U.S. Army Corps of Engineers
Louisville District

Defense Environmental Restoration Program
For
Formerly Used Defense Sites

Limited Site Investigation

Final Report

for
the former

Plum Brook Ordnance Works

TNT Rail Car Loading Area

Sandusky, Ohio
Project Number G05OH001816

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List of Acronyms

ASTM	American Standards for Testing Materials
BTEX	benzene, toluene, ethylbenzene, xylene
bgs	below ground surface
CERCLA	Comprehensive Environmental Response, Compensation, Liability Act of 1980
CERCLIS	Comprehensive Environmental Response, Compensation, and Liability Information System
CLP	Contract Laboratory Program
COC	Chain of Custody
CRL	Central Regional Laboratory
D&D	Decontamination & Decommissioning
DERP	Defense Environmental Restoration Program
DNT	dinitrotoluene
DOD	U.S. Department of Defense
DQO	Data Quality Objective
EPA	U.S. Environmental Protection Agency
ERIIS	Environmental Risk Information & Imaging Services
ERNS	Emergency Response Notification System
FSP	Field Sampling Plan
FUDS	Formerly Used Defense Sites
gpm	gallons per minute
GSA	General Services Administration
HNO_3	acetic acid
IDW	Investigation-Derived Waste
INPR	Inventory Project Request
IT	IT Corporation
LeRC	Lewis Research Center
MDL	Method Detection Limit
MRL	Method Reporting Limit
MS/MSD	Matrix Spike/Matrix Spike Duplicate
MSDS	Material Safety Data Sheet
msl	mean sea level
NACA	National Advisory Committee for Aeronautics
NASA	National Aeronautical and Space Administration
NIST	National Institute of Standard Technology
NPL	National Priorities Lists
OEPA	Ohio Environmental Protection Agency
PA	Preliminary Assessment
PAWL	Pentolite Area Waste Lagoons
PBOW	Plum Brook Ordnance Works
PBRF	Plum Brook Reactor Facility
PBS	Plum Brook Station

PE	Pentaerythritol
PETN	Pentaerythritol tetranitrate
PID	Photoionization Detector
ppb	parts per billion
PRGs	Preliminary Remediation Goals
QA	Quality Assurance
QAPP	Quality Assurance Project Plan
QC	Quality Control
SAIC	Science Applications International Corporation
SAP	Sampling and Analysis Plan
SARA	Superfund Amendments and Reauthorization Act
SAS	Spectial Analytical Services
SI	Site Investigation
SOP	Standard Operating Procedure
SVOC	Semi-Volatile Organic Compound
SW846	Test Methods for Evaluating Solid Waste 1986
TAL	Target Analyte List
TCL	Target Compound List
TOC	Total Organic Carbon
TNT	trinitrotoluene
USACE	U.S. Army Corp of Engineers
USCS	Unified Soil Classification System
USEPA	U.S. Environmental Protection Agency
VOA	Volatile Organic Analysis
VOC	Volatile Organic Compound

1.0 Introduction

Located south of Sandusky, Ohio, the former Plum Brook Ordnance Works (PBOW) installation was operated from 1941 to 1945 by the Department of Defense (DOD) for the manufacturing of trinitrotoluene (TNT), dinitrotoluene (DNT) and pentolite. Contamination has been detected at several sites within the facility that is potentially related to past DOD activities. These sites are being addressed by the DOD under the Defense Environmental Restoration Program (DERP), Formerly Used Defense Sites (FUDS).

A limited Site Investigation (SI) of a former Rail Car Loading Area (RCLA) was conducted and is reported herein. The potential for contamination of the former RCLA site was identified in an Inventory Project Request (INPR) (Huntington District, U.S. Army Corps of Engineers (USACE), 1998). The purpose of this limited SI is to evaluate the potential contamination of the RCLA resulting from past Department of Defense (DOD) activities. Historical information was reviewed to identify the environmental media and locations most likely affected by former site-related activities. The References section of this report identifies the guidance documents and information used to evaluate the site history, environmental media, and the site-specific locations. Field sampling and chemical laboratory analyses were performed to evaluate the environmental media at the site. Results of the laboratory analyses are compared to risk-based, media specific screening criteria. USEPA Region 9 Preliminary Remediation Goals (PRGs) have been used for the screening criteria.

This project is one of several limited SI projects simultaneously undertaken by the US Army Corps of Engineers to be executed by the Louisville district (CELRL) in cooperation with the Huntington District (CELRH).

The sampling and chemical laboratory analyses were performed in accordance with the Quality Assurance Project Plan (QAPP) prepared by the Corps of Engineers, Louisville District, dated June 1999. The Data Quality Objectives (DQOs) were defined for this site investigation to choose the sampling and analysis methods that would properly characterize the site at the SI level of work for the TNT Rail Car Loading Area. A non-statistical sampling approach was used to locate the samples and to select the number of samples. This process was implemented because this was a limited SI. The sampling was both purposeful and biased to locations that were most likely contaminated. The detection limits presented by the analytical laboratory were appropriate for the site investigation. The Data Review and Validation Report presented herein gives a detailed examination of the usability of the analytical results. The TNT Rail Car Loading Area has been recommended for no further action. In correspondence dated December 9, 1999 the Ohio EPA, Division of Emergency and Remedial Response conditionally accepted the recommendation for No Further Action.

2.0 Site Description

2.1 Location

The RCLA 1017 site is located within the southern portion of the Plum Brook Station (PBS) facility in Erie County, Ohio (Figure 1). The PBS facility, formerly Plum Brook Ordnance Works (PBOW) encompasses the majority of Perkins and Oxford townships approximately four miles south of Sandusky, Ohio (Figure 2). The PBS installation is currently operated by the National Aeronautical and Space Administration (NASA).

Several miles of railroad track transverse the PBOW installation. Along these single-track rail lines, docks were constructed for the loading and unloading of finished and intermediate trinitrotoluene (TNT) products. The loading docks have been targeted as areas of concern because of their high probability of susceptibility of contamination from spills that may have occurred during the loading and/or unloading operations. Rail Car Loading Area 1017, adjacent to the former Dunnage Storage Building 1017 (Figures 3 and 4), is the loading dock being investigated under this limited SI project.

2.2 Climate

Erie County is characterized by continental climate. Winters are cold and cloudy and summers are warm and humid. The county's first freezing temperature is typically in October, and its last freezing temperature is normally in April. Average annual precipitation for Sandusky from 1961 to 1990 was 34.05 inches. Wind is from the southwest 55 percent of the time (Dames & Moore 1997).

2.3 Topography

The surface of the area that presently occupies the former RCLA 1017 is relatively flat and at approximately 675 feet above mean sea level (msl). Refer to Figure 4 for actual site elevations. Based on review of historic topographic quadrangles (USGS, 1959 and 1969), the surface elevation in the former PBOW has not changed significantly since 1959. A copy of these topographic quadrangles is provided in Appendix B.

2.4 Hydrology

Surface water runoff in the former RCLA 1017 generally flows north/northeast draining into an unnamed ditch that ultimately discharge into Plum Brook, which flows northeast, off the installation, and eventually discharges into Lake Erie. Based on a topographic quadrangle (Kimball Quadrangle, Ohio, dated 1969), it appears that two wetlands are

within close proximity to the subject site. The wetlands are located to the northeast and southeast at approximately 1800 feet and 1500 feet, respectively, from the subject site.

2.5 Geology

Based on the Site Wide Groundwater Study (IT Corporation, 1997-1998), three formations, all of the Devonian Age, underlie the PBOW installation. The Delaware Limestone is the lowermost formation. It is characterized as a hard, dense, finely crystalline limestone and dolomite. Dissolution of this unit has produced solution channels along bedding planes and joints, and in severe dissolution condition, has even produced caverns in some areas. The unit is typically buff colored and usually described as fossiliferous. In the vicinity of PBOW, benzene, toluene, ethyl benzene, and xylene (BTEX) and hydrogen sulfide are common in area quarries. Overlying the Delaware Limestone is the Olentangy Formation. Two members of the Olentangy Formation have been characterized at the PBOW installation, the Plumbrook Shale and the overlying Prout Limestone. The Plum Brook Shale is interpreted to consist of approximately 35 feet of bluish-gray, soft, fossiliferous shale containing thin layers of dark, hard, fossiliferous limestone. The Prout Limestone has been interpreted to be a unit approximately 15 feet thick which outcrops occasionally in a 1,000 to 2,000 foot-wide, northeast striking band across the middle portion of the PBOW installation. It has been described as a dark-gray to blue, very hard, siliceous, fossiliferous limestone or dolomitic mudstone. The uppermost formation at the PBOW installation is the Ohio Shale. Only the Huron Shale, member of the Ohio Shale formation is present in the PBOW installation. This unit has been described as black, thinly bedded, with pyrite and abundant carbonaceous matter with some large pyrite/carbonate concretions of up to 6 feet in diameter.

The bedrock overburden in Erie County is predominantly glacial till, outwash or lacustrine (lake) deposits. In the vicinity of PBOW installation, the glacial soil has been interpreted to be lacustrine. In many areas, the overburden also consists of highly weathered bedrock. The thickness of the overburden ranges from approximately five feet or less for most of PBOW to greater than 25 feet. The overburden is thickest on the northern portion of the installation.

Based on review of the U.S. Department of Agriculture, Soil Survey, Erie County, Ohio, dated February, 1971 and soil boring records from the vicinity of the RCLA 1017 site, overburden soils generally consist of an upper layer of brown silt with a trace of fine sand and clay extending to a depth of approximately four feet below ground surface (bgs). This material was typically classified as ML, silty or clayey fine sands or clayey silts with slight plasticity, in accordance with the Unified Soil Classification System (USCS). This upper, brown silt layer is generally underlain by fractured, weathered shale extending to a boring termination depth of approximately 8 feet bgs. (Site Inspection Report, Morrison Knudsen Corporation, dated 1994). Bedrock encountered consists of weathered shale underlain by limestone. Groundwater is generally encountered within the bedrock (Groundwater Resources of Erie County, 1986).

2.6 Hydrogeology

Based on the Site-wide Groundwater Study (IT Corporation, 1997-1998), potable groundwater is encountered in the bedrock units underlying the PBOW installation. Generally this groundwater migrates northward toward Lake Erie. Based on the hydrogeologic information given in Appendix C (Groundwater Resources of Erie County, 1986), the PBOW installation includes three (3) distinct hydrogeologic regions. Groundwater yields from these regions range from limited, in the northeast and south regions, to more than 500 gallons per minute (gpm), in the northwest region.

The RCLA 1017 site is located in a hydrogeologic region, which seldom yields groundwater at more than 3 gpm. Groundwater in the overburden soils is generally expected to be perched or trapped water. Limited quantities of groundwater are obtained from thin, discontinuous sand and gravel deposits interbedded in fine, sandy clay or from the underlying shale. Perched water sources contain widely varying quantities of water depending on recent precipitation and other site-specific factors. Based on the expected soil types, overburden groundwater quantities should be minimal. Drilling deeper than 30 feet into the shale is not recommended. Occasional gas or salt may be encountered in the eastern half of the county.

3.0 Operational History and Waste Characteristics

3.1 Plum Brook Station (Installation Wide)

Based on the Archives Search Report (USACE, 1993), the original PBS site was established in 1941 and referred to as Plum Brook Ordnance Works (PBOW). The installation was established for the purpose of manufacturing trinitrotoluene (TNT), dinitrotoluene (DNT), pentolite, and nitric and sulfuric acids. Built by E.B. Badger and Sons Company, the facility was operated under contract by the Trojan Powder Company. Production of explosives ceased two weeks after V-J Day, having manufactured in excess of one billion pounds of explosives during the four-year operating period.

By September 1945, the entire Ordnance Inspection Department was abolished. Decontamination of TNT, acid, pentolite and DNT manufacturing lines was completed during the last quarter of 1945. On December 17, 1945, the physical custody of the plant was transferred from Trojan to the Ordnance Department. The U.S. Corps of Engineers assumed responsibility for maintenance and custodial duties until September 1946 when the property was transferred to the War Assets Administration (predecessor to the Government Services Administration (GSA)), after it was certified by the U.S. Army to be decontaminated.

NASA acquired the PBOW in 1963 and is presently using the site, now referred to as PBS.

The PBS site currently lies in an area that is primarily rural and agricultural with a low population density. The NASA Lewis Research Center occupies a majority of the former ordnance works. The Department of the Army maintains a reserve center on the westernmost portion of the facility. The remainder of the former installation is in private ownership with the vast majority being cultivated. A tract on the northern boundary is owned by the Perldns Board of Education and is utilized as a bus maintenance facility. A land use map (dated 1980/1983) and an historic land ownership map (dated 1865) of the PBOW vicinity is included in Appendix D.

3.2 Rail Car Loading Areas (Site Specific)

Based on the nearby presence of the Dunnage Storage Building (Building 1017), the layout of roads and railroad tracks, and the positioning of the subject site between the TNT Area B and the Magazine Area, it appears that RCLA 1017 was a major rail car loading area for TNT and associated products. Refer to Figure 5, a 1950 aerial photograph of the former RCLA 1017 site. The railroad tracks split into 3 spurs, at the subject site, with an explosion containment wall located between the two northern tracks. The three railroad spurs run parallel to one another, for approximately 1500 feet, before merging into a single railroad line. RCLA 1017 is situated southeast of the TNT Area B and west of the Magazine Area. Historic aerial photographs of the site do not show much variation over the years, except that growing vegetation has been encroaching on the subject site (Figure 6). This was apparent during the site reconnaissance, performed in March 1995, at which time dense vegetation was observed especially on the west and south portions of the subject site. In a March 1999 interview, with Keith Peecook, a NASA employee currently working at the PBOW installation, informed us that, "Currently, NASA allows local law enforcement agencies to use the site as an outdoor range training area for small caliber weapons."

Based on topographic quadrangles dated 1959 and 1969 (Appendix B), historical aerial photographs dated 1956, 1977, and 1995 (Appendix E), and a previous site reconnaissance performed in March 1999, it appears that the RCLA 1017 site has remained unchanged since the decommissioning of this facilities.

Environmental Information and Imaging Services (ERIIS) performed a database search of the northern portion of PBOW installation. The data base search included those sites within close proximity to the PBOW installation that are currently listed under the following database records:

- National Priorities List (NPL)
- Resource Conservation and Recovery Information System-TSDs: Subject to Corrective Action (RCRIS_CA)
- Resource Conservation and Recovery Information System- Non-Corrective Action TSD Facilities (RCRIS_TS)

- Comprehensive Environmental Response, Compensation and Liability Information System (CERCLIS)
- No Further Remedial Action Planned Sites (NFRAP)
- Resource Conservation and Recovery Information System-Large Quantity Generators (RCRIS_LG)
- Resource Conservation and Recovery Information System-Small Quantity Generators (RCRIS_SG)
- Emergency Response Notification System (ERNS)
- Ohio Master Sites List (HWS)
- Ohio Leaking Underground Storage Tank Report (LRST)
- Ohio Solid Waste Facility List (SWF)
- Ohio Underground Storage Tank Report (RST)

A description of each of these records is presented in Appendix F. Within the radii on the ERIIS figure in Appendix F, the search revealed 25 LRST sites, 18 RST sites, 3 SWF sites, 1 RCRIS_TS sites, 1 NFRAP site, 5 RCRIS_SG sites, 1 ERNS site, and 3 HWS sites. Of these sites, 6 LRST sites, 9 RST sites, 1 RCRIS_SG site, 1 RCRIS_TS site, 1 NFRAP site, and 1 HWS site are located on the PBOW installation. The remainder of the listed sites is located outside the installation boundary. Information concerning each of these listed facilities and their location is included in Appendix F. Based on the proximity of these sites and/or their status, the potential for any of these listed facilities to negatively impact the RCLA 1017 site is minimal. However, since the environmental database search was focused on the northern portion of the PBOW installation and did not include the immediate vicinity of the RCLA. However, based on review of the aforementioned aerial photographs, the property in the vicinity of the RCLA has never been developed. Therefore, it is unlikely that unidentified listed facilities are present that could negatively impact the RCLA site.

4.0 Soil Source Sampling

4.1 Sampling Activities

The rationale for the design of the sampling process was discussed in the Field Sampling Plan (FSP), paragraphs 4.0. Field activities closely followed the FSP. With the exception of the location of the samples, the FSP specified the collection of surface soil samples along four sampling lines. The original sampling lines were to be adjacent to and parallel the 500-foot railroad tracks. However, based on observations made during the site reconnaissance it was determined that a biased sampling approach, concentrating the investigative effort within the area where most of the loading operations had been performed, would provide the most conclusive results. Therefore, five sampling lines, positioned in an east/west orientation, were designated to run parallel to the railroad tracks. The five sampling lines varied in length from 175 feet to 300 feet. The loading operation areas included within this sampling effort are designated as around the explosion containment wall, adjacent to the former Building 1017, and the gully located

north of the explosion containment wall. The sampling lines are identified by numbers 1 through 5 from south to north, respectively (Figure 4).

All borings were advanced using a stainless-steel hand auger. Field screening was performed in accordance with the FSP. Field screening samples were collected every 25 feet and four soil samples were composited, for field analysis, every 100 feet. Field screening of the four composited samples was accomplished by utilizing the EnSys Test Kit. The range of this test is between 1 to 30 parts per million (ppm) TNT/TNB and DNT. The least detectable concentration is 0.7 ppm TNT. The manufacture of the test kit does not guarantee that the results of this test kit will always agree with analytical laboratory methods. Further details of the field screening procedures are outlined in the project's QAPP, date May 1999, revised July 2000. Twelve composited surface soil samples were collected and field screened. The results of the field screening indicated that all of the samples were in the non-detection range for TNT. Refer to Figure 4 for actual field screening locations. The Field Screening Log Form is included in Appendix G.

Six surface soil samples were collected, in accordance with the FSP, for laboratory analysis. Each surface soil sample was taken from six-inches to one-foot below the existing ground surface. Two soil samples were collected, along sample line 1, between the southern railroad tracks and Building 1017. Two soil samples were collected, along sample line 2, between the two railroad tracks running between Building 1017 and the explosion containment wall. In addition, two soil samples were collected, along sample line 5, from the gully located north of the explosion containment wall. Refer to Figure 4 for actual analytical soil sample locations. All surface soil samples were obtained within the six-inch to one-foot interval below the existing ground surface.

To minimize cross-contamination between borings and maximize the quality of the field sampling effort, decontamination and sampling procedures were performed in accordance with the site-specific QAPP, dated May 1999, revised July 2000. Collected surface soil samples were placed in appropriate containers, labeled, and preserved on ice. At the field base station, the samples were processed and packaged for shipment. A chain-of-custody record was generated and custody seals were placed on the sample coolers. Subsequently, the samples were shipped overnight, via Federal Express, to Quanterra Laboratory located in North Canton, Ohio for chemical analyses. Surface soil samples were analyzed for semi-volatile organic compounds (SVOCs) by SW-846 method 8270C, nitroaromatics (explosives) by SW-846 method 8330, Resource Conservation and Recovery Act (RCRA) metals by SW-846 6000/7000 series methods. Total organic carbon (TOC), pH, and geotechnical parameters (Sieve/Atterberg tests) were also preformed. Table 1 identifies the sample numbers, sample locations, media type, and analyses performed on each sample. The results of the laboratory analyses are presented in the subsequent sections of this report.

The following field quality control samples were collected to monitor sampling precision, cross-contamination, and decontamination procedures:

Duplicates – A duplicate sample (SSCL07) was collected at the same time as the original sample (SSCL02) and in the same analytical sequence. One field duplicate was collected for every 10 primary samples. Duplicate samples were used to monitor sampling precision in the field. Duplicate sample analysis included SVOCs, metals and Explosives analyses.

Rinsate – A rinsate sample (SWCL01) was collected, by rinsing sampling equipment with deionized water, after decontamination was performed. The water used to rinse the equipment collected in the appropriate sample container. One rinsate was collected for every 20 investigative samples. Rinsate samples were used to monitor field-sampling procedures for decontamination completeness. Metals analysis was performed on the rinsate sample.

Field Blanks – A field blank sample (SWCL02) was collected by pouring deionized water, used in the decontamination process of field equipment, directly into prepared sample bottles. The field blank sample was handled and analyzed in the same manner as environmental samples obtained at the subject site. Field blank analyses are used to indicate the baseline contamination that may be introduced during each sampling event by the use of deionized water in the field effort. Metals analysis was performed on the field blank.

Temperature Blanks - These samples were prepared by adding deionized water to a sample bottle. This sample was clearly identified as a temperature blank. This sample was added in every cooler prepared for shipment to the analytical laboratory to monitor temperature of the samples while in transit from the field to the laboratory.

4.2 Field Screening and Analytical Results

As stated before, field screening with the EnSys Test Kit indicated explosive concentrations in the non-detection range. Field screening results are provided in Appendix G. The results of the laboratory chemical analysis sheets are provided in Appendix H. An independent, chemical data validation report is provided in Appendix I.

Analytical test results are presented on tables 2 through 4. Those analytes that indicated concentrations above the detection limits are included in these tables. A summary of findings is discussed hereafter.

4.2.1 SVOCs:

The results of the SVOC analysis are presented in Table 3. One sample (SSCL04) indicated a concentration of 3.4 mg/kg methylnaphthalene. The Region 9 PRGs do not provide screening level criteria for 2-methylnaphthalene. 2-methylnaphthalene is an analyte for which risk-based parameters do not exist and for which PRGs are not developed

4.2.2 Explosives:

The results of the explosive analysis are presented in Table 2. Sample SSCL01, SSCL04, and SSCL05 indicated traces levels of explosives (2,4,6-trinitrotoluene, 4-amino-2,6-dinitrotoluene, and 2,4-dinitrotoluene) which were within the acceptable Region 9 PRG screening criteria.

4.2.3 Metals:

The results of the metal analysis are presented in Table 4. Laboratory results indicated concentrations of arsenic at levels ranging from 1.2 milligrams per kilogram (mg/kg) to 28.6 mg/kg, in samples SSCL03 and SSCL04, respectively. The Region 9 PRG screening level for arsenic is .38 mg/kg. However, based on the referenced report entitled, "Site Investigations of the Reservoir No.2....Ash Pit" (IT Corporation, 1997), the arsenic detected, at the RCLA 1017, is consistent with background levels identified at the PBOW installation. Barium, chromium, lead, and selenium were the other metals detected at concentration well below the analyte-specific, Region 9 PRG screening criteria. The maximum concentrations indicated for these metal are barium, in sample SSCL06, at 71.3 mg/kg, chromium, in sample SSCL06, at 9.2 mg/kg, lead, in sample SSCL04, at 43.1 mg/kg, and selenium, in sample SSCL04, at 3.1 mg/kg. The Region 9 screening levels for these metals are 5,200, 210, 130, and 370 mg/kg, respectively.

4.3 Conclusions

The Data Quality Objectives (DQOs) were defined for this site investigation to choose the sampling and analysis methods that would properly characterize the site at the SI level of work for the TNT Rail Car Loading Area. A non-statistical sampling approach was used to locate the samples and to select the number of samples. This process was implemented because this was a limited SI. The sampling was both purposeful and biased to locations that were most likely contaminated.

Contamination was not encountered by the surface soil sampling performed for this site investigation and was not identified by the field screening and chemical laboratory analyses performed within the potential source areas of the RCLA 1017 site. Sampling was directed to locations most likely to be contaminated. Independent data validation revealed the laboratory analytical data is acceptable with the exception of 4-chloroaniline for each sample, which was rejected due to an insufficient control spike recovery. Details on chemical data validation are presented in Appendix I. The TNT Rail Car Loading Area has been recommended for no further action. In correspondence dated December 9, 1999 the Ohio EPA, Division of Emergency and Remedial Response conditionally accepted the recommendation for No Further Action.

5.0 Pathways

5.1 Groundwater Pathways

Groundwater pathways were not considered under this investigation.

5.2 Surface Water Pathways

Surface water pathways were not considered under this investigation.

5.3 Surface Soil Pathway

Surface soil sampling and analysis did not reveal a source of contamination. Therefore, it is very unlikely that surface soils have been impacted by the loading operations that took place at the RCLA 1017 site.

5.4 Air Pathway

Air pathways were not considered under this investigation.

6.0 Summary, Conclusions and Recommendations

The Site Investigation of the RCLA 1017 site was performed to gather pertinent information to evaluate the subject site for potential chemical contamination resulting from past DOD activities. Historical information was reviewed and surface soil samples were collected and analyzed, to evaluate the subject site's environmental media and potential migration pathways. In addition, information gathered was used to identify potential environmental concerns and targets that may be affected by the site. Field observations, field screening, surface soil sampling, and chemical laboratory analysis indicated no evidence of contaminated media.

- The RCLA 1017 site was used for the loading and unloading of TNT. The TNT was loaded in the manufacturing areas, shipped to other areas (RCLA 1017) of the PBOW installation for further packing or assembly, if required, and then either shipped off-site or temporarily stored in the magazine area.

- The RCLA 1017 site potentially may have been chemically impacted either by metals, SVOCs, and/or explosive contaminants.

- Surface soil samples were collected at the RCLA 1017 site and analyzed for SVOCs, explosives, and metals. With the exception of arsenic, all contaminants identified were found to be below the Region 9 PRG screening level criteria. Arsenic was found to be at levels consistent with the background concentration for the PBOW installation.

Based on the results of this SI, the operation and decommissioning of the RCLA 1017 site has not significantly impacted the environment in a negative manner. Coordination with federal and/or state regulatory authorities to proceed with a No Further Action (NFA) decision document for the former RCLA 1017 site is recommended.

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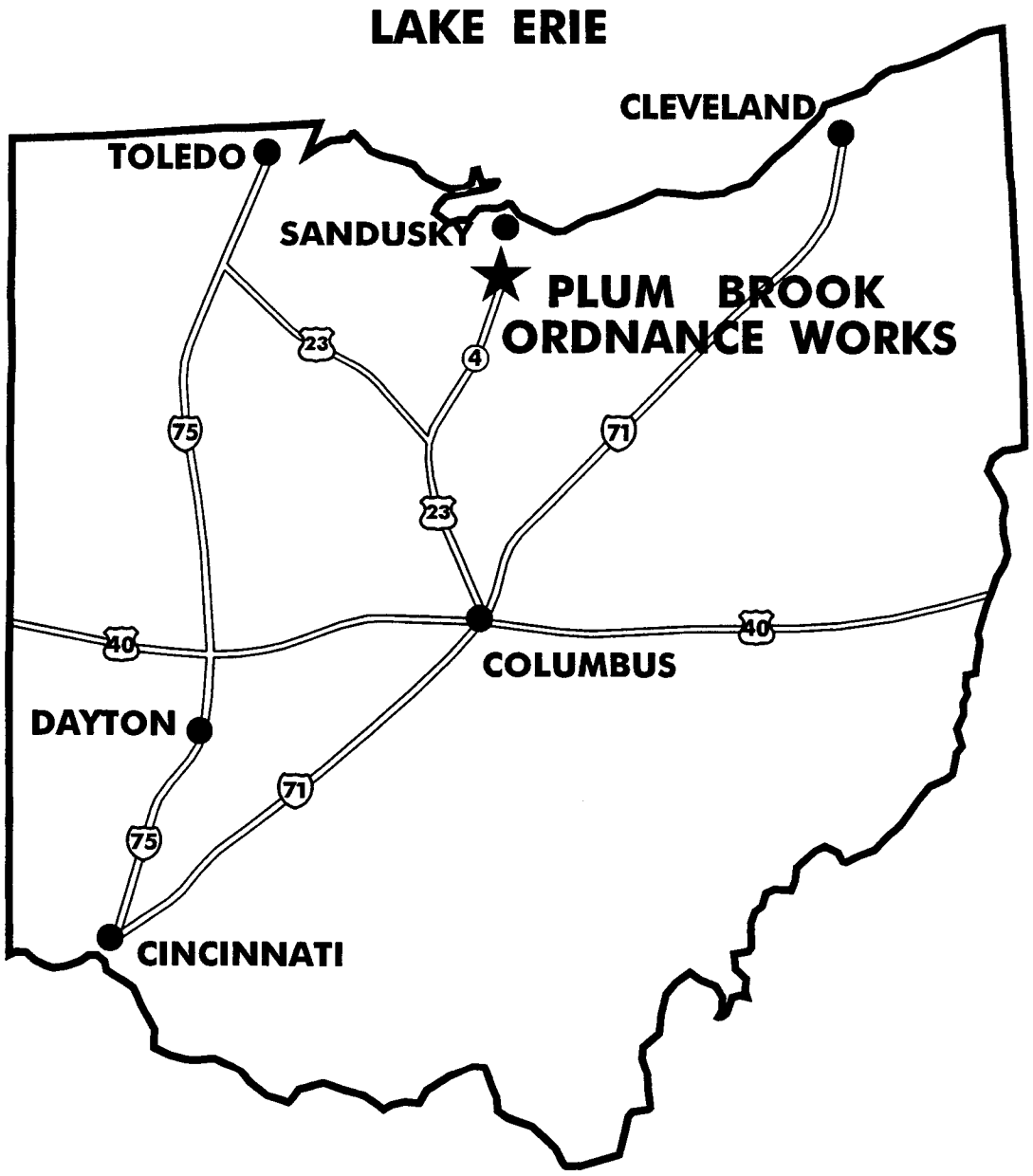
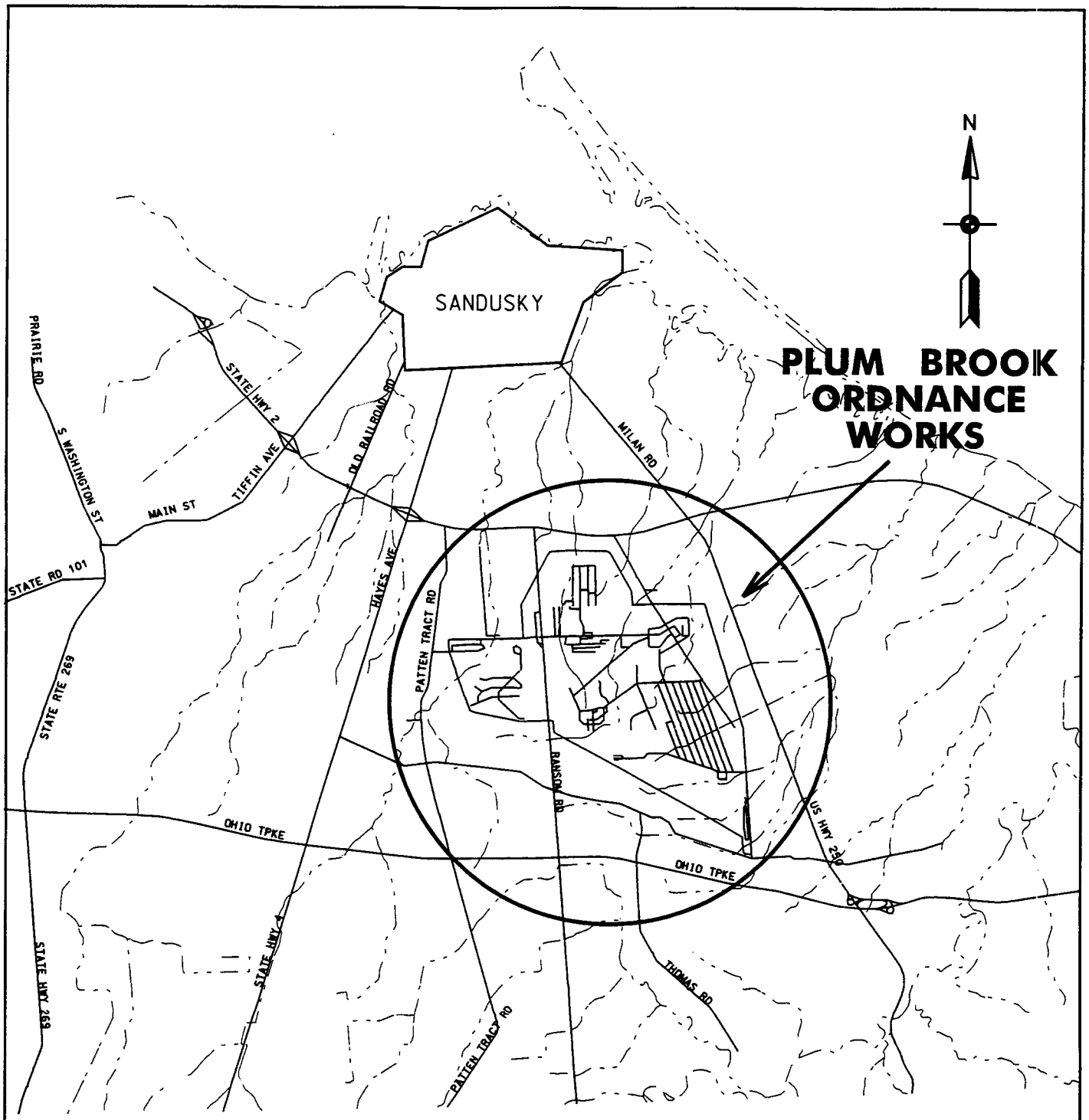
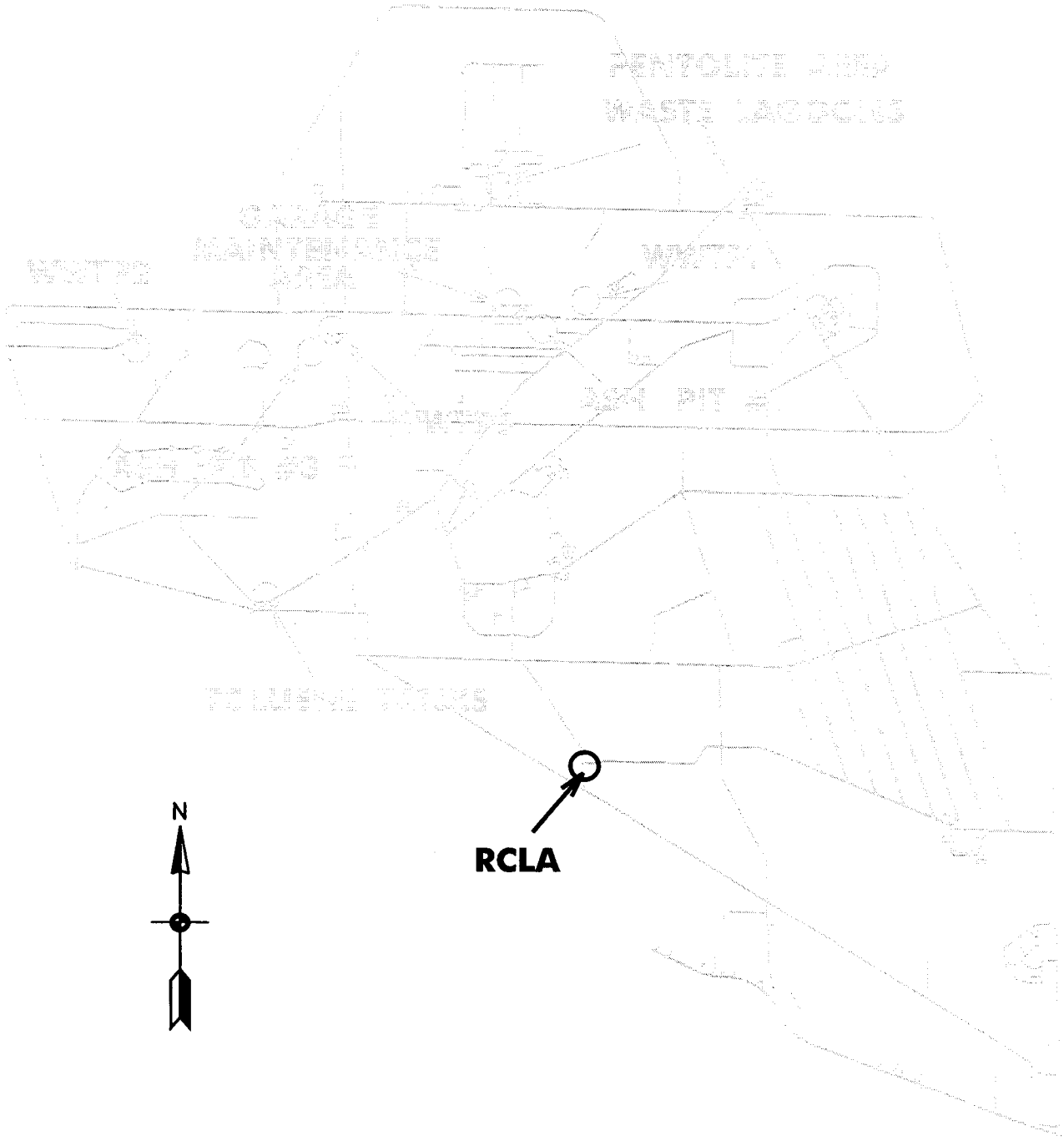


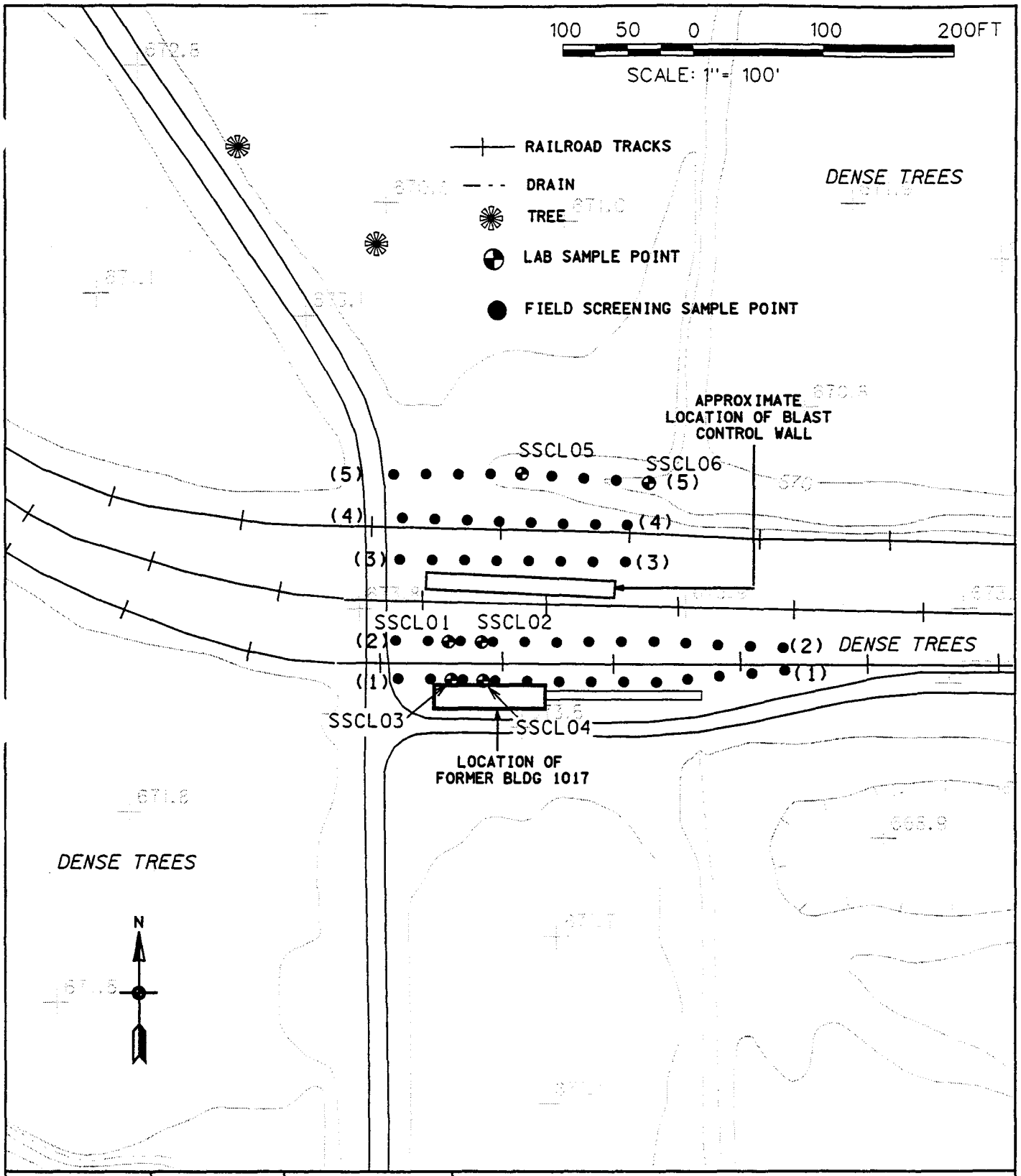
Design By:	Drawn By: WDB	Checked By:	US Army Corps of Engineers	AREA MAP TNT RAIL CAR LOADING AREA 1017 PLUM BROOK ORDNANCE WORKS SANDUSKY, OHIO	
Reviewed By: AJR	Approved By: MVW				
Date: AUG 1999	Scale: NONE		Drawing Code:	Sheet Ref. No.	FIGURE 1



Design By:	Drawn By: WDB	Checked By:	US Army Corps of Engineers	PLUM BROOK LOCATION MAP TNT RAIL CAR LOADING AREA 1017 PLUM BROOK ORDNANCE WORKS SANDUSKY, OHIO		
Reviewed By: AJR	Approved By: MVW					
Date: AUG 1999	Scale: NONE		Drawing Code:		Sheet Ref. No.	FIGURE 2

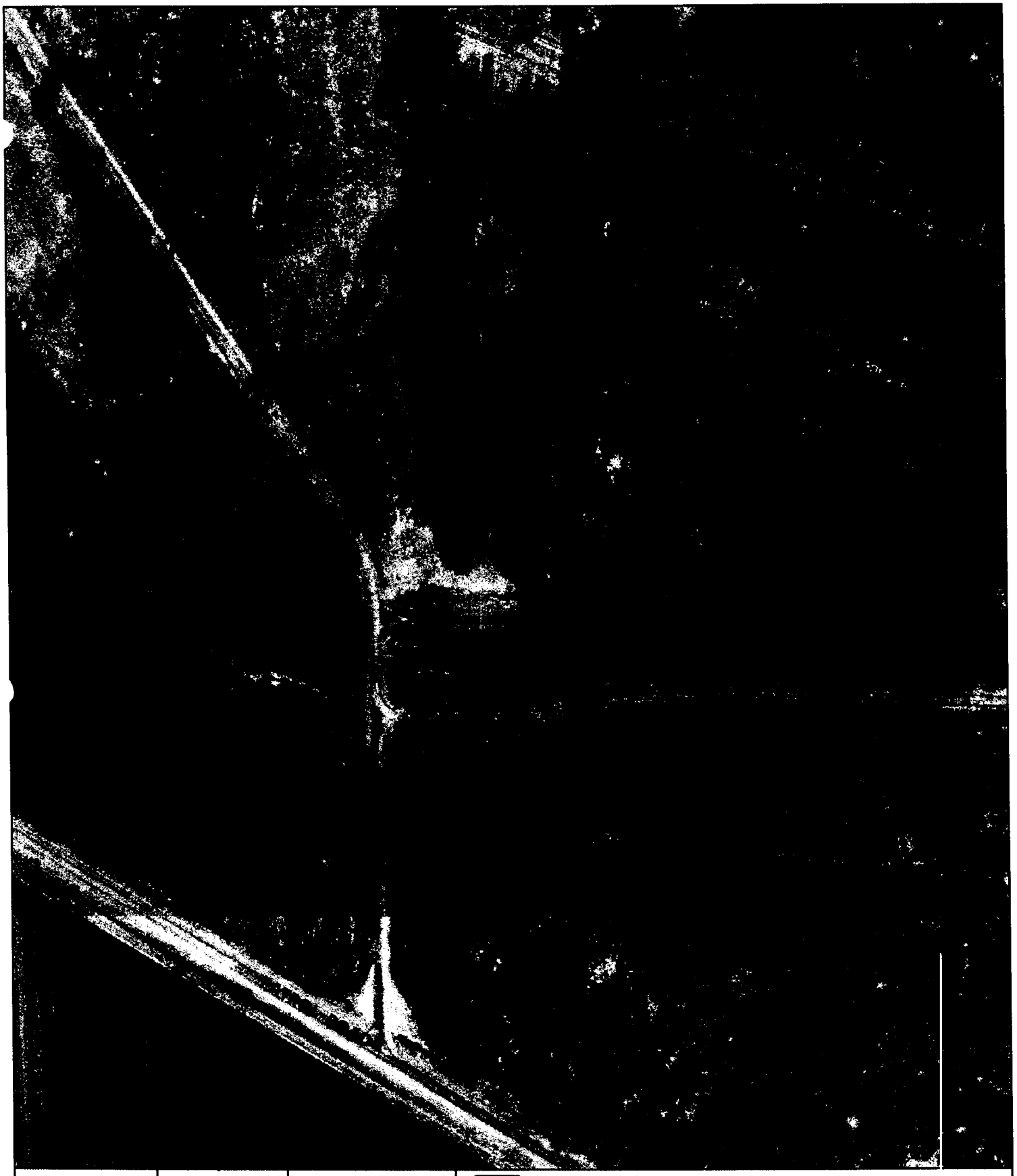


Design By:	Drawn By: WDB	Checked By:	US Army Corps of Engineers	SITE LOCATION PLAN TNT RAIL CAR LOADING AREA 1017 PLUM BROOK ORDNANCE WORKS SANDUSKY, OHIO		
Reviewed By: AJR	Approved By: MVW					
Date: AUG 1999	Scale: NONE		Drawing Code:		Sheet Ref. No.	FIGURE 3



Design By:	Drawn By: WDB	Checked By:	US Army Corps of Engineers	SAMPLE LOCATION PLAN TNT RAIL CAR LOADING AREA 1017 PLUM BROOK ORDNANCE WORKS SANDUSKY, OHIO	
Reviewed By: AJR	Approved By: MVW				
Date: AUG 1999	Scale: 1" = 100'		Drawing Code:	Sheet Ref. No.	FIGURE 4

Design By:	Drawn By: WDB	Checked By:	US Army Corps of Engineers	TNT RAIL CAR LOADING AREA FROM c. 1950 AERIAL PHOTOGRAPH PLUM BROOK ORDNANCE WORKS SANDUSKY, OHIO	
Reviewed By: AJR	Approved By: MVW				
Date: AUG 1999	Scale: 1" = 300'		Drawing Code:	Sheet Ref. No.	FIGURE 5



Design By:	Drawn By: WDB	Checked By:	US Army Corps of Engineers	TNT RAIL CAR LOADING AREA 1017 ILLUSTRATED ON 1997 AERIAL PHOTOGRAPH PLUM BROOK ORDNANCE WORKS SANDUSKY, OHIO	
Reviewed By: AJR	Approved By: MVW				
Date: AUG 1999	Scale: 1" = 200'		Drawing Code:	Sheet Ref. No.	FIGURE 6

Table 1 RCLA Sampling List.

