Site Investigation of Acid Areas
Former Plum Brook Ordnance Works
Sandusky, Ohio

Prepared By:

IT Corporation
312 Directors Drive
Knoxville, Tennessee 37923

Submitted To:

Commander
U.S. Army Engineer District, Nashville
Post Office Box 1070
Nashville, Tennessee 37202-1070

IT Project No. 773206
Control Copy No. 17

Revision 1

December 1998

Distribution List

Control Copy Nos. 1 through 15	Mrs. Linda Ingram
Control Copy No. 16	M. Spangberg
Control Copy No. 17	S. Muffler
Control Copy No. 18	R. Ellis
Control Copy No. 19	M. McMyler
Control Copy No. 20	M. Gunderson
Control Copy No. 21	Project File

Table of Contents

Page

List of Tables iii
List of Figures iv
List of Acronyms v
1.0 Introduction 1-1
1.1 Scope of Work and Project Objectives 1-1
1.2 Site History and Potential for Contamination 1-2
1.3 Summary of Existing Site Conditions 1-2
2.0 Field Activities 2-1
2.1 Soil Borings at Acid Area No. 1 2-1
2.2 Soil Borings at Acid Area No. 2 2-2
2.3 Soil Borings at Acid Area No. 3 2-2
2.4 Background Soil Borings 2-2
2.5 Geotechnical Soil Borings 2-2
2.6 Land Surveying 2-3
2.7 Investigation-Derived Waste Management 2-3
2.8 Decontamination Procedures 2-3
2.9 Variances and Nonconformances 2-4
3.0 Analytical Program 3-1
3.1 Analytical Program and Methodologies 3-1
3.2 Blank Correction 3-2
3.3 Screening Criteria 3-2
4.0 Statistical Evaluation of Background Soil Data 4-1
4.1 Background Soil Analytical Results 4-1
4.1.1 Surface Soil 4-2
4.1.2 Subsurface Soil 4-2
4.2 Technical Approach 4-3
4.2.1 Handling of Nondetections 4-3
4.2.2 Checking Distributional Assumptions 4-4
4.2.3 Descriptions of Background Distributions 4-5
4.3 Evaluation Results 4-7
4.4 Basis for Comparison with Background 4-7

Table of Contents (Continued)

Page

4.5 Acid Area No. 1 4-7
4.6 Acid Area No. 2 4-8
4.7 Acid Area No. 3 4-8
5.0 Analytical Results 5-1
5.1 Acid Area No. 1 5-1
5.1.1 Surface Soil 5-1
5.1.2 Subsurface Soil 5-2
5.2 Acid Area No. 2 5-2
5.2.1 Surface Soil 5-3
5.2.2 Subsurface Soil 5-3
5.3 Acid Area No. 3 5-4
5.3.1 Surface Soil 5-4
5.3.2 Subsurface Soil 5-5
5.4 Geotechnical Testing Results 5-6
6.0 Conclusions and Recommendations 6-1
6.1 Conclusions 6-1
6.1.1 Acid Area No. 1 6-1
6.1.2 Acid Area No. 2 6-1
6.1.3 Acid Area No. 3 6-2
6.1.4 All Acid Areas 6-3
6.2 Recommendations 6-4
7.0 References 7-1
Appendix A - Soil Boring Logs
Appendix B - Geotechnical Testing Data
Appendix C - Land Survey Data
Appendix D - Data Quality Evaluation
Appendix E - Data Validation Summary
Appendix F - Laboratory Analytical Data Summary
Appendix G - Dames & Moore Background Data

List of Tables

Number	Title	Follows Page
2-1	Primary Soil Samples Collected from Acid Area No. 1	2-1
2-2	Primary Soil Samples Collected from Acid Area No. 2	2-2
2-3	Primary Soil Samples Collected from Acid Area No. 3, Maintenance Shop, and Power Substation	2-2
2-4	Primary Soil Samples Collected from Background Locations	2-2
2-5	Summary of Geotechnical Soil Samples Collected	2-2
3-1	Summary of Soil Analytical Parameters and Methods	3-1
4-1	Summary of Organic Analytical Results in Surface Background Soils	4-2
4-2	Summary of Metal Analytical Results in Surface Background Soils	4-2
4-3	Summary of Organic Analytical Results in Subsurface Background Soils	4-2
4-4	Summary of Metal Analytical Results in Subsurface Background Soils	4-3
4-5	Background Distributions of Metals in Soil (values in mg/kg)	4-5
4-6	Example Calculation for Estimation of Shapiro-Wilks Test Statistic (W)	4-5
4-7	Comparison of Maximum Detected Concentrations of Metals with Background Metals Data	4-7
5-1	Summary of Organic Analytical Results for Surface Soils in Acid Area No. 1	5-1
5-2	Summary of Metal Analytical Results for Surface Soils in Acid Area No. 1	5-2
5-3	Summary of Organic Analytical Results for Subsurface Soils in Acid Area No. 1	5-2
5-4	Summary of Metal Analytical Results for Subsurface Soils in Acid Area No. 1	5-2
5-5	Summary of Organic Analytical Results for Surface Soils in Acid Area No. 2	5-3
5-6	Summary of Metal Analytical Results for Surface Soils in Acid Area No. 2	5-3
5-7	Summary of Organic Analytical Results for Subsurface Soils in Acid Area No. 2	5-3
5-8	Summary of Metal Analytical Results for Subsurface Soils in Acid Area No. 2	5-4
5-9	Summary of Organic Analytical Results for Surface Soils in Acid Area No. 3	5-4
5-10	Summary of Metal Analytical Results for Surface Soils in Acid Area No. 3	5-5
5-11	Summary of Organic Analytical Results for Subsurface Soils in Acid Area No. 3	5-5
5-12	Summary of Metal Analytical Results for Subsurface Soils in Acid Area No. 3	5-6

List of Figures

Number	Title	Follows Page
1-1	Vicinity Map	1-1
1-2	Locations of Acid Areas and Other Investigative Areas	1-2
2-1	Soil Boring Locations in Acid Area No. 1	2-1
2-2	Soil Boring Locations in Acid Area No. 2	2-2
2-3	Soil Boring Locations in Acid Area No. 3 and Associated Sites	2-2
2-4	Background Soil Boring Locations	2-2
4-1	Detected Concentrations Above RBCs in Background Samples	4-2
5-1	Locations with Organic Contaminants Detected at Concentrations Above RBCs in Acid Area No. 1	5-1
5-2	Detected Metal Concentrations Above RBCs in Acid Area No. 1	5-2
5-3	Locations with Organic Contaminants Detected at Concentration Above RBCs in Acid Area No. 2	5-3
5-4	Locations with Metal Concentrations Detected Above RBCs in Acid Area No. 2	5-3
5-5	Locations with Organic Contaminants Detected at Concentration Above RBCs in Acid Area No. 3	5-4
5-6	Locations with Metal Concentrations Detected Above RBCs in Acid Area No. 3	5-5
5-7	Locations with Metal Concentrations Detected Above RBCs in MNT and PSB Areas	5-6

List of Acronyms

AA1	Acid Area No. 1
AA2	Acid Area No. 2
AA3	Acid Area No. 3
ASTM	American Society for Testing and Materials
bgs	below ground surface
COC	chemical of concern
COPC	chemical of potential concern
D&M	Dames & Moore, Inc.
DERP	Defense Environmental Restoration Program
DNT	dinitrotoluene
DOD	U.S. Department of Defense
EPA	U.S. Environmental Protection Agency
FUDS	Formerly Used Defense Sites
HI	hazard index
IDW	investigation-derived waste
IT	IT Corporation
LeRC	Lewis Research Center
µg/kg	micrograms per kilogram
mg/kg	milligrams per kilogram
MDC	maximum detected concentration
MNT	maintenance shop
NASA	National Aeronautic and Space Administration
OEPA	Ohio Environmental Protection Agency
PBOW	Plum Brook Ordnance Works
PBS	Plum Brook Station
PCB	polychlorinated biphenyl
PID	photoionization detector
PSB	Power Substation
PPE	personal protective equipment
QA/QC	quality assurance/quality control
QAPP	quality assurance project plan
RBC	risk-based concentration
SAP	sampling and analysis plan

List of Acronyms *(Continued)*

SI	site investigation
SVOC	semivolatile organic compound
TCL	target compound list
TNB	trinitrobenzene
TNT	trinitrotoluene
USACE	U.S. Army Corps of Engineers
USCS	Unified Soil Classification System
UTL	upper tolerance limit
VOC	volatile organic compound

1.0 Introduction

The U.S. Army is conducting studies of the environmental impact of suspected hazardous waste sites at previously owned U.S. Department of Defense (DOD) properties. This work is being pursued by the U.S. Army Corps of Engineers (USACE) under the Defense Environmental Restoration Program (DERP), Formerly Used Defense Sites (FUDS) funding. The former Plum Brook Ordnance Works (PBOW) in Sandusky, Ohio (Figure 1-1) is a DERP FUDS project currently being managed and technically overseen by the USACE Nashville District. IT Corporation (IT) was retained by USACE to conduct a site investigation (SI) of soils at three former Acid Areas: Acid Area No. 1 (AA1), Acid Area No. 2 (AA2), and Acid Area No. 3 (AA3), as well as the Maintenance Shop (MNT) area and the Power Substation (PSB) that are associated with AA3. In addition, the SI included the sampling of background locations to establish sitewide background concentrations for metals in soils.

1.1 Scope of Work and Project Objectives

As specified in the scope of work (USACE, 1997), SI of the Acid Areas included the preparation of site-specific addendums to the site-wide sampling and analysis plan (SAP) and safety and health plan; completion of field activities, including drilling and sampling of soil borings from selected locations for chemical analysis; evaluation of analytical results; report preparation; and a geographic information system deliverable.

The soil sampling scheme for the SI was designed to provide data that could be used to make management decisions concerning the necessity of additional study at the sites. Additionally, the collected data are of sufficient quality to support human health and ecological risk assessments, if necessary.

The overall objective of the SI was to determine the presence of potential contaminants of concern in the soils of the three Acid Areas, the MNT, and the PSB, as well as to establish sitewide soil background concentrations for metals. Specific objectives of the SI are summarized as follows:

- Determine if any chemicals of potential concern (COPC) are present in site soils at concentrations that exceed acceptable risks and thus become chemicals of concern (COC).
- Define physical site features and characteristics (soil background conditions).

- Narrow the focus of future sampling (if necessary) to specific COCs.

1.2 Site History and Potential for Contamination

The PBOW site was operated from early 1941 to 1945 as a manufacturing plant for 2,4,6-trinitrotoluene (TNT), dinitrotoluene (DNT), and pentolite. Production of explosives began in December 1941 and continued until 1945. After the plant was shut down, decontamination of TNT, acid, pentolite, and DNT processing lines began; decontamination was completed in the 1960s in accordance with DOD standards at that time. The property was initially transferred to the Ordnance Department, then to the War Assets Administration after it was certified by the U.S. Army to be decontaminated. In 1949, PBOW was transferred to the General Services Administration. The National Aeronautics and Space Administration (NASA) acquired the PBOW in 1963 and is presently utilizing the site as the Plum Brook Station (PBS) of NASA's Lewis Research Center (LeRC). The NASA LeRC is located in Cleveland, Ohio.

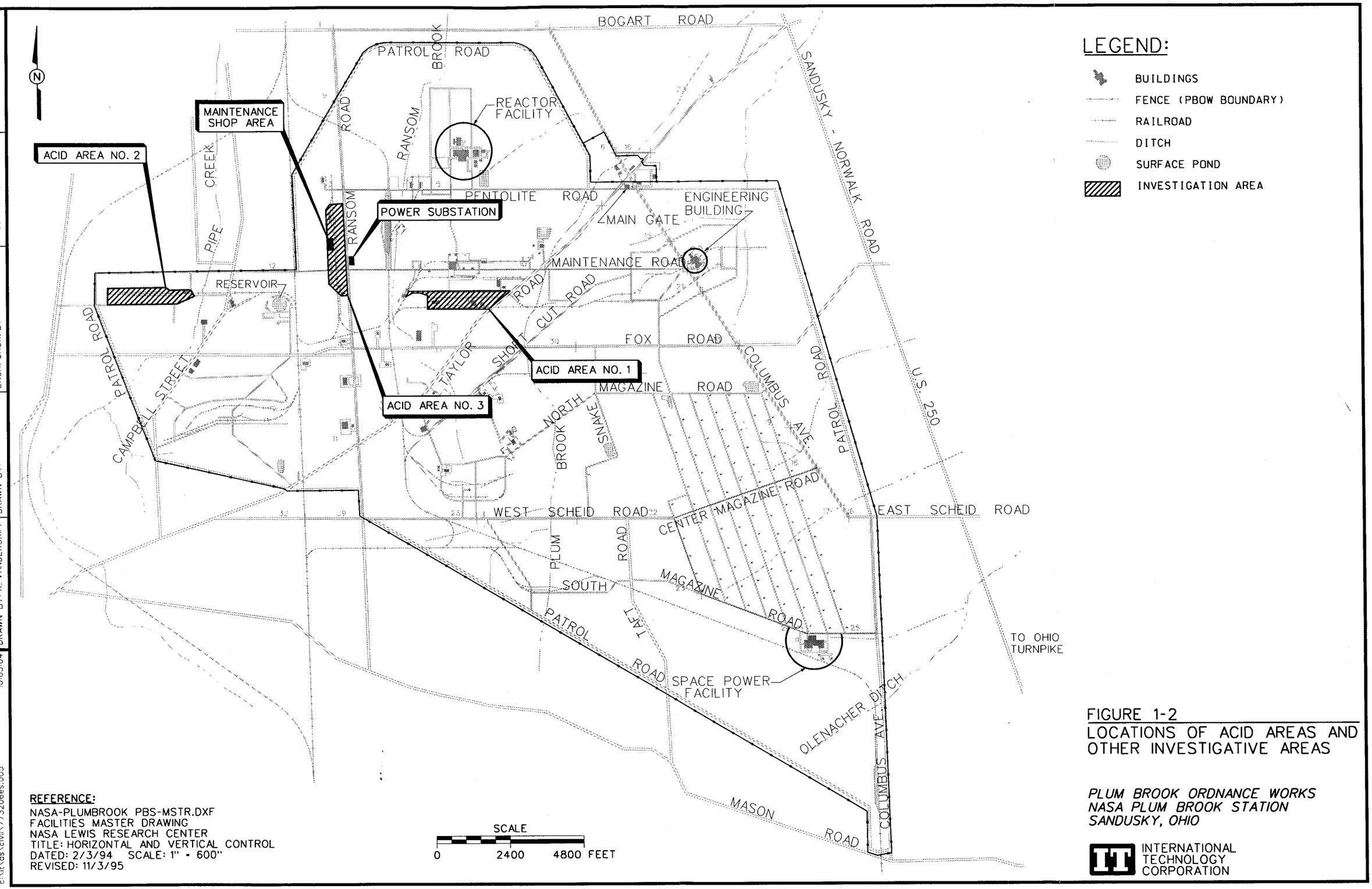
1.3 Summary of Existing Site Conditions

The three formerly used Acid Areas, the MNT, and the PSB are located as shown in Figure 1-2. The Acid Areas were used to produce oleum and nitric acid for the manufacture of TNT. In November 1997, IT conducted a records review for the three acid areas and no previous investigations at these locations were found.

The records review included review of all available historical drawings and a 1-day site walk-over to locate old buildings and process lines. Most of the buildings and process lines were no longer in place and the Acids Areas are covered with trees and bushes. The records review findings were used in the placement of soil borings.

AA1 is located south of the NASA Shipping and Receiving building (NASA Building No. 9209) and is bordered on the east by Taylor Road. AA2 is located between Patrol Road and Campbell Street at the northwest corner of the facility. AA3 is located north of Fox Road and is bordered on the east by Ransom Road in the northwest portion of the facility. Two other areas investigated are associated with AA3: the MNT (Building No. 809), located in the west central portion of AA3, and the PSB, located across Ransom Road and east of Building No. 808. All targeted investigation areas are readily accessible by vehicle.

Two hydrolithologic units are known to exist at the PBOW site. The overburden unit, composed of glacial outwash materials, has a thickness ranging from a few feet in the south to greater than



REFERENCE:
NASA-PLUMBROOK PBS-MSTR.DXF
FACILITIES MASTER DRAWING
NASA LEWIS RESEARCH CENTER
TITLE: HORIZONTAL AND VERTICAL CONTROL
DATED: 2/3/94 SCALE: 1" = 600"
REVISED: 11/3/95

FIGURE 1-2
LOCATIONS OF ACID AREAS AND OTHER INVESTIGATIVE AREAS

PLUM BROOK ORDNANCE WORKS
NASA PLUM BROOK STATION
SANDUSKY, OHIO

INTERNATIONAL TECHNOLOGY CORPORATION

STARTING DATE: 12/18/97	DATE LAST REV.:	DRAFT. CHCK. BY: C. TUMLIN	INITIATOR: G. YU
DRAWN BY: R. VANDERGRIFF	DRAWN BY:	ENGR. CHCK. BY: G. YU	PROJ. MGR.: SPANGBERG

DWG. NO.: 3206es.005
PROJ. NO.: 773206

22 DEC 98 10:05:04
bvanderg
c:\it\as\civil\773206es.005

Two hydrolithologic units are known to exist at the PBOW site. The overburden unit, composed of glacial outwash materials, has a thickness ranging from a few feet in the south to greater than 40 feet in some locations in the north. The bedrock unit consists of Devonian limestone and shale that dip to the southeast at approximately 35 feet per mile.

Two monitoring wells were installed at each Acid Area in September 1997 as part of the sitewide groundwater investigation (IT, 1997a). Groundwater samples collected during the investigation indicate that several metals were commonly found in the overburden and bedrock water-bearing zones at concentrations exceeding the screening levels. However, organic compounds, including benzene and methylene chloride, were detected at concentrations exceeding the screening levels only in the bedrock water-bearing zone. Results of the groundwater investigation are not presented herein; however, they may be referenced in the Annual Groundwater Report to be issued in January 1999.

In general, groundwater flows in a northerly direction, towards Lake Erie, in both the unconsolidated overburden material and consolidated bedrock. On the western side of the site, groundwater in the overburden water-bearing zone flows to the northwest, while groundwater in the bedrock aquifer flows to the northeast.

2.0 Field Activities

Field activities at the Acids Areas, MNT, PSB, and background locations included soil borings with surface and subsurface soil sample collection, a land survey, and investigation-derived waste (IDW) management. A total of 53 surface and 51 subsurface soil samples for chemical analysis were collected, along with the required quality assurance/quality control (QA/QC) and 6 geotechnical samples. Both surficial and subsurface soil samples were collected from locations within the former Acid Areas. Additionally, 6 soil borings were sampled (surface and subsurface) to fill spatial data gaps in establishing background metal concentrations. Field activities for the Acid Areas SI began on April 27 and continued until May 3, 1998. A representative of the Nashville district of the USACE field approved the boring locations.

Soil borings were advanced using a CME-450 drill rig mounted on an all-terrain vehicle. Soil samples for chemical analysis were collected using 3-by-24-inch stainless-steel split spoons through the center of a hollow-stem auger. Soil samples were visually inspected for color, moisture content, lithology, texture, and other pertinent features and these observations were recorded on drilling logs (ENG Form 5056-R), which are included in Appendix A. Continuous air monitoring in both the breathing zone and the borehole was performed using a photoionization detector (PID). The subsurface soil sample interval selected was usually the interval with the highest reading on the PID. Soil samples collected by IT field personnel were documented through the use of Analysis Request/Chain of Custody Record forms (Figure 6-2 of the sampling and analysis plan [SAP] {IT, 1996a}) following field custody procedures specified in Section 5.1 of the quality assurance project plan (QAPP) (IT, 1996b). After collection, all sample locations were land surveyed.

2.1 Soil Borings at Acid Area No. 1

A total of 15 soil borings were installed at AA1 (AA1-SB01 through AA1-SB15), with 2 discrete samples (1 surface and 1 subsurface sample) collected from each boring location, as summarized in Table 2-1 and shown on Figure 2-1. In addition, two boring locations (AA1-SB02 and -SB05) were selected for the collection of two geotechnical samples each at discrete intervals. Surface soil samples were collected from 0.5 to 1.5 feet below ground surface (bgs) (0 to 1 foot into the native soil) and subsurface samples were collected at various depth intervals between 2 and 10 feet bgs based on primarily on PID readings.

Table 2-1

Primary Soil Samples Collected from Acid Area No. 1
Site Investigation of Acid Areas
Former Plum Brook Ordnance Works, Sandusky, Ohio

Soil Sample Identification	Soil Boring Identification[a]	Date of Collection	Sample Depth (feet bgs)[b]
PBOW-98-AA1-SB01-6010-(0.5-1.5)	AA1-SB01	4/30/98	0-1
PBOW-98-AA1-SB01-6020-(8.0-10)			8.0-10.0
PBOW-98-AA1-SB02-6030-(0.5-1.5)	AA1-SB02	4/30/98	0-1
PBOW-98-AA1-SB02-6040-(6.0-8.0)			6.0-8.0
PBOW-98-AA1-SB03-6050-(0.5-1.5)	AA1-SB03	4/29/98	0-1
PBOW-98-AA1-SB03-6060-(6.0-8.0)			6.0-8.0
PBOW-98-AA1-SB04-6070-(0.5-1.5)	AA1-SB04	4/29/98	0-1
PBOW-98-AA1-SB04-6080-(8.0-10)			8.0-10.0
PBOW-98-AA1-SB05-6090-(0.5-1.5)	AA1-SB05	4/30/98	0-1
PBOW-98-AA1-SB05-6100-(6.0-8.0)			6.0-8.0
PBOW-98-AA1-SB06-6110-(0.5-1.5)	AA1-SB06	4/29/98	0-1
PBOW-98-AA1-SB06-6120-(6.0-8.0)			6.0-8.0
PBOW-98-AA1-SB07-6130-(0.5-1.5)	AA1-SB07	4/29/98	0-1
PBOW-98-AA1-SB07-6140-(2.0-4.0)			2.0-4.0
PBOW-98-AA1-SB08-6150-(0.5-1.5)	AA1-SB08	4/29/98	0-1
PBOW-98-AA1-SB08-6160-(2.0-4.0)			2.0-4.0
PBOW-98-AA1-SB09-6170-(0.5-1.5)	AA1-SB09	4/30/98	0-1
PBOW-98-AA1-SB09-6180-(2.0-4.0)			2.0-4.0
PBOW-98-AA1-SB10-6190-(0.5-1.5)	AA1-SB10	4/30/98	0-1
PBOW-98-AA1-SB10-6200-(4.0-6.0)			4.0-6.0
PBOW-98-AA1-SB11-6210-(0.5-1.5)	AA1-SB11	4/30/98	0-1
PBOW-98-AA1-SB11-6220-(4.0-6.0)			4.0-6.0
PBOW-98-AA1-SB12-6230-(0.5-1.5)	AA1-SB12	4/30/98	0-1
PBOW-98-AA1-SB12-6240-(2.0-4.0)			2.0-4.0
PBOW-98-AA1-SB13-6250-(0.5-1.5)	AA1-SB13	4/29/98	0-1
PBOW-98-AA1-SB13-6260-(2.0-4.0)			2.0-4.0
PBOW-98-AA1-SB14-6270-(0.5-1.5)	AA1-SB14	4/29/98	0-1
PBOW-98-AA1-SB14-6280-(8.0-10)			8.0-10.0
PBOW-98-AA1-SB15-6290-(0.5-1.5)	AA1-SB15	4/29/98	0-1
PBOW-98-AA1-SB15-6300-(8.0-10)			8.0-10.0

[a] Soil boring locations are shown in Figure 2-1.

[b] Sample depth interval for surface soil was measured from the top of the native soil. A 0.5-foot top soil (vegetation) was not sampled.

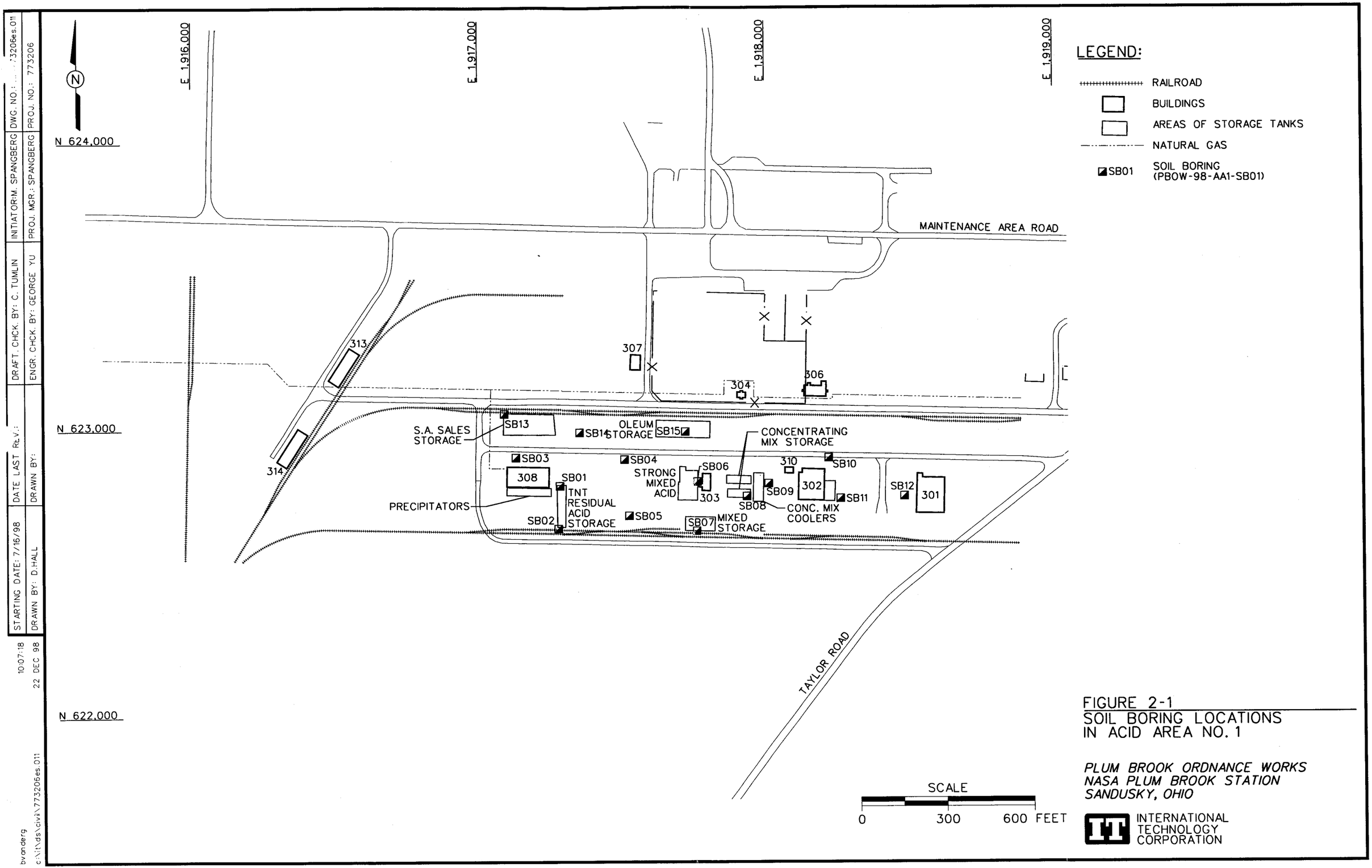


FIGURE 2-1
SOIL BORING LOCATIONS
IN ACID AREA NO. 1

PLUM BROOK ORDNANCE WORKS
NASA PLUM BROOK STATION
SANDUSKY, OHIO

STARTING DATE: 7/16/98 | DATE LAST REV.: | DRAFT. CHCK. BY: C. TUMLIN | INITIATOR: M. SPANGBERG | DWG. NO.: 3206es.011
DRAWN BY: D.HALL | DRAWN BY: | ENGR. CHCK. BY: GEORGE YU | PROJ. MGR.: SPANGBERG | PROJ. NO.: 773206

10:07:18 22 DEC 98
bvanderg
c:\it\ds\civil\773206es.011

2.2 Soil Borings at Acid Area No. 2

A total of 15 soil borings were installed at AA2 (AA2-SB01 through AA2-SB15), with 2 discrete samples (1 surface and 1 subsurface sample) collected from each boring location as summarized in Table 2-2 and shown on Figure 2-2. In addition, 2 boring locations (AA2-SB08 and -SB12) were selected for the collection of 2 geotechnical samples each at discrete intervals.

2.3 Soil Borings at Acid Area No. 3

A total of 18 soil borings were installed at AA3 (AA3-SB01 through AA3-SB15) and associated MNT area (MNT-SB01 through MNT-SB03), with 2 discrete samples (1 surface and 1 subsurface sample) collected from each boring location. In addition, 2 surface soil samples (PSB-SS01 and PSB-SS02) were collected from the area believed to be the location of a former power substation. Soil samples collected from AA3 are summarized in Table 2-3 and sample locations are shown on Figure 2-3. Two boring locations in AA3 (AA3-SB09 and -SB10) were selected for the collection of 2 geotechnical samples each at discrete intervals.

2.4 Background Soil Borings

The placement of background soil borings was based upon review of previous background soil boring locations installed by Dames & Moore, Inc. ([D&M], 1996) in areas thought to be unaffected by former DOD and/or NASA activities, and in locations where data gaps were identified. All six background soil borings were located along Patrol Road, which marks the PBOW facility boundary, where soils are believed to be least affected by PBOW operations and/or by post-DOD activities. These locations were jointly selected by the USACE and IT, with assistance provided by NASA PBS personnel during the on-site kick-off meeting held on April 23, 1998. The Ohio Environmental Protection Agency (OEPA) also concurred on the selection of these locations. Two discrete samples were obtained at each background location from the depth interval exhibiting lithological variations. Table 2-4 summarizes the background soil samples collected during the present investigation while locations of background borings are presented in Figure 2-4, including those background soil borings placed by D&M in 1994.

2.5 Geotechnical Soil Borings

Geotechnical samples were collected to determine the geotechnical nature of the unconsolidated lithological units. Four geotechnical samples representing as diverse soil materials as possible were obtained from each Acid Area (Table 2-5). The sampling location and depth interval for each geotechnical sample was determined by the IT field geologist, based on visual inspection of soil materials.

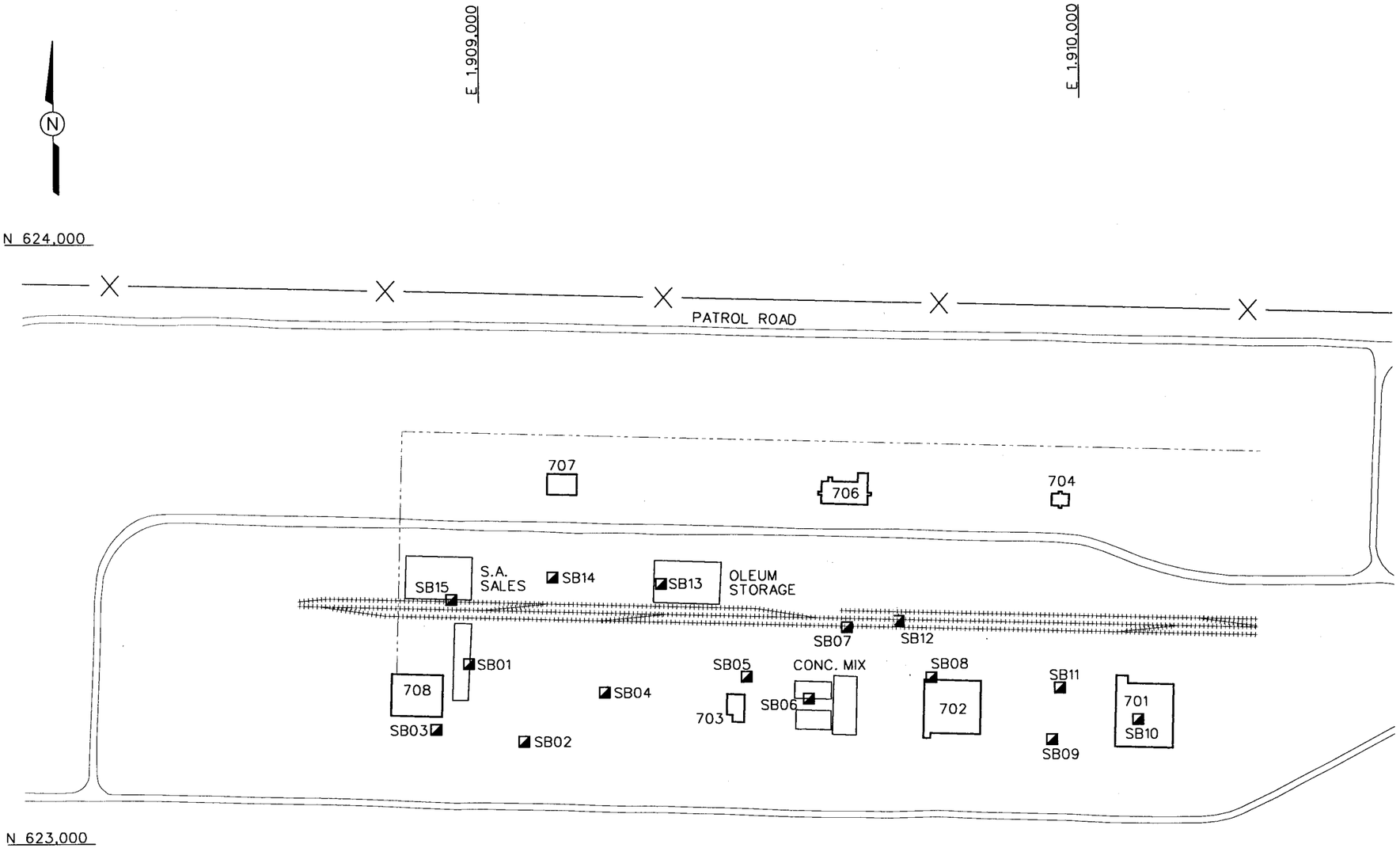
Table 2-2

Primary Soil Samples Collected from Acid Area No. 2
Site Investigation of Acid Areas
Former Plum Brook Ordnance Works, Sandusky, Ohio

Soil Sample Identification	Soil Boring Identification[a]	Date of Collection	Sample Depth (feet bgs)[b]
PBOW-98-AA2-SB01-6310-(0.5-1.5)	AA2-SB01	4/27/98	0-1
PBOW-98-AA2-SB01-6320-(6.0-8.0)			6.0-8.0
PBOW-98-AA2-SB02-6330-(0.5-1.5)	AA2-SB02	4/28/98	0-1
PBOW-98-AA2-SB02-6340-(2.0-4.0)			2.0-4.0
PBOW-98-AA2-SB03-6350-(0.0-1.0)	AA2-SB03	4/27/98	0-1
PBOW-98-AA2-SB03-6360-(4.0-6.0)			4.0-6.0
PBOW-98-AA2-SB04-6370-(0.5-1.5)	AA2-SB04	4/27/98	0-1
PBOW-98-AA2-SB04-6380-(8.0-10)			8.0-10.0
PBOW-98-AA2-SB05-6390-(0.5-1.5)	AA2-SB05	4/28/98	0-1
PBOW-98-AA2-SB05-6400-(4.0-6.0)			4.0-6.0
PBOW-98-AA2-SB06-6410-(0.5-1.5)	AA2-SB06	4/28/98	0-1
PBOW-98-AA2-SB06-6420-(4.0-5.5)			4.0-5.5
PBOW-98-AA2-SB07-6430-(0.5-1.5)	AA2-SB07	4/28/98	0-1
PBOW-98-AA2-SB07-6440-(4.0-6.0)			4.0-6.0
PBOW-98-AA2-SB08-6450-(0.5-1.5)	AA2-SB08	4/28/98	0-1
PBOW-98-AA2-SB08-6460-(6.0-8.0)			6.0-8.0
PBOW-98-AA2-SB09-6470-(0.5-1.5)	AA2-SB09	4/28/98	0-1
PBOW-98-AA2-SB09-6480-(4.0-6.0)			4.0-6.0
PBOW-98-AA2-SB10-6490-(0.5-1.5)	AA2-SB10	4/28/98	0-1
PBOW-98-AA2-SB10-6500-(8.0-10)			8.0-10.0
PBOW-98-AA2-SB11-6510-(0.5-1.5)	AA2-SB11	4/28/98	0-1
PBOW-98-AA2-SB11-6520-(2.0-4.0)			2.0-4.0
PBOW-98-AA2-SB12-6530-(0.5-1.5)	AA2-SB12	4/28/98	0-1
PBOW-98-AA2-SB12-6540-(6.0-8.0)			6.0-8.0
PBOW-98-AA2-SB13-6550-(0.5-1.5)	AA2-SB13	4/27/98	0-1
PBOW-98-AA2-SB13-6560-(2.0-4.0)			2.0-4.0
PBOW-98-AA2-SB14-6570-(0.5-1.5)	AA2-SB14	4/27/98	0-1
PBOW-98-AA2-SB14-6580-(4.0-6.0)			4.0-6.0
PBOW-98-AA2-SB15-6590-(0.5-1.5)	AA2-SB15	4/27/98	0-1
PBOW-98-AA2-SB15-6600-(2.0-4.0)			2.0-4.0

[a] Soil boring locations are shown in Figure 2-2.

[b] Sample depth interval for surface soil was measured from the top of the native soil. A 0.5-foot top soil (vegetation) was not sampled.



LEGEND:

- RAILROAD
- BUILDINGS
- AREA OF STORAGE TANKS
- NATURAL GAS
- SB01 SOIL BORING (PBOW-98-AA2-SB01)

FIGURE 2-2
SOIL BORING LOCATIONS
IN ACID AREA NO. 2

PLUM BROOK ORDNANCE WORKS
NASA PLUM BROOK STATION
SANDUSKY, OHIO

SCALE
0 200 400 FEET

INTERNATIONAL TECHNOLOGY CORPORATION

STARTING DATE: 7/16/98	DATE LAST REV.:
DRAWN BY: D.HALL	DRAWN BY:
DRAFT. CHCK. BY: C. TUMLIN	INITIATOR: M. SPANGBERG
ENGR. CHCK. BY: GEORGE YU	PROJ. MGR.: SPANGBERG
DWG. NO.: 3206es.012	
PROJ. NO.: 773206	

10:10:36 22 DEC 98
bvanderg
c:\it\ds\civil\773206es.012

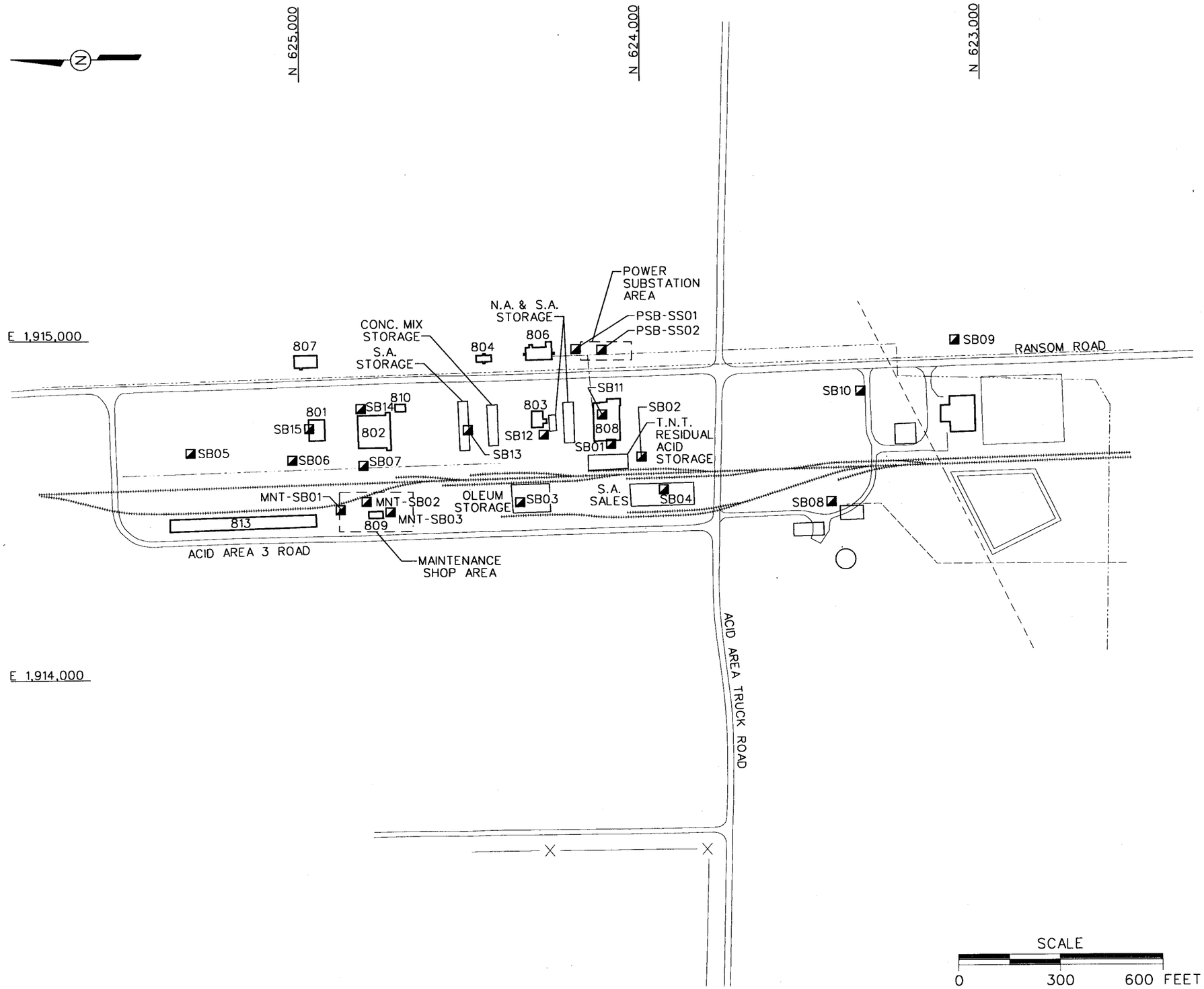
Table 2-3

Primary Soil Samples Collected from Acid Area No. 3, Maintenance Shop, and Power Substation Site Investigation of Acid Areas Former Plum Brook Ordnance Works, Sandusky, Ohio

Soil Sample Identification	Soil Boring Identification[a]	Date of Collection	Sample Depth (feet bgs)[b]
Acid Area No. 3			
PBOW-98-AA3-SB01-6610-(0.5-1.5)	AA3-SB01	5/3/98	0-1
PBOW-98-AA3-SB01-6620-(6.0-8.0)			6.0-8.0
PBOW-98-AA3-SB02-6630-(0.5-1.5)	AA3-SB02	5/1/98	0-1
PBOW-98-AA3-SB02-6640-(6.0-8.0)			6.0-8.0
PBOW-98-AA3-SB03-6650-(0.5-1.5)	AA3-SB03	5/1/98	0-1
PBOW-98-AA3-SB03-6660-(6.0-8.0)			6.0-8.0
PBOW-98-AA3-SB04-6670-(0.5-1.5)	AA3-SB04	5/1/98	0-1
PBOW-98-AA3-SB04-6680-(8.0-10)			8.0-10.0
PBOW-98-AA3-SB05-6690-(0.5-1.5)	AA3-SB05	5/1/98	0-1
PBOW-98-AA3-SB05-6700-(8.0-10)			8.0-10.0
PBOW-98-AA3-SB06-6710-(0.5-1.5)	AA3-SB06	5/1/98	0-1
PBOW-98-AA3-SB06-6720-(4.0-6.0)			4.0-6.0
PBOW-98-AA3-SB07-6730-(0.5-1.5)	AA3-SB07	5/1/98	0-1
PBOW-98-AA3-SB07-6740-(2.0-4.0)			2.0-4.0
PBOW-98-AA3-SB08-6750-(0.5-1.5)	AA3-SB08	5/1/98	0-1
PBOW-98-AA3-SB08--6760-(4.0-6.0)			4.0-6.0
PBOW-98-AA3-SB09-6770-(0.5-1.5)	AA3-SB09	5/2/98	0-1
PBOW-98-AA3-SB09-6780-(8.0-10)			8.0-10.0
PBOW-98-AA3-SB10-6790-()0.5-1.5	AA3-SB10	5/2/98	0-1
PBOW-98-AA3-SB10-6800-(6.0-8.0)			6.0-8.0
PBOW-98-AA3-SB11-6810-(0.5-1.5)	AA3-SB11	4/30/98	0-1
PBOW-98-AA3-SB11-6820-(2.0-4.0)			2.0-4.0
PBOW-98-AA3-SB12-6830-(0.5-1.5)	AA3-SB12	5/1/98	0-1
PBOW-98-AA3-SB12-6840-(2.0-4.0)			2.0-4.0
PBOW-98-AA3-SB13-6850-(0.5-1.5)	AA3-SB13	5/1/98	0-1
PBOW-98-AA3-SB13-6860-(8.0-10)			8.0-10.0
PBOW-98-AA3-SB14-6870-(0.5-1.5)	AA3-SB14	5/1/98	0-1
PBOW-98-AA3-SB14-6880-(2.0-4.0)			2.0-4.0
PBOW-98-AA3-SB15-6890-(0.5-1.5)	AA3-SB15	5/1/98	0-1
PBOW-98-AA3-SB15-6900-(6.0-8.0)			6.0-8.0
Maintenance Shop Area			
PBOW-98-MNT-SB01-6910-(0.5-1.5)	MNT-SB01	5/3/98	0-1
PBOW-98-MNT-SB01-6920-(4.0-6.0)			4.0-6.0
PBOW-98-MNT-SB02-6930-(0.5-1.5)	MNT-SB02	5/2/98	0-1
PBOW-98-MNT-SB02-6940-(2.0-4.0)			2.0-4.0
PBOW-98-MNT-SB03-6950-(0.5-1.5)	MNT-SB03	5/2/98	0-1
PBOW-98-MNT-SB03-6960-(6.0-8.0)			6.0-8.0
Power Substation			
PBOW-98-PSB-SS01-6970-(0.0-1.0)	PSB-SS01	5/3/98	0-1
PBOW-98-PSB-SS02-6980-(0.0-1.0)	PSB-SS02	5/2/98	0-1

[a] Soil boring locations are shown in Figure 2-3.

[b] Sample depth interval for surface soil was measured from the top of the native soil. A 0.5-foot top soil (vegetation) was not sampled.



LEGEND:

- RAILROAD
- BUILDINGS
- AREA OF STORAGE TANKS
- NATURAL GAS
- RAW WATER
- EVAPORATOR LINES
- FORMER SEWER LINE
- SB01 SOIL BORING

FIGURE 2-3
SOIL BORING LOCATIONS IN ACID AREA NO. 3 AND ASSOCIATED SITES

PLUM BROOK ORDNANCE WORKS
NASA PLUM BROOK STATION
SANDUSKY, OHIO

INTERNATIONAL TECHNOLOGY CORPORATION

DRAFT. CHCK. BY: C. TUMLIN	INITIATOR: M. SPANGBERG	DWG. NO.:	3206es.013
ENGR. CHCK. BY: GEORGE YU	PROJ. MGR.: SPANGBERG	PROJ. NO.:	773206
DATE LAST REV.:			
DRAWN BY:			
STARTING DATE: 7/16/98			
DRAWN BY: D.HALL			

10:12:29
22 DEC 98
bvanderg
c:\it\ads\civil\773206es.013

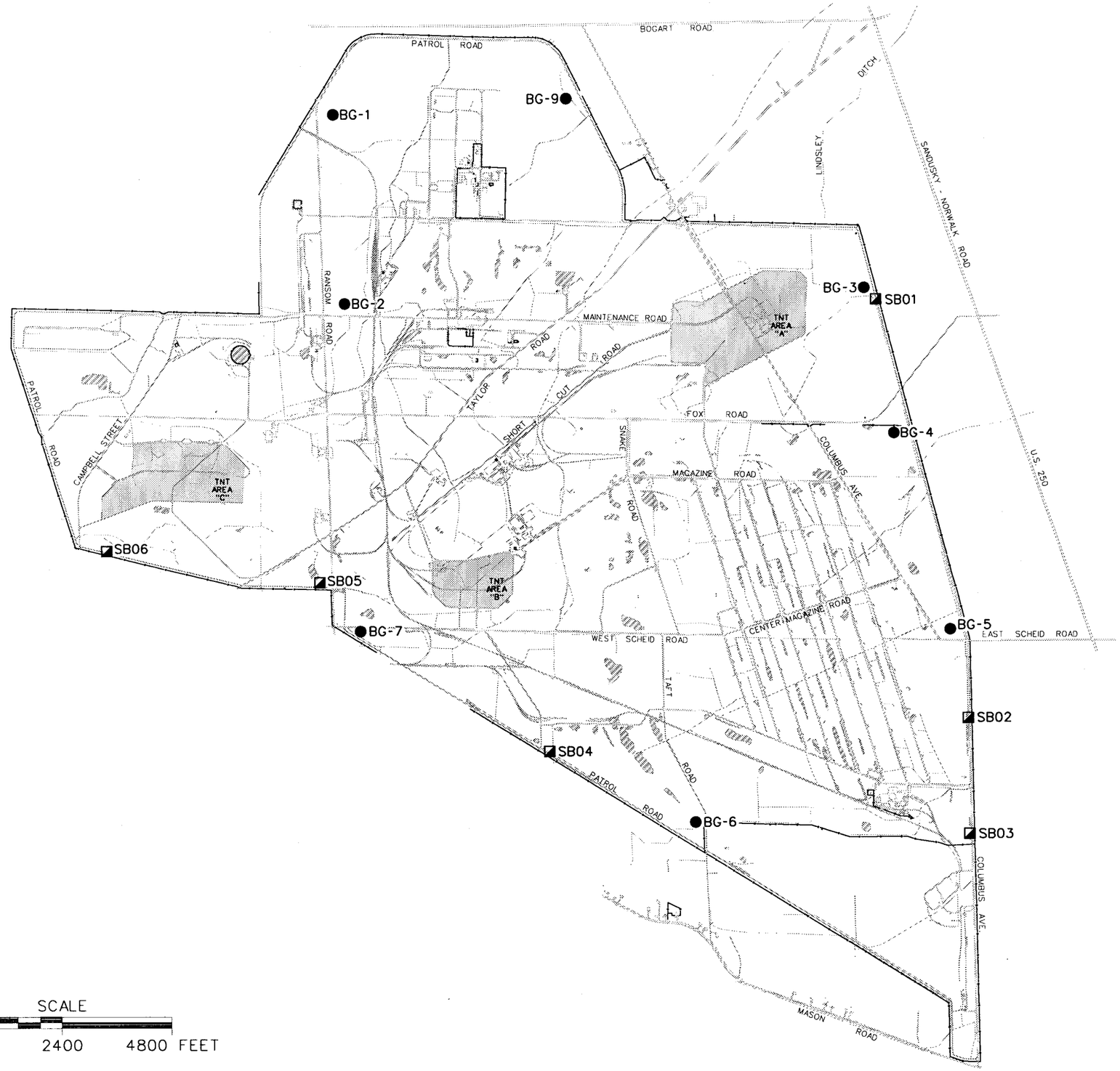
Table 2-4

Primary Soil Samples Collected from Background Locations
Site Investigation of Acid Areas
Former Plum Brook Ordnance Works, Sandusky, Ohio

Background Soil Sample Identification	Soil Boring Identification[a]	Date of Collection	Sample Depth (feet)[b]
PBOW-98-BK-SB01-6990-(0.5-1.5)	BCG-SB01	5/3/98	0-1
PBOW-98-BK-SB01-7000-(4.0-5.5)		5/3/98	4-5.5
PBOW-98-BK-SB02-7010-(0.5-1.5)	BCGSB02	5/2/98	0-1
PBOW-98-BK-SB02-7020-(2.0-4.0)		5/2/98	2.0-4.0
PBOW-98-BK-SB03-7030-(0.5-1.5)	BCG-SB03	5/2/98	0-1
PBOW-98-BK-SB03-7040-(6.0-8.0)		5/2/98	6.0-8.0
PBOW-98-BK-SB04-7050-(0.5-1.5)	BCG-SB04	5/2/98	0-1
PBOW-98-BK-SB04-7060-(2.0-4.0)		5/2/98	2.0-4.0
PBOW-98-BK-SB05-7070-(0.5-1.5)	BCG-SB05	5/3/98	0-1
PBOW-98-BK-SB05-7080-(4.0-6.0		5/3/98	4.0-6.0
PBOW-98-BK-SB06-7090-(0.5-1.5)	BCG-SB06	5/2/98	0-1
PBOW-98-BK-SB06-7100-(6.0-7.0)		5/2/98	6.0-7.0

[a] Background soil boring locations are shown in Figure 2-4.

[b] Sample depth interval for surface soil was measured from the top of the native soil. A 0.5-foot top soil (vegetation) was not sampled.



LEGEND:

- BUILDINGS
- FENCE (PBOW BOUNDARY)
- RAILROAD
- DITCH
- SURFACE POND
- SB01 — BACKGROUND SOIL SAMPLE LOCATION (PBOW-98-BCG-SB01)
- BG-1 — APPROXIMATE LOCATION OF DAMES & MOORE BACKGROUND BORING

FIGURE 2-4

BACKGROUND SOIL BORING LOCATIONS

PLUM BROOK ORDNANCE WORKS
NASA PLUM BROOK STATION
SANDUSKY, OHIO

INTERNATIONAL TECHNOLOGY CORPORATION

DRAFT. CHCK. BY: C. TUMLIN	INITIATOR: G. YU	DWG. NO.: 3206es.014	
ENGR. CHCK. BY: G. YU	PROJ. MGR.: SPANGBERG	PROJ. NO.: 773206	
STARTING DATE: 7/16/98	DATE LAST REV.:		
DRAWN BY: D.HALL	DRAWN BY:		

22 DEC 98 10:14:02

c:\it\ds\civil\773206es.014

bvanderg

Table 2-5

Summary of Geotechnical Soil Samples Collected
Site Investigation of Acids Areas
Former Plum Brook Ordnance Works, Sandusky, Ohio

Geotechnical Sample Identification	Soil Boring Identification[a]	Sample Depth (feet bgs)[b]
Acid Area No. 1		
PBOW-98-AA1-SB02-Geot-(2.0-4.0)	AA1-SB02	2.0-4.0
PBOW-98-AA1-SB02-Geot-(4.0-6.0)		4.0-6.0
PBOW-98-AA1-SB05-Geot-(2.0-4.0)	AA1-SB05	2.0-4.0
PBOW-98-AA1-SB05-Geot-(4.0-6.0)		4.0-6.0
Acid Area No. 2		
PBOW-98-AA2-SB08-Geot-(2.0-4.0)	AA2-SB08	2.0-4.0
PBOW-98-AA2-SB08-Geot-(4.0-6.0)		4.0-6.0
PBOW-98-AA2-SB12-Geot-(2.0-4.0)	AA2-SB12	2.0-4.0
PBOW-98-AA2-SB12-Geot-(4.0-6.0)		4.0-6.0
Acid Area No. 3		
PBOW-98-AA3-SB09-Geot-(2.0-4.0)	AA3-SB09	2.0-4.0
PBOW-98-AA3-SB09-Geot-(4.0-6.0)		4.0-6.0
PBOW-98-AA3-SB10-Geot-(2.0-4.0)	AA3-SB10	2.0-4.0
PBOW-98-AA3-SB10-Geot-(4.0-6.0)		4.0-6.0

[a] Soil boring locations are shown in Figures 2-1, 2-2, 2-3, respectively.
[b] Below ground surface. Sampling depths are measured from ground surface.

Geotechnical samples were collected using a thin-walled metal tube to recover relatively undisturbed soil samples from a boring location, following procedures described in American Society for Testing and Materials (ASTM) D 1587-94. Briefly, a thin-walled metal tube (shelby tube) was pressed into the soil using a drill rig, the soil-filled tube was removed, and both ends of the tube were sealed to prevent the soil from being disturbed or losing moisture. Samples were sent to the laboratory in the sealed tube for moisture content, grain size distribution, and Atterberg limits testing, as well as Unified Soil Classification System (USCS). The geotechnical testing results indicate that the predominant overburden material is silt and silty clay with some rock fragments. Appendix B presents the geotechnical testing results.

2.6 Land Surveying

A land survey was conducted at all boring locations to establish coordinates and elevation of soil borings by a professional land surveyor registered in the State of Ohio. The elevation of each boring location was surveyed to the closest 0.01 foot and referenced to the 1988 North American Vertical Datum. Horizontal coordinates were surveyed to the closest 0.01 foot and referenced to the Ohio State Plane Coordinate System (North Zone). The survey data are included in Appendix C.

2.7 Investigation-Derived Waste Management

IDW generated during the SI was limited to used personal protective equipment (PPE) and decontamination fluid. The decontamination fluids, which included wash water, nonphosphate soapy water, and final rinse water, were kept in plastic tubs during the decontamination process, and were placed in 55-gallon drums upon completion of field sampling. Decontamination fluid containing small quantities of solvents such as methanol or hexane were collected in metal pans for evaporation. PPE was wrapped in double plastic bags and placed in drums. IDW drums were labeled to indicate project name, date collected, and contents. They were then stored on pallets in the staging area located east of the Building 9201 north of Pentolite Road pending disposal. Recommendations concerning disposition of these IDW drums will be provided under separate cover to the USACE and OEPA.

2.8 Decontamination Procedures

Decontamination requirements and procedures specified in detail in Chapter 5.0 of the SAP (IT, 1996a) were followed during the current investigation. A decontamination station was constructed next to a storage building (Red Barn) off Campbell Street in the western portion of the facility. This area was made available by PBS for use in support of the field investigation.

Potable water used for decontamination was obtained from the PBS fire station, which receives water from Erie County. The following test summarizes decontamination procedures for sampling equipment before site entry, between borings, and before site departure:

For equipment (drill rig and augers) used not in contact with analytical samples:

- Steam-rinse with potable water, or wash and scrub using a brush with nonphosphate detergent, and then rinse with potable water.

For equipment used to collect analytical samples:

- Wash and scrub using a brush with nonphosphate detergent.
- Rinse with potable water.
- Rinse with deionized water (ASTM Type II water).
- Rinse with methanol.
- Final rinse with deionized water. The volume of water used will be at least five times greater than the volume of methanol used.
- Air dry.
- Wrap in aluminum foil.

Six equipment rinsate samples were collected and analyzed for the same parameters as the primary soil samples. The results did not indicate any contamination that may have been introduced during the equipment decontamination process.

2.9 Variances and Nonconformances

No variances or noconformances were recorded during this field sampling event.

3.0 Analytical Program

All primary soil samples for chemical analysis were analyzed by Quanterra laboratory located in Knoxville, Tennessee. Wet chemistry data was analyzed by Quanterra's Tampa, Florida laboratory. The analytical data packages were submitted by the laboratory to the IT data management group for input into the IT Environmental Management System™ database in accordance with the QAPP (IT, 1996b). Chemical data were evaluated by the IT project chemist for conformance with the QA/QC protocols during the field sampling and laboratory analysis of the samples. It was determined that there were no significant problems observed that would adversely affect the usability of the data. Appendix D presents the data quality evaluation in its entirety. Data validation was performed by E&I Technologies located in Oak Ridge, Tennessee and the results are presented in Appendix E. The laboratory analytical data packages, including the data summary, and risk-based concentration (RBC) comparison summary, are included in Appendix F.

3.1 Analytical Program and Methodologies

The analytical program was designed to acquire sufficient and defensible data to determine whether or not soils in the investigated areas exhibit impact from past land use.

All soil samples were analyzed for target compound list (TCL) volatile organic compounds (VOC), TCL semivolatile organic compounds (SVOC), and target analyte list metals as summarized in Table 3-1. In addition, soil samples collected from selected areas were analyzed for polychlorinated biphenyls (PCB) (surface samples only), nitroaromatic compounds (TNT acid tank and background samples only), and inorganic constituents such as nitrate and sulfate as well as pH (excluding samples from MNT and PSB areas) as specified in Tables 2-1 through 2-4 of the site-specific sampling and analysis plan (IT, 1998). Laboratory QC procedures and data quality requirements are specified in and referenced to appropriate sections of the QAPP (IT, 1996b).

Because the Acid Areas were not used in the manufacture of explosives but rather to produce acids in support of the explosives production, nitroaromatic compounds or explosive residues were not expected in site media. However, each Acid Area received residual acids from the manufacturing process, and this residual acid may have contained nitroaromatic constituents. Therefore, soil samples collected around the former residual TNT acid tanks were also sampled for nitroaromatic compounds.

Table 3-1

Summary of Soil Analytical Parameters and Methods
Site Investigation of Acid Areas
Former Plum Brook Ordnance Works, Sandusky, Ohio

Analytical Parameters	Analytical Method
TCL Volatile Organic Compounds	EPA SW-846 8260A[a]
TCL Semivolatile Organic Compounds	EPA SW-846 3540B/8270B[a]
TAL Metals	SW-846 3050A 3050A/6010A[b] for Ag, Al, As, Ba, Be, Ca, Cd, Co, Cr, Cu, Fe, K, Mg, Mn, Na, Ni, Pb, Sb, Se, Tl, V, Zn 7471A[a] for Hg
PCBs	EPA SW-846 8081
Nitroaromatic Compounds	EPA SW-846/8330[c]
pH	EPA SW-846 9045B
Nitrate	EPA SW-846 9056
Sulfate	EPA SW-846 9056

[a] Test Method for Evaluating Solid Waste, Physical/Chemical Methods, 3rd Edition, update II September 1994.
[b] Test Method for Evaluating Solid Waste, Physical/Chemical Methods, 3rd Edition, update I July 1992.
[c] Test Method for Evaluating Solid Waste, Physical/Chemical Methods, 3rd Edition, Revision 1 December 1990.
TAL - Target analyte list.
TCL - Target compound list.

3.2 Blank Correction

As a function of the data validation process, the analytical data generated by the soil investigation were evaluated in regard to the results in associated field blanks, equipment rinsates, trip blanks, and laboratory method blanks. The method blank results reported with the analytical data were evaluated for high readings characteristic of background or process contamination. There were no significant concentrations detected in the designated blank samples that indicate any analytical process out of control or requiring further corrective action.

3.3 Screening Criteria

The analytical data obtained from the SI at the Acid Areas have been screened against RBCs derived from the published U.S. Environmental Protection Agency (EPA) Region III tables (EPA, 1998). RBCs are media-specific contaminant levels used to reduce the list of site-related chemicals carried through all the steps of the COPCs selection and quantitative risk assessment. RBCs have been conservatively derived by assuming a residential receptor, applying high-end values for most of the exposure variables, and setting the target cancer risk at 10^{-6} and the target hazard index (HI) at 0.1. The cancer risk of 10^{-6} reflects the lower end of the target risk range as defined in the National Contingency Plan (EPA, 1990). The HI of 0.1 provides additional protection from noncancer effects arising from exposure to multiple chemicals. Chemicals present in environmental media at concentrations below the RBCs will not contribute significantly to total site risk.

RBCs were obtained preferentially from the EPA Region III tables compiled for this purpose (EPA, 1998). No attempt was made to develop RBCs for ubiquitous, nutritionally essential elements unlikely to be toxic at concentrations ordinarily found in environmental media and for which toxicity values are unavailable (i.e., calcium, magnesium, potassium, and sodium). RBCs used in the screening data are presented in Chapter 4.0 tables and Appendix F.

Residential rather than commercial/industrial RBCs were used as the more conservative screening concentrations for contaminants in site soils. The use of RBCs as screening criteria is consistent with previous soil investigations at PBOW (IT, 1996; D&M, 1997; IT 1997b).

4.0 Statistical Evaluation of Background Soil Data

This chapter contains the statistical evaluation on sitewide background data focusing on metal constituents in site soils, along with the statistical methodology used to compare background metals data with site-specific data. The purpose of this analysis is to re-evaluate sitewide background concentrations for various metal constituents that were established by D&M (1997), using the additional data acquired from this investigation. The D&M (1997) background data is presented in Appendix G. Note that the background comparison of metal constituents is limited to those with concentrations exceeding RBCs as presented in Chapter 5.0, since metals present below RBCs are not considered to pose unacceptable risk to humans and the environment. In the evaluation of sitewide background soil data, the raw data obtained by D&M (1997) were combined with the data of present investigation to increase the sample size. The evaluation follows the procedure and guidelines specified in related EPA publications (EPA, 1989, 1992). Section 4.1 presents a summary of the background data used in the evaluation and Section 4.2 presents the technical approach for carrying out the evaluation. Section 4.3 discusses the results of the statistical evaluation while, Section 4.4 shows the comparisons of detected metal concentrations in three Acid Areas to the background data.

4.1 Background Soil Analytical Results

A total of six soil borings were installed in preselected locations to establish sitewide background concentrations for metal constituents. One surface and one subsurface soil sample were collected from each boring and were analyzed for VOCs, SVOCs, explosives, PCBs (surface soil only), metals, nitrate, and sulfate. The following paragraphs discuss the detected constituents in these background soils by chemical group. The background data presented in the following sections are believed to be representative of natural soil conditions. Nevertheless, soil background data were compared against RBCs to facilitate comparison of the sitewide background data against screening levels used in this report. RBC exceedances within the background data set, especially metals, do not invalidate the usefulness of these data as background measurements. A statistical evaluation of metals concentrations in the background samples is presented in Sections 4.2 through 4.7.

4.1.1 Surface Soil

Volatile Organic Compounds. VOCS were not detected in any of the six surface soil samples collected in background borings.

Semivolatile Organic Compounds. A suite of 12 SVOCs was detected in BCG-SB02, with one compound (benzo(a)pyrene, 400 micrograms per kilogram [µg/kg]) exceeding the RBC of 88 µg/kg (Figure 4-1). The detected SVOCs are believed to be from common asphaltic road materials or runoff associated with Patrol Road. From a qualitative comparison between the organic constituents detected and the corresponding metals concentrations in BCG-SB02, no elevation of metal concentration is apparent. Therefore, the metals concentrations in this sample were used in the background evaluation. The remaining 5 background samples exhibited no detection of any SVOCs as summarized in Table 4-1.

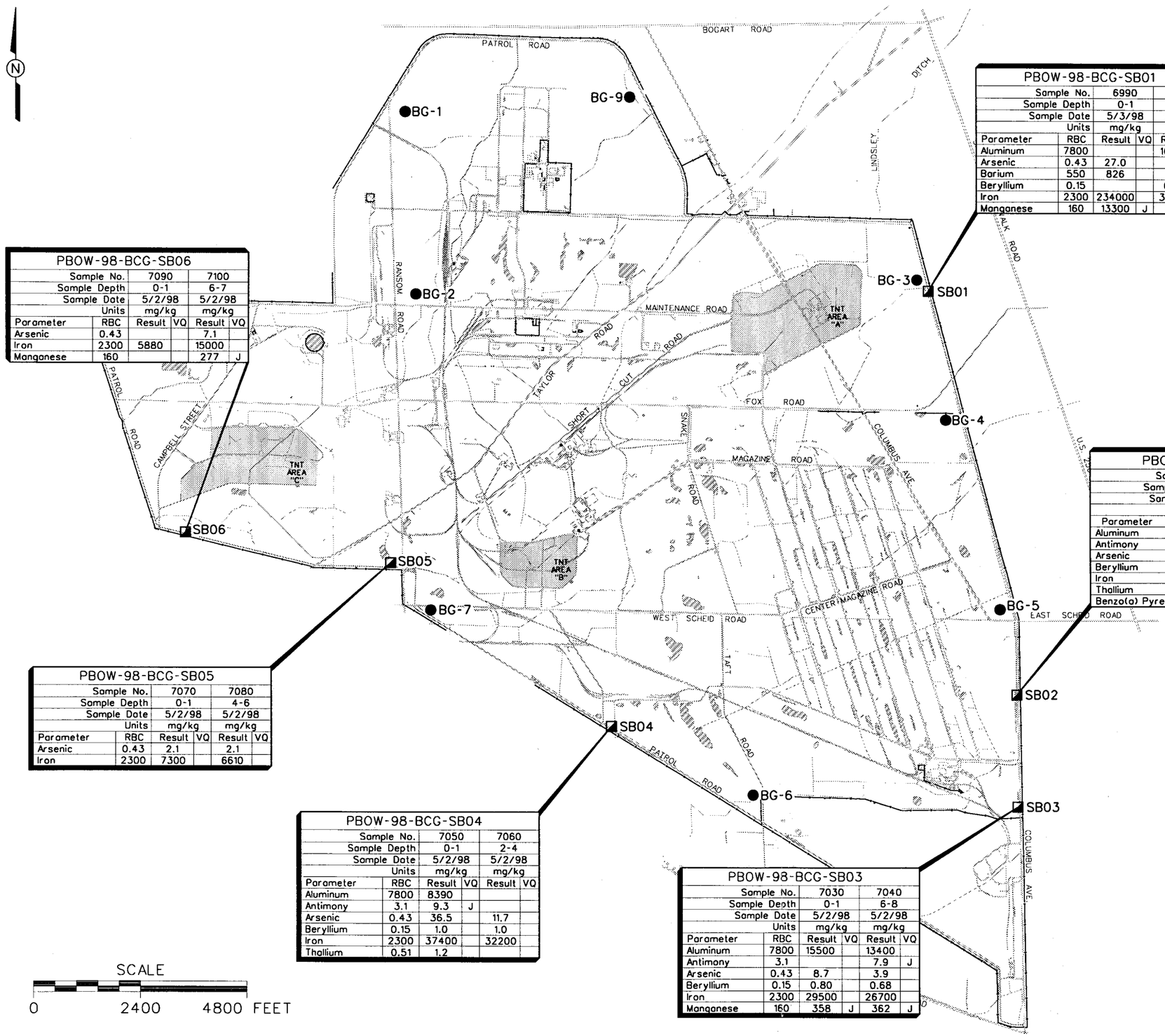
Explosives. Explosive compounds were not detected in any surface soil samples collected from the background borings.

PCBs. PCBs were not detected in any surface soil samples collected from the background borings.

Metals. A suite of 18 metals was present in surface soil samples from the background locations as summarized in Table 4-2. Of these, 8 metals were detected at concentrations exceeding their respective RBCs at least once (Figure 4-1). The metals exceeding RBCs included aluminum, antimony, arsenic, barium, beryllium, iron, manganese, thallium. Other detected metals with concentrations below the respective RBCs include chromium, cobalt, copper, lead, mercury, nickel, selenium, silver, vanadium, and zinc.

4.1.2 Subsurface Soil

Volatile Organic Compounds. Four VOCs were detected in subsurface soil samples from selective locations as summarized in Table 4-3. However, the detected concentrations were all below the respective RBCs. These VOCs were not detected in any surface soil samples from the same borings as discussed under surface soils.



PBOW-98-BCG-SB01					
Sample No.		6990		7000	
Sample Depth		0-1		4-6	
Sample Date		5/3/98		5/3/98	
	Units	mg/kg		mg/kg	
Parameter	RBC	Result	VQ	Result	VQ
Aluminum	7800			10400	
Arsenic	0.43	27.0		16.8	
Barium	550	826			
Beryllium	0.15			0.57	
Iron	2300	234000		34200	
Manganese	160	13300	J	771	J

PBOW-98-BCG-SB06					
Sample No.		7090		7100	
Sample Depth		0-1		6-7	
Sample Date		5/2/98		5/2/98	
	Units	mg/kg		mg/kg	
Parameter	RBC	Result	VQ	Result	VQ
Arsenic	0.43			7.1	
Iron	2300	5880		15000	
Manganese	160			277	J

PBOW-98-BCG-SB02					
Sample No.		7010		7020	
Sample Depth		0-1		2-4	
Sample Date		5/2/98		5/2/98	
	Units	mg/kg		mg/kg	
Parameter	RBC	Result	VQ	Result	VQ
Aluminum	7800	9270		11100	
Antimony	3.1			7.8	J
Arsenic	0.43	5.2		15.5	
Beryllium	0.15			0.67	
Iron	2300	17700		35000	
Thallium	0.51			1.3	
Benzo(a) Pyrene	0.088	0.4	J		

PBOW-98-BCG-SB05					
Sample No.		7070		7080	
Sample Depth		0-1		4-6	
Sample Date		5/2/98		5/2/98	
	Units	mg/kg		mg/kg	
Parameter	RBC	Result	VQ	Result	VQ
Arsenic	0.43	2.1		2.1	
Iron	2300	7300		6610	

PBOW-98-BCG-SB04					
Sample No.		7050		7060	
Sample Depth		0-1		2-4	
Sample Date		5/2/98		5/2/98	
	Units	mg/kg		mg/kg	
Parameter	RBC	Result	VQ	Result	VQ
Aluminum	7800	8390			
Antimony	3.1	9.3	J		
Arsenic	0.43	36.5		11.7	
Beryllium	0.15	1.0		1.0	
Iron	2300	37400		32200	
Thallium	0.51	1.2			

PBOW-98-BCG-SB03					
Sample No.		7030		7040	
Sample Depth		0-1		6-8	
Sample Date		5/2/98		5/2/98	
	Units	mg/kg		mg/kg	
Parameter	RBC	Result	VQ	Result	VQ
Aluminum	7800	15500		13400	
Antimony	3.1			7.9	J
Arsenic	0.43	8.7		3.9	
Beryllium	0.15	0.80		0.68	
Iron	2300	29500		26700	
Manganese	160	358	J	362	J

LEGEND:

- BUILDINGS
- FENCE (PBOW BOUNDARY)
- RAILROAD
- DITCH
- SURFACE POND
- SB01 BACKGROUND SOIL SAMPLE LOCATION (PBOW-98-BCG-SB01)
- BG-1 APPROXIMATE LOCATION OF DAMES & MOORE BACKGROUND BORING

FIGURE 4-1

DETECTED CONCENTRATIONS ABOVE RBCs IN BACKGROUND SAMPLES

PLUM BROOK ORDNANCE WORKS
NASA PLUM BROOK STATION
SANDUSKY, OHIO

INTERNATIONAL TECHNOLOGY CORPORATION

DWG. NO.: 3206es.015
PROJ. NO.: 773206
INITIATOR: G. YU
PROJ. MGR.: SPANGBERG
DRAFT. CHCK. BY: C. TUMLIN
ENGR. CHCK. BY: G. YU
DATE LAST REV.:
DRAWN BY:
STARTING DATE: 7/16/98
DRAWN BY: D.HALL
22 DEC 98 10:23:07
bvanderg
c:\it\ds\civil\773206es.015

Table 4-1

Summary of Organic Analytical Results in Surface Background Soils
Site Investigation of Acid Areas
Former Plum Brook Ordnance Works, Sandusky, Ohio

	Sample Location:	BCG-SB01		BCG-SB02		BCG-SB03		BCG-SB04		BCG-SB05		BCG-SB06	
	Sample No:	6990		7010		7030		7050		7070		7090	
	Sample Date:	3-May-98		2-May-98		2-May-98		2-May-98		2-May-98		2-May-98	
	Depth (feet):	0-1		0-1		0-1		0-1		0-1		0-1	
	Units:	µg/kg		µg/kg		µg/kg		µg/kg		µg/kg		µg/kg	
SEMIVOLATILES	RBCs (µg/kg)[a]	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
ACENAPHTHYLENE	470,000			110	J[b]								
ANTHRACENE	2,300,000			65	J								
BENZO(a)ANTHRACENE	880			360	J								
BENZO(a)PYRENE	88			400	J								
BENZO(b)FLUORANTHENE	880			480									
BENZO(ghi)PERYLENE	8,800			240	J								
BENZO(k)FLUORANTHENE	8,800			410									
CHRYSENE	88,000			370	J								
FLUORANTHENE	310,000			570									
INDENO(1,2,3-cd)PYRENE	880			240	J								
PHENANTHRENE	31,000			130	J								
PYRENE	230,000			450									

[a] Risk-based concentrations for residential soil taken from EPA, 1998, risk-based concentration table.
[b] J qualifier. Analyte present. Reported value may not be accurate or precise.
Note 1: Shading indicates concentration exceeds RBC.
Note 2: Blank cells indicate that compound was analyzed for, but was not detected unless otherwise noted.

Table 4-2

Summary of Metal Analytical Results in Surface Background Soils
Site Investigation of Acid Areas
Former Plum Brook Ordnance Works, Sandusky, Ohio

	Sample Location:	BCG-SB01		BCG-SB02		BCG-SB03		BCG-SB04		BCG-SB05		BCG-SB06	
	Sample No:	6990		7010		7030		7050		7070		7090	
	Sample Date:	3-May-98		2-May-98		2-May-98		2-May-98		2-May-98		2-May-98	
	Depth (feet):	0-1		0-1		0-1		0-1		0-1		0-1	
	Units:	mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg	
METALS	RBCs (mg/kg)[a]	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
ALUMINUM	7,800	7590		9270		15500		8390		6050		4680	
ANTIMONY	3.1							9.3	J[b]				
ARSENIC	0.43	27		5.2		8.7		36.5		2.1			
BARIUM	550	826		65.1		97.8		79.8					
BERYLLIUM	0.15					0.8		1					
CHROMIUM	39			15.4	J	25.7	J	10.4	J	7.9	J	4.4	J
COBALT	470	116		9.6		19.5		21.6					
COPPER	310	30.1		14.4		25.3		56.2		3.9			
IRON	2,300	234000		17700		29500		37400		7300		5880	
LEAD	400	48.6		7.9		11.1		21.8		3.2		1.9	
MANGANESE	160	13300	J	104	J	358	J	87.8	J	147	J	25.3	J
MERCURY	2.3	0.085						0.085					
NICKEL	160	55.1		17.2		34.1		22.8		8.4		5.4	
SELENIUM	39			0.82				2					
SILVER	39	11.1											
THALLIUM	0.51							1.2					
VANADIUM	55			23.7	J	39	J	40.9	J	14.4	J	9	J
ZINC	2,300	655		51.6		65.3		34.6		26.3		13.7	

[a] Risk-based concentrations for residential soil taken from EPA, 1998, risk-based concentration table.

[b] J qualifier. Analyte present. Reported value may not be accurate or precise.

Note 1: Shading indicates concentration exceeds RBCs.

Note 2: Blank cells indicate that compound was analyzed for, but was not detected unless otherwise noted.

Table 4-3

Summary of Organic Analytical Results in Subsurface Background Soils
Site Investigation of Acid Areas
Former Plum Brook Ordnance Works, Sandusky, Ohio

	Sample Location:	BCG-SB01		BCG-SB02		BCG-SB03		BCG-SB04		BCG-SB05		BCG-SB06	
	Sample No:	7000		7020		7040		7060		7080		7100	
	Sample Date:	3-May-98		2-May-98		2-May-98		2-May-98		2-May-98		2-May-98	
	Depth (feet):	4-6		2-4		6-8		2-4		4-6		6-7	
	Units:	µg/kg		µg/kg		µg/kg		µg/kg		µg/kg		µg/kg	
VOLATILES	RBCs (µg/kg)[a]	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
ACETONE	780,000					9	J[b]					8.5	J
CARBON DISULFIDE	780,000					1.6	J					4.4	J
METHYLENE CHLORIDE	85,000							7.1	J				
TOLUENE	1,600,000							2.6	J				
SEMIVOLATILES													
PHENANTHRENE	31,000											46	J

[a] Risk-based concentrations for residential soil taken from EPA, 1998, risk-based concentration table.

[b] J qualifier. Analyte present. Reported value may not be accurate or precise.

Note 1: Blank cells indicate that compound was analyzed for, but was not detected unless otherwise noted.

Semivolatile Organic Compounds. One SVOC (phenanthrene) was detected in BCG-SB06 at an estimated concentration of 46 µg/kg, which was below the RBC of 31,000 µg/kg (Table 4-3). Other samples exhibited no detection of any SVOCs. Unlike the surface soil sample collected from BCG-SB02, where twelve SVOCs were present (Figure 4-1), the subsurface soil from the same boring exhibited no detection of any SVOC.

Explosives. Explosive compounds were not detected in any subsurface background soil samples.

Metals. A suite of 16 metals was present in subsurface soil samples from the background locations as summarized in Table 4-4. Of them, 7 metals were detected at concentrations higher than their respective RBCs at least once (Figure 4-1). The metals exceeding RBCs included aluminum, antimony, arsenic, beryllium, iron, manganese, and thallium. Other metals detected at concentrations below the respective RBCs include barium, chromium, cobalt, copper, lead, nickel, selenium, vanadium, and zinc.

4.2 Technical Approach

Background concentrations of naturally occurring metals in soil form a distribution of values over a given spatial area. The characterization of background can be defined as the process of describing the statistical distribution of concentration values from samples obtained at representative locations. The statistical methodology used here to establish background distributions of metals in soil is based on published OEPA guidance (OEPA, 1991) and EPA guidance (EPA, 1989, 1992). The following key issues are addressed in the background characterization methodology:

- Handling of nondetects
- Checking distributional assumptions
- Calculation of summary statistics.

The following sections explain how these key issues are addressed, followed by the results of the background calculations for 19 metals in soil.

4.2.1 Handling of Nondetections

A certain proportion of nondetections are common in background data sets. A variety of methods to deal with nondetections have been proposed, each of which has advantages and disadvantages with respect to introducing unwanted bias into the description of background. The

Table 4-4

Summary of Metal Analytical Results in Subsurface Background Soils
Site Investigation of Acid Areas
Former Plum Brook Ordnance Works, Sandusky, Ohio

	Sample Location:	BCG-SB01		BCG-SB02		BCG-SB03		BCG-SB04		BCG-SB05		BCG-SB06	
	Sample No:	7000		7020		7040		7060		7080		7100	
	Sample Date:	3-May-98		2-May-98		2-May-98		2-May-98		2-May-98		2-May-98	
	Depth (feet):	4-6		2-4		6-8		2-4		4-6		6-7	
	Units:	mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg	
METALS	RBCs (mg/kg)[a]	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
ALUMINUM	7,800	10400		11100		13400		6830		3520		4430	
ANTIMONY	3.1			7.8	J[b]	7.9	J						
ARSENIC	0.43	16.8		15.5		3.9		11.7		2.1		7.1	
BARIUM	550	48.3		47.7		107		45.4				35.6	
BERYLLIUM	0.15	0.57		0.67		0.68		1					
CHROMIUM	39	16.4	J	20.1	J	24.7	J	10.9	J	7.7	J	9.2	J
COBALT	470	22		18.5		16.5		25.2				12.8	
COPPER	310	30.7		19.2		19.1		43.4		4.8		18.6	
IRON	2,300	34200		35000		26700		32200		6610		15000	
LEAD	400	12		8.9		7		12.4		2.8		7.4	
MANGANESE	160	771	J	149	J	362	J	118	J	68.7	J	277	J
NICKEL	160	43.9		27.1		27.7		47.6		8		23.6	
SELENIUM	39	0.61		0.68				1.2					
THALLIUM	0.51			1.3									
VANADIUM	55	22.6	J	37.2	J	30.4	J	20.2	J	14.4	J	15.3	J
ZINC	2,300	88.9		64.6		60.7		81		23.7		45.8	

[a] Risk-based concentrations for residential soil taken from EPA, 1998, risk-based concentration table.
[b] J qualifier. Analyte present. Reported value may not be accurate or precise.
Note 1: Shading indicates concentration exceeds RBC.
Note 2: Blank cells indicate that compound was analyzed for, but was not detected unless otherwise noted.

Table 4-5

Background Distributions of Metals in Soil (values in mg/kg)
Site Investigation of Acid Areas
Former Plum Brook Ordnance Works, Sandusky, Ohio

Metal	Number of Samples	Percent Nondetect	Distribution Type	Minimum	Maximum	Mean	Standard Deviation	Median	95th Percentile	95% UTL[a]
Aluminum	12	0	Lognormal	3,520	15,500	8,430	3,687	7,990	NA	26,879
Antimony	25	64.0	Nonparametric	<5.4	9.3	4.68	2.10	<7.4	7.88	NA
Arsenic	26	11.5	Lognormal	<1.2	36.5	10.8	8.62	8.55	NA	70.8
Barium	12	25.0	Nonparametric	<23.2	826	116	226	48	431	NA
Beryllium	25	76.0	Nonparametric	<0.57	<1.2	0.56	0.18	<1.1	0.96	NA
Cadmium	25	100	Nonparametric	<0.57	<1.2	0.45	0.13	<1.1	<1.2	NA
Chromium	26	3.8	Lognormal	4.4	29	13.4	6.33	13	NA	36.0
Cobalt	12	25.0	Nonparametric	<5.8	116	22.6	30.5	17.5	66.1	NA
Copper	26	11.5	Lognormal	<2.2	56.2	17.0	15.0	14.2	NA	147
Iron	12	0	Lognormal	5,880	234,000	40,124	62,173	28,100	NA	358,040
Lead	26	0	Lognormal	1.9	48.6	12.8	9.7	11	NA	51.2
Manganese	26	0	Lognormal	21	13,300	729	2,571	153	NA	3,494
Mercury	26	92.3	Nonparametric	<0.037	<0.3	0.09	0.059	<0.27	0.149	NA
Nickel	25	0	Lognormal	5.4	55.1	23.4	12.8	22.8	NA	78.205
Selenium	25	80.0	Nonparametric	<0.57	<4.9	1.55	0.90	<4.3	2.39	NA
Silver	26	96.2	Nonparametric	<1.1	11.1	1.00	2.1	<1.2	<1.97	NA
Thallium	25	96.0	Nonparametric	<1.1	<6.1	1.91	1.1	<5.4	<6.0	NA
Vanadium	12	8.3	Lognormal	9	<61.7	24.8	10.7	23.15	NA	83.1
Zinc	26	0	Lognormal	6.6	655	73.0	124	45.4	NA	321

[a]UTL - Upper tolerance limit.

EPA guidance for dealing with nondetections (EPA, 1989) was used for this study, which was to replace nondetections with a value equal to one-half of the practical quantitation limit for that analyte.

One sample (BCG-SB01) has detection limit values for several metals (antimony, beryllium, cadmium, selenium, and thallium) that are much higher than the other samples. These high nondetect values were deleted from the data sets. This results in the reduction of background values for the relevant metals and would preclude the introduction of a potentially high bias as the result of an elevated detection limit.

4.2.2 Checking Distributional Assumptions

The specific statistical procedures used to analyze the data and the parameters used to describe background distributions are all dependent on the type of distributions. The selection of an appropriate type of statistical distribution for describing background concentrations in this report is based on the guidance provided by EPA (1989, 1992). This guidance recommends that environmental concentration data first be tested for a lognormal distribution because trace element data generally follow this type of distribution (EPA, 1992). Lognormality is tested by taking the logarithm (log-transform) of the data and testing for normality. If lognormality cannot be demonstrated, then normality testing is performed on the untransformed data. If neither a normal nor a lognormal distribution can be demonstrated, then nonparametric techniques are used to describe the distributions. Nonparametric techniques do not require that the data follow any particular type of distribution.

The EPA recommends several statistical procedures for determining whether the distribution of concentration data is normal or lognormal (EPA, 1992). On such recommended procedure, the Shapiro-Wilks is used to determine the distribution of the data sets. The Shapiro-Wilks test is considered one of the best tests of normality available (EPA, 1992). The Shapiro-Wilks normality test is based on the premise that if a data set is normally distributed, the ordered values should be highly correlated with corresponding quantiles taken from a normal distribution The software package STATISTICA™ is used perform the Shapiro-Wilks normality test. STATISTICA™ return a Shapiro-Wilks test statistic (W). The test-statistic W is calculated as follows (EPA, 1992):

$$W = \frac{\left[\sum_i m_i X_{(i)}\right]^2}{(n-1)SD^2 \sum_i m_i^2} \qquad \text{Eq. 4.1}$$

where:

m_i	=	denotes the approximate expected value of the ith-ordered normal quantile
$X_{(I)}$	=	the ith-ordered value of the sample, in increasing order
SD	=	standard deviation
n	=	number of samples.

The values for m_i can be approximately computed using the equation:

$$m_i = \Phi^{-1}\left(\frac{i}{n+1}\right) \qquad \text{Eq. 4.2}$$

where:

Φ^{-1} denotes the inverse of the standard normal distribution with zero mean and unit variance. Φ^{-1} are computed using a normal probability table or a software package.

If $W < W_{0.95}$, where $W_{0.95}$ is the tabulated critical value (EPA, 1992) at a 0.05 level of significance the hypothesis that the data is normally distributed should be rejected. A significance level of 0.05 indicates an acceptable fit to a normal model at the 95th-percent confidence level, or in other words, there is only a one-in-twenty chance of falsely identifying the distribution as normal when it really is not. If $W \geq W_{0.95}$ then it is assumed that the data are approximately normally distributed for purposes of further statistical analysis. Lognormality is tested by taking the logarithm (log-transform) of the data and testing for normality. If the data set fits both normal and lognormal distributions, the distribution with the greater W statistic is selected because the W test-statistic tends to be large for a better-fit.

The outputs of the W-statistics from the software package STATISTICA, the $W_{0.95}$ critical values (EPA, 1992) and distribution selection process for the data sets tested are presented in Table 4-5. Data sets with greater than 15 percent nondetects are automatically treated as nonparametric distributions as per EPA (1989) guidance. A example calculation for estimating the W-statistic on the aluminum data set is presented in Table 4-6.

4.2.3 Descriptions of Background Distributions

A complete description of a background distribution includes the range of values (minimum and maximum); some measure of the central tendency (arithmetic mean, geometric mean, or median); some measure of the dispersion of the data (standard deviation, variance, or coefficient of variation); and some estimation of the upper range of the data (upper tolerance limit [UTL] or

Table 4-6

Example Calculation for Estimation of Shapiro-Wilks Test Statistic (W)
Site Investigation of Acid Areas
Former Plum Brook Ordnance Works, Sandusky, Ohio

x_i	m_i	$m_i x_i$	m_i^2
Aluminum Data			
3520	-1.4260786	-5019.8	2.0337
4430	-1.02007562	-4518.93	1.040554
4680	-0.73631554	-3445.96	0.542161
6050	-0.502402	-3039.54	0.252408
6830	-0.29338139	-2003.79	0.086073
7590	-0.09655878	-732.881	0.009324
8390	0.096558779	810.1282	0.009324
9270	0.29338139	2719.645	0.86073
10400	0.5024026	5224.987	0.252408
11100	0.736315542	8173.103	0.542161
13400	1.020075615	13669.01	1.0400554
15500	1.426078597	22104.22	2.0037
Test-Statistic Calculation			
$[E\ m_i x_i]^2 = 1.15E+09$			
$[Em_i]^2 = 7.93$			
$n = 12.00$			
$SD = 3686.63$			
Shapiro-Wilks W-statistic = 0.97			

Note:

m_i = Denotes the approximate expected value of the ith-ordered normal quantile (see Section 4.2.2).
x_i = The ith-ordered value of the sample, in increasing order.
SD = Standard deviation.
n = Number of samples.

percentile). The actual parameters selected to describe the distribution are dependent on the type of distribution (normal, lognormal, or nonparametric).

The 95 percent UTL is defined as (OEPA, 1991):

$$95\% \text{ UTL} = \bar{X} + (K \bullet S) \qquad \text{Eq. 4.3}$$

where:

UTL = Upper tolerance limit
$\bar{X}$ = Arithmetic mean of the data set
S = Standard deviation of the data set
K = One-sided normal tolerance factor.

The UTL establishes a concentration range that is constructed to contain a specified proportion of the population with a specified confidence. The proportion of the population included is referred to as the coverage, and the probability with which the tolerance interval included the proportion is referred to as the tolerance coefficient. The one-sided normal tolerance factor (K) in the previous equation is a function of the desired percent coverage, the desired tolerance coefficient, and the number of samples. The EPA-recommended coverage value of 95 percent and tolerance coefficient value of 95 percent (EPA, 1989) are used in this report to calculate the 95 percent UTLs. For lognormal data sets, the UTL calculations are performed on the log-transformed data, and the antilog of the 95 percent UTL calculated using the previously described procedure is provided.

The 95 percent UTL or 95th percentile implies that 5 percent of the values comprising the natural background population are expected to be above the 95 percent UTL or 95th percentile. Hence, values that are above the 95 percent UTL or 95th percentile do not necessarily represent contamination. It is convenient, however, to provide a single value such as an upper UTL or percentile to describe background for purposes of comparison as well as for modeling or risk assessment.

Nonparametric techniques are used to describe background distributions for data sets that do not have normal or lognormal distributions, as well as data sets with greater than 15 percent non-detects. For these data sets, the 95th percentile value (rather than the UTL) is provided. The central tendency of the nonparametric distributions is best described by the median (50th percentile) of the data rather than the mean, but both values are provided.

4.3 Evaluation Results

Complete descriptions of the background distributions of nineteen metals are provided for PBOW soils in Table 4-5. These descriptions include the number of samples, percent non-detects, distribution type, minimum value, maximum value, arithmetic mean, sample standard deviation, median, and either a 95 percent UTL for lognormal distributions, or a 95th percentile for nonparametric distributions.

The percent nondetects for the metals vary from 100 percent for cadmium and thallium, to 0 percent for aluminum, iron, lead, manganese, nickel, and zinc. If nondetect values are greater than 50 percent of the data set, then the median is expressed as less than the median detection limit. Likewise, if the nondetect values are greater than 95 percent of the data set, then the 95th percentile is expressed as less than the detection limit.

The soil at the site is primarily composed of silica sand with lesser amounts of weathered limestone and shale grains. The sum of the average concentrations of the 19 analyzed metals equals approximately 50,000 milligrams per kilogram (mg/kg), which represents 5 percent of the total mass of the soil. Silica and calcium-magnesium carbonate, along with minor amounts of sodium, potassium, sulfate, and organics, probably account for the remaining 95 percent of the mass of the soil.

4.4 Basis for Comparison with Background

Based on EPA (1989) guidance, if a single site-related compound exceeds the 95 percent UTL or the 95th percentile of the background value for that particular compound, it can be assumed that the site-related data is greater than the background range. Thus, the 95 percent UTL or the 95th percentile on background for a given metal at a given site is compared to the maximum detected concentration (MDC) of its site-related data set. If the site-related MDC is less than the 95 percent UTL or the 95th percentile on background data, then it can be concluded with 95 percent confidence that the site data is within the background range of values. If the site-related MDC exceeds the background values, then it can be concluded that the site-related data exceeds the background values.

4.5 Acid Area No. 1

A suite of five metals exceeded the RBCs in both surface and subsurface soils in AA1, including aluminum, arsenic, beryllium, iron, and manganese. As shown in Table 4-7, the MDC for each

Table 4-7

Comparison of Maximum Detected Concentrations of Metals with Background Metals Data
Site Investigation of Acid Areas
Former Plum Brook Ordnance Works
Sandusky, Ohio

Unit: mg/kg

Metal[a]	RBC[b]	Background		Acid Area No. 1		Acid Area No. 2		Acid Area No. 3		MNT Area		PSB Area
		95% UTL[c]	95th Percentile[d]	Surface	Subsurface	Surface	Subsurface	Surface	Subsurface	Surface	Subsurface	Surface
Aluminum	7,800	26,879	na[e]	14,300.0	17,400.0	18,400.0	14,200.0	11,800.0	11,100.0	8,440.0	11,900.0	8,210.0
Antimony	3.1	na	7.88	--[f]	--	--	--	--	8.0	--	--	--
Arsenic	0.43	70.8	na	17.3	10.9	19.3	16.5	9.6	32.2	9.6	11.6	5.1
Beryllium	0.15	na	0.96	0.7	0.7	0.9	0.8	--	0.8	--	0.8	--
Iron	2,300	358,400	na	29,000.0	35,100.0	36,100.0	27,300.0	26,600.0	34,300.0	16,600.0	22,700.0	14,400.0
Manganese	160	3,494	na	910.0	1,070.0	1,010.0	889.0	922.0	1,180.0	574.0	609.0	312.0

[a] Only the maximum metal concentrations detected from each acid area that exceeded the respective risk-based concentrations (RBC) were compared against background data.

[b] RBCs as published by EPA Region III, 1998.

[c] 95 percent upper tolerance limit for data exhibiting lognormal distribution.

[d] 95th percentile for data exhibiting nonparametric distribution.

[e] Not available for the data distribution .

[f] The compound is either not detected or detected at concentrations below the RBC.

metal is significantly below the 95 percent UTL or the 95th percentile value derived from the background data. Therefore, the elevated concentration for these metal constituents may be attributable to natural site conditions.

4.6 Acid Area No. 2

A suite of five metals also exceeded the RBCs in both surface and subsurface soils in AA2, including aluminum, arsenic, beryllium, iron, and manganese. As shown in Table 4-7, the MDC for each metal is significantly below the 95 percent UTL or the 95th percentile value derived from the background data. Therefore, the elevated concentration for these metal constituents may be attributable to natural site conditions.

4.7 Acid Area No. 3

A suite of five metals exceeded the RBCs in surface and subsurface soils, including aluminum, arsenic, beryllium, iron, and manganese. As shown in Table 4-7, the MDC for each metal is significantly below the 95 percent UTL or the 95th percentile value derived from the background data. Therefore, the elevated concentration for these metal constituents may be attributable to natural site conditions. In subsurface soils, the MDC for antimony exceeded both the RBC and the 95th percentile value of 7.88 mg/kg. However, the detected antimony concentration (8.0 mg/kg) is within 2 percent of the background and is below the maximum antimony concentration of 9.3 mg/kg in the background samples, suggesting that it is not necessarily an indication of site-related contamination.

In the MNT area, four metals (aluminum, arsenic, iron, and manganese) in surface soil and five metals (aluminum, arsenic, beryllium, iron, and manganese) in subsurface soil exceeded the RBCs respectively. As shown in Table 4-7, the MDC for each metal is significantly below the 95 percent UTL or the 95th percentile value derived from the background data. Therefore, the elevated concentration for these metal constituents may be attributable to natural site conditions.

In the PSB area, four metals (aluminum, arsenic, iron, and manganese) exceeded the RBCs in surface soil. The MDC for each metal is significantly below the 95 percent UTL or the 95th percentile value derived from the background data. Therefore, the elevated concentration for these metal constituents may be attributable to natural site conditions.

5.0 Analytical Results

A total of 104 primary soil samples were collected from 53 boring locations. Of these, 53 were surface soil samples and 51 were subsurface samples. Only surface soil samples were collected from 2 boring locations at the former PSB area associated with AA3.

5.1 Acid Area No. 1

A total of 30 soil samples were collected within AA1, with 2 discrete samples from each of the 15 boring locations. The surface soil samples were obtained from depths of 0.5 to 1.5 feet below grade (0 to 1.0 foot into the native soil), while subsurface soil samples were collected from a 2-foot interval no deeper than 10 feet bgs. Competent bedrock was not encountered in this area during the advancement of the soil borings. The following paragraphs discuss the detected constituents in site soils by chemical groups.

5.1.1 Surface Soil

Volatile Organic Compounds. Three VOCs were detected in a limited number of surface soil samples. These VOCs include 1,1,1-trichloroethene (one detection), methylene chloride (two detections), and toluene (two detections). All detected concentrations are significantly below the respective RBCs as summarized in Table 5-1.

Semivolatile Organic Compounds. A total of 12 SVOCs were detected in selected locations as shown in Table 5-1. However, concentrations were below the respective RBCs.

Explosives. Two surface soil samples (AA1-SB01 and AA1-SB02) located near the residual TNT acid storage tanks were analyzed for nitroaromatic compounds. Four nitroaromatic compounds were detected in AA1-SB02 including 1,3,5-trinitrobenzene (TNB), 2,4-DNT, and 2,4,6-TNT at concentrations below the RBCs. The fourth explosive compound, 4-amino-2,6-DNT, was detected at a concentration of 810 µg/kg, exceeding the RBC of 470 µg/kg (Table 5-1 and Figure 5-1).

PCBs. All of the surface soil samples were analyzed for PCBs. Aroclor 1260 was detected in 9 of the 15 surface soil samples analyzed, with concentrations ranging from 45 to 9,000 µg/kg (Table 5-1). The RBC for this compound is 83 µg/kg and was exceeded in 7 surface soil samples (AA1-SB01, -SB06, -SB08, -SB11, -SB12, -SB14, and -SB15), as shown in Figure 5-1.

Table 5-1

Summary of Organic Analytical Results for Surface Soils in Acid Area No. 1
Site Investigation of Acid Areas
Former Plum Brook Ordnance Works, Sandusky, Ohio

	Sample Location:	AA1-SB01		AA1-SB02		AA1-SB03		AA1-SB04		AA1-SB05	
	Sample No:	6010		6030		6050		6070		6090	
	Sample Date:	30-Apr-98		30-Apr-98		29-Apr-98		29-Apr-98		30-Apr-98	
	Depth (feet):	0-1		0-1		0-1		0-1		0-1	
	Units:	µg/kg		µg/kg		µg/kg		µg/kg		µg/kg	
VOLATILES	RBCs (µg/kg)[a]	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
1,1,1-TRICHLOROETHANE	1,600,000										
METHYLENE CHLORIDE	85,000									2.5	J[b]
TOLUENE	1,600,000							1.8	J		
SEMIVOLATILES											
2,4-DINITROTOLUENE	16,000			460							
ANTHRACENE	2,300,000										
BENZO(a)ANTHRACENE	880										
BENZO(a)PYRENE	88	29	J	21	J						
BENZO(b)FLUORANTHENE	880										
BENZO(k)FLUORANTHENE	8,800										
BIS(2-ETHYLHEXYL)PHTHALATE	46,000			39	J					210	J
CHRYSENE	88,000										
FLUORANTHENE	310,000	58	J								
INDENO(1,2,3-cd)PYRENE	880										
PHENANTHRENE	31,000										
PYRENE	230,000	51	J								
PCBs											
AROCLOR 1260	83	140								45	
EXPLOSIVES (only anlayzed for AA1-SB01 and AA1-SB02)											
1,3,5-TRINITROBENZENE	390			300							
2,4,6-TRINITROTOLUENE	3,900			320							
2,4-DINITROTOLUENE	16,000			2500							
4-AMINO-2,6-DINITROTOLUENE	470			810							

Table 5-1

Summary of Organic Analytical Results for Surface Soils in Acid Area No. 1
Site Investigation of Acid Areas
Former Plum Brook Ordnance Works, Sandusky, Ohio

	Sample Location:	AA1-SB06		AA1-SB07		AA1-SB08		AA1-SB09		AA1-SB10	
	Sample No:	6110		6130		6150		6170		6190	
	Sample Date:	29-Apr-98		29-Apr-98		29-Apr-98		30-Apr-98		30-Apr-98	
	Depth (feet):	0-1		0-1		0-1		0-1		0-1	
	Units:	µg/kg		µg/kg		µg/kg		µg/kg		µg/kg	
VOLATILES	RBCs (µg/kg)[a]	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
1,1,1-TRICHLOROETHANE	1,600,000										
METHYLENE CHLORIDE	85,000							3.2	J		
TOLUENE	1,600,000										
SEMIVOLATILES											
2,4-DINITROTOLUENE	16,000										
ANTHRACENE	2,300,000										
BENZO(a)ANTHRACENE	880										
BENZO(a)PYRENE	88									42	J
BENZO(b)FLUORANTHENE	880										
BENZO(k)FLUORANTHENE	8,800										
BIS(2-ETHYLHEXYL)PHTHALATE	46,000	49	J	95	J			58	J		
CHRYSENE	88,000										
FLUORANTHENE	310,000									44	J
INDENO(1,2,3-cd)PYRENE	880										
PHENANTHRENE	31,000										
PYRENE	230,000										
PCBs											
AROCLOR 1260	83	160		73		9000					
EXPLOSIVES (only analyzed for AA1-SB01 and AA1-SB02)											
1,3,5-TRINITROBENZENE	390										
2,4,6-TRINITROTOLUENE	3,900										
2,4-DINITROTOLUENE	16,000										
4-AMINO-2,6-DINITROTOLUENE	470										

Table 5-1

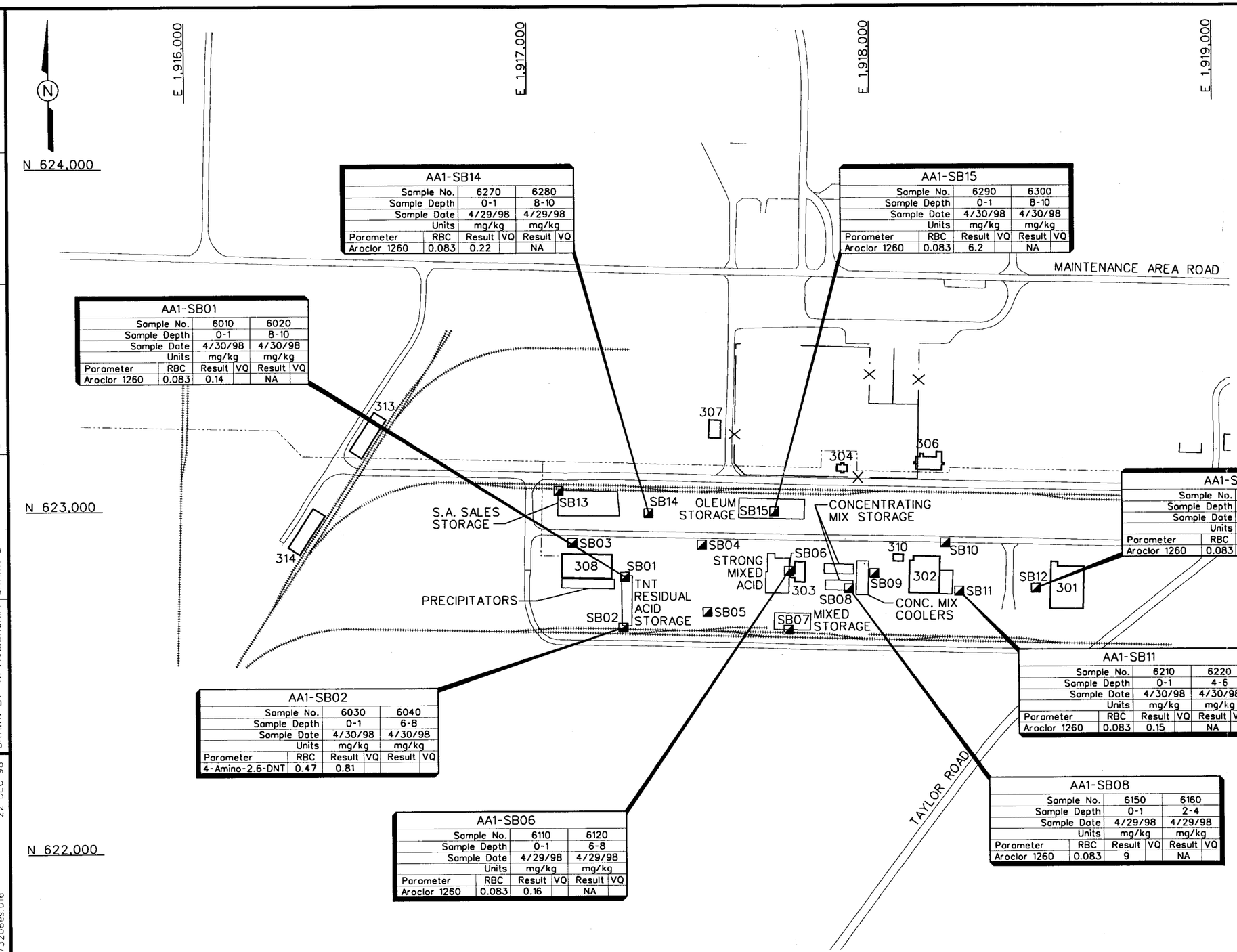
Summary of Organic Analytical Results for Surface Soils in Acid Area No. 1
Site Investigation of Acid Areas
Former Plum Brook Ordnance Works, Sandusky, Ohio

	Sample Location:	AA1-SB11		AA1-SB12		AA1-SB13		AA1-SB14		AA1-SB15	
	Sample No:	6210		6230		6250		6270		6290	
	Sample Date:	30-Apr-98		30-Apr-98		29-Apr-98		29-Apr-98		30-Apr-98	
	Depth (feet):	0-1		0-1		0-1		0-1		0-1	
	Units:	µg/kg		µg/kg		µg/kg		µg/kg		µg/kg	
VOLATILES	RBCs (µg/kg)[a]	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
1,1,1-TRICHLOROETHANE	1,600,000	2.1	J								
METHYLENE CHLORIDE	85,000										
TOLUENE	1,600,000	1.6	J								
SEMIVOLATILES											
2,4-DINITROTOLUENE	16,000										
ANTHRACENE	2,300,000							26	J		
BENZO(a)ANTHRACENE	880	36	J					79	J		
BENZO(a)PYRENE	88	37	J					78	J		
BENZO(b)FLUORANTHENE	880							94	J		
BENZO(k)FLUORANTHENE	8,800							75	J		
BIS(2-ETHYLHEXYL)PHTHALATE	46,000										
CHRYSENE	88,000	45	J					100	J		
FLUORANTHENE	310,000	82	J					160	J		
INDENO(1,2,3-cd)PYRENE	880							43	J		
PHENANTHRENE	31,000							57	J		
PYRENE	230,000	52	J					110	J		
PCBs											
AROCLOR 1260	83	150		250	J			220		6200	
EXPLOSIVES (only analyzed for AA1-SB01 and AA1-SB02)											
1,3,5-TRINITROBENZENE	390										
2,4,6-TRINITROTOLUENE	3,900										
2,4-DINITROTOLUENE	16,000										
4-AMINO-2,6-DINITROTOLUENE	470										

Table 5-1

Summary of Organic Analytical Results for Surface Soils in Acid Area No. 1
Site Investigation of Acid Areas
Former Plum Brook Ordnance Works, Sandusky, Ohio

[a] Risk-based concentrations for residential soil taken from EPA, 1998, risk-based concentration table.
[b] J qualifier. Analyte present. Reported value may not be accurate or precise.
Note 1: Concentration exceeds RBC.
Note 2: Blank cells indicate that compound was analyzed for, but was not detected unless otherwise noted.



LEGEND:

- RAILROAD
- BUILDINGS
- AREAS OF STORAGE TANKS
- NATURAL GAS
- SB01 — SOIL BORING (PBOW-98-AA1-SB01)

AA1-SB14

Sample No.		6270		6280	
Sample Depth		0-1		8-10	
Sample Date		4/29/98		4/29/98	
	Units	mg/kg		mg/kg	
Parameter	RBC	Result	VQ	Result	VQ
Aroclor 1260	0.083	0.22		NA	

AA1-SB15

Sample No.		6290		6300	
Sample Depth		0-1		8-10	
Sample Date		4/30/98		4/30/98	
	Units	mg/kg		mg/kg	
Parameter	RBC	Result	VQ	Result	VQ
Aroclor 1260	0.083	6.2		NA	

AA1-SB01

Sample No.		6010		6020	
Sample Depth		0-1		8-10	
Sample Date		4/30/98		4/30/98	
	Units	mg/kg		mg/kg	
Parameter	RBC	Result	VQ	Result	VQ
Aroclor 1260	0.083	0.14		NA	

AA1-SB12

Sample No.		6230		6240	
Sample Depth		0-1		2-4	
Sample Date		4/30/98		4/30/98	
	Units	mg/kg		mg/kg	
Parameter	RBC	Result	VQ	Result	VQ
Aroclor 1260	0.083	0.25	J	NA	

AA1-SB11

Sample No.		6210		6220	
Sample Depth		0-1		4-6	
Sample Date		4/30/98		4/30/98	
	Units	mg/kg		mg/kg	
Parameter	RBC	Result	VQ	Result	VQ
Aroclor 1260	0.083	0.15		NA	

AA1-SB02

Sample No.		6030		6040	
Sample Depth		0-1		6-8	
Sample Date		4/30/98		4/30/98	
	Units	mg/kg		mg/kg	
Parameter	RBC	Result	VQ	Result	VQ
4-Amino-2,6-DNT	0.47	0.81			

AA1-SB06

Sample No.		6110		6120	
Sample Depth		0-1		6-8	
Sample Date		4/29/98		4/29/98	
	Units	mg/kg		mg/kg	
Parameter	RBC	Result	VQ	Result	VQ
Aroclor 1260	0.083	0.16		NA	

AA1-SB08

Sample No.		6150		6160	
Sample Depth		0-1		2-4	
Sample Date		4/29/98		4/29/98	
	Units	mg/kg		mg/kg	
Parameter	RBC	Result	VQ	Result	VQ
Aroclor 1260	0.083	9		NA	

FIGURE 5-1
LOCATIONS WITH ORGANIC CONTAMINANTS DETECTED AT CONCENTRATIONS ABOVE RBCs IN ACID AREA NO. 1

PLUM BROOK ORDNANCE WORKS
NASA PLUM BROOK STATION
SANDUSKY, OHIO

INTERNATIONAL TECHNOLOGY CORPORATION

STARTING DATE: 8/5/98 | DATE LAST REV.: | DRAFT. CHCK. BY: VANDERGRIFF | INITIATOR: D. KESSLER | DWG. NO.: ...3206es.016
DRAWN BY: R. VANDERGRIFF | DRAWN BY: | ENGR. CHCK. BY: D. KESSLER | PROJ. MGR.: SPANGBERG | PROJ. NO.: 773206
22 DEC 98 | 10:39:56
bvanderg
c:\it\ds\civil\773206es.016

Metals. A total of 15 metals were detected in surface soil samples collected from AA1. Of these, 5 were detected at concentrations exceeding the respective RBCs (Figure 5-2), including aluminum, arsenic, beryllium, iron, and manganese (Table 5-2). However, none of the detected metals at AA1 exceeded the background concentrations.

5.1.2 Subsurface Soil

Volatile Organic Compounds. A total of 11 VOCs were detected in subsurface soil samples collected from AA1, but the detected concentrations were all significantly below their respective RBCs as summarized in Table 5-3. Two subsurface samples (AA1-SB10 and AA1-SB11) exhibited more VOC detections than other samples, with 7 and 5 hits respectively, while 4 samples (AA1-SB02, -SB03, -SB08, and -SB13) had no VOCs detected.

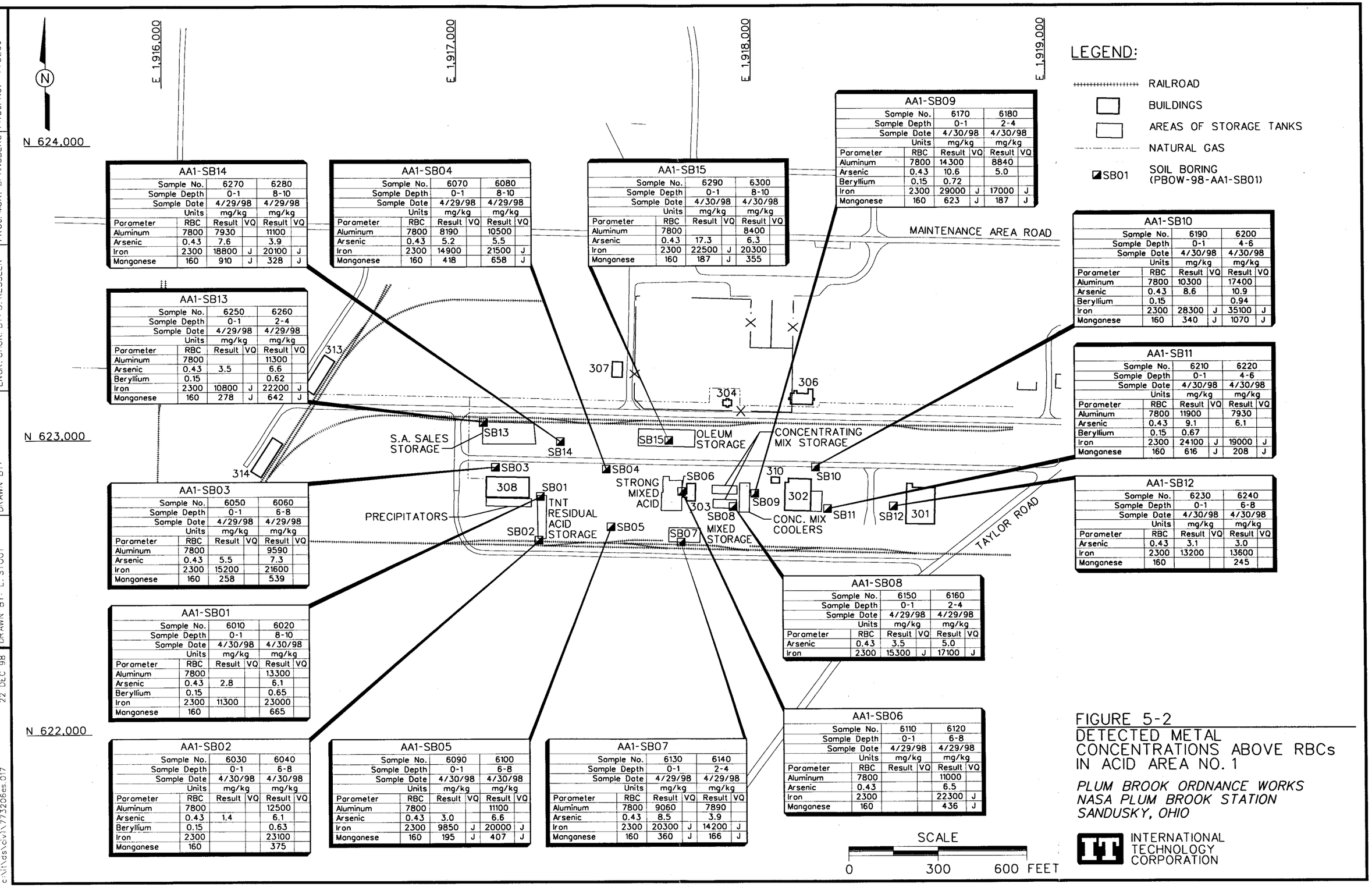
Semivolatile Organic Compounds. One SVOC (bis[2-ethylhexyl]phthalate) was detected in two of the fifteen subsurface soil samples, with concentrations below the RBC (Table 5-3).

Explosives. Two subsurface soil samples (AA1-SB01 and AA1-SB02) were analyzed for nitroaromatic compounds. Explosives were not detected in either sample.

Metals. A total of 14 metals were detected in the subsurface soil samples collected within AA1. Of these, 5 metals were present at concentrations exceeding the RBCs (Table 5-4 and Figure 5-2), including aluminum, arsenic, beryllium, iron, and manganese. However, none of the detected metals in subsurface soils at AA1 exceeded the background concentrations.

5.2 Acid Area No. 2

A total of 30 soil samples were collected within the AA2, with 2 discrete samples from each of the 15 boring locations. The surface soil samples were obtained from depths of 0.5 to 1.5 feet bgs (0 to 1.0 foot into the native soil), while subsurface soil samples were collected from a 2-foot interval no deeper than 10 feet bgs. Competent bedrock was not encountered in this area during the advancement of the soil borings. The following paragraphs discuss the detected constituents in site soils by chemical groups.



AA1-SB14

Sample No.		6270		6280	
Sample Depth		0-1		8-10	
Sample Date		4/29/98		4/29/98	
	Units	mg/kg		mg/kg	
Parameter	RBC	Result	VQ	Result	VQ
Aluminum	7800	7930		11100	
Arsenic	0.43	7.6		3.9	
Iron	2300	18800	J	20100	J
Manganese	160	910	J	328	J

AA1-SB04

Sample No.		6070		6080	
Sample Depth		0-1		8-10	
Sample Date		4/29/98		4/29/98	
	Units	mg/kg		mg/kg	
Parameter	RBC	Result	VQ	Result	VQ
Aluminum	7800	8190		10500	
Arsenic	0.43	5.2		5.5	
Iron	2300	14900		21500	J
Manganese	160	418		658	J

AA1-SB15

Sample No.		6290		6300	
Sample Depth		0-1		8-10	
Sample Date		4/30/98		4/30/98	
	Units	mg/kg		mg/kg	
Parameter	RBC	Result	VQ	Result	VQ
Aluminum	7800			8400	
Arsenic	0.43	17.3		6.3	
Iron	2300	22500	J	20300	
Manganese	160	187	J	355	

AA1-SB09

Sample No.		6170		6180	
Sample Depth		0-1		2-4	
Sample Date		4/30/98		4/30/98	
	Units	mg/kg		mg/kg	
Parameter	RBC	Result	VQ	Result	VQ
Aluminum	7800	14300		8840	
Arsenic	0.43	10.6		5.0	
Beryllium	0.15	0.72			
Iron	2300	29000	J	17000	J
Manganese	160	623	J	187	J

AA1-SB10

Sample No.		6190		6200	
Sample Depth		0-1		4-6	
Sample Date		4/30/98		4/30/98	
	Units	mg/kg		mg/kg	
Parameter	RBC	Result	VQ	Result	VQ
Aluminum	7800	10300		17400	
Arsenic	0.43	8.6		10.9	
Beryllium	0.15			0.94	
Iron	2300	28300	J	35100	J
Manganese	160	340	J	1070	J

AA1-SB13

Sample No.		6250		6260	
Sample Depth		0-1		2-4	
Sample Date		4/29/98		4/29/98	
	Units	mg/kg		mg/kg	
Parameter	RBC	Result	VQ	Result	VQ
Aluminum	7800			11300	
Arsenic	0.43	3.5		6.6	
Beryllium	0.15			0.62	
Iron	2300	10800	J	22200	J
Manganese	160	278	J	642	J

AA1-SB11

Sample No.		6210		6220	
Sample Depth		0-1		4-6	
Sample Date		4/30/98		4/30/98	
	Units	mg/kg		mg/kg	
Parameter	RBC	Result	VQ	Result	VQ
Aluminum	7800	11900		7930	
Arsenic	0.43	9.1		6.1	
Beryllium	0.15	0.67			
Iron	2300	24100	J	19000	J
Manganese	160	616	J	208	J

AA1-SB03

Sample No.		6050		6060	
Sample Depth		0-1		6-8	
Sample Date		4/29/98		4/29/98	
	Units	mg/kg		mg/kg	
Parameter	RBC	Result	VQ	Result	VQ
Aluminum	7800			9590	
Arsenic	0.43	5.5		7.3	
Iron	2300	15200		21600	
Manganese	160	258		539	

AA1-SB12

Sample No.		6230		6240	
Sample Depth		0-1		6-8	
Sample Date		4/30/98		4/30/98	
	Units	mg/kg		mg/kg	
Parameter	RBC	Result	VQ	Result	VQ
Arsenic	0.43	3.1		3.0	
Iron	2300	13200		13600	
Manganese	160			245	

AA1-SB01

Sample No.		6010		6020	
Sample Depth		0-1		8-10	
Sample Date		4/30/98		4/30/98	
	Units	mg/kg		mg/kg	
Parameter	RBC	Result	VQ	Result	VQ
Aluminum	7800			13300	
Arsenic	0.43	2.8		6.1	
Beryllium	0.15			0.65	
Iron	2300	11300		23000	
Manganese	160			665	

AA1-SB08

Sample No.		6150		6160	
Sample Depth		0-1		2-4	
Sample Date		4/29/98		4/29/98	
	Units	mg/kg		mg/kg	
Parameter	RBC	Result	VQ	Result	VQ
Arsenic	0.43	3.5		5.0	
Iron	2300	15300	J	17100	J

AA1-SB02

Sample No.		6030		6040	
Sample Depth		0-1		6-8	
Sample Date		4/30/98		4/30/98	
	Units	mg/kg		mg/kg	
Parameter	RBC	Result	VQ	Result	VQ
Aluminum	7800			12500	
Arsenic	0.43	1.4		6.1	
Beryllium	0.15			0.63	
Iron	2300			23100	
Manganese	160			375	

AA1-SB05

Sample No.		6090		6100	
Sample Depth		0-1		6-8	
Sample Date		4/30/98		4/30/98	
	Units	mg/kg		mg/kg	
Parameter	RBC	Result	VQ	Result	VQ
Aluminum	7800			11100	
Arsenic	0.43	3.0		6.6	
Iron	2300	9850	J	20000	J
Manganese	160	195	J	407	J

AA1-SB07

Sample No.		6130		6140	
Sample Depth		0-1		2-4	
Sample Date		4/29/98		4/29/98	
	Units	mg/kg		mg/kg	
Parameter	RBC	Result	VQ	Result	VQ
Aluminum	7800	9060		7890	
Arsenic	0.43	8.5		3.9	
Iron	2300	20300	J	14200	J
Manganese	160	360	J	166	J

AA1-SB06

Sample No.		6110		6120	
Sample Depth		0-1		6-8	
Sample Date		4/29/98		4/29/98	
	Units	mg/kg		mg/kg	
Parameter	RBC	Result	VQ	Result	VQ
Aluminum	7800			11000	
Arsenic	0.43			6.5	
Iron	2300			22300	J
Manganese	160			436	J

FIGURE 5-2
DETECTED METAL CONCENTRATIONS ABOVE RBCs IN ACID AREA NO. 1

PLUM BROOK ORDNANCE WORKS
NASA PLUM BROOK STATION
SANDUSKY, OHIO

INTERNATIONAL TECHNOLOGY CORPORATION

DRAFT. CHCK. BY: VANDERGRIFF | INITIATOR: D. KESSLER | DWG. NO.: ...3206es.017
ENGR. CHCK. BY: D. KESSLER | PROJ. MGR.: SPANGBERG | PROJ. NO.: 773206
DATE LAST REV.:
DRAWN BY:
STARTING DATE: 8/5/98 | DRAWN BY: L. STOUT
10:41:53 22 DEC 98
bvanderg c:\ntwas\civil\773206es.017

Table 5-2

Summary of Metal Analytical Results for Surface Soils in Acid Area No. 1
Site Investigation of Acid Areas
Former Plum Brook Ordnance Works, Sandusky, Ohio

	Sample Location:	AA1-SB01		AA1-SB02		AA1-SB03		AA1-SB04		AA1-SB05	
	Sample No:	6010		6030		6050		6070		6090	
	Sample Date:	30-Apr-98		30-Apr-98		29-Apr-98		29-Apr-98		30-Apr-98	
	Depth (feet):	0-1		0-1		0-1		0-1		0-1	
	Units:	mg/kg		mg/kg		mg/kg		mg/kg		mg/kg	
METALS	RBCs (mg/kg)[a]	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
ALUMINUM	7,800	7730		1920		7520		8190		6260	
ARSENIC	0.43	2.8		1.4		5.5		5.2		3	
BARIUM	550			43.8		29.7		50.4		36.3	
BERYLLIUM	0.15										
CHROMIUM	39	11		2.3		11.2		10.7		8.6	J[b]
COBALT	470					7.4		13.8			
COPPER	310	6				9.6		13.4		5	
IRON	2,300	11300		1050		15200		14900		9850	J
LEAD	400	44.3		9.3		5.6		6.3		31.4	
MANGANESE	160	89.2		14.8		258		418		195	J
MERCURY	2.3										
NICKEL	160	6.3				13.4		31.4		6.8	
SELENIUM	39							0.65			
VANADIUM	55	20.2				21.1		18		15.5	
ZINC	2,300	33.6		6.2		34.2		41.4		22.9	J

Table 5-2

Summary of Metal Analytical Results for Surface Soils in Acid Area No. 1
Site Investigation of Acid Areas
Former Plum Brook Ordnance Works, Sandusky, Ohio

	Sample Location:	AA1-SB06		AA1-SB07		AA1-SB08		AA1-SB09		AA1-SB10	
	Sample No:	6110		6130		6150		6170		6190	
	Sample Date:	29-Apr-98		29-Apr-98		29-Apr-98		30-Apr-98		30-Apr-98	
	Depth (feet):	0-1		0-1		0-1		0-1		0-1	
	Units:	mg/kg		mg/kg		mg/kg		mg/kg		mg/kg	
METALS	RBCs (mg/kg)[a]	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
ALUMINUM	7,800	155		9060		5800		14300		10300	
ARSENIC	0.43			8.5		3.5		10.6		8.6	
BARIUM	550			41.5		43.6		111		69.4	
BERYLLIUM	0.15							0.72			
CHROMIUM	39			13.4	J[b]	11.1	J	20.1	J	15.8	J
COBALT	470			12.1				13.2		11.9	
COPPER	310	3.7		14.4		10.5		26		12.1	
IRON	2,300	218	J	20300	J	15300	J	29000	J	28300	J
LEAD	400	222		10.3		85.6		19.4		8.9	
MANGANESE	160	3	J	360	J	153	J	623	J	340	J
MERCURY	2.3	0.091				0.045				0.045	
NICKEL	160			20.1		9.9		30.9		16.3	
SELENIUM	39									0.94	
VANADIUM	55			25.3		16.4		33.6		29.1	
ZINC	2,300	6.2	J	52.9	J	34.8	J	74.6	J	45.8	J

Table 5-2

Summary of Metal Analytical Results for Surface Soils in Acid Area No. 1
Site Investigation of Acid Areas
Former Plum Brook Ordnance Works, Sandusky, Ohio

	Sample Location:	AA1-SB11		AA1-SB12		AA1-SB13		AA1-SB14		AA1-SB15	
	Sample No:	6210		6230		6250		6270		6290	
	Sample Date:	30-Apr-98		30-Apr-98		29-Apr-98		29-Apr-98		30-Apr-98	
	Depth (feet):	0-1		0-1		0-1		0-1		0-1	
	Units:	mg/kg		mg/kg		mg/kg		mg/kg		mg/kg	
METALS	RBCs (mg/kg)[a]	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
ALUMINUM	7800	11900		6170		6250		7930		7480	
ARSENIC	0.43	9.1		3.1		3.5		7.6		17.3	
BARIUM	550	85.7		27.3		24.4		71.2		72.9	
BERYLLIUM	0.15	0.67									
CHROMIUM	39	17	J[b]	12.4		9.2	J	10	J	14.7	J
COBALT	470	13.8		7.7		7.8		15.2		8.4	
COPPER	310	19.6		5.6		5.1		9.8		16.2	
IRON	2300	24100	J	13200		10800	J	18800	J	22500	J
LEAD	400	12.8		6.6		4.7		11.2		23.1	
MANGANESE	160	616	J	139		278	J	910	J	187	J
MERCURY	2.3	0.048									
NICKEL	160	28.1		8.8		9.2		11.4		13.6	
SELENIUM	39										
VANADIUM	55	28.6		25.8		18.7		23.9		23.3	
ZINC	2300	71.5	J	38.6		22.4	J	31.2	J	49.2	J

[a] Risk-based concentrations for residential soil taken from EPA, 1998, risk-based concentration table.

[b] J qualifier. Analyte present. Reported value may not be accurate or precise.

Note 1: Shading indicates concentration exceeds RBC.

Note 2: Blank cells indicate that compound was analyzed for, but was not detected unless otherwise noted.

Table 5-3

Summary of Organic Analytical Results for Subsurface Soils in Acid Area No. 1
Site Investigation of Acid Areas
Former Plum Brook Ordnance Works, Sandusky, Ohio

	Sample Location:	AA1-SB01		AA1-SB02		AA1-SB03		AA1-SB04		AA1-SB05	
	Sample No:	6020		6040		6060		6080		6100	
	Sample Date:	30-Apr-98		30-Apr-98		29-Apr-98		29-Apr-98		30-Apr-98	
	Depth (feet):	8-10		6-8		6-8		8-10		6-8	
	Units:	µg/kg		µg/kg		µg/kg		µg/kg		µg/kg	
VOLATILES	RBCs (µg/kg)[a]	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
1,1,1-TRICHLOROETHANE	1,600,000										
1,1-DICHLOROETHANE	780,000										
1,1-DICHLOROETHENE	1,100										
1,2-DICHLOROETHENE	70,000										
2-BUTANONE	4,700,000										
ACETONE	780,000	13	J[b]					480			
CARBON DISULFIDE	780,000									4.2	J
METHYLENE CHLORIDE	85,000									3.3	J
TETRACHLOROETHENE	12,000										
TOLUENE	1,600,000							4	J		
TRICHLOROETHENE	58,000										
SEMIVOLATILES											
BIS(2-ETHYLHEXYL)PHTHALATE	46,000										

Table 5-3

Summary of Organic Analytical Results for Subsurface Soils in Acid Area No. 1
Site Investigation of Acid Areas
Former Plum Brook Ordnance Works, Sandusky, Ohio

	Sample Location:	AA1-SB06		AA1-SB07		AA1-SB08		AA1-SB09		AA1-SB10	
	Sample No:	6120		6140		6160		6180		6200	
	Sample Date:	29-Apr-98		29-Apr-98		29-Apr-98		30-Apr-98		30-Apr-98	
	Depth (feet):	6-8		2-4		2-4		2-4		4-6	
	Units:	µg/kg		µg/kg		µg/kg		µg/kg		µg/kg	
VOLATILES	RBCs (µg/kg)[a]	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
1,1,1-TRICHLOROETHANE	1,600,000									6.7	
1,1-DICHLOROETHANE	780,000										
1,1-DICHLOROETHENE	1,100										
1,2-DICHLOROETHENE	70,000									4	J
2-BUTANONE	4,700,000									9.9	J
ACETONE	780,000	16	J[b]	130						110	
CARBON DISULFIDE	780,000										
METHYLENE CHLORIDE	85,000							2.3	J		
TETRACHLOROETHENE	12,000									240	J
TOLUENE	1,600,000									3.1	J
TRICHLOROETHENE	58,000									35	J
SEMIVOLATILES											
BIS(2-ETHYLHEXYL)PHTHALATE	46,000	48	J			49	J				

Table 5-3

Summary of Organic Analytical Results for Subsurface Soils in Acid Area No. 1
Site Investigation of Acid Areas
Former Plum Brook Ordnance Works, Sandusky, Ohio

	Sample Location:	AA1-SB11		AA1-SB12		AA1-SB13		AA1-SB14		AA1-SB15	
	Sample No:	6220		6240		6260		6280		6300	
	Sample Date:	30-Apr-98		30-Apr-98		29-Apr-98		29-Apr-98		30-Apr-98	
	Depth (feet):	4-6		2-4		2-4		8-10		8-10	
	Units:	µg/kg		µg/kg		µg/kg		µg/kg		µg/kg	
VOLATILES	RBCs (µg/kg)[a]	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
1,1,1-TRICHLOROETHANE	1,600,000	53									
1,1-DICHLOROETHANE	780,000	33									
1,1-DICHLOROETHENE	1,100	1.8	J[b]								
1,2-DICHLOROETHENE	70,000	7.4									
2-BUTANONE	4,700,000										
ACETONE	780,000			270				79		270	
CARBON DISULFIDE	780,000										
METHYLENE CHLORIDE	85,000										
TETRACHLOROETHENE	12,000										
TOLUENE	1,600,000							2.4	J		
TRICHLOROETHENE	58,000	32	J								
SEMIVOLATILES											
BIS(2-ETHYLHEXYL)PHTHALATE	46,000										

[a] Risk-based concentrations for residential soil taken from EPA, 1998, risk-based concentration 8table.

[b] J qualifier. Analyte present. Reported value may not be accurate or precise.

Note 1: Shading indicates concentration exceeds RBC.

Note 2: Blank cells indicate that compound was analyzed for, but was not detected unless otherwise noted.

Table 5-4

Summary of Metal Analytical Results for Subsurface Soils in Acid Area No. 1
Site Investigation of Acid Areas
Former Plum Brook Ordnance Works, Sandusky, Ohio

	Sample Location:	AA1-SB01		AA1-SB02		AA1-SB03		AA1-SB04		AA1-SB05	
	Sample No:	6020		6040		6060		6080		6100	
	Sample Date:	30-Apr-98		30-Apr-98		29-Apr-98		29-Apr-98		30-Apr-98	
	Depth (feet):	8-10		6-8		6-8		8-10		6-8	
	Units:	mg/kg		mg/kg		mg/kg		mg/kg		mg/kg	
METALS	RBCs (mg/kg)[a]	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
ALUMINUM	7,800	13300		12500		9590		10500		11100	
ARSENIC	0.43	6.1		6.1		7.3		5.5		6.6	
BARIUM	550	72		56.4		65.2		91.3		61.5	
BERYLLIUM	0.15	0.65		0.63							
CHROMIUM	39	19.2		18.5		15		17.3	J[b]	18.3	J
COBALT	470	16.8		10.4		10.8		13.1		12.6	
COPPER	310	23.7		24		23.6		24		23.5	
IRON	2,300	23000		23100		21600		21500	J	20000	J
LEAD	400	10.6		9.8		9.8		10.7		10.2	
MANGANESE	160	665		375		539		658	J	407	J
NICKEL	160	34.9		26.9		27.5		31.3		29.2	
SELENIUM	39					1.2					
VANADIUM	55	28.7		28.7		25.3		24		28.5	
ZINC	2,300	69.8		68.3		64		61.8	J	58.9	J

Table 5-4

Summary of Metal Analytical Results for Subsurface Soils in Acid Area No. 1
Site Investigation of Acid Areas
Former Plum Brook Ordnance Works, Sandusky, Ohio

	Sample Location:	AA1-SB06		AA1-SB07		AA1-SB08		AA1-SB09		AA1-SB10	
	Sample No:	6120		6140		6160		6180		6200	
	Sample Date:	29-Apr-98		29-Apr-98		29-Apr-98		30-Apr-98		30-Apr-98	
	Depth (feet):	6-8		2-4		2-4		2-4		4-6	
	Units:	mg/kg		mg/kg		mg/kg		mg/kg		mg/kg	
METALS	RBCs (mg/kg)[a]	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
ALUMINUM	7,800	11000		7890		6630		8840		17400	
ARSENIC	0.43	6.5		3.9		5		5		10.9	
BARIUM	550	58.6		39.1		26.1		56.2		118	
BERYLLIUM	0.15									0.94	
CHROMIUM	39	17.6	J[b]	11.7	J	13.2	J	13.8	J	23	J
COBALT	470	10.2		6.7		7		8.2		23.6	
COPPER	310	20.5		11.8		12.2		9.7		34.5	
IRON	2,300	22300	J	14200	J	17100	J	17000	J	35100	J
LEAD	400	10.2		8.7		6.4		6.8		15.4	
MANGANESE	160	436	J	166	J	135	J	187	J	1070	J
NICKEL	160	24.2		13.1		16.1		13.9		47.2	
SELENIUM	39										
VANADIUM	55	28.7		21.4		24.7		20.7		32.4	
ZINC	2,300	71.4	J	40.7	J	44.3	J	33	J	86.5	J

Table 5-4

Summary of Metal Analytical Results for Subsurface Soils in Acid Area No. 1
Site Investigation of Acid Areas
Former Plum Brook Ordnance Works, Sandusky, Ohio

	Sample Location:	AA1-SB11		AA1-SB12		AA1-SB13		AA1-SB14		AA1-SB15	
	Sample No:	6220		6240		6260		6280		6300	
	Sample Date:	30-Apr-98		30-Apr-98		29-Apr-98		29-Apr-98		30-Apr-98	
	Depth (feet):	4-6		2-4		2-4		8-10		8-10	
	Units:	mg/kg		mg/kg		mg/kg		mg/kg		mg/kg	
METALS	RBCs (mg/kg)[a]	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
ALUMINUM	7,800	7930		4700		11300		11100		8440	
ARSENIC	0.43	6.1		3		6.6		3.9		6.3	
BARIUM	550	54.7				81.5		60.4		63	
BERYLLIUM	0.15					0.62					
CHROMIUM	39	14.1	J[b]	12		17.8	J	19.3	J	14.4	
COBALT	470	10.1		8.3		13		9.3		13.4	
COPPER	310	16.8		5.9		17.4		23.4		22.6	
IRON	2,300	19000	J	13600		22200	J	20100	J	20300	
LEAD	400	9.4		4.2		9.1		10		10.6	
MANGANESE	160	208	J	245		642	J	328	J	355	
NICKEL	160	19.4		9.6		26.5		25.6		27.5	
SELENIUM	39							1.2		0.78	
VANADIUM	55	22.8		27.3		24.1		25.9		26.5	
ZINC	2,300	47.5	J	40.7		62.6	J	61.4	J	65.1	

[a] Risk-based concentrations for residential soil taken from EPA, 1998, risk-based concentration 8table.

[b] J qualifier. Analyte present. Reported value may not be accurate or precise.

Note 1: Shading indicates concentration exceeds RBC.

Note 2: Blank cells indicate that compound was analyzed for, but was not detected unless otherwise noted.

5.2.1 Surface Soil

Volatile Organic Compounds. Three VOCs (acetone, methylene chloride, and toluene) were present in a limited number of surface soil samples (Table 5-5). However, their concentrations were all below established RBCs.

Semivolatile Organic Compounds. A suite of 22 SVOCs was detected in surface soil samples collected within AA2, of which 5 exceeded the RBC concentrations (Table 5-5 and Figure 5-3). In addition, 3,3'-dichlorobenzidine, for which an RBC has not been established, was detected at AA2-SB13 at an estimated concentration of 140 µg/kg. SVOCs exceeding the RBCs included benzo(a)anthracene (AA2-SB03); benzo(a)pyrene (AA2-SB03, -SB06, -SB11, and -SB13); benzo(b)fluoranthene (AA2-SB03), and indeno(1,2,3-cd)pyrene (AA2-SB03). The surface soil sample from AA2-SB03 (sample number 6350) exhibited VOC detections that were significantly higher in both the number of hits and the concentrations than any other sample collected from within AA2.

Explosives. Two surface soil samples (AA2-SB06 and AA2-SB07) were analyzed for explosive compounds. No detection of any explosive compounds was reported.

PCBs. Only surface soil samples were analyzed for the presence of PCBs. Aroclor 1260 was present in nine of the fifteen samples analyzed (Table 5-5). Of these, seven detections exceeded the RBC of 83 µg/kg, with concentrations ranging from 240 µg/kg (AA2-SB11) to 20,000 µg/kg (AA2-SB01).

Metals. A total of 16 metals were detected in the subsurface soil samples collected within AA2. Five of the metals were present at concentrations exceeding the RBCs (Table 5-6 and Figure 5-4), including aluminum, arsenic, beryllium, iron, and manganese. However, none of the detected metals exceeding RBCs also exceeded the background concentrations.

5.2.2 Subsurface Soil

Volatile Organic Compounds. Four VOCs (acetone, methylene chloride, toluene, and total xylenes) were present in a limited number of surface soil samples (Table 5-7). However, their concentrations were all below established RBCs.

