	97LE1851	N/A	10/07/97	10/22/97
PBLKAN	MB1 BSD	W	97LE1851	N/A	10/07/97	10/22/97

90
11-05-97

2E
WATER PESTICIDE SURROGATE RECOVERY

Lab Name: Recra.LabNet

Contract: 1901-01-03

Case No.: USACE-DEAL TEST SITE

RFW Lot No.: 9710L600

	CLIENT SAMPLE NO.	S1 (DCB) #	OTHER TCX
01	GW3	49	38
02	GW4	52	22 *
03	GW5	58	42
04	FB03	61	58
05	SW1	76	35
06	SW2	78	27
07	PBLKANLE1851-MB1	76	40
08	PBLKANLE1851-MB1 BS	73	42
09	PBLKANLE1851-MB1 BSD	75	45

ADVISORY
QC LIMITS
(22-126)
(27-129)

S1 (DCB) = Decachlorobiphenyl
S2 (TCX) = Tetrachloro-m-xylene

Column to be used to flag recovery values
* Values outside of QC limits
D Surrogates diluted out

gn
11-05-77

2F
SOIL PESTICIDE SURROGATE RECOVERY

Lab Name: Recra.LabNet

Contract: 1901-01-03

Case No.: USACE-DEAL TEST SITE

RFW Lot No.: 9710L600

	CLIENT SAMPLE NO.	S1 (DCB)#	OTHER TCX
01	S7	D	D
02	S8	D	D
03	S9	D	D
04	S10	D	D
05	S11	D	D
06	SD1	D	D
07	SD2	D	D
08	PBLKBDLE1832-MB1	94	80
09	PBLKBDLE1832-MB1 BS	99	85

ADVISORY
QC LIMITS
(38-122)
(28-118)

S1 (DCB) = Decachlorobiphenyl
S2 (TCX) = Tetrachloro-m-xylene

Column to be used to flag recovery values
* Values outside of QC limits
D Surrogates diluted out

9/11-05-97

3F
SOIL PESTICIDE MATRIX SPIKE RECOVERY

Lab Name: Recra.LabNet

Contract: 1901-01-03

Case No.: USACE-DEAL TEST SITE

RFW Lot No.: 9710L600

MATRIX Spike - Sample No.: PBLKBDLE1832-MB1

Level: (low/med) LOW

COMPOUND	SPIKE	SAMPLE	MS	MS	QC
	ADDED	CONCENTRATION	CONCENTRATION	%	LIMITS
	UG/KG	UG/KG	UG/KG	REC #	REC
gamma-BHC (Lindane)	6.67	0	6.33	95	30 -125
Heptachlor	6.67	0	6.67	100	37 -126
Aldrin	6.67	0	6.67	100	27 -133
Dieldrin	16.7	0	17.0	102	40 -125
Endrin	16.7	0	17.7	106	45 -130
4,4'-DDT	16.7	0	17.0	102	33 -123

Column to be used to flag recovery value with an asterisk
* Values outside of QC limits

Spike Recovery: 0 out of 6 outside limits

COMMENTS:

N
11-05-97

WATER PESTICIDE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Name: Recra.LabNetContract: 1901-01-03Site No.: USACE-DEAL TEST SITERFW Lot No.: 9710L600MATRIX Spike - Sample No.: PBLKANLE1851-MB1Level: (low/med) LOW

COMPOUND	SPIKE	SAMPLE	MS	MS	QC
	ADDED	CONCENTRATION	CONCENTRATION	%	LIMITS
	UG/L	UG/L	UG/L	REC #	REC
gamma-BHC (Lindane)	0.200	0	0.170	85	56 -127
Heptachlor	0.200	0	0.130	65	50 -129
Aldrin	0.200	0	0.120	60	48 -133
Dieldrin	0.500	0	0.460	92	57 -131
Endrin	0.500	0	0.480	96	46 -150
4,4'-DDT	0.500	0	0.500	100	38 -138

COMPOUND	SPIKE	MSD	MSD	%	QC LIMITS	
	ADDED	CONCENTRATION	%	%	RPD	REC
	UG/L	UG/L	REC #	RPD #	RPD	REC
gamma-BHC (Lindane)	0.200	0.170	85	0	15	56 -127
Heptachlor	0.200	0.130	65	0	20	50 -129
Aldrin	0.200	0.120	60	0	22	48 -133
Dieldrin	0.500	0.460	92	0	18	57 -131
Endrin	0.500	0.460	92	4	21	46 -150
4,4'-DDT	0.500	0.450	90	10	27	38 -138

Column to be used to flag recovery and RPD values with an asterisk
 * Values outside of QC limits

RPD: 0 out of 6 outside limitsSpike Recovery: 0 out of 12 outside limits

COMMENTS:

mw
11-05-97

PESTICIDE METHOD BLANK SUMMARY

Lab Name: Recra.LabNetContract: 1901-01-03Case No.: USACE-DEAL TEST SITELab Sample ID: 97LE1832-MB1Lab File ID: 10209709 .32Matrix:(Soil/Water) SOILLevel:(low/med) LOWDate Extracted: 10/06/97Extraction:(SepF/Cont/Sonc) SONCDate Analyzed (1): 10/21/97Date Analyzed (2): 10/21/97Time Analyzed (1): 1526Time Analyzed (2): 1526Instrument ID (1): 09Instrument ID (2): 10GC Column ID (1): DB608GC Column ID (2): RTX1701

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS AND MSD:

	CLIENT SAMPLE NO.	LAB SAMPLE ID	DATE ANALYZED 1	DATE ANALYZED 2
01	S7	9710L600-001	10/22/97	10/22/97
02	S8	9710L600-002	10/24/97	10/24/97
03	S9	9710L600-003	10/22/97	10/22/97
04	S10	9710L600-004	10/28/97	10/28/97
05	S11	9710L600-005	10/22/97	10/22/97
06	SD1	9710L600-015	10/22/97	10/22/97
07	SD2	9710L600-016	10/22/97	10/22/97
08	PBLKBDLE1832-MB1 BS	97LE1832-MB1S	10/21/97	10/21/97

COMMENTS:

pw
11-05-97

4C
PESTICIDE METHOD BLANK SUMMARY

Lab Name: Recra.LabNet Contract: 1901-01-03
 Case No.: USACE-DEAL TEST SITE
 Lab Sample ID: 97LE1851-MB1 Lab File ID: 10209735 .47
 Matrix: (Soil/Water) WATER Level: (low/med) LOW
 Date Extracted: 10/07/97 Extraction: (SepF/Cont/Sonc) CONT
 Date Analyzed (1): 10/22/97 Date Analyzed (2): 10/22/97
 Time Analyzed (1): 0120 Time Analyzed (2): 0120
 Instrument ID (1): 35 Instrument ID (2): 36
 GC Column ID (1): B608 GC Column ID (2): TX1701

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS AND MSD:

	CLIENT SAMPLE NO.	LAB SAMPLE ID	DATE ANALYZED 1	DATE ANALYZED 2
	=====	=====	=====	=====
01	GW3	9710L600-007	10/22/97	10/22/97
02	GW4	9710L600-008	10/22/97	10/22/97
03	GW5	9710L600-009	10/22/97	10/22/97
04	FB03	9710L600-011	10/22/97	10/22/97
05	SW1	9710L600-013	10/22/97	10/22/97
06	SW2	9710L600-014	10/22/97	10/22/97
07	PBLKANLE1851-MB1 BS	97LE1851-MB1S	10/22/97	10/22/97
08	PBLKANLE1851-MB1 BSD	97LE1851-MB1T	10/22/97	10/22/97

COMMENTS:

ju
11-05-97



a division of Recra Environmental, Inc.

Virtual Laboratories Everywhere

Recra LabNet Philadelphia Analytical Report

Client : USACE-DEAL TEST SITE
RFW# : 9710L600

W.O.# : 11901-001-003-0001-00
Date Received: 10-02-97

METALS CASE NARRATIVE

1. This narrative covers the analyses of 7 soil and 11 water samples.
2. Samples were prepared and analyzed in accordance with methods checked on the attached glossary.
3. All analyses were performed within the required holding times.
4. The cooler temperatures have been recorded on the Chain of Custody.
5. All Initial and Continuing Calibration Verifications (ICV/CCVs) were within control limits.
6. All Initial and Continuing Calibration Blanks (ICB/CCBs) were within control limits.
7. All preparation/method blanks were within method criteria. Refer to the Inorganics Method Blank Data Summary.
8. All ICP Interference Check Standards were within control limits.
9. All laboratory control samples (LCS) were within the laboratory control limits with the exception of 97L2146-LC1 for Silver at 92.8% (range 93.6-106.4%) and Lead at 91.1% (range 92.2-107.1%). The soil sample results could be biased low for Silver and Lead. Refer to the Inorganics Laboratory Control Standards Report.
10. All matrix spike (MS) and matrix spike duplicate (MSD) recoveries (sample SW1) were within the 80-120% control limits. The MS and MSD recoveries (sample S7) for 1 analyte were outside the 80-120% control limits. Refer to the Inorganics Accuracy Report.

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 16 pages.

001

11. For analytes where the ICP MS is out-of-control, a post-digestion MS (PDS) and serial dilution are performed. An interference test is performed on GFAA analytes. A PDS was prepared at meaningful concentration levels, due to high concentrations of the following analyte:

<u>Sample ID</u>	<u>Element</u>	<u>PDS Concentration (ppb)</u>	<u>PDS % Recovery</u>
S7	Silver	200	96.1

11. All MSs and MSDs were within the 20% Relative Percent Difference (RPD) control limits. Refer to the Inorganics Matrix Spike Duplicate Report.
12. The duplicate analyses for 1 analyte (sample SW1) and 5 analytes (sample S7) were outside the 20% RPD control limits. Refer to the Inorganics Precision Report.
13. For the purposes of this report, the data has been reported to the Instrument Detection Limit (IDL). Values between the IDL and the Practical Quantitation Limit (PQL) are acquired in a region of less-certain quantification.

Bruce C. Taylor unit leader
 J. Michael Taylor
 Vice President and Laboratory Manager
 Lionville Analytical Laboratory

skl/m10-600

11-12-27
 Date



METALS METHODS GLOSSARY

The following methods are used as reference for the digestion and analysis of samples contained within the RFW Lot#: 9710L600

Leaching Procedure: 1310 1311 1312 Other: _____

CLP Metals Digestion and Analysis Methods: ILM03.0 ILM04.0

Metals Digestion Methods: 3005A 3010A 3015 3020A 3050A 3051 200.7 SS17
 Other: _____