SAMPLE NO.	LOCATION	ANALYTES
PBOW99SSCL01	Line #2, 40 ft	Nitroaromatics, SVOCs, RCRA Metals, TOC, pH, Sieve/Atterberg
PBOW99SSCL02	Line #2, 65 ft	Nitroaromatics, SVOCs, TAL Metals
PBOW99SSCL03	Line #1, 40 ft	Nitroaromatics, SVOCs, TAL Metals
PBOW99SSCL04	Line #1, 65 ft	Nitroaromatics, SVOCs, TAL Metals
PBOW99SSCL05	Line #5, 100ft	Nitroaromatics, SVOCs, TAL Metals
PBOW99SSCL06	Line #5, 150ft	Nitroaromatics, SVOCs, TAL Metals
PBOW99SSCL07	Duplicate, of CL02	Nitroaromatics, SVOCs, TAL Metals
PBOW99SWCL01	rinsate	RCRA Metals
PBOW99SWCL02	field blank	RCRA Metals
	temperature blank	

Sample No. Code:

PBOW: Plum Brook Ordnance Works

99: year

SS: Surface Soil; SD: Sediment; WW: Surface Water

CL: Rail Car Loading Area

nn: ordinal number

Table 2. RCLA Chemical Analytical Results for Explosives Testing (Detection Summary). All results in micrograms per kilogram (mg/kg)

COMPOUND/SAMPLE NO.	PRGs	SSCL01	SSCL02	SSCL03	SSCL04
2,4,6-trinitrotoluene	15	0.33	U	U	U
4-amino-2,6-dinitrotoluene	NL	U	U	U	0.33
2,4-dinitrotoluene	11	U	U	U	0.35

COMPOUND/SAMPLE NO.	PRGs	SSCL05	SSCL06	SSCL07
2,4,6-trinitrotoluene	15	U	U	U
4-amino-2,6-dinitrotoluene	NL	U	U	U
2,4-dinitrotoluene	11	2.1	U	U

NL = not listed
U = undetected
PRGs = Region IX Preliminary Remediation Goals.

Table 3. RCLA Chemical Analytical Results for Semivolatiles Testing (Detection Summary). All results in micrograms per kilogram (mg/kg)

COMPOUND/SAMPLE NO.	PRGs	SSCL01	SSCL02	SSCL03	SSCL04
2-methylnaphthalene	NL	U	U	U	3.4

COMPOUND/SAMPLE NO.	PRGs	SSCL05	SSCL06	SSCL07
2-methylnaphthalene	NL	U	U	U

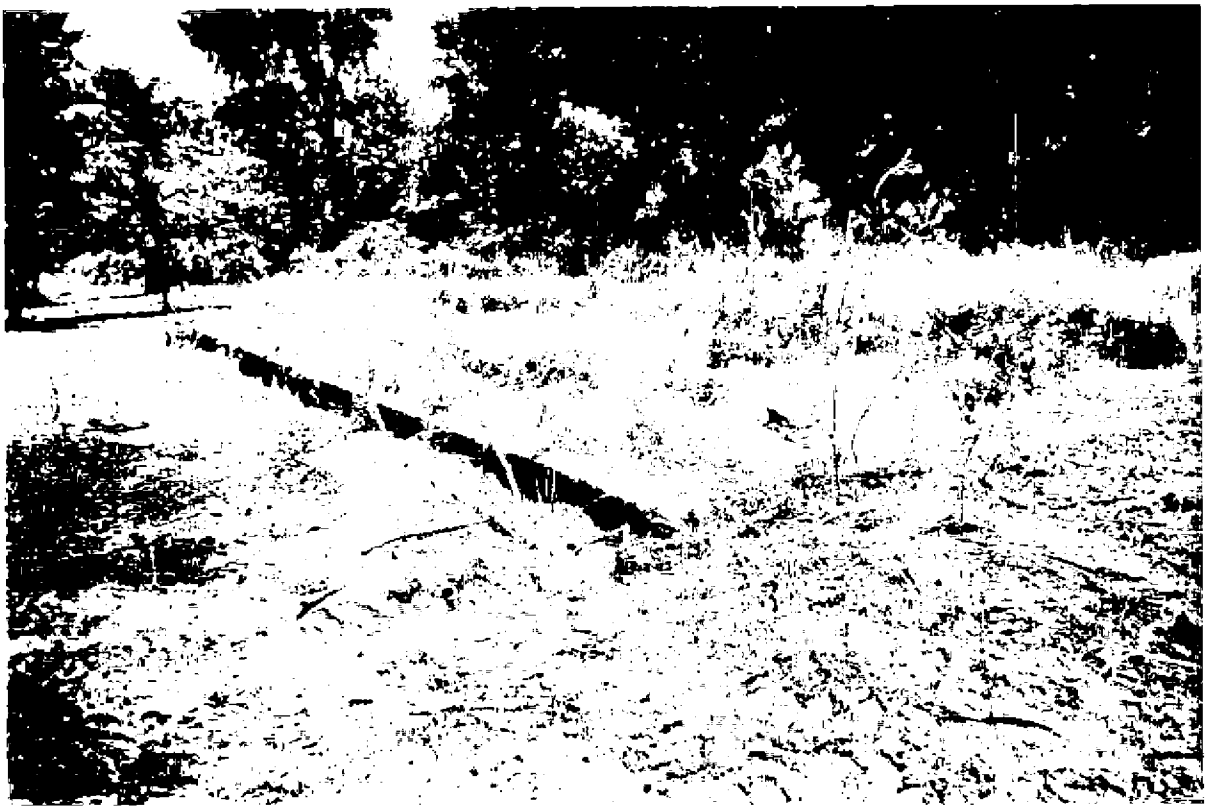
NL = not listed
U = undetected
PRGs = Region IX Preliminary Remediation Goals.

Table 4. RCLA Chemical Analytical Results for Metals Testing
(Detection Summary). All results in micrograms per kilogram (mg/kg)

COMPOUND/SAMPLE NO.	PRGs	SSCL01	SSCL02	SSCL03	SSCL04
Arsenic	0.38	18.4	6.5	9.7	28.6
Barium	5,200	105	47.5	78.3	33.2
Chromium VI/Chromium III	30/210	11.2	6	17.6	8.2
Lead	400	17.5	21	10.4	43.1
Selenium	370	1.2	0.81	0.86	3.1

COMPOUND/SAMPLE NO.	PRGs	SSCL05	SSCL06	SSCL07
Arsenic	0.38	6.1	17.2	5.7
Barium	5200	27.6	71.3	42.2
Chromium VI/Chromium III	30/210	6.9	9.2	6.6
Lead	400	11.3	18.5	20.5
Selenium	370	U	1.6	U

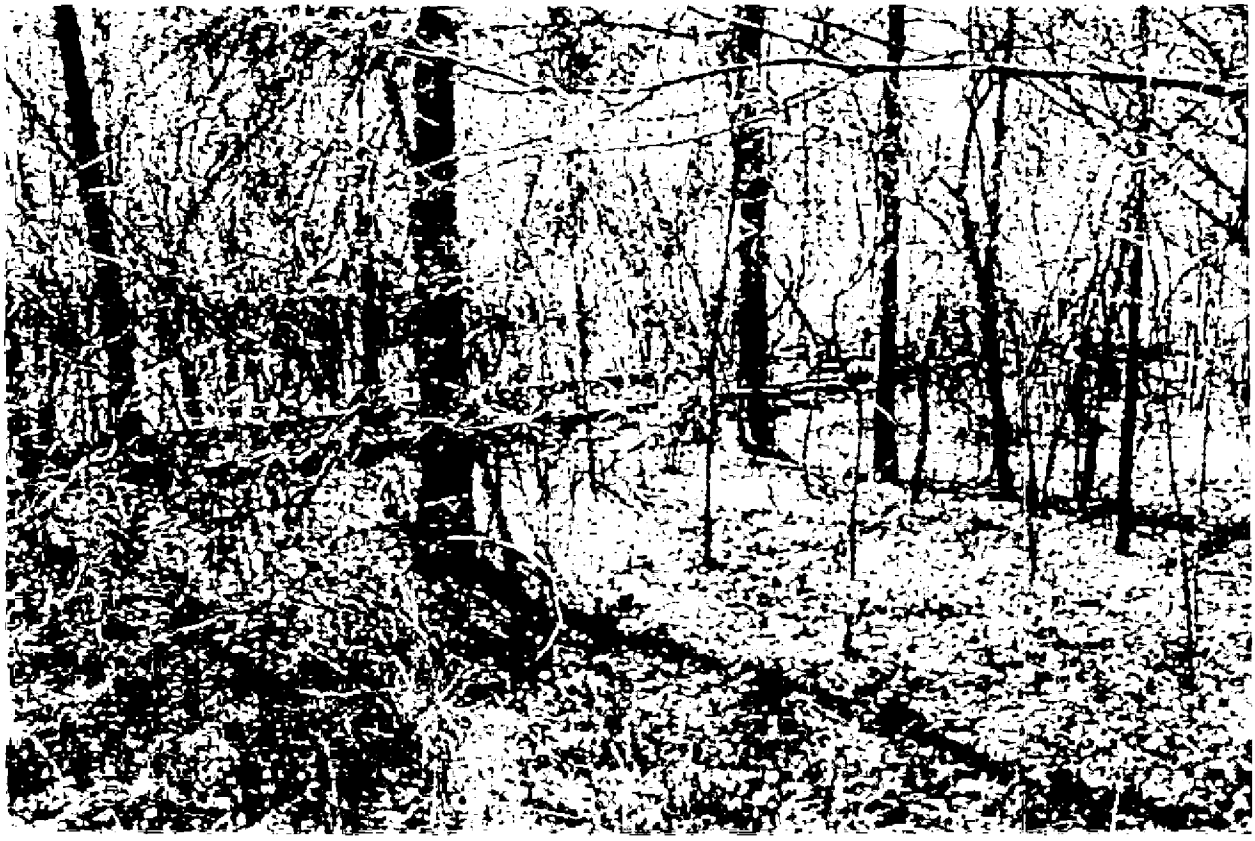
U = undetected
PRGs = Region IX Preliminary Remediation Goals



Slab Former Dunnage Storage

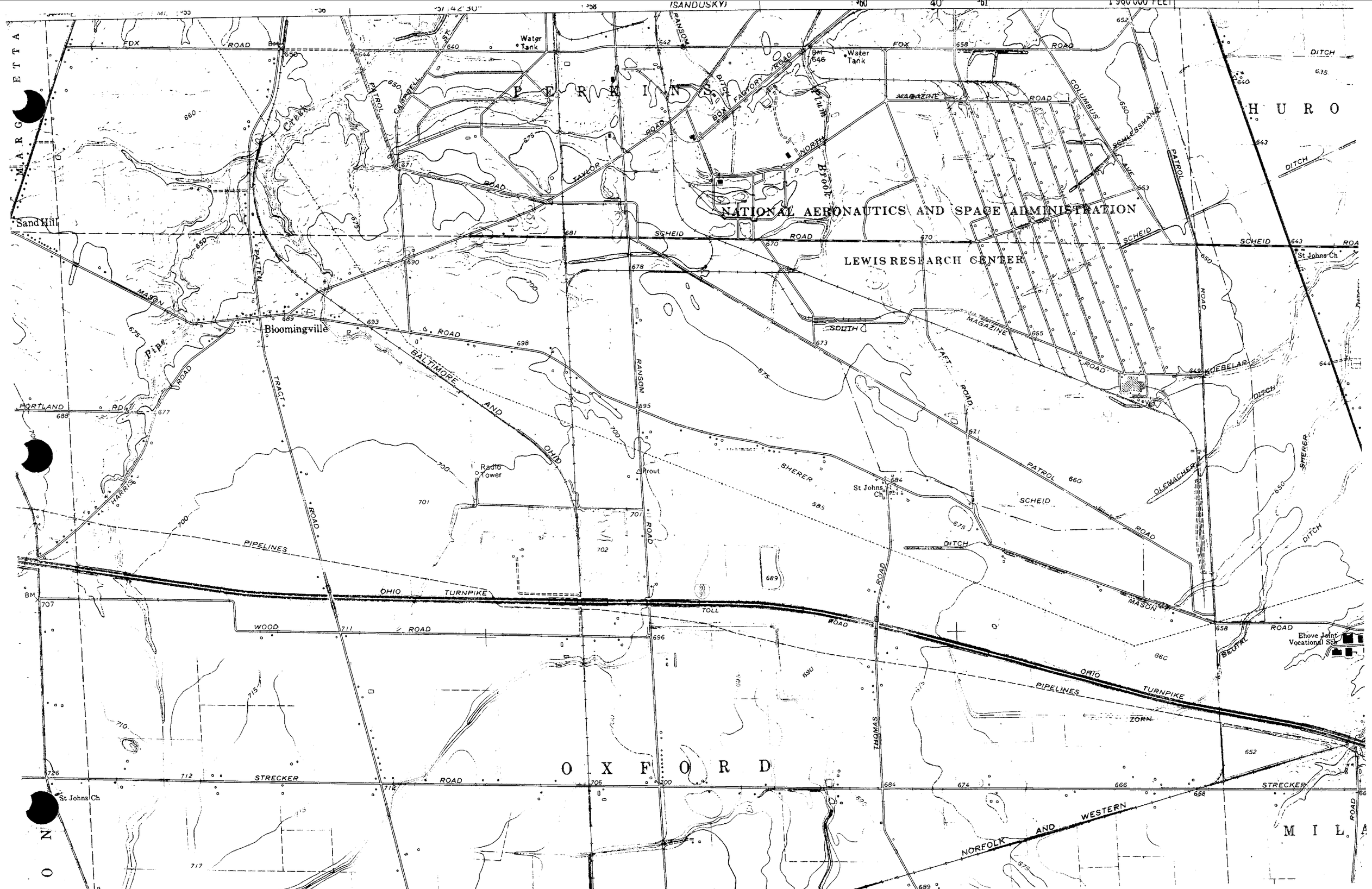
Containment Wall

Ravine



Rail Road Tracks

356000m.E.
42'30"
(SANDUSKY)
40'
1 360 000 FEET
BOGART 1.5 mi
R 22 W
R 23
MARGARETTA
WRIGHT BROS MEMORIAL HY
FOX ROAD
CAMPBELL
PERKINS
TAYLOR ROAD
Plum Brook
PLUM BROOK ORDNANCE WORKS
COLUMBUS AVE
HURO
SCHEID ROAD
Sand Hill
Gravel Pits
MASON RD
Bloomingville
Pipe Creek
BALTIMORE AND OHIO
PIPELINE
RANSOM
PORTLAND RD
HARRIS
PATTEN TRACT ROAD
St Johns Ch
Cem
PIPELINE
OHIO TURNPIKE
TOLL ROAD
MASON ROAD
WOOD ROAD
THOMAS ROAD
OXFORD
STRECKER ROAD
Town Hall
ST LOUIS
MILA
NO


(SANDUSKY)
1 960 000 FEET
MARGETTA
PERKINS
HURO
OXFORD
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
LEWIS RESEARCH CENTER
Sand Hill
Bloomingville
Water Tank
Radio Tower
Trout
St Johns Ch
Ehove Joint Vocational Sch
FOX ROAD
CAMPBELL ROAD
TAYLOR ROAD
BOX FACTORY ROAD
NORTH BOND
MAGAZINE ROAD
COLUMBUS AVE
SCHLESSMAN
PATROL ROAD
SCHEID ROAD
KUEBELAR
DITCH
PATTEN TRACT
MASON ROAD
Pipe ROAD
BALTIMORE AND OHIO
RANSOM ROAD
SOUTH
TAFT ROAD
PORTLAND RD
HARRIS
SHERER
OLEMACHER
PIPELINES
OHIO TURNPIKE
TOLL ROAD
WOOD ROAD
THOMAS ROAD
ZORN
BEUTEL
STRECKER ROAD
NORFOLK AND WESTERN
MILA

LEGEND

AREAS IN WHICH YIELDS OF 100 TO 500 GALLONS PER MINUTE MAY BE DEVELOPED.

Yields of more than 500 gallons per minute have been developed at depths of less than 200 feet in cavernous limestone and dolomite. Domestic supplies are generally obtained at depths of around 100 feet.

Hydrogen sulfide, in varying amounts, may be encountered in the bedrock.

Areas in which there is a potential concentration of contamination due to the underground disposal of storm wastes from Bellevue.

Municipal and industrial water supplies are available from wells drilled into permeable sand and gravel deposits in ancient buried valley.

AREAS IN WHICH YIELDS OF 25 TO 100 GALLONS PER MINUTE MAY BE DEVELOPED.

Buried valley containing more than 150 feet of unconsolidated deposits. Much of the valley fill consists of clay and fine sand. Extensive test drilling may be needed to locate coarse materials capable of supplying larger yields to drilled wells.

AREAS IN WHICH YIELDS OF 5 TO 25 GALLONS PER MINUTE MAY BE DEVELOPED.

Yields of 15, or less, gallons per minute are developed from wells drilled into the limestone. Hydrogen sulfide may be present in varying amounts.

AREAS IN WHICH YIELDS OF 3 TO 10 GALLONS PER MINUTE MAY BE DEVELOPED.

Ground water obtained from the Berea sandstone. Although this formation covers a larger area than shown, its thickness and recharge potential limit productivity to isolated zones.

AREAS IN WHICH YIELDS SELDOM EXCEED 3 GALLONS PER MINUTE

Limited quantities of ground water are obtained from thin, discontinuous sand and gravel deposits interbedded in fine, sandy clay or from the underlying shale. Drilling deeper than 30 feet into the shale is not recommended. Occasional gas or salt noted in the eastern half of the county.

Larger yields may be obtained in western Huron and Oxford townships and southeastern Perkins Township. Wells may encounter water-bearing limestone beneath as much as 60 feet of impervious shale.

Thick deposits (as much as 90 feet) of clay, sand and gravel cover the shale bedrock. Where permeable sands and gravels are present, adequate domestic supplies are obtained.

The ground-water characteristics of Erie County have been mapped regionally, based upon interpretations of 2100 water well records and the area's geology and hydrology. Well log data on the map were selected as typical for the areas shown.

Information regarding specific sites may be obtained from the Division of Water.

Chemical Analysis Table

Well site	A	B	C	D	E	F
Depth (ft.)	168	60	146	100	69	30
Aquifer	LS	LS	SG	SS	Sh	Sh
Iron (Fe)	0.33	0.02	1.3	0.92	1.1	0.39
Calcium (Ca)	536.	130.	82.	86.	8.2	4.0
Sodium (Na)	6.5	29.	30.	21.	479.	100.
Chloride (Cl)	12.0	49.	0.6	10.	134.	10.
Fluoride (F)	1.0	0.3	0.43	0.2	0.8	0.2
Sulfate (SO_4)	1224.	232.	68.	72.	188.	16.0
Hydrogen Sulfide (H_2S)	0.5	—	—	—	Trace	Trace
Hardness as $CaCO_3$	1537.	472.	282.	301.	32.0	14.0
Dissolved Solids	2150.	630.	—	328.	1230.	267.
pH	7.3	6.9	7.5	6.8	8.0	6.7

Chemical Constituents as Mg/1

Depth (ft.) - Water-bearing Formation - Yield (gpm)

154-LS-15
110

Depth to Bedrock (ft.)

● Domestic Well

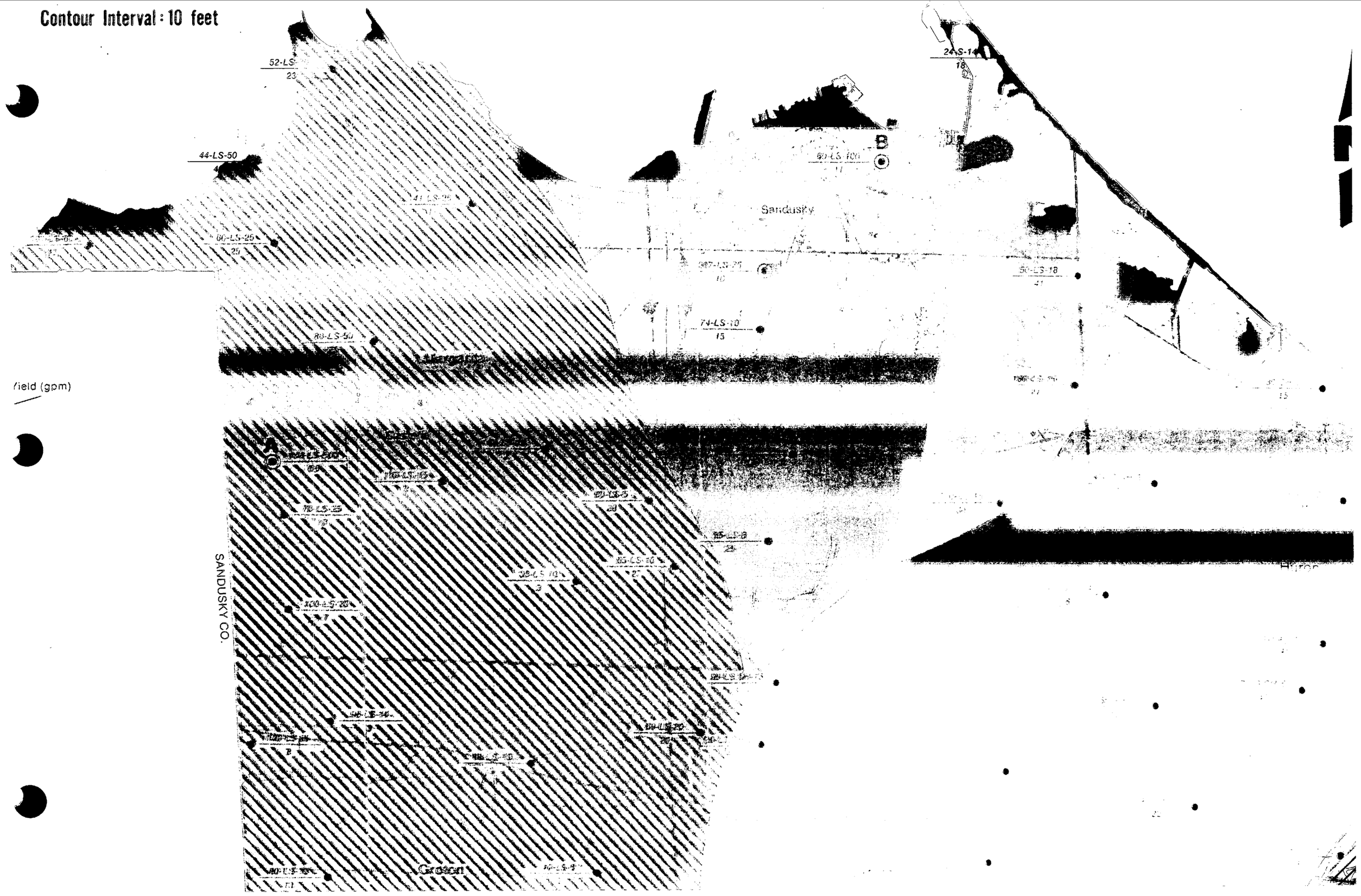
◉ Municipal—Industrial Well

A Chemical Analyses

Formations

SS - Sandstone
SH - Shale
LS - Limestone
SG - Sand and Gravel

Contour Interval: 10 feet



LAND USE AND LAND COVER

1 URBAN OR BUILT-UP LAND

11 Residential
12 Commercial and Services
13 Industrial
14 Transportation, Communications and Utilities
15 Industrial and Commercial Complexes
16 Mixed Urban or Built-up Land
17 Other Urban or Built-up Land

2 AGRICULTURAL LAND

21 Cropland and Pasture
22 Orchards, Groves, Vineyards, Nurseries, and Ornamental Horticultural Areas
23 Confined Feeding Operations
24 Other Agricultural Land

3 RANGELAND

31 Herbaceous Rangeland
32 Shrub and Brush Rangeland
33 Mixed Rangeland

4 FOREST LAND

41 Deciduous Forest Land
42 Evergreen Forest Land
43 Mixed Forest Land

5 WATER

51 Streams and Canals
52 Lakes
53 Reservoirs
54 Bays and Estuaries

6 WETLAND

61 Forested Wetland
62 Nonforested Wetland

7 BARREN LAND

71 Dry Salt Flats
72 Beaches
73 Sandy Areas Other than Beaches
74 Bare Exposed Rock
75 Strip Mines, Quarries, and Gravel Pits
76 Transitional Areas
77 Mixed Barren Land

8 TUNDRA

81 Shrub and Brush Tundra
82 Herbaceous Tundra
83 Bare Ground Tundra
84 Wet Tundra
85 Mixed Tundra

For definitions of Level I and Level II categories see U.S. Geological Survey Professional Paper 964, *A Land Use and Land Cover Classification System for Use With Remote Sensor Data, 1976*, by Anerson, J. R., E. E. Hardy, J. T. Roach, and R. E. Witmer. Minimum mapping units are: 4 hectares (10 acres) for Level II categories 11–17, 23–24, 51–54, 75, and urban occurrences of 76; and 16 hectares (40 acres) for all other Level II categories.

SCALE 1:250 000

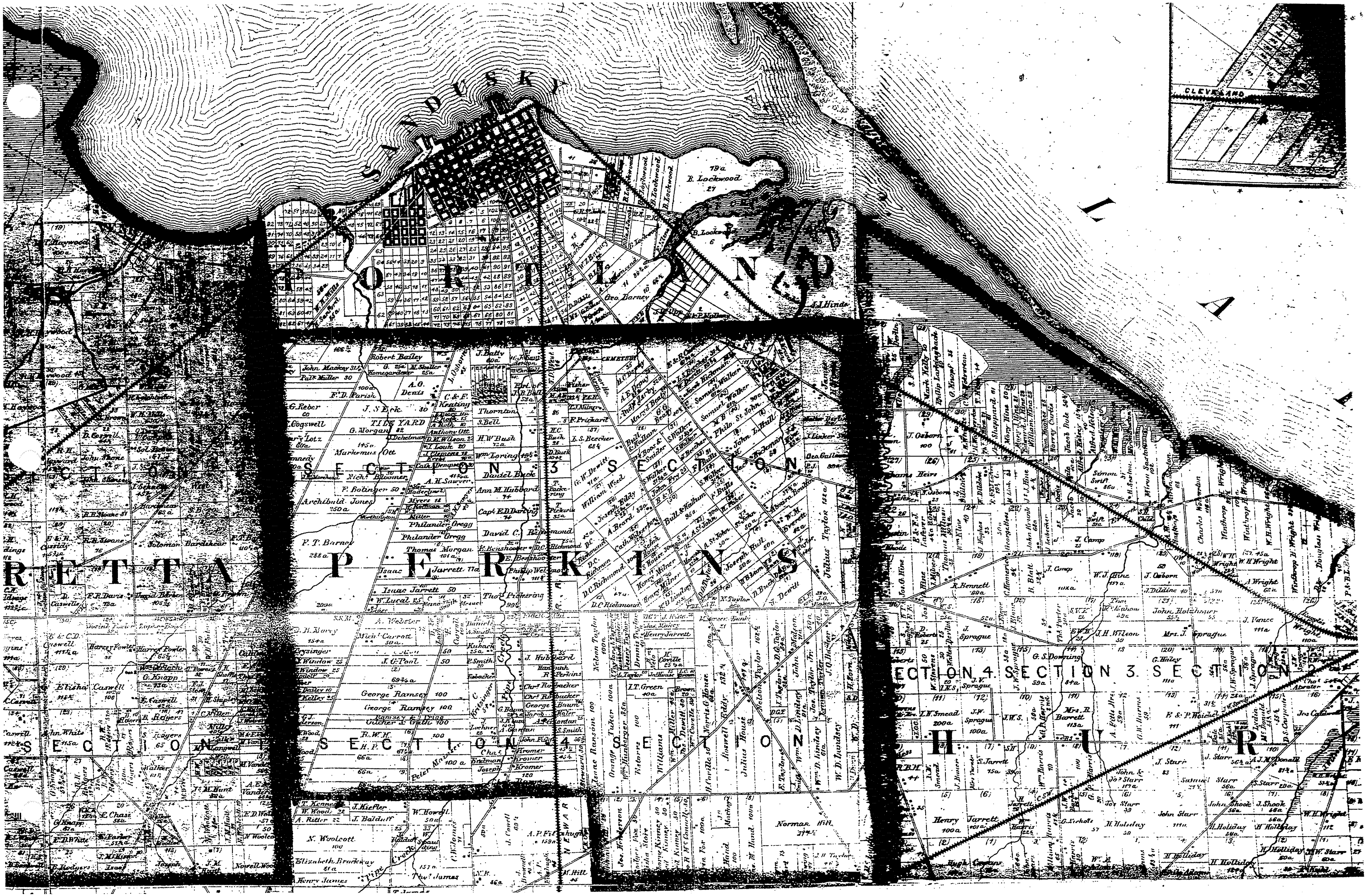
5 0 5
KILOMETERS

5 0 5
MILES

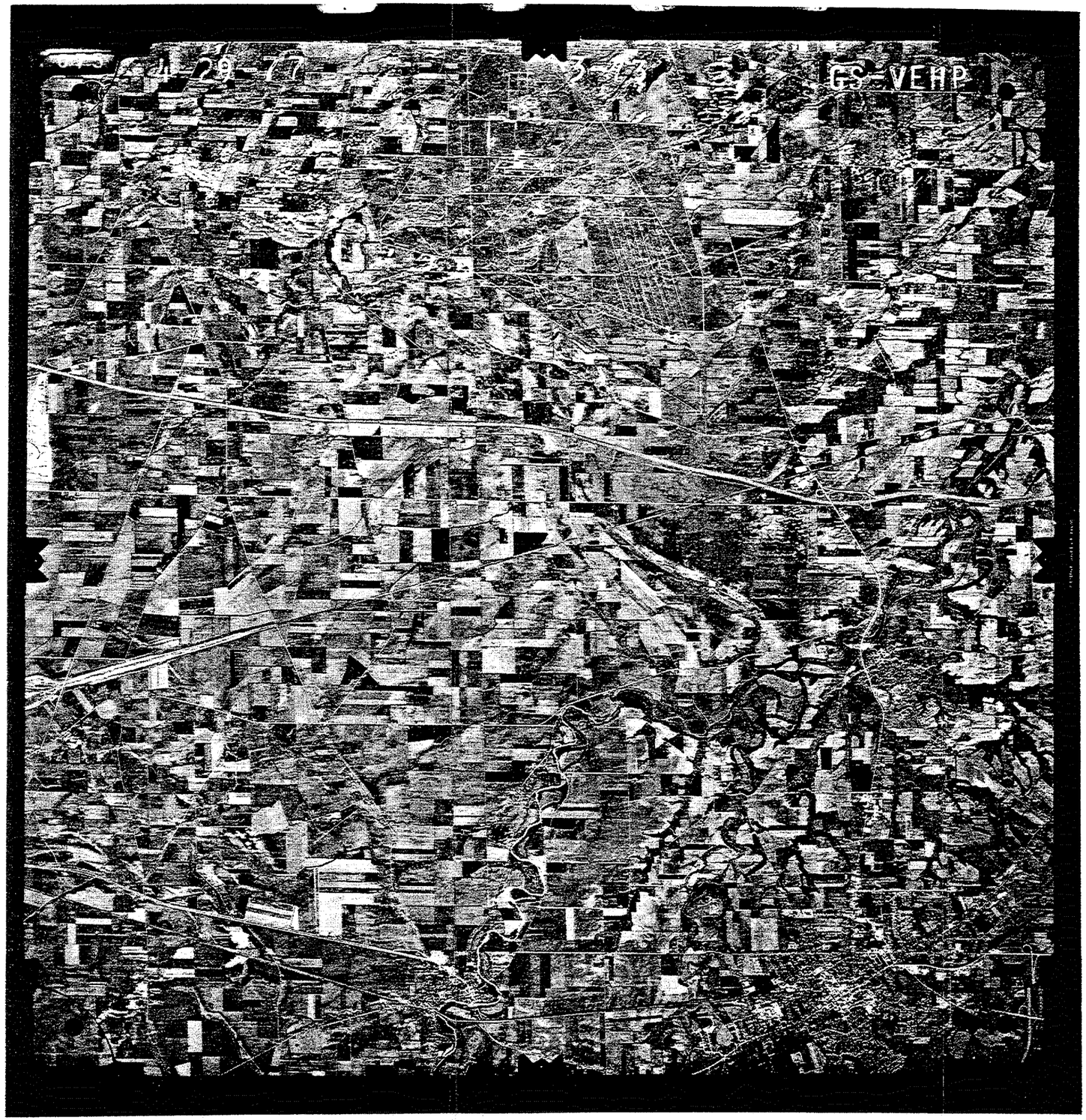
Land use and land cover information compiled from source materials dated 1980 and 1983

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

54


SANDUSKY
PORTLAND
CLEVELAND
PERKINS
SECTION 3
SECTION 4
SECTION 3
SECTION 2
SECTION 1
SECTION 4
SECTION
TILE YARD
CEMETERY
Robert Bailey
John Mackey
F. D. Parish
J. S. Eck
G. Morgan
Markemus Ott
Archibald Jones
F. T. Barney
Thomas Morgan
Philander Gregg
Isaac Jarrett
David C. Richmond
Ann M. Hubbard
Daniel Buck
Julius Taylor
Norman Hill
Henry Jarrett
J. Osborn
J. Camp
B. Lockwood
Geo. Barney
George Ramsey
Elizabeth Brockway
N. Woolcott
Elisha Caswell
Solomon Bardshear
John Holzhauer
Mrs. J. Sprague
G. S. Downing
John Starr

5-7-56 2B-12 GS-CBR
KODAK AEROGRAPHIC SAFETY FILM 1A
KODAK AEROGRAPHIC SAFETY FILM 1A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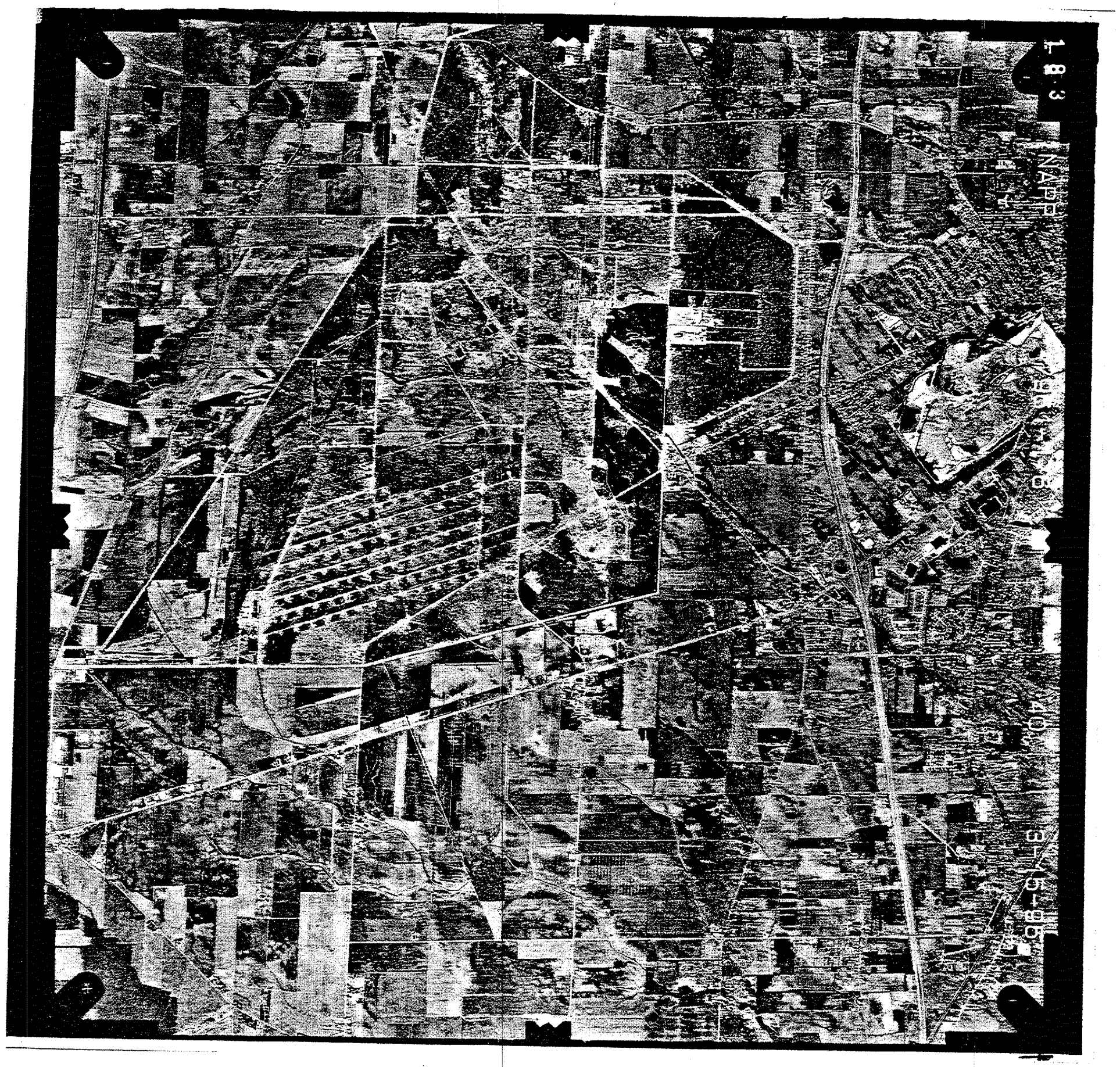

183
NABR
40
81/6/18

ERIIS REPORT OVERVIEW

The following features are available for an ERIIS report:

* Database Report
    * Statistical Profile
    * Database Records
* Related Maps
    * Digital Custom Plotted Map
    * Sanborn Fire Insurance Map(s)
    * Topographical Map(s)

Statistical Profile

The statistical profile is an at-a-glance numeric summary of the databases searched for your ERIIS Report.

Database Records

The detailed federal and state database information indicates potential and actual environmental threats within the study radius. These records are sorted by their distance from the study site.