Table 5-5

Summary of Organic Analytical Results for Surface Soils in Acid Area No. 2
Site Investigation of Acid Areas
Former Plum Brook Ordnance Works, Sandusky, Ohio

	Sample Location:	AA2-SB01		AA2-SB02		AA2-SB03		AA2-SB04		AA2-SB05	
	Sample No:	6310		6330		6350		6370		6390	
	Sample Date:	27-Apr-98		28-Apr-98		27-Apr-98		27-Apr-98		28-Apr-98	
	Depth (feet):	0-1		0-1		0-1		0-1		0-1	
	Units:	µg/kg		µg/kg		µg/kg		µg/kg		µg/kg	
VOLATILES	RBCs (µg/kg)[a]	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
ACETONE	780,000			380						77	
METHYLENE CHLORIDE	85,000	2.4	J[b]								
TOLUENE	1,600,000							1.8	J		
SEMIVOLATILES											
2,4-DINITROTOLUENE	16,000	44	J			5800					
2-METHYLNAPHTHALENE	64,000					60	J				
3,3'-DICHLOROBENZIDINE	NE[c]										
ACENAPHTHENE	470,000					800					
ACENAPHTHYLENE	470,000					70	J				
ANTHRACENE	2,300,000					1800					
BENZO(a)ANTHRACENE	880	67	J	45	J	8500	D[d]				
BENZO(a)PYRENE	88	72	J	45	J	7300	D				
BENZO(b)FLUORANTHENE	880	71	J			9700	D				
BENZO(ghi)PERYLENE	8,800	41	J			1900					
BENZO(k)FLUORANTHENE	8,800	79	J	53	J	6300	D				
BIS(2-ETHYLHEXYL)PHTHALATE	46,000										
CARBAZOLE	32,000					1500					
CHRYSENE	8,800	100	J	52	J	8300	D				
DIBENZ(a,h)ANTHRACENE	88					1100					
DIBENZOFURAN	31,000					190	J				
FLUORANTHENE	310,000	110	J	71	J	17000	D				
FLUORENE	310,000					420					
INDENO(1,2,3-cd)PYRENE	880	38	J			2200					
NAPHTHALENE	310,000					120	J				
PHENANTHRENE	31,000					7100	D				
PYRENE	230,000	110	J	58	J	15000	D				
PCBs											
AROCLOR 1260	83	20000		260		7800					

Table 5-5

Summary of Organic Analytical Results for Surface Soils in Acid Area No. 2
Site Investigation of Acid Areas
Former Plum Brook Ordnance Works, Sandusky, Ohio

	Sample Location:	AA2-SB06		AA2-SB07		AA2-SB08		AA2-SB09		AA2-SB10	
	Sample No:	6410		6430		6450		6470		6490	
	Sample Date:	28-Apr-98		28-Apr-98		28-Apr-98		28-Apr-98		28-Apr-98	
	Depth:	0-1		0-1		0-1		0-1		0-1	
	Units:	µg/kg		µg/kg		µg/kg		µg/kg		µg/kg	
VOLATILES	RBCs (µg/kg)[a]			Result	VQ	Result	VQ				
ACETONE	780,000			8600	J[b]	4300	J				
METHYLENE CHLORIDE	85,000										
TOLUENE	1,600,000										
SEMIVOLATILES											
2,4-DINITROTOLUENE	16,000										
2-METHYLNAPHTHALENE	64,000										
3,3'-DICHLOROBENZIDINE	NE										
ACENAPHTHENE	470,000										
ACENAPHTHYLENE	470,000	87	J								
ANTHRACENE	2,300,000	100	J								
BENZO(a)ANTHRACENE	880	230	J								
BENZO(a)PYRENE	88	260	J								
BENZO(b)FLUORANTHENE	880	190	J								
BENZO(ghi)PERYLENE	8,800	160	J								
BENZO(k)FLUORANTHENE	8,800	270	J								
BIS(2-ETHYLHEXYL)PHTHALATE	46,000	50	J	55	J						
CARBAZOLE	32,000										
CHRYSENE	8,800	240	J								
DIBENZ(a,h)ANTHRACENE	88	77	J								
DIBENZOFURAN	31,000										
FLUORANTHENE	310,000	340	J								
FLUORENE	310,000										
INDENO(1,2,3-cd)PYRENE	880	160	J								
NAPHTHALENE	310,000										
PHENANTHRENE	31,000	68	J								
PYRENE	230,000	260	J								
PCBs											
AROCLOR 1260	83	3600								1500	

Table 5-5

Summary of Organic Analytical Results for Surface Soils in Acid Area No. 2
Site Investigation of Acid Areas
Former Plum Brook Ordnance Works, Sandusky, Ohio

	Sample Location:	AA2-SB11		AA2-SB12		AA2-SB13		AA2-SB14		AA2-SB15	
	Sample No:	6510		6530		6550		6570		6590	
	Sample Date:	28-Apr-98		28-Apr-98		27-Apr-98		27-Apr-98		27-Apr-98	
	Depth:	0-1		0-1		0-1		0-1		0-1	
	Units:	µg/kg		µg/kg		µg/kg		µg/kg		µg/kg	
VOLATILES	RBCs (µg/kg)[a]	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
ACETONE	780,000	13	J[b]								
METHYLENE CHLORIDE	85,000					2.7	J	2.2	J		
TOLUENE	1,600,000										
SEMIVOLATILES											
2,4-DINITROTOLUENE	16,000										
2-METHYLNAPHTHALENE	64,000										
3,3'-DICHLOROBENZIDINE	NE					140	J				
ACENAPHTHENE	470,000										
ACENAPHTHYLENE	470,000	68	J								
ANTHRACENE	2,300,000	69	J			45	J				
BENZO(a)ANTHRACENE	880	180	J			110	J				
BENZO(a)PYRENE	88	180	J			120	J				
BENZO(b)FLUORANTHENE	880	140	J			100	J				
BENZO(ghi)PERYLENE	8,800	110	J			43	J				
BENZO(k)FLUORANTHENE	8,800	190	J			110	J				
BIS(2-ETHYLHEXYL)PHTHALATE	46,000			42	J			39	J	45	J
CARBAZOLE	32,000										
CHRYSENE	8,800	180	J			110	J				
DIBENZ(a,h)ANTHRACENE	88	53	J								
DIBENZOFURAN	31,000										
FLUORANTHENE	310,000	260	J			200	J				
FLUORENE	310,000										
INDENO(1,2,3-cd)PYRENE	880	110	J			51	J				
NAPHTHALENE	310,000										
PHENANTHRENE	31,000	73	J			47	J				
PYRENE	230,000	190	J			160	J				
PCBs											
AROCLOR 1260	83	240				9800		45		47	

Table 5-5

Summary of Organic Analytical Results for Surface Soils in Acid Area No. 2
Site Investigation of Acid Areas
Former Plum Brook Ordnance Works, Sandusky, Ohio

[a] Risk-based concentrations for residential soil taken from EPA, 1998, risk-based concentration table.

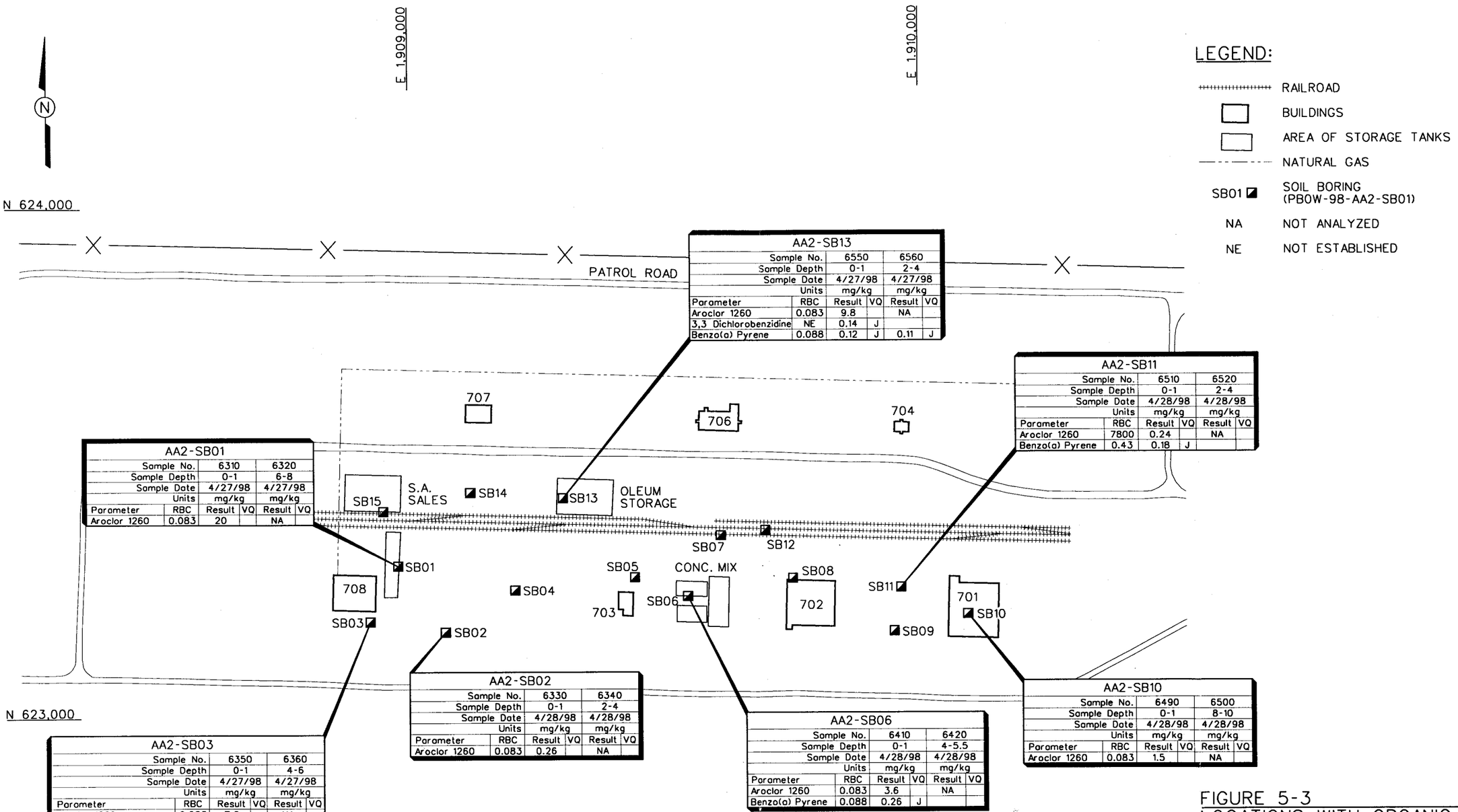
[b] J qualifier. Analyte present. Reported value may not be accurate or precise.

[c] RBC was not established for this compound.

[d] D qualifier. Sample requires dilution.

Note 1: Shading indicates concentration exceeds RBC.

Note 2: Blank cells indicate that compound was analyzed for, but was not detected unless otherwise noted.



LEGEND:

- RAILROAD
- BUILDINGS
- AREA OF STORAGE TANKS
- NATURAL GAS
- SB01 — SOIL BORING (PBOW-98-AA2-SB01)
- NA — NOT ANALYZED
- NE — NOT ESTABLISHED

AA2-SB13

Sample No.		6550		6560	
Sample Depth		0-1		2-4	
Sample Date		4/27/98		4/27/98	
Units		mg/kg		mg/kg	
Parameter	RBC	Result	VQ	Result	VQ
Aroclor 1260	0.083	9.8		NA	
3,3 Dichlorobenzidine	NE	0.14	J		
Benzo(a) Pyrene	0.088	0.12	J	0.11	J

AA2-SB11

Sample No.		6510		6520	
Sample Depth		0-1		2-4	
Sample Date		4/28/98		4/28/98	
Units		mg/kg		mg/kg	
Parameter	RBC	Result	VQ	Result	VQ
Aroclor 1260	7800	0.24		NA	
Benzo(a) Pyrene	0.43	0.18	J		

AA2-SB01

Sample No.		6310		6320	
Sample Depth		0-1		6-8	
Sample Date		4/27/98		4/27/98	
Units		mg/kg		mg/kg	
Parameter	RBC	Result	VQ	Result	VQ
Aroclor 1260	0.083	20		NA	

AA2-SB02

Sample No.		6330		6340	
Sample Depth		0-1		2-4	
Sample Date		4/28/98		4/28/98	
Units		mg/kg		mg/kg	
Parameter	RBC	Result	VQ	Result	VQ
Aroclor 1260	0.083	0.26		NA	

AA2-SB03

Sample No.		6350		6360	
Sample Depth		0-1		4-6	
Sample Date		4/27/98		4/27/98	
Units		mg/kg		mg/kg	
Parameter	RBC	Result	VQ	Result	VQ
Aroclor 1260	0.083	7.8		NA	
Benzo(a) Anthracene	0.88	8.5	D		
Benzo(b) Pyrene	0.088	7.3	D		
Benzo(b) Fluoranthene	0.88	9.7	D		
Dibenzo(a,h) Anthracene	0.088	1.1			
Indeno(1,2,3-cd) Pyrene	0.88	2.2			

AA2-SB06

Sample No.		6410		6420	
Sample Depth		0-1		4-5.5	
Sample Date		4/28/98		4/28/98	
Units		mg/kg		mg/kg	
Parameter	RBC	Result	VQ	Result	VQ
Aroclor 1260	0.083	3.6		NA	
Benzo(a) Pyrene	0.088	0.26	J		

AA2-SB10

Sample No.		6490		6500	
Sample Depth		0-1		8-10	
Sample Date		4/28/98		4/28/98	
Units		mg/kg		mg/kg	
Parameter	RBC	Result	VQ	Result	VQ
Aroclor 1260	0.083	1.5		NA	

FIGURE 5-3
LOCATIONS WITH ORGANIC CONTAMINANTS DETECTED AT CONCENTRATIONS ABOVE RBCs IN ACID AREA NO. 2

PLUM BROOK ORDNANCE WORKS
NASA PLUM BROOK STATION
SANDUSKY, OHIO

SCALE
0 200 400 FEET

INTERNATIONAL TECHNOLOGY CORPORATION

DRAFT. CHCK. BY: VANDERGRIFF | INITIATOR: D. KESSLER | DWG. NO.: /3206es.019
ENGR. CHCK. BY: D. KESSLER | PROJ. MGR.: SPANGBERG | PROJ. NO.: 773206
STARTING DATE: 8/6/98 | DATE LAST Rev.:
DRAWN BY: R. VANDERGRIFF | DRAWN BY:
10:45:30 22 DEC 98
bvanderg
c:\nt\ds\civil\773206es.019

Table 5-6

Summary of Metal Analytical Results for Surface Soils in Acid Area No. 2
Site Investigation of Acid Areas
Former Plum Brook Ordnance Works, Sandusky, Ohio

	Sample Location:	AA2-SB01		AA2-SB02		AA2-SB03		AA2-SB04		AA2-SB05	
	Sample No:	6310		6330		6350		6370		6390	
	Sample Date:	27-Apr-98		28-Apr-98		27-Apr-98		27-Apr-98		28-Apr-98	
	Depth:	0-1		0-1		0-1		0-1		0-1	
	Units:	mg/kg		mg/kg		mg/kg		mg/kg		mg/kg	
METALS	RBCs (mg/kg)[a]	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
ALUMINUM	7,800	9320		5390		4230		10900		10700	
ARSENIC	0.43	7.2		4.9		19.3		8.3		7.3	
BARIUM	550	84.4		28.3		188		54		72.4	
BERYLLIUM	0.15							0.61			
CADMIUM	3.9	0.62				1.3					
CHROMIUM	39	20.8		11		14.6		16		15.7	
COBALT	470	10.6				7.7		11.2		11.8	
COPPER	310	19.6		9.2		70.4		21		26	
IRON	2,300	20000		15200		36100		22200		21100	
LEAD	400	143		71.2		7410		8.1		11.8	
MANGANESE	160	488		109		1010		170		197	
MERCURY	2.3					0.069				0.04	
NICKEL	160	22.7		9.4		21.8		24.9		20.6	
SELENIUM	39	0.66								0.8	
VANADIUM	55	23.1		23.3		32.7		23.3		24.8	
ZINC	2,300	252		38.3	J[b]	336		60.1		71.7	J

Table 5-6

Summary of Metal Analytical Results for Surface Soils in Acid Area No. 2
Site Investigation of Acid Areas
Former Plum Brook Ordnance Works, Sandusky, Ohio

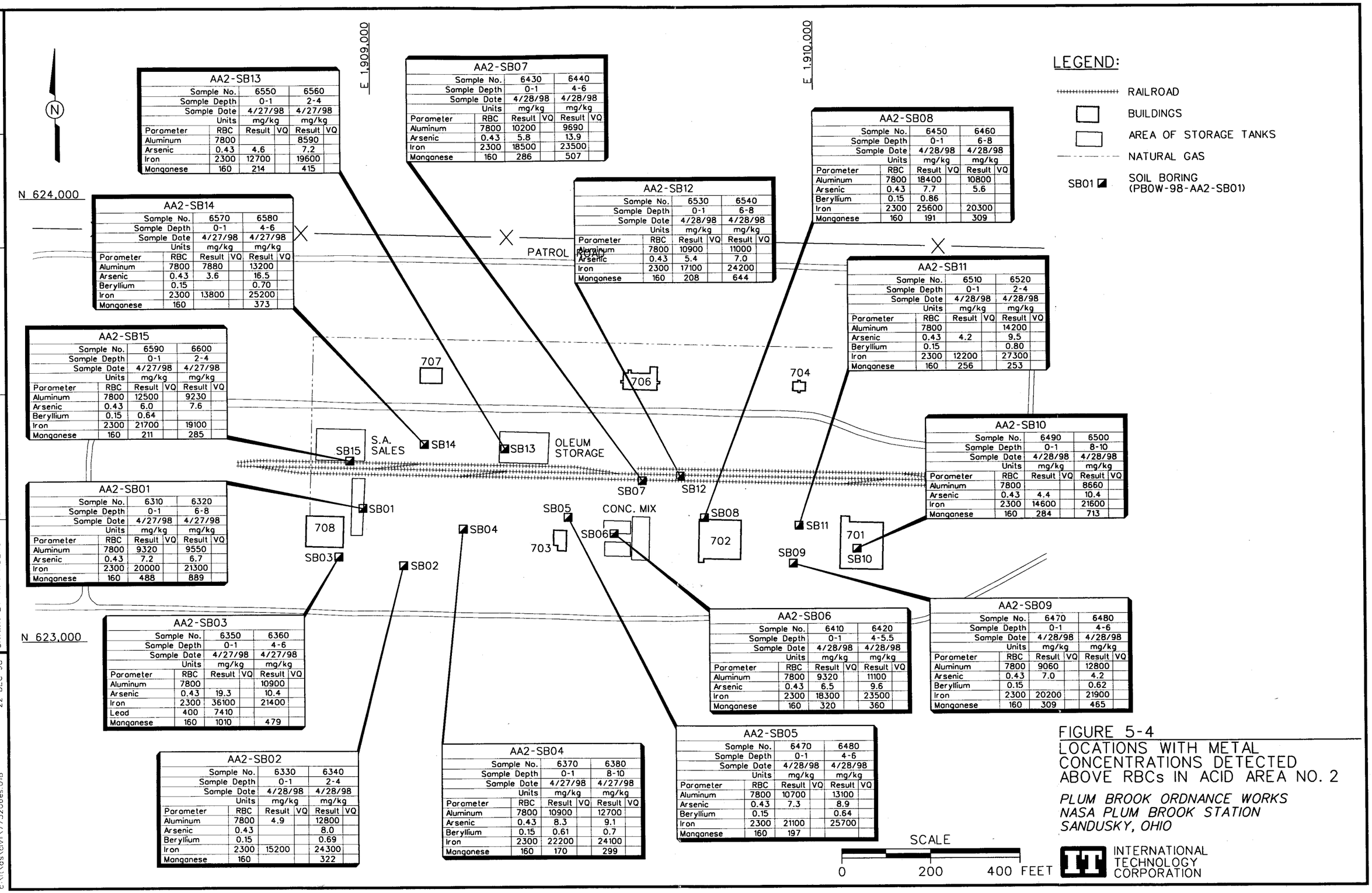
	Sample Location:	AA2-SB06		AA2-SB07		AA2-SB08		AA2-SB09		AA2-SB10	
	Sample No:	6410		6430		6450		6470		6490	
	Sample Date:	28-Apr-98		28-Apr-98		28-Apr-98		28-Apr-98		28-Apr-98	
	Depth:	0-1		0-1		0-1		0-1		0-1	
	Units:	mg/kg		mg/kg		mg/kg		mg/kg		mg/kg	
METALS	RBCs (mg/kg)[a]	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
ALUMINUM	7,800	9320		10200		18400		9060		7090	
ARSENIC	0.43	6.5		5.8		7.7		7		4.4	
BARIUM	550	54.6		42.3		98.6		26.3		59.1	
BERYLLIUM	0.15					0.86					
CADMIUM	3.9										
CHROMIUM	39	14.9		15		23.7		15.1		10.2	
COBALT	470	9.7		11.3		11.9		8.8		6.9	
COPPER	310	14.9		12.5		18.2		13.5		11.5	
IRON	2,300	18300		18500		25600		20200		14600	
LEAD	400	40.1		7.7		13.2		7		20.4	
MANGANESE	160	320		286		191		309		284	
MERCURY	2.3					0.04		0.046			
NICKEL	160	16.5		16.4		25		15.7		14.4	
SELENIUM	39	0.78		0.72		0.73					
VANADIUM	55	23.5		24.8		35.3		26.7		17.5	
ZINC	2,300	112	J[b]	37.6	J	59.9	J	39.1	J	84.1	J

Table 5-6

Summary of Metal Analytical Results for Surface Soils in Acid Area No. 2
Site Investigation of Acid Areas
Former Plum Brook Ordnance Works, Sandusky, Ohio

	Sample Location:	AA2-SB11		AA2-SB12		AA2-SB13		AA2-SB14		AA2-SB15	
	Sample No:	6510		6530		6550		6570		6590	
	Sample Date:	28-Apr-98		28-Apr-98		27-Apr-98		27-Apr-98		27-Apr-98	
	Depth:	0-1		0-1		0-1		0-1		0-1	
	Units:	mg/kg		mg/kg		mg/kg		mg/kg		mg/kg	
METALS	RBCs (mg/kg)[a]	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
ALUMINUM	7,800	7230		10900		6740		7880		12500	
ARSENIC	0.43	4.2		5.4		4.6		3.6		6	
BARIUM	550	43		64.5		44.6		43.1		83.1	
BERYLLIUM	0.15									0.64	
CADMIUM	3.9										
CHROMIUM	39	9		14.6		10.5		11.5		17.2	
COBALT	470	6.4		8.6		6.4		6.2		10.1	
COPPER	310	7.4		12.7		8.6		6.4		19.2	
IRON	2,300	12200		17100		12700		13800		21700	
LEAD	400	8.1		8.7		28.8		5.8		9.1	
MANGANESE	160	256		208		214		118		211	
MERCURY	2.3										
NICKEL	160	11		17		11.4		10.2		19	
SELENIUM	39	0.59						0.61		0.82	
VANADIUM	55	17.3		25.3		18.8		19.9		24.5	
ZINC	2,300	33.4	J[b]	44.7	J	66.5		31.7		72.3	

[a] Risk-based concentrations for residential soil taken from EPA, 1998, risk-based concentration 8table.
[b] J qualifier. Analyte present. Reported value may not be accurate or precise.
Note 1: Shading indicates concentration exceeds RBC.
Note 2: Blank cells indicate that compound was analyzed for, but was not detected unless otherwise noted.



AA2-SB13

Sample No.		6550		6560	
Sample Depth		0-1		2-4	
Sample Date		4/27/98		4/27/98	
	Units	mg/kg		mg/kg	
Parameter	RBC	Result	VQ	Result	VQ
Aluminum	7800			8590	
Arsenic	0.43	4.6		7.2	
Iron	2300	12700		19600	
Manganese	160	214		415	

AA2-SB07

Sample No.		6430		6440	
Sample Depth		0-1		4-6	
Sample Date		4/28/98		4/28/98	
	Units	mg/kg		mg/kg	
Parameter	RBC	Result	VQ	Result	VQ
Aluminum	7800	10200		9690	
Arsenic	0.43	5.8		13.9	
Iron	2300	18500		23500	
Manganese	160	286		507	

AA2-SB08

Sample No.		6450		6460	
Sample Depth		0-1		6-8	
Sample Date		4/28/98		4/28/98	
	Units	mg/kg		mg/kg	
Parameter	RBC	Result	VQ	Result	VQ
Aluminum	7800	18400		10800	
Arsenic	0.43	7.7		5.6	
Beryllium	0.15	0.86			
Iron	2300	25600		20300	
Manganese	160	191		309	

AA2-SB14

Sample No.		6570		6580	
Sample Depth		0-1		4-6	
Sample Date		4/27/98		4/27/98	
	Units	mg/kg		mg/kg	
Parameter	RBC	Result	VQ	Result	VQ
Aluminum	7800	7880		13200	
Arsenic	0.43	3.6		16.5	
Beryllium	0.15			0.70	
Iron	2300	13800		25200	
Manganese	160			373	

AA2-SB12

Sample No.		6530		6540	
Sample Depth		0-1		6-8	
Sample Date		4/28/98		4/28/98	
	Units	mg/kg		mg/kg	
Parameter	RBC	Result	VQ	Result	VQ
Aluminum	7800	10900		11000	
Arsenic	0.43	5.4		7.0	
Iron	2300	17100		24200	
Manganese	160	208		644	

AA2-SB11

Sample No.		6510		6520	
Sample Depth		0-1		2-4	
Sample Date		4/28/98		4/28/98	
	Units	mg/kg		mg/kg	
Parameter	RBC	Result	VQ	Result	VQ
Aluminum	7800			14200	
Arsenic	0.43	4.2		9.5	
Beryllium	0.15			0.80	
Iron	2300	12200		27300	
Manganese	160	256		253	

AA2-SB15

Sample No.		6590		6600	
Sample Depth		0-1		2-4	
Sample Date		4/27/98		4/27/98	
	Units	mg/kg		mg/kg	
Parameter	RBC	Result	VQ	Result	VQ
Aluminum	7800	12500		9230	
Arsenic	0.43	6.0		7.6	
Beryllium	0.15	0.64			
Iron	2300	21700		19100	
Manganese	160	211		285	

AA2-SB10

Sample No.		6490		6500	
Sample Depth		0-1		8-10	
Sample Date		4/28/98		4/28/98	
	Units	mg/kg		mg/kg	
Parameter	RBC	Result	VQ	Result	VQ
Aluminum	7800			8660	
Arsenic	0.43	4.4		10.4	
Iron	2300	14600		21600	
Manganese	160	284		713	

AA2-SB01

Sample No.		6310		6320	
Sample Depth		0-1		6-8	
Sample Date		4/27/98		4/27/98	
	Units	mg/kg		mg/kg	
Parameter	RBC	Result	VQ	Result	VQ
Aluminum	7800	9320		9550	
Arsenic	0.43	7.2		6.7	
Iron	2300	20000		21300	
Manganese	160	488		889	

AA2-SB06

Sample No.		6410		6420	
Sample Depth		0-1		4-5.5	
Sample Date		4/28/98		4/28/98	
	Units	mg/kg		mg/kg	
Parameter	RBC	Result	VQ	Result	VQ
Aluminum	7800	9320		11100	
Arsenic	0.43	6.5		9.6	
Iron	2300	18300		23500	
Manganese	160	320		360	

AA2-SB09

Sample No.		6470		6480	
Sample Depth		0-1		4-6	
Sample Date		4/28/98		4/28/98	
	Units	mg/kg		mg/kg	
Parameter	RBC	Result	VQ	Result	VQ
Aluminum	7800	9060		12800	
Arsenic	0.43	7.0		4.2	
Beryllium	0.15			0.62	
Iron	2300	20200		21900	
Manganese	160	309		465	

AA2-SB03

Sample No.		6350		6360	
Sample Depth		0-1		4-6	
Sample Date		4/27/98		4/27/98	
	Units	mg/kg		mg/kg	
Parameter	RBC	Result	VQ	Result	VQ
Aluminum	7800			10900	
Arsenic	0.43	19.3		10.4	
Iron	2300	36100		21400	
Lead	400	7410			
Manganese	160	1010		479	

AA2-SB05

Sample No.		6470		6480	
Sample Depth		0-1		4-6	
Sample Date		4/28/98		4/28/98	
	Units	mg/kg		mg/kg	
Parameter	RBC	Result	VQ	Result	VQ
Aluminum	7800	10700		13100	
Arsenic	0.43	7.3		8.9	
Beryllium	0.15			0.64	
Iron	2300	21100		25700	
Manganese	160	197			

AA2-SB02

Sample No.		6330		6340	
Sample Depth		0-1		2-4	
Sample Date		4/28/98		4/28/98	
	Units	mg/kg		mg/kg	
Parameter	RBC	Result	VQ	Result	VQ
Aluminum	7800	4.9		12800	
Arsenic	0.43			8.0	
Beryllium	0.15			0.69	
Iron	2300	15200		24300	
Manganese	160			322	

AA2-SB04

Sample No.		6370		6380	
Sample Depth		0-1		8-10	
Sample Date		4/27/98		4/27/98	
	Units	mg/kg		mg/kg	
Parameter	RBC	Result	VQ	Result	VQ
Aluminum	7800	10900		12700	
Arsenic	0.43	8.3		9.1	
Beryllium	0.15	0.61		0.7	
Iron	2300	22200		24100	
Manganese	160	170		299	

FIGURE 5-4
LOCATIONS WITH METAL CONCENTRATIONS DETECTED ABOVE RBCs IN ACID AREA NO. 2

PLUM BROOK ORDNANCE WORKS
NASA PLUM BROOK STATION
SANDUSKY, OHIO

INTERNATIONAL TECHNOLOGY CORPORATION

DRAFT. CHCK. BY: VANDERGRIFF | INITIATOR: D. KESSLER | DWG. NO.: ...206es.018
ENGR. CHCK. BY: D. KESSLER | PROJ. MGR.: SPANGBERG | PROJ. NO.: 773206
STARTING DATE: 8/6/98 | DATE LAST REV.:
DRAWN BY: R. VANDERGRIFF | DRAWN BY:
22 DEC 98 10:43:48
c:\ntwds\civil\773206es.018
bvanderg

Table 5-7

Summary of Organic Analytical Results for Subsurface Soils in Acid Area No. 2
Site Investigation of Acid Areas
Former Plum Brook Ordnance Works, Sandusky, Ohio

	Sample Location:	AA2-SB01		AA2-SB02		AA2-SB03		AA2-SB04		AA2-SB05	
	Sample No:	6320		6340		6360		6380		6400	
	Sample Date:	27-Apr-98		28-Apr-98		27-Apr-98		27-Apr-98		28-Apr-98	
	Depth (feet):	6-8		2-4		4-6		8-10		4-6	
	Units	µg/kg		µg/kg		µg/kg		µg/kg		µg/kg	
VOLATILES	RBCs (µg/kg)[a]	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
ACETONE	780,000			18	J[b]	32				29	
METHYLENE CHLORIDE	85,000					2.5	J				
TOLUENE	1,600,000	2.2	J					1.4	J		
TOTAL XYLENES	1,600,000	3.4	J			1.6	J				
SEMIVOLATILES											
ANTHRACENE	2,300,000										
BENZO(a)ANTHRACENE	880										
BENZO(a)PYRENE	88										
BENZO(b)FLUORANTHENE	880										
BENZO(ghi)PERYLENE	230,000										
BENZO(k)FLUORANTHENE	8,000										
BIS(2-ETHYLHEXYL)PHTHALATE	46,000	51	J					49	J		
CHRYSENE	88,000										
DI-n-BUTYL PHTHALATE	780,000	47	J								
FLUORANTHENE	310,000										
INDENO(1,2,3-cd)PYRENE	880										
PHENANTHRENE	2,300,000										
PYRENE	230,000										

Table 5-7

Summary of Organic Analytical Results for Subsurface Soils in Acid Area No. 2
Site Investigation of Acid Areas
Former Plum Brook Ordnance Works, Sandusky, Ohio

	Sample Location:	AA2-SB06		AA2-SB07		AA2-SB08		AA2-SB09		AA2-SB10	
	Sample No:	6420		6440		6460		6480		6500	
	Sample Date:	28-Apr-98		28-Apr-98		28-Apr-98		28-Apr-98		28-Apr-98	
	Depth (feet):	4-5.5		4-6		6-8		4-6		8-10	
	Units	µg/kg		µg/kg		µg/kg		µg/kg		µg/kg	
VOLATILES	RBCs (µg/kg)[a]	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
ACETONE	780,000	1600	D[c]	3500	D	750	J	2100	D	5000	J
METHYLENE CHLORIDE	85,000	6.6	J							20	J
TOLUENE	1,600,000										
TOTAL XYLENES	1,600,000										
SEMIVOLATILES											
ANTHRACENE	2,300,000										
BENZO(a)ANTHRACENE	880										
BENZO(a)PYRENE	88										
BENZO(b)FLUORANTHENE	880										
BENZO(ghi)PERYLENE	230,000										
BENZO(k)FLUORANTHENE	8,000										
BIS(2-ETHYLHEXYL)PHTHALATE	46,000										
CHRYSENE	88,000										
DI-n-BUTYL PHTHALATE	780,000										
FLUORANTHENE	310,000										
INDENO(1,2,3-cd)PYRENE	880										
PHENANTHRENE	2,300,000										
PYRENE	230,000										

Table 5-7

Summary of Organic Analytical Results for Subsurface Soils in Acid Area No. 2
Site Investigation of Acid Areas
Former Plum Brook Ordnance Works, Sandusky, Ohio

	Sample Location:	AA2-SB11		AA2-SB12		AA2-SB13		AA2-SB14		AA2-SB15	
	Sample No:	6520		6540		6560		6580		6600	
	Sample Date:	28-Apr-98		28-Apr-98		27-Apr-98		27-Apr-98		27-Apr-98	
	Depth (feet):	2-4		6-8		2-4		4-6		2-4	
	Units	µg/kg		µg/kg		µg/kg				µg/kg	
VOLATILES	RBCs (µg/kg)[a]	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
ACETONE	780,000			320							
METHYLENE CHLORIDE	85,000					2.3	J[b]				
TOLUENE	1,600,000										
TOTAL XYLENES	1,600,000										
SEMIVOLATILES											
ANTHRACENE	2,300,000					57	J				
BENZO(a)ANTHRACENE	880					110	J				
BENZO(a)PYRENE	88					110	J				
BENZO(b)FLUORANTHENE	880					95	J				
BENZO(ghi)PERYLENE	230,000					37	J				
BENZO(k)FLUORANTHENE	8,000					120	J				
BIS(2-ETHYLHEXYL)PHTHALATE	46,000					51	J	58	J	41	J
CHRYSENE	88,000					120	J				
DI-n-BUTYL PHTHALATE	780,000										
FLUORANTHENE	310,000					210	J				
INDENO(1,2,3-cd)PYRENE	880					45	J				
PHENANTHRENE	2,300,000					71	J				
PYRENE	230,000					170	J				

[a] Risk-based concentrations for residential soil taken from EPA, 1998, risk-based concentration table.
[b] J qualifier. Analyte present. Reported value may not be accurate or precise.
[c] D qualifier. Sample requires dilution.
Note 1: Shading indicates concentration exceeds RBCs.
Note 2: Blank cells indicate that compound was analyzed for, but was not detected unless otherwise noted.

Semivolatile Organic Compounds. A total of 13 SVOCs were detected in these 15 subsurface soil samples from AA2, but 13 of the 15 compounds were detected only in AA2-SB13 (Table 5-7). One SVOC, benzo(a)pyrene, exceeded the RBC of 88 µg/kg in AA2-SB13 (Figure 5-3), while all other SVOC analytes were below their respective RBCs.

Explosives. Two surface soil samples (AA2-SB06 and AA2-SB07) were analyzed for explosive compounds. However, explosives were not detected in either sample.

Metals. Similar to surface soil results, a suite of 16 metals was also detected in the subsurface soil samples collected within AA2. Of these, 5 were present at concentrations exceeding the RBCs (Table 5-8 and Figure 5-4), including aluminum, arsenic, beryllium, iron, and manganese. However, none of the detected metals exceeding RBCs also exceeded the background concentrations.

5.3 Acid Area No. 3

A total of 30 soil samples were collected within AA3, with 2 discrete samples from each of the 15 boring locations. The surface soil samples were obtained from depths of 0.5 to 1.5 feet bgs (0 to 1.0 foot into the native soil), while subsurface soil samples were collected from a 2-foot interval no deeper than 10 feet bgs. In addition, 3 borings were installed within the former MNT area, with 2 samples from each boring, and 2 surface soil samples were collected from the former PSB area. Competent bedrock was not encountered in this area during the advancement of the soil borings. The following paragraphs discuss the detected constituents in site soils by chemical groups.

5.3.1 Surface Soil

Volatile Organic Compounds. Two VOCs (acetone and toluene) were present in a limited number of surface soil samples (Table 5-9). However, their concentrations were all below established RBCs.

Semivolatile Organic Compounds. A total of 22 SVOCs were detected in surface soil samples collected within AA3, with 5 exceeding the respective RBCs; 12 were detected in samples from PSB area, with one exceeding the RBC, while none were detected in the MNT area (Table 5-9 and Figure 5-5). Benzo(a)anthracene exceeded the RBC in AA3-SB08 and AA3-SB10, while benzo(a)pyrene exceeded the RBC in five locations (AA3-SB02, -SB06, -SB08,

Table 5-8

Summary of Metal Analytical Results for Subsurface Soils in Acid Area No. 2
Site Investigation of Acid Areas
Former Plum Brook Ordnance Works, Sandusky, Ohio

	Sample Location:	AA2-SB01		AA2-SB02		AA2-SB03		AA2-SB04		AA2-SB05	
	Sample No:	6320		6340		6360		6380		6400	
	Sample Date:	27-Apr-98		28-Apr-98		27-Apr-98		27-Apr-98		28-Apr-98	
	Depth (feet):	6-8		2-4		4-6		8-10		4-6	
	Units:	mg/kg		mg/kg		mg/kg		mg/kg		mg/kg	
METALS	RBCs (mg/kg)[a]	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
ALUMINUM	7800	9550		12800		10900		12700		13100	
ARSENIC	0.43	6.7		8		10.4		9.1		8.9	
BARIUM	550	57.4		63.7		65.1		69.2		68.1	
BERYLLIUM	0.15			0.69				0.7		0.64	
CADMIUM	3.9										
CHROMIUM	39	13.8		20.3		16.2		19.8		19.9	
COBALT	470	12.5		12.9		11		12.9		10.3	
COPPER	310	21.6		22.8		23		27.3		14.8	
IRON	2300	21300		24300		21400		24100		25700	
LEAD	400	8		9.7		10.5		12.5		10.2	
MANGANESE	160	889		322		479		299		138	
MERCURY	2.3									0.047	
NICKEL	160	24.4		28.8		27.8		32.9		22.9	
SELENIUM	39							1.5			
VANADIUM	55	26.5		25.5		26.1		33.4		24	
ZINC	2300	58.1		75.9	J[b]	68		71.7		84.3	J

Table 5-8

Summary of Metal Analytical Results for Subsurface Soils in Acid Area No. 2
Site Investigation of Acid Areas
Former Plum Brook Ordnance Works, Sandusky, Ohio

	Sample Location:	AA2-SB06		AA2-SB07		AA2-SB08		AA2-SB09		AA2-SB10	
	Sample No:	6420		6440		6460		6480		6500	
	Sample Date:	28-Apr-98		28-Apr-98		28-Apr-98		28-Apr-98		28-Apr-98	
	Depth (feet):	4-5.5		4-6		6-8		4-6		8-10	
	Units:	mg/kg		mg/kg		mg/kg		mg/kg		mg/kg	
METALS	RBCs (mg/kg)[a]	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
ALUMINUM	7800	11100		9690		10800		12800		8660	
ARSENIC	0.43	9.6		13.9		5.6		4.2		10.4	
BARIUM	550	65.2		59.2		59.4		57.5		107	
BERYLLIUM	0.15							0.62			
CADMIUM	3.9										
CHROMIUM	39	17.2		15.6		16.9		19.3		13.1	
COBALT	470	10.9		10.2		9.3		11.6		12.6	
COPPER	310	26.5		24.4		22.5		24.1		23.1	
IRON	2300	23500		23500		20300		21900		21600	
LEAD	400	10.6		9		9.7		10.4		10	
MANGANESE	160	360		507		309		465		713	
MERCURY	2.3										
NICKEL	160	23.8		29.2		23.3		27.1		28.1	
SELENIUM	39										
VANADIUM	55	27.1		26.7		26.8		30		23.5	
ZINC	2300	68.1	J[b]	61.8	J	65.2	J	69.2	J	56.7	J

Table 5-8

Summary of Metal Analytical Results for Subsurface Soils in Acid Area No. 2
Site Investigation of Acid Areas
Former Plum Brook Ordnance Works, Sandusky, Ohio

	Sample Location:	AA2-SB11		AA2-SB12		AA2-SB13		AA2-SB14		AA2-SB15	
	Sample No:	6520		6540		6560		6580		6600	
	Sample Date:	28-Apr-98		28-Apr-98		27-Apr-98		27-Apr-98		27-Apr-98	
	Depth (feet):	2-4		6-8		2-4		4-6		2-4	
	Units:	mg/kg		mg/kg		mg/kg		mg/kg		mg/kg	
METALS	RBCs (mg/kg)[a]	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
ALUMINUM	7800	14200		11000		8590		13200		9230	
ARSENIC	0.43	9.5		7		7.2		16.5		7.6	
BARIUM	550	78.5		81		89.2		61.9		51	
BERYLLIUM	0.15	0.8						0.7			
CADMIUM	3.9					0.77					
CHROMIUM	39	21.4		16		19		18.8		14.9	
COBALT	470	10.3		17.3		9.5		14.6		9.6	
COPPER	310	23.4		26.2		17.4		27.5		17.7	
IRON	2300	27300		24200		19600		25200		19100	
LEAD	400	11.8		12.2		113		11.7		7.9	
MANGANESE	160	253		644		415		373		285	
MERCURY	2.3										
NICKEL	160	25.4		39.2		20.6		27.3		20.4	
SELENIUM	39										
VANADIUM	55	32.2		28.1		21.4		34.7		24.2	
ZINC	2300	63.7	J[b]	68.8	J	304		69		73.9	

[a] Risk-based concentrations for residential soil taken from EPA, 1998, risk-based concentration table.

[b] J qualifier. Analyte present. Reported value may not be accurate or precise.

Note 1: Shading indicates concentration exceeds RBCs.

Note 2: Blank cells indicate that compound was analyzed for, but was not detected unless otherwise noted.

Table 5-9

Summary of Organic Analytical Results for Surface Soils in Acid Area No. 3
Site Investigation of Acid Areas
Former Plum Brook Ordnance Works, Sandusky, Ohio

	Sample Location:	AA3-SB01		AA3-SB02		AA3-SB03		AA3-SB04		AA3-SB05	
	Sample No:	6610		6630		6650		6670		6690	
	Sample Date:	3-May-98		1-May-98		1-May-98		1-May-98		1-May-98	
	Depth (feet):	0-1		0-1		0-1		0-1		0-1	
	Units:	µg/kg		µg/kg		mg/kg		µg/kg		µg/kg	
VOLATILES	RBCs (µg/kg)[a]	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
ACETONE	780,000										
TOLUENE	1,600,000			8							
SEMIVOLATILES											
2,4-DINITROTOLUENE	16,000	5600									
2,6-DINITROTOLUENE	7,800	870									
2-METHYLNAPHTHALENE	64,000	240	J[b]								
ACENAPHTHENE	470,000										
ACENAPHTHYLENE	470,000			76	J						
ANTHRACENE	2,300,000			120	J						
BENZO(a)ANTHRACENE	880	59	J	410	J						
BENZO(a)PYRENE	88	63	J	370	J	26	J				
BENZO(b)FLUORANTHENE	880	68	J	420	J						
BENZO(ghi)PERYLENE	8,800	41	J	250	J						
BENZO(k)FLUORANTHENE	8,800	82	J	300	J						
BIS(2-ETHYLHEXYL)PHTHALATE	46,000	120	J								
CARBAZOLE	32,000										
CHRYSENE	88,000	91	J	410	J						
DIBENZ(a,h)ANTHRACENE	88	24	J								
DIBENZOFURAN	31										
FLUORANTHENE	310,000	87	J	700		44	J				
FLUORENE	310,000										
INDENO(1,2,3-cd)PYRENE	880	43	J	240	J						
NAPHTHALENE	310,000	61	J								
PHENANTHRENE	31,000	96	J	250	J						
PYRENE	230,000	83	J	510		39	J				
PCBs											
AROCLOR 1260	83	3200		850				84			
EXPLOSIVES (only for AA3-SB01 and AA3-SB02)											
2,4-DINITROTOLUENE	16,000	810									

Table 5-9

Summary of Organic Analytical Results for Surface Soils in Acid Area No. 3
Site Investigation of Acid Areas
Former Plum Brook Ordnance Works, Sandusky, Ohio

	Sample Location:	AA3-SB06		AA3-SB07		AA3-SB08		AA3-SB09		AA3-SB10	
	Sample No:	6710		6730		6750		6770		6790	
	Sample Date:	1-May-98		1-May-98		1-May-98		2-May-98		2-May-98	
	Depth (feet):	0-1		0-1		0-1		0-1		0-1	
	Units:	µg/kg		µg/kg		µg/kg		µg/kg		µg/kg	
VOLATILES	RBCs (µg/kg)[a]	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
ACETONE	780,000										
TOLUENE	1,600,000										
SEMIVOLATILES											
2,4-DINITROTOLUENE	16,000										
2,6-DINITROTOLUENE	7,800										
2-METHYLNAPHTHALENE	64,000										
ACENAPHTHENE	470,000					51	J[b]			52	J
ACENAPHTHYLENE	470,000					730				750	
ANTHRACENE	2,300,000					630				790	
BENZO(a)ANTHRACENE	880					2100				3500	
BENZO(a)PYRENE	88					2200		27	J	3300	
BENZO(b)FLUORANTHENE	880					2400				3400	
BENZO(ghi)PERYLENE	8,800					1100				1300	
BENZO(k)FLUORANTHENE	8,800					1400				3300	
BIS(2-ETHYLHEXYL)PHTHALATE	46,000	55	J	41	J						
CARBAZOLE	32,000					120	J			200	J
CHRYSENE	88,000					2200				3400	
DIBENZ(a,h)ANTHRACENE	88										
DIBENZOFURAN	31					61	J				
FLUORANTHENE	310,000					4600		52	J	5500	
FLUORENE	310,000					140	J			190	J
INDENO(1,2,3-cd)PYRENE	880					1200				1400	
NAPHTHALENE	310,000										
PHENANTHRENE	31,000					1100				2400	
PYRENE	230,000					3500		42	J	4600	
PCBs											
AROCLOR 1260	83					160					
EXPLOSIVES (only analyzed for AA3-SB01 and AA3-SB02)											
2,4-DINITROTOLUENE	16,000										

Table 5-9

Summary of Organic Analytical Results for Surface Soils in Acid Area No. 3
Site Investigation of Acid Areas
Former Plum Brook Ordnance Works, Sandusky, Ohio

	Sample Location:	AA3-SB11		AA3-SB12		AA3-SB13		AA3-SB14		AA3-SB15	
	Sample No:	6810		6830		6850		6870		6890	
	Sample Date:	30-Apr-98		1-May-98		1-May-98		1-May-98		1-May-98	
	Depth (feet):	0-1		0-1		0-1		0-1		0-1	
	Units:	µg/kg		µg/kg		µg/kg		µg/kg		µg/kg	
VOLATILES	RBCs (µg/kg)[a]	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
ACETONE	780,000					7.4	J				
TOLUENE	1,600,000										
SEMIVOLATILES											
2,4-DINITROTOLUENE	16,000										
2,6-DINITROTOLUENE	7,800										
2-METHYLNAPHTHALENE	64,000										
ACENAPHTHENE	470,000										
ACENAPHTHYLENE	470,000			120	J[b]						
ANTHRACENE	2,300,000			120	J			40	J		
BENZO(a)ANTHRACENE	880			280	J			110	J		
BENZO(a)PYRENE	88			280	J			100	J		
BENZO(b)FLUORANTHENE	880			280	J			83	J		
BENZO(ghi)PERYLENE	8,800			160	J			56	J		
BENZO(k)FLUORANTHENE	8,800			300	J			110	J		
BIS(2-ETHYLHEXYL)PHTHALATE	46,000										
CARBAZOLE	32,000										
CHRYSENE	88,000			340	J			110	J		
DIBENZ(a,h)ANTHRACENE	88										
DIBENZOFURAN	31										
FLUORANTHENE	310,000			800				260	J	52	J
FLUORENE	310,000			96	J						
INDENO(1,2,3-cd)PYRENE	880			160	J			56	J		
NAPHTHALENE	310,000										
PHENANTHRENE	31,000			580				150	J		
PYRENE	230,000			540				190	J	41	J
PCBs											
AROCLOR 1260	83							390			
EXPLOSIVES (only analyzed for AA3-SB01 and AA3-SB02)											
2,4-DINITROTOLUENE	16,000										

Table 5-9

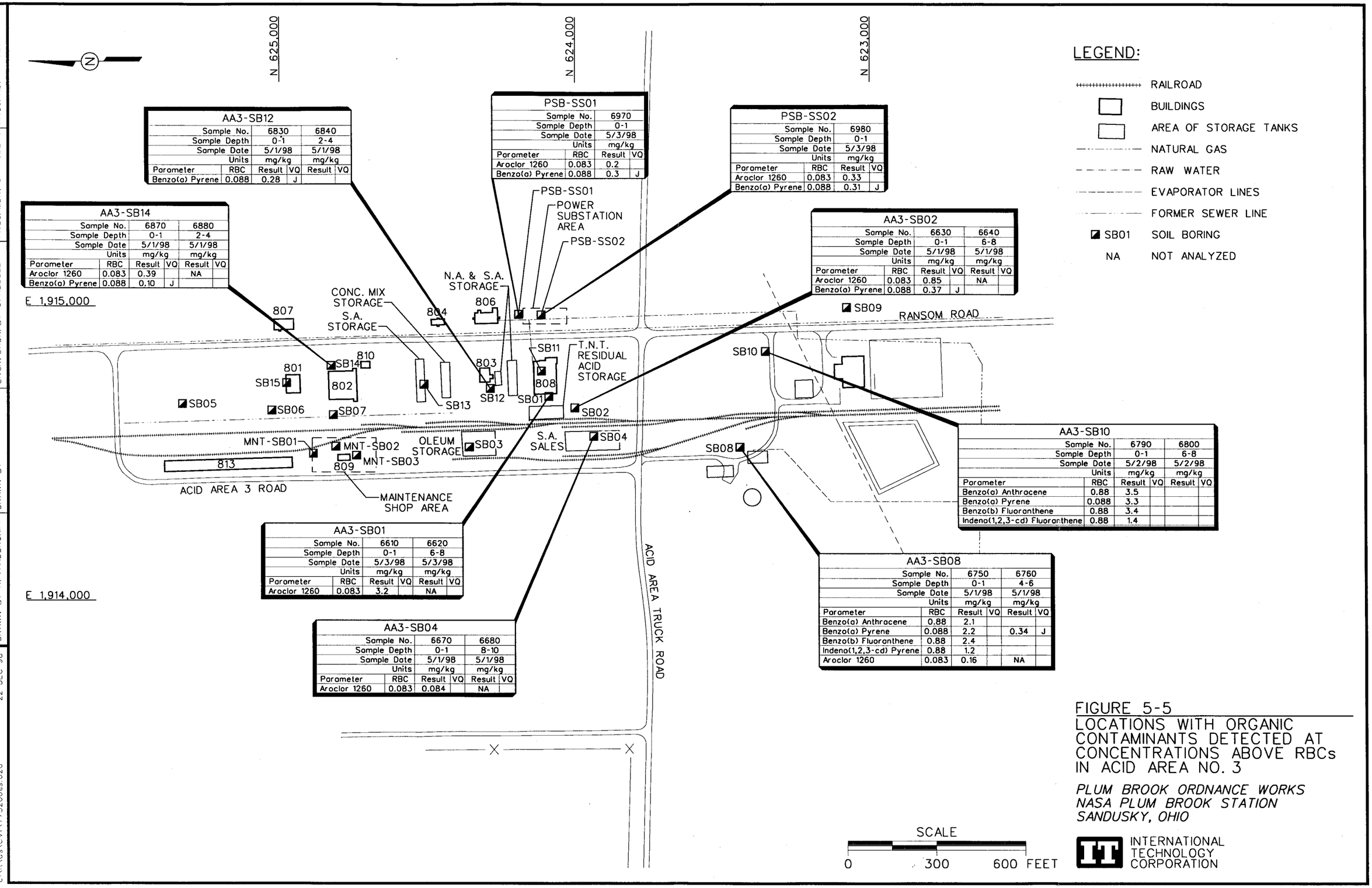
Summary of Organic Analytical Results for Surface Soils in Acid Area No. 3
Site Investigation of Acid Areas
Former Plum Brook Ordnance Works, Sandusky, Ohio

	Sample Location:	MNT-SB01		MNT-SB02		MNT-SB03		PSB-SS01		PSB-SS02	
	Sample No:	6910		6930		6950		6970		6980	
	Sample Date:	3-May-98		2-May-98		2-May-98		3-May-98		3-May-98	
	Depth (feet):	0-1		0-1		0-1		0-1		0-1	
	Units:	µg/kg		µg/kg		µg/kg		µg/kg		µg/kg	
VOLATILES	RBCs (µg/kg)[a]	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
ACETONE	780,000										
TOLUENE	1,600,000									2.1	J[b]
SEMIVOLATILES											
2,4-DINITROTOLUENE	16,000										
2,6-DINITROTOLUENE	7,800										
2-METHYLNAPHTHALENE	64,000										
ACENAPHTHENE	470,000										
ACENAPHTHYLENE	470,000							64	J	68	J
ANTHRACENE	2,300,000							65	J	68	J
BENZO(a)ANTHRACENE	880							260	J	270	J
BENZO(a)PYRENE	88							300	J	310	J
BENZO(b)FLUORANTHENE	880							320	J	310	J
BENZO(ghi)PERYLENE	8,800							150	J	150	J
BENZO(k)FLUORANTHENE	8,800							320	J	360	J
BIS(2-ETHYLHEXYL)PHTHALATE	46,000										
CARBAZOLE	32,000										
CHRYSENE	88,000							340	J	340	J
DIBENZ(a,h)ANTHRACENE	88										
DIBENZOFURAN	31										
FLUORANTHENE	310,000							630		620	
FLUORENE	310,000										
INDENO(1,2,3-cd)PYRENE	880							160	J	160	J
NAPHTHALENE	310,000										
PHENANTHRENE	31,000							270	J	210	J
PYRENE	230,000							510		520	
PCBs											
AROCLOR 1260	83			63				200		330	
EXPLOSIVES (only analyzed for AA3-SB01 and AA3-SB02)											
2,4-DINITROTOLUENE	16,000										

Table 5-9

Summary of Organic Analytical Results for Surface Soils in Acid Area No. 3
Site Investigation of Acid Areas
Former Plum Brook Ordnance Works, Sandusky, Ohio

[a] Risk-based concentrations for residential soil taken from EPA, 1998, risk-based concentration table.
[b] J qualifier. Analyte present. Reported value may not be accurate or precise.
Note 1: Shading indicates concentration exceeding RBCs.
Note 2: Blank cells indicate that compound was analyzed for, but was not detected unless otherwise noted.



AA3-SB12

Sample No.		6830		6840
Sample Depth		0-1		2-4
Sample Date		5/1/98		5/1/98
Units		mg/kg		mg/kg
Parameter	RBC	Result	VQ	Result	VQ
Benzo(a) Pyrene	0.088	0.28	J		

PSB-SS01

Sample No.		6970	
Sample Depth		0-1	
Sample Date		5/3/98	
Units		mg/kg	
Parameter	RBC	Result	VQ
Aroclor 1260	0.083	0.2	
Benzo(a) Pyrene	0.088	0.3	J

PSB-SS02

Sample No.		6980	
Sample Depth		0-1	
Sample Date		5/3/98	
Units		mg/kg	
Parameter	RBC	Result	VQ
Aroclor 1260	0.083	0.33	
Benzo(a) Pyrene	0.088	0.31	J

AA3-SB14

Sample No.		6870		6880	
Sample Depth		0-1		2-4	
Sample Date		5/1/98		5/1/98	
Units		mg/kg		mg/kg	
Parameter	RBC	Result	VQ	Result	VQ
Aroclor 1260	0.083	0.39		NA	
Benzo(a) Pyrene	0.088	0.10	J		

AA3-SB02

Sample No.		6630		6640	
Sample Depth		0-1		6-8	
Sample Date		5/1/98		5/1/98	
Units		mg/kg		mg/kg	
Parameter	RBC	Result	VQ	Result	VQ
Aroclor 1260	0.083	0.85		NA	
Benzo(a) Pyrene	0.088	0.37	J		

AA3-SB10

Sample No.		6790		6800	
Sample Depth		0-1		6-8	
Sample Date		5/2/98		5/2/98	
Units		mg/kg		mg/kg	
Parameter	RBC	Result	VQ	Result	VQ
Benzo(a) Anthracene	0.88	3.5			
Benzo(a) Pyrene	0.088	3.3			
Benzo(b) Fluoranthene	0.88	3.4			
Indeno(1,2,3-cd) Fluoranthene	0.88	1.4			

AA3-SB01

Sample No.		6610		6620	
Sample Depth		0-1		6-8	
Sample Date		5/3/98		5/3/98	
Units		mg/kg		mg/kg	
Parameter	RBC	Result	VQ	Result	VQ
Aroclor 1260	0.083	3.2		NA	

AA3-SB08

Sample No.		6750		6760	
Sample Depth		0-1		4-6	
Sample Date		5/1/98		5/1/98	
Units		mg/kg		mg/kg	
Parameter	RBC	Result	VQ	Result	VQ
Benzo(a) Anthracene	0.88	2.1			
Benzo(a) Pyrene	0.088	2.2		0.34	J
Benzo(b) Fluoranthene	0.88	2.4			
Indeno(1,2,3-cd) Pyrene	0.88	1.2			
Aroclor 1260	0.083	0.16		NA	

AA3-SB04

Sample No.		6670		6680	
Sample Depth		0-1		8-10	
Sample Date		5/1/98		5/1/98	
Units		mg/kg		mg/kg	
Parameter	RBC	Result	VQ	Result	VQ
Aroclor 1260	0.083	0.084		NA	

FIGURE 5-5
LOCATIONS WITH ORGANIC CONTAMINANTS DETECTED AT CONCENTRATIONS ABOVE RBCs IN ACID AREA NO. 3

PLUM BROOK ORDNANCE WORKS
NASA PLUM BROOK STATION
SANDUSKY, OHIO

INTERNATIONAL TECHNOLOGY CORPORATION

DWG. NO.: ...206es.020 | PROJ. NO.: 773206 | INITIATOR: D. KESSLER | PROJ. MGR.: SPANGBERG | DRAFT. CHCK. BY: VANDERGRIFF | ENGR. CHCK. BY: D. KESSLER | STARTING DATE: 8/7/98 | DATE LAST REV.: | DRAWN BY: R. VANDERGRIFF | DRAWN BY: | 10:46:49 22 DEC 98 | bvanderg c:\it\ds\civil\773206es.020

-SB10, PSB-SS01, and PSB-SS02). The compound of benzo(b)fluoranthene was detected at concentrations exceeding the RBC at AA3-SB08, dibenzofuran exceeded the RBC in AA3-SB08, and indeno(1,2,3-cd)pyrene exceeded the RBC in both AA3-SB08 and AA3-SB10. Six surface soil samples (AA3-SB01, -SB02, -SB08, -SB10, -SB12 and -SB14) exhibited SVOC detections that were significantly higher in both the number of hits and the concentrations than any other samples within the area. In addition, the 2 surface soil samples from the PSB area (PSB-SS01 and -SS02) also exhibited frequent SVOCs detections.

Explosives. Two surface soil samples (AA3-SB01 and AA3-SB02) were analyzed for explosive compounds. One compound (2,4-DNT) was detected in AA3-SB01 at a concentration of 810 µg/kg, which is below the RBC of 16,000 µg/kg (Table 5-9).

PCBs. Aroclor 1260 was detected in five of the fifteen surface soil samples from AA3, in one of the three samples from MNT, and in both surface soil samples from PBS area (Table 5-9 and Figure 5-5). Of these, all five detections in AA3 samples exceeded the RBC of 83 µg/kg, with concentrations ranging from 84 µg/kg (AA3-SB04) to 3200 µg/kg (AA3-SB10). The same compound exceeded the RBC in both surface soil samples obtained from PSB at concentrations of 200 µg/kg (PSB-SS01) and 330 µg/kg (PSB-SS02). The other detection of Aroclor 1260 was in MNT-SB02, but the concentration (63 µg/kg) was below the RBC.

Metals. A total of 14 metals were detected in the surface soil samples collected within AA3 and associated MNT and PSB areas. Of these, 4 metals were present at concentrations exceeding the RBCs (Table 5-10 and Figure 5-6), including aluminum, arsenic, iron, and manganese. However, none of the detected metals exceeding RBCs also exceeded the background concentrations.

5.3.2 Subsurface Soil

Volatile Organic compounds. A total of six VOCs (2-butanone, acetone, carbon disulfide, methylene chloride, toluene, and total xylenes) were detected in subsurface soils within AA3. Three VOCs (acetone, methylene chloride, and toluene) were detected in the MNT area. However, all detected VOC concentrations were below the respective RBCs.

Semivolatile Organic Compounds. A suite of 20 SVOCs was detected in subsurface soil samples. Of these, 1 SVOC, benzo(a)pyrene, was detected at AA3-SB08 (depth interval 4 to 6 feet) at a concentration of 340 µg/kg, exceeding the RBC (Table 5-11 and Figure 5-5). Only 1

Table 5-10

Summary of Metal Analytical Results for Surface Soils in Acid Area No. 3
Site Investigation of Acid Areas
Former Plum Brook Ordnance works, Sandusky, Ohio

	Sample Location:	AA3-SB01		AA3-SB02		AA3-SB03		AA3-SB04		AA3-SB05	
	Sample No:	6610		6630		6650		6670		6690	
	Sample Date:	3-May-98		1-May-98		1-May-98		1-May-98		1-May-98	
	Depth (feet):	0-1		0-1		0-1		0-1		0-1	
	Units:	mg/kg		mg/kg		mg/kg		mg/kg		mg/kg	
METALS	RBCs (mg/kg)[a]	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
ALUMINUM	7,800	7310		7320		7740		11800		10600	
ARSENIC	0.43	8.2		5.9		9.4		9.6		7	
BARIUM	550	62		64.2		53.3		115		84.7	
CHROMIUM	39	12.8		11.4		12.1		17.1		15.5	
COBALT	470	11.7		8.7		11.6		22.3		9.3	
COPPER	310	19.1		12		13.1		22.2		18.3	
IRON	2,300	18600		13600		17400		26600		15900	
LEAD	400	46.9		35.7		7.4		10.6		10.6	
MANGANESE	160	353		531		442		922		205	
MERCURY	2.3			0.044						0.049	
NICKEL	160	21		13.9		15.3		36.5		19.1	
SELENIUM	39	0.69								0.7	
VANADIUM	55	23		20.7		22.6		30		23.9	
ZINC	2,300	74.6		41.3		35		60.1		66.6	

Table 5-10

Summary of Metal Analytical Results for Surface Soils in Acid Area No. 3
Site Investigation of Acid Areas
Former Plum Brook Ordnance works, Sandusky, Ohio

	Sample Location:	AA3-SB06		AA3-SB07		AA3-SB08		AA3-SB09		AA3-SB10	
	Sample No:	6710		6730		6750		6770		6790	
	Sample Date:	1-May-98		1-May-98		1-May-98		2-May-98		2-May-98	
	Depth (feet):	0-1		0-1		0-1		0-1		0-1	
	Units:	mg/kg		mg/kg		mg/kg		mg/kg		mg/kg	
METALS	RBCs (mg/kg)[a]	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
ALUMINUM	7,800	8730		3960		6540		6510		5010	
ARSENIC	0.43	7.8		3.4		5.9		4.7		3.1	
BARIUM	550	56.7		40.5		47.1		29		25	
CHROMIUM	39	12.4		6.5		11.4		9.9		6.4	
COBALT	470	15.8				8.9		11.7			
COPPER	310	16.3		4.1		14.1		7.8		6.4	
IRON	2,300	20200		6810		14600		12800		8230	
LEAD	400	9.8		3.6		34.2		6		5.8	
MANGANESE	160	540		213		287		290		159	
MERCURY	2.3	0.046				0.19					
NICKEL	160	19		7		15.4		10.3		7.1	
SELENIUM	39	0.67									
VANADIUM	55	23.7		14.5		19.9		18.7		13.3	
ZINC	2,300	44.3		21.3		75.4		27.9		24.2	

Table 5-10

Summary of Metal Analytical Results for Surface Soils in Acid Area No. 3
Site Investigation of Acid Areas
Former Plum Brook Ordnance works, Sandusky, Ohio

	Sample Location:	AA3-SB11		AA3-SB12		AA3-SB13		AA3-SB14		AA3-SB15	
	Sample No:	6810		6830		6850		6870		6890	
	Sample Date:	30-Apr-98		1-May-98		1-May-98		1-May-98		1-May-98	
	Depth (feet):	0-1		0-1		0-1		0-1		0-1	
	Units:	mg/kg		mg/kg		mg/kg		mg/kg		mg/kg	
METALS	RBCs (mg/kg)[a]	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
ALUMINUM	7,800	7940		6190		7700		5990		5720	
ARSENIC	0.43	7.7		4.6		6		2.5		6	
BARIUM	550	41		57.8		53.3				31.9	
CHROMIUM	39	11.6		8.9		12.1		7.4		8.4	
COBALT	470	10.6		6.4		17.1				6.7	
COPPER	310	14.1		11.3		20.5		4.2		9.7	
IRON	2,300	16200		11100		21100		9180		11100	
LEAD	400	8.6		10.4		9.8		6		12.6	
MANGANESE	160	388		182		814		51.9		224	
MERCURY	2.3			0.042							
NICKEL	160	20		10		34.9		6.8		12.2	
SELENIUM	39			1						0.6	
VANADIUM	55	23.2		16.7		25.9		14.3		17	
ZINC	2,300	44.6		36		61.3		23.2		51.8	

Table 5-10

Summary of Metal Analytical Results for Surface Soils in Acid Area No. 3
Site Investigation of Acid Areas
Former Plum Brook Ordnance works, Sandusky, Ohio

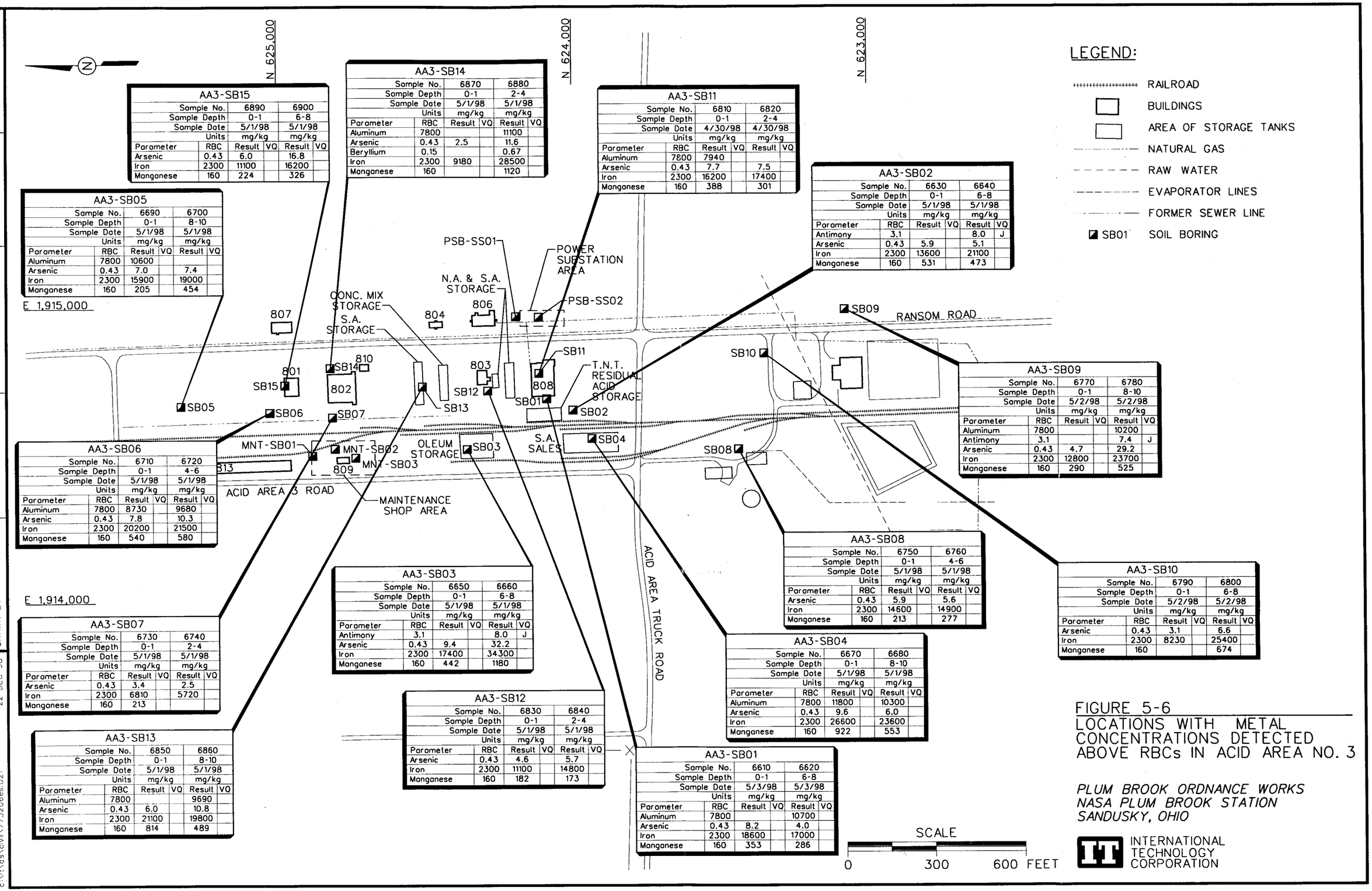
	Sample Location:	MNT-SB01		MNT-SB02		MNT-SB03		PSB-SS01		PSB-SS02	
	Sample No:	6910		6930		6950		6970		6980	
	Sample Date:	3-May-98		2-May-98		2-May-98		3-May-98		3-May-98	
	Depth (feet):	0-1		0-1		0-1		0-1		0-1	
	Units:	mg/kg		mg/kg		mg/kg		mg/kg		mg/kg	
METALS	RBCs (mg/kg)[a]	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
ALUMINUM	7,800	6400		5830		8440		5660		8210	
ARSENIC	0.43	7		9.6		5.8		3.8		5.1	
BARIUM	550	36.7		36.1		81.4		40.8		49.5	
CHROMIUM	39	10.2		9.7		10.9		11.1		14.4	
COBALT	470	8.6		9.1		10.5		8.6		11.4	
COPPER	310	12.4		13.7		12.9		9.7		13.4	
IRON	2,300	13400		13600		16600		11000		14400	
LEAD	400	6.5		7.6		11.5		16.5		33.6	
MANGANESE	160	298		381		574		226		312	
MERCURY	2.3					0.046				0.045	
NICKEL	160	13.6		16		12.2		10.3		15.3	
SELENIUM	39					0.62					
VANADIUM	55	21.1		18.4		21.1		16.6		23.1	
ZINC	2,300	38		39.6		40.2		128	J[b]	238	J

[a] Risk-based concentrations for residential soil taken from EPA, 1998, risk-based concentration table.

[b] J qualifier. Analyte present. Reported value may not be accurate or precise.

Note 1: Shading indicates concentrations exceeding RBCs.

Note 2: Blank cells indicate that compound was analyzed for, but was not detected unless otherwise noted.



AA3-SB15

Sample No.		6890		6900	
Sample Depth		0-1		6-8	
Sample Date		5/1/98		5/1/98	
	Units	mg/kg		mg/kg	
Parameter	RBC	Result	VQ	Result	VQ
Arsenic	0.43	6.0		16.8	
Iron	2300	11100		16200	
Manganese	160	224		326	

AA3-SB14

Sample No.		6870		6880	
Sample Depth		0-1		2-4	
Sample Date		5/1/98		5/1/98	
	Units	mg/kg		mg/kg	
Parameter	RBC	Result	VQ	Result	VQ
Aluminum	7800			11100	
Arsenic	0.43	2.5		11.6	
Beryllium	0.15			0.67	
Iron	2300	9180		28500	
Manganese	160			1120	

AA3-SB11

Sample No.		6810		6820	
Sample Depth		0-1		2-4	
Sample Date		4/30/98		4/30/98	
	Units	mg/kg		mg/kg	
Parameter	RBC	Result	VQ	Result	VQ
Aluminum	7800	7940			
Arsenic	0.43	7.7		7.5	
Iron	2300	16200		17400	
Manganese	160	388		301	

AA3-SB02

Sample No.		6630		6640	
Sample Depth		0-1		6-8	
Sample Date		5/1/98		5/1/98	
	Units	mg/kg		mg/kg	
Parameter	RBC	Result	VQ	Result	VQ
Antimony	3.1			8.0	J
Arsenic	0.43	5.9		5.1	
Iron	2300	13600		21100	
Manganese	160	531		473	

AA3-SB05

Sample No.		6690		6700	
Sample Depth		0-1		8-10	
Sample Date		5/1/98		5/1/98	
	Units	mg/kg		mg/kg	
Parameter	RBC	Result	VQ	Result	VQ
Aluminum	7800	10600			
Arsenic	0.43	7.0		7.4	
Iron	2300	15900		19000	
Manganese	160	205		454	

AA3-SB09

Sample No.		6770		6780	
Sample Depth		0-1		8-10	
Sample Date		5/2/98		5/2/98	
	Units	mg/kg		mg/kg	
Parameter	RBC	Result	VQ	Result	VQ
Aluminum	7800			10200	
Antimony	3.1			7.4	J
Arsenic	0.43	4.7		29.2	
Iron	2300	12800		23700	
Manganese	160	290		525	

AA3-SB06

Sample No.		6710		6720	
Sample Depth		0-1		4-6	
Sample Date		5/1/98		5/1/98	
	Units	mg/kg		mg/kg	
Parameter	RBC	Result	VQ	Result	VQ
Aluminum	7800	8730		9680	
Arsenic	0.43	7.8		10.3	
Iron	2300	20200		21500	
Manganese	160	540		580	

AA3-SB08

Sample No.		6750		6760	
Sample Depth		0-1		4-6	
Sample Date		5/1/98		5/1/98	
	Units	mg/kg		mg/kg	
Parameter	RBC	Result	VQ	Result	VQ
Arsenic	0.43	5.9		5.6	
Iron	2300	14600		14900	
Manganese	160	213		277	

AA3-SB10

Sample No.		6790		6800	
Sample Depth		0-1		6-8	
Sample Date		5/2/98		5/2/98	
	Units	mg/kg		mg/kg	
Parameter	RBC	Result	VQ	Result	VQ
Arsenic	0.43	3.1		6.6	
Iron	2300	8230		25400	
Manganese	160			674	

AA3-SB03

Sample No.		6650		6660	
Sample Depth		0-1		6-8	
Sample Date		5/1/98		5/1/98	
	Units	mg/kg		mg/kg	
Parameter	RBC	Result	VQ	Result	VQ
Antimony	3.1			8.0	J
Arsenic	0.43	9.4		32.2	
Iron	2300	17400		34300	
Manganese	160	442		1180	

AA3-SB04

Sample No.		6670		6680	
Sample Depth		0-1		8-10	
Sample Date		5/1/98		5/1/98	
	Units	mg/kg		mg/kg	
Parameter	RBC	Result	VQ	Result	VQ
Aluminum	7800	11800		10300	
Arsenic	0.43	9.6		6.0	
Iron	2300	26600		23600	
Manganese	160	922		553	

AA3-SB07

Sample No.		6730		6740	
Sample Depth		0-1		2-4	
Sample Date		5/1/98		5/1/98	
	Units	mg/kg		mg/kg	
Parameter	RBC	Result	VQ	Result	VQ
Arsenic	0.43	3.4		2.5	
Iron	2300	6810		5720	
Manganese	160	213			

AA3-SB12

Sample No.		6830		6840	
Sample Depth		0-1		2-4	
Sample Date		5/1/98		5/1/98	
	Units	mg/kg		mg/kg	
Parameter	RBC	Result	VQ	Result	VQ
Arsenic	0.43	4.6		5.7	
Iron	2300	11100		14800	
Manganese	160	182		173	

AA3-SB13

Sample No.		6850		6860	
Sample Depth		0-1		8-10	
Sample Date		5/1/98		5/1/98	
	Units	mg/kg		mg/kg	
Parameter	RBC	Result	VQ	Result	VQ
Aluminum	7800			9690	
Arsenic	0.43	6.0		10.8	
Iron	2300	21100		19800	
Manganese	160	814		489	

AA3-SB01

Sample No.		6610		6620	
Sample Depth		0-1		6-8	
Sample Date		5/3/98		5/3/98	
	Units	mg/kg		mg/kg	
Parameter	RBC	Result	VQ	Result	VQ
Aluminum	7800			10700	
Arsenic	0.43	8.2		4.0	
Iron	2300	18600		17000	
Manganese	160	353		286	

FIGURE 5-6
LOCATIONS WITH METAL CONCENTRATIONS DETECTED ABOVE RBCs IN ACID AREA NO. 3

PLUM BROOK ORDNANCE WORKS
NASA PLUM BROOK STATION
SANDUSKY, OHIO

INTERNATIONAL TECHNOLOGY CORPORATION

DRAFT. CHCK. BY: VANDERGRIFF | INITIATOR: D. KESSLER | DWG. NO.: 773206es.021
ENGR. CHCK. BY: D. KESSLER | PROJ. MGR.: SPANGBERG | PROJ. NO.: 773206
STARTING DATE: 8/10/98 | DATE LAST REV.:
DRAWN BY: R. VANDERGRIFF | DRAWN BY:
22 DEC 98 11:25:47
c:\it\ds\civil\773206es.021
bvanderg

Table 5-11

Summary of Organic Analytical Results for Subsurface Soils in Acid Area No. 3
Site Investigation of Acid Area
Former Plum Brook Ordnance Works, Sandusky, Ohio

	Sample Location:	AA3-SB01		AA3-SB02		AA3-SB03		AA3-SB04		AA3-SB05		AA3-SB06	
	Sample No:	6620		6640		6660		6680		6700		6720	
	Sample Date:	3-May-98		1-May-98		1-May-98		1-May-98		1-May-98		1-May-98	
	Depth (feet):	6-8		6-8		6-8		8-10		8-10		4-6	
	Units:	µg/kg		µg/kg		µg/kg		µg/kg		µg/kg		µg/kg	
VOLATILES	RBCs (µg/kg)[a]	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
2-BUTANONE	4,700,000												
ACETONE	780,000			22	J[b]					250			
CARBON DISULFIDE	780,000							2.3	J				
METHYLENE CHLORIDE	85,000												
TOLUENE	1,600,000												
TOTAL XYLENES	16,000,000												
SEMIVOLATILES													
2,4-DINITROTOLUENE	16,000	1300											
2,6-DINITROTOLUENE	7,800	60	J										
2-METHYLNAPHTHALENE	64,000												
ACENAPHTHENE	470,000												
ACENAPHTHYLENE	470,000												
ANTHRACENE	2,800,000												
BENZO(a)ANTHRACENE	880												
BENZO(a)PYRENE	88												
BENZO(b)FLUORANTHENE	880												
BENZO(ghi)PERYLENE	8,800												
BENZO(k)FLUORANTHENE	8,800												
BIS(2-ETHYLHEXYL)PHTHALATE	46,000									140	J	45	J
CHRYSENE	88,000							26	J				
DIBENZOFURAN	31,000												
FLUORANTHENE	310,000												
FLUORENE	310,000												
INDENO(1,2,3-cd)PYRENE	880												
NAPHTHALENE	310,000												
PHENANTHRENE	31,000												
PYRENE	230,000												
EXPLOSIVES (only analyzed for AA3-SB01 and AA3-SB02)													
2,4-DINITROTOLUENE	16,000	2100											

Table 5-11

Summary of Organic Analytical Results for Subsurface Soils in Acid Area No. 3
Site Investigation of Acid Area
Former Plum Brook Ordnance Works, Sandusky, Ohio

	Sample Location:	AA3-SB07		AA3-SB08		AA3-SB09		AA3-SB10		AA3-SB11		AA3-SB12	
	Sample No:	6740		6760		6780		6800		6820		6840	
	Sample Date:	1-May-98		1-May-98		2-May-98		2-May-98		30-Apr-98		1-May-98	
	Depth (feet):	2-4		4-6		8-10		6-8		2-4		2-4	
	Units:	µg/kg		µg/kg		µg/kg		µg/kg		µg/kg		µg/kg	
VOLATILES	RBCs (µg/kg)[a]		VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
2-BUTANONE	4,700,000			5.5	J[b]								
ACETONE	780,000												
CARBON DISULFIDE	780,000					6	J						
METHYLENE CHLORIDE	85,000												
TOLUENE	1,600,000												
TOTAL XYLENES	16,000,000			6.5									
SEMIVOLATILES													
2,4-DINITROTOLUENE	16,000												
2,6-DINITROTOLUENE	7,800												
2-METHYLNAPHTHALENE	64,000			81	J								
ACENAPHTHENE	470,000			100	J								
ACENAPHTHYLENE	470,000			120	J								
ANTHRACENE	2,800,000			280	J								
BENZO(a)ANTHRACENE	880			360	J								
BENZO(a)PYRENE	88			340	J								
BENZO(b)FLUORANTHENE	880			340	J								
BENZO(ghi)PERYLENE	8,800			170	J								
BENZO(k)FLUORANTHENE	8,800			320	J								
BIS(2-ETHYLHEXYL)PHTHALATE	46,000												
CHRYSENE	88,000			360	J								
DIBENZOFURAN	31,000			280	J								
FLUORANTHENE	310,000			1000									
FLUORENE	310,000			410									
INDENO(1,2,3-cd)PYRENE	880			170	J								
NAPHTHALENE	310,000			140	J								
PHENANTHRENE	31,000			1300									
PYRENE	230,000			730									
EXPLOSIVES (only analyzed for AA3-SB01 and AA3-SB02)													
	16,000												

Table 5-11

Summary of Organic Analytical Results for Subsurface Soils in Acid Area No. 3
Site Investigation of Acid Area
Former Plum Brook Ordnance Works, Sandusky, Ohio

	Sample Location:	AA3-SB13		AA3-SB14		AA3-SB15		MNT-SB01		MNT-SB02		MNT-SB03	
	Sample No:	6860		6880		6900		6920		6940		6960	
	Sample Date:	1-May-98		1-May-98		1-May-98		3-May-98		2-May-98		2-May-98	
	Depth (feet):	8-10		2-4		6-8		4-6		2-4		6-8	
	Units:	µg/kg		µg/kg		µg/kg		µg/kg		µg/kg		µg/kg	
VOLATILES	RBCs (µg/kg)[a]	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
2-BUTANONE	4,700,000												
ACETONE	780,000	19	J[b]	68									
CARBON DISULFIDE	780,000	13											
METHYLENE CHLORIDE	85,000							6.1	J				
TOLUENE	1,600,000							3.2	J				
TOTAL XYLENES	16,000,000												
SEMIVOLATILES													
2,4-DINITROTOLUENE	16,000												
2,6-DINITROTOLUENE	7,800												
2-METHYLNAPHTHALENE	64,000												
ACENAPHTHENE	470,000												
ACENAPHTHYLENE	470,000												
ANTHRACENE	2,800,000												
BENZO(a)ANTHRACENE	880												
BENZO(a)PYRENE	88												
BENZO(b)FLUORANTHENE	880												
BENZO(ghi)PERYLENE	8,800												
BENZO(k)FLUORANTHENE	8,800												
BIS(2-ETHYLHEXYL)PHTHALATE	46,000	120	J									91	J
CHRYSENE	88,000												
DIBENZOFURAN	31,000												
FLUORANTHENE	310,000			50	J								
FLUORENE	310,000												
INDENO(1,2,3-cd)PYRENE	880												
NAPHTHALENE	310,000												
PHENANTHRENE	31,000												
PYRENE	230,000			35	J								
EXPLOSIVES (only analyzed for AA3-SB01 and AA3-SB02)													
2,4-DINITROTOLUENE	16,000												

Table 5-11

Summary of Organic Analytical Results for Subsurface Soils in Acid Area No. 3
Site Investigation of Acid Area
Former Plum Brook Ordnance Works, Sandusky, Ohio

[a] Risk-based concentrations for residential soil taken from EPA, 1998, risk-based concentration table.
[b] J qualifier. Analyte present. Reported value may not be accurate or precise.
Note 1: Shading indicates concentrations exceeding RBCs.
Note 2: Blank cells indicate that compound was analyzed for, but was not detected unless otherwise noted.

SVOC, bis(2-ethylhexyl)phthalate, was detected in the MNT area, but at a concentration below the RBC.

Explosives. Two subsurface soil samples (AA3-SB01 and AA3-SB02) were analyzed for explosive compounds. One compound (2,4-DNT) was detected in AA3-SB01 at a concentration of 2,100 µg/kg, which is below the RBC of 16,000 µg/kg (Table 5-11).

Metals. A suite of 15 metals were detected in the subsurface soil samples collected within AA3 and associated MNT and PSB areas. Of these, 6 metals were present at concentrations exceeding the RBCs (Table 5-12 and Figure 5-7), including aluminum, antimony, arsenic, beryllium, iron, and manganese. However, of the detected metals exceeding RBCs, only antimony in AA3-SB03 also exceeded the background concentration.

5.4 Geotechnical Testing Results

A total of 12 soil samples (4 from each Acid Area) were collected and analyzed for geotechnical properties, including grain size distribution, moisture content, and Atterberg Limits. Soil samples were classified based on the geotechnical testing data using USCS nomenclature. These results indicate that the samples collected are predominantly silt with some clay. The geotechnical testing results are provided in Appendix B.

Table 5-12

Summary of Metal Analytical Results for Subsurface Soils in Acid Area No. 3
Site Investigation of Acid Areas
Former Plum Brook Ordnance Works, Sandusky, Ohio

	Sample Location:	AA3-SB01		AA3-SB02		AA3-SB03		AA3-SB04		AA3-SB05		AA3-SB06	
	Sample No:	6620		6640		6660		6680		6700		6720	
	Sample Date:	3-May-98		1-May-98		1-May-98		1-May-98		1-May-98		1-May-98	
	Depth (feet):	6-8		6-8		6-8		8-10		8-10		4-6	
	Units:	mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg	
METALS	RBCs (mg/kg)[a]	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
ALUMINUM	7,800	10700		9550		7330		10300		6840		9680	
ANTIMONY	3.1					8	J[b]						
ARSENIC	0.43	4		5.1		32.2		6		7.4		10.3	
BARIUM	550	98.5		69.8		126		70.6		74.4		88	
BERYLLIUM	0.15												
CHROMIUM	39	17.6		16.1		10.5		17.2		12.1		15.2	
COBALT	470	11.4		12.7		20		16.5		10.2		13.6	
COPPER	310	25.9		25.3		22.9		23.3		21.4		22.5	
IRON	2,300	17000		21100		34300		23600		19000		21500	
LEAD	400	12.6		11.3		8.8		10		9.2		10.3	
MANGANESE	160	286		473		1180		553		454		580	
NICKEL	160	23.8		30.4		45		31.7		23.5		31.5	
SELENIUM	39	1.6		0.75		0.64		0.65		0.87		0.72	
VANADIUM	55	29.6		25.9		24.2		27.7		21.4		26.3	
ZINC	2,300	59.9		66.7		71.1		67.9		61.4		66.2	

Table 5-12

Summary of Metal Analytical Results for Subsurface Soils in Acid Area No. 3
Site Investigation of Acid Areas
Former Plum Brook Ordnance Works, Sandusky, Ohio

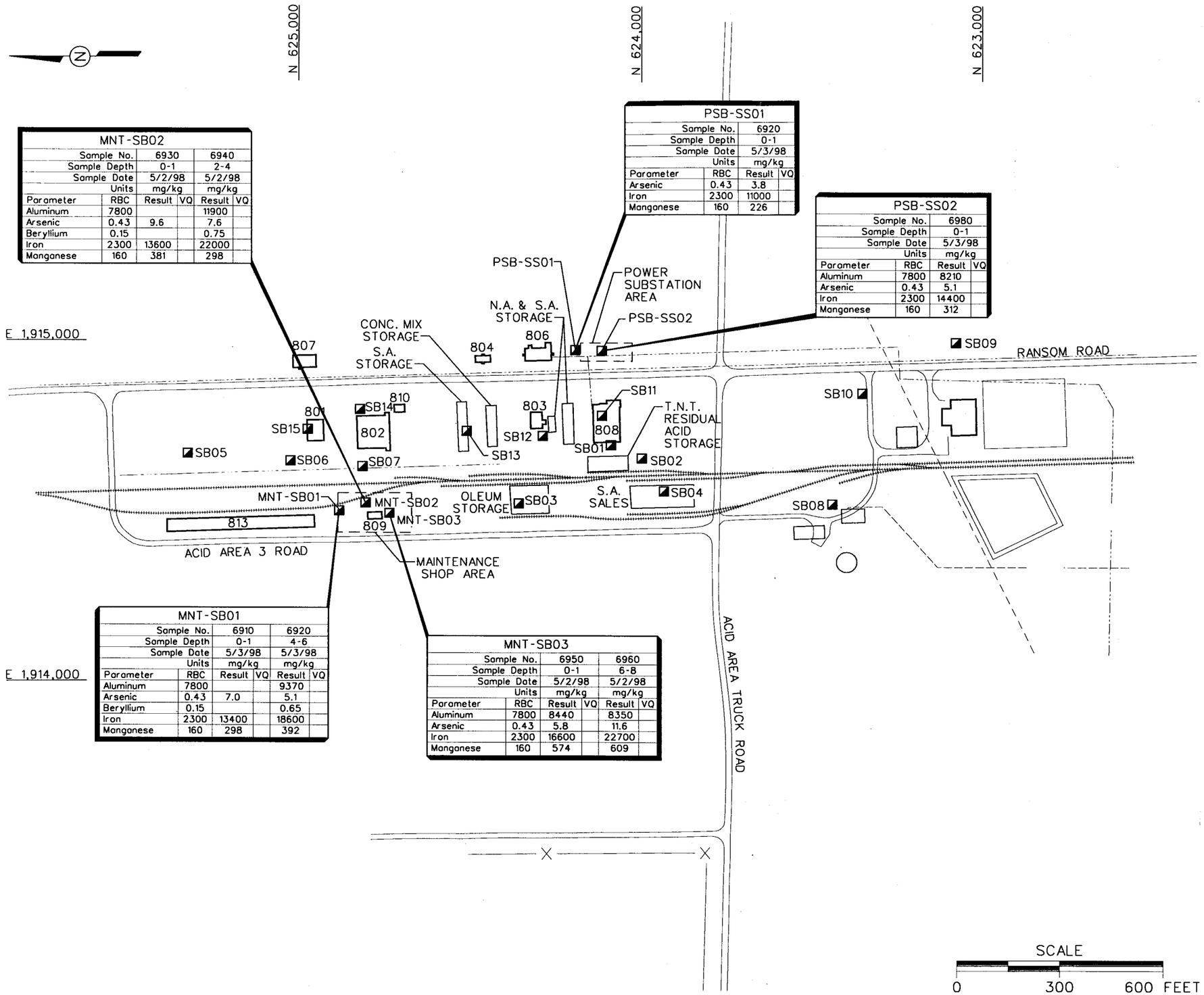
	Sample Location:	AA3-SB07		AA3-SB08		AA3-SB09		AA3-SB10		AA3-SB11		AA3-SB12	
	Sample No:	6740		6760		6780		6800		6820		6840	
	Sample Date:	1-May-98		1-May-98		2-May-98		2-May-98		30-Apr-98		1-May-98	
	Depth (feet):	2-4		4-6		8-10		6-8		2-4		2-4	
	Units:	mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg	
METALS	RBCs (mg/kg)[a]	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
ALUMINUM	7,800	2650		7070		10200		7500		7300		5790	
ANTIMONY	3.1					7.4	J[b]						
ARSENIC	0.43	2.5		5.6		29.2		6.6		7.5		5.7	
BARIUM	550			46.9		65		83.1		33.8		39.5	
BERYLLIUM	0.15												
CHROMIUM	39	4.5		10.9		16.4		13.1		12.3		10	
COBALT	470			11.1		16.3		20.2		10		8.3	
COPPER	310			14.5		21.1		24.3		12.8		11.2	
IRON	2,300	5720		14900		23700		25400		17400		14800	
LEAD	400	2.5		8.9		9		10.4		6.5		6.8	
MANGANESE	160	93.4		277		525		674		301		173	
NICKEL	160	6.2		19		28.5		33		18.5		15.7	
SELENIUM	39					0.71							
VANADIUM	55	8.2		19.8		28.1		26.9		22.5		18.7	
ZINC	2,300	16.9		48.2		62.7		77.5		39.5		39.5	

Table 5-12

Summary of Metal Analytical Results for Subsurface Soils in Acid Area No. 3
Site Investigation of Acid Areas
Former Plum Brook Ordnance Works, Sandusky, Ohio

	Sample Location:	AA3-SB13		AA3-SB14		AA3-SB15		MNT-SB01		MNT-SB02		MNT-SB03	
	Sample No:	6860		6880		6900		6920		6940		6960	
	Sample Date:	1-May-98		1-May-98		1-May-98		3-May-98		2-May-98		2-May-98	
	Depth (feet):	8-10		2-4		6-8		4-6		2-4		6-8	
	Units:	mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg	
METALS	RBCs (mg/kg)[a]	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
ALUMINUM	7,800	9690		11100		5620		9370		11900		8350	
ANTIMONY	3.1												
ARSENIC	0.43	10.8		11.6		16.8		5.1		7.6		11.6	
BARIUM	550	58.6		79.8		41.2		92.3		88.3		84.2	
BERYLLIUM	0.15			0.67				0.65		0.75			
CHROMIUM	39	14.8		16.2		10.6		14.3		16.8		15	
COBALT	470	12.4		18.1		8.2		12.6		14.2		15.6	
COPPER	310	19.3		23.4		14.8		16.5		18.2		21.4	
IRON	2,300	19800		28500		16200		18600		22000		22700	
LEAD	400	10.1		12		7		9.6		10.3		9.7	
MANGANESE	160	489		1120		326		392		298		609	
NICKEL	160	25.7		39.8		16.7		18.5		19.9		24.8	
SELENIUM	39	0.66		0.81						0.64			
VANADIUM	55	27.7		31.5		20.5		21.2		28.5		24.8	
ZINC	2,300	57.9		68.7		45.5		53.8		61.2		60.2	

[a] Risk-based concentrations for residential soil taken from EPA, 1998, risk-based concentration table.
[b] J qualifier. Analyte present. Reported value may not be accurate or precise.
Note 1: Shading indicates concentrations exceeding RBCs.
Note 2: Blank cells indicate that compound was analyzed for, but was not detected unless otherwise noted.



MNT-SB02

Sample No.		6930		6940	
Sample Depth		0-1		2-4	
Sample Date		5/2/98		5/2/98	
	Units	mg/kg		mg/kg	
Parameter	RBC	Result	VQ	Result	VQ
Aluminum	7800			11900	
Arsenic	0.43	9.6		7.6	
Beryllium	0.15			0.75	
Iron	2300	13600		22000	
Manganese	160	381		298	

PSB-SS01

Sample No.		6920	
Sample Depth		0-1	
Sample Date		5/3/98	
	Units	mg/kg	
Parameter	RBC	Result	VQ
Arsenic	0.43	3.8	
Iron	2300	11000	
Manganese	160	226	

PSB-SS02

Sample No.		6980	
Sample Depth		0-1	
Sample Date		5/3/98	
	Units	mg/kg	
Parameter	RBC	Result	VQ
Aluminum	7800	8210	
Arsenic	0.43	5.1	
Iron	2300	14400	
Manganese	160	312	

MNT-SB01

Sample No.		6910		6920	
Sample Depth		0-1		4-6	
Sample Date		5/3/98		5/3/98	
	Units	mg/kg		mg/kg	
Parameter	RBC	Result	VQ	Result	VQ
Aluminum	7800			9370	
Arsenic	0.43	7.0		5.1	
Beryllium	0.15			0.65	
Iron	2300	13400		18600	
Manganese	160	298		392	

MNT-SB03

Sample No.		6950		6960	
Sample Depth		0-1		6-8	
Sample Date		5/2/98		5/2/98	
	Units	mg/kg		mg/kg	
Parameter	RBC	Result	VQ	Result	VQ
Aluminum	7800	8440		8350	
Arsenic	0.43	5.8		11.6	
Iron	2300	16600		22700	
Manganese	160	574		609	

FIGURE 5-7
LOCATIONS WITH METAL CONCENTRATIONS DETECTED AOVE RBCs IN MNT AND PSB AREAS

PLUM BROOK ORDNANCE WORKS
NASA PLUM BROOK STATION
SANDUSKY, OHIO

INTERNATIONAL TECHNOLOGY CORPORATION

STARTING DATE: 8/10/98 | DATE LAST RL.: | DRAFT. CHCK. BY: VANDERGRIFF | INITIATOR: D. KESSLER | DWG. NO.: ...206es.022
DRAWN BY: R. VANDERGRIFF | DRAWN BY: | ENGR. CHCK. BY: D. KESSLER | PROJ. MGR.: SPANGBERG | PROJ. NO.: 773206
22 DEC 98 14:07:30
c:\it\gs\civil\773206es.022 bvanderg

6.0 Conclusions and Recommendations

6.1 Conclusions

The following conclusions are derived for each of the three investigated Acid Areas. The conclusions are based on the soil metal comparison against the background data as discussed in Chapter 4.0 and the analytical data presented in Chapter 5.0. The background comparisons make it possible to distinguish between those metals that are naturally occurring and those that are likely attributable to past site activities.

6.1.1 Acid Area No. 1

Very low concentrations of some organic compounds (VOCs and SVOCs) were detected in subsurface soils within AA1 but concentrations were well below the established RBCs. PCBs were not analyzed for in the subsurface soil. Contamination by SVOCs, explosives, and PCBs was evident in shallow soils (less than 1.5 feet below grade). A PCB compound (Aroclor 1260) was detected in 9 of the 15 surface soil samples, with 7 detections exceeding the RBC. The maximum concentration of Aroclor 1260 detected in the surface soil was 9,000 µg/kg, exceeding the RBC of 83 µg/kg by more than 2 orders of magnitude. In addition, 5 SVOCs exceeded the RBCs at least once and 1 explosive compound (4-amino-2,6-DNT) exceeded the RBC in 1 surface soil sample collected from the former TNT tank area. Three additional explosive compounds were detected but at concentrations below the RBCs.

Seven COPCs were identified in the surface soils at Acid Area 1. These COPCs (all organic compounds) include benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, dibenz(a,h)-anthracene, indeno(1,2,3-cd)pyrene, Aroclor 1260, and 4-amino-2,6-DNT. For both surface and subsurface soils, five metals (aluminum, arsenic, beryllium, iron, and manganese) exceeded the RBCs. However, their concentrations are attributable to background conditions and are therefore not considered COPCs.

6.1.2 Acid Area No. 2

Neither surface nor subsurface soil exhibited any detections of VOCs at concentrations exceeding the RBCs. Explosives were not detected in either surface or subsurface soil samples. However, SVOCs were detected to a limited degree in both surface and subsurface samples. PCBs were detected in the surface soil but were not analyzed for in the subsurface soil. A PCB compound (Aroclor 1260) was detected in 9 of the 15 surface soil samples, with 7 detections exceeding the

RBC. The maximum concentration of Aroclor 1260 was 20,000 µg/kg, significantly above the RBC of 83 µg/kg.

The COPCs for surface soil at AA2 include SVOCs (benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, dibenz(a,h)anthracene, indeno(1,2,3-cd)pyrene) and PCBs (Aroclor 1260), while subsurface soil COPCs are limited to benzo(a)pyrene. For both surface and subsurface soils, five metals (aluminum, arsenic, beryllium, iron, and manganese) exceeded the RBCs. However, their concentrations are attributable to background conditions and are not considered COPCs.

6.1.3 Acid Area No. 3

Neither surface nor subsurface soil exhibited any detections of VOCs at concentrations exceeding the RBCs. One explosive (2,4-DNT) was detected in both surface and subsurface samples from the same location (AA3-SB01), but the concentrations were below the RBC. SVOCs were detected to a limited degree in both surface and subsurface soil samples.

Five SVOCs in surface soil and one SVOC in subsurface soil at AA3 exceeded the RBCs. One SVOC also exceeded the RBC in surface soil in PSB area. SVOCs were not detected in any samples from MNT at concentrations exceeding the RBCs.

PCBs were analyzed for in surface soil but not in the subsurface soil. A PCB compound (Aroclor 1260) was detected in five of the fifteen subsurface soil samples from AA3, with all detections exceeding the RBC. Aroclor 1260 was detected in both samples from the PSB area at concentrations exceeding the RBC and in the MNT area, in one of the three samples, but at a concentration below the RBC. The maximum concentration of Aroclor 1260 was 3,200 µg/kg (AA3-SB01), exceeding the RBC of 83 µg/kg.

For both surface and subsurface soils in AA3, five metals (aluminum, arsenic, beryllium [subsurface only], iron, and manganese) exceeded the RBCs. However, their concentrations are attributable to background conditions. The elevated concentration for antimony in subsurface soil at AA3 is not necessarily attributed to site contamination because its concentration of 8 mg/kg is comparable to the background value at 7.88 mg/kg (within 2 percent of the background) and is less than the maximum detection of 9.3 mg/kg in the background sample. In the MNT area, five metals (aluminum, arsenic, beryllium, iron, and manganese) exceeded the RBCs in either surface or subsurface soils or both. However, their concentrations are all attributable to

the background conditions. In the PSB area, four metals (aluminum, arsenic, iron, and manganese) were detected at concentrations exceeding the RBCs, but are attributable to site background conditions.

The COPCs for surface soil at AA3 include SVOCs (benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, dibenzofuran, indeno(1,2,3-cd)pyrene), and one PCB (Aroclor 1260), while subsurface soil COPCs are limited to benzo(a)pyrene. In the PSB area, COPCs for surface soil are benzo(a)pyrene and Aroclor 1260.

6.1.4 All Acid Areas

For the three Acid Areas being investigated, surface and subsurface soils have not been impacted by VOCs.

Several SVOCs were widely present in soils in all areas. Similar to results from previous investigations in other areas (Additional Burning Ground, Reservoir No. 2 Burning Ground, Wastewater Disposal Plant No. 2) at PBOW (IT, 1997b), the SVOCs were detected with greater frequency in surface soil than in the subsurface, probably due to reduced mobility of these detected compounds. Several SVOCs were present at concentrations exceeding their respective RBCs.

With the exception of the MNT area, PCB Aroclor 1260 was frequently detected in surficial soils at all sites with concentrations exceeding the RBC. The maximum PCB concentration was more than two orders of magnitude higher than the RBC. The same compound was also found in many surface soil samples collected from other areas (Additional Burning Ground, Reservoir No. 2 Burning Ground, Wastewater Disposal Plant No. 2) as reported previously (IT, 1997b). Subsurface soil samples were not analyzed for PCBs in these areas; therefore, no comparison to this medium could be made.

Soil sampling results from the Acid Area investigations have demonstrated that limited surface soil contamination by SVOCs and PCBs are present in all areas investigated except the MNT area. One explosive compound (2,4-DNT) exceeded the RBC only at one location in AA3, indicating a limited and isolated impact by explosive compounds. It appears that surface soil contamination by SVOCs is generally more widespread and notable than in the subsurface in all three areas, probably due to reduced mobility of the detected compounds. For metal constituents, the magnitude of detections in the subsurface soils was statistically higher than in the surface.

Five metals (aluminum, arsenic, beryllium, iron, and manganese) were detected in almost all soil samples, with concentrations exceeding the respective RBCs. However, the comparisons of these elevated detections against the background concentrations indicate that these metal constituents are likely attributable to natural conditions rather than to past land use. One metal (antimony) slightly exceeded both the RBC and the background value. This slight exceedance of background may indicate site related contamination; however, as previously noted in Section 5.2, the antimony concentration is within 2 percent of the background value, indicating its comparability to the background.

Although the vertical and horizontal extent of the soil contamination in each Acid Area could only be established with a greater certainty through more systematic sampling, the primary COPCs in each area have been established based on the comparison of the analytical data with the RBCs and with the background metals data.

6.2 Recommendations

Based on the surface soil analytical results and conclusions of the investigations at the three Acid Areas at the former PBOW, the following recommendations are made:

- The PCB (Aroclor 1260) was frequently detected in surface soils with elevated concentrations (exceeding RBC) as high as 20,000 µg/kg. In addition, SVOCs were infrequently detected at concentrations exceeding the RBCs. Site-specific risk assessments (human health and ecological) should be performed to determine the risk associated with these contaminants in surface soils.

- Should risk assessments performed on the surface soil indicate unacceptable risk at the Acid Areas, then an additional investigation possibly including subsurface soil and/or groundwater sampling may be warranted.

7.0 References

Dames & Moore, Inc. (D&M), 1997, ***TNT Areas Site Investigation, Final Report, Plum Brook Ordnance Works, Sandusky, Ohio***, April.

Dames & Moore, Inc. (D&M), 1996, ***Draft Report, Site-wide Groundwater Investigation, Plum Brook Ordnance Works, Sandusky, Ohio***, May.

IT Corporation (IT), 1998, ***Site-Specific Sampling and Analysis Plan, Plum Brook Ordnance Works, Sandusky, Ohio***.

IT Corporation (IT), 1997a, ***Site-Wide Groundwater Investigation, Former Plum Brook Ordnance Works, Sandusky, Ohio***, September.

IT Corporation (IT), 1997b, ***Site Investigation of the Reservoir No. 2 Burning Ground, Additional Burning Ground, Wastewater Disposal Plant No. 2, and Powerhouse No. 2 Ash Pit, Former Plum Brook Ordnance Works, Sandusky, Ohio***, December.

IT Corporation (IT), 1996a, ***Site-Wide Sampling and Analysis Plan, Plum Brook Ordnance Works, Sandusky, Ohio***, July.

IT Corporation (IT), 1996b, ***Quality Assurance Project Plan, Plum Brook Ordnance Works, Sandusky, Ohio***, July.

Ohio Environmental Protection Agency (OEPA), 1991, ***Final How Clean is Clean Policy***, OEPA Division of Emergency and Remedial Response, July.

U.S. Army Corps of Engineers (USACE), Nashville District, 1997, ***Scope of Work, Site Investigation of Acid Areas, Former Plum Brook Ordnance Works (PBOW), Sandusky, Ohio,*** August.

U.S. Environmental Protection Agency (EPA), 1998, ***Risk-Based Concentration Table***, EPA Region III, April.

U.S. Environmental Protection Agency (EPA), 1992, ***Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Addendum to Interim Final Guidance***, EPA/530/SW-89/026, Environmental Statistics and Information Division (2163), Office of Policy, Planning, and Evaluation, U.S. Environmental Protection Agency, Washington, DC, July.

U.S. Environmental Protection Agency (EPA), 1990, ***National Oil and Hazardous Substances Pollution Contingency Plan***, Final Rules, 55 FR 8666-8865, March.

U.S. Environmental Protection Agency (EPA), 1989, ***Statistical Analysis of Ground–Water Monitoring Data at RCRA Facilities, Interim Final Guidance***, EPA/530/SW-89/026,

U.S. Environmental Protection Agency, Office Of Solid Waste, Waste Management Division, Washington, DC, February.

APPENDIX A

SOIL BORING LOGS

HTRW DRILLING LOG

DISTRICT: Nashville - TN		HOLE NUMBER: SB01
1. COMPANY NAME: I.T. Corp.	2. DRILL SUBCONTRACTOR: Belasco Drilling Services	SHEET 1 OF 2 SHEETS
3. PROJECT: PBOW - Acid Area 1	4. LOCATION: Acid Area 1	
5. NAME OF DRILLER: Scott Guyer	6. MANUFACTURER'S DESIGNATION OF DRILL: CME-450 ATV	
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: 4-Inch Solid Stem Augers with 3" x 24" Split Spoon Sampler	8. HOLE LOCATION: SB01	
	9. SURFACE ELEVATION: NA	
	10. DATE STARTED: 4-30-98	11. DATE COMPLETED: 4-30-98
12. OVERBURDEN THICKNESS: NA	13. DEPTH GROUNDWATER ENCOUNTERED: NA	
13. DEPTH DRILLED INTO ROCK: NA	14. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: NA	
14. TOTAL DEPTH OF HOLE: 10.0 Ft.	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): NA	

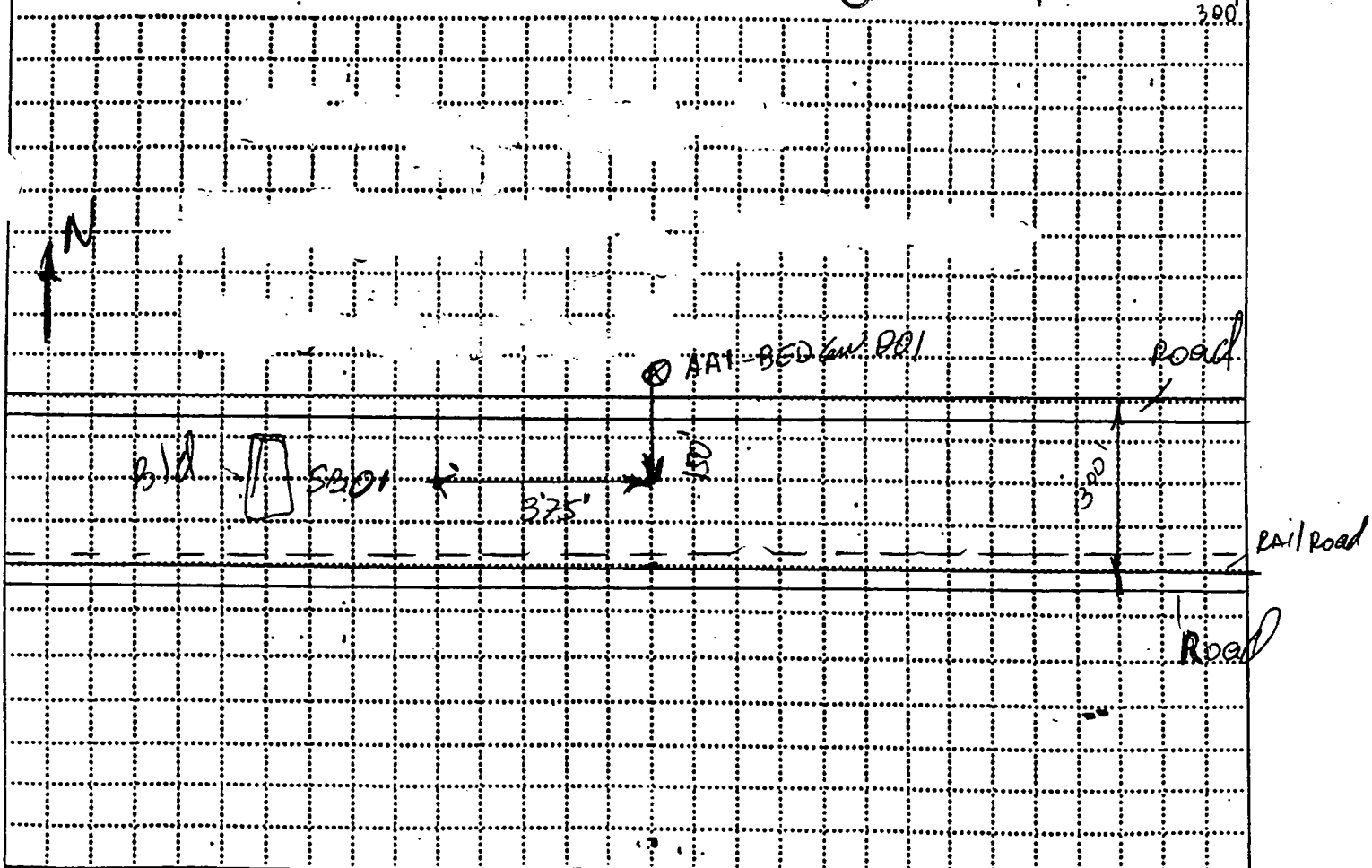
18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
NA			0

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC/SVOC	METALS/PH	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
Nitroaromatics (2)	2	2	PCB's (1)	Nitrate/Sulfate (2)		NA

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
Grout	X			John Vaughn

LOCATION SKETCH/COMMENTS

SCALE: 150' 300'



PROJECT	HOLE NO.
PBOW - Acid Area No. 1	SB01

ENG FORM 5056-R, AUG 94

(Proponent: CECW-EG)

HTRW DRILLING LOG (CONTINUATION SHEET)

HOLE NUMBER: SB01

PROJECT: USCS PBOW - Acid Area 1

INSPECTOR: John Vogedin

SHEET 2 OF 2 SHEETS

SYMBOL (a)	DEPTH (b)	DESCRIPTION OF MATERIALS (c)	FIELD SCREENING RESULTS (d)	GEOTECH SAMPLE OR CORE BOX NO (e)	ANALYTICAL SAMPLE NO. (f)	BLOW COUNT (g)	REMARKS (h)
SM	1	0.5-2.0. Loose, Light-dark brown, Fine Silty Sand, moist	(PID)		0.5' 6010 1.5'	2,3, 3,7	PID meter Not Functioning Properly due to excessive Atmospheric moisture
	2 3	2'-4' Same as Above, moist-Slightly wet.	NA			3,3, 3,7	
	4 5	4'-5' Same as Above, grey 5.0'	NA			6,6, 6,9	
ML	6 7	5'-6' Soft-m. Firm, Light-dark brown, black, and grey, v. Fine Sandy Silt to clayey silt, low-med. plast. Slightly mottled, moist 6'-8' Same as Above.	NA	NA		6,8, 10,10	
	8 9 10	8'-10' Same as Above, moist-Slightly wet	NA		8.0' 6020 10.0'	6,6, 11,15	Bottom of Boring at 10.0'

PROJECT: PBOW - Acid Area 1

HOLE NO. SB01

ENG FORM 5056A-R, AUG 94

(Proponent: CECW-EG)

HTRW DRILLING LOG

DISTRICT: Nashville - TN		HOLE NUMBER: SB02
1. COMPANY NAME: I.T. Corp.	2. DRILL SUBCONTRACTOR: Belasco Drilling Services	SHEET 1 OF 2 SHEETS
3. PROJECT: PBOW - Acid Area 1	4. LOCATION: Acid Area 1	
5. NAME OF DRILLER: Scott Guyer	6. MANUFACTURER'S DESIGNATION OF DRILL: CME-450 ATV	
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: 4-Inch Solid Stem Augers with 3" x 24" Split Spoon Sampler	8. HOLE LOCATION: SB02	
	9. SURFACE ELEVATION: NA	
	10. DATE STARTED: 4-30-98	11. DATE COMPLETED: 4-30-98
12. OVERBURDEN THICKNESS: NA	13. DEPTH GROUNDWATER ENCOUNTERED: 7.5 Ft.	
13. DEPTH DRILLED INTO ROCK: NA	14. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: NA	
14. TOTAL DEPTH OF HOLE: 10.0 Ft.	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): NA	

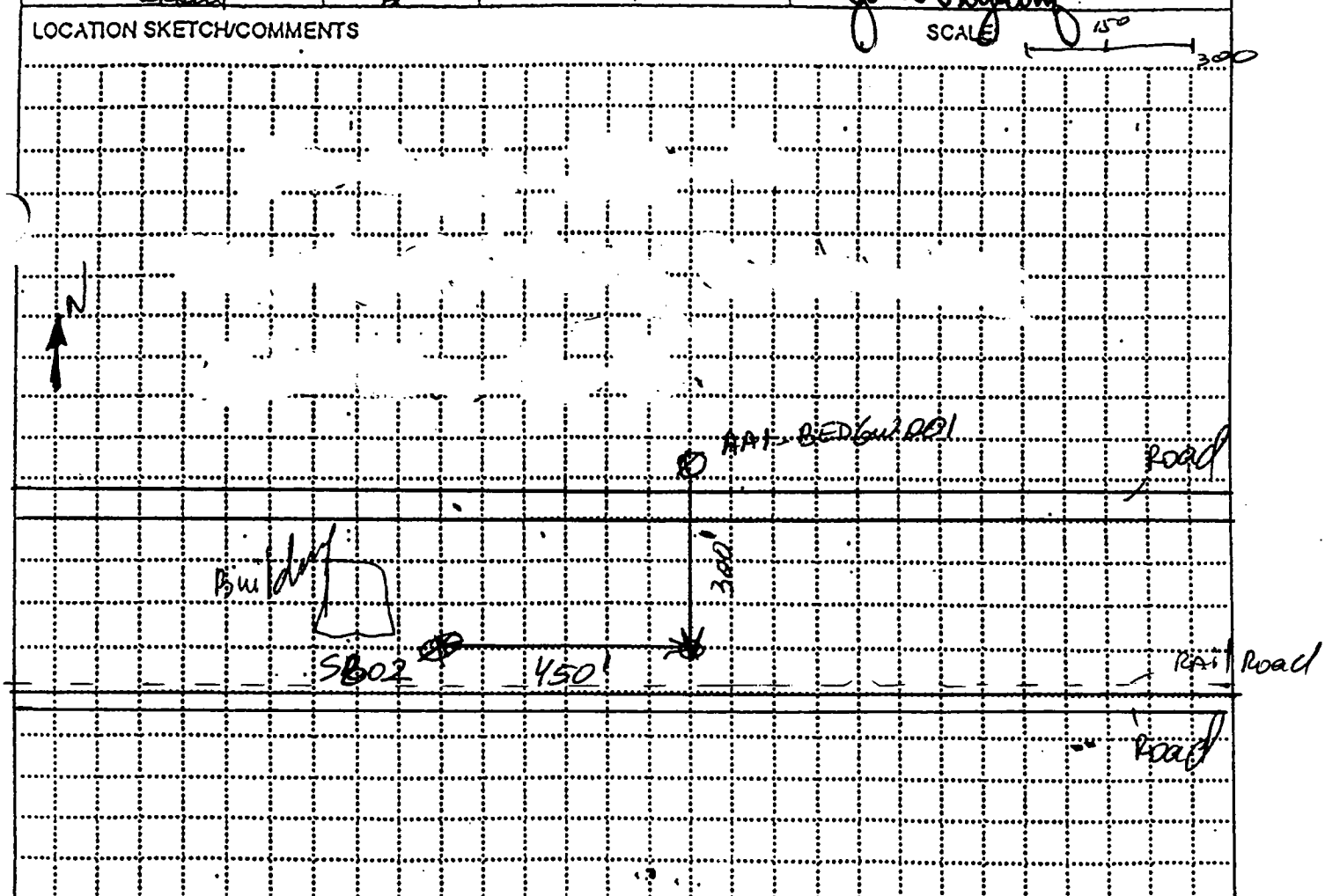
18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
2			0

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC/SVOC	METALS/PH	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
Nitroaromatics (2)	2	2	PCB's (1)	Nitrate/Sulfate (2)		NA

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
Grout	X			John Vogeding

LOCATION SKETCH/COMMENTS

SCALE: 150 300



PROJECT: PBOW - Acid Area No. 1 HOLE NO. SB02

ENG FORM 5056-R, AUG 94 (Proponent: CECW-EG)

HTRW DRILLING LOG (CONTINUATION SHEET)

HOLE NUMBER: SB02

PROJECT: USCS PBOW - Acid Area 1

INSPECTOR: John Vogeding

SHEET 2 OF 2 SHEETS

SYMBOL	DEPTH (b)	DESCRIPTION OF MATERIALS (c)	FIELD SCREENING RESULTS (d)	GEOTECH SAMPLE OR CORE BOX NO. (e)	ANALYTICAL SAMPLE NO. (f)	BLOW COUNT (g)	REMARKS (h)
SM	1	0.5 - 1.5' Loose, brown-grey, Fine, Silty Sand, moist 1.5'	NA		0.5' 6030 1.5'	3,17, 20,20	
ML	2	1.5'-2.0' Firm, grey, Clayey Silt, med. plasticity, mottled, moist 2.0'		2.0'			
SM	3	2'-4' Loose, med brown, Fine, Silty Sand, moist 4.0'	NA	PBOW-98-SO-AA1 -SB02-Geot.- (0204) 4.0'		NA (Shelby Tube)	Pushed Shelby tube From 2'-4'. 6" Recovery. Used split Spoon to recover lost material for Geotech. Sample.
	4	4'-6' Sandy-Clayey Silt	NA	PBOW-98-SO-AA1 -SB02-Geot.- (0406) 6.0'	6.0'	NA (Shelby Tube)	
ML	5						
	6	6'-8' Soft-Firm, med brown-grey, v. Fine Sandy Silt to Clayey Silt, med. Plasticity, Slightly mottled, moist-wet.	NA		6040 8.0'	3,7, 9,12	wet at 7.5'
	7						
	8	8'-10' Same as Above, grey, high Plasticity wet.	NA			5,7, 10,17	Bottom of Boring at 10.0'
	9						
	10						

PROJECT: PBOW - Acid Area 1

HOLE NO. SB02

ENG FORM 5056A-R, AUG 94

(Proponent: CECW-EG)

HTRW DRILLING LOG

DISTRICT: Nashville - TN		HOLE NUMBER: SB03
1. COMPANY NAME: I.T. Corp.	2. DRILL SUBCONTRACTOR: Belasco Drilling Services	SHEET 1 OF 2 SHEETS
3. PROJECT: PBOW - Acid Area 1	4. LOCATION: Acid Area 1	
5. NAME OF DRILLER: Scott Guyer	6. MANUFACTURER'S DESIGNATION OF DRILL: CME-450 ATV	
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: 4-Inch Solid Stem Augers with 3" x 24" Split Spoon Sampler	8. HOLE LOCATION: SB03	
	9. SURFACE ELEVATION: NA	
	10. DATE STARTED: 4-29-98	11. DATE COMPLETED: 4-29-98
12. OVERBURDEN THICKNESS: NA	13. DEPTH GROUNDWATER ENCOUNTERED: 3.5'	
13. DEPTH DRILLED INTO ROCK: NA	14. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: NA	
14. TOTAL DEPTH OF HOLE: 10.0 Ft.	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): NA	

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
NA			0

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC/SVOC	METALS/PH	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
	2	2	PCB's (1)	Nitrate/Sulfate (2)		NA

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
Grouting	X			John Vogeding

LOCATION SKETCH/COMMENTS SCALE:

See Figure VII-3
Proposed Soil Boring Location Map
Acid Area No. 1

PROJECT	HOLE NO.
PBOW - Acid Area No. 1	SB03

ENG FORM 5056-R, AUG 94 (Proponent: CECW-EG)

HTRW DRILLING LOG (CONTINUATION SHEET)

HOLE NUMBER: SB03

PROJECT: PBOW - Acid Area 1

INSPECTOR: John Voegding

SHEET 2 OF 2 SHEETS

SYMBOL (a)	DEPTH (b)	DESCRIPTION OF MATERIALS (c)	FIELD SCREENING RESULTS (d)	GEOTECH SAMPLE OR CORE BOX NO. (e)	ANALYTICAL SAMPLE NO. (f)	BLOW COUNT (g)	REMARKS (h)
		0-0.5' grass and Topsoil			0.5'		
		0.5'-2.0'	(PID)			2,5,	
	1	Soft-m. Firm, med-dark brown, and black, v. fine Sandy silt, moist	0 ppm		6050 1.5'	6,10	
	2	2'-4' Same as Above, wet from 3.5'-4.0'	3.0 ppm			8,8, 14,12	
ml	4	4'-6' Same as Above, wet	2.5 ppm	NA		4,3, 6,8	
	5	grey at 5.5'			6.0'		
	6	6'-8' Same as Above, wet, brown and grey	3.0 ppm		6060 8.0'	6,9, 11,18	
	8	8'-10' Same as Above, wet.	2.0 ppm			9,12 11,12	
	9	grey at 9.5'					
	10						Bottom of Boring at 10.0'

PROJECT: PBOW - Acid Area 1 HOLE NO. SB03

ENG FORM 5056A-R, AUG 94 (Proponent: CECW-EG)

HTRW DRILLING LOG

1. COMPANY NAME I.T. Corp.	2. DRILL SUBCONTRACTOR Belasco Drilling Services	DISTRICT Nashville - TN
3. PROJECT PBOW - Acid Area 1	4. LOCATION Acid Area 1	HOLE NUMBER SB04
5. NAME OF DRILLER Scott Guyer	6. MANUFACTURER'S DESIGNATION OF DRILL CME-450 ATV	SHEET 1 OF SHEETS 2
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT 4-Inch Solid Stem Augers with 3" x 24" Split Spoon Sampler	8. HOLE LOCATION SB04	
	9. SURFACE ELEVATION NA	
	10. DATE STARTED 4-28-98	11. DATE COMPLETED 4-28-98
12. OVERBURDEN THICKNESS NA	13. DEPTH GROUNDWATER ENCOUNTERED NA	
13. DEPTH DRILLED INTO ROCK NA	14. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED NA	
14. TOTAL DEPTH OF HOLE 10.0 Ft.	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY) NA	

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
NA			0

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC/SVOC	METALS/PH	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
	2	2	PCBs (1)	Nitrate/Sulfate (2)		NA

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
Grouting	X			John Vogelsing

LOCATION SKETCH/COMMENTS SCALE:

See Figure VII-3
Proposed Soil Boring Location Map
Acid Area No. 1

PROJECT PBOW - Acid Area No. 1 HOLE NO. SB04

FORM 5056-R, AUG 94 (Proponent: CECW-EG)

HTRW DRILLING LOG (CONTINUATION SHEET)

HOLE NUMBER: SB04

PROJECT: PBOW - Acid Area 1

INSPECTOR: John Voegeding

SHEET 2 OF 2 SHEETS

DEPTH (b)	DESCRIPTION OF MATERIALS (c)	FIELD SCREENING RESULTS (d)	GEOTECH SAMPLE OR CORE BOX NO. (e)	ANALYTICAL SAMPLE NO. (f)	BLOW COUNT (g)	REMARKS (h)
	0-0.5' grass and Topsoil	(PID)		0.5'		
	0.5'-2.0'				3,1,	
1	Soft-m.Firm, light-dark brown, black, and grey, v. Fine Sandy Silt to clayey silt, low-med Plasticity, slightly mottled, moist-Slightly wet	0 ppm		6070 1.5'	6,10	reddish Fe Staining From 1'-1.5'
2						
	2'-4' Same as Above				4,4,	
3		4.0 ppm			4,8	
4	4'-6' Same As Above				3,5,	
5		3.5 ppm			6,7	
6	6'-8' Same as Above				4,5,	
7		4.0 ppm			7,8	
8				8.0		
	8'-10' Same as Above, some black staining.				3,6,	
9		4.0 ppm		6080	7,8	
10				10.0		Bottom of Boring at 10.0'

ml

PROJECT: PBOW - Acid Area 1

HOLE NO. SB04

ENG FORM 5056A-R, AUG 94

(Proponent: CECW-EG)

HTRW DRILLING LOG

DISTRICT: Nashville - TN		HOLE NUMBER: SB05
1. COMPANY NAME: I.T. Corp.	2. DRILL SUBCONTRACTOR: Belasco Drilling Services	SHEET 1 OF 2 SHEETS
3. PROJECT: PBOW - Acid Area 1	4. LOCATION: Acid Area 1	
5. NAME OF DRILLER: Scott Guyer	6. MANUFACTURER'S DESIGNATION OF DRILL: CME-450 ATV	
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: 4-Inch Solid Stem Augers with 3" x 24" Split Spoon Sampler	8. HOLE LOCATION: SB05	
	9. SURFACE ELEVATION: NA	
	10. DATE STARTED: 4-30-98	11. DATE COMPLETED: 4-30-98
12. OVERBURDEN THICKNESS: NA	13. DEPTH GROUNDWATER ENCOUNTERED: NA	
13. DEPTH DRILLED INTO ROCK: NA	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: NA	
14. TOTAL DEPTH OF HOLE: 10.0 Ft.	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): NA	

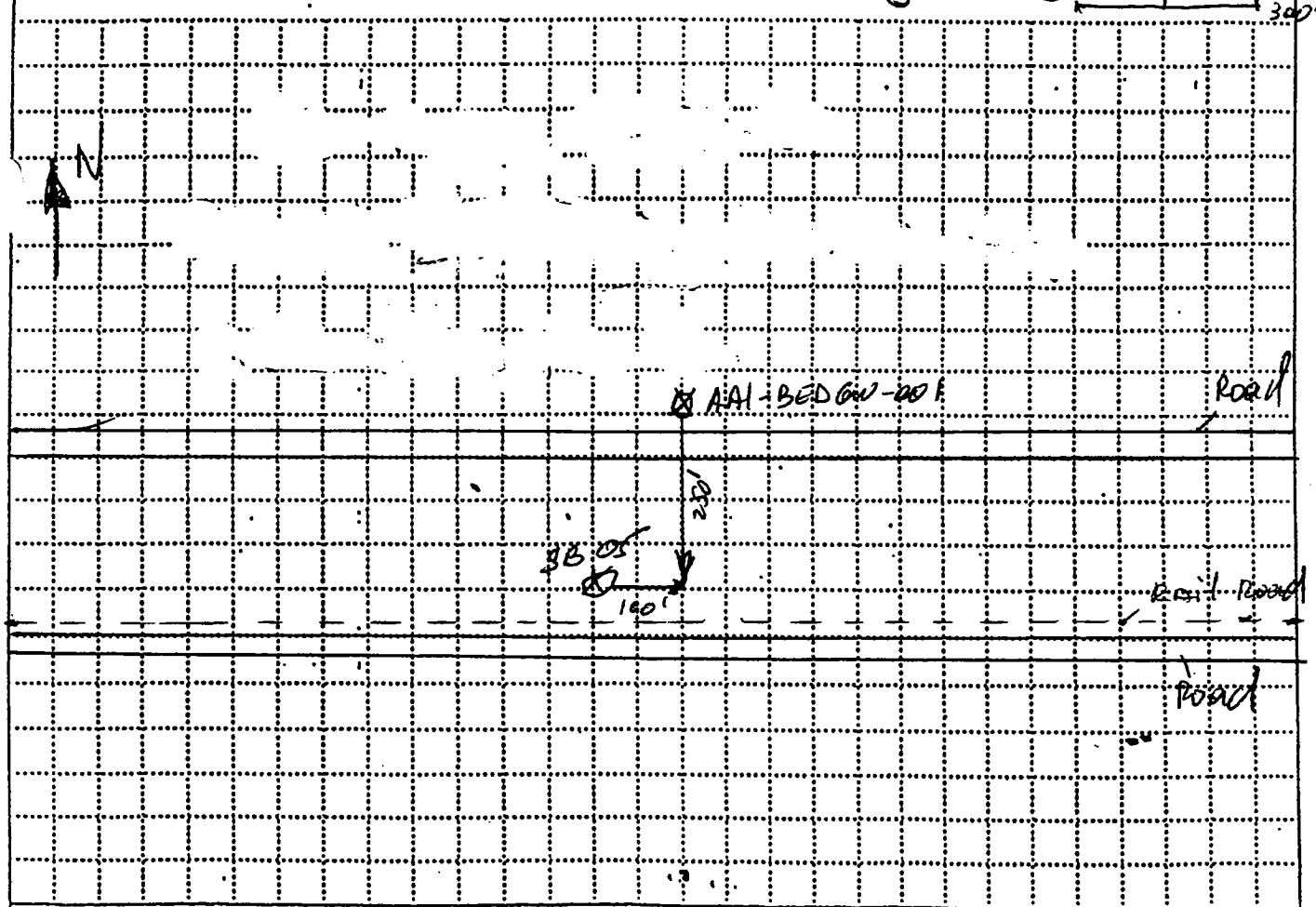
18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
	2		0

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC/SVOC	METALS/PH	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
	2	2	PCBs (1)	Nitrate/Sul	fate (2)	NA

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
Grout	X			John Vogydy

LOCATION SKETCH/COMMENTS

SCALE 150' 300'



PROJECT: PBOW - Acid Area No. 1 | HOLE NO. SB05

ENG FORM 5056-R, AUG 94 (Proponent: CECW-EG)

HTRW DRILLING LOG (CONTINUATION SHEET)

HOLE NUMBER SB05

PROJECT USCS PBOW - Acid Area 1 | INSPECTOR John Vogedin | SHEET 2 OF 2 SHEETS

SYMBOL (a)	DEPTH (b)	DESCRIPTION OF MATERIALS (c)	FIELD SCREENING RESULTS (d)	GEOTECH SAMPLE OR CORE BOX NO. (e)	ANALYTICAL SAMPLE NO. (f)	BLOW COUNT (g)	REMARKS (h)
		0-0.5' grass and Topsoil	(PID)		0.5'	1, 2,	
Sm	1	0.5'-2.0' Loose, Light-dark brown, Fine Silty Sand, moist-wet.	0 ppm	2.0'	6090 1.5'	3, 6	
	2		NA	PBOW-98-SO-AA1-SB05-Geot-(0204) 4.0'		NA (Shelby Tube)	Pushed Shelby Tube from 2'-4' 2' Recovery.
	3	3.0' Soft-Firm, light-dark brown, black, and grey, v. Fine Sandy Silt to Clayey Silt, low-med. Plasticity, Slightly mottled, moist					
	4	4'-6' Same as Above	NA	PBOW-98-SO-AA1-SB05-Geot-(0406) 6.0'	6.0'	NA (Shelby Tube)	Pushed Shelby Tube from 4'-6' 2' Recovery
Ml	6	6'-8' Same as Above, Firm, grey, high Plasticity, moist-slightly wet.	3.5 ppm		6100 8.0'	7, 11, 17, 19	
	8	8'-10' Same as Above	2.0 ppm			3, 6, 10, 15	Bottom of Boring at 10.0'
	10						

PROJECT PBOW - Acid Area 1 | HOLE NO. SB05

ENG FORM 5056A-R, AUG 94 (Proponent: CECW-EG)

HTRW DRILLING LOG

DISTRICT: Nashville - TN		HOLE NUMBER: SB06
1. COMPANY NAME: I.T. Corp.	2. DRILL SUBCONTRACTOR: Belasco Drilling Services	SHEET 1 OF 2 SHEETS
3. PROJECT: PBOW - Acid Area 1	4. LOCATION: Acid Area 1	
5. NAME OF DRILLER: Scott Guyer	6. MANUFACTURER'S DESIGNATION OF DRILL: CME-450 ATV	
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: 4-Inch Solid Stem Augers with 3" x 24" Split Spoon Sampler	8. HOLE LOCATION: SB06	
	9. SURFACE ELEVATION: NA	
	10. DATE STARTED: 4-29-98	11. DATE COMPLETED: 4-29-98
12. OVERBURDEN THICKNESS: NA	13. DEPTH GROUNDWATER ENCOUNTERED: 8.0 Ft.	
13. DEPTH DRILLED INTO ROCK: NA	14. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: NA	
14. TOTAL DEPTH OF HOLE: 10.0 Ft.	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): NA	

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
NA			0

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC/SVOC	METALS/PH	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
	2	2	PCB's (1)	Nitrate/Sulfate (2)		NA

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
	X			John Vogeding

LOCATION SKETCH/COMMENTS SCALE:

See Figure VII-3
Proposed Soil Boring Location Map
Acid Area No. 1

PROJECT: PBOW - Acid Area No. 1 HOLE NO. SB06

HTRW DRILLING LOG (CONTINUATION SHEET)

HOLE NUMBER: SB06

PROJECT USCS: PBOW - Acid Area 1

INSPECTOR: John Vogeding

SHEET 2 OF 2 SHEETS

SYMBOL (b)	DEPTH (b)	DESCRIPTION OF MATERIALS (c)	FIELD SCREENING RESULTS (d)	GEOTECH SAMPLE OR CORE BOX NO. (e)	ANALYTICAL SAMPLE NO. (f)	BLOW COUNT (g)	REMARKS (h)
		0-0.5' grass and Topsoil	(PID)		0.5'	2,1,	
	1	0.5'-2.0' Loose, dark brown, black, and grey, Fine, Silty Sand, moist-Slightly wet	0 ppm		6110 1.5'	4,4	
	2	2'-4' Same as Above.					
SM	3		5.0 ppm			2,5, 6,6	
	4	4'-4.5' Same as Above 4.5'					
	5	4.5'-6.0' Soft, grey-brown, v.fine, Sandy Silt, wet.	6.0 ppm	NA	6.0'	1,1, 2,3	
ML	6	6'-8' Same as Above, light-dark brown, and grey, v.fine Sandy Silt to Clayey Silt, low-med. plasticity, Slightly mottled with Fe staining, moist-wet.					
	7		6.0 ppm		6120 8.0'	4,7, 9,10	
	8	8'-10' Same as Above, wet					All wet at 8'
	9		5.0 ppm			5,12, 16,21	Bottom of Boring at 10.0'
	10						

PROJECT: PBOW - Acid Area 1

HOLE NO. SB06

ENG FORM 5056A-R, AUG 94

(Proponent: CECW-EG)

HTRW DRILLING LOG

DISTRICT: Nashville - TN		HOLE NUMBER: SB07
1. COMPANY NAME: I.T. Corp.	2. DRILL SUBCONTRACTOR: Belasco Drilling Services	SHEET 1 OF 2 SHEETS
3. PROJECT: PBOW - Acid Area 1	4. LOCATION: Acid Area 1	
5. NAME OF DRILLER: Scott Guyer	6. MANUFACTURER'S DESIGNATION OF DRILL: CME-450 ATV	
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: 4-Inch Solid Stem Augers with 3" x 24" Split Spoon Sampler	8. HOLE LOCATION: SB07	
	9. SURFACE ELEVATION: NA	
	10. DATE STARTED: 4-29-98	11. DATE COMPLETED: 4-29-98
12. OVERBURDEN THICKNESS: NA	13. DEPTH GROUNDWATER ENCOUNTERED: NA	
13. DEPTH DRILLED INTO ROCK: NA	14. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: NA	
14. TOTAL DEPTH OF HOLE: 10.0 Ft.	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): NA	

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
NA			0

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC/SVOC	METALS/PH	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
	2	2	PCB's (1)	Nitrate/Sulfate (2)		NA

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
Grouting	X			John Vogeding

LOCATION SKETCH/COMMENTS SCALE:

See Figure VII-3
Proposed Soil Boring Location Map
Acid Area No. 1

PROJECT	HOLE NO.
PBOW - Acid Area No. 1	SB07

HTRW DRILLING LOG (CONTINUATION SHEET)

HOLE NUMBER: SB07

PROJECT: PBOW - Acid Area 1

INSPECTOR: John Vogeding

SHEET 2 OF 2 SHEETS

SYMBOL	DEPTH (b)	DESCRIPTION OF MATERIALS (c)	FIELD SCREENING RESULTS (d)	GEOTECH SAMPLE OR CORE BOX NO. (e)	ANALYTICAL SAMPLE NO. (f)	BLOW COUNT (g)	REMARKS (h)
		0-0.5 Fill (gravel, Med, Angular)	(PID)		0.5'	4,3,	
	1	0.5'-2.0' Loose, Light-dark brown and black, V. Fine Silty Sand, moist.	0 ppm		6130 1.5'	2,3	
SM	2				2.0'		
		2'-3.5' Same as Above, wet				2,4,	
	3	3.5'	25.0 ppm		6140	4,9	
		3.5'-4.0' Soft-Firm, light-dark brown, black, grey, clayey silt, low-med. plasticity, slightly mottled w/ Fe stains, moist.			4.0'		
	4					5,12,	
	5	4'-6' Same as Above, Firm-Hard, grey, moist	12.0 ppm	NA		20,28	
	6	6'-8' Same as Above w/ 20% Fine-med, rounded pebbles/gravel (glacial Till)				5,9,	
ML	7		9.0 ppm			15,20	
	8	8'-10' Same as Above Firm-Hard, moist				5,12,	
	9		4.0 ppm			14,20	Bottom of Boring at 10.0'
	10						

PROJECT: PBOW - Acid Area 1

HOLE NO. SB07

ENG FORM 5056A-R, AUG 94

(Proponent: CECW-EG)

HTRW DRILLING LOG

DISTRICT: Nashville - TN		HOLE NUMBER: SB08
1. COMPANY NAME: I.T. Corp.	2. DRILL SUBCONTRACTOR: Belasco Drilling Services	SHEET 1 OF 2 SHEETS
3. PROJECT: PBOW - Acid Area 1	4. LOCATION: Acid Area 1	
5. NAME OF DRILLER: Scott Guyer	6. MANUFACTURER'S DESIGNATION OF DRILL: CME-450 ATV	
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: 4-Inch Solid Stem Augers with 3" x 24" Split Spoon Sampler	8. HOLE LOCATION: SB08	
	9. SURFACE ELEVATION: NA	
	10. DATE STARTED: 4-29-98	11. DATE COMPLETED: 4-29-98
12. OVERBURDEN THICKNESS: NA	13. DEPTH GROUNDWATER ENCOUNTERED: NA	
13. DEPTH DRILLED INTO ROCK: NA	14. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: NA	
14. TOTAL DEPTH OF HOLE: 10.0 Ft.	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): NA	

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
NA			0

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC/SVOC	METALS/PH	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
	2	2	PCB's (1)	Nitrate/Sulfate (2)		NA

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
	X			John Vogeding

LOCATION SKETCH/COMMENTS SCALE:

See Figure VII-3
Proposed Soil Boring Location Map
Acid Area No. 1

PROJECT: PBOW - Acid Area No. 1 HOLE NO. SB08

ENG FORM 5056-R, AUG 94 (Proponent: CECW-EG)

HTRW DRILLING LOG (CONTINUATION SHEET)

HOLE NUMBER SB08

PROJECT UESC PBOW - Acid Area 1

INSPECTOR John Vogedin

SHEET 2 OF 2 SHEETS

SYMBOL (a)	DEPTH (b)	DESCRIPTION OF MATERIALS (c)	FIELD SCREENING RESULTS (d)	GEOTECH SAMPLE OR CORE BOX NO. (e)	ANALYTICAL SAMPLE NO. (f)	BLOW COUNT (g)	REMARKS (h)
		0-0.5' grass and Topsoil	(PID)		0.5'	2,2,	
	1	0.5'-2.0' Loose-m.Dense, Light-dark brown, V. Fine, Silty Sand, moist.	0 ppm		6150 1.5'	6,8	
	2				2.0'		
SM		2'-4' Same as Above, wet.				4,8,	
	3	~~3'-3.5' Same as Above~~	9.0 ppm		6160	7,7	
	4	~~3~~			4.0'		
		4-4.5' Same As Above					
	5	4.5'-6.0' Soft-Firm, light-dark brown, black, and grey, V. Fine Sandy Silt to Clayey Silt, Low-Med Plasticity, Slightly mottled w/ Fe stains, moist-slightly wet.	7.0 ppm	NA		2,3, 7,12	
	6						
ML	7	6'-8' Same as Above, Firm-Hard.	5.5 ppm			6,12, 20,18	
	8	8'-10' Same as Above, Grey				7,17,	
	9		5.0 ppm			14,17	Bottom of Boring at 10.0'
	10						

PROJECT PBOW - Acid Area 1

HOLE NO. SB08

ENG FORM 5056A-R, AUG 94

(Proponent: CECW-EG)

HTRW DRILLING LOG

DISTRICT: Nashville - TN		HOLE NUMBER: SB09
1. COMPANY NAME: I.T. Corp.	2. DRILL SUBCONTRACTOR: Belasco Drilling Services	SHEET 1 OF 2 SHEETS
3. PROJECT: PBOW - Acid Area 1	4. LOCATION: Acid Area 1	
5. NAME OF DRILLER: Scott Guyer	6. MANUFACTURER'S DESIGNATION OF DRILL: CME-450 ATV	
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: 4-Inch Solid Stem Augers with 3" x 24" Split Spoon Sampler	8. HOLE LOCATION: SB09	
	9. SURFACE ELEVATION: NA	
	10. DATE STARTED: 4-30-98	11. DATE COMPLETED: 4-30-98
12. OVERBURDEN THICKNESS: NA	13. DEPTH GROUNDWATER ENCOUNTERED: NA	
13. DEPTH DRILLED INTO ROCK: NA	14. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: NA	
14. TOTAL DEPTH OF HOLE: 10.0 Ft.	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): NA	

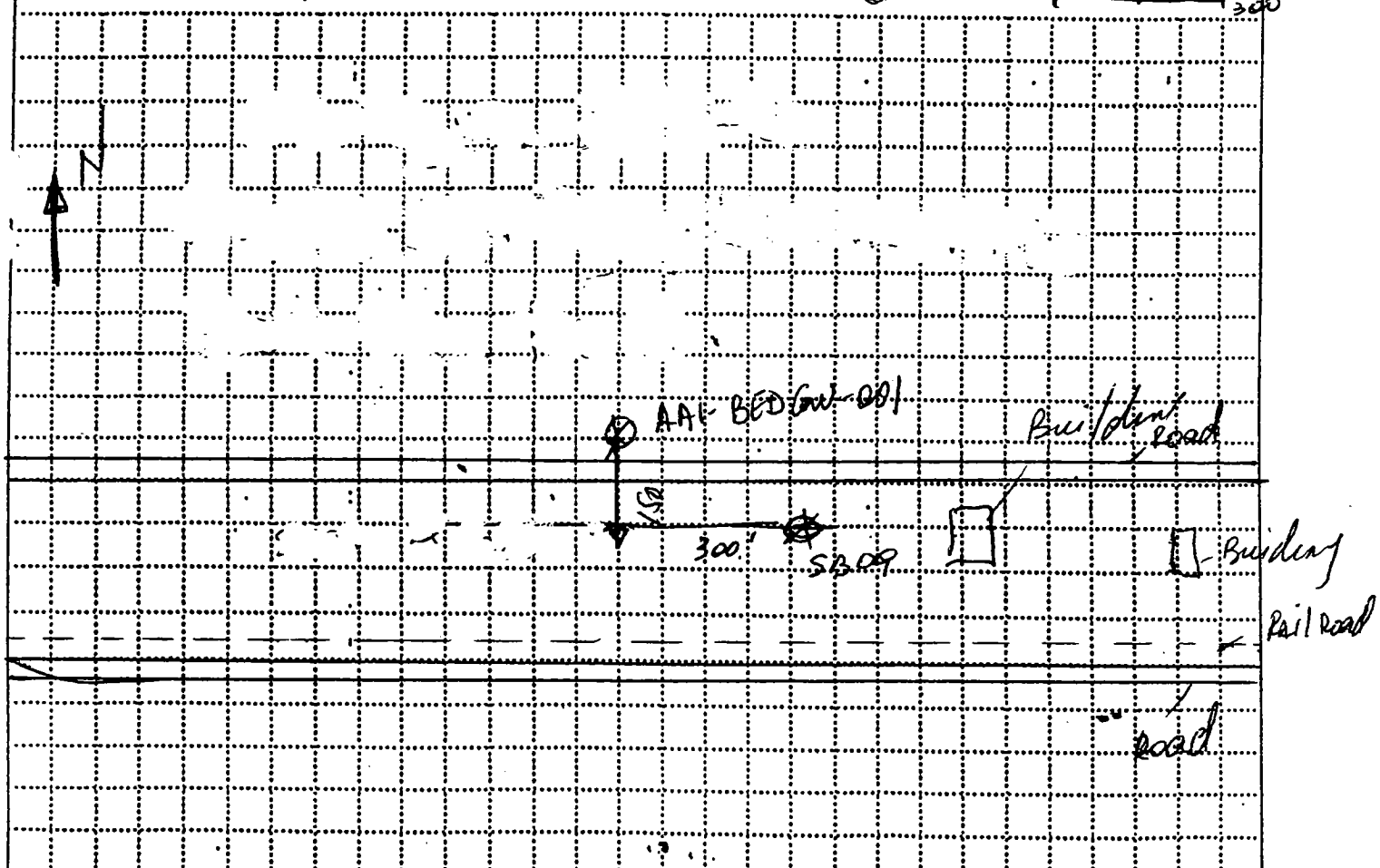
18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
NA			0