Metals Analysis Methods

	SW846	EPA	STD MTD	EPA OSWR	USATHAMA
Aluminum	<u> </u> 6010A	<u> </u> 200.7			<u> </u> 99
Antimony	<u> </u> 6010A <u> </u> 7041 ⁵	<u> </u> 200.7 <u> </u> 204.2			<u> </u> 99
Arsenic	<input checked="" type="checkbox"/> 6010A <u> </u> 7060A ⁵	<u> </u> 200.7 <u> </u> 206.2	<u> </u> 3113B		<u> </u> 99
Barium	<input checked="" type="checkbox"/> 6010A	<u> </u> 200.7			<u> </u> 99
Beryllium	<u> </u> 6010A	<u> </u> 200.7			<u> </u> 99
Bismuth	<u> </u> 6010A ¹	<u> </u> 200.7 ¹			<u> </u> 99
Boron	<u> </u> 6010A ¹	<u> </u> 200.7		<u> </u> 1620	<u> </u> 99
Cadmium	<input checked="" type="checkbox"/> 6010A <u> </u> 7131A ⁵	<u> </u> 200.7 <u> </u> 213.2			<u> </u> 99
Calcium	<u> </u> 6010A	<u> </u> 200.7			<u> </u> 99
Chromium	<input checked="" type="checkbox"/> 6010A <u> </u> 7191 ⁵	<u> </u> 200.7 <u> </u> 218.2			<u> </u> 99
Cobalt	<u> </u> 6010A	<u> </u> 200.7			<u> </u> SS17
Copper	<u> </u> 6010A <u> </u> 7211 ⁵	<u> </u> 200.7 <u> </u> 220.2			<u> </u> 99
Iron	<u> </u> 6010A	<u> </u> 200.7			<u> </u> 99
Lead	<input checked="" type="checkbox"/> 6010A <u> </u> 7421 ⁵	<u> </u> 200.7 <u> </u> 239.2	<u> </u> 3113B		<u> </u> 99
Lithium	<u> </u> 6010A <u> </u> 7430 ⁴	<u> </u> 200.7			<u> </u> 99
Magnesium	<u> </u> 6010A	<u> </u> 200.7		<u> </u> 1620	<u> </u> 99
Manganese	<u> </u> 6010A	<u> </u> 200.7			<u> </u> 99
Mercury	<input checked="" type="checkbox"/> 470A ³ <input checked="" type="checkbox"/> 7471A ³	<u> </u> 245.1 ² <u> </u> 245.5 ²			<u> </u> 99
Molybdenum	<u> </u> 6010A	<u> </u> 200.7			<u> </u> 99
Nickel	<u> </u> 6010A	<u> </u> 200.7			<u> </u> 99
Potassium	<u> </u> 6010A <u> </u> 7610 ⁴	<u> </u> 200.7 <u> </u> 258.1 ⁴			<u> </u> 99
Rare Earths	<u> </u> 6010A ¹	<u> </u> 200.7 ¹			<u> </u> 99
Selenium	<input checked="" type="checkbox"/> 6010A <u> </u> 7740 ⁵	<u> </u> 200.7 <u> </u> 270.2	<u> </u> 3113B	<u> </u> 1620	<u> </u> 99
Silicon	<u> </u> 6010A ¹	<u> </u> 200.7			<u> </u> 99
Silica	<u> </u> 6010A ¹	<u> </u> 200.7		<u> </u> 1620	<u> </u> 99
Silver	<input checked="" type="checkbox"/> 6010A <u> </u> 7761 ⁵	<u> </u> 200.7 <u> </u> 272.2		<u> </u> 1620	<u> </u> 99
Sodium	<u> </u> 6010A <u> </u> 7770 ⁴	<u> </u> 200.7 <u> </u> 273.1 ⁴			<u> </u> 99
Strontium	<u> </u> 6010A	<u> </u> 200.7			<u> </u> 99
Thallium	<u> </u> 6010A <u> </u> 7841 ⁵	<u> </u> 200.7 <u> </u> 279.2 <u> </u> 200.9			<u> </u> 99
Tin	<u> </u> 6010A ¹	<u> </u> 200.7			<u> </u> 99
Titanium	<u> </u> 6010A ¹	<u> </u> 200.7			<u> </u> 99
Uranium	<u> </u> 6010A ¹	<u> </u> 200.7 ¹			<u> </u> 99
Vanadium	<u> </u> 6010A	<u> </u> 200.7		<u> </u> 1620	<u> </u> 99
Zinc	<u> </u> 6010A	<u> </u> 200.7			<u> </u> 99
Zirconium	<u> </u> 6010A ¹	<u> </u> 200.7 ¹		<u> </u> 1620	<u> </u> 99

Other: _____

Method: _____

METHOD REFERENCES AND DATA QUALIFIERS

DATA QUALIFIERS

U = Indicates that the parameter was not detected at or above the reported limit. The associated numerical value is the sample detection limit.

* = Indicates that the original sample result is greater than 4x the spike amount added.

ABBREVIATIONS

MB = Method or Preparation Blank.

MS = Matrix Spike.

MSD = Matrix Spike Duplicate.

REP = Sample Replicate

LCS = Laboratory Control Sample.

NC = Not calculated.

ANALYTICAL METAL METHODS

1. Not included in the method element list.
2. Modified Hg: Hg1 and Hg2 require less total volume of digestate due to the autosampler analysis. Sample volumes and reagents for mercury determinations in water and soil have been proportionately scaled down to adapt to this semi-automated technique. The sample volume used for water analysis is 33 mL. For soils, 0.1 grams of sample is taken to a final volume of 50 mL (including all reagents).
3. Modified Hg: Hg1 and Hg2 require less total volume of digestate due to the autosampler analysis. Sample volumes and reagents for mercury determinations in water and soil have been proportionately scaled down to adapt to this semi-automated technique. The sample volume used for water analysis is 33 mL. For soils, three 0.1 gram of sample is taken to a final volume of 50 mL (including all reagents).
4. Flame AA.
5. Graphite Furnace AA.

RFW 21-21L-033/N-10/96

Recra LabNet - Lionville

INORGANICS DATA SUMMARY REPORT 11/07/97

CLIENT: USACE-DEAL TEST SITE
 WORK ORDER: 11901-001-003-0001-00

RECRA LOT #: 9710L600

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
=====	=====	=====	=====	=====	=====	=====
-001	S7	Silver, Total	0.22	u MG/KG	0.22	1.0
		Arsenic, Total	246	J MG/KG	0.66	1.0
		Barium, Total	92.7	MG/KG	0.05	1.0
		Cadmium, Total	0.78	MG/KG	0.11	1.0
		Chromium, Total	25.0	MG/KG	0.16	1.0
		Mercury, Total	0.05	u MG/KG	0.05	1.0
		Lead, Total	24.4	J MG/KG	0.79	1.0
		Selenium, Total	6.6	J MG/KG	1.2	1.0
		-002	S8	Silver, Total	0.10	u MG/KG
Arsenic, Total	69.7			J MG/KG	0.31	1.0
Barium, Total	35.0			MG/KG	0.03	1.0
Cadmium, Total	0.16			MG/KG	0.05	1.0
Chromium, Total	30.1			MG/KG	0.08	1.0
Mercury, Total	0.02			u MG/KG	0.02	1.0
Lead, Total	3.9			J MG/KG	0.37	1.0
Selenium, Total	0.78			MG/KG	0.56	1.0
-003	S9			Silver, Total	0.19	u MG/KG
		Arsenic, Total	504	J MG/KG	0.57	1.0
		Barium, Total	102	MG/KG	0.05	1.0
		Cadmium, Total	0.1	u MG/KG	0.1	1.0
		Chromium, Total	31.2	MG/KG	0.14	1.0
		Mercury, Total	0.07	MG/KG	0.04	1.0
		Lead, Total	26.3	J MG/KG	0.69	1.0
		Selenium, Total	4.0	MG/KG	1.0	1.0

Recra LabNet - Lionville

INORGANICS DATA SUMMARY REPORT 11/07/97

CLIENT: USACE-DEAL TEST SITE

RECRA LOT #: 9710L600

WORK ORDER: 11901-001-003-0001-00

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
=====	=====	=====	=====	=====	=====	=====
-004	S10	Silver, Total	0.1	u MG/KG	0.1	1.0
		Arsenic, Total	25.4	MG/KG	0.30	1.0
		Barium, Total	18.6	MG/KG	0.02	1.0
		Cadmium, Total	0.1	MG/KG	0.05	1.0
		Chromium, Total	37.0	MG/KG	0.07	1.0
		Mercury, Total	0.02	u MG/KG	0.02	1.0
		Lead, Total	4.0	MG/KG	0.36	1.0
		Selenium, Total	0.55	u MG/KG	0.55	1.0
-005	S11	Silver, Total	0.15	u MG/KG	0.15	1.0
		Arsenic, Total	157	MG/KG	0.44	1.0
		Barium, Total	114	MG/KG	0.04	1.0
		Cadmium, Total	0.16	MG/KG	0.07	1.0
		Chromium, Total	19.1	MG/KG	0.11	1.0
		Mercury, Total	0.12	MG/KG	0.03	1.0
		Lead, Total	28.9	MG/KG	0.53	1.0
		Selenium, Total	3.2	MG/KG	0.81	1.0
-007	GW3	Silver, Total	0.80	u UG/L	0.80	1.0
		Arsenic, Total	53.6	UG/L	2.4	1.0
		Barium, Total	84.4	UG/L	0.20	1.0
		Cadmium, Total	0.68	UG/L	0.40	1.0
		Chromium, Total	474	UG/L	0.60	1.0
		Mercury, Total	0.10	u UG/L	0.10	1.0
		Lead, Total	17.7	UG/L	2.9	1.0
		Selenium, Total	11.2	UG/L	4.4	1.0

Recra LabNet - Lionville

INORGANICS DATA SUMMARY REPORT 11/07/97

CLIENT: USACE-DEAL TEST SITE
 WORK ORDER: 11901-001-003-0001-00

RECRA LOT #: 9710L600

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
=====	=====	=====	=====	=====	=====	=====
-008	GW4	Silver, Total	0.80	u UG/L	0.80	1.0
		Arsenic, Total	374	↓ UG/L	2.4	1.0
		Barium, Total	186	↓ UG/L	0.20	1.0
		Cadmium, Total	2.7	↓ UG/L	0.40	1.0
		Chromium, Total	767	↓ UG/L	0.60	1.0
		Mercury, Total	0.10	u UG/L	0.10	1.0
		Lead, Total	81.1	↓ UG/L	2.9	1.0
		Selenium, Total	24.9	↓ UG/L	4.4	1.0
-009	GW5	Silver, Total	0.80	u UG/L	0.80	1.0
		Arsenic, Total	37.9	UG/L	2.4	1.0
		Barium, Total	53.7	UG/L	0.20	1.0
		Cadmium, Total	0.40	u UG/L	0.40	1.0
		Chromium, Total	478	UG/L	0.60	1.0
		Mercury, Total	0.10	u UG/L	0.10	1.0
		Lead, Total	12.2	UG/L	2.9	1.0
		Selenium, Total	9.8	UG/L	4.4	1.0
-011	FB03	Silver, Soluble	0.80	u UG/L	0.80	1.0
		Arsenic, Soluble	2.4	u UG/L	2.4	1.0
		Barium, Soluble	0.35	UG/L	0.20	1.0
		Cadmium, Soluble	0.40	u UG/L	0.40	1.0
		Chromium, Soluble	1.0	UG/L	0.60	1.0
		Mercury, Soluble	0.10	u UG/L	0.10	1.0
		Lead, Soluble	3.4	UG/L	2.9	1.0
		Selenium, Soluble	4.4	UG/L	4.4	1.0

Recra LabNet - Lionville

INORGANICS DATA SUMMARY REPORT 11/07/97

USACE-DEAL TEST SITE
 ORDER: 11901-001-003-0001-00

RECRA LOT #: 9710L600

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-013	SW1	Silver, Total	0.80 u	UG/L	0.80	1.0
		Arsenic, Total	2.4 u	UG/L	2.4	1.0
		Barium, Total	30.9	UG/L	0.20	1.0
		Cadmium, Total	0.40 u	UG/L	0.40	1.0
		Chromium, Total	0.60 u	UG/L	0.60	1.0
		Mercury, Total	0.10 u	UG/L	0.10	1.0
		Lead, Total	2.9 u	UG/L	2.9	1.0
		Selenium, Total	4.4 u	UG/L	4.4	1.0
-014	SW2	Silver, Total	0.80 u	UG/L	0.80	1.0
		Arsenic, Total	2.4 u	UG/L	2.4	1.0
		Barium, Total	42.8	UG/L	0.20	1.0
		Cadmium, Total	0.40 u	UG/L	0.40	1.0
		Chromium, Total	0.62 U	UG/L	0.60	1.0
		Mercury, Total	0.10 u	UG/L	0.10	1.0
		Lead, Total	2.9 u	UG/L	2.9	1.0
		Selenium, Total	4.4 u	UG/L	4.4	1.0
-015	SD1	Silver, Total	0.09 u	MG/KG	0.09	1.0
		Arsenic, Total	6.1	MG/KG	0.28	1.0
		Barium, Total	30.3	MG/KG	0.02	1.0
		Cadmium, Total	0.17	MG/KG	0.05	1.0
		Chromium, Total	8.5	MG/KG	0.07	1.0
		Mercury, Total	0.02 u	MG/KG	0.02	1.0
		Lead, Total	17.8	MG/KG	0.34	1.0
		Selenium, Total	0.52 u	MG/KG	0.52	1.0