Digital Custom Map

The digital custom map is cross referenced with the database records. The cross-in-circle in the center of the map represents the study site. The red circles represent distances from the study site. The plottable sites in the report are distinguished on the map by symbols of different shape and color.

Historic Fire Insurance Maps

The ERIIS collection of historical Sanborn Fire Insurance Maps covers 14,000 cities and towns. These maps may indicate prior use of the study site. If no maps are available for the study site, a notice to that effect is included. This notice should serve as evidence of due diligence.

Topographical Map

USGS topographical maps show natural and man-made features as well as the shape and elevation of the terrain. The 7.5 minute quad maps are produced at a scale of 1:24,000, or one inch represents 2,000 feet.

If you have any questions about this report,
please contact ERIIS Customer Service at 1-800-989-0403

ERIIS CORRIDOR STATISTICAL PROFILE
State: OH

ERIIS Report #317596A

Mar 4, 1999

Site:
SOUTH OF SANDUSKY
SANDUSKY, OH

Database	Plotted Sites
NPL	0
RCRIS_CA	0
RCRIS_TS	1
CERCLIS	0
NFRAP	1
RCRIS_LG	0
RCRIS_SG	1
ERNS	0
HWS	1
LRST	6
SWF	0
RST	9
	19

NR in a radius count indicates that the database cannot be reported by this search criteria due to insufficient and/or inaccurate addresses reported by a federal/state agency.

NPL
Date of Data: 10/14/1998
lease Date: 10/20/1998
e on System: 11/20/1998
Environmental Protection Agency
ffice of Solid Waste and Emergency Response
703/603-8881
Date of Last Contact: 11/02/1998

National Priorities List

The NPL Report is an EPA listing of the nation's worst uncontrolled or abandoned hazardous waste sites. NPL sites are targeted for possible long-term remedial action under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980. In addition, the NPL Report includes information concerning cleanup agreements between EPA and Potentially Responsible Parties (commonly called Records of Decision, or RODS), any liens filed against contaminated properties, as well as the past and current EPA budget expenditures tracked within the Superfund Consolidated Accomplishments Plan (SCAP).

RCRIS_CA
Date of Data: 07/01/1998
Release Date: 09/18/1998
Date on System: 12/04/1998
US Environmental Protection Agency
Office of Solid Waste and Emergency Response
800/424-9346
Date of Last Contact: 11/04/1998

Resource Conservation and Recovery Information System - TSD's Subject to Corrective Action

The RCRIS_CA Report contains information pertaining to hazardous waste treatment, storage , and disposal Facilities (RCRA TSD's) which have conducted, or are currently conducting, a corrective action(s) as regulated under the Resource Conservation and Recovery Act. The following information is included within the RCRIS_CA Report:
- Information pertaining to the status of facilities tracked by the RCRA Administrative Action Tracking System (RAATS)
- Inspections & evaluations conducted by federal and state agencies
- All reported facility violations, the environmental statute(s) violated, and any proposed & actual penalties
- Information pertaining to corrective actions undertaken by the facility or EPA

RCRIS_TS
Date of Data: 07/01/1998
Release Date: 09/18/1998
Date on System: 12/04/1998
US Environmental Protection Agency
Office of Solid Waste and Emergency Response
800/424-9346
Date of Last Contact: 11/04/1998

Resource Conservation and Recovery Information System - Non-Corrective Action TSD Facilities

The RCRIS_TS Report contains information pertaining to facilities which either treat, store, or dispose of EPA regulated hazardous waste. The following information is also included in the RCRIS_TS Report:

- Information pertaining to the status of facilities tracked by the RCRA Administrative Action Tracking System (RAATS)
- Inspections & evaluations conducted by federal and state agencies
- All reported facility violations, the environmental statute(s) violated, and any proposed & actual penalties

CLIS
of Data: 10/14/1998
ase Date: 10/20/1998
ate on System: 11/13/1998
US Environmental Protection Agency
Office of Solid Waste and Emergency Response
703/603-8881
Date of Last Contact: 11/02/1998

Comprehensive Environmental Response, Compensation, and Liability Information System

The CERCLIS Database is a comprehensive listing of known or suspected uncontrolled or abandoned hazardous waste sites. These sites have either been investigated, or are currently under investigation by the U.S. EPA for the release, or threatened release of hazardous substances. Once a site is placed in CERCLIS, it may be subjected to several levels of review and evaluation, and ultimately placed on the National Priorities List (NPL). In addition to site events and milestone dates, the CERCLIS Report also contains financial information from the Superfund Consolidated Accomplishments Plan (SCAP).

NFRAP
Date of Data: 10/14/1998
Release Date: 10/20/1998
Date on System: 11/13/1998
US Environmental Protection Agency
Office of Solid Waste and Emergency Response
703/603-8881
Date of Last Contact: 11/02/1998

No Further Remedial Action Planned Sites

The No Further Remedial Action Planned Report (NFRAP), also known as the CERCLIS Archive, contains information pertaining to sites which have been removed from the U.S. EPA's CERCLIS Database. NFRAP sites may be sites where, following an initial investigation, either no contamination was found, contamination was removed quickly without need for the site to be placed on the NPL, or the contamination was not serious enough to require federal Superfund action or NPL consideration.

RCRIS_LG
Date of Data: 07/01/1998
Release Date: 09/18/1998
Date on System: 12/04/1998
US Environmental Protection Agency
Office of Solid Waste and Emergency Response
800/424-9346
Date of Last Contact: 11/04/1998

Resource Conservation and Recovery Information System - Large Quantity Generators

The RCRIS_LG Report contains information pertaining to facilities which either generate more than 1000kg of EPA regulated hazardous waste per month, or meet other applicable requirements of the Resource Conservation And Recovery Act. The following information is also included in the RCRIS_LG Report:
- Information pertaining to the status of facilities tracked by the RCRA Administrative Action Tracking System (RAATS)
- Inspections & evaluations conducted by federal and state agencies
- All reported facility violations, the environmental statute(s) violated, and any proposed & actual penalties
- Information pertaining to corrective actions undertaken by the facility or EPA

RCRIS_SG
Date of Data: 07/01/1998
`elease Date: 09/18/1998
ate on System: 12/04/1998
S Environmental Protection Agency
Office of Solid Waste and Emergency Response
800/424-9346
Date of Last Contact: 11/04/1998

Resource Conservation and Recovery Information System - Small Quantity Generators

The RCRIS_SG Report contains information pertaining to facilities which either generate between 100kg and 1000kg of EPA regulated hazardous waste per month, or meet other applicable requirements of the Resource Conservation And Recovery Act. On advice of the U.S. EPA, ERIIS does not report so-called "RCRA Protective Filers." Protective Filers, commonly called Conditionally Exempt Small Quantity Generators (CESQG's), are facilities that have completed RCRA notification paperwork, but are not, in fact, subject to RCRA regulation. The determination of CESQG status is made by the U.S. EPA. The following information is also included in the RCRIS_SG Report:
- Information pertaining to the status of facilities tracked by the RCRA Administrative Action Tracking System (RAATS)
- Inspections & evaluations conducted by federal and state agencies
- All reported facility violations, the environmental statute(s) violated, and any proposed & actual penalties
- Information pertaining to corrective actions undertaken by the facility or EPA

ERNS
Date of Data: 10/08/1998
Release Date: 10/09/1998
Date on System: 11/13/1998
US Environmental Protection Agency
Office of Solid Waste and Emergency Response
202/260-2342
Date of Last Contact: 10/19/1998

Emergency Response Notification System

ERNS is a national computer database system that is used to store information concerning the sudden and/or accidental release of hazardous substances, including petroleum, into the environment. The ERNS Reporting System contains preliminary information on specific releases, including the spill location, the substance released, and the responsible party. Please note that the information in the ERNS Report pertains only to those releases that occured between January 1, 1997 and October 8, 1998.

HWS
Date of Data: 01/02/1998
Release Date: 01/02/1998
Date on System: 02/27/1998
OH Environmental Protection Agency
Emergency and Remedial Response Division
614/644-2924
Date of Last Contact: 08/19/1998

Ohio Master Sites List

The Ohio Master Sites List tracks sites in Ohio where hazardous waste has been found or where there are any known, suspected, or likely release of such wastes from a facility.

RST
`e of Data: 10/01/1998
ease Date: 11/20/1998
te on System: 12/04/1998
OH Office of the State Fire Marshal
Bureau of Licensing and Certification
614/752-7924
Date of Last Contact: 12/01/1998

Ohio Leaking Underground Storage Tank Report

The Ohio Leaking Underground Storage Tank Report (formerly The Petroleum Underground Storage Tank Release Incident Report, or PUSTR) is a comprehensive listing of all reported active and inactive leaking underground storage tanks located within the State of Ohio.

SWF
Date of Data: 12/31/1997
Release Date: 02/01/1998
Date on System: 03/11/1998
OH Environmental Protection Agency
Division of Solid Waste Management
614/644-3135
Date of Last Contact: 10/16/1998

Ohio Solid Waste Facility List

The Ohio Solid Waste Facility List contains information pertaining to all active and closed permitted solid waste landfills and processing facilities within the State of Ohio.

RST
Date of Data: 10/01/1998
Release Date: 10/01/1998
Date on System: 10/01/1998
OH Office of the State Fire Marshal
Bureau of Licensing and Certification
614/752-7924
Date of Last Contact: 10/26/1998

Ohio Underground Storage Tank Report

The Ohio Underground Storage Tank Report is a comprehensive listing of all registered active and inactive underground storage tanks located within the State of Ohio.

ERIIS ID.	FACILITY/ADDRESS	DATABASE	DISTANCE FROM SITE	MAP ID
05009583	HEMMINGER FARMS 1118 FOX RD SANDUSKY, OH 44870-8367 COUNTY: ERIE	LRST	Corridor	9583
39005013250	NASA 6100 CLEVELAND AVE SANDUSKY, OH 44870 COUNTY: ERIE	LRST	Corridor	3250
39005013251	NASA 6100 COLUMBUS AVE SANDUSKY, OH 44870-8329 COUNTY: ERIE	LRST	Corridor	3251
39013000073	NASA LERC PLUM BROOK STATION 6100 COLUMBUS AVE SANDUSKY, OH 44870-8329 COUNTY: ERIE	RCRIS_TS	Corridor	73
39039000797	NASA PLUM BROOK 6100 COLUMBUS AVE SANDUSKY, OH 44870-8329 COUNTY: ERIE	NFRAP	Corridor	797
39005013257	NASA PLUM BROOK STATION 6100 COLUMBUS AVE SANDUSKY, OH 44870-8329 COUNTY: ERIE	LRST	Corridor	3257
39010005044	NASA PLUM BROOK STATION 6100 COLUMBUS AVE SANDUSKY, OH 44870-8329 COUNTY: ERIE	RST	Corridor	5044
39010005045	NASA PLUM BROOK STATION 6100 COLUMBUS AVE SANDUSKY, OH 44870-8329 COUNTY: ERIE	RST	Corridor	5045
39010005046	NASA PLUM BROOK STATION 6100 COLUMBUS AVE SANDUSKY, OH 44870-8329 COUNTY: ERIE	RST	Corridor	5046
0005047	NASA PLUM BROOK STATION 6100 COLUMBUS AVE SANDUSKY, OH 44870-8329 COUNTY: ERIE	RST	Corridor	5047
39010005048	NASA PLUM BROOK STATION 6100 COLUMBUS AVE SANDUSKY, OH 44870-8329 COUNTY: ERIE	RST	Corridor	5048
39010005049	NASA PLUM BROOK STATION 6100 COLUMBUS AVE SANDUSKY, OH 44870-8329 COUNTY: ERIE	RST	Corridor	5049
39010005050	NASA PLUM BROOK STATION 6100 COLUMBUS AVE SANDUSKY, OH 44870-8329 COUNTY: ERIE	RST	Corridor	5050
39010005051	NASA PLUM BROOK STATION 6100 COLUMBUS AVE SANDUSKY, OH 44870-8329 COUNTY: ERIE	RST	Corridor	5051
39010005052	NASA PLUM BROOK STATION 6100 COLUMBUS AVE SANDUSKY, OH 44870-8329 COUNTY: ERIE	RST	Corridor	5052
39005013258	NASA PLUMBROOK STATION 6100 COLUMBUS AVE SANDUSKY, OH 44870-8329 COUNTY: ERIE	LRST	Corridor	3258
39005014705	PERKINS TRANSP. BUS GARAGE TAYLOR RD AT COLUMBUS AVE SANDUSKY, OH 44870 COUNTY: ERIE	LRST	Corridor	4705
39050000278	US NASA PLUM BROOK TAYLOR & COLUMBUS RD SANDUSKY, OH 44870 COUNTY: ERIE	HWS	Corridor	278
9010305	USDOI SANDUSKY BIOLOGICAL STATION 6100 COLUMBUS AVE SANDUSKY, OH 44870-8329 COUNTY: ERIE	RCRIS_SG	Corridor	305

ERIIS ID EPA ID	FACILITY	ADDRESS	RAATS ISSUE DATE RAATS ACTION/STATUS RAATS PENALTIES	DISTANCE FROM SITE	DIRECTION FROM SITE	MAP ID
39013000073 OH3800015379	NASA LERC PLUM BROOK STATION COUNTY: ERIE	6100 COLUMBUS AVE SANDUSKY, OH 44870-8329	FACILITY NOT REPORTED IN RAATS	Corridor Site		73

FACILITY VIOLATIONS

	DATE DETERMINED:	DATE RESOLVED:	AREA OF VIOLATION:
1.	08/24/1989	12/05/1991	GENERATOR-ALL REQUIREMENTS
2.	08/24/1989	12/05/1991	GENERATOR-LAND BAN REQUIREMENTS
3.	02/18/1992	05/20/1992	GENERATOR-ALL REQUIREMENTS

FACILITY EVALUATIONS

	EVALUATION DATE:	EVALUATING AGENCY:	TYPE OF EVALUATION:	AREA(S) OF EVALUATION:
1.	08/24/1989	STATE	COMPLIANCE EVALUATION INSPECTION	GENERATOR-ALL REQUIREMENTS GENERATOR-LAND BAN REQUIREMENTS
2.	02/18/1992	STATE	COMPLIANCE EVALUATION INSPECTION	GENERATOR-ALL REQUIREMENTS GENERATOR-LAND BAN REQUIREMENTS

FACILITY ENFORCEMENTS

	ENFORCEMENT DATE:	ENFORCING AGENCY:	TYPE OF ACTION:	PENALTY(S):
1.	09/21/1990	EPA	WRITTEN, INFORMAL ADMINISTRATIVE ACTION	
2.	02/28/1992	STATE	WRITTEN, INFORMAL ADMINISTRATIVE ACTION	

ERIIS ID EPA ID	FACILITY	ADDRESS	DISTANCE FROM SITE	DIRECTION FROM SITE	MAP ID
39039000797 OH3800015379	NASA PLUM BROOK COUNTY: ERIE	6100 COLUMBUS AVE SANDUSKY, OH 44870-8329	Corridor		797

SITE EVENT(S)	COMPLETE DATE
DISCOVERY	08-01-1983
PRELIMINARY ASSESSMENT	08-01-1984
STATE, FUND FINANCED	09-30-1994

ERIIS ID EPA ID	FACILITY	ADDRESS	RAATS ISSUE DATE RAATS ACTION/STATUS RAATS PENALTIES	DISTANCE FROM SITE	DIRECTION FROM SITE	MAP ID
39008010305 OH3143690250	USDOI SANDUSKY BIOLOGICAL STATION COUNTY: ERIE	6100 COLUMBUS AVE SANDUSKY, OH 44870-8329	FACILITY NOT REPORTED IN RAATS	Corridor Site		305

ERIIS ID US EPA ID. OH EPA ID.	FACILITY	ADDRESS	PRIORITY	DELISTED(Y/N)	MAP ID
39050000278 OH3800015379 322-0552	US NASA PLUM BROOK DISTANCE FROM SITE: Corridor Site DIRECTION FROM SITE:	TAYLOR & COLUMBUS RD SANDUSKY, OH 44870 COUNTY: ERIE	NO PRIORITY	NOT REPORTED	278

ERIIS ID	FACILITY	ADDRESS	COUNTY	DISTANCE FROM SITE	DIRECTION FROM SITE	MAP ID
39005009583	HEMMINGER FARMS	1118 FOX RD SANDUSKY, OH 44870-8367	ERIE	Corridor Site		9583

INCIDENT NO.	STATUS	LUST TRUST FUND (LTF) ELIGIBILITY
220219400	NO FURTHER ACTION	ELIGIBLE FOR LTF OVERSIGHT AND/OR SPENDING - SUSPECTED OR CONFIRMED FOR RELEASE OF PETROLEUM FROM A REGULATED UST.

39005014705	PERKINS TRANSP. BUS GARAGE	TAYLOR RD AT COLUMBUS AVE SANDUSKY, OH 44870	ERIE	Corridor Site		4705

INCIDENT NO.	STATUS	LUST TRUST FUND (LTF) ELIGIBILITY
228167200	REPORTED	CLOSURE OF AN UNDERGROUND STORAGE TANK.

39005013250	NASA	6100 CLEVELAND AVE SANDUSKY, OH 44870	ERIE	Corridor Site		3250

INCIDENT NO.	STATUS	LUST TRUST FUND (LTF) ELIGIBILITY
22936903	INITIAL CORRECTIVE ACTION	SUSPECTED OR CONFIRMED FOR RELEASE OF PETROLEUM FROM AN UST NOT REGULATED BY RCRA SUBTITLE I.
22936902	NO FURTHER ACTION	ELIGIBLE FOR LTF OVERSIGHT AND/OR SPENDING - SUSPECTED OR CONFIRMED FOR RELEASE OF PETROLEUM FROM A REGULATED UST.

39005013251	NASA	6100 COLUMBUS AVE SANDUSKY, OH 44870-8329	ERIE	Corridor Site		3251

INCIDENT NO.	STATUS	LUST TRUST FUND (LTF) ELIGIBILITY
22936901	NO FURTHER ACTION	ELIGIBLE FOR LTF OVERSIGHT AND/OR SPENDING - SUSPECTED OR CONFIRMED FOR RELEASE OF PETROLEUM FROM A REGULATED UST.
22936907	NO FURTHER ACTION	ELIGIBLE FOR LTF OVERSIGHT AND/OR SPENDING - SUSPECTED OR CONFIRMED FOR RELEASE OF PETROLEUM FROM A REGULATED UST.
22936905	INITIAL CORRECTIVE ACTIONS	SUSPECTED OR CONFIRMED FOR RELEASE OF A HAZARDOUS SUBSTANCE FROM A REGULATED UST.
22936906	INITIAL CORRECTIVE ACTIONS	SUSPECTED OR CONFIRMED FOR RELEASE OF A HAZARDOUS SUBSTANCE FROM A REGULATED UST.
22936908	INITIAL CORRECTIVE ACTIONS	SUSPECTED OR CONFIRMED FOR RELEASE OF A HAZARDOUS SUBSTANCE FROM A REGULATED UST.
22936904	INITIAL CORRECTIVE ACTIONS	SUSPECTED OR CONFIRMED FOR RELEASE OF A HAZARDOUS SUBSTANCE FROM A REGULATED UST.

39005013257	NASA PLUM BROOK STATION	6100 COLUMBUS AVE SANDUSKY, OH 44870-8329	ERIE	Corridor Site		3257

INCIDENT NO.	STATUS	LUST TRUST FUND (LTF) ELIGIBILITY
22936910	NO FURTHER ACTION	CLOSURE OF AN UNDERGROUND STORAGE TANK.

39005013258	NASA PLUMBROOK STATION	6100 COLUMBUS AVE SANDUSKY, OH 44870-8329	ERIE	Corridor Site		3258

INCIDENT NO.	STATUS	LUST TRUST FUND (LTF) ELIGIBILITY
22936911	NO FURTHER ACTION	CLOSURE OF AN UNDERGROUND STORAGE TANK.

ERIIS ID / FACILITY ID	FACILITY	ADDRESS	OWNER ADDRESS	MANAGER	MAP ID
39010005044 / 0-227802	NASA PLUM BROOK STATION DISTANCE FROM SITE: Corridor Site DIRECTION FROM SITE:	6100 COLUMBUS AVE SANDUSKY, OH 44870-8329 COUNTY: ERIE	NASA LEWIS RESEARCH CENTER 21000 BROOKPARK RD CLEVELAND, OH 44135	PETER W. MCCALLUM (216) 433-8852	5044

TANK ID	STATUS	SUBSTANCE	CAPACITY	AGE	CONSTRUCTION
28	REMOVED	NOT REPORTED	3,000	55	BARE STEEL
29	REMOVED	NOT REPORTED	770	33	BARE STEEL
30	REMOVED	NOT REPORTED	770	33	BARE STEEL
31	REMOVED	NOT REPORTED	770	33	BARE STEEL

39010005045 / 0-227803	NASA PLUM BROOK STATION DISTANCE FROM SITE: Corridor Site DIRECTION FROM SITE:	6100 COLUMBUS AVE SANDUSKY, OH 44870-8329 COUNTY: ERIE	NASA LEWIS RESEARCH CENTER 21000 BROOKPARK RD CLEVELAND, OH 44135		5045

TANK ID	STATUS	SUBSTANCE	CAPACITY	AGE	CONSTRUCTION
32	REMOVED	USED OIL	1,500	55	BARE STEEL

39010005046 / 0-227804	NASA PLUM BROOK STATION DISTANCE FROM SITE: Corridor Site DIRECTION FROM SITE:	6100 COLUMBUS AVE SANDUSKY, OH 44870-8329 COUNTY: ERIE	NASA LEWIS RESEARCH CENTER 21000 BROOKPARK RD CLEVELAND, OH 44135		5046

TANK ID	STATUS	SUBSTANCE	CAPACITY	AGE	CONSTRUCTION
201	CURRENTLY IN USE	GASOLINE	8,000	8	FIBERGLASS
202	CURRENTLY IN USE	DIESEL	8,000	8	FIBERGLASS

39010005047 / 0-227805	NASA PLUM BROOK STATION DISTANCE FROM SITE: Corridor Site DIRECTION FROM SITE:	6100 COLUMBUS AVE SANDUSKY, OH 44870-8329 COUNTY: ERIE	NASA LEWIS RESEARCH CENTER 21000 BROOKPARK RD CLEVELAND, OH 44135		5047

TANK ID	STATUS	SUBSTANCE	CAPACITY	AGE	CONSTRUCTION
37	REMOVED	NOT REPORTED	12,000	18	BARE STEEL
38	REMOVED	NOT REPORTED	12,000	18	BARE STEEL

39010005048 / 0-227806	NASA PLUM BROOK STATION DISTANCE FROM SITE: Corridor Site DIRECTION FROM SITE:	6100 COLUMBUS AVE SANDUSKY, OH 44870-8329 COUNTY: ERIE	NASA LEWIS RESEARCH CENTER 21000 BROOKPARK RD CLEVELAND, OH 44135		5048

TANK ID	STATUS	SUBSTANCE	CAPACITY	AGE	CONSTRUCTION
39	REMOVED	UNK	250	UNK	UNKNOWN

39010005049 / 0-227807	NASA PLUM BROOK STATION DISTANCE FROM SITE: Corridor Site DIRECTION FROM SITE:	6100 COLUMBUS AVE SANDUSKY, OH 44870-8329 COUNTY: ERIE	NASA LEWIS RESEARCH CENTER 21000 BROOKPARK RD CLEVELAND, OH 44135		5049

TANK ID	STATUS	SUBSTANCE	CAPACITY	AGE	CONSTRUCTION
23	REMOVED	USED OIL	500	36	BARE STEEL

39010005050 / 0-227808	NASA PLUM BROOK STATION DISTANCE FROM SITE: Corridor Site DIRECTION FROM SITE:	6100 COLUMBUS AVE SANDUSKY, OH 44870-8329 COUNTY: ERIE	NASA LEWIS RESEARCH CENTER 21000 BROOKPARK RD CLEVELAND, OH 44135		5050

TANK ID	STATUS	SUBSTANCE	CAPACITY	AGE	CONSTRUCTION
24	REMOVED	USED OIL	1,000	29	BARE STEEL

ERIIS ID / FACILITY ID	FACILITY	ADDRESS	OWNER ADDRESS	MANAGER	MAP ID
39010005051 / 0-227809	NASA PLUM BROOK STATION DISTANCE FROM SITE: Corridor Site DIRECTION FROM SITE:	6100 COLUMBUS AVE SANDUSKY, OH 44870-8329 COUNTY: ERIE	NASA LEWIS RESEARCH CENTER 21000 BROOKPARK RD CLEVELAND, OH 44135		5051

TANK ID	STATUS	SUBSTANCE	CAPACITY	AGE	CONSTRUCTION
26	REMOVED	NOT REPORTED	11,000	29	BARE STEEL
27	REMOVED	NOT REPORTED	11,000	29	BARE STEEL

ERIIS ID / FACILITY ID	FACILITY	ADDRESS	OWNER ADDRESS	MANAGER	MAP ID
39010005052 / 0-227810	NASA PLUM BROOK STATION DISTANCE FROM SITE: Corridor Site DIRECTION FROM SITE:	6100 COLUMBUS AVE SANDUSKY, OH 44870-8329 COUNTY: ERIE	NASA LEWIS RESEARCH CENTER 21000 BROOKPARK RD CLEVELAND, OH 44135		5052

TANK ID	STATUS	SUBSTANCE	CAPACITY	AGE	CONSTRUCTION
35	REMOVED	GASOLINE	9,000	55	BARE STEEL

Unplottable Sites

The remaining report pages list additional environmental sites that have been selected based on geographic criteria unique to your study site. They are classified as "unplottable sites" and require further investigation to assess their potential impact on your site.

How to Evaluate Unplottable Sites

Step 1
Streets Within the Radius: the following page is an alphabetical index of all streets that intersect or are contained within the largest study radius (usually one mile).

Step 2
Cross-Reference: use the "Streets Within the Radius" index to cross-reference the unplottable sites. For example, if Maple Avenue and Oak Avenue are listed in the street index, then any unplottable sites with a Maple Avenue or Oak Avenue address should be checked for possible impact on study site.

Questions on ERIIS' Proprietary Geocoding?

We're happy to answer any questions you might have about our data processing and **point-geocoding** (assigning a latitude and longitude to each address). Just give us a call on our toll-free number at (800) 989-0402 and let us know what state you're calling from. Our customer service staff is available from 8 a.m. to 8 p.m. (EST).

The ASTM Standard Practice For Environmental Site Assessments

As stated in the recently published **Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process** (E1527) by the American Society for Testing and Materials (ASTM):

> "For large databases with numerous facility records (such as RCRA hazardous waste generators and registered underground storage tanks), the records are not practically reviewable unless they can be obtained from the source agency in the smaller geographic area of ZIP code (3.3.24)."

Therefore, this Report contains information available by latitude/longitude or by ZIP code. If your research requires environmental records for which only city or county information is available (i.e., no valid street or ZIP code) ERIIS will include this data at no extra charge.

ERIIS LIST OF STREETS IN THE RADIUS

ERIIS Report #317596A Mar 4, 1999

STREET NAME
BIRCHWOOD DR
E BOGART ROAD
W BOGART ROAD
BOSTON ROAD
BOTAY ROAD
BOUY ROAD
BOX FACTORY ROAD
CAMBRIDGE CIR
CAMPBELL ST
CLARK ROAD
COLUMBUS AVE
COUNTRY PLACE DR
DALLAS AVE
DEERFIELD LANE
DENVER AVE
FOX ROAD
HARTFORD AVE
INDIANA AVE
INDUSTRIAL PKY
KIRKWOOD TER
LAKE CT
S LAKE WILMER DR
LINDEN WAY
LINDEN WAY DR
LISBON CIR
LONDON ROAD
N MAGAZINE ROAD
MAINTENANCE ROAD
MASON ROAD
MEMPHIS AVE
MICHIGAN AVE
MILAN ROAD
NORMANDY CT
OHIO TER
PARKWAY S
PATROL ROAD
PATTEN TRACT ROAD
PENNSYLVANIA AVE
PENTOLITE ROAD
RANSOM ROAD
RICHMOND CIR
SCHEID ROAD
SCHENK ROAD
SHORT CUT ROAD
STATE HWY 2
SWANO DR
TAYLOR ROAD
US HWY 250
VIRGINIA AVE
WALT LAKE TRL

ERIIS SUMMARY OF UNPLOTTABLE SITES
(Facilities sorted alphabetically within ZIP Code)

ERIIS Report #317596A — Mar 4, 1999

ERIIS ID.	FACILITY/STREET	CITY/STATE/ZIP/COUNTY	DATABASE
)5021849	BOB GARBA-FRANKLIN FLATS 90601 RIVER VIEW DR	HURON, OH 44839 COUNTY: ERIE	LRST
39005022207	CONSOLIDATED ELECTRIC 1901 SAWMILL INDUSTRIAL PKWY	HURON, OH 44839 COUNTY: ERIE	LRST
39010004952	DANIEL & CAROL LAPP 2112 CLEVELAND RD	HURON, OH 44839 COUNTY: ERIE	RST
39005022311	DANIEL LAPP 2112 CLEVELAND AVE	HURON, OH 44839 COUNTY: ERIE	LRST
39010019398	DENNIS MICHELSON 2416 CLEVELAND SANDUSY RD	HURON, OH 44839 COUNTY: ERIE	RST
39010005028	ERIE COUNTY LANDFILL HOOVER RD	HURON, OH 44839 COUNTY: ERIE	RST
39005022468	ERIE CTY LANDFILL HOOVER RD	HURON, OH 44839 COUNTY: ERIE	LRST
39005022729	GASTOWN 3674 2103 CLEVELAND	HURON, OH 44839 COUNTY: ERIE	LRST
39005022843	GTE NORTH, INC. MAIN ST	HURON, OH 44839 COUNTY: ERIE	LRST
39010005038	GTE NORTH, INC. MAIN & SHIRLEY	HURON, OH 44839 COUNTY: ERIE	RST
39018000056	HURON LIME COMPANY LANDFILL #1 RIVER RD	HURON, OH 44839 COUNTY: ERIE	SWF
3000052	HURON LIME COMPANY LANDFILL #2 PO BOX 451	HURON, OH 44839-0451 COUNTY: ERIE	SWF
39005023854	PRESTON TRUCKING CO 1711 SAWMILL INDUSTRIAL PKWY	HURON, OH 44839 COUNTY: ERIE	LRST
39010004878	RYE BEACH HY-MILER 2026 CLEVELAND RD	HURON, OH 44839 COUNTY: ERIE	RST
39005025012	YELLOW FREIGHT RYE BEACH RD	HURON, OH 44839 COUNTY: ERIE	LRST
39005021816	BFI SR 101	SANDUSKY, OH 44870 COUNTY: ERIE	LRST
39010004932	C.S.C. OIL CO. #484 607 PERKINS AVE	SANDUSKY, OH 44870 COUNTY: ERIE	RST
39005022026	CAUSEWAY DR LIFT STA 1300 CAUSEWAY DR	SANDUSKY, OH 44870 COUNTY: ERIE	LRST
39010004967	CEDAR POINT #1 CAUSEWAY DR	SANDUSKY, OH 44870 COUNTY: ERIE	RST
39005022195	COMMODORE PERRY SVC PLAZA MILE POST 100.0 SOUTH SIDE	SANDUSKY, OH 44870 COUNTY: ERIE	LRST
39008008756	ERIE COUNTY SCHOOLS 7142 TAYLOR-COLUMBUS AVE	SANDUSKY, OH 44870 COUNTY: ERIE	RCRIS_SG
39005022515	FARWELL ST LIFT STATION FARWELL ST	SANDUSKY, OH 44870 COUNTY: ERIE	LRST
39005022720	GAS AMERICA 7065 US RT 30	SANDUSKY, OH 44870 COUNTY: ERIE	LRST
,009438	GORDON FOOD SERVICE INC 1415 HOLLAND RD	PERRYSBURG, OH 44870 COUNTY: ERIE	RCRIS_SG

ERIIS ENVIRONMENTAL DATA REPORT
RESOURCE CONSERVATION AND RECOVERY INFORMATION SYSTEM
RCRIS_SG - UNPLOTTABLE SITES

ERIIS Report #317596A

Mar 4, 1999

ERIIS ID EPA ID	FACILITY	ADDRESS	RAATS ISSUE DATE RAATS ACTION/STATUS RAATS PENALTIES
39008004325 OHD981786650	NORTHCOAST AUTO BODY COUNTY: ERIE	1944 ONE HALF MILAN RD SANDUSKY, OH 44870	FACILITY NOT REPORTED IN RAATS
39008004832 OHD982211450	SOHIO OIL CO NO 06672 COUNTY: ERIE	RTE 2 AND RTE 250 SANDUSKY, OH 44870	FACILITY NOT REPORTED IN RAATS
39008008756 OHR000003673	ERIE COUNTY SCHOOLS COUNTY: ERIE	7142 TAYLOR-COLUMBUS AVE SANDUSKY, OH 44870	FACILITY NOT REPORTED IN RAATS
39008009438 OHR000025809	GORDON FOOD SERVICE INC COUNTY: ERIE	1415 HOLLAND RD PERRYSBURG, OH 44870	FACILITY NOT REPORTED IN RAATS

ERIIS ENVIRONMENTAL DATA REPORT
EMERGENCY RESPONSE NOTIFICATION SYSTEM
ERNS - UNPLOTTABLE SITES

ERIIS Report #317596A

Mar 4, 1999

ERIIS ID REPORT NUMBER SOURCE AGENCY	SPILL CITY, STATE, ZIP CODE SPILL COUNTY	DISCHARGER NAME ORGANIZATION ADDRESS	MEDIA AFFECTED LAND	WATER	AIR	GRND WATER	FACILITY	SPILL DATE WATER WAY AFFECTED
39002000030 420277 NATL. RESPONSE CTR	SANDUSKY, OH 44870 ERIE	JIMS AUTO SALVAGE 1707 GEORGE STREET SANDUSKY, OH 44870	N	N	N	N	N	01/17/1998 STORM DRAIN/SOIL

LOCATION: Superior Street / Dead End, North Side Of Venice Road
DESCRIPTION: Caller States: Company Towed Many Vehicles Over 2 Days, Some Of The Vehicles Being Towed Spilled Gasoline And Motor Oil Onto The Roadway
MATERIAL SPILLED: Oil, Misc: Motor QTY: 0 Unk LBS: 0 QTY IN WATER: 0 Unk
Oil: Diesel QTY: 0 Unk LBS: 0 QTY IN WATER: 0 Unk
Gasoline: Automotive (4.23g Pb/g QTY: 0 Unk LBS: 0 QTY IN WATER: 0 Unk
ACTIONS TAKEN: None / Police Were Onscene, Were Going To Make Company Clean Up / Nothing Has Been Done To Date
MISCELLANEOUS: Sandusky Bay Is .5 Miles Away / Some Product Has Reached A Storm Drain And It Has Been Raining

ERIIS ENVIRONMENTAL DATA REPORT
OHIO MASTER SITES LIST
HWS - UNPLOTTABLE SITES

ERIIS Report #317596A

Mar 4, 1999

ERIIS ID US EPA ID. OH EPA ID.	FACILITY	ADDRESS	PRIORITY	DELISTED(Y/N)
39050000992 OHD980611487 362-0117		PORT CLINTON, OH 44870 COUNTY: ERIE	LOW	YES REASON: DSIWM SITE
39050000993 OHD980611487 362-0117		PORT CLINTON, OH 44870 COUNTY: ERIE	LOW	YES REASON: DSIWM REGULATION

ERIIS ID	FACILITY	ADDRESS	COUNTY
39005021849	BOB GARBA-FRANKLIN FLATS	90601 RIVER VIEW DR HURON, OH 44839	ERIE
INCIDENT NO. 228205100	STATUS REPORTED	LUST TRUST FUND (LTF) ELIGIBILITY CLOSURE OF AN UNDERGROUND STORAGE TANK.	
39005022207	CONSOLIDATED ELECTRIC	1901 SAWMILL INDUSTRIAL PKWY HURON, OH 44839	ERIE
INCIDENT NO. 224197300	STATUS NO FURTHER ACTION	LUST TRUST FUND (LTF) ELIGIBILITY CLOSURE OF AN UNDERGROUND STORAGE TANK.	
39005022311	DANIEL LAPP	2112 CLEVELAND AVE HURON, OH 44839	ERIE
INCIDENT NO. 222179300	STATUS NO FURTHER ACTION	LUST TRUST FUND (LTF) ELIGIBILITY CLOSURE OF AN UNDERGROUND STORAGE TANK.	
39005022468	ERIE CTY LANDFILL	HOOVER RD HURON, OH 44839	ERIE
INCIDENT NO. 397128300	STATUS REPORTED	LUST TRUST FUND (LTF) ELIGIBILITY CLOSURE OF AN UNDERGROUND STORAGE TANK.	
39005022729	GASTOWN 3674	2103 CLEVELAND HURON, OH 44839	ERIE
INCIDENT NO. 229105800	STATUS CORRECTIVE ACTIONS IN PROGRESS	LUST TRUST FUND (LTF) ELIGIBILITY ELIGIBLE FOR LTF OVERSIGHT AND/OR SPENDING - SUSPECTED OR CONFIRMED FOR RELEASE OF PETROLEUM FROM A REGULATED UST.	
39005022843	GTE NORTH, INC.	MAIN ST HURON, OH 44839	ERIE
INCIDENT NO. 226093300	STATUS NO FURTHER ACTION	LUST TRUST FUND (LTF) ELIGIBILITY CLOSURE OF AN UNDERGROUND STORAGE TANK.	
39005023854	PRESTON TRUCKING CO	1711 SAWMILL INDUSTRIAL PKWY HURON, OH 44839	ERIE
INCIDENT NO. 224197400	STATUS NO FURTHER ACTION	LUST TRUST FUND (LTF) ELIGIBILITY CLOSURE OF AN UNDERGROUND STORAGE TANK.	
39005025012	YELLOW FREIGHT	RYE BEACH RD HURON, OH 44839	ERIE
INCIDENT NO. 220106100	STATUS NO FURTHER ACTION	LUST TRUST FUND (LTF) ELIGIBILITY ELIGIBLE FOR LTF OVERSIGHT AND/OR SPENDING - SUSPECTED OR CONFIRMED FOR RELEASE OF PETROLEUM FROM A REGULATED UST.	
39005021816	BFI	SR 101 SANDUSKY, OH 44870	ERIE
INCIDENT NO. 221113001	STATUS DISPROVED	LUST TRUST FUND (LTF) ELIGIBILITY ELIGIBLE FOR LTF OVERSIGHT AND/OR SPENDING - SUSPECTED OR CONFIRMED FOR RELEASE OF PETROLEUM FROM A REGULATED UST.	

ERIIS ID	FACILITY	ADDRESS	COUNTY
39005022026	CAUSEWAY DR LIFT STA	1300 CAUSEWAY DR SANDUSKY, OH 44870	ERIE
INCIDENT NO. 220126300	STATUS NO FURTHER ACTION	LUST TRUST FUND (LTF) ELIGIBILITY CLOSURE OF AN UNDERGROUND STORAGE TANK.	
39005022195	COMMODORE PERRY SVC PLAZA	MILE POST 100.0 SOUTH SIDE SANDUSKY, OH 44870	ERIE
INCIDENT NO. 72948000	STATUS NO FURTHER ACTION	LUST TRUST FUND (LTF) ELIGIBILITY ELIGIBLE FOR LTF OVERSIGHT AND/OR SPENDING - SUSPECTED OR CONFIRMED FOR RELEASE OF PETROLEUM FROM A REGULATED UST.	
39005022515	FARWELL ST LIFT STATION	FARWELL ST SANDUSKY, OH 44870	ERIE
INCIDENT NO. 220078600	STATUS NO FURTHER ACTION	LUST TRUST FUND (LTF) ELIGIBILITY ELIGIBLE FOR LTF OVERSIGHT AND/OR SPENDING - SUSPECTED OR CONFIRMED FOR RELEASE OF PETROLEUM FROM A REGULATED UST.	
39005022720	GAS AMERICA	7065 US RT 30 SANDUSKY, OH 44870	ERIE
INCIDENT NO. 880063800	STATUS NO FURTHER ACTION	LUST TRUST FUND (LTF) ELIGIBILITY ELIGIBLE FOR LTF OVERSIGHT AND/OR SPENDING - SUSPECTED OR CONFIRMED FOR RELEASE OF PETROLEUM FROM A REGULATED UST.	
39005023788	PETERSON LIFT STATION	PETERSON LN SANDUSKY, OH 44870	ERIE
INCIDENT NO. 222274400	STATUS NO FURTHER ACTION	LUST TRUST FUND (LTF) ELIGIBILITY CLOSURE OF AN UNDERGROUND STORAGE TANK.	
39005024063	SANDUSKY BD OF EDUCATION	8118 CAMP ST SANDUSKY, OH 44870	ERIE
INCIDENT NO. 222173700	STATUS NO FURTHER ACTION	LUST TRUST FUND (LTF) ELIGIBILITY CLOSURE OF AN UNDERGROUND STORAGE TANK.	
39005024532	UNITED PARCEL SERV	PERKINS AVE SANDUSKY, OH 44870	ERIE
INCIDENT NO. 220165100	STATUS NO FURTHER ACTION	LUST TRUST FUND (LTF) ELIGIBILITY CLOSURE OF AN UNDERGROUND STORAGE TANK.	
39005024617	UNKNOWN	PERKINS TOWNSHIP SANDUSKY, OH 44870	ERIE
INCIDENT NO. 22704500	STATUS DISPROVED	LUST TRUST FUND (LTF) ELIGIBILITY ELIGIBLE FOR LTF OVERSIGHT AND/OR SPENDING - SUSPECTED OR CONFIRMED FOR RELEASE OF PETROLEUM FROM A REGULATED UST.	
39005024619	UNKNOWN	RAMADA & US RT 250 SANDUSKY, OH 44870	ERIE
INCIDENT NO. 221060900	STATUS REPORTED	LUST TRUST FUND (LTF) ELIGIBILITY ELIGIBLE FOR LTF OVERSIGHT AND/OR SPENDING - SUSPECTED OR CONFIRMED FOR RELEASE OF PETROLEUM FROM A REGULATED UST.	

ERIIS ID	FACILITY	ADDRESS	COUNTY
39005024648	UNKNOWN (CITY WATER/SEWER LINE)	SR 101 SANDUSKY, OH 44870	ERIE

INCIDENT NO.	STATUS	LUST TRUST FUND (LTF) ELIGIBILITY
221113000	REPORTED	ELIGIBLE FOR LTF OVERSIGHT AND/OR SPENDING - SUSPECTED OR CONFIRMED FOR RELEASE OF PETROLEUM FROM A REGULATED UST.

