Remedial Options Report

Southeast Chicago Cluster Site
Chicago, Illinois

Clayton Project No. 15-01019
September 27, 2002

Volume 1 of 2:
Text, Figures, Tables, Appendix G

Prepared for:
ILLINOIS ENVIRONMENTAL PROTECTION AGENCY
Springfield, Illinois

Prepared by:
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Clayton® GROUP SERVICES

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Appendices A through F

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CONTENTS

Volume 1 of 2: Text, Figures, Tables, Appendix G
Volume 2 of 2: Appendices A through F

Section		Page
1.0	**INTRODUCTION**	**1-1**
1.1	SITE LOCATION	1-1
1.2	SITE DESCRIPTION	1-2
1.3	SITE HISTORY	1-2
2.0	**SITE CONDITIONS**	**2-1**
2.1	PREVIOUS INVESTIGATIONS	2-1
2.1.1	Ecology & Environment Investigation – 1998 and 1999	2-1
2.1.2	Illinois EPA Test Pit Investigation – 2000	2-1
2.1.3	Illinois EPA/Clayton Test Pit Investigation – 2001	2-2
2.2	SOIL CONTAMINATION SUMMARY	2-3
2.2.1	Metals	2-3
2.2.1.1	Ecology & Environment Investigation	2-3
2.2.1.2	Illinois EPA Test Pit Investigation	2-4
2.2.1.3	Illinois EPA/Clayton Test Pit Investigation	2-5
2.2.2	Volatile Organic Compounds (VOCs)	2-5
2.2.2.1	Ecology & Environment Investigation	2-5
2.2.2.2	Illinois EPA Test Pit Investigation	2-6
2.2.2.3	Illinois EPA/Clayton Test Pit Investigation	2-7
2.2.3	Semi-Volatile Organic Compounds (SVOCs)	2-7
2.2.3.1	Ecology & Environment Investigation	2-7
2.2.3.2	Illinois EPA Test Pit Investigation	2-8
2.2.3.3	Illinois EPA/Clayton Test Pit Investigation	2-9
2.2.4	Pesticides	2-9
2.2.4.1	Ecology & Environment Investigation	2-9
2.2.4.2	Illinois EPA Test Pit Investigation	2-9
2.2.4.3	Illinois EPA/Clayton Test Pit Investigation	2-10
2.2.5	Polychlorinated Biphenyls (PCBs)	2-10
2.2.5.1	Ecology & Environment Investigation	2-10
2.2.5.2	Illinois EPA Test Pit Investigation	2-10
2.2.5.3	Illinois EPA/Clayton Test Pit Investigation	2-11
2.2.6	Dioxins	2-11
2.2.6.1	Illinois EPA Test Pit Investigation	2-11
2.2.7	Ecological Threat	2-11
2.2.7.1	Ecology & Environment Investigation	2-11
2.3	GROUNDWATER CONTAMINATION SUMMARY	2-12
2.4	STORMWATER RUNOFF	2-14

CONTENTS
(Continued)

Section		Page
3.0	**RISK ASSESSMENTS**	**3-1**
3.1	HUMAN HEALTH RISK ASSESSMENT	3-1
3.2	ECOLOGICAL RISK ASSESSMENT	3-1
4.0	**REMEDIAL OPTIONS EVALUATION**	**4-1**
4.1	REMEDIAL OPTIONS SCREENING PROCESS	4-1
4.1.1	Summary of Remedial Options	4-2
4.1.2	Independent Review of Remedial Options	4-3
4.2	OPTION 2A – EXCAVATE SITE TO 3 FEET WITH CLAY CAP	4-5
4.2.1	Description of Remedial Option	4-5
4.2.1.1	Site Preparation	4-6
4.2.1.2	Excavation of Wastes	4-6
4.2.1.3	Waste Disposal	4-7
4.2.1.4	Clay Cap and Vegetation	4-7
4.2.2	Effectiveness and Cost Evaluation	4-8
4.3	OPTION 2B – EXCAVATE SITE TO 3 FEET WITH CLAY CAP/INTEGRATED WETLANDS	4-10
4.3.1	Description of Remedial Option	4-10
4.3.1.1	Site Preparation	4-11
4.3.1.2	Waste Excavation	4-11
4.3.1.3	Waste Disposal	4-12
4.3.1.4	Clay Cap and Vegetation	4-12
4.3.1.5	Integrated Wetlands	4-12
4.3.2	Effectiveness and Cost Evaluation	4-13
4.4	OPTION 2C – EXCAVATE SITE TO 10 FEET WITH CLAY CAP	4-15
4.4.1	Description of Remedial Option	4-15
4.4.1.1	Site Preparation	4-15
4.4.1.2	Excavation of Wastes	4-16
4.4.1.3	Waste Disposal	4-16
4.4.1.4	Clay Cap and Vegetation	4-17
4.4.2	Effectiveness and Cost Evaluation	4-18