Recra LabNet - Lionville

INORGANICS DATA SUMMARY REPORT 11/07/97

CLIENT: USACE-DEAL TEST SITE
 WORK ORDER: 11901-001-003-0001-00

RECRA LOT #: 9710L600

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING	DILUTION
					LIMIT	FACTOR
=====	=====	=====	=====	=====	=====	=====
-016	SD2	Silver, Total	0.10 u	MG/KG	0.10	1.0
		Arsenic, Total	3.9 J	MG/KG	0.31	1.0
		Barium, Total	20.4	MG/KG	0.03	1.0
		Cadmium, Total	0.11	MG/KG	0.05	1.0
		Chromium, Total	5.8	MG/KG	0.08	1.0
		Mercury, Total	0.02 u	MG/KG	0.02	1.0
		Lead, Total	15.7	MG/KG	0.37	1.0
		Selenium, Total	0.56 u	MG/KG	0.56	1.0
-017	GW2	Silver, Soluble	0.80 u	UG/L	0.80	1.0
		Arsenic, Soluble	55.9 J	UG/L	2.4	1.0
		Barium, Soluble	7.8 J	UG/L	0.20	1.0
		Cadmium, Soluble	0.40 u J	UG/L	0.40	1.0
		Chromium, Soluble	5.6 UJ	UG/L	0.60	1.0
		Mercury, Soluble	0.10 u	UG/L	0.10	1.0
		Lead, Soluble	2.9 u	UG/L	2.9	1.0
		Selenium, Soluble	5.9 UJ	UG/L	4.4	1.0
-018	GW3	Silver, Soluble	0.80 u	UG/L	0.80	1.0
		Arsenic, Soluble	3.3	UG/L	2.4	1.0
		Barium, Soluble	23.6 J	UG/L	0.20	1.0
		Cadmium, Soluble	0.40 u	UG/L	0.40	1.0
		Chromium, Soluble	0.60 u	UG/L	0.60	1.0
		Mercury, Soluble	0.10 u	UG/L	0.10	1.0
		Lead, Soluble	2.9 u	UG/L	2.9	1.0
		Selenium, Soluble	4.4 u	UG/L	4.4	1.0

Recra LabNet - Lionville

INORGANICS DATA SUMMARY REPORT 11/07/97

CLIENT: USACE-DEAL TEST SITE
 WORK ORDER: 11901-001-003-0001-00

RECRA LOT #: 9710L600

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
=====	=====	=====	=====	=====	=====	=====
-019	GW4	Silver, Soluble	0.80	u UG/L	0.80	1.0
		Arsenic, Soluble	39.4	u UG/L	2.4	1.0
		Barium, Soluble	9.7	u UG/L	0.20	1.0
		Cadmium, Soluble	0.57	u UG/L	0.40	1.0
		Chromium, Soluble	7.7	u UG/L	0.60	1.0
		Mercury, Soluble	0.10	u UG/L	0.10	1.0
		Lead, Soluble	2.9	u UG/L	2.9	1.0
		Selenium, Soluble	4.4	u UG/L	4.4	1.0
-020	SW1	Silver, Soluble	0.80	u UG/L	0.80	1.0
		Arsenic, Soluble	2.4	u UG/L	2.4	1.0
		Barium, Soluble	28.9	u UG/L	0.20	1.0
		Cadmium, Soluble	0.40	u UG/L	0.40	1.0
		Chromium, Soluble	0.60	u UG/L	0.60	1.0
		Mercury, Soluble	0.10	u UG/L	0.10	1.0
		Lead, Soluble	2.9	u UG/L	2.9	1.0
		Selenium, Soluble	4.4	u UG/L	4.4	1.0
-021	SW2	Silver, Soluble	0.80	u UG/L	0.80	1.0
		Arsenic, Soluble	2.4	u UG/L	2.4	1.0
		Barium, Soluble	41.1	u UG/L	0.20	1.0
		Cadmium, Soluble	0.40	u UG/L	0.40	1.0
		Chromium, Soluble	0.64	u UG/L	0.60	1.0
		Mercury, Soluble	0.10	u UG/L	0.10	1.0
		Lead, Soluble	2.9	u UG/L	2.9	1.0
		Selenium, Soluble	4.4	u UG/L	4.4	1.0

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INORGANICS METHOD BLANK DATA SUMMARY PAGE 11/07/97

CLIENT: USACE-DEAL TEST SITE

RECRA LOT #: 9710L600

WORK ORDER: 11901-001-003-0001-00

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
=====	=====	=====	=====	=====	=====	=====
BLANK1	97L2146-MB1	Silver, Total	0.08	u MG/KG	0.08	1.0
		Arsenic, Total	0.24	u MG/KG	0.24	1.0
		Barium, Total	0.02	u MG/KG	0.02	1.0
		Cadmium, Total	0.04	u MG/KG	0.04	1.0
		Chromium, Total	0.26	u MG/KG	0.06	1.0
		Lead, Total	0.29	u MG/KG	0.29	1.0
		Selenium, Total	0.44	u MG/KG	0.44	1.0
BLANK1	97C0799-MB1	Mercury, Total	0.02	u MG/KG	0.02	1.0
BLANK1	97L2144-MB1	Silver, Total	0.80	u UG/L	0.80	1.0
		Arsenic, Total	2.4	u UG/L	2.4	1.0
		Barium, Total	0.20	u UG/L	0.20	1.0
		Cadmium, Total	0.40	u UG/L	0.40	1.0
		Chromium, Total	1.1	u UG/L	0.60	1.0
		Lead, Total	2.9	u UG/L	2.9	1.0
		Selenium, Total	4.4	u UG/L	4.4	1.0
BLANK1	97C0793-MB1	Mercury, Total	0.10	u UG/L	0.10	1.0

Recra LabNet - Lionville

INORGANICS ACCURACY REPORT 11/07/97

CLIENT: USACE-DEAL TEST SITE

RECRA LOT #: 9710L600

WORK ORDER: 11901-001-003-0001-00

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR (SPK)
=====	=====	=====	=====	=====	=====	=====	=====
-001	S7	Silver, Total	12.1	0.22u	13.1	92.4	1.0
		Silver, Total MSD	12.5	0.22u	13.5	92.6	1.0
		Arsenic, Total	589	246	525	65.2	1.0
		Arsenic, Total MSD	614	246	541	67.9	1.0
		Barium, Total	552	92.7	525	87.3	1.0
		Barium, Total MSD	572	92.7	541	88.7	1.0
		Cadmium, Total	12.1	0.78	13.1	86.4	1.0
		Cadmium, Total MSD	12.4	0.78	13.5	86.0	1.0
		Chromium, Total	82.5	25.0	52.5	109.5	1.0
		Chromium, Total MSD	75.4	25.0	54.1	93.2	1.0
		Mercury, Total	0.41	0.05u	0.46	91.0	1.0
		Mercury, Total MSD	0.42	0.05u	0.46	92.3	1.0
		Lead, Total	142	24.4	131	89.3	1.0
		Lead, Total MSD	146	24.4	135	89.9	1.0
		Selenium, Total	482	6.6	525	90.4	1.0
		Selenium, Total MSD	495	6.6	541	90.3	1.0
-013	SW1	Silver, Total	48.6	0.80u	50.0	97.2	1.0
		Silver, Total MSD	49.5	0.80u	50.0	99.0	1.0
		Arsenic, Total	1940	2.4 u	2000	96.8	1.0
		Arsenic, Total MSD	1940	2.4 u	2000	96.8	1.0
		Barium, Total	2000	30.9	2000	98.4	1.0
		Barium, Total MSD	1990	30.9	2000	98.1	1.0
		Cadmium, Total	48.7	0.40u	50.0	97.4	1.0
		Cadmium, Total MSD	48.2	0.40u	50.0	96.4	1.0
		Chromium, Total	192	0.60u	200	96.0	1.0
		Chromium, Total MSD	192	0.60u	200	95.8	1.0
		Lead, Total	475	2.9 u	500	95.1	1.0
		Lead, Total MSD	472	2.9 u	500	94.4	1.0
		Selenium, Total	1910	4.4 u	2000	95.6	1.0
		Selenium, Total MSD	1920	4.4 u	2000	96.1	1.0

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INORGANICS DUPLICATE SPIKE REPORT 11/07/97

CLIENT: USACE-DEAL TEST SITE
 WORK ORDER: 11901-001-003-0001-00

RECRA LOT #: 9710L600

SAMPLE	SITE ID	ANALYTE	SPIKE#1	SPIKE#2	%DIFF
			%RECOV	%RECOV	
-001	S7	Silver, Total	92.4	92.6	0.24
		Arsenic, Total	65.2	67.9	4.0
		Barium, Total	87.3	88.7	1.5
		Cadmium, Total	86.4	86.0	0.39
		Chromium, Total	109.5	93.2	16.1
		Mercury, Total	91.0	92.3	1.4
		Lead, Total	89.3	89.9	0.76
		Selenium, Total	90.4	90.3	0.12
-013	SW1	Silver, Total	97.2	99.0	1.8
		Arsenic, Total	96.8	96.8	0.098
		Barium, Total	98.4	98.1	0.29
		Cadmium, Total	97.4	96.4	1.0
		Chromium, Total	96.0	95.8	0.21
		Lead, Total	95.1	94.4	0.70
		Selenium, Total	95.6	96.1	0.56

Recra LabNet - Lionville

INORGANICS PRECISION REPORT 11/07/97

USACE-DEAL TEST SITE
 ORDER: 11901-001-003-0001-00

RECRA LOT #: 9710L600

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR (REP)
-001REP	S7	Silver, Total	0.22u	0.22u	NC	1.0
		Arsenic, Total	246	116	72.1	1.0
		Barium, Total	92.7	66.2	33.4	1.0
		Cadmium, Total	0.78	0.12	147.9	1.0
		Chromium, Total	25.0	34.9	33.1	1.0
		Mercury, Total	0.05u	0.05u	NC	1.0
		Lead, Total	24.4	22.5	8.1	1.0
		Selenium, Total	6.6	4.5	37.8	1.0
-013REP	SW1	Silver, Total	0.80u	0.80u	NC	1.0
		Arsenic, Total	2.4 u	2.4 u	NC	1.0
		Barium, Total	30.9	30.3	2.0	1.0
		Cadmium, Total	0.40u	0.40u	NC	1.0
		Chromium, Total	0.60u	0.95	NC	1.0
		Lead, Total	2.9 u	2.9 u	NC	1.0
		Selenium, Total	4.4 u	4.4 u	NC	1.0

200
correction
11/14/97

Recra LabNet - Lionville

INORGANICS LABORATORY CONTROL STANDARDS REPORT 11/07/97

CLIENT: USACE-DEAL TEST SITE
 WORK ORDER: 11901-001-003-0001-00

RECRA LOT #: 9710L600

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	SPIKED AMOUNT	UNITS	%RECOV
=====	=====	=====	=====	=====	=====	=====
LCS1	97L2146-LC1	Silver, LCS	46.4	50.0	MG/KG	92.8
		Arsenic, LCS	890	1000	MG/KG	89.0
		Barium, LCS	456	500	MG/KG	91.2
		Cadmium, LCS	22.8	25.0	MG/KG	91.2
		Chromium, LCS	46.1	50.0	MG/KG	92.2
		Lead, LCS	228	250	MG/KG	91.1
		Selenium, LCS	871	1000	MG/KG	87.1
LCS1	97C0799-LC1	Mercury, LCS	3.0	2.9	MG/KG	103.6
LCS1	97L2144-LC1	Silver, LCS	497	500	UG/L	99.4
		Arsenic, LCS	9740	10000	UG/L	97.4
		Barium, LCS	4790	5000	UG/L	95.8
		Cadmium, LCS	247	250	UG/L	98.7
		Chromium, LCS	489	500	UG/L	97.8
		Lead, LCS	2450	2500	UG/L	98.0
		Selenium, LCS	9720	10000	UG/L	97.2
LCS1	97C0793-LC1	Mercury, LCS	5.5	5.0	UG/L	109.6

Recra LabNet - Lionville Laboratory
 INORGANIC ANALYTICAL DATA PACKAGE FOR
 USACE-DEAL TEST SITE