ERIIS ID FACILITY ID	FACILITY ADDRESS	OPERATOR ADDRESS
39018000056 22-00-04	HURON LIME COMPANY LANDFILL #1 RIVER RD HURON, OH 44839 COUNTY: ERIE FACILITY TYPE: INDUSTRIAL SW LF CAPACITY: NOT REPORTED	H J MICHAELS HURON LIME COMPANY NOT REPORTED NOT REPORTED (419) 433-2141 FACILITY STATUS: CLOSED
39018000052 22-00-05	HURON LIME COMPANY LANDFILL #2 PO BOX 451 HURON, OH 44839-0451 COUNTY: ERIE FACILITY TYPE: INDUSTRIAL SW LF CAPACITY: NOT REPORTED	A.J. PARIS, HURON LIME COMPANY PO BOX 451 HURON, OH 44839 (419) 433-2141 FACILITY STATUS: ACTIVE
39018000388	HENSEN DUMP AKA HURON LIME CO. #2 WEST SIDE OF RIVER ROAD, 1/2 MILE HURON TOWNSHIP, OH COUNTY: ERIE FACILITY TYPE: PRIVATE, LIME SLUDGE CAPACITY: 12 ACRES	NOT REPORTED NOT REPORTED NOT REPORTED NOT REPORTED FACILITY STATUS: CLOSED 1982

ERIIS ENVIRONMENTAL DATA REPORT
OHIO UNDERGROUND STORAGE TANKS
RST - UNPLOTTABLE SITES

ERIIS Report #317596A

Mar 4, 1999

ERIIS ID / FACILITY ID	FACILITY	ADDRESS	OWNER ADDRESS	MANAGER
39010004878 / 0-220041	RYE BEACH HY-MILER	2026 CLEVELAND RD HURON, OH 44839 COUNTY: ERIE	DISTRICT PETROLEUM PRODUCTS, INC 1832 MILAN RD SANDUSKY, O 44870	MIKE STIPP

TANK ID	STATUS	SUBSTANCE	CAPACITY	AGE	CONSTRUCTION
1	CURRENTLY IN USE	GASOHOL	10,000	23	FIBERGLASS
2	CURRENTLY IN USE	GASOHOL	4,000	23	BARE STEEL
3	CURRENTLY IN USE	GASOHOL	6,000	23	BARE STEEL
4	CURRENTLY IN USE	GASOHOL	6,000	23	BARE STEEL
5	CURRENTLY IN USE	KEROSENE	2,000	23	BARE STEEL
6	TEMPORARILY OUT OF USE	USED OIL	550	23	BARE STEEL

39010004952 / 0-220235	DANIEL & CAROL LAPP	2112 CLEVELAND RD HURON, OH 44839 COUNTY: ERIE	DANIEL & CAROL LAPP 404 S HAMPTON CT HURON, OH 44839	

TANK ID	STATUS	SUBSTANCE	CAPACITY	AGE	CONSTRUCTION
1	REMOVED	GASOLINE	6,000	24	FIBERGLASS
2	REMOVED	GASOLINE	6,000	24	FIBERGLASS
3	REMOVED	GASOLINE	6,000	24	FIBERGLASS

39010005028 / 0-225986	ERIE COUNTY LANDFILL	HOOVER RD HURON, OH 44839 COUNTY: ERIE	ERIE COUNTY COMMISSIONERS PO BOX 370 HURON, OH 44839	JACK R. MYERS

TANK ID	STATUS	SUBSTANCE	CAPACITY	AGE	CONSTRUCTION
1	CURRENTLY IN USE	DIESEL	1,000	27	UNKNOWN

39010005038 / 0-227135	GTE NORTH, INC.	MAIN & SHIRLEY HURON, OH 44839 COUNTY: ERIE	GTE NORTH, INC. 1300 COLUMBUS SANDUSKY RD N MARION, OH 43302	KEITH E. ZUSPAN

TANK ID	STATUS	SUBSTANCE	CAPACITY	AGE	CONSTRUCTION
2	CURRENTLY IN USE	DIESEL	8,000	1	FIBERGLASS

39010019398 / 0-220307	DENNIS MICHELSON	2416 CLEVELAND SANDUSY RD HURON, OH 44839 COUNTY: ERIE	DENNIS MICHELSON 6322 146TH ST SW EDMONDS, WA 98026	

TANK ID	STATUS	SUBSTANCE	CAPACITY	AGE	CONSTRUCTION
1	CURRENTLY IN USE	UNK	UNKNOWN	UNK	UNKNOWN
2	CURRENTLY IN USE	UNK	UNKNOWN	UNK	UNKNOWN
3	CURRENTLY IN USE	UNK	UNKNOWN	UNK	UNKNOWN
4	CURRENTLY IN USE	UNK	UNKNOWN	UNK	UNKNOWN

39010004932 / 0-220191	C.S.C. OIL CO. #484	607 PERKINS AVE SANDUSKY, OH 44870 COUNTY: ERIE	C.S.C. OIL CO. 2210 GOLDSMITH LN - STE 108 LOUISVILLE, KY 40218	WILLIAM SHEPARD

TANK ID	STATUS	SUBSTANCE	CAPACITY	AGE	CONSTRUCTION
1	CURRENTLY IN USE	GASOLINE	10,000	25	BARE STEEL
2	CURRENTLY IN USE	GASOLINE	10,000	25	BARE STEEL
3	CURRENTLY IN USE	GASOLINE	10,000	25	BARE STEEL

ERIIS ENVIRONMENTAL DATA REPORT
OHIO UNDERGROUND STORAGE TANKS
RST - UNPLOTTABLE SITES

ERIIS Report #317596A

Mar 4, 1999

ERIIS ID / FACILITY ID	FACILITY	ADDRESS	OWNER ADDRESS	MANAGER
39010004967 / 0-220277	CEDAR POINT	#1 CAUSEWAY DR SANDUSKY, OH 44870 COUNTY: ERIE	CEDAR FAIR LIMITED PARTNERSHIP PO BOX 5006 SANDUSKY, OH 44870	RONALD K. FUSSNER

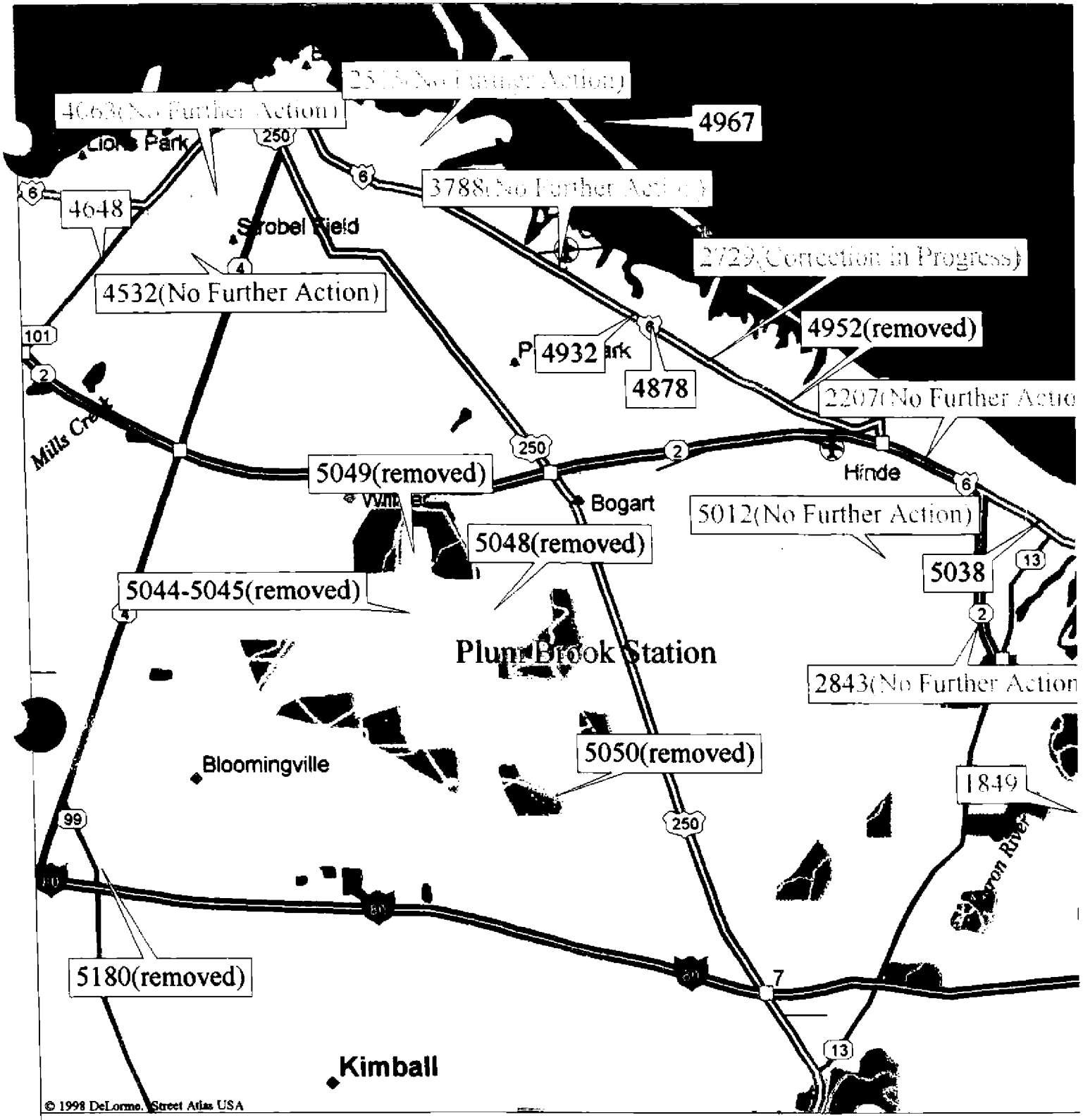
TANK ID	STATUS	SUBSTANCE	CAPACITY	AGE	CONSTRUCTION
10	CURRENTLY IN USE	GASOLINE	10,000	13	FIBERGLASS
11	CURRENTLY IN USE	DIESEL	6,000	13	FIBERGLASS
4	CURRENTLY IN USE	GASOLINE	2,500	8	FIBERGLASS
6	CURRENTLY IN USE	USED OIL	2,500	7	FIBERGLASS
7	CURRENTLY IN USE	DIESEL	6,000	7	FIBERGLASS
8	CURRENTLY IN USE	GASOLINE	10,000	7	FIBERGLASS
9	CURRENTLY IN USE	GASOLINE	10,000	13	FIBERGLASS

39010009256 / 0-390093	SANDUSKY STEEL & SUPPLY CO.	4957 RT 250 N NORWALK, OH 44870 COUNTY: ERIE	SANDUSKY STEEL & SUPPLY CO. 4957 RT 250 N MILAN, OH 44846	STEVE LICHTESSIEN

TANK ID	STATUS	SUBSTANCE	CAPACITY	AGE	CONSTRUCTION
1	REMOVED	GASOLINE	550	24	BARE STEEL

39010015180 / 0-720201	O.E. MEYER CO.	1520 E STATE ST SANDUSKY, OH 44870 COUNTY: ERIE	O.E. MEYER CO. PO BOX 479 SANDUSKY, OH 44870

TANK ID	STATUS	SUBSTANCE	CAPACITY	AGE	CONSTRUCTION
1	REMOVED	UNK	2,000	34	COMPOSITE
2	REMOVED	UNK	2,000	34	UNKNOWN



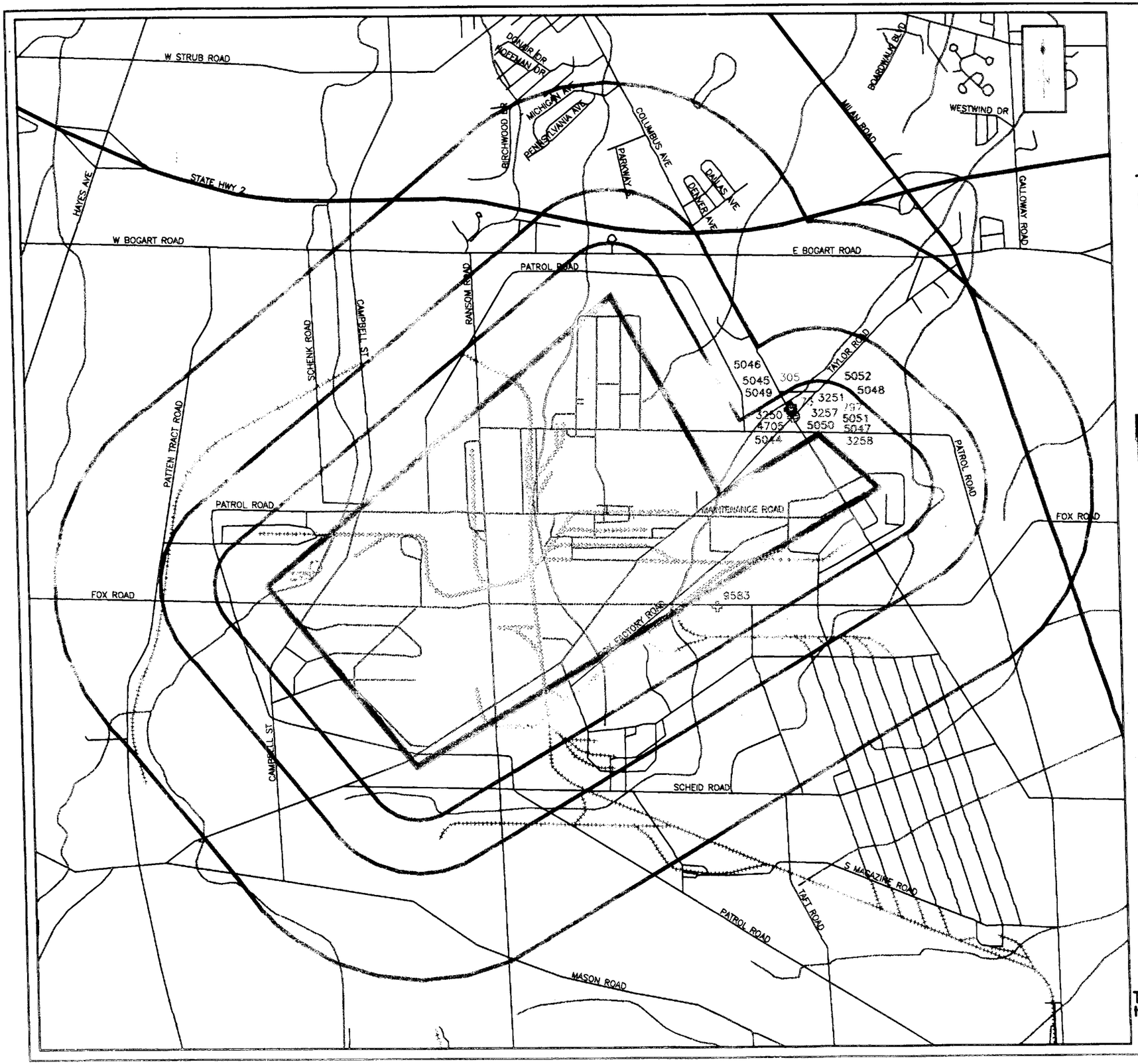
Mag 12.00
Tue Aug 10 14:12 1999
Scale 1:87,500 (at center)

2 Miles

2 KM

Local Road
Major Connector
State Route
Primary State Route
Ferry
Interstate/Limited Access
Toll Highway
US Highway

Exit
Utility/Pipe
Railroad
Small Town
Airfield
Park/Reservation
Locale
Public Airport



ERIS
505 Huntmar Park Dr, Suite 200
Herndon, VA 20170
(703)834-0600 (800)989-0402
FAX: (703)834-0606

SITE INFORMATION

South Of Sandusky
Sandusky, OH
Sandusky County
Job Number: 317596A
Map Plotted: Mar 4, 1999

MAP LEGEND

- Study Site
- ASTM Buffer
- Hydrography
- Railroads
- Roads
- Highways
- NPL 0 Sites
- RCRIS_TS 1 Site
- RCRIS_CA 0 Sites
- CERCLIS 0 Sites
- NFRAP 1 Site
- RCRIS_LG 0 Sites
- RCRIS_SG 1 Site
- ERNS 0 Sites
- HWS 1 Site
- LRST 6 Sites
- SWF 0 Sites
- RST 9 Sites

Miles

0 0.5

The Information on this map is subject to the ERIIS Disclaimer

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TNT SOIL TEST KIT WORKSHEET

Abs background 0.001 Abs control

1	2 0.003	3	4	5	6
SAMPLE #	Abs initial	Abs sample	Abs initial x4	Abs final (Column 3 - Column 4)	TNT CONC ppm (Column 5/0.0323)
L1P1 *	0.025	0.036			
L1P2	0.015	0.032			
L1P3	0.035	0.106			
L2P1	0.223	0.273 0.280 10 min			
L2P2	0.046	10 min - 0.078 0.092			
L2P3	0.027	0.078 10 min - 0.067			
L3P1	2.876	3.217 3.201			
L3P2	1.718	1.945 10 min - 1.963			
L4P1	0.312	0.422 10 min - 0.423			
L4P2	0.053	0.066 10 min - 0.066			
L5P1	0.048	0.091 10 min - 0.096			
L5P2	0.026	0.031 10 min - 0.031			

GEOTECHNICAL SOIL TESTING RESULTS
PLUM BROOK ORDNANCE WORKS

45FL99010A.00

Table B-1

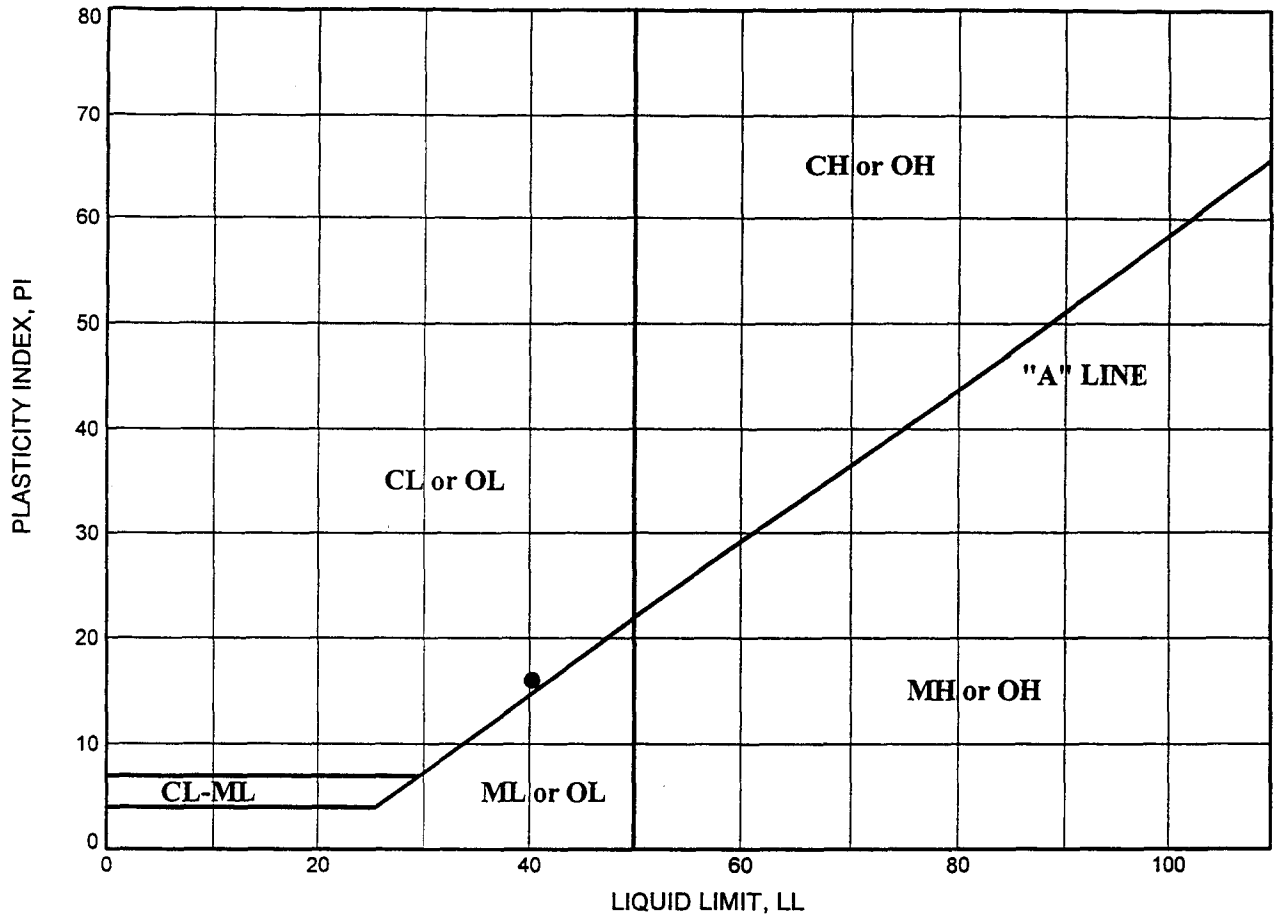
GEO FUDS

Plum Brook Ordnance Works - Rail Car Unloading

Summary of Laboratory Test Data

Sandusky, Ohio

Boring No.	Sample Depth ft	Unified Soil Classification	Water Content %	Dry Unit Weight pcf	Liquid Limit %	Plastic Limit %	% Passing No. 200 Sieve	Grain Size Data Figure	Unconfined Compression Compressive Strength ksf	Unconfined Compression Strain at Failure %	Torvane Strength ksf	Penetrometer Strength ksf	Volume Change Data Figures
DP02	3	ML	9				17						
DP02	7	CL	27		40	24							



Boring Number	Depth (feet)	Test Symbol	Moisture Content (%)	LL	PL	PI	Description
DP02	7	●	27	40	24	16	CL

Project: GEO FUDS
Plum Brook Ordnance Works - Rail Car Unloading
Sandusky, Ohio
Project Number: 45FL99010A.00

PLASTICITY CHART

Figure 1

URS Greiner Woodward Clyde

7/2/99 2ATT 45FL010A.GPJ DP02

Quanterra Incorporated
4101 Shuffel Drive, NW
North Canton, Ohio 44720

330 497-9396 Telephone
330 497-0772 Fax

ANALYTICAL REPORT

RAIL CAR LOADING AREA

Lot #: A9F140135

U.S. Army Corps of Engineers

QUANTERRA INCORPORATED

Debora A. Bula
Project Manager

July 22, 1999

CASE NARRATIVE

The following report contains the analytical results for seven solid samples and two water samples submitted to Quanterra-North Canton by the U.S. Army Corps of Engineers from the Rail Car Loading Area Site. The samples were received June 10, 1999, according to documented sample acceptance procedures.

Quanterra-North Canton utilizes USEPA approved methods in all analytical work. The samples presented in this report were analyzed for the parameters listed on the Analytical Methods Summary page in accordance with the method indicated.

The results included in this report have been reviewed for compliance with the laboratory QA/QC plan. All data have been found to be compliant with laboratory protocol.

SUPPLEMENTAL QC INFORMATION

SAMPLE RECEIVING

The cooler was received at the laboratory at a temperature of 5.8° C.

GC/MS SEMIVOLATILES

Surrogate recoveries were outside acceptance limits in samples "PBOW99SSCL05" and "PBOW99SSCL07" due to probable matrix effect. The recoveries were >10% and the associated quality control was acceptable; therefore, no corrective action was taken.

Samples "PBOW99SSCL03" and "PBOW99SSCL06" exhibited surrogate recoveries outside acceptance limits. Upon re-extraction and re-analysis, all surrogates were within acceptance limits; however, the recommended sample holding time had expired. Both sets of data are reported.

Sample "PBOW99SSCL04" had elevated reporting limits due to matrix interference.

The matrix spike/matrix spike duplicate associated with sample "PBOW99SSCL01" in batch 9168112 failed recovery and RPD criteria. The laboratory control sample associated with this batch was in control. This is believed to be a matrix effect; therefore, no further corrective action was taken.

CASE NARRATIVE (continued)

EXPLOSIVES

Surrogate recoveries for sample "PBOW99SSCL04" were outside the acceptance criteria due to obvious matrix interferences.
Reporting Limits have been adjusted for dry weight
Sample "PBOW99SSSCL04" was reported with elevated reporting limits for 2-nitrotoluene and 4-nitrotoluene due to sample matrix interferences.

METALS

Matrix spike/spike duplicate spike recoveries were outside the acceptance limits for some analytes. The acceptable laboratory control sample analysis data indicated that the analytical system was operating within control and this condition is most likely due to matrix interference. See the Matrix Spike Report for the affected analytes, which have been flagged with "N".

ANALYTICAL METHODS SUMMARY

A9F140135

PARAMETER	ANALYTICAL METHOD
pH Aqueous	SW846 9040B
Inductively Coupled Plasma (ICP) Metals	SW846 6010B
Mercury in Liquid Waste (Manual Cold-Vapor)	SW846 7470A
Mercury in Solid Waste (Manual Cold-Vapor)	SW846 7471A
Nitroaromatics and Nitramines by HPLC	SW846 8330
Semivolatile Organic Compounds by GC/MS	SW846 8270C
Soil and Waste pH	SW846 9045C
Total Organic Carbon	SMCA WALKLEY-BLACK
Total Residue as Percent Solids	MCAWW 160.3 MOD
Trace Inductively Coupled Plasma (ICP) Metals	SW846 6010B

References:

MCAWW "Methods for Chemical Analysis of Water and Wastes", EPA-600/4-79-020, March 1983 and subsequent revisions.

SMCA 90-3, Standard Methods of Chemical Analysis, 6th Edition, D. Van Nostrand Co., Princeton, N.J., 1963.

SW846 "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 and its updates.

SAMPLE SUMMARY

A9F140135

WO #	SAMPLE#	CLIENT SAMPLE ID	DATE	TIME
CWV5X	001	PBOW99SSCL01	06/09/99	11:00
CWV6F	002	PBOW99SSCL02	06/09/99	11:30
CWV6H	003	PBOW99SSCL03	06/09/99	13:00
CWV6J	004	PBOW99SSCL04	06/09/99	13:30
CWV6K	005	PBOW99SSCL05	06/09/99	14:00
CWV6L	006	PBOW99SSCL06	06/09/99	14:30
CWV6M	007	PBOW99SSCL07	06/09/99	14:30
CWV6N	008	PBOW99SWCL01	06/09/99	
CWV72	009	PBOW99SWCL02	06/09/99	

NOTE(S):

- The analytical results of the samples listed above are presented on the following pages.
- All calculations are performed before rounding to avoid round-off errors in calculated results.
- Results noted as "ND" were not detected at or above the stated limit.
- This report must not be reproduced, except in full, without the written approval of the laboratory.
- Results for the following parameters are never reported on a dry weight basis: color, corrosivity, density, flashpoint, ignitability, layers, odor, paint filter test, pH, porosity pressure, reactivity, redox potential, specific gravity, spot tests, solids, solubility, temperature, viscosity, and weight.

U.S. ARMY CORPS OF ENGINEERS

Client Sample ID: PBOW99SSCL01

GC/MS Semivolatiles

Lot-Sample #...: A9F140135-001 **Work Order #...:** CWV5X101 **Matrix.....:** SOLID
Date Sampled...: 06/09/99 11:00 **Date Received..:** 06/10/99
Prep Date.....: 06/17/99 **Analysis Date..:** 06/24/99
Prep Batch #...: 9168112
Dilution Factor: 1
% Moisture.....: 30 **Method.....:** SW846 8270C

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Acenaphthene	ND	470	ug/kg
Acenaphthylene	ND	470	ug/kg
Anthracene	ND	470	ug/kg
Benzo(a)anthracene	ND	470	ug/kg
Benzo(b)fluoranthene	ND	470	ug/kg
Benzo(k)fluoranthene	ND	470	ug/kg
Benzo(ghi)perylene	ND	470	ug/kg
Benzo(a)pyrene	ND	470	ug/kg
bis(2-Chloroethoxy) methane	ND	470	ug/kg
bis(2-Chloroethyl)-ether	ND	470	ug/kg
bis(2-Ethylhexyl) hthalate	ND	470	ug/kg
4-Bromophenyl phenyl ether	ND	470	ug/kg
Butyl benzyl phthalate	ND	470	ug/kg
4-Chloroaniline	ND	470	ug/kg
4-Chloro-3-methylphenol	ND	470	ug/kg
2-Chloronaphthalene	ND	470	ug/kg
2-Chlorophenol	ND	470	ug/kg
4-Chlorophenyl phenyl ether	ND	470	ug/kg
Chrysene	ND	470	ug/kg
Dibenz(a,h)anthracene	ND	470	ug/kg
Dibenzofuran	ND	470	ug/kg
Di-n-butyl phthalate	ND	470	ug/kg
1,2-Dichlorobenzene	ND	470	ug/kg
1,3-Dichlorobenzene	ND	470	ug/kg
1,4-Dichlorobenzene	ND	470	ug/kg
3,3'-Dichlorobenzidine	ND	470	ug/kg
2,4-Dichlorophenol	ND	470	ug/kg
Diethyl phthalate	ND	470	ug/kg
2,4-Dimethylphenol	ND	470	ug/kg
Dimethyl phthalate	ND	470	ug/kg
Di-n-octyl phthalate	ND	470	ug/kg
4,6-Dinitro-2-methylphenol	ND	1100	ug/kg

(Continued on next page)

U.S. ARMY CORPS OF ENGINEERS

Client Sample ID: PBOW99SSCL01

GC/MS Semivolatiles

Lot-Sample #...: A9F140135-001 **Work Order #...:** CWV5X101 **Matrix.....:** SOLID

PARAMETER	RESULT	REPORTING LIMIT	UNITS
2,4-Dinitrophenol	ND	1100	ug/kg
2,4-Dinitrotoluene	ND	470	ug/kg
2,6-Dinitrotoluene	ND	470	ug/kg
Fluoranthene	ND	470	ug/kg
Fluorene	ND	470	ug/kg
Hexachlorobenzene	ND	470	ug/kg
Hexachlorobutadiene	ND	470	ug/kg
Hexachlorocyclopenta-diene	ND	470	ug/kg
Hexachloroethane	ND	470	ug/kg
Indeno(1,2,3-cd)pyrene	ND	470	ug/kg
Isophorone	ND	470	ug/kg
2-Methylnaphthalene	ND	470	ug/kg
2-Methylphenol	ND	470	ug/kg
Naphthalene	ND	470	ug/kg
2-Nitroaniline	ND	1100	ug/kg
3-Nitroaniline	ND	1100	ug/kg
4 Nitroaniline	ND	1100	ug/kg
obenzene	ND	470	ug/kg
2 ..itrophenol	ND	470	ug/kg
4-Nitrophenol	ND	1100	ug/kg
N-Nitrosodi-n-propyl-amine	ND	470	ug/kg
N-Nitrosodiphenylamine	ND	470	ug/kg
Pentachlorophenol	ND	1100	ug/kg
Phenanthrene	ND	470	ug/kg
Phenol	ND	470	ug/kg
Pyrene	ND	470	ug/kg
1,2,4-Trichlorobenzene	ND	470	ug/kg
2,4,5-Trichlorophenol	ND	470	ug/kg
2,4,6-Trichlorophenol	ND	470	ug/kg
Carbazole	ND	470	ug/kg
4-Methylphenol	ND	470	ug/kg
bis(2-Chloroisopropyl) ether	ND	470	ug/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Nitrobenzene-d5	47	(23 - 120)
Terphenyl-d14	51	(18 - 137)
2-Fluorobiphenyl	50	(30 - 115)
2-Fluorophenol	50	(30 - 115)
Phenol-d5	46	(24 - 113)
2 6-Tribromophenol	45	(19 - 122)

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

U.S. ARMY CORPS OF ENGINEERS

Client Sample ID: PBOW99SSCL01

HPLC

Lot-Sample #...: A9F140135-001 **Work Order #...:** CWV5X10C **Matrix.....:** SOLID
Date Sampled...: 06/09/99 11:00 **Date Received..:** 06/10/99
Prep Date.....: 06/19/99 **Analysis Date..:** 06/24/99
Prep Batch #...: 9170118
Dilution Factor: 1
% Moisture.....: 30 **Method.....:** SW846 8330

PARAMETER	RESULT	REPORTING LIMIT	UNITS
HMX	ND	0.50	mg/kg
RDX	ND	0.50	mg/kg
1,3,5-Trinitrobenzene	ND	0.25	mg/kg
1,3-Dinitrobenzene	ND	0.25	mg/kg
Tetryl	ND	0.65	mg/kg
Nitrobenzene	ND	0.25	mg/kg
2,4,6-Trinitrotoluene	**0.33**	**0.25**	**mg/kg**
4-Amino-2,6-dinitrotoluene	ND	0.25	mg/kg
2-Amino-4,6-dinitrotoluene	ND	0.25	mg/kg
2,6-Dinitrotoluene	ND	0.25	mg/kg
2,4-Dinitrotoluene	ND	0.25	mg/kg
2-Nitrotoluene	ND	0.25	mg/kg
4-Nitrotoluene	ND	0.25	mg/kg
[illegible]trotoluene	ND	0.25	mg/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
1-Chloro-3-nitrobenzene	117	(76 - 124)

U.S. ARMY CORPS OF ENGINEERS

Client Sample ID: PBOW99SSCL01

TOTAL Metals

Lot-Sample #...: A9F140135-001 **Matrix.....:** SOLID
Date Sampled...: 06/09/99 11:00 **Date Received..:** 06/10/99
% Moisture.....: 30

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
Prep Batch #...: 9167363						
Silver	ND	0.71	mg/kg	SW846 6010B	06/17-06/19/99	CWV5X103
		Dilution Factor: 1				
Arsenic	**18.4**	**1.4**	**mg/kg**	**SW846 6010B**	**06/17-06/19/99**	**CWV5X104**
		Dilution Factor: 1				
Barium	**105**	**28.5**	**mg/kg**	**SW846 6010B**	**06/17-06/19/99**	**CWV5X102**
		Dilution Factor: 1				
Cadmium	ND	0.28	mg/kg	SW846 6010B	06/17-06/19/99	CWV5X105
		Dilution Factor: 1				
Chromium	**11.2**	**0.71**	**mg/kg**	**SW846 6010B**	**06/17-06/19/99**	**CWV5X106**
		Dilution Factor: 1				
1	**17.5**	**0.43**	**mg/kg**	**SW846 6010B**	**06/17-06/19/99**	**CWV5X107**
		Dilution Factor: 1				
Mercury	ND	0.14	mg/kg	SW846 7471A	06/17-06/21/99	CWV5X109
		Dilution Factor: 1				
Selenium	**1.2**	**0.71**	**mg/kg**	**SW846 6010B**	**06/17-06/19/99**	**CWV5X108**
		Dilution Factor: 1				

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

U.S. ARMY CORPS OF ENGINEERS

Client Sample ID: PBOW99SSCL01

General Chemistry

Lot-Sample #...: A9F140135-001 **Work Order #...:** CWV5X **Matrix.....:** SOLID
Date Sampled...: 06/09/99 11:00 **Date Received..:** 06/10/99
% Moisture.....: 30

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
pH (solid)	4.5		No Units	SW846 9045C	06/10/99	9162288
	Dilution Factor: 1					
Percent Solids	70.2	0.10	%	MCAWW 160.3 MOD	06/21-06/22/99	9172191
	Dilution Factor: 1					
Total Organic Carbon	6200	140	mg/kg	SMCA WALKLEY-BLAC	06/26/99	9177206
	Dilution Factor: 1					

NOTE(S):

RL Reporting Limit

Results and reporting limits have been adjusted for dry weight.

U.S. ARMY CORPS OF ENGINEERS

Client Sample ID: PBOW99SSCL02

GC/MS Semivolatiles

Lot-Sample #...: A9F140135-002 **Work Order #...:** CWV6F101 **Matrix.....:** SOLID
Date Sampled...: 06/09/99 11:30 **Date Received..:** 06/10/99
Prep Date.....: 06/17/99 **Analysis Date..:** 06/25/99
Prep Batch #...: 9168112
Dilution Factor: 1
% Moisture.....: 35 **Method.....:** SW846 8270C

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Acenaphthene	ND	510	ug/kg
Acenaphthylene	ND	510	ug/kg
Anthracene	ND	510	ug/kg
Benzo(a)anthracene	ND	510	ug/kg
Benzo(b)fluoranthene	ND	510	ug/kg
Benzo(k)fluoranthene	ND	510	ug/kg
Benzo(ghi)perylene	ND	510	ug/kg
Benzo(a)pyrene	ND	510	ug/kg
bis(2-Chloroethoxy) methane	ND	510	ug/kg
bis(2-Chloroethyl)-ether	ND	510	ug/kg
bis(2-Ethylhexyl) phthalate	ND	510	ug/kg
4-Bromophenyl phenyl ether	ND	510	ug/kg
Butyl benzyl phthalate	ND	510	ug/kg
4-Chloroaniline	ND	510	ug/kg
4-Chloro-3-methylphenol	ND	510	ug/kg
2-Chloronaphthalene	ND	510	ug/kg
2-Chlorophenol	ND	510	ug/kg
4-Chlorophenyl phenyl ether	ND	510	ug/kg
Chrysene	ND	510	ug/kg
Dibenz(a,h)anthracene	ND	510	ug/kg
Dibenzofuran	ND	510	ug/kg
Di-n-butyl phthalate	ND	510	ug/kg
1,2-Dichlorobenzene	ND	510	ug/kg
1,3-Dichlorobenzene	ND	510	ug/kg
1,4-Dichlorobenzene	ND	510	ug/kg
3,3'-Dichlorobenzidine	ND	510	ug/kg
2,4-Dichlorophenol	ND	510	ug/kg
Diethyl phthalate	ND	510	ug/kg
2,4-Dimethylphenol	ND	510	ug/kg
Dimethyl phthalate	ND	510	ug/kg
Di-n-octyl phthalate	ND	510	ug/kg
4,6-Dinitro-2-methylphenol	ND	1200	ug/kg

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U.S. ARMY CORPS OF ENGINEERS

Client Sample ID: PBOW99SSCL02

GC/MS Semivolatiles

Lot-Sample #...: A9F140135-002 **Work Order #...:** CWV6F101 **Matrix.....:** SOLID

PARAMETER	RESULT	REPORTING LIMIT	UNITS
2,4-Dinitrophenol	ND	1200	ug/kg
2,4-Dinitrotoluene	ND	510	ug/kg
2,6-Dinitrotoluene	ND	510	ug/kg
Fluoranthene	ND	510	ug/kg
Fluorene	ND	510	ug/kg
Hexachlorobenzene	ND	510	ug/kg
Hexachlorobutadiene	ND	510	ug/kg
Hexachlorocyclopenta-diene	ND	510	ug/kg
Hexachloroethane	ND	510	ug/kg
Indeno(1,2,3-cd)pyrene	ND	510	ug/kg
Isophorone	ND	510	ug/kg
2-Methylnaphthalene	ND	510	ug/kg
2-Methylphenol	ND	510	ug/kg
Naphthalene	ND	510	ug/kg
2-Nitroaniline	ND	1200	ug/kg
3-Nitroaniline	ND	1200	ug/kg
4-Nitroaniline	ND	1200	ug/kg
robenzene	ND	510	ug/kg
2-Nitrophenol	ND	510	ug/kg
4-Nitrophenol	ND	1200	ug/kg
N-Nitrosodi-n-propyl-amine	ND	510	ug/kg
N-Nitrosodiphenylamine	ND	510	ug/kg
Pentachlorophenol	ND	1200	ug/kg
Phenanthrene	ND	510	ug/kg
Phenol	ND	510	ug/kg
Pyrene	ND	510	ug/kg
1,2,4-Trichlorobenzene	ND	510	ug/kg
2,4,5-Trichlorophenol	ND	510	ug/kg
2,4,6-Trichlorophenol	ND	510	ug/kg
Carbazole	ND	510	ug/kg
4-Methylphenol	ND	510	ug/kg
bis(2-Chloroisopropyl) ether	ND	510	ug/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Nitrobenzene-d5	36	(23 - 120)
Terphenyl-d14	54	(18 - 137)
2-Fluorobiphenyl	42	(30 - 115)
2-Fluorophenol	44	(30 - 115)
Phenol-d5	44	(24 - 113)
6-Tribromophenol	26	(19 - 122)

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

U.S. ARMY CORPS OF ENGINEERS

Client Sample ID: PBOW99SSCL02

HPLC

Lot-Sample #...: A9F140135-002 **Work Order #...:** CWV6F10C **Matrix.....:** SOLID
Date Sampled...: 06/09/99 11:30 **Date Received..:** 06/10/99
Prep Date.....: 06/19/99 **Analysis Date..:** 06/24/99
Prep Batch #...: 9170118
Dilution Factor: 1
% Moisture.....: 35 **Method.....:** SW846 8330

PARAMETER	RESULT	REPORTING LIMIT	UNITS
HMX	ND	0.50	mg/kg
RDX	ND	0.50	mg/kg
1,3,5-Trinitrobenzene	ND	0.25	mg/kg
1,3-Dinitrobenzene	ND	0.25	mg/kg
Tetryl	ND	0.65	mg/kg
Nitrobenzene	ND	0.25	mg/kg
2,4,6-Trinitrotoluene	ND	0.25	mg/kg
4-Amino-2,6-dinitrotoluene	ND	0.25	mg/kg
2-Amino-4,6-dinitrotoluene	ND	0.25	mg/kg
2,6-Dinitrotoluene	ND	0.25	mg/kg
2,4-Dinitrotoluene	ND	0.25	mg/kg
2-Nitrotoluene	ND	0.25	mg/kg
4-Nitrotoluene	ND	0.25	mg/kg
[illegible]rotoluene	ND	0.25	mg/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
1-Chloro-3-nitrobenzene	105	(76 - 124)

U.S. ARMY CORPS OF ENGINEERS

Client Sample ID: PBOW99SSCL02

TOTAL Metals

Lot-Sample #...: A9F140135-002 **Matrix.....:** SOLID
Date Sampled...: 06/09/99 11:30 **Date Received..:** 06/10/99
% Moisture.....: 35

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
Prep Batch #...: 9167363						
Silver	ND	0.77	mg/kg	SW846 6010B	06/17-06/19/99	CWV6F103
		Dilution Factor: 1				
Arsenic	**6.5**	**1.5**	**mg/kg**	**SW846 6010B**	**06/17-06/19/99**	**CWV6F104**
		Dilution Factor: 1				
Barium	**47.5**	**30.7**	**mg/kg**	**SW846 6010B**	**06/17-06/19/99**	**CWV6F102**
		Dilution Factor: 1				
Cadmium	ND	0.31	mg/kg	SW846 6010B	06/17-06/19/99	CWV6F105
		Dilution Factor: 1				
Chromium	**6.0**	**0.77**	**mg/kg**	**SW846 6010B**	**06/17-06/19/99**	**CWV6F106**
		Dilution Factor: 1				
Le	**21.0**	**0.46**	**mg/kg**	**SW846 6010B**	**06/17-06/19/99**	**CWV6F107**
		Dilution Factor: 1				
Mercury	ND	0.15	mg/kg	SW846 7471A	06/17-06/21/99	CWV6F109
		Dilution Factor: 1				
Selenium	**0.81**	**0.77**	**mg/kg**	**SW846 6010B**	**06/17-06/19/99**	**CWV6F108**
		Dilution Factor: 1				

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

U.S. ARMY CORPS OF ENGINEERS

Client Sample ID: PBOW99SSCL02

General Chemistry

Lot-Sample #...: A9F140135-002 **Work Order #...:** CWV6F **Matrix.....:** SOLID
Date Sampled...: 06/09/99 11:30 **Date Received..:** 06/10/99
% Moisture.....: 35

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
pH (solid)	6.8		No Units	SW846 9045C	06/10/99	9162288
	Dilution Factor: 1					
Percent Solids	65.1	0.10	%	MCAWW 160.3 MOD	06/16-06/17/99	9167253
	Dilution Factor: 1					

NOTE(S):

RL Reporting Limit

Results and reporting limits have been adjusted for dry weight.