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC/SVOC	METALS/PH	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
	2	2	PCB's (1)	Nitrate/Sulfate (2)		NA

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
Grout	X			John Vogelin

LOCATION SKETCH/COMMENTS

SCALE 150' 300'



PROJECT: PBOW - Acid Area No. 1

HOLE NO. SB09

ENG FORM 5056-R, AUG 94

(Proponent: CECW-EG)

HTRW DRILLING LOG (CONTINUATION SHEET)

HOLE NUMBER: SB09

PROJECT: USCS PBOW - Acid Area 1

INSPECTOR: John Vogeding

SHEET 2 OF 2 SHEETS

SYMBOL (a)	DEPTH (b)	DESCRIPTION OF MATERIALS (c)	FIELD SCREENING RESULTS (d)	GEOTECH SAMPLE OR CORE BOX NO. (e)	ANALYTICAL SAMPLE NO. (f)	BLOW COUNT (g)	REMARKS (h)
		0-0.5' grass and Topsoil			0.5'	2,3,	
	1	0.5'-2.0' Soft-m. Firm, light-dark brown, black and grey, v. Fine Sandy Silt to Clayey silt, low-med. Plasticity, moist	(PID) 0 ppm		6170 1.5'	8,7	
	2				2.0'		
	3	2'-4' Same as Above, high organic content.	5.0 ppm		6180	7,7, 18,18	
	4				4.0'		
Mil	5	4'-6' Same as Above Slightly mottled, low organic content.	5.0 ppm	NA		5,5, 7,10	
	6						
	7	6'-8' Same as Above moist.	5.0 ppm			4,8, 11,16	
	8						
	9	8'-10' Same as Above Firm, moist	4.0 ppm			8,11, 18,22	Bottom of Boring at 10.0'
	10						

PROJECT: PBOW - Acid Area 1

HOLE NO. SB09

ENG FORM 5056A-R, AUG 94

(Proponent: CECW-EG)

HTRW DRILLING LOG

DISTRICT: Nashville - TN		HOLE NUMBER: SB10
1. COMPANY NAME: I.T. Corp.	2. DRILL SUBCONTRACTOR: Belasco Drilling Services	SHEET 1 OF 2 SHEETS
3. PROJECT: PBOW - Acid Area 1	4. LOCATION: Acid Area 1	
5. NAME OF DRILLER: Scott Guyer	6. MANUFACTURER'S DESIGNATION OF DRILL: CME-450 ATV	
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: 4-Inch Solid Stem Augers with 3" x 24" Split Spoon Sampler	8. HOLE LOCATION: SB10	
	9. SURFACE ELEVATION: NA	
	10. DATE STARTED: 4-30-98	11. DATE COMPLETED: 4-30-98
12. OVERBURDEN THICKNESS: NA	13. DEPTH GROUNDWATER ENCOUNTERED: NA	
13. DEPTH DRILLED INTO ROCK: NA	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: NA	
14. TOTAL DEPTH OF HOLE: 10.0 Ft.	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): NA	

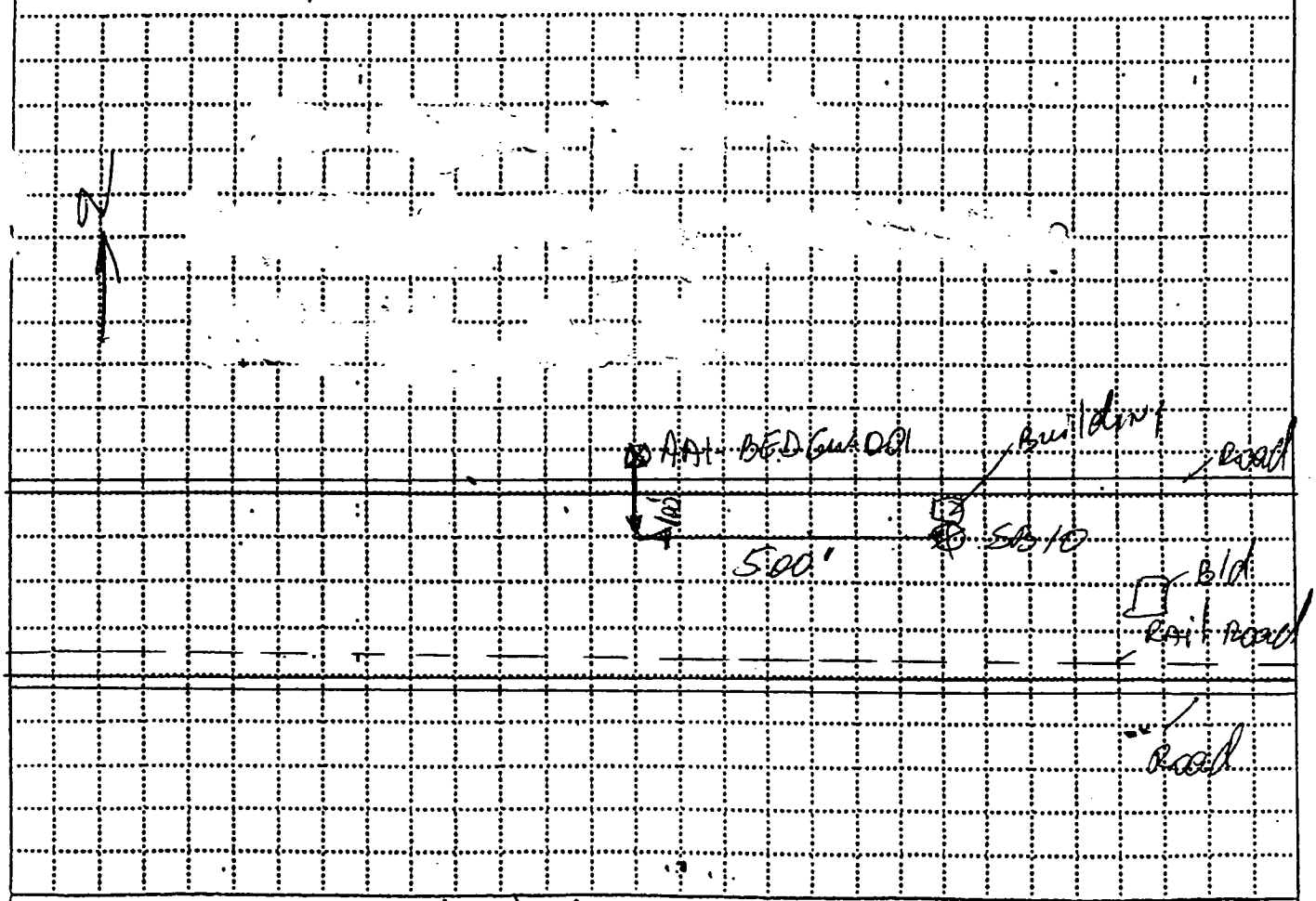
18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
NA			0

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC/SVOC	METALS/PH	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
	2	2	PCB's (1)	Nitrate/Sulfate (2)		NA

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
Count	*			John Voegelin

LOCATION SKETCH/COMMENTS

SCALE



PROJECT: PBOW - Acid Area No. 1 | HOLE NO. SB10

ENG FORM 5056-R, AUG 94 (Proponent: CECW-EG)

HTRW DRILLING LOG (CONTINUATION SHEET)

HOLE NUMBER: SB10

PROJECT: USCS PBOW - Acid Area 1

INSPECTOR: John Voegding

SHEET 2 OF 2 SHEETS

~~Trade~~ Symbol	DEPTH (b)	DESCRIPTION OF MATERIALS (c)	FIELD SCREENING RESULTS (d)	GEOTECH SAMPLE OR CORE BOX NO. (e)	ANALYTICAL SAMPLE NO. (f)	BLOW COUNT (g)	REMARKS (h)
		0-0.5' grass and Topsoil			0.5'		
		0.5'-2.0'	(PID)			4,10,	
	1	Soft-m. Firm, light-dark brown, black and grey, V. Fine Sandy Silt, moist	0 ppm		6190 1.5'	7,8	
	2	2'-4' Same as Above.				7,6,	
	3		5.0 ppm			6,7	
	4				4.0'		
ml		4'-5' Same as Above, Firm, moist				6,10,	
	5	5'-6' olive brown-grey, Clayey Silt, low-med Plasticity, slightly mottled, moist	5.5 ppm	NA	6200 6.0'	13,16	
	6						
		6'-8' Same as Above, med-high Plasticity	5.5 ppm			6,14, 14,20	
	7						
	8	8'-10' Same as Above. w/ 20% Fine, well rounded pebbles (glacial Till), moist	2.5 ppm			5,13, 14,20	
	9						
	10						Bottom of Boring at 10.0'

PROJECT: PBOW - Acid Area 1

HOLE NO. SB10

ENG FORM 5056A-R, AUG 94

(Proponent: CECW-EG)

HTRW DRILLING LOG

DISTRICT: Nashville - TN		HOLE NUMBER: SB11
1. COMPANY NAME: I.T. Corp.	2. DRILL SUBCONTRACTOR: Belasco Drilling Services	SHEET 1 OF 2 SHEETS
3. PROJECT: PBOW - Acid Area 1	4. LOCATION: Acid Area 1	
5. NAME OF DRILLER: Scott Guyer	6. MANUFACTURER'S DESIGNATION OF DRILL: CME-450 ATV	
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: 4-Inch Solid Stem Augers with 3" x 24" Split Spoon Sampler	8. HOLE LOCATION: SB11	
	9. SURFACE ELEVATION: NA	
	10. DATE STARTED: 4-30-98	11. DATE COMPLETED: 4-30-98
12. OVERBURDEN THICKNESS: NA	13. DEPTH GROUNDWATER ENCOUNTERED: NA	
13. DEPTH DRILLED INTO ROCK: NA	14. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: NA	
14. TOTAL DEPTH OF HOLE: 10.0 Ft.	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): NA	

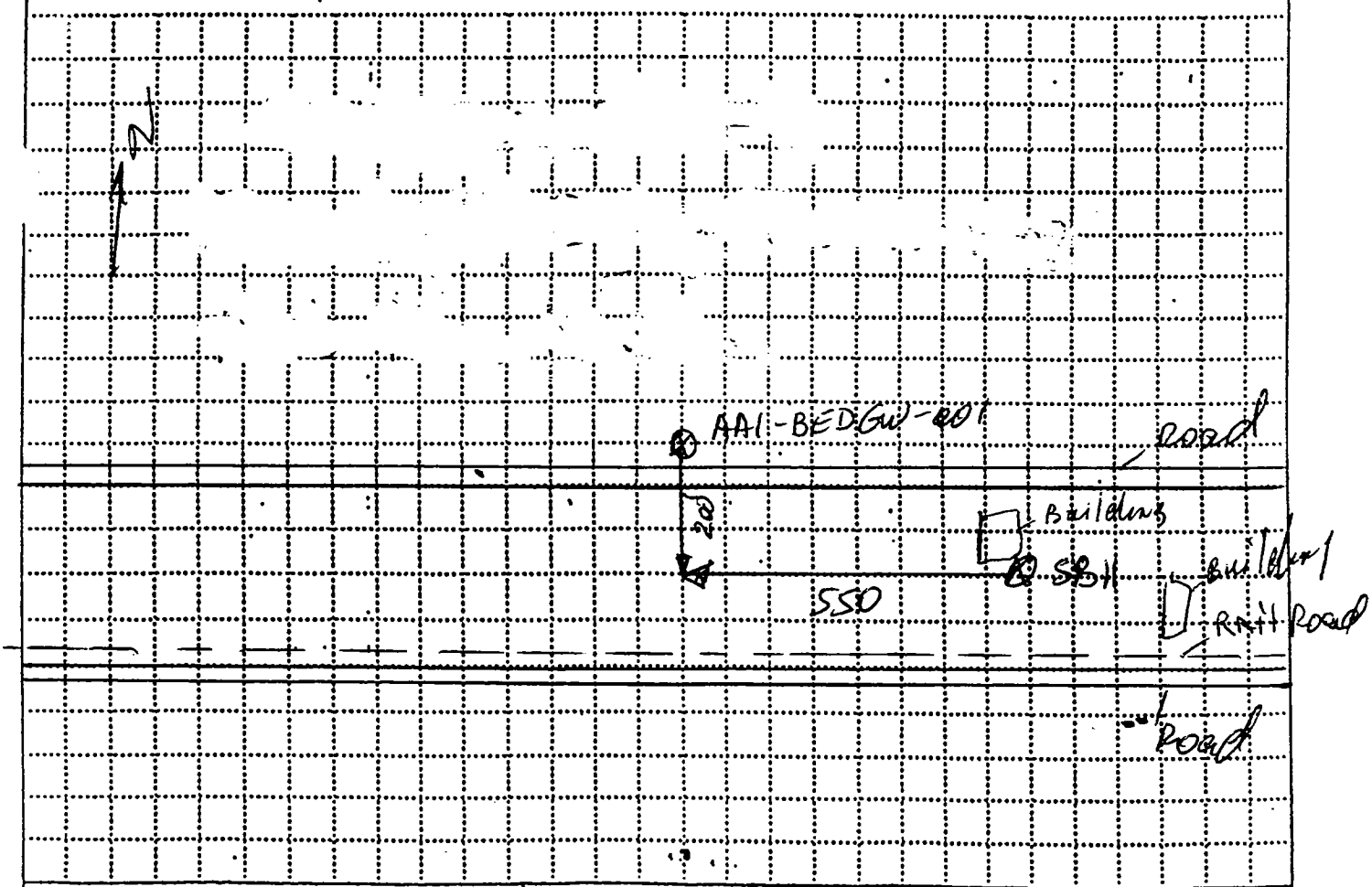
18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
NA			0

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC/SVOC	METALS/PH	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
	2	2	PCB's (1)	Nitrate/Sulfate (2)		NA

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
Grout	#			John Vaughn

LOCATION SKETCH/COMMENTS

SCALE:



PROJECT: PBOW - Acid Area No. 1

HOLE NO. SB11

ENG FORM 5056-R, AUG 94

(Proponent: CECW-EG)

HTRW DRILLING LOG (CONTINUATION SHEET)

HOLE NUMBER: SB11

PROJECT: USCS PBOW - Acid Area 1

INSPECTOR: John Vogeding

SHEET 2 OF 2 SHEETS

SYMBOL (a)	DEPTH (b)	DESCRIPTION OF MATERIALS (c)	FIELD SCREENING RESULTS (d)	GEOTECH SAMPLE OR CORE BOX NO. (e)	ANALYTICAL SAMPLE NO. (f)	BLOW COUNT (g)	REMARKS (h)
ML		0.0.5' grass and Topsoil			0.5'		
		0.5'-2.0'	(PID)			3,4,	
	1	Soft-m. Firm, Light-dark brown, black, and grey, V. Fine Sandy Silt to clayey Silt, low-Med. Plasticity, slightly Mottled, moist.	0 ppm		6210 1.5'	7,8	
	2	2'-4' Same as Above				4,5,	
	3		4.0 ppm			7,9	
	4	4'-6' Same As Above, moist-wet.			4.0'		
	5		5.5 ppm	NA	6220	3,3, 4,5	
	6	6'-8' Same as Above			6.0'		
	7		5.0 ppm			3,5, 7,7	
	8	8'-10' Same as Above, med-high Plasticity					
	9		3.0 ppm			3,7, 10,15	Bottom of Boring at 10.0'
	10						

PROJECT: PBOW - Acid Area 1

HOLE NO. SB11

ENG FORM 5056A-R, AUG 94

(Proponent: CECW-EG)

HTRW DRILLING LOG

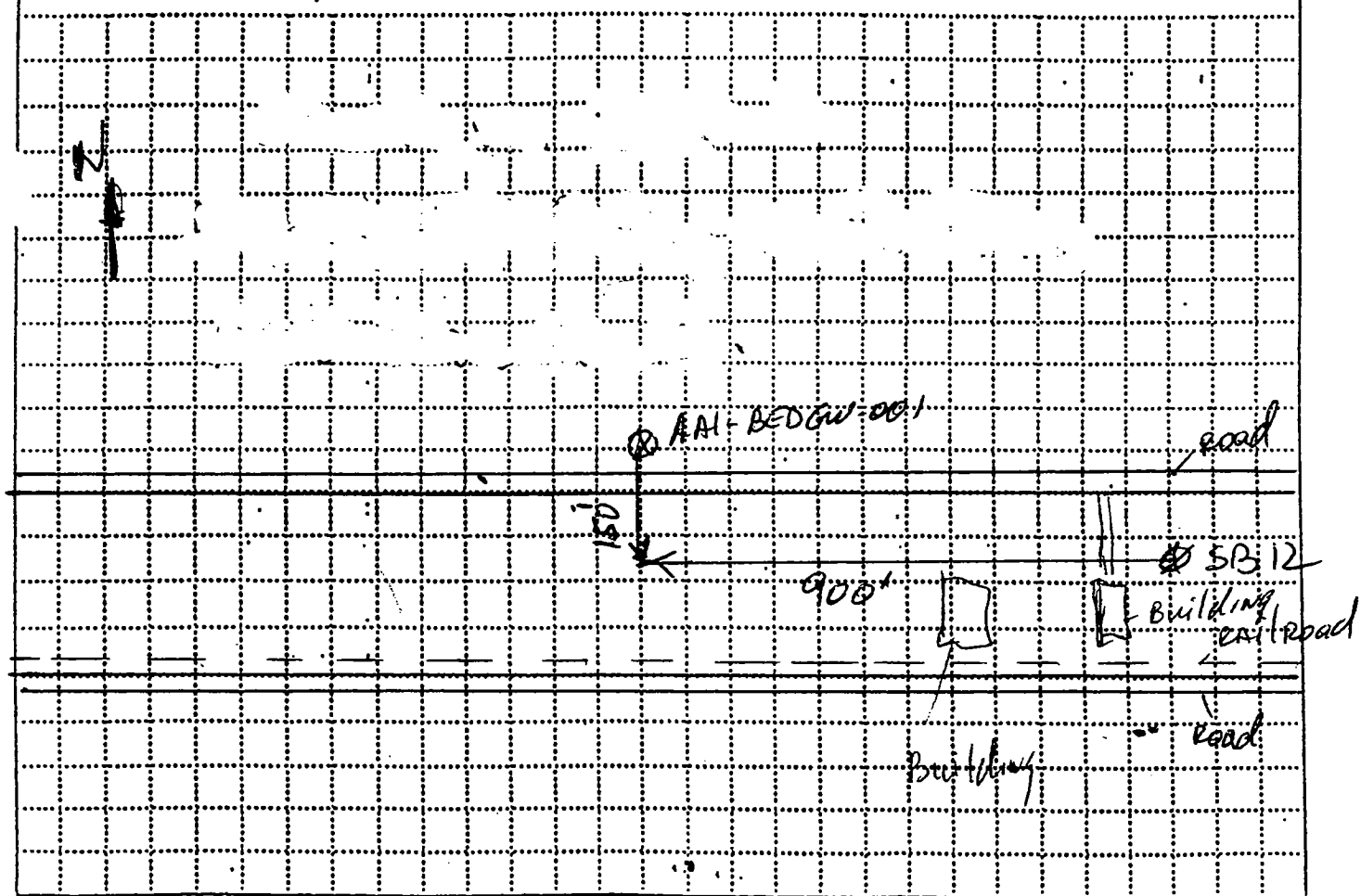
DISTRICT	Nashville - TN
HOLE NUMBER	SB12
1. COMPANY NAME	I.T. Corp.
2. DRILL SUBCONTRACTOR	Belasco Drilling Services
SHEET / SHEETS	1 of 2
3. PROJECT	PBOW - Acid Area 1
4. LOCATION	Acid Area 1
5. NAME OF DRILLER	Scott Guyer
6. MANUFACTURER'S DESIGNATION OF DRILL	CME-450 ATV
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT	4-Inch Solid Stem Augers with 3" x 24" Split Spoon Sampler
8. HOLE LOCATION	SB12
9. SURFACE ELEVATION	NA
10. DATE STARTED	4-30-98
11. DATE COMPLETED	4-30-98
12. OVERBURDEN THICKNESS	NA
13. DEPTH GROUNDWATER ENCOUNTERED	0.5 Ft.
13. DEPTH DRILLED INTO ROCK	NA
14. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED	NA
14. TOTAL DEPTH OF HOLE	10.0 Ft.
17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY)	NA
18. GEOTECHNICAL SAMPLES	NA
DISTURBED	
UNDISTURBED	
19. TOTAL NUMBER OF CORE BOXES	0

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC/SVOC	METALS/PH	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
	2	2	PCBs (1)	Nitrate/Sul	fate (2)	NA

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
Grout	*			John Vogelsing

LOCATION SKETCH/COMMENTS

SCALE:



PROJECT	HOLE NO.
PBOW - Acid Area No. 1	SB12

ENG FORM 5056-R, AUG 94

(Proponent: CECW-EG)

HTRW DRILLING LOG (CONTINUATION SHEET)

HOLE NUMBER SB12

PROJECT USCS PBOW - Acid Area 1

INSPECTOR John Vogeding

SHEET 2 OF 2 SHEETS

ELEV. SYMBOL (a)	DEPTH (b)	DESCRIPTION OF MATERIALS (c)	FIELD SCREENING RESULTS (d)	GEOTECH SAMPLE OR CORE BOX NO. (e)	ANALYTICAL SAMPLE NO. (f)	BLOW COUNT (g)	REMARKS (h)
		0-0.5' grass and Topsoil			0.5'	2,6,	
		0.5'-2.0'	(PID)				
	1	Loose-m.Dense, light-dark brown, Fine, Silty Sand, wet.			6230 1.5'	8,10	
			0 ppm		2.0'		
	2	2'-4' Same as Above, wet				4,7,	
Sm	3		5.0 ppm		6240 4.0'	9,7	
	4	4'-5.5' Same as Above				3,7,	
	5	grey at 5' 5.5'	4.5 ppm	NA		6,6	
		5.5'-6.0' Soft, grey, v.Fine, Sandy Silt, wet					
	6	6'-8' Same as Above, wet				3,7,	
	7		4.0 ppm			8,12	
ML	8	8'-10' Same as Above, wet.				7,8,	
	9		2.0 ppm			11,8	Bottom of Boring at 10.0'
	10						

PROJECT PBOW - Acid Area 1 HOLE NO. SB12

ENG FORM 5056A-R, AUG 94 (Proponent: CECW-EG)

HTRW DRILLING LOG

DISTRICT: Nashville - TN		HOLE NUMBER: SB13
1. COMPANY NAME: I.T. Corp.	2. DRILL SUBCONTRACTOR: Belasco Drilling Services	SHEET 1 OF 2 SHEETS
3. PROJECT: PBOW - Acid Area 1	4. LOCATION: Acid Area 1	
5. NAME OF DRILLER: Scott Guyer	6. MANUFACTURER'S DESIGNATION OF DRILL: CME-450 ATV	
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: 4-Inch Solid Stem Augers with 3" x 24" Split Spoon Sampler	8. HOLE LOCATION: SB13	
	9. SURFACE ELEVATION: NA	
	10. DATE STARTED: 4-29-98	11. DATE COMPLETED: 4-29-98
12. OVERBURDEN THICKNESS: NA	13. DEPTH GROUNDWATER ENCOUNTERED: NA	
13. DEPTH DRILLED INTO ROCK: NA	14. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: NA	
14. TOTAL DEPTH OF HOLE: 10.0 Ft.	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): NA	

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
NA			0

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC/SVOC	METALS/PH	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
	2	2	PCB's (1)	Nitrate/Sulfate (2)		NA

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
Grouted	X			John Vogelding

LOCATION SKETCH/COMMENTS SCALE:

See Figure VII-3
Proposed Soil Boring Location Map
Acid Area No. 1

PROJECT: PBOW - Acid Area No. 1 HOLE NO. SB13

ENG FORM 5056-R, AUG 94 (Proponent: CECW-EG)

HTRW DRILLING LOG (CONTINUATION SHEET)

HOLE NUMBER: SB13

PROJECT: USCS PBOW - Acid Area 1

INSPECTOR: John Vogeding

SHEET 2 OF 2 SHEETS

USCS SYMBOL (a)	DEPTH (b)	DESCRIPTION OF MATERIALS (c)	FIELD SCREENING RESULTS (d)	GEOTECH SAMPLE OR CORE BOX NO. (e)	ANALYTICAL SAMPLE NO. (f)	BLOW COUNT (g)	REMARKS (h)
		0-0.5' grass and Topsoil					
		0.5-2.0'	(PID)		0.5'	3,3,	
	1	Soft-m. stiff, light-dark brown, black, and grey, v. Fine, sandy Silt, moist	0 ppm		6250 1.5'	5,5	
					2.0'		
	2	2'-4' Same as Above					
						5,5	
	3	wet at 3.0 ft.	4.0 ppm		6260	4,5	
	4				4.0'		
		4'-6' Same as Above, v. Fine Sand, Silt to Clayey Silt, low-med. Plasticity, Slightly mottled, moist-Slightly wet.				3,5,	
ML	5		3.0 ppm	NA		9,10	
	6						
		6'-8' Same as Above				2,5,	
	7		3.0 ppm			7,9	
	8	8'-10' Same As Above					
						5,7,	
	9		2.0 ppm			8,10	
	10						Bottom of Boring at 10.0'

PROJECT: PBOW - Acid Area 1

HOLE NO. SB13

ENG FORM 5056A-R, AUG 94

(Proponent: CECW-EG)

HTRW DRILLING LOG

DISTRICT: Nashville - TN		HOLE NUMBER: SB14
1. COMPANY NAME: I.T. Corp.	2. DRILL SUBCONTRACTOR: Belasco Drilling Services	SHEET 1 OF 2 SHEETS
3. PROJECT: PBOW - Acid Area 1	4. LOCATION: Acid Area 1	
5. NAME OF DRILLER: Scott Guyer	6. MANUFACTURER'S DESIGNATION OF DRILL: CME-450 ATV	
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: 4-Inch Solid Stem Augers with 3" x 24" Split Spoon Sampler	8. HOLE LOCATION: SB14	
	9. SURFACE ELEVATION: NA	
	10. DATE STARTED: 4-29-98	11. DATE COMPLETED: 4-29-98
12. OVERBURDEN THICKNESS: NA	13. DEPTH GROUNDWATER ENCOUNTERED: NA	
13. DEPTH DRILLED INTO ROCK: NA	14. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: NA	
14. TOTAL DEPTH OF HOLE: 10.0 Ft.	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): NA	

14. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
NA			0

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC/SVOC	METALS/PH	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
	2	2	PCB's (1)	Nitrate/Sulfate (2)		NA

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
Grouted	X			John Vogeding

LOCATION SKETCH/COMMENTS

SCALE:

See Figure VII-3
Proposed Soil Boring Location Map
Acid Area No. 1

PROJECT: PBOW - Acid Area No. 1

HOLE NO. SB14

ENG FORM 5056-R, AUG 94

(Proponent: CECW-EG)

HTRW DRILLING LOG (CONTINUATION SHEET)

HOLE NUMBER: SB14

PROJECT: USCS PBOW - Acid Area 1

INSPECTOR: John Vogeding

SHEET 2 OF 2 SHEETS

Symbol (a)	Depth (b)	Description of Materials (c)	Field Screening Results (d)	Geotech Sample or Core Box No. (e)	Analytical Sample No. (f)	Blow Count (g)	Remarks (h)
ML	0	0-0.5' grass and Topsoil	(PID)	NA	0.5'		
		0.5'-2.0' Soft-M. Firm, light-dark brown, black, and grey, V. Fine. Sandy Silt to Clayey Silt, low-med. Plasticity, Slightly mottled, moist	0 PPm		6270 1.5'	2,2, 3,3	
	2	2'-4' Same as Above wet at 3.5'	3.0 PPm			4,2, 6,8	
	4	4-6' Same as Above, Firm, wet	3.0 PPm			3,2, 8,12	
	6	6'-8' Same as Above Firm, ~~wet~~ moist	3.0 PPm		8.0'	6,9, 15,17	
	8	8'-10' Same As Above, Firm, Moist	3.0 PPm		6280 10.0'	6,10, 13,15	Bottom of Boring at 10.0'
	10						

PROJECT: PBOW - Acid Area 1

HOLE NO. SB14

ENG FORM 5056A-R, AUG 94

(Proponent: CECW-EG)

HTRW DRILLING LOG

DISTRICT: Nashville - TN		HOLE NUMBER: SB15
1. COMPANY NAME: I.T. Corp.	2. DRILL SUBCONTRACTOR: Belasco Drilling Services	SHEET 1 OF SHEETS 2
3. PROJECT: PBOW - Acid Area 1	4. LOCATION: Acid Area 1	
5. NAME OF DRILLER: Scott Guyer	6. MANUFACTURER'S DESIGNATION OF DRILL: CME-450 ATV	
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: 4-Inch Solid Stem Augers with 3" x 24" Split Spoon Sampler	8. HOLE LOCATION: SB15	
	9. SURFACE ELEVATION: NA	
	10. DATE STARTED: 4-29-98	11. DATE COMPLETED: 4-29-98
12. OVERBURDEN THICKNESS: NA	13. DEPTH GROUNDWATER ENCOUNTERED: 6.0 Ft.	
13. DEPTH DRILLED INTO ROCK: NA	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: NA	
14. TOTAL DEPTH OF HOLE: 10.0 Ft.	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): NA	

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
NA			0

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC/SVOC	METALS/PH	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
	2	2	PCB's (1)	Nitrate/Sulfate (2)		NA

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
Grouted	X			John Voegding

LOCATION SKETCH/COMMENTS SCALE:

See Figure VII-3
Proposed Soil Boring Location Map
Acid Area No. 1

PROJECT	HOLE NO.
PBOW - Acid Area No. 1	SB15

ENG FORM 5056-R, AUG 94 (Proponent: CECW-EG)

HTRW DRILLING LOG (CONTINUATION SHEET)

HOLE NUMBER: SB15

PROJECT: USCS PBOW - Acid Area 1

INSPECTOR: John Vogeding

SHEET 2 OF 2 SHEETS

SYMBOL (b)	DEPTH (b)	DESCRIPTION OF MATERIALS (c)	FIELD SCREENING RESULTS (d)	GEOTECH SAMPLE OR CORE BOX NO. (e)	ANALYTICAL SAMPLE NO. (f)	BLOW COUNT (g)	REMARKS (h)
ML 2'	1 2	0-0.5' grass and Topsoil 0.5'-2.0' Soft-Firm, light-dark brown, black and grey, v. Fine Sandy Silt to Clayey Silt, low-Med. Plasticity, Slightly Mottled, moist-Slightly wet 2.0'	(PID) 0 ppm	NA	0.5' 6290 1.5'	4,5, 19,22	Rock Fragment in tip of Sampler
SM 5'	3 4	2'-4' m. Dense, light brown, Fine, Silty Sand, moist 4'-5' Same as Above 5.0'	3.5 ppm			7,11, 17,19	
ML	5 6 7 8 9 10	5'-6' v. Fine Sandy Silty to Clayey Silt. 6'-8' Same as Above, moist-wet. 8'-10' Same as Above, moist-wet	4.0 ppm 4.0 ppm 4.0 ppm		8.0 6300 10.0'	6,10, 11,12 6,9, 11,12 8,12, 12,14	

PROJECT: PBOW - Acid Area 1 HOLE NO. SB15

ENG FORM 5056A-R, AUG 94 (Proponent: CECW-EG)

HTRW DRILLING LOG

DISTRICT: Nashville - TN		HOLE NUMBER: SB01
1. COMPANY NAME: I.T. Corp.	2. DRILL SUBCONTRACTOR: Belasco Drilling Services	SHEET 1 OF 2 SHEETS
3. PROJECT: PBOW - Acid Area 2	4. LOCATION: Acid Area 2	
5. NAME OF DRILLER: Scott Guyer	6. MANUFACTURER'S DESIGNATION OF DRILL: CME-450 ATV	
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: 4-Inch Solid Stem Augers with 3" x 24" Split Spoon	8. HOLE LOCATION: SB01	
	9. SURFACE ELEVATION: NA	
	10. DATE STARTED: 4-27-98	11. DATE COMPLETED: 4-27-98
12. OVERBURDEN THICKNESS: NA	15. DEPTH GROUNDWATER ENCOUNTERED: NA	
13. DEPTH DRILLED INTO ROCK: NA	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: NA	
14. TOTAL DEPTH OF HOLE: 10.0 Ft.	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): NA	

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
NA			0

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC/SVOC	METALS/PH	~~OTHER (SPECIFY)~~	~~OTHER (SPECIFY)~~	~~OTHER (SPECIFY)~~	21. TOTAL CORE RECOVERY
	2	2	PCB's (1)	Nitrate/Sulfate (2)		NA

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
	X			John Vogelin

LOCATION SKETCH/COMMENTS

SCALE:

See Figure VII-4
Proposed Soil Boring Location Map
Acid Area No. 2.

PROJECT: PBOW - Acid Area No. 2

HOLE NO. SB01

ENG FORM 5056-R, AUG 94

(Proponent: CECW-EG)

HTRW DRILLING LOG (CONTINUATION SHEET)

HOLE NUMBER: SB01

PROJECT: PBOW - Acid Area 2

INSPECTOR: John Voegding

SHEET 2 OF 2 SHEETS

USCS Symbol (a)	DEPTH (b)	DESCRIPTION OF MATERIALS (c)	FIELD SCREENING RESULTS (d)	GEOTECH SAMPLE OR CORE BOX NO. (e)	ANALYTICAL SAMPLE NO. (f)	BLOW COUNT (g)	REMARKS (h)
		0-0.5' grass and Topsoil	(PID)		0.5'		
	1	0.5'-2.0' Soft-med. Firm, light-dark brown, black, and grey, Fine Sandy silt and Clayey Silt, moist	0 ppm		6310 1.5'	3,4, 7,9	
	2						
	3	2'-4' Same as Above	4.0 ppm			4,6, 9,11	
	4	3" Fine Sand lens at 4', wet					Perched water zone within sand lens.
ml	5	4'-6' Same as Above	4.0 ppm	NA		4,6, 6,8	
	6				6.0'		
	7	6-8' Same as Above, medium-very Firm with 4" Fine Sand lense at 7'.	4.0 ppm		6320 8.0'	3,5, 7,9	Perched water zone within sand lens.
	8						
	9	8'-10' Same as Above grey at 9.5'	2.0 ppm			4,12, 16,18	
	10						Bottom of Boring at 10.0'

PROJECT: PBOW - Acid Area 2 HOLE NO. SB01

ENG FORM 5056A-R, AUG 94 (Proponent: CECW-EG)

HTRW DRILLING LOG

DISTRICT: Nashville - TN		HOLE NUMBER: SB02
1. COMPANY NAME: I.T. Corp.	2. DRILL SUBCONTRACTOR: Belasco Drilling Services	SHEET 1 OF 2 SHEETS
3. PROJECT: PBOW - Acid Area 2	4. LOCATION: Acid Area 2	
5. NAME OF DRILLER: Scott Guyer	6. MANUFACTURER'S DESIGNATION OF DRILL: CME - 450 ATV	
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: 4-Inch Solid Stem Augers with 3"x24" Split Spoons	8. HOLE LOCATION: SB02	
	9. SURFACE ELEVATION: NA	
	10. DATE STARTED: 4-28-98	11. DATE COMPLETED: 4-28-98
12. OVERBURDEN THICKNESS: NA	13. DEPTH GROUNDWATER ENCOUNTERED: 6.0 Ft.	
13. DEPTH DRILLED INTO ROCK: NA	14. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: NA	
14. TOTAL DEPTH OF HOLE: 10.0 Ft.	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): NA	

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
NA			0

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC/SVOC	METALS/PN	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
	2	2	PCB's (1)	Nitrate/Sulfate (2)		NA

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
	X			John Vaglio

LOCATION SKETCH/COMMENTS

SCALE:

See Figure VII-4
Proposed Soil Boring Location Map
Acid Area No. 2.

PROJECT: PBOW - Acid Area No. 2

HOLE NO. SB02

ENG FORM 5056-R, AUG 94

(Proponent: CECW-EG)

HTRW DRILLING LOG (CONTINUATION SHEET)

HOLE NUMBER: SB02

PROJECT: USCS PBOW- Acid Area 2

INSPECTOR: John Vogeding

SHEET 2 OF 2 SHEETS

SYMBOL (a)	DEPTH (b)	DESCRIPTION OF MATERIALS (c)	FIELD SCREENING RESULTS (d)	GEOTECH SAMPLE OR CORE BOX NO. (e)	ANALYTICAL SAMPLE NO. (f)	BLOW COUNT (g)	REMARKS (h)
ML	1	0-0.5' grass and Topsoil 0.5'-2.0' Soft - m. Firm, light-dark brown, black, and grey, Fine Sandy Silt to clayey Silt, moist. (low-med. Plasticity slightly mottled)	(PID) 0 ppm	NA	0.5' 6330 1.5' 2.0'	2,4, 5,8	
	2 3	2'-4' Same as Above, moist-Slightly wet.	3.5 ppm		6340 4.0'	2,3, 6,9	
	4 5	4'-6' Same as Above, moist-Slightly wet.	3.0 ppm			5,9, 16,17	
	6 7	6'-8' Same as Above, wet at 6' grey at 7.5'	2.5 ppm			6,14, 12,10	
	8 9 10	8'-10' Same as Above, grey, med-high Plasticity	4.0 ppm			7,8, 10,12	Bottom of boring at 10.0'

PROJECT: PBOW - Acid Area 2 HOLE NO. SB02

ENG FORM 5056A-R, AUG 94 (Proponent: CECW-EG)

HTRW DRILLING LOG

DISTRICT: Nashville - TN		HOLE NUMBER: SB03
1. COMPANY NAME: I.T. Corp.	2. DRILL SUBCONTRACTOR: Belasco Drilling Services	SHEET 1 OF 2 SHEETS
3. PROJECT: PBOW - Acid Area 2	4. LOCATION: Acid Area 2	
NAME OF DRILLER: Scott Guyer	6. MANUFACTURER'S DESIGNATION OF DRILL: CME-450 ATV	
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: 4-Inch Solid Stem Augers with 3" x 24" Split Spoons	8. HOLE LOCATION: SB03	
	9. SURFACE ELEVATION: NA	
	10. DATE STARTED: 4-27-98	11. DATE COMPLETED: 4-27-98
12. OVERBURDEN THICKNESS: NA	13. DEPTH GROUNDWATER ENCOUNTERED: 8.0 Ft.	
13. DEPTH DRILLED INTO ROCK: NA	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: NA	
14. TOTAL DEPTH OF HOLE: 10.0 Ft.	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): NA	

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
NA			0

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC/SVOC	METALS/PH	~~OTHER (SPECIFY)~~	~~OTHER (SPECIFY)~~	~~OTHER (SPECIFY)~~	21. TOTAL CORE RECOVERY
	2	2	PCB's (1)	Nitrate/Sulfate (2)		NA

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
	X			John Vingelding

LOCATION SKETCH/COMMENTS

SCALE:

See Figure VII-4
Proposed Soil Boring Location Map
Acid Area No. 2.

PROJECT: PBOW - Acid Area No. 2

HOLE NO. SB03

ENG FORM 5056-R, AUG 94

(Proponent: CECW-EG)

HTRW DRILLING LOG (CONTINUATION SHEET)

HOLE NUMBER: SB03

PROJECT: PBOW - Acid Area 2

INSPECTOR: John Vogeding

SHEET 2 OF 2 SHEETS

SYMBOL (a)	DEPTH (b)	DESCRIPTION OF MATERIALS (c)	FIELD SCREENING RESULTS (d)	GEOTECH SAMPLE OR CORE BOX NO. (e)	ANALYTICAL SAMPLE NO. (f)	BLOW COUNT (g)	REMARKS (h)
NA (Fill)	1	0-0.5' grass and Topsoil 0.5'-2.0' med-Dense, dark brown-black, Fine-Coarse, Clayey Sand and gravel, brick Fragments, moist.	(PID) 0 ppm		6350 1.0'	5,23, 50/2"	Refusal at 1.0' Drilled through to 2.0'
ml	2 3 4	2'-4' med. Firm-Hard, light-dark brown, black, and grey, v. Fine Sandy Silt and Clayey Silt, med. Plasticity, Slightly mottled, moist	6.0 ppm		4.0'	7,9, 15,12	
	5 6	4'-6' Same as Above	6.5 ppm	NA	6360 6.0'	5,9, 14,15	
	7 8	6'-8' Same as Above grey at 7' wet at 8'	4.0 ppm			2,6, 8,10	
	9 10	8'-10' Same as Above	3.0 ppm			5,6, 10,11	Bottom of Boring at 10.0'

PROJECT: PBOW - Acid Area 2

HOLE NO. SB03

ENG FORM 5056A-R, AUG 94

(Proponent: CECW-EG)

HTRW DRILLING LOG

DISTRICT: Nashville - TN		HOLE NUMBER: SB04
1. COMPANY NAME: I.T. Corp.	2. DRILL SUBCONTRACTOR: Belasco Drilling Services	SHEET 1 OF 2 SHEETS
3. PROJECT: PBOW - Acid Area 2	4. LOCATION: Acid Area 2	
5. NAME OF DRILLER: Scott Guyer	6. MANUFACTURER'S DESIGNATION OF DRILL: CME - 450 ATV	
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: 4-Inch Solid Stem Augers with 3" x 24" Split Spoons	8. HOLE LOCATION: SB04	
	9. SURFACE ELEVATION: NA	
	10. DATE STARTED: 4-27-98	11. DATE COMPLETED: 4-27-98
12. OVERBURDEN THICKNESS: NA	13. DEPTH GROUNDWATER ENCOUNTERED: NA	
13. DEPTH DRILLED INTO ROCK: NA	14. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: NA	
14. TOTAL DEPTH OF HOLE: 10.0 Ft.	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): NA	

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
NA			0

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC/SVOC	METALS/PH	~~OTHER (SPECIFY)~~	~~OTHER (SPECIFY)~~	~~OTHER (SPECIFY)~~	21. TOTAL CORE RECOVERY
	2	2	PCB's (1)	Nitrate/Sulfate (2)		NA

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
	X			John Vogeding

LOCATION SKETCH/COMMENTS

SCALE:

See Figure VII-4
Proposed Soil Boring Location Map
Acid Area No. 2.

PROJECT: PBOW - Acid Area No. 2	HOLE NO. SB04

ENG FORM 5056-R, AUG 94

(Proponent: CECW-EG)

HTRW DRILLING LOG (CONTINUATION SHEET)

HOLE NUMBER SB04

PROJECT USCS PBOW - Acid Area 2

INSPECTOR John Vogeding

SHEET 2 OF 2 SHEETS

USCS Symbol (a)	DEPTH (b)	DESCRIPTION OF MATERIALS (c)	FIELD SCREENING RESULTS (d)	GEOTECH SAMPLE OR CORE BOX NO. (e)	ANALYTICAL SAMPLE NO. (f)	BLOW COUNT (g)	REMARKS (h)
		0-0.5' grass and Topsoil	(PID)		0.5'	2,2,	
	1	0.5'-2.0' Soft-Firm, Light-dark brown, black, and grey, v. Fine, Sandy Silt and Clayey Silt, Med. Plasticity, Slightly mottled, moist-Slightly wet.	0 ppm		6370 1.5'	4,4	
	2	2'-4' Same as Above,	4.0 ppm			3,3, 5,7	
	3						
	4	4'-6' Same as Above with 3" Fine Sand lense at 4.5'. Firm-Hard	4.0 ppm	NA		3,6, 17,16	Perched water within Sand lens.
ML	5						
	6	6'-8' Same as Above, Firm-Hard.	4.0 ppm		8.0'	5,8, 16,18	
	7						
	8	8'-10' Same as Above, grey	4.0 ppm		6380 10.0'	5,7, 11,12	Bottom of Boring at 10.0'
	9						
	10						

PROJECT PBOW - Acid Area 2 HOLE NO. SB04

ENG FORM 5056A-R, AUG 94 (Proponent: CECW-EG)

HTRW DRILLING LOG

DISTRICT: Nashville - TN		HOLE NUMBER: SB05
1. COMPANY NAME: I.T. Corp.	2. DRILL SUBCONTRACTOR: Belasco Drilling Services	SHEET 1 OF SHEETS 2
3. PROJECT: PBOW - Acid Area 2	4. LOCATION: Acid Area 2	
5. NAME OF DRILLER: Scott Guyer	6. MANUFACTURER'S DESIGNATION OF DRILL: CME - 450 ATV	
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: 4-Inch Solid Stem Augers with 3" x 24" Split Spoons	8. HOLE LOCATION: SB05	
	9. SURFACE ELEVATION: NA	
	10. DATE STARTED: 4-28-98	11. DATE COMPLETED: 4-28-98
12. OVERBURDEN THICKNESS: NA	13. DEPTH GROUNDWATER ENCOUNTERED: 7.5 ft.	
13. DEPTH DRILLED INTO ROCK: NA	14. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: NA	
14. TOTAL DEPTH OF HOLE: 10.0 ft.	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): NA	

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
NA			0

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC/SVOC	METALS/PN	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
	2	2	PCB's (1)	Nitrate/Sulfate (2)		NA

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
	X			John Vogeding

LOCATION SKETCH/COMMENTS — SCALE:

See Figure VII-4
Proposed Soil Boring Location Map
Acid Area No. 2.

PROJECT: PBOW - Acid Area No. 2 — HOLE NO. SB05

ENG FORM 5056-R, AUG 94 (Proponent: CECW-EG)

HTRW DRILLING LOG (CONTINUATION SHEET)

HOLE NUMBER: SB05

PROJECT: USSS PBOW - Acid Area 2

INSPECTOR: John Vogeding

SHEET 2 OF 2 SHEETS

USCS Symbol	DEPTH (b)	DESCRIPTION OF MATERIALS (c)	FIELD SCREENING RESULTS (d)	GEOTECH SAMPLE OR CORE BOX NO. (e)	ANALYTICAL SAMPLE NO. (f)	BLOW COUNT (g)	REMARKS (h)
		0-0.5' grass and Topsoil					
		0.5'-2.0'	(PID)		0.5'	4,6,	
	1	Soft-m. Firm, Light-dark brown, black and grey, v. Fine Sandy Silt to Clay of Silt, low-med. Plasticity, Slightly mottled, moist.	0 ppm		6390 1.5'	6,10	
	2						
		2'-4' Same as Above, Firm-Hard.				4,6,	
	3		3.5 ppm			11,12	
					4.0'		
	4						
		4'-6' Same as Above, Firm-Hard				4,10,	
ML	5		3.5 ppm	NA	6400	12,12	
		~~wet at 5.5'~~					
					6.0'		
	6	6'-8' Same as Above, Firm				3,5,	
	7		3.0 ppm			5,5	
		wet at 7.5'					
	8						
		8'-10' Same as Above, Firm				2,5,	
	9		2.5 ppm			8,8	
							Bottom of Boring at 10.0'
	10						

PROJECT: PBOW - Acid Area 2

HOLE NO. SB05

ENG FORM 5056A-R, AUG 94

(Proponent: CECW-EG)

HTRW DRILLING LOG

DISTRICT: Nashville - TN		HOLE NUMBER: SB06
1. COMPANY NAME: I.T. Corp.	2. DRILL SUBCONTRACTOR: Belasco Drilling Services	SHEET 1 OF 2 SHEETS
3. PROJECT: PBOW - Acid Area 2	4. LOCATION: Acid Area 2	
5. NAME OF DRILLER: Scott Guyer	6. MANUFACTURER'S DESIGNATION OF DRILL: CME-450 ATV	
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: 4-Inch Solid Stem Augers with 3" x 24" split spoons	8. HOLE LOCATION: SB06	
	9. SURFACE ELEVATION: NA	
	10. DATE STARTED: 4-28-98	11. DATE COMPLETED: 4-28-98
12. OVERBURDEN THICKNESS: NA	13. DEPTH GROUNDWATER ENCOUNTERED: 5.5 Ft.	
13. DEPTH DRILLED INTO ROCK: NA	14. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: NA	
14. TOTAL DEPTH OF HOLE: 10.0 Ft.	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): NA	

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
NA			0

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC/SVOC	METALS/PH	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
Nitroaromatics (2)	2	2	PCB's (1)	Nitrate/Sulfate (2)		NA

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
	X			John Vogeding

LOCATION SKETCH/COMMENTS

SCALE:

See Figure VII-4
Proposed Soil Boring Location Map
Acid Area No. 2.

PROJECT	HOLE NO.
PBOW - Acid Area No. 2	SB06

ENG FORM 5056-R, AUG 94

(Proponent: CECW-EG)

HTRW DRILLING LOG (CONTINUATION SHEET)

HOLE NUMBER: SB06

PROJECT: USCS PBOW - Acid Area 2

INSPECTOR: John Vogeding

SHEET 2 OF 2 SHEETS

SYMBOL	DEPTH (b)	DESCRIPTION OF MATERIALS (c)	FIELD SCREENING RESULTS (d)	GEOTECH SAMPLE OR CORE BOX NO. (e)	ANALYTICAL SAMPLE NO. (f)	BLOW COUNT (g)	REMARKS (h)
ml		0-0.5' grass and Topsoil	(PID)	NA	0.5'	2, 4,	
		0.5'-2.0' Soft-m. Firm, light-dark brown, black, and grey, v. Fine Sandy Silt to Clayey Silt moist (low-med. Plasticity slightly mottled)	0 ppm		6410 6411 6412 1.5'	4, 12	3"-4" of med, angular gravel at 1.5 ft.
	1						
	2	2'-4' Same as Above	7.0 ppm		4.0'	4, 6, 8, 9	
	3						
	4	4'-6' Same as Above, moist-slightly wet.	8.0 ppm		6420 5.5'	4, 8, 10, 12	
	5	wet at 5.5'					
	6	6'-8' Same as Above, wet	30.0 ppm			6, 16, 10, 10	
	7						
	8	8'-10' Same as Above, grey, wet.	8.0 ppm			2, 5, 6, 8	
	9						
	10						

PROJECT: PBOW - Acid Area 2

HOLE NO. SB06

ENG FORM 5056A-R, AUG 94

(Proponent: CECW-EG)

HTRW DRILLING LOG

DISTRICT: Nashville - TN		HOLE NUMBER: SB07
1. COMPANY NAME: I.T. Corp.	2. DRILL SUBCONTRACTOR: Belasco Drilling Services	SHEET 1 OF 2 SHEETS
3. PROJECT: PBOW - Acid Area 2	4. LOCATION: Acid Area 2	
5. NAME OF DRILLER: Scott Guyer	6. MANUFACTURER'S DESIGNATION OF DRILL: CME-450 ATV	
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: 4-Inch Solid Stem Augers with 3" x 24" Split Spoons	8. HOLE LOCATION: SB07	
	9. SURFACE ELEVATION: NA	
	10. DATE STARTED: 4-28-98	11. DATE COMPLETED: 4-28-98
12. OVERBURDEN THICKNESS: NA	15. DEPTH GROUNDWATER ENCOUNTERED: 7.5 Ft.	
13. DEPTH DRILLED INTO ROCK: NA	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: NA	
14. TOTAL DEPTH OF HOLE: 10.0 Ft.	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): NA	

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
NA			0

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC/SVOC	METALS/pH	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
Nitroaromatics (2)	2	2	PCB's (1)	Nitrate/Sulfate (2)		NA

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
	X			John Vogelsang

LOCATION SKETCH/COMMENTS — SCALE

See Figure VII-4
Proposed Soil Boring Location Map
Acid Area No. 2.

PROJECT	HOLE NO.
PBOW - Acid Area No. 2	SB07

ENG FORM 5056-R, AUG 94 (Proponent: CECW-EG)

HTRW DRILLING LOG (CONTINUATION SHEET)

HOLE NUMBER: SB07

PROJECT: USCS PBOW - Acid Area 2

INSPECTOR: John Vogeding

SHEET 2 OF 2 SHEETS

Symbol (a)	DEPTH (b)	DESCRIPTION OF MATERIALS (c)	FIELD SCREENING RESULTS (d)	GEOTECH SAMPLE OR CORE BOX NO. (e)	ANALYTICAL SAMPLE NO. (f)	BLOW COUNT (g)	REMARKS (h)
ML		0.5'-1.5' grass and Topsoil	(PID)	NA	0.5'	6,4,	
		0.5'-2.0'			6430 6431 6432		
	1	Soft-m. Firm, light-dark brown, black, and grey, Fine Sandy Silt to Clayey Silt, low-med. Plasticity, Slightly mottled, moist	0 PPm		1.5'	4,6	
	2	2'-4' Same as Above	9.0 PPm			4,3, 8,9	
	3						
	4	4'-6' Same as Above	10.0 PPm		4.0' 6440 6.0'	3,6, 9,12	
	5						
	6	6'-8' Same as Above, Firm	8.0 PPm			3,6, 11,14	
	7	wet at 7.5'					
	8	8'-10' Same as Above,	10.0 PPm			2,4, 6,7	
	9	grey at 9.0'					Bottom of Boring at 10.0'
	10						

PROJECT: PBOW - Acid Area 2 HOLE NO. SB07

ENG FORM 5056A-R, AUG 94 (Proponent: CECW-EG)

HTRW DRILLING LOG

DISTRICT: Nashville - TN		HOLE NUMBER: SB08
1. COMPANY NAME: I.T. Corp.	2. DRILL SUBCONTRACTOR: Belasco Drilling Services	SHEET 1 OF 2 SHEETS
3. PROJECT: PBOW - Acid Area 2	4. LOCATION: Acid Area 2	
5. NAME OF DRILLER: Scott Guyer	6. MANUFACTURER'S DESIGNATION OF DRILL: CME-450 ATV	
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: 4-Inch Solid Stem Augers with 3" x 24" Split Spoons and Shelby Tubes	8. HOLE LOCATION: SB08	
	9. SURFACE ELEVATION: NA	
	10. DATE STARTED: 4-28-98	11. DATE COMPLETED: 4-28-98
12. OVERBURDEN THICKNESS: NA	13. DEPTH GROUNDWATER ENCOUNTERED: 8.0 Ft.	
13. DEPTH DRILLED INTO ROCK: NA	14. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: NA	
14. TOTAL DEPTH OF HOLE: 10.0 Ft.	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): NA	

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
	2		0

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC/SVOC	METALS/PN	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
	2	2	PCBs (1)	Nitrate/Sulfate (2)		NA

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
	X			John Vogelding

LOCATION SKETCH/COMMENTS SCALE:

See Figure VII-4
Proposed Soil Boring Location Map
Acid Area No. 2.

PROJECT: PBOW - Acid Area No. 2 HOLE NO. SB08

ENG FORM 5056-R, AUG 94 (Proponent: CECW-EG)

HTRW DRILLING LOG (CONTINUATION SHEET)

HOLE NUMBER: SB08

PROJECT: PBOW - Acid Area 2 | INSPECTOR: John Vogeding | SHEET 2 OF 2 SHEETS

USCS Symbol	DEPTH (b)	DESCRIPTION OF MATERIALS (c)	FIELD SCREENING RESULTS (d)	GEOTECH SAMPLE OR CORE BOX NO. (e)	ANALYTICAL SAMPLE NO. (f)	BLOW COUNT (g)	REMARKS (h)
ML		0-0.5' grass and Topsoil	(PID)		0.5'		
		0.5'-2.0'			6450	2,4,	2-3" of rusty metal debris at 0.5'
	1	Soft-m. Firm, light-dark brown, black and grey, v. Fine Sandy Silt to Clayey Silt, low-med. Plasticity, Slightly mottled, moist	0 ppm		1.5'	6,6	
	2	2'-4' Same as Above	NA	PBOW-98-SO-AA1-(0204) SB08-Geotech-(0204) 2.0'		NA (Shelby Tube)	Shelby Tube Sample from 2'-4'. 2 Ft. recovery.
	3						
	4	4'-6' Same as Above, wet at bottom	NA	PBOW-98-SO-AA1-(0406) SB08-Geotech-(0406) 4.0'		NA (Shelby Tube)	Shelby Tube Sample from 4'-6'. 2 Ft. Recovery.
	5						
	6	6'-8' Same as Above, moist-wet.	2.5 ppm	6.0'	6.0' 6460	2,5, 6,7	
	7						
	8	8'-10' Same as Above, wet.	3.5 ppm		8.0'	6,8, 12,9	
	9	grey at 9.0'					Bottom of Boring at 10.0'
	10						

PROJECT: PBOW - Acid Area 2 | HOLE NO. SB08

ENG FORM 5056A-R, AUG 94 (Proponent: CECW-EG)

HTRW DRILLING LOG

DISTRICT: Nashville - TN		HOLE NUMBER: SB09
1. COMPANY NAME: I.T. Corp.	2. DRILL SUBCONTRACTOR: Belasco Drilling Services	SHEET 1 OF SHEETS 2
3. PROJECT: PBOW - Acid Area 2	4. LOCATION: Acid Area 2	
5. NAME OF DRILLER: Scott Guyer	6. MANUFACTURER'S DESIGNATION OF DRILL: CME - 450 ATV	
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: 4-Inch Solid Stem Augers with 3" x 24" Split Spoon Sampler	8. HOLE LOCATION: SB09	
	9. SURFACE ELEVATION: NA	
	10. DATE STARTED: 4-28-98	11. DATE COMPLETED: 4-28-98
12. OVERBURDEN THICKNESS: NA	13. DEPTH GROUNDWATER ENCOUNTERED: 8.0 Ft.	
13. DEPTH DRILLED INTO ROCK: NA	14. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: NA	
14. TOTAL DEPTH OF HOLE: 10.0 Ft.	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): NA	

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
NA			0

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC/SVOC	METALS/PH	OTHER (SPECIFY)	~~OTHER (SPECIFY)~~	~~OTHER (SPECIFY)~~	21. TOTAL CORE RECOVERY
	2	2	PCB's (1)	Nitrate/Sulfate (1)		NA

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
	X			John Vogel

LOCATION SKETCH/COMMENTS SCALE:

See Figure VII-4
Proposed Soil Boring Location Map
Acid Area No. 2.

PROJECT: PBOW - Acid Area No. 2 HOLE NO. SB09

ENG FORM 5056-R, AUG 94 (Proponent: CECW-EG)

HTRW DRILLING LOG (CONTINUATION SHEET)

HOLE NUMBER: SB09

PROJECT: USCS PBOW - Acid Area 2

INSPECTOR: John Voegding

SHEET 2 OF 2 SHEETS

Symbol (a)	DEPTH (b)	DESCRIPTION OF MATERIALS (c)	FIELD SCREENING RESULTS (d)	GEOTECH SAMPLE OR CORE BOX NO. (e)	ANALYTICAL SAMPLE NO. (f)	BLOW COUNT (g)	REMARKS (h)
		0-0.5' grass and Topsoil					
		0.5'-1.0' Loose, Med. brown, V. Fine Silty Sand, moist	0 PPm		0.5' 6470	1,3,	
SM	1						
		1.0'-2.0' Soft-M. Firm, light-dark brown, black, and grey, V. Fine Sandy Silt to Clayey Silt, low-med. Plasticity, Slightly Mottled, moist			1.5'	4,3	
	2					1,2,	
	3	2'-4' Same as Above, moist-Slightly wet.	5.0 PPm			3,3	
	4				4.0'		
		4'-6' Same as Above.				1,2,	
ML	5		5.5 PPm	NA	6480	5,5	
	6	6'-8' Same as Above			6.0'		
	7	grey at 7.0'	3.0 PPm			3,6, 7,7	
	8	8'-10' Same as above, grey, wet.				2,3,	
	9		3.5 PPm			4,6	
	10						Bottom of Boring at 10.0'

PROJECT: PBOW - Acid Area 2 HOLE NO. SB09

ENG FORM 5056A-R, AUG 94 (Proponent: CECW-EG)

HTRW DRILLING LOG

DISTRICT: Nashville - TN		HOLE NUMBER: SB10
1. COMPANY NAME: I.T. Corp.	2. DRILL SUBCONTRACTOR: Belasco Drilling Services	SHEET 1 OF 2 SHEETS
3. PROJECT: PBOW - Acid Area 2	4. LOCATION: Acid Area 2	
5. NAME OF DRILLER: Scott Guyer	6. MANUFACTURER'S DESIGNATION OF DRILL: CME-450 ATV	
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: 4-Inch Solid Stem Augers with 3" x 24" Split Spoon Sampler	8. HOLE LOCATION: SB10	
	9. SURFACE ELEVATION: NA	
	10. DATE STARTED: 4-28-98	11. DATE COMPLETED: 4-28-98
12. OVERBURDEN THICKNESS: NA	13. DEPTH GROUNDWATER ENCOUNTERED: 7.0 Ft.	
13. DEPTH DRILLED INTO ROCK: NA	14. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: NA	
14. TOTAL DEPTH OF HOLE: 10.0 Ft.	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): NA	

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
NA			0

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC/SVOC	METALS/PH	~~OTHER (SPECIFY)~~	~~OTHER (SPECIFY)~~	~~OTHER (SPECIFY)~~	21. TOTAL CORE RECOVERY
	2	2	PCB's (1)	Nitrate/Sulfate (2)		NA

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
	X			John Vogelding

LOCATION SKETCH/COMMENTS

SCALE:

See Figure VII-4
Proposed Soil Boring Location Map
Acid Area No. 2.

PROJECT	HOLE NO.
PBOW - Acid Area No. 2	SB10

ENG FORM 5056-R, AUG 94

(Proponent: CECW-EG)

HTRW DRILLING LOG (CONTINUATION SHEET)

HOLE NUMBER: SB10

PROJECT: PBOW- Acid Area 2 | INSPECTOR: John Vogeding | SHEET 2 OF 2 SHEETS

USCS Symbol (a)	DEPTH (b)	DESCRIPTION OF MATERIALS (c)	FIELD SCREENING RESULTS (d)	GEOTECH SAMPLE OR CORE BOX NO. (e)	ANALYTICAL SAMPLE NO. (f)	BLOW COUNT (g)	REMARKS (h)
ml	1	0-0.5' grass and Topsoil 0.5'-1.5' Soft-m. Firm, light-dark brown, black, and grey, v. Fine Sandy Silt, moist.	(PID) 0 ppm	NA	0.5' 6490 1.5'	2,3, 4,5	0.5'-1.0' highly organic
ml/Pt	2 3 4	2'-4' Same as Above, high organic content.	5.0 ppm			4,2, 3,3	
ml	5 6	4'-6' Same as Above, v. Fine Sandy Silt to Clayey Silt, med plasticity, slightly mottled, moist-slightly wet.	4.0 ppm			2,3, 4,5	
	7	6'-8' Same as Above wet at 7.0'	4.0 ppm		8.0'	2,5, 8,10	
	8 9 10	8'-10' Same as Above, wet grey at 9.0'	6.0 ppm		6500 10.0'	10,5, 6,7	Bottom of Boring at 10.0'

PROJECT: PBOW - Acid Area 2 | HOLE NO. SB10

ENG FORM 5056A-R, AUG 94 (Proponent: CECW-EG)

HTRW DRILLING LOG

DISTRICT: Nashville - TN		HOLE NUMBER: SB11
1. COMPANY NAME: I.T. Corp.	2. DRILL SUBCONTRACTOR: Belasco Drilling Services	SHEET 1 OF 2 SHEETS
3. PROJECT: PBOW - Acid Area 2	4. LOCATION: Acid Area 2	
5. NAME OF DRILLER: Scott Guyer	6. MANUFACTURER'S DESIGNATION OF DRILL: CME-450 ATV	
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: 4-Inch Solid Stem Augers With 3"x24" Split Spoon Sampler	8. HOLE LOCATION: SB11	
	9. SURFACE ELEVATION: NA	
	10. DATE STARTED: 4-28-98	11. DATE COMPLETED: 4-28-98
12. OVERBURDEN THICKNESS: NA	13. DEPTH GROUNDWATER ENCOUNTERED: 7.0 Ft.	
13. DEPTH DRILLED INTO ROCK: NA	14. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: NA	
14. TOTAL DEPTH OF HOLE: 10.0 Ft.	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): NA	

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
NA			0

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC/SVOC	METALS/PH	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
	2	2	PCB's (1)	Nitrate/Sulfate (2)		NA

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
	X			John Vogelsang

LOCATION SKETCH/COMMENTS SCALE

See Figure VII-4
Proposed Soil Boring Location Map
Acid Area No. 2.

PROJECT: PBOW - Acid Area No. 2 HOLE NO. SB11

ENG FORM 5056-R, AUG 94 (Proponent: CECW-EG)

HTRW DRILLING LOG (CONTINUATION SHEET)

HOLE NUMBER: SB11

PROJECT: PBOW - Acid Area 2 | INSPECTOR: John Voegding | SHEET 2 OF 2 SHEETS

USCS SYMBOL (a)	DEPTH (b)	DESCRIPTION OF MATERIALS (c)	FIELD SCREENING RESULTS (d)	GEOTECH SAMPLE OR CORE BOX NO. (e)	ANALYTICAL SAMPLE NO. (f)	BLOW COUNT (g)	REMARKS (h)
		0-0.5' grass and Topsoil	(PID)		0.5		
		0.5'-2.0'				1, 3,	
	1	Soft-m. Firm, light-dark brown, black, and grey, V. Fine Sandy Silt to clayey silt, low-med. Plasticity, Slightly mottled, moist.	0 ppm		6510 1.5	6, 7	
	2				2.0		
		2'-4' Same as Above moist-Slightly wet.				5, 6,	
	3		5.5 ppm		6520	8, 8	
	4				4.0		
		4'-6' Same as Above, moist-Slightly wet.				3, 5,	
ml	5		4.5 ppm	NA		6, 6	
	6	6'-8' Same as Above.				6, 10,	
	7	wet at 7.0'	2.0 ppm			15, 16	
	8	8'-10' Same As Above, wet				3, 6,	
	9	grey at 9.0'	5.5 ppm			6, 6	
	10						Bottom of Boring at 10.0'

PROJECT: PBOW - Acid Area 2 | HOLE NO. SB11

ENG FORM 5056A-R, AUG 94 (Proponent: CECW-EG)

HTRW DRILLING LOG

DISTRICT: Nashville - TN		HOLE NUMBER: SB12
1. COMPANY NAME: I.T. Corp.	2. DRILL SUBCONTRACTOR: Belasco Drilling Services	SHEET 1 OF 2 SHEETS
3. PROJECT: PBOW - Acid Area 2	4. LOCATION: Acid Area 2	
5. NAME OF DRILLER: Scott Guyer	6. MANUFACTURER'S DESIGNATION OF DRILL: CME-450 ATV	
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: 4-Inch Solid Stem Augers; 3"x24" S/S samples	8. HOLE LOCATION: SB12	
	9. SURFACE ELEVATION: NA	
	10. DATE STARTED: 4-28-98	11. DATE COMPLETED: 4-28-98
12. OVERBURDEN THICKNESS: NA	13. DEPTH GROUNDWATER ENCOUNTERED: 8.0 Ft.	
13. DEPTH DRILLED INTO ROCK: NA	14. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: NA	
14. TOTAL DEPTH OF HOLE: 10.0 Ft.	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): NA	

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
	2		0

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC/SVOC	METALS/PH	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
	2	2	PCB's (1)	Nitrate/Sulfate (2)		NA

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
	X			John Vogelding

LOCATION SKETCH/COMMENTS SCALE:

See Figure VII-4
Proposed Soil Boring Location Map
Acid Area No. 2.

PROJECT: PBOW - Acid Area No. 2 HOLE NO. SB12

ENG FORM 5056-R, AUG 94 (Proponent: CECW-EG)

HTRW DRILLING LOG (CONTINUATION SHEET)

HOLE NUMBER: SB12

PROJECT: PBOW - Acid Area 2 | INSPECTOR: John Vogeding | SHEET 2 OF 2

USCS Symbol	DEPTH (b)	DESCRIPTION OF MATERIALS (c)	FIELD SCREENING RESULTS (d)	GEOTECH SAMPLE OR CORE BOX NO. (e)	ANALYTICAL SAMPLE NO. (f)	BLOW COUNT (g)	REMARKS (h)
ML	1	0-0.5' grass and Topsoil 0.5'-2.0' Soft-m. Firm, light-dark brown, black, and grey, V. Fine Sandy Silt to Clayey Silt, low-med. Plasticity, Slightly Mottled, moist 2.0'	(PID) 0 PPm	1. 2.0'	0.5' 6530 1.5'	2,4, 4,5	
SM	3	2'-4' Loose, Med. brown, V. Fine Silty Sand, moist. wet at 4' 4.0'	NA	PBOW-98-SO-AA17 SB12-Geot-(0208) 4.0'		NA (Shelby Tube)	Pushed 3"x2' Shelby tube from 2'-4'. 8" Recovery. Sample stored in (2) Zip-lock bags for Geotech. Analysis
ML	5	4'-6' Soft, light-med brown, V. Fine Sandy Silt, wet	NA	PBOW-98-SO-AA17 SB12-Geot-(0406) 6.0'	6.0'	NA (Shelby Tube)	Pushed Shelby Tube from 4'-6'. No Recovery. Used 3"x24" split spoon to collect sample for Geotech. Analysis.
ML	7	6'-8' Same as Above, grading to Clayey Silt, med plasticity, Slightly mottled, moist - slightly wet. 8.0'	8.0 PPm		6540 8.0'	4,6, 6,9	
SM	8	8'-9' Med. Dense, light brown, V. Fine, Silty Sand, wet 9.0'	6.0 PPm			17,10,	
ML	9	9'-10' m. Firm, brown-grey, V. Fine Sandy Silt, wet. 10.0'				10,12	Bottom of Boring at 10.0'

PROJECT: PBOW - Acid Area 2 | HOLE NO. SB12

HTRW DRILLING LOG

DISTRICT: Nashville - TN		HOLE NUMBER: SB13
1. COMPANY NAME: I.T. Corp.	2. DRILL SUBCONTRACTOR: Belasco Drilling Services	SHEET 1 OF 2 SHEETS
3. PROJECT: PBOW - Acid Area 2	4. LOCATION: Acid Area 2	
5. NAME OF DRILLER: Scott Guyer	6. MANUFACTURER'S DESIGNATION OF DRILL: CME-450 ATV	
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: 4-Inch Solid Stem Augers with 3" x 24" Split Spoons	8. HOLE LOCATION: SB13	
	9. SURFACE ELEVATION: NA	
	10. DATE STARTED: 4-27-98	11. DATE COMPLETED: 4-27-98
12. OVERBURDEN THICKNESS: NA	13. DEPTH GROUNDWATER ENCOUNTERED: 6.0 Ft.	
13. DEPTH DRILLED INTO ROCK: NA	14. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: NA	
14. TOTAL DEPTH OF HOLE: 10.0 Ft.	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): NA	

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
NA			0

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC/SVOC	METALS/PH	~~OTHER (SPECIFY)~~	~~OTHER (SPECIFY)~~	~~OTHER (SPECIFY)~~	21. TOTAL CORE RECOVERY
	2	2	PCB's (1)	Nitrate/Sulfate (2)		NA

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
	X			John Voegeding

LOCATION SKETCH/COMMENTS

SCALE:

See Figure VII-4
Proposed Soil Boring Location Map
Acid Area No. 2.

PROJECT: PBOW - Acid Area No. 2

HOLE NO. SB13

ENG FORM 5056-R, AUG 94

(Proponent: CECW-EG)

HTRW DRILLING LOG (CONTINUATION SHEET)

HOLE NUMBER SB13

PROJECT PBOW - Acid Area 2

INSPECTOR John Vogeding

SHEET 2 OF 2 SHEETS

SYMBOL	DEPTH (b)	DESCRIPTION OF MATERIALS (c)	FIELD SCREENING RESULTS (d)	GEOTECH SAMPLE OR CORE BOX NO. (e)	ANALYTICAL SAMPLE NO. (f)	BLOW COUNT (g)	REMARKS (h)
		0-0.5' grass and Topsoil	(PID)		0.5'		
		0.5'-2.0'				2,3,	
	1	Soft-m. Firm, light-dark brown, black, and grey, Fine Sandy Silt and Clayey Silt, med. Plasticity, Slightly	0 ppm		6550 1.5'	3,4	
	2	mottled, moist-Slightly wet.			2.0'		
		2'-4' Same as Above with 2" Fine Sand lens at 4' (wet) (Perched)	12.0 ppm		6560	4,4, 14/2"	Refusal at 3' (Concrete-Rebar) moved 15' East and resume Sampling at 4.0'
	3				4.0'		
	4						
ML		4'-6' Same as above with 2" Fine Sand lens at 6'	7.0 ppm	NA		2,3, 4,5	
	5						
	6	wet at 6'					
		6'-8' Same as Above	5.5 ppm			3,5, 11,12	
	7						
	8	8'-10' Same as Above	4.5 ppm			5,7, 8,7	
	9						
	10						Bottom of Boring at 10.0'

PROJECT PBOW - Acid Area 2 HOLE NO. SB13

ENG FORM 5056A-R, AUG 94 (Proponent: CECW-EG)

HTRW DRILLING LOG

DISTRICT: Nashville - TN		HOLE NUMBER: SB14
1. COMPANY NAME: I.T. Corp.	2. DRILL SUBCONTRACTOR: Belasco Drilling Services	SHEET 1 OF 2 SHEETS
3. PROJECT: PBOW - Acid Area 2	4. LOCATION: Acid Area 2	
5. NAME OF DRILLER: Scott Guyer	6. MANUFACTURER'S DESIGNATION OF DRILL: CME-450 ATV	
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: 4-Inch Solid Stem Augers with 3" x 24" Split Spoon	8. HOLE LOCATION: SB14	
	9. SURFACE ELEVATION: NA	
	10. DATE STARTED: 4-27-98	11. DATE COMPLETED: 4-27-98
12. OVERBURDEN THICKNESS: NA	13. DEPTH GROUNDWATER ENCOUNTERED: 7.5 Ft.	
13. DEPTH DRILLED INTO ROCK: NA	14. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: NA	
14. TOTAL DEPTH OF HOLE: 10.0 Ft.	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): NA	

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
NA			0

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC/SVOC	METALS/PH	~~OTHER (SPECIFY)~~	~~OTHER (SPECIFY)~~	~~OTHER (SPECIFY)~~	21. TOTAL CORE RECOVERY
	2	2	PCB's (1)	Nitrate/Sulfate (2)		NA

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
	X			John Voegeding

LOCATION SKETCH/COMMENTS SCALE:

See Figure VII-4
Proposed Soil Boring Location Map
Acid Area No. 2.

PROJECT	HOLE NO.
PBOW - Acid Area No. 2	SB14

ENG FORM 5056-R, AUG 94 (Proponent: CECW-EG)

HTRW DRILLING LOG (CONTINUATION SHEET)

HOLE NUMBER SB14

PROJECT USCS PBOW - Acid Area 2 | INSPECTOR John Vogeding | SHEET 2 OF 2 SHEETS

SYMBOL (b)	DEPTH (b)	DESCRIPTION OF MATERIALS (c)	FIELD SCREENING RESULTS (d)	GEOTECH SAMPLE OR CORE BOX NO. (e)	ANALYTICAL SAMPLE NO. (f)	BLOW COUNT (g)	REMARKS (h)
		0-0.5' grass and Topsoil	(PID)		0.5'		
		0.5'-2.0'				2,2,	
	1	Soft-Med. Firm, light-dark brown, black, and grey, Fine Sandy Silt and Clayey Silt, low-med. Plasticity, Slightly mottled, moist-Slightly wet.	0 ppm		6570 1.5'	3,6	
	2	2'-4' Same as Above.	3.5 ppm		4.0'	3,4, 4,5	Several Minor Perched Zones of water from 2'-6'.
ML	4	4'-6' Same as Above.	4.5 ppm	NA	6580 6.0'	3,6, 8,10	
	6	6'-8' Same as Above wet at 7.5'	3.5 ppm			4,4, 17,12	
	8	8'-10' Same as Above, grey	NA			3,4, 7,10	Bottom of Boring at 10.0'
	10						

PROJECT PBOW - Acid Area 2 | HOLE NO. SB14

ENG FORM 5056A-R, AUG 94 (Proponent: CECW-EG)

HTRW DRILLING LOG

DISTRICT: Nashville - TN		HOLE NUMBER: SB15
1. COMPANY NAME: I.T. Corp.	2. DRILL SUBCONTRACTOR: Belasco Drilling Services	SHEET 1 OF SHEETS 2
3. PROJECT: PBOW - Acid Area 2	4. LOCATION: Acid Area 2	
5. NAME OF DRILLER: Scott Guyer	6. MANUFACTURER'S DESIGNATION OF DRILL: CME-450 ATV	
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: 4-Inch Solid Stem Augers with 3" x 24" Split Spoon	8. HOLE LOCATION: SB15	
	9. SURFACE ELEVATION: NA	
	10. DATE STARTED: 4-27-98	11. DATE COMPLETED: 4-27-98
12. OVERBURDEN THICKNESS: NA	13. DEPTH GROUNDWATER ENCOUNTERED: 8.0 Ft.	
13. DEPTH DRILLED INTO ROCK: NA	14. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: NA	
14. TOTAL DEPTH OF HOLE: 10.0 Ft.	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): NA	

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
NA			0

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC/SVOC	METALS/PH	~~OTHER (SPECIFY)~~	~~OTHER (SPECIFY)~~	~~OTHER (SPECIFY)~~	21. TOTAL CORE RECOVERY
	2	2	PCB's (1)	Nitrate/Sulfate (2)		NA

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
	X			John Vogelding

LOCATION SKETCH/COMMENTS SCALE:

See Figure VII-4
Proposed Soil Boring Location Map
Acid Area No. 2.

PROJECT	HOLE NO.
PBOW - Acid Area No. 2	SB15

ENG FORM 5056-R, AUG 94 (Proponent: CECW-EG)

HTRW DRILLING LOG (CONTINUATION SHEET)

HOLE NUMBER: SB15

PROJECT: PBOW - Acid Area 2

INSPECTOR: John Vogeding

SHEET 2 OF 2 SHEETS

DEPTH (b)	DESCRIPTION OF MATERIALS (c)	FIELD SCREENING RESULTS (d)	GEOTECH SAMPLE OR CORE BOX NO. (e)	ANALYTICAL SAMPLE NO. (f)	BLOW COUNT (g)	REMARKS (h)
	0-0.5' grass and Topsoil.	(PID)		0.5'	2,3,	
1	0.5'-2.0' Soft-med. Firm, light-dark brown, black, and grey, V. Fine Sandy Silt and Clayey Silt, low-med. Plasticity, Slightly mottled, moist-Slightly wet.	0 ppm		6590 1.5'	4,8	
2				2.0'		
3	2'-4' Same as Above with Few thin Fine sand leases.	4.5 ppm		6600	4,5, 9,8	Perched water within Sand leases.
4				4.0'		
5	4'-6' Same as Above with Few thin Fine sand leases.	4.0 ppm	NA		4,5, 8,7	
6						
7	6'-8' Same as Above, Firm-Hard.	2.0 ppm			3,7, 19,19	
8	wet at 8' 8'-10' Same as Above				2,8,	
9	grey at 9'	NA			9,10	
10						Bottom of Boring at 10.0'

PROJECT: PBOW - Acid Area 2 HOLE NO. SB15

ENG FORM 5056A-R, AUG 94 (Proponent: CECW-EG)

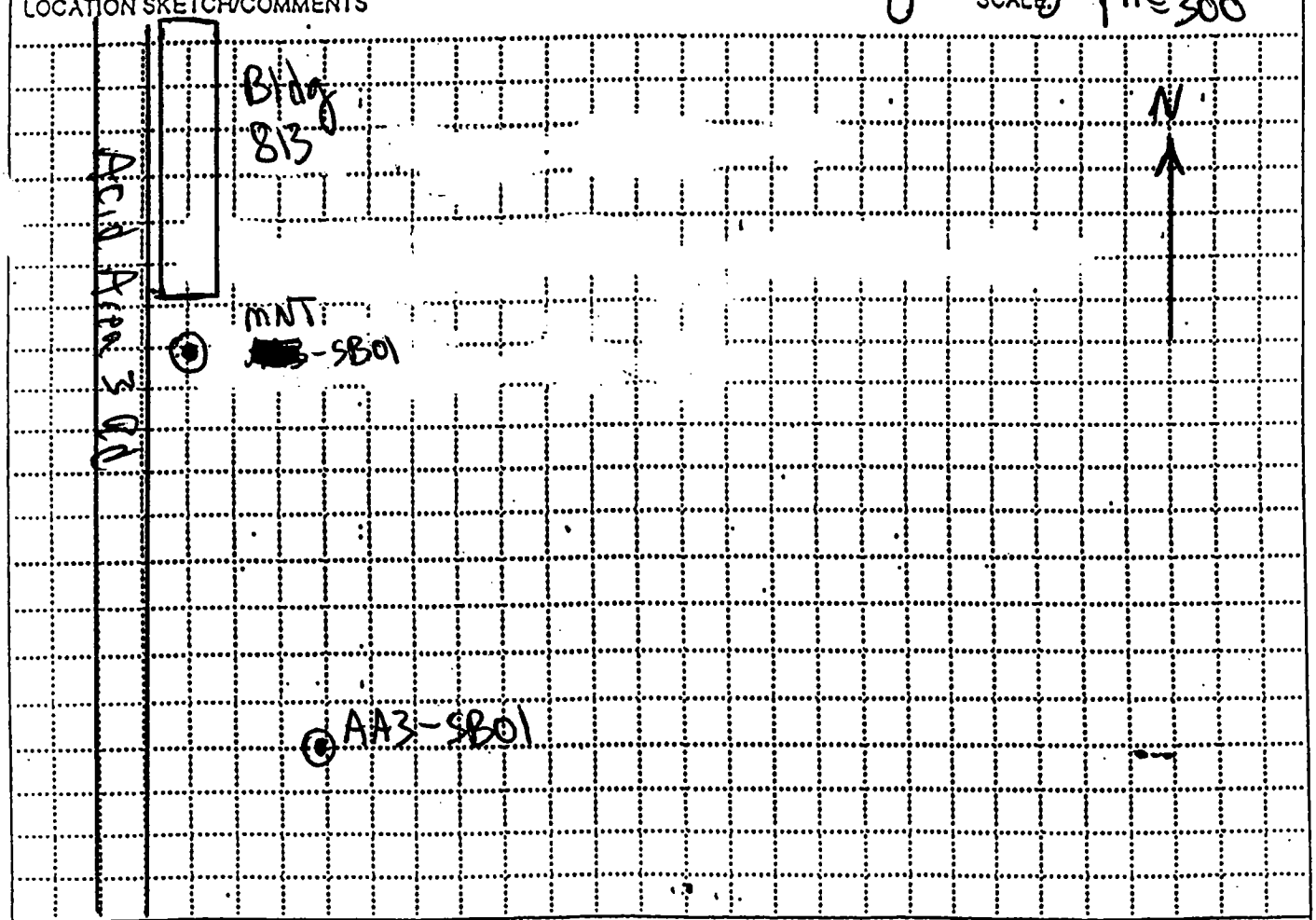
HTRW DRILLING LOG

DISTRICT: Nashville - TN		HOLE NUMBER: AA3-SB01
1. COMPANY NAME: I.T. Corp.	2. DRILL SUBCONTRACTOR: Belasco Drilling Services	SHEET 1 OF 2 SHEETS
3. PROJECT: PBOW - Acid Area 3	4. LOCATION: Acid Area 3	
5. NAME OF DRILLER: Scott Guyer	6. MANUFACTURER'S DESIGNATION OF DRILL: CME-450 ATV	
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: 4-Inch Solid Stem Augers with 3" x 24" Split Spoon Sampler	8. HOLE LOCATION: AA3-SB01	
	9. SURFACE ELEVATION: NA	
	10. DATE STARTED: 5-3-98	11. DATE COMPLETED: 5-3-98
12. OVERBURDEN THICKNESS: NA	13. DEPTH GROUNDWATER ENCOUNTERED: 8.0 Ft.	
13. DEPTH DRILLED INTO ROCK: NA	14. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: NA	
15. TOTAL DEPTH OF HOLE: 10.0 Ft.	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): NA	

18. GEOTECHNICAL SAMPLES: NA	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES: 0				
20. SAMPLES FOR CHEMICAL ANALYSIS	VOC/SVOC	METALS/PH	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY: NA	
Nitroaromatics (2)	2	2	PCBs (1)	Nitrate/Sulfate (2)			
22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR: John Vogelin			
	X (grouted)						

LOCATION SKETCH/COMMENTS

SCALE: 1" = 300'



PROJECT: PBOW - Acid Area No. 3

HOLE NO.: AA3-SB01

ENG FORM 5056-R, AUG 94

(Proponent: CECW-EG)

HTRW DRILLING LOG (CONTINUATION SHEET)

HOLE NUMBER: SB01

PROJECT: PBOW- Acid Area 3

INSPECTOR: John Vogeding

SHEET 2 OF 2 SHEETS

SYMBOL (a)	DEPTH (b)	DESCRIPTION OF MATERIALS (c)	FIELD SCREENING RESULTS (d)	GEOTECH SAMPLE OR CORE BOX NO. (e)	ANALYTICAL SAMPLE NO. (f)	BLOW COUNT (g)	REMARKS (h)
ML	1	0-0.5' grass and Topsoil 0.5'-2.0' Soft-m.Firm, light-dark brown, black, and grey, V.Fine Sandy Silt, moist	(PID) 0ppm		0.5' 6610 1.5'	3,3, 6,11	@ 1110
	2	2-2.5' Same as Above				5,17,	
Fill	3	2.5'-3.0' Oil treated wood (RR Tie), gravel	NA			15,16	
ML	4	3.0'-4.0' m.Dense, brown-grey, Clayey Silt and gravel				4,8,	Note: Auger refusal at 4.0', moved rig around boring location Approx 10 times. Continued to encounter refusal at 3'-4'.
	5	4'-6' m.Firm, Light-dark brown, black and grey, V.Fine, Sandy Silt, moist - Slightly wet	6.0 ppm	NA		15,12	
	6	6'-8' Same as Above,			6.0'	6,10,	Broke keyway on drive head gears on rig.
	7	grey at 7.0'	6.0 ppm		6620 8.0'	9,9	@ 1400 Resumed drilling and Sampling at 4 ft. BGS approx. 40 ft E. of original location.
	8	8'-10' Same as Above, grey, wet				3,4,	
	9		3.5 ppm			6,10	Bottom of Boring at 10.0'
	10						

PROJECT: PBOW - Acid Area 3 HOLE NO. SB01

ENG FORM 5056A-R, AUG 94 (Proponent: CECW-EG)

HTRW DRILLING LOG

DISTRICT: Nashville - TN		HOLE NUMBER: SB02
1. COMPANY NAME: I.T. Corp.	2. DRILL SUBCONTRACTOR: Belasco Drilling Services	SHEET 1 OF 2 SHEETS
3. PROJECT: PBOW - Acid Area 3	4. LOCATION: Acid Area 3	
5. NAME OF DRILLER: Scott Guyer	6. MANUFACTURER'S DESIGNATION OF DRILL: CME - 450 ATV	
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: 4-Inch Solid Stem Augers with 3" x 24" Split Spoon Sampler	8. HOLE LOCATION: SB02	
	9. SURFACE ELEVATION: NA	
	10. DATE STARTED: 5-1-98	11. DATE COMPLETED: 5-1-98
12. OVERBURDEN THICKNESS: NA	13. DEPTH GROUNDWATER ENCOUNTERED: 8.0 Ft.	
13. DEPTH DRILLED INTO ROCK: NA	14. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: NA	
15. TOTAL DEPTH OF HOLE: 10.0 Ft.	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): NA	

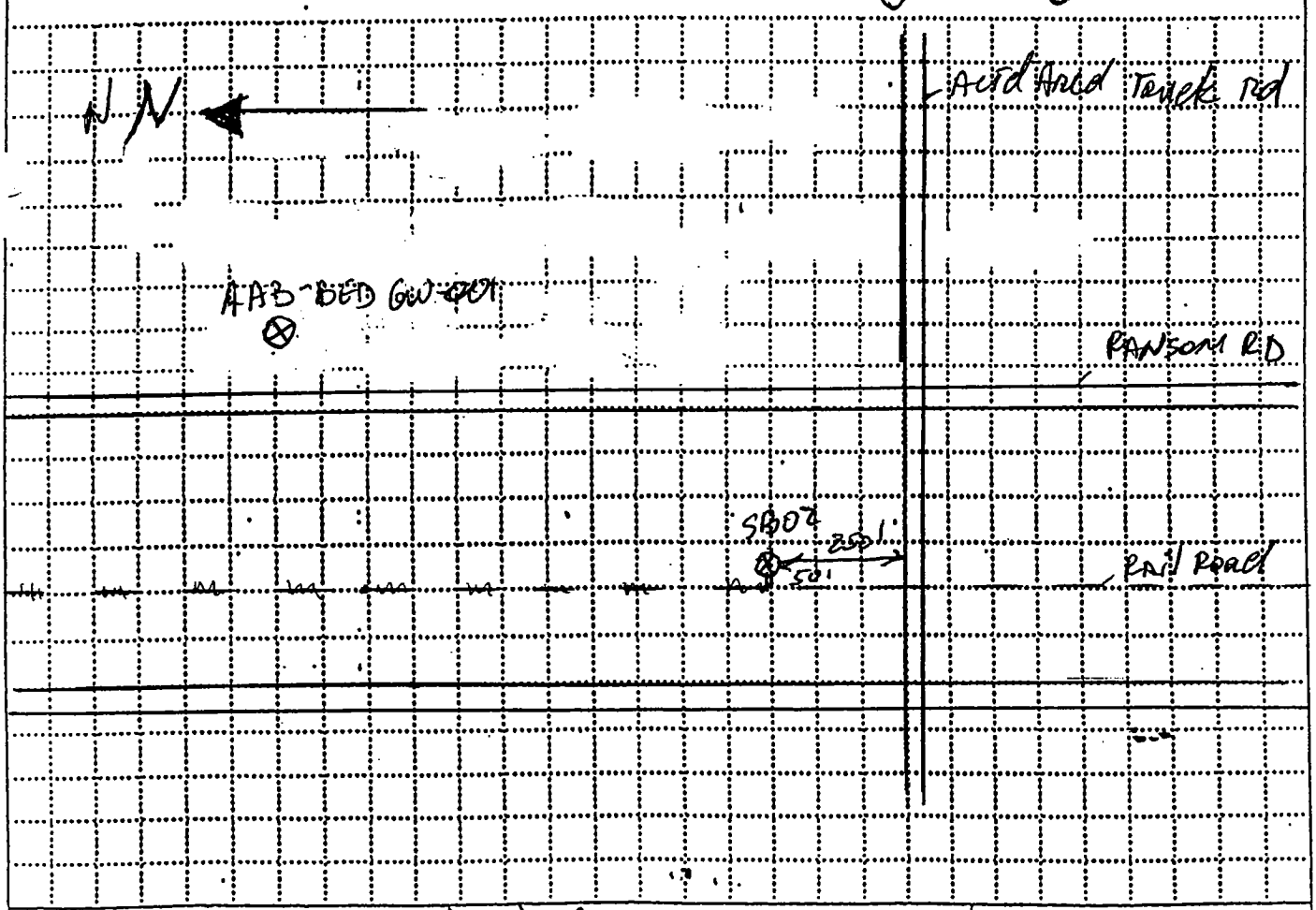
18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
NA			0

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC/SVOC	METALS/PH	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
	2	2	PCBs (1)	Nitrate/Sulfate (2)		NA

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
	X (grout)			John Vogeding

LOCATION SKETCH/COMMENTS

SCALE:



PROJECT: PBOW - Acid Area No. 3 | HOLE NO. SB02

ENG FORM 5056-R, AUG 94 (Proponent: CECW-EG)

HTRW DRILLING LOG (CONTINUATION SHEET)

HOLE NUMBER SB02

PROJECT PBOW- Acid Area 3 INSPECTOR John Vogeding SHEET 2 OF 2 SHEETS

USCS SYMBOL	DEPTH (b)	DESCRIPTION OF MATERIALS (c)	FIELD SCREENING RESULTS (d)	GEOTECH SAMPLE OR CORE BOX NO. (e)	ANALYTICAL SAMPLE NO. (f)	BLOW COUNT (g)	REMARKS (h)
ML	1	0-0.5' grass and Topsoil 0.5'-2.0 Soft-m. Firm, light-dark brown, black and grey, v. Fine Sandy Silt to clayey silt, low-med. Plasticity, Slightly mottled, moist.	(PID) 0 ppm	NA	0.5' 6630 1.5'	2,7, 9,10	
	2	2'-4' Same as above with 3" v. Fine Sand lens at 4.5'	5.0 ppm			6,6, 12,7	Sand lens is wet
	4	4'-6' Sandy silt as Above moist-Slightly wet.	4.5 ppm		6.0'	3,6, 11,11	
	6	6'-8' Same as Above grey at 7.0'	5.0 ppm		6640 8.0'	4,6, 6,8	
	8	8'-10' Same as Above, grey, wet.	3.0 ppm			3,6, 6,7	Bottom of Boring at 10.0'
	10						

PROJECT PBOW - Acid Area 3 HOLE NO. SB02

ENG FORM 5056A-R, AUG 94 (Proponent: CECW-EG)

HTRW DRILLING LOG

DISTRICT: Nashville - TN		HOLE NUMBER: SB03
1. COMPANY NAME: I.T. Corp.	2. DRILL SUBCONTRACTOR: Belasco Drilling Services	SHEET 1 OF 2 SHEETS
3. PROJECT: PBOW - Acid Area 3	4. LOCATION: Acid Area 3	
5. NAME OF DRILLER: Scott Guyer	6. MANUFACTURER'S DESIGNATION OF DRILL: CME-450 ATV	
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: 4-Inch Solid Stem Augers With 3" x 24" Split Spoon Sampler	8. HOLE LOCATION: SB03	
	9. SURFACE ELEVATION: NA	
	10. DATE STARTED: 5-1-98	11. DATE COMPLETED: 5-1-98
12. OVERBURDEN THICKNESS: NA	13. DEPTH GROUNDWATER ENCOUNTERED: 3.5 Ft.	
13. DEPTH DRILLED INTO ROCK: NA	14. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: NA	
15. TOTAL DEPTH OF HOLE: 10.0 Ft.	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): NA	

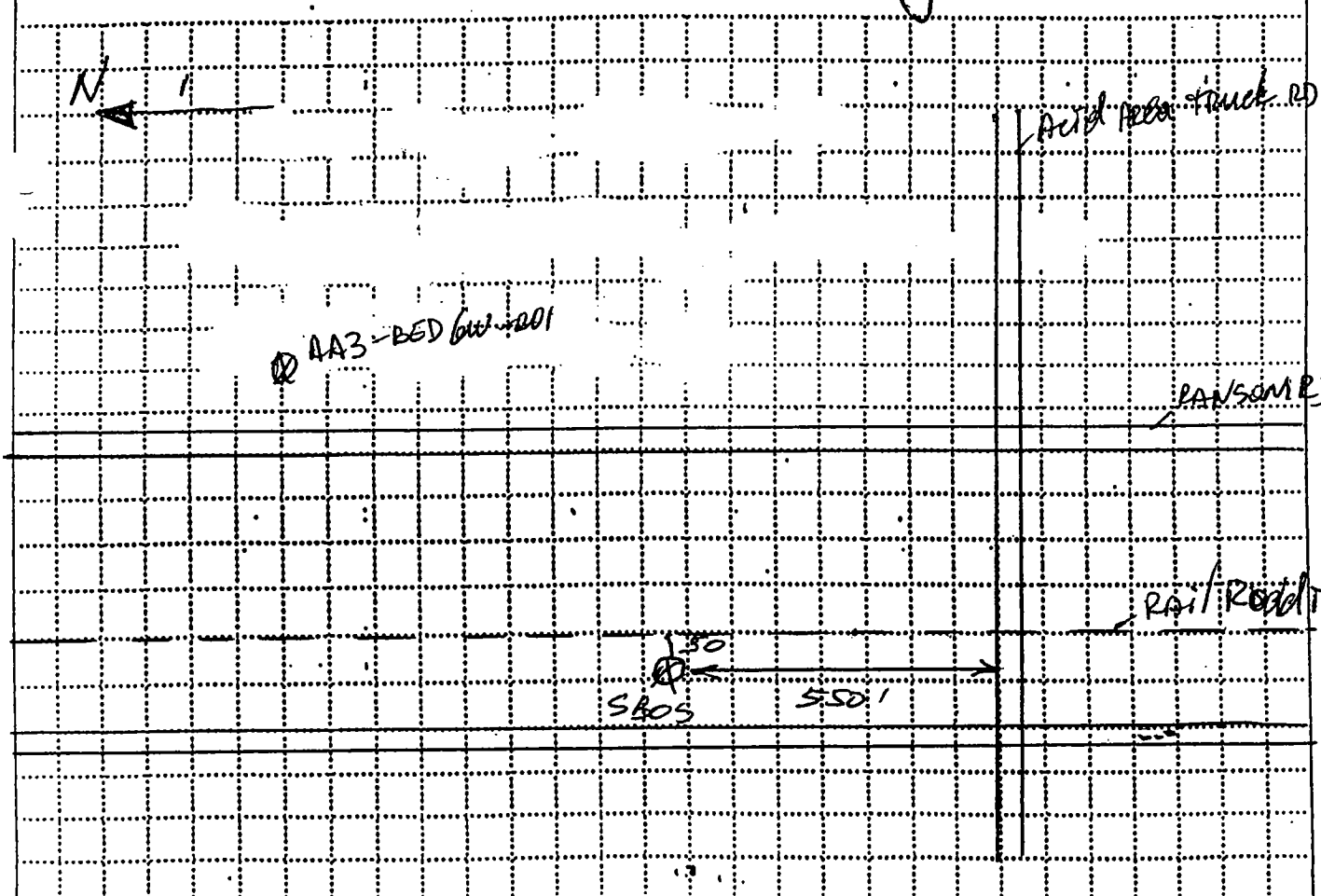
18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
NA			0

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC/SVOC	METALS/PH	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
	2	2	PCB's (1)	Nitrate/Sulfate (2)		NA

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
	X (grout)			John V Dogdin

LOCATION SKETCH/COMMENTS

SCALE:



PROJECT: PBOW - Acid Area No. 3 | HOLE NO. SB03

ENG FORM 5056-R, AUG 94 (Proponent: CECW-EG)

HTRW DRILLING LOG (CONTINUATION SHEET)

HOLE NUMBER SB03

PROJECT ISCS PBOW- Acid Area 3

INSPECTOR John Vogeding

SHEET 2 OF 2 SHEETS

SYMBOL	DEPTH (b)	DESCRIPTION OF MATERIALS (c)	FIELD SCREENING RESULTS (d)	GEOTECH SAMPLE OR CORE BOX NO. (e)	ANALYTICAL SAMPLE NO. (f)	BLOW COUNT (g)	REMARKS (h)
ML	0	0-0.5' grass and Topsoil	(PID)	NA	0.5'	1,4,	
	1	0.5'-2.0' Soft-M. Firm, light-dark brown, black, and grey, v. Fine Sandy Silt to Clayey Silt, low-Med. Plasticity, moist	0 ppm		6650 1.5'	8,8	Few gravel zones with coal + Cinders
	2	2'-4' Same as Above	6.0 ppm			8,9, 9,14	Auger refusal at 2.0'. Moved rig ≈ 5' SE. Resume Sampl at 2'.
	3	wet from 3.5'-4.0'.					
	4	4'-6' Same as Above, wet.	4.0 ppm		6.0'	8,8, 9,11	
	5						
	6	6'-8' Same as above, wet	6.0 ppm		6660 8.0'	5,10, 8,8.	
	7	grey at 7.0'					
	8	8'-10' Same as above, grey, wet	3.0 ppm			2,5, 6,8	
	9						Bottom of Boring at 10.0'
	10						

PROJECT PBOW - Acid Area 3

HOLE NO. SB03

ENG FORM 5056A-R, AUG 94

(Proponent: CECW-EG)

HTRW DRILLING LOG

DISTRICT: Nashville - TN		HOLE NUMBER: SB04
1. COMPANY NAME: I.T. Corp.	2. DRILL SUBCONTRACTOR: Belasco Drilling Services	SHEET 1 OF 2 SHEETS
3. PROJECT: PBOW - Acid Area 3	4. LOCATION: Acid Area 3	
5. NAME OF DRILLER: Scott Guyer	6. MANUFACTURER'S DESIGNATION OF DRILL: CME-450 ATV	
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: 4-Inch Solid Stem Augers with 3" x 24" Split Spoon Sampler	8. HOLE LOCATION: SB04	
	9. SURFACE ELEVATION: NA	
	10. DATE STARTED: 5-1-98	11. DATE COMPLETED: 5-1-98
12. OVERBURDEN THICKNESS: NA	13. DEPTH GROUNDWATER ENCOUNTERED: 6.0 Ft.	
13. DEPTH DRILLED INTO ROCK: NA	14. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: NA	
15. TOTAL DEPTH OF HOLE: 10.0 Ft.	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): NA	

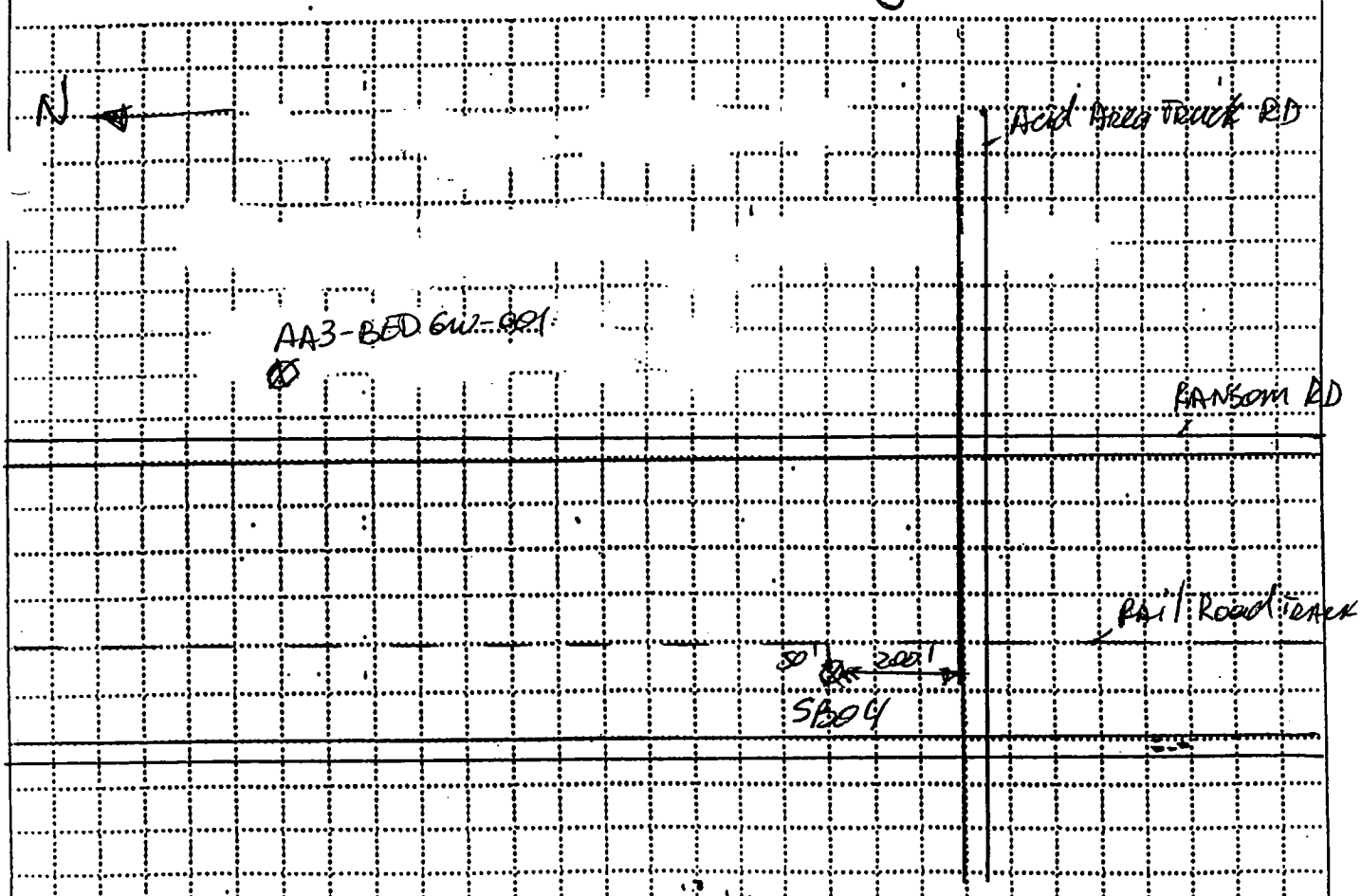
18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
NA			0

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC/SVOC	METALS/PH	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
	2	2	PCB's (1)	Nitrate/Sulfate (2)		NA

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
	X (grout)			John Vogelin

LOCATION SKETCH/COMMENTS

SCALE:



PROJECT: PBOW - Acid Area No. 3

HOLE NO. SB04

ENG FORM 5056-R, AUG 94

(Proponent: CECW-EG)

HTRW DRILLING LOG (CONTINUATION SHEET)

HOLE NUMBER SB04

SHEET 2 OF 2 SHEETS

PROJECT SCS PBOW- Acid Area 3

INSPECTOR John Vogeding

SYMBOL (a)	DEPTH (b)	DESCRIPTION OF MATERIALS (c)	FIELD SCREENING RESULTS (d)	GEOTECH SAMPLE OR CORE BOX NO. (e)	ANALYTICAL SAMPLE NO. (f)	BLOW COUNT (g)	REMARKS (h)
		0-0.5' grass and Topsoil	(PID)		0.5'		
		0.5'-2.0'				3,5,	
	1	Soft-m. Firm, light-dark brown			6670	7,7	
		and grey, v. Fine Sandy	0 ppm		1.5'		
		Silt to clayey Silt, low-med. Plasticity, Slightly					
	2	mottled w/ Fe Stains, moist				3,8,	
		2'-4' Same as Above,				10,10	
	3	Brown and Black from 3'-4'	4.0 ppm				
	4	4'-6' Same as Above, moist-Slightly wet.		NA		3,3,	
ml	5		4.5 ppm			7,6	
	6	6'-8' Same as Above, wet.				6,12,	
	7	grey at 7.0'	4.0 ppm			12,12	
					8.0'		
	8	8'-10' Same as Above, grey, wet.				4,5,	
			2.0 ppm		6680	6,8	
	9						Bottom of Boring at 10.0'
	10				10.0'		

PROJECT PBOW - Acid Area 3

HOLE NO. SB04

ENG FORM 5056A-R, AUG 94

(Proponent: CECW-EG)

HTRW DRILLING LOG

DISTRICT: Nashville - TN		HOLE NUMBER: SB05
1. COMPANY NAME: I.T. Corp.	2. DRILL SUBCONTRACTOR: Belasco Drilling Services	SHEET 1 OF 2 SHEETS
3. PROJECT: PBOW - Acid Area 3	4. LOCATION: Acid Area 3	
5. NAME OF DRILLER: Scott Guyer	6. MANUFACTURER'S DESIGNATION OF DRILL: CME-450 ATV	
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: 4-Inch Solid Stem Augers with 3" x 24" Split Spoon Sampler	8. HOLE LOCATION: SB05	
	9. SURFACE ELEVATION: NA	
	10. DATE STARTED: 5-1-98	11. DATE COMPLETED: 5-1-98
12. OVERBURDEN THICKNESS: NA	13. DEPTH GROUNDWATER ENCOUNTERED: 7.0 Ft.	
13. DEPTH DRILLED INTO ROCK: NA	14. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: NA	
14. TOTAL DEPTH OF HOLE: 10.0 Ft.	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): NA	

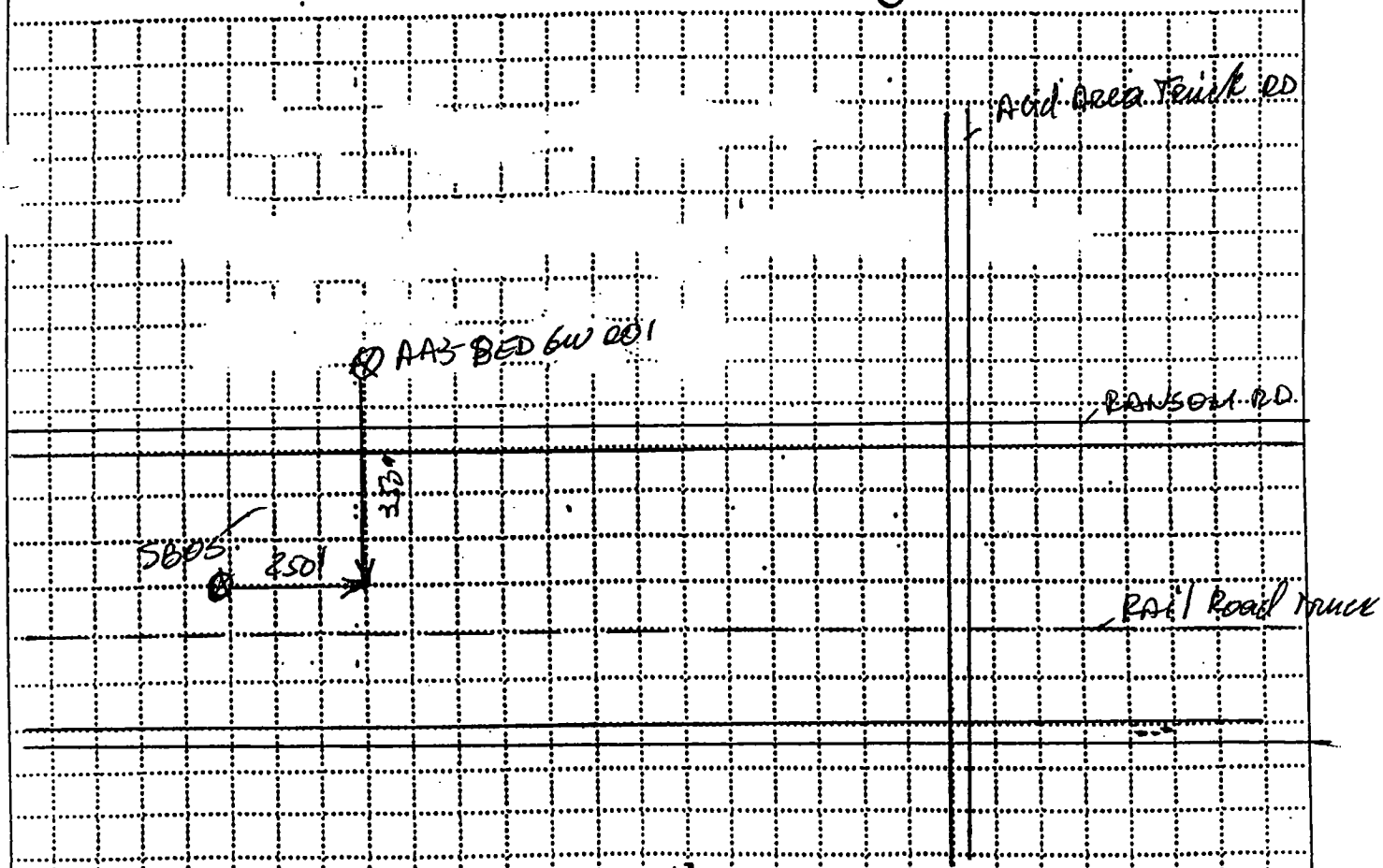
18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
NA			0

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC/SVOC	METALS/PH	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
	2	2	PCB's (1)	Nitrate/Sulfate (2)		NA

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
	X (grout)			John Vogelsang

LOCATION SKETCH/COMMENTS

SCALE:



PROJECT: PBOW - Acid Area No. 3

HOLE NO. SB05

ENG FORM 5056-R, AUG 94

(Proponent: CECW-EG)

HTRW DRILLING LOG (CONTINUATION SHEET)

HOLE NUMBER: SB05

PROJECT: SCS PBOW- Acid Area 3

INSPECTOR: John Vogeding

SHEET 2 OF 2 SHEETS

SYMBOL	DEPTH (b)	DESCRIPTION OF MATERIALS (c)	FIELD SCREENING RESULTS (d)	GEOTECH SAMPLE OR CORE BOX NO. (e)	ANALYTICAL SAMPLE NO. (f)	BLOW COUNT (g)	REMARKS (h)
ml		0-0.5' grass and Topsoil	(PID)		0.5'	1,2,	
		0.5'-2.0' Soft-m. Firm, light-dark brown, black, and grey, V. Fine Sandy Silt to clayey Silt, low-med Plasticity, slightly mottled, moist-Slightly wet.	NA		6690 1.5'	3,7	
	1						
	2	2'-4' Same as Above, moist	NA			2,5, 7,7	
	3						
	4	4'-6' Same as Above,	NA	NA		2,3, 5,7	
	5						
	6	6'-8' Same as Above, moist.	NA			3,5, 8,11	
	7	wet from 7'-7.5'			8.0'		
	8	8'-10' Same as Above, wet.	NA		6700	5,5, 5,6	
	9	grey at 9.0'					
	10				10.0'		Bottom of Boring at 10.0'

PROJECT: PBOW - Acid Area 3

HOLE NO. SB05

ENG FORM 5056A-R, AUG 94

(Proponent: CECW-EG)

HTRW DRILLING LOG

DISTRICT: Nashville - TN		HOLE NUMBER: SB06
1. COMPANY NAME: I.T. Corp.	2. DRILL SUBCONTRACTOR: Belasco Drilling Services	SHEET 1 OF 2 SHEETS
3. PROJECT: PBOW - Acid Area 3	4. LOCATION: Acid Area 3	
5. NAME OF DRILLER: Scott Guyer	6. MANUFACTURER'S DESIGNATION OF DRILL: CME-450 ATV	
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: 4-Inch Solid Stem Augers with 3" x 24" Split Spoon Sampler	8. HOLE LOCATION: SB06	
	9. SURFACE ELEVATION: NA	
	10. DATE STARTED: 5-1-98	11. DATE COMPLETED: 5-1-98
12. OVERBURDEN THICKNESS: NA	13. DEPTH GROUNDWATER ENCOUNTERED: 4.0 Ft.	
13. DEPTH DRILLED INTO ROCK: NA	14. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: NA	
15. TOTAL DEPTH OF HOLE: 10.0 Ft.	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): NA	

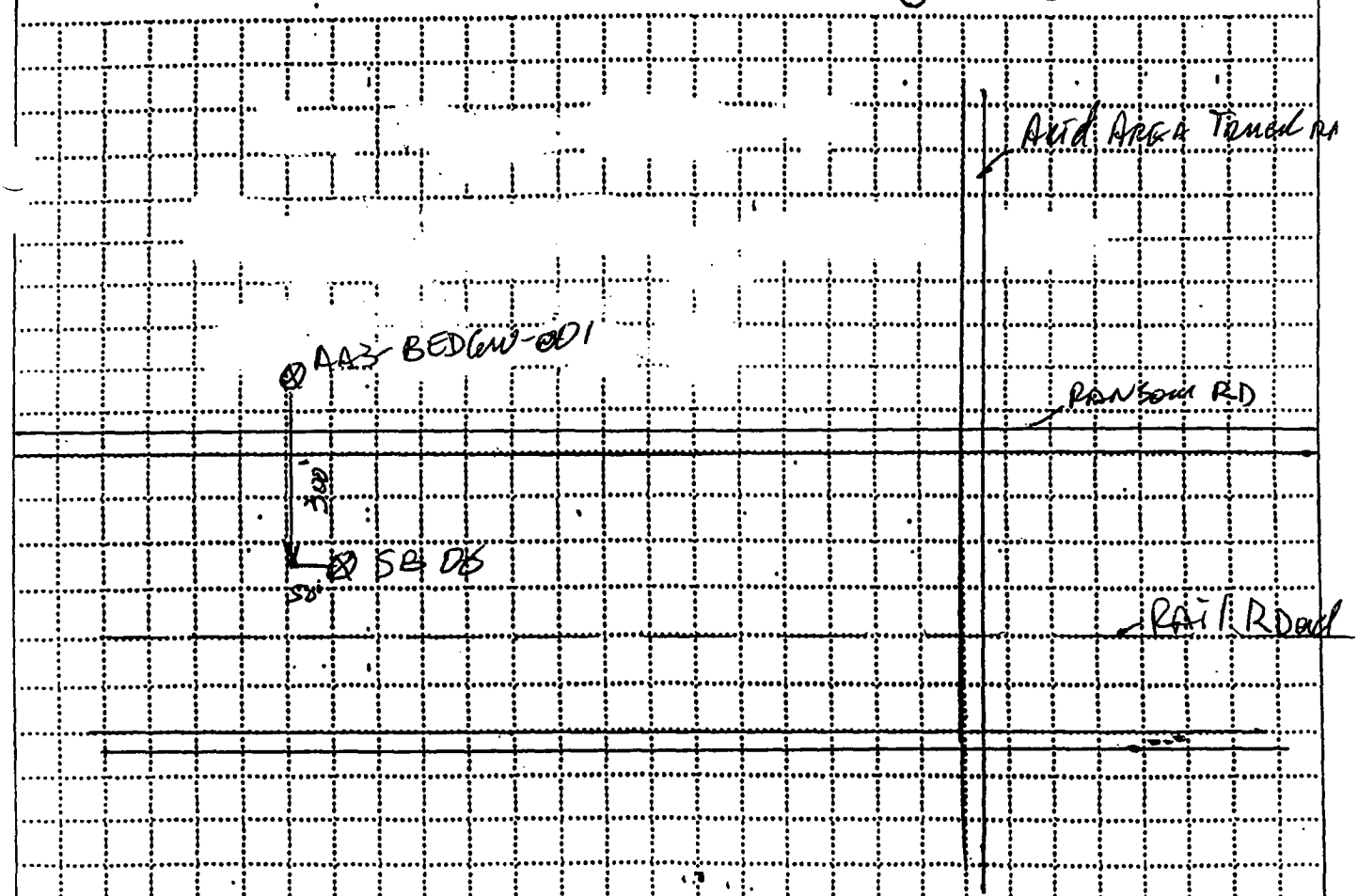
18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
NA			0

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC/SVOC	METALS/PH	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
	2	2	PCBs (1)	Nitrate/Sulfate (2)		NA

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
	X (grout)			John V Boyd

LOCATION SKETCH/COMMENTS

SCALE



PROJECT: PBOW - Acid Area No. 3

HOLE NO. SB06

ENG FORM 5056-R, AUG 94

(Proponent: CECW-EG)

HTRW DRILLING LOG (CONTINUATION SHEET)

HOLE NUMBER: SB06

PROJECT: PBOW - Acid Area 3

INSPECTOR: John Vogeding

SHEET 2 OF 2 SHEETS

SYMBOL (a)	DEPTH (b)	DESCRIPTION OF MATERIALS (c)	FIELD SCREENING RESULTS (d)	GEOTECH SAMPLE OR CORE BOX NO. (e)	ANALYTICAL SAMPLE NO. (f)	BLOW COUNT (g)	REMARKS (h)
SM	1	0-0.5' grass and Topsoil 0.5'-2.0' Loose, light-dark brown, Fine Silty Sand, moist 2.0	(PID) 0ppm		0.5' 6710 1.5'	1,3, 4,5	
ML	2 3	2'-4' Soft-m. Firm, light-dark brown, black, and grey, v. Fine Sandy Silt to clayey Silt, low-med. Plasticity, Slightly mottled, moist-Slightly wet. 4.0	6.5 ppm		4.0'	2,3, 5,9	
	4 5	Same as Above, Firm, wet. 6.0	6.5 ppm	NA	6720 6.0'	10,9, 15,20	
	6 7	6'-8' Same as Above, Firm, wet grey at 7.0'	5.5 ppm			3,15, 17,17	
	8 9 10	8'-10' Same as Above	4.0 ppm			4,6, 10,16	Bottom of Boring at 10.0'

PROJECT: PBOW - Acid Area 3

HOLE NO. SB06

ENG FORM 5056A-R, AUG 94

(Proponent: CECW-EG)

HTRW DRILLING LOG

1. COMPANY NAME: I.T. Corp.	DISTRICT: Nashville - TN	HOLE NUMBER: SB07
2. DRILL SUBCONTRACTOR: Belasco Drilling Services		SHEET 1 OF 2 SHEETS
3. PROJECT: PBOW - Acid Area 3	4. LOCATION: Acid Area 3	
5. NAME OF DRILLER: Scott Guyer	6. MANUFACTURER'S DESIGNATION OF DRILL: CME-450 ATV	
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: 4-Inch Solid Stem Augers with 3" x 24" Split Spoon Sampler	8. HOLE LOCATION: SB07	
	9. SURFACE ELEVATION: NA	
	10. DATE STARTED: 5-1-98	11. DATE COMPLETED: 5-1-98
12. OVERBURDEN THICKNESS: NA	13. DEPTH GROUNDWATER ENCOUNTERED: NA	
13. DEPTH DRILLED INTO ROCK: NA	14. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: NA	
15. TOTAL DEPTH OF HOLE: ~~10.0 Ft.~~ 5.5 Ft.	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): NA	

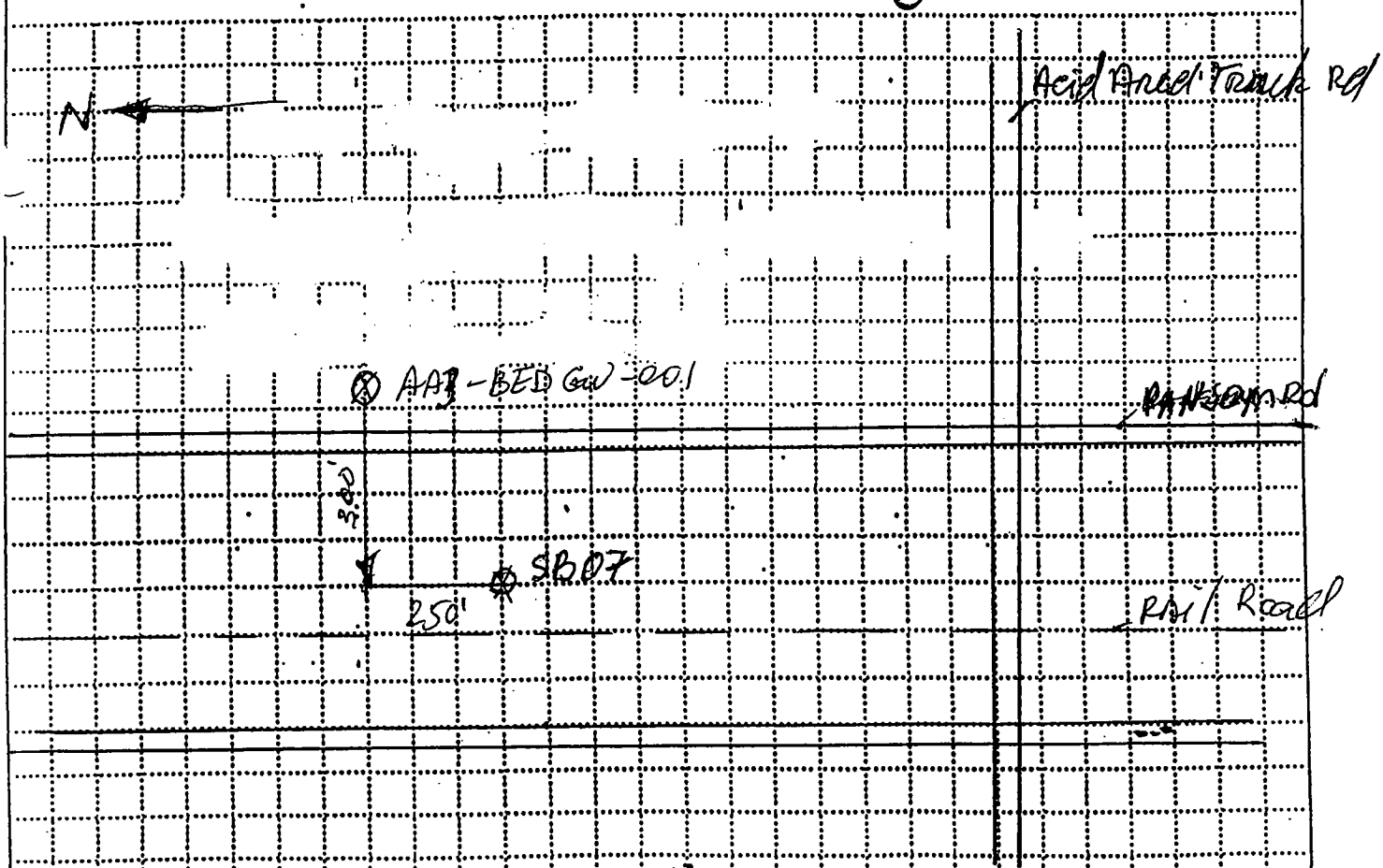
18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
NA			0

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC/SVOC	METALS/PH	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
	2	2	PCBs (1)	Nitrate/Sulfate (2)		NA

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
	X (grout)			John Vogelsang

LOCATION SKETCH/COMMENTS

SCALE:



PROJECT	HOLE NO.
PBOW - Acid Area No. 3	SB07

ENG FORM 5056-R, AUG 94 (Proponent: CECW-EG)

HTRW DRILLING LOG (CONTINUATION SHEET)

HOLE NUMBER: SB07

PROJECT: PBOW- Acid Area 3 | INSPECTOR: John Vogeding | SHEET 2 OF 2 SHEETS

Symbol (b)	Depth (b)	Description of Materials (c)	Field Screening Results (d)	Geotech Sample or Core Box No. (e)	Analytical Sample No. (f)	Blow Count (g)	Remarks (h)
gm		0-0.5' grass and Topsoil 0.5'-1.0' grey, angular, med. gravel	(PID)		0.5'	2,16,	
	1	1.0'-2.0' m.Dense, Med. brown, Fine Silty sand, moist.	0 PPM		6730 1.5'	16,17	
	2	2'-4' Same as Above			2.0		
SM	3		7.0 PPM		6740	7,10, 12,14	
	4	4'-6' Same as Above, V.Dense	6.5 PPM	NA	4.0'	8,30,	
	5	Concrete and S.S. Fragments at 5.0'				50/2"	Auger Refusal at 5.5'
	6						
	7		PPM				Moved 5 times around boring location. Auger Refusal at each location
	8						
	9		PPM				Bottom of Boring at ~~10.0'~~ 5.5'
	10						

PROJECT: PBOW - Acid Area 3 | HOLE NO. SB07

ENG FORM 5056A-R, AUG 94 (Proponent: CECW-EG)

HTRW DRILLING LOG

DISTRICT: Nashville - TN		HOLE NUMBER: SB08
1. COMPANY NAME: I.T. Corp.	2. DRILL SUBCONTRACTOR: Belasco Drilling Services	SHEET 1 OF 2 SHEETS
3. PROJECT: PBOW - Acid Area 3	4. LOCATION: Acid Area 3	
5. NAME OF DRILLER: Scott Guyer	6. MANUFACTURER'S DESIGNATION OF DRILL: CME-450 ATV	
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: 4-Inch Solid Stem Augers with 3" x 24" Split Spoon Sampler	8. HOLE LOCATION: SB08	
	9. SURFACE ELEVATION: NA	
	10. DATE STARTED: 5-1-98	11. DATE COMPLETED: 5-1-98
12. OVERBURDEN THICKNESS: NA	13. DEPTH GROUNDWATER ENCOUNTERED: 4.0 Ft.	
13. DEPTH DRILLED INTO ROCK: NA	14. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: NA	
15. TOTAL DEPTH OF HOLE: 10.0 Ft.	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): NA	

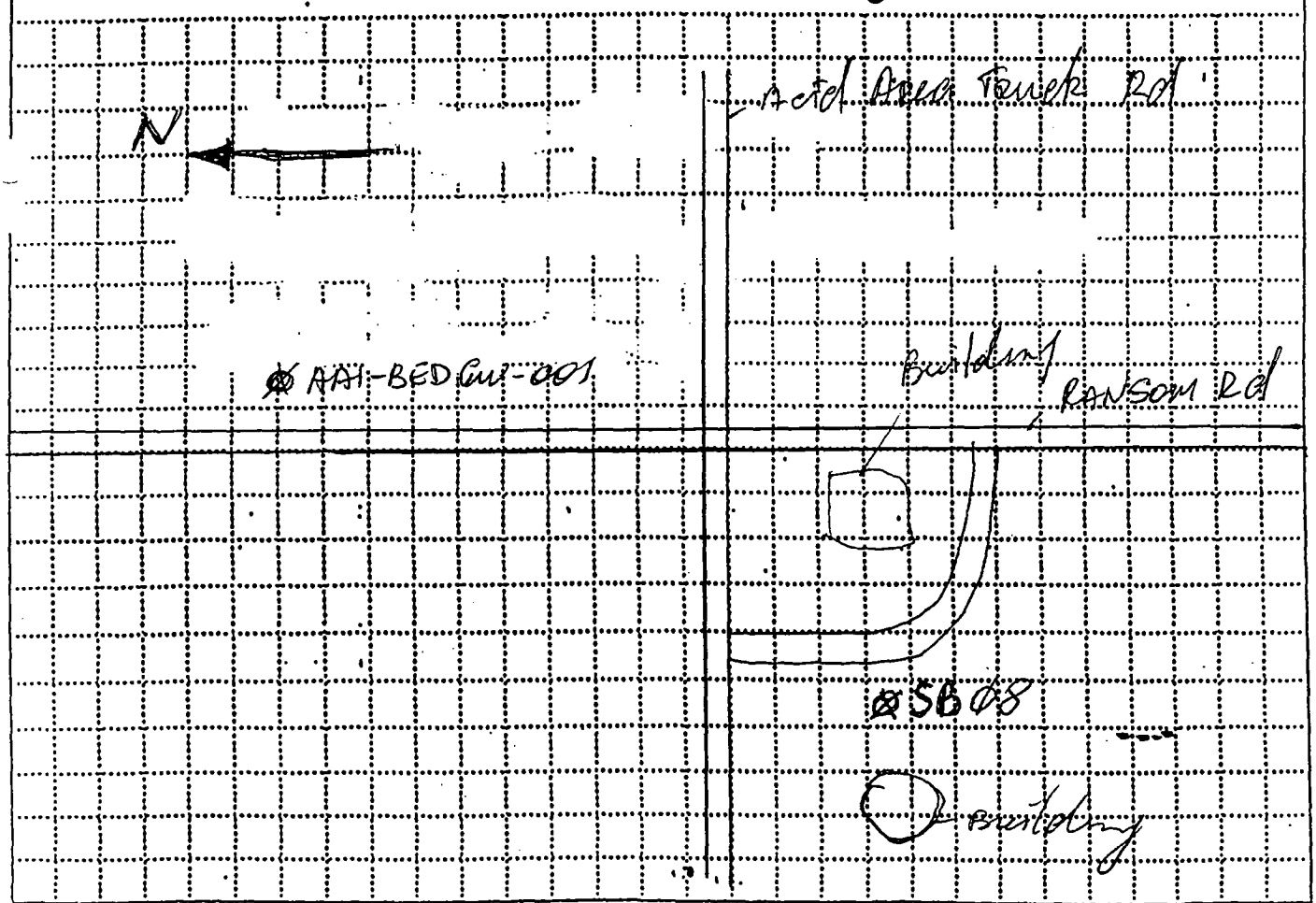
18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
NA			0

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC/SVOC	METALS/PH	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
	2	2	PCB's (1)	Nitrate/Sulfate (2)		NA

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
	X (grout)			John Vogelin

LOCATION SKETCH/COMMENTS

SCALE:



PROJECT: PBOW - Acid Area No. 3 | HOLE NO. SB08

ENG FORM 5056-R, AUG 94 (Proponent: CECW-EG)

HTRW DRILLING LOG (CONTINUATION SHEET)

HOLE NUMBER SB08

PROJECT USCS PBOW- Acid Area 3

INSPECTOR John Vogeding

SHEET 2 OF 2 SHEETS

SYMBOL	DEPTH (b)	DESCRIPTION OF MATERIALS (c)	FIELD SCREENING RESULTS (d)	GEOTECH SAMPLE OR CORE BOX NO. (e)	ANALYTICAL SAMPLE NO. (f)	BLOW COUNT (g)	REMARKS (h)
NA (Fill)		0-0.5' grass + topsoil	(PID)		0.5'	3,23,	
	1	0.5-2.0' Fill (grey-brown, med-coarse, angular gravel, concrete, brick, moist)	0 ppm		6750 1.5'	3,15	
	2	Fill 2-3.5' (grey-brown, med-coarse, angular gravel, moist)	5.0 ppm			14,17,	
	3	3.5'				20,7	
ML	4	3.5'-4.0'. Soft-M. Firm, light-dark brown, black, and grey, v. Fine, Sandy Silt to Clayey Silt, low-med. plasticity, moist	5.0 ppm	NA	4.0	5,5,	
	5	4'-6' Same as Above, moist-wet. grey at 5.5'			6760 6.0'	5,6	
	6	6'-8' Same As Above, grey, moist-wet	4.0 ppm			2,3,	
	7					4,5	
	8	8'-10' Same as Above, grey, wet.	2.5 ppm			2,3,	
	9					3,4	Bottom of Boring at 10.0'
	10						

PROJECT PBOW - Acid Area 3

HOLE NO. SB08

ENG FORM 5056A-R, AUG 94

(Proponent: CECW-EG)

HTRW DRILLING LOG

DISTRICT: Nashville - TN		HOLE NUMBER: SB09
1. COMPANY NAME: I.T. Corp.	2. DRILL SUBCONTRACTOR: Belasco Drilling Services	SHEET 1 OF 2 SHEETS
3. PROJECT: PBOW - Acid Area 3	4. LOCATION: Acid Area 3	
5. NAME OF DRILLER: Scott Guyer	6. MANUFACTURER'S DESIGNATION OF DRILL: CME-450 ATV	
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: 4-Inch Solid Stem Augers with 3" x 24" Split Spoon Sampler	8. HOLE LOCATION: SB09	
	9. SURFACE ELEVATION: NA	
	10. DATE STARTED: 5-2-98	11. DATE COMPLETED: 5-2-98
12. OVERBURDEN THICKNESS: NA	13. DEPTH OF GROUNDWATER ENCOUNTERED: 7.0'	
13. DEPTH DRILLED INTO ROCK: NA	14. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: NA	
15. TOTAL DEPTH OF HOLE: 10.0 Ft.	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): NA	

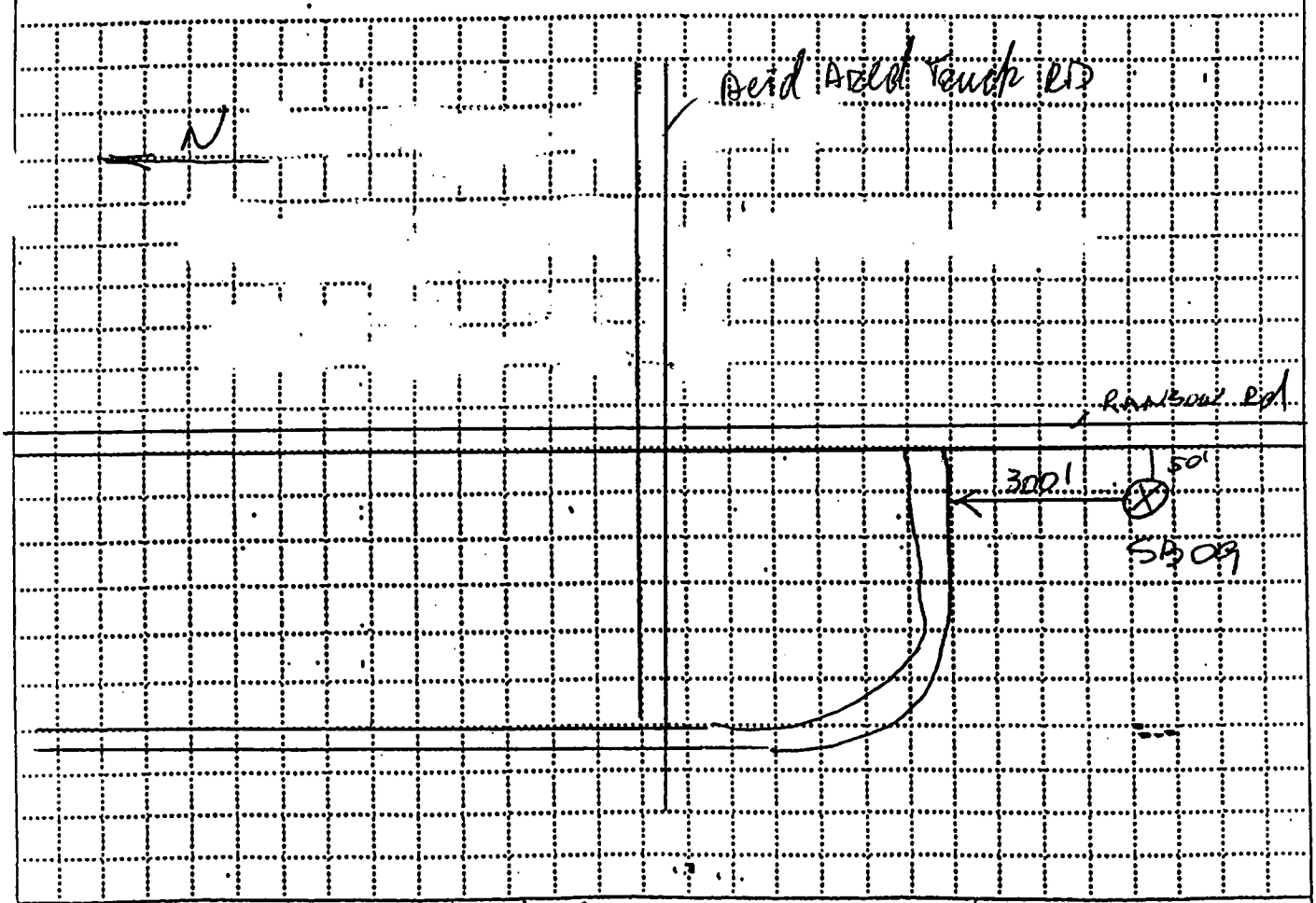
18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
	2		0

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC/SVOC	METALS/PH	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
	2	2	PCB's (1)	Nitrate/Sulfate (2)		NA

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
	X (Grouted)			John Vogeding

LOCATION SKETCH/COMMENTS

SCALE



PROJECT: PBOW - Acid Area No. 3 | HOLE NO. SB09

ENG FORM 5056-R, AUG 94 (Proponent: CECW-EG)

HTRW DRILLING LOG (CONTINUATION SHEET)

HOLE NUMBER: SB09

PROJECT: PBOW- Acid Area 3 | INSPECTOR: John Vogeding | SHEET 2 OF 2 SHEETS

USCS Symbol	DEPTH (b)	DESCRIPTION OF MATERIALS (c)	FIELD SCREENING RESULTS (d)	GEOTECH SAMPLE OR CORE BOX NO. (e)	ANALYTICAL SAMPLE NO. (f)	BLOW COUNT (g)	REMARKS (h)
		0-0.5' grass and Topsoil	(PID)		0.5'	2,2,	
	1	0.5'-2.0' soft-m. Firm, light-dark brown black, and grey, V. Fine Sandy Silt to Clayty Silt, low-mpd. Plasticity, moist	0 ppm	2.0	6770 1.5'	5,5	
	2	2'-4' Same as Above	NA	PBOW-98-SO-AA3 -SB09-Geot -(0204) 4.0'		NA (Shelby Tube)	Pushed Shelby Tube 2'-4' 1.5' Recovery
	4	4'-6' Same as Above	NA	PBOW-98-SO-AA3 -SB09-Geot- (0406) 6.0'		NA (Shelby Tube)	Pushed Shelby Tube 4'-6' 1.0' Recovery
	6	6'-8' Same as Above, grey wet at 7.0'	3.0 ppm		8.0'	7,12, 14,14	
	8	8'-10' Same as Above grey, wet	4.0 ppm		6780 10.0'	4,7, 14,18	Bottom of Boring at 10.0'
	10						

ML

PROJECT: PBOW - Acid Area 3 | HOLE NO. SB09

ENG FORM 5056A-R, AUG 94 (Proponent: CECW-EG)

HTRW DRILLING LOG

DISTRICT: Nashville - TN		HOLE NUMBER: SB10
1. COMPANY NAME: I.T. Corp.	2. DRILL SUBCONTRACTOR: Belasco Drilling Services	SHEET 1 OF 2 SHEETS
3. PROJECT: PBOW - Acid Area 3	4. LOCATION: Acid Area 3	
5. NAME OF DRILLER: Scott Guyer	6. MANUFACTURER'S DESIGNATION OF DRILL: CME-450 ATV	
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: 4-Inch Solid Stem Augers with 3" x 24" Split Spoon Sampler	8. HOLE LOCATION: SB10	
	9. SURFACE ELEVATION: NA	
	10. DATE STARTED: 5-2-98	11. DATE COMPLETED: 5-2-98
12. OVERBURDEN THICKNESS: NA	13. DEPTH GROUNDWATER ENCOUNTERED: 6.0'	
13. DEPTH DRILLED INTO ROCK: NA	14. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: NA	
15. TOTAL DEPTH OF HOLE: 10.0 Ft.	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): NA	

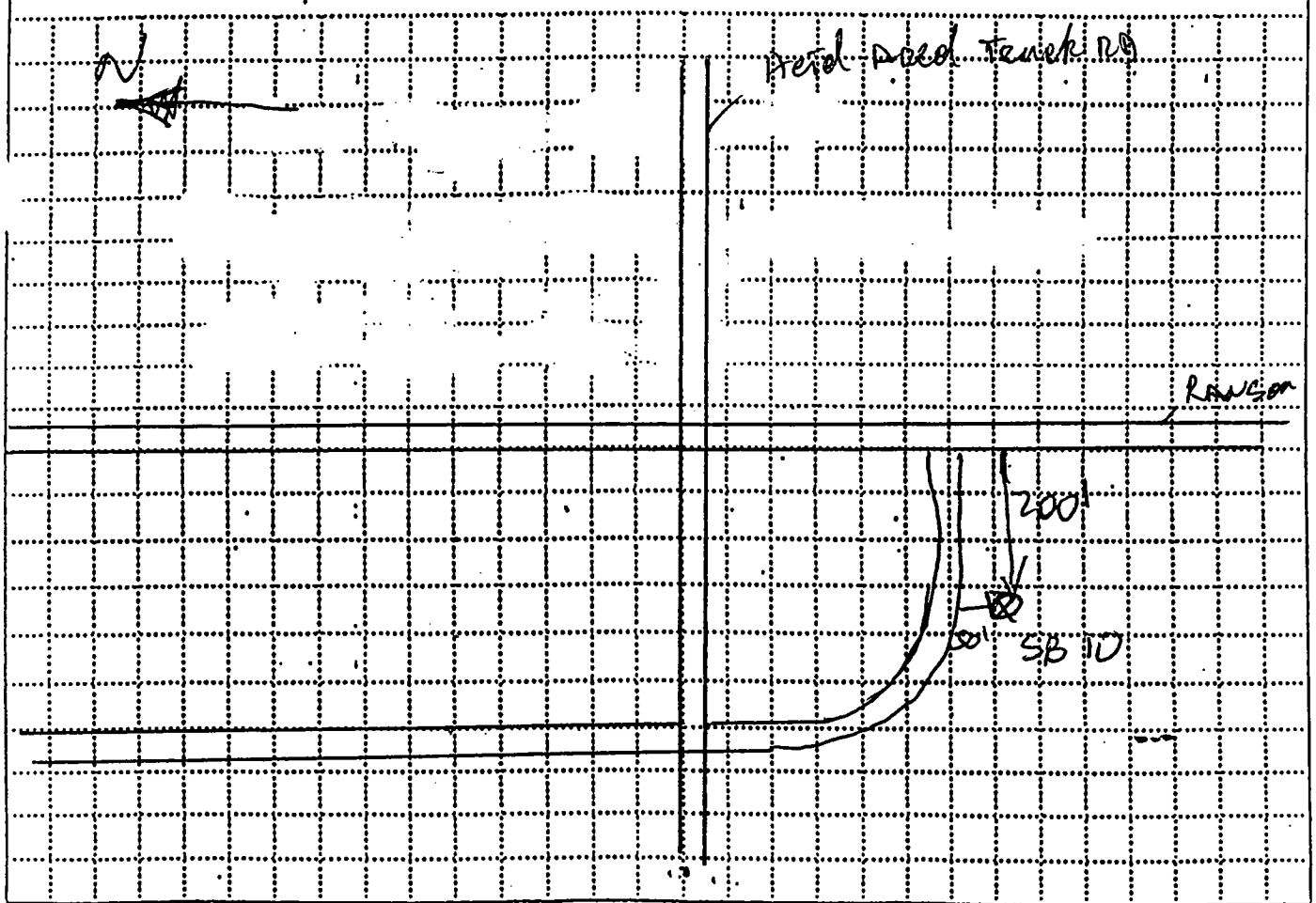
18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
	2		0