DATE RECEIVED: 10/02/97

RFW LOT # :9710L600

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
S7						
SILVER, TOTAL	001	S	97L2146	10/01/97	10/28/97	10/29/97
SILVER, TOTAL	001 REP	S	97L2146	10/01/97	10/28/97	10/29/97
SILVER, TOTAL	001 MS	S	97L2146	10/01/97	10/28/97	10/29/97
SILVER, TOTAL	001 MSD	S	97L2146	10/01/97	10/28/97	10/29/97
ARSENIC, TOTAL	001	S	97L2146	10/01/97	10/28/97	10/29/97
ARSENIC, TOTAL	001 REP	S	97L2146	10/01/97	10/28/97	10/29/97
ARSENIC, TOTAL	001 MS	S	97L2146	10/01/97	10/28/97	10/29/97
ARSENIC, TOTAL	001 MSD	S	97L2146	10/01/97	10/28/97	10/29/97
BARIUM, TOTAL	001	S	97L2146	10/01/97	10/28/97	10/29/97
BARIUM, TOTAL	001 REP	S	97L2146	10/01/97	10/28/97	10/29/97
BARIUM, TOTAL	001 MS	S	97L2146	10/01/97	10/28/97	10/29/97
BARIUM, TOTAL	001 MSD	S	97L2146	10/01/97	10/28/97	10/29/97
CADMIUM, TOTAL	001	S	97L2146	10/01/97	10/28/97	10/29/97
CADMIUM, TOTAL	001 REP	S	97L2146	10/01/97	10/28/97	10/29/97
CADMIUM, TOTAL	001 MS	S	97L2146	10/01/97	10/28/97	10/29/97
CADMIUM, TOTAL	001 MSD	S	97L2146	10/01/97	10/28/97	10/29/97
CHROMIUM, TOTAL	001	S	97L2146	10/01/97	10/28/97	10/29/97
CHROMIUM, TOTAL	001 REP	S	97L2146	10/01/97	10/28/97	10/29/97
CHROMIUM, TOTAL	001 MS	S	97L2146	10/01/97	10/28/97	10/29/97
CHROMIUM, TOTAL	001 MSD	S	97L2146	10/01/97	10/28/97	10/29/97
MERCURY, TOTAL	001	S	97C0799	10/01/97	10/21/97	10/22/97
MERCURY, TOTAL	001 REP	S	97C0799	10/01/97	10/21/97	10/22/97
MERCURY, TOTAL	001 MS	S	97C0799	10/01/97	10/21/97	10/22/97
MERCURY, TOTAL	001 MSD	S	97C0799	10/01/97	10/21/97	10/22/97
LEAD, TOTAL	001	S	97L2146	10/01/97	10/28/97	10/29/97
LEAD, TOTAL	001 REP	S	97L2146	10/01/97	10/28/97	10/29/97
LEAD, TOTAL	001 MS	S	97L2146	10/01/97	10/28/97	10/29/97
LEAD, TOTAL	001 MSD	S	97L2146	10/01/97	10/28/97	10/29/97
SELENIUM, TOTAL	001	S	97L2146	10/01/97	10/28/97	10/29/97
SELENIUM, TOTAL	001 REP	S	97L2146	10/01/97	10/28/97	10/29/97
SELENIUM, TOTAL	001 MS	S	97L2146	10/01/97	10/28/97	10/29/97
SELENIUM, TOTAL	001 MSD	S	97L2146	10/01/97	10/28/97	10/29/97

S8

SILVER, TOTAL	002	S	97L2146	10/01/97	10/28/97	10/29/97
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Recra LabNet - Lionville Laboratory
 INORGANIC ANALYTICAL DATA PACKAGE FOR
 USACE-DEAL TEST SITE

DATE RECEIVED: 10/02/97

RFW LOT # :9710L600

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
ARSENIC, TOTAL	002	S	97L2146	10/01/97	10/28/97	10/29/97
BARIUM, TOTAL	002	S	97L2146	10/01/97	10/28/97	10/29/97
CADMIUM, TOTAL	002	S	97L2146	10/01/97	10/28/97	10/29/97
CHROMIUM, TOTAL	002	S	97L2146	10/01/97	10/28/97	10/29/97
MERCURY, TOTAL	002	S	97C0799	10/01/97	10/21/97	10/22/97
LEAD, TOTAL	002	S	97L2146	10/01/97	10/28/97	10/29/97
SELENIUM, TOTAL	002	S	97L2146	10/01/97	10/28/97	10/29/97

S9

SILVER, TOTAL	003	S	97L2146	10/01/97	10/28/97	10/29/97
ARSENIC, TOTAL	003	S	97L2146	10/01/97	10/28/97	10/29/97
BARIUM, TOTAL	003	S	97L2146	10/01/97	10/28/97	10/29/97
CADMIUM, TOTAL	003	S	97L2146	10/01/97	10/28/97	10/29/97
CHROMIUM, TOTAL	003	S	97L2146	10/01/97	10/28/97	10/29/97
MERCURY, TOTAL	003	S	97C0799	10/01/97	10/21/97	10/22/97
LEAD, TOTAL	003	S	97L2146	10/01/97	10/28/97	10/29/97
SELENIUM, TOTAL	003	S	97L2146	10/01/97	10/28/97	10/29/97

S10

SILVER, TOTAL	004	S	97L2146	10/01/97	10/28/97	10/29/97
ARSENIC, TOTAL	004	S	97L2146	10/01/97	10/28/97	10/29/97
BARIUM, TOTAL	004	S	97L2146	10/01/97	10/28/97	10/29/97
CADMIUM, TOTAL	004	S	97L2146	10/01/97	10/28/97	10/29/97
CHROMIUM, TOTAL	004	S	97L2146	10/01/97	10/28/97	10/29/97
MERCURY, TOTAL	004	S	97C0799	10/01/97	10/21/97	10/22/97
LEAD, TOTAL	004	S	97L2146	10/01/97	10/28/97	10/29/97
SELENIUM, TOTAL	004	S	97L2146	10/01/97	10/28/97	10/29/97

S11

SILVER, TOTAL	005	S	97L2146	10/01/97	10/28/97	10/29/97
ARSENIC, TOTAL	005	S	97L2146	10/01/97	10/28/97	10/29/97
BARIUM, TOTAL	005	S	97L2146	10/01/97	10/28/97	10/29/97
CADMIUM, TOTAL	005	S	97L2146	10/01/97	10/28/97	10/29/97
CHROMIUM, TOTAL	005	S	97L2146	10/01/97	10/28/97	10/29/97
MERCURY, TOTAL	005	S	97C0799	10/01/97	10/21/97	10/22/97

Recra LabNet - Lionville Laboratory
 INORGANIC ANALYTICAL DATA PACKAGE FOR
 USACE-DEAL TEST SITE

DATE RECEIVED: 10/02/97

RFW LOT # :9710L600

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
LEAD, TOTAL	005	S	97L2146	10/01/97	10/28/97	10/29/97
SELENIUM, TOTAL	005	S	97L2146	10/01/97	10/28/97	10/29/97
GW3						
SILVER, TOTAL	007	W	97L2144	10/01/97	10/28/97	10/28/97
ARSENIC, TOTAL	007	W	97L2144	10/01/97	10/28/97	10/28/97
BARIUM, TOTAL	007	W	97L2144	10/01/97	10/28/97	10/28/97
CADMIUM, TOTAL	007	W	97L2144	10/01/97	10/28/97	10/28/97
CHROMIUM, TOTAL	007	W	97L2144	10/01/97	10/28/97	10/28/97
MERCURY, TOTAL	007	W	97C0793	10/01/97	10/21/97	10/22/97
LEAD, TOTAL	007	W	97L2144	10/01/97	10/28/97	10/28/97
SELENIUM, TOTAL	007	W	97L2144	10/01/97	10/28/97	10/28/97
GW4						
SILVER, TOTAL	008	W	97L2144	10/01/97	10/28/97	10/28/97
ARSENIC, TOTAL	008	W	97L2144	10/01/97	10/28/97	10/28/97
BARIUM, TOTAL	008	W	97L2144	10/01/97	10/28/97	10/28/97
CADMIUM, TOTAL	008	W	97L2144	10/01/97	10/28/97	10/28/97
CHROMIUM, TOTAL	008	W	97L2144	10/01/97	10/28/97	10/28/97
MERCURY, TOTAL	008	W	97C0793	10/01/97	10/21/97	10/22/97
LEAD, TOTAL	008	W	97L2144	10/01/97	10/28/97	10/28/97
SELENIUM, TOTAL	008	W	97L2144	10/01/97	10/28/97	10/28/97
GW5						
SILVER, TOTAL	009	W	97L2144	10/01/97	10/28/97	10/28/97
ARSENIC, TOTAL	009	W	97L2144	10/01/97	10/28/97	10/28/97
BARIUM, TOTAL	009	W	97L2144	10/01/97	10/28/97	10/28/97
CADMIUM, TOTAL	009	W	97L2144	10/01/97	10/28/97	10/28/97
CHROMIUM, TOTAL	009	W	97L2144	10/01/97	10/28/97	10/28/97
MERCURY, TOTAL	009	W	97C0793	10/01/97	10/21/97	10/22/97
LEAD, TOTAL	009	W	97L2144	10/01/97	10/28/97	10/28/97
SELENIUM, TOTAL	009	W	97L2144	10/01/97	10/28/97	10/28/97
FB03						
SILVER, SOLUBLE	011	W	97L2144	10/01/97	10/28/97	10/28/97

Recra LabNet - Lionville Laboratory
 INORGANIC ANALYTICAL DATA PACKAGE FOR
 USACE-DEAL TEST SITE

DATE RECEIVED: 10/02/97

RFW LOT # :9710L600

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
ARSENIC, SOLUBLE	011	W	97L2144	10/01/97	10/28/97	10/28/97
BARIUM, SOLUBLE	011	W	97L2144	10/01/97	10/28/97	10/28/97
CADMIUM, SOLUBLE	011	W	97L2144	10/01/97	10/28/97	10/28/97
CHROMIUM, SOLUBLE	011	W	97L2144	10/01/97	10/28/97	10/28/97
MERCURY, SOLUBLE	011	W	97C0793	10/01/97	10/21/97	10/22/97
LEAD, SOLUBLE	011	W	97L2144	10/01/97	10/28/97	10/28/97
SELENIUM, SOLUBLE	011	W	97L2144	10/01/97	10/28/97	10/28/97

SW1

SILVER, TOTAL	013	W	97L2144	10/01/97	10/28/97	10/28/97
SILVER, TOTAL	013 REP	W	97L2144	10/01/97	10/28/97	10/28/97
SILVER, TOTAL	013 MS	W	97L2144	10/01/97	10/28/97	10/28/97
SILVER, TOTAL	013 MSD	W	97L2144	10/01/97	10/28/97	10/28/97
ARSENIC, TOTAL	013	W	97L2144	10/01/97	10/28/97	10/28/97
ARSENIC, TOTAL	013 REP	W	97L2144	10/01/97	10/28/97	10/28/97
ARSENIC, TOTAL	013 MS	W	97L2144	10/01/97	10/28/97	10/28/97
ARSENIC, TOTAL	013 MSD	W	97L2144	10/01/97	10/28/97	10/28/97
BARIUM, TOTAL	013	W	97L2144	10/01/97	10/28/97	10/28/97
BARIUM, TOTAL	013 REP	W	97L2144	10/01/97	10/28/97	10/28/97
BARIUM, TOTAL	013 MS	W	97L2144	10/01/97	10/28/97	10/28/97
BARIUM, TOTAL	013 MSD	W	97L2144	10/01/97	10/28/97	10/28/97
CADMIUM, TOTAL	013	W	97L2144	10/01/97	10/28/97	10/28/97
CADMIUM, TOTAL	013 REP	W	97L2144	10/01/97	10/28/97	10/28/97
CADMIUM, TOTAL	013 MS	W	97L2144	10/01/97	10/28/97	10/28/97
CADMIUM, TOTAL	013 MSD	W	97L2144	10/01/97	10/28/97	10/28/97
CHROMIUM, TOTAL	013	W	97L2144	10/01/97	10/28/97	10/28/97
CHROMIUM, TOTAL	013 REP	W	97L2144	10/01/97	10/28/97	10/28/97
CHROMIUM, TOTAL	013 MS	W	97L2144	10/01/97	10/28/97	10/28/97
CHROMIUM, TOTAL	013 MSD	W	97L2144	10/01/97	10/28/97	10/28/97
MERCURY, TOTAL	013	W	97C0793	10/01/97	10/21/97	10/22/97
LEAD, TOTAL	013	W	97L2144	10/01/97	10/28/97	10/28/97
LEAD, TOTAL	013 REP	W	97L2144	10/01/97	10/28/97	10/28/97
LEAD, TOTAL	013 MS	W	97L2144	10/01/97	10/28/97	10/28/97
LEAD, TOTAL	013 MSD	W	97L2144	10/01/97	10/28/97	10/28/97
SELENIUM, TOTAL	013	W	97L2144	10/01/97	10/28/97	10/28/97
SELENIUM, TOTAL	013 REP	W	97L2144	10/01/97	10/28/97	10/28/97
SELENIUM, TOTAL	013 MS	W	97L2144	10/01/97	10/28/97	10/28/97