U.S. ARMY CORPS OF ENGINEERS

Client Sample ID: PBOW99SSCL03

GC/MS Semivolatiles

Lot-Sample #...: A9F140135-003 **Work Order #...:** CWV6H101 **Matrix.....:** SOLID
Date Sampled...: 06/09/99 13:00 **Date Received..:** 06/10/99
Prep Date.....: 06/17/99 **Analysis Date..:** 06/25/99
Prep Batch #...: 9168112
Dilution Factor: 1
% Moisture.....: 14 **Method.....:** SW846 8270C

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Acenaphthene	ND	380	ug/kg
Acenaphthylene	ND	380	ug/kg
Anthracene	ND	380	ug/kg
Benzo(a)anthracene	ND	380	ug/kg
Benzo(b)fluoranthene	ND	380	ug/kg
Benzo(k)fluoranthene	ND	380	ug/kg
Benzo(ghi)perylene	ND	380	ug/kg
Benzo(a)pyrene	ND	380	ug/kg
bis(2-Chloroethoxy) methane	ND	380	ug/kg
bis(2-Chloroethyl)-ether	ND	380	ug/kg
bis(2-Ethylhexyl) phthalate	ND	380	ug/kg
4-Bromophenyl phenyl ether	ND	380	ug/kg
Butyl benzyl phthalate	ND	380	ug/kg
4-Chloroaniline	ND	380	ug/kg
4-Chloro-3-methylphenol	ND	380	ug/kg
2-Chloronaphthalene	ND	380	ug/kg
2-Chlorophenol	ND	380	ug/kg
4-Chlorophenyl phenyl ether	ND	380	ug/kg
Chrysene	ND	380	ug/kg
Dibenz(a,h)anthracene	ND	380	ug/kg
Dibenzofuran	ND	380	ug/kg
Di-n-butyl phthalate	ND	380	ug/kg
1,2-Dichlorobenzene	ND	380	ug/kg
1,3-Dichlorobenzene	ND	380	ug/kg
1,4-Dichlorobenzene	ND	380	ug/kg
3,3'-Dichlorobenzidine	ND	380	ug/kg
2,4-Dichlorophenol	ND	380	ug/kg
Diethyl phthalate	ND	380	ug/kg
2,4-Dimethylphenol	ND	380	ug/kg
Dimethyl phthalate	ND	380	ug/kg
Di-n-octyl phthalate	ND	380	ug/kg
4,6-Dinitro-2-methylphenol	ND	930	ug/kg

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U.S. ARMY CORPS OF ENGINEERS

Client Sample ID: PBOW99SSCL03

GC/MS Semivolatiles

Lot-Sample #...: A9F140135-003 **Work Order #...:** CWV6H101 **Matrix.....:** SOLID

PARAMETER	RESULT	REPORTING LIMIT	UNITS
2,4-Dinitrophenol	ND	930	ug/kg
2,4-Dinitrotoluene	ND	380	ug/kg
2,6-Dinitrotoluene	ND	380	ug/kg
Fluoranthene	ND	380	ug/kg
Fluorene	ND	380	ug/kg
Hexachlorobenzene	ND	380	ug/kg
Hexachlorobutadiene	ND	380	ug/kg
Hexachlorocyclopenta-diene	ND	380	ug/kg
Hexachloroethane	ND	380	ug/kg
Indeno(1,2,3-cd)pyrene	ND	380	ug/kg
Isophorone	ND	380	ug/kg
2-Methylnaphthalene	ND	380	ug/kg
2-Methylphenol	ND	380	ug/kg
Naphthalene	ND	380	ug/kg
2-Nitroaniline	ND	930	ug/kg
3-Nitroaniline	ND	930	ug/kg
itroaniline	ND	930	ug/kg
robenzene	ND	380	ug/kg
2-Nitrophenol	ND	380	ug/kg
4-Nitrophenol	ND	930	ug/kg
N-Nitrosodi-n-propyl-amine	ND	380	ug/kg
N-Nitrosodiphenylamine	ND	380	ug/kg
Pentachlorophenol	ND	930	ug/kg
Phenanthrene	ND	380	ug/kg
Phenol	ND	380	ug/kg
Pyrene	ND	380	ug/kg
1,2,4-Trichlorobenzene	ND	380	ug/kg
2,4,5-Trichlorophenol	ND	380	ug/kg
2,4,6-Trichlorophenol	ND	380	ug/kg
Carbazole	ND	380	ug/kg
4-Methylphenol	ND	380	ug/kg
bis(2-Chloroisopropyl) ether	ND	380	ug/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Nitrobenzene-d5	53	(23 - 120)
Terphenyl-d14	65	(18 - 137)
2-Fluorobiphenyl	55	(30 - 115)
2-Fluorophenol	53	(30 - 115)
Phenol-d5	53	(24 - 113)
6-Tribromophenol	7.5 *	(19 - 122)

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U.S. ARMY CORPS OF ENGINEERS

Client Sample ID: PBOW99SSCL03

GC/MS Semivolatiles

Lot-Sample #...: A9F140135-003 **Work Order #...:** CWV6H101 **Matrix.....:** SOLID

NOTE(S):

* Surrogate recovery is outside stated control limits.

Results and reporting limits have been adjusted for dry weight.

U.S. ARMY CORPS OF ENGINEERS

Client Sample ID: PBOW99SSCL03

GC/MS Semivolatiles

Lot-Sample #...: A9F140135-003 **Work Order #...:** CWV6H201 **Matrix.....:** SOLID
Date Sampled...: 06/09/99 13:00 **Date Received..:** 06/10/99
Prep Date.....: 06/28/99 **Analysis Date..:** 07/01/99
Prep Batch #...: 9177103
Dilution Factor: 1
% Moisture.....: 14 **Method.....:** SW846 8270C

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Acenaphthene	ND	680	ug/kg
Acenaphthylene	ND	680	ug/kg
Anthracene	ND	680	ug/kg
Benzo(a)anthracene	ND	680	ug/kg
Benzo(b)fluoranthene	ND	680	ug/kg
Benzo(k)fluoranthene	ND	680	ug/kg
Benzo(ghi)perylene	ND	680	ug/kg
Benzo(a)pyrene	ND	680	ug/kg
bis(2-Chloroethoxy) methane	ND	680	ug/kg
bis(2-Chloroethyl)-ether	ND	680	ug/kg
(2-Ethylhexyl) phthalate	ND	680	ug/kg
4-Bromophenyl phenyl ether	ND	680	ug/kg
Butyl benzyl phthalate	ND	680	ug/kg
4-Chloroaniline	ND	680	ug/kg
4-Chloro-3-methylphenol	ND	680	ug/kg
2-Chloronaphthalene	ND	680	ug/kg
2-Chlorophenol	ND	680	ug/kg
4-Chlorophenyl phenyl ether	ND	680	ug/kg
Chrysene	ND	680	ug/kg
Dibenz(a,h)anthracene	ND	680	ug/kg
Dibenzofuran	ND	680	ug/kg
Di-n-butyl phthalate	ND	680	ug/kg
1,2-Dichlorobenzene	ND	680	ug/kg
1,3-Dichlorobenzene	ND	680	ug/kg
1,4-Dichlorobenzene	ND	680	ug/kg
3,3'-Dichlorobenzidine	ND	680	ug/kg
2,4-Dichlorophenol	ND	680	ug/kg
Diethyl phthalate	ND	680	ug/kg
2,4-Dimethylphenol	ND	680	ug/kg
Dimethyl phthalate	ND	680	ug/kg
Di-n-octyl phthalate	ND	680	ug/kg
4,6-Dinitro-2-methylphenol	ND	1700	ug/kg

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U.S. ARMY CORPS OF ENGINEERS

Client Sample ID: PBOW99SSCL03

GC/MS Semivolatiles

Lot-Sample #...: A9F140135-003 **Work Order #...:** CWV6H201 **Matrix.....:** SOLID

PARAMETER	RESULT	REPORTING LIMIT	UNITS
2,4-Dinitrophenol	ND	1700	ug/kg
2,4-Dinitrotoluene	ND	680	ug/kg
2,6-Dinitrotoluene	ND	680	ug/kg
Fluoranthene	ND	680	ug/kg
Fluorene	ND	680	ug/kg
Hexachlorobenzene	ND	680	ug/kg
Hexachlorobutadiene	ND	680	ug/kg
Hexachlorocyclopenta-diene	ND	680	ug/kg
Hexachloroethane	ND	680	ug/kg
Indeno(1,2,3-cd)pyrene	ND	680	ug/kg
Isophorone	ND	680	ug/kg
2-Methylnaphthalene	ND	680	ug/kg
2-Methylphenol	ND	680	ug/kg
Naphthalene	ND	680	ug/kg
2-Nitroaniline	ND	1700	ug/kg
3-Nitroaniline	ND	1700	ug/kg
˙itroaniline	ND	1700	ug/kg
robenzene	ND	680	ug/kg
2-Nitrophenol	ND	680	ug/kg
4-Nitrophenol	ND	1700	ug/kg
N-Nitrosodi-n-propyl-amine	ND	680	ug/kg
N-Nitrosodiphenylamine	ND	680	ug/kg
Pentachlorophenol	ND	1700	ug/kg
Phenanthrene	ND	680	ug/kg
Phenol	ND	680	ug/kg
Pyrene	ND	680	ug/kg
1,2,4-Trichlorobenzene	ND	680	ug/kg
2,4,5-Trichlorophenol	ND	680	ug/kg
2,4,6-Trichlorophenol	ND	680	ug/kg
Carbazole	ND	680	ug/kg
4-Methylphenol	ND	680	ug/kg
bis(2-Chloroisopropyl) ether	ND	680	ug/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Nitrobenzene-d5	63	(23 - 120)
Terphenyl-d14	84	(18 - 137)
2-Fluorobiphenyl	62	(30 - 115)
2-Fluorophenol	55	(30 - 115)
Phenol-d5	55	(24 - 113)
˙ 6-Tribromophenol	49	(19 - 122)

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

U.S. ARMY CORPS OF ENGINEERS

Client Sample ID: PBOW99SSCL03

HPLC

Lot-Sample #...: A9F140135-003 **Work Order #...:** CWV6H10C **Matrix.....:** SOLID
Date Sampled...: 06/09/99 13:00 **Date Received..:** 06/10/99
Prep Date.....: 06/19/99 **Analysis Date..:** 06/24/99
Prep Batch #...: 9170118
Dilution Factor: 1
% Moisture.....: 14 **Method.....:** SW846 8330

PARAMETER	RESULT	REPORTING LIMIT	UNITS
HMX	ND	0.50	mg/kg
RDX	ND	0.50	mg/kg
1,3,5-Trinitrobenzene	ND	0.25	mg/kg
1,3-Dinitrobenzene	ND	0.25	mg/kg
Tetryl	ND	0.65	mg/kg
Nitrobenzene	ND	0.25	mg/kg
2,4,6-Trinitrotoluene	ND	0.25	mg/kg
4-Amino-2,6-dinitrotoluene	ND	0.25	mg/kg
2-Amino-4,6-dinitrotoluene	ND	0.25	mg/kg
2,6-Dinitrotoluene	ND	0.25	mg/kg
2,4-Dinitrotoluene	ND	0.25	mg/kg
2-Nitrotoluene	ND	0.25	mg/kg
[illegible]itrotoluene	ND	0.25	mg/kg
[illegible]trotoluene	ND	0.25	mg/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
1-Chloro-3-nitrobenzene	108	(76 - 124)

U.S. ARMY CORPS OF ENGINEERS

Client Sample ID: PBOW99SSCL03

TOTAL Metals

Lot-Sample #...: A9F140135-003 **Matrix.....:** SOLID
Date Sampled...: 06/09/99 13:00 **Date Received..:** 06/10/99
% Moisture.....: 14

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
Prep Batch #...: 9167363						
Silver	ND	0.58 Dilution Factor: 1	mg/kg	SW846 6010B	06/17-06/19/99	CWV6H103
Arsenic	**9.7**	**1.2** Dilution Factor: 1	**mg/kg**	**SW846 6010B**	**06/17-06/19/99**	**CWV6H104**
Barium	**78.3**	**23.3** Dilution Factor: 1	**mg/kg**	**SW846 6010B**	**06/17-06/19/99**	**CWV6H102**
Cadmium	ND	0.23 Dilution Factor: 1	mg/kg	SW846 6010B	06/17-06/19/99	CWV6H105
Chromium	**17.6**	**0.58** Dilution Factor: 1	**mg/kg**	**SW846 6010B**	**06/17-06/19/99**	**CWV6H106**
L	**10.4**	**0.35** Dilution Factor: 1	**mg/kg**	**SW846 6010B**	**06/17-06/19/99**	**CWV6H107**
Mercury	ND	0.12 Dilution Factor: 1	mg/kg	SW846 7471A	06/17-06/21/99	CWV6H109
Selenium	**0.86**	**0.58** Dilution Factor: 1	**mg/kg**	**SW846 6010B**	**06/17-06/19/99**	**CWV6H108**

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

U.S. ARMY CORPS OF ENGINEERS

Client Sample ID: PBOW99SSCL03

General Chemistry

Lot-Sample #...: A9F140135-003 **Work Order #...:** CWV6H **Matrix.....:** SOLID
Date Sampled...: 06/09/99 13:00 **Date Received..:** 06/10/99
% Moisture.....: 14

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
pH (solid)	**7.8**		**No Units**	**SW846 9045C**	**06/10/99**	**9162288**
	Dilution Factor: 1					
Percent Solids	**85.8**	**0.10**	**%**	**MCAWW 160.3 MOD**	**06/16-06/17/99**	**9167253**
	Dilution Factor: 1					

NOTE(S):

RL Reporting Limit

Results and reporting limits have been adjusted for dry weight.

U.S. ARMY CORPS OF ENGINEERS

Client Sample ID: PBOW99SSCL04

GC/MS Semivolatiles

Lot-Sample #...: A9F140135-004 **Work Order #...:** CWV6J101 **Matrix.....:** SOLID
Date Sampled...: 06/09/99 13:30 **Date Received..:** 06/10/99
Prep Date.....: 06/17/99 **Analysis Date..:** 06/25/99
Prep Batch #...: 9168112
Dilution Factor: 5
% Moisture.....: 17 **Method.....:** SW846 8270C

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Acenaphthene	ND	2000	ug/kg
Acenaphthylene	ND	2000	ug/kg
Anthracene	ND	2000	ug/kg
Benzo(a)anthracene	ND	2000	ug/kg
Benzo(b)fluoranthene	ND	2000	ug/kg
Benzo(k)fluoranthene	ND	2000	ug/kg
Benzo(ghi)perylene	ND	2000	ug/kg
Benzo(a)pyrene	ND	2000	ug/kg
bis(2-Chloroethoxy) methane	ND	2000	ug/kg
bis(2-Chloroethyl)-ether	ND	2000	ug/kg
b' '2-Ethylhexyl) hthalate	ND	2000	ug/kg
4-Bromophenyl phenyl ether	ND	2000	ug/kg
Butyl benzyl phthalate	ND	2000	ug/kg
4-Chloroaniline	ND	2000	ug/kg
4-Chloro-3-methylphenol	ND	2000	ug/kg
2-Chloronaphthalene	ND	2000	ug/kg
2-Chlorophenol	ND	2000	ug/kg
4-Chlorophenyl phenyl ether	ND	2000	ug/kg
Chrysene	ND	2000	ug/kg
Dibenz(a,h)anthracene	ND	2000	ug/kg
Dibenzofuran	ND	2000	ug/kg
Di-n-butyl phthalate	ND	2000	ug/kg
1,2-Dichlorobenzene	ND	2000	ug/kg
1,3-Dichlorobenzene	ND	2000	ug/kg
1,4-Dichlorobenzene	ND	2000	ug/kg
3,3'-Dichlorobenzidine	ND	2000	ug/kg
2,4-Dichlorophenol	ND	2000	ug/kg
Diethyl phthalate	ND	2000	ug/kg
2,4-Dimethylphenol	ND	2000	ug/kg
Dimethyl phthalate	ND	2000	ug/kg
Di-n-octyl phthalate	ND	2000	ug/kg
4,6-Dinitro-2-methylphenol	ND	4800	ug/kg

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U.S. ARMY CORPS OF ENGINEERS

Client Sample ID: PBOW99SSCL04

GC/MS Semivolatiles

Lot-Sample #...: A9F140135-004 **Work Order #...:** CWV6J101 **Matrix.....:** SOLID

PARAMETER	RESULT	REPORTING LIMIT	UNITS
2,4-Dinitrophenol	ND	4800	ug/kg
2,4-Dinitrotoluene	ND	2000	ug/kg
2,6-Dinitrotoluene	ND	2000	ug/kg
Fluoranthene	ND	2000	ug/kg
Fluorene	ND	2000	ug/kg
Hexachlorobenzene	ND	2000	ug/kg
Hexachlorobutadiene	ND	2000	ug/kg
Hexachlorocyclopenta-diene	ND	2000	ug/kg
Hexachloroethane	ND	2000	ug/kg
Indeno(1,2,3-cd)pyrene	ND	2000	ug/kg
Isophorone	ND	2000	ug/kg
2-Methylnaphthalene	**3400**	**2000**	**ug/kg**
2-Methylphenol	ND	2000	ug/kg
Naphthalene	ND	2000	ug/kg
2-Nitroaniline	ND	4800	ug/kg
3-Nitroaniline	ND	4800	ug/kg
·itroaniline	ND	4800	ug/kg
.robenzene	ND	2000	ug/kg
2-Nitrophenol	ND	2000	ug/kg
4-Nitrophenol	ND	4800	ug/kg
N-Nitrosodi-n-propyl-amine	ND	2000	ug/kg
N-Nitrosodiphenylamine	ND	2000	ug/kg
Pentachlorophenol	ND	4800	ug/kg
Phenanthrene	ND	2000	ug/kg
Phenol	ND	2000	ug/kg
Pyrene	ND	2000	ug/kg
1,2,4-Trichlorobenzene	ND	2000	ug/kg
2,4,5-Trichlorophenol	ND	2000	ug/kg
2,4,6-Trichlorophenol	ND	2000	ug/kg
Carbazole	ND	2000	ug/kg
4-Methylphenol	ND	2000	ug/kg
bis(2-Chloroisopropyl) ether	ND	2000	ug/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Nitrobenzene-d5	77 DIL	(23 - 120)
Terphenyl-d14	73 DIL	(18 - 137)
2-Fluorobiphenyl	64 DIL	(30 - 115)
2-Fluorophenol	61 DIL	(30 - 115)
Phenol-d5	49 DIL	(24 - 113)
6-Tribromophenol	69 DIL	(19 - 122)

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U.S. ARMY CORPS OF ENGINEERS

Client Sample ID: PBOW99SSCL04

GC/MS Semivolatiles

Lot-Sample #...: A9F140135-004 **Work Order #...:** CWV6J101 **Matrix.....:** SOLID

NOTE(S):

DIL The concentration is estimated or not reported due to dilution or the presence of interfering analytes.

Results and reporting limits have been adjusted for dry weight.

U.S. ARMY CORPS OF ENGINEERS

Client Sample ID: PBOW99SSCL04

HPLC

Lot-Sample #...: A9F140135-004 **Work Order #...:** CWV6J10C **Matrix.....:** SOLID
Date Sampled...: 06/09/99 13:30 **Date Received..:** 06/10/99
Prep Date.....: 06/19/99 **Analysis Date..:** 06/24/99
Prep Batch #...: 9170118
Dilution Factor: 1
% Moisture.....: 17 **Method.....:** SW846 8330

PARAMETER	RESULT	REPORTING LIMIT	UNITS
HMX	ND	0.50	mg/kg
RDX	ND	0.50	mg/kg
1,3,5-Trinitrobenzene	ND	0.25	mg/kg
1,3-Dinitrobenzene	ND	0.25	mg/kg
Tetryl	ND	0.65	mg/kg
Nitrobenzene	ND	0.25	mg/kg
2,4,6-Trinitrotoluene	ND	0.25	mg/kg
4-Amino-2,6-dinitrotoluene	**0.33**	**0.25**	**mg/kg**
2-Amino-4,6-dinitrotoluene	ND	0.25	mg/kg
2,6-Dinitrotoluene	ND	0.25	mg/kg
2,4-Dinitrotoluene	**0.35**	**0.25**	**mg/kg**
2-Nitrotoluene	ND G	0.40	mg/kg
[illegible]-Nitrotoluene	ND G	0.35	mg/kg
[illegible]Nitrotoluene	ND	0.25	mg/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
1-Chloro-3-nitrobenzene	155 *	(76 - 124)

NOTE(S):

* Surrogate recovery is outside stated control limits.

G Elevated reporting limit. The reporting limit is elevated due to matrix interference.

U.S. ARMY CORPS OF ENGINEERS

Client Sample ID: PBOW99SSCL04

TOTAL Metals

Lot-Sample #...: A9F140135-004 **Matrix.....:** SOLID
Date Sampled...: 06/09/99 13:30 **Date Received..:** 06/10/99
% Moisture.....: 17

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
Prep Batch #...: 9167363						
Silver	ND	0.60 Dilution Factor: 1	mg/kg	SW846 6010B	06/17-06/19/99	CWV6J103
Arsenic	**28.6**	**1.2** Dilution Factor: 1	**mg/kg**	**SW846 6010B**	**06/17-06/19/99**	**CWV6J104**
Barium	**33.2**	**24.1** Dilution Factor: 1	**mg/kg**	**SW846 6010B**	**06/17-06/19/99**	**CWV6J102**
Cadmium	ND	0.24 Dilution Factor: 1	mg/kg	SW846 6010B	06/17-06/19/99	CWV6J105
Chromium	**8.2**	**0.60** Dilution Factor: 1	**mg/kg**	**SW846 6010B**	**06/17-06/19/99**	**CWV6J106**
I	**43.1**	**0.36** Dilution Factor: 1	**mg/kg**	**SW846 6010B**	**06/17-06/19/99**	**CWV6J107**
Mercury	ND	0.12 Dilution Factor: 1	mg/kg	SW846 7471A	06/17-06/21/99	CWV6J109
Selenium	**3.1**	**0.60** Dilution Factor: 1	**mg/kg**	**SW846 6010B**	**06/17-06/19/99**	**CWV6J108**

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

U.S. ARMY CORPS OF ENGINEERS

Client Sample ID: PBOW99SSCL04

General Chemistry

Lot-Sample #...: A9F140135-004 **Work Order #...:** CWV6J **Matrix.....:** SOLID
Date Sampled...: 06/09/99 13:30 **Date Received..:** 06/10/99
% Moisture.....: 17

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
pH (solid)	3.8		No Units	SW846 9045C	06/10/99	9162288
	Dilution Factor: 1					
Percent Solids	82.9	0.10	%	MCAWW 160.3 MOD	06/16-06/17/99	9167253
	Dilution Factor: 1					

NOTE(S):

RL Reporting Limit

Results and reporting limits have been adjusted for dry weight.

U.S. ARMY CORPS OF ENGINEERS

Client Sample ID: PBOW99SSCL05

GC/MS Semivolatiles

Lot-Sample #...: A9F140135-005 **Work Order #...:** CWV6K101 **Matrix.....:** SOLID
Date Sampled...: 06/09/99 14:00 **Date Received..:** 06/10/99
Prep Date.....: 06/17/99 **Analysis Date..:** 06/25/99
Prep Batch #...: 9168112
Dilution Factor: 1
% Moisture.....: 19 **Method.....:** SW846 8270C

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Acenaphthene	ND	410	ug/kg
Acenaphthylene	ND	410	ug/kg
Anthracene	ND	410	ug/kg
Benzo(a)anthracene	ND	410	ug/kg
Benzo(b)fluoranthene	ND	410	ug/kg
Benzo(k)fluoranthene	ND	410	ug/kg
Benzo(ghi)perylene	ND	410	ug/kg
Benzo(a)pyrene	ND	410	ug/kg
bis(2-Chloroethoxy) methane	ND	410	ug/kg
bis(2-Chloroethyl)-ether	ND	410	ug/kg
(2-Ethylhexyl) phthalate	ND	410	ug/kg
4-Bromophenyl phenyl ether	ND	410	ug/kg
Butyl benzyl phthalate	ND	410	ug/kg
4-Chloroaniline	ND	410	ug/kg
4-Chloro-3-methylphenol	ND	410	ug/kg
2-Chloronaphthalene	ND	410	ug/kg
2-Chlorophenol	ND	410	ug/kg
4-Chlorophenyl phenyl ether	ND	410	ug/kg
Chrysene	ND	410	ug/kg
Dibenz(a,h)anthracene	ND	410	ug/kg
Dibenzofuran	ND	410	ug/kg
Di-n-butyl phthalate	ND	410	ug/kg
1,2-Dichlorobenzene	ND	410	ug/kg
1,3-Dichlorobenzene	ND	410	ug/kg
1,4-Dichlorobenzene	ND	410	ug/kg
3,3'-Dichlorobenzidine	ND	410	ug/kg
2,4-Dichlorophenol	ND	410	ug/kg
Diethyl phthalate	ND	410	ug/kg
2,4-Dimethylphenol	ND	410	ug/kg
Dimethyl phthalate	ND	410	ug/kg
Di-n-octyl phthalate	ND	410	ug/kg
4,6-Dinitro-2-methylphenol	ND	990	ug/kg

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U.S. ARMY CORPS OF ENGINEERS

Client Sample ID: PBOW99SSCL05

GC/MS Semivolatiles

Lot-Sample #...: A9F140135-005 **Work Order #...:** CWV6K101 **Matrix.....:** SOLID

PARAMETER	RESULT	REPORTING LIMIT	UNITS
2,4-Dinitrophenol	ND	990	ug/kg
2,4-Dinitrotoluene	ND	410	ug/kg
2,6-Dinitrotoluene	ND	410	ug/kg
Fluoranthene	ND	410	ug/kg
Fluorene	ND	410	ug/kg
Hexachlorobenzene	ND	410	ug/kg
Hexachlorobutadiene	ND	410	ug/kg
Hexachlorocyclopenta-diene	ND	410	ug/kg
Hexachloroethane	ND	410	ug/kg
Indeno(1,2,3-cd)pyrene	ND	410	ug/kg
Isophorone	ND	410	ug/kg
2-Methylnaphthalene	ND	410	ug/kg
2-Methylphenol	ND	410	ug/kg
Naphthalene	ND	410	ug/kg
2-Nitroaniline	ND	990	ug/kg
3-Nitroaniline	ND	990	ug/kg
itroaniline	ND	990	ug/kg
robenzene	ND	410	ug/kg
2-Nitrophenol	ND	410	ug/kg
4-Nitrophenol	ND	990	ug/kg
N-Nitrosodi-n-propyl-amine	ND	410	ug/kg
N-Nitrosodiphenylamine	ND	410	ug/kg
Pentachlorophenol	ND	990	ug/kg
Phenanthrene	ND	410	ug/kg
Phenol	ND	410	ug/kg
Pyrene	ND	410	ug/kg
1,2,4-Trichlorobenzene	ND	410	ug/kg
2,4,5-Trichlorophenol	ND	410	ug/kg
2,4,6-Trichlorophenol	ND	410	ug/kg
Carbazole	ND	410	ug/kg
4-Methylphenol	ND	410	ug/kg
bis(2-Chloroisopropyl) ether	ND	410	ug/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Nitrobenzene-d5	53	(23 - 120)
Terphenyl-d14	67	(18 - 137)
2-Fluorobiphenyl	63	(30 - 115)
2-Fluorophenol	56	(30 - 115)
Phenol-d5	62	(24 - 113)
6-Tribromophenol	13 *	(19 - 122)

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U.S. ARMY CORPS OF ENGINEERS

Client Sample ID: PBOW99SSCL05

GC/MS Semivolatiles

Lot-Sample #...: A9F140135-005 **Work Order #...:** CWV6K101 **Matrix.....:** SOLID

NOTE(S):

* Surrogate recovery is outside stated control limits.

Results and reporting limits have been adjusted for dry weight.

U.S. ARMY CORPS OF ENGINEERS

Client Sample ID: PBOW99SSCL05

HPLC

Lot-Sample #...: A9F140135-005 **Work Order #...:** CWV6K10C **Matrix.....:** SOLID
Date Sampled...: 06/09/99 14:00 **Date Received..:** 06/10/99
Prep Date.....: 06/19/99 **Analysis Date..:** 06/24/99
Prep Batch #...: 9170118
Dilution Factor: 1
% Moisture.....: 19 **Method.....:** SW846 8330

PARAMETER	RESULT	REPORTING LIMIT	UNITS
HMX	ND	0.50	mg/kg
RDX	ND	0.50	mg/kg
1,3,5-Trinitrobenzene	ND	0.25	mg/kg
1,3-Dinitrobenzene	ND	0.25	mg/kg
Tetryl	ND	0.65	mg/kg
Nitrobenzene	ND	0.25	mg/kg
2,4,6-Trinitrotoluene	ND	0.25	mg/kg
4-Amino-2,6-dinitrotoluene	ND	0.25	mg/kg
2-Amino-4,6-dinitrotoluene	ND	0.25	mg/kg
2,6-Dinitrotoluene	ND	0.25	mg/kg
2,4-Dinitrotoluene	**2.1**	**0.25**	**mg/kg**
2-Nitrotoluene	ND	0.25	mg/kg
4 trotoluene	ND	0.25	mg/kg
3 rotoluene	ND	0.25	mg/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
1-Chloro-3-nitrobenzene	98	(76 - 124)

U.S. ARMY CORPS OF ENGINEERS

Client Sample ID: PBOW99SSCL05

TOTAL Metals

Lot-Sample #...: A9F140135-005 **Matrix.....:** SOLID
Date Sampled...: 06/09/99 14:00 **Date Received..:** 06/10/99
% Moisture.....: 19

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
Prep Batch #...: 9167363						
Silver	ND	0.62 Dilution Factor: 1	mg/kg	SW846 6010B	06/17-06/19/99	CWV6K103
Arsenic	**6.1**	**1.2** Dilution Factor: 1	**mg/kg**	**SW846 6010B**	**06/17-06/19/99**	**CWV6K104**
Barium	**27.6**	**24.8** Dilution Factor: 1	**mg/kg**	**SW846 6010B**	**06/17-06/19/99**	**CWV6K102**
Cadmium	ND	0.25 Dilution Factor: 1	mg/kg	SW846 6010B	06/17-06/19/99	CWV6K105
Chromium	**6.9**	**0.62** Dilution Factor: 1	**mg/kg**	**SW846 6010B**	**06/17-06/19/99**	**CWV6K106**
[illegible]	**11.3**	**0.37** Dilution Factor: 1	**mg/kg**	**SW846 6010B**	**06/17-06/19/99**	**CWV6K107**
Mercury	ND	0.12 Dilution Factor: 1	mg/kg	SW846 7471A	06/17-06/21/99	CWV6K109
Selenium	ND	0.62 Dilution Factor: 1	mg/kg	SW846 6010B	06/17-06/19/99	CWV6K108

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

U.S. ARMY CORPS OF ENGINEERS

Client Sample ID: PBOW99SSCL05

General Chemistry

Lot-Sample #...: A9F140135-005 **Work Order #...:** CWV6K **Matrix.....:** SOLID
Date Sampled...: 06/09/99 14:00 **Date Received..:** 06/10/99
% Moisture.....: 19

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
pH (solid)	**7.6**		**No Units**	**SW846 9045C**	**06/10/99**	**9162288**
	Dilution Factor: 1					
Percent Solids	**80.8**	**0.10**	**%**	**MCAWW 160.3 MOD**	**06/16-06/17/99**	**9167253**
	Dilution Factor: 1					

NOTE(S):

RL Reporting Limit

Results and reporting limits have been adjusted for dry weight.

U.S. ARMY CORPS OF ENGINEERS

Client Sample ID: PBOW99SSCL06

GC/MS Semivolatiles

Lot-Sample #...: A9F140135-006 **Work Order #...:** CWV6L101 **Matrix.....:** SOLID
Date Sampled...: 06/09/99 14:30 **Date Received..:** 06/10/99
Prep Date.....: 06/17/99 **Analysis Date..:** 06/24/99
Prep Batch #...: 9168112
Dilution Factor: 1
% Moisture.....: 21 **Method.....:** SW846 8270C

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Acenaphthene	ND	420	ug/kg
Acenaphthylene	ND	420	ug/kg
Anthracene	ND	420	ug/kg
Benzo(a)anthracene	ND	420	ug/kg
Benzo(b)fluoranthene	ND	420	ug/kg
Benzo(k)fluoranthene	ND	420	ug/kg
Benzo(ghi)perylene	ND	420	ug/kg
Benzo(a)pyrene	ND	420	ug/kg
bis(2-Chloroethoxy) methane	ND	420	ug/kg
bis(2-Chloroethyl)-ether	ND	420	ug/kg
bis(2-Ethylhexyl) phthalate	ND	420	ug/kg
4-Bromophenyl phenyl ether	ND	420	ug/kg
Butyl benzyl phthalate	ND	420	ug/kg
4-Chloroaniline	ND	420	ug/kg
4-Chloro-3-methylphenol	ND	420	ug/kg
2-Chloronaphthalene	ND	420	ug/kg
2-Chlorophenol	ND	420	ug/kg
4-Chlorophenyl phenyl ether	ND	420	ug/kg
Chrysene	ND	420	ug/kg
Dibenz(a,h)anthracene	ND	420	ug/kg
Dibenzofuran	ND	420	ug/kg
Di-n-butyl phthalate	ND	420	ug/kg
1,2-Dichlorobenzene	ND	420	ug/kg
1,3-Dichlorobenzene	ND	420	ug/kg
1,4-Dichlorobenzene	ND	420	ug/kg
3,3'-Dichlorobenzidine	ND	420	ug/kg
2,4-Dichlorophenol	ND	420	ug/kg
Diethyl phthalate	ND	420	ug/kg
2,4-Dimethylphenol	ND	420	ug/kg
Dimethyl phthalate	ND	420	ug/kg
Di-n-octyl phthalate	ND	420	ug/kg
4,6-Dinitro-2-methylphenol	ND	1000	ug/kg

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U.S. ARMY CORPS OF ENGINEERS

Client Sample ID: PBOW99SSCL06

GC/MS Semivolatiles

Lot-Sample #...: A9F140135-006 **Work Order #...:** CWV6L101 **Matrix.....:** SOLID

PARAMETER	RESULT	REPORTING LIMIT	UNITS
2,4-Dinitrophenol	ND	1000	ug/kg
2,4-Dinitrotoluene	ND	420	ug/kg
2,6-Dinitrotoluene	ND	420	ug/kg
Fluoranthene	ND	420	ug/kg
Fluorene	ND	420	ug/kg
Hexachlorobenzene	ND	420	ug/kg
Hexachlorobutadiene	ND	420	ug/kg
Hexachlorocyclopenta-diene	ND	420	ug/kg
Hexachloroethane	ND	420	ug/kg
Indeno(1,2,3-cd)pyrene	ND	420	ug/kg
Isophorone	ND	420	ug/kg
2-Methylnaphthalene	ND	420	ug/kg
2-Methylphenol	ND	420	ug/kg
Naphthalene	ND	420	ug/kg
2-Nitroaniline	ND	1000	ug/kg
3-Nitroaniline	ND	1000	ug/kg
4 [illegible]troaniline	ND	1000	ug/kg
N [illegible]benzene	ND	420	ug/kg
2-Nitrophenol	ND	420	ug/kg
4-Nitrophenol	ND	1000	ug/kg
N-Nitrosodi-n-propyl-amine	ND	420	ug/kg
N-Nitrosodiphenylamine	ND	420	ug/kg
Pentachlorophenol	ND	1000	ug/kg
Phenanthrene	ND	420	ug/kg
Phenol	ND	420	ug/kg
Pyrene	ND	420	ug/kg
1,2,4-Trichlorobenzene	ND	420	ug/kg
2,4,5-Trichlorophenol	ND	420	ug/kg
2,4,6-Trichlorophenol	ND	420	ug/kg
Carbazole	ND	420	ug/kg
4-Methylphenol	ND	420	ug/kg
bis(2-Chloroisopropyl) ether	ND	420	ug/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Nitrobenzene-d5	48	(23 - 120)
Terphenyl-d14	57	(18 - 137)
2-Fluorobiphenyl	55	(30 - 115)
2-Fluorophenol	51	(30 - 115)
Phenol-d5	52	(24 - 113)
[illegible] Tribromophenol	7.1 *	(19 - 122)

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U.S. ARMY CORPS OF ENGINEERS

Client Sample ID: PBOW99SSCL06

GC/MS Semivolatiles

Lot-Sample #...: A9F140135-006 **Work Order #...:** CWV6L101 **Matrix.....:** SOLID

NOTE(S):

* Surrogate recovery is outside stated control limits.

Results and reporting limits have been adjusted for dry weight.