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC/SVOC	METALS/PH	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
	2	2	PCB's (1)	Nitrate/Sulfate (2)		NA

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
	X (grouted)			John Vogeding

LOCATION SKETCH/COMMENTS

SCALE:



PROJECT: PBOW - Acid Area No. 3

HOLE NO. SB10

ENG FORM 5056-R, AUG 94

(Proponent: CECW-EG)

HTRW DRILLING LOG (CONTINUATION SHEET)

HOLE NUMBER SB10

PROJECT USCS PBOW- Acid Area 3

INSPECTOR John Vogeding

SHEET 2 OF 2 SHEETS

SYMBOL	DEPTH (a)	DESCRIPTION OF MATERIALS (c)	FIELD SCREENING RESULTS (d)	GEOTECH SAMPLE OR CORE BOX NO. (e)	ANALYTICAL SAMPLE NO. (f)	BLOW COUNT (g)	REMARKS (h)
ML	1	0-0.5' grass and Topsoil 0.5'-2.0' Soft-M. Firm, light-dark brown, black, and grey, V. Fine, Sandy silt, moist	(PID) 0 ppm	2.0'	0.5' 6790 1.5'	3,11, 8,8	
	2 3	2-4' Same as Above	NA	PBOW-98-SO-AA3-SB10-Geot-(0204) 4.0'		NA (Shelby Tube)	Pushed Shelby Tube 2'-4' 2' Recovery
	4 5	4-6' Same as Above	NA	PBOW-98-SO-AA3-SB10-Geot-(0406) 6.0'	6.0'	NA (Shelby Tube)	Pushed Shelby Tube 4-6' 2' Recovery
	6 7	6-8 Same as Above, wet. grey at 7'	ppm		6800 8.0'	6,10, 12,12	Hourmeter Not working due to Rain
	8 9 10	8'-10' Same as Above, wet	ppm			6,11, 13,13	Bottom of Boring at 10.0'

PROJECT PBOW - Acid Area 3

HOLE NO. SB10

ENG FORM 5056A-R, AUG 94

(Proponent: CECW-EG)

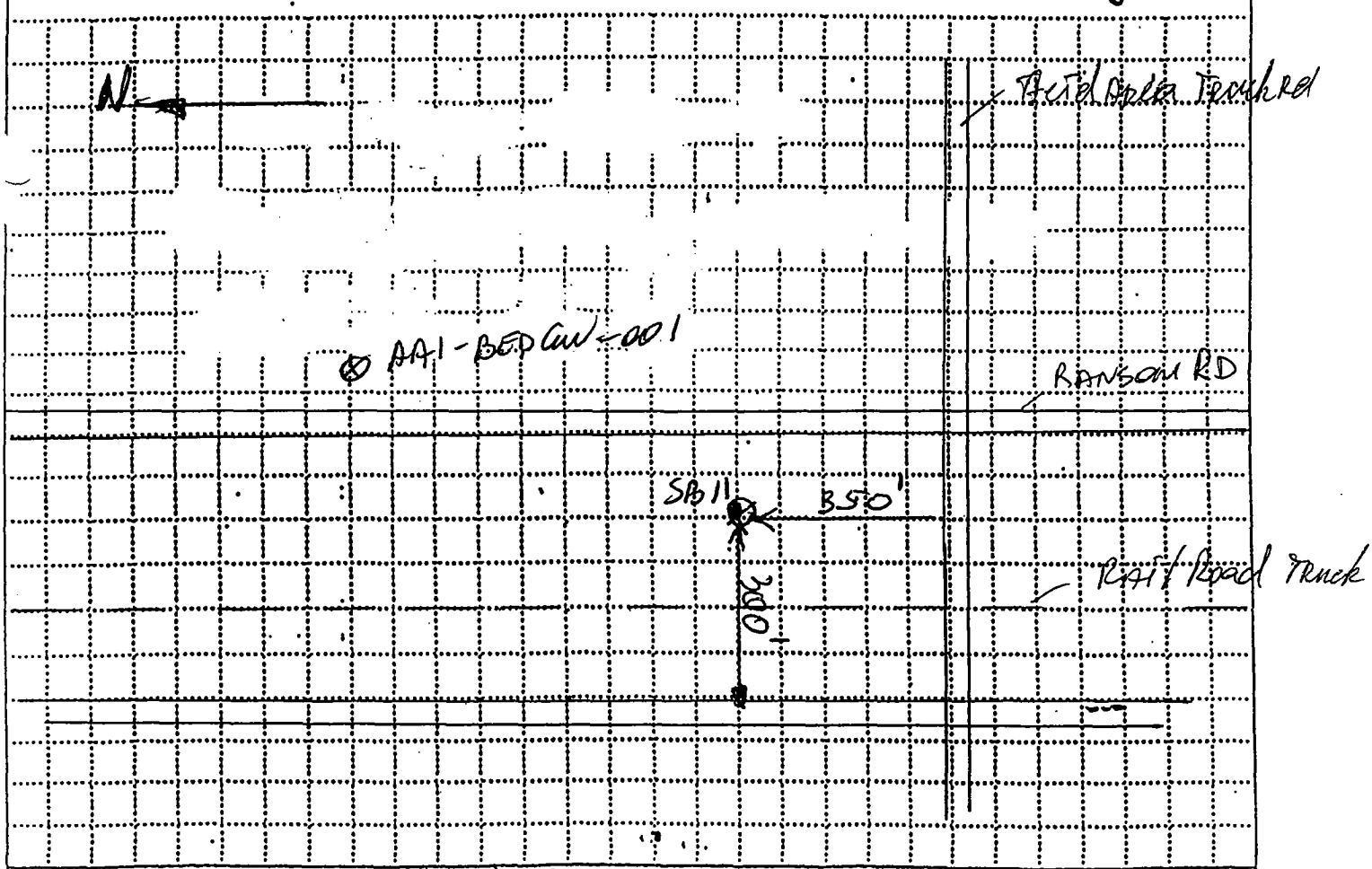
HTRW DRILLING LOG

DISTRICT: Nashville - TN		HOLE NUMBER: SB11
1. COMPANY NAME: I.T. Corp.	2. DRILL SUBCONTRACTOR: Belasco Drilling Services	SHEET 1 OF 2 SHEETS
3. PROJECT: PBOW - Acid Area 3	4. LOCATION: Acid Area 3	
5. NAME OF DRILLER: Scott Guyer	6. MANUFACTURER'S DESIGNATION OF DRILL: CME-450 ATV	
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: 4-Inch Solid Stem Augers with 3" x 24" Split Spoon Sampler	8. HOLE LOCATION: SB11	
	9. SURFACE ELEVATION: NA	
	10. DATE STARTED: 5-1-98	11. DATE COMPLETED: 5-1-98
12. OVERBURDEN THICKNESS: NA	13. DEPTH GROUNDWATER ENCOUNTERED: NA	
13. DEPTH DRILLED INTO ROCK: NA	14. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: NA	
14. TOTAL DEPTH OF HOLE: 10.0 Ft.	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): NA	

18. GEOTECHNICAL SAMPLES: NA	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES: 0				
20. SAMPLES FOR CHEMICAL ANALYSIS	VOC/SVOC	METALS/PH	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY: NA	
	2	2	PCBs (1)	Nitrate/Sulfate (2)			
22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR: John Vogeding			
	X (grout)						

LOCATION SKETCH/COMMENTS

SCALE:



PROJECT: PBOW - Acid Area No. 3 HOLE NO. SB11

ENG FORM 5056-R, AUG 94 (Proponent: CECW-EG)

HTRW DRILLING LOG (CONTINUATION SHEET)

HOLE NUMBER SB11

PROJECT USCS PBOW - Acid Area 3

INSPECTOR John Voytkin

SHEET 2 OF 2 SHEETS

SYMBOL (a)	DEPTH (b)	DESCRIPTION OF MATERIALS (c)	FIELD SCREENING RESULTS (d)	GEOTECH SAMPLE OR CORE BOX NO. (e)	ANALYTICAL SAMPLE NO. (f)	BLOW COUNT (g)	REMARKS (h)
		0-0.5' grass and Topsoil	(PID)		0.5'		
		0.5'-2.0' Loose-m. Dense, Light-dark brown, Fine Silty Sand, moist.	0 ppm		1640 1.5'	1,2, 5,7	
	1						
					2.0'		
SM	2	2'-4' Same as Above.	9.0 ppm		1715 4.0'	6,14, 14,10	
	3						
		4.0'					
	4	4'-6' Soft-m. Stiff, light-dark brown, black, and grey, v. Fine Sandy Silt, moist.	7.0 ppm	NA		6,11, 10,12	
	5						
	6	6'-8' Same as Above.	6.5 ppm			6,7, 11,14	
ML	7						
	8	8'-10' Same as Above grey, v. Fine Sandy Silt to Clayey Silt, med-high Plasticity, moist	3.5 ppm			6,7, 11,10	Bottom of Boring at 10.0'
	9						
	10						

PROJECT PBOW - Acid Area 3

HOLE NO. SB11

ENG FORM 5056A-R, AUG 94

(Proponent: CECW-EG)

HTRW DRILLING LOG

DISTRICT: Nashville - TN		HOLE NUMBER: SB12
1. COMPANY NAME: I.T. Corp.	2. DRILL SUBCONTRACTOR: Belasco Drilling Services	SHEET 1 OF SHEETS 2
3. PROJECT: PBOW - Acid Area 3	4. LOCATION: Acid Area 3	
5. NAME OF DRILLER: Scott Guyer	6. MANUFACTURER'S DESIGNATION OF DRILL: CME-450 ATV	
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: 4-Inch Solid Stem Augers With 3" x 24" Split Spoon Sampler	8. HOLE LOCATION: SB12	
	9. SURFACE ELEVATION: NA	
	10. DATE STARTED: 5-1-98	11. DATE COMPLETED: 5-1-98
12. OVERBURDEN THICKNESS: NA	13. DEPTH GROUNDWATER ENCOUNTERED: 9.0 Ft.	
13. DEPTH DRILLED INTO ROCK: NA	14. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: NA	
15. TOTAL DEPTH OF HOLE: 10.0 Ft.	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): NA	

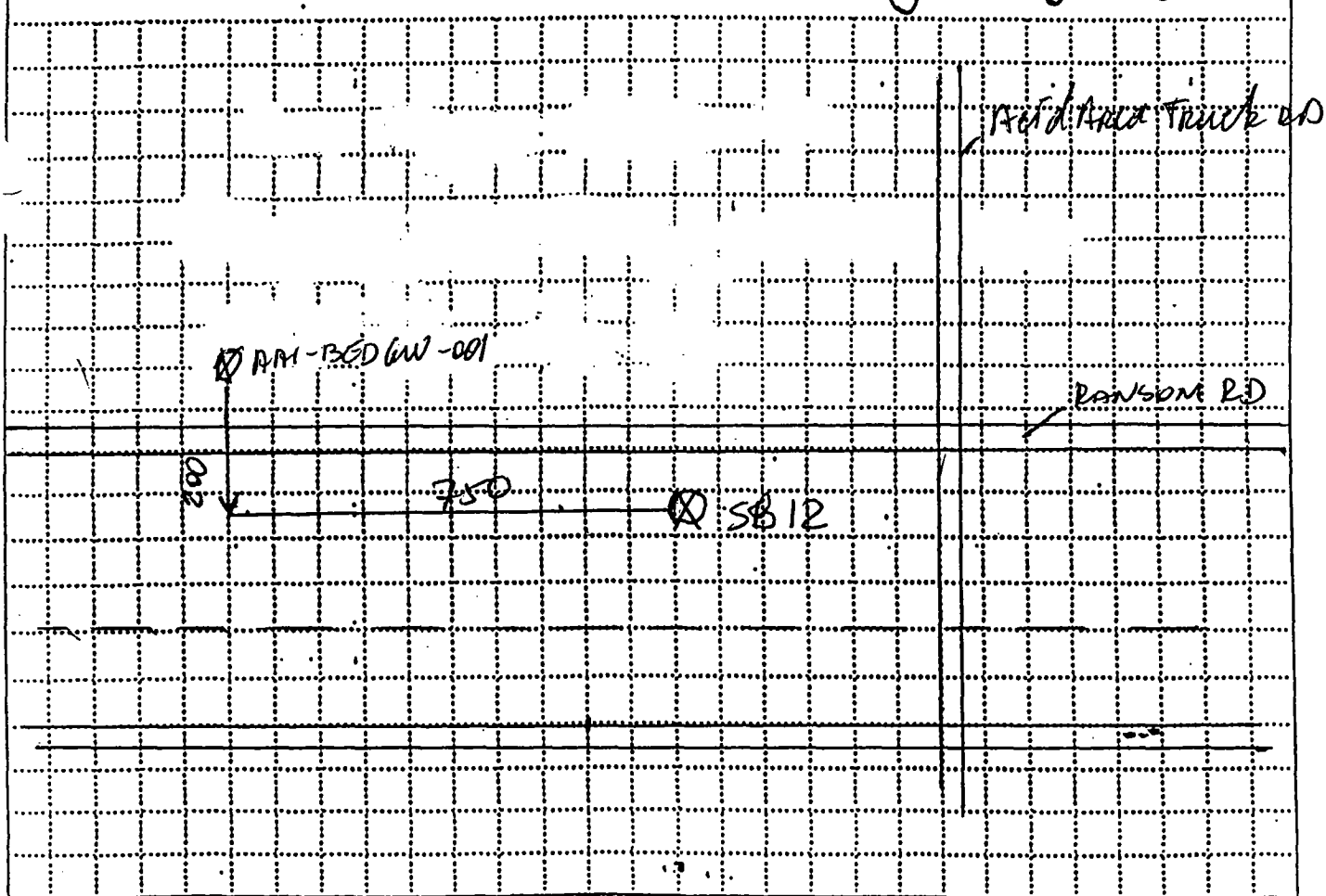
18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
NA			0

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC/SVOC	METALS/PH	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
	2	2	PCB's (1)	Nitrate/Sulfate (2)		NA

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
	X (Drilled)			John Vongding

LOCATION SKETCH/COMMENTS

SCALE:



PROJECT	HOLE NO.
PBOW - Acid Area No. 3	SB12

ENG FORM 5056-R, AUG 94

(Proponent: CECW-EG)

HTRW DRILLING LOG (CONTINUATION SHEET)

HOLE NUMBER SB 12

PROJECT SCS PBOW- Acid Area 3

INSPECTOR John Vogeding

SHEET 2 OF 2 SHEETS

SYMBOL (a)	DEPTH (b)	DESCRIPTION OF MATERIALS (c)	FIELD SCREENING RESULTS (d)	GEOTECH SAMPLE OR CORE BOX NO. (e)	ANALYTICAL SAMPLE NO. (f)	BLOW COUNT (g)	REMARKS (h)
gM		0'-0.5' grass and Topsoil 0.5'-1.0' grey Angular gravel	(PID)		0.5'	7,4,	
	1	1.0-2.0 Soft-m. Firm, light-dark brown, black, and grey, v. Fine Sandy Silt, moist	0ppm		6830 1.5'	6,11	
	2	2'-4' Same as Above			2.0'		
	3		NA		6840	4,8, 10,10	Hnu Meter Not Functioning Properly due to excessive Atmospheric moisture.
	4	4'-6' Same as Above			4.0'		
ml	5		NA	NA		6,10, 10,12	
	6	6'-8' Same as Above					
	7		NA			9,10, 14,15	
	8	8'-10' Same as Above grey at 8.5'				5,7,	
	9	wet at 9.0'	NA			11,14	
	10						Bottom of Boring at 10.0'

PROJECT PBOW - Acid Area 3 HOLE NO. SB 12

ENG FORM 5056A-R, AUG 94 (Proponent: CECW-EG)

HTRW DRILLING LOG

DISTRICT: Nashville - TN		HOLE NUMBER: SB13
1. COMPANY NAME: I.T. Corp.	2. DRILL SUBCONTRACTOR: Belasco Drilling Services	SHEET 1 OF 2 SHEETS
3. PROJECT: PBOW - Acid Area 3	4. LOCATION: Acid Area 3	
5. NAME OF DRILLER: Scott Guyer	6. MANUFACTURER'S DESIGNATION OF DRILL: CME-450 ATV	
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: 4-Inch Solid Stem Augers With 3" x 24" Split Spoon Sampler	8. HOLE LOCATION: SB13	
	9. SURFACE ELEVATION: NA	
	10. DATE STARTED: 5-1-98	11. DATE COMPLETED: 5-1-98
12. OVERBURDEN THICKNESS: NA	13. DEPTH GROUNDWATER ENCOUNTERED: 5.5 Ft.	
13. DEPTH DRILLED INTO ROCK: NA	14. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: NA	
15. TOTAL DEPTH OF HOLE: 10.0 Ft.	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): NA	

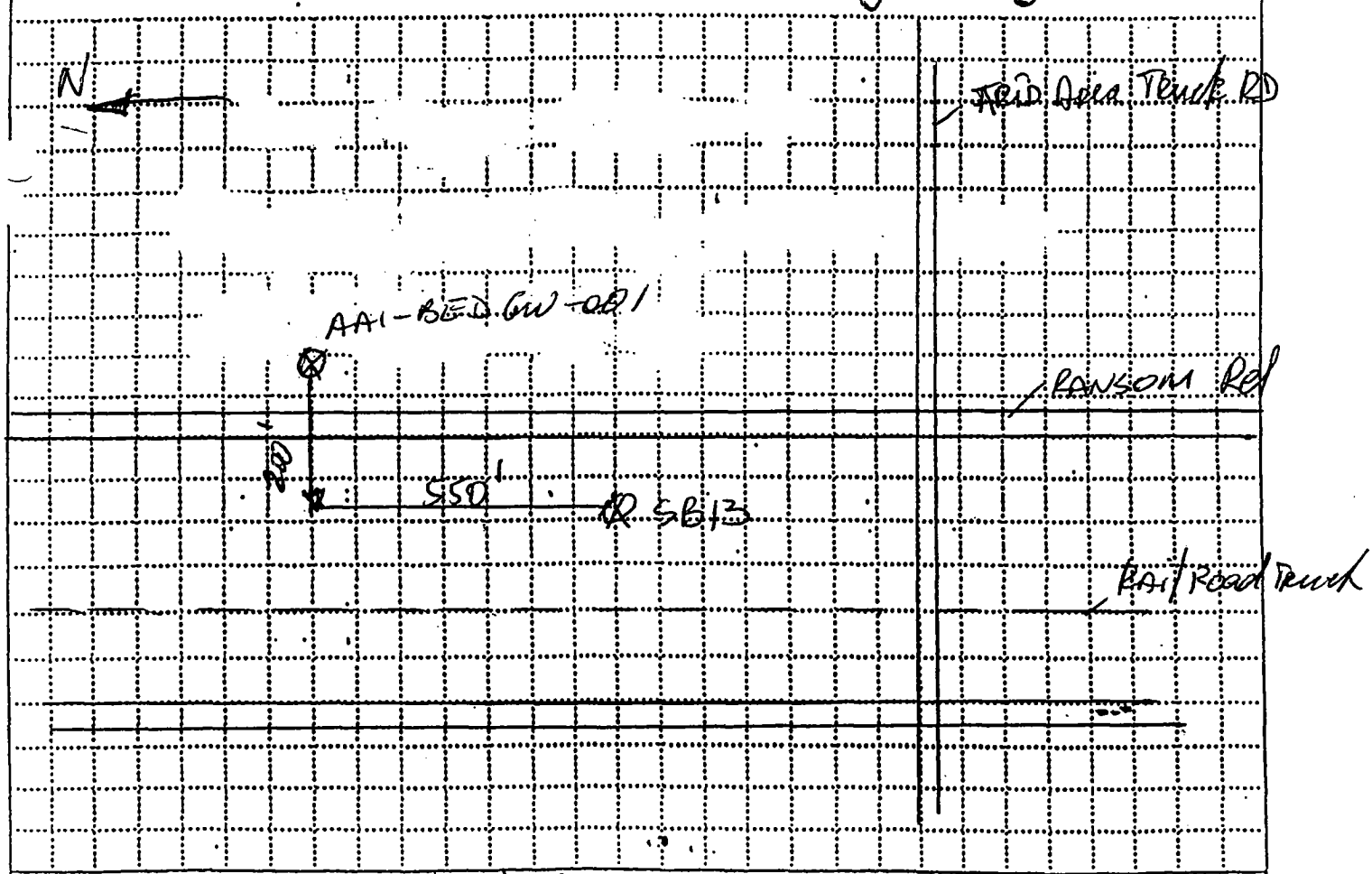
18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
NA			0

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC/SVOC	METALS/PH	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
	2	2	PCB's (1)	Nitrate/Sulfate (2)		NA

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
	X (grout)			John Vaughn

LOCATION SKETCH/COMMENTS

SCALE:



PROJECT: PBOW - Acid Area No. 3

HOLE NO. SB13

ENG FORM 5056-R, AUG 94

(Proponent: CECW-EG)

HTRW DRILLING LOG (CONTINUATION SHEET)

HOLE NUMBER SB13

PROJECT SCS PBOW- Acid Area 3 | INSPECTOR John Vogeding | SHEET 2 OF 2 SHEETS

Symbol	Depth (b)	Description of Materials (c)	Field Screening Results (d)	Geotech Sample or Core Box No. (e)	Analytical Sample No. (f)	Blow Count (g)	Remarks (h)
		0-0.5' grass and Topsoil	(PID)		0.5'	2,3,	
		0.5'-2.0' Soft-m. Firm, light-dark brown, black, and grey, v. Fine Sandy Silt to Clayey Silt, low-med. plasticity, moist	NA		6850 1.5'	6,7	How meter Not Functioning properly due to excessive atmospheric moisture
	1						
	2	2'-4' Sandy Silt as Above	NA			8,12, 12,12	
	3						
	4	4'-6' Sandy Silt as Above	NA	NA		3,3, 4,4	
Mil	5	wet at 5.5'					
	6	6'-8' Same as Above, wet	NA		8.0'	2,2, 4,2	
	7						
	8	8'-10' Same as above, wet	NA		6860	1,1, 2,3	
	9	grey at 9.0'					Bottom of Boring at 10.0'
	10				10.0'		

PROJECT PBOW - Acid Area 3 | HOLE NO. SB13

ENG FORM 5056A-R, AUG 94 (Proponent: CECW-EG)

HTRW DRILLING LOG

DISTRICT: Nashville - TN		HOLE NUMBER: SB14
1. COMPANY NAME: I.T. Corp.	2. DRILL SUBCONTRACTOR: Belasco Drilling Services	SHEET 1 OF 2 SHEETS
3. PROJECT: PBOW - Acid Area 3	4. LOCATION: Acid Area 3	
5. NAME OF DRILLER: Scott Guyer	6. MANUFACTURER'S DESIGNATION OF DRILL: CME-450 ATV	
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: 4-Inch Solid Stem Augers with 3" x 24" Split Spoon Sampler	8. HOLE LOCATION: SB14	
	9. SURFACE ELEVATION: NA	
	10. DATE STARTED: 5-1-98	11. DATE COMPLETED: 5-1-98
12. OVERBURDEN THICKNESS: NA	13. DEPTH GROUNDWATER ENCOUNTERED: 5.0 Ft.	
13. DEPTH DRILLED INTO ROCK: NA	14. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: NA	
15. TOTAL DEPTH OF HOLE: 10.0 Ft.	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): NA	

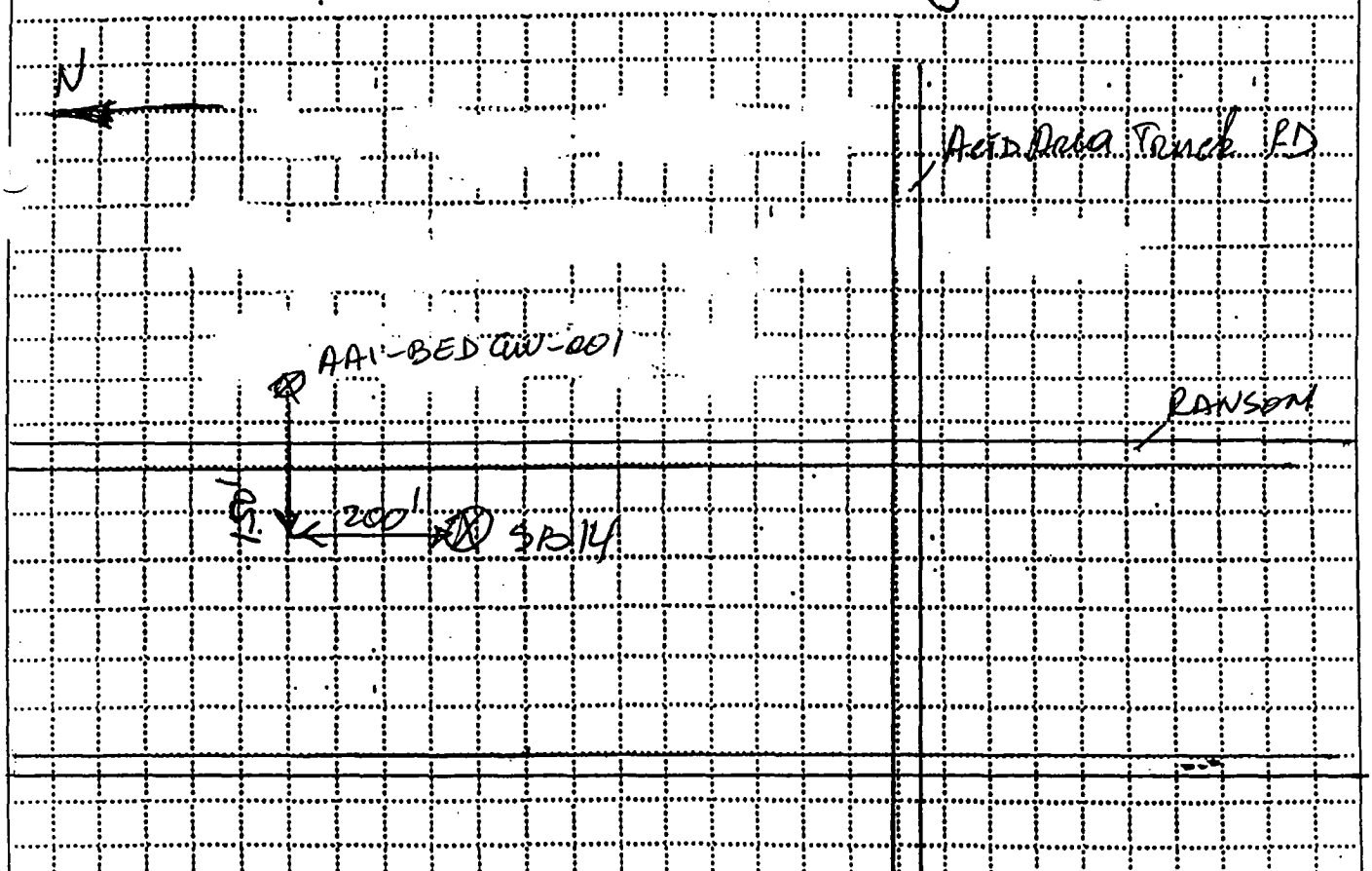
18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
NA			0

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC/SVOC	METALS/PH	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
	2	2	PCB's (1)	Nitrate/Sulfate (2)		NA

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
	X (GROUT)			John Vogelin

LOCATION SKETCH/COMMENTS

SCALE:



PROJECT	HOLE NO.
PBOW - Acid Area No. 3	SB14

ENG FORM 5056-R, AUG 94

(Proponent: CECW-EG)

HTRW DRILLING LOG (CONTINUATION SHEET)

HOLE NUMBER SB14

PROJECT USCS PBOW- Acid Area 3 | INSPECTOR John Vogeding | SHEET 2 OF 2 SHEETS

SYMBOL (a)	DEPTH (b)	DESCRIPTION OF MATERIALS (c)	FIELD SCREENING RESULTS (d)	GEOTECH SAMPLE OR CORE BOX NO. (e)	ANALYTICAL SAMPLE NO. (f)	BLOW COUNT (g)	REMARKS (h)
ML	1	0-0.5' grass and Topsoil 0.5'-2.0' Soft-m.Firm, light-dark brown, black, and grey, v.Fine Sandy Silt, moist	(PID) 0 ppm		0.5' 6870 1.5' 2.0'	3,3, 6,7	
ML	2 3	2'-4' Same as above, v.Fine Sandy Silt to Clayey Silt, low-med. plasticity, moist	6.5 ppm		6880 4.0'	4,7, 7,10	
	4 5	4'-5' Same as Above, moist. 5.0'	5.0 ppm	NA		8,9, 9,14	
SM	6	5'-6' m.Dense, light brown, v.Fine, Silty Sand, wet 6'-7' Same as Above, wet 7.0'	5.5 ppm			6,8, 10,10	
ML	7 8 9 10	7'-8' Soft-m.Firm, light-dark brown, v.Fine, Sandy Silt, wet 8'-10' Same as Above, grey at 9.0'	4.0 ppm			4,7, 7,9	Bottom of Boring at 10.0'

PROJECT PBOW - Acid Area 3 | HOLE NO. SB14

ENG FORM 5056A-R, AUG 94 (Proponent: CECW-EG)

HTRW DRILLING LOG

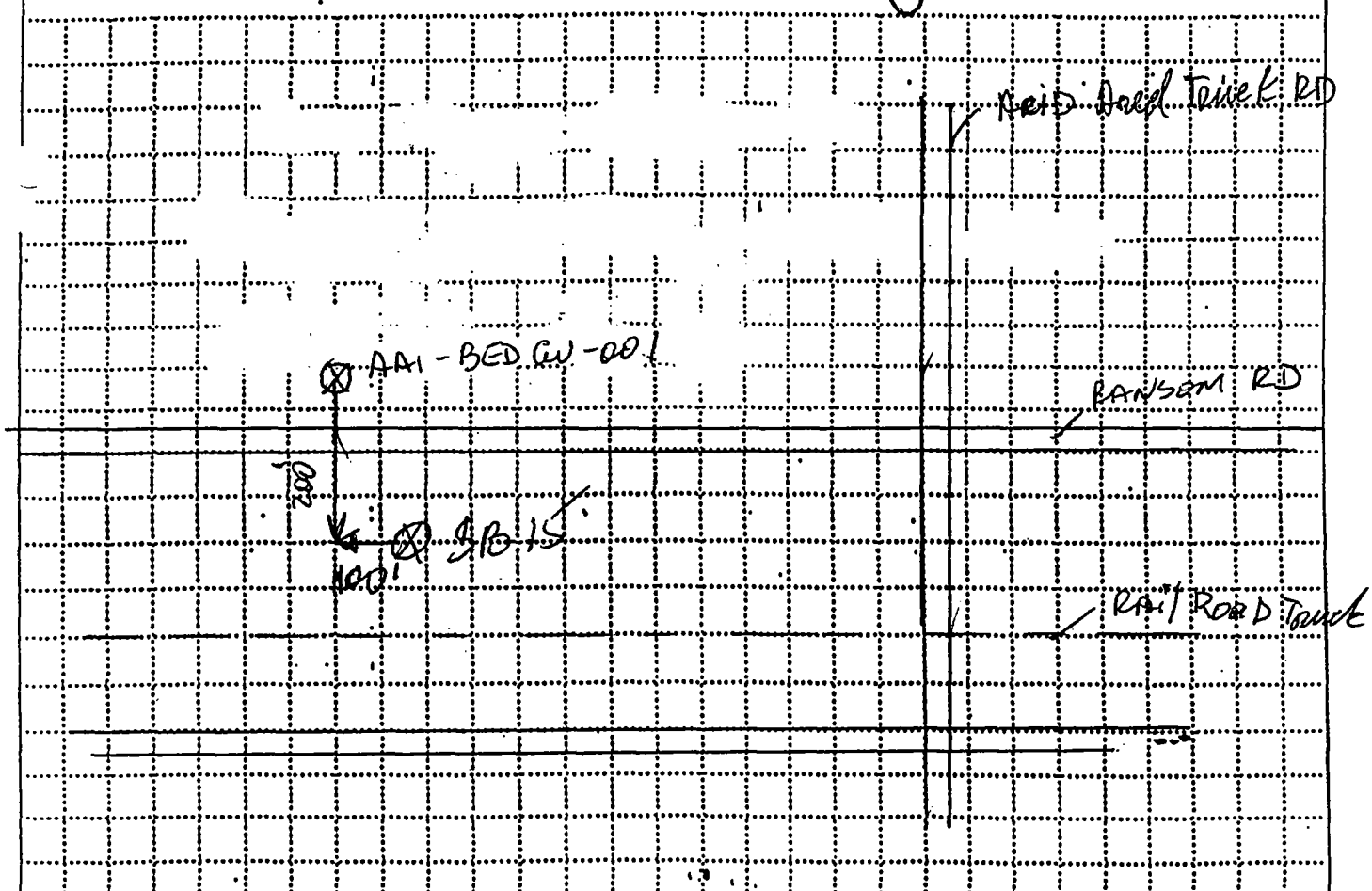
DISTRICT: Nashville - TN		HOLE NUMBER: SB15
1. COMPANY NAME: I.T. Corp.	2. DRILL SUBCONTRACTOR: Belasco Drilling Services	SHEET 1 OF 2 SHEETS
3. PROJECT: PBOW - Acid Area 3	4. LOCATION: Acid Area 3	
5. NAME OF DRILLER: Scott Guyer	6. MANUFACTURER'S DESIGNATION OF DRILL: CME-450 ATV	
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: 4-Inch Solid Stem Augers with 3" x 24" Split Spoon Sampler	8. HOLE LOCATION: SB15	
	9. SURFACE ELEVATION: NA	
	10. DATE STARTED: 5-1-98	11. DATE COMPLETED: 5-1-98
12. OVERBURDEN THICKNESS: NA	13. DEPTH GROUNDWATER ENCOUNTERED: 4.5 Ft.	
13. DEPTH DRILLED INTO ROCK: NA	14. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: NA	
15. TOTAL DEPTH OF HOLE: 10.0 Ft.	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): NA	

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
NA			0

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC/SVOC	METALS/PH	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
	2	2	PCB's (1)	Nitrate/Sulfate (2)		NA

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
	X (grout)			John Vogel

LOCATION SKETCH/COMMENTS SCALE:



PROJECT: PBOW - Acid Area No. 3 HOLE NO. SB15

ENG FORM 5056-R, AUG 94 (Proponent: CECW-EG)

HTRW DRILLING LOG (CONTINUATION SHEET)

HOLE NUMBER SB15

PROJECT SCS PBOW- Acid Area 3 | INSPECTOR John Vogeding | SHEET 2 OF 2 SHEETS

SYMBOL (a)	DEPTH (b)	DESCRIPTION OF MATERIALS (c)	FIELD SCREENING RESULTS (d)	GEOTECH SAMPLE OR CORE BOX NO. (e)	ANALYTICAL SAMPLE NO. (f)	BLOW COUNT (g)	REMARKS (h)
ML	1	0-0.5' grass and Topsoil 0.5'-2.0' Soft-m. Firm, light-dark brown, black, and grey, v. Fine Sandy Silt to Clayey silt, low-med. Plasticity, Slightly mottled, moist	(PID) NA		0.5' 6890 1.5'	1,3, 4,7	Hnu meter Not Functioning properly due to excessive atmospheric moisture.
	2	2'-4' Same as Above.	NA			4,5, 7,8	
	3						
	4	4'-4.5' Same as Above 4.5'	NA			5,5,	
SM	5	4.5'-6.0' Loose-m. dense, light-Red brown, Fine Silty Sand, wet		NA		8,14	
	6	6'-7.5' Same as Above, wet.	NA		6.0' 6900	7,8,	
	7	7.5'				13,15	
ML	8	7.5'-8.0' v. Fine Sandy Silt, As Above 8'-10' Same as Above, wet			8.0'	2,3,	
	9	grey at 9.0'	NA			5,7	
	10						Bottom of Boring at 10.0'

PROJECT PBOW - Acid Area 3 | HOLE NO. SB15

ENG FORM 5056A-R, AUG 94 (Proponent: CECW-EG)

HTRW DRILLING LOG

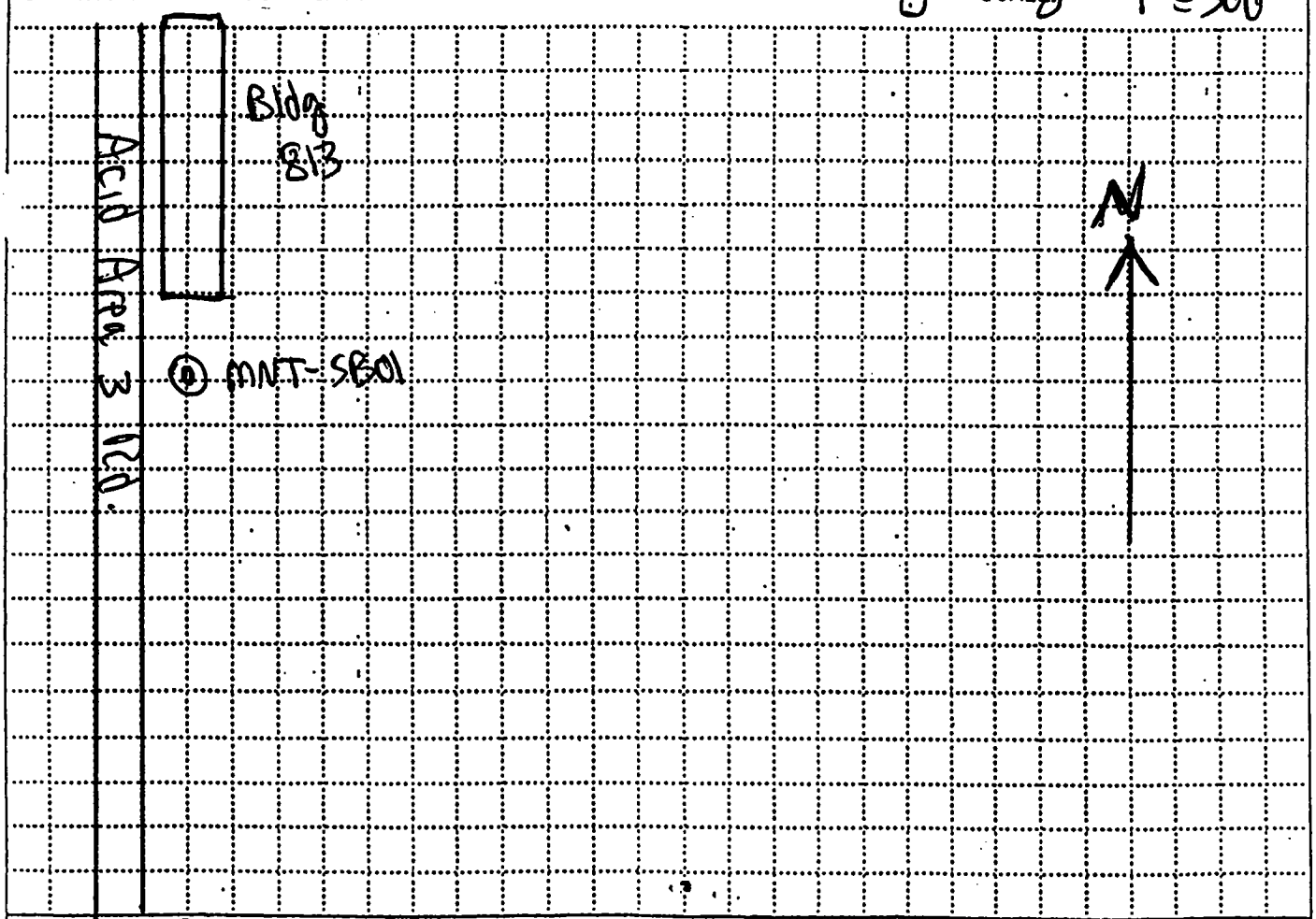
DISTRICT Nashville - TN		HOLE NUMBER MNT-SB01
1. COMPANY NAME I.T. Corp.	2. DRILL SUBCONTRACTOR Belasco Drilling Services	SHEET 1 OF SHEETS 2
3. PROJECT PBOW - Maintainence Shop	4. LOCATION Maintainance Shop Area	
5. NAME OF DRILLER Scott Guyer	6. MANUFACTURER'S DESIGNATION OF DRILL CME 450 ATV	
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT 4" Solid Stem Augers with 3" x 24" Split Spoon Sampler	8. HOLE LOCATION MNT-SB01	
	9. SURFACE ELEVATION NA	
	10. DATE STARTED 5-3-98	11. DATE COMPLETED 5-3-98
12. OVERBURDEN THICKNESS NA	13. DEPTH GROUNDWATER ENCOUNTERED 6.0 Ft.	
13. DEPTH DRILLED INTO ROCK NA	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED NA	
14. TOTAL DEPTH OF HOLE 10.0 Ft	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY) NA	

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
NA			0

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC/SVOC	METALS / PH	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
	2	2	PCBs (1)			NA

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
	Grouted			John Vagedes

LOCATION SKETCH/COMMENTS SCALE: 1" = 300'



PROJECT PBOW - Maintainence Shop Area HOLE NO. MNT-SB01

ENG FORM 5056-R, AUG 94 (Proponent: CECW-EG)

HTRW DRILLING LOG (CONTINUATION SHEET)

HOLE NUMBER: SB01

PROJECT: USCS PBOW - Maint. Shop Area

INSPECTOR: John Vogeding

SHEET 2 OF 2 SHEETS

~~ELEV.~~ SYMBOL (a)	DEPTH (b)	DESCRIPTION OF MATERIALS (c)	FIELD SCREENING RESULTS (d)	GEOTECH SAMPLE OR CORE BOX NO. (e)	ANALYTICAL SAMPLE NO. (f)	BLOW COUNT (g)	REMARKS (h)
SM	1	0-0.5' grass and Topsoil 0.5'-2.0' m. Dense, Light-dark brown, v. Fine Silty Sand, moist 2.0'	(PID)		0.5' 6910 1.5'	2,5, 7,7	(a) 142'
ML	2 3	2'-4' Soft-m. Firm, light-dark brown, black, and Grey, v. Fine Sandy Silt, 20% organic material, moist	4.5 PPm		4.0	3,5, 8,14	
	4 5	4'-6' Same as Above, v. Fine Sandy Silt to Clayey Silt, low-Med. Plasticity, Slightly mottled, moist	5.0 PPm	NA	6920 6.0'	2,5, 7,8	(b) 145
	6 7	6'-8' Same as Above, v. Fine, Sandy Silt, wet	1.5 PPm			3,3, 5,7	
	8 9 10	Same as Above, wet.	2.0 PPm				Bottom of Boring at 10.0'

PROJECT: PBOW - Maintainence Shop Area

HOLE NO. SB01

ENG FORM 5056A-R, AUG 94

(Proponent: CECW-EG)

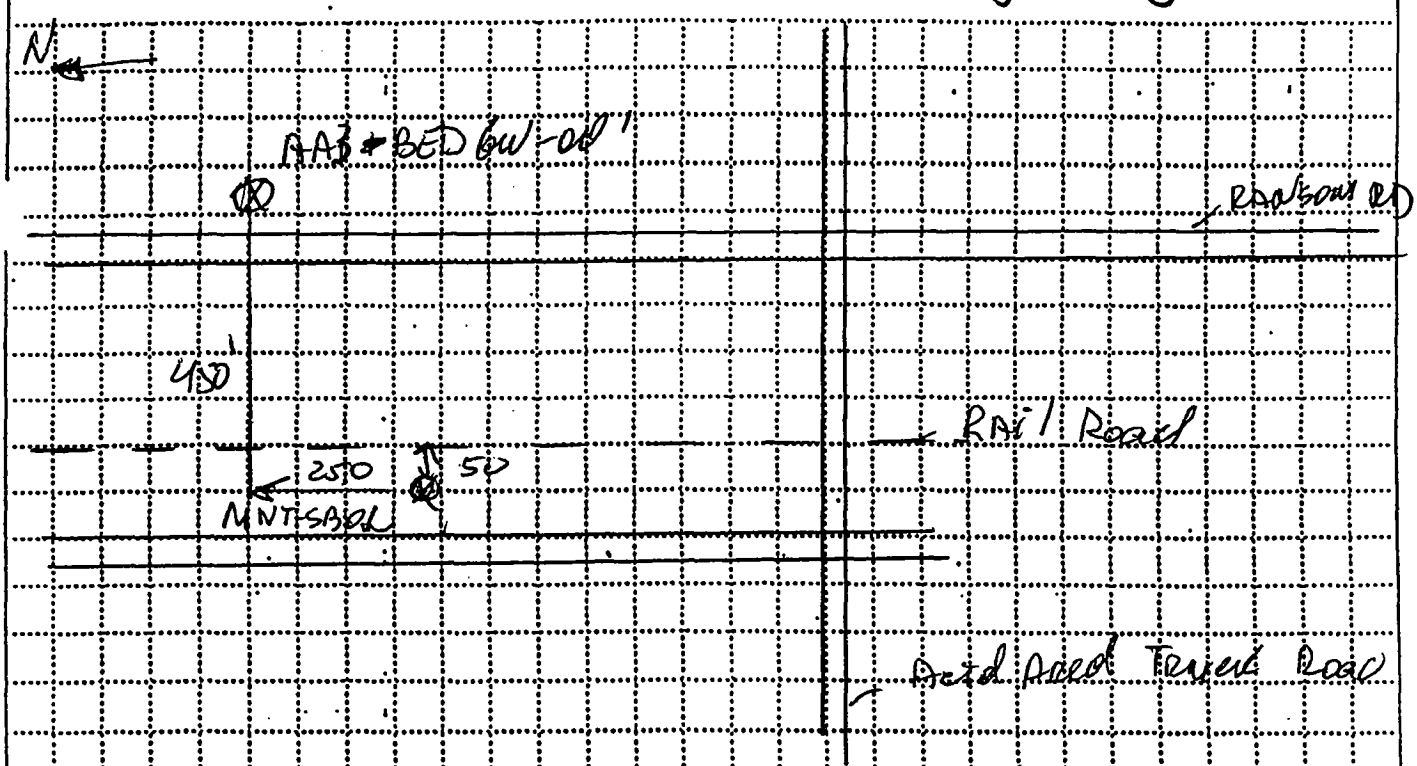
HTRW DRILLING LOG

DISTRICT	Nashville - TN
HOLE NUMBER	MNT-SB02
1. COMPANY NAME	I.T. Corp.
2. DRILL SUBCONTRACTOR	Belasco Drilling Services
SHEET / SHEETS	1 of 2
3. PROJECT	PBOW - Maintainence Shop
4. LOCATION	Maintainence Shop Area
5. NAME OF DRILLER	Scott Guyer
6. MANUFACTURER'S DESIGNATION OF DRILL	CME 450 ATV
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT	4" Solid Stem Augers with 3" x 24" Split Spoon Sampler
8. HOLE LOCATION	MNT-SB02
9. SURFACE ELEVATION	NA
10. DATE STARTED	5-2-98
11. DATE COMPLETED	5-2-98
12. OVERBURDEN THICKNESS	NA
13. DEPTH GROUNDWATER ENCOUNTERED	8.0'
13. DEPTH DRILLED INTO ROCK	NA
14. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED	NA
14. TOTAL DEPTH OF HOLE	10.0 Ft
17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY)	NA
18. GEOTECHNICAL SAMPLES	NA
DISTURBED	
UNDISTURBED	
19. TOTAL NUMBER OF CORE BOXES	0

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC/SVOCS	METALS / pH	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
	2	2	PCB's (1)			NA

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
	Grouted			John Vergoth

LOCATION SKETCH/COMMENTS SCALE:



PROJECT PBOW - Maintainence Shop Area HOLE NO. MNT-SB02

ENG FORM 5056-R, AUG 94 (Proponent: CECW-EG)

HTRW DRILLING LOG (CONTINUATION SHEET)

MNF

HOLE NUMBER: SB02

PROJECT: USCS PBOW - Maintenance Shop

INSPECTOR: John Voegeding

SHEET 2 OF 2 SHEETS

SYMBOL (a)	DEPTH (b)	DESCRIPTION OF MATERIALS (c)	FIELD SCREENING RESULTS (d)	GEOTECH SAMPLE OR CORE BOX NO. (e)	ANALYTICAL SAMPLE NO. (f)	BLOW COUNT (g)	REMARKS (h)
ML	1	0-0.5' grass and Topsoil 0.5'-2.0' Soft-m. Firm, light-dark brown, v. Fine Sandy Silt to clayey Silt, low-med. Plasticity, moist	(PID) 0 ppm	NA	0.5' 6930 1.5' 2.0'	2,5, 8,5	Few S.S. Fragments from 1.0'-2.0'
	2 3	2'-4' Same as Above, light-dark brown, black and grey, slightly mottled, moist	4.0 ppm		6940 4.0'	4,7, 8,9	
	4 5	4-6 NA - No Recovery	NA			4,5, 7,9	
	6 7	6'-8' - Same as Above, moist-wet.	3.0 ppm			5,7, 8,9	
SM	8 9	8'-10' Same as above with Fine Sand lens from 8'-9', wet grey at 9'	2.0 ppm		9'	6,7, 9,9	
ML	10						Bottom of Boring at 10.0'

PROJECT: PBOW - Maintainence Shop Area

HOLE NO. MNF SB02

ENG FORM 5056A-R, AUG 94

(Proponent: CECW-EG)

HTRW DRILLING LOG

DISTRICT: Nashville - TN MNT-		HOLE NUMBER: SB03
1. COMPANY NAME: I.T. Corp.	2. DRILL SUBCONTRACTOR: Belasco Drilling Services	SHEET 1 OF 2 SHEETS
3. PROJECT: PBOW - Maintainence Shop	4. LOCATION: Maintainance Shop Area	
5. NAME OF DRILLER: Scott Guyer	6. MANUFACTURER'S DESIGNATION OF DRILL: CME 450 ATV	
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: 4" Solid Stem Augers with 3" x 24" Split Spoon Sampler	8. HOLE LOCATION: MNT-SB03	
	9. SURFACE ELEVATION: NA	
	10. DATE STARTED: 5-2-98	11. DATE COMPLETED: 5-2-98
12. OVERBURDEN THICKNESS: NA	15. DEPTH GROUNDWATER ENCOUNTERED: 7.0'	
13. DEPTH DRILLED INTO ROCK: NA	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: NA	
14. TOTAL DEPTH OF HOLE: 10.0 Ft	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): NA	

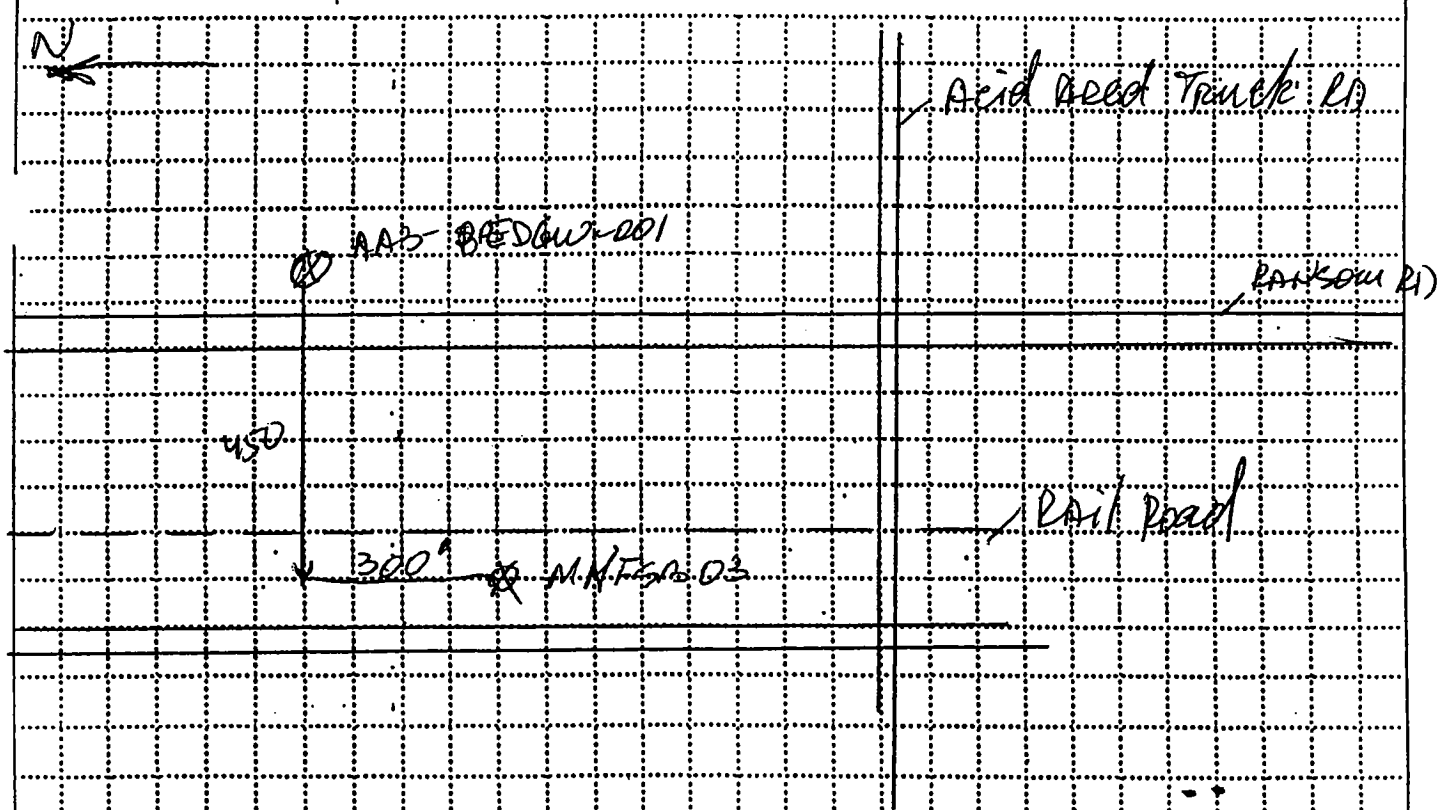
18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
NA			0

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC/SVOCS	METALS / pH	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
	2	2	PCB's (1)			NA

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
	Grouted			John Vaughn

LOCATION SKETCH/COMMENTS

SCALE:



PROJECT: PBOW - Maintainance Shop Area | HOLE NO. MNT-SB03

ENG FORM 5056-R, AUG 94 (Proponent: CECW-EG)

HTRW DRILLING LOG (CONTINUATION SHEET)

HOLE NUMBER: MNT-SB03

PROJECT: USCS PBOW- Maintainance Shop

INSPECTOR: John Vogedin

SHEET 2 OF 2 SHEETS

~~ELEV~~ SYMBOL (a)	DEPTH (b)	DESCRIPTION OF MATERIALS (c)	FIELD SCREENING RESULTS (d)	GEOTECH SAMPLE OR CORE BOX NO. (e)	ANALYTICAL SAMPLE NO. (f)	BLOW COUNT (g)	REMARKS (h)
ML	1	0-0.5' grass and Topsoil 0.5'-2.0' Soft-m. Firm, light-dark brown, black and grey, v. Fine Sandy Silt to Clayey Silt, low-med Plasticity, slightly mottled with Fe Stains, moist	(PID) 0 ppm	NA	0.5' 6950 1.5'	1,4, 6,6	
	2	2'-4' Same as Above.	4.0 ppm			4,6, 7,8	
	4	4'-6' Same as Above	3.0 ppm		6.0'	3,5, 6,8	
	6	6'-8' Same as Above grey at 7.0' and wet	4.0 ppm		6960 8.0'	4,5, 7,9	
	8	8'-10' Same as Above, grey, wet.	3.0 ppm			4,7, 13,14	Bottom of Boring at 10.0'
	10						

PROJECT: PBOW- Maintainence Shop Area

HOLE NO. MNT-SB03

ENG FORM 5056A-R, AUG 94

(Proponent: CECW-EG)

HTRW DRILLING LOG

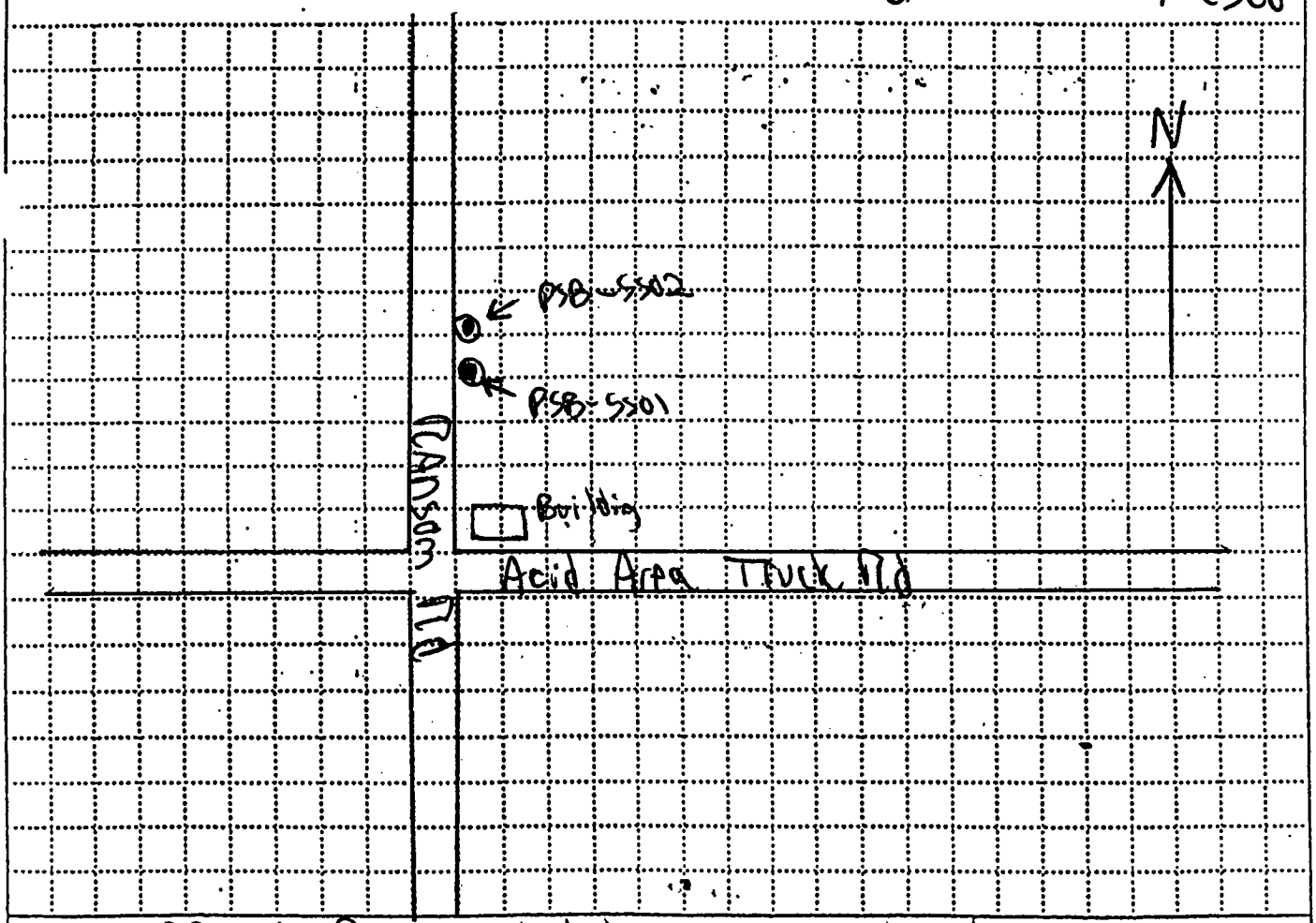
DISTRICT: Nashville - TN		HOLE NUMBER: PSB-SS01
1. COMPANY NAME: IT Corp.	2. DRILL SUBCONTRACTOR: Belasco Drilling Services, Inc.	SHEET 2 OF 2 SHEETS
3. PROJECT: PBOW - Power Substation Investig.	4. LOCATION: Power Substation Area	
5. NAME OF DRILLER: NA - John Vogeding (IT Corp)	6. MANUFACTURER'S DESIGNATION OF DRILL: NA - Hand Auger	
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: 2" Diameter Stainless Steel Hand Auger	8. HOLE LOCATION: PSB-SS0	
	9. SURFACE ELEVATION: NA	
	10. DATE STARTED: 5-3-98	11. DATE COMPLETED: 5-3-98
12. OVERBURDEN THICKNESS: NA	13. DEPTH GROUNDWATER ENCOUNTERED: NA	
13. DEPTH DRILLED INTO ROCK: NA	14. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: NA	
14. TOTAL DEPTH OF HOLE: 1.0 ft.	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): NA	

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER CORE BOXES
NA			0

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC/[redacted]	METALS[redacted]	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
	[redacted] 1	[redacted] 1	PCB's (1)			NA

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
	X			John Vogeding

LOCATION SKETCH/COMMENTS — SCALE: 1" = 300'



PROJECT: PBOW - Power Substation Investigation | HOLE NO.: PSB-SS01

ENG FORM 5056-R, AUG 94 (Proponent: CECW-EG)

HTRW DRILLING LOG (CONTINUATION SHEET)

HOLE NUMBER: PSB-SS01

PROJECT: USCS PBOW - Power Substation Invest.

INSPECTOR: John Vogeding

SHEET 2 OF 2 SHEETS

SYMBOL (a)	DEPTH (b)	DESCRIPTION OF MATERIALS (c)	FIELD SCREENING RESULTS (d)	GEOTECH SAMPLE OR CORE BOX NO. (e)	ANALYTICAL SAMPLE NO. (f)	BLOW COUNT (g)	REMARKS (h)
OL	1	0-1' Soft, Black-dark brown, Organic Silt and V. Fine Sand, moist	(PID) 0 ppm	NA	6970 1.0'	NA	NA
							Bottom of Boring at 1.0'

PROJECT: PBOW - Power Substation Investigation

HOLE NO. PSB-SS01

ENG FORM 5056A-R, AUG 94

(Proponent: CECW-EG)

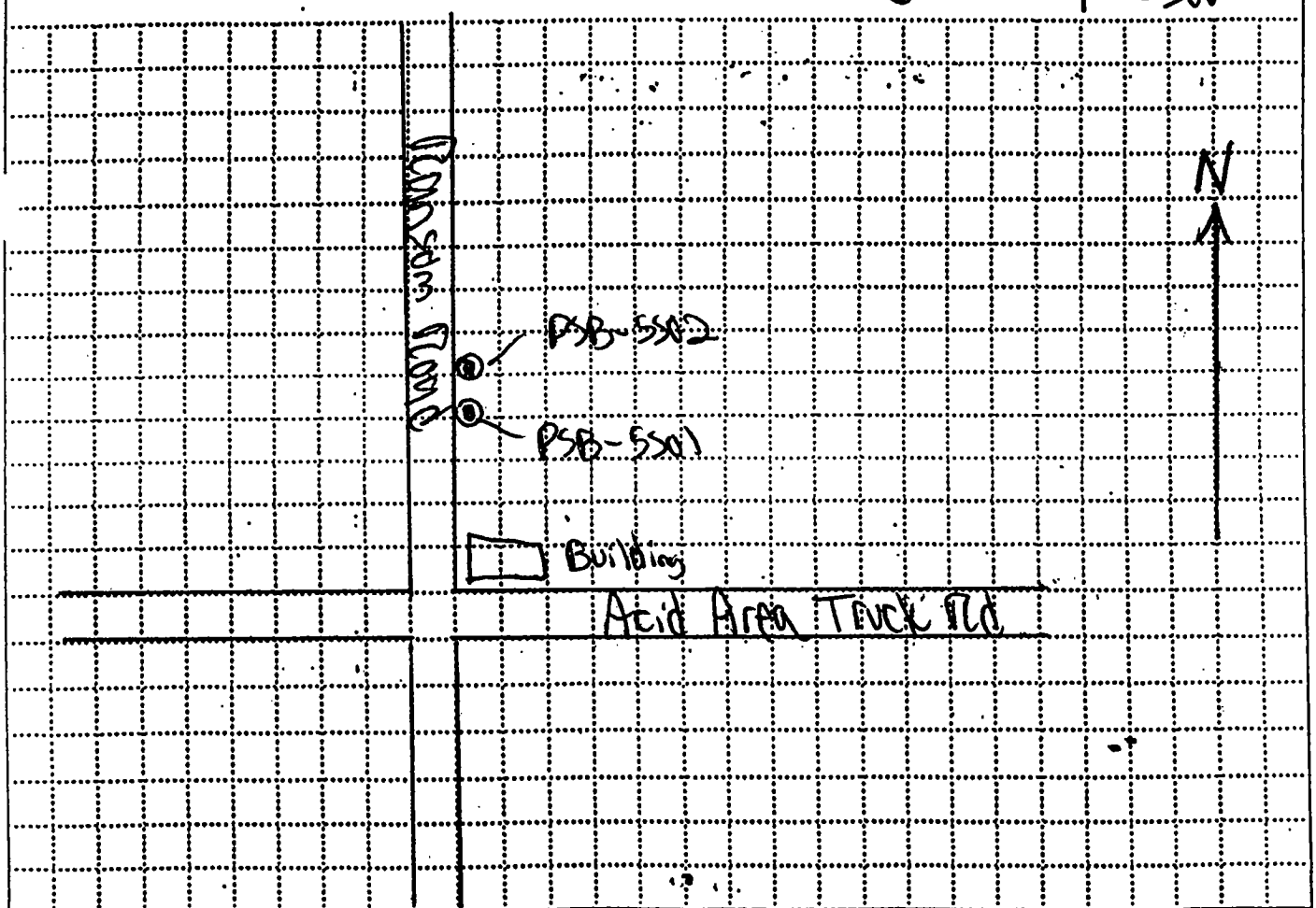
HTRW DRILLING LOG

DISTRICT: Nashville - TN	PSB-SS02	HOLE NUMBER
1. COMPANY NAME: IT Corp.	2. DRILL SUBCONTRACTOR: Belasco Drilling Services, Inc.	SHEET 2 OF 2 SHEETS
3. PROJECT: PBOW - Power Substation Investigation	4. LOCATION: Power Substation Area	
5. NAME OF DRILLER: NA - John Vogeding (IT Corp)	6. MANUFACTURER'S DESIGNATION OF DRILL: NA - Hand Auger	
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: 2" Diameter Stainless Steel Hand Auger	8. HOLE LOCATION: PSB-SS0	
	9. SURFACE ELEVATION: NA	
	10. DATE STARTED: 5-3-98	11. DATE COMPLETED: 5-3-98
12. OVERBURDEN THICKNESS: NA	13. DEPTH GROUNDWATER ENCOUNTERED: NA	
13. DEPTH DRILLED INTO ROCK: NA	14. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: NA	
14. TOTAL DEPTH OF HOLE: 1.0 ft.	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): NA	

18. GEOTECHNICAL SAMPLES: NA	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES: 0			
20. SAMPLES FOR CHEMICAL ANALYSIS	VOC / [redacted]	METALS [redacted]	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY: NA
	[redacted] 1	[redacted] 1	PCB's (1)			
22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR: John Vogeding		
	X					

LOCATION SKETCH/COMMENTS

SCALE: 1" = 300'



PROJECT: PBOW - Power Substation Investigation | HOLE NO. PSB-SS02

ENG FORM 5056-R, AUG 94 (Proponent: CECW-EG)

HTRW DRILLING LOG (CONTINUATION SHEET)

HOLE NUMBER: PSB-5502

PROJECT: PBOW - Power Substation Investigation

INSPECTOR: John Vogelsing

SHEET 2 OF 2 SHEETS

SYMBOL (a)	DEPTH (b)	DESCRIPTION OF MATERIALS (c)	FIELD SCREENING RESULTS (d)	GEOTECH SAMPLE OR CORE BOX NO. (e)	ANALYTICAL SAMPLE NO. (f)	BLOW COUNT (g)	REMARKS (h)
OL	1'	0-1' Soft, Black-dark brown, Organic Silt and V. Fine Sand, moist	0 ppm	NA	6980	NA	NA
							Bottom of Boring at 1.0'

1600

PROJECT: PBOW - Power Substation Investigation

HOLE NO. PSB-5502

ENG FORM 5056A-R, AUG 94 (Proponent: CECW-EG)

HTRW DRILLING LOG

DISTRICT: Nashville - TN	PSB-SS01	HOLE NUMBER
1. COMPANY NAME: IT Corp.	2. DRILL SUBCONTRACTOR: Belasco Drilling Services, Inc.	SHEET 2 OF 2 SHEETS
3. PROJECT: PBOW - Power Substation Investigation	4. LOCATION: Power Substation Area	
5. NAME OF DRILLER: NA - John Vogeding (IT Corp)	6. MANUFACTURER'S DESIGNATION OF DRILL: NA - Hand Auger	
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: 2" Diameter Stainless Steel Hand Auger	8. HOLE LOCATION: PSB-SS0	
	9. SURFACE ELEVATION: NA	
	10. DATE STARTED: 5-3-98	11. DATE COMPLETED: 5-3-98
12. OVERBURDEN THICKNESS: NA	15. DEPTH GROUNDWATER ENCOUNTERED: NA	
13. DEPTH DRILLED INTO ROCK: NA	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: NA	
14. TOTAL DEPTH OF HOLE: 1.0 ft.	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): NA	

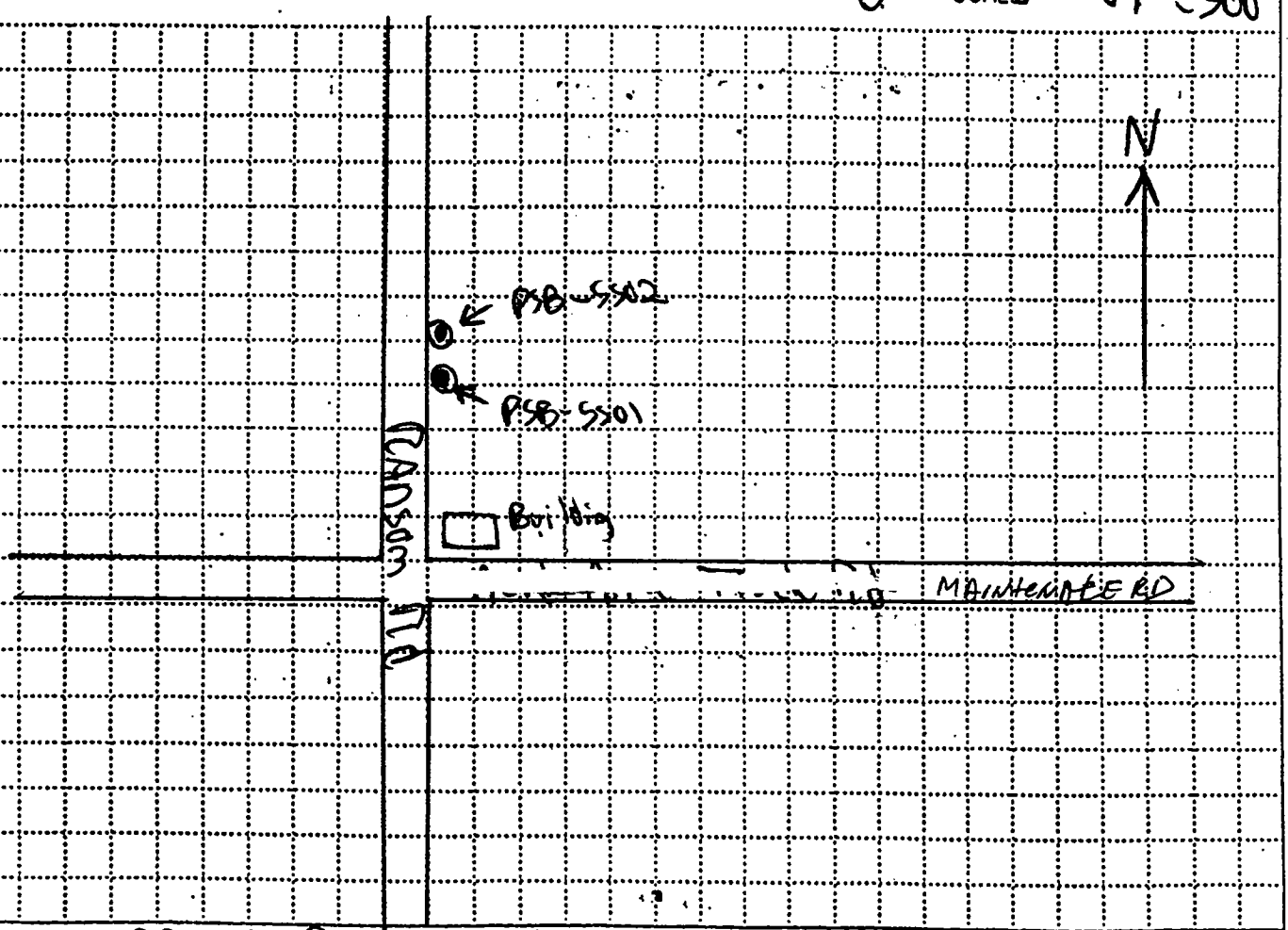
18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
NA			0

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC/[redacted]	METALS[redacted]	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
	[redacted] 1	[redacted] 1	PCB's (1)			NA

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
	X			John Vogeding

LOCATION SKETCH/COMMENTS

SCALE: 1" = 300'



PROJECT: PBOW - Power Substation Investigation | HOLE NO.: PSB-SS01

ENG FORM 5056-R, AUG 94 (Proponent: CECW-EG)

HTRW DRILLING LOG (CONTINUATION SHEET)

HOLE NUMBER: PSB-SS01

PROJECT: USCS PBOW - Power Substation Invest.

INSPECTOR: John Vogeding

SHEET 2 OF 2 SHEETS

SYMBOL (a)	DEPTH (b)	DESCRIPTION OF MATERIALS (c)	FIELD SCREENING RESULTS (d)	GEOTECH SAMPLE OR CORE BOX NO. (e)	ANALYTICAL SAMPLE NO. (f)	BLOW COUNT (g)	REMARKS (h)
OL	1	0-1' Soft, Black-dark brown, Organic Silt and V. Fine Sand, moist	(PID) 0 ppm	NA	6970 1.0'	NA	NA ⑩ 1530
							Bottom of Boring at 1.0'

PROJECT: PBOW - Power Substation Investigation

HOLE NO. PSB-SS01

ENG FORM 5056A-R, AUG 94

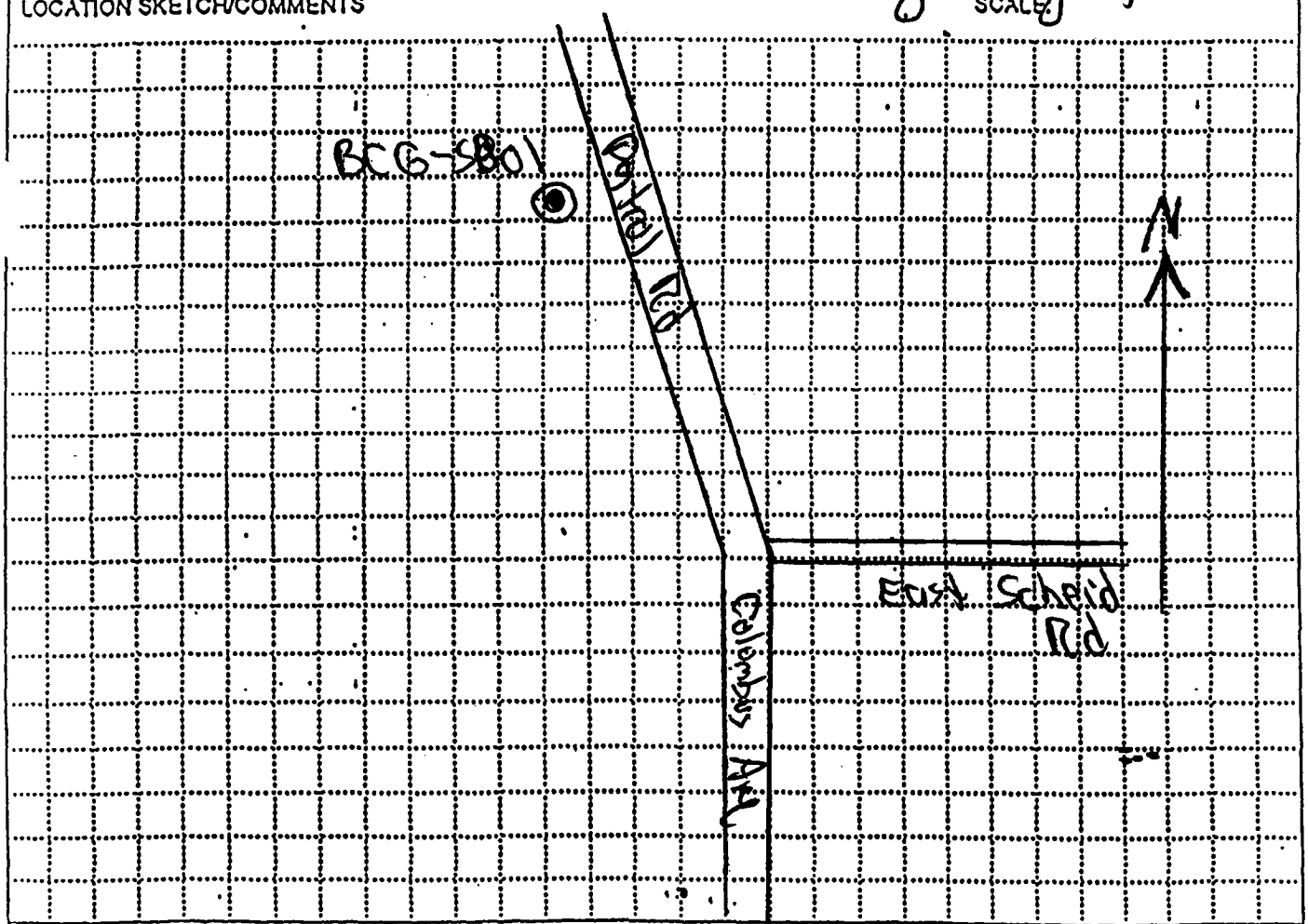
(Proponent: CECW-EG)

HTRW DRILLING LOG

DISTRICT	Nashville - TN
HOLE NUMBER	BCG-SB01
1. COMPANY NAME	I.T. Corp.
2. DRILL SUBCONTRACTOR	Belasco Drilling Services
SHEET / SHEETS	1 of 2
3. PROJECT	PBOW - Background
4. LOCATION	Background
5. NAME OF DRILLER	Scott Guyer
6. MANUFACTURER'S DESIGNATION OF DRILL	CME 450 ATV
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT	4" Solid Stem Augers with 3" x 24" Split Spoon Sampler
8. HOLE LOCATION	BCG-SB01
9. SURFACE ELEVATION	NA
10. DATE STARTED	5-3-98
11. DATE COMPLETED	5-3-98
12. OVERBURDEN THICKNESS	NA
13. DEPTH DRILLED INTO ROCK	NA
14. TOTAL DEPTH OF HOLE	6.0 ~~10.0~~ Ft BMW
15. DEPTH GROUNDWATER ENCOUNTERED	NA
16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED	NA
17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY)	NA
18. GEOTECHNICAL SAMPLES	NA
DISTURBED	
UNDISTURBED	
19. TOTAL NUMBER OF CORE BOXES	0
20. SAMPLES FOR CHEMICAL ANALYSIS	Nitroaromatics (2)
VOC/SVOC	2
METALS / PH	2
OTHER (SPECIFY)	PCB's (1)
OTHER (SPECIFY)	Nitrate / Sulfate (2)
OTHER (SPECIFY)	
21. TOTAL CORE RECOVERY	NA
22. DISPOSITION OF HOLE	Grouted
BACKFILLED	
MONITORING WELL	
OTHER (SPECIFY)	
23. SIGNATURE OF INSPECTOR	John Vogelsang

LOCATION SKETCH/COMMENTS

SCALE



PROJECT PBOW - Background Soil Sampling

HOLE NO. BCG-SB01

ENG FORM 5056-R, AUG 94

(Proponent: CECW-EG)

HTRW DRILLING LOG (CONTINUATION SHEET)

HOLE NUMBER SB01

PROJECT USCS PBOW - Background | INSPECTOR John Vogeding | SHEET 2 OF 2 SHEETS

SYMBOL (a)	DEPTH (b)	DESCRIPTION OF MATERIALS (c)	FIELD SCREENING RESULTS (d)	GEOTECH SAMPLE OR CORE BOX NO. (e)	ANALYTICAL SAMPLE NO. (f)	BLOW COUNT (g)	REMARKS (h)
		0-0.5' grass and Topsoil	(PID)		0.5'	3,7,	
		0.5'-2.0'					
	1	Soft-m. Firm, light-dark brown, black, and grey, V. Fine Sandy Silt to Clayey Silt, low-Med Plasticity, moist	0 PPM		6990 1.5'	7,7	1'-2' Some red brick Fragments @ 0910
	2	2'-4' Same As Above, Firm-Hard with 20-30% Fine, rounded pebbles and Shale Fragments.	0 PPM			4,10, 20,20	encountering Concrete at ≈ 2.5' (and sandsto Boulder) moved around 5 times Consistent Refusal at 2.5'.
ML	3						
					4.0'		moved 50 Ft. N and resumed Sampling at 2
	4	4'-6' Same as Above very Hard w/ 20-30% Fine, rounded pebbles, Black Shale Fragments From 5-5.5', moist	0 PPM	NA	7000 5.5'	18,30, 50/5" Refusal	@ 0940
	5						
		6.0'					Auger refusal at 6.0'
	6						
	7		PPM				Bottom of Boring at 6.0'
	8						
	9		PPM				
	10						

PROJECT PBOW - Background Soil Sampling | HOLE NO. SB01

ENG FORM 5056A-R, AUG 94 (Proponent: CECW-EG)

HTRW DRILLING LOG

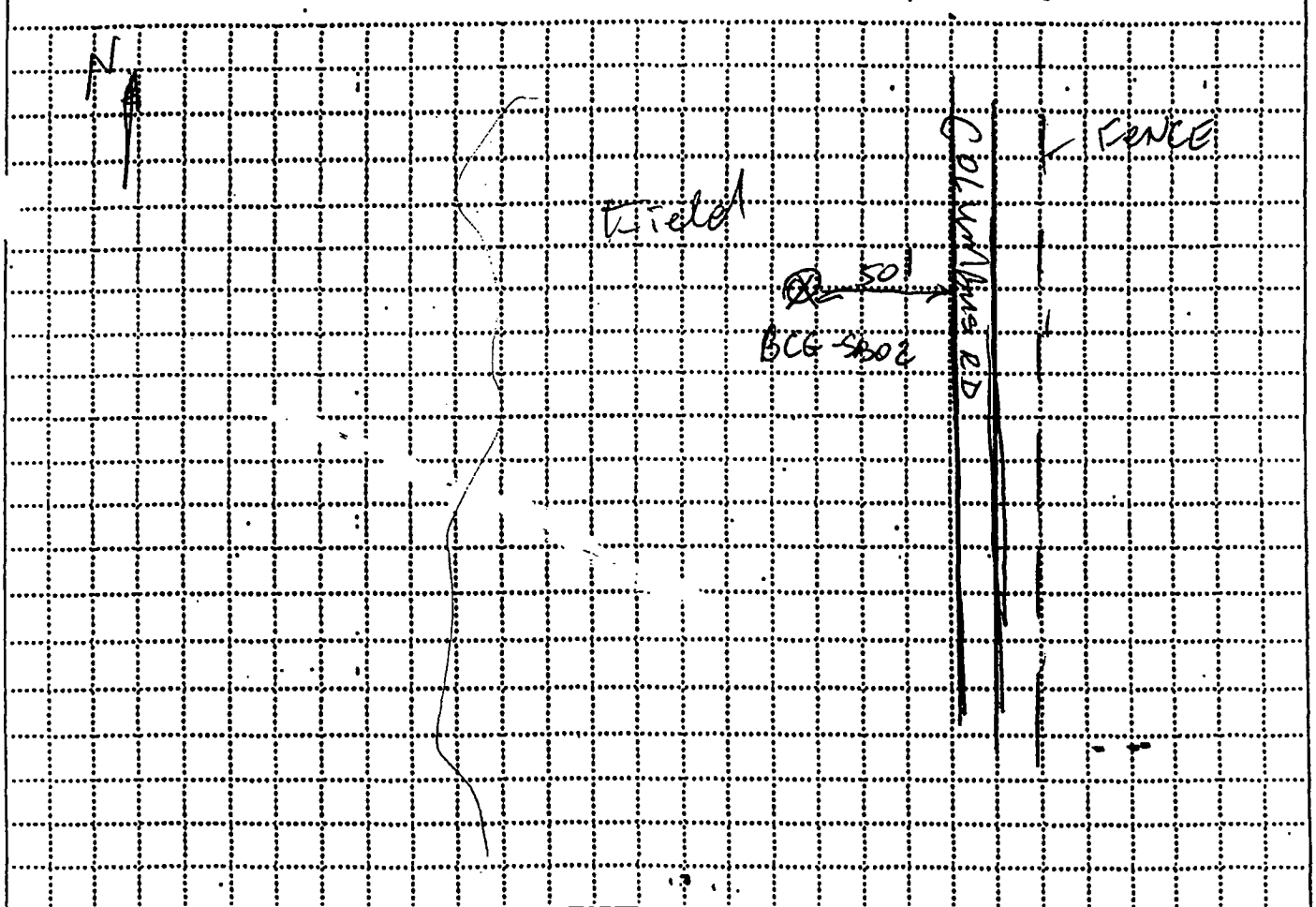
DISTRICT Nashville - TN BCG	HOLE NUMBER BCG-SB02	
1. COMPANY NAME I.T. Corp.	2. DRILL SUBCONTRACTOR Belasco Drilling Services	SHEET 1 OF 2 SHEETS
3. PROJECT PBOW - Background Sampling	4. LOCATION Background	
5. NAME OF DRILLER Scott Guyer	6. MANUFACTURER'S DESIGNATION OF DRILL CME 450 ATV	
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT 4" Solid Stem Augers with 3" x 24" Split Spoon Sampler	8. HOLE LOCATION BCG-SB02	
	9. SURFACE ELEVATION NA	
	10. DATE STARTED 5-2-98	11. DATE COMPLETED 5-2-98
12. OVERBURDEN THICKNESS NA	13. DEPTH GROUNDWATER ENCOUNTERED NA	
13. DEPTH DRILLED INTO ROCK NA	14. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED NA	
14. TOTAL DEPTH OF HOLE 10.0 Ft	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY) NA	

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
NA			0

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC/SVOC	METALS / pH	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
Nitroaromatics (2)	2	2	PCBs (1)	Nitrate / Sulfate (2)		NA

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
	Grouted			John Vaughn

LOCATION SKETCH/COMMENTS SCALE



PROJECT PBOW - Background Soil Sampling HOLE NO. BCG-SB02

ENG FORM 5056-R, AUG 94 (Proponent: CECW-EG)

HTRW DRILLING LOG (CONTINUATION SHEET)

HOLE NUMBER: BCG-SB02

PROJECT: USCS PBOW - Background

INSPECTOR: John Vogeding

SHEET 2 OF 2 SHEETS

SYMBOL	DEPTH (b)	DESCRIPTION OF MATERIALS (c)	FIELD SCREENING RESULTS (d)	GEOTECH SAMPLE OR CORE BOX NO. (e)	ANALYTICAL SAMPLE NO. (f)	BLOW COUNT (g)	REMARKS (h)
		0-~~0.5~~ 1.0' grass and Topsoil	(PID)		0.5'	2,3,	
	1	1.0-2.0' Soft-Med. Firm, light-dark brown, black and grey, clayey Silt, low-med. plasticity, moist	NA PPM		7010 1.5' 2.0	5,6	Hnu meter Not Functioning Properly due to excessive Atmospheric moisture (Raining) (@) 1720
	2	2'-4' Same as Above.	NA PPM		7020 4.0'	2,2, 4,4	(@) 174
ML	4	4'-6' Same as Above	NA PPM	NA		3,3, 4,4	
	6	6-8' Same as Above Firm-Hard, grey	NA PPM			4,5, 17,21	
	8	8'-10' Same as Above, Firm-Hard, grey, w/ 30% Fine, rounded Pebbles/gravel (till)	NA PPM			7,15 23,31	Bottom of Boring at 10.0'
	10						

PROJECT: PBOW - Background Soil Sampling

HOLE NO. BCG-SB02

ENG FORM 5056A-R, AUG 94

(Proponent: CECW-EG)

HTRW DRILLING LOG

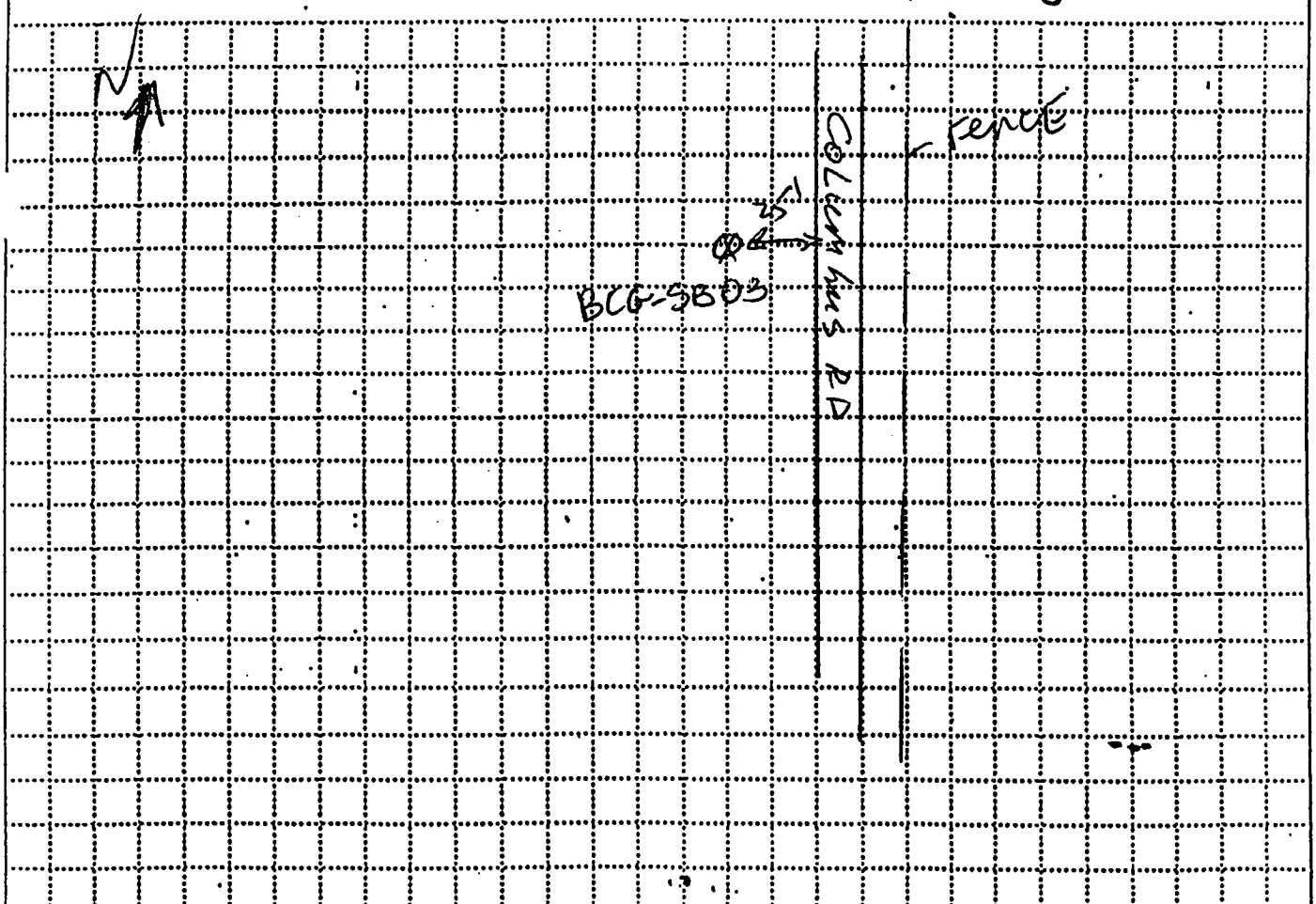
DISTRICT Nashville - TN BCG-SB03		HOLE NUMBER
1. COMPANY NAME I.T. Corp.	2. DRILL SUBCONTRACTOR Belasco Drilling Services	SHEET 1 OF 2 SHEETS
3. PROJECT PBOW - Background	4. LOCATION Background	
5. NAME OF DRILLER Scott Guyer	6. MANUFACTURER'S DESIGNATION OF DRILL CME 450 ATV	
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT 4" Solid Stem Augers with 3" x 24" Split Spoon Sampler	8. HOLE LOCATION BCG-SB03	
	9. SURFACE ELEVATION NA	
	10. DATE STARTED 5-2-98	11. DATE COMPLETED 5-2-98
12. OVERBURDEN THICKNESS NA	13. DEPTH GROUNDWATER ENCOUNTERED 8.5 Ft.	
13. DEPTH DRILLED INTO ROCK NA	14. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED NA	
14. TOTAL DEPTH OF HOLE 10.0 Ft	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY) NA	

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
NA			0

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC/SVOCS	METALS/pH	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
Nitroaromatics (2)	2	2	PCBs (1)	Nitrate	Sulfate (2)	NA

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
	Grouted			John Vaughn

LOCATION SKETCH/COMMENTS SCALE:



PROJECT PBOW - Background Soil Sampling HOLE NO. BCG-SB03

ENG FORM 5056-R, AUG 94 (Proponent: CECW-EG)

HTRW DRILLING LOG (CONTINUATION SHEET)

HOLE NUMBER: BCG-SB03

PROJECT: USCS PBOW - Background

INSPECTOR: John Vogeding

SHEET 2 OF 2 SHEETS

SYMBOL	DEPTH (b)	DESCRIPTION OF MATERIALS (c)	FIELD SCREENING RESULTS (d)	GEOTECH SAMPLE OR CORE BOX NO. (e)	ANALYTICAL SAMPLE NO. (f)	BLOW COUNT (g)	REMARKS (h)
		0-0.5' grass and Topsoil	(PID)		0.5'	2,6,	
		0.5'-2.0'					
	1	Soft-m. Firm, light-dark brown, black, ~~Dark~~ grey ~~V.F.~~ Clayey Silt, low-Med. Plasticity, Slightly Mottled w/ Fe Stains, moist	NA PPM		7030 1.5'	9,13	Hnu Meter Not Functioning Properly due to excessive atmospheric moisture. (Raining)
	2	2'-4' Same as Above, med-High Plasticity, moist	NA PPM			2,5, 8,12	
ml/Cl	4 5	4'-6' Same as Above, Firm-Hard, med-high Plasticity, moist	NA PPM	NA	6.0'	8,18, 26,35	
	6 7	6'-8' Same as Above, Firm-Hard, grey.	NA PPM		7040 8.0'	9,14, 21,21	
	8	8-8.5' Same as Above 8.5'	NA PPM			7,9, 14,12	
Shale	9 10	8.5'-10.0' grey, Black, Shale Fragments, Clay and Med. Sand, wet.					

(h) 16'

(h) 1705

PROJECT: PBOW - Background Soil Sampling

HOLE NO. BCG-SB03

ENG FORM 5056A-R, AUG 94 (Proponent: CECW-EG)

HTRW DRILLING LOG

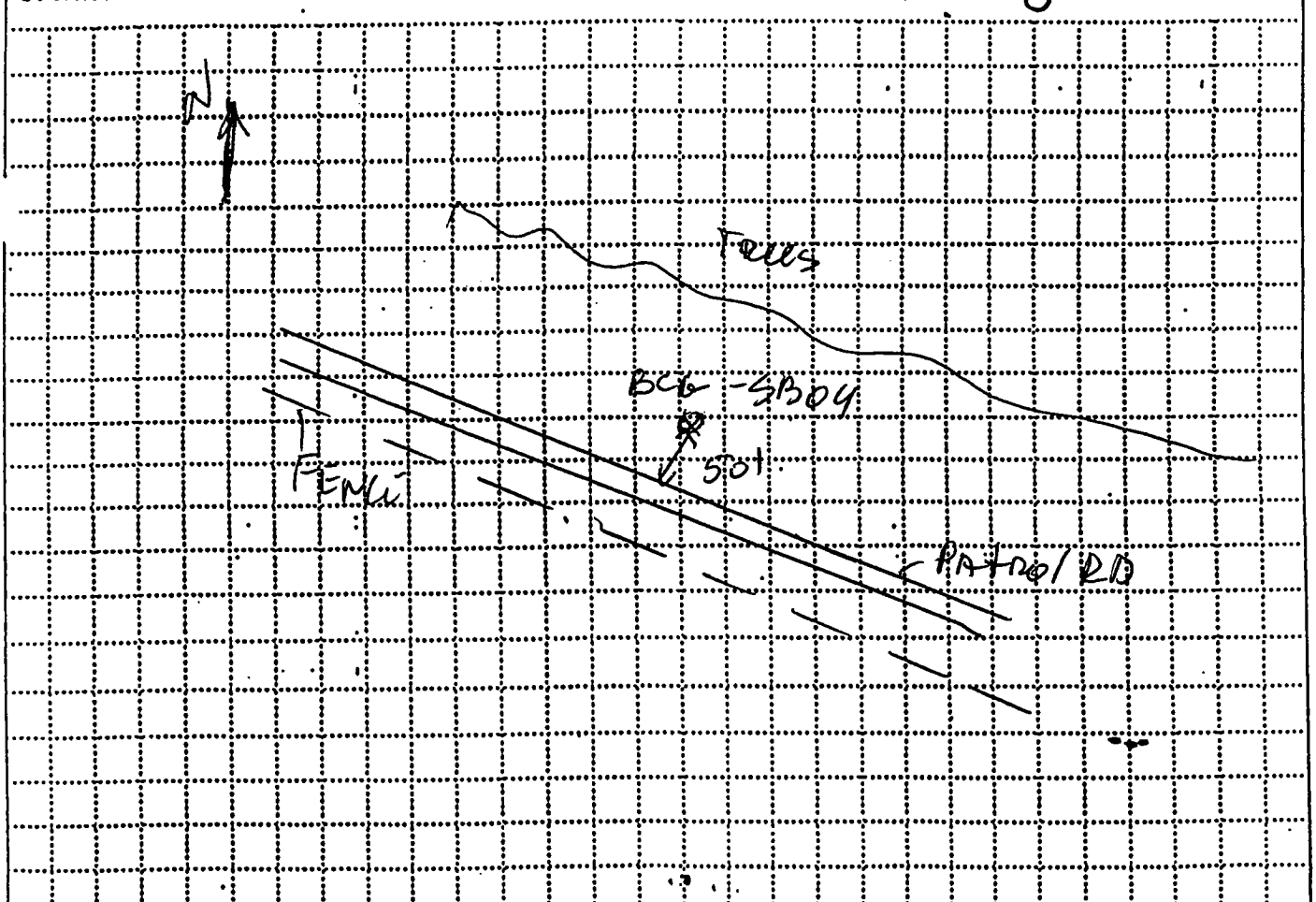
DISTRICT Nashville - TN		HOLE NUMBER BCG-SB04
1. COMPANY NAME I.T. Corp.	2. DRILL SUBCONTRACTOR Belasco Drilling Services	SHEET 1 OF 2 SHEETS
3. PROJECT PBOW - Background	4. LOCATION Background	
5. NAME OF DRILLER Scott Guyer	6. MANUFACTURER'S DESIGNATION OF DRILL CME 450 ATV	
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT 4" Solid Stem Augers with 3" x 24" Split Spoon Sampler	8. HOLE LOCATION BCG-SB04	
	9. SURFACE ELEVATION NA	
	10. DATE STARTED 5-2-98	11. DATE COMPLETED 5-2-98
12. OVERBURDEN THICKNESS NA	13. DEPTH GROUNDWATER ENCOUNTERED NA	
13. DEPTH DRILLED INTO ROCK NA	14. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED NA	
14. TOTAL DEPTH OF HOLE 10.0 Ft	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY) NA	

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
NA			0

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC/SVOCS	METALS / pH	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
Nitroaromatics (2)	2	2	PCBs (1)	Nitrate/Sulfate (2)		NA

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
	Grouted			John Vaughn

LOCATION SKETCH/COMMENTS SCALE



PROJECT PBOW - Background Soil Sampling HOLE NO. BCG-SB04

ENG FORM 5056-R, AUG 94 (Proponent: CECW-EG)

HTRW DRILLING LOG (CONTINUATION SHEET)

HOLE NUMBER: BCG-SB04

PROJECT: USCS PBOW - Background

INSPECTOR: John Vogeding

SHEET 2 OF 2 SHEETS

SYMBOL	DEPTH (b)	DESCRIPTION OF MATERIALS (c)	FIELD SCREENING RESULTS (d)	GEOTECH SAMPLE OR CORE BOX NO. (e)	ANALYTICAL SAMPLE NO. (f)	BLOW COUNT (g)	REMARKS (h)
		0-0.5' grass and Topsoil	(PID)		0.5'	2,4,	
	1	0.5'-2.0' Soft-m. Firm, light-dark brown, black, and grey, V. Fine Sandy Silt to Clayey Silt, low-med. Plasticity, Slightly mottled w/Fe Stains, moist	NA PPM		7050 1.5' 2.0'	9,8	Hnu Meter Not Functioning Properly due to excessive Atmospheric moisture (Raining) (a) 145
ML	2	2'-4' Same as Above, moist	NA PPM		7060 4.0'	4,8, 9,15	(a) 15
	3						
	4	4-4.5' Same as Above 4.5'	NA	NA		12,12	Bottom of Boring at 5.0'
Shale	5	4.5'-5.0 Black and Grey, weathered shale Fragments	NA PPM			50/2"	
	6		NA PPM				
	7						
	8		NA PPM				
	9						
	10						

PROJECT: PBOW - Background Soil Sampling

HOLE NO. BCG-SB04

ENG FORM 5056A-R, AUG 94 (Proponent: CECW-EG)

HTRW DRILLING LOG

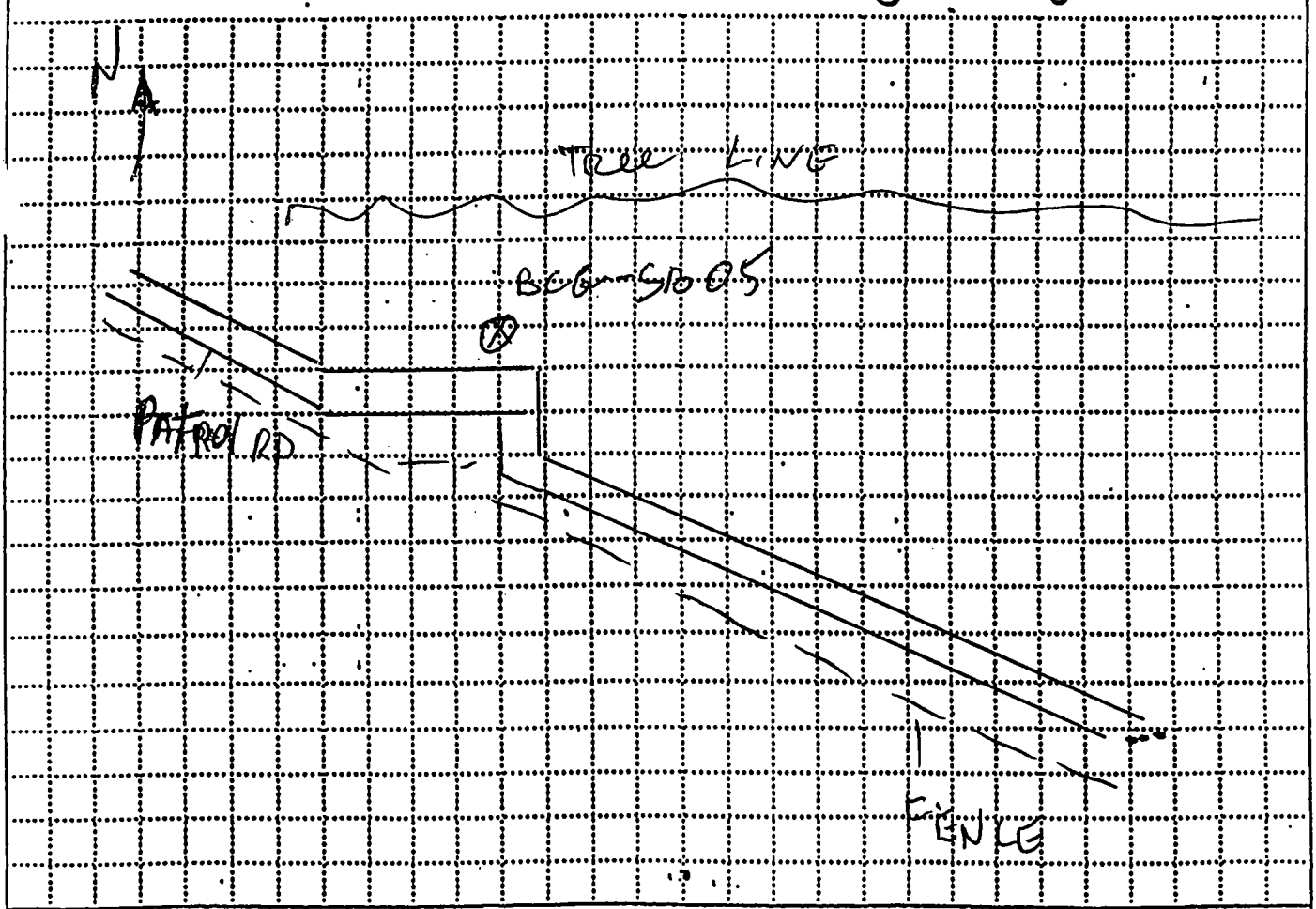
DISTRICT: Nashville - TN BCG	HOLE NUMBER: SB05	
1. COMPANY NAME: I.T. Corp.	2. DRILL SUBCONTRACTOR: Belasco Drilling Services	SHEET 1 OF 2 SHEETS
3. PROJECT: PBOW - Background	4. LOCATION: Background	
5. NAME OF DRILLER: Scott Guyer	6. MANUFACTURER'S DESIGNATION OF DRILL: CME 450 ATV	
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: 4" Solid Stem Augers with 3" x 24" Split Spoon Sampler	8. HOLE LOCATION: BCG-SB05	
	9. SURFACE ELEVATION: NA	
	10. DATE STARTED: 5-2-98	11. DATE COMPLETED: 5-2-98
12. OVERBURDEN THICKNESS: NA	13. DEPTH GROUNDWATER ENCOUNTERED: 3.0 Ft.	
13. DEPTH DRILLED INTO ROCK: NA	14. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: NA	
14. TOTAL DEPTH OF HOLE: 10.0 Ft	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): NA	

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
NA			0

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC/SVOCS	METALS / PH	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
Nitroaromatics (2)	2	2	PCBs (1)	Nitrate / Sulfate (2)		NA

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
	Grouted			John Vaughn

LOCATION SKETCH/COMMENTS — SCALE:



PROJECT: PBOW - Background Soil Sampling | HOLE NO. BCG-SB05

ENG FORM 5056-R, AUG 94 (Proponent: CECW-EG)

HTRW DRILLING LOG (CONTINUATION SHEET)

HOLE NUMBER: BCG-SB05

PROJECT: USCS PBOW - Background

INSPECTOR: John Vogeding

SHEET 2 OF 2 SHEETS

SYMBOL	DEPTH (b)	DESCRIPTION OF MATERIALS (c)	FIELD SCREENING RESULTS (d)	GEOTECH SAMPLE OR CORE BOX NO. (e)	ANALYTICAL SAMPLE NO. (f)	BLOW COUNT (g)	REMARKS (h)
		0-0.5' grass and topsoil	(PID)		0.5'	1,3,	
		0.5'-2.0' Loose-m. dense, light-dark brown, Fine Silty Sand, moist	NA PPM		7070 1.5'	4,6	Hnu meter Not Functioning Properly due to excessive atmospheric moisture (Raining) @ 14
	1						
	2	2'-4' Same as Above, wet at 3'	NA PPM			5,7, 7,7	
	3				4.0		
SM	4	4-6' Same as Above, wet	NA PPM	NA	7080	3,5, 2,1	@ 14'
	5	grey at 5.5'			6.0		
	6	6-7.5' Same as Above, grey, wet	NA PPM			3,6, 17 50/4"	
	7	7.5'					
Shale		7.5'-8' Black, Shale Fragments (Bedrock) 8.0'					Split Spoon and auger refusal at 8.0'
	8		NA PPM				
	9						Bottom of Boring at 8.0'
	10						

PROJECT: PBOW - Background Soil Sampling

HOLE NO. BCG-SB05

ENG FORM 5056A-R, AUG 94

(Proponent: CECW-EG)

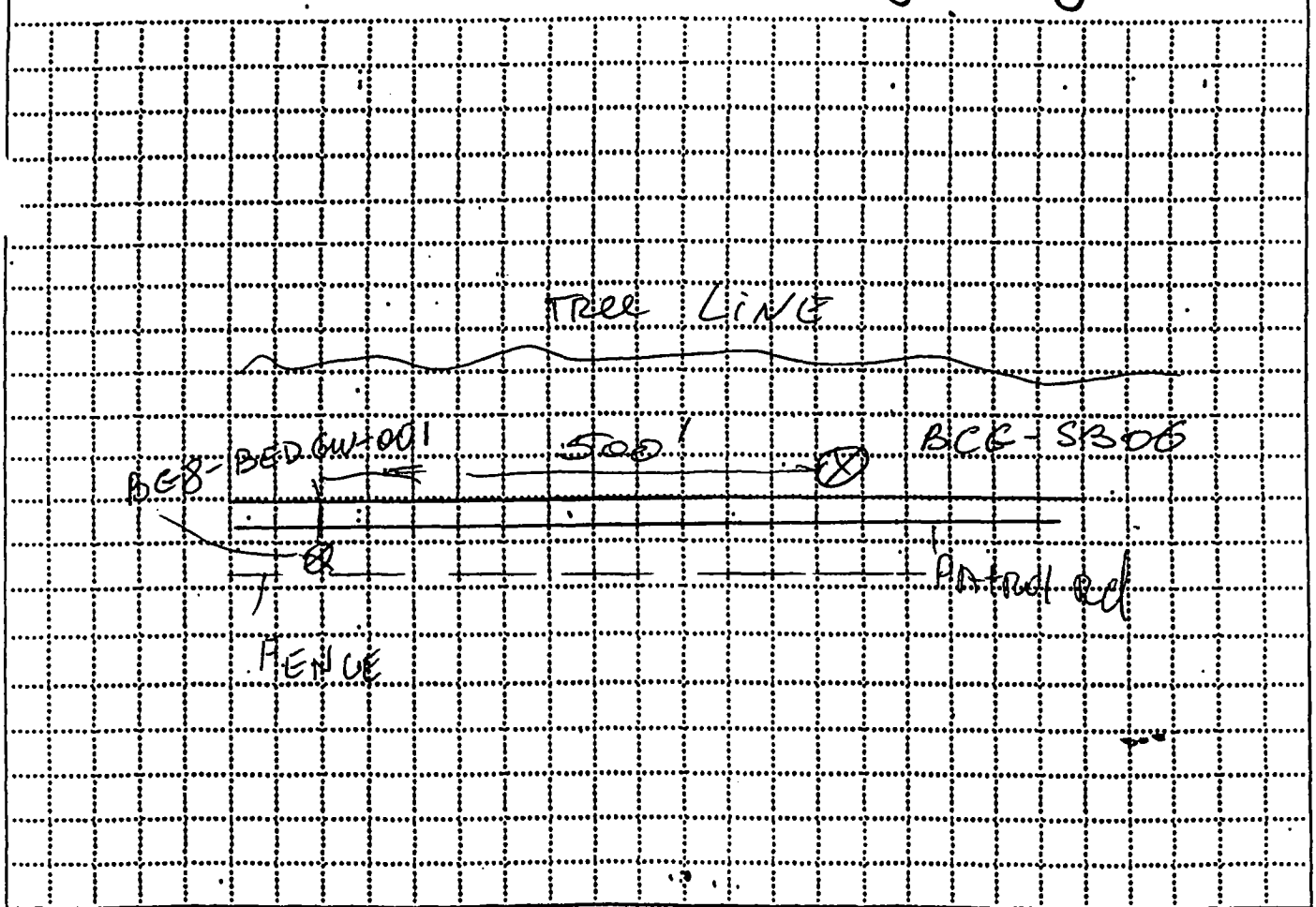
HTRW DRILLING LOG

DISTRICT	Nashville - TN
HOLE NUMBER	BCG-SB06
1. COMPANY NAME	I.T. Corp.
2. DRILL SUBCONTRACTOR	Belasco Drilling Services
SHEET / SHEETS	1 of 2
3. PROJECT	PBOW - Background
4. LOCATION	Background
5. NAME OF DRILLER	Scott Guyer
6. MANUFACTURER'S DESIGNATION OF DRILL	CME 450 ATV
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT	4" Solid Stem Augers with 3" x 24" Split Spoon Sampler
8. HOLE LOCATION	BCG-SB06
9. SURFACE ELEVATION	NA
10. DATE STARTED	5-2-98
11. DATE COMPLETED	5-2-98
12. OVERBURDEN THICKNESS	NA
13. DEPTH GROUNDWATER ENCOUNTERED	5.0 Ft.
13. DEPTH DRILLED INTO ROCK	NA
14. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED	NA
14. TOTAL DEPTH OF HOLE	10.0 Ft
17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY)	NA
18. GEOTECHNICAL SAMPLES	NA
DISTURBED	
UNDISTURBED	
19. TOTAL NUMBER OF CORE BOXES	0

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC/SVOCS	METALS / PH	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
Nitroaromatics (2)	2	2	PCB's (1)	Nitrate/Sulfate (2)		NA

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
	Grouted			John Vogel

LOCATION SKETCH/COMMENTS SCALE:



PROJECT PBOW - Background Soil Sampling

HOLE NO. BCG-SB06

ENG FORM 5056-R, AUG 94

(Proponent: CECW-EG)

HTRW DRILLING LOG (CONTINUATION SHEET)

HOLE NUMBER: BCG-SB06

PROJECT: USCS PBOW - Background

INSPECTOR: John Voegding

SHEET 2 OF 2 SHEETS

SYMBOL	DEPTH (b)	DESCRIPTION OF MATERIALS (c)	FIELD SCREENING RESULTS (d)	GEOTECH SAMPLE OR CORE BOX NO. (e)	ANALYTICAL SAMPLE NO. (f)	BLOW COUNT (g)	REMARKS (h)
		0-0.5' grass and Topsoil	(PID)		0.5'	1,2,	
	1	0.5'-2.0' Loose-m.Dense, light-dark brown, Fine Sand, moist	NA PPM		7090 1.5'	5,6	@ 1'
Sm	2	2'-3.5' Same as Above	NA PPM			4,5,	Hanmeter Not Functioning due excessive Atmospheric Moisture (Raining)
	3					5,7	
		3.5-4.0' Same as Above, Silty-Clayey Fine Sand.					
4.0'	4	4'-6' Soft-m.Firm, grey and black, Clayey Silt w/ 40% shale Fragments, wet	NA PPM	NA		3,3,	
Md	5					6,9	
	6	6'-7' Same as Above	NA PPM		6.0' 7100 ~~8000~~	3,17,	@ 135
	7	7.0'-7.5' Black Shale Fragments (Bedrock)			7.0'	50/5"	Split Spoon and Auger refusal at 7.5 ft.
	8						
	9		PPM				Bottom of Boring at 7.5 ft.
	10						

PROJECT: PBOW - Background Soil Sampling

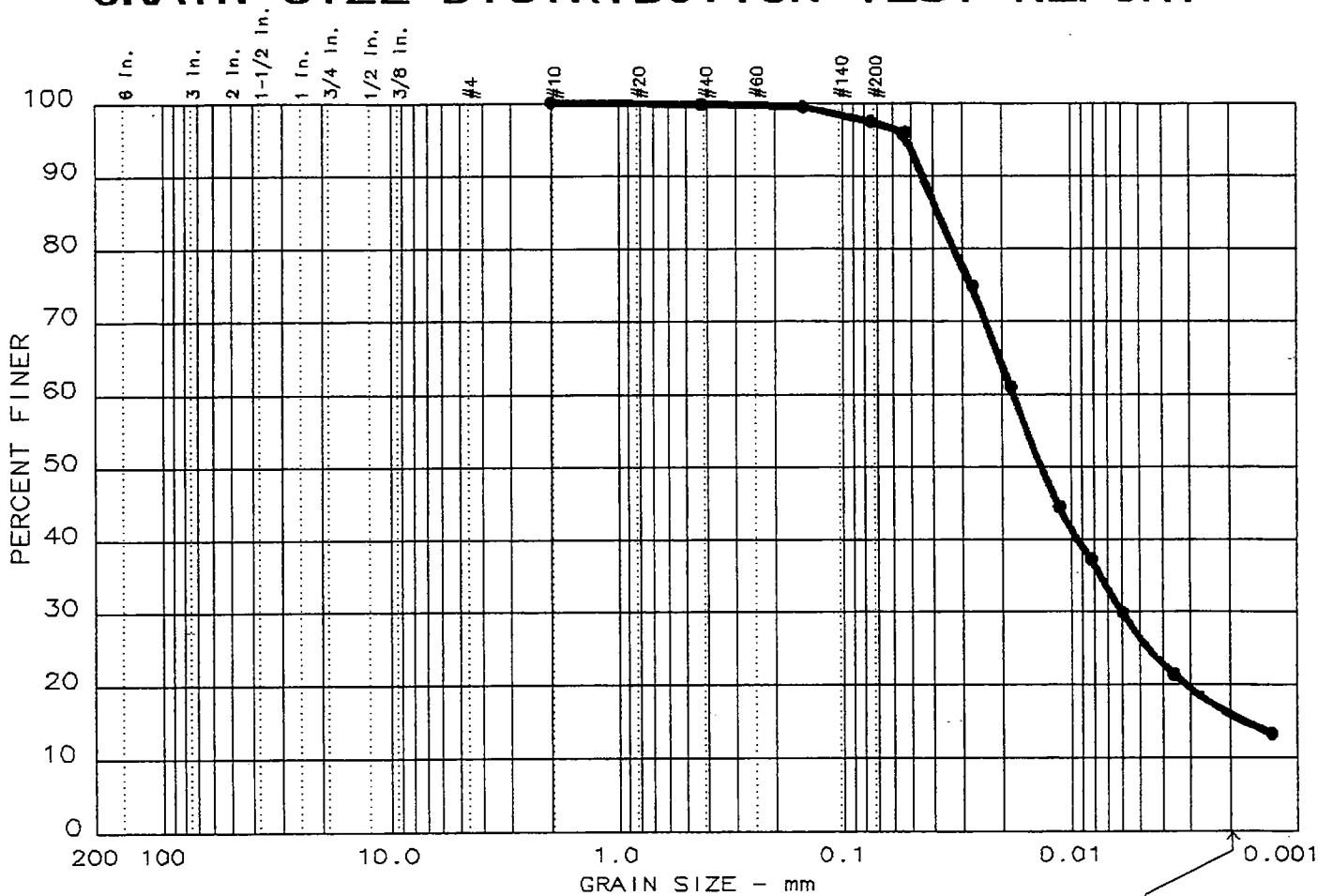
HOLE NO. BCG-SB06

ENG FORM 5056A-R, AUG 94 (Proponent: CECW-EG)

APPENDIX B

GEOTECHNICAL TESTING DATA

GRAIN SIZE DISTRIBUTION TEST REPORT



	Test	%+75mm	% GRAVEL	% SAND	% SILT	% CLAY
●	1	0.0	0.0	2.6	81.4	16.0

	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
●	26	10	0.04	0.02	0.01	0.006	0.0017			

MATERIAL DESCRIPTION	USCS	AASHTO
● LEAN CLAY	CL	

Project No.: 60364.002
Project: NASA - Plum Brook Station
● Location: Boring:PBOW-98-50 AA1-SB02 (0406) */

Date: 3/19/98

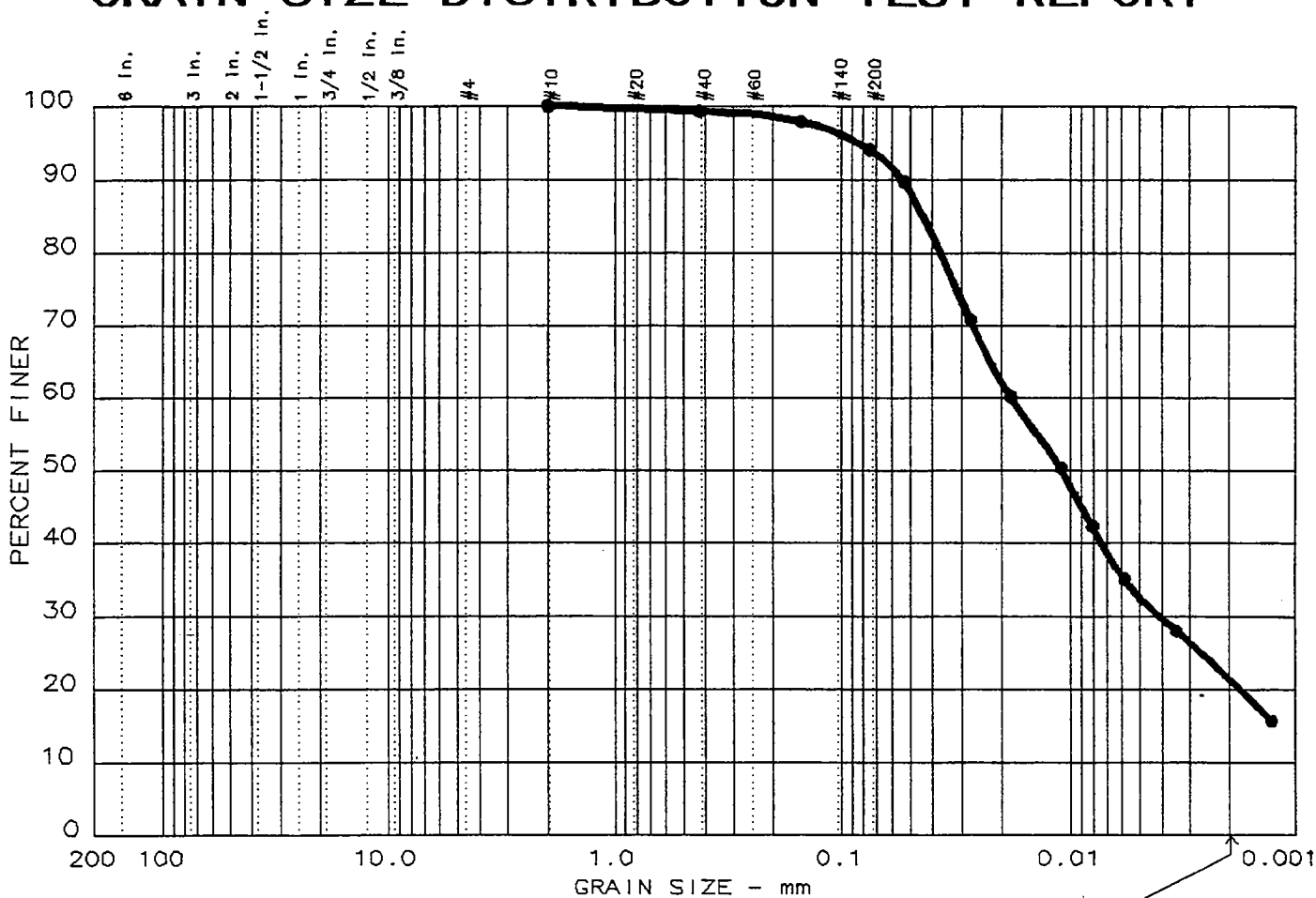
Remarks:
Client:Belasco Drilling Services Inc.
*/ Depth:4-6'
Lab No. 4213

GRAIN SIZE DISTRIBUTION TEST REPORT

H. C. NUTTING COMPANY

Figure No. _____

GRAIN SIZE DISTRIBUTION TEST REPORT



	Test	%+75mm	% GRAVEL	% SAND	% SILT	% CLAY
●	2	0.0	0.0	6.0	72.6	21.4

	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
●	31	15	0.04	0.02	0.01	0.004				

MATERIAL DESCRIPTION	USCS	AASHTO
● LEAN CLAY	CL	

Project No.: 60364.002
Project: NASA - Plum Brook Station
● Location: Boring:PBOW-98-50 AA1-SB05 (0406) */

Date: 3/19/98

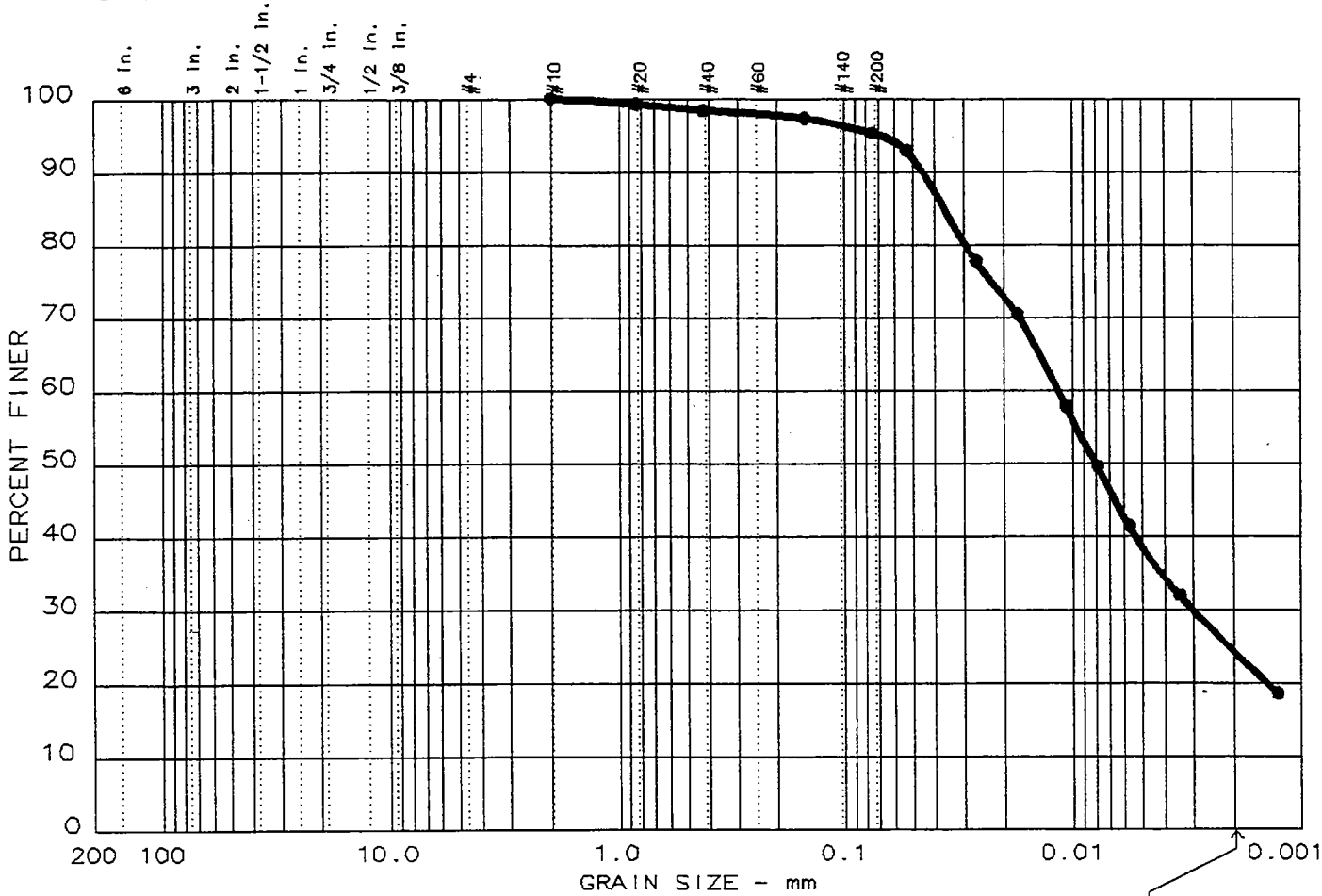
Remarks:
Client:Belasco Drilling Services Inc.
*/ Depth:4-6'
Lab No. 4214

GRAIN SIZE DISTRIBUTION TEST REPORT

H. C. NUTTING COMPANY

Figure No. _____

GRAIN SIZE DISTRIBUTION TEST REPORT



	Test	%+75mm	% GRAVEL	% SAND	% SILT	% CLAY
●	3	0.0	0.0	4.8	70.9	24.3

	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
●	31	16	0.04	0.01	0.01	0.003				

MATERIAL DESCRIPTION	USCS	AASHTO
● LEAN CLAY	CL	

Project No.: 60364.002
Project: NASA - Plum Brook Station
● Location: Boring:PBOW-98-50 AA1-SB05 (0204) */

Date: 3/19/98

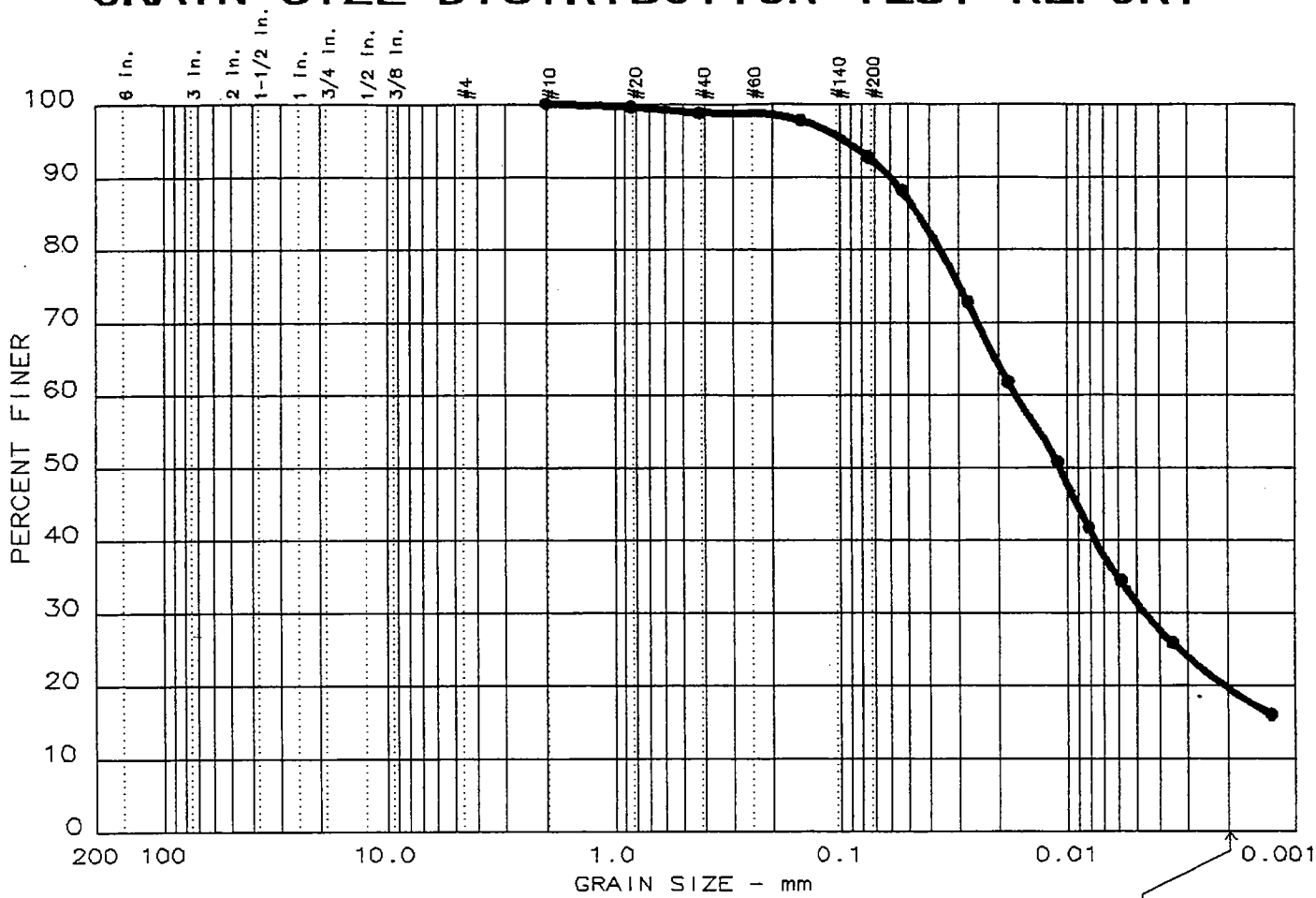
Remarks:
Client:Belasco Drilling Services Inc.
*/ Depth:2-4'
Lab No. 4215

GRAIN SIZE DISTRIBUTION TEST REPORT

H. C. NUTTING COMPANY

Figure No. _____

GRAIN SIZE DISTRIBUTION TEST REPORT



	Test	%+75mm	% GRAVEL	% SAND	% SILT	% CLAY
●	4	0.0	0.0	7.3	73.0	19.7

	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
●	28	12	0.04	0.02	0.01	0.005				

MATERIAL DESCRIPTION	USCS	AASHTO
● LEAN CLAY	CL	

Project No.: 60364.002
Project: NASA - Plum Brook Station
● Location: Boring:PBOW-98-50 AA1-SB08 (0204) */

Date: 3/19/98

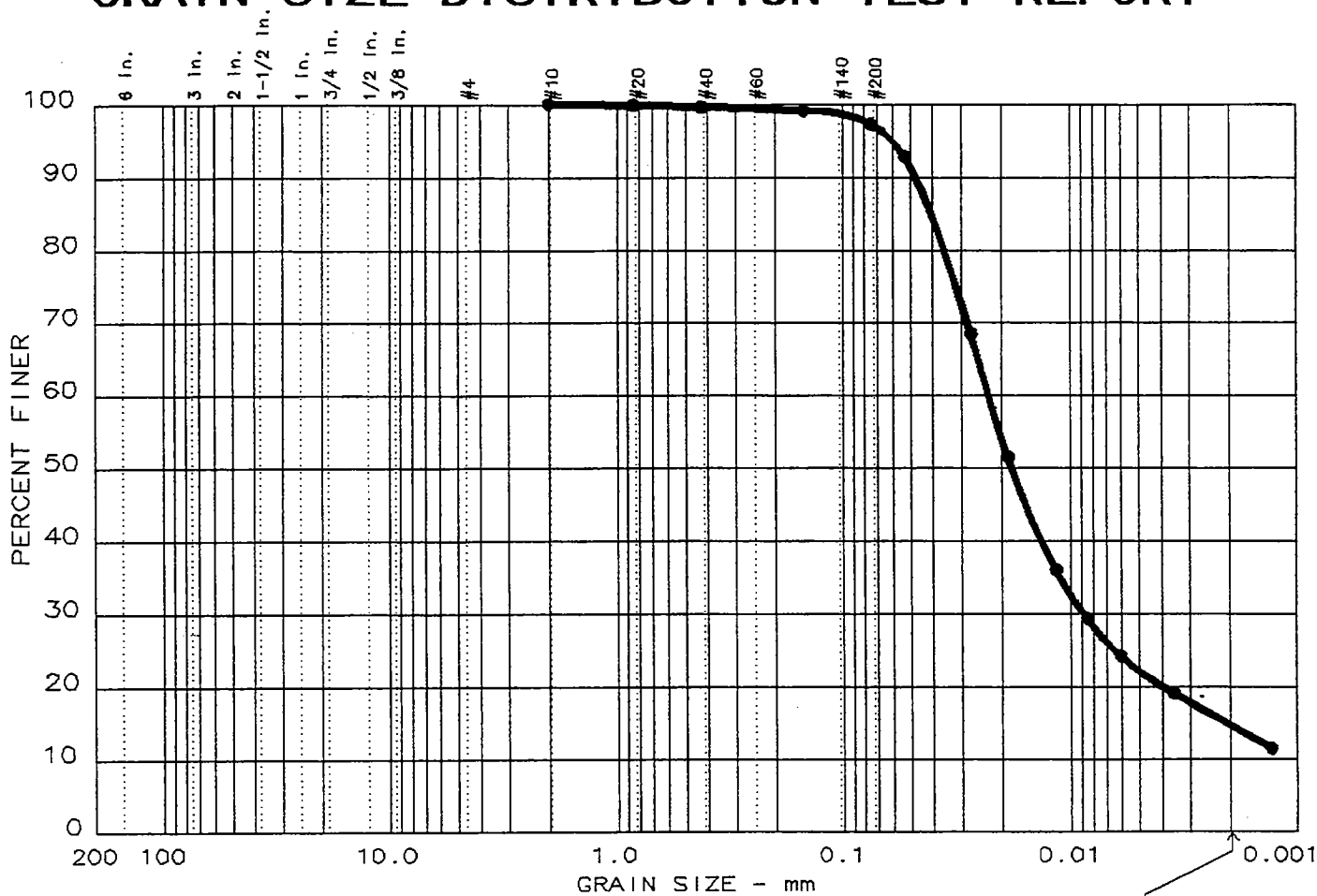
Remarks:
Client:Belasco Drilling Services Inc.
*/ Depth:4.0'
Lab No. 4216

GRAIN SIZE DISTRIBUTION TEST REPORT

H. C. NUTTING COMPANY

Figure No. _____

GRAIN SIZE DISTRIBUTION TEST REPORT



	Test	%+75mm	% GRAVEL	% SAND	% SILT	% CLAY
●	5	0.0	0.0	2.7	82.6	14.7

	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
●	26	10	0.04	0.02	0.02	0.009	0.0021			

MATERIAL DESCRIPTION	USCS	AASHTO
● LEAN CLAY	CL	

Project No.: 60364.002
Project: NASA - Plum Brook Station
● Location: Boring:PBOW-98-50 AA2-SB08 (0406)

Date: 3/19/98

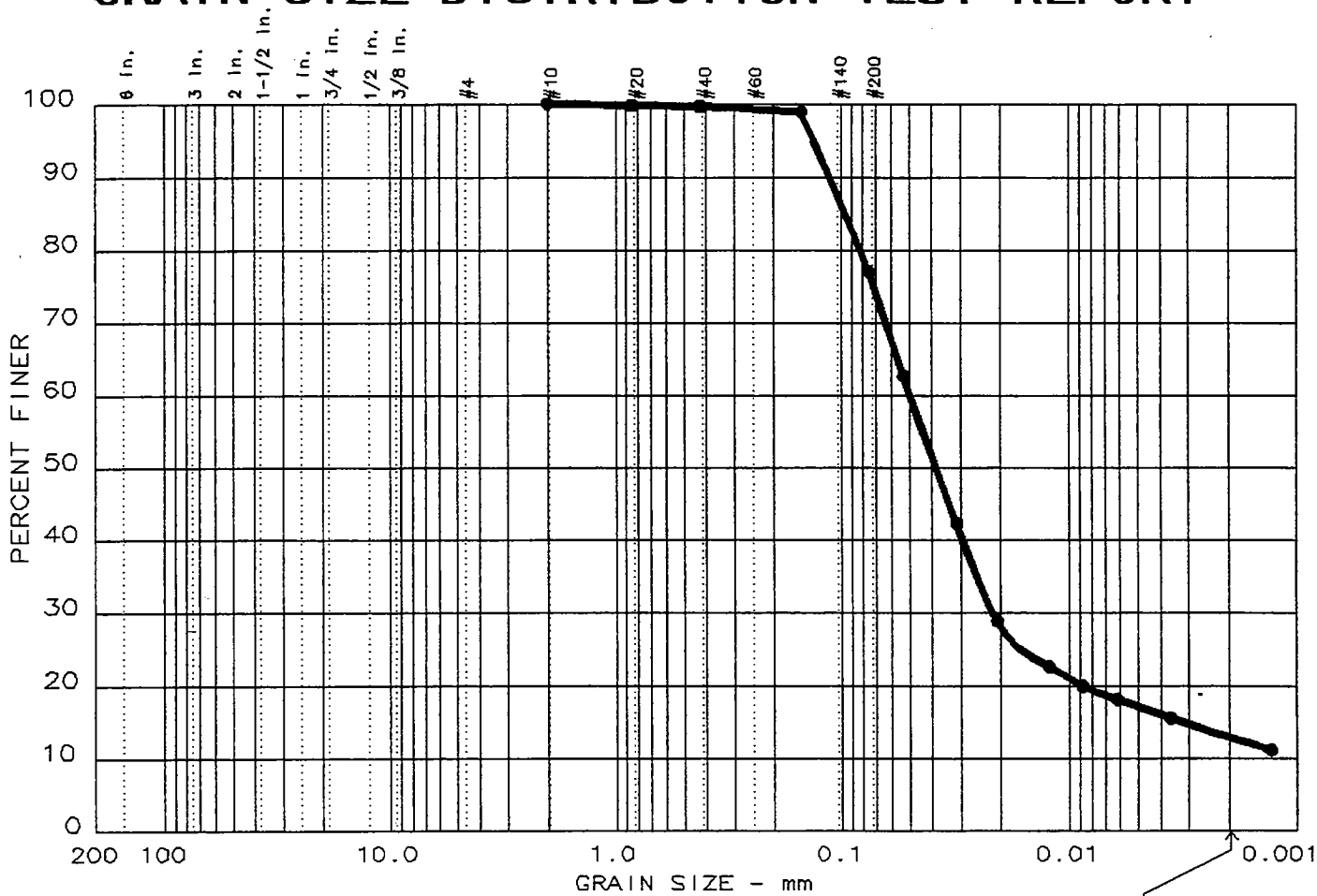
Remarks:
Client:Belasco Drilling Services Inc.