Recra LabNet - Lionville Laboratory
 INORGANIC ANALYTICAL DATA PACKAGE FOR
 USACE-DEAL TEST SITE

RECEIVED: 10/02/97

RFW LOT # :9710L600

ELEMENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
SELENIUM, TOTAL	013 MSD	W	97L2144	10/01/97	10/28/97	10/28/97
SW2						
SILVER, TOTAL	014	W	97L2144	10/01/97	10/28/97	10/28/97
ARSENIC, TOTAL	014	W	97L2144	10/01/97	10/28/97	10/28/97
BARIUM, TOTAL	014	W	97L2144	10/01/97	10/28/97	10/28/97
CADMIUM, TOTAL	014	W	97L2144	10/01/97	10/28/97	10/28/97
CHROMIUM, TOTAL	014	W	97L2144	10/01/97	10/28/97	10/28/97
MERCURY, TOTAL	014	W	97C0793	10/01/97	10/21/97	10/22/97
LEAD, TOTAL	014	W	97L2144	10/01/97	10/28/97	10/28/97
SELENIUM, TOTAL	014	W	97L2144	10/01/97	10/28/97	10/28/97
SD1						
SILVER, TOTAL	015	S	97L2146	10/01/97	10/28/97	10/29/97
ARSENIC, TOTAL	015	S	97L2146	10/01/97	10/28/97	10/29/97
BARIUM, TOTAL	015	S	97L2146	10/01/97	10/28/97	10/29/97
CADMIUM, TOTAL	015	S	97L2146	10/01/97	10/28/97	10/29/97
CHROMIUM, TOTAL	015	S	97L2146	10/01/97	10/28/97	10/29/97
MERCURY, TOTAL	015	S	97C0799	10/01/97	10/21/97	10/22/97
LEAD, TOTAL	015	S	97L2146	10/01/97	10/28/97	10/29/97
SELENIUM, TOTAL	015	S	97L2146	10/01/97	10/28/97	10/29/97
SD2						
SILVER, TOTAL	016	S	97L2146	10/01/97	10/28/97	10/29/97
ARSENIC, TOTAL	016	S	97L2146	10/01/97	10/28/97	10/29/97
BARIUM, TOTAL	016	S	97L2146	10/01/97	10/28/97	10/29/97
CADMIUM, TOTAL	016	S	97L2146	10/01/97	10/28/97	10/29/97
CHROMIUM, TOTAL	016	S	97L2146	10/01/97	10/28/97	10/29/97
MERCURY, TOTAL	016	S	97C0799	10/01/97	10/21/97	10/22/97
LEAD, TOTAL	016	S	97L2146	10/01/97	10/28/97	10/29/97
SELENIUM, TOTAL	016	S	97L2146	10/01/97	10/28/97	10/29/97
GW2						
SILVER, SOLUBLE	017	W	97L2144	10/01/97	10/28/97	10/28/97

Recre LabNet - Lionville Laboratory
 INORGANIC ANALYTICAL DATA PACKAGE FOR
 USACE-DEAL TEST SITE

DATE RECEIVED: 10/02/97

RFW LOT # :9710L600

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
ARSENIC, SOLUBLE	017	W	97L2144	10/01/97	10/28/97	10/28/97
BARIUM, SOLUBLE	017	W	97L2144	10/01/97	10/28/97	10/28/97
CADMIUM, SOLUBLE	017	W	97L2144	10/01/97	10/28/97	10/28/97
CHROMIUM, SOLUBLE	017	W	97L2144	10/01/97	10/28/97	10/28/97
MERCURY, SOLUBLE	017	W	97C0793	10/01/97	10/21/97	10/22/97
LEAD, SOLUBLE	017	W	97L2144	10/01/97	10/28/97	10/28/97
SELENIUM, SOLUBLE	017	W	97L2144	10/01/97	10/28/97	10/28/97

GW3

SILVER, SOLUBLE	018	W	97L2144	10/01/97	10/28/97	10/28/97
ARSENIC, SOLUBLE	018	W	97L2144	10/01/97	10/28/97	10/28/97
BARIUM, SOLUBLE	018	W	97L2144	10/01/97	10/28/97	10/28/97
CADMIUM, SOLUBLE	018	W	97L2144	10/01/97	10/28/97	10/28/97
CHROMIUM, SOLUBLE	018	W	97L2144	10/01/97	10/28/97	10/28/97
MERCURY, SOLUBLE	018	W	97C0793	10/01/97	10/21/97	10/22/97
LEAD, SOLUBLE	018	W	97L2144	10/01/97	10/28/97	10/28/97
SELENIUM, SOLUBLE	018	W	97L2144	10/01/97	10/28/97	10/28/97

GW4

SILVER, SOLUBLE	019	W	97L2144	10/01/97	10/28/97	10/28/97
ARSENIC, SOLUBLE	019	W	97L2144	10/01/97	10/28/97	10/28/97
BARIUM, SOLUBLE	019	W	97L2144	10/01/97	10/28/97	10/28/97
CADMIUM, SOLUBLE	019	W	97L2144	10/01/97	10/28/97	10/28/97
CHROMIUM, SOLUBLE	019	W	97L2144	10/01/97	10/28/97	10/28/97
MERCURY, SOLUBLE	019	W	97C0793	10/01/97	10/21/97	10/22/97
LEAD, SOLUBLE	019	W	97L2144	10/01/97	10/28/97	10/28/97
SELENIUM, SOLUBLE	019	W	97L2144	10/01/97	10/28/97	10/28/97

SW1

SILVER, SOLUBLE	020	W	97L2144	10/01/97	10/28/97	10/28/97
ARSENIC, SOLUBLE	020	W	97L2144	10/01/97	10/28/97	10/28/97
BARIUM, SOLUBLE	020	W	97L2144	10/01/97	10/28/97	10/28/97
CADMIUM, SOLUBLE	020	W	97L2144	10/01/97	10/28/97	10/28/97
CHROMIUM, SOLUBLE	020	W	97L2144	10/01/97	10/28/97	10/28/97
MERCURY, SOLUBLE	020	W	97C0793	10/01/97	10/21/97	10/22/97

Recra LabNet - Lionville Laboratory
 INORGANIC ANALYTICAL DATA PACKAGE FOR
 USACE-DEAL TEST SITE

DATE RECEIVED: 10/02/97

RFW LOT # :9710L600

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
LEAD, SOLUBLE	020	W	97L2144	10/01/97	10/28/97	10/28/97
SELENIUM, SOLUBLE	020	W	97L2144	10/01/97	10/28/97	10/28/97
SW2						
SILVER, SOLUBLE	021	W	97L2144	10/01/97	10/28/97	10/28/97
ARSENIC, SOLUBLE	021	W	97L2144	10/01/97	10/28/97	10/28/97
BARIUM, SOLUBLE	021	W	97L2144	10/01/97	10/28/97	10/28/97
CADMIUM, SOLUBLE	021	W	97L2144	10/01/97	10/28/97	10/28/97
CHROMIUM, SOLUBLE	021	W	97L2144	10/01/97	10/28/97	10/28/97
MERCURY, SOLUBLE	021	W	97C0793	10/01/97	10/21/97	10/22/97
LEAD, SOLUBLE	021	W	97L2144	10/01/97	10/28/97	10/28/97
SELENIUM, SOLUBLE	021	W	97L2144	10/01/97	10/28/97	10/28/97

LAB QC:

SILVER LABORATORY	LC1 BS	S	97L2146	N/A	10/28/97	10/29/97
SILVER, TOTAL	MB1	S	97L2146	N/A	10/28/97	10/29/97
ARSENIC LABORATORY	LC1 BS	S	97L2146	N/A	10/28/97	10/29/97
ARSENIC, TOTAL	MB1	S	97L2146	N/A	10/28/97	10/29/97
BARIUM LABORATORY	LC1 BS	S	97L2146	N/A	10/28/97	10/29/97
BARIUM, TOTAL	MB1	S	97L2146	N/A	10/28/97	10/29/97
CADMIUM LABORATORY	LC1 BS	S	97L2146	N/A	10/28/97	10/29/97
CADMIUM, TOTAL	MB1	S	97L2146	N/A	10/28/97	10/29/97
CHROMIUM LABORATORY	LC1 BS	S	97L2146	N/A	10/28/97	10/29/97
CHROMIUM, TOTAL	MB1	S	97L2146	N/A	10/28/97	10/29/97
MERCURY LABORATORY	LC1 BS	S	97C0799	N/A	10/21/97	10/22/97
MERCURY, TOTAL	MB1	S	97C0799	N/A	10/21/97	10/22/97
LEAD LABORATORY	LC1 BS	S	97L2146	N/A	10/28/97	10/29/97
LEAD, TOTAL	MB1	S	97L2146	N/A	10/28/97	10/29/97
SELENIUM LABORATORY	LC1 BS	S	97L2146	N/A	10/28/97	10/29/97
SELENIUM, TOTAL	MB1	S	97L2146	N/A	10/28/97	10/29/97
SILVER LABORATORY	LC1 BS	W	97L2144	N/A	10/28/97	10/28/97
SILVER, TOTAL	MB1	W	97L2144	N/A	10/28/97	10/28/97
ARSENIC LABORATORY	LC1 BS	W	97L2144	N/A	10/28/97	10/28/97
ARSENIC, TOTAL	MB1	W	97L2144	N/A	10/28/97	10/28/97
BARIUM LABORATORY	LC1 BS	W	97L2144	N/A	10/28/97	10/28/97
BARIUM, TOTAL	MB1	W	97L2144	N/A	10/28/97	10/28/97

Recra LabNet - Lionville Laboratory
 INORGANIC ANALYTICAL DATA PACKAGE FOR
 USACE-DEAL TEST SITE

DATE RECEIVED: 10/02/97

RFW LOT # :9710L600

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
CADMIUM LABORATORY	LC1 BS	W	97L2144	N/A	10/28/97	10/28/97
CADMIUM, TOTAL	MB1	W	97L2144	N/A	10/28/97	10/28/97
CHROMIUM LABORATORY	LC1 BS	W	97L2144	N/A	10/28/97	10/28/97
CHROMIUM, TOTAL	MB1	W	97L2144	N/A	10/28/97	10/28/97
MERCURY LABORATORY	LC1 BS	W	97C0793	N/A	10/21/97	10/22/97
MERCURY, TOTAL	MB1	W	97C0793	N/A	10/21/97	10/22/97
LEAD LABORATORY	LC1 BS	W	97L2144	N/A	10/28/97	10/28/97
LEAD, TOTAL	MB1	W	97L2144	N/A	10/28/97	10/28/97
SELENIUM LABORATORY	LC1 BS	W	97L2144	N/A	10/28/97	10/28/97
SELENIUM, TOTAL	MB1	W	97L2144	N/A	10/28/97	10/28/97



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Virtual Laboratories Everywhere

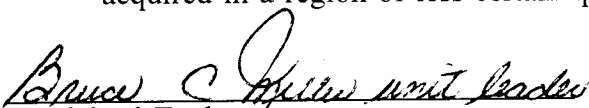
Recra LabNet Philadelphia Analytical Report