CONTENTS
(Continued)

Section		Page
4.5	OPTION 2D – EXCAVATE TO 10 FEET WITH CLAY CAP/INTEGRATED WETLANDS	4-20
4.5.1	Description of Remedial Option	4-20
4.5.1.1	Site Preparation	4-20
4.5.1.2	Waste Excavation	4-21
4.5.1.3	Waste Disposal	4-21
4.5.1.4	Clay Cap and Vegetation	4-21
4.5.1.5	Integrated Wetlands	4-22
4.5.2	Effectiveness and Cost Evaluation	4-22
4.6	OPTION 3A – CONSOLIDATE WASTE WITH CLAY CAP	4-24
4.6.1	Description of Remedial Option	4-24
4.6.1.1	Site Preparation	4-24
4.6.1.2	Excavation for Reconsolidation	4-25
4.6.1.3	Clay Cap and Vegetation	4-25
4.6.2	Effectiveness and Cost Evaluation	4-26
4.7	OPTION 3B – CONSOLIDATE WASTE WITH CLAY CAP/INTEGRATED WETLANDS	4-28
4.7.1	Description of Remedial Option	4-28
4.7.1.1	Site Preparation	4-29
4.7.1.2	Waste Excavation for Consolidation	4-29
4.7.1.3	Clay Cap and Vegetation	4-30
4.7.1.4	Integrated Wetlands	4-30
4.7.2	Effectiveness and Cost Evaluation	4-30
4.8	OPTION 3C – CONSOLIDATE WASTE WITH GCL CAP	4-32
4.8.1	Description of Remedial Option	4-32
4.8.1.1	Site Preparation	4-33
4.8.1.2	Excavation for Reconsolidation	4-33
4.8.1.3	Composite Cap and Vegetation	4-34
4.8.2	Effectiveness and Cost Evaluation	4-35
4.9	OPTION 3D – CONSOLIDATE WASTE WITH FML CAP	4-37
4.9.1	Description of Remedial Option	4-37
4.9.1.1	Site Preparation	4-37
4.9.1.2	Excavation for Reconsolidation	4-38
4.9.1.3	Composite Cap and Vegetation	4-38
4.9.2	Effectiveness and Cost Evaluation	4-39

CONTENTS
(Continued)

Section		Page
4.10	OPTION 3E – CONSOLIDATE WASTE WITH FML CAP/INTEGRATED WETLANDS	4-41
4.10.1	Description of Remedial Option	4-41
4.10.1.1	Site Preparation	4-42
4.10.1.2	Waste Excavation for Reconsolidation	4-42
4.10.1.3	Composite Cap and Vegetation	4-43
4.10.1.4	Integrated Wetlands	4-43
4.10.2	Effectiveness and Cost Evaluation	4-43
4.11	OPTION 4A – COVER EXISTING WASTE CLAY CAP	4-46
4.11.1	Description of Remedial Option	4-46
4.11.1.1	Site Preparation	4-46
4.11.1.2	Excavation for Construction	4-47
4.11.1.3	Clay Cap and Vegetation	4-47
4.11.2	Effectiveness and Cost Evaluation	4-48
4.12	OPTION 4B – COVER EXISTING WASTE WITH CLAY CAP/INTEGRATED WETLANDS	4-50
4.12.1	Description of Remedial Option	4-50
4.12.1.1	Site Preparation	4-50
4.12.1.2	Waste Excavation for Cap Construction	4-51
4.12.1.3	Clay Cap and Vegetation	4-51
4.12.1.4	Integrated Wetlands	4-52
4.12.2	Effectiveness and Cost Evaluation	4-52
4.13	GROUNDWATER MANAGEMENT SYSTEM	4-54
4.14	INTEGRATED WETLANDS	4-56
4.15	EVALUATION OF LINER TYPES	4-58
4.15.1	Infiltration Analysis and HELP Model Results	4-59
4.16	GAS GENERATION ISSUES	4-61
4.17	POTENTIAL COST SAVINGS	4-62
4.17.1	Alternative Materials Sources	4-62
4.17.2	Alternative Construction Materials	4-64
4.18	POTENTIAL COST INCREASES	4-65
5.0	**REFERENCES**	**5-1**