Lab No. 4217

GRAIN SIZE DISTRIBUTION TEST REPORT
H. C. NUTTING COMPANY

Figure No. _____

GRAIN SIZE DISTRIBUTION TEST REPORT



	Test	%+75 mm	% GRAVEL	% SAND	% SILT	% CLAY
●	7	0.0	0.0	23.0	64.1	12.9

	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
●	24	7	0.10	0.05	0.04	0.022	0.0032			

MATERIAL DESCRIPTION	USCS	AASHTO
● SILTY CLAY WITH SAND	CL-ML	

Project No.: 60364.002
Project: NASA - Plum Brook Station
● Location: Boring:PBOW-98-50 AA3-SB09 (0204) */

Date: 3/19/98

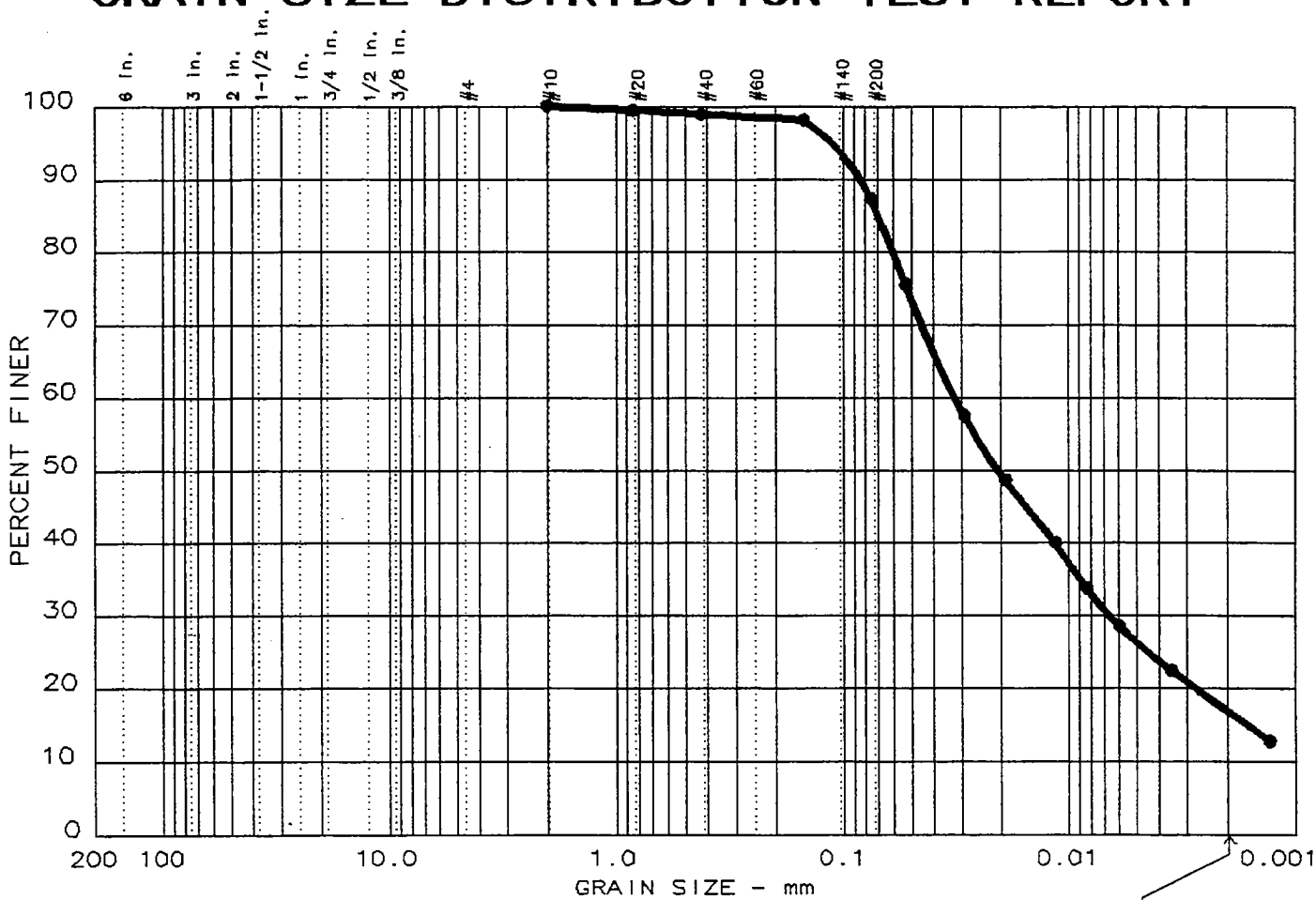
Remarks:
Client:Belasco Drilling Services Inc.
*/ Depth: 2-4'
Lab No. 4219

GRAIN SIZE DISTRIBUTION TEST REPORT

H. C. NUTTING COMPANY

Figure No. _____

GRAIN SIZE DISTRIBUTION TEST REPORT



	Test	%+75mm	% GRAVEL	% SAND	% SILT	% CLAY
●	8	0.0	0.0	12.7	70.4	16.9

	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
●	25	9	0.07	0.03	0.02	0.007	0.0016			

MATERIAL DESCRIPTION	USCS	AASHTO
● LEAN CLAY	CL	

Project No.: 60364.002
Project: NASA - Plum Brook Station
● Location: Boring:PBOW-98-50 AA3-SB09 (0406) */

Date: 3/19/98

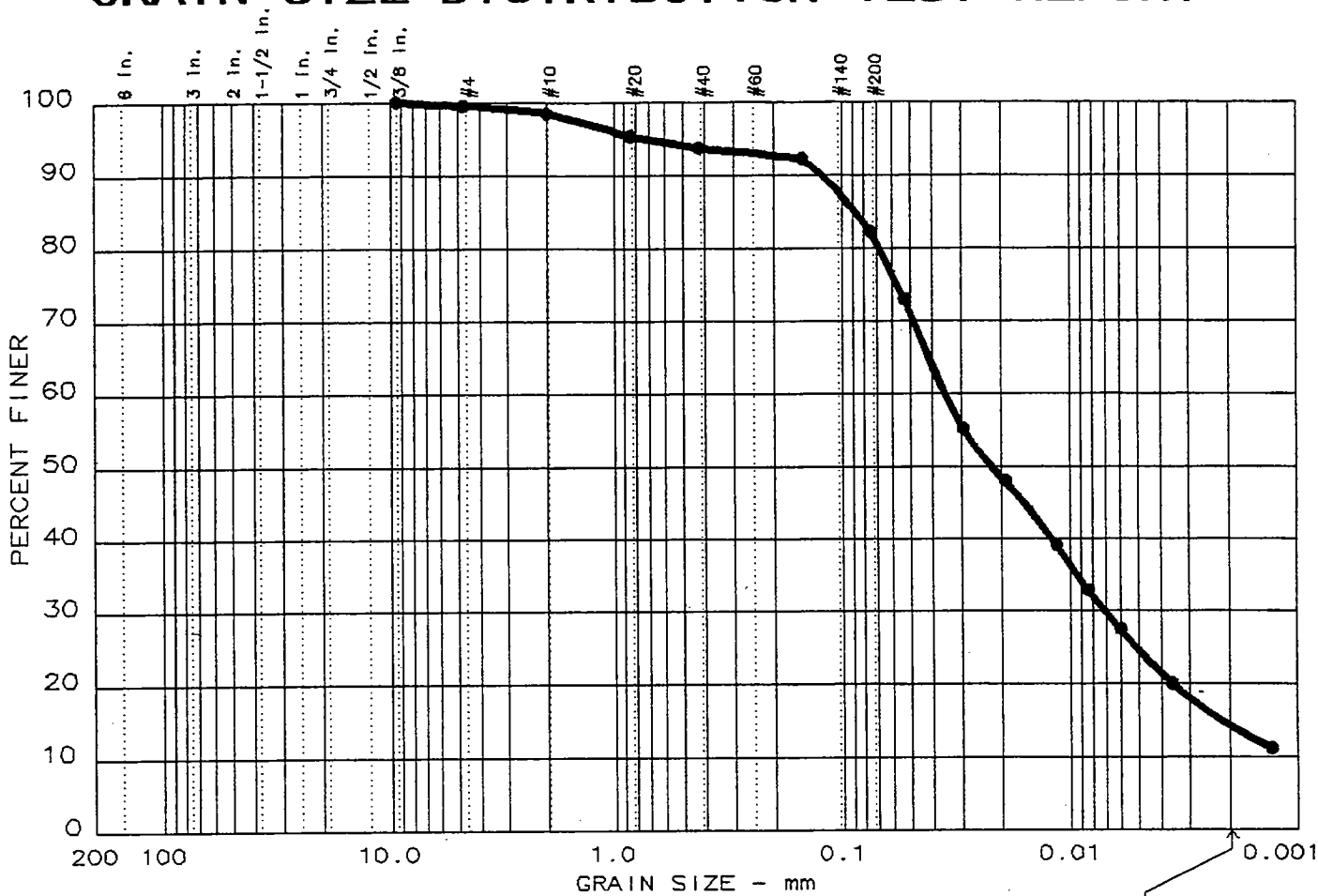
Remarks:
Client:Belasco Drilling Services Inc.
*/ Depth: 4-6'
Lab No. 4220

GRAIN SIZE DISTRIBUTION TEST REPORT

H. C. NUTTING COMPANY

Figure No. _____

GRAIN SIZE DISTRIBUTION TEST REPORT



	Test	%+75mm	% GRAVEL	% SAND	% SILT	% CLAY
●	6	0.0	0.5	17.3	67.9	14.3

	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
●	25	8	0.09	0.04	0.02	0.007	0.0022			

MATERIAL DESCRIPTION	USCS	AASHTO
● LEAN CLAY WITH SAND	CL	

Project No.: 60364.002
Project: NASA - Plum Brook Station
● Location: Boring:PBOW-98-50 AA3-SB10 (0204) */

Date: 3/19/98

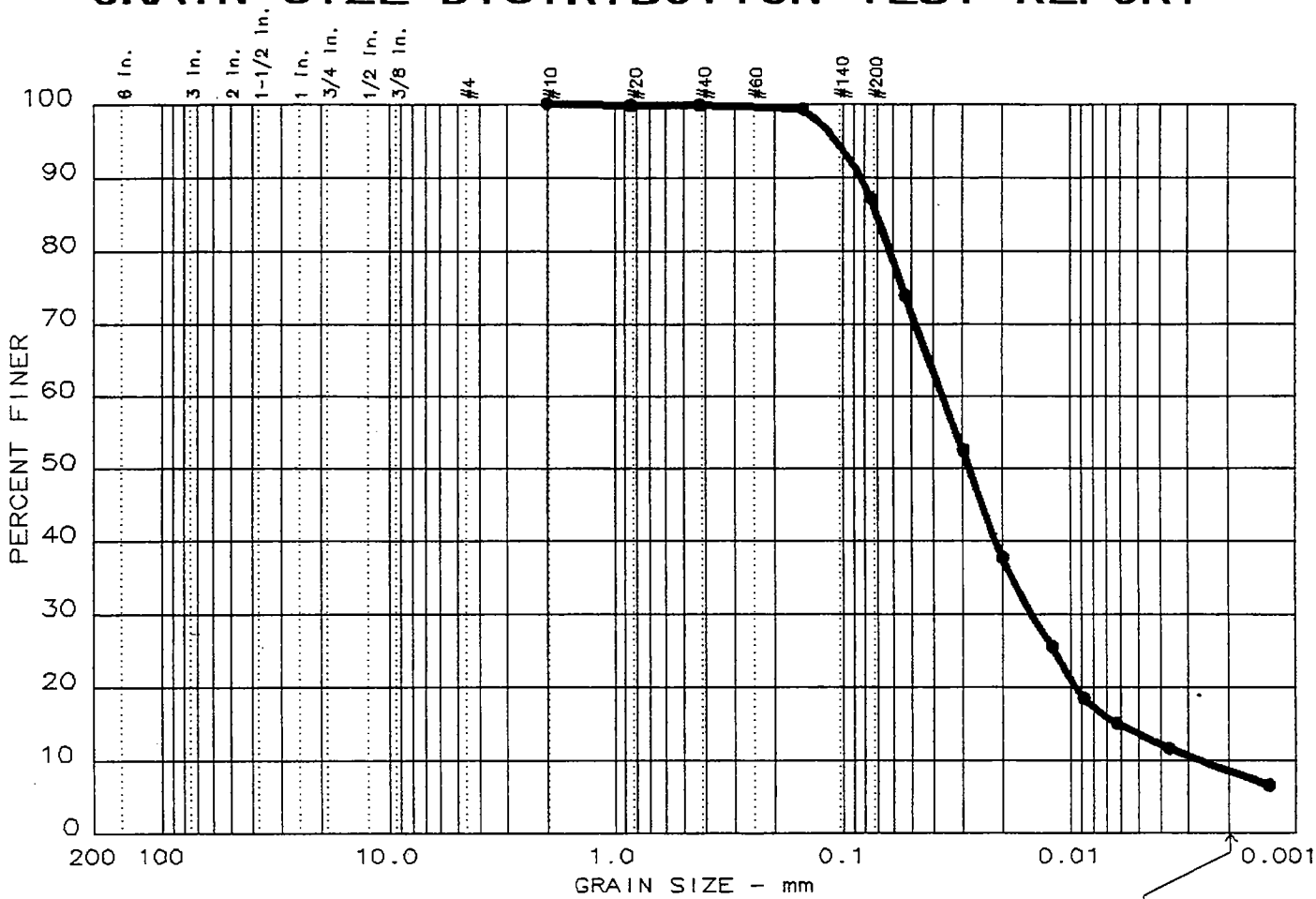
Remarks:
Client:Belasco Drilling Services Inc.
*/ Depth: 2-4'
Lab No. 4218

GRAIN SIZE DISTRIBUTION TEST REPORT

H. C. NUTTING COMPANY

Figure No. _____

GRAIN SIZE DISTRIBUTION TEST REPORT



	Test	%+75 mm	% GRAVEL	% SAND	% SILT	% CLAY
●	9	0.0	0.0	12.9	78.6	8.5

	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
●	23	7	0.07	0.04	0.03	0.015	0.0061	0.0027	2.26	13.7

MATERIAL DESCRIPTION	USCS	AASHTO
● SILTY CLAY	CL-ML	

Project No.: 60364.002
Project: NASA - Plum Brook Station
● Location: Boring:PBOW-98-50 AA3-SB10 (0406) */

Date: 3/19/98

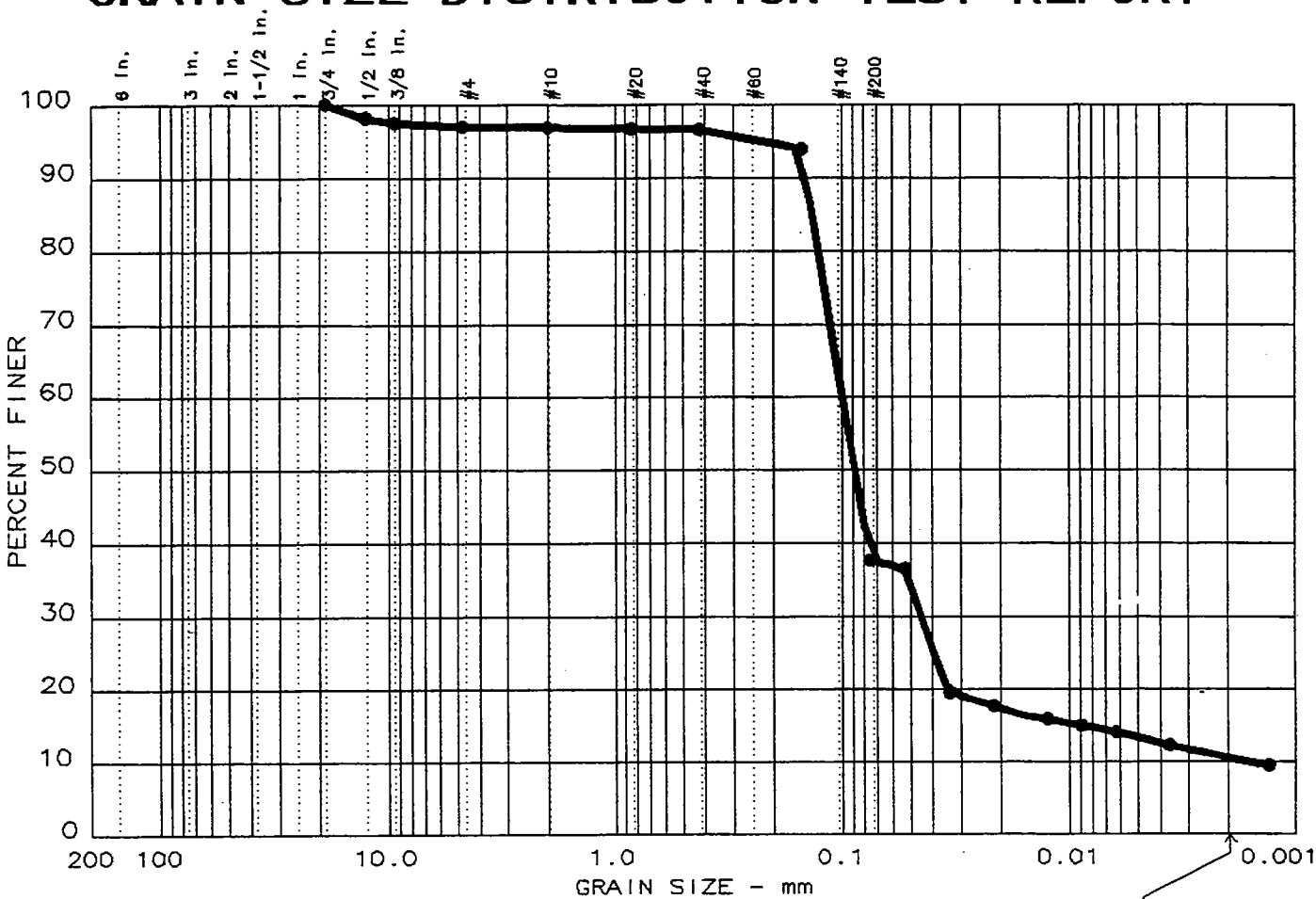
Remarks:
Client:Belasco Drilling Services Inc.
*/ Depth: 4-6'
Lab No. 4221

GRAIN SIZE DISTRIBUTION TEST REPORT

H. C. NUTTING COMPANY

Figure No. _____

GRAIN SIZE DISTRIBUTION TEST REPORT



	Test	%+75mm	% GRAVEL	% SAND	% SILT	% CLAY
●	2	0.0	3.1	59.3	27.0	10.6

	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
●	NP	NP	0.13	0.10	0.09	0.045	0.0089	0.0016	12.88	63.1

MATERIAL DESCRIPTION	USCS	AASHTO
● SILTY SAND	SM	

Project No.: 60364.002
Project: NASA-Plum Brook Station
● Location: Boring:PBOW-98-50 AA1 (0204) */

Date: 6/17/98

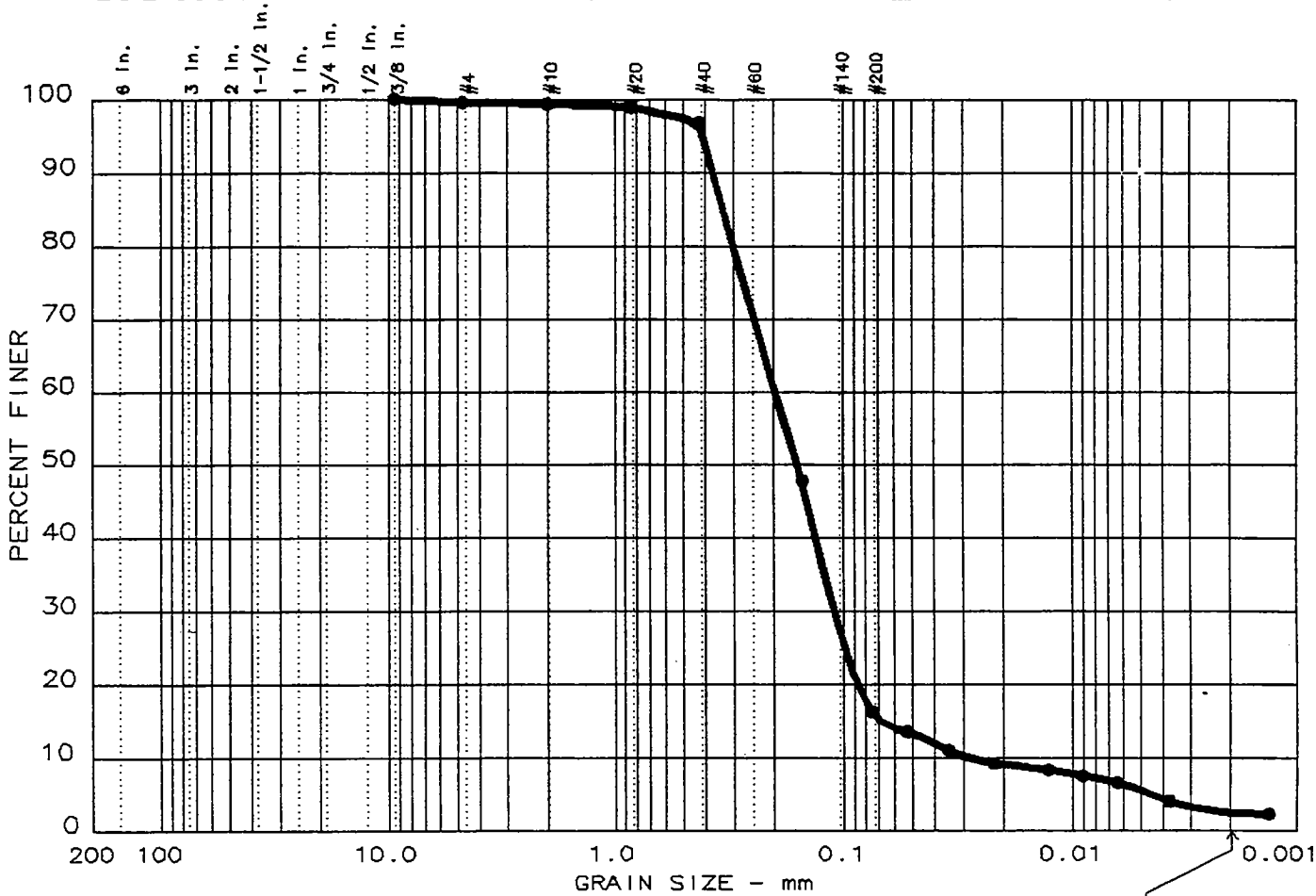
Remarks:
Client: Belasco Drilling Services Inc.
*/ Sample: Beggie
Lab No. 4222

GRAIN SIZE DISTRIBUTION TEST REPORT

H. C. NUTTING COMPANY

Figure No. _____

GRAIN SIZE DISTRIBUTION TEST REPORT



	Test	%+75mm	% GRAVEL	% SAND	% SILT	% CLAY
●	3	0.0	0.4	83.3	13.8	2.5

	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
●	NP	NP	0.33	0.20	0.16	0.109	0.0687	0.0274	2.21	7.2

MATERIAL DESCRIPTION	USCS	AASHTO
● SILTY SAND	SM	

Project No.: 60364.002
Project: NASA-Plum Brook Station
● Location: Boring:PBOW-98-50 (0204) SB12 */

Date: 6/17/98

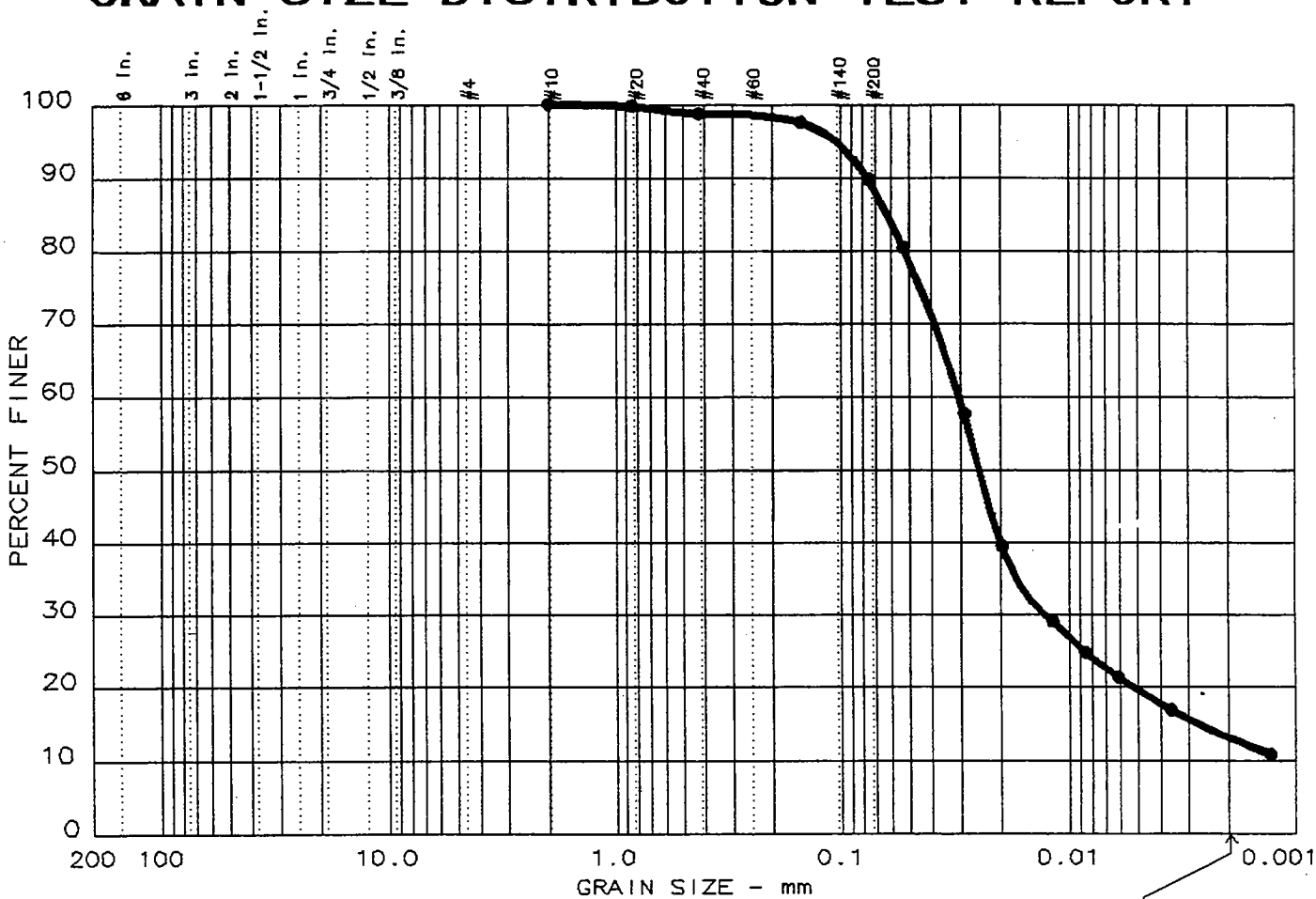
Remarks:
Client: Belasco Drilling Services Inc.
*/Samp:Beggie Depth:2-4
Lab No. 4223

GRAIN SIZE DISTRIBUTION TEST REPORT

H. C. NUTTING COMPANY

Figure No. _____

GRAIN SIZE DISTRIBUTION TEST REPORT



	Test	%+75 mm	% GRAVEL	% SAND	% SILT	% CLAY
●	3	0.0	0.0	10.3	76.5	13.2

	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
●	24	8	0.06	0.03	0.02	0.013	0.0027			

MATERIAL DESCRIPTION	USCS	AASHTO
● LEAN CLAY	CL	

Project No.: 60364.002
Project: NASA-Plum Brook Station
● Location: Boring:PBOW-98-50 (D406) SB-12 */

Date: 6/17/98

Remarks:
Client: Belasco Drilling Services Inc.
*/Samp:Beggie Depth:4-6
Lab No. 4224

GRAIN SIZE DISTRIBUTION TEST REPORT

H. C. NUTTING COMPANY

Figure No. _____

H.C. Nutting Company
4120 Airport Road
Cincinnati, Ohio 45226

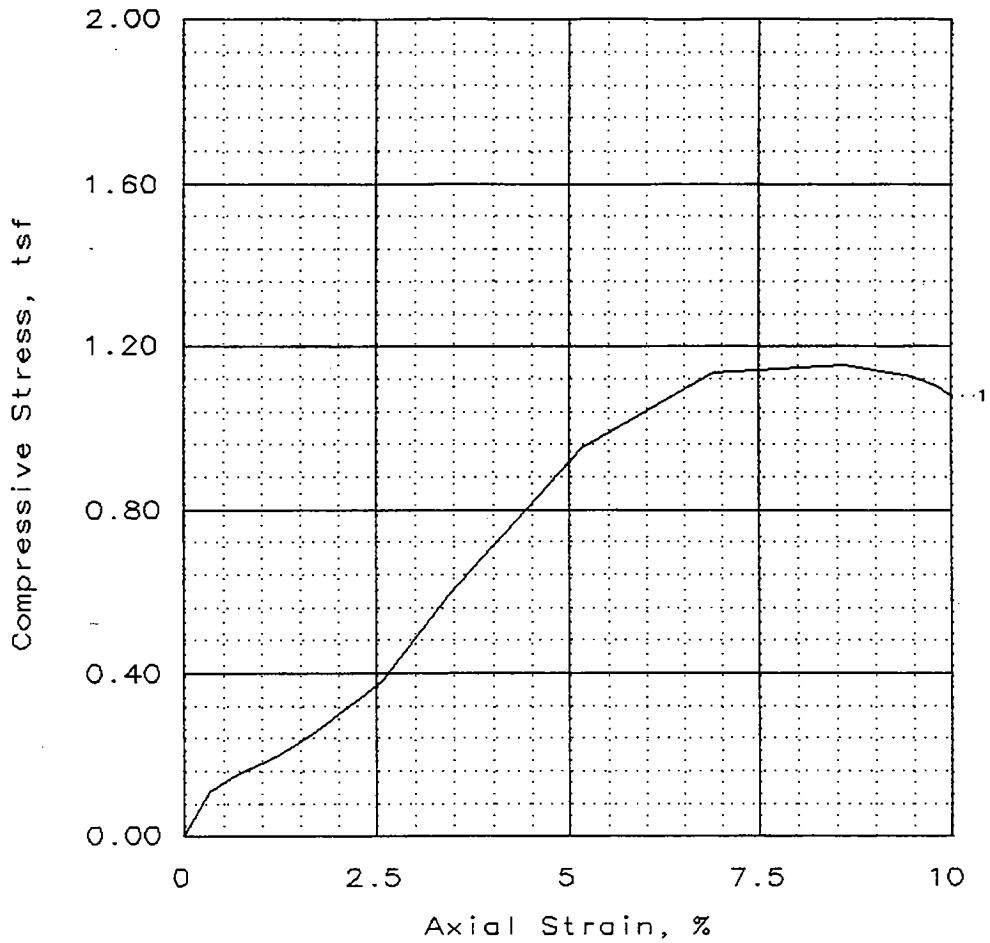
Belasco Drilling Services, Inc.
NASA - Plum Brook Station
Sandusky, OH
HCN W.O. # 60364.002

6/18/98smo

TABLE II
TABULATION OF UNDISTURBED DATA

Boring No.	Sample No.	Depth (Ft.)	Unconfined Compressive Strength (TSF)	Confining Pressure P.S.I.	Failure Strain (%)	Dry Density (Lbs./Cu. Ft.)	Water Content (%)
PB0W-98-50							
AA1-SBO2	(0406) ST	4-6	1.27	0	6.9	97.6	23.9
AA1-SB05	(0406) ST	4-6	1.16	0	8.6	117.7	25.0
	(0204) ST	2-4	1.30	0	8.6	121.6	25.6
AA1-SB08	(0204) ST	4.0	2.12	0	6.2	101.9	22.5
AA2-SB08	(0406) ST	---	1.62	0	5.2	99.8	24.2
AA3-SB09	(0204) ST	2-4	1.25	0	5.2	98.2	24.8
	(0406) ST	4-6					
AA3-SB10	(0204) ST	2-4	1.99	0	3.4	103.4	19.5
	(0406) ST	4-6					

UNCONFINED COMPRESSION TEST



Sample number:	1			
Unconfined strength, tsf	1.16			
Undrained shear strength, tsf	0.58			
Strain rate, %/min	1.000			
Water content, %	25.0			
Wet density, pcf	117.7			
Dry density, pcf	94.1			
Saturation, %	84.7			
Void ratio	0.804			
Specimen diameter, in	2.85			
Specimen height, in	5.80			

Description: Gr & Br LEAN CLAY, moist-stiff

LL = 31	PL = 16	PI = 15	GS =	Type:

Project No.: 60364.002
Date: 6/18/98
Remarks:
Lab No. 4214

Client: Belasco Drilling Services, Inc.

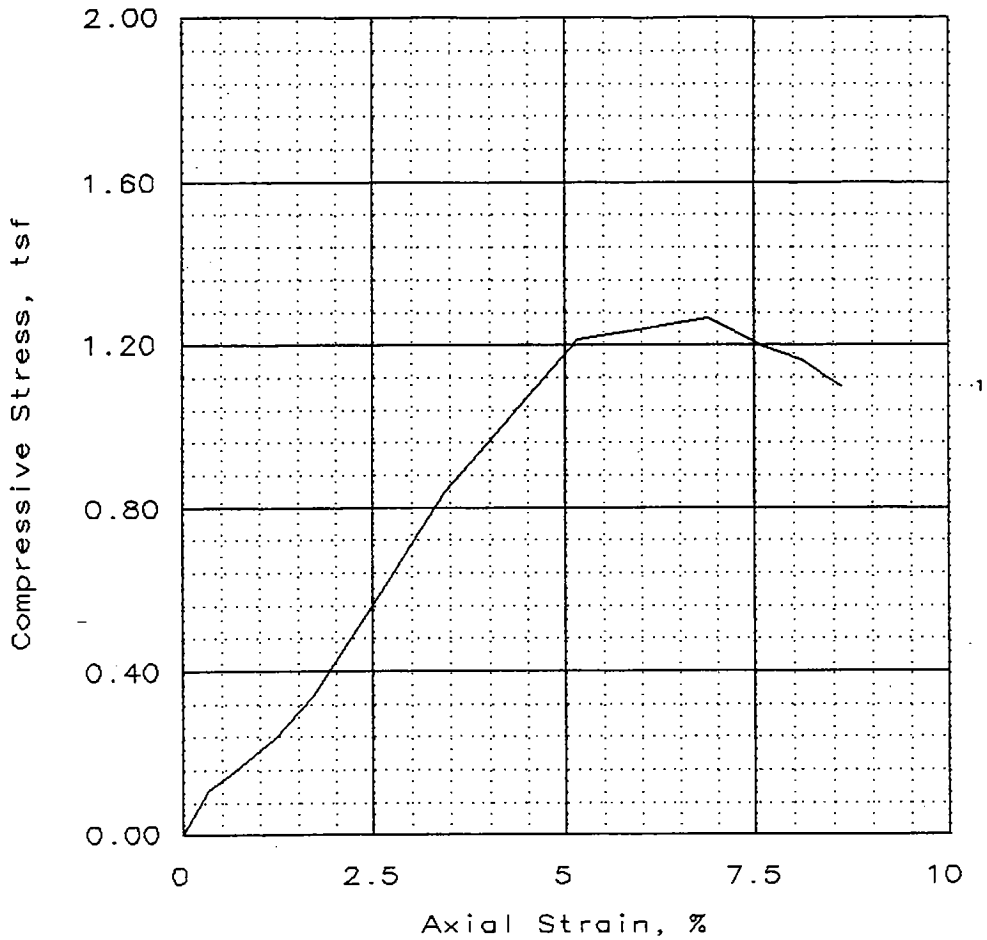
Project: NASA - Plum Brook Station
Sandusky, OH
Location: Boring:PBOW-98-50 AA1
SB05(0406) Depth:4-6' Samp:ST

UNCONFINED COMPRESSION TEST

H. C. NUTTING COMPANY

Fig No.

UNCONFINED COMPRESSION TEST



Sample number:	1			
Unconfined strength, tsf	1.27			
Undrained shear strength, tsf	0.63			
Strain rate, %/min	1.000			
Water content, %	23.9			
Wet density, pcf	120.9			
Dry density, pcf	97.6			
Saturation, %	87.8			
Void ratio	0.741			
Specimen diameter, in	2.84			
Specimen height, in	5.80			

Description: Lt Gr LEAN CLAY

LL = 26	PL = 16	PI = 10	GS =	Type:

Project No.: 60364.002

Date: 6/18/98

Remarks:

Lab No. 4213

Client: Belasco Drilling Services, Inc.

Project: NASA - Plum Brook Station
Sandusky, OH

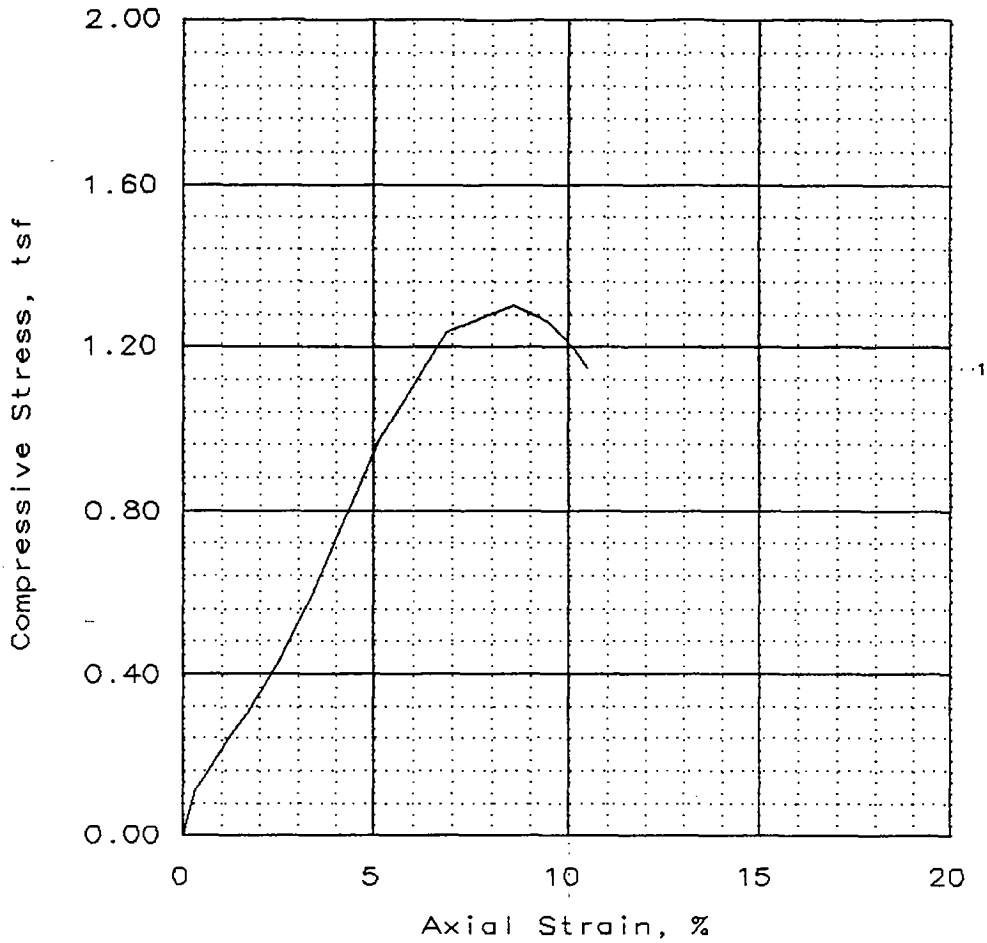
Location: Boring:PBOW-98-50 AA1
SB02 (0406) Depth:4-6' Samp:ST

UNCONFINED COMPRESSION TEST

H. C. NUTTING COMPANY

Fig No.

UNCONFINED COMPRESSION TEST



Sample number:	1			
Unconfined strength, tsf	1.30			
Undrained shear strength, tsf	0.65			
Strain rate, %/min	1.000			
Water content, %	25.6			
Wet density, pcf	121.6			
Dry density, pcf	96.8			
Saturation, %	92.3			
Void ratio	0.754			
Specimen diameter, in	2.82			
Specimen height, in	5.80			

Description: Br & Gr LEAN CLAY, moist-stiff

LL = 31	PL = 15	PI = 16	GS =	Type:

Project No.: 60364.002
Date: 6/18/98
Remarks:
Lab No. 4215

Client: Belasco Drilling Services, Inc.

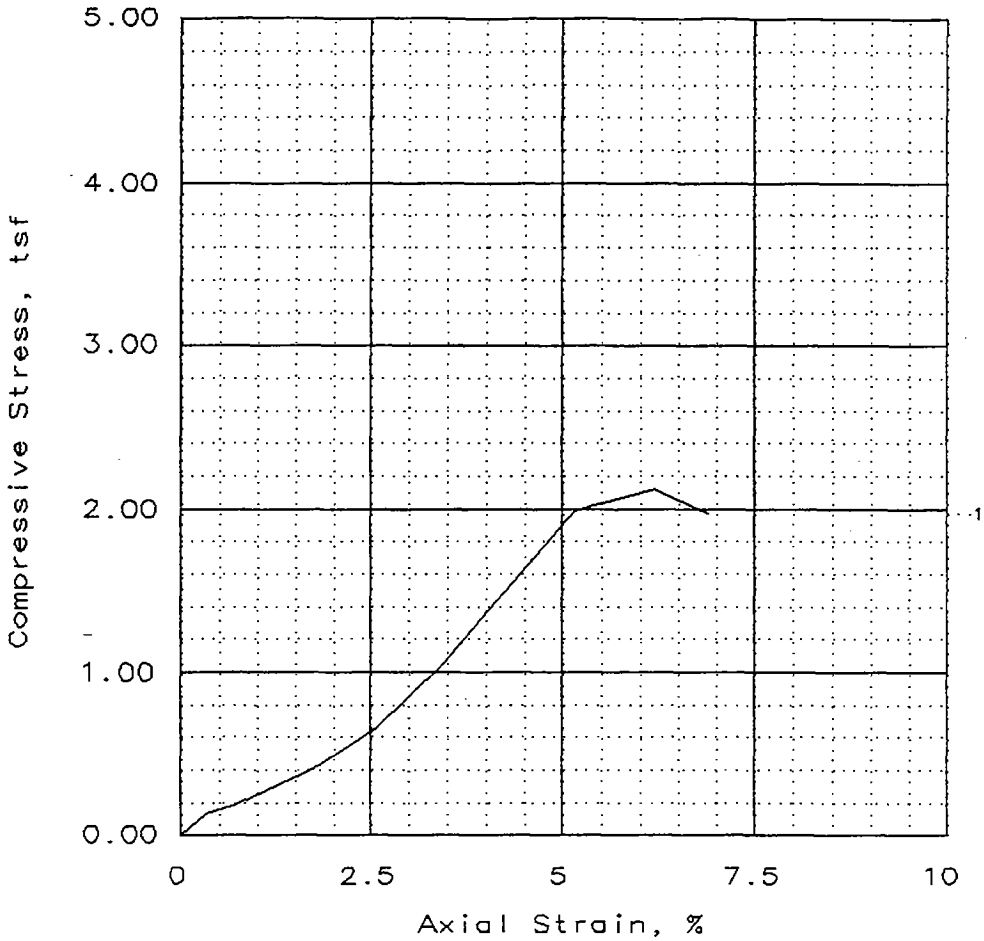
Project: NASA - Plum Brook Station
Sandusky, OH
Location: Boring:PBOW-98-50 AA1
SB-5 (0204) Depth:2-4' Samp:ST

UNCONFINED COMPRESSION TEST

Fig No.

H. C. NUTTING COMPANY

UNCONFINED COMPRESSION TEST



Sample number:	1			
Unconfined strength, tsf	2.12			
Undrained shear strength, tsf	1.06			
Strain rate, %/min	1.000			
Water content, %	22.5			
Wet density, pcf	124.8			
Dry density, pcf	101.9			
Saturation, %	91.8			
Void ratio	0.666			
Specimen diameter, in	2.80			
Specimen height, in	5.80			

Description: Br & Tr Gr LEAN CLAY, moist-stiff

LL = 28	PL = 16	PI = 12	GS =	Type:

Project No.: 60364.002
Date: 6/18/98
Remarks:
Lab No. 4216

Client: Belasco Drilling Services, Inc.

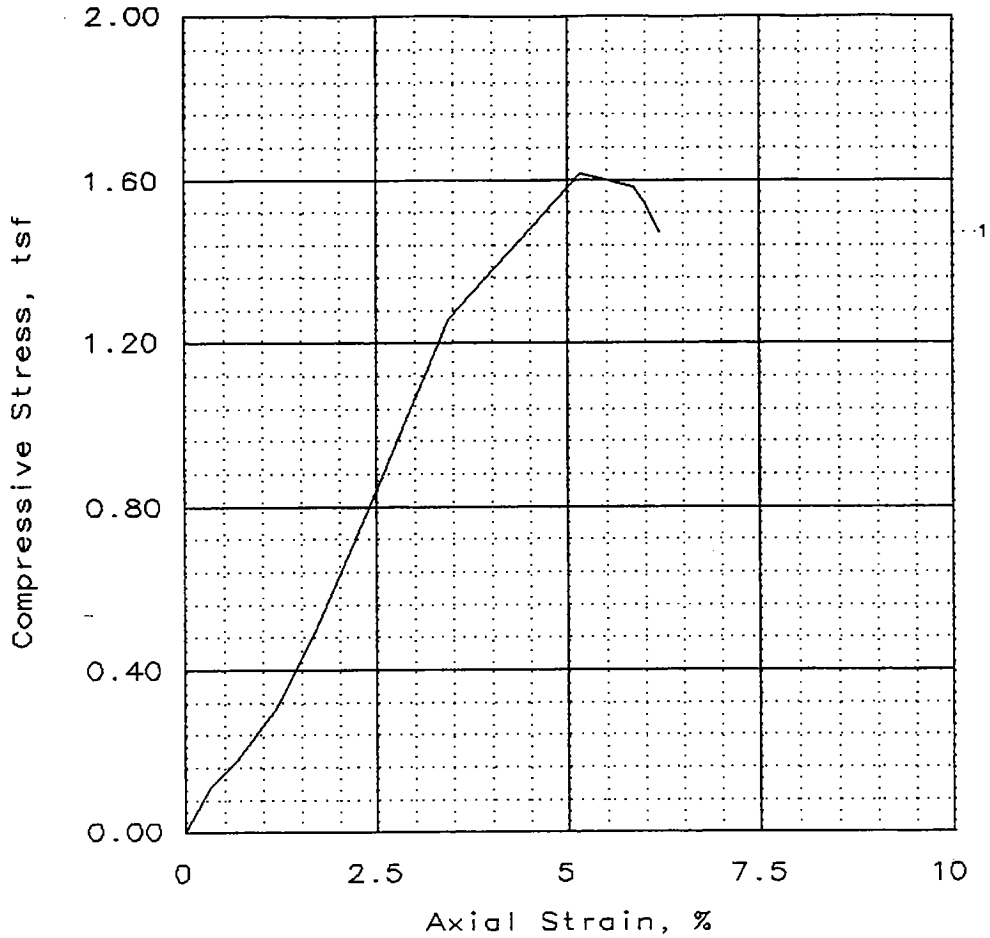
Project: NASA - Plum Brook Station
Sandusky, OH
Location: Boring:PBOW-98-50 AA1
SB08 (0204) Depth:4.0' Samp:ST

UNCONFINED COMPRESSION TEST

H. C. NUTTING COMPANY

Fig No.

UNCONFINED COMPRESSION TEST



Sample number:	1			
Unconfined strength, tsf	1.62			
Undrained shear strength, tsf	0.81			
Strain rate, %/min	1.000			
Water content, %	24.2			
Wet density, pcf	123.9			
Dry density, pcf	99.8			
Saturation, %	93.7			
Void ratio	0.702			
Specimen diameter, in	2.81			
Specimen height, in	5.80			

Description: Br LEAN CLAY, moist-stiff

LL = 26	PL = 16	PI = 10	GS =	Type:

Project No.: 60364.002
Date: 6/18/98
Remarks:
Lab No. 4217

Fig No.

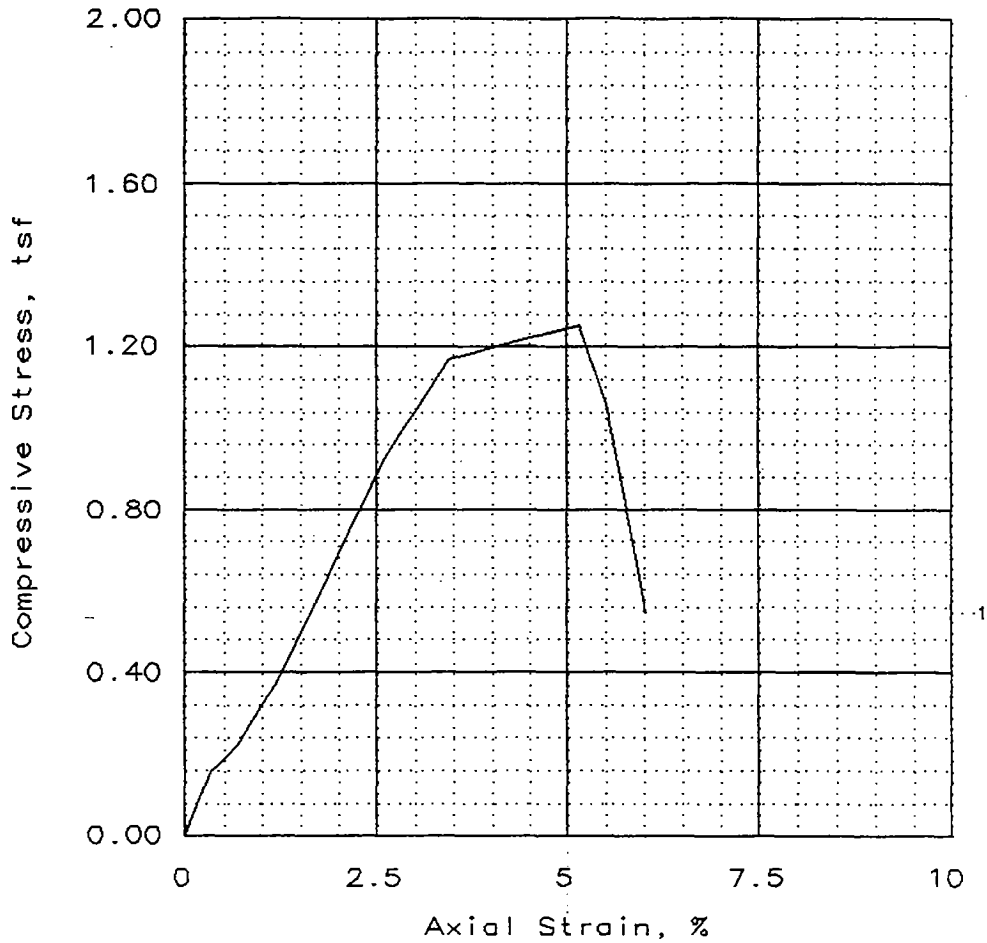
Client: Belasco Drilling Services, Inc.

Project: NASA - Plum Brook Station
Sandusky, OH
Location: Boring:PBOW-98-50 AA2
SB08 (0406) Samp:St

UNCONFINED COMPRESSION TEST

H. C. NUTTING COMPANY

UNCONFINED COMPRESSION TEST



Sample number:	1			
Unconfined strength, tsf	1.25			
Undrained shear strength, tsf	0.63			
Strain rate, %/min	1.000			
Water content, %	24.8			
Wet density, pcf	122.6			
Dry density, pcf	98.2			
Saturation, %	92.6			
Void ratio	0.730			
Specimen diameter, in	2.81			
Specimen height, in	5.80			

Description: Br SILTY CLAY WITH SAND

LL = 24	PL = 17	PI = 7	GS =	Type:

Project No.: 60364.002
Date: 6/18/98
Remarks:
Lab No. 4219

Client: Belasco Drilling Services, Inc.

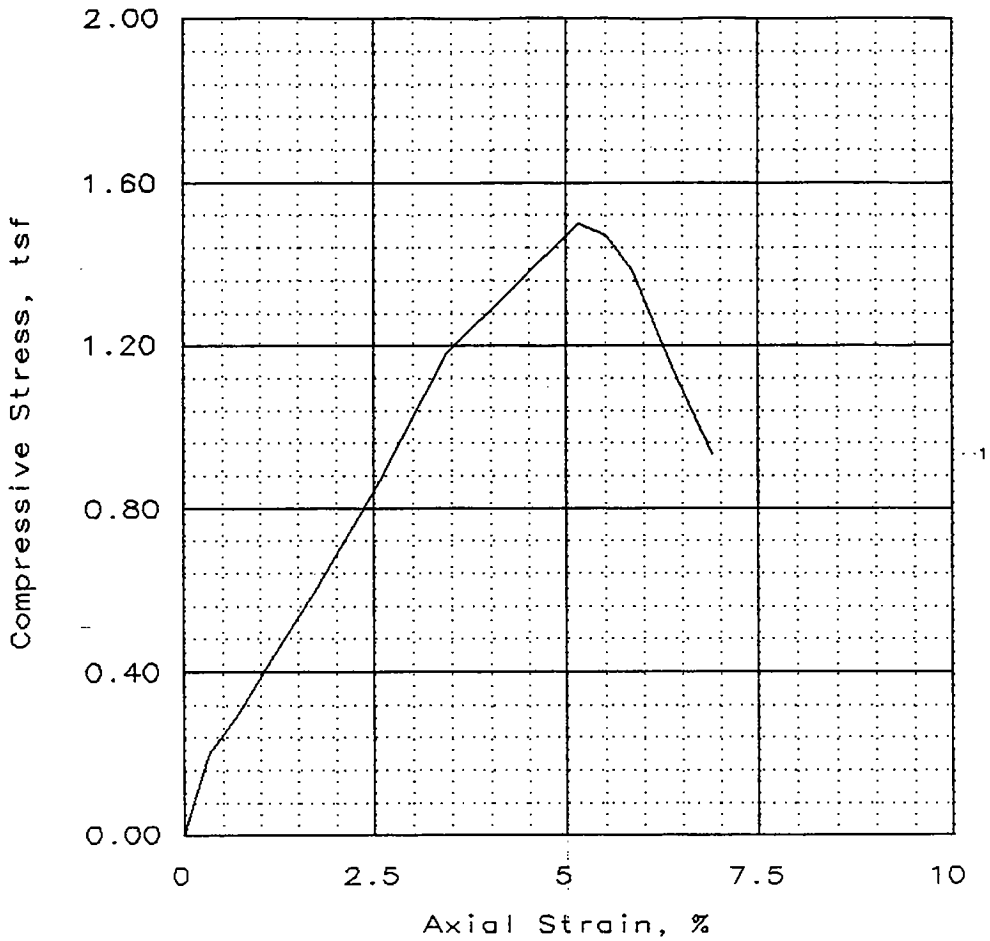
Project: NASA - Plum Brook Station
Sandusky, OH
Location: Boring:PBOW-98-50 AA3
SB09 (0204) Depth:2-4' Samp:ST

UNCONFINED COMPRESSION TEST

H. C. NUTTING COMPANY

Fig No.

UNCONFINED COMPRESSION TEST



Sample number:	1			
Unconfined strength, tsf	1.50			
Undrained shear strength, tsf	0.75			
Strain rate, %/min	1.000			
Water content, %	25.3			
Wet density, pcf	120.6			
Dry density, pcf	96.2			
Saturation, %	89.9			
Void ratio	0.764			
Specimen diameter, in	2.82			
Specimen height, in	5.80			

Description: Br LEAN CLAY, moist-stiff

LL = 25	PL = 16	PI = 9	GS =	Type:

Project No.: 60364.002
Date: 6/18/98
Remarks:
Lab No. 4220

Client: Belasco Drilling Services, Inc.

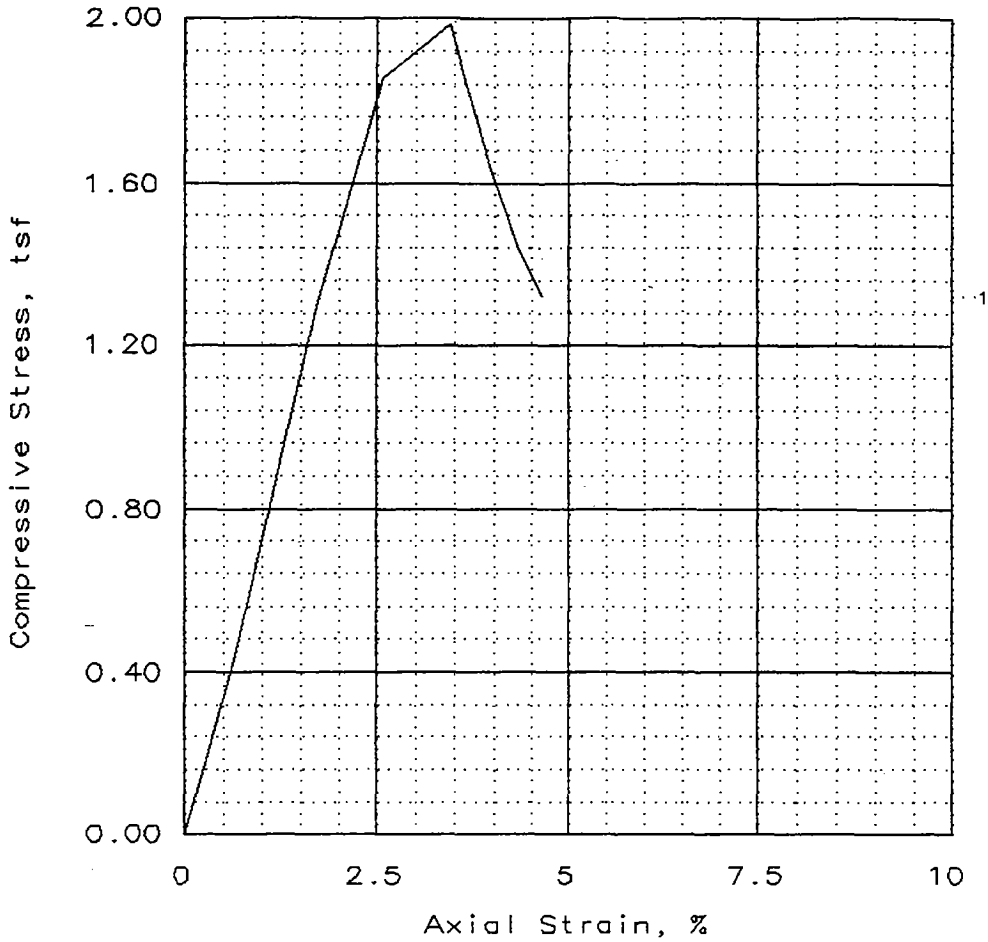
Project: NASA - Plum Brook Station
Sandusky, OH
Location: Boring:PBOW-98-50 AA3
SB09 (0406) Depth:4-6' Samp:St

UNCONFINED COMPRESSION TEST

H. C. NUTTING COMPANY

Fig No.

UNCONFINED COMPRESSION TEST



Sample number:	1			
Unconfined strength, tsf	1.99			
Undrained shear strength, tsf	0.99			
Strain rate, %/min	1.000			
Water content, %	19.5			
Wet density, pcf	123.5			
Dry density, pcf	103.4			
Saturation, %	82.5			
Void ratio	0.643			
Specimen diameter, in	2.86			
Specimen height, in	5.80			

Description: Gr & Br LEAN CLAY,WITH SAND

LL = 25	PL = 17	PI = 8	GS =	Type:

Project No.: 60364.002
Date: 6/18/98
Remarks:
Lab No. 4218

Client: Belasco Drilling Services, Inc.

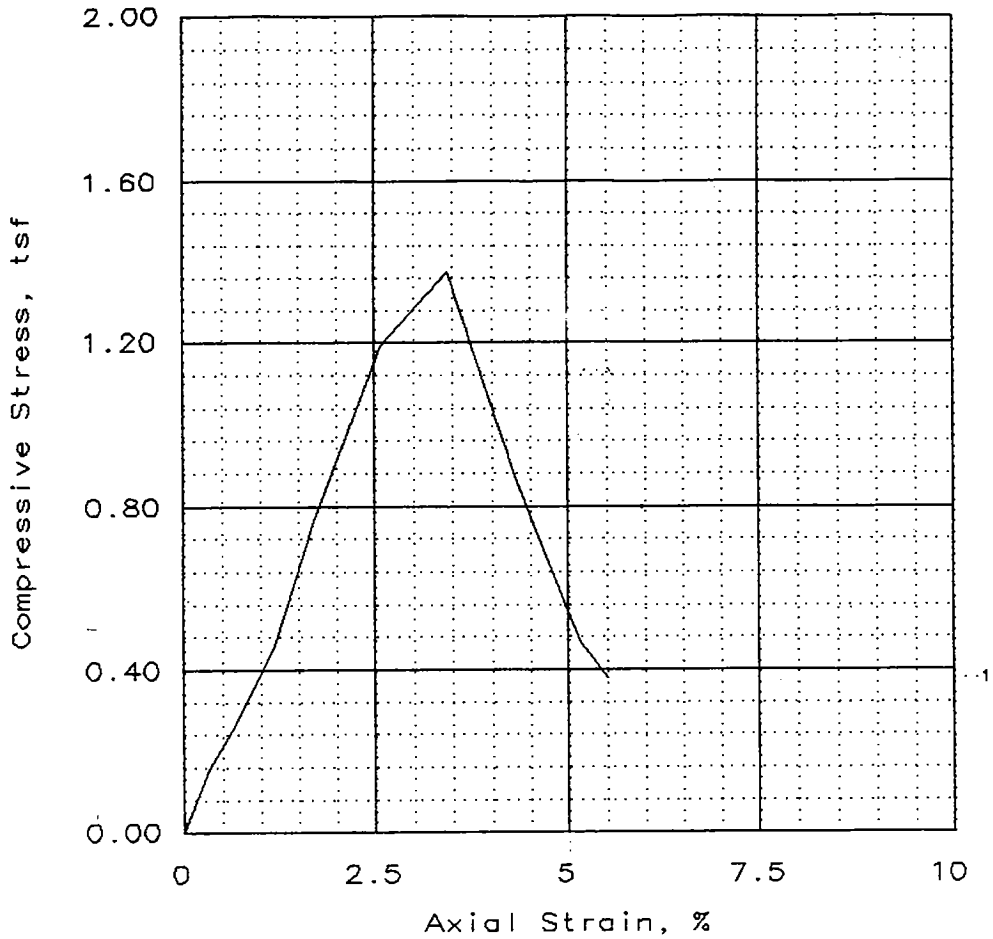
Project: NASA - Plum Brook Station
Sandusky, OH
Location: Boring:PB02-98-50 AA3
SB10 (0204) Depth:2-4' Samp:ST

UNCONFINED COMPRESSION TEST

H. C. NUTTING COMPANY

Fig No.

UNCONFINED COMPRESSION TEST



Sample number:	1			
Unconfined strength, tsf	1.38			
Undrained shear strength, tsf	0.69			
Strain rate, %/min	1.000			
Water content, %	26.1			
Wet density, pcf	120.9			
Dry density, pcf	95.9			
Saturation, %	92.0			
Void ratio	0.771			
Specimen diameter, in	2.82			
Specimen height, in	5.80			

Description: Br SILTY CLAY

LL = 23	PL = 16	PI = 7	GS =	Type:

Project No.: 60364.002

Date: 6/18/98

Remarks:

Lab No. 4221

Client: Belasco Drilling Services, Inc.

Project: NSAS - Plum Brook Station
Sandusky, OH

Location: Boring:PBOW-98-50 AA3
SB10 (0406) Depth:4-6' Samp:ST

UNCONFINED COMPRESSION TEST

H. C. NUTTING COMPANY

Fig No.

APPENDIX C

LAND SURVEY DATA

Land Survey Results for the Acid Areas
Site Investigation of Acid Areas, Former Plum Brook Ordnance Works
Sandusky, Ohio

Point #	Y	X	Elevation	Point Name (ID)	Remarks
Background Soil Borings					
573	624,092.57	1,926,913.80	641.87	PBOW-98-BCG-SO01	
506	614,952.11	1,928,879.60	648.61	PBOW-98-BCG-SO02	
505	612,433.45	1,928,904.46	650.69	PBOW-98-BCG-SO03	
507	614,233.05	1,919,767.03	670.87	PBOW-98-BCG-SO04	
504	617,926.45	1,914,799.00	674.86	PBOW-98-BCG-SO05	
502	618,621.03	1,910,167.34	665.98	PBOW-98-BCG-SO06	
Acid Area Number 1					
539	622,800.41	1,917,283.29	639.42	PBOW-98-AA1-SB01	
542	622,651.05	1,917,277.80	638.54	PBOW-98-AA1-SB02	Geotechnical samples included
544	622,900.44	1,917,131.72	639.24	PBOW-98-AA1-SB03	
540	622,893.74	1,917,508.79	637.07	PBOW-98-AA1-SB04	
538	622,696.42	1,917,524.25	638.33	PBOW-98-AA1-SB05	Geotechnical samples included
537	622,815.70	1,917,764.35	639.00	PBOW-98-AA1-SB06	
536	622,643.33	1,917,761.89	639.02	PBOW-98-AA1-SB07	
535	622,764.24	1,917,936.76	638.92	PBOW-98-AA1-SB08	
534	622,808.81	1,918,011.35	639.06	PBOW-98-AA1-SB09	
533	622,898.53	1,918,219.13	639.82	PBOW-98-AA1-SB10	
547	622,756.10	1,918,259.65	638.53	PBOW-98-AA1-SB11	
546	622,763.62	1,918,483.67	639.84	PBOW-98-AA1-SB12	
545	623,053.59	1,917,092.13	638.38	PBOW-98-AA1-SB13	
543	622,987.72	1,917,352.61	637.06	PBOW-98-AA1-SB14	
529	622,990.79	1,917,721.63	638.45	PBOW-98-AA1-SB15	
Acid Area Number 2					
568	623,295.22	1,908,982.37	643.19	PBOW-98-AA2-SB01	
571	623,165.31	1,909,074.13	643.09	PBOW-98-AA2-SB02	
569	623,185.50	1,908,927.20	643.29	PBOW-98-AA2-SB03	
572	623,247.19	1,909,209.21	642.18	PBOW-98-AA2-SB04	
562	623,273.00	1,909,444.76	640.88	PBOW-98-AA2-SB05	
560	623,235.70	1,909,548.32	640.80	PBOW-98-AA2-SB06	
561	623,355.41	1,909,611.97	641.41	PBOW-98-AA2-SB07	
558	623,271.09	1,909,753.45	640.31	PBOW-98-AA2-SB08	Geotechnical samples included
556	623,167.15	1,909,952.11	640.76	PBOW-98-AA2-SB09	
555	623,200.41	1,910,096.19	640.31	PBOW-98-AA2-SB10	
557	623,253.22	1,909,965.66	640.11	PBOW-98-AA2-SB11	
559	623,365.58	1,909,698.81	641.49	PBOW-98-AA2-SB12	Geotechnical samples included
563	623,428.96	1,909,303.69	642.45	PBOW-98-AA2-SB13	
564	623,439.90	1,909,122.62	642.98	PBOW-98-AA2-SB14	
567	623,402.80	1,908,953.16	642.93	PBOW-98-AA2-SB15	

Land Survey Results for the Acid Areas
Site Investigation of Acid Areas, Former Plum Brook Ordnance Works
Sandusky, Ohio

Point #	Y	X	Elevation	Point Name (ID)	Remarks
Acid Area Number 3					
523	624,877.83	1,914,494.76	636.05	PBOW-98-MNT-SB01	
522	624,801.12	1,914,518.56	636.40	PBOW-98-MNT-SB02	
528	624,731.91	1,914,488.00	635.06	PBOW-98-MNT-SB03	
513	624,083.60	1,914,688.34	635.63	PBOW-98-AA3-SB01	
512	623,995.28	1,914,649.76	635.58	PBOW-98-AA3-SB02	
521	624,351.58	1,914,516.42	635.67	PBOW-98-AA3-SB03	
511	623,930.97	1,914,552.52	636.67	PBOW-98-AA3-SB04	
524	625,321.14	1,914,663.48	632.21	PBOW-98-AA3-SB05	
525	625,019.44	1,914,641.91	634.79	PBOW-98-AA3-SB06	
526	624,810.01	1,914,625.65	635.34	PBOW-98-AA3-SB07	
510	623,435.01	1,914,515.59	636.84	PBOW-98-AA3-SB08	
508	623,074.05	1,914,990.76	637.35	PBOW-98-AA3-SB09	Geotechnical samples included
509	623,348.41	1,914,841.86	637.75	PBOW-98-AA3-SB10	Geotechnical samples included
514	624,109.42	1,914,774.71	635.78	PBOW-98-AA3-SB11	
515	624,281.43	1,914,715.48	635.61	PBOW-98-AA3-SB12	
516	624,504.25	1,914,729.83	636.11	PBOW-98-AA3-SB13	
517	624,817.11	1,914,793.08	635.51	PBOW-98-AA3-SB14	
518	624,969.27	1,914,734.78	635.40	PBOW-98-AA3-SB15	
519	624,186.43	1,914,967.28	635.97	PBOW-98-PSB-SS01	
520	624,110.11	1,914,965.49	635.41	PBOW-98-PSB-SS02	

NOTICE: Values were scaled to the Ohio State Plane Coordinate System (North Zone).
A combined factor of 0.999927 was used in this determination.
These coordinates are NAD 1983 Datum expressed in feet.
Vertical datum is NGVD 1929.

APPENDIX D

DATA QUALITY EVALUATION

Appendix D

Data Quality Evaluation
Plum Brook Ordnance Works
Site Investigation of Acid Areas

D1.0 Introduction

This appendix of the Plum Brook Site Investigation Report presents the results of the Quality Assurance/Quality Control (QA/QC) protocols implemented during the sampling and analysis portion of the investigations of Acid Area No. 1 (AA1), Acid Area No.2 (AA2), Acid Area No. 3 (AA3), Maintenance Shop Area (MNT), Power Substation Area (PSB), and Background (BCG). The quality indicators from every aspect of the data collection process have been reviewed, and an assessment of the data with regard to the project specific objectives is presented. The reliability of the sampling and analytical procedures used during the investigations was demonstrated by implementing the project specific quality assurance procedures specified in the site-wide Sampling and Analysis Plan and Quality Assurance Project Plan (IT 1996a) and its site-specific attachments (SSAP, IT 1998). Successful execution of these procedures provides strong supporting evidence for the acceptance of the data as being representative of the area under investigation. A complete evaluation of the procedures implemented in the investigations are summarized in this Data Quality Evaluation (DQE).

The DQE for the Plumbrook site investigations is divided into two phases. The first phase includes the discussion of the overall field sampling effort and the field quality control (QC) activities employed. The resulting QC data are presented and compared to the procedures and goals established in the Sampling and Analysis Plan (SAP) and Quality Assurance Project Plan (QAPP), as well as the verification of the completeness, accuracy and representativeness of the field sampling. The second phase deals with the analytical program and the results of the QC activities employed. An overall comparison to data quality objectives (DQOs) was performed as well as a complete data review. All elements of data evaluation were compiled and used to determine the usability and overall applicability of the resulting data.

D2.0 Field Sampling Program

Field Quality Control Activities. To ensure the reliability of the field sampling procedures, and analytical data, field QA/QC samples were collected or prepared for each medium sampled, each sample shipment and/or each sampling event. These QA/QC samples are then used to address any sample variability and uncertainty in procedures.

D2.1 Field Duplicates

The purpose of the field duplicate is to generate data used to evaluate the precision of the sample collection, handling and analysis procedures. As field duplicate was collected for each of the investigation areas. Field duplicate samples were collected from the following locations: AA1-SB01, AA2-SB06, AA3-SB01, MNT-SB01, PSB-SS01, and BCG-SB01.

It can be difficult to collect true duplicate samples, especially for solid matrices that are inherently more heterogeneous than liquid matrices. Greater variations are seen in the precision data which are measured by calculating the relative percent difference (RPD) between the original sample results and its duplicate results. Higher RPDs are thought to reflect difficulties often encountered during the collection of duplicate samples or sample handling. Wide variations in soil results may be attributable to actual variations in concentrations rather than denoting problems with precision or sampling effectiveness.

All positive concentrations and the calculated RPD for the original sample and/or its duplicate are presented in Tables D-1 to D-6. The RPD results were calculated as follows:

$$RPD = \frac{A - B}{[(A + B)/2]} \; 100$$

where:

RPD = Relative percent difference
A = Original sample result
B = Duplicate sample result.

When concentrations are detected in only one of the two samples, "NC" is used to represent the RPD which is then "not calculable" for the parameter. There is no quantifiable result available

from the "non-detect" sample to be used in the RPD calculation. When "estimated" (J qualified) concentrations are reported, there is a greater potential for increased variability between the primary and duplicate results as reflected in the RPD calculation.

Sample results with RPD values less than 50 are considered acceptable. Within each sampling area, there were results exceeding that value. Results from AA1-SB01 outside acceptable limits were calcium (86 percent), zinc (62 percent), lead (146 percent), sulfate (126 percent), and Aroclor 1260 (184 percent). Three semivolatile compounds exceeded the RPD limit, but the detected results were estimated and below the reporting limits. Results from AA2-SB06 demonstrated good precision with two exceptions: Aroclor 1260 (139 percent) and lead (54 percent). Also, acetone was detected in the duplicate at 44000 µg/kg, but not in the original. An RPD value could not be calculated. The samples collected from AA3-SB01 demonstrated good precision for the metals except for lead (71 percent). Nine semivolatile compounds exceeded the RPD limit. Seven of those compounds were estimated and below the reporting limit. 2,6-Dinitrotoluene (74 percent) and 2,4-dinitrotouene (73 percent) were not estimated. The RPD for Aroclor 1260 was 98 percent with the duplicate result qualified estimated. The samples from MNT-SB01 demonstrated good precision with the exception of calcium (79 percent). Aroclor 1260 (67 percent) was the only compound from the PSB-SS01 samples to exceed the RPD value. The background samples from BCG-SB01 exhibited a great degree of variability. Twelve of fourteen metals with calcuable RPD values exceeded the acceptable level.

D2.2 Trip Blanks

The site investigation involved the collection and analysis of soil samples only, therefore, trip blanks were not required for this field investigation.

D2.3 Equipment Rinse Blanks

Equipment rinses (ER) are used to assess the effectiveness of the equipment decontamination procedures employed and the potential of cross-contamination of environmental samples between sampling locations. The rinsates are collected by passing clean, analyte-free water through and over the sampling equipment after the decontamination procedures have been executed. One ER was collected for each of the six sites. The blanks were analyzed for most of the analytical parameters as the associated environmental samples collected.

The analytical results exhibited some low level concentrations of volatiles, semivolatiles, and metals. Volatile organics carbon disulfide, methylene chloride, toluene, chloroform, and ethylbenzene were reported in the rinsates at estimated concentrations below the laboratory's

reporting limits. bis (2-Ethylhexyl) phthalate (13 μg/L) was the only semivolatile organic compound reported. The metals reported were manganese (16.3 μg/L) and zinc (20.2 μg/L).

Careful review of all site related sample data suggested that the concentrations reported are not indicative of deficiencies in the decon process but rather laboratory process contamination or constituents detected or inherent in the water used in the final rinse. The ER data were used in the validation process by applying the "5X/10X Rule" and associated results were qualified accordingly.

D2.4 Field Blanks

Field blanks were prepared from clean water used in the decontamination procedures employed. Analysis of the blanks ensures that all water sources used during decon are free of parameters of interest. A field blank was collected from the final decontamination rinse water. Only one lot number of the deionized final rinse water was used; therefore, one (1) field blank was submitted for analysis and tested for the parameters analyzed in this investigation.

The non-potable, analyte-free water used in the final rinse of the sampling equipment exhibited low level concentrations of volatile organics. The volatiles detected were acetone at 1.6 μg/L, chloroform at 0.18 μg/L, and toluene at 0.17 μg/L. All concentrations are below reporting limits and qualified as estimated. Review of the associated field sample data suggest that these concentrations are a result of laboratory process contamination and should not be considered to be native to the water source being evaluated.

D3.0 Analytical Program

The analytical program determined, with documented precision and accuracy, if specific compounds were present in the soil samples collected from the areas investigated. Chemical analyses for the investigation were performed in accordance with the guidelines prescribed by the U.S. Environmental Protection Agency (EPA) Test Methods for Evaluating Solid Waste (SW-846), Physical/Chemical Methods, Third Edition, September 1986 and subsequent revisions. The soil samples and associated QA/QC samples were analyzed for volatile organics, semivolatile organics, pesticides/PCBs, metals, pH, nitrate, sulfate, and a specific list of nitroaromatics and nitroamines.

All analytical samples collected for the generation of definitive data were reported in EPA Level IV CLP-like data packages and a Level III data validation was performed using EPA validation guidelines as stated in EPA Contract Laboratory Functional Guidelines for Organic and Inorganic dated February 1994. The regulatory compound/analyte list reported was the Target Compound List (TCL) for organics and the Target Analyte List (TAL) for inorganics. These data packages have also been reviewed for completeness and compliance to the approved final work plan (IT, 1996). All samples were submitted to the laboratory accompanied by a request for analysis/ chain of custody (RFA/COC) form. The RFA portion of the form provides project specific analytical specifications and quality control instruction to the laboratories. A formal chain-of-custody (COC) traceability record was included as part of the document ensuring documentation of custody for sample transportation, storage and eventual disposal by the laboratory. Copies of all custody documentation are included in the data packages submitted. All samples were received at the laboratory within the 4 +/- 2 degrees Celsius with custody seals intact.

D3.1 QA/QC Procedures

The project QA/QC program described in the SAP and QAPP was followed for the sample collection and laboratory analysis of samples. The elements of this program are discussed in the sections that follow. The laboratory analytical program consisted of EPA SW-846 methods with Level IV CLP-like deliverables for the generation of definitive data for the investigation. Deliverables included sample preparation information, calibration records, QC data such as method blanks, spikes, duplicates, surrogate recoveries, internal standards, and copies of the RFA and COC records. Chemical analyses for this project were performed following standardized protocols, which include specific requirements for how compounds are analyzed, identified and reported.

Each of the methods employed included specific QA/QC protocols that are used to support the validity of the sampling event and the resulting data. These QA/QC protocols are a critical part of the analytical method and were followed explicitly during sample analysis. Specific measures included detailed record keeping procedures, analysis of duplicate samples, instrument calibrations, and the analyses of blanks, surrogate and internal standards.

D3.1.1 Reporting Limits

Practical Quantitation Limits (PQLs), the laboratories' statistically determined reporting limits, were presented in the QAPP section of the Final Work Plan for the investigation for the Quanterra-Knoxville, TN laboratory. The analytical program executed required the use of SW-

846 methods which specify the procedures for calculating the PQLs presented. Each laboratory is required to demonstrate method performance through method detection limit (MDL) studies for every analysis, media, and instrument. These studies are required to be laboratory specific so that individual laboratory variables such as equipment brands, reagent suppliers, chemist technique, etc., are all factored into the performance study. The PQL is statistically supported by the MDL established. The PQL calculation is designed to use the MDL, established using controlled matrices (i.e. distilled water), and adjusts the limit by a predetermined mathematical factor for the analysis of actual environmental sample matrices (i.e. soil, groundwater, etc.). For purposes of clarity and consistency with respect to definition and terminology, the term "reporting limit" has been substituted for PQL when referencing the limit of detection the laboratory reported for each sample and analytical parameter. This value has been corrected for all necessary dilution and interference factors based on the analytical data for each sample.

All laboratory results were reviewed with respect to the actual reporting limits achieved as compared to the limits presented in the SAP. Dilutions resulted in high reporting limits for several organics, metals, and sulfate. Interference by Aroclor 1260 resulted in elevated limits for Aroclor 1254. Data were reported on a dry-weight basis and reporting limits were adjusted accordingly.

D3.1.2 Holding Times

All laboratory results submitted for the Plumbrook site investigations were reviewed with respect to laboratory adherence to analysis holding times. Maximum analytical holding times, as presented in Table 5-1 of the QAPP, were usually met by the laboratory. The laboratory exceeded the holding time for pH and nitrate analyses. The data were qualified as estimated.

D3.1.3 Method Blanks

Method blanks were analyzed with each analytical "batch" processed. The blanks were carried through the analytical procedure, step-by-step, including the addition of all solvents and other reagents required in the analytical process. The purpose of the blank is to ensure that no contaminants are being introduced to the sample as a result of any part of the analytical process, helping to eliminate the element of doubt as to the origin of reported concentrations.

The method blank results reported with the site investigation data were evaluated for high readings characteristic of background or process contamination. There were no significant concentrations detected in the associated blank samples that indicate analytical processes were out of control. The acetone, methylene chloride, and bis(2-ethylhexyl)phthalate concentrations

reported for the method blanks are likely to be attributable to laboratory process contamination. Acetone and methylene chloride are used as laboratory solvents. Methylene chloride is used in the preparation and extraction of samples for many analyses. Phthalate esters are thought to originate from the extraction portion of the semivolatiles analysis either through the safety gloves worn by the extraction technician or other theorized origins. All analytes detected in the method blanks and associated samples were qualified (B) by the laboratory.

All applicable method blank criteria were met for all parameters as specified by the method employed and the SAP. The analytical data presented in the site investigation report are blank corrected as a function of the data validation process.

D3.1.4 Laboratory Control Samples

Laboratory control samples (LCSs) were used in the analytical program as a measure of accuracy without the influence of matrix on the analysis. The laboratory control sample is best described as a spiked laboratory blank measured and reported by calculating the percent recovery of the known spiked concentrations. An LCS was analyzed with every batch of samples processed and analyzed. The control limits applied were statistically derived by the laboratory as required by the method. The review of the LCS data associated with these site investigation data sets showed the data to be within the specified control limits demonstrating accuracy for the analytical processes employed, except for potassium and thallium. The associated sample results for the two metals were qualified estimated (J).

D3.1.5 Matrix Spike\Matrix Spike Duplicates

Matrix spikes are used to provide an indication of bias due to matrix effects and a measure of accuracy of associated results. Duplicate analyses, sometimes performed using a matrix spike duplicate in the case of organics analyses, provide a measure of precision in the analytical process. Six matrix spike/matrix spike duplicate (MS/MSD) pairs were analyzed for the Acid Areas site investigation. Samples 6030, 6430, 6630, 6930, 6980, and 7010 were collected and submitted for an MS/MSD analysis. The observed percent recoveries of the spikes were used to determine accuracy for the analyses. Control limits used to evaluate these recoveries were determined statistically by the laboratory for organics as required by the methods employed. Relative percent difference (RPD) calculations are used to evaluate duplicate sample results as they are for field duplicate samples. The acceptance criteria for the precision data were statistically determined by the laboratory. Metals data exhibited variability in accuracy for several elements in all of the MS/MSD pairs. Antimony percent recoveries were consistently low in each of the analyses. Chromium, magnesium, and potassium were high in all but one set.

Percent recoveries for several other metals did not fall within the acceptable project range of 80-120 percent. They included calcium, lead, manganese, selenium, thallium, vanadium, and zinc. Precision data were all within the control limits with the exception of manganese and calcium. RPDs for manganese were 193 percent in 6930 and 113 percent in 7010. RPD of calcium was 86 percent for sample 6430. Associated data were qualified as estimated in the validation process for the affected elements where appropriate. Accuracy and precision were good for the organics, except for difficulties with PCBs. Aroclor 1260 was not detected in the MS/MSD of 6630. Sample 6980 had low recoveries for Aroclors 1016 and 1260 in the matrix spike. This resulted in RPDs of 66 percent and 200 percent. In sample 7010, only Aroclor 1016 recovery was above accepted criteria in the MS, but the RPDs for both Aroclors were out of the acceptable range. In 6930, recovery of Aroclor 1016 exceeded the range, but precision was acceptable. None of these problems resulted in qualification by the validator. For explosives data, sample 6030 had low recovery of 2,4-dinitrotoluene in the MS. The RPD (11 percent) was acceptable. Sulfate recoveries were low in sample 7010. The RPD was 0 percent.

D3.1.6 Surrogate Standards

Surrogate standards were used in the analytical program to monitor the percent recovery efficiencies of the sample preparation and analytical procedure on a sample-by-sample basis for organic constituents. The surrogate standards used were those required by the analytical methodology employed and were compliant with the requirements of the method employed. Control limits for the surrogate recovery were determined statistically by the laboratory as required by the methodology. Evaluation of the surrogate standard data exhibited acceptable results for most analyses. Volatile analyses exhibited some anomalies in the surrogate standard recoveries that were attributed to matrix interferences based on recoveries for the affected analytes and the recoveries reported for the sample reanalyses. Some PCB and semivolatile surrogates exceeded the acceptable range. Data were estimated in the validation process as a result of these variations, but all data were found to be acceptable as reported and qualified. No other problems were encountered in the surrogate standard data reported.

D 4.0 Data Quality Objectives

DQOs are qualitative and quantitative criteria used to guide sample collection and analysis activities. The DQOs for the project were developed at the outset of the investigation to ensure that the data generated during the execution of the analytical program were of appropriate quality to support the anticipated end use of the data. DQOs describe the level of uncertainty that a

decision-maker is willing to accept in results derived from the environmental data. This uncertainty is used to the quality of the measurement data, usually in terms of objectives, bias, representativeness, comparability and completeness. DQOs seek to ensure that the right type, amount and quality of data are collected to accomplish the objectives of the project.

The DQOs for this project are to produce scientifically valid data of known accuracy and precision, which are complete with respect to identified critical samples, comparable with similar data types and representative of the media sampled so as to be useful for the cited purposes.

In order to achieve these DQOs, criteria were established in the SAP by which these goals could be achieved. The Site Investigation required that all laboratory analyses be performed and resulting data reported as definitive data. A non-CLP, (SW-846) method was employed and Level IV (CLP-like) data packages were provided for evaluation for these samples. Definitive data criteria were chosen because compliance with the criteria specified within its guidelines provides quantified concentrations with acceptable reliability for the purposes of the investigation. All reported analytical data met or exceeded the requirements of Level IV QC criteria.

D5.0 Data Useability

The data review process as presented in this report, compares sample results to pre-established criteria to confirm that the data are of acceptable technical quality. Specific criteria were reviewed which verifies the achievement of all precision, accuracy, completeness, comparability and representativeness goals established to meet the project DQOs. To verify that these objectives were met, field measurements, sampling and handling procedures, laboratory analysis and reporting and all nonconformances and discrepancies in the data were examined to determine compliance with the appropriate and applicable procedures. The results of this review were presented in previous sections with all outliers or nonconformances were discussed where they occurred.

Precision data was obtained through the analysis and evaluation of duplicate QA samples. Accuracy was determined through the analysis and evaluation of method blanks, laboratory control samples, trip blanks and matrix spike samples. These QA samples were collected and/or analyzed at the frequency established in the SAP, verifying the completeness element of the goals

along with the evaluation of holding times, and reporting limits.

Completeness is a measure of the amount of valid data that are obtained during a sampling event. There were no data points rejected in the evaluation process.

Comparability is a qualitative parameter expressing the confidence with which one data set can be compared with another. Comparability ensures that results for the sampling event can be compared with data from other past and/or future sampling programs. Comparability for this sampling event was achieved through the use of established and recognized techniques and accepted standard EPA methods. All samples collected and analyzed were subjected to the same sampling, handling, preparation, analysis, reporting and validation criteria for the purpose of achieving comparability goals within the data set.

To verify sample representativeness, field data such as field activity daily logs (FADL), sample collection logs, COC/RFA forms, field instrument calibrations and variances were reviewed. The overall results of the analyses as discussed in this evaluation suggest that representative samples were collected and analyzed with results being indicative of the media analyzed with the exception of the few anomalies noted. Organic chemicals were omitted from consideration if they were a common laboratory contaminant or could be traced to some other source within the analytical investigation process. Overall, the investigation data do reflect expected site conditions.

All analytical results for chemicals are reported using laboratory data qualifiers. Chemicals flagged with a "U" qualifier are considered to be not detected, or detected at a concentration below the normal, random "noise" of the analytical instrument. The "J" qualifier describes an estimated value when a compound is qualitatively identified (spectral identification criteria are met), but at values less that the project-required reporting limit. A full list of laboratory data qualifiers and their definitions are included in the laboratory data report.

D6.0 Conclusions

The goals and objectives for the Plumbrook Site Investigation were to provide information concerning the possible environmental contamination that can be used in making management decisions for the necessity of further work at the site. The investigation is preliminary in nature and the information acquired will provide a foundation upon which other studies of the site, if

other studies are deemed necessary and appropriate, should be based. Specifically , the objectives of the site investigation were as follows: define the location and extent of the acid areas (where applicable); confirm or deny the presence of residual chemical contamination of surface and subsurface soils; and determine whether or not soils are the sample media of importance, and if other media should be further evaluated. To accomplish this goal, samples were collected and definitive data were generated for the contaminants of potential concern. Evaluation of the data using the specific DQOs established for the project and the data validation process resulted in the determination that the data set is valid and of sufficient quality to meet the objectives of the investigation. There were no significant problems observed that would adversely affect the application of the data or the success of the overall investigation.

Table D-1

Field Duplicate Results
Acid Area No. 1
Former Plum Brook Ordnance Works, Sandusky, Ohio
PBOW-98-SO-AA1-SB01-6010 (0-1.0)

Parameter	6010 Original (ug/kg)	6011 Duplicate (ug/kg)	RPD %
Benzo(a)anthracene	410 U	130 J	NC
Benzo(a)pyrene	29 J	110 J	117
Benzo(b)fluoranthene	410 U	120 J	NC
Benzo(ghi)perylene	410 U	88 J	NC
Benzo(k)fluoranthene	410 U	130 J	NC
bis(2-Ethylhexyl)phthalate	410 U	100 J	NC
Chrysene	410 U	150 J	NC
Fluoranthene	58 J	320 J	139
Indeno(1,2,3-cd)pyrene	410 U	75 J	NC
Phenanthrene	410 U	130 J	NC
Pyrene	51 J	230 J	127
Aroclor 1260	140	3400	184

U = Compound analyzed for but not detected; value given is quantitation limit.
J = Compound detected but value is estimated.
NC = Not calculable.

Table D-1

Field Duplicate Results
Acid Area No. 1
Former Plum Brook Ordnance Works, Sandusky, Ohio
PBOW-98-SO-AA1-SB01-6010 (0-1.0)

Parameter	6010 Original (mg/kg)	6011 Duplicate (mg/kg)	RPD %
Aluminum	7730	5980	26
Arsenic	2.8	3.5	22
Barium	24.7 U	35.0	NC
Calcium	2400	6050	86
Chromium	11.0	9.4	16
Copper	6.0	6.2	3.3
Iron	11300	11300	0
Lead	44.3	283	146
Magnesium	769	996	26
Manganese	89.2	103	14
Nickel	6.3	7.6	19
Vanadium	20.2	17.2	16
Zinc	33.6	64.0	62
Sulfate	823	3610	126

U = Compound analyzed for but not detected; value given is quantitation limit.
J = Compound detected but value is estimated.
NC = Not calculable.

Table D-2

Field Duplicate Results
Acid Area No. 2
Former Plum Brook Ordnance Works, Sandusky, Ohio
PBOW-98-SO-AA2-SB06-6410 (0-1.0)

Parameter	6410 Original (ug/kg)	6411 Duplicate (ug/kg)	RPD %
Acetone	24 U	44000 D	NC
Methylene Chloride	6.1 U	28 J	NC
Acenaphthylene	87 J	100 J	14
Anthracene	100 J	140 J	33
Benzo(a)anthracene	230 J	280 J	20
Benzo(a)pyrene	260 J	290 J	11
Benzo(b)fluoranthene	190 J	230 J	19
Benzo(ghi)perylene	160 J	170 J	6.1
Benzo(k)fluoranthene	270 J	310 J	14
bis(2-Ethylhexyl)phthalate	50 J	390 U	NC
Chrysene	240 J	280 J	15
Dibenz(a,h) anthracene	77 J	87 J	12
Indeno(1,2,3-cd)pyrene	160 J	180 J	12
Fluoranthene	340 J	440	26
Phenanthrene	68 J	100 J	38
Pyrene	260 J	310 J	18
Aroclor 1260	3600	20000	139

U = Compound analyzed for but not detected; value given is quantitation limit.
J = Compound detected but value is estimated.
NC = Not calculable.

Table D-2

Field Duplicate Results
Acid Area No. 2
Former Plum Brook Ordnance Works, Sandusky, Ohio
PBOW-98-SO-AA2-SB06-6410 (0-1.0)

Parameter	6410 Original (mg/kg)	6411 Duplicate (mg/kg)	RPD %
Aluminum	9320	7300	24
Arsenic	6.5	6.1	6.3
Barium	54.6	67.5	21
Calcium	9350 J	8850 J	5.5
Chromium	14.9	13.8	7.7
Cobalt	9.7	8.3	16
Copper	14.9	15.7	5.2
Iron	18300	17200	6.2
Lead	40.1	70	54
Magnesium	3270	3140	4.1
Manganese	320	320	0
Nickel	16.5	16.5	0
Potassium	987	955	3.3
Selenium	0.78	0.62	23
Sodium	607 U	650	NC
Vanadium	23.5	18.4	24
Zinc	112 J	136 J	19

U = Compound analyzed for but not detected; value given is quantitation limit.
J = Compound detected but value is estimated.
NC = Not calculable.

Table D-3

Field Duplicate Results
Acid Area No. 3
Former Plum Brook Ordnance Works, Sandusky, Ohio
PBOW-98-SO-AA3-SB01-6610 (0-1.0)

Parameter	6610 Original (ug/kg)	6611 Duplicate (ug/kg)	RPD %
2,4-Dinitrotoluene	5600	2600	73
2,6-Dinitrotoluene	870	400	74
2-Methylnaphthalene	240 J	170 J	34
Anthracene	400 U	48 J	NC
Benzo(a)anthracene	59 J	130 J	75
Benzo(a)pyrene	63 J	120 J	62
Benzo(b)fluoranthene	68 J	130 J	63
Benzo(ghi)perylene	41 J	54 J	27
Benzo(k)fluoranthene	82 J	110 J	29
bis(2-Ethylhexyl)phthalate	120 J	61 J	65
Chrysene	91 J	140 J	42
Dibenz(a,h) anthracene	24 J	31 J	25
Fluoranthene	87 J	240 J	94
Fluorene	400 U	20 J	NC
Indeno(1,2,3-cd)pyrene	43 J	55 J	24
Naphthalene	61 J	45 J	30
Phenanthrene	96 J	200 J	70
Pyrene	83 J	210 J	87
Aroclor 1260	3200	1100 J	98

U = Compound analyzed for but not detected; value given is quantitation limit.
J = Compound detected but value is estimated.
NC = Not calculable.

Table D-3

Field Duplicate Results
Acid Area No. 3
Former Plum Brook Ordnance Works, Sandusky, Ohio
PBOW-98-SO-AA3-SB01-6610 (0-1.0)

Parameter	6610 Original (mg/kg)	6611 Duplicate (mg/kg)	RPD %
2,4-Dinitrotoluene	0.81	1.3	46
Aluminum	7310	9040	21
Arsenic	8.2	8.7	5.9
Barium	62.0	62.1	0.2
Calcium	39300	29400	29
Chromium	12.8	15.4	18
Cobalt	11.7	14.6	22
Copper	19.1	25.6	29
Iron	18600	20500	10
Lead	46.9	22.2	71
Magnesium	8550	9590	11
Manganese	353	442	22
Nickel	21.0	25.7	20
Potassium	1030 J	1230 J	18
Selenium	0.69	0.59 U	NC
Vanadium	23.0	26.3	13
Zinc	74.6	92.8	22
Sulfate	8670 J	8530 J	1.6

U = Compound analyzed for but not detected; value given is quantitation limit.
J = Compound detected but value is estimated.
NC = Not calculable.

Table D-4

Field Duplicate Results
Maintenance Shop Area
Former Plum Brook Ordnance Works, Sandusky, Ohio
PBOW-98-SO-MNT-SB01-6910 (0-1.0)

Parameter	6910 Original (mg/kg)	6911 Duplicate (mg/kg)	RPD %
bis (2-Ethylhexyl) phthalate	0.068 J	0.39 U	NC
Aluminum	6400	9640	40
Arsenic	7.0	7.7	9.5
Barium	36.7	56.8	43
Calcium	51300	22300	79
Chromium	10.2	15.1	39
Cobalt	8.6	12.9	40
Copper	12.4	17.7	35
Iron	13400	19400	37
Lead	6.5	8.3	24
Magnesium	13900	8500	48
Manganese	298	418	34
Nickel	13.6	20.8	42
Potassium	953 J	1110 J	15
Vanadium	21.1	27.0	25
Zinc	38.0	48.8	25

U = Compound analyzed for but not detected; value given is quantitation limit.
J = Compound detected but value is estimated.
NC = Not calculable.

Table D-5

Field Duplicate Results
Power Substation Area
Former Plum Brook Ordnance Works, Sandusky, Ohio
PBOW-98-SO-PSB-SS01-6970 (0-1.0)

Parameter	6970 Original (ug/kg)	6971 Duplicate (ug/kg)	RPD %
Toluene	6.2 U	4.4 J	NC
Acenaphthylene	64 J	57 J	12
Anthracene	65 J	57 J	13
Benzo(a)anthracene	260 J	220 J	17
Benzo(a)pyrene	300 J	260 J	14
Benzo(b)fluoranthene	320 J	270 J	17
Benzo(ghi)perylene	150 J	130 J	14
Benzo(k)fluoranthene	320 J	290 J	9.8
Chrysene	340 J	290 J	16
Fluoranthene	630	520	19
Indeno(1,2,3-cd)pyrene	160 J	130 J	21
Phenanthrene	270 J	180 J	40
Pyrene	510	440	15
Aroclor 1260	200	400	67

U = Compound analyzed for but not detected; value given is quantitation limit.
J = Compound detected but value is estimated.
NC = Not calculable.

Table D-5

Field Duplicate Results
Power Substation Area
Former Plum Brook Ordnance Works, Sandusky, Ohio
PBOW-98-SO-PSB-SS01-6970 (0-1.0)

Parameter	6970 Original (mg/kg)	6971 Duplicate (mg/kg)	RPD %
Aluminum	5660	6000	5.8
Arsenic	3.8	3.6	5.4
Barium	40.8	39.4	3.5
Calcium	2540	2410	5.3
Chromium	11.1	11.2	0.9
Cobalt	8.6	8.5	1.2
Copper	9.7	9.3	4.2
Iron	11000	10900	0.9
Lead	16.5	16.7	1.2
Magnesium	1340	1350	0.7
Manganese	226	230	1.8
Nickel	10.3	10.0	3.0
Selenium	0.62 U	0.64	NC
Vanadium	16.6	17.2	3.6
Zinc	128 J	132 J	3.1

U = Compound analyzed for but not detected; value given is quantitation limit.
J = Compound detected but value is estimated.
NC = Not calculable.

Table D-6

Field Duplicate Results
Background
Former Plum Brook Ordnance Works, Sandusky, Ohio
PBOW-98-SO-BCG-SB01-6990 (0-1.0)

Parameter	6990 Original (mg/kg)	6991 Duplicate (mg/kg)	RPD %
Aluminum	7590	12100	76
Antimony	74.0 U	10.1 J	NC
Arsenic	27.0	7.9	109
Barium	826	213	118
Beryllium	6.2 U	1.2	NC
Calcium	2550	4540	56
Cobalt	116	23.9	132
Copper	30.1	17.6	52
Iron	234000	67900	110
Lead	48.6	19.0	88
Magnesium	629	1290	69
Manganese	13300 J	4550 J	98
Mercury	0.085	0.071	18
Nickel	55.1	19.1	92
Silver	11.1	1.3 U	NC
Vanadium	23.5 J	26.5 J	12
Zinc	655	124	136

U = Compound analyzed for but not detected; value given is quantitation limit.
J = Compound detected but value is estimated.
NC = Not calculable.

APPENDIX E

DATA VALIDATION SUMMARY

E & T Technologies, Inc.

Plum Brook Ordnance Works
Data Validation Summary
July, 1998

Data collected from soil samples collected in April and May, 1998, were 100% validated at Level III according to the EPA National Functional Guidelines for data review. SDGs included PB016, PB017, PB018, PB019, PB020, PB021, and PB022.

Volatiles: Acetone exceeded the calibration range in eight samples from SDG PB017. The values from the original sample were rejected while the results from the dilution reanalysis were accepted.

Methylene chloride was found in the method, trip and field blanks associated with 88 samples across all SDG's. The compound's values were raised to the detection limit and qualified as nondetected "U". The same is true for toluene and acetone in 2 samples in SDG PB021 and 5 samples from SDGs PB018 and PB020, respectively

Thirty-two samples across all the SDGs had low internal standard area recoveries and were qualified as J/UJ

Semivolatiles: Semivolatile results were excellent. One sample from SDG PB016 had one compound that exceeded the instrument calibration limit and required dilution. Twelve samples from SDG PB022 had bis-(2ethyl hexyl) phthalate qualified as U and raised to the reporting limit due to its presence in the equipment rinsate.

Explosives: Three samples from SDG PB021 did not have the results for 2,4 - DNT corrected for percent moisture. These corrections were made.

Pesticides/PCBs: One sample from SDG PB020 had a high surrogate recovery. Aroclor 1260 in that sample required a "J" qualifier.

Metals: Recoveries in the laboratory matrix spike resulted in UJ/J qualifiers for antimony, calcium, potassium, chromium, vanadium, manganese, and zinc in all 106 samples across all the SDGs. In addition percent differences in the serial dilution that exceeded 10% resulted in zinc receiving a J qualifier in the 19 samples in PB017 and calcium, chromium, iron, manganese, and zinc in the 21 samples in PB018.

109 Northshore Drive, Suite 400
Knoxville, TN 37919

(423) 450-5156
Fax: (423) 450-9104

Wet Chemistry/Cyanide: All pH and nitrate analyses were performed outside the holding time and all were qualified as J/UJ, as required. The three samples from SDG PB021 had sulfate qualified as J due to low ms/msd recovery.

APPENDIX F

LABORATORY ANALYTICAL DATA SUMMARY

PLUMBROOK

Acid Area 1 Soils

RBC Comparison - Blank Corrected

Report Date: 07/24/98

Sample Location:				AA1-SB01		AA1-SB02		AA1-SB03	
Sample No:				6010		6030		6050	
Sample Date:				30-APR-98		30-APR-98		29-APR-98	
Depth				0-1		0-1		0-1	
AA1:PCBS	Fltr	Units	Screening Levels	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
AROCLOR 1260		mg/kg	0.083	.14					

PLUMBROOK

Acid Area 1 Soils

Report Date: 07/24/98

RBC Comparison - Blank Corrected

Sample Location:				AA1-SB04		AA1-SB05		AA1-SB06	
Sample No:				6070		6090		6110	
Sample Date:				29-APR-98		30-APR-98		29-APR-98	
Depth				0-1		0-1		0-1	
AA1:PCBS	Fltr	Units	Screening Levels	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
AROCLOR 1260		mg/kg	0.083					.16	

PLUMBROOK

Acid Area 1 Soils

RBC Comparison - Blank Corrected

Report Date: 07/24/98

Sample Location:				AA1-SB07		AA1-SB08		AA1-SB09	
Sample No:				6130		6150		6170	
Sample Date:				29-APR-98		29-APR-98		30-APR-98	
Depth				0-1		0-1		0-1	
AA1:PCBS	Fltr	Units	Screening Levels	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
AROCLOR 1260		mg/kg	0.083			9			

PLUMBROOK

Acid Area 1 Soils

Report Date: 07/24/98

RBC Comparison - Blank Corrected

Sample Location:				AA1-SB10		AA1-SB11		AA1-SB12	
Sample No:				6190		6210		6230	
Sample Date:				30-APR-98		30-APR-98		30-APR-98	
Depth				0-1		0-1		0-1	
AA1:PCBS	Fltr	Units	Screening Levels	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
AROCLOR 1260		mg/kg	0.083			.15		.25	J

PLUMBROOK

Acid Area 1 Soils

Report Date: 07/24/98

RBC Comparison - Blank Corrected

Sample Location:				AA1-SB13		AA1-SB14		AA1-SB15	
Sample No:				6250		6270		6290	
Sample Date:				29-APR-98		29-APR-98		30-APR-98	
Depth				0-1		0-1		0-1	
AA1:PCBS	Fltr	Units	Screening Levels	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
AROCLOR 1260		mg/kg	0.083			.22		6.2	

PLUMBROOK

Acid Area 1 Soils

Report Date: 07/24/98

RBC Comparison - Blank Corrected

Sample Location:				AA1-SB01		AA1-SB01		AA1-SB02	
Sample No:				6010		6020		6030	
Sample Date:				30-APR-98		30-APR-98		30-APR-98	
Depth				0-1		8-10		0-1	
AA1:METALS	Fltr	Units	Screening Levels	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
ALUMINUM		mg/kg	7800			13300			
ARSENIC		mg/kg	.43	2.8		6.1		1.4	
BERYLLIUM		mg/kg	0.15			0.65			
CALCIUM		mg/kg		2400		50500		3350	
IRON		mg/kg	2300	11300		23000			
MAGNESIUM		mg/kg		769		14800			
MANGANESE		mg/kg	160			665			
POTASSIUM		mg/kg				2650			

PLUMBROOK

Acid Area 1 Soils

Report Date: 07/24/98

RBC Comparison - Blank Corrected

Sample Location:				AA1-SB02		AA1-SB03		AA1-SB03	
Sample No:				6040		6050		6060	
Sample Date:				30-APR-98		29-APR-98		29-APR-98	
Depth				6-8		0-1		6-8	
AA1:METALS	Fltr	Units	Screening Levels	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
ALUMINUM		mg/kg	7800	12500				9590	
ARSENIC		mg/kg	.43	6.1		5.5		7.3	
BERYLLIUM		mg/kg	0.15	0.63					
CALCIUM		mg/kg		53700		2060		58300	
IRON		mg/kg	2300	23100		15200		21600	
MAGNESIUM		mg/kg		17200		1460		18300	
MANGANESE		mg/kg	160	375		258		539	
POTASSIUM		mg/kg		2920		647		1900	

PLUMBROOK

Acid Area 1 Soils

Report Date: 07/24/98

RBC Comparison - Blank Corrected

Sample Location:				AA1-SB04		AA1-SB04		AA1-SB05	
Sample No:				6070		6080		6090	
Sample Date:				29-APR-98		29-APR-98		30-APR-98	
Depth				0-1		8-10		0-1	
AA1:METALS	Fltr	Units	Screening Levels	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
ALUMINUM		mg/kg	7800	8190		10500			
ARSENIC		mg/kg	.43	5.2		5.5		3.0	
BERYLLIUM		mg/kg	0.15						
CALCIUM		mg/kg		2620		53600	J	1890	J
IRON		mg/kg	2300	14900		21500	J	9850	J
MAGNESIUM		mg/kg		1650		15200		884	
MANGANESE		mg/kg	160	418		658	J	195	J
POTASSIUM		mg/kg		638		2510	J		

PLUMBROOK

Acid Area 1 Soils

Report Date: 07/24/98

RBC Comparison - Blank Corrected

Sample Location:				AA1-SB05		AA1-SB06		AA1-SB06	
Sample No:				6100		6110		6120	
Sample Date:				30-APR-98		29-APR-98		29-APR-98	
Depth				6-8		0-1		6-8	
AA1:METALS	Fltr	Units	Screening Levels	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
ALUMINUM		mg/kg	7800	11100				11000	
ARSENIC		mg/kg	.43	6.6				6.5	
BERYLLIUM		mg/kg	0.15						
CALCIUM		mg/kg		66300	J	1040	J	52100	J
IRON		mg/kg	2300	20000	J			22300	J
MAGNESIUM		mg/kg		18100				17500	
MANGANESE		mg/kg	160	407	J			436	J
POTASSIUM		mg/kg		2860	J			2250	J

PLUMBROOK

Acid Area 1 Soils

Report Date: 07/24/98

RBC Comparison - Blank Corrected

Sample Location:				AA1-SB07		AA1-SB07		AA1-SB08	
Sample No:				6130		6140		6150	
Sample Date:				29-APR-98		29-APR-98		29-APR-98	
Depth				0-1		2-4		0-1	
AA1:METALS	Fltr	Units	Screening Levels	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
ALUMINUM		mg/kg	7800	9060		7890			
ARSENIC		mg/kg	.43	8.5		3.9		3.5	
BERYLLIUM		mg/kg	0.15						
CALCIUM		mg/kg		3580	J	14200	J	4780	J
IRON		mg/kg	2300	20300	J	14200	J	15300	J
MAGNESIUM		mg/kg		1640		5390		1240	
MANGANESE		mg/kg	160	360	J	166	J		
POTASSIUM		mg/kg		674	J	1100	J		

PLUMBROOK

Acid Area 1 Soils

Report Date: 07/24/98

RBC Comparison - Blank Corrected

Sample Location:				AA1-SB08		AA1-SB09		AA1-SB09	
Sample No:				6160		6170		6180	
Sample Date:				29-APR-98		30-APR-98		30-APR-98	
Depth				2-4		0-1		2-4	
AA1:METALS	Fltr	Units	Screening Levels	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
ALUMINUM		mg/kg	7800			14300		8840	
ARSENIC		mg/kg	.43	5.0		10.6		5.0	
BERYLLIUM		mg/kg	0.15			0.72			
CALCIUM		mg/kg		1830	J	44200	J	3580	J
IRON		mg/kg	2300	17100	J	29000	J	17000	J
MAGNESIUM		mg/kg		1060		10000		1690	
MANGANESE		mg/kg	160			623	J	187	J
POTASSIUM		mg/kg				1550	J	661	J

PLUMBROOK

Acid Area 1 Soils

Report Date: 07/24/98

RBC Comparison - Blank Corrected

Sample Location:				AA1-SB10		AA1-SB10		AA1-SB11	
Sample No:				6190		6200		6210	
Sample Date:				30-APR-98		30-APR-98		30-APR-98	
Depth				0-1		4-6		0-1	
AA1:METALS	Fltr	Units	Screening Levels	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
ALUMINUM		mg/kg	7800	10300		17400		11900	
ARSENIC		mg/kg	.43	8.6		10.9		9.1	
BERYLLIUM		mg/kg	0.15			0.94		0.67	
CALCIUM		mg/kg		4420	J	4070	J	4660	J
IRON		mg/kg	2300	28300	J	35100	J	24100	J
MAGNESIUM		mg/kg		1750		6070		3260	
MANGANESE		mg/kg	160	340	J	1070	J	616	J
POTASSIUM		mg/kg		715	J	2430	J	1770	J

PLUMBROOK

Acid Area 1 Soils

RBC Comparison - Blank Corrected

Sample Location:				AA1-SB11		AA1-SB12		AA1-SB12	
Sample No:				6220		6230		6240	
Sample Date:				30-APR-98		30-APR-98		30-APR-98	
Depth				4-6		0-1		2-4	
AA1:METALS	Fltr	Units	Screening Levels	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
ALUMINUM		mg/kg	7800	7930					
ARSENIC		mg/kg	.43	6.1		3.1		3.0	
BERYLLIUM		mg/kg	0.15						
CALCIUM		mg/kg		7020	J	3470		11700	
IRON		mg/kg	2300	19000	J	13200		13600	
MAGNESIUM		mg/kg		3670		1430		3500	
MANGANESE		mg/kg	160	208	J			245	
POTASSIUM		mg/kg		820	J			643	

PLUMBROOK

Acid Area 1 Soils

Report Date: 07/24/98

RBC Comparison - Blank Corrected

Sample Location:				AA1-SB13		AA1-SB13		AA1-SB14	
Sample No:				6250		6260		6270	
Sample Date:				29-APR-98		29-APR-98		29-APR-98	
Depth				0-1		2-4		0-1	
AA1:METALS	Fltr	Units	Screening Levels	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
ALUMINUM		mg/kg	7800			11300		7930	
ARSENIC		mg/kg	.43	3.5		6.6		7.6	
BERYLLIUM		mg/kg	0.15			0.62			
CALCIUM		mg/kg		1440	J	4150	J	3270	J
IRON		mg/kg	2300	10800	J	22200	J	18800	J
MAGNESIUM		mg/kg		1080		3340		1360	
MANGANESE		mg/kg	160	278	J	642	J	910	J
POTASSIUM		mg/kg				1250	J		

PLUMBROOK

Acid Area 1 Soils

Report Date: 07/24/98

RBC Comparison - Blank Corrected

Sample Location:				AA1-SB14		AA1-SB15		AA1-SB15	
Sample No:				6280		6290		6300	
Sample Date:				29-APR-98		30-APR-98		30-APR-98	
Depth				8-10		0-1		8-10	
AA1:METALS	Fltr	Units	Screening Levels	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
ALUMINUM		mg/kg	7800	11100				8440	
ARSENIC		mg/kg	.43	3.9		17.3		6.3	
BERYLLIUM		mg/kg	0.15						
CALCIUM		mg/kg		57300	J	4840	J	55400	
IRON		mg/kg	2300	20100	J	22500	J	20300	
MAGNESIUM		mg/kg		16400		2050		19400	
MANGANESE		mg/kg	160	328	J	187	J	355	
POTASSIUM		mg/kg		2560	J	1110	J	1680	

PLUMBROOK

Acid Area 1 Soils

Report Date: 07/24/98

RBC Comparison - Blank Corrected

Sample Location:				AA1-SB01		AA1-SB01		AA1-SB02	
Sample No:				6010		6020		6030	
Sample Date:				30-APR-98		30-APR-98		30-APR-98	
Depth				0-1		8-10		0-1	
AA1:EXPLOSIVES	Fltr	Units	Screening Levels	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
4-AMINO-2,6-DINITROTOLUENE		mg/kg	0.47					0.81	

PLUMBROOK

Acid Area 1 Soils

Report Date: 07/24/98

RBC Comparison - Blank Corrected

Sample Location:				AA1-SB02	
Sample No:				6040	
Sample Date:				30-APR-98	
Depth				6-8	
AA1:EXPLOSIVES	Fltr	Units	Screening Levels	Result	Val Qlfr
4-AMINO-2,6-DINITROTOLUENE		mg/kg	0.47		

PLUMBROOK

Acid Area 2 Soils

Report Date: 07/24/98

RBC Comparison - Blank Corrected

Sample Location:				AA2-SB01		AA2-SB01		AA2-SB02	
Sample No:				6310		6320		6330	
Sample Date:				27-APR-98		27-APR-98		28-APR-98	
Depth				0-1		6-8		0-1	
AA2:SEMIVOLATILES	Fltr	Units	Screening Levels	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
3,3'-DICHLOROBENZIDINE		mg/kg							
BENZO(a)ANTHRACENE		mg/kg	0.88						
BENZO(a)PYRENE		mg/kg	0.088						
BENZO(b)FLUORANTHENE		mg/kg	0.88						
DIBENZ(a,h)ANTHRACENE		mg/kg	0.088						
INDENO(1,2,3-cd)PYRENE		mg/kg	0.88						

PLUMBROOK

Acid Area 2 Soils

Report Date: 07/24/98

RBC Comparison - Blank Corrected

Sample Location:				AA2-SB02		AA2-SB03		AA2-SB03	
Sample No:				6340		6350		6360	
Sample Date:				28-APR-98		27-APR-98		27-APR-98	
Depth				2-4		0-1		4-6	
AA2:SEMIVOLATILES	Fltr	Units	Screening Levels	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
3,3'-DICHLOROBENZIDINE		mg/kg							
BENZO(a)ANTHRACENE		mg/kg	0.88			8.5	D		
BENZO(a)PYRENE		mg/kg	0.088			7.3	D		
BENZO(b)FLUORANTHENE		mg/kg	0.88			9.7	D		
DIBENZ(a,h)ANTHRACENE		mg/kg	0.088			1.1			
INDENO(1,2,3-cd)PYRENE		mg/kg	0.88			2.2			

PLUMBROOK

Acid Area 2 Soils

RBC Comparison - Blank Corrected

Report Date: 07/24/98

Sample Location:				AA2-SB04		AA2-SB04		AA2-SB05	
Sample No:				6370		6380		6390	
Sample Date:				27-APR-98		27-APR-98		28-APR-98	
Depth				0-1		8-10		0-1	
AA2:SEMIVOLATILES	Fltr	Units	Screening Levels	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
3,3'-DICHLOROBENZIDINE		mg/kg							
BENZO(a)ANTHRACENE		mg/kg	0.88						
BENZO(a)PYRENE		mg/kg	0.088						
BENZO(b)FLUORANTHENE		mg/kg	0.88						
DIBENZ(a,h)ANTHRACENE		mg/kg	0.088						
INDENO(1,2,3-cd)PYRENE		mg/kg	0.88						

PLUMBROOK

Acid Area 2 Soils

Report Date: 07/24/98

RBC Comparison - Blank Corrected

Sample Location:				AA2-SB05		AA2-SB06		AA2-SB06	
Sample No:				6400		6410		6420	
Sample Date:				28-APR-98		28-APR-98		28-APR-98	
Depth				4-6		0-1		4-5.5	
AA2:SEMIVOLATILES	Fltr	Units	Screening Levels	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
3,3'-DICHLOROBENZIDINE		mg/kg							
BENZO(a)ANTHRACENE		mg/kg	0.88						
BENZO(a)PYRENE		mg/kg	0.088			.26	J		
BENZO(b)FLUORANTHENE		mg/kg	0.88						
DIBENZ(a,h)ANTHRACENE		mg/kg	0.088						
INDENO(1,2,3-cd)PYRENE		mg/kg	0.88						

PLUMBROOK

Acid Area 2 Soils

Report Date: 07/24/98

RBC Comparison - Blank Corrected

Sample Location:				AA2-SB07		AA2-SB07		AA2-SB08	
Sample No:				6430		6440		6450	
Sample Date:				28-APR-98		28-APR-98		28-APR-98	
Depth				0-1		4-6		0-1	
AA2:SEMIVOLATILES	Fltr	Units	Screening Levels	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
3,3'-DICHLOROBENZIDINE		mg/kg							
BENZO(a)ANTHRACENE		mg/kg	0.88						
BENZO(a)PYRENE		mg/kg	0.088						
BENZO(b)FLUORANTHENE		mg/kg	0.88						
DIBENZ(a,h)ANTHRACENE		mg/kg	0.088						
INDENO(1,2,3-cd)PYRENE		mg/kg	0.88						

PLUMBROOK

Acid Area 2 Soils

Report Date: 07/24/98

RBC Comparison - Blank Corrected

Sample Location:				AA2-SB08		AA2-SB09		AA2-SB09	
Sample No:				6460		6470		6480	
Sample Date:				28-APR-98		28-APR-98		28-APR-98	
Depth				6-8		0-1		4-6	
AA2:SEMIVOLATILES	Fltr	Units	Screening Levels	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
3,3'-DICHLOROBENZIDINE		mg/kg							
BENZO(a)ANTHRACENE		mg/kg	0.88						
BENZO(a)PYRENE		mg/kg	0.088						
BENZO(b)FLUORANTHENE		mg/kg	0.88						
DIBENZ(a,h)ANTHRACENE		mg/kg	0.088						
INDENO(1,2,3-cd)PYRENE		mg/kg	0.88						

PLUMBROOK

Acid Area 2 Soils

Report Date: 07/24/98

RBC Comparison - Blank Corrected

Sample Location:				AA2-SB10		AA2-SB10		AA2-SB11	
Sample No:				6490		6500		6510	
Sample Date:				28-APR-98		28-APR-98		28-APR-98	
Depth				0-1		8-10		0-1	
AA2:SEMIVOLATILES	Fltr	Units	Screening Levels	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
3,3'-DICHLOROBENZIDINE		mg/kg							
BENZO(a)ANTHRACENE		mg/kg	0.88						
BENZO(a)PYRENE		mg/kg	0.088					.18	J
BENZO(b)FLUORANTHENE		mg/kg	0.88						
DIBENZ(a,h)ANTHRACENE		mg/kg	0.088						
INDENO(1,2,3-cd)PYRENE		mg/kg	0.88						

PLUMBROOK

Acid Area 2 Soils

Report Date: 07/24/98

RBC Comparison - Blank Corrected

Sample Location:				AA2-SB11		AA2-SB12		AA2-SB12	
Sample No:				6520		6530		6540	
Sample Date:				28-APR-98		28-APR-98		28-APR-98	
Depth				2-4		0-1		6-8	
AA2:SEMIVOLATILES	Fltr	Units	Screening Levels	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
3,3'-DICHLOROBENZIDINE		mg/kg							
BENZO(a)ANTHRACENE		mg/kg	0.88						
BENZO(a)PYRENE		mg/kg	0.088						
BENZO(b)FLUORANTHENE		mg/kg	0.88						
DIBENZ(a,h)ANTHRACENE		mg/kg	0.088						
INDENO(1,2,3-cd)PYRENE		mg/kg	0.88						

PLUMBROOK

Acid Area 2 Soils

Report Date: 07/24/98

RBC Comparison - Blank Corrected

Sample Location:				AA2-SB13		AA2-SB13		AA2-SB14	
Sample No:				6550		6560		6570	
Sample Date:				27-APR-98		27-APR-98		27-APR-98	
Depth				0-1		2-4		0-1	
AA2-SEMIVOLATILES	Fltr	Units	Screening Levels	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
3,3'-DICHLOROBENZIDINE		mg/kg		.14	J				
BENZO(a)ANTHRACENE		mg/kg	0.88						
BENZO(a)PYRENE		mg/kg	0.088	.12	J	.11	J		
BENZO(b)FLUORANTHENE		mg/kg	0.88						
DIBENZ(a,h)ANTHRACENE		mg/kg	0.088						
INDENO(1,2,3-cd)PYRENE		mg/kg	0.88						

PLUMBROOK

Acid Area 2 Soils

Report Date: 07/24/98

RBC Comparison - Blank Corrected

Sample Location:				AA2-SB14		AA2-SB15		AA2-SB15	
Sample No:				6580		6590		6600	
Sample Date:				27-APR-98		27-APR-98		27-APR-98	
Depth				4-6		0-1		2-4	
AA2:SEMIVOLATILES	Fltr	Units	Screening Levels	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
3,3'-DICHLOROBENZIDINE		mg/kg							
BENZO(a)ANTHRACENE		mg/kg	0.88						
BENZO(a)PYRENE		mg/kg	0.088						
BENZO(b)FLUORANTHENE		mg/kg	0.88						
DIBENZ(a,h)ANTHRACENE		mg/kg	0.088						
INDENO(1,2,3-cd)PYRENE		mg/kg	0.88						

PLUMBROOK

Acid Area 2 Soils

Report Date: 07/24/98

RBC Comparison - Blank Corrected

Sample Location				AA2-SB01		AA2-SB02		AA2-SB03	
Sample No:				6310		6330		6350	
Sample Date:				27-APR-98		28-APR-98		27-APR-98	
Depth				0-1		0-1		0-1	
AA2:PCBS	Fltr	Units	Screening Levels	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
AROCLOR 1260		mg/kg	0.083	20		.26		7.8	

PLUMBROOK

Acid Area 2 Soils

Report Date: 07/24/98

RBC Comparison - Blank Corrected

Sample Location:				AA2-SB04		AA2-SB05		AA2-SB06	
Sample No:				6370		6390		6410	
Sample Date:				27-APR-98		28-APR-98		28-APR-98	
Depth				0-1		0-1		0-1	
AA2:PCBS	Fltr	Units	Screening Levels	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
AROCLOR 1260		mg/kg	0.083					3.6	

PLUMBROOK

Acid Area 2 Soils

Report Date: 07/24/98

RBC Comparison - Blank Corrected

Sample Location:				AA2-SB07		AA2-SB08		AA2-SB09	
Sample No:				6430		6450		6470	
Sample Date:				28-APR-98		28-APR-98		28-APR-98	
Depth				0-1		0-1		0-1	
AA2:PCBS	Fltr	Units	Screening Levels	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
AROCLOR 1260		mg/kg	0.083						

PLUMBROOK

Acid Area 2 Soils

Report Date: 07/24/98

RBC Comparison - Blank Corrected

Sample Location:				AA2-SB10		AA2-SB11		AA2-SB12	
Sample No:				6490		6510		6530	
Sample Date:				28-APR-98		28-APR-98		28-APR-98	
Depth				0-1		0-1		0-1	
AA2:PCBS	Fltr	Units	Screening Levels	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
AROCLOR 1260		mg/kg	0.083	1.5		.24			

PLUMBROOK

Acid Area 2 Soils

Report Date: 07/24/98

RBC Comparison - Blank Corrected

Sample Location:				AA2-SB13		AA2-SB14		AA2-SB15	
Sample No:				6550		6570		6590	
Sample Date:				27-APR-98		27-APR-98		27-APR-98	
Depth				0-1		0-1		0-1	
AA2:PCBS	Fltr	Units	Screening Levels	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
AROCLOR 1260		mg/kg	0.083	9.8					

PLUMBROOK

Acid Area 2 Soils

Report Date: 07/24/98

RBC Comparison - Blank Corrected

Sample Location:				AA2-SB01		AA2-SB01		AA2-SB02	
Sample No:				6310		6320		6330	
Sample Date:				27-APR-98		27-APR-98		28-APR-98	
Depth				0-1		6-8		0-1	
AA2:METALS	Fltr	Units	Screening Levels	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
ALUMINUM		mg/kg	7800	9320		9550			
ARSENIC		mg/kg	.43	7.2		6.7		4.9	
BERYLLIUM		mg/kg	0.15						
CALCIUM		mg/kg		7440		47900		1800	J
IRON		mg/kg	2300	20000		21300		15200	
LEAD		mg/kg	400						
MAGNESIUM		mg/kg		3280		15200		912	
MANGANESE		mg/kg	160	488		889			
POTASSIUM		mg/kg		1450		2160			

PLUMBROOK

Acid Area 2 Soils

Report Date: 07/24/98

RBC Comparison - Blank Corrected

Sample Location:				AA2-SB02		AA2-SB03		AA2-SB03	
Sample No:				6340		6350		6360	
Sample Date:				28-APR-98		27-APR-98		27-APR-98	
Depth				2-4		0-1		4-6	
AA2:METALS	Fltr	Units	Screening Levels	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
ALUMINUM		mg/kg	7800	12800				10900	
ARSENIC		mg/kg	.43	8.0		19.3		10.4	
BERYLLIUM		mg/kg	0.15	0.69					
CALCIUM		mg/kg		7150	J	104000		57200	
IRON		mg/kg	2300	24300		36100		21400	
LEAD		mg/kg	400			7410			
MAGNESIUM		mg/kg		7010		9770		16800	
MANGANESE		mg/kg	160	322		1010		479	
POTASSIUM		mg/kg		1690		744		2300	

PLUMBROOK

Acid Area 2 Soils

Report Date: 07/24/98

RBC Comparison - Blank Corrected

Sample Location:				AA2-SB04		AA2-SB04		AA2-SB05	
Sample No:				6370		6380		6390	
Sample Date:				27-APR-98		27-APR-98		28-APR-98	
Depth				0-1		8-10		0-1	
AA2:METALS	Fltr	Units	Screening Levels	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
ALUMINUM		mg/kg	7800	10900		12700		10700	
ARSENIC		mg/kg	.43	8.3		9.1		7.3	
BERYLLIUM		mg/kg	0.15	0.61		0.70			
CALCIUM		mg/kg		1870		44600		3710	J
IRON		mg/kg	2300	22200		24100		21100	
LEAD		mg/kg	400						
MAGNESIUM		mg/kg		2730		18800		2450	
MANGANESE		mg/kg	160	170		299		197	
POTASSIUM		mg/kg		1190		2890		1330	

PLUMBROOK

Acid Area 2 Soils

Report Date: 07/24/98

RBC Comparison - Blank Corrected

Sample Location:				AA2-SB05		AA2-SB06		AA2-SB06	
Sample No:				6400		6410		6420	
Sample Date:				28-APR-98		28-APR-98		28-APR-98	
Depth				4-6		0-1		4-5.5	
AA2:METALS	Fltr	Units	Screening Levels	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
ALUMINUM		mg/kg	7800	13100		9320		11100	
ARSENIC		mg/kg	.43	8.9		6.5		9.6	
BERYLLIUM		mg/kg	0.15	0.64					
CALCIUM		mg/kg		3910	J	9350	J	63000	J
IRON		mg/kg	2300	25700		18300		23500	
LEAD		mg/kg	400						
MAGNESIUM		mg/kg		4420		3270		14800	
MANGANESE		mg/kg	160			320		360	
POTASSIUM		mg/kg		2230		987		1800	

PLUMBROOK

Acid Area 2 Soils

Report Date: 07/24/98

RBC Comparison - Blank Corrected

Sample Location:				AA2-SB07		AA2-SB07		AA2-SB08	
Sample No:				6430		6440		6450	
Sample Date:				28-APR-98		28-APR-98		28-APR-98	
Depth				0-1		4-6		0-1	
AA2:METALS	Fltr	Units	Screening Levels	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
ALUMINUM		mg/kg	7800	10200		9690		18400	
ARSENIC		mg/kg	.43	5.8		13.9		7.7	
BERYLLIUM		mg/kg	0.15					0.86	
CALCIUM		mg/kg		5160	J	54000	J	3670	J
IRON		mg/kg	2300	18500		23500		25600	
LEAD		mg/kg	400						
MAGNESIUM		mg/kg		2750		16900		3710	
MANGANESE		mg/kg	160	286		507		191	
POTASSIUM		mg/kg		1000		1710		1850	

PLUMBROOK

Acid Area 2 Soils

Report Date: 07/24/98

RBC Comparison - Blank Corrected

Sample Location:				AA2-SB08		AA2-SB09		AA2-SB09	
Sample No:				6460		6470		6480	
Sample Date:				28-APR-98		28-APR-98		28-APR-98	
Depth				6-8		0-1		4-6	
AA2:METALS	Fltr	Units	Screening Levels	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
ALUMINUM		mg/kg	7800	10800		9060		12800	
ARSENIC		mg/kg	.43	5.6		7.0		4.2	
BERYLLIUM		mg/kg	0.15					0.62	
CALCIUM		mg/kg		55300	J	1620	J	55300	J
IRON		mg/kg	2300	20300		20200		21900	
LEAD		mg/kg	400						
MAGNESIUM		mg/kg		17200		2190		15000	
MANGANESE		mg/kg	160	309		309		465	
POTASSIUM		mg/kg		2120		835		2640	

PLUMBROOK

Acid Area 2 Soils

Report Date: 07/24/98

RBC Comparison - Blank Corrected

Sample Location:				AA2-SB10		AA2-SB10		AA2-SB11	
Sample No:				6490		6500		6510	
Sample Date:				28-APR-98		28-APR-98		28-APR-98	
Depth				0-1		8-10		0-1	
AA2:METALS	Fltr	Units	Screening Levels	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
ALUMINUM		mg/kg	7800			8660			
ARSENIC		mg/kg	.43	4.4		10.4		4.2	
BERYLLIUM		mg/kg	0.15						
CALCIUM		mg/kg		3030	J	58100	J	2990	J
IRON		mg/kg	2300	14600		21600		12200	
LEAD		mg/kg	400						
MAGNESIUM		mg/kg		1780		16900		1860	
MANGANESE		mg/kg	160	284		713		256	
POTASSIUM		mg/kg		669		2010		587	

PLU...ROOK

Acid Area 2 Soils

Report Date: 07/24/98

RBC Comparison - Blank Corrected

Sample Location:				AA2-SB11		AA2-SB12		AA2-SB12	
Sample No:				6520		6530		6540	
Sample Date:				28-APR-98		28-APR-98		28-APR-98	
Depth				2-4		0-1		6-8	
AA2:METALS	Fltr	Units	Screening Levels	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
ALUMINUM		mg/kg	7800	14200		10900		11000	
ARSENIC		mg/kg	.43	9.5		5.4		7.0	
BERYLLIUM		mg/kg	0.15	0.80					
CALCIUM		mg/kg		3980	J	4970	J	48400	J
IRON		mg/kg	2300	27300		17100		24200	
LEAD		mg/kg	400						
MAGNESIUM		mg/kg		4120		2660		18100	
MANGANESE		mg/kg	160	253		208		644	
POTASSIUM		mg/kg		1330		896		2430	

PLUMBROOK

Acid Area 2 Soils

Report Date: 07/24/98

RBC Comparison - Blank Corrected

Sample Location:				AA2-SB13		AA2-SB13		AA2-SB14	
Sample No:				6550		6560		6570	
Sample Date:				27-APR-98		27-APR-98		27-APR-98	
Depth				0-1		2-4		0-1	
AA2:METALS	Fltr	Units	Screening Levels	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
ALUMINUM		mg/kg	7800			8590		7880	
ARSENIC		mg/kg	.43	4.6		7.2		3.6	
BERYLLIUM		mg/kg	0.15						
CALCIUM		mg/kg		7890		25200		1950	
IRON		mg/kg	2300	12700		19600		13800	
LEAD		mg/kg	400						
MAGNESIUM		mg/kg		2070		5340		1590	
MANGANESE		mg/kg	160	214		415			
POTASSIUM		mg/kg				1120			

PLUMBROOK

Acid Area 2 Soils

Report Date: 07/24/98

RBC Comparison - Blank Corrected

Sample Location:				AA2-SB14		AA2-SB15		AA2-SB15	
Sample No:				6580		6590		6600	
Sample Date:				27-APR-98		27-APR-98		27-APR-98	
Depth				4-6		0-1		2-4	
AA2:METALS	Fltr	Units	Screening Levels	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
ALUMINUM		mg/kg	7800	13200		12500		9230	
ARSENIC		mg/kg	.43	16.5		6.0		7.6	
BERYLLIUM		mg/kg	0.15	0.70		0.64			
CALCIUM		mg/kg		56700		4580		24000	
IRON		mg/kg	2300	25200		21700		19100	
LEAD		mg/kg	400						
MAGNESIUM		mg/kg		16700		2990		12500	
MANGANESE		mg/kg	160	373		211		285	
POTASSIUM		mg/kg		2730		1200		1150	

PLUMBROOK

Acid Area 3, Maintenance Shop, and Power Substation Areas Soils

Report Date: 07/27/98

RBC Comparison - Blank Corrected

Sample Location:				PSB-SS01		PSB-SS02	
Sample No:				6970		6980	
Sample Date:				03-MAY-98		03-MAY-98	
Depth				0-1		0-1	
PSB:SEMIVOLATILES	Fltr	Units	Screening Levels	Result	Val Qlfr	Result	Val Qlfr
BENZO(a)PYRENE		mg/kg	0.088	.3	J	.31	J

PLUMBROOK

Acid Area 3, Maintenance Shop, and Power Substation Areas Soils

Report Date: 07/27/98

RBC Comparison - Blank Corrected

Sample Location:				PSB-SS01		PSB-SS02	
Sample No:				6970		6980	
Sample Date:				03-MAY-98		03-MAY-98	
Depth				0-1		0-1	
PSB:PCBS	Fltr	Units	Screening Levels	Result	Val Qlfr	Result	Val Qlfr
AROCLOR 1260		mg/kg	0.083	.2		.33	

PLUMBROOK

Acid Area 3, Maintenance Shop, and Power Substation Areas Soils

Report Date: 07/27/98

RBC Comparison - Blank Corrected

Sample Location:				PSB-SS01		PSB-SS02	
Sample No:				6970		6980	
Sample Date:				03-MAY-98		03-MAY-98	
Depth				0-1		0-1	
PSB:METALS	Fltr	Units	Screening Levels	Result	Val Qlfr	Result	Val Qlfr
ALUMINUM		mg/kg	7800			8210	
ARSENIC		mg/kg	.43	3.8		5.1	
CALCIUM		mg/kg		2540		6540	
IRON		mg/kg	2300	11000		14400	
MAGNESIUM		mg/kg		1340		2330	
MANGANESE		mg/kg	160	226		312	
POTASSIUM		mg/kg				1160	

PLUMBROOK

Acid Area 3, Maintenance Shop, and Power Substation Areas Soils

Report Date: 07/27/98

RBC Comparison - Blank Corrected

Sample Location:				MNT-SB01		MNT-SB01		MNT-SB02	
Sample No:				6910		6920		6930	
Sample Date:				03-MAY-98		03-MAY-98		02-MAY-98	
Depth				0-1		4-6		0-1	
MSA:METALS	Fltr	Units	Screening Levels	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
ALUMINUM		mg/kg	7800			9370			
ARSENIC		mg/kg	.43	7.0		5.1		9.6	
BERYLLIUM		mg/kg	0.15			0.65			
CALCIUM		mg/kg		51300		3940		47700	
IRON		mg/kg	2300	13400		18600		13600	
MAGNESIUM		mg/kg		13900		2660		12700	
MANGANESE		mg/kg	160	298		392		381	
POTASSIUM		mg/kg		953	J	699	J	998	

PLUMBROOK

Acid Area 3, Maintenance Shop, and Power Substation Areas Soils

Report Date: 07/27/98

RBC Comparison - Blank Corrected

Sample Location:				MNT-SB02		MNT-SB03		MNT-SB03	
Sample No:				6940		6950		6960	
Sample Date:				02-MAY-98		02-MAY-98		02-MAY-98	
Depth				2-4		0-1		6-8	
MSA:METALS	Fltr	Units	Screening Levels	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
ALUMINUM		mg/kg	7800	11900		8440		8350	
ARSENIC		mg/kg	.43	7.6		5.8		11.6	
BERYLLIUM		mg/kg	0.15	0.75					
CALCIUM		mg/kg		3800		4410		56100	
IRON		mg/kg	2300	22000		16600		22700	
MAGNESIUM		mg/kg		2490		1740		15800	
MANGANESE		mg/kg	160	298		574		609	
POTASSIUM		mg/kg		722		611		1630	

PLUMBROOK

Acid Area 3, Maintenance Shop, and Power Substation Areas Soils

Report Date: 07/27/98

RBC Comparison - Blank Corrected

Sample Location:				AA3-SB01		AA3-SB01		AA3-SB02	
Sample No:				6610		6620		6630	
Sample Date:				03-MAY-98		03-MAY-98		01-MAY-98	
Depth				0-1		6-8		0-1	
AA3:SEMIVOLATILES	Fltr	Units	Screening Levels	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
BENZO(a)ANTHRACENE		mg/kg	0.88						
BENZO(a)PYRENE		mg/kg	0.088					.37	J
BENZO(b)FLUORANTHENE		mg/kg	0.88						
INDENO(1,2,3-cd)PYRENE		mg/kg	0.88						

PLUMBROOK

Acid Area 3, Maintenance Shop, and Power Substation Areas Soils

RBC Comparison - Blank Corrected

Sample Location:				AA3-SB02		AA3-SB03		AA3-SB03	
Sample No:				6640		6650		6660	
Sample Date:				01-MAY-98		01-MAY-98		01-MAY-98	
Depth				6-8		0-1		6-8	
AA3:SEMIVOLATILES	Fltr	Units	Screening Levels	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
BENZO(a)ANTHRACENE		mg/kg	0.88						
BENZO(a)PYRENE		mg/kg	0.088						
BENZO(b)FLUORANTHENE		mg/kg	0.88						
INDENO(1,2,3-cd)PYRENE		mg/kg	0.88						

PLUMBROOK

Acid Area 3, Maintenance Shop, and Power Substation Areas Soils

Report Date: 07/27/98

RBC Comparison - Blank Corrected

Sample Location:				AA3-SB04		AA3-SB04		AA3-SB05	
Sample No:				6670		6680		6690	
Sample Date:				01-MAY-98		01-MAY-98		01-MAY-98	
Depth				0-1		8-10		0-1	
AA3:SEMIVOLATILES	Fltr	Units	Screening Levels	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
BENZO(a)ANTHRACENE		mg/kg	0.88						
BENZO(a)PYRENE		mg/kg	0.088						
BENZO(b)FLUORANTHENE		mg/kg	0.88						
INDENO(1,2,3-cd)PYRENE		mg/kg	0.88						

PLUMBROOK

Acid Area 3, Maintenance Shop, and Power Substation Areas Soils

Report Date: 07/27/98

RBC Comparison - Blank Corrected

Sample Location:				AA3-SB05		AA3-SB06		AA3-SB06	
Sample No:				6700		6710		6720	
Sample Date:				01-MAY-98		01-MAY-98		01-MAY-98	
Depth				8-10		0-1		4-6	
AA3:SEMIVOLATILES	Fltr	Units	Screening Levels	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
BENZO(a)ANTHRACENE		mg/kg	0.88						
BENZO(a)PYRENE		mg/kg	0.088						
BENZO(b)FLUORANTHENE		mg/kg	0.88						
INDENO(1,2,3-cd)PYRENE		mg/kg	0.88						

PLUMBROOK

Acid Area 3, Maintenance Shop, and Power Substation Areas Soils

Report Date: 07/27/98

RBC Comparison - Blank Corrected

Sample Location:				AA3-SB07		AA3-SB07		AA3-SB08	
Sample No:				6730		6740		6750	
Sample Date:				01-MAY-98		01-MAY-98		01-MAY-98	
Depth				0-1		2-4		0-1	
AA3:SEMIVOLATILES	Fltr	Units	Screening Levels	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
BENZO(a)ANTHRACENE		mg/kg	0.88					2.1	
BENZO(a)PYRENE		mg/kg	0.088					2.2	
BENZO(b)FLUORANTHENE		mg/kg	0.88					2.4	
INDENO(1,2,3-cd)PYRENE		mg/kg	0.88					1.2	

PLUMBROOK

Acid Area 3, Maintenance Shop, and Power Substation Areas Soils

Report Date: 07/27/98

RBC Comparison - Blank Corrected

Sample Location:				AA3-SB08		AA3-SB09		AA3-SB09	
Sample No:				6760		6770		6780	
Sample Date:				01-MAY-98		02-MAY-98		02-MAY-98	
Depth				4-6		0-1		8-10	
AA3:SEMIVOLATILES	Fltr	Units	Screening Levels	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
BENZO(a)ANTHRACENE		mg/kg	0.88						
BENZO(a)PYRENE		mg/kg	0.088	.34	J				
BENZO(b)FLUORANTHENE		mg/kg	0.88						
INDENO(1,2,3-cd)PYRENE		mg/kg	0.88						

PLUMBROOK

Acid Area 3, Maintenance Shop, and Power Substation Areas Soils

RBC Comparison - Blank Corrected

Sample Location:				AA3-SB10		AA3-SB10		AA3-SB11	
Sample No:				6790		6800		6810	
Sample Date:				02-MAY-98		02-MAY-98		30-APR-98	
Depth				0-1		6-8		0-1	
AA3:SEMIVOLATILES	Fltr	Units	Screening Levels	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
BENZO(a)ANTHRACENE		mg/kg	0.88	3.5					
BENZO(a)PYRENE		mg/kg	0.088	3.3					
BENZO(b)FLUORANTHENE		mg/kg	0.88	3.4					
INDENO(1,2,3-cd)PYRENE		mg/kg	0.88	1.4					

PLUMBROOK

Acid Area 3, Maintenance Shop, and Power Substation Areas Soils

Report Date: 07/27/98

RBC Comparison - Blank Corrected

Sample Location:				AA3-SB11		AA3-SB12		AA3-SB12	
Sample No:				6820		6830		6840	
Sample Date:				30-APR-98		01-MAY-98		01-MAY-98	
Depth				2-4		0-1		2-4	
AA3:SEMIVOLATILES	Fltr	Units	Screening Levels	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
BENZO(a)ANTHRACENE		mg/kg	0.88						
BENZO(a)PYRENE		mg/kg	0.088			.28	J		
BENZO(b)FLUORANTHENE		mg/kg	0.88						
INDENO(1,2,3-cd)PYRENE		mg/kg	0.88						

PLUMBROOK

Acid Area 3, Maintenance Shop, and Power Substation Areas Soils

RBC Comparison - Blank Corrected

Sample Location:				AA3-SB13		AA3-SB13		AA3-SB14	
Sample No:				6850		6860		6870	
Sample Date:				01-MAY-98		01-MAY-98		01-MAY-98	
Depth				0-1		8-10		0-1	
AA3:SEMIVOLATILES	Fltr	Units	Screening Levels	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
BENZO(a)ANTHRACENE		mg/kg	0.88						
BENZO(a)PYRENE		mg/kg	0.088					.1	J
BENZO(b)FLUORANTHENE		mg/kg	0.88						
INDENO(1,2,3-cd)PYRENE		mg/kg	0.88						

PLUMBROOK

Acid Area 3, Maintenance Shop, and Power Substation Areas Soils

Report Date: 07/27/98

RBC Comparison - Blank Corrected

Sample Location:				AA3-SB14		AA3-SB15		AA3-SB15	
Sample No:				6880		6890		6900	
Sample Date:				01-MAY-98		01-MAY-98		01-MAY-98	
Depth				2-4		0-1		6-8	
AA3:SEMIVOLATILES	Fltr	Units	Screening Levels	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
BENZO(a)ANTHRACENE		mg/kg	0.88						
BENZO(a)PYRENE		mg/kg	0.088						
BENZO(b)FLUORANTHENE		mg/kg	0.88						
INDENO(1,2,3-cd)PYRENE		mg/kg	0.88						

PLUMBROOK

Acid Area 3, Maintenance Shop, and Power Substation Areas Soils

RBC Comparison - Blank Corrected

Sample Location:				AA3-SB01		AA3-SB02		AA3-SB03	
Sample No:				6610		6630		6650	
Sample Date:				03-MAY-98		01-MAY-98		01-MAY-98	
Depth				0-1		0-1		0-1	
AA3:PCBS	Fltr	Units	Screening Levels	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
AROCLOR 1260		mg/kg	0.083	3.2		.85			

PLUMBROOK

Acid Area 3, Maintenance Shop, and Power Substation Areas Soils

RBC Comparison - Blank Corrected

Sample Location:				AA3-SB04		AA3-SB05		AA3-SB06	
Sample No:				6670		6690		6710	
Sample Date:				01-MAY-98		01-MAY-98		01-MAY-98	
Depth				0-1		0-1		0-1	
AA3:PCBS	Fltr	Units	Screening Levels	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
AROCLOR 1260		mg/kg	0.083	.084					

PLUMBROOK

Acid Area 3, Maintenance Shop, and Power Substation Areas Soils

Report Date: 07/27/98

RBC Comparison - Blank Corrected

Sample Location:				AA3-SB07		AA3-SB08		AA3-SB09	
Sample No:				6730		6750		6770	
Sample Date:				01-MAY-98		01-MAY-98		02-MAY-98	
Depth				0-1		0-1		0-1	
AA3:PCBS	Fltr	Units	Screening Levels	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
AROCLOR 1260		mg/kg	0.083			.16			

PLUMBROOK

Acid Area 3, Maintenance Shop, and Power Substation Areas Soils

RBC Comparison - Blank Corrected

Sample Location:				AA3-SB10		AA3-SB11		AA3-SB12	
Sample No:				6790		6810		6830	
Sample Date:				02-MAY-98		30-APR-98		01-MAY-98	
Depth				0-1		0-1		0-1	
AA3:PCBS	Fltr	Units	Screening Levels	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
AROCLOR 1260		mg/kg	0.083						

PLUMBROOK

Acid Area 3, Maintenance Shop, and Power Substation Areas Soils

Report Date: 07/27/98

RBC Comparison - Blank Corrected

Sample Location:				AA3-SB13		AA3-SB14		AA3-SB15	
Sample No:				6850		6870		6890	
Sample Date:				01-MAY-98		01-MAY-98		01-MAY-98	
Depth				0-1		0-1		0-1	
AA3:PCBS	Fltr	Units	Screening Levels	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
AROCLOR 1260		mg/kg	0.083			.39			

PLUMBROOK

Acid Area 3, Maintenance Shop, and Power Substation Areas Soils

Report Date: 07/27/98

RBC Comparison - Blank Corrected

Sample Location:				AA3-SB01		AA3-SB01		AA3-SB02	
Sample No:				6610		6620		6630	
Sample Date:				03-MAY-98		03-MAY-98		01-MAY-98	
Depth				0-1		6-8		0-1	
AA3:METALS	Fltr	Units	Screening Levels	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
ALUMINUM		mg/kg	7800			10700			
ANTIMONY		mg/kg	3.1						
ARSENIC		mg/kg	.43	8.2		4.0		5.9	
BERYLLIUM		mg/kg	0.15						
CALCIUM		mg/kg		39300		59900		16300	J
IRON		mg/kg	2300	18600		17000		13600	
MAGNESIUM		mg/kg		8550		19900		4260	
MANGANESE		mg/kg	160	353		286		531	
POTASSIUM		mg/kg		1030	J	2550	J		