Client : USACE-DEAL TEST SITE
RFW# : 9710L573

W.O.# : 11901-001-003-0001-00
Date Received: 10-01-97

METALS CASE NARRATIVE

1. This narrative covers the analyses of 6 soil and 4 water samples.
2. Samples were prepared and analyzed in accordance with methods checked on the attached glossary.
3. All analyses were performed within the required holding times.
4. The cooler temperature has been recorded on the Chain of Custody.
5. All Initial and Continuing Calibration Verifications (ICV/CCVs) were within control limits.
6. All Initial and Continuing Calibration Blanks (ICB/CCBs) were within control limits.
7. All preparation/method blanks were within method criteria. Refer to the Inorganics Method Blank Data Summary.
8. All ICP Interference Check Standards were within control limits.
9. All laboratory control samples (LCS) were within the laboratory control limits with the exception of 97L2146-LC1 for Silver at 92.8% (range 93.6-106.4%) and Lead at 91.1% (range 92.2-107.1%). The soil sample results could be biased low for Silver and Lead. Refer to the Inorganics Laboratory Control Standards Report.
10. The Mercury matrix spike (MS) and matrix spike duplicate (MSD) recoveries were within the 80-120% control limits. Refer to the Inorganics Accuracy Report.
11. The Mercury MSs and MSDs were within the 20% Relative Percent Difference (RPD) control limits. Refer to the Inorganics Matrix Spike Duplicate Report.
12. The duplicate Mercury analyses were within the 20% RPD control limits. Refer to the Inorganics Precision Report.
13. For the purposes of this report, the data has been reported to the Instrument Detection Limit (IDL). Values between the IDL and the Practical Quantitation Limit (PQL) are acquired in a region of less-certain quantification.

for 
J. Michael Taylor
Vice President and Laboratory Manager
Lionville Analytical Laboratory

11-12-97
Date

sklm10-573

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 19 pages.

METALS METHODS GLOSSARY

The following methods are used as reference for the digestion and analysis of samples contained within RFW Lot#: 97102573

Leaching Procedure: 1310 1311 1312 Other:_____

CLP Metals Digestion and Analysis Methods: ILM03.0 ILM04.0

Metals Digestion Methods: /3005A 3010A 3015 3020A /3050A 3051 200.7 SS17
 Other: _____

Metals Analysis Methods

	SW846	EPA	STD MTD	EPA OSWR	USATHA
Aluminum	<u> 6010A</u>	<u> 200.7</u>			
Antimony	<u> 6010A 7041⁵</u>	<u> 200.7 204.2</u>			<u> 99</u>
Arsenic	<u> /6010A 7060A⁵</u>	<u> 200.7 206.2</u>	<u> 3113B</u>		<u> 99</u>
Barium	<u> /6010A</u>	<u> 200.7</u>			<u> 99</u>
Beryllium	<u> 6010A</u>	<u> 200.7</u>			<u> 99</u>
Bismuth	<u> 6010A¹</u>	<u> 200.7¹</u>			<u> 99</u>
Boron	<u> 6010A¹</u>	<u> 200.7</u>		<u> 1620</u>	<u> 99</u>
Cadmium	<u> /6010A 7131A⁵</u>	<u> 200.7 213.2</u>			<u> 99</u>
Calcium	<u> 6010A</u>	<u> 200.7</u>			<u> 99</u>
Chromium	<u> /6010A 7191⁵</u>	<u> 200.7 218.2</u>			<u> 99</u>
Cobalt	<u> 6010A</u>	<u> 200.7</u>			<u> SS17</u>
Copper	<u> 6010A 7211⁵</u>	<u> 200.7 220.2</u>			<u> 99</u>
Iron	<u> 6010A</u>	<u> 200.7</u>			<u> 99</u>
Lead	<u> /6010A 7421⁵</u>	<u> 200.7 239.2</u>	<u> 3113B</u>		<u> 99</u>
Lithium	<u> 6010A 7430⁴</u>	<u> 200.7</u>			<u> 99</u>
Magnesium	<u> 6010A</u>	<u> 200.7</u>		<u> 1620</u>	<u> 99</u>
Manganese	<u> 6010A</u>	<u> 200.7</u>			<u> 99</u>
Mercury	<u> /7470A³ /7471A³</u>	<u> 245.1² 245.5²</u>			<u> 99</u>
Molybdenum	<u> 6010A</u>	<u> 200.7</u>			<u> 99</u>
Nickel	<u> 6010A</u>	<u> 200.7</u>			<u> 99</u>
Potassium	<u> 6010A 7610⁴</u>	<u> 200.7 258.1⁴</u>			<u> 99</u>
Rare Earths	<u> 6010A¹</u>	<u> 200.7¹</u>			<u> 99</u>
Selenium	<u> /6010A 7740⁵</u>	<u> 200.7 270.2</u>	<u> 3113B</u>	<u> 1620</u>	<u> 99</u>
Silicon	<u> 6010A¹</u>	<u> 200.7</u>			<u> 99</u>
Silica	<u> 6010A¹</u>	<u> 200.7</u>		<u> 1620</u>	<u> 99</u>
Silver	<u> /6010A 7761⁵</u>	<u> 200.7 272.2</u>		<u> 1620</u>	<u> 99</u>
Sodium	<u> 6010A 7770⁴</u>	<u> 200.7 273.1⁴</u>			<u> 99</u>
Strontium	<u> 6010A</u>	<u> 200.7</u>			<u> 99</u>
Thallium	<u> 6010A 7841⁵</u>	<u> 200.7 279.2 200.9</u>			<u> 99</u>
Tin	<u> 6010A¹</u>	<u> 200.7</u>			<u> 99</u>
Titanium	<u> 6010A¹</u>	<u> 200.7</u>			<u> 99</u>
Uranium	<u> 6010A¹</u>	<u> 200.7¹</u>			<u> 99</u>
Vanadium	<u> 6010A</u>	<u> 200.7</u>		<u> 1620</u>	<u> 99</u>
Zinc	<u> 6010A</u>	<u> 200.7</u>			<u> 99</u>
Zirconium	<u> 6010A¹</u>	<u> 200.7¹</u>		<u> 1620</u>	<u> 99</u>

Other: _____

Method: _____

METHOD REFERENCES AND DATA QUALIFIERS

DATA QUALIFIERS

U = Indicates that the parameter was not detected at or above the reported limit. The associated numerical value is the sample detection limit.

* = Indicates that the original sample result is greater than 4x the spike amount added.

ABBREVIATIONS

MB = Method or Preparation Blank.

MS = Matrix Spike.

MSD = Matrix Spike Duplicate.

REP = Sample Replicate

LCS = Laboratory Control Sample.

NC = Not calculated.

ANALYTICAL METAL METHODS

1. Not included in the method element list.
2. Modified Hg: Hg1 and Hg2 require less total volume of digestate due to the autosampler analysis. Sample volumes and reagents for mercury determinations in water and soil have been proportionately scaled down to adapt to this semi-automated technique. The sample volume used for water analysis is 33 mL. For soils, 0.1 grams of sample is taken to a final volume of 50 mL (including all reagents).
3. Modified Hg: Hg1 and Hg2 require less total volume of digestate due to the autosampler analysis. Sample volumes and reagents for mercury determinations in water and soil have been proportionately scaled down to adapt to this semi-automated technique. The sample volume used for water analysis is 33 mL. For soils, three 0.1 gram of sample is taken to a final volume of 50 mL (including all reagents).
4. Flame AA.
5. Graphite Furnace AA.

RFW 21-21L-033/N-10/96

Recra LabNet - Lionville

INORGANICS DATA SUMMARY REPORT 11/07/97

CLIENT: USACE-DEAL TEST SITE

RECRA LOT #: 9710L573

WORK ORDER: 11901-001-003-0001-00

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
=====	=====	=====	=====	=====	=====	=====
-001	S1	Silver, Total	0.19	u MG/KG	0.19	1.0
		Arsenic, Total	129	MG/KG	0.58	1.0
		Barium, Total	64.9	MG/KG	0.05	1.0
		Cadmium, Total	0.33	MG/KG	0.1	1.0
		Chromium, Total	25.3	MG/KG	0.15	1.0
		Mercury, Total	0.04	u MG/KG	0.04	1.0
		Lead, Total	51.6	MG/KG	0.70	1.0
		Selenium, Total	5.1	MG/KG	1.1	1.0
-002	S2	Silver, Total	0.10	u MG/KG	0.10	1.0
		Arsenic, Total	22.0	MG/KG	0.31	1.0
		Barium, Total	20.5	MG/KG	0.03	1.0
		Cadmium, Total	0.05	MG/KG	0.05	1.0
		Chromium, Total	18.3	MG/KG	0.08	1.0
		Mercury, Total	0.02	u MG/KG	0.02	1.0
		Lead, Total	4.2	MG/KG	0.37	1.0
		Selenium, Total	1.0	MG/KG	0.57	1.0
-003	S3	Silver, Total	0.23	u MG/KG	0.23	1.0
		Arsenic, Total	138	MG/KG	0.69	1.0
		Barium, Total	72.4	MG/KG	0.06	1.0
		Cadmium, Total	0.12	u MG/KG	0.12	1.0
		Chromium, Total	44.7	MG/KG	0.17	1.0
		Mercury, Total	0.05	u MG/KG	0.05	1.0
		Lead, Total	6.0	MG/KG	0.84	1.0
		Selenium, Total	3.8	MG/KG	1.3	1.0

Recra LabNet - Lionville

INORGANICS DATA SUMMARY REPORT 11/07/97

USACE-DEAL TEST SITE
 ORDER: 11901-001-003-0001-00

RECRA LOT #: 9710L573

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-004	S4	Silver, Total	0.1	u MG/KG	0.1	1.0
		Arsenic, Total	17.5	MG/KG	0.30	1.0
		Barium, Total	17.6	MG/KG	0.02	1.0
		Cadmium, Total	0.05	u MG/KG	0.05	1.0
		Chromium, Total	19.6	MG/KG	0.07	1.0
		Mercury, Total	0.02	u MG/KG	0.02	1.0
		Lead, Total	3.2	MG/KG	0.36	1.0
		Selenium, Total	0.68	MG/KG	0.54	1.0
-005	S5	Silver, Total	0.25	u MG/KG	0.25	1.0
		Arsenic, Total	146	MG/KG	0.76	1.0
		Barium, Total	88.4	MG/KG	0.06	1.0
		Cadmium, Total	0.13	u MG/KG	0.13	1.0
		Chromium, Total	35.3	MG/KG	0.19	1.0
		Mercury, Total	0.05	u MG/KG	0.05	1.0
		Lead, Total	27.2	MG/KG	0.92	1.0
		Selenium, Total	6.2	MG/KG	1.4	1.0
-006	S6	Silver, Total	0.11	u MG/KG	0.11	1.0
		Arsenic, Total	47.7	MG/KG	0.34	1.0
		Barium, Total	23.2	MG/KG	0.03	1.0
		Cadmium, Total	0.06	u MG/KG	0.06	1.0
		Chromium, Total	18.5	MG/KG	0.08	1.0
		Mercury, Total	0.02	u MG/KG	0.02	1.0
		Lead, Total	2.4	MG/KG	0.41	1.0
		Selenium, Total	1.4	MG/KG	0.62	1.0