CONTENTS
(Continued)

FIGURES

1-1 Site Location Map
1-2 Site Features Map
2-1 Test Pit Locations
2-2 Illinois EPA Test Pit Location Map
2-3 Arsenic: 0 to 3 Feet
2-4 Arsenic: 0 to 10 Feet
2-5 Benzene: 0 to 3 Feet
2-6 Benzene: 0 to 10 Feet
2-7 Toluene: 0 to 10 Feet
2-8 Benzo(a)pyrene: 0 to 3 Feet
2-9 Dibenzo(a,h)anthracene: 0 to 3 Feet
2-10 Total PCBs: 0 to 3 Feet
2-11 Total PCBs: 0 to 10 Feet
2-12 Shallow Groundwater Map
2-13 Generalized Geologic Cross-Section
4-1 Clay cap Cross-Section for Options 1 & 9
4-2 Post Remedial Plan Without Wetlands
4-3 Clay cap Cross-Section for Options 2 & 10
4-4 Clay cap Cross-Section for Options 3, 7 & 8
4-5 Composite Cap Cross-Section for Options 4, 5 & 8
4-6 Clay cap Cross-Section for Options 6 & 11
4-7 Post Remedial Plan With Wetlands
4-8 Groundwater Management System Layout
4-9 Typical Constructed Wetlands Cross-Section

TABLES

2-1 Summary of Illinois EPA/Clayton TCLP Sampling Results – May 2001
3-1 Human Health Carcinogenic Risk and Non-Carcinogenic Hazards
3-2 Ecological Risk: Endpoints, Pathways and Food Sources
4-1 Remedial Option Cost Estimate Summary

CONTENTS
(Continued)

APPENDICES

A Investigation Report for Lake Calumet Cluster Site (*Text Only*) – Ecology & Environment (November 1999)

B Draft Comprehensive Site Investigation Report for Lake Calumet Cluster Site – Harza (May 2001)

C Comprehensive Site Investigation Report for Indian Ridge Marsh (*Text Only*) – Harza (June 2001)

D Final Human Health Risk Assessment Report for Lake Calumet Cluster Site – Montgomery Watson Harza (October 2001)

E Ecological Risk Assessment Lake Calumet Cluster Site (*Text Only*) – Lockheed Martin REAC (November 2001)

F Presentation by George Roadcap

G Detailed Remedial Option Cost Estimates

NOTE:
Appendices are in Volume 2, which is **not** attached, but which can be found and reviewed at the following repository locations:

- Calumet Environmental Resource Center
  Chicago State University
  Library 303
  9501 South King Drive
  Chicago, IL 60628

- Vodak Library
  Attn: Sheila Hanlon
  10542 South Ewing
  Chicago, IL 60617

- Harold Washington Library Center
  Municipal Reference Collection
  Attn: Unit Head – Shah Tiwana
  5th Floor
  400 South State Street
  Chicago, IL 60605

LIST OF ACRONYMS AND ABBREVIATIONS

ACOE	Army Corps of Engineers
ASTM	American Society of Testing and Materials
BTEX	Benzene, Toluene, Ethylbenzene, Total Xylenes
Bgs	Below ground surface
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
Cfs	Cubic feet per second
Clayton	Clayton Group Services, Inc.
Cluster Site	Southeast Chicago Cluster Site
COPC	Contaminants of Potential Concern
E&E	Ecology and Environment
EDQL	Ecological Data Quality Levels
FML	Flexible Membrane Liner
GCL	Geosynthetic Clay Liner
GPS	Global Positioning System
HDPE	High-Density Polyethylene
HELP	Hydrologic Evaluation of Landfill Performance
HHRA	Human Health Risk Assessment
HQ	Hazard Quotient
IDW	Inverse Distance Weighted
Illinois EPA	Illinois Environmental Protection Agency
IPCB	Illinois Pollution Control Board
LOAEL	Lowest Observable Adverse Effect Level
MWRDGC	Metropolitan Water Reclamation District of Greater Chicago
NCP	National Contingency Plan
NOAEL	No Observable Adverse Effect Level
PCB	Polychlorinated biphenyl
PID	Photoionization Detector
PRG	Preliminary Remediation Goals
RCRA	Resource Conservation and Recovery Act
RO	Remediation Objective
SRO	Soil Remediation Objective
SVOC	Semi-Volatile Organic Compound
TACO	Tiered Approach to Corrective Action Objectives
TCLP	Toxicity Characteristics Leaching Procedure
TIN	Triangulated Irregular Network
USEPA	United States Environmental Protection Agency
VOC	Volatile Organic Compound

EXECUTIVE SUMMARY

The process of remedial option evaluation began with the review of the existing site information in relation to the current understanding of the probable future use for the property. As indicated by the site history and analytical results from several investigations, the site is essentially an unpermitted former landfill with widespread contamination generally to a depth of 30 feet. The most likely future use of the property is either open space or open space with some possible location for a solar energy farm.