PLUMBROOK

Acid Area 3, Maintenance Shop, and Power Substation Areas Soils

Report Date: 07/27/98

RBC Comparison - Blank Corrected

Sample Location:				AA3-SB02		AA3-SB03		AA3-SB03	
Sample No:				6640		6650		6660	
Sample Date:				01-MAY-98		01-MAY-98		01-MAY-98	
Depth				6-8		0-1		6-8	
AA3:METALS	Fltr	Units	Screening Levels	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
ALUMINUM		mg/kg	7800	9550					
ANTIMONY		mg/kg	3.1					8.0	J
ARSENIC		mg/kg	.43	5.1		9.4		32.2	
BERYLLIUM		mg/kg	0.15						
CALCIUM		mg/kg		55700	J	9680		56200	
IRON		mg/kg	2300	21100		17400		34300	
MAGNESIUM		mg/kg		19200		3660		16400	
MANGANESE		mg/kg	160	473		442		1180	
POTASSIUM		mg/kg		2080				1580	

PLUMBROOK

Acid Area 3, Maintenance Shop, and Power Substation Areas Soils

Report Date: 07/27/98

RBC Comparison - Blank Corrected

Sample Location:				AA3-SB04		AA3-SB04		AA3-SB05	
Sample No:				6670		6680		6690	
Sample Date:				01-MAY-98		01-MAY-98		01-MAY-98	
Depth				0-1		8-10		0-1	
AA3:METALS	Fltr	Units	Screening Levels	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
ALUMINUM		mg/kg	7800	11800		10300		10600	
ANTIMONY		mg/kg	3.1						
ARSENIC		mg/kg	.43	9.6		6.0		7.0	
BERYLLIUM		mg/kg	0.15						
CALCIUM		mg/kg		11900		63500		3510	J
IRON		mg/kg	2300	26600		23600		15900	
MAGNESIUM		mg/kg		5440		18200		2770	
MANGANESE		mg/kg	160	922		553		205	
POTASSIUM		mg/kg		901		2440		775	

PLUMBROOK

Acid Area 3, Maintenance Shop, and Power Substation Areas Soils

Report Date: 07/27/98

RBC Comparison - Blank Corrected

Sample Location:				AA3-SB05		AA3-SB06		AA3-SB06	
Sample No:				6700		6710		6720	
Sample Date:				01-MAY-98		01-MAY-98		01-MAY-98	
Depth				8-10		0-1		4-6	
AA3:METALS	Fltr	Units	Screening Levels	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
ALUMINUM		mg/kg	7800			8730		9680	
ANTIMONY		mg/kg	3.1						
ARSENIC		mg/kg	.43	7.4		7.8		10.3	
BERYLLIUM		mg/kg	0.15						
CALCIUM		mg/kg		56500	J	1650	J	52000	J
IRON		mg/kg	2300	19000		20200		21500	
MAGNESIUM		mg/kg		15800		2140		18000	
MANGANESE		mg/kg	160	454		540		580	
POTASSIUM		mg/kg		1430				1790	

PLUMBROOK

Acid Area 3, Maintenance Shop, and Power Substation Areas Soils

Report Date: 07/27/98

RBC Comparison - Blank Corrected

Sample Location:				AA3-SB07		AA3-SB07		AA3-SB08	
Sample No:				6730		6740		6750	
Sample Date:				01-MAY-98		01-MAY-98		01-MAY-98	
Depth				0-1		2-4		0-1	
AA3:METALS	Fltr	Units	Screening Levels	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
ALUMINUM		mg/kg	7800						
ANTIMONY		mg/kg	3.1						
ARSENIC		mg/kg	.43	3.4		2.5		5.9	
BERYLLIUM		mg/kg	0.15						
CALCIUM		mg/kg		52200	J	3250	J	47600	
IRON		mg/kg	2300	6810		5720		14600	
MAGNESIUM		mg/kg		2240		744		9820	
MANGANESE		mg/kg	160	213				287	
POTASSIUM		mg/kg						772	

PLUMBROOK

Acid Area 3, Maintenance Shop, and Power Substation Areas Soils

Report Date: 07/27/98

RBC Comparison - Blank Corrected

Sample Location:				AA3-SB08		AA3-SB09		AA3-SB09	
Sample No:				6760		6770		6780	
Sample Date:				01-MAY-98		02-MAY-98		02-MAY-98	
Depth				4-6		0-1		8-10	
AA3:METALS	Fltr	Units	Screening Levels	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
ALUMINUM		mg/kg	7800					10200	
ANTIMONY		mg/kg	3.1					7.4	J
ARSENIC		mg/kg	.43	5.6		4.7		29.2	
BERYLLIUM		mg/kg	0.15						
CALCIUM		mg/kg		27500		1630		61300	
IRON		mg/kg	2300	14900		12800		23700	
MAGNESIUM		mg/kg		7700		1330		18800	
MANGANESE		mg/kg	160	277		290		525	
POTASSIUM		mg/kg		812				2530	

PLUMBROOK

Acid Area 3, Maintenance Shop, and Power Substation Areas Soils

RBC Comparison - Blank Corrected

Sample Location:				AA3-SB10		AA3-SB10		AA3-SB11	
Sample No:				6790		6800		6810	
Sample Date:				02-MAY-98		02-MAY-98		30-APR-98	
Depth				0-1		6-8		0-1	
AA3:METALS	Fltr	Units	Screening Levels	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
ALUMINUM		mg/kg	7800					7940	
ANTIMONY		mg/kg	3.1						
ARSENIC		mg/kg	.43	3.1		6.6		7.7	
BERYLLIUM		mg/kg	0.15						
CALCIUM		mg/kg		18600		64200		31300	J
IRON		mg/kg	2300	8230		25400		16200	
MAGNESIUM		mg/kg		2240		21400		8900	
MANGANESE		mg/kg	160			674		388	
POTASSIUM		mg/kg				1480		908	

PLUMBROOK

Acid Area 3, Maintenance Shop, and Power Substation Areas Soils

RBC Comparison - Blank Corrected

Sample Location:				AA3-SB11		AA3-SB12		AA3-SB12	
Sample No:				6820		6830		6840	
Sample Date:				30-APR-98		01-MAY-98		01-MAY-98	
Depth				2-4		0-1		2-4	
AA3:METALS	Fltr	Units	Screening Levels	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
ALUMINUM		mg/kg	7800						
ANTIMONY		mg/kg	3.1						
ARSENIC		mg/kg	.43	7.5		4.6		5.7	
BERYLLIUM		mg/kg	0.15						
CALCIUM		mg/kg		10200	J	4620	J	3240	J
IRON		mg/kg	2300	17400		11100		14800	
MAGNESIUM		mg/kg		3890		1270		1810	
MANGANESE		mg/kg	160	301		182		173	
POTASSIUM		mg/kg							

PLUMBROOK

Acid Area 3, Maintenance Shop, and Power Substation Areas Soils

Report Date: 07/27/98

RBC Comparison - Blank Corrected

Sample Location:				AA3-SB13		AA3-SB13		AA3-SB14	
Sample No:				6850		6860		6870	
Sample Date:				01-MAY-98		01-MAY-98		01-MAY-98	
Depth				0-1		8-10		0-1	
AA3:METALS	Fltr	Units	Screening Levels	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
ALUMINUM		mg/kg	7800			9690			
ANTIMONY		mg/kg	3.1						
ARSENIC		mg/kg	.43	6.0		10.8		2.5	
BERYLLIUM		mg/kg	0.15						
CALCIUM		mg/kg		48400	J	43900	J	2400	J
IRON		mg/kg	2300	21100		19800		9180	
MAGNESIUM		mg/kg		13400		13200		992	
MANGANESE		mg/kg	160	814		489			
POTASSIUM		mg/kg		945		1480			

PLUMBROOK

Acid Area 3, Maintenance Shop, and Power Substation Areas Soils

Report Date: 07/27/98

RBC Comparison - Blank Corrected

Sample Location:				AA3-SB14		AA3-SB15		AA3-SB15	
Sample No:				6880		6890		6900	
Sample Date:				01-MAY-98		01-MAY-98		01-MAY-98	
Depth				2-4		0-1		6-8	
AA3:METALS	Fltr	Units	Screening Levels	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
ALUMINUM		mg/kg	7800	11100					
ANTIMONY		mg/kg	3.1						
ARSENIC		mg/kg	.43	11.6		6.0		16.8	
BERYLLIUM		mg/kg	0.15	0.67					
CALCIUM		mg/kg		4240	J	22700	J	59400	J
IRON		mg/kg	2300	28500		11100		16200	
MAGNESIUM		mg/kg		3590		6500		15800	
MANGANESE		mg/kg	160	1120		224		326	
POTASSIUM		mg/kg		839				1190	

PLUMBROOK

Background Soils

Report Date: 07/24/98

RBC Comparison - Blank Corrected

Sample Location:				BCG-SB01		BCG-SB01		BCG-SB02	
Sample No:				6990		7000		7010	
Sample Date:				03-MAY-98		03-MAY-98		02-MAY-98	
Depth				0-1		4-6		0-1	
BCG:SEMIVOLATILES	Fltr	Units	Screening Levels	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
BENZO(a)PYRENE		mg/kg	0.088					.4	J

PLUMBROOK

Background Soils

Report Date: 07/24/98

RBC Comparison - Blank Corrected

Sample Location:				BCG-SB02		BCG-SB03		BCG-SB03	
Sample No:				7020		7030		7040	
Sample Date:				02-MAY-98		02-MAY-98		02-MAY-98	
Depth				2-4		0-1		6-8	
BCG:SEMIVOLATILES	Fltr	Units	Screening Levels	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
BENZO(a)PYRENE		mg/kg	0.088						

PLUMBROOK

Background Soils

Report Date: 07/24/98

RBC Comparison - Blank Corrected

Sample Location:				BCG-SB04		BCG-SB04		BCG-SB05	
Sample No:				7050		7060		7070	
Sample Date:				02-MAY-98		02-MAY-98		02-MAY-98	
Depth				0-1		2-4		0-1	
BCG:SEMIVOLATILES	Fltr	Units	Screening Levels	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
BENZO(a)PYRENE		mg/kg	0.088						

PLUMBROOK

Background Soils

Report Date: 07/24/98

RBC Comparison - Blank Corrected

Sample Location:				BCG-SB05		BCG-SB06		BCG-SB06	
Sample No:				7080		7090		7100	
Sample Date:				02-MAY-98		02-MAY-98		02-MAY-98	
Depth				4-6		0-1		6-7	
BCG:SEMIVOLATILES	Fltr	Units	Screening Levels	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
BENZO(a)PYRENE		mg/kg	0.088						

PLUMBROOK

Background Soils

RBC Comparison - Blank Corrected

Report Date: 07/24/98

Sample Location:				BCG-SB01		BCG-SB01		BCG-SB02	
Sample No:				6990		7000		7010	
Sample Date:				03-MAY-98		03-MAY-98		02-MAY-98	
Depth				0-1		4-6		0-1	
BCG:METALS	Fltr	Units	Screening Levels	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
ALUMINUM		mg/kg	7800			10400		9270	
ANTIMONY		mg/kg	3.1						
ARSENIC		mg/kg	.43	27.0		16.8		5.2	
BARIUM		mg/kg	550	826					
BERYLLIUM		mg/kg	0.15			0.57			
CALCIUM		mg/kg		2550		34100		4810	
IRON		mg/kg	2300	234000		34200		17700	
MAGNESIUM		mg/kg		629		7700		2280	
MANGANESE		mg/kg	160	13300	J	771	J		
POTASSIUM		mg/kg				2220	J	864	J
THALLIUM		mg/kg	0.51						

PLUMBROOK

Background Soils

Report Date: 07/24/98

RBC Comparison - Blank Corrected

Sample Location:				BCG-SB02		BCG-SB03		BCG-SB03	
Sample No.				7020		7030		7040	
Sample Date:				02-MAY-98		02-MAY-98		02-MAY-98	
Depth				2-4		0-1		6-8	
BCG:METALS	Fltr	Units	Screening Levels	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
ALUMINUM		mg/kg	7800	11100		15500		13400	
ANTIMONY		mg/kg	3.1	7.8	J			7.9	J
ARSENIC		mg/kg	.43	15.5		8.7		3.9	
BARIUM		mg/kg	550						
BERYLLIUM		mg/kg	0.15	0.67		0.80		0.68	
CALCIUM		mg/kg		3590		4880		52300	
IRON		mg/kg	2300	35000		29500		26700	
MAGNESIUM		mg/kg		2660		4630		10400	
MANGANESE		mg/kg	160			358	J	362	J
POTASSIUM		mg/kg		1320	J	1390	J	3390	J
THALLIUM		mg/kg	0.51	1.3					

PLUMBROOK

Background Soils

Report Date: 07/24/98

RBC Comparison - Blank Corrected

Sample Location:				BCG-SB04		BCG-SB04		BCG-SB05	
Sample No:				7050		7060		7070	
Sample Date:				02-MAY-98		02-MAY-98		02-MAY-98	
Depth				0-1		2-4		0-1	
BCGMETALS	Fltr	Units	Screening Levels	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
ALUMINUM		mg/kg	7800	8390					
ANTIMONY		mg/kg	3.1	9.3	J				
ARSENIC		mg/kg	.43	36.5		11.7		2.1	
BARIUM		mg/kg	550						
BERYLLIUM		mg/kg	0.15	1.0		1.0			
CALCIUM		mg/kg		1590		808		1470	
IRON		mg/kg	2300	37400		32200		7300	
MAGNESIUM		mg/kg		1220		1500		868	
MANGANESE		mg/kg	160						
POTASSIUM		mg/kg		1190	J	1460	J		
THALLIUM		mg/kg	0.51	1.2					

PLUMBROOK

Background Soils

Report Date: 07/24/98

RBC Comparison - Blank Corrected

Sample Location:				BCG-SB05		BCG-SB06		BCG-SB06	
Sample No:				7080		7090		7100	
Sample Date:				02-MAY-98		02-MAY-98		02-MAY-98	
Depth				4-6		0-1		6-7	
BCG:METALS	Fltr	Units	Screening Levels	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
ALUMINUM		mg/kg	7800						
ANTIMONY		mg/kg	3.1						
ARSENIC		mg/kg	.43	2.1				7.1	
BARIUM		mg/kg	550						
BERYLLIUM		mg/kg	0.15						
CALCIUM		mg/kg		1830		735		27300	
IRON		mg/kg	2300	6610		5880		15000	
MAGNESIUM		mg/kg		838		719		5680	
MANGANESE		mg/kg	160					277	J
POTASSIUM		mg/kg						917	J
THALLIUM		mg/kg	0.51						

PLUMBROOK

Acid Area 1

Data Summary - Soils

Report Date: 07/24/98

Sample Location:		AA1-SB01		AA1-SB01		AA1-SB02		AA1-SB02		AA1-SB03	
Associated Site:		AA1		AA1		AA1		AA1		AA1	
Sample No:		6010		6020		6030		6040		6050	
Sample Date:		30-APR-98		30-APR-98		30-APR-98		30-APR-98		29-APR-98	
Depth:		0-1		8-10		0-1		6-8		0-1	
pH	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
pH	STD UNIT	7.2		7.3		6.8		7.2		8.0	J

PLUMBROOK

Acid Area 1

Data Summary - Soils

Report Date: 07/24/98

Sample Location:		AA1-SB03		AA1-SB04		AA1-SB04		AA1-SB05		AA1-SB05	
Associated Site:		AA1		AA1		AA1		AA1		AA1	
Sample No:		6060		6070		6080		6090		6100	
Sample Date:		29-APR-98		29-APR-98		29-APR-98		30-APR-98		30-APR-98	
Depth:		6-8		0-1		8-10		0-1		6-8	
pH	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
pH	STD UNIT	7.9	J	7.2	J	7.9	J	7.6		8.0	

PLUMBROOK

Acid Area 1

Data Summary - Soils

Report Date: 07/24/98

Sample Location:		AA1-SB06		AA1-SB06		AA1-SB07		AA1-SB07		AA1-SB08	
Associated Site:		AA1		AA1		AA1		AA1		AA1	
Sample No:		6110		6120		6130		6140		6150	
Sample Date:		29-APR-98		29-APR-98		29-APR-98		29-APR-98		29-APR-98	
Depth:		0-1		6-8		0-1		2-4		0-1	
pH	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
pH	STD UNIT	7.3	J	7.4	J	7.0	J	7.0	J	7.8	J

PLUMBROOK

Acid Area 1

Data Summary - Soils

Report Date: 07/24/98

Sample Location:		AA1-SB08		AA1-SB09		AA1-SB09		AA1-SB10		AA1-SB10	
Associated Site:		AA1		AA1		AA1		AA1		AA1	
Sample No:		6160		6170		6180		6190		6200	
Sample Date:		29-APR-98		30-APR-98		30-APR-98		30-APR-98		30-APR-98	
Depth:		2-4		0-1		2-4		0-1		4-6	
pH	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
pH	STD UNIT	6.3	J	7.8		7.1		7.1		7.6	

PLU. .OOK

Acid Area 1

Data Summary - Soils

Report Date: 07/24/98

Sample Location:		AA1-SB11		AA1-SB11		AA1-SB12		AA1-SB12		AA1-SB13	
Associated Site:		AA1		AA1		AA1		AA1		AA1	
Sample No:		6210		6220		6230		6240		6250	
Sample Date:		30-APR-98		30-APR-98		30-APR-98		30-APR-98		29-APR-98	
Depth:		0-1		4-6		0-1		2-4		0-1	
pH	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
pH	STD UNIT	7.8		7.7		7.2	J	7.9	J	8.1	J

PLUMBROOK

Acid Area 1

Data Summary - Soils

Report Date: 07/24/98

Sample Location:		AA1-SB13		AA1-SB14		AA1-SB14		AA1-SB15		AA1-SB15	
Associated Site:		AA1		AA1		AA1		AA1		AA1	
Sample No:		6260		6270		6280		6290		6300	
Sample Date:		29-APR-98		29-APR-98		29-APR-98		30-APR-98		30-APR-98	
Depth:		2-4		0-1		8-10		0-1		8-10	
pH	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
pH	STD UNIT	7.6	J	7.7	J	8.0	J	7.6		8.0	

Report Date: 07/24/98

Sample Location:		AA1-SB01		AA1-SB01		AA1-SB02		AA1-SB02		AA1-SB03	
Associated Site:		AA1		AA1		AA1		AA1		AA1	
Sample No:		6010		6020		6030		6040		6050	
Sample Date:		30-APR-98		30-APR-98		30-APR-98		30-APR-98		29-APR-98	
Depth:		0-1		8-10		0-1		6-8		0-1	
VOLATILES	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
1,1,1-TRICHLOROETHANE	ug/kg	6.2	U	6.3	U	5.7	U	6.3	U	6.0	U
1,1,2,2-TETRACHLOROETHANE	ug/kg	6.2	U	6.3	U	5.7	U	6.3	UJ	6.0	U
1,1,2-TRICHLOROETHANE	ug/kg	6.2	U	6.3	U	5.7	U	6.3	U	6.0	U
1,1-DICHLOROETHANE	ug/kg	6.2	U	6.3	U	5.7	U	6.3	U	6.0	U
1,1-DICHLOROETHENE	ug/kg	6.2	U	6.3	U	5.7	U	6.3	U	6.0	U
1,2-DICHLOROETHANE	ug/kg	6.2	U	6.3	U	5.7	U	6.3	U	6.0	U
1,2-DICHLOROETHENE	ug/kg	6.2	U	6.3	U	5.7	U	6.3	U	6.0	U
1,2-DICHLOROPROPANE	ug/kg	6.2	U	6.3	U	5.7	U	6.3	U	6.0	U
2-BUTANONE	ug/kg	25	U	25	U	23	U	25	U	24	U
2-HEXANONE	ug/kg	25	U	25	U	23	U	25	U	24	U
4-METHYL-2-PENTANONE	ug/kg	25	U	25	U	23	U	25	U	24	U
ACETONE	ug/kg	25	U	13	J	23	U	25	U	24	U
BENZENE	ug/kg	6.2	U	6.3	U	5.7	U	6.3	U	6.0	U
BROMODICHLOROMETHANE	ug/kg	6.2	U	6.3	U	5.7	U	6.3	U	6.0	U
BROMOFORM	ug/kg	6.2	U	6.3	U	5.7	U	6.3	U	6.0	U
BROMOMETHANE	ug/kg	12	U	13	U	11	U	13	U	12	U
CARBON DISULFIDE	ug/kg	6.2	U	6.3	U	5.7	U	6.3	U	6.0	U
CARBON TETRACHLORIDE	ug/kg	6.2	U	6.3	U	5.7	U	6.3	U	6.0	U
CHLOROBENZENE	ug/kg	6.2	U	6.3	U	5.7	U	6.3	U	6.0	U
CHLOROETHANE	ug/kg	12	U	13	U	11	U	13	U	12	U
CHLOROFORM	ug/kg	6.2	U	6.3	U	5.7	U	6.3	U	6.0	U
CHLOROMETHANE	ug/kg	12	U	13	U	11	U	13	U	12	U
DIBROMOCHLOROMETHANE	ug/kg	6.2	U	6.3	U	5.7	U	6.3	U	6.0	U
ETHYLBENZENE	ug/kg	6.2	U	6.3	U	5.7	U	6.3	U	6.0	U
METHYLENE CHLORIDE	ug/kg	7.5	U	6.3	U	5.8	U	6.3	U	7.8	U
STYRENE	ug/kg	6.2	U	6.3	U	5.7	U	6.3	U	6.0	U
TETRACHLOROETHENE	ug/kg	6.2	U	6.3	U	5.7	U	6.3	U	6.0	U
TOLUENE	ug/kg	6.2	U	6.3	U	5.7	U	6.3	U	6.0	U
TOTAL XYLENES	ug/kg	6.2	U	6.3	U	5.7	U	6.3	U	6.0	U
TRICHLOROETHENE	ug/kg	6.2	U	6.3	U	5.7	U	6.3	U	6.0	U

PLUMBROOK

Acid Area 1

Data Summary - Soils

Report Date: 07/24/98

Sample Location:		AA1-SB03		AA1-SB04		AA1-SB04		AA1-SB05		AA1-SB05	
Associated Site:		AA1		AA1		AA1		AA1		AA1	
Sample No:		6060		6070		6080		6090		6100	
Sample Date:		29-APR-98		29-APR-98		29-APR-98		30-APR-98		30-APR-98	
Depth:		6-8		0-1		8-10		0-1		6-8	
VOLATILES	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
1,1,1-TRICHLOROETHANE	ug/kg	6.3	U	6.0	U	6.3	U	6.3	U	6.0	U
1,1,2,2-TETRACHLOROETHANE	ug/kg	6.3	U	6.0	U	6.3	UJ	6.3	U	6.0	U
1,1,2-TRICHLOROETHANE	ug/kg	6.3	U	6.0	U	6.3	UJ	6.3	U	6.0	U
1,1-DICHLOROETHANE	ug/kg	6.3	U	6.0	U	6.3	U	6.3	U	6.0	U
1,1-DICHLOROETHENE	ug/kg	6.3	U	6.0	U	6.3	U	6.3	U	6.0	U
1,2-DICHLOROETHANE	ug/kg	6.3	U	6.0	U	6.3	U	6.3	U	6.0	U
1,2-DICHLOROETHENE	ug/kg	6.3	U	6.0	U	6.3	U	6.3	U	6.0	U
1,2-DICHLOROPROPANE	ug/kg	6.3	U	6.0	U	6.3	UJ	6.3	U	6.0	U
2-BUTANONE	ug/kg	25	U	24	U	25	U	25	U	24	U
2-HEXANONE	ug/kg	25	U	24	U	25	UJ	25	U	24	U
4-METHYL-2-PENTANONE	ug/kg	25	U	24	U	25	UJ	25	U	24	U
ACETONE	ug/kg	25	U	24	U	480		25	U	24	U
BENZENE	ug/kg	6.3	U	6.0	U	6.3	UJ	6.3	U	6.0	U
BROMODICHLOROMETHANE	ug/kg	6.3	U	6.0	U	6.3	UJ	6.3	U	6.0	U
BROMOFORM	ug/kg	6.3	U	6.0	U	6.3	UJ	6.3	U	6.0	U
BROMOMETHANE	ug/kg	13	U	12	U	13	U	13	U	12	U
CARBON DISULFIDE	ug/kg	6.3	U	6.0	U	6.3	U	6.3	U	4.2	J
CARBON TETRACHLORIDE	ug/kg	6.3	U	6.0	U	6.3	UJ	6.3	U	6.0	U
CHLOROBENZENE	ug/kg	6.3	U	6.0	U	6.3	UJ	6.3	U	6.0	U
CHLOROETHANE	ug/kg	13	U	12	U	13	U	13	U	12	U
CHLOROFORM	ug/kg	6.3	U	6.0	U	6.3	U	6.3	U	6.0	U
CHLOROMETHANE	ug/kg	13	U	12	U	13	U	13	U	12	U
DIBROMOCHLOROMETHANE	ug/kg	6.3	U	6.0	U	6.3	UJ	6.3	U	6.0	U
ETHYLBENZENE	ug/kg	6.3	U	6.0	U	6.3	UJ	6.3	U	6.0	U
METHYLENE CHLORIDE	ug/kg	6.3	U	7.7	U	7.0	U	2.5	J	3.3	J
STYRENE	ug/kg	6.3	U	6.0	U	6.3	UJ	6.3	U	6.0	U
TETRACHLOROETHENE	ug/kg	6.3	U	6.0	U	6.3	UJ	6.3	U	6.0	U
TOLUENE	ug/kg	6.3	U	1.8	J	4.0	J	6.3	U	6.0	U
TOTAL XYLENES	ug/kg	6.3	U	6.0	U	6.3	UJ	6.3	U	6.0	U
TRICHLORO[illegible]ENE	ug/kg	6.3	U	6.0	U	6.3	UJ	6.3	U	[illegible]	U

Report Date: 07/24/98

Sample Location:		AA1-SB06		AA1-SB06		AA1-SB07		AA1-SB07		AA1-SB08	
Associated Site:		AA1		AA1		AA1		AA1		AA1	
Sample No:		6110		6120		6130		6140		6150	
Sample Date:		29-APR-98		29-APR-98		29-APR-98		29-APR-98		29-APR-98	
Depth:		0-1		6-8		0-1		2-4		0-1	
VOLATILES	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
1,1,1-TRICHLOROETHANE	ug/kg	6.4	U	6.2	U	5.9	U	6.2	U	6.1	U
1,1,2,2-TETRACHLOROETHANE	ug/kg	6.4	U	6.2	U	5.9	U	6.2	U	6.1	U
1,1,2-TRICHLOROETHANE	ug/kg	6.4	U	6.2	U	5.9	U	6.2	U	6.1	U
1,1-DICHLOROETHANE	ug/kg	6.4	U	6.2	U	5.9	U	6.2	U	6.1	U
1,1-DICHLOROETHENE	ug/kg	6.4	U	6.2	U	5.9	U	6.2	U	6.1	U
1,2-DICHLOROETHANE	ug/kg	6.4	U	6.2	U	5.9	U	6.2	U	6.1	U
1,2-DICHLOROETHENE	ug/kg	6.4	U	6.2	U	5.9	U	6.2	U	6.1	U
1,2-DICHLOROPROPANE	ug/kg	6.4	U	6.2	U	5.9	U	6.2	U	6.1	U
2-BUTANONE	ug/kg	26	U	25	U	24	U	25	U	24	U
2-HEXANONE	ug/kg	26	U	25	U	24	U	25	U	24	U
4-METHYL-2-PENTANONE	ug/kg	26	U	25	U	24	U	25	U	24	U
ACETONE	ug/kg	26	U	16	J	24	U	130		24	U
BENZENE	ug/kg	6.4	U	6.2	U	5.9	U	6.2	U	6.1	U
BROMODICHLOROMETHANE	ug/kg	6.4	U	6.2	U	5.9	U	6.2	U	6.1	U
BROMOFORM	ug/kg	6.4	U	6.2	U	5.9	U	6.2	U	6.1	U
BROMOMETHANE	ug/kg	13	U	12	U	12	U	12	U	12	U
CARBON DISULFIDE	ug/kg	6.4	U	6.2	U	5.9	U	6.2	U	6.1	U
CARBON TETRACHLORIDE	ug/kg	6.4	U	6.2	U	5.9	U	6.2	U	6.1	U
CHLOROBENZENE	ug/kg	6.4	U	6.2	U	5.9	U	6.2	U	6.1	U
CHLOROETHANE	ug/kg	13	U	12	U	12	U	12	U	12	U
CHLOROFORM	ug/kg	6.4	U	6.2	U	5.9	U	6.2	U	6.1	U
CHLOROMETHANE	ug/kg	13	U	12	U	12	U	12	U	12	U
DIBROMOCHLOROMETHANE	ug/kg	6.4	U	6.2	U	5.9	U	6.2	U	6.1	U
ETHYLBENZENE	ug/kg	6.4	U	6.2	U	5.9	U	6.2	U	6.1	U
METHYLENE CHLORIDE	ug/kg	6.4	U	11	U	5.9	U	8.6	U	6.1	U
STYRENE	ug/kg	6.4	U	6.2	U	5.9	U	6.2	U	6.1	U
TETRACHLOROETHENE	ug/kg	6.4	U	6.2	U	5.9	U	6.2	U	6.1	U
TOLUENE	ug/kg	6.4	U	6.2	U	5.9	U	6.2	U	6.1	U
TOTAL XYLENES	ug/kg	6.4	U	6.2	U	5.9	U	6.2	U	6.1	U
TRICHLOROETHENE	ug/kg	6.4	U	6.2	U	5.9	U	6.2	U	6.1	U

Sample Location:		AA1-SB08		AA1-SB09		AA1-SB09		AA1-SB10		AA1-SB10	
Associated Site:		AA1		AA1		AA1		AA1		AA1	
Sample No:		6160		6170		6180		6190		6200	
Sample Date:		29-APR-98		30-APR-98		30-APR-98		30-APR-98		30-APR-98	
Depth:		2-4		0-1		2-4		0-1		4-6	
VOLATILES	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
1,1,1-TRICHLOROETHANE	ug/kg	6.0	U	6.0	U	5.9	U	6.2	U	6.7	
1,1,2,2-TETRACHLOROETHANE	ug/kg	6.0	U	6.0	U	5.9	U	6.2	U	6.0	UJ
1,1,2-TRICHLOROETHANE	ug/kg	6.0	U	6.0	U	5.9	U	6.2	U	6.0	UJ
1,1-DICHLOROETHANE	ug/kg	6.0	U	6.0	U	5.9	U	6.2	U	6.0	U
1,1-DICHLOROETHENE	ug/kg	6.0	U	6.0	U	5.9	U	6.2	U	6.0	U
1,2-DICHLOROETHANE	ug/kg	6.0	U	6.0	U	5.9	U	6.2	U	6.0	U
1,2-DICHLOROETHENE	ug/kg	6.0	U	6.0	U	5.9	U	6.2	U	4.0	J
1,2-DICHLOROPROPANE	ug/kg	6.0	U	6.0	U	5.9	U	6.2	U	6.0	UJ
2-BUTANONE	ug/kg	24	U	24	U	24	U	25	U	9.9	J
2-HEXANONE	ug/kg	24	U	24	U	24	U	25	U	24	UJ
4-METHYL-2-PENTANONE	ug/kg	24	U	24	U	24	U	25	U	24	UJ
ACETONE	ug/kg	24	U	24	U	24	U	25	U	110	
BENZENE	ug/kg	6.0	U	6.0	U	5.9	U	6.2	U	6.0	UJ
BROMODICHLOROMETHANE	ug/kg	6.0	U	6.0	U	5.9	U	6.2	U	6.0	UJ
BROMOFORM	ug/kg	6.0	U	6.0	U	5.9	U	6.2	U	6.0	UJ
BROMOMETHANE	ug/kg	12	U	12	U	12	U	12	U	12	U
CARBON DISULFIDE	ug/kg	6.0	U	6.0	U	5.9	U	6.2	U	6.0	U
CARBON TETRACHLORIDE	ug/kg	6.0	U	6.0	U	5.9	U	6.2	U	6.0	UJ
CHLOROBENZENE	ug/kg	6.0	U	6.0	U	5.9	U	6.2	U	6.0	UJ
CHLOROETHANE	ug/kg	12	U	12	U	12	U	12	U	12	U
CHLOROFORM	ug/kg	6.0	U	6.0	U	5.9	U	6.2	U	6.0	U
CHLOROMETHANE	ug/kg	12	U	12	U	12	U	12	U	12	U
DIBROMOCHLOROMETHANE	ug/kg	6.0	U	6.0	U	5.9	U	6.2	U	6.0	UJ
ETHYLBENZENE	ug/kg	6.0	U	6.0	U	5.9	U	6.2	U	6.0	UJ
METHYLENE CHLORIDE	ug/kg	6.0	U	3.2	J	2.3	J	6.2	U	6.0	U
STYRENE	ug/kg	6.0	U	6.0	U	5.9	U	6.2	U	6.0	UJ
TETRACHLOROETHENE	ug/kg	6.0	U	6.0	U	5.9	U	6.2	U	240	J
TOLUENE	ug/kg	6.0	U	6.0	U	5.9	U	6.2	U	3.1	J
TOTAL XYLENES	ug/kg	6.0	U	6.0	U	5.9	U	6.2	U	6.0	UJ
TRICHLOROETHENE	ug/kg	6.0	U	6.0	U	5.9	U	6.2	U	35	J

Sample Location:		AA1-SB11		AA1-SB11		AA1-SB12		AA1-SB12		AA1-SB13	
Associated Site:		AA1		AA1		AA1		AA1		AA1	
Sample No:		6210		6220		6230		6240		6250	
Sample Date:		30-APR-98		30-APR-98		30-APR-98		30-APR-98		29-APR-98	
Depth:		0-1		4-6		0-1		2-4		0-1	
VOLATILES	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
1,1,1-TRICHLOROETHANE	ug/kg	2.1	J	53		6.1	U	6.0	U	5.9	U
1,1,2,2-TETRACHLOROETHANE	ug/kg	6.0	UJ	6.2	UJ	6.1	U	6.0	U	5.9	U
1,1,2-TRICHLOROETHANE	ug/kg	6.0	U	6.2	UJ	6.1	U	6.0	U	5.9	U
1,1-DICHLOROETHANE	ug/kg	6.0	U	33		6.1	U	6.0	U	5.9	U
1,1-DICHLOROETHENE	ug/kg	6.0	U	1.8	J	6.1	U	6.0	U	5.9	U
1,2-DICHLOROETHANE	ug/kg	6.0	U	6.2	U	6.1	U	6.0	U	5.9	U
1,2-DICHLOROETHENE	ug/kg	6.0	U	7.4		6.1	U	6.0	U	5.9	U
1,2-DICHLOROPROPANE	ug/kg	6.0	U	6.2	UJ	6.1	U	6.0	U	5.9	U
2-BUTANONE	ug/kg	24	U	25	U	24	U	24	U	23	U
2-HEXANONE	ug/kg	24	U	25	UJ	24	U	24	U	23	U
4-METHYL-2-PENTANONE	ug/kg	24	U	25	UJ	24	U	24	U	23	U
ACETONE	ug/kg	24	U	25	U	24	U	270		23	U
BENZENE	ug/kg	6.0	U	6.2	UJ	6.1	U	6.0	U	5.9	U
BROMODICHLOROMETHANE	ug/kg	6.0	U	6.2	UJ	6.1	U	6.0	U	5.9	U
BROMOFORM	ug/kg	6.0	U	6.2	UJ	6.1	U	6.0	U	5.9	U
BROMOMETHANE	ug/kg	12	U	12	U	12	U	12	U	12	U
CARBON DISULFIDE	ug/kg	6.0	U	6.2	U	6.1	U	6.0	U	5.9	U
CARBON TETRACHLORIDE	ug/kg	6.0	U	6.2	UJ	6.1	U	6.0	U	5.9	U
CHLOROBENZENE	ug/kg	6.0	U	6.2	UJ	6.1	U	6.0	U	5.9	U
CHLOROETHANE	ug/kg	12	U	12	U	12	U	12	U	12	U
CHLOROFORM	ug/kg	6.0	U	6.2	U	6.1	U	6.0	U	5.9	U
CHLOROMETHANE	ug/kg	12	U	12	U	12	U	12	U	12	U
DIBROMOCHLOROMETHANE	ug/kg	6.0	U	6.2	UJ	6.1	U	6.0	U	5.9	U
ETHYLBENZENE	ug/kg	6.0	U	6.2	UJ	6.1	U	6.0	U	5.9	U
METHYLENE CHLORIDE	ug/kg	6.0	U	6.2	U	6.1	U	6.0	U	5.9	U
STYRENE	ug/kg	6.0	U	6.2	UJ	6.1	U	6.0	U	5.9	U
TETRACHLOROETHENE	ug/kg	6.0	U	6.2	UJ	6.1	U	6.0	U	5.9	U
TOLUENE	ug/kg	1.6	J	6.2	UJ	6.1	U	6.0	U	5.9	U
TOTAL XYLENES	ug/kg	6.0	U	6.2	UJ	6.1	U	6.0	U	5.9	U
TRICHLOROETHENE	ug/kg	6.0	U	32	J	6.1	U	6.0	U	5.9	U

PLUMBROOK

Acid Area 1

Data Summary - Soils

Report Date: 07/24/98

Sample Location:		AA1-SB13		AA1-SB14		AA1-SB14		AA1-SB15		AA1-SB15	
Associated Site:		AA1		AA1		AA1		AA1		AA1	
Sample No:		6260		6270		6280		6290		6300	
Sample Date:		29-APR-98		29-APR-98		29-APR-98		30-APR-98		30-APR-98	
Depth:		2-4		0-1		8-10		0-1		8-10	
VOLATILES	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
1,1,1-TRICHLOROETHANE	ug/kg	6.2	U	6.2	U	6.2	U	6.0	U	6.2	U
1,1,2,2-TETRACHLOROETHANE	ug/kg	6.2	U	6.2	U	6.2	UJ	6.0	U	6.2	U
1,1,2-TRICHLOROETHANE	ug/kg	6.2	U	6.2	U	6.2	UJ	6.0	U	6.2	U
1,1-DICHLOROETHANE	ug/kg	6.2	U	6.2	U	6.2	U	6.0	U	6.2	U
1,1-DICHLOROETHENE	ug/kg	6.2	U	6.2	U	6.2	U	6.0	U	6.2	U
1,2-DICHLOROETHANE	ug/kg	6.2	U	6.2	U	6.2	U	6.0	U	6.2	U
1,2-DICHLOROETHENE	ug/kg	6.2	U	6.2	U	6.2	U	6.0	U	6.2	U
1,2-DICHLOROPROPANE	ug/kg	6.2	U	6.2	U	6.2	UJ	6.0	U	6.2	U
2-BUTANONE	ug/kg	25	U	25	U	25	U	24	U	25	U
2-HEXANONE	ug/kg	25	U	25	U	25	UJ	24	U	25	U
4-METHYL-2-PENTANONE	ug/kg	25	U	25	U	25	UJ	24	U	25	U
ACETONE	ug/kg	25	U	25	U	79		24	U	270	
BENZENE	ug/kg	6.2	U	6.2	U	6.2	UJ	6.0	U	6.2	U
BROMODICHLOROMETHANE	ug/kg	6.2	U	6.2	U	6.2	UJ	6.0	U	6.2	U
BROMOFORM	ug/kg	6.2	U	6.2	U	6.2	UJ	6.0	U	6.2	U
BROMOMETHANE	ug/kg	12	U	12	U	12	U	12	U	12	U
CARBON DISULFIDE	ug/kg	6.2	U	6.2	U	6.2	U	6.0	U	6.2	U
CARBON TETRACHLORIDE	ug/kg	6.2	U	6.2	U	6.2	UJ	6.0	U	6.2	U
CHLOROBENZENE	ug/kg	6.2	U	6.2	U	6.2	UJ	6.0	U	6.2	U
CHLOROETHANE	ug/kg	12	U	12	U	12	U	12	U	12	U
CHLOROFORM	ug/kg	6.2	U	6.2	U	6.2	U	6.0	U	6.2	U
CHLOROMETHANE	ug/kg	12	U	12	U	12	U	12	U	12	U
DIBROMOCHLOROMETHANE	ug/kg	6.2	U	6.2	U	6.2	UJ	6.0	U	6.2	U
ETHYLBENZENE	ug/kg	6.2	U	6.2	U	6.2	UJ	6.0	U	6.2	U
METHYLENE CHLORIDE	ug/kg	6.2	U	6.2	U	6.8	U	6.0	U	6.2	U
STYRENE	ug/kg	6.2	U	6.2	U	6.2	UJ	6.0	U	6.2	U
TETRACHLOROETHENE	ug/kg	6.2	U	6.2	U	6.2	UJ	6.0	U	6.2	U
TOLUENE	ug/kg	6.2	U	6.2	U	2.4	J	6.0	U	6.2	U
TOTAL XYLENES	ug/kg	6.2	U	6.2	U	6.2	UJ	6.0	U	6.2	U
TRICHLOROETHENE	ug/kg	6.2	U	6.2	U	6.2	UJ	6.0	U	6.2	U

Sample Location:		AA1-SB01		AA1-SB01		AA1-SB02		AA1-SB02		AA1-SB03	
Associated Site:		AA1		AA1		AA1		AA1		AA1	
Sample No:		6010		6020		6030		6040		6050	
Sample Date:		30-APR-98		30-APR-98		30-APR-98		30-APR-98		29-APR-98	
Depth:		0-1		8-10		0-1		6-8		0-1	
VOLATILES	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
VINYL CHLORIDE	ug/kg	12	U	13	U	11	U	13	U	12	U
cis-1,3-DICHLOROPROPENE	ug/kg	6.2	U	6.3	U	5.7	U	6.3	U	6.0	U
trans-1,3-DICHLOROPROPENE	ug/kg	6.2	U	6.3	U	5.7	U	6.3	U	6.0	U

PLUMBROOK

Acid Area 1

Data Summary - Soils

Report Date: 07/24/98

Sample Location:		AA1-SB03		AA1-SB04		AA1-SB04		AA1-SB05		AA1-SB05	
Associated Site:		AA1		AA1		AA1		AA1		AA1	
Sample No:		6060		6070		6080		6090		6100	
Sample Date:		29-APR-98		29-APR-98		29-APR-98		30-APR-98		30-APR-98	
Depth:		6-8		0-1		8-10		0-1		6-8	
VOLATILES	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
VINYL CHLORIDE	ug/kg	13	U	12	U	13	U	13	U	12	U
cis-1,3-DICHLOROPROPENE	ug/kg	6.3	U	6.0	U	6.3	UJ	6.3	U	6.0	U
trans-1,3-DICHLOROPROPENE	ug/kg	6.3	U	6.0	U	6.3	UJ	6.3	U	6.0	U

Report Date: 07/24/98

Sample Location:		AA1-SB06		AA1-SB06		AA1-SB07		AA1-SB07		AA1-SB08	
Associated Site:		AA1		AA1		AA1		AA1		AA1	
Sample No:		6110		6120		6130		6140		6150	
Sample Date:		29-APR-98		29-APR-98		29-APR-98		29-APR-98		29-APR-98	
Depth:		0-1		6-8		0-1		2-4		0-1	
VOLATILES	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
VINYL CHLORIDE	ug/kg	13	U	12	U	12	U	12	U	12	U
cis-1,3-DICHLOROPROPENE	ug/kg	6.4	U	6.2	U	5.9	U	6.2	U	6.1	U
trans-1,3-DICHLOROPROPENE	ug/kg	6.4	U	6.2	U	5.9	U	6.2	U	6.1	U

PLUMBROOK

Acid Area 1

Data Summary - Soils

Report Date: 07/24/98

Sample Location:		AA1-SB08		AA1-SB09		AA1-SB09		AA1-SB10		AA1-SB10	
Associated Site:		AA1		AA1		AA1		AA1		AA1	
Sample No:		6160		6170		6180		6190		6200	
Sample Date:		29-APR-98		30-APR-98		30-APR-98		30-APR-98		30-APR-98	
Depth:		2-4		0-1		2-4		0-1		4-6	
VOLATILES	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
VINYL CHLORIDE	ug/kg	12	U	12	U	12	U	12	U	12	U
cis-1,3-DICHLOROPROPENE	ug/kg	6.0	U	6.0	U	5.9	U	6.2	U	6.0	UJ
trans-1,3-DICHLOROPROPENE	ug/kg	6.0	U	6.0	U	5.9	U	6.2	U	6.0	UJ

Sample Location:		AA1-SB11		AA1-SB11		AA1-SB12		AA1-SB12		AA1-SB13	
Associated Site:		AA1		AA1		AA1		AA1		AA1	
Sample No:		6210		6220		6230		6240		6250	
Sample Date:		30-APR-98		30-APR-98		30-APR-98		30-APR-98		29-APR-98	
Depth:		0-1		4-6		0-1		2-4		0-1	
VOLATILES	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
VINYL CHLORIDE	ug/kg	12	U	12	U	12	U	12	U	12	U
cis-1,3-DICHLOROPROPENE	ug/kg	6.0	U	6.2	UJ	6.1	U	6.0	U	5.9	U
trans-1,3-DICHLOROPROPENE	ug/kg	6.0	U	6.2	UJ	6.1	U	6.0	U	5.9	U

Sample Location:		AA1-SB13		AA1-SB14		AA1-SB14		AA1-SB15		AA1-SB15	
Associated Site:		AA1		AA1		AA1		AA1		AA1	
Sample No:		6260		6270		6280		6290		6300	
Sample Date:		29-APR-98		29-APR-98		29-APR-98		30-APR-98		30-APR-98	
Depth:		2-4		0-1		8-10		0-1		8-10	
VOLATILES	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
VINYL CHLORIDE	ug/kg	12	U	12	U	12	U	12	U	12	U
cis-1,3-DICHLOROPROPENE	ug/kg	6.2	U	6.2	U	6.2	UJ	6.0	U	6.2	U
trans-1,3-DICHLOROPROPENE	ug/kg	6.2	U	6.2	U	6.2	UJ	6.0	U	6.2	U

PLUMBROOK

Acid Area 1

Data Summary - Soils

Report Date: 07/24/98

Sample Location:		AA1-SB01		AA1-SB01		AA1-SB02		AA1-SB02		AA1-SB03	
Associated Site:		AA1		AA1		AA1		AA1		AA1	
Sample No:		6010		6020		6030		6040		6050	
Sample Date:		30-APR-98		30-APR-98		30-APR-98		30-APR-98		29-APR-98	
Depth:		0-1		8-10		0-1		6-8		0-1	
SULFATE	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
SULFATE	mg/kg	823		4760		166		12.6	U	2840	

Sample Location:		AA1-SB03		AA1-SB04		AA1-SB04		AA1-SB05		AA1-SB05	
Associated Site:		AA1		AA1		AA1		AA1		AA1	
Sample No:		6060		6070		6080		6090		6100	
Sample Date:		29-APR-98		29-APR-98		29-APR-98		30-APR-98		30-APR-98	
Depth:		6-8		0-1		8-10		0-1		6-8	
SULFATE	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
SULFATE	mg/kg	26.4		94.3		216		21.4		74.3	

PLUMBROOK

Acid Area 1

Data Summary - Soils

Report Date: 07/24/98

Sample Location:		AA1-SB06		AA1-SB06		AA1-SB07		AA1-SB07		AA1-SB08	
Associated Site:		AA1		AA1		AA1		AA1		AA1	
Sample No:		6110		6120		6130		6140		6150	
Sample Date:		29-APR-98		29-APR-98		29-APR-98		29-APR-98		29-APR-98	
Depth:		0-1		6-8		0-1		2-4		0-1	
SULFATE	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
SULFATE	mg/kg	3910		5440		321		766		13.4	

PLUMBROOK

Acid Area 1

Data Summary - Soils

Report Date: 07/24/98

Sample Location:		AA1-SB08		AA1-SB09		AA1-SB09		AA1-SB10		AA1-SB10	
Associated Site:		AA1		AA1		AA1		AA1		AA1	
Sample No:		6160		6170		6180		6190		6200	
Sample Date:		29-APR-98		30-APR-98		30-APR-98		30-APR-98		30-APR-98	
Depth:		2-4		0-1		2-4		0-1		4-6	
SULFATE	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
SULFATE	mg/kg	168		12.0	U	218		24.4		12.1	U

Report Date: 07/24/98

Sample Location:		AA1-SB11		AA1-SB11		AA1-SB12		AA1-SB12		AA1-SB13	
Associated Site:		AA1		AA1		AA1		AA1		AA1	
Sample No:		6210		6220		6230		6240		6250	
Sample Date:		30-APR-98		30-APR-98		30-APR-98		30-APR-98		29-APR-98	
Depth:		0-1		4-6		0-1		2-4		0-1	
SULFATE	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
SULFATE	mg/kg	11.9	U	46.5		13.5		12.1	U	11.7	U

Sample Location:		AA1-SB13		AA1-SB14		AA1-SB14		AA1-SB15		AA1-SB15	
Associated Site:		AA1		AA1		AA1		AA1		AA1	
Sample No:		6260		6270		6280		6290		6300	
Sample Date:		29-APR-98		29-APR-98		29-APR-98		30-APR-98		30-APR-98	
Depth:		2-4		0-1		8-10		0-1		8-10	
SULFATE	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
SULFATE	mg/kg	12.5	U	108		208		16.4		141	

Report Date: 07/24/98

Sample Location:		AA1-SB01		AA1-SB01		AA1-SB02		AA1-SB02		AA1-SB03	
Associated Site:		AA1		AA1		AA1		AA1		AA1	
Sample No:		6010		6020		6030		6040		6050	
Sample Date:		30-APR-98		30-APR-98		30-APR-98		30-APR-98		29-APR-98	
Depth:		0-1		8-10		0-1		6-8		0-1	
SEMIVOLATILES	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
1,2,4-TRICHLOROBENZENE	ug/kg	410	U	420	U	380	U	420	U	400	U
1,2-DICHLOROBENZENE	ug/kg	410	U	420	U	380	U	420	U	400	U
1,3-DICHLOROBENZENE	ug/kg	410	U	420	U	380	U	420	U	400	U
1,4-DICHLOROBENZENE	ug/kg	410	U	420	U	380	U	420	U	400	U
2,4,5-TRICHLOROPHENOL	ug/kg	410	U	420	U	380	U	420	U	400	U
2,4,6-TRICHLOROPHENOL	ug/kg	410	U	420	U	380	U	420	U	400	U
2,4-DICHLOROPHENOL	ug/kg	410	U	420	U	380	U	420	U	400	U
2,4-DIMETHYLPHENOL	ug/kg	410	U	420	U	380	U	420	U	400	U
2,4-DINITROPHENOL	ug/kg	2000	U	2000	U	1800	U	2000	U	1900	U
2,4-DINITROTOLUENE	ug/kg	410	U	420	U	460		420	U	400	U
2,6-DINITROTOLUENE	ug/kg	410	U	420	U	380	U	420	U	400	U
2-CHLORONAPHTHALENE	ug/kg	410	U	420	U	380	U	420	U	400	U
2-CHLOROPHENOL	ug/kg	410	U	420	U	380	U	420	U	400	U
2-METHYLNAPHTHALENE	ug/kg	410	U	420	U	380	U	420	U	400	U
2-METHYLPHENOL	ug/kg	410	U	420	U	380	U	420	U	400	U
2-NITROANILINE	ug/kg	2000	U	2000	U	1800	U	2000	U	1900	U
2-NITROPHENOL	ug/kg	410	U	420	U	380	U	420	U	400	U
3,3'-DICHLOROBENZIDINE	ug/kg	2000	U	2000	U	1800	U	2000	U	1900	U
3-NITROANILINE	ug/kg	2000	U	2000	U	1800	U	2000	U	1900	U
4,6-DINITRO-2-METHYLPHENOL	ug/kg	2000	U	2000	U	1800	U	2000	U	1900	U
4-BROMOPHENYL PHENYL ETHER	ug/kg	410	U	420	U	380	U	420	U	400	U
4-CHLORO-3-METHYLPHENOL	ug/kg	410	U	420	U	380	U	420	U	400	U
4-CHLOROANILINE	ug/kg	410	U	420	U	380	U	420	U	400	U
4-CHLOROPHENYL PHENYL ETHER	ug/kg	410	U	420	U	380	U	420	U	400	U
4-METHYLPHENOL	ug/kg	410	U	420	U	380	U	420	U	400	U
4-NITROANILINE	ug/kg	2000	U	2000	U	1800	U	2000	U	1900	U
4-NITROPHENOL	ug/kg	2000	U	2000	U	1800	U	2000	U	1900	U
ACENAPHTHENE	ug/kg	410	U	420	U	380	U	420	U	400	U
ACENAPHTHYLENE	ug/kg	410	U	420	U	380	U	420	U	400	U
ANTHRACENE	ug/kg	410	U	420	U	380	U	420	U	400	U

Sample Location:		AA1-SB03		AA1-SB04		AA1-SB04		AA1-SB05		AA1-SB05	
Associated Site:		AA1		AA1		AA1		AA1		AA1	
Sample No:		6060		6070		6080		6090		6100	
Sample Date:		29-APR-98		29-APR-98		29-APR-98		30-APR-98		30-APR-98	
Depth:		6-8		0-1		8-10		0-1		6-8	
SEMIVOLATILES	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
1,2,4-TRICHLOROBENZENE	ug/kg	420	U	400	U	420	U	410	U	400	U
1,2-DICHLOROBENZENE	ug/kg	420	U	400	U	420	U	410	U	400	U
1,3-DICHLOROBENZENE	ug/kg	420	U	400	U	420	U	410	U	400	U
1,4-DICHLOROBENZENE	ug/kg	420	U	400	U	420	U	410	U	400	U
2,4,5-TRICHLOROPHENOL	ug/kg	420	U	400	U	420	U	410	U	400	U
2,4,6-TRICHLOROPHENOL	ug/kg	420	U	400	U	420	U	410	U	400	U
2,4-DICHLOROPHENOL	ug/kg	420	U	400	U	420	U	410	U	400	U
2,4-DIMETHYLPHENOL	ug/kg	420	U	400	U	420	U	410	U	400	U
2,4-DINITROPHENOL	ug/kg	2000	U	1900	U	2000	U	2000	U	1900	U
2,4-DINITROTOLUENE	ug/kg	420	U	400	U	420	U	410	U	400	U
2,6-DINITROTOLUENE	ug/kg	420	U	400	U	420	U	410	U	400	U
2-CHLORONAPHTHALENE	ug/kg	420	U	400	U	420	U	410	U	400	U
2-CHLOROPHENOL	ug/kg	420	U	400	U	420	U	410	U	400	U
2-METHYLNAPHTHALENE	ug/kg	420	U	400	U	420	U	410	U	400	U
2-METHYLPHENOL	ug/kg	420	U	400	U	420	U	410	U	400	U
2-NITROANILINE	ug/kg	2000	U	1900	U	2000	U	2000	U	1900	U
2-NITROPHENOL	ug/kg	420	U	400	U	420	U	410	U	400	U
3,3'-DICHLOROBENZIDINE	ug/kg	2000	U	1900	U	2000	U	2000	U	1900	U
3-NITROANILINE	ug/kg	2000	U	1900	U	2000	U	2000	U	1900	U
4,6-DINITRO-2-METHYLPHENOL	ug/kg	2000	U	1900	U	2000	U	2000	U	1900	U
4-BROMOPHENYL PHENYL ETHER	ug/kg	420	U	400	U	420	U	410	U	400	U
4-CHLORO-3-METHYLPHENOL	ug/kg	420	U	400	U	420	U	410	U	400	U
4-CHLOROANILINE	ug/kg	420	U	400	U	420	U	410	U	400	U
4-CHLOROPHENYL PHENYL ETHER	ug/kg	420	U	400	U	420	U	410	U	400	U
4-METHYLPHENOL	ug/kg	420	U	400	U	420	U	410	U	400	U
4-NITROANILINE	ug/kg	2000	U	1900	U	2000	U	2000	U	1900	U
4-NITROPHENOL	ug/kg	2000	U	1900	U	2000	U	2000	U	1900	U
ACENAPHTHENE	ug/kg	420	U	400	U	420	U	410	U	400	U
ACENAPHTHYLENE	ug/kg	420	U	400	U	420	U	410	U	400	U
ANTHRACENE	ug/kg	420	U	400	U	420	U	410	U	400	U

Sample Location:		AA1-SB06		AA1-SB06		AA1-SB07		AA1-SB07		AA1-SB08	
Associated Site:		AA1		AA1		AA1		AA1		AA1	
Sample No:		6110		6120		6130		6140		6150	
Sample Date:		29-APR-98		29-APR-98		29-APR-98		29-APR-98		29-APR-98	
Depth:		0-1		6-8		0-1		2-4		0-1	
SEMIVOLATILES	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
1,2,4-TRICHLOROBENZENE	ug/kg	420	U	410	U	390	U	410	U	400	U
1,2-DICHLOROBENZENE	ug/kg	420	U	410	U	390	U	410	U	400	U
1,3-DICHLOROBENZENE	ug/kg	420	U	410	U	390	U	410	U	400	U
1,4-DICHLOROBENZENE	ug/kg	420	U	410	U	390	U	410	U	400	U
2,4,5-TRICHLOROPHENOL	ug/kg	420	U	410	U	390	U	410	U	400	U
2,4,6-TRICHLOROPHENOL	ug/kg	420	U	410	U	390	U	410	U	400	U
2,4-DICHLOROPHENOL	ug/kg	420	U	410	U	390	U	410	U	400	U
2,4-DIMETHYLPHENOL	ug/kg	420	U	410	U	390	U	410	U	400	U
2,4-DINITROPHENOL	ug/kg	2000	U	2000	U	1900	U	2000	U	1900	U
2,4-DINITROTOLUENE	ug/kg	420	U	410	U	390	U	410	U	400	U
2,6-DINITROTOLUENE	ug/kg	420	U	410	U	390	U	410	U	400	U
2-CHLORONAPHTHALENE	ug/kg	420	U	410	U	390	U	410	U	400	U
2-CHLOROPHENOL	ug/kg	420	U	410	U	390	U	410	U	400	U
2-METHYLNAPHTHALENE	ug/kg	420	U	410	U	390	U	410	U	400	U
2-METHYLPHENOL	ug/kg	420	U	410	U	390	U	410	U	400	U
2-NITROANILINE	ug/kg	2000	U	2000	U	1900	U	2000	U	1900	U
2-NITROPHENOL	ug/kg	420	U	410	U	390	U	410	U	400	U
3,3'-DICHLOROBENZIDINE	ug/kg	2000	U	2000	U	1900	U	2000	U	1900	U
3-NITROANILINE	ug/kg	2000	U	2000	U	1900	U	2000	U	1900	U
4,6-DINITRO-2-METHYLPHENOL	ug/kg	2000	U	2000	U	1900	U	2000	U	1900	U
4-BROMOPHENYL PHENYL ETHER	ug/kg	420	U	410	U	390	U	410	U	400	U
4-CHLORO-3-METHYLPHENOL	ug/kg	420	U	410	U	390	U	410	U	400	U
4-CHLOROANILINE	ug/kg	420	U	410	U	390	U	410	U	400	U
4-CHLOROPHENYL PHENYL ETHER	ug/kg	420	U	410	U	390	U	410	U	400	U
4-METHYLPHENOL	ug/kg	420	U	410	U	390	U	410	U	400	U
4-NITROANILINE	ug/kg	2000	U	2000	U	1900	U	2000	U	1900	U
4-NITROPHENOL	ug/kg	2000	U	2000	U	1900	U	2000	U	1900	U
ACENAPHTHENE	ug/kg	420	U	410	U	390	U	410	U	400	U
ACENAPHTHYLENE	ug/kg	420	U	410	U	390	U	410	U	400	U
ANTHRACENE	ug/kg	420	U	410	U	390	U	410	U	400	U

Sample Location:		AA1-SB08		AA1-SB09		AA1-SB09		AA1-SB10		AA1-SB10	
Associated Site:		AA1		AA1		AA1		AA1		AA1	
Sample No:		6160		6170		6180		6190		6200	
Sample Date:		29-APR-98		30-APR-98		30-APR-98		30-APR-98		30-APR-98	
Depth:		2-4		0-1		2-4		0-1		4-6	
SEMIVOLATILES	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
1,2,4-TRICHLOROBENZENE	ug/kg	390	U	400	U	390	U	410	U	400	U
1,2-DICHLOROBENZENE	ug/kg	390	U	400	U	390	U	410	U	400	U
1,3-DICHLOROBENZENE	ug/kg	390	U	400	U	390	U	410	U	400	U
1,4-DICHLOROBENZENE	ug/kg	390	U	400	U	390	U	410	U	400	U
2,4,5-TRICHLOROPHENOL	ug/kg	390	U	400	U	390	U	410	U	400	U
2,4,6-TRICHLOROPHENOL	ug/kg	390	U	400	U	390	U	410	U	400	U
2,4-DICHLOROPHENOL	ug/kg	390	U	400	U	390	U	410	U	400	U
2,4-DIMETHYLPHENOL	ug/kg	390	U	400	U	390	U	410	U	400	U
2,4-DINITROPHENOL	ug/kg	1900	U	1900	U	1900	U	2000	U	1900	U
2,4-DINITROTOLUENE	ug/kg	390	U	400	U	390	U	410	U	400	U
2,6-DINITROTOLUENE	ug/kg	390	U	400	U	390	U	410	U	400	U
2-CHLORONAPHTHALENE	ug/kg	390	U	400	U	390	U	410	U	400	U
2-CHLOROPHENOL	ug/kg	390	U	400	U	390	U	410	U	400	U
2-METHYLNAPHTHALENE	ug/kg	390	U	400	U	390	U	410	U	400	U
2-METHYLPHENOL	ug/kg	390	U	400	U	390	U	410	U	400	U
2-NITROANILINE	ug/kg	1900	U	1900	U	1900	U	2000	U	1900	U
2-NITROPHENOL	ug/kg	390	U	400	U	390	U	410	U	400	U
3,3'-DICHLOROBENZIDINE	ug/kg	1900	U	1900	U	1900	U	2000	U	1900	U
3-NITROANILINE	ug/kg	1900	U	1900	U	1900	U	2000	U	1900	U
4,6-DINITRO-2-METHYLPHENOL	ug/kg	1900	U	1900	U	1900	U	2000	U	1900	U
4-BROMOPHENYL PHENYL ETHER	ug/kg	390	U	400	U	390	U	410	U	400	U
4-CHLORO-3-METHYLPHENOL	ug/kg	390	U	400	U	390	U	410	U	400	U
4-CHLOROANILINE	ug/kg	390	U	400	U	390	U	410	U	400	U
4-CHLOROPHENYL PHENYL ETHER	ug/kg	390	U	400	U	390	U	410	U	400	U
4-METHYLPHENOL	ug/kg	390	U	400	U	390	U	410	U	400	U
4-NITROANILINE	ug/kg	1900	U	1900	U	1900	U	2000	U	1900	U
4-NITROPHENOL	ug/kg	1900	U	1900	U	1900	U	2000	U	1900	U
ACENAPHTHENE	ug/kg	390	U	400	U	390	U	410	U	400	U
ACENAPHTHYLENE	ug/kg	390	U	400	U	390	U	410	U	400	U
ANTHRACENE	ug/kg	390	U	400	U	390	U	410	U	400	U

Sample Location:		AA1-SB11		AA1-SB11		AA1-SB12		AA1-SB12		AA1-SB13	
Associated Site:		AA1		AA1		AA1		AA1		AA1	
Sample No:		6210		6220		6230		6240		6250	
Sample Date:		30-APR-98		30-APR-98		30-APR-98		30-APR-98		29-APR-98	
Depth:		0-1		4-6		0-1		2-4		0-1	
SEMIVOLATILES	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
1,2,4-TRICHLOROBENZENE	ug/kg	390	U	410	U	400	U	400	U	390	U
1,2-DICHLOROBENZENE	ug/kg	390	U	410	U	400	U	400	U	390	U
1,3-DICHLOROBENZENE	ug/kg	390	U	410	U	400	U	400	U	390	U
1,4-DICHLOROBENZENE	ug/kg	390	U	410	U	400	U	400	U	390	U
2,4,5-TRICHLOROPHENOL	ug/kg	390	U	410	U	400	U	400	U	390	U
2,4,6-TRICHLOROPHENOL	ug/kg	390	U	410	U	400	U	400	U	390	U
2,4-DICHLOROPHENOL	ug/kg	390	U	410	U	400	U	400	U	390	U
2,4-DIMETHYLPHENOL	ug/kg	390	U	410	U	400	U	400	U	390	U
2,4-DINITROPHENOL	ug/kg	1900	U	2000	U	1900	U	1900	U	1900	U
2,4-DINITROTOLUENE	ug/kg	390	U	410	U	400	U	400	U	390	U
2,6-DINITROTOLUENE	ug/kg	390	U	410	U	400	U	400	U	390	U
2-CHLORONAPHTHALENE	ug/kg	390	U	410	U	400	U	400	U	390	U
2-CHLOROPHENOL	ug/kg	390	U	410	U	400	U	400	U	390	U
2-METHYLNAPHTHALENE	ug/kg	390	U	410	U	400	U	400	U	390	U
2-METHYLPHENOL	ug/kg	390	U	410	U	400	U	400	U	390	U
2-NITROANILINE	ug/kg	1900	U	2000	U	1900	U	1900	U	1900	U
2-NITROPHENOL	ug/kg	390	U	410	U	400	U	400	U	390	U
3,3'-DICHLOROBENZIDINE	ug/kg	1900	U	2000	U	1900	U	1900	U	1900	U
3-NITROANILINE	ug/kg	1900	U	2000	U	1900	U	1900	U	1900	U
4,6-DINITRO-2-METHYLPHENOL	ug/kg	1900	U	2000	U	1900	U	1900	U	1900	U
4-BROMOPHENYL PHENYL ETHER	ug/kg	390	U	410	U	400	U	400	U	390	U
4-CHLORO-3-METHYLPHENOL	ug/kg	390	U	410	U	400	U	400	U	390	U
4-CHLOROANILINE	ug/kg	390	U	410	U	400	U	400	U	390	U
4-CHLOROPHENYL PHENYL ETHER	ug/kg	390	U	410	U	400	U	400	U	390	U
4-METHYLPHENOL	ug/kg	390	U	410	U	400	U	400	U	390	U
4-NITROANILINE	ug/kg	1900	U	2000	U	1900	U	1900	U	1900	U
4-NITROPHENOL	ug/kg	1900	U	2000	U	1900	U	1900	U	1900	U
ACENAPHTHENE	ug/kg	390	U	410	U	400	U	400	U	390	U
ACENAPHTHYLENE	ug/kg	390	U	410	U	400	U	400	U	390	U
ANTHRACENE	ug/kg	390	U	410	U	400	U	400	U	390	U

Sample Location:		AA1-SB13		AA1-SB14		AA1-SB14		AA1-SB15		AA1-SB15	
Associated Site:		AA1		AA1		AA1		AA1		AA1	
Sample No:		6260		6270		6280		6290		6300	
Sample Date:		29-APR-98		29-APR-98		29-APR-98		30-APR-98		30-APR-98	
Depth:		2-4		0-1		8-10		0-1		8-10	
SEMIVOLATILES	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
1,2,4-TRICHLOROBENZENE	ug/kg	410	U	410	U	410	U	400	U	410	U
1,2-DICHLOROBENZENE	ug/kg	410	U	410	U	410	U	400	U	410	U
1,3-DICHLOROBENZENE	ug/kg	410	U	410	U	410	U	400	U	410	U
1,4-DICHLOROBENZENE	ug/kg	410	U	410	U	410	U	400	U	410	U
2,4,5-TRICHLOROPHENOL	ug/kg	410	U	410	U	410	U	400	U	410	U
2,4,6-TRICHLOROPHENOL	ug/kg	410	U	410	U	410	U	400	U	410	U
2,4-DICHLOROPHENOL	ug/kg	410	U	410	U	410	U	400	U	410	U
2,4-DIMETHYLPHENOL	ug/kg	410	U	410	U	410	U	400	U	410	U
2,4-DINITROPHENOL	ug/kg	2000	U	2000	U	2000	U	1900	U	2000	U
2,4-DINITROTOLUENE	ug/kg	410	U	410	U	410	U	400	U	410	U
2,6-DINITROTOLUENE	ug/kg	410	U	410	U	410	U	400	U	410	U
2-CHLORONAPHTHALENE	ug/kg	410	U	410	U	410	U	400	U	410	U
2-CHLOROPHENOL	ug/kg	410	U	410	U	410	U	400	U	410	U
2-METHYLNAPHTHALENE	ug/kg	410	U	410	U	410	U	400	U	410	U
2-METHYLPHENOL	ug/kg	410	U	410	U	410	U	400	U	410	U
2-NITROANILINE	ug/kg	2000	U	2000	U	2000	U	1900	U	2000	U
2-NITROPHENOL	ug/kg	410	U	410	U	410	U	400	U	410	U
3,3'-DICHLOROBENZIDINE	ug/kg	2000	U	2000	U	2000	U	1900	U	2000	U
3-NITROANILINE	ug/kg	2000	U	2000	U	2000	U	1900	U	2000	U
4,6-DINITRO-2-METHYLPHENOL	ug/kg	2000	U	2000	U	2000	U	1900	U	2000	U
4-BROMOPHENYL PHENYL ETHER	ug/kg	410	U	410	U	410	U	400	U	410	U
4-CHLORO-3-METHYLPHENOL	ug/kg	410	U	410	U	410	U	400	U	410	U
4-CHLOROANILINE	ug/kg	410	U	410	U	410	U	400	U	410	U
4-CHLOROPHENYL PHENYL ETHER	ug/kg	410	U	410	U	410	U	400	U	410	U
4-METHYLPHENOL	ug/kg	410	U	410	U	410	U	400	U	410	U
4-NITROANILINE	ug/kg	2000	U	2000	U	2000	U	1900	U	2000	U
4-NITROPHENOL	ug/kg	2000	U	2000	U	2000	U	1900	U	2000	U
ACENAPHTHENE	ug/kg	410	U	410	U	410	U	400	U	410	U
ACENAPHTHYLENE	ug/kg	410	U	410	U	410	U	400	U	410	U
ANTHRACENE	ug/kg	410	U	26	J	410	U	400	U	[illegible]0	U

Sample Location:		AA1-SB01		AA1-SB01		AA1-SB02		AA1-SB02		AA1-SB03	
Associated Site:		AA1		AA1		AA1		AA1		AA1	
Sample No:		6010		6020		6030		6040		6050	
Sample Date:		30-APR-98		30-APR-98		30-APR-98		30-APR-98		29-APR-98	
Depth:		0-1		8-10		0-1		6-8		0-1	
SEMIVOLATILES	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
BENZO(a)ANTHRACENE	ug/kg	410	U	420	U	380	U	420	U	400	U
BENZO(a)PYRENE	ug/kg	29	J	420	U	21	J	420	U	400	U
BENZO(b)FLUORANTHENE	ug/kg	410	U	420	U	380	U	420	U	400	U
BENZO(ghi)PERYLENE	ug/kg	410	U	420	U	380	U	420	U	400	U
BENZO(k)FLUORANTHENE	ug/kg	410	U	420	U	380	U	420	U	400	U
BIS(2-CHLOROETHOXY)METHANE	ug/kg	410	U	420	U	380	U	420	U	400	U
BIS(2-CHLOROETHYL)ETHER	ug/kg	410	U	420	U	380	U	420	U	400	U
BIS(2-CHLOROISOPROPYL)ETHER	ug/kg	410	U	420	U	380	U	420	U	400	U
BIS(2-ETHYLHEXYL)PHTHALATE	ug/kg	410	U	420	U	39	J	420	U	400	U
BUTYL BENZYL PHTHALATE	ug/kg	410	U	420	U	380	U	420	U	400	U
CARBAZOLE	ug/kg	410	U	420	U	380	U	420	U	400	U
CHRYSENE	ug/kg	410	U	420	U	380	U	420	U	400	U
DI-n-BUTYL PHTHALATE	ug/kg	410	U	420	U	380	U	420	U	400	U
DI-n-OCTYL PHTHALATE	ug/kg	410	U	420	U	380	U	420	U	400	U
DIBENZ(a,h)ANTHRACENE	ug/kg	410	U	420	U	380	U	420	U	400	U
DIBENZOFURAN	ug/kg	410	U	420	U	380	U	420	U	400	U
DIETHYL PHTHALATE	ug/kg	410	U	420	U	380	U	420	U	400	U
DIMETHYL PHTHALATE	ug/kg	410	U	420	U	380	U	420	U	400	U
FLUORANTHENE	ug/kg	58	J	420	U	380	U	420	U	400	U
FLUORENE	ug/kg	410	U	420	U	380	U	420	U	400	U
HEXACHLOROBENZENE	ug/kg	410	U	420	U	380	U	420	U	400	U
HEXACHLOROBUTADIENE	ug/kg	410	U	420	U	380	U	420	U	400	U
HEXACHLOROCYCLOPENTADIENE	ug/kg	2000	U	2000	U	1800	U	2000	U	1900	U
HEXACHLOROETHANE	ug/kg	410	U	420	U	380	U	420	U	400	U
INDENO(1,2,3-cd)PYRENE	ug/kg	410	U	420	U	380	U	420	U	400	U
ISOPHORONE	ug/kg	410	U	420	U	380	U	420	U	400	U
N-NITROSO-DI-n-PROPYLAMINE	ug/kg	410	U	420	U	380	U	420	U	400	U
N-NITROSODIPHENYLAMINE	ug/kg	410	U	420	U	380	U	420	U	400	U
NAPHTHALENE	ug/kg	410	U	420	U	380	U	420	U	400	U
NITROBENZENE	ug/kg	410	U	420	U	380	U	420	U	400	U

Sample Location:		AA1-SB03		AA1-SB04		AA1-SB04		AA1-SB05		AA1-SB05	
Associated Site:		AA1		AA1		AA1		AA1		AA1	
Sample No:		6060		6070		6080		6090		6100	
Sample Date:		29-APR-98		29-APR-98		29-APR-98		30-APR-98		30-APR-98	
Depth:		6-8		0-1		8-10		0-1		6-8	
SEMIVOLATILES	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
BENZO(a)ANTHRACENE	ug/kg	420	U	400	U	420	U	410	U	400	U
BENZO(a)PYRENE	ug/kg	420	U	400	U	420	U	410	U	400	U
BENZO(b)FLUORANTHENE	ug/kg	420	U	400	U	420	U	410	U	400	U
BENZO(ghi)PERYLENE	ug/kg	420	U	400	U	420	U	410	U	400	U
BENZO(k)FLUORANTHENE	ug/kg	420	U	400	U	420	U	410	U	400	U
BIS(2-CHLOROETHOXY)METHANE	ug/kg	420	U	400	U	420	U	410	U	400	U
BIS(2-CHLOROETHYL)ETHER	ug/kg	420	U	400	U	420	U	410	U	400	U
BIS(2-CHLOROISOPROPYL)ETHER	ug/kg	420	U	400	U	420	U	410	U	400	U
BIS(2-ETHYLHEXYL)PHTHALATE	ug/kg	420	U	400	U	420	U	210	J	400	U
BUTYL BENZYL PHTHALATE	ug/kg	420	U	400	U	420	U	410	U	400	U
CARBAZOLE	ug/kg	420	U	400	U	420	U	410	U	400	U
CHRYSENE	ug/kg	420	U	400	U	420	U	410	U	400	U
DI-n-BUTYL PHTHALATE	ug/kg	420	U	400	U	420	U	410	U	400	U
DI-n-OCTYL PHTHALATE	ug/kg	420	U	400	U	420	U	410	U	400	U
DIBENZ(a,h)ANTHRACENE	ug/kg	420	U	400	U	420	U	410	U	400	U
DIBENZOFURAN	ug/kg	420	U	400	U	420	U	410	U	400	U
DIETHYL PHTHALATE	ug/kg	420	U	400	U	420	U	410	U	400	U
DIMETHYL PHTHALATE	ug/kg	420	U	400	U	420	U	410	U	400	U
FLUORANTHENE	ug/kg	420	U	400	U	420	U	410	U	400	U
FLUORENE	ug/kg	420	U	400	U	420	U	410	U	400	U
HEXACHLOROBENZENE	ug/kg	420	U	400	U	420	U	410	U	400	U
HEXACHLOROBUTADIENE	ug/kg	420	U	400	U	420	U	410	U	400	U
HEXACHLOROCYCLOPENTADIENE	ug/kg	2000	U	1900	U	2000	U	2000	U	1900	U
HEXACHLOROETHANE	ug/kg	420	U	400	U	420	U	410	U	400	U
INDENO(1,2,3-cd)PYRENE	ug/kg	420	U	400	U	420	U	410	U	400	U
ISOPHORONE	ug/kg	420	U	400	U	420	U	410	U	400	U
N-NITROSO-DI-n-PROPYLAMINE	ug/kg	420	U	400	U	420	U	410	U	400	U
N-NITROSODIPHENYLAMINE	ug/kg	420	U	400	U	420	U	410	U	400	U
NAPHTHALENE	ug/kg	420	U	400	U	420	U	410	U	400	U
NITROBENZENE	ug/kg	420	U	400	U	420	U	410	U	400	U

Sample Location:		AA1-SB06		AA1-SB06		AA1-SB07		AA1-SB07		AA1-SB08	
Associated Site:		AA1		AA1		AA1		AA1		AA1	
Sample No:		6110		6120		6130		6140		6150	
Sample Date:		29-APR-98		29-APR-98		29-APR-98		29-APR-98		29-APR-98	
Depth:		0-1		6-8		0-1		2-4		0-1	
SEMIVOLATILES	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
BENZO(a)ANTHRACENE	ug/kg	420	U	410	U	390	U	410	U	400	U
BENZO(a)PYRENE	ug/kg	420	U	410	U	390	U	410	U	400	U
BENZO(b)FLUORANTHENE	ug/kg	420	U	410	U	390	U	410	U	400	U
BENZO(ghi)PERYLENE	ug/kg	420	U	410	U	390	U	410	U	400	U
BENZO(k)FLUORANTHENE	ug/kg	420	U	410	U	390	U	410	U	400	U
BIS(2-CHLOROETHOXY)METHANE	ug/kg	420	U	410	U	390	U	410	U	400	U
BIS(2-CHLOROETHYL)ETHER	ug/kg	420	U	410	U	390	U	410	U	400	U
BIS(2-CHLOROISOPROPYL)ETHER	ug/kg	420	U	410	U	390	U	410	U	400	U
BIS(2-ETHYLHEXYL)PHTHALATE	ug/kg	49	J	48	J	95	J	410	U	400	U
BUTYL BENZYL PHTHALATE	ug/kg	420	U	410	U	390	U	410	U	400	U
CARBAZOLE	ug/kg	420	U	410	U	390	U	410	U	400	U
CHRYSENE	ug/kg	420	U	410	U	390	U	410	U	400	U
DI-n-BUTYL PHTHALATE	ug/kg	420	U	410	U	390	U	410	U	400	U
DI-n-OCTYL PHTHALATE	ug/kg	420	U	410	U	390	U	410	U	400	U
DIBENZ(a,h)ANTHRACENE	ug/kg	420	U	410	U	390	U	410	U	400	U
DIBENZOFURAN	ug/kg	420	U	410	U	390	U	410	U	400	U
DIETHYL PHTHALATE	ug/kg	420	U	410	U	390	U	410	U	400	U
DIMETHYL PHTHALATE	ug/kg	420	U	410	U	390	U	410	U	400	U
FLUORANTHENE	ug/kg	420	U	410	U	390	U	410	U	400	U
FLUORENE	ug/kg	420	U	410	U	390	U	410	U	400	U
HEXACHLOROBENZENE	ug/kg	420	U	410	U	390	U	410	U	400	U
HEXACHLOROBUTADIENE	ug/kg	420	U	410	U	390	U	410	U	400	U
HEXACHLOROCYCLOPENTADIENE	ug/kg	2000	U	2000	U	1900	U	2000	U	1900	U
HEXACHLOROETHANE	ug/kg	420	U	410	U	390	U	410	U	400	U
INDENO(1,2,3-cd)PYRENE	ug/kg	420	U	410	U	390	U	410	U	400	U
ISOPHORONE	ug/kg	420	U	410	U	390	U	410	U	400	U
N-NITROSO-DI-n-PROPYLAMINE	ug/kg	420	U	410	U	390	U	410	U	400	U
N-NITROSODIPHENYLAMINE	ug/kg	420	U	410	U	390	U	410	U	400	U
NAPHTHALENE	ug/kg	420	U	410	U	390	U	410	U	400	U
NITROBENZENE	ug/kg	420	U	410	U	390	U	410	U	400	U

Sample Location:		AA1-SB08		AA1-SB09		AA1-SB09		AA1-SB10		AA1-SB10	
Associated Site:		AA1		AA1		AA1		AA1		AA1	
Sample No:		6160		6170		6180		6190		6200	
Sample Date:		29-APR-98		30-APR-98		30-APR-98		30-APR-98		30-APR-98	
Depth:		2-4		0-1		2-4		0-1		4-6	
SEMIVOLATILES	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
BENZO(a)ANTHRACENE	ug/kg	390	U	400	U	390	U	410	U	400	U
BENZO(a)PYRENE	ug/kg	390	U	400	U	390	U	42	J	400	U
BENZO(b)FLUORANTHENE	ug/kg	390	U	400	U	390	U	410	U	400	U
BENZO(ghi)PERYLENE	ug/kg	390	U	400	U	390	U	410	U	400	U
BENZO(k)FLUORANTHENE	ug/kg	390	U	400	U	390	U	410	U	400	U
BIS(2-CHLOROETHOXY)METHANE	ug/kg	390	U	400	U	390	U	410	U	400	U
BIS(2-CHLOROETHYL)ETHER	ug/kg	390	U	400	U	390	U	410	U	400	U
BIS(2-CHLOROISOPROPYL)ETHER	ug/kg	390	U	400	U	390	U	410	U	400	U
BIS(2-ETHYLHEXYL)PHTHALATE	ug/kg	49	J	58	J	390	U	410	U	400	U
BUTYL BENZYL PHTHALATE	ug/kg	390	U	400	U	390	U	410	U	400	U
CARBAZOLE	ug/kg	390	U	400	U	390	U	410	U	400	U
CHRYSENE	ug/kg	390	U	400	U	390	U	410	U	400	U
DI-n-BUTYL PHTHALATE	ug/kg	390	U	400	U	390	U	410	U	400	U
DI-n-OCTYL PHTHALATE	ug/kg	390	U	400	U	390	U	410	U	400	U
DIBENZ(a,h)ANTHRACENE	ug/kg	390	U	400	U	390	U	410	U	400	U
DIBENZOFURAN	ug/kg	390	U	400	U	390	U	410	U	400	U
DIETHYL PHTHALATE	ug/kg	390	U	400	U	390	U	410	U	400	U
DIMETHYL PHTHALATE	ug/kg	390	U	400	U	390	U	410	U	400	U
FLUORANTHENE	ug/kg	390	U	400	U	390	U	44	J	400	U
FLUORENE	ug/kg	390	U	400	U	390	U	410	U	400	U
HEXACHLOROBENZENE	ug/kg	390	U	400	U	390	U	410	U	400	U
HEXACHLOROBUTADIENE	ug/kg	390	U	400	U	390	U	410	U	400	U
HEXACHLOROCYCLOPENTADIENE	ug/kg	1900	U	1900	U	1900	U	2000	U	1900	U
HEXACHLOROETHANE	ug/kg	390	U	400	U	390	U	410	U	400	U
INDENO(1,2,3-cd)PYRENE	ug/kg	390	U	400	U	390	U	410	U	400	U
ISOPHORONE	ug/kg	390	U	400	U	390	U	410	U	400	U
N-NITROSO-DI-n-PROPYLAMINE	ug/kg	390	U	400	U	390	U	410	U	400	U
N-NITROSODIPHENYLAMINE	ug/kg	390	U	400	U	390	U	410	U	400	U
NAPHTHALENE	ug/kg	390	U	400	U	390	U	410	U	400	U
NITROBENZENE	ug/kg	390	U	400	U	390	U	410	U	400	U

Sample Location:		AA1-SB11		AA1-SB11		AA1-SB12		AA1-SB12		AA1-SB13	
Associated Site:		AA1		AA1		AA1		AA1		AA1	
Sample No:		6210		6220		6230		6240		6250	
Sample Date:		30-APR-98		30-APR-98		30-APR-98		30-APR-98		29-APR-98	
Depth:		0-1		4-6		0-1		2-4		0-1	
SEMIVOLATILES	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
BENZO(a)ANTHRACENE	ug/kg	36	J	410	U	400	U	400	U	390	U
BENZO(a)PYRENE	ug/kg	37	J	410	U	400	U	400	U	390	U
BENZO(b)FLUORANTHENE	ug/kg	390	U	410	U	400	U	400	U	390	U
BENZO(ghi)PERYLENE	ug/kg	390	U	410	U	400	U	400	U	390	U
BENZO(k)FLUORANTHENE	ug/kg	390	U	410	U	400	U	400	U	390	U
BIS(2-CHLOROETHOXY)METHANE	ug/kg	390	U	410	U	400	U	400	U	390	U
BIS(2-CHLOROETHYL)ETHER	ug/kg	390	U	410	U	400	U	400	U	390	U
BIS(2-CHLOROISOPROPYL)ETHER	ug/kg	390	U	410	U	400	U	400	U	390	U
BIS(2-ETHYLHEXYL)PHTHALATE	ug/kg	390	U	410	U	400	U	400	U	390	U
BUTYL BENZYL PHTHALATE	ug/kg	390	U	410	U	400	U	400	U	390	U
CARBAZOLE	ug/kg	390	U	410	U	400	U	400	U	390	U
CHRYSENE	ug/kg	45	J	410	U	400	U	400	U	390	U
DI-n-BUTYL PHTHALATE	ug/kg	390	U	410	U	400	U	400	U	390	U
DI-n-OCTYL PHTHALATE	ug/kg	390	U	410	U	400	U	400	U	390	U
DIBENZ(a,h)ANTHRACENE	ug/kg	390	U	410	U	400	U	400	U	390	U
DIBENZOFURAN	ug/kg	390	U	410	U	400	U	400	U	390	U
DIETHYL PHTHALATE	ug/kg	390	U	410	U	400	U	400	U	390	U
DIMETHYL PHTHALATE	ug/kg	390	U	410	U	400	U	400	U	390	U
FLUORANTHENE	ug/kg	82	J	410	U	400	U	400	U	390	U
FLUORENE	ug/kg	390	U	410	U	400	U	400	U	390	U
HEXACHLOROBENZENE	ug/kg	390	U	410	U	400	U	400	U	390	U
HEXACHLOROBUTADIENE	ug/kg	390	U	410	U	400	U	400	U	390	U
HEXACHLOROCYCLOPENTADIENE	ug/kg	1900	U	2000	U	1900	U	1900	U	1900	U
HEXACHLOROETHANE	ug/kg	390	U	410	U	400	U	400	U	390	U
INDENO(1,2,3-cd)PYRENE	ug/kg	390	U	410	U	400	U	400	U	390	U
ISOPHORONE	ug/kg	390	U	410	U	400	U	400	U	390	U
N-NITROSO-DI-n-PROPYLAMINE	ug/kg	390	U	410	U	400	U	400	U	390	U
N-NITROSODIPHENYLAMINE	ug/kg	390	U	410	U	400	U	400	U	390	U
NAPHTHALENE	ug/kg	390	U	410	U	400	U	400	U	390	U
NITROBENZENE	ug/kg	390	U	410	U	400	U	400	U	390	U

Sample Location:		AA1-SB13		AA1-SB14		AA1-SB14		AA1-SB15		AA1-SB15	
Associated Site:		AA1		AA1		AA1		AA1		AA1	
Sample No:		6260		6270		6280		6290		6300	
Sample Date:		29-APR-98		29-APR-98		29-APR-98		30-APR-98		30-APR-98	
Depth:		2-4		0-1		8-10		0-1		8-10	
SEMIVOLATILES	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
BENZO(a)ANTHRACENE	ug/kg	410	U	79	J	410	U	400	U	410	U
BENZO(a)PYRENE	ug/kg	410	U	78	J	410	U	400	U	410	U
BENZO(b)FLUORANTHENE	ug/kg	410	U	94	J	410	U	400	U	410	U
BENZO(ghi)PERYLENE	ug/kg	410	U	410	U	410	U	400	U	410	U
BENZO(k)FLUORANTHENE	ug/kg	410	U	75	J	410	U	400	U	410	U
BIS(2-CHLOROETHOXY)METHANE	ug/kg	410	U	410	U	410	U	400	U	410	U
BIS(2-CHLOROETHYL)ETHER	ug/kg	410	U	410	U	410	U	400	U	410	U
BIS(2-CHLOROISOPROPYL)ETHER	ug/kg	410	U	410	U	410	U	400	U	410	U
BIS(2-ETHYLHEXYL)PHTHALATE	ug/kg	410	U	410	U	410	U	400	U	410	U
BUTYL BENZYL PHTHALATE	ug/kg	410	U	410	U	410	U	400	U	410	U
CARBAZOLE	ug/kg	410	U	410	U	410	U	400	U	410	U
CHRYSENE	ug/kg	410	U	100	J	410	U	400	U	410	U
DI-n-BUTYL PHTHALATE	ug/kg	410	U	410	U	410	U	400	U	410	U
DI-n-OCTYL PHTHALATE	ug/kg	410	U	410	U	410	U	400	U	410	U
DIBENZ(a,h)ANTHRACENE	ug/kg	410	U	410	U	410	U	400	U	410	U
DIBENZOFURAN	ug/kg	410	U	410	U	410	U	400	U	410	U
DIETHYL PHTHALATE	ug/kg	410	U	410	U	410	U	400	U	410	U
DIMETHYL PHTHALATE	ug/kg	410	U	410	U	410	U	400	U	410	U
FLUORANTHENE	ug/kg	410	U	160	J	410	U	400	U	410	U
FLUORENE	ug/kg	410	U	410	U	410	U	400	U	410	U
HEXACHLOROBENZENE	ug/kg	410	U	410	U	410	U	400	U	410	U
HEXACHLOROBUTADIENE	ug/kg	410	U	410	U	410	U	400	U	410	U
HEXACHLOROCYCLOPENTADIENE	ug/kg	2000	U	2000	U	2000	U	1900	U	2000	U
HEXACHLOROETHANE	ug/kg	410	U	410	U	410	U	400	U	410	U
INDENO(1,2,3-cd)PYRENE	ug/kg	410	U	43	J	410	U	400	U	410	U
ISOPHORONE	ug/kg	410	U	410	U	410	U	400	U	410	U
N-NITROSO-DI-n-PROPYLAMINE	ug/kg	410	U	410	U	410	U	400	U	410	U
N-NITROSODIPHENYLAMINE	ug/kg	410	U	410	U	410	U	400	U	410	U
NAPHTHALENE	ug/kg	410	U	410	U	410	U	400	U	410	U
NITROBENZENE	ug/kg	410	U	410	U	410	U	400	U	410	U

Sample Location:		AA1-SB01		AA1-SB01		AA1-SB02		AA1-SB02		AA1-SB03	
Associated Site:		AA1		AA1		AA1		AA1		AA1	
Sample No:		6010		6020		6030		6040		6050	
Sample Date:		30-APR-98		30-APR-98		30-APR-98		30-APR-98		29-APR-98	
Depth:		0-1		8-10		0-1		6-8		0-1	
SEMIVOLATILES	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
PENTACHLOROPHENOL	ug/kg	2000	U	2000	U	1800	U	2000	U	1900	U
PHENANTHRENE	ug/kg	410	U	420	U	380	U	420	U	400	U
PHENOL	ug/kg	410	U	420	U	380	U	420	U	400	U
PYRENE	ug/kg	51	J	420	U	380	U	420	U	400	U

Sample Location:		AA1-SB03		AA1-SB04		AA1-SB04		AA1-SB05		AA1-SB05	
Associated Site:		AA1		AA1		AA1		AA1		AA1	
Sample No:		6060		6070		6080		6090		6100	
Sample Date:		29-APR-98		29-APR-98		29-APR-98		30-APR-98		30-APR-98	
Depth:		6-8		0-1		8-10		0-1		6-8	
SEMIVOLATILES	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
PENTACHLOROPHENOL	ug/kg	2000	U	1900	U	2000	U	2000	U	1900	U
PHENANTHRENE	ug/kg	420	U	400	U	420	U	410	U	400	U
PHENOL	ug/kg	420	U	400	U	420	U	410	U	400	U
PYRENE	ug/kg	420	U	400	U	420	U	410	U	400	U

Sample Location:		AA1-SB06		AA1-SB06		AA1-SB07		AA1-SB07		AA1-SB08	
Associated Site:		AA1		AA1		AA1		AA1		AA1	
Sample No:		6110		6120		6130		6140		6150	
Sample Date:		29-APR-98		29-APR-98		29-APR-98		29-APR-98		29-APR-98	
Depth:		0-1		6-8		0-1		2-4		0-1	
SEMIVOLATILES	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
PENTACHLOROPHENOL	ug/kg	2000	U	2000	U	1900	U	2000	U	1900	U
PHENANTHRENE	ug/kg	420	U	410	U	390	U	410	U	400	U
PHENOL	ug/kg	420	U	410	U	390	U	410	U	400	U
PYRENE	ug/kg	420	U	410	U	390	U	410	U	400	U

Sample Location:		AA1-SB08		AA1-SB09		AA1-SB09		AA1-SB10		AA1-SB10	
Associated Site:		AA1		AA1		AA1		AA1		AA1	
Sample No:		6160		6170		6180		6190		6200	
Sample Date:		29-APR-98		30-APR-98		30-APR-98		30-APR-98		30-APR-98	
Depth:		2-4		0-1		2-4		0-1		4-6	
SEMIVOLATILES	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
PENTACHLOROPHENOL	ug/kg	1900	U	1900	U	1900	U	2000	U	1900	U
PHENANTHRENE	ug/kg	390	U	400	U	390	U	410	U	400	U
PHENOL	ug/kg	390	U	400	U	390	U	410	U	400	U
PYRENE	ug/kg	390	U	400	U	390	U	410	U	400	U

Sample Location:		AA1-SB11		AA1-SB11		AA1-SB12		AA1-SB12		AA1-SB13	
Associated Site:		AA1		AA1		AA1		AA1		AA1	
Sample No:		6210		6220		6230		6240		6250	
Sample Date:		30-APR-98		30-APR-98		30-APR-98		30-APR-98		29-APR-98	
Depth:		0-1		4-6		0-1		2-4		0-1	
SEMIVOLATILES	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
PENTACHLOROPHENOL	ug/kg	1900	U	2000	U	1900	U	1900	U	1900	U
PHENANTHRENE	ug/kg	390	U	410	U	400	U	400	U	390	U
PHENOL	ug/kg	390	U	410	U	400	U	400	U	390	U
PYRENE	ug/kg	52	J	410	U	400	U	400	U	390	U

Sample Location:		AA1-SB13		AA1-SB14		AA1-SB14		AA1-SB15		AA1-SB15	
Associated Site:		AA1		AA1		AA1		AA1		AA1	
Sample No:		6260		6270		6280		6290		6300	
Sample Date:		29-APR-98		29-APR-98		29-APR-98		30-APR-98		30-APR-98	
Depth:		2-4		0-1		8-10		0-1		8-10	
SEMIVOLATILES	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
PENTACHLOROPHENOL	ug/kg	2000	U	2000	U	2000	U	1900	U	2000	U
PHENANTHRENE	ug/kg	410	U	57	J	410	U	400	U	410	U
PHENOL	ug/kg	410	U	410	U	410	U	400	U	410	U
PYRENE	ug/kg	410	U	110	J	410	U	400	U	410	U

Report Date: 07/24/98

Sample Location:		AA1-SB01		AA1-SB02		AA1-SB03		AA1-SB04		AA1-SB05	
Associated Site:		AA1		AA1		AA1		AA1		AA1	
Sample No:		6010		6030		6050		6070		6090	
Sample Date:		30-APR-98		30-APR-98		29-APR-98		29-APR-98		30-APR-98	
Depth:		0-1		0-1		0-1		0-1		0-1	
PCBS	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
AROCLOR 1016	ug/kg	41	U	38	U	40	U	40	U	41	U
AROCLOR 1221	ug/kg	41	U	38	U	40	U	40	U	41	U
AROCLOR 1232	ug/kg	41	U	38	U	40	U	40	U	41	U
AROCLOR 1242	ug/kg	41	U	38	U	40	U	40	U	41	U
AROCLOR 1248	ug/kg	41	U	38	U	40	U	40	U	41	U
AROCLOR 1254	ug/kg	41	U	38	U	40	U	40	U	41	U
AROCLOR 1260	ug/kg	140		38	U	40	U	40	U	45	

PLUMBROOK

Acid Area 1

Data Summary - Soils

Report Date: 07/24/98

Sample Location:		AA1-SB06		AA1-SB07		AA1-SB08		AA1-SB09		AA1-SB10	
Associated Site:		AA1		AA1		AA1		AA1		AA1	
Sample No:		6110		6130		6150		6170		6190	
Sample Date:		29-APR-98		29-APR-98		29-APR-98		30-APR-98		30-APR-98	
Depth:		0-1		0-1		0-1		0-1		0-1	
PCBS	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
AROCLOR 1016	ug/kg	42	U	39	U	800	U	40	U	41	U
AROCLOR 1221	ug/kg	42	U	39	U	800	U	40	U	41	U
AROCLOR 1232	ug/kg	42	U	39	U	800	U	40	U	41	U
AROCLOR 1242	ug/kg	42	U	39	U	800	U	40	U	41	U
AROCLOR 1248	ug/kg	42	U	39	U	800	U	40	U	41	U
AROCLOR 1254	ug/kg	170	U	39	U	2900	U	40	U	41	U
AROCLOR 1260	ug/kg	160		73		9000		40	U	41	U

Report Date: 07/24/98

Sample Location:		AA1-SB11		AA1-SB12		AA1-SB13		AA1-SB14		AA1-SB15	
Associated Site:		AA1		AA1		AA1		AA1		AA1	
Sample No:		6210		6230		6250		6270		6290	
Sample Date:		30-APR-98		30-APR-98		29-APR-98		29-APR-98		30-APR-98	
Depth:		0-1		0-1		0-1		0-1		0-1	
PCBS	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
AROCLOR 1016	ug/kg	39	U	40	U	39	U	41	U	800	U
AROCLOR 1221	ug/kg	39	U	40	U	39	U	41	U	800	U
AROCLOR 1232	ug/kg	39	U	40	U	39	U	41	U	800	U
AROCLOR 1242	ug/kg	39	U	40	U	39	U	41	U	800	U
AROCLOR 1248	ug/kg	39	U	40	U	39	U	41	U	800	U
AROCLOR 1254	ug/kg	160	U	300	U	39	U	78	U	2600	U
AROCLOR 1260	ug/kg	150		250	J	39	U	220		6200	

PLUMBROOK

Acid Area 1

Data Summary - Soils

Report Date: 07/24/98

Sample Location:		AA1-SB01		AA1-SB01		AA1-SB02		AA1-SB02		AA1-SB03	
Associated Site:		AA1		AA1		AA1		AA1		AA1	
Sample No:		6010		6020		6030		6040		6050	
Sample Date:		30-APR-98		30-APR-98		30-APR-98		30-APR-98		29-APR-98	
Depth:		0-1		8-10		0-1		6-8		0-1	
NITRATE	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
NITRATE	mg/kg	6.2	U	6.3	U	5.7	U	6.3	U	6.0	UJ

Sample Location:		AA1-SB03		AA1-SB04		AA1-SB04		AA1-SB05		AA1-SB05	
Associated Site:		AA1		AA1		AA1		AA1		AA1	
Sample No:		6060		6070		6080		6090		6100	
Sample Date:		29-APR-98		29-APR-98		29-APR-98		30-APR-98		30-APR-98	
Depth:		6-8		0-1		8-10		0-1		6-8	
NITRATE	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
NITRATE	mg/kg	6.3	UJ	6.0	UJ	6.3	UJ	6.3	U	6.0	U

PLUMBROOK

Acid Area I

Data Summary - Soils

Report Date: 07/24/98

Sample Location:		AA1-SB06		AA1-SB06		AA1-SB07		AA1-SB07		AA1-SB08	
Associated Site:		AA1		AA1		AA1		AA1		AA1	
Sample No:		6110		6120		6130		6140		6150	
Sample Date:		29-APR-98		29-APR-98		29-APR-98		29-APR-98		29-APR-98	
Depth:		0-1		6-8		0-1		2-4		0-1	
NITRATE	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
NITRATE	mg/kg	6.4	UJ	58.6	J	5.9	UJ	6.2	UJ	6.1	UJ

Sample Location:		AA1-SB08		AA1-SB09		AA1-SB09		AA1-SB10		AA1-SB10	
Associated Site:		AA1		AA1		AA1		AA1		AA1	
Sample No:		6160		6170		6180		6190		6200	
Sample Date:		29-APR-98		30-APR-98		30-APR-98		30-APR-98		30-APR-98	
Depth:		2-4		0-1		2-4		0-1		4-6	
NITRATE	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
NITRATE	mg/kg	6.0	UJ	6.0	U	5.9	U	6.2	U	6.0	U

PLUMBROOK

Acid Area 1

Data Summary - Soils

Report Date: 07/24/98

Sample Location:		AA1-SB11		AA1-SB11		AA1-SB12		AA1-SB12		AA1-SB13	
Associated Site:		AA1		AA1		AA1		AA1		AA1	
Sample No:		6210		6220		6230		6240		6250	
Sample Date:		30-APR-98		30-APR-98		30-APR-98		30-APR-98		29-APR-98	
Depth:		0-1		4-6		0-1		2-4		0-1	
NITRATE	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
NITRATE	mg/kg	6.0	U	6.2	U	6.1	UJ	6.0	UJ	5.9	UJ

Sample Location:		AA1-SB13		AA1-SB14		AA1-SB14		AA1-SB15		AA1-SB15	
Associated Site:		AA1		AA1		AA1		AA1		AA1	
Sample No:		6260		6270		6280		6290		6300	
Sample Date:		29-APR-98		29-APR-98		29-APR-98		30-APR-98		30-APR-98	
Depth:		2-4		0-1		8-10		0-1		8-10	
NITRATE	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
NITRATE	mg/kg	6.2	UJ	6.2	UJ	6.2	UJ	6.0	U	6.2	U

PLUMBROOK

Acid Area 1

Data Summary - Soils

Report Date: 07/24/98

Sample Location:		AA1-SB01		AA1-SB01		AA1-SB02		AA1-SB02		AA1-SB03	
Associated Site:		AA1		AA1		AA1		AA1		AA1	
Sample No:		6010		6020		6030		6040		6050	
Sample Date:		30-APR-98		30-APR-98		30-APR-98		30-APR-98		29-APR-98	
Depth:		0-1		8-10		0-1		6-8		0-1	
METALS	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
ALUMINUM	mg/kg	7730		13300		1920		12500		7520	
ANTIMONY	mg/kg	7.4	UJ	7.6	UJ	6.8	UJ	7.6	UJ	7.2	UJ
ARSENIC	mg/kg	2.8		6.1		1.4		6.1		5.5	
BARIUM	mg/kg	24.7	U	72.0		43.8		56.4		29.7	
BERYLLIUM	mg/kg	0.62	U	0.65		0.57	U	0.63		0.60	U
CADMIUM	mg/kg	0.62	U	0.63	U	0.57	U	0.63	U	0.60	U
CALCIUM	mg/kg	2400		50500		3350		53700		2060	
CHROMIUM	mg/kg	11.0		19.2		2.3		18.5		11.2	
COBALT	mg/kg	6.2	U	16.8		5.7	U	10.4		7.4	
COPPER	mg/kg	6.0		23.7		2.8	U	24.0		9.6	
IRON	mg/kg	11300		23000		1050		23100		15200	
LEAD	mg/kg	44.3		10.6		9.3		9.8		5.6	
MAGNESIUM	mg/kg	769		14800		569	U	17200		1460	
MANGANESE	mg/kg	89.2		665		14.8		375		258	
MERCURY	mg/kg	0.041	U	0.042	U	0.038	U	0.042	U	0.040	U
NICKEL	mg/kg	6.3		34.9		4.6	U	26.9		13.4	
POTASSIUM	mg/kg	617	U	2650		569	U	2920		647	
SELENIUM	mg/kg	0.62	U	0.63	U	0.57	U	0.63	U	0.60	U
SILVER	mg/kg	1.2	U	1.3	U	1.1	U	1.3	U	1.2	U
SODIUM	mg/kg	617	U	631	U	569	U	630	U	601	U
THALLIUM	mg/kg	1.2	U	1.3	U	1.1	U	1.3	U	1.2	U
VANADIUM	mg/kg	20.2		28.7		5.7	U	28.7		21.1	
ZINC	mg/kg	33.6		69.8		6.2		68.3		34.2	

Sample Location:		AA1-SB03		AA1-SB04		AA1-SB04		AA1-SB05		AA1-SB05	
Associated Site:		AA1		AA1		AA1		AA1		AA1	
Sample No:		6060		6070		6080		6090		6100	
Sample Date:		29-APR-98		29-APR-98		29-APR-98		30-APR-98		30-APR-98	
Depth:		6-8		0-1		8-10		0-1		6-8	
METALS	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
ALUMINUM	mg/kg	9590		8190		10500		6260		11100	
ANTIMONY	mg/kg	7.6	UJ	7.3	UJ	7.6	UJ	7.5	UJ	7.2	UJ
ARSENIC	mg/kg	7.3		5.2		5.5		3.0		6.6	
BARIUM	mg/kg	65.2		50.4		91.3		36.3		61.5	
BERYLLIUM	mg/kg	0.63	U	0.60	U	0.63	U	0.63	U	0.60	U
CADMIUM	mg/kg	0.63	U	0.60	U	0.63	U	0.63	U	0.60	U
CALCIUM	mg/kg	58300		2620		53600	J	1890	J	66300	J
CHROMIUM	mg/kg	15.0		10.7		17.3	J	8.6	J	18.3	J
COBALT	mg/kg	10.8		13.8		13.1		6.3	U	12.6	
COPPER	mg/kg	23.6		13.4		24.0		5.0		23.5	
IRON	mg/kg	21600		14900		21500	J	9850	J	20000	J
LEAD	mg/kg	9.8		6.3		10.7		31.4		10.2	
MAGNESIUM	mg/kg	18300		1650		15200		884		18100	
MANGANESE	mg/kg	539		418		658	J	195	J	407	J
MERCURY	mg/kg	0.042	U	0.040	U	0.042	U	0.041	U	0.040	U
NICKEL	mg/kg	27.5		31.4		31.3		6.8		29.2	
POTASSIUM	mg/kg	1900		638		2510	J	627	UJ	2860	J
SELENIUM	mg/kg	1.2		0.65		0.63	U	0.63	U	0.60	U
SILVER	mg/kg	1.3	U	1.2	U	1.3	U	1.3	U	1.2	U
SODIUM	mg/kg	631	U	605	U	635	U	627	U	600	U
THALLIUM	mg/kg	1.3	U	1.2	U	1.3	U	1.3	U	1.2	U
VANADIUM	mg/kg	25.3		18.0		24.0		15.5		28.5	
ZINC	mg/kg	64.0		41.4		61.8	J	22.9	J	58.9	J

PLUMBROOK

Acid Area 1

Data Summary - Soils

Report Date: 07/24/98

Sample Location:		AA1-SB06		AA1-SB06		AA1-SB07		AA1-SB07		AA1-SB08	
Associated Site:		AA1		AA1		AA1		AA1		AA1	
Sample No:		6110		6120		6130		6140		6150	
Sample Date:		29-APR-98		29-APR-98		29-APR-98		29-APR-98		29-APR-98	
Depth:		0-1		6-8		0-1		2-4		0-1	
METALS	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
ALUMINUM	mg/kg	155		11000		9060		7890		5800	
ANTIMONY	mg/kg	7.7	UJ	7.5	UJ	7.1	UJ	7.4	UJ	7.3	UJ
ARSENIC	mg/kg	1.3	U	6.5		8.5		3.9		3.5	
BARIUM	mg/kg	25.6	U	58.6		41.5		39.1		43.6	
BERYLLIUM	mg/kg	0.64	U	0.62	U	0.59	U	0.62	U	0.61	U
CADMIUM	mg/kg	0.64	U	0.62	U	0.59	U	0.62	U	0.61	U
CALCIUM	mg/kg	1040	J	52100	J	3580	J	14200	J	4780	J
CHROMIUM	mg/kg	1.3	U	17.6	J	13.4	J	11.7	J	11.1	J
COBALT	mg/kg	6.4	U	10.2		12.1		6.7		6.1	U
COPPER	mg/kg	3.7		20.5		14.4		11.8		10.5	
IRON	mg/kg	218	J	22300	J	20300	J	14200	J	15300	J
LEAD	mg/kg	222		10.2		10.3		8.7		85.6	
MAGNESIUM	mg/kg	639	U	17500		1640		5390		1240	
MANGANESE	mg/kg	3.0	J	436	J	360	J	166	J	153	J
MERCURY	mg/kg	0.091		0.041	U	0.039	U	0.041	U	0.045	
NICKEL	mg/kg	5.1	U	24.2		20.1		13.1		9.9	
POTASSIUM	mg/kg	639	UJ	2250	J	674	J	1100	J	605	UJ
SELENIUM	mg/kg	0.64	U	0.62	U	0.59	U	0.62	U	0.61	U
SILVER	mg/kg	1.3	U	1.2	U	1.2	U	1.2	U	1.2	U
SODIUM	mg/kg	639	U	622	U	592	U	615	U	605	U
THALLIUM	mg/kg	1.3	U	1.2	U	1.2	U	1.2	U	1.2	U
VANADIUM	mg/kg	6.4	U	28.7		25.3		21.4		16.4	
ZINC	mg/kg	6.2	J	71.4	J	52.9	J	40.7	J	34.8	J

Report Date: 07/24/98

Sample Location:		AA1-SB08		AA1-SB09		AA1-SB09		AA1-SB10		AA1-SB10	
Associated Site:		AA1		AA1		AA1		AA1		AA1	
Sample No:		6160		6170		6180		6190		6200	
Sample Date:		29-APR-98		30-APR-98		30-APR-98		30-APR-98		30-APR-98	
Depth:		2-4		0-1		2-4		0-1		4-6	
METALS	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
ALUMINUM	mg/kg	6630		14300		8840		10300		17400	
ANTIMONY	mg/kg	7.2	UJ	7.2	UJ	7.1	UJ	7.5	UJ	7.2	UJ
ARSENIC	mg/kg	5.0		10.6		5.0		8.6		10.9	
BARIUM	mg/kg	26.1		111		56.2		69.4		118	
BERYLLIUM	mg/kg	0.60	U	0.72		0.59	U	0.62	U	0.94	
CADMIUM	mg/kg	0.60	U	0.60	U	0.59	U	0.62	U	0.60	U
CALCIUM	mg/kg	1830	J	44200	J	3580	J	4420	J	4070	J
CHROMIUM	mg/kg	13.2	J	20.1	J	13.8	J	15.8	J	23.0	J
COBALT	mg/kg	7.0		13.2		8.2		11.9		23.6	
COPPER	mg/kg	12.2		26.0		9.7		12.1		34.5	
IRON	mg/kg	17100	J	29000	J	17000	J	28300	J	35100	J
LEAD	mg/kg	6.4		19.4		6.8		8.9		15.4	
MAGNESIUM	mg/kg	1060		10000		1690		1750		6070	
MANGANESE	mg/kg	135	J	623	J	187	J	340	J	1070	J
MERCURY	mg/kg	0.039	U	0.040	U	0.039	U	0.045		0.040	U
NICKEL	mg/kg	16.1		30.9		13.9		16.3		47.2	
POTASSIUM	mg/kg	598	UJ	1550	J	661	J	715	J	2430	J
SELENIUM	mg/kg	0.60	U	0.60	U	0.59	U	0.94		0.60	U
SILVER	mg/kg	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U
SODIUM	mg/kg	598	U	601	U	595	U	624	U	603	U
THALLIUM	mg/kg	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U
VANADIUM	mg/kg	24.7		33.6		20.7		29.1		32.4	
ZINC	mg/kg	44.3	J	74.6	J	33.0	J	45.8	J	86.5	J

PLUMBROOK

Acid Area 1

Data Summary - Soils

Report Date: 07/24/98

Sample Location:		AA1-SB11		AA1-SB11		AA1-SB12		AA1-SB12		AA1-SB13	
Associated Site:		AA1		AA1		AA1		AA1		AA1	
Sample No:		6210		6220		6230		6240		6250	
Sample Date:		30-APR-98		30-APR-98		30-APR-98		30-APR-98		29-APR-98	
Depth:		0-1		4-6		0-1		2-4		0-1	
METALS	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
ALUMINUM	mg/kg	11900		7930		6170		4700		6250	
ANTIMONY	mg/kg	7.2	UJ	7.4	UJ	7.3	UJ	7.3	UJ	7.0	UJ
ARSENIC	mg/kg	9.1		6.1		3.1		3.0		3.5	
BARIUM	mg/kg	85.7		54.7		27.3		24.2	U	24.4	
BERYLLIUM	mg/kg	0.67		0.62	U	0.61	U	0.60	U	0.59	U
CADMIUM	mg/kg	0.60	U	0.62	U	0.61	U	0.60	U	0.59	U
CALCIUM	mg/kg	4660	J	7020	J	3470		11700		1440	J
CHROMIUM	mg/kg	17.0	J	14.1	J	12.4		12.0		9.2	J
COBALT	mg/kg	13.8		10.1		7.7		8.3		7.8	
COPPER	mg/kg	19.6		16.8		5.6		5.9		5.1	
IRON	mg/kg	24100	J	19000	J	13200		13600		10800	J
LEAD	mg/kg	12.8		9.4		6.6		4.2		4.7	
MAGNESIUM	mg/kg	3260		3670		1430		3500		1080	
MANGANESE	mg/kg	616	J	208	J	139		245		278	J
MERCURY	mg/kg	0.048		0.041	U	0.040	U	0.040	U	0.039	U
NICKEL	mg/kg	28.1		19.4		8.8		9.6		9.2	
POTASSIUM	mg/kg	1770	J	820	J	609	U	643		586	UJ
SELENIUM	mg/kg	0.60	U	0.62	U	0.61	U	0.60	U	0.59	U
SILVER	mg/kg	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U
SODIUM	mg/kg	596	U	617	U	609	U	605	U	586	U
THALLIUM	mg/kg	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U
VANADIUM	mg/kg	28.6		22.8		25.8		27.3		18.7	
ZINC	mg/kg	71.5	J	47.5	J	38.6		40.7		22.4	J

Sample Location:		AA1-SB13		AA1-SB14		AA1-SB14		AA1-SB15		AA1-SB15	
Associated Site:		AA1		AA1		AA1		AA1		AA1	
Sample No:		6260		6270		6280		6290		6300	
Sample Date:		29-APR-98		29-APR-98		29-APR-98		30-APR-98		30-APR-98	
Depth:		2-4		0-1		8-10		0-1		8-10	
METALS	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
ALUMINUM	mg/kg	11300		7930		11100		7480		8440	
ANTIMONY	mg/kg	7.5	UJ	7.5	UJ	7.4	UJ	7.2	UJ	7.4	U
ARSENIC	mg/kg	6.6		7.6		3.9		17.3		6.3	
BARIUM	mg/kg	81.5		71.2		60.4		72.9		63.0	
BERYLLIUM	mg/kg	0.62		0.62	U	0.62	U	0.60	U	0.62	U
CADMIUM	mg/kg	0.62	U	0.62	U	0.62	U	0.60	U	0.62	U
CALCIUM	mg/kg	4150	J	3270	J	57300	J	4840	J	55400	
CHROMIUM	mg/kg	17.8	J	10	J	19.3	J	14.7	J	14.4	
COBALT	mg/kg	13.0		15.2		9.3		8.4		13.4	
COPPER	mg/kg	17.4		9.8		23.4		16.2		22.6	
IRON	mg/kg	22200	J	18800	J	20100	J	22500	J	20300	
LEAD	mg/kg	9.1		11.2		10		23.1		10.6	
MAGNESIUM	mg/kg	3340		1360		16400		2050		19400	
MANGANESE	mg/kg	642	J	910	J	328	J	187	J	355	
MERCURY	mg/kg	0.041	U	0.041	U	0.041	U	0.040	U	0.041	U
NICKEL	mg/kg	26.5		11.4		25.6		13.6		27.5	
POTASSIUM	mg/kg	1250	J	625	UJ	2560	J	1110	J	1680	
SELENIUM	mg/kg	0.62	U	0.62	U	1.2		0.60	U	0.78	
SILVER	mg/kg	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U
SODIUM	mg/kg	623	U	625	U	619	U	604	U	616	U
THALLIUM	mg/kg	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U
VANADIUM	mg/kg	24.1		23.9		25.9		23.3		26.5	
ZINC	mg/kg	62.6	J	31.2	J	61.4	J	49.2	J	65.1	

PLUMBROOK

Acid Area 1

Data Summary - Soils

Report Date: 07/24/98

Sample Location:		AA1-SB01		AA1-SB01		AA1-SB02		AA1-SB02	
Associated Site:		AA1		AA1		AA1		AA1	
Sample No:		6010		6020		6030		6040	
Sample Date:		30-APR-98		30-APR-98		30-APR-98		30-APR-98	
Depth:		0-1		8-10		0-1		6-8	
EXPLOSIVES	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
1,3,5-TRINITROBENZENE	ug/kg	250	U	250	U	300		250	U
1,3-DINITROBENZENE	ug/kg	250	U	250	U	250	U	250	U
2,4,6-TRINITROTOLUENE	ug/kg	250	U	250	U	320		250	U
2,4-DINITROTOLUENE	ug/kg	250	U	250	U	2500		250	U
2,6-DINITROTOLUENE	ug/kg	250	U	250	U	250	U	250	U
2-NITROTOLUENE	ug/kg	250	U	250	U	250	U	250	U
3-NITROTOLUENE	ug/kg	250	U	250	U	250	U	250	U
4-AMINO-2,6-DINITROTOLUENE	ug/kg	250	U	250	U	810		250	U
HMX	ug/kg	500	U	500	U	500	U	500	U
NITROBENZENE	ug/kg	250	U	250	U	250	U	250	U
RDX	ug/kg	500	U	500	U	500	U	500	U
TETRYL	ug/kg	650	U	650	U	650	U	650	U

PLU .OOK

Acid Area 2

Data Summary - Soils

Report Date: 07/27/98

Sample Location:		AA2-SB01		AA2-SB01		AA2-SB02		AA2-SB02		AA2-SB03	
Associated Site:		AA2		AA2		AA2		AA2		AA2	
Sample No:		6310		6320		6330		6340		6350	
Sample Date:		27-APR-98		27-APR-98		28-APR-98		28-APR-98		27-APR-98	
Depth:		0-1		6-8		0-1		2-4		0-1	
pH	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
pH	STD UNIT	7.4	J	7.7	J	5.2	J	7.2	J	9.4	J

PLUMBROOK

Acid Area 2

Data Summary - Soils

Report Date: 07/27/98

Sample Location:		AA2-SB03		AA2-SB04		AA2-SB04		AA2-SB05		AA2-SB05	
Associated Site:		AA2		AA2		AA2		AA2		AA2	
Sample No:		6360		6370		6380		6390		6400	
Sample Date:		27-APR-98		27-APR-98		27-APR-98		28-APR-98		28-APR-98	
Depth:		4-6		0-1		8-10		0-1		4-6	
pH	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
pH	STD UNIT	7.8	J	5.1	J	7.7	J	7.7	J	7.2	J

PLU... ..ROOK

Acid Area 2

Data Summary - Soils

Report Date: 07/27/98

Sample Location:		AA2-SB06		AA2-SB06		AA2-SB07		AA2-SB07		AA2-SB08	
Associated Site:		AA2		AA2		AA2		AA2		AA2	
Sample No:		6410		6420		6430		6440		6450	
Sample Date:		28-APR-98		28-APR-98		28-APR-98		28-APR-98		28-APR-98	
Depth:		0-1		4-5.5		0-1		4-6		0-1	
pH	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
pH	STD UNIT	8.8	J	8.2	J	7.8	J	8.1	J	7.9	J

PLUMBROOK

Acid Area 2

Data Summary - Soils

Report Date: 07/27/98

Sample Location:		AA2-SB08		AA2-SB09		AA2-SB09		AA2-SB10		AA2-SB10	
Associated Site:		AA2		AA2		AA2		AA2		AA2	
Sample No:		6460		6470		6480		6490		6500	
Sample Date:		28-APR-98		28-APR-98		28-APR-98		28-APR-98		28-APR-98	
Depth:		6-8		0-1		4-6		0-1		8-10	
pH	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
pH	STD UNIT	8.0	J	7.4	J	7.8	J	7.9	J	7.7	J

PLU. .OOK

Acid Area 2

Data Summary - Soils

Report Date: 07/27/98

Sample Location:		AA2-SB11		AA2-SB11		AA2-SB12		AA2-SB12		AA2-SB13	
Associated Site:		AA2		AA2		AA2		AA2		AA2	
Sample No:		6510		6520		6530		6540		6550	
Sample Date:		28-APR-98		28-APR-98		28-APR-98		28-APR-98		27-APR-98	
Depth:		0-1		2-4		0-1		6-8		0-1	
pH	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
pH	STD UNIT	7.5	J	7.7	J	7.7	J	7.6	J	7.6	J

PLUMBROOK

Acid Area 2

Data Summary - Soils

Report Date: 07/27/98

Sample Location:		AA2-SB13		AA2-SB14		AA2-SB14		AA2-SB15		AA2-SB15	
Associated Site:		AA2		AA2		AA2		AA2		AA2	
Sample No:		6560		6570		6580		6590		6600	
Sample Date:		27-APR-98		27-APR-98		27-APR-98		27-APR-98		27-APR-98	
Depth:		2-4		0-1		4-6		0-1		2-4	
pH	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
pH	STD UNIT	7.5	J	7.4	J	7.9	J	7.5	J	7.7	J

Sample Location:		AA2-SB01		AA2-SB01		AA2-SB02		AA2-SB02		AA2-SB03	
Associated Site:		AA2		AA2		AA2		AA2		AA2	
Sample No:		6310		6320		6330		6340		6350	
Sample Date:		27-APR-98		27-APR-98		28-APR-98		28-APR-98		27-APR-98	
Depth:		0-1		6-8		0-1		2-4		0-1	
VOLATILES	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
1,1,1-TRICHLOROETHANE	ug/kg	6.0	U	6.2	U	6.1	U	6.4	U	6.0	U
1,1,2,2-TETRACHLOROETHANE	ug/kg	6.0	U	6.2	U	6.1	U	6.4	U	6.0	U
1,1,2-TRICHLOROETHANE	ug/kg	6.0	U	6.2	U	6.1	U	6.4	U	6.0	U
1,1-DICHLOROETHANE	ug/kg	6.0	U	6.2	U	6.1	U	6.4	U	6.0	U
1,1-DICHLOROETHENE	ug/kg	6.0	U	6.2	U	6.1	U	6.4	U	6.0	U
1,2-DICHLOROETHANE	ug/kg	6.0	U	6.2	U	6.1	U	6.4	U	6.0	U
1,2-DICHLOROETHENE	ug/kg	6.0	U	6.2	U	6.1	U	6.4	U	6.0	U
1,2-DICHLOROPROPANE	ug/kg	6.0	U	6.2	U	6.1	U	6.4	U	6.0	U
2-BUTANONE	ug/kg	24	U	25	U	24	U	26	U	24	U
2-HEXANONE	ug/kg	24	U	25	U	24	U	26	U	24	U
4-METHYL-2-PENTANONE	ug/kg	24	U	25	U	24	U	26	U	24	U
ACETONE	ug/kg	24	U	25	U	380		18	J	24	U
BENZENE	ug/kg	6.0	U	6.2	U	6.1	U	6.4	U	6.0	U
BROMODICHLOROMETHANE	ug/kg	6.0	U	6.2	U	6.1	U	6.4	U	6.0	U
BROMOFORM	ug/kg	6.0	U	6.2	U	6.1	U	6.4	U	6.0	U
BROMOMETHANE	ug/kg	12	U	12	U	12	U	13	U	12	U
CARBON DISULFIDE	ug/kg	6.0	U	6.2	U	6.1	U	6.4	U	6.0	U
CARBON TETRACHLORIDE	ug/kg	6.0	U	6.2	U	6.1	U	6.4	U	6.0	U
CHLOROBENZENE	ug/kg	6.0	U	6.2	U	6.1	U	6.4	U	6.0	U
CHLOROETHANE	ug/kg	12	U	12	U	12	U	13	U	12	U
CHLOROFORM	ug/kg	6.0	U	6.2	U	6.1	U	6.4	U	6.0	U
CHLOROMETHANE	ug/kg	12	U	12	U	12	U	13	U	12	U
DIBROMOCHLOROMETHANE	ug/kg	6.0	U	6.2	U	6.1	U	6.4	U	6.0	U
ETHYLBENZENE	ug/kg	6.0	U	6.2	U	6.1	U	6.4	U	6.0	U
METHYLENE CHLORIDE	ug/kg	2.4	J	6.2	U	6.1	U	6.4	U	6.0	U
STYRENE	ug/kg	6.0	U	6.2	U	6.1	U	6.4	U	6.0	U
TETRACHLOROETHENE	ug/kg	6.0	U	6.2	U	6.1	U	6.4	U	6.0	U
TOLUENE	ug/kg	6.0	U	2.2	J	6.1	U	6.4	U	6.0	U
TOTAL XYLENES	ug/kg	6.0	U	3.4	J	6.1	U	6.4	U	6.0	U
TRICHLOROETHENE	ug/kg	6.0	U	6.2	U	6.1	U	6.4	U	6.0	U

PLUMBROOK

Acid Area 2

Data Summary - Soils

Report Date: 07/27/98

Sample Location:		AA2-SB03		AA2-SB04		AA2-SB04		AA2-SB05		AA2-SB05	
Associated Site:		AA2		AA2		AA2		AA2		AA2	
Sample No:		6360		6370		6380		6390		6400	
Sample Date:		27-APR-98		27-APR-98		27-APR-98		28-APR-98		28-APR-98	
Depth:		4-6		0-1		8-10		0-1		4-6	
VOLATILES	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
1,1,1-TRICHLOROETHANE	ug/kg	6.2	U	6.1	U	6.1	UJ	6.1	U	6.1	U
1,1,2,2-TETRACHLOROETHANE	ug/kg	6.2	U	6.1	UJ	6.1	UJ	6.1	UJ	6.1	U
1,1,2-TRICHLOROETHANE	ug/kg	6.2	U	6.1	U	6.1	UJ	6.1	U	6.1	U
1,1-DICHLOROETHANE	ug/kg	6.2	U	6.1	U	6.1	U	6.1	U	6.1	U
1,1-DICHLOROETHENE	ug/kg	6.2	U	6.1	U	6.1	U	6.1	U	6.1	U
1,2-DICHLOROETHANE	ug/kg	6.2	U	6.1	U	6.1	U	6.1	U	6.1	U
1,2-DICHLOROETHENE	ug/kg	6.2	U	6.1	U	6.1	U	6.1	U	6.1	U
1,2-DICHLOROPROPANE	ug/kg	6.2	U	6.1	U	6.1	UJ	6.1	U	6.1	U
2-BUTANONE	ug/kg	25	U	24	U	24	U	25	U	25	U
2-HEXANONE	ug/kg	25	U	24	U	24	UJ	25	U	25	U
4-METHYL-2-PENTANONE	ug/kg	25	U	24	U	24	UJ	25	U	25	U
ACETONE	ug/kg	32		24	U	24	U	77		29	
BENZENE	ug/kg	6.2	U	6.1	U	6.1	UJ	6.1	U	6.1	U
BROMODICHLOROMETHANE	ug/kg	6.2	U	6.1	U	6.1	UJ	6.1	U	6.1	U
BROMOFORM	ug/kg	6.2	U	6.1	U	6.1	UJ	6.1	U	6.1	U
BROMOMETHANE	ug/kg	12	U	12	U	12	U	12	U	12	U
CARBON DISULFIDE	ug/kg	6.2	U	6.1	U	6.1	U	6.1	U	6.1	U
CARBON TETRACHLORIDE	ug/kg	6.2	U	6.1	U	6.1	UJ	6.1	U	6.1	U
CHLOROBENZENE	ug/kg	6.2	U	6.1	U	6.1	UJ	6.1	U	6.1	U
CHLOROETHANE	ug/kg	12	U	12	U	12	U	12	U	12	U
CHLOROFORM	ug/kg	6.2	U	6.1	U	6.1	U	6.1	U	6.1	U
CHLOROMETHANE	ug/kg	12	U	12	U	12	U	12	U	12	U
DIBROMOCHLOROMETHANE	ug/kg	6.2	U	6.1	U	6.1	UJ	6.1	U	6.1	U
ETHYLBENZENE	ug/kg	6.2	U	6.1	U	6.1	UJ	6.1	U	6.1	U
METHYLENE CHLORIDE	ug/kg	2.5	J	6.1	U	6.1	U	6.1	U	6.1	U
STYRENE	ug/kg	6.2	U	6.1	U	6.1	UJ	6.1	U	6.1	U
TETRACHLOROETHENE	ug/kg	6.2	U	6.1	U	6.1	UJ	6.1	U	6.1	U
TOLUENE	ug/kg	6.2	U	1.8	J	1.4	J	6.1	U	6.1	U
TOTAL XYLENES	ug/kg	1.6	J	6.1	U	6.1	UJ	6.1	U	6.1	U
TRICHLOROETHENE	ug/kg	6.2	U	6.1	U	6.1	UJ	6.1	U	6.1	U

Report Date: 07/27/98

Sample Location:		AA2-SB06		AA2-SB06		AA2-SB07		AA2-SB07		AA2-SB08	
Associated Site:		AA2		AA2		AA2		AA2		AA2	
Sample No:		6410		6420		6430		6440		6450	
Sample Date:		28-APR-98		28-APR-98		28-APR-98		28-APR-98		28-APR-98	
Depth:		0-1		4-5.5		0-1		4-6		0-1	
VOLATILES	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
1,1,1-TRICHLOROETHANE	ug/kg	6.1	U	12	U	60	U	12	U	29	U
1,1,2,2-TETRACHLOROETHANE	ug/kg	6.1	U	12	U	60	U	12	U	29	U
1,1,2-TRICHLOROETHANE	ug/kg	6.1	U	12	U	60	U	12	U	29	U
1,1-DICHLOROETHANE	ug/kg	6.1	U	12	U	60	U	12	U	29	U
1,1-DICHLOROETHENE	ug/kg	6.1	U	12	U	60	U	12	U	29	U
1,2-DICHLOROETHANE	ug/kg	6.1	U	12	U	60	U	12	U	29	U
1,2-DICHLOROETHENE	ug/kg	6.1	U	12	U	60	U	12	U	29	U
1,2-DICHLOROPROPANE	ug/kg	6.1	U	12	U	60	U	12	U	29	U
2-BUTANONE	ug/kg	24	U	49	U	240	U	50	U	110	U
2-HEXANONE	ug/kg	24	U	49	U	240	U	50	U	110	U
4-METHYL-2-PENTANONE	ug/kg	24	U	49	U	240	U	50	U	110	U
ACETONE	ug/kg	24	U	1600	D	8600	J	3500	D	4300	J
BENZENE	ug/kg	6.1	U	12	U	60	U	12	U	29	U
BROMODICHLOROMETHANE	ug/kg	6.1	U	12	U	60	U	12	U	29	U
BROMOFORM	ug/kg	6.1	U	12	U	60	U	12	U	29	U
BROMOMETHANE	ug/kg	12	U	24	U	120	U	25	U	57	U
CARBON DISULFIDE	ug/kg	6.1	U	12	U	60	U	12	U	29	U
CARBON TETRACHLORIDE	ug/kg	6.1	U	12	U	60	U	12	U	29	U
CHLOROBENZENE	ug/kg	6.1	U	12	U	60	U	12	U	29	U
CHLOROETHANE	ug/kg	12	U	24	U	120	U	25	U	57	U
CHLOROFORM	ug/kg	6.1	U	12	U	60	U	12	U	29	U
CHLOROMETHANE	ug/kg	12	U	24	U	120	U	25	U	57	U
DIBROMOCHLOROMETHANE	ug/kg	6.1	U	12	U	60	U	12	U	29	U
ETHYLBENZENE	ug/kg	6.1	U	12	U	60	U	12	U	29	U
METHYLENE CHLORIDE	ug/kg	6.1	U	6.6	J	29	J	12	U	29	U
STYRENE	ug/kg	6.1	U	12	U	60	U	12	U	29	U
TETRACHLOROETHENE	ug/kg	6.1	U	12	U	60	U	12	U	29	U
TOLUENE	ug/kg	6.1	U	12	U	60	U	12	U	29	U
TOTAL XYLENES	ug/kg	6.1	U	12	U	60	U	12	U	29	U
TRICHLOROETHENE	ug/kg	6.1	U	12	U	60	U	12	U	29	U

PLUMBROOK

Acid Area 2

Data Summary - Soils

Report Date: 07/27/98

Sample Location:		AA2-SB08		AA2-SB09		AA2-SB09		AA2-SB10		AA2-SB10	
Associated Site:		AA2		AA2		AA2		AA2		AA2	
Sample No:		6460		6470		6480		6490		6500	
Sample Date:		28-APR-98		28-APR-98		28-APR-98		28-APR-98		28-APR-98	
Depth:		6-8		0-1		4-6		0-1		8-10	
VOLATILES	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
1,1,1-TRICHLOROETHANE	ug/kg	6.4	U	6.2	U	6.2	U	6.2	U	63	U
1,1,2,2-TETRACHLOROETHANE	ug/kg	6.4	U	6.2	U	6.2	U	6.2	U	63	U
1,1,2-TRICHLOROETHANE	ug/kg	6.4	U	6.2	U	6.2	U	6.2	U	63	U
1,1-DICHLOROETHANE	ug/kg	6.4	U	6.2	U	6.2	U	6.2	U	63	U
1,1-DICHLOROETHENE	ug/kg	6.4	U	6.2	U	6.2	U	6.2	U	63	U
1,2-DICHLOROETHANE	ug/kg	6.4	U	6.2	U	6.2	U	6.2	U	63	U
1,2-DICHLOROETHENE	ug/kg	6.4	U	6.2	U	6.2	U	6.2	U	63	U
1,2-DICHLOROPROPANE	ug/kg	6.4	U	6.2	U	6.2	U	6.2	U	63	U
2-BUTANONE	ug/kg	26	U	25	U	25	U	25	U	250	U
2-HEXANONE	ug/kg	26	U	25	U	25	U	25	U	250	U
4-METHYL-2-PENTANONE	ug/kg	26	U	25	U	25	U	25	U	250	U
ACETONE	ug/kg	750	J	25	U	2100	D	25	U	5000	J
BENZENE	ug/kg	6.4	U	6.2	U	6.2	U	6.2	U	63	U
BROMODICHLOROMETHANE	ug/kg	6.4	U	6.2	U	6.2	U	6.2	U	63	U
BROMOFORM	ug/kg	6.4	U	6.2	U	6.2	U	6.2	U	63	U
BROMOMETHANE	ug/kg	13	U	12	U	12	U	12	U	130	U
CARBON DISULFIDE	ug/kg	6.4	U	6.2	U	6.2	U	6.2	U	63	U
CARBON TETRACHLORIDE	ug/kg	6.4	U	6.2	U	6.2	U	6.2	U	63	U
CHLOROBENZENE	ug/kg	6.4	U	6.2	U	6.2	U	6.2	U	63	U
CHLOROETHANE	ug/kg	13	U	12	U	12	U	12	U	130	U
CHLOROFORM	ug/kg	6.4	U	6.2	U	6.2	U	6.2	U	63	U
CHLOROMETHANE	ug/kg	13	U	12	U	12	U	12	U	130	U
DIBROMOCHLOROMETHANE	ug/kg	6.4	U	6.2	U	6.2	U	6.2	U	63	U
ETHYLBENZENE	ug/kg	6.4	U	6.2	U	6.2	U	6.2	U	63	U
METHYLENE CHLORIDE	ug/kg	6.4	U	6.2	U	6.2	U	6.2	U	20	J
STYRENE	ug/kg	6.4	U	6.2	U	6.2	U	6.2	U	63	U
TETRACHLOROETHENE	ug/kg	6.4	U	6.2	U	6.2	U	6.2	U	63	U
TOLUENE	ug/kg	6.4	U	6.2	U	6.2	U	6.2	U	63	U
TOTAL XYLENES	ug/kg	6.4	U	6.2	U	6.2	U	6.2	U	63	U
TRICHLOROETHENE	ug/kg	6.4	U	6.2	U	6.2	U	6.2	U	63	U

Report Date: 07/27/98

Sample Location:		AA2-SB11		AA2-SB11		AA2-SB12		AA2-SB12		AA2-SB13	
Associated Site:		AA2		AA2		AA2		AA2		AA2	
Sample No:		6510		6520		6530		6540		6550	
Sample Date:		28-APR-98		28-APR-98		28-APR-98		28-APR-98		27-APR-98	
Depth:		0-1		2-4		0-1		6-8		0-1	
VOLATILES	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
1,1,1-TRICHLOROETHANE	ug/kg	5.8	U	6.1	U	6.1	U	6.3	U	6.2	U
1,1,2,2-TETRACHLOROETHANE	ug/kg	5.8	U	6.1	U	6.1	U	6.3	UJ	6.2	U
1,1,2-TRICHLOROETHANE	ug/kg	5.8	U	6.1	U	6.1	U	6.3	U	6.2	U
1,1-DICHLOROETHANE	ug/kg	5.8	U	6.1	U	6.1	U	6.3	U	6.2	U
1,1-DICHLOROETHENE	ug/kg	5.8	U	6.1	U	6.1	U	6.3	U	6.2	U
1,2-DICHLOROETHANE	ug/kg	5.8	U	6.1	U	6.1	U	6.3	U	6.2	U
1,2-DICHLOROETHENE	ug/kg	5.8	U	6.1	U	6.1	U	6.3	U	6.2	U
1,2-DICHLOROPROPANE	ug/kg	5.8	U	6.1	U	6.1	U	6.3	U	6.2	U
2-BUTANONE	ug/kg	23	U	25	U	24	U	25	U	25	U
2-HEXANONE	ug/kg	23	U	25	U	24	U	25	U	25	U
4-METHYL-2-PENTANONE	ug/kg	23	U	25	U	24	U	25	U	25	U
ACETONE	ug/kg	13	J	25	U	24	U	320		25	U
BENZENE	ug/kg	5.8	U	6.1	U	6.1	U	6.3	U	6.2	U
BROMODICHLOROMETHANE	ug/kg	5.8	U	6.1	U	6.1	U	6.3	U	6.2	U
BROMOFORM	ug/kg	5.8	U	6.1	U	6.1	U	6.3	U	6.2	U
BROMOMETHANE	ug/kg	12	U	12	U	12	U	13	U	12	U
CARBON DISULFIDE	ug/kg	5.8	U	6.1	U	6.1	U	6.3	U	6.2	U
CARBON TETRACHLORIDE	ug/kg	5.8	U	6.1	U	6.1	U	6.3	U	6.2	U
CHLOROBENZENE	ug/kg	5.8	U	6.1	U	6.1	U	6.3	U	6.2	U
CHLOROETHANE	ug/kg	12	U	12	U	12	U	13	U	12	U
CHLOROFORM	ug/kg	5.8	U	6.1	U	6.1	U	6.3	U	6.2	U
CHLOROMETHANE	ug/kg	12	U	12	U	12	U	13	U	12	U
DIBROMOCHLOROMETHANE	ug/kg	5.8	U	6.1	U	6.1	U	6.3	U	6.2	U
ETHYLBENZENE	ug/kg	5.8	U	6.1	U	6.1	U	6.3	U	6.2	U
METHYLENE CHLORIDE	ug/kg	5.8	U	6.1	U	6.1	U	6.3	U	2.7	J
STYRENE	ug/kg	5.8	U	6.1	U	6.1	U	6.3	U	6.2	U
TETRACHLOROETHENE	ug/kg	5.8	U	6.1	U	6.1	U	6.3	U	6.2	U
TOLUENE	ug/kg	5.8	U	6.1	U	6.1	U	6.3	U	6.2	U
TOTAL XYLENES	ug/kg	5.8	U	6.1	U	6.1	U	6.3	U	6.2	U
TRICHLOROETHENE	ug/kg	5.8	U	6.1	U	6.1	U	6.3	U	6.2	U

PLUMBROOK
Acid Area 2
Data Summary - Soils

Report Date: 07/27/98

Sample Location:		AA2-SB13		AA2-SB14		AA2-SB14		AA2-SB15		AA2-SB15	
Associated Site:		AA2		AA2		AA2		AA2		AA2	
Sample No:		6560		6570		6580		6590		6600	
Sample Date:		27-APR-98		27-APR-98		27-APR-98		27-APR-98		27-APR-98	
Depth:		2-4		0-1		4-6		0-1		2-4	
VOLATILES	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
1,1,1-TRICHLOROETHANE	ug/kg	6.0	U	5.9	U	6.2	U	6.2	U	6.1	U
1,1,2,2-TETRACHLOROETHANE	ug/kg	6.0	U	5.9	U	6.2	U	6.2	U	6.1	U
1,1,2-TRICHLOROETHANE	ug/kg	6.0	U	5.9	U	6.2	U	6.2	U	6.1	U
1,1-DICHLOROETHANE	ug/kg	6.0	U	5.9	U	6.2	U	6.2	U	6.1	U
1,1-DICHLOROETHENE	ug/kg	6.0	U	5.9	U	6.2	U	6.2	U	6.1	U
1,2-DICHLOROETHANE	ug/kg	6.0	U	5.9	U	6.2	U	6.2	U	6.1	U
1,2-DICHLOROETHENE	ug/kg	6.0	U	5.9	U	6.2	U	6.2	U	6.1	U
1,2-DICHLOROPROPANE	ug/kg	6.0	U	5.9	U	6.2	U	6.2	U	6.1	U
2-BUTANONE	ug/kg	24	U	23	U	25	U	25	U	24	U
2-HEXANONE	ug/kg	24	U	23	U	25	U	25	U	24	U
4-METHYL-2-PENTANONE	ug/kg	24	U	23	U	25	U	25	U	24	U
ACETONE	ug/kg	24	U	23	U	25	U	25	U	24	U
BENZENE	ug/kg	6.0	U	5.9	U	6.2	U	6.2	U	6.1	U
BROMODICHLOROMETHANE	ug/kg	6.0	U	5.9	U	6.2	U	6.2	U	6.1	U
BROMOFORM	ug/kg	6.0	U	5.9	U	6.2	U	6.2	U	6.1	U
BROMOMETHANE	ug/kg	12	U	12	U	12	U	12	U	12	U
CARBON DISULFIDE	ug/kg	6.0	U	5.9	U	6.2	U	6.2	U	6.1	U
CARBON TETRACHLORIDE	ug/kg	6.0	U	5.9	U	6.2	U	6.2	U	6.1	U
CHLOROBENZENE	ug/kg	6.0	U	5.9	U	6.2	U	6.2	U	6.1	U
CHLOROETHANE	ug/kg	12	U	12	U	12	U	12	U	12	U
CHLOROFORM	ug/kg	6.0	U	5.9	U	6.2	U	6.2	U	6.1	U
CHLOROMETHANE	ug/kg	12	U	12	U	12	U	12	U	12	U
DIBROMOCHLOROMETHANE	ug/kg	6.0	U	5.9	U	6.2	U	6.2	U	6.1	U
ETHYLBENZENE	ug/kg	6.0	U	5.9	U	6.2	U	6.2	U	6.1	U
METHYLENE CHLORIDE	ug/kg	2.3	J	2.2	J	6.2	U	6.2	U	6.1	U
STYRENE	ug/kg	6.0	U	5.9	U	6.2	U	6.2	U	6.1	U
TETRACHLOROETHENE	ug/kg	6.0	U	5.9	U	6.2	U	6.2	U	6.1	U
TOLUENE	ug/kg	6.0	U	5.9	U	6.2	U	6.2	U	6.1	U
TOTAL XYLENES	ug/kg	6.0	U	5.9	U	6.2	U	6.2	U	6.1	U
TRICHLOROETHENE	ug/kg	6.0	U	5.9	U	6.2	U	6.2	U	6.1	U

Sample Location:		AA2-SB01		AA2-SB01		AA2-SB02		AA2-SB02		AA2-SB03	
Associated Site:		AA2		AA2		AA2		AA2		AA2	
Sample No:		6310		6320		6330		6340		6350	
Sample Date:		27-APR-98		27-APR-98		28-APR-98		28-APR-98		27-APR-98	
Depth:		0-1		6-8		0-1		2-4		0-1	
VOLATILES	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
VINYL CHLORIDE	ug/kg	12	U	12	U	12	U	13	U	12	U
cis-1,3-DICHLOROPROPENE	ug/kg	6.0	U	6.2	U	6.1	U	6.4	U	6.0	U
trans-1,3-DICHLOROPROPENE	ug/kg	6.0	U	6.2	U	6.1	U	6.4	U	6.0	U