Recra LabNet - Lionville

INORGANICS DATA SUMMARY REPORT 11/07/97

CLIENT: USACE-DEAL TEST SITE

RECRA LOT #: 9710L573

WORK ORDER: 11901-001-003-0001-00

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
=====	=====	=====	=====	=====	=====	=====
-007	GW1	Silver, Total	0.80	u UG/L	0.80	1.0
		Arsenic, Total	135	UG/L	2.4	1.0
		Barium, Total	195	UG/L	0.20	1.0
		Cadmium, Total	1.3	UG/L	0.40	1.0
		Chromium, Total	650	UG/L	0.60	1.0
		Mercury, Total	0.10	u UG/L	0.10	1.0
		Lead, Total	53.2	UG/L	2.9	1.0
		Selenium, Total	26.3	UG/L	4.4	1.0
-008	GW2	Silver, Total	0.80	u UG/L	0.80	1.0
		Arsenic, Total	747	UG/L	2.4	1.0
		Barium, Total	833	UG/L	0.20	1.0
		Cadmium, Total	10.9	UG/L	0.40	1.0
		Chromium, Total	1230	UG/L	0.60	1.0
		Mercury, Total	0.10	u UG/L	0.10	1.0
		Lead, Total	222	UG/L	2.9	1.0
		Selenium, Total	34.7	UG/L	4.4	1.0
-009	FB-1	Silver, Total	0.80	u UG/L	0.80	1.0
		Arsenic, Total	2.4	u UG/L	2.4	1.0
		Barium, Total	0.20	u UG/L	0.20	1.0
		Cadmium, Total	0.40	u UG/L	0.40	1.0
		Chromium, Total	0.96	UG/L	0.60	1.0
		Mercury, Total	0.10	u UG/L	0.10	1.0
		Lead, Total	4.3	UG/L	2.9	1.0
		Selenium, Total	4.4	u UG/L	4.4	1.0

Recra LabNet - Lionville

INORGANICS DATA SUMMARY REPORT 11/07/97

CLIENT: USACE-DEAL TEST SITE
 WORK ORDER: 11901-001-003-0001-00

RECRA LOT #: 9710L573

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
=====	=====	=====	=====	=====	=====	=====
-011	GW1	Silver, Soluble	0.80 u	UG/L	0.80	1.0
		Arsenic, Soluble	2.5	UG/L	2.4	1.0
		Barium, Soluble	74.4	UG/L	0.20	1.0
		Cadmium, Soluble	0.40 u	UG/L	0.40	1.0
		Chromium, Soluble	0.60 u	UG/L	0.60	1.0
		Mercury, Soluble	0.10 u	UG/L	0.10	1.0
		Lead, Soluble	2.9 u	UG/L	2.9	1.0
		Selenium, Soluble	5.7	UG/L	4.4	1.0

INORGANICS METHOD BLANK DATA SUMMARY PAGE 11/07/97

CLIENT: USACE-DEAL TEST SITE

RECRA LOT #: 9710L573

WORK ORDER: 11901-001-003-0001-00

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
=====	=====	=====	=====	=====	=====	=====
BLANK1	97L2146-MB1	Silver, Total	0.08 u	MG/KG	0.08	1.0
		Arsenic, Total	0.24 u	MG/KG	0.24	1.0
		Barium, Total	0.02 u	MG/KG	0.02	1.0
		Cadmium, Total	0.04 u	MG/KG	0.04	1.0
		Chromium, Total	0.26	MG/KG	0.06	1.0
		Lead, Total	0.29 u	MG/KG	0.29	1.0
		Selenium, Total	0.44 u	MG/KG	0.44	1.0
BLANK1	97C0799-MB1	Mercury, Total	0.02 u	MG/KG	0.02	1.0
BLANK1	97L2144-MB1	Silver, Total	0.80 u	UG/L	0.80	1.0
		Arsenic, Total	2.4 u	UG/L	2.4	1.0
		Barium, Total	0.20 u	UG/L	0.20	1.0
		Cadmium, Total	0.40 u	UG/L	0.40	1.0
		Chromium, Total	1.1	UG/L	0.60	1.0
		Lead, Total	2.9 u	UG/L	2.9	1.0
		Selenium, Total	4.4 u	UG/L	4.4	1.0
BLANK1	97C0778-MB1	Mercury, Total	0.10 u	UG/L	0.10	1.0
BLANK1	97C0793-MB1	Mercury, Total	0.10 u	UG/L	0.10	1.0

Recra LabNet - Lionville

INORGANICS ACCURACY REPORT 11/07/97

CLIENT: USACE-DEAL TEST SITE
 WORK ORDER: 11901-001-003-0001-00

RECRA LOT #: 9710L573

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR (SPK)
-007	GW1	Mercury, Total	1.1	0.10u	1.0	109.8	1.0
		Mercury, Total MSD	1.1	0.10u	1.0	111.8	1.0
-011	GW1	Mercury, Soluble	1.0	0.10u	1.0	104.1	1.0
		Mercury, Soluble MSD	1.0	0.10u	1.0	101.6	1.0

Recra LabNet - Lionville

INORGANICS DUPLICATE SPIKE REPORT 11/07/97

CLIENT: USACE-DEAL TEST SITE

RECRA LOT #: 9710L573

WORK ORDER: 11901-001-003-0001-00

SAMPLE	SITE ID	ANALYTE	SPIKE#1 %RECOV	SPIKE#2 %RECOV	%DIFF
-007	GW1	Mercury, Total	109.8	111.8	1.8
-011	GW1	Mercury, Soluble	104.1	101.6	2.4

Recra LabNet - Lionville

INORGANICS PRECISION REPORT 11/07/97

USACE-DEAL TEST SITE
ORDER: 11901-001-003-0001-00

RECRA LOT #: 9710L573

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR (REP)
-007REP	GW1	Mercury, Total	0.10u	0.10u	NC	1.0
-011REP	GW1	Mercury, Soluble	0.10u	0.10u	NC	1.0

INORGANICS LABORATORY CONTROL STANDARDS REPORT 11/07/97

CLIENT: USACE-DEAL TEST SITE

RECRA LOT #: 9710L573

WORK ORDER: 11901-001-003-0001-00

SAMPLE	SITE ID	ANALYTE	SPIKED	SPIKED	UNITS	%RECOV
			SAMPLE	AMOUNT		
=====	=====	=====	=====	=====	=====	=====
LCS1	97L2146-LC1	Silver, LCS	46.4	50.0	MG/KG	92.8
		Arsenic, LCS	890	1000	MG/KG	89.0
		Barium, LCS	456	500	MG/KG	91.2
		Cadmium, LCS	22.8	25.0	MG/KG	91.2
		Chromium, LCS	46.1	50.0	MG/KG	92.2
		Lead, LCS	228	250	MG/KG	91.1
		Selenium, LCS	871	1000	MG/KG	87.1
LCS1	97C0799-LC1	Mercury, LCS	3.0	2.9	MG/KG	103.6
LCS1	97L2144-LC1	Silver, LCS	497	500	UG/L	99.4
		Arsenic, LCS	9740	10000	UG/L	97.4
		Barium, LCS	4790	5000	UG/L	95.8
		Cadmium, LCS	247	250	UG/L	98.7
		Chromium, LCS	489	500	UG/L	97.8
		Lead, LCS	2450	2500	UG/L	98.0
		Selenium, LCS	9720	10000	UG/L	97.2
LCS1	97C0778-LC1	Mercury, LCS	5.1	5.0	UG/L	101.7
LCS1	97C0793-LC1	Mercury, LCS	5.5	5.0	UG/L	109.6

Recra LabNet - Lionville Laboratory
 INORGANIC ANALYTICAL DATA PACKAGE FOR
 USACE-DEAL TEST SITE

DATE RECEIVED: 10/01/97

RFW LOT # :9710L573

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
S1						
SILVER, TOTAL	001	S	97L2146	09/30/97	10/28/97	10/29/97
ARSENIC, TOTAL	001	S	97L2146	09/30/97	10/28/97	10/29/97
BARIUM, TOTAL	001	S	97L2146	09/30/97	10/28/97	10/29/97
CADMIUM, TOTAL	001	S	97L2146	09/30/97	10/28/97	10/29/97
CHROMIUM, TOTAL	001	S	97L2146	09/30/97	10/28/97	10/29/97
MERCURY, TOTAL	001	S	97C0799	09/30/97	10/21/97	10/22/97
LEAD, TOTAL	001	S	97L2146	09/30/97	10/28/97	10/29/97
SELENIUM, TOTAL	001	S	97L2146	09/30/97	10/28/97	10/29/97
S2						
SILVER, TOTAL	002	S	97L2146	09/30/97	10/28/97	10/29/97
ARSENIC, TOTAL	002	S	97L2146	09/30/97	10/28/97	10/29/97
BARIUM, TOTAL	002	S	97L2146	09/30/97	10/28/97	10/29/97
CADMIUM, TOTAL	002	S	97L2146	09/30/97	10/28/97	10/29/97
CHROMIUM, TOTAL	002	S	97L2146	09/30/97	10/28/97	10/29/97
MERCURY, TOTAL	002	S	97C0799	09/30/97	10/21/97	10/22/97
LEAD, TOTAL	002	S	97L2146	09/30/97	10/28/97	10/29/97
SELENIUM, TOTAL	002	S	97L2146	09/30/97	10/28/97	10/29/97
S3						
SILVER, TOTAL	003	S	97L2146	09/30/97	10/28/97	10/29/97
ARSENIC, TOTAL	003	S	97L2146	09/30/97	10/28/97	10/29/97
BARIUM, TOTAL	003	S	97L2146	09/30/97	10/28/97	10/29/97
CADMIUM, TOTAL	003	S	97L2146	09/30/97	10/28/97	10/29/97
CHROMIUM, TOTAL	003	S	97L2146	09/30/97	10/28/97	10/29/97
MERCURY, TOTAL	003	S	97C0799	09/30/97	10/21/97	10/22/97
LEAD, TOTAL	003	S	97L2146	09/30/97	10/28/97	10/29/97
SELENIUM, TOTAL	003	S	97L2146	09/30/97	10/28/97	10/29/97
S4						
SILVER, TOTAL	004	S	97L2146	09/30/97	10/28/97	10/29/97
ARSENIC, TOTAL	004	S	97L2146	09/30/97	10/28/97	10/29/97

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 INORGANIC ANALYTICAL DATA PACKAGE FOR
 USACE-DEAL TEST SITE

DATE RECEIVED: 10/01/97

RFW LOT # :9710L573

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
BARIUM, TOTAL	004	S	97L2146	09/30/97	10/28/97	10/29/97
CADMIUM, TOTAL	004	S	97L2146	09/30/97	10/28/97	10/29/97
CHROMIUM, TOTAL	004	S	97L2146	09/30/97	10/28/97	10/29/97
MERCURY, TOTAL	004	S	97C0799	09/30/97	10/21/97	10/22/97
LEAD, TOTAL	004	S	97L2146	09/30/97	10/28/97	10/29/97
SELENIUM, TOTAL	004	S	97L2146	09/30/97	10/28/97	10/29/97

S5

SILVER, TOTAL	005	S	97L2146	09/30/97	10/28/97	10/29/97
ARSENIC, TOTAL	005	S	97L2146	09/30/97	10/28/97	10/29/97
BARIUM, TOTAL	005	S	97L2146	09/30/97	10/28/97	10/29/97
CADMIUM, TOTAL	005	S	97L2146	09/30/97	10/28/97	10/29/97
CHROMIUM, TOTAL	005	S	97L2146	09/30/97	10/28/97	10/29/97
MERCURY, TOTAL	005	S	97C0799	09/30/97	10/21/97	10/22/97
LEAD, TOTAL	005	S	97L2146	09/30/97	10/28/97	10/29/97
SELENIUM, TOTAL	005	S	97L2146	09/30/97	10/28/97	10/29/97

S6

SILVER, TOTAL	006	S	97L2146	09/30/97	10/28/97	10/29/97
ARSENIC, TOTAL	006	S	97L2146	09/30/97	10/28/97	10/29/97
BARIUM, TOTAL	006	S	97L2146	09/30/97	10/28/97	10/29/97
CADMIUM, TOTAL	006	S	97L2146	09/30/97	10/28/97	10/29/97
CHROMIUM, TOTAL	006	S	97L2146	09/30/97	10/28/97	10/29/97
MERCURY, TOTAL	006	S	97C0799	09/30/97	10/21/97	10/22/97
LEAD, TOTAL	006	S	97L2146	09/30/97	10/28/97	10/29/97
SELENIUM, TOTAL	006	S	97L2146	09/30/97	10/28/97	10/29/97