Most technologies currently available are not able to address both organics and inorganics. Furthermore, the sheer volume of waste present at the site (in excess of 4.75 million cubic yards assuming a total depth of 30 feet) makes any option focused on removal or treatment of the total volume economically unfeasible. The screening process was completed by concluding that the remedial options to be evaluated for the site would focus on the United States Environmental Protection Agency's (USEPA) presumptive remedy for an inactive landfill, which involves containment.

The surviving potential remedial options all included two essential operative elements: an engineered cap to isolate the buried waste materials and to reduce infiltration, and a groundwater management system to control flow gradients to minimize offsite migration of contaminated groundwater. Additional consideration was given to the suitability of options to the anticipated future land uses, compatibility with surrounding existing land uses, and the impacts of construction. While this report details 11 variations, there are essentially only 3 categories:

- Excavate a portion of the waste, cap, and provide groundwater management
- Consolidate a portion of the waste, cap, and provide groundwater management, and,
- Place and grade clean fill over the waste, cap, and provide groundwater management

The 11 selected options were evaluated for effectiveness and cost and were found to range in cost from approximately $18 million up to $87 million.

1.0 INTRODUCTION

Clayton Group Services, Inc. (Clayton) was contracted by the Illinois Environmental Protection Agency (Illinois EPA) to review all available information regarding the Southeast Chicago Cluster Site (Cluster Site) and develop a Remedial Option Report. As part of the report development, Clayton screened various remedial options and developed a number of remedial options that were then further evaluated. Evaluation of the remedial options included developing cost estimates and assessing each remedial option in comparison to decreasing risk and meeting the expected final land use.

The remainder of this section summarizes information regarding the site location and history. Section 2.0 presents a summary of the available soil and groundwater analytical information collected by various parties. A summary of both the Human Health Risk Assessment and Ecological Risk Assessment for the site is included in Section 3.0. Section 4.0 details the remedial option screening process, as well as results of the final options evaluation based on existing analytical and risk assessment information. A list of reference documents used in the development of this report is included in Section 5.0.

1.1 SITE LOCATION

The Southeast Chicago Cluster Site (Cluster Site), often referred to as the Lake Calumet Cluster Site(s), is located in southeastern Chicago, Illinois (Township 37 North Range 14 East, Section 24). Figure 1-1 presents the site location. The site is southeast of Lake Calumet and approximately 2 miles northeast of Hegewisch. The property is immediately bounded by Land & Lakes #3 landfill to the west, Paxton II landfill on the northwest corner, Paxton I landfill to the north, the Norfolk Southern Railroad to the east, and 122nd Street on the south. The boundary with Paxton I landfill on the north is virtually indistinguishable, with no clearly defined fence line, different land use, or differing topography.

1.2 SITE DESCRIPTION

The Cluster Site, so called because of the aggregation of landfills and waste disposal industrial facilities in close proximity to each other, actually comprises four named areas; the Alburn Incinerator parcel, the U.S. Drum parcel, the Unnamed parcel, and the Paxton Lagoons. Only the Paxton Lagoons parcel is visually distinct from the others. The Cluster Site occupies approximately 87 acres that are mostly dry uplands of grass and weeds on the western half, sloping slightly to the east, with occasional depressions and swampy areas. An open water pond exists in the north central area of the site, and another smaller pond in the southeast corner. An access road to the Paxton landfill sites traverses the Cluster Site from 122nd Street and runs north-south through the site. Vegetation on the site ranges from sparse, poor coverage weeds, to very dense, high Johnson grass in the northeast quadrant.

1.3 SITE HISTORY

Prior to 1949, aerial photographs did not reveal any indications of activities at what is now the Cluster Site. The site was mostly wetlands, characterized by marsh-type vegetation and some open water. As described in this report, "wetlands" refers to land which is covered by water part of the year, and which sustains a plant community consistent with wetlands, as opposed to the Army Corps of Engineers regulatory definition of a wetlands. Activities until the 1970s consisted primarily of a combination of what are described as "extraction" activities, which evidently refer to excavation and removal of soil materials from the site, and filling activities. The filling activities were first noted in the northwest quadrant of the site, and were described as the dumping of both solid and liquid wastes in this area. Drainage was noted to flow towards the eastern half of the site, which was still wetlands area.