U.S. ARMY CORPS OF ENGINEERS

Client Sample ID: PBOW99SSCL06

GC/MS Semivolatiles

Lot-Sample #...: A9F140135-006 **Work Order #...:** CWV6L201 **Matrix.....:** SOLID
Date Sampled...: 06/09/99 14:30 **Date Received..:** 06/10/99
Prep Date.....: 06/28/99 **Analysis Date..:** 07/01/99
Prep Batch #...: 9177103
Dilution Factor: 1
% Moisture.....: 21 **Method.....:** SW846 8270C

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Acenaphthene	ND	420	ug/kg
Acenaphthylene	ND	420	ug/kg
Anthracene	ND	420	ug/kg
Benzo(a)anthracene	ND	420	ug/kg
Benzo(b)fluoranthene	ND	420	ug/kg
Benzo(k)fluoranthene	ND	420	ug/kg
Benzo(ghi)perylene	ND	420	ug/kg
Benzo(a)pyrene	ND	420	ug/kg
bis(2-Chloroethoxy) methane	ND	420	ug/kg
bis(2-Chloroethyl)-ether	ND	420	ug/kg
(2-Ethylhexyl) phthalate	ND	420	ug/kg
4-Bromophenyl phenyl ether	ND	420	ug/kg
Butyl benzyl phthalate	ND	420	ug/kg
4-Chloroaniline	ND	420	ug/kg
4-Chloro-3-methylphenol	ND	420	ug/kg
2-Chloronaphthalene	ND	420	ug/kg
2-Chlorophenol	ND	420	ug/kg
4-Chlorophenyl phenyl ether	ND	420	ug/kg
Chrysene	ND	420	ug/kg
Dibenz(a,h)anthracene	ND	420	ug/kg
Dibenzofuran	ND	420	ug/kg
Di-n-butyl phthalate	ND	420	ug/kg
1,2-Dichlorobenzene	ND	420	ug/kg
1,3-Dichlorobenzene	ND	420	ug/kg
1,4-Dichlorobenzene	ND	420	ug/kg
3,3'-Dichlorobenzidine	ND	420	ug/kg
2,4-Dichlorophenol	ND	420	ug/kg
Diethyl phthalate	ND	420	ug/kg
2,4-Dimethylphenol	ND	420	ug/kg
Dimethyl phthalate	ND	420	ug/kg
Di-n-octyl phthalate	ND	420	ug/kg
4,6-Dinitro-2-methylphenol	ND	1000	ug/kg

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U.S. ARMY CORPS OF ENGINEERS

Client Sample ID: PBOW99SSCL06

GC/MS Semivolatiles

Lot-Sample #...: A9F140135-006 **Work Order #...:** CWV6L201 **Matrix.....:** SOLID

PARAMETER	RESULT	REPORTING LIMIT	UNITS
2,4-Dinitrophenol	ND	1000	ug/kg
2,4-Dinitrotoluene	ND	420	ug/kg
2,6-Dinitrotoluene	ND	420	ug/kg
Fluoranthene	ND	420	ug/kg
Fluorene	ND	420	ug/kg
Hexachlorobenzene	ND	420	ug/kg
Hexachlorobutadiene	ND	420	ug/kg
Hexachlorocyclopenta-diene	ND	420	ug/kg
Hexachloroethane	ND	420	ug/kg
Indeno(1,2,3-cd)pyrene	ND	420	ug/kg
Isophorone	ND	420	ug/kg
2-Methylnaphthalene	ND	420	ug/kg
2-Methylphenol	ND	420	ug/kg
Naphthalene	ND	420	ug/kg
2-Nitroaniline	ND	1000	ug/kg
3-Nitroaniline	ND	1000	ug/kg
troaniline	ND	1000	ug/kg
obenzene	ND	420	ug/kg
2-Nitrophenol	ND	420	ug/kg
4-Nitrophenol	ND	1000	ug/kg
N-Nitrosodi-n-propyl-amine	ND	420	ug/kg
N-Nitrosodiphenylamine	ND	420	ug/kg
Pentachlorophenol	ND	1000	ug/kg
Phenanthrene	ND	420	ug/kg
Phenol	ND	420	ug/kg
Pyrene	ND	420	ug/kg
1,2,4-Trichlorobenzene	ND	420	ug/kg
2,4,5-Trichlorophenol	ND	420	ug/kg
2,4,6-Trichlorophenol	ND	420	ug/kg
Carbazole	ND	420	ug/kg
4-Methylphenol	ND	420	ug/kg
bis(2-Chloroisopropyl) ether	ND	420	ug/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Nitrobenzene-d5	80	(23 - 120)
Terphenyl-d14	99	(18 - 137)
2-Fluorobiphenyl	79	(30 - 115)
2-Fluorophenol	72	(30 - 115)
Phenol-d5	71	(24 - 113)
-Tribromophenol	52	(19 - 122)

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

U.S. ARMY CORPS OF ENGINEERS

Client Sample ID: PBOW99SSCL06

HPLC

Lot-Sample #...: A9F140135-006 **Work Order #...:** CWV6L10C **Matrix.....:** SOLID
Date Sampled...: 06/09/99 14:30 **Date Received..:** 06/10/99
Prep Date.....: 06/19/99 **Analysis Date..:** 06/24/99
Prep Batch #...: 9170118
Dilution Factor: 1
% Moisture.....: 21 **Method.....:** SW846 8330

PARAMETER	RESULT	REPORTING LIMIT	UNITS
HMX	ND	0.50	mg/kg
RDX	ND	0.50	mg/kg
1,3,5-Trinitrobenzene	ND	0.25	mg/kg
1,3-Dinitrobenzene	ND	0.25	mg/kg
Tetryl	ND	0.65	mg/kg
Nitrobenzene	ND	0.25	mg/kg
2,4,6-Trinitrotoluene	ND	0.25	mg/kg
4-Amino-2,6-dinitrotoluene	ND	0.25	mg/kg
2-Amino-4,6-dinitrotoluene	ND	0.25	mg/kg
2,6-Dinitrotoluene	ND	0.25	mg/kg
2,4-Dinitrotoluene	ND	0.25	mg/kg
2-Nitrotoluene	ND	0.25	mg/kg
[illegible]trotoluene	ND	0.25	mg/kg
[illegible]trotoluene	ND	0.25	mg/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
1-Chloro-3-nitrobenzene	112	(76 - 124)

U.S. ARMY CORPS OF ENGINEERS

Client Sample ID: PBOW99SSCL06

TOTAL Metals

Lot-Sample #...: A9F140135-006 **Matrix.....:** SOLID
Date Sampled...: 06/09/99 14:30 **Date Received..:** 06/10/99
% Moisture.....: 21

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
Prep Batch #...: 9167363						
Silver	ND	0.63 Dilution Factor: 1	mg/kg	SW846 6010B	06/17-06/19/99	CWV6L103
Arsenic	**17.2**	**1.3** Dilution Factor: 1	**mg/kg**	**SW846 6010B**	**06/17-06/19/99**	**CWV6L104**
Barium	**71.3**	**25.2** Dilution Factor: 1	**mg/kg**	**SW846 6010B**	**06/17-06/19/99**	**CWV6L102**
Cadmium	ND	0.25 Dilution Factor: 1	mg/kg	SW846 6010B	06/17-06/19/99	CWV6L105
Chromium	**9.2**	**0.63** Dilution Factor: 1	**mg/kg**	**SW846 6010B**	**06/17-06/19/99**	**CWV6L106**
Le	**18.5**	**0.38** Dilution Factor: 1	**mg/kg**	**SW846 6010B**	**06/17-06/19/99**	**CWV6L107**
Mercury	ND	0.13 Dilution Factor: 1	mg/kg	SW846 7471A	06/17-06/21/99	CWV6L109
Selenium	**1.6**	**0.63** Dilution Factor: 1	**mg/kg**	**SW846 6010B**	**06/17-06/19/99**	**CWV6L108**

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

U.S. ARMY CORPS OF ENGINEERS

Client Sample ID: PBOW99SSCL06

General Chemistry

Lot-Sample #...: A9F140135-006 **Work Order #...:** CWV6L **Matrix.....:** SOLID
Date Sampled...: 06/09/99 14:30 **Date Received..:** 06/10/99
% Moisture.....: 21

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
pH (solid)	7.2		No Units	SW846 9045C	06/10/99	9162288
	Dilution Factor: 1					
Percent Solids	79.3	0.10	%	MCAWW 160.3 MOD	06/16-06/17/99	9167253
	Dilution Factor: 1					

NOTE(S):

RL Reporting Limit

Results and reporting limits have been adjusted for dry weight.

U.S. ARMY CORPS OF ENGINEERS

Client Sample ID: PBOW99SSCL07

GC/MS Semivolatiles

Lot-Sample #...: A9F140135-007 **Work Order #...:** CWV6M101 **Matrix.....:** SOLID
Date Sampled...: 06/09/99 14:30 **Date Received..:** 06/10/99
Prep Date.....: 06/17/99 **Analysis Date..:** 06/24/99
Prep Batch #...: 9168112
Dilution Factor: 1
% Moisture.....: 32 **Method.....:** SW846 8270C

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Acenaphthene	ND	490	ug/kg
Acenaphthylene	ND	490	ug/kg
Anthracene	ND	490	ug/kg
Benzo(a)anthracene	ND	490	ug/kg
Benzo(b)fluoranthene	ND	490	ug/kg
Benzo(k)fluoranthene	ND	490	ug/kg
Benzo(ghi)perylene	ND	490	ug/kg
Benzo(a)pyrene	ND	490	ug/kg
bis(2-Chloroethoxy) methane	ND	490	ug/kg
bis(2-Chloroethyl)-ether	ND	490	ug/kg
b 2-Ethylhexyl) nthalate	ND	490	ug/kg
4-Bromophenyl phenyl ether	ND	490	ug/kg
Butyl benzyl phthalate	ND	490	ug/kg
4-Chloroaniline	ND	490	ug/kg
4-Chloro-3-methylphenol	ND	490	ug/kg
2-Chloronaphthalene	ND	490	ug/kg
2-Chlorophenol	ND	490	ug/kg
4-Chlorophenyl phenyl ether	ND	490	ug/kg
Chrysene	ND	490	ug/kg
Dibenz(a,h)anthracene	ND	490	ug/kg
Dibenzofuran	ND	490	ug/kg
Di-n-butyl phthalate	ND	490	ug/kg
1,2-Dichlorobenzene	ND	490	ug/kg
1,3-Dichlorobenzene	ND	490	ug/kg
1,4-Dichlorobenzene	ND	490	ug/kg
3,3'-Dichlorobenzidine	ND	490	ug/kg
2,4-Dichlorophenol	ND	490	ug/kg
Diethyl phthalate	ND	490	ug/kg
2,4-Dimethylphenol	ND	490	ug/kg
Dimethyl phthalate	ND	490	ug/kg
Di-n-octyl phthalate	ND	490	ug/kg
4,6-Dinitro-2-methylphenol	ND	1200	ug/kg

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U.S. ARMY CORPS OF ENGINEERS

Client Sample ID: PBOW99SSCL07

GC/MS Semivolatiles

Lot-Sample #...: A9F140135-007 **Work Order #...:** CWV6M101 **Matrix.....:** SOLID

PARAMETER	RESULT	REPORTING LIMIT	UNITS
2,4-Dinitrophenol	ND	1200	ug/kg
2,4-Dinitrotoluene	ND	490	ug/kg
2,6-Dinitrotoluene	ND	490	ug/kg
Fluoranthene	ND	490	ug/kg
Fluorene	ND	490	ug/kg
Hexachlorobenzene	ND	490	ug/kg
Hexachlorobutadiene	ND	490	ug/kg
Hexachlorocyclopenta-diene	ND	490	ug/kg
Hexachloroethane	ND	490	ug/kg
Indeno(1,2,3-cd)pyrene	ND	490	ug/kg
Isophorone	ND	490	ug/kg
2-Methylnaphthalene	ND	490	ug/kg
2-Methylphenol	ND	490	ug/kg
Naphthalene	ND	490	ug/kg
2-Nitroaniline	ND	1200	ug/kg
3-Nitroaniline	ND	1200	ug/kg
'troaniline	ND	1200	ug/kg
.obenzene	ND	490	ug/kg
2-Nitrophenol	ND	490	ug/kg
4-Nitrophenol	ND	1200	ug/kg
N-Nitrosodi-n-propyl-amine	ND	490	ug/kg
N-Nitrosodiphenylamine	ND	490	ug/kg
Pentachlorophenol	ND	1200	ug/kg
Phenanthrene	ND	490	ug/kg
Phenol	ND	490	ug/kg
Pyrene	ND	490	ug/kg
1,2,4-Trichlorobenzene	ND	490	ug/kg
2,4,5-Trichlorophenol	ND	490	ug/kg
2,4,6-Trichlorophenol	ND	490	ug/kg
Carbazole	ND	490	ug/kg
4-Methylphenol	ND	490	ug/kg
bis(2-Chloroisopropyl) ether	ND	490	ug/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Nitrobenzene-d5	55	(23 - 120)
Terphenyl-d14	63	(18 - 137)
2-Fluorobiphenyl	59	(30 - 115)
2-Fluorophenol	57	(30 - 115)
Phenol-d5	56	(24 - 113)
' 5-Tribromophenol	17 *	(19 - 122)

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U.S. ARMY CORPS OF ENGINEERS

Client Sample ID: PBOW99SSCL07

GC/MS Semivolatiles

Lot-Sample #...: A9F140135-007 **Work Order #...:** CWV6M101 **Matrix.....:** SOLID

NOTE(S):

* Surrogate recovery is outside stated control limits.

Results and reporting limits have been adjusted for dry weight.

U.S. ARMY CORPS OF ENGINEERS

Client Sample ID: PBOW99SSCL07

HPLC

Lot-Sample #...: A9F140135-007 **Work Order #...:** CWV6M10C **Matrix.....:** SOLID
Date Sampled...: 06/09/99 14:30 **Date Received..:** 06/10/99
Prep Date.....: 06/19/99 **Analysis Date..:** 06/24/99
Prep Batch #...: 9170118
Dilution Factor: 1
% Moisture.....: 32 **Method.....:** SW846 8330

PARAMETER	RESULT	REPORTING LIMIT	UNITS
HMX	ND	0.50	mg/kg
RDX	ND	0.50	mg/kg
1,3,5-Trinitrobenzene	ND	0.25	mg/kg
1,3-Dinitrobenzene	ND	0.25	mg/kg
Tetryl	ND	0.65	mg/kg
Nitrobenzene	ND	0.25	mg/kg
2,4,6-Trinitrotoluene	ND	0.25	mg/kg
4-Amino-2,6-dinitrotoluene	ND	0.25	mg/kg
2-Amino-4,6-dinitrotoluene	ND	0.25	mg/kg
2,6-Dinitrotoluene	ND	0.25	mg/kg
2,4-Dinitrotoluene	ND	0.25	mg/kg
2-Nitrotoluene	ND	0.25	mg/kg
'itrotoluene	ND	0.25	mg/kg
.itrotoluene	ND	0.25	mg/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
1-Chloro-3-nitrobenzene	106	(76 - 124)

U.S. ARMY CORPS OF ENGINEERS

Client Sample ID: PBOW99SSCL07

TOTAL Metals

Lot-Sample #...: A9F140135-007 **Matrix.....:** SOLID
Date Sampled...: 06/09/99 14:30 **Date Received..:** 06/10/99
% Moisture.....: 32

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
Prep Batch #...: 9167363						
Silver	ND	0.74	mg/kg	SW846 6010B	06/17-06/19/99	CWV6M103
		Dilution Factor: 1				
Arsenic	**5.7**	**1.5**	**mg/kg**	**SW846 6010B**	**06/17-06/19/99**	**CWV6M104**
		Dilution Factor: 1				
Barium	**42.2**	**29.5**	**mg/kg**	**SW846 6010B**	**06/17-06/19/99**	**CWV6M102**
		Dilution Factor: 1				
Cadmium	ND	0.30	mg/kg	SW846 6010B	06/17-06/19/99	CWV6M105
		Dilution Factor: 1				
Chromium	**6.6**	**0.74**	**mg/kg**	**SW846 6010B**	**06/17-06/19/99**	**CWV6M106**
		Dilution Factor: 1				
L	**20.5**	**0.44**	**mg/kg**	**SW846 6010B**	**06/17-06/19/99**	**CWV6M107**
		Dilution Factor: 1				
Mercury	ND	0.15	mg/kg	SW846 7471A	06/17-06/21/99	CWV6M109
		Dilution Factor: 1				
Selenium	ND	0.74	mg/kg	SW846 6010B	06/17-06/19/99	CWV6M108
		Dilution Factor: 1				

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

U.S. ARMY CORPS OF ENGINEERS

Client Sample ID: PBOW99SSCL07

General Chemistry

Lot-Sample #...: A9F140135-007 **Work Order #...:** CWV6M **Matrix.....:** SOLID
Date Sampled...: 06/09/99 14:30 **Date Received..:** 06/10/99
% Moisture.....: 32

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
pH (solid)	6.8		No Units	SW846 9045C	06/10/99	9162288
	Dilution Factor: 1					
Percent Solids	67.8	0.10	%	MCAWW 160.3 MOD	06/16-06/17/99	9167253
	Dilution Factor: 1					
Total Organic Carbon	7500	150	mg/kg	SMCA WALKLEY-BLAC	06/26/99	9177206
	Dilution Factor: 1					

NOTE(S):

RL Reporting Limit

Results and reporting limits have been adjusted for dry weight.

U.S. ARMY CORPS OF ENGINEERS

Client Sample ID: PBOW99SWCL01

TOTAL Metals

Lot-Sample #...: A9F140135-008 **Matrix.....:** WATER
Date Sampled...: 06/09/99 **Date Received..:** 06/10/99

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
Prep Batch #...: 9172344						
Silver	ND	5.0	ug/L	SW846 6010B	06/22-07/16/99	CWV6N102
		Dilution Factor: 1				
Arsenic	ND	10.0	ug/L	SW846 6010B	06/22-07/16/99	CWV6N103
		Dilution Factor: 1				
Cadmium	ND	2.0	ug/L	SW846 6010B	06/22-07/16/99	CWV6N104
		Dilution Factor: 1				
Barium	ND	200	ug/L	SW846 6010B	06/22-07/16/99	CWV6N108
		Dilution Factor: 1				
Chromium	ND	5.0	ug/L	SW846 6010B	06/22-07/16/99	CWV6N105
		Dilution Factor: 1				
I [illegible]	ND	3.0	ug/L	SW846 6010B	06/22-07/16/99	CWV6N106
		Dilution Factor: 1				
Selenium	ND	5.0	ug/L	SW846 6010B	06/22-07/16/99	CWV6N107
		Dilution Factor: 1				
Mercury	ND	0.20	ug/L	SW846 7470A	06/22-06/23/99	CWV6N101
		Dilution Factor: 1				

U.S. ARMY CORPS OF ENGINEERS

Client Sample ID: PBOW99SWCL02

TOTAL Metals

Lot-Sample #...: A9F140135-009 **Matrix.....:** WATER
Date Sampled...: 06/09/99 **Date Received..:** 06/10/99

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
Prep Batch #...: 9172344						
Silver	ND	5.0	ug/L	SW846 6010B	06/22-07/16/99	CWV72102
		Dilution Factor: 1				
Arsenic	ND	10.0	ug/L	SW846 6010B	06/22-07/16/99	CWV72103
		Dilution Factor: 1				
Cadmium	ND	2.0	ug/L	SW846 6010B	06/22-07/16/99	CWV72104
		Dilution Factor: 1				
Barium	ND	200	ug/L	SW846 6010B	06/22-07/16/99	CWV72108
		Dilution Factor: 1				
Chromium	ND	5.0	ug/L	SW846 6010B	06/22-07/16/99	CWV72105
		Dilution Factor: 1				
Le	ND	3.0	ug/L	SW846 6010B	06/22-07/16/99	CWV72106
		Dilution Factor: 1				
Selenium	ND	5.0	ug/L	SW846 6010B	06/22-07/16/99	CWV72107
		Dilution Factor: 1				
Mercury	ND	0.20	ug/L	SW846 7470A	06/22-06/23/99	CWV72101
		Dilution Factor: 1				

U.S. ARMY CORPS OF ENGINEERS

Client Sample ID: PBOW99SWCL02

General Chemistry

Lot-Sample #...: A9F140135-009 **Work Order #...:** CWV72 **Matrix.....:** WATER
Date Sampled...: 06/09/99 **Date Received..:** 06/10/99

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
pH	**6.4**		**No Units**	**SW846 9040B**	**06/10/99**	**9162286**

Dilution Factor: 1

QUALITY CONTROL SECTION

QUALITY CONTROL ELEMENTS OF SW-846 METHODS

Quanterra® Incorporated conducts a quality assurance/quality control (QA/QC) program designed to provide scientifically valid and legally defensible data. Toward this end, several types of quality control indicators are incorporated into the QA/QC program. These indicators are introduced into the sample testing process to provide a mechanism for the assessment of the analytical data.

QC BATCH

Environmental samples are taken through the testing process in groups called QUALITY CONTROL BATCHES (QC batches). A QC batch contains up to twenty environmental samples of a similar matrix (water, soil) that are processed using the same reagents and standards. Quanterra requires that each environmental sample be associated with a QC batch.

Several quality control samples are included in each QC batch and are processed identically to the twenty environmental samples. These QC samples include a METHOD BLANK (MB), a LABORATORY CONTROL SAMPLE (LCS) and, where appropriate, a MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD) pair or a MATRIX SPIKE/SAMPLE DUPLICATE (MS/DU) pair. If there is insufficient sample to perform an MS/MSD or an MS/DU, then a LABORATORY CONTROL SAMPLE DUPLICATE (LCSD) is included in the QC batch.

LABORATORY CONTROL SAMPLE

The Laboratory Control Sample is a QC sample that is created by adding known concentrations of a full or partial set of target analytes to a matrix similar to that of the environmental samples in the QC batch. The LCS analyte recovery results are used to monitor the analytical process and provide evidence that the laboratory is performing the method within acceptable guidelines. Failure to meet the established recovery guidelines requires the repreparation and reanalysis of all samples in the QC batch. The only exception is that if the LCS recoveries are biased high and the associated sample is ND for the parameter(s) of interest, the batch is acceptable.

At times, a Laboratory Control Sample Duplicate (LCSD) is also included in the QC batch. An LCSD is a QC sample that is created and handled identically to the LCS. Analyte recovery data from the LCSD is assessed in the same way as that of the LCS. The LCSD recoveries, together with the LCS recoveries, are used to determine the reproducibility (precision) of the analytical system. Precision data are expressed as relative percent differences (RPDs). Failure of the RPDs to fall within the laboratory-generated acceptance windows requires the repreparation and reanalysis of all samples in the QC batch. The only exception is that if the MS/MSD RPDs are within acceptance criteria, the batch is acceptable.

METHOD BLANK

The Method Blank is a QC sample consisting of all the reagents used in analyzing the environmental samples contained in the QC batch. Method Blank results are used to determine if interference or contamination in the analytical system could lead to the reporting of false positive data or elevated analyte concentrations. All target analytes must be below the reporting limits (RL) or the associated sample(s) must be ND except for the common laboratory contaminants indicated below.

Volatile (GC or GC/MS)	Semivolatile (GC/MS)	Metals
Methylene chloride	Phthalate Esters	Copper
Acetone		Iron
2-Butanone		Zinc
		Lead*

** for analyses run on TJA Trace ICP or GFAA only*

QUALITY CONTROL ELEMENTS OF SW-846 METHODS
(Continued)

The listed volatile and semivolatile compounds may be present in concentrations up to 5 times the reporting limits. The listed metals may be present in concentrations up to 2 times the reporting limit or must be twenty fold less than the results of the environmental samples. Failure to meet these Method Blank criteria requires the repreparation and reanalysis of all samples in the QC batch.

MATRIX SPIKE/MATRIX SPIKE DUPLICATE

A Matrix Spike and a Matrix Spike Duplicate are a pair of environmental samples to which known concentrations of a full or partial set of target analytes are added. The MS/MSD results are determined in the same manner as the results of the environmental sample used to prepare the MS/MSD. The analyte recoveries and the relative percent differences (RPDs) of the recoveries are calculated and used to evaluate the effect of the sample matrix on the analytical results. When these values fail to meet acceptance criteria, the data is reviewed to determine the cause. If, in the analyst's judgment, sample matrix effects are indicated, no corrective action is performed. Otherwise, the MS/MSD and the environmental sample used to prepare them are reprepared and reanalyzed.

For certain methods, a Matrix Spike/Sample Duplicate (MS/DU) may be included in the QC batch in place of the MS/MSD. For the parameters (i.e. pH, ignitability) where it is not possible to prepare a spiked sample, a Sample Duplicate may be included in the QC batch.

SURROGATE COMPOUNDS

In addition to these batch-related QC indicators, each organic environmental and QC sample are spiked with surrogate compounds. Surrogates are organic chemicals that behave similarly to the analytes of interest and that are rarely present in the environment. Surrogate recoveries are used to monitor the individual performance of a sample in the analytical system.

The acceptance criteria do not apply to samples that are diluted. All other surrogate recoveries will be reported. If the LCS, LCSD, or the Method Blank surrogates fail to meet recovery criteria (exception for dilutions), the entire batch of samples is reprepared and reanalyzed.

If the surrogate recoveries are biased high in the LCS, LCSD, or the Method Blank and the associated sample(s) are ND, the batch is acceptable. If the surrogate recoveries are outside criteria for environmental or MS/MSD samples, the batch may be acceptable based on the analyst's judgment that sample matrix effects are indicated.

For the GC/MS BNA methods, the surrogate criteria is that two of the three surrogates for each fraction must meet acceptance criteria. The third surrogate must have a recovery of ten percent or greater.

For the Pesticide/PCB, PAH, TPH, and Herbicide methods, the surrogate criteria is that one of two surrogate compounds meet acceptance criteria.

LABORATORY CONTROL SAMPLE EVALUATION REPORT

GC/MS Semivolatiles

Client Lot #...: A9F140135 **Work Order #...:** CX0MC102 **Matrix.....:** SOLID
LCS Lot-Sample#: A9F170000-112
Prep Date.....: 06/17/99 **Analysis Date..:** 06/24/99
Prep Batch #...: 9168112
Dilution Factor: 1

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS	METHOD
Acenaphthene	62	(51 - 101)	SW846 8270C
Acenaphthylene	61	(33 - 145)	SW846 8270C
Anthracene	69	(27 - 133)	SW846 8270C
Benzo(a)anthracene	69	(33 - 143)	SW846 8270C
Benzo(b)fluoranthene	67	(24 - 159)	SW846 8270C
Benzo(k)fluoranthene	69	(60 - 125)	SW846 8270C
Benzo(ghi)perylene	74	(10 - 219)	SW846 8270C
Benzo(a)pyrene	67	(17 - 163)	SW846 8270C
bis(2-Chloroethoxy) methane	62	(33 - 184)	SW846 8270C
bis(2-Chloroethyl)-ether	62	(12 - 158)	SW846 8270C
bis(2-Ethylhexyl) ›hthalate	71	(10 - 158)	SW846 8270C
romophenyl phenyl ether	67	(33 - 127)	SW846 8270C
Butyl benzyl phthalate	64	(10 - 122)	SW846 8270C
4-Chloroaniline	18 a	(43 - 91)	SW846 8270C
4-Chloro-3-methylphenol	58	(46 - 106)	SW846 8270C
2-Chloronaphthalene	65	(60 - 118)	SW846 8270C
2-Chlorophenol	62	(44 - 103)	SW846 8270C
4-Chlorophenyl phenyl ether	65	(25 - 158)	SW846 8270C
Chrysene	72	(17 - 168)	SW846 8270C
Dibenz(a,h)anthracene	78	(10 - 227)	SW846 8270C
Dibenzofuran	62 a	(85 - 117)	SW846 8270C
Di-n-butyl phthalate	70	(10 - 118)	SW846 8270C
1,2-Dichlorobenzene	63	(32 - 129)	SW846 8270C
1,3-Dichlorobenzene	62	(10 - 172)	SW846 8270C
1,4-Dichlorobenzene	61	(51 - 95)	SW846 8270C
3,3'-Dichlorobenzidine	26	(10 - 262)	SW846 8270C
2,4-Dichlorophenol	59	(39 - 135)	SW846 8270C
Diethyl phthalate	67	(10 - 114)	SW846 8270C
2,4-Dimethylphenol	50	(32 - 119)	SW846 8270C
Dimethyl phthalate	66	(10 - 112)	SW846 8270C

(Continued on next page)

LABORATORY CONTROL SAMPLE EVALUATION REPORT

GC/MS Semivolatiles

Client Lot #...: A9F140135 **Work Order #...:** CX0MC102 **Matrix.....:** SOLID
LCS Lot-Sample#: A9F170000-112

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS	METHOD
Di-n-octyl phthalate	61	(10 - 146)	SW846 8270C
4,6-Dinitro-2-methylphenol	62	(10 - 181)	SW846 8270C
2,4-Dinitrophenol	46	(10 - 191)	SW846 8270C
2,4-Dinitrotoluene	73	(54 - 129)	SW846 8270C
2,6-Dinitrotoluene	73	(50 - 151)	SW846 8270C
Fluoranthene	73	(26 - 137)	SW846 8270C
Fluorene	65	(59 - 121)	SW846 8270C
Hexachlorobenzene	70	(10 - 152)	SW846 8270C
Hexachlorobutadiene	61	(24 - 116)	SW846 8270C
Hexachlorocyclopentadiene	22	(2.0- 55)	SW846 8270C
Hexachloroethane	58	(40 - 113)	SW846 8270C
Indeno(1,2,3-cd)pyrene	87	(10 - 171)	SW846 8270C
Isophorone	57	(21 - 196)	SW846 8270C
'ethylnaphthalene	60	(15 - 111)	SW846 8270C
ethylphenol	56	(10 - 103)	SW846 8270C
Naphthalene	62	(21 - 133)	SW846 8270C
2-Nitroaniline	64	(32 - 165)	SW846 8270C
3-Nitroaniline	36	(31 - 177)	SW846 8270C
4-Nitroaniline	62	(38 - 229)	SW846 8270C
Nitrobenzene	61	(35 - 180)	SW846 8270C
2-Nitrophenol	66	(29 - 182)	SW846 8270C
4-Nitrophenol	53	(16 - 192)	SW846 8270C
N-Nitrosodi-n-propylamine	54	(39 - 95)	SW846 8270C
N-Nitrosodiphenylamine	69	(28 - 121)	SW846 8270C
Pentachlorophenol	29	(24 - 115)	SW846 8270C
Phenanthrene	70	(54 - 120)	SW846 8270C
Phenol	58	(36 - 103)	SW846 8270C
Pyrene	67	(46 - 147)	SW846 8270C
1,2,4-Trichlorobenzene	64	(51 - 101)	SW846 8270C
2,4,5-Trichlorophenol	62	(13 - 136)	SW846 8270C
2,4,6-Trichlorophenol	58	(37 - 144)	SW846 8270C
Carbazole	74	(50 - 150)	SW846 8270C
4-Methylphenol	54	(10 - 103)	SW846 8270C
2,2'-oxybis(1-Chloropropane)	78	(36 - 166)	SW846 8270C

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LABORATORY CONTROL SAMPLE EVALUATION REPORT

GC/MS Semivolatiles

Client Lot #...: A9F140135 **Work Order #...:** CX0MC102 **Matrix.....:** SOLID
LCS Lot-Sample#: A9F170000-112

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Nitrobenzene-d5	60	(23 - 120)
Terphenyl-d14	70	(18 - 137)
2-Fluorobiphenyl	61	(30 - 115)
2-Fluorophenol	63	(30 - 115)
Phenol-d5	61	(24 - 113)
2,4,6-Tribromophenol	66	(19 - 122)

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

Bold print denotes control parameters

a Spiked analyte recovery is outside stated control limits.

LABORATORY CONTROL SAMPLE EVALUATION REPORT

GC/MS Semivolatiles

Client Lot #...: A9F140135 Work Order #...: CXDQ2102 Matrix.....: SOLID
LCS Lot-Sample#: A9F260000-103
Prep Date.....: 06/28/99 Analysis Date..: 07/01/99
Prep Batch #...: 9177103
Dilution Factor: 1

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS	METHOD
Acenaphthene	78	(51 - 101)	SW846 8270C
Acenaphthylene	77	(33 - 145)	SW846 8270C
Anthracene	83	(27 - 133)	SW846 8270C
Benzo(a)anthracene	84	(33 - 143)	SW846 8270C
Benzo(b)fluoranthene	86	(24 - 159)	SW846 8270C
Benzo(k)fluoranthene	86	(60 - 125)	SW846 8270C
Benzo(ghi)perylene	77	(10 - 219)	SW846 8270C
Benzo(a)pyrene	80	(17 - 163)	SW846 8270C
bis(2-Chloroethoxy) methane	79	(33 - 184)	SW846 8270C
bis(2-Chloroethyl)-ether	74	(12 - 158)	SW846 8270C
bis(2-Ethylhexyl) hthalate	98	(10 - 158)	SW846 8270C
ıromophenyl phenyl ether	92	(33 - 127)	SW846 8270C
Butyl benzyl phthalate	88	(10 - 122)	SW846 8270C
4-Chloroaniline	47	(43 - 91)	SW846 8270C
4-Chloro-3-methylphenol	92	(46 - 106)	SW846 8270C
2-Chloronaphthalene	80	(60 - 118)	SW846 8270C
2-Chlorophenol	75	(44 - 103)	SW846 8270C
4-Chlorophenyl phenyl ether	90	(25 - 158)	SW846 8270C
Chrysene	85	(17 - 168)	SW846 8270C
Dibenz(a,h)anthracene	84	(10 - 227)	SW846 8270C
Dibenzofuran	82 a	(85 - 117)	SW846 8270C
Di-n-butyl phthalate	86	(10 - 118)	SW846 8270C
1,2-Dichlorobenzene	77	(32 - 129)	SW846 8270C
1,3-Dichlorobenzene	70	(10 - 172)	SW846 8270C
1,4-Dichlorobenzene	71	(51 - 95)	SW846 8270C
3,3'-Dichlorobenzidine	51	(10 - 262)	SW846 8270C
2,4-Dichlorophenol	80	(39 - 135)	SW846 8270C
Diethyl phthalate	89	(10 - 114)	SW846 8270C
2,4-Dimethylphenol	69	(32 - 119)	SW846 8270C
Dimethyl phthalate	92	(10 - 112)	SW846 8270C

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LABORATORY CONTROL SAMPLE EVALUATION REPORT

GC/MS Semivolatiles

Client Lot #...: A9F140135 Work Order #...: CXDQ2102 Matrix.....: SOLID
LCS Lot-Sample#: A9F260000-103

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS	METHOD
Di-n-octyl phthalate	97	(10 - 146)	SW846 8270C
4,6-Dinitro-2-methylphenol	74	(10 - 181)	SW846 8270C
2,4-Dinitrophenol	62	(10 - 191)	SW846 8270C
2,4-Dinitrotoluene	87	(54 - 129)	SW846 8270C
2,6-Dinitrotoluene	86	(50 - 151)	SW846 8270C
Fluoranthene	85	(26 - 137)	SW846 8270C
Fluorene	85	(59 - 121)	SW846 8270C
Hexachlorobenzene	92	(10 - 152)	SW846 8270C
Hexachlorobutadiene	82	(24 - 116)	SW846 8270C
Hexachlorocyclopentadiene	22	(2.0- 55)	SW846 8270C
Hexachloroethane	69	(40 - 113)	SW846 8270C
Indeno(1,2,3-cd)pyrene	84	(10 - 171)	SW846 8270C
Isophorone	78	(21 - 196)	SW846 8270C
2 thylnaphthalene	78	(15 - 111)	SW846 8270C
: chylphenol	74	(10 - 103)	SW846 8270C
Naphthalene	75	(21 - 133)	SW846 8270C
2-Nitroaniline	93	(32 - 165)	SW846 8270C
3-Nitroaniline	65	(31 - 177)	SW846 8270C
4-Nitroaniline	75	(38 - 229)	SW846 8270C
Nitrobenzene	83	(35 - 180)	SW846 8270C
2-Nitrophenol	73	(29 - 182)	SW846 8270C
4-Nitrophenol	113	(16 - 192)	SW846 8270C
N-Nitrosodi-n-propylamine	79	(39 - 95)	SW846 8270C
N-Nitrosodiphenylamine	85	(28 - 121)	SW846 8270C
Pentachlorophenol	54	(24 - 115)	SW846 8270C
Phenanthrene	86	(54 - 120)	SW846 8270C
Phenol	76	(36 - 103)	SW846 8270C
Pyrene	90	(46 - 147)	SW846 8270C
1,2,4-Trichlorobenzene	80	(51 - 101)	SW846 8270C
2,4,5-Trichlorophenol	86	(13 - 136)	SW846 8270C
2,4,6-Trichlorophenol	81	(37 - 144)	SW846 8270C
Carbazole	86	(50 - 150)	SW846 8270C
4-Methylphenol	74	(10 - 103)	SW846 8270C
2,2'-oxybis(1-Chloropropane)	94	(36 - 166)	SW846 8270C

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LABORATORY CONTROL SAMPLE EVALUATION REPORT

GC/MS Semivolatiles

Client Lot #...: A9F140135 **Work Order #...:** CXDQ2102 **Matrix.....:** SOLID
LCS Lot-Sample#: A9F260000-103

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Nitrobenzene-d5	79	(23 - 120)
Terphenyl-d14	101	(18 - 137)
2-Fluorobiphenyl	79	(30 - 115)
2-Fluorophenol	73	(30 - 115)
Phenol-d5	76	(24 - 113)
2,4,6-Tribromophenol	82	(19 - 122)

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

Bold print denotes control parameters

a Spiked analyte recovery is outside stated control limits.

LABORATORY CONTROL SAMPLE EVALUATION REPORT

HPLC

Client Lot #...: A9F140135 **Work Order #...:** CX493102-LCS **Matrix.....:** SOLID
LCS Lot-Sample#: H9F190000-118 CX493103-LCSD
Prep Date.....: 06/19/99 **Analysis Date..:** 06/24/99
Prep Batch #...: 9170118
Dilution Factor: 1

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS	RPD	RPD LIMITS	METHOD
HMX	**106**	**(77 - 122)**			**SW846 8330**
	103	**(77 - 122)**	**2.8**	**(0-17)**	**SW846 8330**
RDX	**104**	**(83 - 121)**			**SW846 8330**
	102	**(83 - 121)**	**1.9**	**(0-16)**	**SW846 8330**
1,3,5-Trinitrobenzene	**99**	**(81 - 120)**			**SW846 8330**
	98	**(81 - 120)**	**2.0**	**(0-15)**	**SW846 8330**
1,3-Dinitrobenzene	**103**	**(82 - 117)**			**SW846 8330**
	102	**(82 - 117)**	**1.6**	**(0-15)**	**SW846 8330**
Tetryl	**66**	**(51 - 120)**			**SW846 8330**
	61	**(51 - 120)**	**6.6**	**(0-20)**	**SW846 8330**
Nitrobenzene	**104**	**(83 - 117)**			**SW846 8330**
	102	**(83 - 117)**	**1.6**	**(0-15)**	**SW846 8330**
2,4,6-Trinitrotoluene	**106**	**(74 - 126)**			**SW846 8330**
	103	**(74 - 126)**	**2.5**	**(0-15)**	**SW846 8330**
mino-2,6-dinitrotoluene	**107**	**(81 - 123)**			**SW846 8330**
	104	**(81 - 123)**	**2.9**	**(0-15)**	**SW846 8330**
2-Amino-4,6-dinitrotoluene	**105**	**(80 - 121)**			**SW846 8330**
	102	**(80 - 121)**	**2.3**	**(0-16)**	**SW846 8330**
2,6-Dinitrotoluene	**106**	**(82 - 121)**			**SW846 8330**
	103	**(82 - 121)**	**2.3**	**(0-15)**	**SW846 8330**
2,4-Dinitrotoluene	**105**	**(81 - 120)**			**SW846 8330**
	102	**(81 - 120)**	**2.9**	**(0-15)**	**SW846 8330**
2-Nitrotoluene	**104**	**(81 - 117)**			**SW846 8330**
	102	**(81 - 117)**	**2.2**	**(0-15)**	**SW846 8330**
4-Nitrotoluene	**103**	**(81 - 117)**			**SW846 8330**
	100	**(81 - 117)**	**3.3**	**(0-15)**	**SW846 8330**
3-Nitrotoluene	**106**	**(80 - 118)**			**SW846 8330**
	102	**(80 - 118)**	**4.0**	**(0-15)**	**SW846 8330**

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
1-Chloro-3-nitrobenzene	111	(76 - 124)
	104	(76 - 124)

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

Bold print denotes control parameters

LABORATORY CONTROL SAMPLE EVALUATION REPORT

TOTAL Metals

Client Lot #...: A9F140135 **Matrix.....:** SOLID

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
LCS Lot-Sample#: A9F160000-363 **Prep Batch #...:** 9167363					
Silver	97	(80 - 120)	SW846 6010B	06/17-06/19/99	CX0H4113
		Dilution Factor: 1			
Barium	93	(80 - 109)	SW846 6010B	06/17-06/19/99	CX0H411E
		Dilution Factor: 1			
Arsenic	89	(80 - 120)	SW846 6010B	06/17-06/19/99	CX0H4114
		Dilution Factor: 1			
Cadmium	90	(80 - 120)	SW846 6010B	06/17-06/19/99	CX0H4115
		Dilution Factor: 1			
Chromium	93	(80 - 120)	SW846 6010B	06/17-06/19/99	CX0H4116
		Dilution Factor: 1			
L	88	(80 - 120)	SW846 6010B	06/17-06/19/99	CX0H4117
		Dilution Factor: 1			
Mercury	112	(70 - 130)	SW846 7471A	06/17-06/21/99	CX0H411C
		Dilution Factor: 1			
Selenium	85	(80 - 120)	SW846 6010B	06/17-06/19/99	CX0H4119
		Dilution Factor: 1			

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

LABORATORY CONTROL SAMPLE EVALUATION REPORT

TOTAL Metals

Client Lot #...: A9F140135 **Matrix.....:** WATER

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
LCS Lot-Sample#: A9F210000-344 **Prep Batch #...:** 9172344					
Silver	110	(80 - 120)	SW846 6010B	06/22-07/16/99	CX5X2112
		Dilution Factor: 1			
Arsenic	98	(80 - 120)	SW846 6010B	06/22-07/16/99	CX5X210R
		Dilution Factor: 1			
Cadmium	98	(80 - 120)	SW846 6010B	06/22-07/16/99	CX5X210T
		Dilution Factor: 1			
Barium	100	(87 - 110)	SW846 6010B	06/22-07/16/99	CX5X211C
		Dilution Factor: 1			
Chromium	98	(80 - 120)	SW846 6010B	06/22-07/16/99	CX5X210U
		Dilution Factor: 1			
Le	96	(80 - 120)	SW846 6010B	06/22-07/16/99	CX5X210V
		Dilution Factor: 1			
Selenium	98	(80 - 120)	SW846 6010B	06/22-07/16/99	CX5X210X
		Dilution Factor: 1			
Mercury	92	(80 - 120)	SW846 7470A	06/22-06/23/99	CX5X2111
		Dilution Factor: 1			

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

LABORATORY CONTROL SAMPLE EVALUATION REPORT

General Chemistry

Client Lot #...: A9F140135 **Matrix.....:** SOLID

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Total Organic Carbon		Work Order #: CXEF9102	LCS Lot-Sample#: A9F260000-206		
	84	(69 - 130)	SMCA WALKLEY-BLAC	06/26/99	9177206
		Dilution Factor: 1			

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

METHOD BLANK REPORT

GC/MS Semivolatiles

Client Lot #...: A9F140135 **Work Order #...:** CXDQ2101 **Matrix.....:** SOLID
MB Lot-Sample #: A9F260000-103

Prep Date.....: 06/28/99
Analysis Date..: 07/01/99 **Prep Batch #...:** 9177103
Dilution Factor: 1

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD
Acenaphthene	ND	330	ug/kg	SW846 8270C
Acenaphthylene	ND	330	ug/kg	SW846 8270C
Anthracene	ND	330	ug/kg	SW846 8270C
Benzo(a)anthracene	ND	330	ug/kg	SW846 8270C
Benzo(b)fluoranthene	ND	330	ug/kg	SW846 8270C
Benzo(k)fluoranthene	ND	330	ug/kg	SW846 8270C
Benzo(ghi)perylene	ND	330	ug/kg	SW846 8270C
Benzo(a)pyrene	ND	330	ug/kg	SW846 8270C
bis(2-Chloroethoxy) methane	ND	330	ug/kg	SW846 8270C
bis(2-Chloroethyl)-ether	ND	330	ug/kg	SW846 8270C
bis(2-Ethylhexyl) thalate	ND	330	ug/kg	SW846 8270C
4 mophenyl phenyl ether	ND	330	ug/kg	SW846 8270C
Butyl benzyl phthalate	ND	330	ug/kg	SW846 8270C
4-Chloroaniline	ND	330	ug/kg	SW846 8270C
4-Chloro-3-methylphenol	ND	330	ug/kg	SW846 8270C
2-Chloronaphthalene	ND	330	ug/kg	SW846 8270C
2-Chlorophenol	ND	330	ug/kg	SW846 8270C
4-Chlorophenyl phenyl ether	ND	330	ug/kg	SW846 8270C
Chrysene	ND	330	ug/kg	SW846 8270C
Dibenz(a,h)anthracene	ND	330	ug/kg	SW846 8270C
Dibenzofuran	ND	330	ug/kg	SW846 8270C
Di-n-butyl phthalate	ND	330	ug/kg	SW846 8270C
1,2-Dichlorobenzene	ND	330	ug/kg	SW846 8270C
1,3-Dichlorobenzene	ND	330	ug/kg	SW846 8270C
1,4-Dichlorobenzene	ND	330	ug/kg	SW846 8270C
3,3'-Dichlorobenzidine	ND	330	ug/kg	SW846 8270C
2,4-Dichlorophenol	ND	330	ug/kg	SW846 8270C
Diethyl phthalate	ND	330	ug/kg	SW846 8270C
2,4-Dimethylphenol	ND	330	ug/kg	SW846 8270C
Dimethyl phthalate	ND	330	ug/kg	SW846 8270C
Di-n-octyl phthalate	ND	330	ug/kg	SW846 8270C
4,6-Dinitro-2-methylphenol	ND	800	ug/kg	SW846 8270C
2,4-Dinitrophenol	ND	800	ug/kg	SW846 8270C
2 initrotoluene	ND	330	ug/kg	SW846 8270C
2, initrotoluene	ND	330	ug/kg	SW846 8270C

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METHOD BLANK REPORT

GC/MS Semivolatiles

Client Lot #...: A9F140135 **Work Order #...:** CXDQ2101 **Matrix.....:** SOLID

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD
Fluoranthene	ND	330	ug/kg	SW846 8270C
Fluorene	ND	330	ug/kg	SW846 8270C
Hexachlorobenzene	ND	330	ug/kg	SW846 8270C
Hexachlorobutadiene	ND	330	ug/kg	SW846 8270C
Hexachlorocyclopenta-diene	ND	330	ug/kg	SW846 8270C
Hexachloroethane	ND	330	ug/kg	SW846 8270C
Indeno(1,2,3-cd)pyrene	ND	330	ug/kg	SW846 8270C
Isophorone	ND	330	ug/kg	SW846 8270C
2-Methylnaphthalene	ND	330	ug/kg	SW846 8270C
2-Methylphenol	ND	330	ug/kg	SW846 8270C
Naphthalene	ND	330	ug/kg	SW846 8270C
2-Nitroaniline	ND	800	ug/kg	SW846 8270C
3-Nitroaniline	ND	800	ug/kg	SW846 8270C
4-Nitroaniline	ND	800	ug/kg	SW846 8270C
Nitrobenzene	ND	330	ug/kg	SW846 8270C
2-Nitrophenol	ND	330	ug/kg	SW846 8270C
4 trophenol	ND	800	ug/kg	SW846 8270C
trosodi-n-propyl-amine	ND	330	ug/kg	SW846 8270C
N-Nitrosodiphenylamine	ND	330	ug/kg	SW846 8270C
Pentachlorophenol	ND	800	ug/kg	SW846 8270C
Phenanthrene	ND	330	ug/kg	SW846 8270C
Phenol	ND	330	ug/kg	SW846 8270C
Pyrene	ND	330	ug/kg	SW846 8270C
1,2,4-Trichlorobenzene	ND	330	ug/kg	SW846 8270C
2,4,5-Trichlorophenol	ND	330	ug/kg	SW846 8270C
2,4,6-Trichlorophenol	ND	330	ug/kg	SW846 8270C
Carbazole	ND	330	ug/kg	SW846 8270C
4-Methylphenol	ND	330	ug/kg	SW846 8270C
bis(2-Chloroisopropyl) ether	ND	330	ug/kg	SW846 8270C

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Nitrobenzene-d5	78	(23 - 120)
Terphenyl-d14	92	(18 - 137)
2-Fluorobiphenyl	75	(30 - 115)
2-Fluorophenol	71	(30 - 115)
Phenol-d5	71	(24 - 113)
2,4,6-Tribromophenol	51	(19 - 122)

NOTE(S):

(ions are performed before rounding to avoid round-off errors in calculated results.