GW1

SILVER, TOTAL	007	W	97L2144	09/30/97	10/28/97	10/28/97
ARSENIC, TOTAL	007	W	97L2144	09/30/97	10/28/97	10/28/97
BARIUM, TOTAL	007	W	97L2144	09/30/97	10/28/97	10/28/97
CADMIUM, TOTAL	007	W	97L2144	09/30/97	10/28/97	10/28/97
CHROMIUM, TOTAL	007	W	97L2144	09/30/97	10/28/97	10/28/97
MERCURY, TOTAL	007	W	97C0778	09/30/97	10/14/97	10/15/97
MERCURY, TOTAL	007 REP	W	97C0778	09/30/97	10/14/97	10/15/97

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RFW LOT # :9710L573

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
MERCURY, TOTAL	007 MS	W	97C0778	09/30/97	10/14/97	10/15/97
MERCURY, TOTAL	007 MSD	W	97C0778	09/30/97	10/14/97	10/15/97
LEAD, TOTAL	007	W	97L2144	09/30/97	10/28/97	10/28/97
SELENIUM, TOTAL	007	W	97L2144	09/30/97	10/28/97	10/28/97

GW2

SILVER, TOTAL	008	W	97L2144	09/30/97	10/28/97	10/28/97
ARSENIC, TOTAL	008	W	97L2144	09/30/97	10/28/97	10/28/97
BARIUM, TOTAL	008	W	97L2144	09/30/97	10/28/97	10/28/97
CADMIUM, TOTAL	008	W	97L2144	09/30/97	10/28/97	10/28/97
CHROMIUM, TOTAL	008	W	97L2144	09/30/97	10/28/97	10/28/97
MERCURY, TOTAL	008	W	97C0778	09/30/97	10/14/97	10/15/97
LEAD, TOTAL	008	W	97L2144	09/30/97	10/28/97	10/28/97
SELENIUM, TOTAL	008	W	97L2144	09/30/97	10/28/97	10/28/97

FB-1

SILVER, TOTAL	009	W	97L2144	09/30/97	10/28/97	10/28/97
ARSENIC, TOTAL	009	W	97L2144	09/30/97	10/28/97	10/28/97
BARIUM, TOTAL	009	W	97L2144	09/30/97	10/28/97	10/28/97
CADMIUM, TOTAL	009	W	97L2144	09/30/97	10/28/97	10/28/97
CHROMIUM, TOTAL	009	W	97L2144	09/30/97	10/28/97	10/28/97
MERCURY, TOTAL	009	W	97C0778	09/30/97	10/14/97	10/15/97
LEAD, TOTAL	009	W	97L2144	09/30/97	10/28/97	10/28/97
SELENIUM, TOTAL	009	W	97L2144	09/30/97	10/28/97	10/28/97

GW1

SILVER, SOLUBLE	011	W	97L2144	09/30/97	10/28/97	10/28/97
ARSENIC, SOLUBLE	011	W	97L2144	09/30/97	10/28/97	10/28/97
BARIUM, SOLUBLE	011	W	97L2144	09/30/97	10/28/97	10/28/97
CADMIUM, SOLUBLE	011	W	97L2144	09/30/97	10/28/97	10/28/97
CHROMIUM, SOLUBLE	011	W	97L2144	09/30/97	10/28/97	10/28/97
MERCURY, SOLUBLE	011	W	97C0793	09/30/97	10/21/97	10/22/97
MERCURY, SOLUBLE	011 REP	W	97C0793	09/30/97	10/21/97	10/22/97
MERCURY, SOLUBLE	011 MS	W	97C0793	09/30/97	10/21/97	10/22/97
MERCURY, SOLUBLE	011 MSD	W	97C0793	09/30/97	10/21/97	10/22/97

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RFW LOT # :9710L573

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
LEAD, SOLUBLE	011	W	97L2144	09/30/97	10/28/97	10/28/97
SELENIUM, SOLUBLE	011	W	97L2144	09/30/97	10/28/97	10/28/97

LAB QC:

SILVER LABORATORY	LC1 BS	S	97L2146	N/A	10/28/97	10/29/97
SILVER, TOTAL	MB1	S	97L2146	N/A	10/28/97	10/29/97
ARSENIC LABORATORY	LC1 BS	S	97L2146	N/A	10/28/97	10/29/97
ARSENIC, TOTAL	MB1	S	97L2146	N/A	10/28/97	10/29/97
BARIUM LABORATORY	LC1 BS	S	97L2146	N/A	10/28/97	10/29/97
BARIUM, TOTAL	MB1	S	97L2146	N/A	10/28/97	10/29/97
CADMIUM LABORATORY	LC1 BS	S	97L2146	N/A	10/28/97	10/29/97
CADMIUM, TOTAL	MB1	S	97L2146	N/A	10/28/97	10/29/97
CHROMIUM LABORATORY	LC1 BS	S	97L2146	N/A	10/28/97	10/29/97
CHROMIUM, TOTAL	MB1	S	97L2146	N/A	10/28/97	10/29/97
MERCURY LABORATORY	LC1 BS	S	97C0799	N/A	10/21/97	10/22/97
MERCURY, TOTAL	MB1	S	97C0799	N/A	10/21/97	10/22/97
LEAD LABORATORY	LC1 BS	S	97L2146	N/A	10/28/97	10/29/97
LEAD, TOTAL	MB1	S	97L2146	N/A	10/28/97	10/29/97
SELENIUM LABORATORY	LC1 BS	S	97L2146	N/A	10/28/97	10/29/97
SELENIUM, TOTAL	MB1	S	97L2146	N/A	10/28/97	10/29/97
SILVER LABORATORY	LC1 BS	W	97L2144	N/A	10/28/97	10/28/97
SILVER, TOTAL	MB1	W	97L2144	N/A	10/28/97	10/28/97
ARSENIC LABORATORY	LC1 BS	W	97L2144	N/A	10/28/97	10/28/97
ARSENIC, TOTAL	MB1	W	97L2144	N/A	10/28/97	10/28/97
BARIUM LABORATORY	LC1 BS	W	97L2144	N/A	10/28/97	10/28/97
BARIUM, TOTAL	MB1	W	97L2144	N/A	10/28/97	10/28/97
CADMIUM LABORATORY	LC1 BS	W	97L2144	N/A	10/28/97	10/28/97
CADMIUM, TOTAL	MB1	W	97L2144	N/A	10/28/97	10/28/97
CHROMIUM LABORATORY	LC1 BS	W	97L2144	N/A	10/28/97	10/28/97
CHROMIUM, TOTAL	MB1	W	97L2144	N/A	10/28/97	10/28/97
MERCURY LABORATORY	LC1 BS	W	97C0778	N/A	10/14/97	10/15/97
MERCURY, TOTAL	MB1	W	97C0778	N/A	10/14/97	10/15/97
LEAD LABORATORY	LC1 BS	W	97L2144	N/A	10/28/97	10/28/97
LEAD, TOTAL	MB1	W	97L2144	N/A	10/28/97	10/28/97
SELENIUM LABORATORY	LC1 BS	W	97L2144	N/A	10/28/97	10/28/97
SELENIUM, TOTAL	MB1	W	97L2144	N/A	10/28/97	10/28/97
MERCURY LABORATORY	LC1 BS	W	97C0793	N/A	10/21/97	10/22/97

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RFW LOT # :9710L573

ELEMENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
MERCURY, TOTAL	MB1	W	97C0793	N/A	10/21/97	10/22/97

Appendix E

APPENDIX E

DATA VALIDATION SUMMARY

DATA VALIDATION SUMMARY
Deal Test Site, Ocean Township, New Jersey

Laboratory Lot #9710L573

VOA Analysis

1. All holding times were met with the exceptions of samples GW1 and GW2. These two samples had pH > 2.0, indicating the samples were not properly preserved. The analysis holding time was reduced to 7 days as a result. Both samples were analyzed outside the 7-day holding time. All results were qualified as estimated (J).
2. MS/MSD were analyzed on sample GW2.
3. The moisture contents of samples S1, S3, and S5 are >50%; therefore the results of these samples were qualified as estimated (J).
4. The presence of chloromethane, methylene chloride, and acetone were qualified as non-detected (U) for blank contamination.

BNA Analysis

1. All holding times were met.
2. All results of samples S1, S3, and S5 were qualified as estimated for percent moisture being >50%.
3. The aldol condensation product were rejected [R] in soil samples S2 and S4. The TIC retention time (Rt) at 7.85 in sample GW1 and the TIC Rt= 7.86 in sample GW2 were rejected for blank contamination.
4. The detections of benzoic acid and bis(2-ethylhexyl)phthalate were qualified as non-detect (U) for blank contamination.

Pesticides/PCBs Analysis

1. All holding times were met.
2. The results of soil samples S1, S3, and S5 were qualified as estimated for percent moisture being >50%.
3. All soil samples and water sample GW2 were analyzed at various dilutions. As a result, the reporting limits were elevated. None of the target compounds were detected. No surrogate compounds were recovered.

Metals Analysis

1. All holding times were met.
2. The results of lead reported for samples S3 and S5 were rejected [R] for their concentrations less than 5x the field blank concentration.
3. The soil LCS recoveries for silver and lead were outside the QC limits established by the lab. The results of silver and lead were qualified as estimated for all soil samples.
4. For sample GW1, total and dissolved metals were analyzed. The RPDs were >10% for As, Ba, Cd, Cr, Pb, and Se. As a result, these results were qualified as estimated for both analyses.
5. MS/MSD were performed for mercury.
6. The results of soil samples S1, S3, and S5 were qualified as estimated for percent moisture >50%.

Laboratory Lot #9710L600

VOA Analysis

1. All holding times were met.
2. The results of S7 and S9 were qualified as estimated for percent moisture >50%.
3. Sample S9 was also qualified for surrogate recovery out of QC limit.
4. For sample GW5, all compounds but carbon disulfide were qualified as estimated for surrogate recovery out of QC limit. The carbon disulfide result should be reported from the dilution analysis, which had all surrogate recoveries within the QC limits.
5. Sample S7 was designated for MS/MSD analysis but was not placed in the vials labeled for such purposes. These vials contained matrix spike solution. As a result, MS/MSD were not analyzed by the lab. MS/MSD was performed for sample GW2 (for both lots: 9710L573 and 9710L600).
6. The presence of methylene chloride and acetone in the samples were qualified as non-detect (U) due to blank contamination.

BNA Analysis

1. All holding times were met.
2. The results of S7 and S9 were qualified as estimated for percent moisture >50%.
3. Some TICs were rejected for blank contamination.

4. The presence of benzoic acid and bis(2-ethylhexyl)phthalate in the samples were qualified as non-detect (U) for blank contamination.

Pesticides/PCBs Analysis

1. All holding times were met.

2. The results of samples S7 and S9 were qualified as estimated for percent moisture >50.

3. All soil samples were analyzed at various dilution due to matrix interference. No surrogate compounds were recovered. No target compounds were detected at elevated reporting limits.

4. Sample S7 was designated for MS/MSD but was not extracted. A MS/MSD was run on lot #9710L573.

Metals Analysis

1. All holding time were met.

2. The field blank (of the filter apparatus) was collected for dissolved metals only; therefore it was only used for qualifying water samples for dissolved metal analysis.

3. Soil LCS recoveries were lower than the QC limits for silver and lead. The results of silver and lead were qualified as estimated for all soil samples.

4. The arsenic recoveries in the soil MS/MSD were less than the QC limit. All soil arsenic results were qualified as estimated.

5. The lab duplicate analysis was performed on soil sample S7. The RPD of selenium was outside the QC limit. The selenium result of S7 was qualified as estimated.

6. The water method blank contained chromium at concentration greater than IDL but less than the CRDL. The chromium results in the following samples were qualified as non-detect (U) for their concentrations < 10x blank concentration: SW2 (total), GW2 (dissolved), GW4 (dissolved), and SW2 (dissolved).

7. The field blank FB03 contained barium, chromium, and selenium at concentrations less than the CRDL but above the IDL. It also contained lead at a concentration above the CRDL. The detections of these analytes in some water samples (dissolved analysis) were qualified as non-detect for their concentrations being less than 5x the field blank concentrations.

8. The differences between total and dissolved analyses in some samples exceeded the 10% limit. The affected sample results (from both total and dissolved analyses) were qualified as estimated.