PLUMBROOK

Acid Area 2

Data Summary - Soils

Report Date: 07/27/98

Sample Location:		AA2-SB03		AA2-SB04		AA2-SB04		AA2-SB05		AA2-SB05	
Associated Site:		AA2		AA2		AA2		AA2		AA2	
Sample No:		6360		6370		6380		6390		6400	
Sample Date:		27-APR-98		27-APR-98		27-APR-98		28-APR-98		28-APR-98	
Depth:		4-6		0-1		8-10		0-1		4-6	
VOLATILES	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
VINYL CHLORIDE	ug/kg	12	U	12	U	12	U	12	U	12	U
cis-1,3-DICHLOROPROPENE	ug/kg	6.2	U	6.1	U	6.1	UJ	6.1	U	6.1	U
trans-1,3-DICHLOROPROPENE	ug/kg	6.2	U	6.1	U	6.1	UJ	6.1	U	6.1	U

Sample Location:		AA2-SB06		AA2-SB06		AA2-SB07		AA2-SB07		AA2-SB08	
Associated Site:		AA2		AA2		AA2		AA2		AA2	
Sample No:		6410		6420		6430		6440		6450	
Sample Date:		28-APR-98		28-APR-98		28-APR-98		28-APR-98		28-APR-98	
Depth:		0-1		4-5.5		0-1		4-6		0-1	
VOLATILES	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
VINYL CHLORIDE	ug/kg	12	U	24	U	120	U	25	U	57	U
cis-1,3-DICHLOROPROPENE	ug/kg	6.1	U	12	U	60	U	12	U	29	U
trans-1,3-DICHLOROPROPENE	ug/kg	6.1	U	12	U	60	U	12	U	29	U

PLUMBROOK

Acid Area 2

Data Summary - Soils

Report Date: 07/27/98

Sample Location:		AA2-SB08		AA2-SB09		AA2-SB09		AA2-SB10		AA2-SB10	
Associated Site:		AA2		AA2		AA2		AA2		AA2	
Sample No:		6460		6470		6480		6490		6500	
Sample Date:		28-APR-98		28-APR-98		28-APR-98		28-APR-98		28-APR-98	
Depth:		6-8		0-1		4-6		0-1		8-10	
VOLATILES	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
VINYL CHLORIDE	ug/kg	13	U	12	U	12	U	12	U	130	U
cis-1,3-DICHLOROPROPENE	ug/kg	6.4	U	6.2	U	6.2	U	6.2	U	63	U
trans-1,3-DICHLOROPROPENE	ug/kg	6.4	U	6.2	U	6.2	U	6.2	U	63	U

Report Date: 07/27/98

Sample Location:		AA2-SB11		AA2-SB11		AA2-SB12		AA2-SB12		AA2-SB13	
Associated Site:		AA2		AA2		AA2		AA2		AA2	
Sample No:		6510		6520		6530		6540		6550	
Sample Date:		28-APR-98		28-APR-98		28-APR-98		28-APR-98		27-APR-98	
Depth:		0-1		2-4		0-1		6-8		0-1	
VOLATILES	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
VINYL CHLORIDE	ug/kg	12	U	12	U	12	U	13	U	12	U
cis-1,3-DICHLOROPROPENE	ug/kg	5.8	U	6.1	U	6.1	U	6.3	U	6.2	U
trans-1,3-DICHLOROPROPENE	ug/kg	5.8	U	6.1	U	6.1	U	6.3	U	6.2	U

PLUMBROOK

Acid Area 2

Data Summary - Soils

Report Date: 07/27/98

Sample Location:		AA2-SB13		AA2-SB14		AA2-SB14		AA2-SB15		AA2-SB15	
Associated Site:		AA2		AA2		AA2		AA2		AA2	
Sample No:		6560		6570		6580		6590		6600	
Sample Date:		27-APR-98		27-APR-98		27-APR-98		27-APR-98		27-APR-98	
Depth:		2-4		0-1		4-6		0-1		2-4	
VOLATILES	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
VINYL CHLORIDE	ug/kg	12	U	12	U	12	U	12	U	12	U
cis-1,3-DICHLOROPROPENE	ug/kg	6.0	U	5.9	U	6.2	U	6.2	U	6.1	U
trans-1,3-DICHLOROPROPENE	ug/kg	6.0	U	5.9	U	6.2	U	6.2	U	6.1	U

Sample Location:		AA2-SB01		AA2-SB01		AA2-SB02		AA2-SB02		AA2-SB03	
Associated Site:		AA2		AA2		AA2		AA2		AA2	
Sample No:		6310		6320		6330		6340		6350	
Sample Date:		27-APR-98		27-APR-98		28-APR-98		28-APR-98		27-APR-98	
Depth:		0-1		6-8		0-1		2-4		0-1	
SULFATE	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
SULFATE	mg/kg	796		781		47.4		18.9		172	

PLUMBROOK

Acid Area 2

Data Summary - Soils

Report Date: 07/27/98

Sample Location:		AA2-SB03		AA2-SB04		AA2-SB04		AA2-SB05		AA2-SB05	
Associated Site:		AA2		AA2		AA2		AA2		AA2	
Sample No:		6360		6370		6380		6390		6400	
Sample Date:		27-APR-98		27-APR-98		27-APR-98		28-APR-98		28-APR-98	
Depth:		4-6		0-1		8-10		0-1		4-6	
SULFATE	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
SULFATE	mg/kg	342		175		284		16.5		34.1	

Sample Location:		AA2-SB06		AA2-SB06		AA2-SB07		AA2-SB07		AA2-SB08	
Associated Site:		AA2		AA2		AA2		AA2		AA2	
Sample No:		6410		6420		6430		6440		6450	
Sample Date:		28-APR-98		28-APR-98		28-APR-98		28-APR-98		28-APR-98	
Depth:		0-1		4-5.5		0-1		4-6		0-1	
SULFATE	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
SULFATE	mg/kg	12.1	U	12.2	U	11.9	U	54.6		11.5	U

PLUMBROOK

Acid Area 2

Data Summary - Soils

Report Date: 07/27/98

Sample Location:		AA2-SB08		AA2-SB09		AA2-SB09		AA2-SB10		AA2-SB10	
Associated Site:		AA2		AA2		AA2		AA2		AA2	
Sample No:		6460		6470		6480		6490		6500	
Sample Date:		28-APR-98		28-APR-98		28-APR-98		28-APR-98		28-APR-98	
Depth:		6-8		0-1		4-6		0-1		8-10	
SULFATE	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
SULFATE	mg/kg	37.5		12.4	U	12.4	U	12.3	U	28.0	

Report Date: 07/27/98

Sample Location:		AA2-SB11		AA2-SB11		AA2-SB12		AA2-SB12		AA2-SB13	
Associated Site:		AA2		AA2		AA2		AA2		AA2	
Sample No:		6510		6520		6530		6540		6550	
Sample Date:		28-APR-98		28-APR-98		28-APR-98		28-APR-98		27-APR-98	
Depth:		0-1		2-4		0-1		6-8		0-1	
SULFATE	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
SULFATE	mg/kg	11.7	U	12.3	U	12.2	U	59.0		26.0	

PLUMBROOK

Acid Area 2

Data Summary - Soils

Report Date: 07/27/98

Sample Location:		AA2-SB13		AA2-SB14		AA2-SB14		AA2-SB15		AA2-SB15	
Associated Site:		AA2		AA2		AA2		AA2		AA2	
Sample No:		6560		6570		6580		6590		6600	
Sample Date:		27-APR-98		27-APR-98		27-APR-98		27-APR-98		27-APR-98	
Depth:		2-4		0-1		4-6		0-1		2-4	
SULFATE	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
SULFATE	mg/kg	24.6		11.7	U	12.4	U	16.6		123	

Sample Location:		AA2-SB01		AA2-SB01		AA2-SB02		AA2-SB02		AA2-SB03	
Associated Site:		AA2		AA2		AA2		AA2		AA2	
Sample No:		6310		6320		6330		6340		6350	
Sample Date:		27-APR-98		27-APR-98		28-APR-98		28-APR-98		27-APR-98	
Depth:		0-1		6-8		0-1		2-4		0-1	
SEMIVOLATILES	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
1,2,4-TRICHLOROBENZENE	ug/kg	400	U	410	U	400	U	420	U	400	U
1,2-DICHLOROBENZENE	ug/kg	400	U	410	U	400	U	420	U	400	U
1,3-DICHLOROBENZENE	ug/kg	400	U	410	U	400	U	420	U	400	U
1,4-DICHLOROBENZENE	ug/kg	400	U	410	U	400	U	420	U	400	U
2,4,5-TRICHLOROPHENOL	ug/kg	400	U	410	U	400	U	420	U	400	U
2,4,6-TRICHLOROPHENOL	ug/kg	400	U	410	U	400	U	420	U	400	U
2,4-DICHLOROPHENOL	ug/kg	400	U	410	U	400	U	420	U	400	U
2,4-DIMETHYLPHENOL	ug/kg	400	U	410	U	400	U	420	U	400	U
2,4-DINITROPHENOL	ug/kg	1900	U	2000	U	1900	U	2100	U	1900	U
2,4-DINITROTOLUENE	ug/kg	44	J	410	U	400	U	420	U	5800	
2,6-DINITROTOLUENE	ug/kg	400	U	410	U	400	U	420	U	400	U
2-CHLORONAPHTHALENE	ug/kg	400	U	410	U	400	U	420	U	400	U
2-CHLOROPHENOL	ug/kg	400	U	410	U	400	U	420	U	400	U
2-METHYLNAPHTHALENE	ug/kg	400	U	410	U	400	U	420	U	60	J
2-METHYLPHENOL	ug/kg	400	U	410	U	400	U	420	U	400	U
2-NITROANILINE	ug/kg	1900	U	2000	U	1900	U	2100	U	1900	U
2-NITROPHENOL	ug/kg	400	U	410	U	400	U	420	U	400	U
3,3'-DICHLOROBENZIDINE	ug/kg	1900	U	2000	U	1900	U	2100	U	1900	U
3-NITROANILINE	ug/kg	1900	U	2000	U	1900	U	2100	U	1900	U
4,6-DINITRO-2-METHYLPHENOL	ug/kg	1900	U	2000	U	1900	U	2100	U	1900	U
4-BROMOPHENYL PHENYL ETHER	ug/kg	400	U	410	U	400	U	420	U	400	U
4-CHLORO-3-METHYLPHENOL	ug/kg	400	U	410	U	400	U	420	U	400	U
4-CHLOROANILINE	ug/kg	400	U	410	U	400	U	420	U	400	U
4-CHLOROPHENYL PHENYL ETHER	ug/kg	400	U	410	U	400	U	420	U	400	U
4-METHYLPHENOL	ug/kg	400	U	410	U	400	U	420	U	400	U
4-NITROANILINE	ug/kg	1900	U	2000	U	1900	U	2100	U	1900	U
4-NITROPHENOL	ug/kg	1900	U	2000	U	1900	U	2100	U	1900	U
ACENAPHTHENE	ug/kg	400	U	410	U	400	U	420	U	800	
ACENAPHTHYLENE	ug/kg	400	U	410	U	400	U	420	U	70	J
ANTHRACENE	ug/kg	400	U	410	U	400	U	420	U	1800	

Sample Location:		AA2-SB03		AA2-SB04		AA2-SB04		AA2-SB05		AA2-SB05	
Associated Site:		AA2		AA2		AA2		AA2		AA2	
Sample No:		6360		6370		6380		6390		6400	
Sample Date:		27-APR-98		27-APR-98		27-APR-98		28-APR-98		28-APR-98	
Depth:		4-6		0-1		8-10		0-1		4-6	
SEMIVOLATILES	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
1,2,4-TRICHLOROBENZENE	ug/kg	410	U	400	U	400	U	400	U	400	U
1,2-DICHLOROBENZENE	ug/kg	410	U	400	U	400	U	400	U	400	U
1,3-DICHLOROBENZENE	ug/kg	410	U	400	U	400	U	400	U	400	U
1,4-DICHLOROBENZENE	ug/kg	410	U	400	U	400	U	400	U	400	U
2,4,5-TRICHLOROPHENOL	ug/kg	410	U	400	U	400	U	400	U	400	U
2,4,6-TRICHLOROPHENOL	ug/kg	410	U	400	U	400	U	400	U	400	U
2,4-DICHLOROPHENOL	ug/kg	410	U	400	U	400	U	400	U	400	U
2,4-DIMETHYLPHENOL	ug/kg	410	U	400	U	400	U	400	U	400	U
2,4-DINITROPHENOL	ug/kg	2000	U	1900	U	2000	U	2000	U	2000	U
2,4-DINITROTOLUENE	ug/kg	410	U	400	U	400	U	400	U	400	U
2,6-DINITROTOLUENE	ug/kg	410	U	400	U	400	U	400	U	400	U
2-CHLORONAPHTHALENE	ug/kg	410	U	400	U	400	U	400	U	400	U
2-CHLOROPHENOL	ug/kg	410	U	400	U	400	U	400	U	400	U
2-METHYLNAPHTHALENE	ug/kg	410	U	400	U	400	U	400	U	400	U
2-METHYLPHENOL	ug/kg	410	U	400	U	400	U	400	U	400	U
2-NITROANILINE	ug/kg	2000	U	1900	U	2000	U	2000	U	2000	U
2-NITROPHENOL	ug/kg	410	U	400	U	400	U	400	U	400	U
3,3'-DICHLOROBENZIDINE	ug/kg	2000	U	1900	U	2000	U	2000	U	2000	U
3-NITROANILINE	ug/kg	2000	U	1900	U	2000	U	2000	U	2000	U
4,6-DINITRO-2-METHYLPHENOL	ug/kg	2000	U	1900	U	2000	U	2000	U	2000	U
4-BROMOPHENYL PHENYL ETHER	ug/kg	410	U	400	U	400	U	400	U	400	U
4-CHLORO-3-METHYLPHENOL	ug/kg	410	U	400	U	400	U	400	U	400	U
4-CHLOROANILINE	ug/kg	410	U	400	U	400	U	400	U	400	U
4-CHLOROPHENYL PHENYL ETHER	ug/kg	410	U	400	U	400	U	400	U	400	U
4-METHYLPHENOL	ug/kg	410	U	400	U	400	U	400	U	400	U
4-NITROANILINE	ug/kg	2000	U	1900	U	2000	U	2000	U	2000	U
4-NITROPHENOL	ug/kg	2000	U	1900	U	2000	U	2000	U	2000	U
ACENAPHTHENE	ug/kg	410	U	400	U	400	U	400	U	400	U
ACENAPHTHYLENE	ug/kg	410	U	400	U	400	U	400	U	400	U
ANTHRACEN[illegible]	ug/kg	410	U	400	U	400	U	400	U	[illegible]	U

Sample Location:		AA2-SB06		AA2-SB06		AA2-SB07		AA2-SB07		AA2-SB08	
Associated Site:		AA2		AA2		AA2		AA2		AA2	
Sample No:		6410		6420		6430		6440		6450	
Sample Date:		28-APR-98		28-APR-98		28-APR-98		28-APR-98		28-APR-98	
Depth:		0-1		4-5.5		0-1		4-6		0-1	
SEMIVOLATILES	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
1,2,4-TRICHLOROBENZENE	ug/kg	400	U	400	U	390	U	410	U	380	U
1,2-DICHLOROBENZENE	ug/kg	400	U	400	U	390	U	410	U	380	U
1,3-DICHLOROBENZENE	ug/kg	400	U	400	U	390	U	410	U	380	U
1,4-DICHLOROBENZENE	ug/kg	400	U	400	U	390	U	410	U	380	U
2,4,5-TRICHLOROPHENOL	ug/kg	400	U	400	U	390	U	410	U	380	U
2,4,6-TRICHLOROPHENOL	ug/kg	400	U	400	U	390	U	410	U	380	U
2,4-DICHLOROPHENOL	ug/kg	400	U	400	U	390	U	410	U	380	U
2,4-DIMETHYLPHENOL	ug/kg	400	U	400	U	390	U	410	U	380	U
2,4-DINITROPHENOL	ug/kg	1900	U	2000	U	1900	U	2000	U	1800	U
2,4-DINITROTOLUENE	ug/kg	400	U	400	U	390	U	410	U	380	U
2,6-DINITROTOLUENE	ug/kg	400	U	400	U	390	U	410	U	380	U
2-CHLORONAPHTHALENE	ug/kg	400	U	400	U	390	U	410	U	380	U
2-CHLOROPHENOL	ug/kg	400	U	400	U	390	U	410	U	380	U
2-METHYLNAPHTHALENE	ug/kg	400	U	400	U	390	U	410	U	380	U
2-METHYLPHENOL	ug/kg	400	U	400	U	390	U	410	U	380	U
2-NITROANILINE	ug/kg	1900	U	2000	U	1900	U	2000	U	1800	U
2-NITROPHENOL	ug/kg	400	U	400	U	390	U	410	U	380	U
3,3'-DICHLOROBENZIDINE	ug/kg	1900	U	2000	U	1900	U	2000	U	1800	U
3-NITROANILINE	ug/kg	1900	U	2000	U	1900	U	2000	U	1800	U
4,6-DINITRO-2-METHYLPHENOL	ug/kg	1900	U	2000	U	1900	U	2000	U	1800	U
4-BROMOPHENYL PHENYL ETHER	ug/kg	400	U	400	U	390	U	410	U	380	U
4-CHLORO-3-METHYLPHENOL	ug/kg	400	U	400	U	390	U	410	U	380	U
4-CHLOROANILINE	ug/kg	400	U	400	U	390	U	410	U	380	U
4-CHLOROPHENYL PHENYL ETHER	ug/kg	400	U	400	U	390	U	410	U	380	U
4-METHYLPHENOL	ug/kg	400	U	400	U	390	U	410	U	380	U
4-NITROANILINE	ug/kg	1900	U	2000	U	1900	U	2000	U	1800	U
4-NITROPHENOL	ug/kg	1900	U	2000	U	1900	U	2000	U	1800	U
ACENAPHTHENE	ug/kg	400	U	400	U	390	U	410	U	380	U
ACENAPHTHYLENE	ug/kg	87	J	400	U	390	U	410	U	380	U
ANTHRACENE	ug/kg	100	J	400	U	390	U	410	U	380	U

Sample Location:		AA2-SB08		AA2-SB09		AA2-SB09		AA2-SB10		AA2-SB10	
Associated Site:		AA2		AA2		AA2		AA2		AA2	
Sample No:		6460		6470		6480		6490		6500	
Sample Date:		28-APR-98		28-APR-98		28-APR-98		28-APR-98		28-APR-98	
Depth:		6-8		0-1		4-6		0-1		8-10	
SEMIVOLATILES	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
1,2,4-TRICHLOROBENZENE	ug/kg	420	U	410	U	410	U	410	U	420	U
1,2-DICHLOROBENZENE	ug/kg	420	U	410	U	410	U	410	U	420	U
1,3-DICHLOROBENZENE	ug/kg	420	U	410	U	410	U	410	U	420	U
1,4-DICHLOROBENZENE	ug/kg	420	U	410	U	410	U	410	U	420	U
2,4,5-TRICHLOROPHENOL	ug/kg	420	U	410	U	410	U	410	U	420	U
2,4,6-TRICHLOROPHENOL	ug/kg	420	U	410	U	410	U	410	U	420	U
2,4-DICHLOROPHENOL	ug/kg	420	U	410	U	410	U	410	U	420	U
2,4-DIMETHYLPHENOL	ug/kg	420	U	410	U	410	U	410	U	420	U
2,4-DINITROPHENOL	ug/kg	2100	U	2000	U	2000	U	2000	U	2000	U
2,4-DINITROTOLUENE	ug/kg	420	U	410	U	410	U	410	U	420	U
2,6-DINITROTOLUENE	ug/kg	420	U	410	U	410	U	410	U	420	U
2-CHLORONAPHTHALENE	ug/kg	420	U	410	U	410	U	410	U	420	U
2-CHLOROPHENOL	ug/kg	420	U	410	U	410	U	410	U	420	U
2-METHYLNAPHTHALENE	ug/kg	420	U	410	U	410	U	410	U	420	U
2-METHYLPHENOL	ug/kg	420	U	410	U	410	U	410	U	420	U
2-NITROANILINE	ug/kg	2100	U	2000	U	2000	U	2000	U	2000	U
2-NITROPHENOL	ug/kg	420	U	410	U	410	U	410	U	420	U
3,3'-DICHLOROBENZIDINE	ug/kg	2100	U	2000	U	2000	U	2000	U	2000	U
3-NITROANILINE	ug/kg	2100	U	2000	U	2000	U	2000	U	2000	U
4,6-DINITRO-2-METHYLPHENOL	ug/kg	2100	U	2000	U	2000	U	2000	U	2000	U
4-BROMOPHENYL PHENYL ETHER	ug/kg	420	U	410	U	410	U	410	U	420	U
4-CHLORO-3-METHYLPHENOL	ug/kg	420	U	410	U	410	U	410	U	420	U
4-CHLOROANILINE	ug/kg	420	U	410	U	410	U	410	U	420	U
4-CHLOROPHENYL PHENYL ETHER	ug/kg	420	U	410	U	410	U	410	U	420	U
4-METHYLPHENOL	ug/kg	420	U	410	U	410	U	410	U	420	U
4-NITROANILINE	ug/kg	2100	U	2000	U	2000	U	2000	U	2000	U
4-NITROPHENOL	ug/kg	2100	U	2000	U	2000	U	2000	U	2000	U
ACENAPHTHENE	ug/kg	420	U	410	U	410	U	410	U	420	U
ACENAPHTHYLENE	ug/kg	420	U	410	U	410	U	410	U	420	U
ANTHRACEN	ug/kg	420	U	410	U	410	U	410	U	[illegible]	U

Sample Location:		AA2-SB11		AA2-SB11		AA2-SB12		AA2-SB12		AA2-SB13	
Associated Site:		AA2		AA2		AA2		AA2		AA2	
Sample No:		6510		6520		6530		6540		6550	
Sample Date:		28-APR-98		28-APR-98		28-APR-98		28-APR-98		27-APR-98	
Depth:		0-1		2-4		0-1		6-8		0-1	
SEMIVOLATILES	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
1,2,4-TRICHLOROBENZENE	ug/kg	380	U	400	U	400	U	420	U	410	U
1,2-DICHLOROBENZENE	ug/kg	380	U	400	U	400	U	420	U	410	U
1,3-DICHLOROBENZENE	ug/kg	380	U	400	U	400	U	420	U	410	U
1,4-DICHLOROBENZENE	ug/kg	380	U	400	U	400	U	420	U	410	U
2,4,5-TRICHLOROPHENOL	ug/kg	380	U	400	U	400	U	420	U	410	U
2,4,6-TRICHLOROPHENOL	ug/kg	380	U	400	U	400	U	420	U	410	U
2,4-DICHLOROPHENOL	ug/kg	380	U	400	U	400	U	420	U	410	U
2,4-DIMETHYLPHENOL	ug/kg	380	U	400	U	400	U	420	U	410	U
2,4-DINITROPHENOL	ug/kg	1900	U	2000	U	2000	U	2000	U	2000	U
2,4-DINITROTOLUENE	ug/kg	380	U	400	U	400	U	420	U	410	U
2,6-DINITROTOLUENE	ug/kg	380	U	400	U	400	U	420	U	410	U
2-CHLORONAPHTHALENE	ug/kg	380	U	400	U	400	U	420	U	410	U
2-CHLOROPHENOL	ug/kg	380	U	400	U	400	U	420	U	410	U
2-METHYLNAPHTHALENE	ug/kg	380	U	400	U	400	U	420	U	410	U
2-METHYLPHENOL	ug/kg	380	U	400	U	400	U	420	U	410	U
2-NITROANILINE	ug/kg	1900	U	2000	U	2000	U	2000	U	2000	U
2-NITROPHENOL	ug/kg	380	U	400	U	400	U	420	U	410	U
3,3'-DICHLOROBENZIDINE	ug/kg	1900	U	2000	U	2000	U	2000	U	140	J
3-NITROANILINE	ug/kg	1900	U	2000	U	2000	U	2000	U	2000	U
4,6-DINITRO-2-METHYLPHENOL	ug/kg	1900	U	2000	U	2000	U	2000	U	2000	U
4-BROMOPHENYL PHENYL ETHER	ug/kg	380	U	400	U	400	U	420	U	410	U
4-CHLORO-3-METHYLPHENOL	ug/kg	380	U	400	U	400	U	420	U	410	U
4-CHLOROANILINE	ug/kg	380	U	400	U	400	U	420	U	410	U
4-CHLOROPHENYL PHENYL ETHER	ug/kg	380	U	400	U	400	U	420	U	410	U
4-METHYLPHENOL	ug/kg	380	U	400	U	400	U	420	U	410	U
4-NITROANILINE	ug/kg	1900	U	2000	U	2000	U	2000	U	2000	U
4-NITROPHENOL	ug/kg	1900	U	2000	U	2000	U	2000	U	2000	U
ACENAPHTHENE	ug/kg	380	U	400	U	400	U	420	U	410	U
ACENAPHTHYLENE	ug/kg	68	J	400	U	400	U	420	U	410	U
ANTHRACENE	ug/kg	69	J	400	U	400	U	420	U	45	J

Sample Location:		AA2-SB13		AA2-SB14		AA2-SB14		AA2-SB15		AA2-SB15	
Associated Site:		AA2		AA2		AA2		AA2		AA2	
Sample No:		6560		6570		6580		6590		6600	
Sample Date:		27-APR-98		27-APR-98		27-APR-98		27-APR-98		27-APR-98	
Depth:		2-4		0-1		4-6		0-1		2-4	
SEMIVOLATILES	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
1,2,4-TRICHLOROBENZENE	ug/kg	390	U	390	U	410	U	410	U	400	U
1,2-DICHLOROBENZENE	ug/kg	390	U	390	U	410	U	410	U	400	U
1,3-DICHLOROBENZENE	ug/kg	390	U	390	U	410	U	410	U	400	U
1,4-DICHLOROBENZENE	ug/kg	390	U	390	U	410	U	410	U	400	U
2,4,5-TRICHLOROPHENOL	ug/kg	390	U	390	U	410	U	410	U	400	U
2,4,6-TRICHLOROPHENOL	ug/kg	390	U	390	U	410	U	410	U	400	U
2,4-DICHLOROPHENOL	ug/kg	390	U	390	U	410	U	410	U	400	U
2,4-DIMETHYLPHENOL	ug/kg	390	U	390	U	410	U	410	U	400	U
2,4-DINITROPHENOL	ug/kg	1900	U	1900	U	2000	U	2000	U	2000	U
2,4-DINITROTOLUENE	ug/kg	390	U	390	U	410	U	410	U	400	U
2,6-DINITROTOLUENE	ug/kg	390	U	390	U	410	U	410	U	400	U
2-CHLORONAPHTHALENE	ug/kg	390	U	390	U	410	U	410	U	400	U
2-CHLOROPHENOL	ug/kg	390	U	390	U	410	U	410	U	400	U
2-METHYLNAPHTHALENE	ug/kg	390	U	390	U	410	U	410	U	400	U
2-METHYLPHENOL	ug/kg	390	U	390	U	410	U	410	U	400	U
2-NITROANILINE	ug/kg	1900	U	1900	U	2000	U	2000	U	2000	U
2-NITROPHENOL	ug/kg	390	U	390	U	410	U	410	U	400	U
3,3'-DICHLOROBENZIDINE	ug/kg	1900	U	1900	U	2000	U	2000	U	2000	U
3-NITROANILINE	ug/kg	1900	U	1900	U	2000	U	2000	U	2000	U
4,6-DINITRO-2-METHYLPHENOL	ug/kg	1900	U	1900	U	2000	U	2000	U	2000	U
4-BROMOPHENYL PHENYL ETHER	ug/kg	390	U	390	U	410	U	410	U	400	U
4-CHLORO-3-METHYLPHENOL	ug/kg	390	U	390	U	410	U	410	U	400	U
4-CHLOROANILINE	ug/kg	390	U	390	U	410	U	410	U	400	U
4-CHLOROPHENYL PHENYL ETHER	ug/kg	390	U	390	U	410	U	410	U	400	U
4-METHYLPHENOL	ug/kg	390	U	390	U	410	U	410	U	400	U
4-NITROANILINE	ug/kg	1900	U	1900	U	2000	U	2000	U	2000	U
4-NITROPHENOL	ug/kg	1900	U	1900	U	2000	U	2000	U	2000	U
ACENAPHTHENE	ug/kg	390	U	390	U	410	U	410	U	400	U
ACENAPHTHYLENE	ug/kg	390	U	390	U	410	U	410	U	400	U
ANTHRACEN[illegible]	ug/kg	57	J	[illegible]390	U	410	U	410	U	[illegible]00	U

Sample Location:		AA2-SB01		AA2-SB01		AA2-SB02		AA2-SB02		AA2-SB03	
Associated Site:		AA2		AA2		AA2		AA2		AA2	
Sample No:		6310		6320		6330		6340		6350	
Sample Date:		27-APR-98		27-APR-98		28-APR-98		28-APR-98		27-APR-98	
Depth:		0-1		6-8		0-1		2-4		0-1	
SEMIVOLATILES	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
BENZO(a)ANTHRACENE	ug/kg	67	J	410	U	45	J	420	U	8500	D
BENZO(a)PYRENE	ug/kg	72	J	410	U	45	J	420	U	7300	D
BENZO(b)FLUORANTHENE	ug/kg	71	J	410	U	400	U	420	U	9700	D
BENZO(ghi)PERYLENE	ug/kg	41	J	410	U	400	U	420	U	1900	
BENZO(k)FLUORANTHENE	ug/kg	79	J	410	U	53	J	420	U	6300	D
BIS(2-CHLOROETHOXY)METHANE	ug/kg	400	U	410	U	400	U	420	U	400	U
BIS(2-CHLOROETHYL)ETHER	ug/kg	400	U	410	U	400	U	420	U	400	U
BIS(2-CHLOROISOPROPYL)ETHER	ug/kg	400	U	410	U	400	U	420	U	400	U
BIS(2-ETHYLHEXYL)PHTHALATE	ug/kg	400	U	51	J	400	U	420	U	400	U
BUTYL BENZYL PHTHALATE	ug/kg	400	U	410	U	400	U	420	U	400	U
CARBAZOLE	ug/kg	400	U	410	U	400	U	420	U	1500	
CHRYSENE	ug/kg	100	J	410	U	52	J	420	U	8300	D
DI-n-BUTYL PHTHALATE	ug/kg	400	U	47	J	400	U	420	U	400	U
DI-n-OCTYL PHTHALATE	ug/kg	400	U	410	U	400	U	420	U	400	U
DIBENZ(a,h)ANTHRACENE	ug/kg	400	U	410	U	400	U	420	U	1100	
DIBENZOFURAN	ug/kg	400	U	410	U	400	U	420	U	190	J
DIETHYL PHTHALATE	ug/kg	400	U	410	U	400	U	420	U	400	U
DIMETHYL PHTHALATE	ug/kg	400	U	410	U	400	U	420	U	400	U
FLUORANTHENE	ug/kg	110	J	410	U	71	J	420	U	17000	D
FLUORENE	ug/kg	400	U	410	U	400	U	420	U	420	
HEXACHLOROBENZENE	ug/kg	400	U	410	U	400	U	420	U	400	U
HEXACHLOROBUTADIENE	ug/kg	400	U	410	U	400	U	420	U	400	U
HEXACHLOROCYCLOPENTADIENE	ug/kg	1900	U	2000	U	1900	U	2100	U	1900	U
HEXACHLOROETHANE	ug/kg	400	U	410	U	400	U	420	U	400	U
INDENO(1,2,3-cd)PYRENE	ug/kg	38	J	410	U	400	U	420	U	2200	
ISOPHORONE	ug/kg	400	U	410	U	400	U	420	U	400	U
N-NITROSO-DI-n-PROPYLAMINE	ug/kg	400	U	410	U	400	U	420	U	400	U
N-NITROSODIPHENYLAMINE	ug/kg	400	U	410	U	400	U	420	U	400	U
NAPHTHALENE	ug/kg	400	U	410	U	400	U	420	U	120	J
NITROBENZENE	ug/kg	400	U	410	U	400	U	420	U	400	U

Sample Location:		AA2-SB03		AA2-SB04		AA2-SB04		AA2-SB05		AA2-SB05	
Associated Site:		AA2		AA2		AA2		AA2		AA2	
Sample No:		6360		6370		6380		6390		6400	
Sample Date:		27-APR-98		27-APR-98		27-APR-98		28-APR-98		28-APR-98	
Depth:		4-6		0-1		8-10		0-1		4-6	
SEMIVOLATILES	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
BENZO(a)ANTHRACENE	ug/kg	410	U	400	U	400	U	400	U	400	U
BENZO(a)PYRENE	ug/kg	410	U	400	U	400	U	400	U	400	U
BENZO(b)FLUORANTHENE	ug/kg	410	U	400	U	400	U	400	U	400	U
BENZO(ghi)PERYLENE	ug/kg	410	U	400	U	400	U	400	U	400	U
BENZO(k)FLUORANTHENE	ug/kg	410	U	400	U	400	U	400	U	400	U
BIS(2-CHLOROETHOXY)METHANE	ug/kg	410	U	400	U	400	U	400	U	400	U
BIS(2-CHLOROETHYL)ETHER	ug/kg	410	U	400	U	400	U	400	U	400	U
BIS(2-CHLOROISOPROPYL)ETHER	ug/kg	410	U	400	U	400	U	400	U	400	U
BIS(2-ETHYLHEXYL)PHTHALATE	ug/kg	410	U	400	U	49	J	400	U	400	U
BUTYL BENZYL PHTHALATE	ug/kg	410	U	400	U	400	U	400	U	400	U
CARBAZOLE	ug/kg	410	U	400	U	400	U	400	U	400	U
CHRYSENE	ug/kg	410	U	400	U	400	U	400	U	400	U
DI-n-BUTYL PHTHALATE	ug/kg	410	U	400	U	400	U	400	U	400	U
DI-n-OCTYL PHTHALATE	ug/kg	410	U	400	U	400	U	400	U	400	U
DIBENZ(a,h)ANTHRACENE	ug/kg	410	U	400	U	400	U	400	U	400	U
DIBENZOFURAN	ug/kg	410	U	400	U	400	U	400	U	400	U
DIETHYL PHTHALATE	ug/kg	410	U	400	U	400	U	400	U	400	U
DIMETHYL PHTHALATE	ug/kg	410	U	400	U	400	U	400	U	400	U
FLUORANTHENE	ug/kg	410	U	400	U	400	U	400	U	400	U
FLUORENE	ug/kg	410	U	400	U	400	U	400	U	400	U
HEXACHLOROBENZENE	ug/kg	410	U	400	U	400	U	400	U	400	U
HEXACHLOROBUTADIENE	ug/kg	410	U	400	U	400	U	400	U	400	U
HEXACHLOROCYCLOPENTADIENE	ug/kg	2000	U	1900	U	2000	U	2000	U	2000	U
HEXACHLOROETHANE	ug/kg	410	U	400	U	400	U	400	U	400	U
INDENO(1,2,3-cd)PYRENE	ug/kg	410	U	400	U	400	U	400	U	400	U
ISOPHORONE	ug/kg	410	U	400	U	400	U	400	U	400	U
N-NITROSO-DI-n-PROPYLAMINE	ug/kg	410	U	400	U	400	U	400	U	400	U
N-NITROSODIPHENYLAMINE	ug/kg	410	U	400	U	400	U	400	U	400	U
NAPHTHALENE	ug/kg	410	U	400	U	400	U	400	U	400	U
NITROBENZ[illegible]	ug/kg	410	U	400	U	400	U	400	U	[illegible]0	U

Sample Location:		AA2-SB06		AA2-SB06		AA2-SB07		AA2-SB07		AA2-SB08	
Associated Site:		AA2		AA2		AA2		AA2		AA2	
Sample No:		6410		6420		6430		6440		6450	
Sample Date:		28-APR-98		28-APR-98		28-APR-98		28-APR-98		28-APR-98	
Depth:		0-1		4-5.5		0-1		4-6		0-1	
SEMIVOLATILES	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
BENZO(a)ANTHRACENE	ug/kg	230	J	400	U	390	U	410	U	380	U
BENZO(a)PYRENE	ug/kg	260	J	400	U	390	U	410	U	380	U
BENZO(b)FLUORANTHENE	ug/kg	190	J	400	U	390	U	410	U	380	U
BENZO(ghi)PERYLENE	ug/kg	160	J	400	U	390	U	410	U	380	U
BENZO(k)FLUORANTHENE	ug/kg	270	J	400	U	390	U	410	U	380	U
BIS(2-CHLOROETHOXY)METHANE	ug/kg	400	U	400	U	390	U	410	U	380	U
BIS(2-CHLOROETHYL)ETHER	ug/kg	400	U	400	U	390	U	410	U	380	U
BIS(2-CHLOROISOPROPYL)ETHER	ug/kg	400	U	400	U	390	U	410	U	380	U
BIS(2-ETHYLHEXYL)PHTHALATE	ug/kg	50	J	400	U	55	J	410	U	380	U
BUTYL BENZYL PHTHALATE	ug/kg	400	U	400	U	390	U	410	U	380	U
CARBAZOLE	ug/kg	400	U	400	U	390	U	410	U	380	U
CHRYSENE	ug/kg	240	J	400	U	390	U	410	U	380	U
DI-n-BUTYL PHTHALATE	ug/kg	400	U	400	U	390	U	410	U	380	U
DI-n-OCTYL PHTHALATE	ug/kg	400	U	400	U	390	U	410	U	380	U
DIBENZ(a,h)ANTHRACENE	ug/kg	77	J	400	U	390	U	410	U	380	U
DIBENZOFURAN	ug/kg	400	U	400	U	390	U	410	U	380	U
DIETHYL PHTHALATE	ug/kg	400	U	400	U	390	U	410	U	380	U
DIMETHYL PHTHALATE	ug/kg	400	U	400	U	390	U	410	U	380	U
FLUORANTHENE	ug/kg	340	J	400	U	390	U	410	U	380	U
FLUORENE	ug/kg	400	U	400	U	390	U	410	U	380	U
HEXACHLOROBENZENE	ug/kg	400	U	400	U	390	U	410	U	380	U
HEXACHLOROBUTADIENE	ug/kg	400	U	400	U	390	U	410	U	380	U
HEXACHLOROCYCLOPENTADIENE	ug/kg	1900	U	2000	U	1900	U	2000	U	1800	U
HEXACHLOROETHANE	ug/kg	400	U	400	U	390	U	410	U	380	U
INDENO(1,2,3-cd)PYRENE	ug/kg	160	J	400	U	390	U	410	U	380	U
ISOPHORONE	ug/kg	400	U	400	U	390	U	410	U	380	U
N-NITROSO-DI-n-PROPYLAMINE	ug/kg	400	U	400	U	390	U	410	U	380	U
N-NITROSODIPHENYLAMINE	ug/kg	400	U	400	U	390	U	410	U	380	U
NAPHTHALENE	ug/kg	400	U	400	U	390	U	410	U	380	U
NITROBENZENE	ug/kg	400	U	400	U	390	U	410	U	380	U

Sample Location:		AA2-SB08		AA2-SB09		AA2-SB09		AA2-SB10		AA2-SB10	
Associated Site:		AA2		AA2		AA2		AA2		AA2	
Sample No:		6460		6470		6480		6490		6500	
Sample Date:		28-APR-98		28-APR-98		28-APR-98		28-APR-98		28-APR-98	
Depth:		6-8		0-1		4-6		0-1		8-10	
SEMIVOLATILES	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
BENZO(a)ANTHRACENE	ug/kg	420	U	410	U	410	U	410	U	420	U
BENZO(a)PYRENE	ug/kg	420	U	410	U	410	U	410	U	420	U
BENZO(b)FLUORANTHENE	ug/kg	420	U	410	U	410	U	410	U	420	U
BENZO(ghi)PERYLENE	ug/kg	420	U	410	U	410	U	410	U	420	U
BENZO(k)FLUORANTHENE	ug/kg	420	U	410	U	410	U	410	U	420	U
BIS(2-CHLOROETHOXY)METHANE	ug/kg	420	U	410	U	410	U	410	U	420	U
BIS(2-CHLOROETHYL)ETHER	ug/kg	420	U	410	U	410	U	410	U	420	U
BIS(2-CHLOROISOPROPYL)ETHER	ug/kg	420	U	410	U	410	U	410	U	420	U
BIS(2-ETHYLHEXYL)PHTHALATE	ug/kg	420	U	410	U	410	U	410	U	420	U
BUTYL BENZYL PHTHALATE	ug/kg	420	U	410	U	410	U	410	U	420	U
CARBAZOLE	ug/kg	420	U	410	U	410	U	410	U	420	U
CHRYSENE	ug/kg	420	U	410	U	410	U	410	U	420	U
DI-n-BUTYL PHTHALATE	ug/kg	420	U	410	U	410	U	410	U	420	U
DI-n-OCTYL PHTHALATE	ug/kg	420	U	410	U	410	U	410	U	420	U
DIBENZ(a,h)ANTHRACENE	ug/kg	420	U	410	U	410	U	410	U	420	U
DIBENZOFURAN	ug/kg	420	U	410	U	410	U	410	U	420	U
DIETHYL PHTHALATE	ug/kg	420	U	410	U	410	U	410	U	420	U
DIMETHYL PHTHALATE	ug/kg	420	U	410	U	410	U	410	U	420	U
FLUORANTHENE	ug/kg	420	U	410	U	410	U	410	U	420	U
FLUORENE	ug/kg	420	U	410	U	410	U	410	U	420	U
HEXACHLOROBENZENE	ug/kg	420	U	410	U	410	U	410	U	420	U
HEXACHLOROBUTADIENE	ug/kg	420	U	410	U	410	U	410	U	420	U
HEXACHLOROCYCLOPENTADIENE	ug/kg	2100	U	2000	U	2000	U	2000	U	2000	U
HEXACHLOROETHANE	ug/kg	420	U	410	U	410	U	410	U	420	U
INDENO(1,2,3-cd)PYRENE	ug/kg	420	U	410	U	410	U	410	U	420	U
ISOPHORONE	ug/kg	420	U	410	U	410	U	410	U	420	U
N-NITROSO-DI-n-PROPYLAMINE	ug/kg	420	U	410	U	410	U	410	U	420	U
N-NITROSODIPHENYLAMINE	ug/kg	420	U	410	U	410	U	410	U	420	U
NAPHTHALENE	ug/kg	420	U	410	U	410	U	410	U	420	U
NITROBENZENE	ug/kg	420	U	410	U	410	U	410	U	420	U

Report Date: 07/27/98

Sample Location:		AA2-SB11		AA2-SB11		AA2-SB12		AA2-SB12		AA2-SB13	
Associated Site:		AA2		AA2		AA2		AA2		AA2	
Sample No:		6510		6520		6530		6540		6550	
Sample Date:		28-APR-98		28-APR-98		28-APR-98		28-APR-98		27-APR-98	
Depth:		0-1		2-4		0-1		6-8		0-1	
SEMIVOLATILES	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
BENZO(a)ANTHRACENE	ug/kg	180	J	400	U	400	U	420	U	110	J
BENZO(a)PYRENE	ug/kg	180	J	400	U	400	U	420	U	120	J
BENZO(b)FLUORANTHENE	ug/kg	140	J	400	U	400	U	420	U	100	J
BENZO(ghi)PERYLENE	ug/kg	110	J	400	U	400	U	420	U	43	J
BENZO(k)FLUORANTHENE	ug/kg	190	J	400	U	400	U	420	U	110	J
BIS(2-CHLOROETHOXY)METHANE	ug/kg	380	U	400	U	400	U	420	U	410	U
BIS(2-CHLOROETHYL)ETHER	ug/kg	380	U	400	U	400	U	420	U	410	U
BIS(2-CHLOROISOPROPYL)ETHER	ug/kg	380	U	400	U	400	U	420	U	410	U
BIS(2-ETHYLHEXYL)PHTHALATE	ug/kg	380	U	400	U	42	J	420	U	410	U
BUTYL BENZYL PHTHALATE	ug/kg	380	U	400	U	400	U	420	U	410	U
CARBAZOLE	ug/kg	380	U	400	U	400	U	420	U	410	U
CHRYSENE	ug/kg	180	J	400	U	400	U	420	U	110	J
DI-n-BUTYL PHTHALATE	ug/kg	380	U	400	U	400	U	420	U	410	U
DI-n-OCTYL PHTHALATE	ug/kg	380	U	400	U	400	U	420	U	410	U
DIBENZ(a,h)ANTHRACENE	ug/kg	53	J	400	U	400	U	420	U	410	U
DIBENZOFURAN	ug/kg	380	U	400	U	400	U	420	U	410	U
DIETHYL PHTHALATE	ug/kg	380	U	400	U	400	U	420	U	410	U
DIMETHYL PHTHALATE	ug/kg	380	U	400	U	400	U	420	U	410	U
FLUORANTHENE	ug/kg	260	J	400	U	400	U	420	U	200	J
FLUORENE	ug/kg	380	U	400	U	400	U	420	U	410	U
HEXACHLOROBENZENE	ug/kg	380	U	400	U	400	U	420	U	410	U
HEXACHLOROBUTADIENE	ug/kg	380	U	400	U	400	U	420	U	410	U
HEXACHLOROCYCLOPENTADIENE	ug/kg	1900	U	2000	U	2000	U	2000	U	2000	U
HEXACHLOROETHANE	ug/kg	380	U	400	U	400	U	420	U	410	U
INDENO(1,2,3-cd)PYRENE	ug/kg	110	J	400	U	400	U	420	U	51	J
ISOPHORONE	ug/kg	380	U	400	U	400	U	420	U	410	U
N-NITROSO-DI-n-PROPYLAMINE	ug/kg	380	U	400	U	400	U	420	U	410	U
N-NITROSODIPHENYLAMINE	ug/kg	380	U	400	U	400	U	420	U	410	U
NAPHTHALENE	ug/kg	380	U	400	U	400	U	420	U	410	U
NITROBENZENE	ug/kg	380	U	400	U	400	U	420	U	410	U

Sample Location:		AA2-SB13		AA2-SB14		AA2-SB14		AA2-SB15		AA2-SB15	
Associated Site:		AA2		AA2		AA2		AA2		AA2	
Sample No:		6560		6570		6580		6590		6600	
Sample Date:		27-APR-98		27-APR-98		27-APR-98		27-APR-98		27-APR-98	
Depth:		2-4		0-1		4-6		0-1		2-4	
SEMIVOLATILES	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
BENZO(a)ANTHRACENE	ug/kg	110	J	390	U	410	U	410	U	400	U
BENZO(a)PYRENE	ug/kg	110	J	390	U	410	U	410	U	400	U
BENZO(b)FLUORANTHENE	ug/kg	95	J	390	U	410	U	410	U	400	U
BENZO(ghi)PERYLENE	ug/kg	37	J	390	U	410	U	410	U	400	U
BENZO(k)FLUORANTHENE	ug/kg	120	J	390	U	410	U	410	U	400	U
BIS(2-CHLOROETHOXY)METHANE	ug/kg	390	U	390	U	410	U	410	U	400	U
BIS(2-CHLOROETHYL)ETHER	ug/kg	390	U	390	U	410	U	410	U	400	U
BIS(2-CHLOROISOPROPYL)ETHER	ug/kg	390	U	390	U	410	U	410	U	400	U
BIS(2-ETHYLHEXYL)PHTHALATE	ug/kg	51	J	39	J	58	J	45	J	41	J
BUTYL BENZYL PHTHALATE	ug/kg	390	U	390	U	410	U	410	U	400	U
CARBAZOLE	ug/kg	390	U	390	U	410	U	410	U	400	U
CHRYSENE	ug/kg	120	J	390	U	410	U	410	U	400	U
DI-n-BUTYL PHTHALATE	ug/kg	390	U	390	U	410	U	410	U	400	U
DI-n-OCTYL PHTHALATE	ug/kg	390	U	390	U	410	U	410	U	400	U
DIBENZ(a,h)ANTHRACENE	ug/kg	390	U	390	U	410	U	410	U	400	U
DIBENZOFURAN	ug/kg	390	U	390	U	410	U	410	U	400	U
DIETHYL PHTHALATE	ug/kg	390	U	390	U	410	U	410	U	400	U
DIMETHYL PHTHALATE	ug/kg	390	U	390	U	410	U	410	U	400	U
FLUORANTHENE	ug/kg	210	J	390	U	410	U	410	U	400	U
FLUORENE	ug/kg	390	U	390	U	410	U	410	U	400	U
HEXACHLOROBENZENE	ug/kg	390	U	390	U	410	U	410	U	400	U
HEXACHLOROBUTADIENE	ug/kg	390	U	390	U	410	U	410	U	400	U
HEXACHLOROCYCLOPENTADIENE	ug/kg	1900	U	1900	U	2000	U	2000	U	2000	U
HEXACHLOROETHANE	ug/kg	390	U	390	U	410	U	410	U	400	U
INDENO(1,2,3-cd)PYRENE	ug/kg	45	J	390	U	410	U	410	U	400	U
ISOPHORONE	ug/kg	390	U	390	U	410	U	410	U	400	U
N-NITROSO-DI-n-PROPYLAMINE	ug/kg	390	U	390	U	410	U	410	U	400	U
N-NITROSODIPHENYLAMINE	ug/kg	390	U	390	U	410	U	410	U	400	U
NAPHTHALENE	ug/kg	390	U	390	U	410	U	410	U	400	U
NITROBENZE[illegible]	ug/kg	390	U	390	U	410	U	410	U	[illegible]00	U

Sample Location:		AA2-SB01		AA2-SB01		AA2-SB02		AA2-SB02		AA2-SB03	
Associated Site:		AA2		AA2		AA2		AA2		AA2	
Sample No:		6310		6320		6330		6340		6350	
Sample Date:		27-APR-98		27-APR-98		28-APR-98		28-APR-98		27-APR-98	
Depth:		0-1		6-8		0-1		2-4		0-1	
SEMIVOLATILES	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
PENTACHLOROPHENOL	ug/kg	1900	U	2000	U	1900	U	2100	U	1900	U
PHENANTHRENE	ug/kg	400	U	410	U	400	U	420	U	7100	D
PHENOL	ug/kg	400	U	410	U	400	U	420	U	400	U
PYRENE	ug/kg	110	J	410	U	58	J	420	U	15000	D

Sample Location:		AA2-SB03		AA2-SB04		AA2-SB04		AA2-SB05		AA2-SB05	
Associated Site:		AA2		AA2		AA2		AA2		AA2	
Sample No:		6360		6370		6380		6390		6400	
Sample Date:		27-APR-98		27-APR-98		27-APR-98		28-APR-98		28-APR-98	
Depth:		4-6		0-1		8-10		0-1		4-6	
SEMIVOLATILES	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
PENTACHLOROPHENOL	ug/kg	2000	U	1900	U	2000	U	2000	U	2000	U
PHENANTHRENE	ug/kg	410	U	400	U	400	U	400	U	400	U
PHENOL	ug/kg	410	U	400	U	400	U	400	U	400	U
PYRENE	ug/kg	410	U	400	U	400	U	400	U	400	U

Report Date: 07/27/98

Sample Location:		AA2-SB06		AA2-SB06		AA2-SB07		AA2-SB07		AA2-SB08	
Associated Site:		AA2		AA2		AA2		AA2		AA2	
Sample No:		6410		6420		6430		6440		6450	
Sample Date:		28-APR-98		28-APR-98		28-APR-98		28-APR-98		28-APR-98	
Depth:		0-1		4-5.5		0-1		4-6		0-1	
SEMIVOLATILES	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
PENTACHLOROPHENOL	ug/kg	1900	U	2000	U	1900	U	2000	U	1800	U
PHENANTHRENE	ug/kg	68	J	400	U	390	U	410	U	380	U
PHENOL	ug/kg	400	U	400	U	390	U	410	U	380	U
PYRENE	ug/kg	260	J	400	U	390	U	410	U	380	U

Sample Location:		AA2-SB08		AA2-SB09		AA2-SB09		AA2-SB10		AA2-SB10	
Associated Site:		AA2		AA2		AA2		AA2		AA2	
Sample No:		6460		6470		6480		6490		6500	
Sample Date:		28-APR-98		28-APR-98		28-APR-98		28-APR-98		28-APR-98	
Depth:		6-8		0-1		4-6		0-1		8-10	
SEMIVOLATILES	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
PENTACHLOROPHENOL	ug/kg	2100	U	2000	U	2000	U	2000	U	2000	U
PHENANTHRENE	ug/kg	420	U	410	U	410	U	410	U	420	U
PHENOL	ug/kg	420	U	410	U	410	U	410	U	420	U
PYRENE	ug/kg	420	U	410	U	410	U	410	U	420	U

Report Date: 07/27/98

Sample Location:		AA2-SB11		AA2-SB11		AA2-SB12		AA2-SB12		AA2-SB13	
Associated Site:		AA2		AA2		AA2		AA2		AA2	
Sample No:		6510		6520		6530		6540		6550	
Sample Date:		28-APR-98		28-APR-98		28-APR-98		28-APR-98		27-APR-98	
Depth:		0-1		2-4		0-1		6-8		0-1	
SEMIVOLATILES	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
PENTACHLOROPHENOL	ug/kg	1900	U	2000	U	2000	U	2000	U	2000	U
PHENANTHRENE	ug/kg	73	J	400	U	400	U	420	U	47	J
PHENOL	ug/kg	380	U	400	U	400	U	420	U	410	U
PYRENE	ug/kg	190	J	400	U	400	U	420	U	160	J

Sample Location:		AA2-SB13		AA2-SB14		AA2-SB14		AA2-SB15		AA2-SB15	
Associated Site:		AA2		AA2		AA2		AA2		AA2	
Sample No:		6560		6570		6580		6590		6600	
Sample Date:		27-APR-98		27-APR-98		27-APR-98		27-APR-98		27-APR-98	
Depth:		2-4		0-1		4-6		0-1		2-4	
SEMIVOLATILES	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
PENTACHLOROPHENOL	ug/kg	1900	U	1900	U	2000	U	2000	U	2000	U
PHENANTHRENE	ug/kg	71	J	390	U	410	U	410	U	400	U
PHENOL	ug/kg	390	U	390	U	410	U	410	U	400	U
PYRENE	ug/kg	170	J	390	U	410	U	410	U	400	U

Sample Location:		AA2-SB01		AA2-SB02		AA2-SB03		AA2-SB04		AA2-SB05	
Associated Site:		AA2		AA2		AA2		AA2		AA2	
Sample No:		6310		6330		6350		6370		6390	
Sample Date:		27-APR-98		28-APR-98		27-APR-98		27-APR-98		28-APR-98	
Depth:		0-1		0-1		0-1		0-1		0-1	
PCBS	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
AROCLOR 1016	ug/kg	2000	U	40	U	400	U	40	U	40	U
AROCLOR 1221	ug/kg	2000	U	40	U	400	U	40	U	40	U
AROCLOR 1232	ug/kg	2000	U	40	U	400	U	40	U	40	U
AROCLOR 1242	ug/kg	2000	U	40	U	400	U	40	U	40	U
AROCLOR 1248	ug/kg	2000	U	40	U	400	U	40	U	40	U
AROCLOR 1254	ug/kg	7300	U	40	U	2300	U	40	U	40	U
AROCLOR 1260	ug/kg	20000		260		7800		40	U	40	U

Sample Location:		AA2-SB06		AA2-SB07		AA2-SB08		AA2-SB09		AA2-SB10	
Associated Site:		AA2		AA2		AA2		AA2		AA2	
Sample No:		6410		6430		6450		6470		6490	
Sample Date:		28-APR-98		28-APR-98		28-APR-98		28-APR-98		28-APR-98	
Depth:		0-1		0-1		0-1		0-1		0-1	
PCBS	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
AROCLOR 1016	ug/kg	400	U	39	U	38	U	41	U	200	U
AROCLOR 1221	ug/kg	400	U	39	U	38	U	41	U	200	U
AROCLOR 1232	ug/kg	400	U	39	U	38	U	41	U	200	U
AROCLOR 1242	ug/kg	400	U	39	U	38	U	41	U	200	U
AROCLOR 1248	ug/kg	400	U	39	U	38	U	41	U	200	U
AROCLOR 1254	ug/kg	1400	U	39	U	38	U	41	U	1500	U
AROCLOR 1260	ug/kg	3600		39	U	38	U	41	U	1500	

Report Date: 07/27/98

Sample Location:		AA2-SB11		AA2-SB12		AA2-SB13		AA2-SB14		AA2-SB15	
Associated Site:		AA2		AA2		AA2		AA2		AA2	
Sample No:		6510		6530		6550		6570		6590	
Sample Date:		28-APR-98		28-APR-98		27-APR-98		27-APR-98		27-APR-98	
Depth:		0-1		0-1		0-1		0-1		0-1	
PCBS	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
AROCLOR 1016	ug/kg	38	U	40	U	820	U	39	U	41	U
AROCLOR 1221	ug/kg	38	U	40	U	820	U	39	U	41	U
AROCLOR 1232	ug/kg	38	U	40	U	820	U	39	U	41	U
AROCLOR 1242	ug/kg	38	U	40	U	820	U	39	U	41	U
AROCLOR 1248	ug/kg	38	U	40	U	820	U	39	U	41	U
AROCLOR 1254	ug/kg	38	U	40	U	4800	U	39	U	41	U
AROCLOR 1260	ug/kg	240		40	U	9800		45		47	

Sample Location:		AA2-SB01		AA2-SB01		AA2-SB02		AA2-SB02		AA2-SB03	
Associated Site:		AA2		AA2		AA2		AA2		AA2	
Sample No:		6310		6320		6330		6340		6350	
Sample Date:		27-APR-98		27-APR-98		28-APR-98		28-APR-98		27-APR-98	
Depth:		0-1		6-8		0-1		2-4		0-1	
NITRATE	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
NITRATE	mg/kg	6.0	UJ	6.2	UJ	6.1	UJ	6.4	UJ	6.0	UJ

Sample Location.		AA2-SB03		AA2-SB04		AA2-SB04		AA2-SB05		AA2-SB05	
Associated Site:		AA2		AA2		AA2		AA2		AA2	
Sample No:		6360		6370		6380		6390		6400	
Sample Date:		27-APR-98		27-APR-98		27-APR-98		28-APR-98		28-APR-98	
Depth:		4-6		0-1		8-10		0-1		4-6	
NITRATE	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
NITRATE	mg/kg	6.2	UJ	6.1	UJ	6.1	UJ	6.1	UJ	6.1	UJ

PLUMBROOK

Acid Area 2

Data Summary - Soils

Report Date: 07/27/98

Sample Location:		AA2-SB06		AA2-SB06		AA2-SB07		AA2-SB07		AA2-SB08	
Associated Site:		AA2		AA2		AA2		AA2		AA2	
Sample No:		6410		6420		6430		6440		6450	
Sample Date:		28-APR-98		28-APR-98		28-APR-98		28-APR-98		28-APR-98	
Depth:		0-1		4-5.5		0-1		4-6		0-1	
NITRATE	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
NITRATE	mg/kg	6.1	UJ	6.1	UJ	6.0	UJ	6.2	UJ	5.7	UJ

Sample Location:		AA2-SB08		AA2-SB09		AA2-SB09		AA2-SB10		AA2-SB10	
Associated Site:		AA2		AA2		AA2		AA2		AA2	
Sample No:		6460		6470		6480		6490		6500	
Sample Date:		28-APR-98		28-APR-98		28-APR-98		28-APR-98		28-APR-98	
Depth:		6-8		0-1		4-6		0-1		8-10	
NITRATE	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
NITRATE	mg/kg	6.4	UJ	6.2	UJ	6.2	UJ	6.2	UJ	6.3	UJ

Sample Location:		AA2-SB11		AA2-SB11		AA2-SB12		AA2-SB12		AA2-SB13	
Associated Site:		AA2		AA2		AA2		AA2		AA2	
Sample No:		6510		6520		6530		6540		6550	
Sample Date:		28-APR-98		28-APR-98		28-APR-98		28-APR-98		27-APR-98	
Depth:		0-1		2-4		0-1		6-8		0-1	
NITRATE	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
NITRATE	mg/kg	5.8	UJ	6.1	UJ	6.1	UJ	6.3	UJ	6.2	UJ

Report Date: 07/27/98

Sample Location:		AA2-SB13		AA2-SB14		AA2-SB14		AA2-SB15		AA2-SB15	
Associated Site:		AA2		AA2		AA2		AA2		AA2	
Sample No:		6560		6570		6580		6590		6600	
Sample Date:		27-APR-98		27-APR-98		27-APR-98		27-APR-98		27-APR-98	
Depth:		2-4		0-1		4-6		0-1		2-4	
NITRATE	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
NITRATE	mg/kg	6.0	UJ	5.9	UJ	6.2	UJ	6.2	UJ	6.1	UJ

Sample Location:		AA2-SB01		AA2-SB01		AA2-SB02		AA2-SB02		AA2-SB03	
Associated Site:		AA2		AA2		AA2		AA2		AA2	
Sample No:		6310		6320		6330		6340		6350	
Sample Date:		27-APR-98		27-APR-98		28-APR-98		28-APR-98		27-APR-98	
Depth:		0-1		6-8		0-1		2-4		0-1	
METALS	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
ALUMINUM	mg/kg	9320		9550		5390		12800		4230	
ANTIMONY	mg/kg	7.2	UJ	7.5	UJ	7.3	UJ	7.7	UJ	7.2	UJ
ARSENIC	mg/kg	7.2		6.7		4.9		8.0		19.3	
BARIUM	mg/kg	84.4		57.4		28.3		63.7		188	
BERYLLIUM	mg/kg	0.60	U	0.62	U	0.61	U	0.69		0.60	U
CADMIUM	mg/kg	0.62		0.62	U	0.61	U	0.64	U	1.3	
CALCIUM	mg/kg	7440		47900		1800	J	7150	J	104000	
CHROMIUM	mg/kg	20.8		13.8		11.0		20.3		14.6	
COBALT	mg/kg	10.6		12.5		6.1	U	12.9		7.7	
COPPER	mg/kg	19.6		21.6		9.2		22.8		70.4	
IRON	mg/kg	20000		21300		15200		24300		36100	
LEAD	mg/kg	143		8.0		71.2		9.7		7410	
MAGNESIUM	mg/kg	3280		15200		912		7010		9770	
MANGANESE	mg/kg	488		889		109		322		1010	
MERCURY	mg/kg	0.040	U	0.041	U	0.040	U	0.042	U	0.069	
NICKEL	mg/kg	22.7		24.4		9.4		28.8		21.8	
POTASSIUM	mg/kg	1450		2160		609	U	1690		744	
SELENIUM	mg/kg	0.66		0.62	U	0.61	U	0.64	U	6.0	U
SILVER	mg/kg	1.2	U	1.2	U	1.2	U	1.3	U	1.2	U
SODIUM	mg/kg	600	U	624	U	609	U	641	U	600	U
THALLIUM	mg/kg	1.2	U	1.2	U	1.2	U	1.3	U	12.0	U
VANADIUM	mg/kg	23.1		26.5		23.3		25.5		32.7	
ZINC	mg/kg	252		58.1		38.3	J	75.9	J	336	

Sample Location:		AA2-SB03		AA2-SB04		AA2-SB04		AA2-SB05		AA2-SB05	
Associated Site:		AA2		AA2		AA2		AA2		AA2	
Sample No:		6360		6370		6380		6390		6400	
Sample Date:		27-APR-98		27-APR-98		27-APR-98		28-APR-98		28-APR-98	
Depth:		4-6		0-1		8-10		0-1		4-6	
METALS	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
ALUMINUM	mg/kg	10900		10900		12700		10700		13100	
ANTIMONY	mg/kg	7.4	UJ	7.3	UJ	7.3	UJ	7.4	UJ	7.4	UJ
ARSENIC	mg/kg	10.4		8.3		9.1		7.3		8.9	
BARIUM	mg/kg	65.1		54.0		69.2		72.4		68.1	
BERYLLIUM	mg/kg	0.62	U	0.61		0.70		0.61	U	0.64	
CADMIUM	mg/kg	0.62	U	0.61	U	0.61	U	0.61	U	0.61	U
CALCIUM	mg/kg	57200		1870		44600		3710	J	3910	J
CHROMIUM	mg/kg	16.2		16.0		19.8		15.7		19.9	
COBALT	mg/kg	11.0		11.2		12.9		11.8		10.3	
COPPER	mg/kg	23.0		21.0		27.3		26.0		14.8	
IRON	mg/kg	21400		22200		24100		21100		25700	
LEAD	mg/kg	10.5		8.1		12.5		11.8		10.2	
MAGNESIUM	mg/kg	16800		2730		18800		2450		4420	
MANGANESE	mg/kg	479		170		299		197		138	
MERCURY	mg/kg	0.041	U	0.040	U	0.040	U	0.040		0.047	
NICKEL	mg/kg	27.8		24.9		32.9		20.6		22.9	
POTASSIUM	mg/kg	2300		1190		2890		1330		2230	
SELENIUM	mg/kg	0.62	U	0.61	U	1.5		0.80		0.61	U
SILVER	mg/kg	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U
SODIUM	mg/kg	619	U	607	U	612	U	613	U	613	U
THALLIUM	mg/kg	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U
VANADIUM	mg/kg	26.1		23.3		33.4		24.8		24.0	
ZINC	mg/kg	68.0		60.1		71.7		71.7	J	84.3	J

PLUMBROOK

Acid Area 2

Data Summary - Soils

Report Date: 07/27/98

Sample Location:		AA2-SB06		AA2-SB06		AA2-SB07		AA2-SB07		AA2-SB08	
Associated Site:		AA2		AA2		AA2		AA2		AA2	
Sample No:		6410		6420		6430		6440		6450	
Sample Date:		28-APR-98		28-APR-98		28-APR-98		28-APR-98		28-APR-98	
Depth:		0-1		4-5.5		0-1		4-6		0-1	
METALS	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
ALUMINUM	mg/kg	9320		11100		10200		9690		18400	
ANTIMONY	mg/kg	7.3	UJ	7.3	UJ	7.1	UJ	7.5	UJ	6.9	UJ
ARSENIC	mg/kg	6.5		9.6		5.8		13.9		7.7	
BARIUM	mg/kg	54.6		65.2		42.3		59.2		98.6	
BERYLLIUM	mg/kg	0.61	U	0.61	U	0.60	U	0.62	U	0.86	
CADMIUM	mg/kg	0.61	U	0.61	U	0.60	U	0.62	U	0.57	U
CALCIUM	mg/kg	9350	J	63000	J	5160	J	54000	J	3670	J
CHROMIUM	mg/kg	14.9		17.2		15.0		15.6		23.7	
COBALT	mg/kg	9.7		10.9		11.3		10.2		11.9	
COPPER	mg/kg	14.9		26.5		12.5		24.4		18.2	
IRON	mg/kg	18300		23500		18500		23500		25600	
LEAD	mg/kg	40.1		10.6		7.7		9.0		13.2	
MAGNESIUM	mg/kg	3270		14800		2750		16900		3710	
MANGANESE	mg/kg	320		360		286		507		191	
MERCURY	mg/kg	0.040	U	0.040	U	0.039	U	0.041	U	0.040	
NICKEL	mg/kg	16.5		23.8		16.4		29.2		25.0	
POTASSIUM	mg/kg	987		1800		1000		1710		1850	
SELENIUM	mg/kg	0.78		0.61	U	0.72		0.62	U	0.73	
SILVER	mg/kg	1.2	U	1.2	U	1.2	U	1.2	U	1.1	U
SODIUM	mg/kg	607	U	611	U	595	U	625	U	573	U
THALLIUM	mg/kg	1.2	U	1.2	U	1.2	U	1.2	U	1.1	U
VANADIUM	mg/kg	23.5		27.1		24.8		26.7		35.3	
ZINC	mg/kg	112	J	68.1	J	37.6	J	61.8	J	59.9	J

Sample Location:		AA2-SB08		AA2-SB09		AA2-SB09		AA2-SB10		AA2-SB10	
Associated Site:		AA2		AA2		AA2		AA2		AA2	
Sample No:		6460		6470		6480		6490		6500	
Sample Date:		28-APR-98		28-APR-98		28-APR-98		28-APR-98		28-APR-98	
Depth:		6-8		0-1		4-6		0-1		8-10	
METALS	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
ALUMINUM	mg/kg	10800		9060		12800		7090		8660	
ANTIMONY	mg/kg	7.7	UJ	7.4	UJ	7.4	UJ	7.4	UJ	7.6	UJ
ARSENIC	mg/kg	5.6		7.0		4.2		4.4		10.4	
BARIUM	mg/kg	59.4		26.3		57.5		59.1		107	
BERYLLIUM	mg/kg	0.64	U	0.62	U	0.62		0.62	U	0.63	U
CADMIUM	mg/kg	0.64	U	0.62	U	0.62	U	0.62	U	0.63	U
CALCIUM	mg/kg	55300	J	1620	J	55300	J	3030	J	58100	J
CHROMIUM	mg/kg	16.9		15.1		19.3		10.2		13.1	
COBALT	mg/kg	9.3		8.8		11.6		6.9		12.6	
COPPER	mg/kg	22.5		13.5		24.1		11.5		23.1	
IRON	mg/kg	20300		20200		21900		14600		21600	
LEAD	mg/kg	9.7		7.0		10.4		20.4		10.0	
MAGNESIUM	mg/kg	17200		2190		15000		1780		16900	
MANGANESE	mg/kg	309		309		465		284		713	
MERCURY	mg/kg	0.042	U	0.046		0.041	U	0.041	U	0.042	U
NICKEL	mg/kg	23.3		15.7		27.1		14.4		28.1	
POTASSIUM	mg/kg	2120		835		2640		669		2010	
SELENIUM	mg/kg	0.64	U	0.62	U	0.62	U	0.62	U	0.63	U
SILVER	mg/kg	1.3	U	1.2	U	1.2	U	1.2	U	1.3	U
SODIUM	mg/kg	644	U	620	U	620	U	617	U	631	U
THALLIUM	mg/kg	1.3	U	1.2	U	1.2	U	1.2	U	1.3	U
VANADIUM	mg/kg	26.8		26.7		30.0		17.5		23.5	
ZINC	mg/kg	65.2	J	39.1	J	69.2	J	84.1	J	56.7	J

Sample Location:		AA2-SB11		AA2-SB11		AA2-SB12		AA2-SB12		AA2-SB13	
Associated Site:		AA2		AA2		AA2		AA2		AA2	
Sample No:		6510		6520		6530		6540		6550	
Sample Date:		28-APR-98		28-APR-98		28-APR-98		28-APR-98		27-APR-98	
Depth:		0-1		2-4		0-1		6-8		0-1	
METALS	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
ALUMINUM	mg/kg	7230		14200		10900		11000		6740	
ANTIMONY	mg/kg	7.0	UJ	7.4	UJ	7.3	UJ	7.6	UJ	7.4	UJ
ARSENIC	mg/kg	4.2		9.5		5.4		7.0		4.6	
BARIUM	mg/kg	43.0		78.5		64.5		81.0		44.6	
BERYLLIUM	mg/kg	0.58	U	0.80		0.61	U	0.63	U	0.62	U
CADMIUM	mg/kg	0.58	U	0.61	U	0.61	U	0.63	U	0.62	U
CALCIUM	mg/kg	2990	J	3980	J	4970	J	48400	J	7890	
CHROMIUM	mg/kg	9.0		21.4		14.6		16.0		10.5	
COBALT	mg/kg	6.4		10.3		8.6		17.3		6.4	
COPPER	mg/kg	7.4		23.4		12.7		26.2		8.6	
IRON	mg/kg	12200		27300		17100		24200		12700	
LEAD	mg/kg	8.1		11.8		8.7		12.2		28.8	
MAGNESIUM	mg/kg	1860		4120		2660		18100		2070	
MANGANESE	mg/kg	256		253		208		644		214	
MERCURY	mg/kg	0.038	U	0.040	U	0.040	U	0.042	U	0.041	U
NICKEL	mg/kg	11.0		25.4		17.0		39.2		11.4	
POTASSIUM	mg/kg	587		1330		896		2430		618	U
SELENIUM	mg/kg	0.59		0.61	U	0.61	U	0.63	U	0.62	U
SILVER	mg/kg	1.2	U	1.2	U	1.2	U	1.3	U	1.2	U
SODIUM	mg/kg	583	U	613	U	611	U	631	U	618	U
THALLIUM	mg/kg	1.2	U	1.2	U	1.2	U	1.3	U	1.2	U
VANADIUM	mg/kg	17.3		32.2		25.3		28.1		18.8	
ZINC	mg/kg	33.4	J	63.7	J	44.7	J	68.8	J	66.5	

Sample Location:		AA2-SB13		AA2-SB14		AA2-SB14		AA2-SB15		AA2-SB15	
Associated Site:		AA2		AA2		AA2		AA2		AA2	
Sample No:		6560		6570		6580		6590		6600	
Sample Date:		27-APR-98		27-APR-98		27-APR-98		27-APR-98		27-APR-98	
Depth:		2-4		0-1		4-6		0-1		2-4	
METALS	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
ALUMINUM	mg/kg	8590		7880		13200		12500		9230	
ANTIMONY	mg/kg	7.2	UJ	7.0	UJ	7.4	UJ	7.5	UJ	7.3	UJ
ARSENIC	mg/kg	7.2		3.6		16.5		6.0		7.6	
BARIUM	mg/kg	89.2		43.1		61.9		83.1		51.0	
BERYLLIUM	mg/kg	0.60	U	0.59	U	0.70		0.64		0.61	U
CADMIUM	mg/kg	0.77		0.59	U	0.62	U	0.62	U	0.61	U
CALCIUM	mg/kg	25200		1950		56700		4580		24000	
CHROMIUM	mg/kg	19.0		11.5		18.8		17.2		14.9	
COBALT	mg/kg	9.5		6.2		14.6		10.1		9.6	
COPPER	mg/kg	17.4		6.4		27.5		19.2		17.7	
IRON	mg/kg	19600		13800		25200		21700		19100	
LEAD	mg/kg	113		5.8		11.7		9.1		7.9	
MAGNESIUM	mg/kg	5340		1590		16700		2990		12500	
MANGANESE	mg/kg	415		118		373		211		285	
MERCURY	mg/kg	0.039	U	0.039	U	0.041	U	0.041	U	0.040	U
NICKEL	mg/kg	20.6		10.2		27.3		19.0		20.4	
POTASSIUM	mg/kg	1120		586	U	2730		1200		1150	
SELENIUM	mg/kg	0.60	U	0.61		0.62	U	0.82		0.61	U
SILVER	mg/kg	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U
SODIUM	mg/kg	596	U	586	U	620	U	622	U	611	U
THALLIUM	mg/kg	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U
VANADIUM	mg/kg	21.4		19.9		34.7		24.5		24.2	
ZINC	mg/kg	304		31.7		69.0		72.3		73.9	

Sample Location:		AA2-SB06		AA2-SB06		AA2-SB07		AA2-SB07	
Associated Site:		AA2		AA2		AA2		AA2	
Sample No:		6410		6420		6430		6440	
Sample Date:		28-APR-98		28-APR-98		28-APR-98		28-APR-98	
Depth:		0-1		4-5.5		0-1		4-6	
EXPLOSIVES	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
1,3,5-TRINITROBENZENE	ug/kg	250	U	250	U	250	U	250	U
1,3-DINITROBENZENE	ug/kg	250	U	250	U	250	U	250	U
2,4,6-TRINITROTOLUENE	ug/kg	250	U	250	U	250	U	250	U
2,4-DINITROTOLUENE	ug/kg	250	U	250	U	250	U	250	U
2,6-DINITROTOLUENE	ug/kg	250	U	250	U	250	U	250	U
2-NITROTOLUENE	ug/kg	250	U	250	U	250	U	250	U
3-NITROTOLUENE	ug/kg	250	U	250	U	250	U	250	U
4-AMINO-2,6-DINITROTOLUENE	ug/kg	250	U	250	U	250	U	250	U
HMX	ug/kg	500	U	500	U	500	U	500	U
NITROBENZENE	ug/kg	250	U	250	U	250	U	250	U
RDX	ug/kg	500	U	500	U	500	U	500	U
TETRYL	ug/kg	650	U	650	U	650	U	650	U

PLUM...OOK

Acid Area 3. Maintenance Shop. and Power Substation Areas

Data Summary - Soils

Report Date: 07/27/98

Sample Location:		AA3-SB01		AA3-SB01		AA3-SB02		AA3-SB02		AA3-SB03	
Associated Site:		AA3		AA3		AA3		AA3		AA3	
Sample No:		6610		6620		6630		6640		6650	
Sample Date:		03-MAY-98		03-MAY-98		01-MAY-98		01-MAY-98		01-MAY-98	
Depth:		0-1		6-8		0-1		6-8		0-1	
pH	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
pH	STD UNIT	7.4	J	7.6	J	7.8	J	8.0	J	8.0	J

PLUMBROOK

Acid Area 3. Maintenance Shop, and Power Substation Areas

Data Summary - Soils

Report Date: 07/27/98

Sample Location:		AA3-SB03		AA3-SB04		AA3-SB04		AA3-SB05		AA3-SB05	
Associated Site:		AA3		AA3		AA3		AA3		AA3	
Sample No:		6660		6670		6680		6690		6700	
Sample Date:		01-MAY-98		01-MAY-98		01-MAY-98		01-MAY-98		01-MAY-98	
Depth:		6-8		0-1		8-10		0-1		8-10	
pH	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
pH	STD UNIT	7.9	J	7.9	J	7.9	J	7.5	J	7.8	J

PLUMBROOK

Acid Area 3, Maintenance Shop, and Power Substation Areas

Data Summary - Soils

Report Date: 07/27/98

Sample Location:		AA3-SB06		AA3-SB06		AA3-SB07		AA3-SB07		AA3-SB08	
Associated Site:		AA3		AA3		AA3		AA3		AA3	
Sample No:		6710		6720		6730		6740		6750	
Sample Date:		01-MAY-98		01-MAY-98		01-MAY-98		01-MAY-98		01-MAY-98	
Depth:		0-1		4-6		0-1		2-4		0-1	
pH	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
pH	STD UNIT	7.4	J	8.1	J	8.5	J	8.3	J	7.7	J

PLUMBROOK

Acid Area 3. Maintenance Shop. and Power Substation Areas

Data Summary - Soils

Report Date: 07/27/98

Sample Location:		AA3-SB08		AA3-SB09		AA3-SB09		AA3-SB10		AA3-SB10	
Associated Site:		AA3		AA3		AA3		AA3		AA3	
Sample No:		6760		6770		6780		6790		6800	
Sample Date:		01-MAY-98		02-MAY-98		02-MAY-98		02-MAY-98		02-MAY-98	
Depth:		4-6		0-1		8-10		0-1		6-8	
pH	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
pH	STD UNIT	7.4	J	7.4	J	7.5	J	7.9	J	7.9	J

PLUMBROOK

Acid Area 3, Maintenance Shop, and Power Substation Areas

Data Summary - Soils

Report Date: 07/27/98

Sample Location:		AA3-SB11		AA3-SB11		AA3-SB12		AA3-SB12		AA3-SB13	
Associated Site:		AA3		AA3		AA3		AA3		AA3	
Sample No:		6810		6820		6830		6840		6850	
Sample Date:		30-APR-98		30-APR-98		01-MAY-98		01-MAY-98		01-MAY-98	
Depth:		0-1		2-4		0-1		2-4		0-1	
pH	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
pH	STD UNIT	7.5	J	7.8	J	7.5	J	7.8	J	7.8	J

PLUMBROOK

Acid Area 3, Maintenance Shop, and Power Substation Areas

Data Summary - Soils

Report Date: 07/27/98

Sample Location:		AA3-SB13		AA3-SB14		AA3-SB14		AA3-SB15		AA3-SB15	
Associated Site:		AA3		AA3		AA3		AA3		AA3	
Sample No:		6860		6870		6880		6890		6900	
Sample Date:		01-MAY-98		01-MAY-98		01-MAY-98		01-MAY-98		01-MAY-98	
Depth:		8-10		0-1		2-4		0-1		6-8	
pH	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
pH	STD UNIT	7.6	J	7.8	J	7.7	J	8.0	J	7.8	J

Report Date: 07/27/98

Sample Location:		AA3-SB01		AA3-SB01		AA3-SB02		AA3-SB02		AA3-SB03	
Associated Site:		AA3		AA3		AA3		AA3		AA3	
Sample No:		6610		6620		6630		6640		6650	
Sample Date:		03-MAY-98		03-MAY-98		01-MAY-98		01-MAY-98		01-MAY-98	
Depth:		0-1		6-8		0-1		6-8		0-1	
VOLATILES	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfi
1,1,1-TRICHLOROETHANE	ug/kg	6.0	U	6.3	U	6.5	U	6.2	U	5.8	U
1,1,2,2-TETRACHLOROETHANE	ug/kg	6.0	UJ	6.3	UJ	6.5	UJ	6.2	UJ	5.8	U
1,1,2-TRICHLOROETHANE	ug/kg	6.0	U	6.3	U	6.5	U	6.2	U	5.8	U
1,1-DICHLOROETHANE	ug/kg	6.0	U	6.3	U	6.5	U	6.2	U	5.8	U
1,1-DICHLOROETHENE	ug/kg	6.0	U	6.3	U	6.5	U	6.2	U	5.8	U
1,2-DICHLOROETHANE	ug/kg	6.0	U	6.3	U	6.5	U	6.2	U	5.8	U
1,2-DICHLOROETHENE	ug/kg	6.0	U	6.3	U	6.5	U	6.2	U	5.8	U
1,2-DICHLOROPROPANE	ug/kg	6.0	U	6.3	U	6.5	U	6.2	U	5.8	U
2-BUTANONE	ug/kg	24	U	25	U	26	U	25	U	23	U
2-HEXANONE	ug/kg	24	U	25	U	26	U	25	U	23	U
4-METHYL-2-PENTANONE	ug/kg	24	U	25	U	26	U	25	U	23	U
ACETONE	ug/kg	24	U	25	U	26	U	22	J	23	U
BENZENE	ug/kg	6.0	U	6.3	U	6.5	U	6.2	U	5.8	U
BROMODICHLOROMETHANE	ug/kg	6.0	U	6.3	U	6.5	U	6.2	U	5.8	U
BROMOFORM	ug/kg	6.0	U	6.3	U	6.5	U	6.2	U	5.8	U
BROMOMETHANE	ug/kg	12	U	13	U	13	U	12	U	12	U
CARBON DISULFIDE	ug/kg	6.0	U	6.3	U	6.5	U	6.2	U	5.8	U
CARBON TETRACHLORIDE	ug/kg	6.0	U	6.3	U	6.5	U	6.2	U	5.8	U
CHLOROBENZENE	ug/kg	6.0	U	6.3	U	6.5	U	6.2	U	5.8	U
CHLOROETHANE	ug/kg	12	U	13	U	13	U	12	U	12	U
CHLOROFORM	ug/kg	6.0	U	6.3	U	6.5	U	6.2	U	5.8	U
CHLOROMETHANE	ug/kg	12	U	13	U	13	U	12	U	12	U
DIBROMOCHLOROMETHANE	ug/kg	6.0	U	6.3	U	6.5	U	6.2	U	5.8	U
ETHYLBENZENE	ug/kg	6.0	U	6.3	U	6.5	U	6.2	U	5.8	U
METHYLENE CHLORIDE	ug/kg	6.0	U	6.3	U	6.5	U	6.2	U	5.8	U
STYRENE	ug/kg	6.0	U	6.3	U	6.5	U	6.2	U	5.8	U
TETRACHLOROETHENE	ug/kg	6.0	U	6.3	U	6.5	U	6.2	U	5.8	U
TOLUENE	ug/kg	6.0	U	6.3	U	8.0		6.2	U	5.8	U
TOTAL XYLENES	ug/kg	6.0	U	6.3	U	6.5	U	6.2	U	5.8	U
TRICHLOROETHENE	ug/kg	6.0	U	6.3	U	6.5	U	6.2	U	5.8	U

PLUMBROOK

Acid Area 3, Maintenance Shop, and Power Substation Areas

Data Summary - Soils

Report Date: 07/27/98

Sample Location:		AA3-SB03		AA3-SB04		AA3-SB04		AA3-SB05		AA3-SB05	
Associated Site:		AA3		AA3		AA3		AA3		AA3	
Sample No:		6660		6670		6680		6690		6700	
Sample Date:		01-MAY-98		01-MAY-98		01-MAY-98		01-MAY-98		01-MAY-98	
Depth:		6-8		0-1		8-10		0-1		8-10	
VOLATILES	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
1,1,1-TRICHLOROETHANE	ug/kg	6.3	U	6.0	U	6.2	U	6.1	U	6.1	U
1,1,2,2-TETRACHLOROETHANE	ug/kg	6.3	U	6.0	U	6.2	U	6.1	U	6.1	UJ
1,1,2-TRICHLOROETHANE	ug/kg	6.3	U	6.0	U	6.2	U	6.1	U	6.1	U
1,1-DICHLOROETHANE	ug/kg	6.3	U	6.0	U	6.2	U	6.1	U	6.1	U
1,1-DICHLOROETHENE	ug/kg	6.3	U	6.0	U	6.2	U	6.1	U	6.1	U
1,2-DICHLOROETHANE	ug/kg	6.3	U	6.0	U	6.2	U	6.1	U	6.1	U
1,2-DICHLOROETHENE	ug/kg	6.3	U	6.0	U	6.2	U	6.1	U	6.1	U
1,2-DICHLOROPROPANE	ug/kg	6.3	U	6.0	U	6.2	U	6.1	U	6.1	U
2-BUTANONE	ug/kg	25	U	24	U	25	U	24	U	24	U
2-HEXANONE	ug/kg	25	U	24	U	25	U	24	U	24	U
4-METHYL-2-PENTANONE	ug/kg	25	U	24	U	25	U	24	U	24	U
ACETONE	ug/kg	33	U	24	U	42	U	24	U	250	
BENZENE	ug/kg	6.3	U	6.0	U	6.2	U	6.1	U	6.1	U
BROMODICHLOROMETHANE	ug/kg	6.3	U	6.0	U	6.2	U	6.1	U	6.1	U
BROMOFORM	ug/kg	6.3	U	6.0	U	6.2	U	6.1	U	6.1	U
BROMOMETHANE	ug/kg	13	U	12	U	12	U	12	U	12	U
CARBON DISULFIDE	ug/kg	6.3	U	6.0	U	2.3	J	6.1	U	6.1	U
CARBON TETRACHLORIDE	ug/kg	6.3	U	6.0	U	6.2	U	6.1	U	6.1	U
CHLOROBENZENE	ug/kg	6.3	U	6.0	U	6.2	U	6.1	U	6.1	U
CHLOROETHANE	ug/kg	13	U	12	U	12	U	12	U	12	U
CHLOROFORM	ug/kg	6.3	U	6.0	U	6.2	U	6.1	U	6.1	U
CHLOROMETHANE	ug/kg	13	U	12	U	12	U	12	U	12	U
DIBROMOCHLOROMETHANE	ug/kg	6.3	U	6.0	U	6.2	U	6.1	U	6.1	U
ETHYLBENZENE	ug/kg	6.3	U	6.0	U	6.2	U	6.1	U	6.1	U
METHYLENE CHLORIDE	ug/kg	6.3	U	6.0	U	6.2	U	6.1	U	6.1	U
STYRENE	ug/kg	6.3	U	6.0	U	6.2	U	6.1	U	6.1	U
TETRACHLOROETHENE	ug/kg	6.3	U	6.0	U	6.2	U	6.1	U	6.1	U
TOLUENE	ug/kg	6.3	U	6.0	U	6.2	U	6.1	U	6.1	U
TOTAL XYLENES	ug/kg	6.3	U	6.0	U	6.2	U	6.1	U	6.1	U
TRICHLORO[illegible]NE	ug/kg	6.3	U	6.0	U	6.2	U	6.1	U	[illegible]	U

PLUMBROOK

Acid Area 3, Maintenance Shop, and Power Substation Areas

Data Summary - Soils

Report Date: 07/27/98

Sample Location:		AA3-SB06		AA3-SB06		AA3-SB07		AA3-SB07		AA3-SB08	
Associated Site:		AA3		AA3		AA3		AA3		AA3	
Sample No:		6710		6720		6730		6740		6750	
Sample Date:		01-MAY-98		01-MAY-98		01-MAY-98		01-MAY-98		01-MAY-98	
Depth:		0-1		4-6		0-1		2-4		0-1	
VOLATILES	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
1,1,1-TRICHLOROETHANE	ug/kg	6.1	U	6.1	U	5.8	U	6.0	U	5.9	U
1,1,2,2-TETRACHLOROETHANE	ug/kg	6.1	U	6.1	UJ	5.8	U	6.0	U	5.9	U
1,1,2-TRICHLOROETHANE	ug/kg	6.1	U	6.1	UJ	5.8	U	6.0	U	5.9	U
1,1-DICHLOROETHANE	ug/kg	6.1	U	6.1	U	5.8	U	6.0	U	5.9	U
1,1-DICHLOROETHENE	ug/kg	6.1	U	6.1	U	5.8	U	6.0	U	5.9	U
1,2-DICHLOROETHANE	ug/kg	6.1	U	6.1	U	5.8	U	6.0	U	5.9	U
1,2-DICHLOROETHENE	ug/kg	6.1	U	6.1	U	5.8	U	6.0	U	5.9	U
1,2-DICHLOROPROPANE	ug/kg	6.1	U	6.1	UJ	5.8	U	6.0	U	5.9	U
2-BUTANONE	ug/kg	24	U	24	U	23	U	24	U	24	U
2-HEXANONE	ug/kg	24	U	24	UJ	23	U	24	U	24	U
4-METHYL-2-PENTANONE	ug/kg	24	U	24	UJ	23	U	24	U	24	U
ACETONE	ug/kg	24	U	24	U	23	U	24	U	24	U
BENZENE	ug/kg	6.1	U	6.1	UJ	5.8	U	6.0	U	5.9	U
BROMODICHLOROMETHANE	ug/kg	6.1	U	6.1	UJ	5.8	U	6.0	U	5.9	U
BROMOFORM	ug/kg	6.1	U	6.1	UJ	5.8	U	6.0	U	5.9	U
BROMOMETHANE	ug/kg	12	U	12	U	12	U	12	U	12	U
CARBON DISULFIDE	ug/kg	6.1	U	6.1	U	5.8	U	6.0	U	5.9	U
CARBON TETRACHLORIDE	ug/kg	6.1	U	6.1	UJ	5.8	U	6.0	U	5.9	U
CHLOROBENZENE	ug/kg	6.1	U	6.1	UJ	5.8	U	6.0	U	5.9	U
CHLOROETHANE	ug/kg	12	U	12	U	12	U	12	U	12	U
CHLOROFORM	ug/kg	6.1	U	6.1	U	5.8	U	6.0	U	5.9	U
CHLOROMETHANE	ug/kg	12	U	12	U	12	U	12	U	12	U
DIBROMOCHLOROMETHANE	ug/kg	6.1	U	6.1	UJ	5.8	U	6.0	U	5.9	U
ETHYLBENZENE	ug/kg	6.1	U	6.1	UJ	5.8	U	6.0	U	5.9	U
METHYLENE CHLORIDE	ug/kg	6.1	U	6.1	U	5.8	U	6.0	U	5.9	U
STYRENE	ug/kg	6.1	U	6.1	UJ	5.8	U	6.0	U	5.9	U
TETRACHLOROETHENE	ug/kg	6.1	U	6.1	UJ	5.8	U	6.0	U	5.9	U
TOLUENE	ug/kg	6.1	U	6.1	UJ	5.8	U	6.0	U	5.9	U
TOTAL XYLENES	ug/kg	6.1	U	6.1	UJ	5.8	U	6.0	U	5.9	U
TRICHLOROETHENE	ug/kg	6.1	U	6.1	UJ	5.8	U	6.0	U	5.9	U

PLUMBROOK

Acid Area 3. Maintenance Shop, and Power Substation Areas

Data Summary - Soils

Report Date: 07/27/98

Sample Location:		AA3-SB08		AA3-SB09		AA3-SB09		AA3-SB10		AA3-SB10	
Associated Site:		AA3		AA3		AA3		AA3		AA3	
Sample No:		6760		6770		6780		6790		6800	
Sample Date:		01-MAY-98		02-MAY-98		02-MAY-98		02-MAY-98		02-MAY-98	
Depth:		4-6		0-1		8-10		0-1		6-8	
VOLATILES	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
1,1,1-TRICHLOROETHANE	ug/kg	6.1	U	5.9	U	6.2	U	5.7	U	6.3	U
1,1,2,2-TETRACHLOROETHANE	ug/kg	6.1	U	5.9	U	6.2	UJ	5.7	U	6.3	U
1,1,2-TRICHLOROETHANE	ug/kg	6.1	U	5.9	U	6.2	UJ	5.7	U	6.3	U
1,1-DICHLOROETHANE	ug/kg	6.1	U	5.9	U	6.2	U	5.7	U	6.3	U
1,1-DICHLOROETHENE	ug/kg	6.1	U	5.9	U	6.2	U	5.7	U	6.3	U
1,2-DICHLOROETHANE	ug/kg	6.1	U	5.9	U	6.2	U	5.7	U	6.3	U
1,2-DICHLOROETHENE	ug/kg	6.1	U	5.9	U	6.2	U	5.7	U	6.3	U
1,2-DICHLOROPROPANE	ug/kg	6.1	U	5.9	U	6.2	UJ	5.7	U	6.3	U
2-BUTANONE	ug/kg	5.5	J	24	U	25	U	23	U	25	U
2-HEXANONE	ug/kg	24	U	24	U	25	UJ	23	U	25	U
4-METHYL-2-PENTANONE	ug/kg	24	U	24	U	25	UJ	23	U	25	U
ACETONE	ug/kg	33	U	24	U	35	U	23	U	25	U
BENZENE	ug/kg	6.1	U	5.9	U	6.2	UJ	5.7	U	6.3	U
BROMODICHLOROMETHANE	ug/kg	6.1	U	5.9	U	6.2	UJ	5.7	U	6.3	U
BROMOFORM	ug/kg	6.1	U	5.9	U	6.2	UJ	5.7	U	6.3	U
BROMOMETHANE	ug/kg	12	U	12	U	12	U	11	U	13	U
CARBON DISULFIDE	ug/kg	6.1	U	5.9	U	6.0	J	5.7	U	6.3	U
CARBON TETRACHLORIDE	ug/kg	6.1	U	5.9	U	6.2	UJ	5.7	U	6.3	U
CHLOROBENZENE	ug/kg	6.1	U	5.9	U	6.2	UJ	5.7	U	6.3	U
CHLOROETHANE	ug/kg	12	U	12	U	12	U	11	U	13	U
CHLOROFORM	ug/kg	6.1	U	5.9	U	6.2	U	5.7	U	6.3	U
CHLOROMETHANE	ug/kg	12	U	12	U	12	U	11	U	13	U
DIBROMOCHLOROMETHANE	ug/kg	6.1	U	5.9	U	6.2	UJ	5.7	U	6.3	U
ETHYLBENZENE	ug/kg	6.1	U	5.9	U	6.2	UJ	5.7	U	6.3	U
METHYLENE CHLORIDE	ug/kg	6.1	U	5.9	U	6.2	U	5.7	U	6.3	U
STYRENE	ug/kg	6.1	U	5.9	U	6.2	UJ	5.7	U	6.3	U
TETRACHLOROETHENE	ug/kg	6.1	U	5.9	U	6.2	UJ	5.7	U	6.3	U
TOLUENE	ug/kg	6.1	U	5.9	U	6.2	UJ	5.7	U	6.3	U
TOTAL XYLENES	ug/kg	6.5		5.9	U	6.2	UJ	5.7	U	6.3	U
TRICHLOROF[illegible]NE	ug/kg	6.1	U	5.9	U	6.2	UJ	5.7	U		U

PLUMBROOK

Acid Area 3, Maintenance Shop, and Power Substation Areas

Data Summary - Soils

Report Date: 07/27/98

Sample Location:		AA3-SB11		AA3-SB11		AA3-SB12		AA3-SB12		AA3-SB13	
Associated Site:		AA3		AA3		AA3		AA3		AA3	
Sample No:		6810		6820		6830		6840		6850	
Sample Date:		30-APR-98		30-APR-98		01-MAY-98		01-MAY-98		01-MAY-98	
Depth:		0-1		2-4		0-1		2-4		0-1	
VOLATILES	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
1,1,1-TRICHLOROETHANE	ug/kg	6.0	U	5.9	U	6.2	U	5.8	U	5.9	U
1,1,2,2-TETRACHLOROETHANE	ug/kg	6.0	U	5.9	U	6.2	UJ	5.8	U	5.9	U
1,1,2-TRICHLOROETHANE	ug/kg	6.0	U	5.9	U	6.2	U	5.8	U	5.9	U
1,1-DICHLOROETHANE	ug/kg	6.0	U	5.9	U	6.2	U	5.8	U	5.9	U
1,1-DICHLOROETHENE	ug/kg	6.0	U	5.9	U	6.2	U	5.8	U	5.9	U
1,2-DICHLOROETHANE	ug/kg	6.0	U	5.9	U	6.2	U	5.8	U	5.9	U
1,2-DICHLOROETHENE	ug/kg	6.0	U	5.9	U	6.2	U	5.8	U	5.9	U
1,2-DICHLOROPROPANE	ug/kg	6.0	U	5.9	U	6.2	U	5.8	U	5.9	U
2-BUTANONE	ug/kg	24	U	24	U	25	U	23	U	24	U
2-HEXANONE	ug/kg	24	U	24	U	25	U	23	U	24	U
4-METHYL-2-PENTANONE	ug/kg	24	U	24	U	25	U	23	U	24	U
ACETONE	ug/kg	24	U	24	U	25	U	23	U	7.4	J
BENZENE	ug/kg	6.0	U	5.9	U	6.2	U	5.8	U	5.9	U
BROMODICHLOROMETHANE	ug/kg	6.0	U	5.9	U	6.2	U	5.8	U	5.9	U
BROMOFORM	ug/kg	6.0	U	5.9	U	6.2	U	5.8	U	5.9	U
BROMOMETHANE	ug/kg	12	U	12	U	12	U	12	U	12	U
CARBON DISULFIDE	ug/kg	6.0	U	5.9	U	6.2	U	5.8	U	5.9	U
CARBON TETRACHLORIDE	ug/kg	6.0	U	5.9	U	6.2	U	5.8	U	5.9	U
CHLOROBENZENE	ug/kg	6.0	U	5.9	U	6.2	U	5.8	U	5.9	U
CHLOROETHANE	ug/kg	12	U	12	U	12	U	12	U	12	U
CHLOROFORM	ug/kg	6.0	U	5.9	U	6.2	U	5.8	U	5.9	U
CHLOROMETHANE	ug/kg	12	U	12	U	12	U	12	U	12	U
DIBROMOCHLOROMETHANE	ug/kg	6.0	U	5.9	U	6.2	U	5.8	U	5.9	U
ETHYLBENZENE	ug/kg	6.0	U	5.9	U	6.2	U	5.8	U	5.9	U
METHYLENE CHLORIDE	ug/kg	6.0	U	5.9	U	6.2	U	5.8	U	5.9	U
STYRENE	ug/kg	6.0	U	5.9	U	6.2	U	5.8	U	5.9	U
TETRACHLOROETHENE	ug/kg	6.0	U	5.9	U	6.2	U	5.8	U	5.9	U
TOLUENE	ug/kg	6.0	U	5.9	U	6.2	U	5.8	U	5.9	U
TOTAL XYLENES	ug/kg	6.0	U	5.9	U	6.2	U	5.8	U	5.9	U
TRICHLOROETHENE	ug/kg	6.0	U	5.9	U	6.2	U	5.8	U	5.9	U

PLUMBROOK

Acid Area 3, Maintenance Shop, and Power Substation Areas

Data Summary - Soils

Report Date: 07/27/98

Sample Location:		AA3-SB13		AA3-SB14		AA3-SB14		AA3-SB15		AA3-SB15	
Associated Site:		AA3		AA3		AA3		AA3		AA3	
Sample No:		6860		6870		6880		6890		6900	
Sample Date:		01-MAY-98		01-MAY-98		01-MAY-98		01-MAY-98		01-MAY-98	
Depth:		8-10		0-1		2-4		0-1		6-8	
VOLATILES	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
1,1,1-TRICHLOROETHANE	ug/kg	6.2	U	6.0	U	6.0	U	6.0	U	6.2	U
1,1,2,2-TETRACHLOROETHANE	ug/kg	6.2	UJ	6.0	U	6.0	U	6.0	U	6.2	U
1,1,2-TRICHLOROETHANE	ug/kg	6.2	UJ	6.0	U	6.0	U	6.0	U	6.2	U
1,1-DICHLOROETHANE	ug/kg	6.2	U	6.0	U	6.0	U	6.0	U	6.2	U
1,1-DICHLOROETHENE	ug/kg	6.2	U	6.0	U	6.0	U	6.0	U	6.2	U
1,2-DICHLOROETHANE	ug/kg	6.2	U	6.0	U	6.0	U	6.0	U	6.2	U
1,2-DICHLOROETHENE	ug/kg	6.2	U	6.0	U	6.0	U	6.0	U	6.2	U
1,2-DICHLOROPROPANE	ug/kg	6.2	UJ	6.0	U	6.0	U	6.0	U	6.2	U
2-BUTANONE	ug/kg	25	U	24	U	24	U	24	U	25	U
2-HEXANONE	ug/kg	25	UJ	24	U	24	U	24	U	25	U
4-METHYL-2-PENTANONE	ug/kg	25	UJ	24	U	24	U	24	U	25	U
ACETONE	ug/kg	19	J	24	U	68		24	U	25	U
BENZENE	ug/kg	6.2	U	6.0	U	6.0	U	6.0	U	6.2	U
BROMODICHLOROMETHANE	ug/kg	6.2	UJ	6.0	U	6.0	U	6.0	U	6.2	U
BROMOFORM	ug/kg	6.2	UJ	6.0	U	6.0	U	6.0	U	6.2	U
BROMOMETHANE	ug/kg	12	U	12	U	12	U	12	U	12	U
CARBON DISULFIDE	ug/kg	13		6.0	U	6.0	U	6.0	U	6.2	U
CARBON TETRACHLORIDE	ug/kg	6.2	UJ	6.0	U	6.0	U	6.0	U	6.2	U
CHLOROBENZENE	ug/kg	6.2	UJ	6.0	U	6.0	U	6.0	U	6.2	U
CHLOROETHANE	ug/kg	12	U	12	U	12	U	12	U	12	U
CHLOROFORM	ug/kg	6.2	U	6.0	U	6.0	U	6.0	U	6.2	U
CHLOROMETHANE	ug/kg	12	U	12	U	12	U	12	U	12	U
DIBROMOCHLOROMETHANE	ug/kg	6.2	UJ	6.0	U	6.0	U	6.0	U	6.2	U
ETHYLBENZENE	ug/kg	6.2	UJ	6.0	U	6.0	U	6.0	U	6.2	U
METHYLENE CHLORIDE	ug/kg	6.2	U	6.0	U	6.0	U	6.0	U	40	B
STYRENE	ug/kg	6.2	UJ	6.0	U	6.0	U	6.0	U	6.2	U
TETRACHLOROETHENE	ug/kg	6.2	UJ	6.0	U	6.0	U	6.0	U	6.2	U
TOLUENE	ug/kg	6.2	UJ	6.0	U	6.0	U	6.0	U	6.2	U
TOTAL XYLENES	ug/kg	6.2	UJ	6.0	U	6.0	U	6.0	U	6.2	U
TRICHLOROF IE	ug/kg	6.2	UJ	0	U	6.0	U	6.0	U		U

Report Date: 07/27/98

Sample Location:		MNT-SB01		MNT-SB01		MNT-SB02		MNT-SB02		MNT-SB03	
Associated Site:		MSA		MSA		MSA		MSA		MSA	
Sample No:		6910		6920		6930		6940		6950	
Sample Date:		03-MAY-98		03-MAY-98		02-MAY-98		02-MAY-98		02-MAY-98	
Depth:		0-1		4-6		0-1		2-4		0-1	
VOLATILES	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
1,1,1-TRICHLOROETHANE	ug/kg	6.0	U	6.1	U	5.9	U	6.0	U	6.1	U
1,1,2,2-TETRACHLOROETHANE	ug/kg	6.0	U	6.1	U	5.9	UJ	6.0	U	6.1	U
1,1,2-TRICHLOROETHANE	ug/kg	6.0	U	6.1	U	5.9	U	6.0	U	6.1	U
1,1-DICHLOROETHANE	ug/kg	6.0	U	6.1	U	5.9	U	6.0	U	6.1	U
1,1-DICHLOROETHENE	ug/kg	6.0	U	6.1	U	5.9	U	6.0	U	6.1	U
1,2-DICHLOROETHANE	ug/kg	6.0	U	6.1	U	5.9	U	6.0	U	6.1	U
1,2-DICHLOROETHENE	ug/kg	6.0	U	6.1	U	5.9	U	6.0	U	6.1	U
1,2-DICHLOROPROPANE	ug/kg	6.0	U	6.1	U	5.9	U	6.0	U	6.1	U
2-BUTANONE	ug/kg	24	U	25	U	24	U	24	U	24	U
2-HEXANONE	ug/kg	24	U	25	U	24	U	24	U	24	U
4-METHYL-2-PENTANONE	ug/kg	24	U	25	U	24	U	24	U	24	U
ACETONE	ug/kg	24	U	25	U	24	U	24	U	24	U
BENZENE	ug/kg	6.0	U	6.1	U	5.9	U	6.0	U	6.1	U
BROMODICHLOROMETHANE	ug/kg	6.0	U	6.1	U	5.9	U	6.0	U	6.1	U
BROMOFORM	ug/kg	6.0	U	6.1	U	5.9	U	6.0	U	6.1	U
BROMOMETHANE	ug/kg	12	U	12	U	12	U	12	U	12	U
CARBON DISULFIDE	ug/kg	6.0	U	6.1	U	5.9	U	6.0	U	6.1	U
CARBON TETRACHLORIDE	ug/kg	6.0	U	6.1	U	5.9	U	6.0	U	6.1	U
CHLOROBENZENE	ug/kg	6.0	U	6.1	U	5.9	U	6.0	U	6.1	U
CHLOROETHANE	ug/kg	12	U	12	U	12	U	12	U	12	U
CHLOROFORM	ug/kg	6.0	U	6.1	U	5.9	U	6.0	U	6.1	U
CHLOROMETHANE	ug/kg	12	U	12	U	12	U	12	U	12	U
DIBROMOCHLOROMETHANE	ug/kg	6.0	U	6.1	U	5.9	U	6.0	U	6.1	U
ETHYLBENZENE	ug/kg	6.0	U	6.1	U	5.9	U	6.0	U	6.1	U
METHYLENE CHLORIDE	ug/kg	6.0	U	6.1	J	5.9	U	6.0	U	6.1	U
STYRENE	ug/kg	6.0	U	6.1	U	5.9	U	6.0	U	6.1	U
TETRACHLOROETHENE	ug/kg	6.0	U	6.1	U	5.9	U	6.0	U	6.1	U
TOLUENE	ug/kg	6.0	U	3.2	J	5.9	U	6.0	U	6.1	U
TOTAL XYLENES	ug/kg	6.0	U	6.1	U	5.9	U	6.0	U	6.1	U
TRICHLOROETHENE	ug/kg	6.0	U	6.1	U	5.9	U	6.0	U	6.1	U

PLUMBROOK

Acid Area 3. Maintenance Shop. and Power Substation Areas

Data Summary - Soils

Report Date: 07/27/98

Sample Location:		MNT-SB03		PSB-SS01		PSB-SS02	
Associated Site:		MSA		PSB		PSB	
Sample No:		6960		6970		6980	
Sample Date:		02-MAY-98		03-MAY-98		03-MAY-98	
Depth:		6-8		0-1		0-1	
VOLATILES	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
1,1,1-TRICHLOROETHANE	ug/kg	6.3	U	6.2	U	6.9	U
1,1,2,2-TETRACHLOROETHANE	ug/kg	6.3	U	6.2	U	6.9	UJ
1,1,2-TRICHLOROETHANE	ug/kg	6.3	U	6.2	U	6.9	U
1,1-DICHLOROETHANE	ug/kg	6.3	U	6.2	U	6.9	U
1,1-DICHLOROETHENE	ug/kg	6.3	U	6.2	U	6.9	U
1,2-DICHLOROETHANE	ug/kg	6.3	U	6.2	U	6.9	U
1,2-DICHLOROETHENE	ug/kg	6.3	U	6.2	U	6.9	U
1,2-DICHLOROPROPANE	ug/kg	6.3	U	6.2	U	6.9	U
2-BUTANONE	ug/kg	25	U	25	U	27	U
2-HEXANONE	ug/kg	25	U	25	U	27	U
4-METHYL-2-PENTANONE	ug/kg	25	U	25	U	27	U
ACETONE	ug/kg	110	B	25	U	27	U
BENZENE	ug/kg	6.3	U	6.2	U	6.9	U
BROMODICHLOROMETHANE	ug/kg	6.3	U	6.2	U	6.9	U
BROMOFORM	ug/kg	6.3	U	6.2	U	6.9	U
BROMOMETHANE	ug/kg	13	U	12	U	14	U
CARBON DISULFIDE	ug/kg	6.3	U	6.2	U	6.9	U
CARBON TETRACHLORIDE	ug/kg	6.3	U	6.2	U	6.9	U
CHLOROBENZENE	ug/kg	6.3	U	6.2	U	6.9	U
CHLOROETHANE	ug/kg	13	U	12	U	14	U
CHLOROFORM	ug/kg	6.3	U	6.2	U	6.9	U
CHLOROMETHANE	ug/kg	13	U	12	U	14	U
DIBROMOCHLOROMETHANE	ug/kg	6.3	U	6.2	U	6.9	U
ETHYLBENZENE	ug/kg	6.3	U	6.2	U	6.9	U
METHYLENE CHLORIDE	ug/kg	6.3	U	6.2	U	6.9	U
STYRENE	ug/kg	6.3	U	6.2	U	6.9	U
TETRACHLOROETHENE	ug/kg	6.3	U	6.2	U	6.9	U
TOLUENE	ug/kg	6.3	U	6.2	U	2.1	J
TOTAL XYLENES	ug/kg	6.3	U	6.2	U	6.9	U
TRICHLORO[illegible]ENE	ug/kg	6.3	U	6.2	U	6.9	U

Report Date: 07/27/98

Sample Location:		AA3-SB01		AA3-SB01		AA3-SB02		AA3-SB02		AA3-SB03	
Associated Site:		AA3		AA3		AA3		AA3		AA3	
Sample No:		6610		6620		6630		6640		6650	
Sample Date:		03-MAY-98		03-MAY-98		01-MAY-98		01-MAY-98		01-MAY-98	
Depth:		0-1		6-8		0-1		6-8		0-1	
VOLATILES	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
VINYL CHLORIDE	ug/kg	12	U	13	U	13	U	12	U	12	U
cis-1,3-DICHLOROPROPENE	ug/kg	6.0	U	6.3	U	6.5	U	6.2	U	5.8	U
trans-1,3-DICHLOROPROPENE	ug/kg	6.0	U	6.3	U	6.5	U	6.2	U	5.8	U

PLUMBROOK

Acid Area 3, Maintenance Shop, and Power Substation Areas

Data Summary - Soils

Report Date: 07/27/98

Sample Location:		AA3-SB03		AA3-SB04		AA3-SB04		AA3-SB05		AA3-SB05	
Associated Site:		AA3		AA3		AA3		AA3		AA3	
Sample No:		6660		6670		6680		6690		6700	
Sample Date:		01-MAY-98		01-MAY-98		01-MAY-98		01-MAY-98		01-MAY-98	
Depth:		6-8		0-1		8-10		0-1		8-10	
VOLATILES	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
VINYL CHLORIDE	ug/kg	13	U	12	U	12	U	12	U	12	U
cis-1,3-DICHLOROPROPENE	ug/kg	6.3	U	6.0	U	6.2	U	6.1	U	6.1	U
trans-1,3-DICHLOROPROPENE	ug/kg	6.3	U	6.0	U	6.2	U	6.1	U	6.1	U

PLUMBROOK

Acid Area 3. Maintenance Shop, and Power Substation Areas

Data Summary - Soils

Report Date: 07/27/98

Sample Location:		AA3-SB06		AA3-SB06		AA3-SB07		AA3-SB07		AA3-SB08	
Associated Site:		AA3		AA3		AA3		AA3		AA3	
Sample No:		6710		6720		6730		6740		6750	
Sample Date:		01-MAY-98		01-MAY-98		01-MAY-98		01-MAY-98		01-MAY-98	
Depth:		0-1		4-6		0-1		2-4		0-1	
VOLATILES	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
VINYL CHLORIDE	ug/kg	12	U	12	U	12	U	12	U	12	U
cis-1,3-DICHLOROPROPENE	ug/kg	6.1	U	6.1	UJ	5.8	U	6.0	U	5.9	U
trans-1,3-DICHLOROPROPENE	ug/kg	6.1	U	6.1	UJ	5.8	U	6.0	U	5.9	U

PLUMBROOK

Acid Area 3. Maintenance Shop. and Power Substation Areas

Data Summary - Soils

Report Date: 07/27/98

Sample Location:		AA3-SB08		AA3-SB09		AA3-SB09		AA3-SB10		AA3-SB10	
Associated Site:		AA3		AA3		AA3		AA3		AA3	
Sample No:		6760		6770		6780		6790		6800	
Sample Date:		01-MAY-98		02-MAY-98		02-MAY-98		02-MAY-98		02-MAY-98	
Depth:		4-6		0-1		8-10		0-1		6-8	
VOLATILES	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
VINYL CHLORIDE	ug/kg	12	U	12	U	12	U	11	U	13	U
cis-1,3-DICHLOROPROPENE	ug/kg	6.1	U	5.9	U	6.2	UJ	5.7	U	6.3	U
trans-1,3-DICHLOROPROPENE	ug/kg	6.1	U	5.9	U	6.2	UJ	5.7	U	6.3	U

PLUMBROOK

Acid Area 3, Maintenance Shop, and Power Substation Areas

Data Summary - Soils

Report Date: 07/27/98

Sample Location:		AA3-SB11		AA3-SB11		AA3-SB12		AA3-SB12		AA3-SB13	
Associated Site:		AA3		AA3		AA3		AA3		AA3	
Sample No:		6810		6820		6830		6840		6850	
Sample Date:		30-APR-98		30-APR-98		01-MAY-98		01-MAY-98		01-MAY-98	
Depth:		0-1		2-4		0-1		2-4		0-1	
VOLATILES	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
VINYL CHLORIDE	ug/kg	12	U	12	U	12	U	12	U	12	U
cis-1,3-DICHLOROPROPENE	ug/kg	6.0	U	5.9	U	6.2	U	5.8	U	5.9	U
trans-1,3-DICHLOROPROPENE	ug/kg	6.0	U	5.9	U	6.2	U	5.8	U	5.9	U

PLUMBROOK

Acid Area 3. Maintenance Shop, and Power Substation Areas

Data Summary - Soils

Report Date: 07/27/98

Sample Location:		AA3-SB13		AA3-SB14		AA3-SB14		AA3-SB15		AA3-SB15	
Associated Site:		AA3		AA3		AA3		AA3		AA3	
Sample No:		6860		6870		6880		6890		6900	
Sample Date:		01-MAY-98		01-MAY-98		01-MAY-98		01-MAY-98		01-MAY-98	
Depth:		8-10		0-1		2-4		0-1		6-8	
VOLATILES	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
VINYL CHLORIDE	ug/kg	12	U	12	U	12	U	12	U	12	U
cis-1,3-DICHLOROPROPENE	ug/kg	6.2	UJ	6.0	U	6.0	U	6.0	U	6.2	U
trans-1,3-DICHLOROPROPENE	ug/kg	6.2	UJ	6.0	U	6.0	U	6.0	U	6.2	U

Report Date: 07/27/98

Sample Location:		MNT-SB01		MNT-SB01		MNT-SB02		MNT-SB02		MNT-SB03	
Associated Site:		MSA		MSA		MSA		MSA		MSA	
Sample No:		6910		6920		6930		6940		6950	
Sample Date:		03-MAY-98		03-MAY-98		02-MAY-98		02-MAY-98		02-MAY-98	
Depth:		0-1		4-6		0-1		2-4		0-1	
VOLATILES	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
VINYL CHLORIDE	ug/kg	12	U	12	U	12	U	12	U	12	U
cis-1,3-DICHLOROPROPENE	ug/kg	6.0	U	6.1	U	5.9	U	6.0	U	6.1	U
trans-1,3-DICHLOROPROPENE	ug/kg	6.0	U	6.1	U	5.9	U	6.0	U	6.1	U

Report Date: 07/27/98

Sample Location:		MNT-SB03		PSB-SS01		PSB-SS02	
Associated Site:		MSA		PSB		PSB	
Sample No:		6960		6970		6980	
Sample Date:		02-MAY-98		03-MAY-98		03-MAY-98	
Depth:		6-8		0-1		0-1	
VOLATILES	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
VINYL CHLORIDE	ug/kg	13	U	12	U	14	U
cis-1,3-DICHLOROPROPENE	ug/kg	6.3	U	6.2	U	6.9	U
trans-1,3-DICHLOROPROPENE	ug/kg	6.3	U	6.2	U	6.9	U

Report Date: 07/27/98

Sample Location:		AA3-SB01		AA3-SB01		AA3-SB02		AA3-SB02		AA3-SB03	
Associated Site:		AA3		AA3		AA3		AA3		AA3	
Sample No:		6610		6620		6630		6640		6650	
Sample Date:		03-MAY-98		03-MAY-98		01-MAY-98		01-MAY-98		01-MAY-98	
Depth:		0-1		6-8		0-1		6-8		0-1	
SULFATE	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
SULFATE	mg/kg	8670	J	432	J	13.0	U	186		11.6	U

PLUMBROOK

Acid Area 3, Maintenance Shop, and Power Substation Areas

Data Summary - Soils

Report Date: 07/27/98

Sample Location:		AA3-SB03		AA3-SB04		AA3-SB04		AA3-SB05		AA3-SB05	
Associated Site:		AA3		AA3		AA3		AA3		AA3	
Sample No:		6660		6670		6680		6690		6700	
Sample Date:		01-MAY-98		01-MAY-98		01-MAY-98		01-MAY-98		01-MAY-98	
Depth:		6-8		0-1		8-10		0-1		8-10	
SULFATE	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfi
SULFATE	mg/kg	41.0		22.6		103		23.7		59.1	

PLUMBROOK

Acid Area 3, Maintenance Shop, and Power Substation Areas

Data Summary - Soils

Report Date: 07/27/98

Sample Location:		AA3-SB06		AA3-SB06		AA3-SB07		AA3-SB07		AA3-SB08	
Associated Site:		AA3		AA3		AA3		AA3		AA3	
Sample No:		6710		6720		6730		6740		6750	
Sample Date:		01-MAY-98		01-MAY-98		01-MAY-98		01-MAY-98		01-MAY-98	
Depth:		0-1		4-6		0-1		2-4		0-1	
SULFATE	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
SULFATE	mg/kg	20.5		28.1		11.7	U	12.1	U	11.8	U

PLUMBROOK

Acid Area 3. Maintenance Shop. and Power Substation Areas

Data Summary - Soils

Report Date: 07/27/98

Sample Location:		AA3-SB08		AA3-SB09		AA3-SB09		AA3-SB10		AA3-SB10	
Associated Site:		AA3		AA3		AA3		AA3		AA3	
Sample No:		6760		6770		6780		6790		6800	
Sample Date:		01-MAY-98		02-MAY-98		02-MAY-98		02-MAY-98		02-MAY-98	
Depth:		4-6		0-1		8-10		0-1		6-8	
SULFATE	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
SULFATE	mg/kg	12.2	U	15.0		27.8		22.2		40.6	

Report Date: 07/27/98

Sample Location:		AA3-SB11		AA3-SB11		AA3-SB12		AA3-SB12		AA3-SB13	
Associated Site:		AA3		AA3		AA3		AA3		AA3	
Sample No:		6810		6820		6830		6840		6850	
Sample Date:		30-APR-98		30-APR-98		01-MAY-98		01-MAY-98		01-MAY-98	
Depth:		0-1		2-4		0-1		2-4		0-1	
SULFATE	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
SULFATE	mg/kg	832		245		8800		368		11.8	U

PLUMBROOK

Acid Area 3, Maintenance Shop. and Power Substation Areas

Data Summary - Soils

Report Date: 07/27/98

Sample Location:		AA3-SB13		AA3-SB14		AA3-SB14		AA3-SB15		AA3-SB15	
Associated Site:		AA3		AA3		AA3		AA3		AA3	
Sample No:		6860		6870		6880		6890		6900	
Sample Date:		01-MAY-98		01-MAY-98		01-MAY-98		01-MAY-98		01-MAY-98	
Depth:		8-10		0-1		2-4		0-1		6-8	
SULFATE	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
SULFATE	mg/kg	144		12.0	U	19.7		12.0	U	22.1	

Sample Location:		AA3-SB01		AA3-SB01		AA3-SB02		AA3-SB02		AA3-SB03	
Associated Site:		AA3		AA3		AA3		AA3		AA3	
Sample No:		6610		6620		6630		6640		6650	
Sample Date:		03-MAY-98		03-MAY-98		01-MAY-98		01-MAY-98		01-MAY-98	
Depth:		0-1		6-8		0-1		6-8		0-1	
SEMIVOLATILES	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
1,2,4-TRICHLOROBENZENE	ug/kg	400	U	420	U	430	U	410	U	380	U
1,2-DICHLOROBENZENE	ug/kg	400	U	420	U	430	U	410	U	380	U
1,3-DICHLOROBENZENE	ug/kg	400	U	420	U	430	U	410	U	380	U
1,4-DICHLOROBENZENE	ug/kg	400	U	420	U	430	U	410	U	380	U
2,4,5-TRICHLOROPHENOL	ug/kg	400	U	420	U	430	U	410	U	380	U
2,4,6-TRICHLOROPHENOL	ug/kg	400	U	420	U	430	U	410	U	380	U
2,4-DICHLOROPHENOL	ug/kg	400	U	420	U	430	U	410	U	380	U
2,4-DIMETHYLPHENOL	ug/kg	400	U	420	U	430	U	410	U	380	U
2,4-DINITROPHENOL	ug/kg	1900	U	2000	U	2100	U	2000	U	1900	U
2,4-DINITROTOLUENE	ug/kg	5600		1300		430	U	410	U	380	U
2,6-DINITROTOLUENE	ug/kg	870		60	J	430	U	410	U	380	U
2-CHLORONAPHTHALENE	ug/kg	400	U	420	U	430	U	410	U	380	U
2-CHLOROPHENOL	ug/kg	400	U	420	U	430	U	410	U	380	U
2-METHYLNAPHTHALENE	ug/kg	240	J	420	U	430	U	410	U	380	U
2-METHYLPHENOL	ug/kg	400	U	420	U	430	U	410	U	380	U
2-NITROANILINE	ug/kg	1900	U	2000	U	2100	U	2000	U	1900	U
2-NITROPHENOL	ug/kg	400	U	420	U	430	U	410	U	380	U
3,3'-DICHLOROBENZIDINE	ug/kg	1900	U	2000	U	2100	U	2000	U	1900	U
3-NITROANILINE	ug/kg	1900	U	2000	U	2100	U	2000	U	1900	U
4,6-DINITRO-2-METHYLPHENOL	ug/kg	1900	U	2000	U	2100	U	2000	U	1900	U
4-BROMOPHENYL PHENYL ETHER	ug/kg	400	U	420	U	430	U	410	U	380	U
4-CHLORO-3-METHYLPHENOL	ug/kg	400	U	420	U	430	U	410	U	380	U
4-CHLOROANILINE	ug/kg	400	U	420	U	430	U	410	U	380	U
4-CHLOROPHENYL PHENYL ETHER	ug/kg	400	U	420	U	430	U	410	U	380	U
4-METHYLPHENOL	ug/kg	400	U	420	U	430	U	410	U	380	U
4-NITROANILINE	ug/kg	1900	U	2000	U	2100	U	2000	U	1900	U
4-NITROPHENOL	ug/kg	1900	U	2000	U	2100	U	2000	U	1900	U
ACENAPHTHENE	ug/kg	400	U	420	U	430	U	410	U	380	U
ACENAPHTHYLENE	ug/kg	400	U	420	U	76	J	410	U	380	U
ANTHRACENE	ug/kg	400	U	420	U	120	J	410	U	380	U

PLUMBROOK

Acid Area 3. Maintenance Shop. and Power Substation Areas

Data Summary - Soils

Report Date: 07/27/98

Sample Location:		AA3-SB03		AA3-SB04		AA3-SB04		AA3-SB05		AA3-SB05	
Associated Site:		AA3		AA3		AA3		AA3		AA3	
Sample No:		6660		6670		6680		6690		6700	
Sample Date:		01-MAY-98		01-MAY-98		01-MAY-98		01-MAY-98		01-MAY-98	
Depth:		6-8		0-1		8-10		0-1		8-10	
SEMIVOLATILES	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
1,2,4-TRICHLOROBENZENE	ug/kg	420	U	390	U	410	U	400	U	400	U
1,2-DICHLOROBENZENE	ug/kg	420	U	390	U	410	U	400	U	400	U
1,3-DICHLOROBENZENE	ug/kg	420	U	390	U	410	U	400	U	400	U
1,4-DICHLOROBENZENE	ug/kg	420	U	390	U	410	U	400	U	400	U
2,4,5-TRICHLOROPHENOL	ug/kg	420	U	390	U	410	U	400	U	400	U
2,4,6-TRICHLOROPHENOL	ug/kg	420	U	390	U	410	U	400	U	400	U
2,4-DICHLOROPHENOL	ug/kg	420	U	390	U	410	U	400	U	400	U
2,4-DIMETHYLPHENOL	ug/kg	420	U	390	U	410	U	400	U	400	U
2,4-DINITROPHENOL	ug/kg	2000	U	1900	U	2000	U	1900	U	1900	U
2,4-DINITROTOLUENE	ug/kg	420	U	390	U	410	U	400	U	400	U
2,6-DINITROTOLUENE	ug/kg	420	U	390	U	410	U	400	U	400	U
2-CHLORONAPHTHALENE	ug/kg	420	U	390	U	410	U	400	U	400	U
2-CHLOROPHENOL	ug/kg	420	U	390	U	410	U	400	U	400	U
2-METHYLNAPHTHALENE	ug/kg	420	U	390	U	410	U	400	U	400	U
2-METHYLPHENOL	ug/kg	420	U	390	U	410	U	400	U	400	U
2-NITROANILINE	ug/kg	2000	U	1900	U	2000	U	1900	U	1900	U
2-NITROPHENOL	ug/kg	420	U	390	U	410	U	400	U	400	U
3,3'-DICHLOROBENZIDINE	ug/kg	2000	U	1900	U	2000	U	1900	U	1900	U
3-NITROANILINE	ug/kg	2000	U	1900	U	2000	U	1900	U	1900	U
4,6-DINITRO-2-METHYLPHENOL	ug/kg	2000	U	1900	U	2000	U	1900	U	1900	U
4-BROMOPHENYL PHENYL ETHER	ug/kg	420	U	390	U	410	U	400	U	400	U
4-CHLORO-3-METHYLPHENOL	ug/kg	420	U	390	U	410	U	400	U	400	U
4-CHLOROANILINE	ug/kg	420	U	390	U	410	U	400	U	400	U
4-CHLOROPHENYL PHENYL ETHER	ug/kg	420	U	390	U	410	U	400	U	400	U
4-METHYLPHENOL	ug/kg	420	U	390	U	410	U	400	U	400	U
4-NITROANILINE	ug/kg	2000	U	1900	U	2000	U	1900	U	1900	U
4-NITROPHENOL	ug/kg	2000	U	1900	U	2000	U	1900	U	1900	U
ACENAPHTHENE	ug/kg	420	U	390	U	410	U	400	U	400	U
ACENAPHTHYLENE	ug/kg	420	U	390	U	410	U	400	U	400	U
ANTHRACEN	ug/kg	420	U	[illegible]90	U	410	U	400	U	[illegible]	U

Report Date: 07/27/98

Sample Location:		AA3-SB06		AA3-SB06		AA3-SB07		AA3-SB07		AA3-SB08	
Associated Site:		AA3		AA3		AA3		AA3		AA3	
Sample No:		6710		6720		6730		6740		6750	
Sample Date:		01-MAY-98		01-MAY-98		01-MAY-98		01-MAY-98		01-MAY-98	
Depth:		0-1		4-6		0-1		2-4		0-1	
SEMIVOLATILES	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
1,2,4-TRICHLOROBENZENE	ug/kg	400	U	400	U	390	U	400	U	390	U
1,2-DICHLOROBENZENE	ug/kg	400	U	400	U	390	U	400	U	390	U
1,3-DICHLOROBENZENE	ug/kg	400	U	400	U	390	U	400	U	390	U
1,4-DICHLOROBENZENE	ug/kg	400	U	400	U	390	U	400	U	390	U
2,4,5-TRICHLOROPHENOL	ug/kg	400	U	400	U	390	U	400	U	390	U
2,4,6-TRICHLOROPHENOL	ug/kg	400	U	400	U	390	U	400	U	390	U
2,4-DICHLOROPHENOL	ug/kg	400	U	400	U	390	U	400	U	390	U
2,4-DIMETHYLPHENOL	ug/kg	400	U	400	U	390	U	400	U	390	U
2,4-DINITROPHENOL	ug/kg	2000	U	1900	U	1900	U	1900	U	1900	U
2,4-DINITROTOLUENE	ug/kg	400	U	400	U	390	U	400	U	390	U
2,6-DINITROTOLUENE	ug/kg	400	U	400	U	390	U	400	U	390	U
2-CHLORONAPHTHALENE	ug/kg	400	U	400	U	390	U	400	U	390	U
2-CHLOROPHENOL	ug/kg	400	U	400	U	390	U	400	U	390	U
2-METHYLNAPHTHALENE	ug/kg	400	U	400	U	390	U	400	U	390	U
2-METHYLPHENOL	ug/kg	400	U	400	U	390	U	400	U	390	U
2-NITROANILINE	ug/kg	2000	U	1900	U	1900	U	1900	U	1900	U
2-NITROPHENOL	ug/kg	400	U	400	U	390	U	400	U	390	U
3,3'-DICHLOROBENZIDINE	ug/kg	2000	U	1900	U	1900	U	1900	U	1900	U
3-NITROANILINE	ug/kg	2000	U	1900	U	1900	U	1900	U	1900	U
4,6-DINITRO-2-METHYLPHENOL	ug/kg	2000	U	1900	U	1900	U	1900	U	1900	U
4-BROMOPHENYL PHENYL ETHER	ug/kg	400	U	400	U	390	U	400	U	390	U
4-CHLORO-3-METHYLPHENOL	ug/kg	400	U	400	U	390	U	400	U	390	U
4-CHLOROANILINE	ug/kg	400	U	400	U	390	U	400	U	390	U
4-CHLOROPHENYL PHENYL ETHER	ug/kg	400	U	400	U	390	U	400	U	390	U
4-METHYLPHENOL	ug/kg	400	U	400	U	390	U	400	U	390	U
4-NITROANILINE	ug/kg	2000	U	1900	U	1900	U	1900	U	1900	U
4-NITROPHENOL	ug/kg	2000	U	1900	U	1900	U	1900	U	1900	U
ACENAPHTHENE	ug/kg	400	U	400	U	390	U	400	U	51	J
ACENAPHTHYLENE	ug/kg	400	U	400	U	390	U	400	U	730	
ANTHRACENE	ug/kg	400	U	400	U	390	U	400	U	630	

PLUMBROOK

Acid Area 3, Maintenance Shop, and Power Substation Areas

Data Summary - Soils

Report Date: 07/27/98

Sample Location:		AA3-SB08		AA3-SB09		AA3-SB09		AA3-SB10		AA3-SB10	
Associated Site:		AA3		AA3		AA3		AA3		AA3	
Sample No:		6760		6770		6780		6790		6800	
Sample Date:		01-MAY-98		02-MAY-98		02-MAY-98		02-MAY-98		02-MAY-98	
Depth:		4-6		0-1		8-10		0-1		6-8	
SEMIVOLATILES	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
1,2,4-TRICHLOROBENZENE	ug/kg	400	U	390	U	410	U	380	U	420	U
1,2-DICHLOROBENZENE	ug/kg	400	U	390	U	410	U	380	U	420	U
1,3-DICHLOROBENZENE	ug/kg	400	U	390	U	410	U	380	U	420	U
1,4-DICHLOROBENZENE	ug/kg	400	U	390	U	410	U	380	U	420	U
2,4,5-TRICHLOROPHENOL	ug/kg	400	U	390	U	410	U	380	U	420	U
2,4,6-TRICHLOROPHENOL	ug/kg	400	U	390	U	410	U	380	U	420	U
2,4-DICHLOROPHENOL	ug/kg	400	U	390	U	410	U	380	U	420	U
2,4-DIMETHYLPHENOL	ug/kg	400	U	390	U	410	U	380	U	420	U
2,4-DINITROPHENOL	ug/kg	2000	U	1900	U	2000	U	1800	U	2000	U
2,4-DINITROTOLUENE	ug/kg	400	U	390	U	410	U	380	U	420	U
2,6-DINITROTOLUENE	ug/kg	400	U	390	U	410	U	380	U	420	U
2-CHLORONAPHTHALENE	ug/kg	400	U	390	U	410	U	380	U	420	U
2-CHLOROPHENOL	ug/kg	400	U	390	U	410	U	380	U	420	U
2-METHYLNAPHTHALENE	ug/kg	81	J	390	U	410	U	380	U	420	U
2-METHYLPHENOL	ug/kg	400	U	390	U	410	U	380	U	420	U
2-NITROANILINE	ug/kg	2000	U	1900	U	2000	U	1800	U	2000	U
2-NITROPHENOL	ug/kg	400	U	390	U	410	U	380	U	420	U
3,3'-DICHLOROBENZIDINE	ug/kg	2000	U	1900	U	2000	U	1800	U	2000	U
3-NITROANILINE	ug/kg	2000	U	1900	U	2000	U	1800	U	2000	U
4,6-DINITRO-2-METHYLPHENOL	ug/kg	2000	U	1900	U	2000	U	1800	U	2000	U
4-BROMOPHENYL PHENYL ETHER	ug/kg	400	U	390	U	410	U	380	U	420	U
4-CHLORO-3-METHYLPHENOL	ug/kg	400	U	390	U	410	U	380	U	420	U
4-CHLOROANILINE	ug/kg	400	U	390	U	410	U	380	U	420	U
4-CHLOROPHENYL PHENYL ETHER	ug/kg	400	U	390	U	410	U	380	U	420	U
4-METHYLPHENOL	ug/kg	400	U	390	U	410	U	380	U	420	U
4-NITROANILINE	ug/kg	2000	U	1900	U	2000	U	1800	U	2000	U
4-NITROPHENOL	ug/kg	2000	U	1900	U	2000	U	1800	U	2000	U
ACENAPHTHENE	ug/kg	100	J	390	U	410	U	52	J	420	U
ACENAPHTHYLENE	ug/kg	120	J	390	U	410	U	750		420	U
ANTHRACENE	ug/kg	280	J	390	U	410	U	790			U

Report Date: 07/27/98

Sample Location:		AA3-SB11		AA3-SB11		AA3-SB12		AA3-SB12		AA3-SB13	
Associated Site:		AA3		AA3		AA3		AA3		AA3	
Sample No:		6810		6820		6830		6840		6850	
Sample Date:		30-APR-98		30-APR-98		01-MAY-98		01-MAY-98		01-MAY-98	
Depth:		0-1		2-4		0-1		2-4		0-1	
SEMIVOLATILES	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
1,2,4-TRICHLOROBENZENE	ug/kg	400	U	390	U	410	U	380	U	390	U
1,2-DICHLOROBENZENE	ug/kg	400	U	390	U	410	U	380	U	390	U
1,3-DICHLOROBENZENE	ug/kg	400	U	390	U	410	U	380	U	390	U
1,4-DICHLOROBENZENE	ug/kg	400	U	390	U	410	U	380	U	390	U
2,4,5-TRICHLOROPHENOL	ug/kg	400	U	390	U	410	U	380	U	390	U
2,4,6-TRICHLOROPHENOL	ug/kg	400	U	390	U	410	U	380	U	390	U
2,4-DICHLOROPHENOL	ug/kg	400	U	390	U	410	U	380	U	390	U
2,4-DIMETHYLPHENOL	ug/kg	400	U	390	U	410	U	380	U	390	U
2,4-DINITROPHENOL	ug/kg	1900	U	1900	U	2000	U	1800	U	1900	U
2,4-DINITROTOLUENE	ug/kg	400	U	390	U	410	U	380	U	390	U
2,6-DINITROTOLUENE	ug/kg	400	U	390	U	410	U	380	U	390	U
2-CHLORONAPHTHALENE	ug/kg	400	U	390	U	410	U	380	U	390	U
2-CHLOROPHENOL	ug/kg	400	U	390	U	410	U	380	U	390	U
2-METHYLNAPHTHALENE	ug/kg	400	U	390	U	410	U	380	U	390	U
2-METHYLPHENOL	ug/kg	400	U	390	U	410	U	380	U	390	U
2-NITROANILINE	ug/kg	1900	U	1900	U	2000	U	1800	U	1900	U
2-NITROPHENOL	ug/kg	400	U	390	U	410	U	380	U	390	U
3,3'-DICHLOROBENZIDINE	ug/kg	1900	U	1900	U	2000	U	1800	U	1900	U
3-NITROANILINE	ug/kg	1900	U	1900	U	2000	U	1800	U	1900	U
4,6-DINITRO-2-METHYLPHENOL	ug/kg	1900	U	1900	U	2000	U	1800	U	1900	U
4-BROMOPHENYL PHENYL ETHER	ug/kg	400	U	390	U	410	U	380	U	390	U
4-CHLORO-3-METHYLPHENOL	ug/kg	400	U	390	U	410	U	380	U	390	U
4-CHLOROANILINE	ug/kg	400	U	390	U	410	U	380	U	390	U
4-CHLOROPHENYL PHENYL ETHER	ug/kg	400	U	390	U	410	U	380	U	390	U
4-METHYLPHENOL	ug/kg	400	U	390	U	410	U	380	U	390	U
4-NITROANILINE	ug/kg	1900	U	1900	U	2000	U	1800	U	1900	U
4-NITROPHENOL	ug/kg	1900	U	1900	U	2000	U	1800	U	1900	U
ACENAPHTHENE	ug/kg	400	U	390	U	410	U	380	U	390	U
ACENAPHTHYLENE	ug/kg	400	U	390	U	120	J	380	U	390	U
ANTHRACENE	ug/kg	400	U	390	U	120	J	380	U	390	U

PLUMBROOK

Acid Area 3, Maintenance Shop. and Power Substation Areas

Data Summary - Soils

Report Date: 07/27/98

Sample Location:		AA3-SB13		AA3-SB14		AA3-SB14		AA3-SB15		AA3-SB15	
Associated Site:		AA3		AA3		AA3		AA3		AA3	
Sample No:		6860		6870		6880		6890		6900	
Sample Date:		01-MAY-98		01-MAY-98		01-MAY-98		01-MAY-98		01-MAY-98	
Depth:		8-10		0-1		2-4		0-1		6-8	
SEMIVOLATILES	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
1,2,4-TRICHLOROBENZENE	ug/kg	410	U	400	U	400	U	400	U	410	U
1,2-DICHLOROBENZENE	ug/kg	410	U	400	U	400	U	400	U	410	U
1,3-DICHLOROBENZENE	ug/kg	410	U	400	U	400	U	400	U	410	U
1,4-DICHLOROBENZENE	ug/kg	410	U	400	U	400	U	400	U	410	U
2,4,5-TRICHLOROPHENOL	ug/kg	410	U	400	U	400	U	400	U	410	U
2,4,6-TRICHLOROPHENOL	ug/kg	410	U	400	U	400	U	400	U	410	U
2,4-DICHLOROPHENOL	ug/kg	410	U	400	U	400	U	400	U	410	U
2,4-DIMETHYLPHENOL	ug/kg	410	U	400	U	400	U	400	U	410	U
2,4-DINITROPHENOL	ug/kg	2000	U	1900	U	1900	U	1900	U	2000	U
2,4-DINITROTOLUENE	ug/kg	410	U	400	U	400	U	400	U	410	U
2,6-DINITROTOLUENE	ug/kg	410	U	400	U	400	U	400	U	410	U
2-CHLORONAPHTHALENE	ug/kg	410	U	400	U	400	U	400	U	410	U
2-CHLOROPHENOL	ug/kg	410	U	400	U	400	U	400	U	410	U
2-METHYLNAPHTHALENE	ug/kg	410	U	400	U	400	U	400	U	410	U
2-METHYLPHENOL	ug/kg	410	U	400	U	400	U	400	U	410	U
2-NITROANILINE	ug/kg	2000	U	1900	U	1900	U	1900	U	2000	U
2-NITROPHENOL	ug/kg	410	U	400	U	400	U	400	U	410	U
3,3'-DICHLOROBENZIDINE	ug/kg	2000	U	1900	U	1900	U	1900	U	2000	U
3-NITROANILINE	ug/kg	2000	U	1900	U	1900	U	1900	U	2000	U
4,6-DINITRO-2-METHYLPHENOL	ug/kg	2000	U	1900	U	1900	U	1900	U	2000	U
4-BROMOPHENYL PHENYL ETHER	ug/kg	410	U	400	U	400	U	400	U	410	U
4-CHLORO-3-METHYLPHENOL	ug/kg	410	U	400	U	400	U	400	U	410	U
4-CHLOROANILINE	ug/kg	410	U	400	U	400	U	400	U	410	U
4-CHLOROPHENYL PHENYL ETHER	ug/kg	410	U	400	U	400	U	400	U	410	U
4-METHYLPHENOL	ug/kg	410	U	400	U	400	U	400	U	410	U
4-NITROANILINE	ug/kg	2000	U	1900	U	1900	U	1900	U	2000	U
4-NITROPHENOL	ug/kg	2000	U	1900	U	1900	U	1900	U	2000	U
ACENAPHTHENE	ug/kg	410	U	400	U	400	U	400	U	410	U
ACENAPHTHYLENE	ug/kg	410	U	400	U	400	U	400	U	410	U
ANTHRACEN	ug/kg	410	U	[illegible]0	J	400	U	400	U		U

PLUMBROOK

Acid Area 3. Maintenance Shop. and Power Substation Areas

Data Summary - Soils

Report Date: 07/27/98

Sample Location:		MNT-SB01		MNT-SB01		MNT-SB02		MNT-SB02		MNT-SB03	
Associated Site:		MSA		MSA		MSA		MSA		MSA	
Sample No:		6910		6920		6930		6940		6950	
Sample Date:		03-MAY-98		03-MAY-98		02-MAY-98		02-MAY-98		02-MAY-98	
Depth:		0-1		4-6		0-1		2-4		0-1	
SEMIVOLATILES	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
1,2,4-TRICHLOROBENZENE	ug/kg	400	U	400	U	390	U	400	U	400	U
1,2-DICHLOROBENZENE	ug/kg	400	U	400	U	390	U	400	U	400	U
1,3-DICHLOROBENZENE	ug/kg	400	U	400	U	390	U	400	U	400	U
1,4-DICHLOROBENZENE	ug/kg	400	U	400	U	390	U	400	U	400	U
2,4,5-TRICHLOROPHENOL	ug/kg	400	U	400	U	390	U	400	U	400	U
2,4,6-TRICHLOROPHENOL	ug/kg	400	U	400	U	390	U	400	U	400	U
2,4-DICHLOROPHENOL	ug/kg	400	U	400	U	390	U	400	U	400	U
2,4-DIMETHYLPHENOL	ug/kg	400	U	400	U	390	U	400	U	400	U
2,4-DINITROPHENOL	ug/kg	1900	U	2000	U	1900	U	1900	U	1900	U
2,4-DINITROTOLUENE	ug/kg	400	U	400	U	390	U	400	U	400	U
2,6-DINITROTOLUENE	ug/kg	400	U	400	U	390	U	400	U	400	U
2-CHLORONAPHTHALENE	ug/kg	400	U	400	U	390	U	400	U	400	U
2-CHLOROPHENOL	ug/kg	400	U	400	U	390	U	400	U	400	U
2-METHYLNAPHTHALENE	ug/kg	400	U	400	U	390	U	400	U	400	U
2-METHYLPHENOL	ug/kg	400	U	400	U	390	U	400	U	400	U
2-NITROANILINE	ug/kg	1900	U	2000	U	1900	U	1900	U	1900	U
2-NITROPHENOL	ug/kg	400	U	400	U	390	U	400	U	400	U
3,3'-DICHLOROBENZIDINE	ug/kg	1900	U	2000	U	1900	U	1900	U	1900	U
3-NITROANILINE	ug/kg	1900	U	2000	U	1900	U	1900	U	1900	U
4,6-DINITRO-2-METHYLPHENOL	ug/kg	1900	U	2000	U	1900	U	1900	U	1900	U
4-BROMOPHENYL PHENYL ETHER	ug/kg	400	U	400	U	390	U	400	U	400	U
4-CHLORO-3-METHYLPHENOL	ug/kg	400	U	400	U	390	U	400	U	400	U
4-CHLOROANILINE	ug/kg	400	U	400	U	390	U	400	U	400	U
4-CHLOROPHENYL PHENYL ETHER	ug/kg	400	U	400	U	390	U	400	U	400	U
4-METHYLPHENOL	ug/kg	400	U	400	U	390	U	400	U	400	U
4-NITROANILINE	ug/kg	1900	U	2000	U	1900	U	1900	U	1900	U
4-NITROPHENOL	ug/kg	1900	U	2000	U	1900	U	1900	U	1900	U
ACENAPHTHENE	ug/kg	400	U	400	U	390	U	400	U	400	U
ACENAPHTHYLENE	ug/kg	400	U	400	U	390	U	400	U	400	U
ANTHRACENE	ug/kg	400	U	400	U	390	U	400	U	400	U