METHOD BLANK REPORT

GC/MS Semivolatiles

Client Lot #...: A9F140135 **Work Order #...:** CX0MC101 **Matrix.....:** SOLID
MB Lot-Sample #: A9F170000-112

Prep Date.....: 06/17/99
Analysis Date..: 06/24/99 **Prep Batch #...:** 9168112
Dilution Factor: 1

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD
Acenaphthene	ND	330	ug/kg	SW846 8270C
Acenaphthylene	ND	330	ug/kg	SW846 8270C
Anthracene	ND	330	ug/kg	SW846 8270C
Benzo(a)anthracene	ND	330	ug/kg	SW846 8270C
Benzo(b)fluoranthene	ND	330	ug/kg	SW846 8270C
Benzo(k)fluoranthene	ND	330	ug/kg	SW846 8270C
Benzo(ghi)perylene	ND	330	ug/kg	SW846 8270C
Benzo(a)pyrene	ND	330	ug/kg	SW846 8270C
bis(2-Chloroethoxy) methane	ND	330	ug/kg	SW846 8270C
bis(2-Chloroethyl)-ether	ND	330	ug/kg	SW846 8270C
bis(2-Ethylhexyl) phthalate	ND	330	ug/kg	SW846 8270C
4-Bromophenyl phenyl ether	ND	330	ug/kg	SW846 8270C
Butyl benzyl phthalate	ND	330	ug/kg	SW846 8270C
4-Chloroaniline	ND	330	ug/kg	SW846 8270C
4-Chloro-3-methylphenol	ND	330	ug/kg	SW846 8270C
2-Chloronaphthalene	ND	330	ug/kg	SW846 8270C
2-Chlorophenol	ND	330	ug/kg	SW846 8270C
4-Chlorophenyl phenyl ether	ND	330	ug/kg	SW846 8270C
Chrysene	ND	330	ug/kg	SW846 8270C
Dibenz(a,h)anthracene	ND	330	ug/kg	SW846 8270C
Dibenzofuran	ND	330	ug/kg	SW846 8270C
Di-n-butyl phthalate	ND	330	ug/kg	SW846 8270C
1,2-Dichlorobenzene	ND	330	ug/kg	SW846 8270C
1,3-Dichlorobenzene	ND	330	ug/kg	SW846 8270C
1,4-Dichlorobenzene	ND	330	ug/kg	SW846 8270C
3,3'-Dichlorobenzidine	ND	330	ug/kg	SW846 8270C
2,4-Dichlorophenol	ND	330	ug/kg	SW846 8270C
Diethyl phthalate	ND	330	ug/kg	SW846 8270C
2,4-Dimethylphenol	ND	330	ug/kg	SW846 8270C
Dimethyl phthalate	ND	330	ug/kg	SW846 8270C
Di-n-octyl phthalate	ND	330	ug/kg	SW846 8270C
4,6-Dinitro-2-methylphenol	ND	800	ug/kg	SW846 8270C
2,4-Dinitrophenol	ND	800	ug/kg	SW846 8270C
2,4-Dinitrotoluene	ND	330	ug/kg	SW846 8270C
2,6-Dinitrotoluene	ND	330	ug/kg	SW846 8270C

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METHOD BLANK REPORT

GC/MS Semivolatiles

Client Lot #...: A9F140135 **Work Order #...:** CX0MC101 **Matrix.....:** SOLID

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD
Fluoranthene	ND	330	ug/kg	SW846 8270C
Fluorene	ND	330	ug/kg	SW846 8270C
Hexachlorobenzene	ND	330	ug/kg	SW846 8270C
Hexachlorobutadiene	ND	330	ug/kg	SW846 8270C
Hexachlorocyclopenta-diene	ND	330	ug/kg	SW846 8270C
Hexachloroethane	ND	330	ug/kg	SW846 8270C
Indeno(1,2,3-cd)pyrene	ND	330	ug/kg	SW846 8270C
Isophorone	ND	330	ug/kg	SW846 8270C
2-Methylnaphthalene	ND	330	ug/kg	SW846 8270C
2-Methylphenol	ND	330	ug/kg	SW846 8270C
Naphthalene	ND	330	ug/kg	SW846 8270C
2-Nitroaniline	ND	800	ug/kg	SW846 8270C
3-Nitroaniline	ND	800	ug/kg	SW846 8270C
4-Nitroaniline	ND	800	ug/kg	SW846 8270C
Nitrobenzene	ND	330	ug/kg	SW846 8270C
2-Nitrophenol	ND	330	ug/kg	SW846 8270C
4 trophenol	ND	800	ug/kg	SW846 8270C
trosodi-n-propyl-amine	ND	330	ug/kg	SW846 8270C
N-Nitrosodiphenylamine	ND	330	ug/kg	SW846 8270C
Pentachlorophenol	ND	800	ug/kg	SW846 8270C
Phenanthrene	ND	330	ug/kg	SW846 8270C
Phenol	ND	330	ug/kg	SW846 8270C
Pyrene	ND	330	ug/kg	SW846 8270C
1,2,4-Trichlorobenzene	ND	330	ug/kg	SW846 8270C
2,4,5-Trichlorophenol	ND	330	ug/kg	SW846 8270C
2,4,6-Trichlorophenol	ND	330	ug/kg	SW846 8270C
Carbazole	ND	330	ug/kg	SW846 8270C
4-Methylphenol	ND	330	ug/kg	SW846 8270C
bis(2-Chloroisopropyl) ether	ND	330	ug/kg	SW846 8270C

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Nitrobenzene-d5	61	(23 - 120)
Terphenyl-d14	70	(18 - 137)
2-Fluorobiphenyl	64	(30 - 115)
2-Fluorophenol	63	(30 - 115)
Phenol-d5	58	(24 - 113)
2,4,6-Tribromophenol	23	(19 - 122)

NOTE(S):

(ions are performed before rounding to avoid round-off errors in calculated results.

METHOD BLANK REPORT

HPLC

Client Lot #...: A9F140135 **Work Order #...:** CX493101 **Matrix.....:** SOLID
MB Lot-Sample #: H9F190000-118

Prep Date.....: 06/19/99
Analysis Date..: 06/24/99 **Prep Batch #...:** 9170118
Dilution Factor: 1

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD
HMX	ND	0.50	mg/kg	SW846 8330
RDX	ND	0.50	mg/kg	SW846 8330
1,3,5-Trinitrobenzene	ND	0.25	mg/kg	SW846 8330
1,3-Dinitrobenzene	ND	0.25	mg/kg	SW846 8330
Tetryl	ND	0.65	mg/kg	SW846 8330
Nitrobenzene	ND	0.25	mg/kg	SW846 8330
2,4,6-Trinitrotoluene	ND	0.25	mg/kg	SW846 8330
4-Amino-2,6-dinitrotoluen	ND	0.25	mg/kg	SW846 8330
2-Amino-4,6-dinitrotoluen	ND	0.25	mg/kg	SW846 8330
2,6-Dinitrotoluene	ND	0.25	mg/kg	SW846 8330
2,4-Dinitrotoluene	ND	0.25	mg/kg	SW846 8330
2-Nitrotoluene	ND	0.25	mg/kg	SW846 8330
4-Nitrotoluene	ND	0.25	mg/kg	SW846 8330
3- rotoluene	ND	0.25	mg/kg	SW846 8330

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
1-Chloro-3-nitrobenzene	114	(76 - 124)

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

METHOD BLANK REPORT

TOTAL Metals

Client Lot #...: A9F140135 **Matrix.....:** SOLID

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
MB Lot-Sample #: A9F160000-363 **Prep Batch #...:** 9167363						
Silver	ND	0.50	mg/kg	SW846 6010B	06/17-06/19/99	CX0H410A
		Dilution Factor: 1				
Arsenic	ND	1.0	mg/kg	SW846 6010B	06/17-06/19/99	CX0H410C
		Dilution Factor: 1				
Barium	ND	20.0	mg/kg	SW846 6010B	06/17-06/19/99	CX0H410M
		Dilution Factor: 1				
Cadmium	ND	0.20	mg/kg	SW846 6010B	06/17-06/19/99	CX0H410D
		Dilution Factor: 1				
Chromium	ND	0.50	mg/kg	SW846 6010B	06/17-06/19/99	CX0H410E
		Dilution Factor: 1				
Lead	ND	0.30	mg/kg	SW846 6010B	06/17-06/19/99	CX0H410F
		Dilution Factor: 1				
ury	ND	0.10	mg/kg	SW846 7471A	06/17-06/21/99	CX0H4120
		Dilution Factor: 1				
Selenium	ND	0.50	mg/kg	SW846 6010B	06/17-06/19/99	CX0H410H
		Dilution Factor: 1				

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

METHOD BLANK REPORT

TOTAL Metals

Client Lot #...: A9F140135 **Matrix.....:** WATER

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
MB Lot-Sample #: A9F210000-344 **Prep Batch #...:** 9172344						
Silver	ND	5.0	ug/L	SW846 6010B	06/22-07/16/99	CX5X2109
		Dilution Factor: 1				
Arsenic	ND	10.0	ug/L	SW846 6010B	06/22-07/16/99	CX5X2101
		Dilution Factor: 1				
Cadmium	ND	2.0	ug/L	SW846 6010B	06/22-07/16/99	CX5X2102
		Dilution Factor: 1				
Barium	ND	200	ug/L	SW846 6010B	06/22-07/16/99	CX5X210K
		Dilution Factor: 1				
Chromium	ND	5.0	ug/L	SW846 6010B	06/22-07/16/99	CX5X2103
		Dilution Factor: 1				
Lead	ND	3.0	ug/L	SW846 6010B	06/22-07/16/99	CX5X2104
		Dilution Factor: 1				
S ıium	ND	5.0	ug/L	SW846 6010B	06/22-07/16/99	CX5X2106
		Dilution Factor: 1				
Mercury	ND	0.20	ug/L	SW846 7470A	06/22-06/23/99	CX5X2108
		Dilution Factor: 1				

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

METHOD BLANK REPORT

General Chemistry

Client Lot #...: A9F140135 **Matrix.....:** SOLID

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Percent Solids		Work Order #: CX004101		MB Lot-Sample #:	A9F160000-253	
	ND	0.10	%	MCAWW 160.3 MOD	06/16-06/17/99	9167253
		Dilution Factor: 1				
Percent Solids		Work Order #: CX584101		MB Lot-Sample #:	A9F210000-191	
	ND	0.10	%	MCAWW 160.3 MOD	06/21-06/22/99	9172191
		Dilution Factor: 1				
Total Organic Carbon		Work Order #: CXEF9101		MB Lot-Sample #:	A9F260000-206	
	ND	100	mg/kg	SMCA WALKLEY-BLAC	06/26/99	9177206
		Dilution Factor: 1				

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

MATRIX SPIKE SAMPLE EVALUATION REPORT

GC/MS Semivolatiles

Client Lot #...: A9F140135 **Work Order #...:** CWV5X10G-MS **Matrix.....:** SOLID
MS Lot-Sample #: A9F140135-001 CWV5X10H-MSD
Date Sampled...: 06/09/99 11:00 **Date Received..:** 06/10/99
Prep Date.....: 06/17/99 **Analysis Date..:** 06/24/99
Prep Batch #...: 9168112
Dilution Factor: 1 **% Moisture.....:** 30

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS	RPD	RPD LIMITS	METHOD
Acenaphthene	56	(47 - 145)			SW846 8270C
	59	(47 - 145)	4.8	(0-28)	SW846 8270C
Acenaphthylene	55	(33 - 145)			SW846 8270C
	56	(33 - 145)	2.2	(0-21)	SW846 8270C
Anthracene	58	(27 - 133)			SW846 8270C
	61	(27 - 133)	5.1	(0-35)	SW846 8270C
Benzo(a)anthracene	57	(33 - 143)			SW846 8270C
	62	(33 - 143)	7.8	(0-39)	SW846 8270C
Benzo(b)fluoranthene	57	(24 - 159)			SW846 8270C
	63	(24 - 159)	11	(0-25)	SW846 8270C
Benzo(k)fluoranthene	59	(22 - 133)			SW846 8270C
	61	(22 - 133)	2.9	(0-54)	SW846 8270C
B[illegible](ghi)perylene	60	(10 - 219)			SW846 8270C
	58	(10 - 219)	3.4	(0-65)	SW846 8270C
Benzo(a)pyrene	56	(17 - 163)			SW846 8270C
	58	(17 - 163)	4.1	(0-35)	SW846 8270C
bis(2-Chloroethoxy) methane	56	(33 - 184)			SW846 8270C
	58	(33 - 184)	3.1	(0-46)	SW846 8270C
bis(2-Chloroethyl)-ether	55	(12 - 158)			SW846 8270C
	59	(12 - 158)	6.6	(0-54)	SW846 8270C
bis(2-Ethylhexyl) phthalate	54	(10 - 158)			SW846 8270C
	58	(10 - 158)	8.5	(0-35)	SW846 8270C
4-Bromophenyl phenyl ether	60	(53 - 127)			SW846 8270C
	62	(53 - 127)	2.7	(0-35)	SW846 8270C
Butyl benzyl phthalate	51	(10 - 122)			SW846 8270C
	51	(10 - 122)	1.2	(0-38)	SW846 8270C
4-Chloroaniline	12 a	(43 - 91)			SW846 8270C
	10 a	(43 - 91)	9.6	(0-17)	SW846 8270C
4-Chloro-3-methylphenol	54	(22 - 147)			SW846 8270C
	55	(22 - 147)	1.7	(0-37)	SW846 8270C
2[illegible]oronaphthalene	59 a	(60 - 118)			SW846 8270C
	61	(60 - 118)	3.1	(0-23)	SW846 8270C

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MATRIX SPIKE SAMPLE EVALUATION REPORT

GC/MS Semivolatiles

Client Lot #...: A9F140135 Work Order #...: CWV5X10G-MS Matrix.....: SOLID
MS Lot-Sample #: A9F140135-001 CWV5X10H-MSD

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS	RPD	RPD LIMITS	METHOD
2-Chlorophenol	57	(23 - 134)			SW846 8270C
	58	(23 - 134)	2.4	(0-29)	SW846 8270C
4-Chlorophenyl phenyl ether	57	(25 - 158)			SW846 8270C
	61	(25 - 158)	6.4	(0-43)	SW846 8270C
Chrysene	61	(17 - 168)			SW846 8270C
	67	(17 - 168)	10	(0-30)	SW846 8270C
Dibenz(a,h)anthracene	64	(10 - 227)			SW846 8270C
	63	(10 - 227)	1.2	(0-48)	SW846 8270C
Dibenzofuran	57 a	(85 - 117)			SW846 8270C
	60 a	(85 - 117)	5.3	(0-11)	SW846 8270C
Di-n-butyl phthalate	58	(10 - 118)			SW846 8270C
	60	(10 - 118)	3.0	(0-25)	SW846 8270C
1,2-Dichlorobenzene	54	(32 - 129)			SW846 8270C
	60	(32 - 129)	8.9	(0-43)	SW846 8270C
1 ichlorobenzene	52	(10 - 172)			SW846 8270C
	59	(10 - 172)	12	(0-43)	SW846 8270C
1,4-Dichlorobenzene	53	(20 - 124)			SW846 8270C
	58	(20 - 124)	9.3	(0-32)	SW846 8270C
3,3'-Dichlorobenzidine	8.4 a	(10 - 262)			SW846 8270C
	4.9 a,p	(10 - 262)	53	(0-45)	SW846 8270C
2,4-Dichlorophenol	57	(39 - 135)			SW846 8270C
	58	(39 - 135)	1.3	(0-32)	SW846 8270C
Diethyl phthalate	54	(10 - 114)			SW846 8270C
	57	(10 - 114)	5.2	(0-43)	SW846 8270C
2,4-Dimethylphenol	52	(32 - 119)			SW846 8270C
	53	(32 - 119)	1.0	(0-30)	SW846 8270C
Dimethyl phthalate	56	(10 - 112)			SW846 8270C
	59	(10 - 112)	4.5	(0-44)	SW846 8270C
Di-n-octyl phthalate	50	(10 - 146)			SW846 8270C
	49	(10 - 146)	3.0	(0-31)	SW846 8270C
4,6-Dinitro-2-methylphenol	64	(10 - 181)			SW846 8270C
	69	(10 - 181)	7.3	(0-35)	SW846 8270C
2,4-Dinitrophenol	67	(10 - 191)			SW846 8270C
	78	(10 - 191)	16	(0-34)	SW846 8270C
2,4-Dinitrotoluene	60	(39 - 139)			SW846 8270C
	63	(39 - 139)	5.2	(0-22)	SW846 8270C
2,6-Dinitrotoluene	62	(50 - 151)			SW846 8270C
	64	(50 - 151)	3.9	(0-41)	SW846 8270C
Fl anthene	63	(26 - 137)			SW846 8270C
	81	(26 - 137)	25	(0-27)	SW846 8270C

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MATRIX SPIKE SAMPLE EVALUATION REPORT

GC/MS Semivolatiles

Client Lot #...: A9F140135 Work Order #...: CWV5X10G-MS Matrix.....: SOLID
MS Lot-Sample #: A9F140135-001 CWV5X10H-MSD

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS	RPD	RPD LIMITS	METHOD
Fluorene	57 a	(59 - 121)			SW846 8270C
	61	(59 - 121)	6.2	(0-30)	SW846 8270C
Hexachlorobenzene	62	(10 - 152)			SW846 8270C
	65	(10 - 152)	4.4	(0-37)	SW846 8270C
Hexachlorobutadiene	52	(24 - 116)			SW846 8270C
	57	(24 - 116)	8.6	(0-33)	SW846 8270C
Hexachlorocyclopenta-diene	7.2	(2.0- 55)			SW846 8270C
	0.0	(2.0- 55)	200	(0-31)	SW846 8270C
Hexachloroethane	48	(40 - 113)			SW846 8270C
	51	(40 - 113)	4.6	(0-25)	SW846 8270C
Indeno(1,2,3-cd)pyrene	71	(10 - 171)			SW846 8270C
	70	(10 - 171)	0.20	(0-50)	SW846 8270C
Isophorone	50	(21 - 196)			SW846 8270C
	50	(21 - 196)	0.09	(0-30)	SW846 8270C
2 hylnaphthalene	59	(15 - 111)			SW846 8270C
	63	(15 - 111)	5.7	(0-31)	SW846 8270C
2-Methylphenol	53	(10 - 103)			SW846 8270C
	56	(10 - 103)	4.6	(0-32)	SW846 8270C
Naphthalene	56	(21 - 133)			SW846 8270C
	60	(21 - 133)	7.2	(0-21)	SW846 8270C
2-Nitroaniline	54	(32 - 165)			SW846 8270C
	55	(32 - 165)	3.4	(0-42)	SW846 8270C
3-Nitroaniline	32	(31 - 177)			SW846 8270C
	30 a	(31 - 177)	8.2	(0-48)	SW846 8270C
4-Nitroaniline	38	(38 - 229)			SW846 8270C
	32 a	(38 - 229)	16	(0-47)	SW846 8270C
Nitrobenzene	53	(35 - 180)			SW846 8270C
	54	(35 - 180)	1.7	(0-31)	SW846 8270C
2-Nitrophenol	59	(29 - 182)			SW846 8270C
	59	(29 - 182)	1.6	(0-29)	SW846 8270C
4-Nitrophenol	53	(10 - 132)			SW846 8270C
	59	(10 - 132)	10	(0-47)	SW846 8270C
N-Nitrosodi-n-propyl-amine	49	(10 - 230)			SW846 8270C
	49	(10 - 230)	1.7	(0-55)	SW846 8270C
N-Nitrosodiphenylamine	59	(10 - 230)			SW846 8270C
	61	(10 - 230)	2.1	(0-32)	SW846 8270C
Pentachlorophenol	15	(14 - 176)			SW846 8270C
	7.9 a,p	(14 - 176)	60	(0-49)	SW846 8270C
Ph nthrene	61	(54 - 120)			SW846 8270C
	73	(54 - 120)	18	(0-35)	SW846 8270C

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MATRIX SPIKE SAMPLE EVALUATION REPORT

GC/MS Semivolatiles

Client Lot #...: A9F140135 **Work Order #...:** CWV5X10G-MS **Matrix.....:** SOLID
MS Lot-Sample #: A9F140135-001 CWV5X10H-MSD

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS	RPD	RPD LIMITS	METHOD
Phenol	**53**	**(10 - 112)**			**SW846 8270C**
	55	**(10 - 112)**	**3.8**	**(0-23)**	**SW846 8270C**
Pyrene	**55**	**(52 - 115)**			**SW846 8270C**
	61	**(52 - 115)**	**10**	**(0-25)**	**SW846 8270C**
1,2,4-Trichlorobenzene	**56**	**(44 - 142)**			**SW846 8270C**
	60	**(44 - 142)**	**6.4**	**(0-28)**	**SW846 8270C**
2,4,5-Trichlorophenol	**60**	**(13 - 136)**			**SW846 8270C**
	59	**(13 - 136)**	**2.2**	**(0-41)**	**SW846 8270C**
2,4,6-Trichlorophenol	**54**	**(37 - 144)**			**SW846 8270C**
	52	**(37 - 144)**	**4.4**	**(0-30)**	**SW846 8270C**
Carbazole	**62**	**(50 - 150)**			**SW846 8270C**
	68	**(50 - 150)**	**8.6**	**(0-50)**	**SW846 8270C**
4-Methylphenol	**52**	**(10 - 103)**			**SW846 8270C**
	54	**(10 - 103)**	**2.7**	**(0-32)**	**SW846 8270C**
2,2'-oxybis(1-Chloro- ɔpane)	**69**	**(36 - 166)**			**SW846 8270C**
	74	**(36 - 166)**	**7.3**	**(0-26)**	**SW846 8270C**

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Nitrobenzene-d5	52	(23 - 120)
	54	(23 - 120)
Terphenyl-d14	57	(18 - 137)
	57	(18 - 137)
2-Fluorobiphenyl	52	(30 - 115)
	58	(30 - 115)
2-Fluorophenol	56	(30 - 115)
	58	(30 - 115)
Phenol-d5	55	(24 - 113)
	58	(24 - 113)
2,4,6-Tribromophenol	55	(19 - 122)
	58	(19 - 122)

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

Bold print denotes control parameters

Results and reporting limits have been adjusted for dry weight.

a Spiked analyte recovery is outside stated control limits.

p Relative percent difference (RPD) is outside stated control limits.

MATRIX SPIKE SAMPLE EVALUATION REPORT

GC/MS Semivolatiles

Client Lot #...: A9F140135 **Work Order #...:** CWV6L10E-MS **Matrix.....:** SOLID
MS Lot-Sample #: A9F140135-006 CWV6L10F-MSD
Date Sampled...: 06/09/99 14:30 **Date Received..:** 06/10/99
Prep Date.....: 06/28/99 **Analysis Date..:** 07/01/99
Prep Batch #...: 9177103
Dilution Factor: 1 **% Moisture.....:** 21

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS	RPD	RPD LIMITS	METHOD
Acenaphthene	80	(47 - 145)			SW846 8270C
	74	(47 - 145)	6.9	(0-28)	SW846 8270C
Acenaphthylene	77	(33 - 145)			SW846 8270C
	73	(33 - 145)	5.6	(0-21)	SW846 8270C
Anthracene	80	(27 - 133)			SW846 8270C
	74	(27 - 133)	7.7	(0-35)	SW846 8270C
Benzo(a)anthracene	83	(33 - 143)			SW846 8270C
	74	(33 - 143)	11	(0-39)	SW846 8270C
Benzo(b)fluoranthene	81	(24 - 159)			SW846 8270C
	74	(24 - 159)	8.5	(0-25)	SW846 8270C
Benzo(k)fluoranthene	79	(22 - 133)			SW846 8270C
	74	(22 - 133)	7.2	(0-54)	SW846 8270C
Be `(ghi)perylene	81	(10 - 219)			SW846 8270C
	68	(10 - 219)	17	(0-65)	SW846 8270C
Benzo(a)pyrene	78	(17 - 163)			SW846 8270C
	72	(17 - 163)	8.4	(0-35)	SW846 8270C
bis(2-Chloroethoxy) methane	77	(33 - 184)			SW846 8270C
	76	(33 - 184)	1.6	(0-46)	SW846 8270C
bis(2-Chloroethyl)-ether	72	(12 - 158)			SW846 8270C
	72	(12 - 158)	0.15	(0-54)	SW846 8270C
bis(2-Ethylhexyl) phthalate	93	(10 - 158)			SW846 8270C
	74	(10 - 158)	22	(0-35)	SW846 8270C
4-Bromophenyl phenyl ether	92	(53 - 127)			SW846 8270C
	84	(53 - 127)	9.5	(0-35)	SW846 8270C
Butyl benzyl phthalate	85	(10 - 122)			SW846 8270C
	74	(10 - 122)	13	(0-38)	SW846 8270C
4-Chloroaniline	30 a	(43 - 91)			SW846 8270C
	31 a	(43 - 91)	3.9	(0-17)	SW846 8270C
4-Chloro-3-methylphenol	105	(22 - 147)			SW846 8270C
	97	(22 - 147)	7.9	(0-37)	SW846 8270C
2- ›ronaphthalene	82	(60 - 118)			SW846 8270C
	78	(60 - 118)	5.2	(0-23)	SW846 8270C

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MATRIX SPIKE SAMPLE EVALUATION REPORT

GC/MS Semivolatiles

Client Lot #...: A9F140135 **Work Order #...:** CWV6L10E-MS **Matrix.....:** SOLID
MS Lot-Sample #: A9F140135-006 CWV6L10F-MSD

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS	RPD	RPD LIMITS	METHOD
2-Chlorophenol	73	(23 - 134)			SW846 8270C
	72	(23 - 134)	1.4	(0-29)	SW846 8270C
4-Chlorophenyl phenyl ether	90	(25 - 158)			SW846 8270C
	83	(25 - 158)	8.2	(0-43)	SW846 8270C
Chrysene	82	(17 - 168)			SW846 8270C
	75	(17 - 168)	8.2	(0-30)	SW846 8270C
Dibenz(a,h)anthracene	87	(10 - 227)			SW846 8270C
	77	(10 - 227)	13	(0-48)	SW846 8270C
Dibenzofuran	85	(85 - 117)			SW846 8270C
	80 a	(85 - 117)	7.1	(0-11)	SW846 8270C
Di-n-butyl phthalate	82	(10 - 118)			SW846 8270C
	75	(10 - 118)	9.2	(0-25)	SW846 8270C
1,2-Dichlorobenzene	77	(32 - 129)			SW846 8270C
	75	(32 - 129)	2.3	(0-43)	SW846 8270C
Dichlorobenzene	69	(10 - 172)			SW846 8270C
	69	(10 - 172)	0.79	(0-43)	SW846 8270C
1,4-Dichlorobenzene	70	(20 - 124)			SW846 8270C
	70	(20 - 124)	0.42	(0-32)	SW846 8270C
3,3'-Dichlorobenzidine	17	(10 - 262)			SW846 8270C
	15	(10 - 262)	14	(0-45)	SW846 8270C
2,4-Dichlorophenol	81	(39 - 135)			SW846 8270C
	76	(39 - 135)	6.5	(0-32)	SW846 8270C
Diethyl phthalate	85	(10 - 114)			SW846 8270C
	79	(10 - 114)	7.7	(0-43)	SW846 8270C
2,4-Dimethylphenol	73	(32 - 119)			SW846 8270C
	70	(32 - 119)	3.4	(0-30)	SW846 8270C
Dimethyl phthalate	95	(10 - 112)			SW846 8270C
	85	(10 - 112)	11	(0-44)	SW846 8270C
Di-n-octyl phthalate	86	(10 - 146)			SW846 8270C
	76	(10 - 146)	11	(0-31)	SW846 8270C
4,6-Dinitro-2-methylphenol	74	(10 - 181)			SW846 8270C
	66	(10 - 181)	12	(0-35)	SW846 8270C
2,4-Dinitrophenol	67	(10 - 191)			SW846 8270C
	56	(10 - 191)	17	(0-34)	SW846 8270C
2,4-Dinitrotoluene	83	(39 - 139)			SW846 8270C
	78	(39 - 139)	6.3	(0-22)	SW846 8270C
2,6-Dinitrotoluene	84	(50 - 151)			SW846 8270C
	78	(50 - 151)	7.5	(0-41)	SW846 8270C
[illegible]ranthene	80	(26 - 137)			SW846 8270C
	76	(26 - 137)	5.3	(0-27)	SW846 8270C

(Continued on next page)

MATRIX SPIKE SAMPLE EVALUATION REPORT

GC/MS Semivolatiles

Client Lot #...: A9F140135 **Work Order #...:** CWV6L10E-MS **Matrix.....:** SOLID
MS Lot-Sample #: A9F140135-006 CWV6L10F-MSD

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS	RPD	RPD LIMITS	METHOD
Fluorene	83	(59 - 121)			SW846 8270C
	79	(59 - 121)	5.4	(0-30)	SW846 8270C
Hexachlorobenzene	90	(10 - 152)			SW846 8270C
	83	(10 - 152)	8.1	(0-37)	SW846 8270C
Hexachlorobutadiene	82	(24 - 116)			SW846 8270C
	82	(24 - 116)	0.77	(0-33)	SW846 8270C
Hexachlorocyclopenta-diene	13	(2.0- 55)			SW846 8270C
	14	(2.0- 55)	3.9	(0-31)	SW846 8270C
Hexachloroethane	67	(40 - 113)			SW846 8270C
	66	(40 - 113)	1.5	(0-25)	SW846 8270C
Indeno(1,2,3-cd)pyrene	86	(10 - 171)			SW846 8270C
	75	(10 - 171)	13	(0-50)	SW846 8270C
Isophorone	76	(21 - 196)			SW846 8270C
	75	(21 - 196)	1.3	(0-30)	SW846 8270C
2 hylnaphthalene	79	(15 - 111)			SW846 8270C
	77	(15 - 111)	3.2	(0-31)	SW846 8270C
2-Methylphenol	73	(10 - 103)			SW846 8270C
	70	(10 - 103)	4.1	(0-32)	SW846 8270C
Naphthalene	73	(21 - 133)			SW846 8270C
	73	(21 - 133)	0.18	(0-21)	SW846 8270C
2-Nitroaniline	90	(32 - 165)			SW846 8270C
	83	(32 - 165)	7.9	(0-42)	SW846 8270C
3-Nitroaniline	53	(31 - 177)			SW846 8270C
	50	(31 - 177)	7.4	(0-48)	SW846 8270C
4-Nitroaniline	62	(38 - 229)			SW846 8270C
	50	(38 - 229)	21	(0-47)	SW846 8270C
Nitrobenzene	80	(35 - 180)			SW846 8270C
	80	(35 - 180)	0.38	(0-31)	SW846 8270C
2-Nitrophenol	71	(29 - 182)			SW846 8270C
	71	(29 - 182)	0.10	(0-29)	SW846 8270C
4-Nitrophenol	110	(10 - 132)			SW846 8270C
	98	(10 - 132)	12	(0-47)	SW846 8270C
N-Nitrosodi-n-propyl-amine	77	(10 - 230)			SW846 8270C
	76	(10 - 230)	1.5	(0-55)	SW846 8270C
N-Nitrosodiphenylamine	81	(10 - 230)			SW846 8270C
	76	(10 - 230)	6.6	(0-32)	SW846 8270C
Pentachlorophenol	46	(14 - 176)			SW846 8270C
	16 p	(14 - 176)	97	(0-49)	SW846 8270C
Ph nthrene	84	(54 - 120)			SW846 8270C
	77	(54 - 120)	7.8	(0-35)	SW846 8270C

(Continued on next page)

MATRIX SPIKE SAMPLE EVALUATION REPORT

GC/MS Semivolatiles

Client Lot #...: A9F140135 **Work Order #...:** CWV6L10E-MS **Matrix.....:** SOLID
MS Lot-Sample #: A9F140135-006 CWV6L10F-MSD

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS	RPD	RPD LIMITS	METHOD
Phenol	**74**	**(10 - 112)**			**SW846 8270C**
	71	**(10 - 112)**	**4.3**	**(0-23)**	**SW846 8270C**
Pyrene	**90**	**(52 - 115)**			**SW846 8270C**
	78	**(52 - 115)**	**15**	**(0-25)**	**SW846 8270C**
1,2,4-Trichlorobenzene	**78**	**(44 - 142)**			**SW846 8270C**
	78	**(44 - 142)**	**0.38**	**(0-28)**	**SW846 8270C**
2,4,5-Trichlorophenol	**87**	**(13 - 136)**			**SW846 8270C**
	76	**(13 - 136)**	**14**	**(0-41)**	**SW846 8270C**
2,4,6-Trichlorophenol	**82**	**(37 - 144)**			**SW846 8270C**
	72	**(37 - 144)**	**12**	**(0-30)**	**SW846 8270C**
Carbazole	**80**	**(50 - 150)**			**SW846 8270C**
	75	**(50 - 150)**	**6.8**	**(0-50)**	**SW846 8270C**
4-Methylphenol	**74**	**(10 - 103)**			**SW846 8270C**
	69	**(10 - 103)**	**6.7**	**(0-32)**	**SW846 8270C**
2,2'-oxybis(1-Chloro-pane)	**90**	**(36 - 166)**			**SW846 8270C**
	90	**(36 - 166)**	**0.03**	**(0-26)**	**SW846 8270C**

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Nitrobenzene-d5	76	(23 - 120)
	77	(23 - 120)
Terphenyl-d14	101	(18 - 137)
	86	(18 - 137)
2-Fluorobiphenyl	76	(30 - 115)
	74	(30 - 115)
2-Fluorophenol	67	(30 - 115)
	67	(30 - 115)
Phenol-d5	74	(24 - 113)
	71	(24 - 113)
2,4,6-Tribromophenol	79	(19 - 122)
	67	(19 - 122)

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

Bold print denotes control parameters

Results and reporting limits have been adjusted for dry weight.

a Spiked analyte recovery is outside stated control limits.

p Relative percent difference (RPD) is outside stated control limits.

MATRIX SPIKE SAMPLE EVALUATION REPORT

HPLC

Client Lot #...: A9F140135 **Work Order #...:** CWV5X10J-MS **Matrix.....:** SOLID
MS Lot-Sample #: A9F140135-001 CWV5X10K-MSD
Date Sampled...: 06/09/99 11:00 **Date Received..:** 06/10/99
Prep Date.....: 06/19/99 **Analysis Date..:** 06/24/99
Prep Batch #...: 9170118
Dilution Factor: 1 **% Moisture.....:** 30

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS	RPD	RPD LIMITS	METHOD
HMX	**99**	**(72 - 122)**			**SW846 8330**
	97	**(72 - 122)**	**2.9**	**(0-17)**	**SW846 8330**
RDX	**93**	**(71 - 121)**			**SW846 8330**
	92	**(71 - 121)**	**1.2**	**(0-16)**	**SW846 8330**
1,3,5-Trinitrobenzene	**98**	**(81 - 120)**			**SW846 8330**
	97	**(81 - 120)**	**1.1**	**(0-15)**	**SW846 8330**
1,3-Dinitrobenzene	**99**	**(82 - 117)**			**SW846 8330**
	97	**(82 - 117)**	**2.4**	**(0-15)**	**SW846 8330**
Tetryl	**100**	**(51 - 124)**			**SW846 8330**
	97	**(51 - 124)**	**2.5**	**(0-20)**	**SW846 8330**
Nitrobenzene	**98**	**(83 - 117)**			**SW846 8330**
	96	**(83 - 117)**	**2.5**	**(0-15)**	**SW846 8330**
2 -Trinitrotoluene	**100**	**(74 - 126)**			**SW846 8330**
	99	**(74 - 126)**	**0.75**	**(0-15)**	**SW846 8330**
4-Amino-2,6-dinitrotoluen	**94**	**(71 - 123)**			**SW846 8330**
	92	**(71 - 123)**	**2.0**	**(0-15)**	**SW846 8330**
2-Amino-4,6-dinitrotoluen	**97**	**(75 - 121)**			**SW846 8330**
	95	**(75 - 121)**	**2.2**	**(0-16)**	**SW846 8330**
2,6-Dinitrotoluene	**103**	**(78 - 125)**			**SW846 8330**
	100	**(78 - 125)**	**2.9**	**(0-15)**	**SW846 8330**
2,4-Dinitrotoluene	**101**	**(81 - 120)**			**SW846 8330**
	99	**(81 - 120)**	**2.4**	**(0-15)**	**SW846 8330**
2-Nitrotoluene	**101**	**(81 - 117)**			**SW846 8330**
	99	**(81 - 117)**	**1.7**	**(0-15)**	**SW846 8330**
4-Nitrotoluene	**100**	**(80 - 117)**			**SW846 8330**
	93	**(80 - 117)**	**6.8**	**(0-15)**	**SW846 8330**
3-Nitrotoluene	**104**	**(80 - 118)**			**SW846 8330**
	101	**(80 - 118)**	**3.0**	**(0-15)**	**SW846 8330**

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
1-Chloro-3-nitrobenzene	109	(76 - 124)
	103	(76 - 124)

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

Bold print denotes control parameters

MATRIX SPIKE SAMPLE EVALUATION REPORT

TOTAL Metals

Client Lot #...: A9F140135 **Matrix.....:** WATER
Date Sampled...: 06/11/99 14:20 **Date Received..:** 06/12/99

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS	RPD	RPD LIMITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
MS Lot-Sample #: A9F150184-015 **Prep Batch #...:** 9172344							
Silver	117	(80 - 120)			SW846 6010B	06/22-07/16/99	CWWDK108
	121 N	(80 - 120)	3.0	(0-20)	SW846 6010B	06/22-07/16/99	CWWDK109
		Dilution Factor: 1					
Arsenic	105	(80 - 120)			SW846 6010B	06/22-07/16/99	CWWDK10C
	110	(80 - 120)	3.9	(0-20)	SW846 6010B	06/22-07/16/99	CWWDK10D
		Dilution Factor: 1					
Cadmium	103	(80 - 120)			SW846 6010B	06/22-07/16/99	CWWDK10F
	107	(80 - 120)	3.6	(0-20)	SW846 6010B	06/22-07/16/99	CWWDK10G
		Dilution Factor: 1					
Barium	103	(80 - 120)			SW846 6010B	06/22-07/15/99	CWWDK115
	105	(80 - 120)	2.2	(0-20)	SW846 6010B	06/22-07/15/99	CWWDK116
		Dilution Factor: 1					
Cr nium	105	(80 - 120)			SW846 6010B	06/22-07/16/99	CWWDK10J
	109	(80 - 120)	3.4	(0-20)	SW846 6010B	06/22-07/16/99	CWWDK10K
		Dilution Factor: 1					
Lead	103	(80 - 120)			SW846 6010B	06/22-07/16/99	CWWDK10M
	107	(80 - 120)	3.6	(0-20)	SW846 6010B	06/22-07/16/99	CWWDK10N
		Dilution Factor: 1					
Selenium	106	(80 - 120)			SW846 6010B	06/22-07/16/99	CWWDK10U
	110	(80 - 120)	3.7	(0-20)	SW846 6010B	06/22-07/16/99	CWWDK10V
		Dilution Factor: 1					
Mercury	98	(80 - 120)			SW846 7470A	06/22-06/23/99	CWWDK105
	103	(80 - 120)	4.9	(0-20)	SW846 7470A	06/22-06/23/99	CWWDK106
		Dilution Factor: 1					

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

N Spiked analyte recovery is outside stated control limits.