PLUMBROOK

Acid Area 3, Maintenance Shop, and Power Substation Areas

Data Summary - Soils

Report Date: 07/27/98

Sample Location:		MNT-SB03		PSB-SS01		PSB-SS02	
Associated Site:		MSA		PSB		PSB	
Sample No:		6960		6970		6980	
Sample Date:		02-MAY-98		03-MAY-98		03-MAY-98	
Depth:		6-8		0-1		0-1	
SEMIVOLATILES	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
1,2,4-TRICHLOROBENZENE	ug/kg	410	U	410	U	450	U
1,2-DICHLOROBENZENE	ug/kg	410	U	410	U	450	U
1,3-DICHLOROBENZENE	ug/kg	410	U	410	U	450	U
1,4-DICHLOROBENZENE	ug/kg	410	U	410	U	450	U
2,4,5-TRICHLOROPHENOL	ug/kg	410	U	410	U	450	U
2,4,6-TRICHLOROPHENOL	ug/kg	410	U	410	U	450	U
2,4-DICHLOROPHENOL	ug/kg	410	U	410	U	450	U
2,4-DIMETHYLPHENOL	ug/kg	410	U	410	U	450	U
2,4-DINITROPHENOL	ug/kg	2000	U	2000	U	2200	U
2,4-DINITROTOLUENE	ug/kg	410	U	410	U	450	U
2,6-DINITROTOLUENE	ug/kg	410	U	410	U	450	U
2-CHLORONAPHTHALENE	ug/kg	410	U	410	U	450	U
2-CHLOROPHENOL	ug/kg	410	U	410	U	450	U
2-METHYLNAPHTHALENE	ug/kg	410	U	410	U	450	U
2-METHYLPHENOL	ug/kg	410	U	410	U	450	U
2-NITROANILINE	ug/kg	2000	U	2000	U	2200	U
2-NITROPHENOL	ug/kg	410	U	410	U	450	U
3,3'-DICHLOROBENZIDINE	ug/kg	2000	U	2000	U	2200	U
3-NITROANILINE	ug/kg	2000	U	2000	U	2200	U
4,6-DINITRO-2-METHYLPHENOL	ug/kg	2000	U	2000	U	2200	U
4-BROMOPHENYL PHENYL ETHER	ug/kg	410	U	410	U	450	U
4-CHLORO-3-METHYLPHENOL	ug/kg	410	U	410	U	450	U
4-CHLOROANILINE	ug/kg	410	U	410	U	450	U
4-CHLOROPHENYL PHENYL ETHER	ug/kg	410	U	410	U	450	U
4-METHYLPHENOL	ug/kg	410	U	410	U	450	U
4-NITROANILINE	ug/kg	2000	U	2000	U	2200	U
4-NITROPHENOL	ug/kg	2000	U	2000	U	2200	U
ACENAPHTHENE	ug/kg	410	U	410	U	450	U
ACENAPHTHYLENE	ug/kg	410	U	64	J	68	J
ANTHRACENE	ug/kg	410	U	5	J	68	J

Report Date: 07/27/98

Sample Location:		AA3-SB01		AA3-SB01		AA3-SB02		AA3-SB02		AA3-SB03	
Associated Site:		AA3		AA3		AA3		AA3		AA3	
Sample No:		6610		6620		6630		6640		6650	
Sample Date:		03-MAY-98		03-MAY-98		01-MAY-98		01-MAY-98		01-MAY-98	
Depth:		0-1		6-8		0-1		6-8		0-1	
SEMIVOLATILES	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
BENZO(a)ANTHRACENE	ug/kg	59	J	420	U	410	J	410	U	380	U
BENZO(a)PYRENE	ug/kg	63	J	420	U	370	J	410	U	26	J
BENZO(b)FLUORANTHENE	ug/kg	68	J	420	U	420	J	410	U	380	U
BENZO(ghi)PERYLENE	ug/kg	41	J	420	U	250	J	410	U	380	U
BENZO(k)FLUORANTHENE	ug/kg	82	J	420	U	300	J	410	U	380	U
BIS(2-CHLOROETHOXY)METHANE	ug/kg	400	U	420	U	430	U	410	U	380	U
BIS(2-CHLOROETHYL)ETHER	ug/kg	400	U	420	U	430	U	410	U	380	U
BIS(2-CHLOROISOPROPYL)ETHER	ug/kg	400	U	420	U	430	U	410	U	380	U
BIS(2-ETHYLHEXYL)PHTHALATE	ug/kg	120	J	420	U	430	U	410	U	380	U
BUTYL BENZYL PHTHALATE	ug/kg	400	U	420	U	430	U	410	U	380	U
CARBAZOLE	ug/kg	400	U	420	U	430	U	410	U	380	U
CHRYSENE	ug/kg	91	J	420	U	410	J	410	U	380	U
DI-n-BUTYL PHTHALATE	ug/kg	400	U	420	U	430	U	410	U	380	U
DI-n-OCTYL PHTHALATE	ug/kg	400	U	420	U	430	U	410	U	380	U
DIBENZ(a,h)ANTHRACENE	ug/kg	24	J	420	U	430	U	410	U	380	U
DIBENZOFURAN	ug/kg	400	U	420	U	430	U	410	U	380	U
DIETHYL PHTHALATE	ug/kg	400	U	420	U	430	U	410	U	380	U
DIMETHYL PHTHALATE	ug/kg	400	U	420	U	430	U	410	U	380	U
FLUORANTHENE	ug/kg	87	J	420	U	700		410	U	44	J
FLUORENE	ug/kg	400	U	420	U	430	U	410	U	380	U
HEXACHLOROBENZENE	ug/kg	400	U	420	U	430	U	410	U	380	U
HEXACHLOROBUTADIENE	ug/kg	400	U	420	U	430	U	410	U	380	U
HEXACHLOROCYCLOPENTADIENE	ug/kg	1900	U	2000	U	2100	U	2000	U	1900	U
HEXACHLOROETHANE	ug/kg	400	U	420	U	430	U	410	U	380	U
INDENO(1,2,3-cd)PYRENE	ug/kg	43	J	420	U	240	J	410	U	380	U
ISOPHORONE	ug/kg	400	U	420	U	430	U	410	U	380	U
N-NITROSO-DI-n-PROPYLAMINE	ug/kg	400	U	420	U	430	U	410	U	380	U
N-NITROSODIPHENYLAMINE	ug/kg	400	U	420	U	430	U	410	U	380	U
NAPHTHALENE	ug/kg	61	J	420	U	430	U	410	U	380	U
NITROBENZENE	ug/kg	400	U	420	U	430	U	410	U	380	U

PLUMBROOK

Acid Area 3. Maintenance Shop, and Power Substation Areas

Data Summary - Soils

Report Date: 07/27/98

Sample Location:		AA3-SB03		AA3-SB04		AA3-SB04		AA3-SB05		AA3-SB05	
Associated Site:		AA3		AA3		AA3		AA3		AA3	
Sample No:		6660		6670		6680		6690		6700	
Sample Date:		01-MAY-98		01-MAY-98		01-MAY-98		01-MAY-98		01-MAY-98	
Depth:		6-8		0-1		8-10		0-1		8-10	
SEMIVOLATILES	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
BENZO(a)ANTHRACENE	ug/kg	420	U	390	U	410	U	400	U	400	U
BENZO(a)PYRENE	ug/kg	420	U	390	U	410	U	400	U	400	U
BENZO(b)FLUORANTHENE	ug/kg	420	U	390	U	410	U	400	U	400	U
BENZO(ghi)PERYLENE	ug/kg	420	U	390	U	410	U	400	U	400	U
BENZO(k)FLUORANTHENE	ug/kg	420	U	390	U	410	U	400	U	400	U
BIS(2-CHLOROETHOXY)METHANE	ug/kg	420	U	390	U	410	U	400	U	400	U
BIS(2-CHLOROETHYL)ETHER	ug/kg	420	U	390	U	410	U	400	U	400	U
BIS(2-CHLOROISOPROPYL)ETHER	ug/kg	420	U	390	U	410	U	400	U	400	U
BIS(2-ETHYLHEXYL)PHTHALATE	ug/kg	420	U	390	U	410	U	400	U	140	J
BUTYL BENZYL PHTHALATE	ug/kg	420	U	390	U	410	U	400	U	400	U
CARBAZOLE	ug/kg	420	U	390	U	410	U	400	U	400	U
CHRYSENE	ug/kg	420	U	390	U	26	J	400	U	400	U
DI-n-BUTYL PHTHALATE	ug/kg	420	U	390	U	410	U	400	U	400	U
DI-n-OCTYL PHTHALATE	ug/kg	420	U	390	U	410	U	400	U	400	U
DIBENZ(a.h)ANTHRACENE	ug/kg	420	U	390	U	410	U	400	U	400	U
DIBENZOFURAN	ug/kg	420	U	390	U	410	U	400	U	400	U
DIETHYL PHTHALATE	ug/kg	420	U	390	U	410	U	400	U	400	U
DIMETHYL PHTHALATE	ug/kg	420	U	390	U	410	U	400	U	400	U
FLUORANTHENE	ug/kg	420	U	390	U	410	U	400	U	400	U
FLUORENE	ug/kg	420	U	390	U	410	U	400	U	400	U
HEXACHLOROBENZENE	ug/kg	420	U	390	U	410	U	400	U	400	U
HEXACHLOROBUTADIENE	ug/kg	420	U	390	U	410	U	400	U	400	U
HEXACHLOROCYCLOPENTADIENE	ug/kg	2000	U	1900	U	2000	U	1900	U	1900	U
HEXACHLOROETHANE	ug/kg	420	U	390	U	410	U	400	U	400	U
INDENO(1,2.3-cd)PYRENE	ug/kg	420	U	390	U	410	U	400	U	400	U
ISOPHORONE	ug/kg	420	U	390	U	410	U	400	U	400	U
N-NITROSO-DI-n-PROPYLAMINE	ug/kg	420	U	390	U	410	U	400	U	400	U
N-NITROSODIPHENYLAMINE	ug/kg	420	U	390	U	410	U	400	U	400	U
NAPHTHALENE	ug/kg	420	U	390	U	410	U	400	U	400	U
NITROBENZENE	ug/kg	420	U	390	U	410	U	400	U	[illegible]	U

PLUMBROOK

Acid Area 3. Maintenance Shop. and Power Substation Areas

Data Summary - Soils

Report Date: 07/27/98

Sample Location:		AA3-SB06		AA3-SB06		AA3-SB07		AA3-SB07		AA3-SB08	
Associated Site:		AA3		AA3		AA3		AA3		AA3	
Sample No:		6710		6720		6730		6740		6750	
Sample Date:		01-MAY-98		01-MAY-98		01-MAY-98		01-MAY-98		01-MAY-98	
Depth:		0-1		4-6		0-1		2-4		0-1	
SEMIVOLATILES	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
BENZO(a)ANTHRACENE	ug/kg	400	U	400	U	390	U	400	U	2100	
BENZO(a)PYRENE	ug/kg	400	U	400	U	390	U	400	U	2200	
BENZO(b)FLUORANTHENE	ug/kg	400	U	400	U	390	U	400	U	2400	
BENZO(ghi)PERYLENE	ug/kg	400	U	400	U	390	U	400	U	1100	
BENZO(k)FLUORANTHENE	ug/kg	400	U	400	U	390	U	400	U	1400	
BIS(2-CHLOROETHOXY)METHANE	ug/kg	400	U	400	U	390	U	400	U	390	U
BIS(2-CHLOROETHYL)ETHER	ug/kg	400	U	400	U	390	U	400	U	390	U
BIS(2-CHLOROISOPROPYL)ETHER	ug/kg	400	U	400	U	390	U	400	U	390	U
BIS(2-ETHYLHEXYL)PHTHALATE	ug/kg	55	J	45	J	41	J	400	U	390	U
BUTYL BENZYL PHTHALATE	ug/kg	400	U	400	U	390	U	400	U	390	U
CARBAZOLE	ug/kg	400	U	400	U	390	U	400	U	120	J
CHRYSENE	ug/kg	400	U	400	U	390	U	400	U	2200	
DI-n-BUTYL PHTHALATE	ug/kg	400	U	400	U	390	U	400	U	390	U
DI-n-OCTYL PHTHALATE	ug/kg	400	U	400	U	390	U	400	U	390	U
DIBENZ(a,h)ANTHRACENE	ug/kg	400	U	400	U	390	U	400	U	390	U
DIBENZOFURAN	ug/kg	400	U	400	U	390	U	400	U	61	J
DIETHYL PHTHALATE	ug/kg	400	U	400	U	390	U	400	U	390	U
DIMETHYL PHTHALATE	ug/kg	400	U	400	U	390	U	400	U	390	U
FLUORANTHENE	ug/kg	400	U	400	U	390	U	400	U	4600	
FLUORENE	ug/kg	400	U	400	U	390	U	400	U	140	J
HEXACHLOROBENZENE	ug/kg	400	U	400	U	390	U	400	U	390	U
HEXACHLOROBUTADIENE	ug/kg	400	U	400	U	390	U	400	U	390	U
HEXACHLOROCYCLOPENTADIENE	ug/kg	2000	U	1900	U	1900	U	1900	U	1900	U
HEXACHLOROETHANE	ug/kg	400	U	400	U	390	U	400	U	390	U
INDENO(1,2,3-cd)PYRENE	ug/kg	400	U	400	U	390	U	400	U	1200	
ISOPHORONE	ug/kg	400	U	400	U	390	U	400	U	390	U
N-NITROSO-DI-n-PROPYLAMINE	ug/kg	400	U	400	U	390	U	400	U	390	U
N-NITROSODIPHENYLAMINE	ug/kg	400	U	400	U	390	U	400	U	390	U
NAPHTHALENE	ug/kg	400	U	400	U	390	U	400	U	390	U
NITROBENZENE	ug/kg	400	U	400	U	390	U	400	U	390	U

PLUMBROOK

Acid Area 3. Maintenance Shop, and Power Substation Areas

Data Summary - Soils

Report Date: 07/27/98

Sample Location:		AA3-SB08		AA3-SB09		AA3-SB09		AA3-SB10		AA3-SB10	
Associated Site:		AA3		AA3		AA3		AA3		AA3	
Sample No:		6760		6770		6780		6790		6800	
Sample Date:		01-MAY-98		02-MAY-98		02-MAY-98		02-MAY-98		02-MAY-98	
Depth:		4-6		0-1		8-10		0-1		6-8	
SEMIVOLATILES	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
BENZO(a)ANTHRACENE	ug/kg	360	J	390	U	410	U	3500		420	U
BENZO(a)PYRENE	ug/kg	340	J	27	J	410	U	3300		420	U
BENZO(b)FLUORANTHENE	ug/kg	340	J	390	U	410	U	3400		420	U
BENZO(ghi)PERYLENE	ug/kg	170	J	390	U	410	U	1300		420	U
BENZO(k)FLUORANTHENE	ug/kg	320	J	390	U	410	U	3300		420	U
BIS(2-CHLOROETHOXY)METHANE	ug/kg	400	U	390	U	410	U	380	U	420	U
BIS(2-CHLOROETHYL)ETHER	ug/kg	400	U	390	U	410	U	380	U	420	U
BIS(2-CHLOROISOPROPYL)ETHER	ug/kg	400	U	390	U	410	U	380	U	420	U
BIS(2-ETHYLHEXYL)PHTHALATE	ug/kg	400	U	390	U	410	U	380	U	420	U
BUTYL BENZYL PHTHALATE	ug/kg	400	U	390	U	410	U	380	U	420	U
CARBAZOLE	ug/kg	400	U	390	U	410	U	200	J	420	U
CHRYSENE	ug/kg	360	J	390	U	410	U	3400		420	U
DI-n-BUTYL PHTHALATE	ug/kg	400	U	390	U	410	U	380	U	420	U
DI-n-OCTYL PHTHALATE	ug/kg	400	U	390	U	410	U	380	U	420	U
DIBENZ(a,h)ANTHRACENE	ug/kg	400	U	390	U	410	U	380	U	420	U
DIBENZOFURAN	ug/kg	280	J	390	U	410	U	380	U	420	U
DIETHYL PHTHALATE	ug/kg	400	U	390	U	410	U	380	U	420	U
DIMETHYL PHTHALATE	ug/kg	400	U	390	U	410	U	380	U	420	U
FLUORANTHENE	ug/kg	1000		52	J	410	U	5500		420	U
FLUORENE	ug/kg	410		390	U	410	U	190	J	420	U
HEXACHLOROBENZENE	ug/kg	400	U	390	U	410	U	380	U	420	U
HEXACHLOROBUTADIENE	ug/kg	400	U	390	U	410	U	380	U	420	U
HEXACHLOROCYCLOPENTADIENE	ug/kg	2000	U	1900	U	2000	U	1800	U	2000	U
HEXACHLOROETHANE	ug/kg	400	U	390	U	410	U	380	U	420	U
INDENO(1,2,3-cd)PYRENE	ug/kg	170	J	390	U	410	U	1400		420	U
ISOPHORONE	ug/kg	400	U	390	U	410	U	380	U	420	U
N-NITROSO-DI-n-PROPYLAMINE	ug/kg	400	U	390	U	410	U	380	U	420	U
N-NITROSODIPHENYLAMINE	ug/kg	400	U	390	U	410	U	380	U	420	U
NAPHTHALENE	ug/kg	140	J	390	U	410	U	380	U	420	U
NITROBENZE'	ug/kg	400	U	[illegible]0	U	410	U	380	U	[illegible]	U

PLUMBROOK

Acid Area 3. Maintenance Shop, and Power Substation Areas

Data Summary - Soils

Report Date: 07/27/98

Sample Location:		AA3-SB11		AA3-SB11		AA3-SB12		AA3-SB12		AA3-SB13	
Associated Site:		AA3		AA3		AA3		AA3		AA3	
Sample No:		6810		6820		6830		6840		6850	
Sample Date:		30-APR-98		30-APR-98		01-MAY-98		01-MAY-98		01-MAY-98	
Depth:		0-1		2-4		0-1		2-4		0-1	
SEMIVOLATILES	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
BENZO(a)ANTHRACENE	ug/kg	400	U	390	U	280	J	380	U	390	U
BENZO(a)PYRENE	ug/kg	400	U	390	U	280	J	380	U	390	U
BENZO(b)FLUORANTHENE	ug/kg	400	U	390	U	280	J	380	U	390	U
BENZO(ghi)PERYLENE	ug/kg	400	U	390	U	160	J	380	U	390	U
BENZO(k)FLUORANTHENE	ug/kg	400	U	390	U	300	J	380	U	390	U
BIS(2-CHLOROETHOXY)METHANE	ug/kg	400	U	390	U	410	U	380	U	390	U
BIS(2-CHLOROETHYL)ETHER	ug/kg	400	U	390	U	410	U	380	U	390	U
BIS(2-CHLOROISOPROPYL)ETHER	ug/kg	400	U	390	U	410	U	380	U	390	U
BIS(2-ETHYLHEXYL)PHTHALATE	ug/kg	400	U	390	U	410	U	380	U	390	U
BUTYL BENZYL PHTHALATE	ug/kg	400	U	390	U	410	U	380	U	390	U
CARBAZOLE	ug/kg	400	U	390	U	410	U	380	U	390	U
CHRYSENE	ug/kg	400	U	390	U	340	J	380	U	390	U
DI-n-BUTYL PHTHALATE	ug/kg	400	U	390	U	410	U	380	U	390	U
DI-n-OCTYL PHTHALATE	ug/kg	400	U	390	U	410	U	380	U	390	U
DIBENZ(a,h)ANTHRACENE	ug/kg	400	U	390	U	410	U	380	U	390	U
DIBENZOFURAN	ug/kg	400	U	390	U	410	U	380	U	390	U
DIETHYL PHTHALATE	ug/kg	400	U	390	U	410	U	380	U	390	U
DIMETHYL PHTHALATE	ug/kg	400	U	390	U	410	U	380	U	390	U
FLUORANTHENE	ug/kg	400	U	390	U	800		380	U	390	U
FLUORENE	ug/kg	400	U	390	U	96	J	380	U	390	U
HEXACHLOROBENZENE	ug/kg	400	U	390	U	410	U	380	U	390	U
HEXACHLOROBUTADIENE	ug/kg	400	U	390	U	410	U	380	U	390	U
HEXACHLOROCYCLOPENTADIENE	ug/kg	1900	U	1900	U	2000	U	1800	U	1900	U
HEXACHLOROETHANE	ug/kg	400	U	390	U	410	U	380	U	390	U
INDENO(1,2,3-cd)PYRENE	ug/kg	400	U	390	U	160	J	380	U	390	U
ISOPHORONE	ug/kg	400	U	390	U	410	U	380	U	390	U
N-NITROSO-DI-n-PROPYLAMINE	ug/kg	400	U	390	U	410	U	380	U	390	U
N-NITROSODIPHENYLAMINE	ug/kg	400	U	390	U	410	U	380	U	390	U
NAPHTHALENE	ug/kg	400	U	390	U	410	U	380	U	390	U
NITROBENZENE	ug/kg	400	U	390	U	410	U	380	U	390	U

PLUMBROOK

Acid Area 3, Maintenance Shop, and Power Substation Areas

Data Summary - Soils

Report Date: 07/27/98

Sample Location:		AA3-SB13		AA3-SB14		AA3-SB14		AA3-SB15		AA3-SB15	
Associated Site:		AA3		AA3		AA3		AA3		AA3	
Sample No:		6860		6870		6880		6890		6900	
Sample Date:		01-MAY-98		01-MAY-98		01-MAY-98		01-MAY-98		01-MAY-98	
Depth:		8-10		0-1		2-4		0-1		6-8	
SEMIVOLATILES	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
BENZO(a)ANTHRACENE	ug/kg	410	U	110	J	400	U	400	U	410	U
BENZO(a)PYRENE	ug/kg	410	U	100	J	400	U	400	U	410	U
BENZO(b)FLUORANTHENE	ug/kg	410	U	83	J	400	U	400	U	410	U
BENZO(ghi)PERYLENE	ug/kg	410	U	56	J	400	U	400	U	410	U
BENZO(k)FLUORANTHENE	ug/kg	410	U	110	J	400	U	400	U	410	U
BIS(2-CHLOROETHOXY)METHANE	ug/kg	410	U	400	U	400	U	400	U	410	U
BIS(2-CHLOROETHYL)ETHER	ug/kg	410	U	400	U	400	U	400	U	410	U
BIS(2-CHLOROISOPROPYL)ETHER	ug/kg	410	U	400	U	400	U	400	U	410	U
BIS(2-ETHYLHEXYL)PHTHALATE	ug/kg	120	J	400	U	400	U	400	U	410	U
BUTYL BENZYL PHTHALATE	ug/kg	410	U	400	U	400	U	400	U	410	U
CARBAZOLE	ug/kg	410	U	400	U	400	U	400	U	410	U
CHRYSENE	ug/kg	410	U	110	J	400	U	400	U	410	U
DI-n-BUTYL PHTHALATE	ug/kg	410	U	400	U	400	U	400	U	410	U
DI-n-OCTYL PHTHALATE	ug/kg	410	U	400	U	400	U	400	U	410	U
DIBENZ(a,h)ANTHRACENE	ug/kg	410	U	400	U	400	U	400	U	410	U
DIBENZOFURAN	ug/kg	410	U	400	U	400	U	400	U	410	U
DIETHYL PHTHALATE	ug/kg	410	U	400	U	400	U	400	U	410	U
DIMETHYL PHTHALATE	ug/kg	410	U	400	U	400	U	400	U	410	U
FLUORANTHENE	ug/kg	410	U	260	J	50	J	52	J	410	U
FLUORENE	ug/kg	410	U	400	U	400	U	400	U	410	U
HEXACHLOROBENZENE	ug/kg	410	U	400	U	400	U	400	U	410	U
HEXACHLOROBUTADIENE	ug/kg	410	U	400	U	400	U	400	U	410	U
HEXACHLOROCYCLOPENTADIENE	ug/kg	2000	U	1900	U	1900	U	1900	U	2000	U
HEXACHLOROETHANE	ug/kg	410	U	400	U	400	U	400	U	410	U
INDENO(1,2,3-cd)PYRENE	ug/kg	410	U	56	J	400	U	400	U	410	U
ISOPHORONE	ug/kg	410	U	400	U	400	U	400	U	410	U
N-NITROSO-DI-n-PROPYLAMINE	ug/kg	410	U	400	U	400	U	400	U	410	U
N-NITROSODIPHENYLAMINE	ug/kg	410	U	400	U	400	U	400	U	410	U
NAPHTHALENE	ug/kg	410	U	400	U	400	U	400	U	410	U
NITROBENZENE	ug/kg	410	U	[illegible]0	U	400	U	400	U	[illegible]	U

Report Date: 07/27/98

Sample Location:		MNT-SB01		MNT-SB01		MNT-SB02		MNT-SB02		MNT-SB03	
Associated Site:		MSA		MSA		MSA		MSA		MSA	
Sample No:		6910		6920		6930		6940		6950	
Sample Date:		03-MAY-98		03-MAY-98		02-MAY-98		02-MAY-98		02-MAY-98	
Depth:		0-1		4-6		0-1		2-4		0-1	
SEMIVOLATILES	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
BENZO(a)ANTHRACENE	ug/kg	400	U	400	U	390	U	400	U	400	U
BENZO(a)PYRENE	ug/kg	400	U	400	U	390	U	400	U	400	U
BENZO(b)FLUORANTHENE	ug/kg	400	U	400	U	390	U	400	U	400	U
BENZO(ghi)PERYLENE	ug/kg	400	U	400	U	390	U	400	U	400	U
BENZO(k)FLUORANTHENE	ug/kg	400	U	400	U	390	U	400	U	400	U
BIS(2-CHLOROETHOXY)METHANE	ug/kg	400	U	400	U	390	U	400	U	400	U
BIS(2-CHLOROETHYL)ETHER	ug/kg	400	U	400	U	390	U	400	U	400	U
BIS(2-CHLOROISOPROPYL)ETHER	ug/kg	400	U	400	U	390	U	400	U	400	U
BIS(2-ETHYLHEXYL)PHTHALATE	ug/kg	68	J	400	U	390	U	400	U	400	U
BUTYL BENZYL PHTHALATE	ug/kg	400	U	400	U	390	U	400	U	400	U
CARBAZOLE	ug/kg	400	U	400	U	390	U	400	U	400	U
CHRYSENE	ug/kg	400	U	400	U	390	U	400	U	400	U
DI-n-BUTYL PHTHALATE	ug/kg	400	U	400	U	390	U	400	U	400	U
DI-n-OCTYL PHTHALATE	ug/kg	400	U	400	U	390	U	400	U	400	U
DIBENZ(a,h)ANTHRACENE	ug/kg	400	U	400	U	390	U	400	U	400	U
DIBENZOFURAN	ug/kg	400	U	400	U	390	U	400	U	400	U
DIETHYL PHTHALATE	ug/kg	400	U	400	U	390	U	400	U	400	U
DIMETHYL PHTHALATE	ug/kg	400	U	400	U	390	U	400	U	400	U
FLUORANTHENE	ug/kg	400	U	400	U	390	U	400	U	400	U
FLUORENE	ug/kg	400	U	400	U	390	U	400	U	400	U
HEXACHLOROBENZENE	ug/kg	400	U	400	U	390	U	400	U	400	U
HEXACHLOROBUTADIENE	ug/kg	400	U	400	U	390	U	400	U	400	U
HEXACHLOROCYCLOPENTADIENE	ug/kg	1900	U	2000	U	1900	U	1900	U	1900	U
HEXACHLOROETHANE	ug/kg	400	U	400	U	390	U	400	U	400	U
INDENO(1,2,3-cd)PYRENE	ug/kg	400	U	400	U	390	U	400	U	400	U
ISOPHORONE	ug/kg	400	U	400	U	390	U	400	U	400	U
N-NITROSO-DI-n-PROPYLAMINE	ug/kg	400	U	400	U	390	U	400	U	400	U
N-NITROSODIPHENYLAMINE	ug/kg	400	U	400	U	390	U	400	U	400	U
NAPHTHALENE	ug/kg	400	U	400	U	390	U	400	U	400	U
NITROBENZENE	ug/kg	400	U	400	U	390	U	400	U	400	U

Report Date: 07/27/98

Sample Location:		MNT-SB03		PSB-SS01		PSB-SS02	
Associated Site:		MSA		PSB		PSB	
Sample No:		6960		6970		6980	
Sample Date:		02-MAY-98		03-MAY-98		03-MAY-98	
Depth:		6-8		0-1		0-1	
SEMIVOLATILES	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
BENZO(a)ANTHRACENE	ug/kg	410	U	260	J	270	J
BENZO(a)PYRENE	ug/kg	410	U	300	J	310	J
BENZO(b)FLUORANTHENE	ug/kg	410	U	320	J	310	J
BENZO(ghi)PERYLENE	ug/kg	410	U	150	J	150	J
BENZO(k)FLUORANTHENE	ug/kg	410	U	320	J	360	J
BIS(2-CHLOROETHOXY)METHANE	ug/kg	410	U	410	U	450	U
BIS(2-CHLOROETHYL)ETHER	ug/kg	410	U	410	U	450	U
BIS(2-CHLOROISOPROPYL)ETHER	ug/kg	410	U	410	U	450	U
BIS(2-ETHYLHEXYL)PHTHALATE	ug/kg	91	J	410	U	450	U
BUTYL BENZYL PHTHALATE	ug/kg	410	U	410	U	450	U
CARBAZOLE	ug/kg	410	U	410	U	450	U
CHRYSENE	ug/kg	410	U	340	J	340	J
DI-n-BUTYL PHTHALATE	ug/kg	410	U	410	U	450	U
DI-n-OCTYL PHTHALATE	ug/kg	410	U	410	U	450	U
DIBENZ(a,h)ANTHRACENE	ug/kg	410	U	410	U	450	U
DIBENZOFURAN	ug/kg	410	U	410	U	450	U
DIETHYL PHTHALATE	ug/kg	410	U	410	U	450	U
DIMETHYL PHTHALATE	ug/kg	410	U	410	U	450	U
FLUORANTHENE	ug/kg	410	U	630		620	
FLUORENE	ug/kg	410	U	410	U	450	U
HEXACHLOROBENZENE	ug/kg	410	U	410	U	450	U
HEXACHLOROBUTADIENE	ug/kg	410	U	410	U	450	U
HEXACHLOROCYCLOPENTADIENE	ug/kg	2000	U	2000	U	2200	U
HEXACHLOROETHANE	ug/kg	410	U	410	U	450	U
INDENO(1,2,3-cd)PYRENE	ug/kg	410	U	160	J	160	J
ISOPHORONE	ug/kg	410	U	410	U	450	U
N-NITROSO-DI-n-PROPYLAMINE	ug/kg	410	U	410	U	450	U
N-NITROSODIPHENYLAMINE	ug/kg	410	U	410	U	450	U
NAPHTHALENE	ug/kg	410	U	410	U	450	U
NITROBENZI	ug/kg	410	U	10	U	450	U

PLUMBROOK

Acid Area 3, Maintenance Shop, and Power Substation Areas

Data Summary - Soils

Report Date: 07/27/98

Sample Location:		AA3-SB01		AA3-SB01		AA3-SB02		AA3-SB02		AA3-SB03	
Associated Site:		AA3		AA3		AA3		AA3		AA3	
Sample No:		6610		6620		6630		6640		6650	
Sample Date:		03-MAY-98		03-MAY-98		01-MAY-98		01-MAY-98		01-MAY-98	
Depth:		0-1		6-8		0-1		6-8		0-1	
SEMIVOLATILES	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
PENTACHLOROPHENOL	ug/kg	1900	U	2000	U	2100	U	2000	U	1900	U
PHENANTHRENE	ug/kg	96	J	420	U	250	J	410	U	380	U
PHENOL	ug/kg	400	U	420	U	430	U	410	U	380	U
PYRENE	ug/kg	83	J	420	U	510		410	U	39	J

Sample Location:		AA3-SB03		AA3-SB04		AA3-SB04		AA3-SB05		AA3-SB05	
Associated Site:		AA3		AA3		AA3		AA3		AA3	
Sample No:		6660		6670		6680		6690		6700	
Sample Date:		01-MAY-98		01-MAY-98		01-MAY-98		01-MAY-98		01-MAY-98	
Depth:		6-8		0-1		8-10		0-1		8-10	
SEMIVOLATILES	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
PENTACHLOROPHENOL	ug/kg	2000	U	1900	U	2000	U	1900	U	1900	U
PHENANTHRENE	ug/kg	420	U	390	U	410	U	400	U	400	U
PHENOL	ug/kg	420	U	390	U	410	U	400	U	400	U
PYRENE	ug/kg	420	U	390	U	410	U	400	U	400	U

Report Date: 07/27/98

Sample Location:		AA3-SB06		AA3-SB06		AA3-SB07		AA3-SB07		AA3-SB08	
Associated Site:		AA3		AA3		AA3		AA3		AA3	
Sample No:		6710		6720		6730		6740		6750	
Sample Date:		01-MAY-98		01-MAY-98		01-MAY-98		01-MAY-98		01-MAY-98	
Depth:		0-1		4-6		0-1		2-4		0-1	
SEMIVOLATILES	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
PENTACHLOROPHENOL	ug/kg	2000	U	1900	U	1900	U	1900	U	1900	U
PHENANTHRENE	ug/kg	400	U	400	U	390	U	400	U	1100	
PHENOL	ug/kg	400	U	400	U	390	U	400	U	390	U
PYRENE	ug/kg	400	U	400	U	390	U	400	U	3500	

PLUMBROOK

Acid Area 3. Maintenance Shop. and Power Substation Areas

Data Summary - Soils

Report Date: 07/27/98

Sample Location:		AA3-SB08		AA3-SB09		AA3-SB09		AA3-SB10		AA3-SB10	
Associated Site:		AA3		AA3		AA3		AA3		AA3	
Sample No:		6760		6770		6780		6790		6800	
Sample Date:		01-MAY-98		02-MAY-98		02-MAY-98		02-MAY-98		02-MAY-98	
Depth:		4-6		0-1		8-10		0-1		6-8	
SEMIVOLATILES	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
PENTACHLOROPHENOL	ug/kg	2000	U	1900	U	2000	U	1800	U	2000	U
PHENANTHRENE	ug/kg	1300		390	U	410	U	2400		420	U
PHENOL	ug/kg	400	U	390	U	410	U	380	U	420	U
PYRENE	ug/kg	730		42	J	410	U	4600		420	U

Report Date: 07/27/98

Sample Location:		AA3-SB11		AA3-SB11		AA3-SB12		AA3-SB12		AA3-SB13	
Associated Site:		AA3		AA3		AA3		AA3		AA3	
Sample No:		6810		6820		6830		6840		6850	
Sample Date:		30-APR-98		30-APR-98		01-MAY-98		01-MAY-98		01-MAY-98	
Depth:		0-1		2-4		0-1		2-4		0-1	
SEMIVOLATILES	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
PENTACHLOROPHENOL	ug/kg	1900	U	1900	U	2000	U	1800	U	1900	U
PHENANTHRENE	ug/kg	400	U	390	U	580		380	U	390	U
PHENOL	ug/kg	400	U	390	U	410	U	380	U	390	U
PYRENE	ug/kg	400	U	390	U	540		380	U	390	U

PLUMBROOK

Acid Area 3, Maintenance Shop, and Power Substation Areas

Data Summary - Soils

Report Date: 07/27/98

Sample Location:		AA3-SB13		AA3-SB14		AA3-SB14		AA3-SB15		AA3-SB15	
Associated Site:		AA3		AA3		AA3		AA3		AA3	
Sample No:		6860		6870		6880		6890		6900	
Sample Date:		01-MAY-98		01-MAY-98		01-MAY-98		01-MAY-98		01-MAY-98	
Depth:		8-10		0-1		2-4		0-1		6-8	
SEMIVOLATILES	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
PENTACHLOROPHENOL	ug/kg	2000	U	1900	U	1900	U	1900	U	2000	U
PHENANTHRENE	ug/kg	410	U	150	J	400	U	400	U	410	U
PHENOL	ug/kg	410	U	400	U	400	U	400	U	410	U
PYRENE	ug/kg	410	U	190	J	35	J	41	J	410	U

PLUMBROOK

Acid Area 3. Maintenance Shop, and Power Substation Areas

Data Summary - Soils

Report Date: 07/27/98

Sample Location:		MNT-SB01		MNT-SB01		MNT-SB02		MNT-SB02		MNT-SB03	
Associated Site:		MSA		MSA		MSA		MSA		MSA	
Sample No:		6910		6920		6930		6940		6950	
Sample Date:		03-MAY-98		03-MAY-98		02-MAY-98		02-MAY-98		02-MAY-98	
Depth:		0-1		4-6		0-1		2-4		0-1	
SEMIVOLATILES	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
PENTACHLOROPHENOL	ug/kg	1900	U	2000	U	1900	U	1900	U	1900	U
PHENANTHRENE	ug/kg	400	U	400	U	390	U	400	U	400	U
PHENOL	ug/kg	400	U	400	U	390	U	400	U	400	U
PYRENE	ug/kg	400	U	400	U	390	U	400	U	400	U

Report Date: 07/27/98

Sample Location:		MNT-SB03		PSB-SS01		PSB-SS02	
Associated Site:		MSA		PSB		PSB	
Sample No:		6960		6970		6980	
Sample Date:		02-MAY-98		03-MAY-98		03-MAY-98	
Depth:		6-8		0-1		0-1	
SEMIVOLATILES	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
PENTACHLOROPHENOL	ug/kg	2000	U	2000	U	2200	U
PHENANTHRENE	ug/kg	410	U	270	J	210	J
PHENOL	ug/kg	410	U	410	U	450	U
PYRENE	ug/kg	410	U	510		520	

Report Date: 07/27/98

Sample Location:		AA3-SB01		AA3-SB02		AA3-SB03		AA3-SB04		AA3-SB05	
Associated Site:		AA3		AA3		AA3		AA3		AA3	
Sample No:		6610		6630		6650		6670		6690	
Sample Date:		03-MAY-98		01-MAY-98		01-MAY-98		01-MAY-98		01-MAY-98	
Depth:		0-1		0-1		0-1		0-1		0-1	
PCBS	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
AROCLOR 1016	ug/kg	800	U	43	U	38	U	39	U	40	U
AROCLOR 1221	ug/kg	800	U	43	U	38	U	39	U	40	U
AROCLOR 1232	ug/kg	800	U	43	U	38	U	39	U	40	U
AROCLOR 1242	ug/kg	800	U	43	U	38	U	39	U	40	U
AROCLOR 1248	ug/kg	800	U	43	U	38	U	39	U	40	U
AROCLOR 1254	ug/kg	2300	U	370	U	38	U	39	U	40	U
AROCLOR 1260	ug/kg	3200		850		38	U	84		40	U

PLUMBROOK

Acid Area 3, Maintenance Shop, and Power Substation Areas

Data Summary - Soils

Report Date: 07/27/98

Sample Location:		AA3-SB06		AA3-SB07		AA3-SB08		AA3-SB09		AA3-SB10	
Associated Site:		AA3		AA3		AA3		AA3		AA3	
Sample No:		6710		6730		6750		6770		6790	
Sample Date:		01-MAY-98		01-MAY-98		01-MAY-98		02-MAY-98		02-MAY-98	
Depth:		0-1		0-1		0-1		0-1		0-1	
PCBS	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
AROCLOR 1016	ug/kg	40	U	39	U	39	U	39	U	38	U
AROCLOR 1221	ug/kg	40	U	39	U	39	U	39	U	38	U
AROCLOR 1232	ug/kg	40	U	39	U	39	U	39	U	38	U
AROCLOR 1242	ug/kg	40	U	39	U	39	U	39	U	38	U
AROCLOR 1248	ug/kg	40	U	39	U	39	U	39	U	38	U
AROCLOR 1254	ug/kg	40	U	39	U	140	U	39	U	38	U
AROCLOR 1260	ug/kg	40	U	39	U	160		39	U	38	U

PLUMBROOK

Acid Area 3. Maintenance Shop. and Power Substation Areas

Data Summary - Soils

Report Date: 07/27/98

Sample Location:		MNT-SB01		MNT-SB02		MNT-SB03		PSB-SS01		PSB-SS02	
Associated Site:		MSA		MSA		MSA		PSB		PSB	
Sample No:		6910		6930		6950		6970		6980	
Sample Date:		03-MAY-98		02-MAY-98		02-MAY-98		03-MAY-98		03-MAY-98	
Depth:		0-1		0-1		0-1		0-1		0-1	
PCBS	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
AROCLOR 1016	ug/kg	40	U	39	U	40	U	41	U	45	U
AROCLOR 1221	ug/kg	40	U	39	U	40	U	41	U	45	U
AROCLOR 1232	ug/kg	40	U	39	U	40	U	41	U	45	U
AROCLOR 1242	ug/kg	40	U	39	U	40	U	41	U	45	U
AROCLOR 1248	ug/kg	40	U	39	U	40	U	41	U	45	U
AROCLOR 1254	ug/kg	40	U	39	U	40	U	110	U	200	U
AROCLOR 1260	ug/kg	40	U	63		40	U	200		330	

PLUMBROOK

Acid Area 3. Maintenance Shop. and Power Substation Areas

Data Summary - Soils

Report Date: 07/27/98

Sample Location:		AA3-SB01		AA3-SB01		AA3-SB02		AA3-SB02		AA3-SB03	
Associated Site:		AA3		AA3		AA3		AA3		AA3	
Sample No:		6610		6620		6630		6640		6650	
Sample Date:		03-MAY-98		03-MAY-98		01-MAY-98		01-MAY-98		01-MAY-98	
Depth:		0-1		6-8		0-1		6-8		0-1	
NITRATE	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
NITRATE	mg/kg	6.0	UJ	6.3	UJ	6.5	UJ	6.2	UJ	5.8	UJ

PLUMBROOK

Acid Area 3. Maintenance Shop. and Power Substation Areas

Data Summary - Soils

Report Date: 07/27/98

Sample Location:		AA3-SB03		AA3-SB04		AA3-SB04		AA3-SB05		AA3-SB05	
Associated Site:		AA3		AA3		AA3		AA3		AA3	
Sample No:		6660		6670		6680		6690		6700	
Sample Date:		01-MAY-98		01-MAY-98		01-MAY-98		01-MAY-98		01-MAY-98	
Depth:		6-8		0-1		8-10		0-1		8-10	
NITRATE	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
NITRATE	mg/kg	6.3	UJ	6.0	UJ	6.2	UJ	6.1	UJ	6.1	UJ

PLUMBROOK

Acid Area 3. Maintenance Shop, and Power Substation Areas

Data Summary - Soils

Report Date: 07/27/98

Sample Location:		AA3-SB06		AA3-SB06		AA3-SB07		AA3-SB07		AA3-SB08	
Associated Site:		AA3		AA3		AA3		AA3		AA3	
Sample No:		6710		6720		6730		6740		6750	
Sample Date:		01-MAY-98		01-MAY-98		01-MAY-98		01-MAY-98		01-MAY-98	
Depth:		0-1		4-6		0-1		2-4		0-1	
NITRATE	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
NITRATE	mg/kg	6.1	UJ	6.1	UJ	5.8	UJ	6.0	UJ	5.9	UJ

PLUMBROOK

Acid Area 3. Maintenance Shop. and Power Substation Areas

Data Summary - Soils

Report Date: 07/27/98

Sample Location:		AA3-SB08		AA3-SB09		AA3-SB09		AA3-SB10		AA3-SB10	
Associated Site:		AA3		AA3		AA3		AA3		AA3	
Sample No:		6760		6770		6780		6790		6800	
Sample Date:		01-MAY-98		02-MAY-98		02-MAY-98		02-MAY-98		02-MAY-98	
Depth:		4-6		0-1		8-10		0-1		6-8	
NITRATE	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
NITRATE	mg/kg	6.1	UJ	5.9	UJ	6.2	UJ	5.7	UJ	6.3	UJ

PLUMBROOK

Acid Area 3, Maintenance Shop, and Power Substation Areas

Data Summary - Soils

Report Date: 07/27/98

Sample Location:		AA3-SB11		AA3-SB11		AA3-SB12		AA3-SB12		AA3-SB13	
Associated Site:		AA3		AA3		AA3		AA3		AA3	
Sample No:		6810		6820		6830		6840		6850	
Sample Date:		30-APR-98		30-APR-98		01-MAY-98		01-MAY-98		01-MAY-98	
Depth:		0-1		2-4		0-1		2-4		0-1	
NITRATE	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
NITRATE	mg/kg	6.0	UJ	5.9	UJ	6.2	UJ	5.8	UJ	5.9	UJ

Sample Location:		AA3-SB13		AA3-SB14		AA3-SB14		AA3-SB15		AA3-SB15	
Associated Site:		AA3		AA3		AA3		AA3		AA3	
Sample No:		6860		6870		6880		6890		6900	
Sample Date:		01-MAY-98		01-MAY-98		01-MAY-98		01-MAY-98		01-MAY-98	
Depth:		8-10		0-1		2-4		0-1		6-8	
NITRATE	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
NITRATE	mg/kg	6.2	UJ	6.0	UJ	6.0	UJ	6.0	UJ	6.2	UJ

PLUMBROOK

Acid Area 3, Maintenance Shop, and Power Substation Areas

Data Summary - Soils

Report Date: 07/27/98

Sample Location:		AA3-SB01		AA3-SB01		AA3-SB02		AA3-SB02		AA3-SB03	
Associated Site:		AA3		AA3		AA3		AA3		AA3	
Sample No:		6610		6620		6630		6640		6650	
Sample Date:		03-MAY-98		03-MAY-98		01-MAY-98		01-MAY-98		01-MAY-98	
Depth:		0-1		6-8		0-1		6-8		0-1	
METALS	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
ALUMINUM	mg/kg	7310		10700		7320		9550		7740	
ANTIMONY	mg/kg	7.2	UJ	7.6	UJ	7.8	UJ	7.5	UJ	7.0	UJ
ARSENIC	mg/kg	8.2		4.0		5.9		5.1		9.4	
ARSENIC											
BARIUM	mg/kg	62.0		98.5		64.2		69.8		53.3	
BERYLLIUM	mg/kg	0.60	U	0.63	U	0.65	U	0.62	U	0.58	U
CADMIUM	mg/kg	0.60	U	0.63	U	0.65	U	0.62	U	0.58	U
CALCIUM	mg/kg	39300		59900		16300	J	55700	J	9680	
CHROMIUM	mg/kg	12.8		17.6		11.4		16.1		12.1	
COBALT	mg/kg	11.7		11.4		8.7		12.7		11.6	
COPPER	mg/kg	19.1		25.9		12.0		25.3		13.1	
IRON	mg/kg	18600		17000		13600		21100		17400	
LEAD	mg/kg	46.9		12.6		35.7		11.3		7.4	
LEAD											
MAGNESIUM	mg/kg	8550		19900		4260		19200		3660	
MANGANESE	mg/kg	353		286		531		473		442	
MERCURY	mg/kg	0.040	U	0.042	U	0.044		0.041	U	0.038	U
NICKEL	mg/kg	21.0		23.8		13.9		30.4		15.3	
POTASSIUM	mg/kg	1030	J	2550	J	649	U	2080		581	U
SELENIUM	mg/kg	0.69		1.6		0.65	U	0.75		0.58	U
SELENIUM											
SILVER	mg/kg	1.2	U	1.3	U	1.3	U	1.2	U	1.2	U
SODIUM	mg/kg	602	U	635	U	649	U	624	U	581	U
THALLIUM	mg/kg	1.2	U	1.3	U	1.3	U	1.2	U	1.2	U
THALLIUM											
VANADIUM	mg/kg	23.0		29.6		20.7		25.9		22.6	

PLUMBROOK

Acid Area 3, Maintenance Shop, and Power Substation Areas

Data Summary - Soils

Report Date: 07/27/98

Sample Location:		AA3-SB03		AA3-SB04		AA3-SB04		AA3-SB05		AA3-SB05	
Associated Site:		AA3		AA3		AA3		AA3		AA3	
Sample No:		6660		6670		6680		6690		6700	
Sample Date:		01-MAY-98		01-MAY-98		01-MAY-98		01-MAY-98		01-MAY-98	
Depth:		6-8		0-1		8-10		0-1		8-10	
METALS	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
ALUMINUM	mg/kg	7330		11800		10300		10600		6840	
ANTIMONY	mg/kg	8.0	J	7.2	UJ	7.4	UJ	7.3	UJ	7.3	UJ
ARSENIC	mg/kg	32.2		9.6		6.0		7.0		7.4	
ARSENIC											
BARIUM	mg/kg	126		115		70.6		84.7		74.4	
BERYLLIUM	mg/kg	0.63	U	0.60	U	0.62	U	0.61	U	0.61	U
CADMIUM	mg/kg	0.63	U	0.60	U	0.62	U	0.61	U	0.61	U
CALCIUM	mg/kg	56200		11900		63500		3510	J	56500	J
CHROMIUM	mg/kg	10.5		17.1		17.2		15.5		12.1	
COBALT	mg/kg	20.0		22.3		16.5		9.3		10.2	
COPPER	mg/kg	22.9		22.2		23.3		18.3		21.4	
IRON	mg/kg	34300		26600		23600		15900		19000	
LEAD	mg/kg	8.8		10.6		10.0		10.6		9.2	
LEAD											
MAGNESIUM	mg/kg	16400		5440		18200		2770		15800	
MANGANESE	mg/kg	1180		922		553		205		454	
MERCURY	mg/kg	0.042	U	0.039	U	0.041	U	0.049		0.040	U
NICKEL	mg/kg	45.0		36.5		31.7		19.1		23.5	
POTASSIUM	mg/kg	1580		901		2440		775		1430	
SELENIUM	mg/kg	0.64		0.60	U	0.65		0.70		0.87	
SELENIUM											
SILVER	mg/kg	1.3	U	1.2	U	1.2	U	1.2	U	1.2	U
SODIUM	mg/kg	633	U	598	U	620	U	606	U	608	U
THALLIUM	mg/kg	1.3	U	1.2	U	1.2	U	1.2	U	1.2	U
THALLIUM											
VANADIUM	mg/kg	24.2		30.0		27.7		23.9		21.4	

PLUMBROOK

Acid Area 3. Maintenance Shop. and Power Substation Areas

Data Summary - Soils

Report Date: 07/27/98

Sample Location:		AA3-SB06		AA3-SB06		AA3-SB07		AA3-SB07		AA3-SB08	
Associated Site:		AA3		AA3		AA3		AA3		AA3	
Sample No:		6710		6720		6730		6740		6750	
Sample Date:		01-MAY-98		01-MAY-98		01-MAY-98		01-MAY-98		01-MAY-98	
Depth:		0-1		4-6		0-1		2-4		0-1	
METALS	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
ALUMINUM	mg/kg	8730		9680		3960		2650		6540	
ANTIMONY	mg/kg	7.3	UJ	7.3	UJ	7.0	UJ	7.2	UJ	7.1	UJ
ARSENIC	mg/kg	7.8		10.3		3.4		2.5		5.9	
ARSENIC											
BARIUM	mg/kg	56.7		88.0		40.5		24.2	U	47.1	
BERYLLIUM	mg/kg	0.61	U	0.61	U	0.58	U	0.60	U	0.59	U
CADMIUM	mg/kg	0.61	U	0.61	U	0.58	U	0.60	U	0.59	U
CALCIUM	mg/kg	1650	J	52000	J	52200	J	3250	J	47600	
CHROMIUM	mg/kg	12.4		15.2		6.5		4.5		11.4	
COBALT	mg/kg	15.8		13.6		5.8	U	6.0	U	8.9	
COPPER	mg/kg	16.3		22.5		4.1		3.0	U	14.1	
IRON	mg/kg	20200		21500		6810		5720		14600	
LEAD	mg/kg	9.8		10.3		3.6		2.5		34.2	
LEAD											
MAGNESIUM	mg/kg	2140		18000		2240		744		9820	
MANGANESE	mg/kg	540		580		213		93.4		287	
MERCURY	mg/kg	0.046		0.040	U	0.039	U	0.040	U	0.19	
NICKEL	mg/kg	19.0		31.5		7.0		6.2		15.4	
POTASSIUM	mg/kg	610	U	1790		584	U	604	U	772	
SELENIUM	mg/kg	0.67		0.72		0.58	U	0.60	U	0.59	U
SELENIUM											
SILVER	mg/kg	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U
SODIUM	mg/kg	610	U	608	U	584	U	604	U	591	U
THALLIUM	mg/kg	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U
THALLIUM											
VANADIUM	mg/kg	23.7		26.3		14.5		8.2		19.9	

PLUMBROOK

Acid Area 3. Maintenance Shop, and Power Substation Areas

Data Summary - Soils

Report Date: 07/27/98

Sample Location:		AA3-SB08		AA3-SB09		AA3-SB09		AA3-SB10		AA3-SB10	
Associated Site:		AA3		AA3		AA3		AA3		AA3	
Sample No:		6760		6770		6780		6790		6800	
Sample Date:		01-MAY-98		02-MAY-98		02-MAY-98		02-MAY-98		02-MAY-98	
Depth:		4-6		0-1		8-10		0-1		6-8	
METALS	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
ALUMINUM	mg/kg	7070		6510		10200		5010		7500	
ANTIMONY	mg/kg	7.3	UJ	7.1	UJ	7.4	J	6.9	UJ	7.6	UJ
ARSENIC	mg/kg	5.6		4.7		29.2		3.1		6.6	
ARSENIC											
BARIUM	mg/kg	46.9		29.0		65.0		25.0		83.1	
BERYLLIUM	mg/kg	0.61	U	0.59	U	0.62	U	0.57	U	0.63	U
CADMIUM	mg/kg	0.61	U	0.59	U	0.62	U	0.57	U	0.63	U
CALCIUM	mg/kg	27500		1630		61300		18600		64200	
CHROMIUM	mg/kg	10.9		9.9		16.4		6.4		13.1	
COBALT	mg/kg	11.1		11.7		16.3		5.7	U	20.2	
COPPER	mg/kg	14.5		7.8		21.1		6.4		24.3	
IRON	mg/kg	14900		12800		23700		8230		25400	
LEAD	mg/kg	8.9		6.0		9.0		5.8		10.4	
LEAD											
MAGNESIUM	mg/kg	7700		1330		18800		2240		21400	
MANGANESE	mg/kg	277		290		525		159		674	
MERCURY	mg/kg	0.040	U	0.039	U	0.041	U	0.038	U	0.042	U
NICKEL	mg/kg	19.0		10.3		28.5		7.1		33.0	
POTASSIUM	mg/kg	812		588	U	2530		574	U	1480	
SELENIUM	mg/kg	0.61	U	0.59	U	0.71		0.57	U	0.63	U
SELENIUM											
SILVER	mg/kg	1.2	U	1.2	U	1.2	U	1.1	U	1.3	U
SODIUM	mg/kg	612	U	588	U	620	U	574	U	632	U
THALLIUM	mg/kg	1.2	U	1.2	U	1.2	U	1.1	U	1.3	U
THALLIUM											
VANADIUM	mg/kg	19.8		18.7		28.1		13.3		26.9	

PLUMBROOK

Acid Area 3, Maintenance Shop, and Power Substation Areas

Data Summary - Soils

Report Date: 07/27/98

Sample Location:		AA3-SB11		AA3-SB11		AA3-SB12		AA3-SB12		AA3-SB13	
Associated Site:		AA3		AA3		AA3		AA3		AA3	
Sample No:		6810		6820		6830		6840		6850	
Sample Date:		30-APR-98		30-APR-98		01-MAY-98		01-MAY-98		01-MAY-98	
Depth:		0-1		2-4		0-1		2-4		0-1	
METALS	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
ALUMINUM	mg/kg	7940		7300		6190		5790		7700	
ANTIMONY	mg/kg	7.3	UJ	7.1	UJ	7.4	UJ	6.9	UJ	7.1	UJ
ARSENIC	mg/kg	7.7		7.5		4.6		5.7		6.0	
ARSENIC											
BARIUM	mg/kg	41.0		33.8		57.8		39.5		53.3	
BERYLLIUM	mg/kg	0.60	U	0.59	U	0.62	U	0.58	U	0.59	U
CADMIUM	mg/kg	0.60	U	0.59	U	0.62	U	0.58	U	0.59	U
CALCIUM	mg/kg	31300	J	10200	J	4620	J	3240	J	48400	J
CHROMIUM	mg/kg	11.6		12.3		8.9		10		12.1	
COBALT	mg/kg	10.6		10.0		6.4		8.3		17.1	
COPPER	mg/kg	14.1		12.8		11.3		11.2		20.5	
IRON	mg/kg	16200		17400		11100		14800		21100	
LEAD	mg/kg	8.6		6.5		10.4		6.8		9.8	
LEAD											
MAGNESIUM	mg/kg	8900		3890		1270		1810		13400	
MANGANESE	mg/kg	388		301		182		173		814	
MERCURY	mg/kg	0.040	U	0.039	U	0.042		0.038	U	0.039	U
NICKEL	mg/kg	20.0		18.5		10		15.7		34.9	
POTASSIUM	mg/kg	908		588	U	620	U	578	U	945	
SELENIUM	mg/kg	0.60	U	0.59	U	1.0		0.58	U	0.59	U
SELENIUM											
SILVER	mg/kg	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U
SODIUM	mg/kg	605	U	588	U	620	U	578	U	592	U
THALLIUM	mg/kg	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U
THALLIUM											
VANADIUM	mg/kg	23.2		22.5		16.7		18.7		25.9	

Sample Location:		AA3-SB13		AA3-SB14		AA3-SB14		AA3-SB15		AA3-SB15	
Associated Site:		AA3		AA3		AA3		AA3		AA3	
Sample No:		6860		6870		6880		6890		6900	
Sample Date:		01-MAY-98		01-MAY-98		01-MAY-98		01-MAY-98		01-MAY-98	
Depth:		8-10		0-1		2-4		0-1		6-8	
METALS	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
ALUMINUM	mg/kg	9690		5990		11100		5720		5620	
ANTIMONY	mg/kg	7.4	UJ	7.2	UJ	7.2	UJ	7.2	UJ	7.4	UJ
ARSENIC	mg/kg	10.8		2.5		11.6		6.0		16.8	
ARSENIC											
BARIUM	mg/kg	58.6		24.0	U	79.8		31.9		41.2	
BERYLLIUM	mg/kg	0.62	U	0.60	U	0.67		0.60	U	0.62	U
CADMIUM	mg/kg	0.62	U	0.60	U	0.60	U	0.60	U	0.62	U
CALCIUM	mg/kg	43900	J	2400	J	4240	J	22700	J	59400	J
CHROMIUM	mg/kg	14.8		7.4		16.2		8.4		10.6	
COBALT	mg/kg	12.4		6.0	U	18.1		6.7		8.2	
COPPER	mg/kg	19.3		4.2		23.4		9.7		14.8	
IRON	mg/kg	19800		9180		28500		11100		16200	
LEAD	mg/kg	10.1		6.0		12.0		12.6		7.0	
LEAD											
MAGNESIUM	mg/kg	13200		992		3590		6500		15800	
MANGANESE	mg/kg	489		51.9		1120		224		326	
MERCURY	mg/kg	0.041	U	0.040	U	0.040	U	0.040	U	0.041	U
NICKEL	mg/kg	25.7		6.8		39.8		12.2		16.7	
POTASSIUM	mg/kg	1480		599	U	839		599	U	1190	
SELENIUM	mg/kg	0.66		0.60	U	0.81		0.60		0.62	U
SELENIUM											
SILVER	mg/kg	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U
SODIUM	mg/kg	619	U	599	U	601	U	599	U	618	U
THALLIUM	mg/kg	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U
THALLIUM											
VANADIUM	mg/kg	27.7		14.3		31.5		17.0		20.5	

PLUMBROOK

Acid Area 3. Maintenance Shop. and Power Substation Areas

Data Summary - Soils

Report Date: 07/27/98

Sample Location:		LAB		MNT-SB01		MNT-SB01		MNT-SB02		MNT-SB02	
Associated Site:		AA3		MSA		MSA		MSA		MSA	
Sample No:		6630		6910		6920		6930		6940	
Sample Date:		01-MAY-98		03-MAY-98		03-MAY-98		02-MAY-98		02-MAY-98	
Depth:		0-1		0-1		4-6		0-1		2-4	
METALS	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
ALUMINUM	mg/kg	7320		6400		9370		5830		11900	
ANTIMONY	mg/kg	7.8	UJ	7.2	UJ	7.4	UJ	7.1	UJ	7.2	UJ
ARSENIC	mg/kg	5.9		7.0		5.1		9.6		7.6	
ARSENIC											
BARIUM	mg/kg	64.2		36.7		92.3		36.1		88.3	
BERYLLIUM	mg/kg	0.65	U	0.60	U	0.65		0.59	U	0.75	
CADMIUM	mg/kg	0.65	U	0.60	U	0.61	U	0.59	U	0.60	U
CALCIUM	mg/kg	16300	J	51300		3940		47700		3800	
CHROMIUM	mg/kg	11.4		10.2		14.3		9.7		16.8	
COBALT	mg/kg	8.7		8.6		12.6		9.1		14.2	
COPPER	mg/kg	12.0		12.4		16.5		13.7		18.2	
IRON	mg/kg	13600		13400		18600		13600		22000	
LEAD	mg/kg	35.7		6.5		9.6		7.6		10.3	
LEAD											
MAGNESIUM	mg/kg	4260		13900		2660		12700		2490	
MANGANESE	mg/kg	531		298		392		381		298	
MERCURY	mg/kg	0.044		0.040	U	0.040	U	0.039	U	0.040	U
NICKEL	mg/kg	13.9		13.6		18.5		16.0		19.9	
POTASSIUM	mg/kg	649	U	953	J	699	J	998		722	
SELENIUM	mg/kg	0.65	U	0.60	U	0.61	U	0.59	U	0.64	
SELENIUM											
SILVER	mg/kg	1.3	U	1.2	U	1.2	U	1.2	U	1.2	U
SODIUM	mg/kg	649	U	602	U	613	U	588	U	604	U
THALLIUM	mg/kg	1.3	U	1.2	U	1.2	U	1.2	U	1.2	U
THALLIUM											
VANADIUM	mg/kg	20.7		21.1		21.2		18.4		28.5	

PLUMBROOK

Acid Area 3, Maintenance Shop, and Power Substation Areas

Data Summary - Soils

Report Date: 07/27/98

Sample Location:		MNT-SB03		MNT-SB03		PSB-SS01		PSB-SS02	
Associated Site:		MSA		MSA		PSB		PSB	
Sample No:		6950		6960		6970		6980	
Sample Date:		02-MAY-98		02-MAY-98		03-MAY-98		03-MAY-98	
Depth:		0-1		6-8		0-1		0-1	
METALS	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
ALUMINUM	mg/kg	8440		8350		5660		8210	
ANTIMONY	mg/kg	7.3	UJ	7.5	UJ	7.5	UJ	8.2	UJ
ARSENIC	mg/kg	5.8		11.6		3.8		5.1	
ARSENIC									
BARIUM	mg/kg	81.4		84.2		40.8		49.5	
BERYLLIUM	mg/kg	0.61	U	0.63	U	0.62	U	0.69	U
CADMIUM	mg/kg	0.61	U	0.63	U	0.62	U	0.69	U
CALCIUM	mg/kg	4410		56100		2540		6540	
CHROMIUM	mg/kg	10.9		15.0		11.1		14.4	
COBALT	mg/kg	10.5		15.6		8.6		11.4	
COPPER	mg/kg	12.9		21.4		9.7		13.4	
IRON	mg/kg	16600		22700		11000		14400	
LEAD	mg/kg	11.5		9.7		16.5		33.6	
LEAD									
MAGNESIUM	mg/kg	1740		15800		1340		2330	
MANGANESE	mg/kg	574		609		226		312	
MERCURY	mg/kg	0.046		0.041	U	0.041	U	0.045	
NICKEL	mg/kg	12.2		24.8		10.3		15.3	
POTASSIUM	mg/kg	611		1630		623	U	1160	
SELENIUM	mg/kg	0.62		0.63	U	0.62	U	0.69	U
SELENIUM									
SILVER	mg/kg	1.2	U	1.3	U	1.2	U	1.4	U
SODIUM	mg/kg	608	U	627	U	623	U	686	U
THALLIUM	mg/kg	1.2	U	1.3	U	1.2	U	1.4	U
THALLIUM									
VANADIUM	mg/kg	21.1		24.8		16.6		23.1	

PLUMBROOK

Acid Area 3. Maintenance Shop. and Power Substation Areas

Data Summary - Soils

Report Date: 07/27/98

Sample Location:		AA3-SB01		AA3-SB01		AA3-SB02		AA3-SB02		AA3-SB03	
Associated Site:		AA3		AA3		AA3		AA3		AA3	
Sample No:		6610		6620		6630		6640		6650	
Sample Date:		03-MAY-98		03-MAY-98		01-MAY-98		01-MAY-98		01-MAY-98	
Depth:		0-1		6-8		0-1		6-8		0-1	
METALS	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
ZINC	mg/kg	74.6		59.9		41.3		66.7		35.0	

PLUMBROOK

Acid Area 3, Maintenance Shop, and Power Substation Areas

Data Summary - Soils

Report Date: 07/27/98

Sample Location:		AA3-SB03		AA3-SB04		AA3-SB04		AA3-SB05		AA3-SB05	
Associated Site:		AA3		AA3		AA3		AA3		AA3	
Sample No:		6660		6670		6680		6690		6700	
Sample Date:		01-MAY-98		01-MAY-98		01-MAY-98		01-MAY-98		01-MAY-98	
Depth:		6-8		0-1		8-10		0-1		8-10	
METALS	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
ZINC	mg/kg	71.1		60.1		67.9		66.6		61.4	

PLUMBROOK

Acid Area 3. Maintenance Shop. and Power Substation Areas

Data Summary - Soils

Report Date: 07/27/98

Sample Location:		AA3-SB06		AA3-SB06		AA3-SB07		AA3-SB07		AA3-SB08	
Associated Site:		AA3		AA3		AA3		AA3		AA3	
Sample No:		6710		6720		6730		6740		6750	
Sample Date:		01-MAY-98		01-MAY-98		01-MAY-98		01-MAY-98		01-MAY-98	
Depth:		0-1		4-6		0-1		2-4		0-1	
METALS	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
ZINC	mg/kg	44.3		66.2		21.3		16.9		75.4	

Report Date: 07/27/98

Sample Location:		AA3-SB08		AA3-SB09		AA3-SB09		AA3-SB10		AA3-SB10	
Associated Site:		AA3		AA3		AA3		AA3		AA3	
Sample No:		6760		6770		6780		6790		6800	
Sample Date:		01-MAY-98		02-MAY-98		02-MAY-98		02-MAY-98		02-MAY-98	
Depth:		4-6		0-1		8-10		0-1		6-8	
METALS	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
ZINC	mg/kg	48.2		27.9		62.7		24.2		77.5	

Report Date: 07/27/98

Sample Location:		AA3-SB11		AA3-SB11		AA3-SB12		AA3-SB12		AA3-SB13	
Associated Site:		AA3		AA3		AA3		AA3		AA3	
Sample No:		6810		6820		6830		6840		6850	
Sample Date:		30-APR-98		30-APR-98		01-MAY-98		01-MAY-98		01-MAY-98	
Depth:		0-1		2-4		0-1		2-4		0-1	
METALS	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
ZINC	mg/kg	44.6		39.5		36.0		39.5		61.3	

Report Date: 07/27/98

Sample Location:		AA3-SB13		AA3-SB14		AA3-SB14		AA3-SB15		AA3-SB15	
Associated Site:		AA3		AA3		AA3		AA3		AA3	
Sample No:		6860		6870		6880		6890		6900	
Sample Date:		01-MAY-98		01-MAY-98		01-MAY-98		01-MAY-98		01-MAY-98	
Depth:		8-10		0-1		2-4		0-1		6-8	
METALS	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
ZINC	mg/kg	57.9		23.2		68.7		51.8		45.5	

PLUMBROOK

Acid Area 3. Maintenance Shop. and Power Substation Areas

Data Summary - Soils

Report Date: 07/27/98

Sample Location:		LAB		MNT-SB01		MNT-SB01		MNT-SB02		MNT-SB02	
Associated Site:		AA3		MSA		MSA		MSA		MSA	
Sample No:		6630		6910		6920		6930		6940	
Sample Date:		01-MAY-98		03-MAY-98		03-MAY-98		02-MAY-98		02-MAY-98	
Depth:		0-1		0-1		4-6		0-1		2-4	
METALS	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
ZINC	mg/kg	41.3		38.0		53.8		39.6		61.2	

PLUMBROOK

Acid Area 3, Maintenance Shop, and Power Substation Areas

Data Summary - Soils

Report Date: 07/27/98

Sample Location:		MNT-SB03		MNT-SB03		PSB-SS01		PSB-SS02	
Associated Site:		MSA		MSA		PSB		PSB	
Sample No:		6950		6960		6970		6980	
Sample Date:		02-MAY-98		02-MAY-98		03-MAY-98		03-MAY-98	
Depth:		0-1		6-8		0-1		0-1	
METALS	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
ZINC	mg/kg	40.2		60.2		128	J	238	J

Report Date: 07/27/98

Sample Location:		AA3-SB01		AA3-SB01		AA3-SB02		AA3-SB02	
Associated Site:		AA3		AA3		AA3		AA3	
Sample No:		6610		6620		6630		6640	
Sample Date:		03-MAY-98		03-MAY-98		01-MAY-98		01-MAY-98	
Depth:		0-1		6-8		0-1		6-8	
EXPLOSIVES	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
1,3,5-TRINITROBENZENE	ug/kg	250	U	250	U	250	U	250	U
1,3-DINITROBENZENE	ug/kg	250	U	250	U	250	U	250	U
2,4,6-TRINITROTOLUENE	ug/kg	250	U	250	U	250	U	250	U
2,4-DINITROTOLUENE	ug/kg	810		2100		250	U	250	U
2,6-DINITROTOLUENE	ug/kg	250	U	250	U	250	U	250	U
2-NITROTOLUENE	ug/kg	250	U	250	U	250	U	250	U
3-NITROTOLUENE	ug/kg	250	U	250	U	250	U	250	U
4-AMINO-2,6-DINITROTOLUENE	ug/kg	250	U	250	U	250	U	250	U
HMX	ug/kg	500	U	500	U	500	U	500	U
NITROBENZENE	ug/kg	250	U	250	U	250	U	250	U
RDX	ug/kg	500	U	500	U	500	U	500	U
TETRYL	ug/kg	650	U	650	U	650	U	650	U

PL...ROOK

Background

Data Summary - Soils

Report Date: 07/24/98

Sample Location:		BCG-SB01		BCG-SB01		BCG-SB02		BCG-SB02		BCG-SB03	
Associated Site:		BCG		BCG		BCG		BCG		BCG	
Sample No:		6990		7000		7010		7020		7030	
Sample Date:		03-MAY-98		03-MAY-98		02-MAY-98		02-MAY-98		02-MAY-98	
Depth.		0-1		4-6		0-1		2-4		0-1	
pH	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
pH	STD UNIT	6.6	J	7.2	J	7.1	J	7.3	J	7.8	J

PLUMBROOK

Background

Data Summary - Soils

Report Date: 07/24/98

Sample Location:		BCG-SB03		BCG-SB04		BCG-SB04		BCG-SB05		BCG-SB05	
Associated Site:		BCG		BCG		BCG		BCG		BCG	
Sample No:		7040		7050		7060		7070		7080	
Sample Date:		02-MAY-98		02-MAY-98		02-MAY-98		02-MAY-98		02-MAY-98	
Depth:		6-8		0-1		2-4		0-1		4-6	
pH	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
pH	STD UNIT	5.6	J	4.7	J	7.1	J	7.0	J	6.8	J

PLA ROOK
Background
Data Summary - Soils

Report Date: 07/24/98

Sample Location:		BCG-SB06		BCG-SB06	
Associated Site:		BCG		BCG	
Sample No:		7090		7100	
Sample Date:		02-MAY-98		02-MAY-98	
Depth:		0-1		6-7	
pH	Units	Result	Val Qlfr	Result	Val Qlfr
pH	STD UNIT	7.1	J	7.1	J

PLUMBROOK
Background
Data Summary - Soils

Report Date: 07/24/98

Sample Location:		BCG-SB01		BCG-SB01		BCG-SB02		BCG-SB02		BCG-SB03	
Associated Site:		BCG		BCG		BCG		BCG		BCG	
Sample No:		6990		7000		7010		7020		7030	
Sample Date:		03-MAY-98		03-MAY-98		02-MAY-98		02-MAY-98		02-MAY-98	
Depth:		0-1		4-6		0-1		2-4		0-1	
VOLATILES	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
1,1,1-TRICHLOROETHANE	ug/kg	6.2	U	5.7	U	6.2	U	6.1	U	6.1	U
1,1,2,2-TETRACHLOROETHANE	ug/kg	6.2	UJ	5.7	UJ	6.2	UJ	6.1	U	6.1	U
1,1,2-TRICHLOROETHANE	ug/kg	6.2	U	5.7	U	6.2	U	6.1	U	6.1	U
1,1-DICHLOROETHANE	ug/kg	6.2	U	5.7	U	6.2	U	6.1	U	6.1	U
1,1-DICHLOROETHENE	ug/kg	6.2	U	5.7	U	6.2	U	6.1	U	6.1	U
1,2-DICHLOROETHANE	ug/kg	6.2	U	5.7	U	6.2	U	6.1	U	6.1	U
1,2-DICHLOROETHENE	ug/kg	6.2	U	5.7	U	6.2	U	6.1	U	6.1	U
1,2-DICHLOROPROPANE	ug/kg	6.2	U	5.7	U	6.2	U	6.1	U	6.1	U
2-BUTANONE	ug/kg	25	U	23	U	25	U	25	U	25	U
2-HEXANONE	ug/kg	25	U	23	U	25	U	25	U	25	U
4-METHYL-2-PENTANONE	ug/kg	25	U	23	U	25	U	25	U	25	U
ACETONE	ug/kg	25	U	23	U	25	U	25	U	25	U
BENZENE	ug/kg	6.2	U	5.7	U	6.2	U	6.1	U	6.1	U
BROMODICHLOROMETHANE	ug/kg	6.2	U	5.7	U	6.2	U	6.1	U	6.1	U
BROMOFORM	ug/kg	6.2	U	5.7	U	6.2	U	6.1	U	6.1	U
BROMOMETHANE	ug/kg	12	U	11	U	12	U	12	U	12	U
CARBON DISULFIDE	ug/kg	6.2	U	5.7	U	6.2	U	6.1	U	6.1	U
CARBON TETRACHLORIDE	ug/kg	6.2	U	5.7	U	6.2	U	6.1	U	6.1	U
CHLOROBENZENE	ug/kg	6.2	U	5.7	U	6.2	U	6.1	U	6.1	U
CHLOROETHANE	ug/kg	12	U	11	U	12	U	12	U	12	U
CHLOROFORM	ug/kg	6.2	U	5.7	U	6.2	U	6.1	U	6.1	U
CHLOROMETHANE	ug/kg	12	U	11	U	12	U	12	U	12	U
DIBROMOCHLOROMETHANE	ug/kg	6.2	U	5.7	U	6.2	U	6.1	U	6.1	U
ETHYLBENZENE	ug/kg	6.2	U	5.7	U	6.2	U	6.1	U	6.1	U
METHYLENE CHLORIDE	ug/kg	6.2	U	5.7	U	6.2	U	6.1	U	6.1	U
STYRENE	ug/kg	6.2	U	5.7	U	6.2	U	6.1	U	6.1	U
TETRACHLOROETHENE	ug/kg	6.2	U	5.7	U	6.2	U	6.1	U	6.1	U
TOLUENE	ug/kg	6.2	U	5.7	U	6.2	U	6.1	U	6.1	U
TOTAL XYLENES	ug/kg	6.2	U	5.7	U	6.2	U	6.1	U	6.1	U
TRICHLOROETHENE	ug/kg	6.2	U	5.7	U	6.2	U	6.1	U	1	U

Sample Location:		BCG-SB03		BCG-SB04		BCG-SB04		BCG-SB05		BCG-SB05	
Associated Site:		BCG		BCG		BCG		BCG		BCG	
Sample No:		7040		7050		7060		7070		7080	
Sample Date:		02-MAY-98		02-MAY-98		02-MAY-98		02-MAY-98		02-MAY-98	
Depth:		6-8		0-1		2-4		0-1		4-6	
VOLATILES	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
1,1,1-TRICHLOROETHANE	ug/kg	6.0	U	6.1	U	6.6	UJ	6.0	U	6.2	U
1,1,2,2-TETRACHLOROETHANE	ug/kg	6.0	UJ	6.1	UJ	6.6	UJ	6.0	U	6.2	U
1,1,2-TRICHLOROETHANE	ug/kg	6.0	UJ	6.1	UJ	6.6	UJ	6.0	U	6.2	U
1,1-DICHLOROETHANE	ug/kg	6.0	U	6.1	U	6.6	UJ	6.0	U	6.2	U
1,1-DICHLOROETHENE	ug/kg	6.0	U	6.1	U	6.6	UJ	6.0	U	6.2	U
1,2-DICHLOROETHANE	ug/kg	6.0	U	6.1	U	6.6	UJ	6.0	U	6.2	U
1,2-DICHLOROETHENE	ug/kg	6.0	U	6.1	U	6.6	UJ	6.0	U	6.2	U
1,2-DICHLOROPROPANE	ug/kg	6.0	UJ	6.1	UJ	6.6	UJ	6.0	U	6.2	U
2-BUTANONE	ug/kg	24	U	24	U	27	UJ	24	U	25	U
2-HEXANONE	ug/kg	24	UJ	24	UJ	27	UJ	24	U	25	U
4-METHYL-2-PENTANONE	ug/kg	24	UJ	24	UJ	27	UJ	24	U	25	U
ACETONE	ug/kg	9.0	J	24	U	27	UJ	24	U	25	U
BENZENE	ug/kg	6.0	UJ	6.1	UJ	6.6	UJ	6.0	U	6.2	U
BROMODICHLOROMETHANE	ug/kg	6.0	UJ	6.1	UJ	6.6	UJ	6.0	U	6.2	U
BROMOFORM	ug/kg	6.0	UJ	6.1	UJ	6.6	UJ	6.0	U	6.2	U
BROMOMETHANE	ug/kg	12	U	12	U	13	UJ	12	U	12	U
CARBON DISULFIDE	ug/kg	1.6	J	6.1	U	6.6	UJ	6.0	U	6.2	U
CARBON TETRACHLORIDE	ug/kg	6.0	UJ	6.1	UJ	6.6	UJ	6.0	U	6.2	U
CHLOROBENZENE	ug/kg	6.0	UJ	6.1	UJ	6.6	UJ	6.0	U	6.2	U
CHLOROETHANE	ug/kg	12	U	12	U	13	UJ	12	U	12	U
CHLOROFORM	ug/kg	6.0	U	6.1	U	6.6	UJ	6.0	U	6.2	U
CHLOROMETHANE	ug/kg	12	U	12	U	13	UJ	12	U	12	U
DIBROMOCHLOROMETHANE	ug/kg	6.0	UJ	6.1	UJ	6.6	UJ	6.0	U	6.2	U
ETHYLBENZENE	ug/kg	6.0	UJ	6.1	UJ	6.6	UJ	6.0	U	6.2	U
METHYLENE CHLORIDE	ug/kg	6.0	U	6.1	U	7.1	J	6.0	U	6.2	U
STYRENE	ug/kg	6.0	UJ	6.1	UJ	6.6	UJ	6.0	U	6.2	U
TETRACHLOROETHENE	ug/kg	6.0	UJ	6.1	UJ	6.6	UJ	6.0	U	6.2	U
TOLUENE	ug/kg	6.0	UJ	6.1	UJ	2.6	J	6.0	U	6.2	U
TOTAL XYLENES	ug/kg	6.0	UJ	6.1	UJ	6.6	UJ	6.0	U	6.2	U
TRICHLOROETHENE	ug/kg	6.0	UJ	6.1	UJ	6.6	UJ	6.0	U	6.2	U

PLUMBROOK
Background
Data Summary - Soils

Report Date: 07/24/98

Sample Location:		BCG-SB06		BCG-SB06	
Associated Site:		BCG		BCG	
Sample No:		7090		7100	
Sample Date:		02-MAY-98		02-MAY-98	
Depth:		0-1		6-7	
VOLATILES	Units	Result	Val Qlfr	Result	Val Qlfr
1,1,1-TRICHLOROETHANE	ug/kg	5.8	U	5.7	UJ
1,1,2,2-TETRACHLOROETHANE	ug/kg	5.8	U	5.7	UJ
1,1,2-TRICHLOROETHANE	ug/kg	5.8	U	5.7	UJ
1,1-DICHLOROETHANE	ug/kg	5.8	U	5.7	UJ
1,1-DICHLOROETHENE	ug/kg	5.8	U	5.7	UJ
1,2-DICHLOROETHANE	ug/kg	5.8	U	5.7	UJ
1,2-DICHLOROETHENE	ug/kg	5.8	U	5.7	UJ
1,2-DICHLOROPROPANE	ug/kg	5.8	U	5.7	UJ
2-BUTANONE	ug/kg	23	U	23	UJ
2-HEXANONE	ug/kg	23	U	23	UJ
4-METHYL-2-PENTANONE	ug/kg	23	U	23	UJ
ACETONE	ug/kg	23	U	8.5	J
BENZENE	ug/kg	5.8	U	5.7	UJ
BROMODICHLOROMETHANE	ug/kg	5.8	U	5.7	UJ
BROMOFORM	ug/kg	5.8	U	5.7	UJ
BROMOMETHANE	ug/kg	12	U	11	UJ
CARBON DISULFIDE	ug/kg	5.8	U	4.4	J
CARBON TETRACHLORIDE	ug/kg	5.8	U	5.7	UJ
CHLOROBENZENE	ug/kg	5.8	U	5.7	UJ
CHLOROETHANE	ug/kg	12	U	11	UJ
CHLOROFORM	ug/kg	5.8	U	5.7	UJ
CHLOROMETHANE	ug/kg	12	U	11	UJ
DIBROMOCHLOROMETHANE	ug/kg	5.8	U	5.7	UJ
ETHYLBENZENE	ug/kg	5.8	U	5.7	UJ
METHYLENE CHLORIDE	ug/kg	5.8	U	5.7	UJ
STYRENE	ug/kg	5.8	U	5.7	UJ
TETRACHLOROETHENE	ug/kg	5.8	U	5.7	UJ
TOLUENE	ug/kg	5.8	U	5.7	UJ
TOTAL XYLENES	ug/kg	5.8	U	5.7	UJ
TRICHLOROETHENE	ug/kg	5.8	U	5.7	UJ

Report Date: 07/24/98

Sample Location:		BCG-SB01		BCG-SB01		BCG-SB02		BCG-SB02		BCG-SB03	
Associated Site:		BCG		BCG		BCG		BCG		BCG	
Sample No:		6990		7000		7010		7020		7030	
Sample Date:		03-MAY-98		03-MAY-98		02-MAY-98		02-MAY-98		02-MAY-98	
Depth:		0-1		4-6		0-1		2-4		0-1	
VOLATILES	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
VINYL CHLORIDE	ug/kg	12	U	11	U	12	U	12	U	12	U
cis-1,3-DICHLOROPROPENE	ug/kg	6.2	U	5.7	U	6.2	U	6.1	U	6.1	U
trans-1,3-DICHLOROPROPENE	ug/kg	6.2	U	5.7	U	6.2	U	6.1	U	6.1	U

PLUMBROOK

Background

Data Summary - Soils

Report Date: 07/24/98

Sample Location:		BCG-SB03		BCG-SB04		BCG-SB04		BCG-SB05		BCG-SB05	
Associated Site:		BCG		BCG		BCG		BCG		BCG	
Sample No:		7040		7050		7060		7070		7080	
Sample Date:		02-MAY-98		02-MAY-98		02-MAY-98		02-MAY-98		02-MAY-98	
Depth:		6-8		0-1		2-4		0-1		4-6	
VOLATILES	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
VINYL CHLORIDE	ug/kg	12	U	12	U	13	UJ	12	U	12	U
cis-1,3-DICHLOROPROPENE	ug/kg	6.0	UJ	6.1	UJ	6.6	UJ	6.0	U	6.2	U
trans-1,3-DICHLOROPROPENE	ug/kg	6.0	UJ	6.1	UJ	6.6	UJ	6.0	U	6.2	U

Sample Location:		BCG-SB06		BCG-SB06	
Associated Site:		BCG		BCG	
Sample No:		7090		7100	
Sample Date:		02-MAY-98		02-MAY-98	
Depth:		0-1		6-7	
VOLATILES	Units	Result	Val Qlfr	Result	Val Qlfr
VINYL CHLORIDE	ug/kg	12	U	11	UJ
cis-1,3-DICHLOROPROPENE	ug/kg	5.8	U	5.7	UJ
trans-1,3-DICHLOROPROPENE	ug/kg	5.8	U	5.7	UJ

PLUMBROOK

Background

Data Summary - Soils

Report Date: 07/24/98

Sample Location:		BCG-SB01		BCG-SB01		BCG-SB02		BCG-SB02		BCG-SB03	
Associated Site:		BCG		BCG		BCG		BCG		BCG	
Sample No:		6990		7000		7010		7020		7030	
Sample Date:		03-MAY-98		03-MAY-98		02-MAY-98		02-MAY-98		02-MAY-98	
Depth:		0-1		4-6		0-1		2-4		0-1	
SULFATE	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
SULFATE	mg/kg	12.3	U	303		20.8		12.3	U	12.3	U

Sample Location:		BCG-SB03		BCG-SB04		BCG-SB04		BCG-SB05		BCG-SB05	
Associated Site:		BCG		BCG		BCG		BCG		BCG	
Sample No:		7040		7050		7060		7070		7080	
Sample Date:		02-MAY-98		02-MAY-98		02-MAY-98		02-MAY-98		02-MAY-98	
Depth:		6-8		0-1		2-4		0-1		4-6	
SULFATE	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
SULFATE	mg/kg	12.0	U	12.6		64.9		12.0	U	12.3	U

Sample Location:		BCG-SB06		BCG-SB06	
Associated Site:		BCG		BCG	
Sample No:		7090		7100	
Sample Date:		02-MAY-98		02-MAY-98	
Depth:		0-1		6-7	
SULFATE	Units	Result	Val Qlfr	Result	Val Qlfr
SULFATE	mg/kg	11.6	U	33.1	

Report Date: 07/24/98

Sample Location:		BCG-SB01		BCG-SB01		BCG-SB02		BCG-SB02		BCG-SB03	
Associated Site:		BCG		BCG		BCG		BCG		BCG	
Sample No:		6990		7000		7010		7020		7030	
Sample Date:		03-MAY-98		03-MAY-98		02-MAY-98		02-MAY-98		02-MAY-98	
Depth:		0-1		4-6		0-1		2-4		0-1	
SEMIVOLATILES	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
1,2,4-TRICHLOROBENZENE	ug/kg	410	U	370	U	410	U	400	U	400	U
1,2-DICHLOROBENZENE	ug/kg	410	U	370	U	410	U	400	U	400	U
1,3-DICHLOROBENZENE	ug/kg	410	U	370	U	410	U	400	U	400	U
1,4-DICHLOROBENZENE	ug/kg	410	U	370	U	410	U	400	U	400	U
2,4,5-TRICHLOROPHENOL	ug/kg	410	U	370	U	410	U	400	U	400	U
2,4,6-TRICHLOROPHENOL	ug/kg	410	U	370	U	410	U	400	U	400	U
2,4-DICHLOROPHENOL	ug/kg	410	U	370	U	410	U	400	U	400	U
2,4-DIMETHYLPHENOL	ug/kg	410	U	370	U	410	U	400	U	400	U
2,4-DINITROPHENOL	ug/kg	2000	U	1800	U	2000	U	2000	U	2000	U
2,4-DINITROTOLUENE	ug/kg	410	U	370	U	410	U	400	U	400	U
2,6-DINITROTOLUENE	ug/kg	410	U	370	U	410	U	400	U	400	U
2-CHLORONAPHTHALENE	ug/kg	410	U	370	U	410	U	400	U	400	U
2-CHLOROPHENOL	ug/kg	410	U	370	U	410	U	400	U	400	U
2-METHYLNAPHTHALENE	ug/kg	410	U	370	U	410	U	400	U	400	U
2-METHYLPHENOL	ug/kg	410	U	370	U	410	U	400	U	400	U
2-NITROANILINE	ug/kg	2000	U	1800	U	2000	U	2000	U	2000	U
2-NITROPHENOL	ug/kg	410	U	370	U	410	U	400	U	400	U
3,3'-DICHLOROBENZIDINE	ug/kg	2000	U	1800	U	2000	U	2000	U	2000	U
3-NITROANILINE	ug/kg	2000	U	1800	U	2000	U	2000	U	2000	U
4,6-DINITRO-2-METHYLPHENOL	ug/kg	2000	U	1800	U	2000	U	2000	U	2000	U
4-BROMOPHENYL PHENYL ETHER	ug/kg	410	U	370	U	410	U	400	U	400	U
4-CHLORO-3-METHYLPHENOL	ug/kg	410	U	370	U	410	U	400	U	400	U
4-CHLOROANILINE	ug/kg	410	U	370	U	410	U	400	U	400	U
4-CHLOROPHENYL PHENYL ETHER	ug/kg	410	U	370	U	410	U	400	U	400	U
4-METHYLPHENOL	ug/kg	410	U	370	U	410	U	400	U	400	U
4-NITROANILINE	ug/kg	2000	U	1800	U	2000	U	2000	U	2000	U
4-NITROPHENOL	ug/kg	2000	U	1800	U	2000	U	2000	U	2000	U
ACENAPHTHENE	ug/kg	410	U	370	U	410	U	400	U	400	U
ACENAPHTHYLENE	ug/kg	410	U	370	U	110	J	400	U	400	U
ANTHRACENE	ug/kg	410	U	370	U	65	J	400	U	400	U

Sample Location:		BCG-SB03		BCG-SB04		BCG-SB04		BCG-SB05		BCG-SB05	
Associated Site:		BCG		BCG		BCG		BCG		BCG	
Sample No:		7040		7050		7060		7070		7080	
Sample Date:		02-MAY-98		02-MAY-98		02-MAY-98		02-MAY-98		02-MAY-98	
Depth:		6-8		0-1		2-4		0-1		4-6	
SEMIVOLATILES	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
1,2,4-TRICHLOROBENZENE	ug/kg	400	U	400	U	440	U	400	U	410	U
1,2-DICHLOROBENZENE	ug/kg	400	U	400	U	440	U	400	U	410	U
1,3-DICHLOROBENZENE	ug/kg	400	U	400	U	440	U	400	U	410	U
1,4-DICHLOROBENZENE	ug/kg	400	U	400	U	440	U	400	U	410	U
2,4,5-TRICHLOROPHENOL	ug/kg	400	U	400	U	440	U	400	U	410	U
2,4,6-TRICHLOROPHENOL	ug/kg	400	U	400	U	440	U	400	U	410	U
2,4-DICHLOROPHENOL	ug/kg	400	U	400	U	440	U	400	U	410	U
2,4-DIMETHYLPHENOL	ug/kg	400	U	400	U	440	U	400	U	410	U
2,4-DINITROPHENOL	ug/kg	1900	U	1900	U	2100	U	1900	U	2000	U
2,4-DINITROTOLUENE	ug/kg	400	U	400	U	440	U	400	U	410	U
2,6-DINITROTOLUENE	ug/kg	400	U	400	U	440	U	400	U	410	U
2-CHLORONAPHTHALENE	ug/kg	400	U	400	U	440	U	400	U	410	U
2-CHLOROPHENOL	ug/kg	400	U	400	U	440	U	400	U	410	U
2-METHYLNAPHTHALENE	ug/kg	400	U	400	U	440	U	400	U	410	U
2-METHYLPHENOL	ug/kg	400	U	400	U	440	U	400	U	410	U
2-NITROANILINE	ug/kg	1900	U	1900	U	2100	U	1900	U	2000	U
2-NITROPHENOL	ug/kg	400	U	400	U	440	U	400	U	410	U
3,3'-DICHLOROBENZIDINE	ug/kg	1900	U	1900	U	2100	U	1900	U	2000	U
3-NITROANILINE	ug/kg	1900	U	1900	U	2100	U	1900	U	2000	U
4,6-DINITRO-2-METHYLPHENOL	ug/kg	1900	U	1900	U	2100	U	1900	U	2000	U
4-BROMOPHENYL PHENYL ETHER	ug/kg	400	U	400	U	440	U	400	U	410	U
4-CHLORO-3-METHYLPHENOL	ug/kg	400	U	400	U	440	U	400	U	410	U
4-CHLOROANILINE	ug/kg	400	U	400	U	440	U	400	U	410	U
4-CHLOROPHENYL PHENYL ETHER	ug/kg	400	U	400	U	440	U	400	U	410	U
4-METHYLPHENOL	ug/kg	400	U	400	U	440	U	400	U	410	U
4-NITROANILINE	ug/kg	1900	U	1900	U	2100	U	1900	U	2000	U
4-NITROPHENOL	ug/kg	1900	U	1900	U	2100	U	1900	U	2000	U
ACENAPHTHENE	ug/kg	400	U	400	U	440	U	400	U	410	U
ACENAPHTHYLENE	ug/kg	400	U	400	U	440	U	400	U	410	U
ANTHRACENE	ug/kg	400	U	400	U	440	U	400	U	410	U

Sample Location:		BCG-SB06		BCG-SB06	
Associated Site:		BCG		BCG	
Sample No:		7090		7100	
Sample Date:		02-MAY-98		02-MAY-98	
Depth:		0-1		6-7	
SEMIVOLATILES	Units	Result	Val Qlfr	Result	Val Qlfr
1,2,4-TRICHLOROBENZENE	ug/kg	380	U	380	U
1,2-DICHLOROBENZENE	ug/kg	380	U	380	U
1,3-DICHLOROBENZENE	ug/kg	380	U	380	U
1,4-DICHLOROBENZENE	ug/kg	380	U	380	U
2,4,5-TRICHLOROPHENOL	ug/kg	380	U	380	U
2,4,6-TRICHLOROPHENOL	ug/kg	380	U	380	U
2,4-DICHLOROPHENOL	ug/kg	380	U	380	U
2,4-DIMETHYLPHENOL	ug/kg	380	U	380	U
2,4-DINITROPHENOL	ug/kg	1900	U	1800	U
2,4-DINITROTOLUENE	ug/kg	380	U	380	U
2,6-DINITROTOLUENE	ug/kg	380	U	380	U
2-CHLORONAPHTHALENE	ug/kg	380	U	380	U
2-CHLOROPHENOL	ug/kg	380	U	380	U
2-METHYLNAPHTHALENE	ug/kg	380	U	380	U
2-METHYLPHENOL	ug/kg	380	U	380	U
2-NITROANILINE	ug/kg	1900	U	1800	U
2-NITROPHENOL	ug/kg	380	U	380	U
3,3'-DICHLOROBENZIDINE	ug/kg	1900	U	1800	U
3-NITROANILINE	ug/kg	1900	U	1800	U
4,6-DINITRO-2-METHYLPHENOL	ug/kg	1900	U	1800	U
4-BROMOPHENYL PHENYL ETHER	ug/kg	380	U	380	U
4-CHLORO-3-METHYLPHENOL	ug/kg	380	U	380	U
4-CHLOROANILINE	ug/kg	380	U	380	U
4-CHLOROPHENYL PHENYL ETHER	ug/kg	380	U	380	U
4-METHYLPHENOL	ug/kg	380	U	380	U
4-NITROANILINE	ug/kg	1900	U	1800	U
4-NITROPHENOL	ug/kg	1900	U	1800	U
ACENAPHTHENE	ug/kg	380	U	380	U
ACENAPHTHYLENE	ug/kg	380	U	380	U
ANTHRACENE	ug/kg	380	U	380	U

Sample Location:		BCG-SB01		BCG-SB01		BCG-SB02		BCG-SB02		BCG-SB03	
Associated Site:		BCG		BCG		BCG		BCG		BCG	
Sample No:		6990		7000		7010		7020		7030	
Sample Date:		03-MAY-98		03-MAY-98		02-MAY-98		02-MAY-98		02-MAY-98	
Depth:		0-1		4-6		0-1		2-4		0-1	
SEMIVOLATILES	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
BENZO(a)ANTHRACENE	ug/kg	410	U	370	U	360	J	400	U	400	U
BENZO(a)PYRENE	ug/kg	410	U	370	U	400	J	400	U	400	U
BENZO(b)FLUORANTHENE	ug/kg	410	U	370	U	480		400	U	400	U
BENZO(ghi)PERYLENE	ug/kg	410	U	370	U	240	J	400	U	400	U
BENZO(k)FLUORANTHENE	ug/kg	410	U	370	U	410		400	U	400	U
BIS(2-CHLOROETHOXY)METHANE	ug/kg	410	U	370	U	410	U	400	U	400	U
BIS(2-CHLOROETHYL)ETHER	ug/kg	410	U	370	U	410	U	400	U	400	U
BIS(2-CHLOROISOPROPYL)ETHER	ug/kg	410	U	370	U	410	U	400	U	400	U
BIS(2-ETHYLHEXYL)PHTHALATE	ug/kg	410	U	370	U	410	U	400	U	400	U
BUTYL BENZYL PHTHALATE	ug/kg	410	U	370	U	410	U	400	U	400	U
CARBAZOLE	ug/kg	410	U	370	U	410	U	400	U	400	U
CHRYSENE	ug/kg	410	U	370	U	370	J	400	U	400	U
DI-n-BUTYL PHTHALATE	ug/kg	410	U	370	U	410	U	400	U	400	U
DI-n-OCTYL PHTHALATE	ug/kg	410	U	370	U	410	U	400	U	400	U
DIBENZ(a,h)ANTHRACENE	ug/kg	410	U	370	U	410	U	400	U	400	U
DIBENZOFURAN	ug/kg	410	U	370	U	410	U	400	U	400	U
DIETHYL PHTHALATE	ug/kg	410	U	370	U	410	U	400	U	400	U
DIMETHYL PHTHALATE	ug/kg	410	U	370	U	410	U	400	U	400	U
FLUORANTHENE	ug/kg	410	U	370	U	570		400	U	400	U
FLUORENE	ug/kg	410	U	370	U	410	U	400	U	400	U
HEXACHLOROBENZENE	ug/kg	410	U	370	U	410	U	400	U	400	U
HEXACHLOROBUTADIENE	ug/kg	410	U	370	U	410	U	400	U	400	U
HEXACHLOROCYCLOPENTADIENE	ug/kg	2000	U	1800	U	2000	U	2000	U	2000	U
HEXACHLOROETHANE	ug/kg	410	U	370	U	410	U	400	U	400	U
INDENO(1,2,3-cd)PYRENE	ug/kg	410	U	370	U	240	J	400	U	400	U
ISOPHORONE	ug/kg	410	U	370	U	410	U	400	U	400	U
N-NITROSO-DI-n-PROPYLAMINE	ug/kg	410	U	370	U	410	U	400	U	400	U
N-NITROSODIPHENYLAMINE	ug/kg	410	U	370	U	410	U	400	U	400	U
NAPHTHALENE	ug/kg	410	U	370	U	410	U	400	U	400	U
NITROBENZENE	ug/kg	410	U	370	U	410	U	400	U		U

Report Date: 07/24/98

Sample Location:		BCG-SB03		BCG-SB04		BCG-SB04		BCG-SB05		BCG-SB05	
Associated Site:		BCG		BCG		BCG		BCG		BCG	
Sample No:		7040		7050		7060		7070		7080	
Sample Date:		02-MAY-98		02-MAY-98		02-MAY-98		02-MAY-98		02-MAY-98	
Depth:		6-8		0-1		2-4		0-1		4-6	
SEMIVOLATILES	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
BENZO(a)ANTHRACENE	ug/kg	400	U	400	U	440	U	400	U	410	U
BENZO(a)PYRENE	ug/kg	400	U	400	U	440	U	400	U	410	U
BENZO(b)FLUORANTHENE	ug/kg	400	U	400	U	440	U	400	U	410	U
BENZO(ghi)PERYLENE	ug/kg	400	U	400	U	440	U	400	U	410	U
BENZO(k)FLUORANTHENE	ug/kg	400	U	400	U	440	U	400	U	410	U
BIS(2-CHLOROETHOXY)METHANE	ug/kg	400	U	400	U	440	U	400	U	410	U
BIS(2-CHLOROETHYL)ETHER	ug/kg	400	U	400	U	440	U	400	U	410	U
BIS(2-CHLOROISOPROPYL)ETHER	ug/kg	400	U	400	U	440	U	400	U	410	U
BIS(2-ETHYLHEXYL)PHTHALATE	ug/kg	400	U	400	U	440	U	400	U	530	U
BUTYL BENZYL PHTHALATE	ug/kg	400	U	400	U	440	U	400	U	410	U
CARBAZOLE	ug/kg	400	U	400	U	440	U	400	U	410	U
CHRYSENE	ug/kg	400	U	400	U	440	U	400	U	410	U
DI-n-BUTYL PHTHALATE	ug/kg	400	U	400	U	440	U	400	U	410	U
DI-n-OCTYL PHTHALATE	ug/kg	400	U	400	U	440	U	400	U	410	U
DIBENZ(a,h)ANTHRACENE	ug/kg	400	U	400	U	440	U	400	U	410	U
DIBENZOFURAN	ug/kg	400	U	400	U	440	U	400	U	410	U
DIETHYL PHTHALATE	ug/kg	400	U	400	U	440	U	400	U	410	U
DIMETHYL PHTHALATE	ug/kg	400	U	400	U	440	U	400	U	410	U
FLUORANTHENE	ug/kg	400	U	400	U	440	U	400	U	410	U
FLUORENE	ug/kg	400	U	400	U	440	U	400	U	410	U
HEXACHLOROBENZENE	ug/kg	400	U	400	U	440	U	400	U	410	U
HEXACHLOROBUTADIENE	ug/kg	400	U	400	U	440	U	400	U	410	U
HEXACHLOROCYCLOPENTADIENE	ug/kg	1900	U	1900	U	2100	U	1900	U	2000	U
HEXACHLOROETHANE	ug/kg	400	U	400	U	440	U	400	U	410	U
INDENO(1,2,3-cd)PYRENE	ug/kg	400	U	400	U	440	U	400	U	410	U
ISOPHORONE	ug/kg	400	U	400	U	440	U	400	U	410	U
N-NITROSO-DI-n-PROPYLAMINE	ug/kg	400	U	400	U	440	U	400	U	410	U
N-NITROSODIPHENYLAMINE	ug/kg	400	U	400	U	440	U	400	U	410	U
NAPHTHALENE	ug/kg	400	U	400	U	440	U	400	U	410	U
NITROBENZENE	ug/kg	400	U	400	U	440	U	400	U	410	U

Sample Location:		BCG-SB06		BCG-SB06	
Associated Site:		BCG		BCG	
Sample No:		7090		7100	
Sample Date:		02-MAY-98		02-MAY-98	
Depth:		0-1		6-7	
SEMIVOLATILES	Units	Result	Val Qlfr	Result	Val Qlfr
BENZO(a)ANTHRACENE	ug/kg	380	U	380	U
BENZO(a)PYRENE	ug/kg	380	U	380	U
BENZO(b)FLUORANTHENE	ug/kg	380	U	380	U
BENZO(ghi)PERYLENE	ug/kg	380	U	380	U
BENZO(k)FLUORANTHENE	ug/kg	380	U	380	U
BIS(2-CHLOROETHOXY)METHANE	ug/kg	380	U	380	U
BIS(2-CHLOROETHYL)ETHER	ug/kg	380	U	380	U
BIS(2-CHLOROISOPROPYL)ETHER	ug/kg	380	U	380	U
BIS(2-ETHYLHEXYL)PHTHALATE	ug/kg	380	U	380	U
BUTYL BENZYL PHTHALATE	ug/kg	380	U	380	U
CARBAZOLE	ug/kg	380	U	380	U
CHRYSENE	ug/kg	380	U	380	U
DI-n-BUTYL PHTHALATE	ug/kg	380	U	380	U
DI-n-OCTYL PHTHALATE	ug/kg	380	U	380	U
DIBENZ(a,h)ANTHRACENE	ug/kg	380	U	380	U
DIBENZOFURAN	ug/kg	380	U	380	U
DIETHYL PHTHALATE	ug/kg	380	U	380	U
DIMETHYL PHTHALATE	ug/kg	380	U	380	U
FLUORANTHENE	ug/kg	380	U	380	U
FLUORENE	ug/kg	380	U	380	U
HEXACHLOROBENZENE	ug/kg	380	U	380	U
HEXACHLOROBUTADIENE	ug/kg	380	U	380	U
HEXACHLOROCYCLOPENTADIENE	ug/kg	1900	U	1800	U
HEXACHLOROETHANE	ug/kg	380	U	380	U
INDENO(1,2,3-cd)PYRENE	ug/kg	380	U	380	U
ISOPHORONE	ug/kg	380	U	380	U
N-NITROSO-DI-n-PROPYLAMINE	ug/kg	380	U	380	U
N-NITROSODIPHENYLAMINE	ug/kg	380	U	380	U
NAPHTHALENE	ug/kg	380	U	380	U
NITROBENZENE	ug/kg	380	U	380	U

Report Date: 07/24/98

Sample Location:		BCG-SB01		BCG-SB01		BCG-SB02		BCG-SB02		BCG-SB03	
Associated Site:		BCG		BCG		BCG		BCG		BCG	
Sample No:		6990		7000		7010		7020		7030	
Sample Date:		03-MAY-98		03-MAY-98		02-MAY-98		02-MAY-98		02-MAY-98	
Depth:		0-1		4-6		0-1		2-4		0-1	
SEMIVOLATILES	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
PENTACHLOROPHENOL	ug/kg	2000	U	1800	U	2000	U	2000	U	2000	U
PHENANTHRENE	ug/kg	410	U	370	U	130	J	400	U	400	U
PHENOL	ug/kg	410	U	370	U	410	U	400	U	400	U
PYRENE	ug/kg	410	U	370	U	450		400	U	400	U

Sample Location:		BCG-SB03		BCG-SB04		BCG-SB04		BCG-SB05		BCG-SB05	
Associated Site:		BCG		BCG		BCG		BCG		BCG	
Sample No:		7040		7050		7060		7070		7080	
Sample Date:		02-MAY-98		02-MAY-98		02-MAY-98		02-MAY-98		02-MAY-98	
Depth:		6-8		0-1		2-4		0-1		4-6	
SEMIVOLATILES	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
PENTACHLOROPHENOL	ug/kg	1900	U	1900	U	2100	U	1900	U	2000	U
PHENANTHRENE	ug/kg	400	U	400	U	440	U	400	U	410	U
PHENOL	ug/kg	400	U	400	U	440	U	400	U	410	U
PYRENE	ug/kg	400	U	400	U	440	U	400	U	410	U

Report Date: 07/24/98

Sample Location:		BCG-SB06		BCG-SB06	
Associated Site:		BCG		BCG	
Sample No:		7090		7100	
Sample Date:		02-MAY-98		02-MAY-98	
Depth:		0-1		6-7	
SEMIVOLATILES	Units	Result	Val Qlfr	Result	Val Qlfr
PENTACHLOROPHENOL	ug/kg	1900	U	1800	U
PHENANTHRENE	ug/kg	380	U	46	J
PHENOL	ug/kg	380	U	380	U
PYRENE	ug/kg	380	U	380	U

PLUMBROOK
Background
Data Summary - Soils

Report Date: 07/24/98

Sample Location:		BCG-SB01		BCG-SB02		BCG-SB03		BCG-SB04		BCG-SB05	
Associated Site:		BCG		BCG		BCG		BCG		BCG	
Sample No:		6990		7010		7030		7050		7070	
Sample Date:		03-MAY-98		02-MAY-98		02-MAY-98		02-MAY-98		02-MAY-98	
Depth:		0-1		0-1		0-1		0-1		0-1	
PCBS	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
AROCLOR 1016	ug/kg	41	U	41	U	40	U	40	U	40	U
AROCLOR 1221	ug/kg	41	U	41	U	40	U	40	U	40	U
AROCLOR 1232	ug/kg	41	U	41	U	40	U	40	U	40	U
AROCLOR 1242	ug/kg	41	U	41	U	40	U	40	U	40	U
AROCLOR 1248	ug/kg	41	U	41	U	40	U	40	U	40	U
AROCLOR 1254	ug/kg	41	U	41	U	40	U	40	U	40	U
AROCLOR 1260	ug/kg	41	U	41	U	40	U	40	U	40	U

Report Date: 07/24/98

Sample Location:		BCG-SB06	
Associated Site:		BCG	
Sample No:		7090	
Sample Date:		02-MAY-98	
Depth:		0-1	
PCBS	Units	Result	Val Qlfr
AROCLOR 1016	ug/kg	38	U
AROCLOR 1221	ug/kg	38	U
AROCLOR 1232	ug/kg	38	U
AROCLOR 1242	ug/kg	38	U
AROCLOR 1248	ug/kg	38	U
AROCLOR 1254	ug/kg	38	U
AROCLOR 1260	ug/kg	38	U

PLUMBROOK

Background

Data Summary - Soils

Report Date: 07/24/98

Sample Location:		BCG-SB01		BCG-SB01		BCG-SB02		BCG-SB02		BCG-SB03	
Associated Site:		BCG		BCG		BCG		BCG		BCG	
Sample No:		6990		7000		7010		7020		7030	
Sample Date:		03-MAY-98		03-MAY-98		02-MAY-98		02-MAY-98		02-MAY-98	
Depth:		0-1		4-6		0-1		2-4		0-1	
NITRATE	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
NITRATE	mg/kg	6.2	UJ	5.7	UJ	6.2	UJ	6.1	UJ	6.1	UJ

Report Date: 07/24/98

Sample Location:		BCG-SB03		BCG-SB04		BCG-SB04		BCG-SB05		BCG-SB05	
Associated Site:		BCG		BCG		BCG		BCG		BCG	
Sample No:		7040		7050		7060		7070		7080	
Sample Date:		02-MAY-98		02-MAY-98		02-MAY-98		02-MAY-98		02-MAY-98	
Depth:		6-8		0-1		2-4		0-1		4-6	
NITRATE	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
NITRATE	mg/kg	6.0	UJ	6.1	UJ	6.6	UJ	6.0	UJ	6.2	UJ

PLUMBROOK

Background

Data Summary - Soils

Report Date: 07/24/98

Sample Location:		BCG-SB06		BCG-SB06	
Associated Site:		BCG		BCG	
Sample No:		7090		7100	
Sample Date:		02-MAY-98		02-MAY-98	
Depth:		0-1		6-7	
NITRATE	Units	Result	Val Qlfr	Result	Val Qlfr
NITRATE	mg/kg	5.8	UJ	5.7	UJ

Report Date: 07/24/98

Sample Location:		BCG-SB01		BCG-SB01		BCG-SB02		BCG-SB02		BCG-SB03	
Associated Site:		BCG		BCG		BCG		BCG		BCG	
Sample No:		6990		7000		7010		7020		7030	
Sample Date:		03-MAY-98		03-MAY-98		02-MAY-98		02-MAY-98		02-MAY-98	
Depth:		0-1		4-6		0-1.		2-4		0-1	
MOISTURE	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
% MOISTURE											

PLUMBROOK

Background

Data Summary - Soils

Report Date: 07/24/98

Sample Location:		BCG-SB03		BCG-SB04		BCG-SB04		BCG-SB05		BCG-SB05	
Associated Site:		BCG		BCG		BCG		BCG		BCG	
Sample No:		7040		7050		7060		7070		7080	
Sample Date:		02-MAY-98		02-MAY-98		02-MAY-98		02-MAY-98		02-MAY-98	
Depth:		6-8		0-1		2-4		0-1		4-6	
MOISTURE	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
% MOISTURE											

Report Date: 07/24/98

Sample Location:		BCG-SB06		BCG-SB06	
Associated Site:		BCG		BCG	
Sample No:		7090		7100	
Sample Date:		02-MAY-98		02-MAY-98	
Depth:		0-1		6-7	
MOISTURE	Units	Result	Val Qlfr	Result	Val Qlfr
% MOISTURE					

Sample Location:		BCG-SB01		BCG-SB01		BCG-SB02		BCG-SB02		BCG-SB03	
Associated Site:		BCG		BCG		BCG		BCG		BCG	
Sample No:		6990		7000		7010		7020		7030	
Sample Date:		03-MAY-98		03-MAY-98		02-MAY-98		02-MAY-98		02-MAY-98	
Depth:		0-1		4-6		0-1		2-4		0-1	
METALS	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
ALUMINUM	mg/kg	7590		10400		9270		11100		15500	
ANTIMONY	mg/kg	74.0	UJ	6.8	UJ	7.4	UJ	7.8	J	7.4	UJ
ARSENIC	mg/kg	27.0		16.8		5.2		15.5		8.7	
BARIUM	mg/kg	826		48.3		65.1		47.7		97.8	
BERYLLIUM	mg/kg	6.2	U	0.57		0.62	U	0.67		0.80	
CADMIUM	mg/kg	6.2	U	0.57	U	0.62	U	0.61	U	0.61	U
CALCIUM	mg/kg	2550		34100		4810		3590		4880	
CHROMIUM	mg/kg	12.3	UJ	16.4	J	15.4	J	20.1	J	25.7	J
COBALT	mg/kg	116		22.0		9.6		18.5		19.5	
COPPER	mg/kg	30.1		30.7		14.4		19.2		25.3	
IRON	mg/kg	234000		34200		17700		35000		29500	
LEAD	mg/kg	48.6		12.0		7.9		8.9		11.1	
MAGNESIUM	mg/kg	629		7700		2280		2660		4630	
MANGANESE	mg/kg	13300	J	771	J	104	J	149	J	358	J
MERCURY	mg/kg	0.085		0.037	U	0.041	U	0.040	U	0.040	U
NICKEL	mg/kg	55.1		43.9		17.2		27.1		34.1	
POTASSIUM	mg/kg	617	UJ	2220	J	864	J	1320	J	1390	J
SELENIUM	mg/kg	12.3	U	0.61		0.82		0.68		0.61	U
SILVER	mg/kg	11.1		1.1	U	1.2	U	1.2	U	1.2	U
SODIUM	mg/kg	617	U	566	U	616	U	613	U	613	U
THALLIUM	mg/kg	24.7	U	1.1	U	1.2	U	1.3		1.2	U
VANADIUM	mg/kg	61.7	UJ	22.6	J	23.7	J	37.2	J	39.0	J
ZINC	mg/kg	655		88.9		51.6		64.6		65.3	

Report Date: 07/24/98

Sample Location:		BCG-SB03		BCG-SB04		BCG-SB04		BCG-SB05		BCG-SB05	
Associated Site:		BCG		BCG		BCG		BCG		BCG	
Sample No:		7040		7050		7060		7070		7080	
Sample Date:		02-MAY-98		02-MAY-98		02-MAY-98		02-MAY-98		02-MAY-98	
Depth:		6-8		0-1		2-4		0-1		4-6	
METALS	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
ALUMINUM	mg/kg	13400		8390		6830		6050		3520	
ANTIMONY	mg/kg	7.9	J	9.3	J	8.0	UJ	7.2	UJ	7.4	UJ
ARSENIC	mg/kg	3.9		36.5		11.7		2.1		2.1	
BARIUM	mg/kg	107		79.8		45.4		24.0	U	24.7	U
BERYLLIUM	mg/kg	0.68		1.0		1.0		0.60	U	0.62	U
CADMIUM	mg/kg	0.60	U	0.61	U	0.66	U	0.60	U	0.62	U
CALCIUM	mg/kg	52300		1590		808		1470		1830	
CHROMIUM	mg/kg	24.7	J	10.4	J	10.9	J	7.9	J	7.7	J
COBALT	mg/kg	16.5		21.6		25.2		6.0	U	6.2	U
COPPER	mg/kg	19.1		56.2		43.4		3.9		4.8	
IRON	mg/kg	26700		37400		32200		7300		6610	
LEAD	mg/kg	7.0		21.8		12.4		3.2		2.8	
MAGNESIUM	mg/kg	10400		1220		1500		868		838	
MANGANESE	mg/kg	362	J	87.8	J	118	J	147	J	68.7	J
MERCURY	mg/kg	0.040	U	0.085		0.044	U	0.040	U	0.041	U
NICKEL	mg/kg	27.7		22.8		47.6		8.4		8.0	
POTASSIUM	mg/kg	3390	J	1190	J	1460	J	600	J	617	J
SELENIUM	mg/kg	0.60	U	2.0		1.2		0.60	U	0.62	U
SILVER	mg/kg	1.2	U	1.2	U	1.3	U	1.2	U	1.2	U
SODIUM	mg/kg	599	U	608	U	663	U	600	U	617	U
THALLIUM	mg/kg	1.2	U	1.2		1.3	U	1.2	U	1.2	U
VANADIUM	mg/kg	30.4	J	40.9	J	20.2	J	14.4	J	14.4	J
ZINC	mg/kg	60.7		34.6		81.0		26.3		23.7	

Sample Location:		BCG-SB06		BCG-SB06	
Associated Site:		BCG		BCG	
Sample No:		7090		7100	
Sample Date:		02-MAY-98		02-MAY-98	
Depth:		0-1		6-7	
METALS	Units	Result	Val Qlfr	Result	Val Qlfr
ALUMINUM	mg/kg	4680		4430	
ANTIMONY	mg/kg	7.0	UJ	6.8	UJ
ARSENIC	mg/kg	1.2	U	7.1	
BARIUM	mg/kg	23.2	U	35.6	
BERYLLIUM	mg/kg	0.58	U	0.57	U
CADMIUM	mg/kg	0.58	U	0.57	U
CALCIUM	mg/kg	735		27300	
CHROMIUM	mg/kg	4.4	J	9.2	J
COBALT	mg/kg	5.8	U	12.8	
COPPER	mg/kg	2.9	U	18.6	
IRON	mg/kg	5880		15000	
LEAD	mg/kg	1.9		7.4	
MAGNESIUM	mg/kg	719		5680	
MANGANESE	mg/kg	25.3	J	277	J
MERCURY	mg/kg	0.038	U	0.038	U
NICKEL	mg/kg	5.4		23.6	
POTASSIUM	mg/kg	579	J	917	J
SELENIUM	mg/kg	0.58	U	0.57	U
SILVER	mg/kg	1.2	U	1.1	U
SODIUM	mg/kg	579	U	571	U
THALLIUM	mg/kg	1.2	U	1.1	U
VANADIUM	mg/kg	9.0	J	15.3	J
ZINC	mg/kg	13.7		45.8	

Report Date: 07/24/98

Sample Location:		BCG-SB01		BCG-SB01		BCG-SB02		BCG-SB02		BCG-SB03	
Associated Site:		BCG		BCG		BCG		BCG		BCG	
Sample No:		6990		7000		7010		7020		7030	
Sample Date:		03-MAY-98		03-MAY-98		02-MAY-98		02-MAY-98		02-MAY-98	
Depth:		0-1		4-6		0-1		2-4		0-1	
EXPLOSIVES	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
1,3,5-TRINITROBENZENE	ug/kg	250	U	250	U	250	U	250	U	250	U
1,3-DINITROBENZENE	ug/kg	250	U	250	U	250	U	250	U	250	U
2,4,6-TRINITROTOLUENE	ug/kg	250	U	250	U	250	U	250	U	250	U
2,4-DINITROTOLUENE	ug/kg	250	U	250	U	250	U	250	U	250	U
2,6-DINITROTOLUENE	ug/kg	250	U	250	U	250	U	250	U	250	U
2-NITROTOLUENE	ug/kg	250	U	250	U	250	U	250	U	250	U
3-NITROTOLUENE	ug/kg	250	U	250	U	250	U	250	U	250	U
4-AMINO-2,6-DINITROTOLUENE	ug/kg	250	U	250	U	250	U	250	U	250	U
HMX	ug/kg	500	U	500	U	500	U	500	U	500	U
NITROBENZENE	ug/kg	250	U	250	U	250	U	250	U	250	U
RDX	ug/kg	500	U	500	U	500	U	500	U	500	U
TETRYL	ug/kg	650	U	650	U	650	U	650	U	650	U

Sample Location:		BCG-SB03		BCG-SB04		BCG-SB04		BCG-SB05		BCG-SB05	
Associated Site:		BCG		BCG		BCG		BCG		BCG	
Sample No:		7040		7050		7060		7070		7080	
Sample Date:		02-MAY-98		02-MAY-98		02-MAY-98		02-MAY-98		02-MAY-98	
Depth:		6-8		0-1		2-4		0-1		4-6	
EXPLOSIVES	Units	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr	Result	Val Qlfr
1,3,5-TRINITROBENZENE	ug/kg	250	U	250	U	250	U	250	U	250	U
1,3-DINITROBENZENE	ug/kg	250	U	250	U	250	U	250	U	250	U
2,4,6-TRINITROTOLUENE	ug/kg	250	U	250	U	250	U	250	U	250	U
2,4-DINITROTOLUENE	ug/kg	250	U	250	U	250	U	250	U	250	U
2,6-DINITROTOLUENE	ug/kg	250	U	250	U	250	U	250	U	250	U
2-NITROTOLUENE	ug/kg	250	U	250	U	250	U	250	U	250	U
3-NITROTOLUENE	ug/kg	250	U	250	U	250	U	250	U	250	U
4-AMINO-2,6-DINITROTOLUENE	ug/kg	250	U	250	U	250	U	250	U	250	U
HMX	ug/kg	500	U	500	U	500	U	500	U	500	U
NITROBENZENE	ug/kg	250	U	250	U	250	U	250	U	250	U
RDX	ug/kg	500	U	500	U	500	U	500	U	500	U
TETRYL	ug/kg	650	U	650	U	650	U	650	U	650	U

Sample Location:		BCG-SB06		BCG-SB06	
Associated Site:		BCG		BCG	
Sample No:		7090		7100	
Sample Date:		02-MAY-98		02-MAY-98	
Depth:		0-1		6-7	
EXPLOSIVES	Units	Result	Val Qlfr	Result	Val Qlfr
1,3,5-TRINITROBENZENE	ug/kg	250	U	250	U
1,3-DINITROBENZENE	ug/kg	250	U	250	U
2,4,6-TRINITROTOLUENE	ug/kg	250	U	250	U
2,4-DINITROTOLUENE	ug/kg	250	U	250	U
2,6-DINITROTOLUENE	ug/kg	250	U	250	U
2-NITROTOLUENE	ug/kg	250	U	250	U
3-NITROTOLUENE	ug/kg	250	U	250	U
4-AMINO-2,6-DINITROTOLUENE	ug/kg	250	U	250	U
HMX	ug/kg	500	U	500	U
NITROBENZENE	ug/kg	250	U	250	U
RDX	ug/kg	500	U	500	U
TETRYL	ug/kg	650	U	650	U

APPENDIX G

DAMES & MOORE BACKGROUND DATA

VOC AND SVOC CONCENTRATIONS IN BACKGROUND SOILS

Sample Location	VOCs					SVOCs
	Sample ID	Toluene	Trichloroethane	Xylenes	Cis-1,2-dichloroethene	Bis(2-ethylhexyl)phthalate
Ranson Road/Patrol Road (North)	BG-S1-0.5/3.0		1.4			
	BG-S1-3.0/5.0	2.2				410
Ranson Road/ Pentolite Road	BG-S2-0.5/3.0			1.2		
	BG-S2-3.0/5.0	1.3	4.5			
Patrol Road (Northeast)	BG-S3-0.5/3.0	1.7				
	BG-S3-3.0/4.0	1.9				
Patrol Road South of Fox Road	BG-S4-0.5/3.0	3.5		3.5		1070
Patrol Road/ Columbus Road	BG-S5-0.5/3.0		1.2			980
	BG-S5-3.0/5.0					
Patrol Road/ Taft Road	BG-S6-0.5/3.0					
	BG-S6-3.0/4.5					
Ranson Road/ W. Scheid Road	BG-S7-0.5/3.0					
Patrol Road (North)	BG-S9-0.5/3.0					
	BG-S9-3.0/5.0		2.2			
QC sample	BG-S8-0.5/3.0		4.6		1.3	

From Dames and Moore, 1997, *TNT Areas Investigation, Final Report, Plum Brook Ordnance Works, Ohio*, April.

VOCs = Volatile organic compounds
SVOCs = semivolatile organic compounds

Concentrations are listed in $\mu g/kg$ or ppb.

All samples listed in the Sample ID column (column 2) were analyzed for all analytes on the VOC and SVOC method analysis lists. Only concentrations above the detection limit are listed on the table. Concentrations corresponding to the blank boxes were below the laboratory detection limit.

sample IDs used in this table are composed of three parts. The investigation area (e.g., BG = ound Location); the soil boring number (e.g., S1 = background soil boring 1); and the depth er which the sample was collected (e.g., 0.5/3.0 = soils from 0.5 to 3.0 feet were The PB designation at the beginning of all sample IDs on the laboratory reports was able.

QC sample BG-S8-0.5/3.0 is a split sample of BG-S4-0.5/3.0.

METALS CONCENTRATIONS IN BACKGROUND SOIL SAMPLES

Sample Location	Sample ID	Antimony	Arsenic	Beryllium	Cadmium	Chromium	Copper	Lead	Manganese	Mercury	Nickel	Selenium	Silver	Thallium	Zinc
Ranson Road/Patrol Road (North)	BG-S1-0.5/3.0		6.8			11	3.6	8.5	270		13				41
	BG-S1-3.0/5.0		10			14	5.2	9.5	400		16				39
Ranson Road/ Pentolite Road	BG-S2-0.5/3.0	6.3	8.4			17	2.3	11	340		16				51
	BG-S2-3.0/5.0		12			17	4.0	9.9	314		17				45
Patrol Road (Northeast)	BG-S3-0.5/3.0		3.5			6.2		5.3	152		9.0				43
	BG-S3-3.0/4.0		15			13	35	24	154		33				187
Patrol Road South of Fox Road	BG-S4-0.5/3.0	7.6	17			13	34	27	24		11				13
Patrol Road/ Columbus Road	BG-S5-0.5/3.0	6.7	17			17	10	11	220		28				54
	BG-S5-3.0/5.0	5.9	6.1			29	6.7	13	330		33				64
Patrol Road/Taft Road	BG-S6-0.5/3.0	6.4	23			6.0	14	15	78		15				56
	BG-S6-3.0/4.5		8.3			9.1	7.5	11	21		20				34
Ranson Road/W. Scheid Road	BG-S7-0.5/3.0	7.5	14			14	34	22	63		24				32
QC Sample	BG-S8-0.5/3.0	6.4	19			10	27	23	8.7		9.4				10
Patrol Road (North)	BG-S9-0.5/3.0					9.2		6.6	133		7.6				24
	BG-S9-3.0/5.0					15	17	15	695		30				61

From Dames and Moore, 1997, ***TNT Areas Investigation, Final Report, Plum Brook Ordnance Works, Ohio***, April.

Concentrations are listed in mg/Kg or ppm.

The sample IDs used in this table are composed of three parts. The investigation area (e.g., BG = Background Location); the soil boring number (e.g., S1 = background soil boring 1); and the depth interval over which the sample was collected (e.g., 0.5/3.0 = soils from 0.5 to 3.0 feet were composited). The PB designation at the beginning of all sample IDs on the laboratory reports was not used in this table.

All samples listed in the Sample ID column (Column 2) were analyzed for all 14 metals listed across the top row of the table. Only concentrations above the detection limit are listed on the table. Concentrations corresponding to the blank boxes were below the laboratory detection limit.

G:\WP\C\COE\PLUM-BRO.OK\TNT\TAB5-5.WPD

QC sample BG-S8-0.5/3.0 is a split of sample BG-S4-0.5/3.0.

Response: to CELRN-EP-R Comments on the Draft Report, Site Investigation of Acid Areas, Former Plum Brook Ordnance Works, Sandusky, Ohio (dated August 1998)

Comment 1: **Discipline Sign-off Review: Please recall the following from the Scope - "A verification statement shall be included with all products submitted to the Government. This statement shall be signed by the independent reviewers identified in the Quality Control Plan, and state they have reviewed the product and resolved all internal comments and the product is ready for release to the Government...."**

Response: The verification statement was added to the discipline sign-off sheet.

Comment 2: ***In addition to the signed verification statement this document should be* accompanied by a brief explanation as to why the QCP identified independent Technical Reviewers (Peer Reviewers in QCP, Table 1) for the Report were not used, and how quality control was maintained despite this variance.**

Response: It is acknowledged that the designated peer reviewers did not sign the sign-off sheet. However, this peer review has been completed and all required reviewers have signed the discipline sign-off sheet for the final submittal.

Comment 3: **Pg 2-1, Section 2.0, first paragraph, last line: No Nashville District representative was present during Acid area sampling. The representative did however field approve the boring locations.**

Response: The text was revised to state the following: "A representative of the Nashville District of the USACE field approved the boring locations."

Comment 4: **Pg 2-1, Section 2.0, second paragraph: As this paragraph is a brief rundown of the sample collection activities, you might want to mention that the boring locations were land surveyed.**

Response: Text was added that states, "After collection, all sample locations were land surveyed."

Comment 5: **Pg 6-3, Section 6.1.4, third paragraph: Change appropriate sentence to say, "The maximum PCB concentration was more than two orders of magnitude higher than the RBC."**

Response: The text was revised to state, "The maximum PCB concentration was *more than* two orders of magnitude higher than the RBC."

Comment 6: **Pg 1-1, Section 1.1 Scope of Work and Project Objectives: Additional objective of study is to identify contaminants of concern (COC), so future sampling (if required) would focus only on those COCs. Please include narrative in text discussing this issue.**

Response: Two of the three objectives have been revised. The first objective was revised to state, "Determine if any contaminants of potential concern (COPC) are present in site soils at concentrations that exceed acceptable risks and thus become Contaminants of Concern (COC)." A third objective was added that states, "Narrow the focus of future sampling (if necessary) to specific COCs."

Comment 7: **Figure 2-3: Figure shows Powerhouse 901 and associated ash pit and coal yard and waste water treatment plant. Suggest removing these from the figure.**

Response: Labels for the associated ash pit and coal yard, evaporator, natural waste, incinerator, and fuel oil tanks will be removed from Figure 2-3.

Comment 8: **Text of report, mainly results and conclusion/recommendation sections are misleading regarding subsurface PCB contamination. Suggest that the report explicitly state subsurface contamination of the PCBs was not investigated.**

Response: Many sentences in the conclusions section stating that PCBs were not analyzed for in the subsurface soil were revised to clarify that subsurface soils were not analyzed for PCBs.

Comment 9: **Please verify why samples for nitroaromatic analysis were only collected from the TNT acid tank area.**

Response: Nitroaromatics were expected in the TNT acid tank area because spent acids from the TNT manufacturing process with nitroaromatics in solution were returned to the TNT acid tanks. Spent acid within which some nitroaromatics were in solution could have been released to the environment there. Other than this area, there is no likely source for nitroaromatics at the acid areas.

Comment 10: **Twelve samples were collected for determination of background levels for Al, Ba, Fe, and V. Other inorganics had either 25 or 26 samples used in summary statistics calculation. Please include information as to why we believe 12 samples are sufficient for background determination for these four constituents. Perhaps we could state that these compounds are not associated with the TNT manufacturing process, therefore we are satisfied with the number used for the background determination. Additionally, we could look at performing an F Test on two different data sets (background data set and acid area 1 data set) to show that both came from the same population.**

Response: Dames and Moore did not analyze for Al, Ba, Fe, and V; therefore, only the 12 samples collected by IT were analyzed for these metals.

An F-test is not considered necessary because IT compared the site maximum detected concentrations (MDCs) for the metals with their background UTLs. The 95 percent UTL is an upper limit below which 95 percent of the background samples will fall. Thus, if a site MDC is less than a background UTL, it can be assumed that the site data is drawn from a background population.

Comment 11: **Collect previously collected background information from the Dames and Moore Investigation and include in this document. Additionally, include an example calculation of summary statistics as an appendix to the document.**

Response: We have added the Dames and Moore background data tables as new Appendix G.

Example calculations of the Shapiro-Wilks test are included in Table 4-6. Text in Section 4.2.2 will be revised to include the equation used to perform the Shapiro-Wilks test. Sample calculations for UTLs are not necessary because UTLs are shown in Table 4-5.

Comment 12: **Please include a discussion of ongoing groundwater investigations and where sampling results can be found.**

Response: The focus of this investigation was not groundwater. An installation-wide annual groundwater report is being prepared and it will summarize the latest groundwater analytical results. The draft version of this report will be submitted in January 1999.

Comment 13: **Section 4.0, 4.2, 4.2.2 and throughout document. Provide title of referenced EPA publication.**

Response: The title of the 1989 and 1992 EPA publication referenced in the text is presented in the list of references (Chapter 7.0).

Comment 14: **Section 5.3.1, pg 5-5. A discussion of volatiles has been included in the semivolatile section. Please edit. Last sentence of section - please clarify if SVOC detected are above the RBCs.**

Response: The referenced text was revised to state, "Six surface soil samples (AA3-SB01, -SB02, -SB08, -SB10, -SB12, and -SB14) exhibited *SVOC* detections that were significantly higher in both the number of hits and the concentrations than any other samples within the area." The first two sentences of the section state that SVOCs do exceed RBCs.

Comment 15: **Section 5.3.2, pg 5-5. A discussion of semivolatiles has been included in the volatiles section. Please edit.**

Response: The referenced text was revised to state, "However, all detected *VOC* concentrations were below the respective RBCs."

Comment 16: **Section 5.3.2, pg 5-6. A discussion of volatiles has been included in the semivolatiles section. Please edit.**

Response: The referenced sentence has been deleted from the text.

Comment 17: **Appendix D. Section D3.1.3. Clarify the last paragraph of this section dealing with blank correction.**

Response: The last sentence on Page D-6 and the first sentence on Page D-7 were revised to state, "There were no significant concentrations detected in the associated blank samples that indicate analytical processes were out of control. The acetone, methylene chloride, and bis(2-ethylhexyl)phthalate concentrations reported for the method blanks are likely to be attributable to laboratory process contamination."

Comment 18: **Typing Errors:**

Pg 1-1, Section 1.1, third paragraph, first line: Change "SI is was" to "SI was."

Pg 1-2, Section 1.3, second paragraph: Change "site walk to locate" to "site walkover to locate."

Pg 1-2, Section 1.3, third paragraph, fourth and fifth lines: Change "Two other investigated areas are..." to "Two other areas investigated are..."

Pg 1-3, Section 3-3, first line: Here and elsewhere (e.g. Section 2.0) it would be more appropriate to use "Acid Area" rather than "acid area."

Pg 3-2, Section 3-3, second paragraph, last line: Change "and as well as" to "and."

Pg 4-1, middle of section 4.0: Change "pose unacceptable risk to human risk" to "pose unacceptable risk to humans."

Pg 4-2, metals paragraph: Change "detected at concentrations exceeded their" to "detected at concentrations exceeding their."

Pg 5-2, Metals paragraph: Change "A total of 14 metals was detected" to "A total of 14 metals were detected."

Pg 5-4, first line: Rewrite. Were there 13 SVOCs or 15 detected?

Pg 5-4, Leader heading for last paragraph: Change "organic" to "Organic."

Pg 6-1, Section 6.1.2, first paragraph: Change "with 7 detections exceeded the RBC" to "with 7 detections exceeding the RBC".

Response: The above typing corrections were made to the text.

Response to HTRX-CX Comments on the Draft Report, Site Investigation of Acid Areas, Former Plum Brook Ordnance Works, Sandusky, Ohio (dated August 1998)

Comment 1: **Page 2-1, Section 2.1. Due to the variety of depth intervals used at these sample locations, suggest identifying any logic or approach which was use as basis to support these decisions.**

Response: All the surface soil samples were collected from the uppermost foot of soil. The report states that the samples were collected from 0.5 to 1.5 feet because the upper 0.5 foot was largely debris and vegetation. Subsurface soil samples were usually collected at the depth with the highest organic vapor reading. However, if bedrock was encountered prior to reaching the maximum depth of the borings (10 feet) then the sample was collected at the soil/bedrock interface in accordance with the work plan.

Comment 2: **Define the location of the Quanterra Laboratory used to generate data. Also define the firm which performed the independent third party review of the data.**

Response: All analytical work except wet chemistry was performed by:

Quanterra Laboratory
5815 Middlebrook Pike
Knoxville, Tennessee 37921

Wet chemistry work was performed by :
Quanterra Laboratory
5910 Breckenridge Pkwy, Suite H
Tampa, Florida 33610

Third-party independent validators:
E&I Technologies
109 W. Tennessee Avenue
Oak Ridge, Tennessee 37830

A few errors were noted:

Comment 3a: **Mercury method 7470 does not apply to soil samples.**

Response: The table has been revised to show Method SW846-7471A.

Comment 3b **Method 6010/7471 is not used for PCBs.**

Response: The text has been revised to state the correct method: SW846-8081

Comment 3c: **Method 9200 has been deleted from SW-846 since June 13, 1997. An alternative reference should be used.**

Response: The text has been revised to state the correct Method: SW846-9056.

Comment 3d: **Suggest future efforts utilize the most recently promulgated methods.**

Response: The most recent promulgated methods were used for analysis as shown on the revision to Table 3-1.

Response to OEPA Comments on the Draft Report, Site Investigation of Acid Areas, Former Plum Brook Ordnance Works, Sandusky, Ohio (dated August 1998)

Comment 1: **Of the six background surface soil samples (0.5 - 1.5 feet bls) collected during the SI, SVOC (benzo(a)pyrene) and 8 metals (aluminum, antimony, arsenic, barium, beryllium, iron, manganese, and thallium) were observed above the associated risk-based concentrations (RBCs). Of the six background subsurface soil samples, (2 - 8 feet bls) collected during the SI, 7(sic) metals were observed above associated RBCs (aluminum, antimony, arsenic, beryllium, iron, manganese, and thallium). ITC presents a discussion of the background metals evaluation of soils in Sections 4.0 through 4.7 of the SI report. However, ITC has failed to include the complete background data set for each metal parameter (combined ITC (1998) and Dames and Moore (1997) soil data) as well as calculation used to test normality and to derive the 95% upper tolerance limit and the 95th percentile for the metal parameters on Table 4-5 (attached in this review) of the SI report. This data should be submitted to the Ohio EPA for verification.**

Response: IT has added the Dames and Moore background data tables to Appendix G of the document.

The text has been revised to include the equations used to perform the Shapiro-Wilks tests. The Shapiro-Wilks test, using the software package STATISTICA™ was used for each metal to determine if the data set is normal, lognormal, or if it is neither of these two distributions (a nonparametric distribution). An example calculation of the Shapiro-Wilks test has been included in new Table 4-6.

Comment 2: **ITC has compared the maximum detected metal concentration in soils [Table 4-6 of the SI report] from each acid area to USEPA Region III RBCs (1998); Table 4-6 is included in this review. According to Sections 4.5 through 4.7 and Table 4-6 of the SI report, there were no concentrations of metal constituents in soils during the SI which exceeded associated RBCs at AA1, AA2, AA3, MNT, or the PSB which were equal to or greater than calculated 95% UTL or 95th percentile standards. ITC concludes that the elevated metal concentrations (i.e., metal concentrations greater than RBCs) observed in surface/subsurface soils at the above locations are attributable to natural site conditions and are not from site-related contamination. The Ohio EPA will reserve comment on this conclusion until ITC submits background data sets and associated calculations for verification by the agency. The 95% UTL values for aluminum, arsenic, iron, and manganese (Table 4-6) appear to be too high when compared to corresponding RBC values.**

Response: The RBC and 95% UTL value for a metal are often not similar in concentration. In actuality, the 95% UTL is frequently higher than the RBC. This disparity is because the two values are derived by very different methods. An RBC of a metal is a medium-specific contaminant level which is calculated using data on the metal's expected effect on human health and are not derived from site-specific information and do not take naturally occurring levels into consideration. The RBC is used to determine if the metal can be eliminated from the list of site-related chemicals at an early stage in the risk assessment process so that it is not carried through all steps of chemical of potential concern (COPC) selection and quantitative risk assessment. In contrast, the 95% UTL for a particular metal was determined by taking samples of naturally occurring soil from PBOW unaffected by plant operations then statistically determining the metal concentrations which should be higher than 95% of the samples collected from the same population. This 95% UTL often exceeds (by many times) the risk-based concentration for that metal, which is derived from current toxicological information.

As requested, the calculation methodology has been outlined in greater detail in the report. The actual calculations were performed by the software program STATISTICA™ and cannot be presented for verification without performing time prohibitive hand calculations. Instead, one example calculation for one metal (aluminum) is presented.

Note that the previous Table 4-6 has changed to Table 4-5.

Comment 3: **Site Investigation surface/subsurface soil analytical results at AA1, AA2, MNT, and the PSB exceeded associated RBCs (see attachments). ITC notes that all maximum detected metal concentrations in soils, which exceed RBCs, at each area above, are below associated 95% UTL and 95th percentile values. ITC should revise Table 4-6 of the SI report to reflect the following items; include a value of 8840 mg/kg for aluminum under Surface, MNT Area; change 547 to 574 mg/kg for manganese under Surface, MNT Area; and move 5.1 mg/kg under Surface, PSB Area from antimony to arsenic. ITC should also include beryllium in Section 5.3.2 of the SI report as a metal which was detected in subsurface soils above its associated RBC.**

Response: What was Table 4-6 (now Table 4-7), and the surface soil sample from location MNT-SB03 (sample number 6950) has been revised to show a concentration of 8440 mg/kg. Table 4-7 also shows the maximum concentration of manganese in the surface soil as 574 mg/kg. In addition, the concentration of 5.1 mg/kg (under surface soil) has been moved from antimony to arsenic as requested.

Beryllium was added to the text in Section 5.3.2 as a metal in the surface soil and subsurface soil above its RBC.

Comment 4: **Based on the observation of PCB and SVOC concentrations in surface soils above RBCs at the three acid areas, ITC has recommended that site-specific risk assessments be performed to evaluate the risk posed by these contaminants to both human and ecological receptors. If the risk evaluations of the contaminants of concern indicate an unacceptable risk to potential receptors, then ITC will perform additional sampling and/or evaluation.**

The Ohio EPA is unclear as to how potentially impacted groundwater occurring in both unconsolidated and consolidated zones at the acid areas will be investigated and evaluated. If groundwater occurring at the three acid areas is to be addressed under a different investigation, then ITC should state this and provide a brief explanation for this course of action to the Ohio EPA. Also, during preparation of the risk assessment, ITC should consider groundwater as a potential pathway unless groundwater will be addressed under a separate risk evaluation.

Response: IT will address the potential for groundwater impact and any necessary course of action at the Acid Areas in the Annual Groundwater Report to be submitted in January 1999.

Comment 5: **ITC should have collected soil samples from the three acid areas for leaching analysis. It is reasonable to assume that if contaminants in the soil are identified at or below a significant zone of saturation, the potential exists for these contaminants to leach into the groundwater. If additional soil sampling is required to be performed at the three acid areas based on results of the subsequent risk evaluation, the Ohio EPA recommends that ITC complete appropriate toxicity characteristic leaching procedure (TCLP) analyses on selected soil samples to determine if identified standards exceed leaching standards. TCLP analyses should be performed for at least PCBs, SVOCs, and metals.**

Response: Because the intent of the investigation was to determine only whether site soils had been impacted by past site activities, no TCLP samples were collected. IT suggests that sampling for TCLP may be applicable if soil cleanup standards are calculated and soil cleanup is necessary.

Comment 6: **During development of background metals concentrations in soil, it is apparent that ITC pooled the analytical results of the surface samples (0-1 foot bls) and the subsurface samples (2-8 feet bls) to create one background concentration for each metal. ITC should have provided a discussion in the SI report as to their reasoning behind compositing the two soil depth intervals to create a single background concentration for each metal.**

Response: Sampling intervals for Dames and Moore (D&M) background data differed greatly with IT's sampling intervals. For example, IT's surface sampling intervals ranged from 0.5 to 1.5 below ground surface (bgs) while D&M's intervals ranged from 0.5 to 3.0 ft bgs. A review of both the surface soil and subsurface soil data indicated that the concentrations of inorganics did not differ significantly. Therefore, the two data sets were combined to increase sample numbers. This combination of data greatly increased the confidence in the results of the statistical output.