MATRIX SPIKE SAMPLE EVALUATION REPORT

TOTAL Metals

Client Lot #...: A9F140135 **Matrix.....:** SOLID
Date Sampled...: 06/10/99 15:15 **Date Received..:** 06/11/99

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS	RPD	RPD LIMITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
MS Lot-Sample #: A9F150161-001 **Prep Batch #...:** 9167363							
Silver	101	(80 - 120)			SW846 6010B	06/17-06/19/99	CWW6C11R
	99	(80 - 120)	1.3	(0-20)	SW846 6010B	06/17-06/19/99	CWW6C11T
		Dilution Factor: 1					
Arsenic	91	(80 - 120)			SW846 6010B	06/17-06/19/99	CWW6C11U
	90	(80 - 120)	0.95	(0-20)	SW846 6010B	06/17-06/19/99	CWW6C11V
		Dilution Factor: 1					
Barium	95	(80 - 120)			SW846 6010B	06/17-06/19/99	CWW6C12F
	96	(80 - 120)	0.93	(0-20)	SW846 6010B	06/17-06/19/99	CWW6C12G
		Dilution Factor: 1					
Cadmium	94	(80 - 120)			SW846 6010B	06/17-06/19/99	CWW6C11W
	93	(80 - 120)	1.2	(0-20)	SW846 6010B	06/17-06/19/99	CWW6C11X
		Dilution Factor: 1					
Cr ium	89	(80 - 120)			SW846 6010B	06/17-06/19/99	CWW6C120
	91	(80 - 120)	1.1	(0-20)	SW846 6010B	06/17-06/19/99	CWW6C121
		Dilution Factor: 1					
Lead	88	(80 - 120)			SW846 6010B	06/17-06/19/99	CWW6C122
	88	(80 - 120)	0.22	(0-20)	SW846 6010B	06/17-06/19/99	CWW6C123
		Dilution Factor: 1					
Mercury	109	(70 - 130)			SW846 7471A	06/17-06/21/99	CWW6C12A
	112	(70 - 130)	2.6	(0-20)	SW846 7471A	06/17-06/21/99	CWW6C12C
		Dilution Factor: 1					
Selenium	88	(80 - 120)			SW846 6010B	06/17-06/19/99	CWW6C126
	88	(80 - 120)	0.48	(0-20)	SW846 6010B	06/17-06/19/99	CWW6C127
		Dilution Factor: 1					

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

Results and reporting limits have been adjusted for dry weight.

SAMPLE DUPLICATE EVALUATION REPORT

General Chemistry

Client Lot #...: A9F140135 **Work Order #...:** CWP2M-SMP CWP2M-DUP **Matrix.....:** SOLID

Date Sampled...: 06/09/99 14:42 **Date Received..:** 06/10/99

% Moisture.....: 39

PARAM	RESULT	DUPLICATE RESULT	UNITS	RPD	RPD LIMIT	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
pH (solid)						SD Lot-Sample #:	A9F100155-005	
	8.2	8.2	No Units	0.49	(0-20)	SW846 9045C	06/10/99	9162288

Dilution Factor: 1

SAMPLE DUPLICATE EVALUATION REPORT

General Chemistry

Client Lot #...: A9F140135 **Work Order #...:** CWP21-SMP CWP21-DUP **Matrix.....:** SOLID

Date Sampled...: 06/09/99 10:10 **Date Received..:** 06/10/99

% Moisture.....: 40

PARAM	RESULT	DUPLICATE RESULT	UNITS	RPD	RPD LIMIT	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
pH (solid)						SD Lot-Sample #:	A9F100155-002	
	7.8	7.7	No Units	1.4	(0-20)	SW846 9045C	06/10/99	9162288

Dilution Factor: 1

SAMPLE DUPLICATE EVALUATION REPORT

General Chemistry

Client Lot #...: A9F140135 **Work Order #...:** CWTPM-SMP CWTPM-DUP **Matrix.....:** SOLID

Date Sampled...: 06/08/99 13:00 **Date Received..:** 06/11/99

% Moisture.....: 19

PARAM	RESULT	DUPLICATE RESULT	UNITS	RPD	RPD LIMIT	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Percent Solids						SD Lot-Sample #:	A9F140102-001	
	81.5	81.6	%	0.097	(0-20)	MCAWW 160.3 MOD	06/16-06/17/99	9167253

Dilution Factor: 1

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

Results and reporting limits have been adjusted for dry weight.

SAMPLE DUPLICATE EVALUATION REPORT

General Chemistry

Client Lot #...: A9F140135 **Work Order #...:** CWV6M-SMP CWV6M-DUP **Matrix.....:** SOLID

Date Sampled...: 06/09/99 14:30 **Date Received..:** 06/10/99

% Moisture.....: 32

PARAM	RESULT	DUPLICATE RESULT	UNITS	RPD	RPD LIMIT	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Percent Solids						SD Lot-Sample #:	A9F140135-007	
	67.8	67.1	%	0.91	(0-20)	MCAWW 160.3 MOD	06/16-06/17/99	9167253

Dilution Factor: 1

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

Results and reporting limits have been adjusted for dry weight.

SAMPLE DUPLICATE EVALUATION REPORT

General Chemistry

Client Lot #...: A9F140135 **Work Order #...:** CWXQN-SMP CWXQN-DUP **Matrix.....:** SOLID

Date Sampled...: 06/15/99 **Date Received..:** 06/16/99

% Moisture.....: 5.7

PARAM	RESULT	DUPLICATE RESULT	UNITS	RPD	RPD LIMIT	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Percent Solids						SD Lot-Sample #:	A9F160148-001	
	94.3	94.3	%	0.001	(0-20)	MCAWW 160.3 MOD	06/21-06/22/99	9172191

Dilution Factor: 1

SAMPLE DUPLICATE EVALUATION REPORT

General Chemistry

Client Lot #...: A9F140135 **Work Order #...:** CX13V-SMP CX13V-DUP **Matrix.....:** SOLID

Date Sampled...: 06/14/99 09:40 **Date Received..:** 06/16/99

% Moisture.....: 55

PARAM	RESULT	DUPLICATE RESULT	UNITS	RPD	RPD LIMIT	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Total Organic Carbon						SD Lot-Sample #: A9F170141-007		
	19000	19000	mg/kg	0.88	(0-20)	SMCA WALKLEY-BLAC	06/26/99	9177206

Dilution Factor: 1

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

Results and reporting limits have been adjusted for dry weight.

SAMPLE DUPLICATE EVALUATION REPORT

General Chemistry

Client Lot #...: A9F140135 **Work Order #...:** CX14Q-SMP CX14Q-DUP **Matrix.....:** SOLID

Date Sampled...: 06/13/99 15:40 **Date Received..:** 06/16/99

% Moisture.....: 34

PARAM	RESULT	DUPLICATE RESULT	UNITS	RPD	RPD LIMIT	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Total Organic Carbon						SD Lot-Sample #: A9F170141-017		
	7400	7700	mg/kg	4.7	(0-20)	SMCA WALKLEY-BLAC	06/26/99	9177206

Dilution Factor: 1

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

Results and reporting limits have been adjusted for dry weight.

[redacted]

Chain c Custod, ecord

Quanter

QUA-4124

Client	Project Manager	Date	Chain Of Custody Number
USACE	ALBERT REYES	9 JUN 99	61640
Address	**Telephone Number (Area Code)/Fax Number**	**Lab Number**	**Page 1 of 2**
PO BOX 59			

City	State	Zip Code	Site Contact
LOUISVILLE	KY	40201	

Project Name	Carrier/Waybill Number
RAIL CAR LOADING AREA	

Contract/Purchase Order/Quote No.

Sample I.D. No. and Description	Date	Time	Sample Type	Total Volume	Containers Type	Containers No.	Preservative	Condition on Receipt	Analysis: NITRO & DINITRO	SVOCs	METAL + PH	TOC	SULFUR/FATTY
PBOW 99 SS CL01	9 JUN 99	11:00	SOIL	4 OZ	GLASS				X				
✓ ✓				4 OZ						X			
✓ ✓				4 OZ								X	
✓ ✓				4 OZ									X
✓ ✓				2 OZ							X		
PBOW 99 SS CL02		11:30		4 OZ					X				
✓ ✓				4 OZ						X			
✓ ✓				2 OZ							X		
PBOW 99 SS CL03		13:00		4 OZ					X				
✓ ✓				4 OZ						X			
✓ ✓				2 OZ							X		
PBOW 99 SS CL04		13:30		4 OZ					X				
✓ ✓				4 OZ						X			
✓ ✓				2 OZ							X		
PBOW 99 SS CL05		14:00		4 OZ					X				
✓ ✓				4 OZ						X			

Special Instructions

Possible Hazard Identification: ☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal: ☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Turn Around Time Required: ☒ Normal ☐ Rush

QC Level: ☐ I. ☐ II. ☐ III.

Project Specific (Specify)

	Date	Time		Date	Time
1. Relinquished By	9 JUN 99	16:30	1. Received By	6 7 95	
2. Relinquished By			2. Received By Perry Burns	6-10-99	1015AM
3. Relinquished By			3. Received By		

Comments

DISTRIBUTION: WHITE - Stays with Sample; CANARY - Returned to Client with Report; PINK - Field Copy

Chain of Custody Record

Quanterra

QUA-4124

Client	Project Manager	Date	Chain Of Custody Number
OSACE			61642
Address	**Telephone Number (Area Code)/Fax Number**	**Lab Number**	Page 2 of 2
City / State / Zip Code	**Site Contact**		
Project Name	**Carrier/Waybill Number**		
Contract/Purchase Order/Quote No. RAIL CAR LOADING AREA			

Sample I.D. No. and Description	Date	Time	Sample Type	Total Volume	Containers Type	Containers No.	Preservative	Condition on Receipt	Analysis: Ultra Arsenic	SVOC	Metals	TOC	Silver Nitrate	PCB
PB0W99SSCL05	9 JUN 99		SOIL	2 oz	GLASS						X			X
PB0W99SSCL06		14:40		4 oz					X					
				4 oz						X				
				2 oz							X			
PB0W99SSCL07		14:30		4 oz					X					
				4 oz						X				
				2 oz							X			
PB0W99SWCL01			WATER	1 LT	PLASTIC		HNO3				X			
PB0W99SWCL02				1 LT			HNO3				X			
				1 LT			NONE							X
PB MORTAR BLANK		10:00												
PB0W99SSCL07		14:30	SOIL	4 oz								X		

Special Instructions

Possible Hazard Identification: ☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal: ☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Turn Around Time Required: ☒ Normal ☐ Rush

QC Level: ☐ I. ☐ II. ☐ III.

Project Specific (Specify)

	Date	Time		Date	Time
1. Relinquished By: ABBALT Ray Albert Ray	6-9-99	16:30	1. Received By: [signature]	6 9 99	
2. Relinquished By:			2. Received By: Terry Burns	6-10-99	1015 AM
3. Relinquished By:			3. Received By:		

Comments

DISTRIBUTION: WHITE - Stays with Sample; CANARY - Returned to Client with Report; PINK - Field Copy

DATA REVIEW AND VAILDATION REPORT - RAILCAR LOADING AREA

PLUM BROOK ORDNANCE WORKS SITE INVESTIGATIONS

Contract Number DACA27-98-D-0029
Delivery Order 0006

June 1, 2000

Prepared For:
U.S. Army Corps of Engineers
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1.0 INTRODUCTION

URS Corporation was contracted by the United States Army Corps of Engineers (USACE), Louisville District, to complete a data review and validation for chemical data generated by Quanterra Incorporated, from soil and groundwater samples collected at the Plum Brook Ordnance Works (PBOW), Railcar Loading Area. Pursuant to the USACE scope of work (SOW), one hundred percent of the data underwent a data review and 10 percent of the data for selected parameters underwent full validation. The data review and validation followed the general guidance provided in National Functional Guidelines for Organic Review (EPA, 1999) and National Functional Guidelines for Inorganic Review (EPA 1994). While these guidance documents were written for methods following the Contract Laboratory Program (CLP) Statement of Work (SOW), the guidelines were used where appropriate for the validated methods.

The data review included the review of the sample results and the quality control summary forms, while the data validation additionally included the review of raw data. The specific elements included in the data review and validation processes are identified in the subsequent sections. Where required, data were qualified as **U** (nondetect), **J** (estimated) or **R** (rejected) based on the data review and validation procedures.

This report is organized such that Section 1 summarizes the results of the data review and validations and the data usability for each Site. Section 2 provides the details of the data review. Sections 3 through 5 provide the details of the data validation for semivolatile organic compounds (SVOCs), explosives and metals, respectively.

1.1 Data Review Summary

Data were qualified based on exceeding holding time criteria, and laboratory control sample (LCS), surrogate and matrix spike/matrix spike duplicate (MS/MSD) recoveries outside evaluation criteria. All qualifications for the Plum Brook Ordnance Works Railcar Loading Area are presented in Table 1-1.

1.2 Data Validation Summary

In addition to the outlying parameters identified in the data review, data were qualified based on the initial calibration. All qualifications for the Plum Brook Ordnance Works Railcar Loading Area are presented in Table 1-1.

1.3 Data Usability

While data were qualified as estimated due to outlying QC parameters, all data should be used for their intended purposes, with the exception of 4-chloroaniline for sample PBOW99SSCL04, which was rejected due to an insufficient control spike recovery. The spike recovery (18%) was less than half of the lower limit (43%) established by the laboratory. Also the data validation of explosives indicated that the retention time (RT) windows were established using nonstandard procedures. While the methods employed to determine RT were not standard procedures, the windows appear appropriate for proper identification since the standard compounds eluted during the windows.

TABLE 1-1

RAILCAR LOADING AREA
DATA QUALIFICATIONS

Sample Identification #	Analysis	Compound	Qualifier	Code
PBOW99SSCL03-RE1	SVOC	All compounds	UJ	HT
PBOW99SSCL06-RE1	SVOC	All compounds	UJ	HT
PBOW99SSCL01	SVOC	4-chloroaniline	R	LCS
PBOW99SSCL01	SVOC	dibenzofuran	UJ	LCS
PBOW99SSCL02	SVOC	4-chloroanaline	R	LCS
PBOW99SSCL02	SVOC	dibenzofuran	UJ	LCS
PBOW99SSCL03	SVOC	4-chloroanaline	R	LCS
PBOW99SSCL03	SVOC	dibenzofuran	UJ	LCS
PBOW99SSCL03	SVOC	All acid fraction[1] compounds	UJ	SUR
PBOW99SSCL04	SVOC	4-chloroanaline	R	LCS
PBOW99SSCL04	SVOC	dibenzofuran	UJ	LCS
PBOW99SSCL04	SVOC	2,4-dinitrophenol	UJ	ICAL
PBOW99SSCL05	SVOC	4-chloroanaline	R	LCS
PBOW99SSCL05	SVOC	dibenzofuran	UJ	LCS
PBOW99SSCL06	SVOC	4-chloroanaline	R	LCS
PBOW99SSCL06	SVOC	dibenzofuran	UJ	LCS
PBOW99SSCL06	SVOC	All acid fraction[1] compounds	UJ	SUR
PBOW99SSCL07	SVOC	4-chloroanaline	R	LCS
PBOW99SSCL07	SVOC	dibenzofuran	UJ	LCS

UJ – Estimated non-detect.
R – Data rejected.
HT – Holding time exceeded.
LCS – Laboratory control spike outside criteria
SUR – Surrogate recovery outside criteria.
ICAL – Initial calibration outside criteria.

[1]Note: Acid fraction compounds include the phenols, or compounds ending with 'ol'.

2.0 PLUM BROOK DATA REVIEW – SDG A9F140135

Sample Identification #	Sample Identification #	Sample Identification #
PBOW99SSCL01	PBOW99SSCL02	PBOW99SSCL03
PBOW99SSCL04	PBOW99SSCL05	PBOW99SSCL06
PBOW99SSCL07	PBOW99SWCL01	PBOW99SWCL02

2.1 Data Package Completeness

Were all items delivered as specified in the QAPP and COC?

Yes.

2.2 Laboratory Case Narrative

Were problems noted in the laboratory case narrative or cooler receipt form, which are not discussed in subsequent sections?

The case narrative indicated the following:

- There were surrogate and MS/MSD recoveries outside QC acceptance limits, and samples with elevated reporting limits due to matrix interference. These issues are addressed in the appropriate sections below. No additional problems were noted in the laboratory case narrative.

2.3 Sample Preservation and Holding Times

Were samples properly preserved and extracted/analyzed within QAPP limits?

All samples were preserved, extracted and analyzed within the required holding times stated in each method, except for samples PBOW99SSCL03-RE1 and PBOW99SSCL06-RE1, which were extracted 5 days beyond the 14 day criteria. These two samples were qualified as estimated non-detect (**UJ**) for all SVOC compounds. No further qualifications of the data were necessary.

2.4 Blank Contamination

Were any analytes detected in the Method Blanks, Field Blanks or Trip Blanks?

No.

2.5 Laboratory Control Sample

Were LCS recoveries within evaluation criteria?

No.

LCS ID	LCS Compound	LCS Recovery	LCS Criteria
9168112	4-Chloroanaline	**18**	43-91
	Dibenzofuran	**62**	85-117
9177103	Dibenzofuran	**82**	85-117

Analytical data, which required qualification based on LCS data, are included in the table below.

Field ID	Analyte	Qual.
PBOW99SSCL01	4-Chloroanaline	**R**
	Dibenzofuran	**UJ**
PBOW99SSCL02	4-Chloroanaline	**R**
	Dibenzofuran	**UJ**
PBOW99SSCL03	4-Chloroanaline	**R**
	Dibenzofuran	**UJ**
PBOW99SSCL04	4-Chloroanaline	**R**
	Dibenzofuran	**UJ**
PBOW99SSCL05	4-Chloroanaline	**R**
	Dibenzofuran	**UJ**
PBOW99SSCL06	4-Chloroanaline	**R**
	Dibenzofuran	**UJ**
PBOW99SSCL07	4-Chloroanaline	**R**
	Dibenzofuran	**UJ**

2.6 Surrogate Recoveries

Were surrogate recoveries within evaluation criteria?

No.

Field ID	Surrogate	Recovery	Criteria
PBOW99SSCL03	2,4,6-Tribromophenol	**7.5**	**19**-122
PBOW99SSCL05	2,4,6-Tribromophenol	**13**	**19**-122
PBOW99SSCL06	2,4,6-Tribromophenol	**7.1**	**19**-122
PBOW99SSCL07	2,4,6-Tribromophenol	**17**	**19**-122

No qualifications of data are necessary for SVOC samples (PBOW99SSCL05 and PBOWSSCL07) with only one surrogate per acid or base/neutral fraction outside criteria, but above 10% recovery. The acid fraction compounds for samples PBOW99SSCL03 and PBOW99SSCL06 were qualified estimated non-detect (**UJ**), due to one acid fraction surrogate recovery below 10%; however, these two samples were re-extracted and re-analyzed with acceptable surrogate recoveries and both sets of data were reported.

2.7 Matrix Spike and Matrix Spike Duplicate Recoveries

Were MS/MSD samples reported as part of this SDG?

Yes.

Were all MS/MSD recoveries within evaluation criteria?

No.

MS/MSD ID	Analyte	MS/MSD Recovery (%)	RPD	Criteria
PBOW99SSCL01	Hexachlorocyclopentadiene	**7/0**	**200**	**2**-55/**31**
	4-Chloroanaline	**12/10**	9.6	**43**-91/17
	2-Chloronaphthalene	**59**/61	3.1	**60**-118/23

MS/MSD ID	Analyte	MS/MSD Recovery (%)	RPD	Criteria
	3-Nitroanaline	32/**30**	8.2	**31**-177/48
	Dibenzofuran	**57/60**	5.3	**85**-117/11
	Fluorene	**57**/61	6.2	**59**-121/30
	4-Nitroanaline	38/**32**	16	**38**-229/47
	Pentachlorophenol	15/**7**	**60**	**14**-176/49
	3,3'-Dichlorobenzidine	**8/4**	**53**	**10**-262/**45**
PBOW99SSCL06	4-Chloroanaline	**30/31**	3.9	**43**-91/17
	Pentachlorophenol	46/**16**	**97**	**14**-176/**49**

Sample PBOW99SSCL01 was previously qualified for 4-chloroanaline and dibenzofuran due to LCS recoveries. Also, sample PBOW99SSCL06 was previously qualified for 4-chloroanaline and pentachlorophenol due to LCS and surrogate recoveries. Since surrogate recoveries and the remaining LCS recoveries were within QC criteria, professional judgement required no further qualifications of SVOC data, based on the MS/MSD alone.

2.8 Lab Duplicate Results

Were lab duplicates samples collected as part of this SDG?

Yes, sample PBOW99SSCL07 was analyzed in duplicate for percent solids.

Were laboratory duplicate sample RPDs within criteria?

Yes, duplicate RPDs were within criteria for percent solids.

2.9 Field Duplicate Results

Were field duplicates samples collected as part of this SDG?

No.

Were field duplicates within evaluation criteria?

N/A.

2.10 Sample Dilutions

Were samples diluted which exceed 10X QAPP limits?

No.

2.11 Additional Qualifications

Were additional qualifications applied?

No.

3.0 FULL VALIDATION OF SVOC DATA – SDG A9F140135

This section describes the full validation for one soil sample that was analyzed for semivolatile organic compounds by USEPA SW-846 Method 8270C. The sample was analyzed by Quanterra Incorporated of North Canton, Ohio, and submitted as part of sample delivery group (SDG) A9F140135. The sample included as part of this validation is listed below:

Sample Identification #
PBOW99SSCL04

Evaluation of the analytical data followed procedures outlined in the USEPA Contract Program National Functional Guidelines for Organic Review (USEPA 1999) where applicable to SW-846 Method 8270C. The evaluation criteria used during the validation were a combination of those criteria presented in Method 8270C and the laboratory criteria based on historical data.

Criteria evaluated included the following method performance criteria:

- Completeness of data package
- Significant problems identified in the Laboratory Case Narrative
- Sample preservation and holding times
- GC/MS instrument performance (tuning)
- Initial calibration
- Calibration verification
- Method blank
- Surrogate recoveries
- Laboratory control samples
- MS/MSD samples
- Internal Standard areas and retention times
- Target compound identification and quantitation
- System performance and overall assessment of data
- Transcription errors

3.1 Data Package Completeness

The data package was reviewed to make certain that it contained the data contractually required in the deliverable. This included checking the data package for the results of each analyte requested, for each field sample submitted in the analytical batch, along with requested QC documentation for the respective methods. The data package was complete for this validation.

3.2 Problems Identified in the Laboratory Case Narrative

The laboratory case narrative indicated that there were surrogate recoveries and MS/MSD spikes and relative percent differences (RPDs) outside evaluation criteria. These issues are addressed in the appropriate sections below. There were no other problems noted in the laboratory case narrative that were applicable to this validation.

3.3 Sample Preservation and Holding Times

Review of the sample collection and analysis dates involved comparing the chain-of-custody, the summary forms, the raw data forms, and the chromatograms for accuracy, consistency, and holding time compliance. The laboratory case narrative and the cooler receipt form indicated that the samples were received at the recommended 4 $\pm$ 2 °C cooler temperature. Also, the samples were extracted and analyzed within holding time criteria of 14 days to extraction and 40 days to analysis.

3.4 Instrument Performance

GC/MS instrument performance checks were performed to ensure mass resolution, identification, and instrument sensitivity. Criteria for evaluation of instrument performance included possible transcription/calculation errors, adherence to instrument tuning frequency requirements, mass assignments, and ion abundance criteria. Instrument performance check samples were evaluated against the laboratory tuning criteria. The laboratory tuning criteria were slightly different than the criteria established in Method 8270C; however, Method 8270C allows for alternate tuning criteria as long as the method performance is not adversely impacted. No qualification of data was required.

Based on the raw data, the ion abundance criteria were within evaluation criteria for all masses, and no calculation or transcription errors were noted.

3.5 Initial Calibration

Calibration criteria were established to assess whether the instrument was capable of producing acceptable qualitative and quantitative data for volatile analyses. An initial calibration was analyzed at the beginning of the run sequence. At least five concentration standards were used to establish the initial calibration curve as required by Method 8270C. For the initial calibration, the response factors (RFs) were reviewed and were greater than 0.05 for all analytes.

Review of the initial calibration summary forms indicated %RSDs were $\leq$ 30 percent for calibration check compounds (CCCs) and less than 15 percent for non-CCCs with the exception of 2,4-dinitrophenol (30.0%) for ICAL 6/20/99, 0731. As a result, the 2,4-dinitrophenol result for sample PBOW99SSCL04 was qualified as estimated non-detect (**UJ**).

Review of the ICAL summary form indicated other analytes had %RSD values greater than 15 percent; however, these analytes were not target compounds for this project.

Recalculations of the RFs and %RSD for eight standard compounds were performed, and no errors in calculation were noted.

3.6 Calibration Verification

Review of the sample chromatograms indicated the calibration verifications (CVs) were performed approximately every 12 hours of operation. Based on the review of continuing calibration raw data and summary forms, all RFs met the evaluation criteria of greater than 0.05 for all analytes. In addition, percent differences (%Ds) met the evaluation criteria of $\leq$ 20 percent for CCCs, and < 50 percent for non-CCCs.

Recalculation of the RF and %D for six standard compounds was completed, and no errors in calculation were noted.

3.7 Blank Samples

The purpose of the method blank samples is to evaluate the existence and magnitude of contamination problems emanating from laboratory activities. Method blank samples were analyzed with each analytical batch as required by USEPA SW-846 Method 8270C. All target compounds were reported as non-detect. Review of chromatograms indicated all peaks present were accounted for or the concentrations reported were below the method detection limit.

3.8 Surrogate Spike Recoveries

Surrogate compounds were used to evaluate the overall laboratory sample preparation efficiency on a per-sample basis. All surrogate recoveries were within the method acceptance criteria for the validated samples. Fifty percent of the recoveries were recalculated, and the summary forms versus the raw data were verified. No calculation or transcription errors were noted.

3.9 Matrix Spike/Matrix Spike Duplicate (MS/MSD) Samples

MS/MSD samples were analyzed to assess accuracy and precision for the analyses. The MS/MSD summary form indicated the sample used as MS/MSD sample for the batch was PBOW99SSCL01, a sample not included as part of the validation. The MS had recoveries below QC limits for 4-chloroaniline (12%), 2-chloronaphthalene (59%), dibenzofuran (57%), fluorene (57%) and 3,3'-dichlorobenzidine (8%), and the MSD had recoveries outside QC limits for hexachlorocyclopentadiene (0%), 4-chloroaniline (10%), 3-nitroaniline (30%), dibenzofuran (60%), 4-nitroaniline (32%), pentachlorophenol (7%), and 3,3'-dichlorobenzidine (4%). All relative percent difference (RPD) values were within evaluation criteria for the spiked compounds, except for hexachlorocyclopentadiene (200%), pentachlorophenol (60%) and 3,3'-dichlorobenzidine (53%).

No qualifications are made on organic MS/MSD data alone. Since the LCS and surrogate data for the validated samples were acceptable, no qualifications to the data were necessary.

Approximately ten percent of the MS/MSD recoveries and RPD values were recalculated from the raw data and no calculation errors were noted.

3.10 Internal Standards

Internal standard (IS) performance criteria ensure that the GC/MS sensitivity and response are stable during each analytical run. IS areas must be within -50 percent to +100 percent and the IS retention times must be within 30 seconds of the IS continuing calibration retention time. IS areas for the validated samples, and associated QC data in this SDG, were within evaluation criteria. All IS retention times were within criteria. The raw data were verified, and no transcription errors were noted.

3.11 Laboratory Control Samples (LCS)

A batch LCS was analyzed to assess the accuracy of the analytical process. All LCS recoveries were within evaluation criteria, with the exception of 4-chloroaniline (18%) and dibenzofuran (62%). Samples below the lower acceptance limit, but greater than 50% of the limit defined by the laboratory, required qualification as estimated, while recoveries less than 50% of the lower acceptance limit required qualification as rejected. As a result, 4-chloroaniline was qualified as rejected (**R**), and dibenzofuran was qualified as estimated non-detect (**UJ**) for sample PBOW99SSCL04.

Approximately ten percent of the spiking compound recoveries for the LCS were recalculated using the LCS summary form, and no calculation or transcription errors were noted.

3.12 Target Compound Identification and Quantitation

For validation of the compound identification, chromatograms were reviewed to verify the major peaks were identified, the spectra of the identified compounds were verified against the library spectra, and the relative retention time was no greater than 0.06 different from the associated continuing calibration retention times. No anomalies were noted with the identification of the target compounds in the samples.

For the validation of compound quantitation, approximately ten percent of the detected compounds were recalculated from the raw data. Although only 2-methylnaphthalene was reported on the sample summary form, several other target compounds were identified on the raw data forms with concentrations between the method detection limit (MDL) and the reporting limit (RL). No calculation or transcription errors were noted.

3.13 Overall Data Assessment

Based on the criteria outlined, it is recommended that the results reported for these analyses be accepted for their intended use. Acceptable levels of accuracy and precision, based on MS/MSD, LCS, and surrogate data were achieved for this SDG with the noted exceptions. In addition, completeness, defined to be the percentage of analytical results which are judged to be valid, including estimated (**J**) data, was 99 percent for the validated sample in this SDG.

4.0 FULL VALIDATION OF EXPLOSIVES DATA – SDG 140135

This section describes the full data validation for the analysis of one soil sample analyzed for explosives following SW-846 Method 8330. Quanterra Environmental Services (QES) of Knoxville, Tennessee completed the analyses. The sample included as part of this validation is listed below:

Sample Identification #
PBOW99SSCL01

The data were validated following the guidance outlined in USEPA Contract Laboratory Program National Functional Guidelines for Organic Review (USEPA 1999) where applicable to SW-846 methodologies. The evaluation criteria used during the validation were a combination of those criteria presented in Method 8330 and laboratory criteria based on historical data.

Criteria evaluated included the following method performance criteria:

- Completeness of data package
- Laboratory case narrative
- Sample preservation and holding times
- Initial calibration
- Retention Time Windows
- Calibration Verification
- Method blank contamination
- Laboratory control samples
- MS/MSD samples
- Target compound identification and quantitation
- System performance and overall assessment of data
- Transcription errors

4.1 Data Package Completeness

The data package was reviewed to make certain that it contained the data contractually required in the deliverable. This included checking the data package for the results of each analyte requested for each field sample submitted in the analytical batch, along with requested QC documentation for the respective methods. The data package was complete for this validation.

4.2 Laboratory Case Narrative

The laboratory case narrative indicated the surrogate recovery for sample PBOW99SSCL04 was above the evaluation criteria. No action was required since this

sample was not included in the validation. The surrogate compound recovery for sample PBOW99SSCL04 was addressed in the data review for the sample delivery group. In addition, the narrative indicated elevated reporting limits for 2-nitrotoluene and 4-nitrotoluene for sample PBOW99SSCL04 due to matrix interference. No additional problems were noted in the case narrative.

4.3 Sample Preservation and Holding Times

Review of the sample collection and analysis dates involved comparing the chain-of-custody and the analytical run log for accuracy, consistency, and holding time compliance. All samples were extracted within 14 days of sample collection and analyzed within 40 days of sample extraction. Therefore, no qualification of data was required.

4.4 Initial Calibration

Initial calibration criteria were established to assess whether the instrument was capable of producing acceptable qualitative and quantitative data for VOC analyses. As required by the method, the linearity of the calibration curve was established using at least five standard concentrations for each target compound. All correlation coefficients (r^2 values) were above the required 0.990, showing linearity of the calibration curve. Ten percent of the r^2 values were recalculated and compared to the raw data. No transcription or calculation errors were noted.

4.5 Retention Times

Retention time (RT) windows are crucial to the identification of target compounds. EPA SW-846 specifies the RT windows as plus or minus three standard deviations of the mean absolute retention time from the initial calibration. The laboratory established the RT window as ± 2 percent of the retention time of the midlevel calibration standard from the initial calibration. This approach was used if the samples were analyzed on the day the initial calibration was established. If the samples were not analyzed on the day the initial calibration was established, the RT windows were ± 2 percent of the RT of the associated calibration verification sample. All results for the validated sample were reported as non-detect. Review of the chromatograms indicated all peaks present were either outside the RT window or the analyte concentration was below the reporting limit. The RT windows were recalculated and no transcription or calculation errors were noted. No qualification of data was required.

4.6 Calibration Verification

Continuing calibrations were performed at the required frequency of every 12 hours of analysis. Review of continuing calibration summary form indicated that all percent differences (%Ds) met the evaluation criteria of < 15 percent.

Ten percent of the %Ds were recalculated for every continuing calibration sample and no calculation or transcription errors were noted.

4.7 Blank Samples

The purpose of the method blank samples is to evaluate the existence and magnitude of contamination problems emanating from laboratory activities. A method blank sample was analyzed as part of the analytical batch. All target analytes were reported as non-detect for the method blank sample. The chromatogram was reviewed and all peaks present were either surrogate compound peaks or detection's of target analytes below the reporting limit.

4.8 Matrix Spike/Matrix Spike Duplicate (MS/MSD) Samples

MS/MSD samples were analyzed to assess the accuracy and precision for the analyses. The laboratory spiked sample PBW99SSCL01. All MS/MSD recoveries and RPDs were within evaluation criteria presented on the MS/MSD summary forms. Approximately ten percent of the MS/MSD recoveries and RPD values were recalculated, and no calculation or transcription errors were noted.

4.9 Laboratory Control Sample (LCS)

The laboratory analyzed a laboratory control sample (LCS) as part of the analytical batch. The LCS is a laboratory prepared standard which is prepared in the same manner as the investigative samples and contains all target analytes. Review of the LCS summary form indicated all recoveries were within the evaluation criteria presented on the LCS summary forms.

Ten percent of the recoveries for the LCS were recalculated from the raw data, and no calculation or transcription errors were noted.

4.10 Surrogate Spike Recoveries

A surrogate compound (1-chloro-3-nitrobenzene) was used to evaluate the overall laboratory sample preparation efficiency on a per-sample basis. Method 8330M requires the explosive surrogate recovery to meet method acceptance criteria. The surrogate recovery for the validated sample was within the evaluation criteria of 76 to 124 percent. The surrogate recovery on the summary form was recalculated and compared to raw data; no calculation or transcription errors were noted.

4.11 Target Compound Identification and Quantitation

For validation of the compound identification, chromatograms were reviewed to verify the peaks identified as target compounds fell within the retention time. All peaks identified and quantified were within the retention time windows. As required by SW-846 Method 8330, compounds detected using the primary column were confirmed using a secondary column. The concentrations quantified from the primary column were reported in all cases. The secondary column was used for qualitative identification only. All results and reporting limits were reported on a wet weight basis.

For the validation of compound quantitation, all detected results were recalculated from the raw data, and no calculation errors were noted.

4.12 Overall Data Assessment

Based on the criteria outlined, it is recommended that the results reported for these analyses be accepted for their intended use. Acceptable levels of accuracy and precision, based on MS/MSD, LCS, and surrogate data were achieved for this SDG. In addition, completeness, defined to be the percentage of analytical results which are judged to be valid, including estimated (J) data, was 100 percent for this SDG and should be used for their intended purpose. Note that the RT windows were established using nonstandard procedures. While the methods employed to determine RT were not standard procedures, the windows do appear appropriate for proper identification since the standard compounds eluted during the windows.

5.0 FULL VALIDATION OF METALS DATA – SDG A9F140135

This section describes the full data validation for two groundwater samples, which were analyzed for metals by EPA Method 3010A/6010B and EPA Method 7470. Samples were analyzed by Quanterra Incorporated of North Canton, Ohio and submitted as part of SDG A9F140135. Per the statement of work (SOW), 10 percent of this SDG was fully validated. Samples included as part of this validation are listed below:

Sample Identification #
PBOW99SWCL01
PBOW99SWCL02

The data were validated following the guidance outlined in USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Review (USEPA 1999) where applicable to SW-846 methodologies. The evaluation criteria used during the validation were a combination of those criteria presented in Method 6010B and 7470 and laboratory criteria based on historical data.

Criteria evaluated included the following method performance criteria:

- Completeness of data package
- Laboratory case narrative
- Sample preservation and holding times
- Blank contamination
- Initial calibration verification
- Continuing calibration verification
- Laboratory control samples (LCS)
- Laboratory duplicate analysis
- Matrix spike/Matrix spike duplicate samples (MS/MSD)
- ICP serial dilution
- ICP interference check samples (ICS)
- Sample result verification
- Reporting limits

5.1 Data Package Completeness

The data package was reviewed to make certain that it contained the data contractually required in the deliverable. This included checking the data package for the results of each analyte requested for each field sample submitted in the analytical batch, along with requested QC documentation for the respective methods. The data package was complete for this validation.

5.2 Laboratory Case Narrative

The metals laboratory case narrative indicated that no quality control or data discrepancies were associated with the validated samples.

5.3 Sample Preservation and Holding Times

Review of the sample collection and analysis dates involved comparing the chain-of-custody, the sample preparation logs, the analysis run logs, and raw data forms for holding time compliance. The samples were preserved properly and analyzed within the evaluation criteria of 28 days (mercury) and 6 months (other metals). No qualification of data was required based on holding time criteria.

5.4 Blank Contamination

The purpose of blank samples was to evaluate the existence and magnitude of contamination problems emanating from laboratory activities. Initial calibration, continuing calibration, and preparation blanks associated with the validated samples were analyzed at the method recommended frequency and reported below the method detection limit for all metals with the exceptions listed below:

Blank ID	Analyte	Conc. (µg/L)	Comments
ICB	Barium	0.8	All associated samples ND
ICB	Cadmium	0.2	All associated samples ND
ICB	Chromium	0.8	All associated samples ND
CCB(b)	Barium	0.7	All associated samples ND
CCB(b)	Chromium	0.8	All associated samples ND
CCB(a)	Barium	0.8	All associated samples ND
CCB(a)	Silver	0.9	All associated samples ND

The validated sample results for barium, cadmium, chromium, and silver were reported as non-detect; therefore, no qualification of data was required. One hundred percent of the blank sample results associated with the validated samples were compared to the raw data; no transcription errors were noted.

5.5 Initial Calibration Verification

Initial calibration verification (ICV) criteria were established to assess whether the instrument was capable of producing acceptable qualitative and quantitative data for metals analyses. All ICV recoveries were within evaluation criteria and therefore no qualification was required based on ICV recoveries. One hundred percent of the ICV recoveries, associated with the validated samples, were recalculated and compared to the raw data; no calculation or transcription errors were noted.

A blank and one standard were used to establish the initial calibration curve for Method 6010B; a blank and five standards were used to establish the calibration curve for mercury. Review of the initial calibration data indicated the r^2 values were greater than 0.995 for all metals; therefore no qualification of data was required. One hundred percent

of the initial calibrations were recalculated and compared to the raw data; no calculation or transcription errors were noted.

5.6 Continuing Calibration Verification

Continuing calibration verification (CCV) criteria were established to assess whether the instrument was capable of producing acceptable qualitative and quantitative data established by the initial calibration curve. CCV samples associated with the validated samples were analyzed at the method recommended frequency and had recoveries within the evaluation criteria; therefore, no qualifications were required based on CCV recoveries. One hundred percent of the CCV sample recoveries, associated with the validated samples, were recalculated and compared to the raw data; no calculation or transcription errors were noted.

5.7 Laboratory Control Sample

Laboratory control samples (LCS) were analyzed to assess the accuracy of the analytical method and to demonstrate laboratory performance. LCS recoveries were within evaluation criteria and therefore no qualification of data was required based on LCS recoveries. One hundred percent of LCS recoveries were recalculated and compared to the raw data; no calculation or transcription errors were noted.

5.8 Laboratory Duplicate Analysis

The laboratory duplicates a sample to assess method precision at the time of analysis. The laboratory did not analyze duplicate sample pairs; however, the laboratory analyzed a matrix spike and matrix spike duplicate sample pair to assess precision, as summarized in the following section.

5.9 Matrix Spike/ Matrix Spike Duplicate Samples (MS/MSD)

Matrix Spike/Matrix Spike Duplicate samples (MS/MSD) were analyzed to assess the effects of matrix interference and precision during analysis. The laboratory spiked and analyzed a non-validated sample, A9F150184-015 in duplicate. All MS/MSD recoveries and relative percent differences (RPDs) were within the evaluation criteria; therefore, no qualification of data was required based on outlying MS/MSD recoveries or RPDs. One hundred percent of the MS/MSD recoveries were recalculated and compared to the raw data; no transcription and calculation errors were noted.

5.10 ICP Serial Dilutions

Serial dilutions were analyzed to assess the potential significant physical or chemical interference due to sample matrix. The laboratory analyzed the serial dilution on sample PBW99SWCL01. The serial dilution percent differences (%D) were within evaluation criteria; therefore, no qualifications of data was required. One hundred percent of the serial dilution %Ds were recalculated and compared to the raw data; no transcription and calculation errors were noted.

5.11 ICP Interference Check Sample

Interference check samples (ICS) were analyzed to verify the contract laboratory's interelement and background correction factors for analysis of metals by ICP. The laboratory analyzed the ICS at the beginning and end of the analytical run (or a minimum or twice per eight hour analytical run) as required by the methodology. The ICS recoveries were within evaluation criteria; therefore, no qualification of the data was required. Fifty percent of the ICS recoveries were recalculated and compared to the raw data; no transcription and calculation errors were noted.

5.12 Sample Result Verification

One hundred percent of the validated sample results were recalculated to validate that analyte quantitation was derived accurately; no calculation errors were noted. Data summary forms were reviewed and compared to the raw data package; no transcription errors were noted.

5.13 Reporting Limits

The sample-reporting limit (RL) is the lowest concentration of an analyte that can be reported by the laboratory to be present in a sample result with a specified level of confidence. The RLs are a function of the sample characteristics, method quantitation, and laboratory performance. The RLs in this SDG were not elevated.

5.14 Overall Data Assessment

Based on the criteria outlined, it is recommended that the results reported for these analyses be accepted for their intended use. Completeness, defined to be the percentage of analytical results that are judged to be valid, including estimated data (**J**), was 100 percent for this SDG.

Comment Responses

Document: **Final Report, Limited Site Inspection for the TNT Rail Car Loading Area.**
Name: **Ronald E. Nabors, Ohio EPA**

General Comment: The Ohio EPA, DERR has no comments for this document.

The Ohio EPA, DERR, is willing to conditionally accept the No Further Action recommendation for the TNT Rail Car Loading at this time. The Army Corps of Engineers must make the needed revisions to the QAPP document and resubmit the necessary pages.