Extraction and filling continued on the site through the early 1970s at which time the entire site was disturbed, and fill occupied the full site north to south and over half the site from west to east. Liquids were noted to be draining in all directions, and standing pools of liquids were noted in the pit areas, which had been excavated and as yet unfilled.

Around 1975, the U.S. Drum parcel began being used for storage and transfer of hazardous waste. Vertical and horizontal tanks, plus a large number of drums, were present. Around 1978, the Alburn incinerator started operation on that parcel – incinerating hazardous and industrial wastes. The operation included both bulk and container storage onsite, and a surface impoundment.

By 1980, the entire site, including the wetlands in the eastern half, had been filled with wastes. The two adjacent landfills, Paxton II and Land & Lakes #3, were now being filled. Filling activities on the Cluster Site were apparently curtailed after the operation of the two landfills began. Aerial photographs taken sometime between 1993 and 1995 show the site to be mainly overgrown with a pool of standing liquids and stained soils evident in the Unnamed parcel area of the site, and in the southeast corner of the site.

Around 1985, removal actions carried out by United States Environmental Protection Agency (USEPA) were conducted at both Alburn and U.S. Drum, involving removal of all stored wastes as well as ponded liquids, lagoon sludge, and some surface soils that had been contaminated. A USEPA immediate removal of drums containing hazardous waste and acidic soils was conducted at the Paxton lagoons in 1990. In 1992, the Illinois EPA incinerated polychlorinated biphenyl (PCB) contaminated soils and used the treated soil to backfill and grade. A 4 ½ foot thick cap was then installed that was sloped for surface drainage.

2.0 SITE CONDITIONS

2.1 PREVIOUS INVESTIGATIONS

2.1.1 Ecology & Environment Investigation – 1998 and 1999

Ecology & Environment (E & E), USEPA, and the Illinois EPA collected 84 surface soil samples and 4 subsurface soil samples from the U.S. Drum and Unnamed Parcel in August and September of 1998. Soil samples were analyzed for total metals, Toxicity Characteristics following Leaching Procedure (TCLP) metals, Volatile Organic Compounds (VOCs), Semi-Volatile Organic Compounds (SVOCs), pesticides, Polychlorinated Biphenyls (PCBs), pH, and percent moisture.

In May and June 1999, 39 surface soil samples, 15 subsurface soil samples from 2 to 3 feet below ground surface (bgs), and 15 subsurface soil samples from 4 to 6 feet bgs were collected from the Alburn site. Soil samples were analyzed for total metals, VOCs, SVOCs, pesticides, PCBs, pH, and percent moisture.

In May 1999, 12 new monitoring wells and 6 existing wells were sampled for groundwater contaminates. Two of the wells were screened entirely within native soils; six were screened entirely within the waste fill material; and eight were screened across the native soil / fill interface. Two existing wells did not have any construction records. The depth to groundwater was within the range of 2 to 10 feet of the ground surface at an elevation within the waste fill material. Each groundwater sample was analyzed for the total metals, VOCs, SVOCs, pesticides, PCBs, nitrogen, and pH.

The text portion of the E & E report titled *The Nature and Extent of Contamination at the Lake Calumet Cluster Site* dated November 1999 has been included as Appendix A.

2.1.2 Illinois EPA Test Pit Investigation - 2000

The Illinois EPA, with assistance from the USEPA and the City of Chicago, collected two or more soil samples from 134 test pits completed at the Cluster Site. Figure 2-1 illustrates the locations of these test pits. One sample at each location was collected from the depth range of 0 to 5 feet bgs, and

one sample was collected from the depth range of 5 to 30 feet bgs. Soil samples were analyzed for total metals, VOCs, SVOCs, pesticides, PCBs, and in some locations, dioxins.

A copy of the *Comprehensive Site Investigation* report prepared by Harza that summarizes the investigation conducted by the Illinois EPA is included in Appendix B.

2.1.3 Illinois EPA/Clayton Test Pit Investigation - 2001

In spring of 2001, it was determined that in previous test pit sampling and analysis performed by the Illinois EPA in 2000 Toxicity Characteristic Leaching Procedure (TCLP) analysis was not performed. Subsequently, the Illinois EPA and Clayton decided to design and conduct additional test pitting and sampling for TCLP purposes.

Locations of the test pits were determined by reviewing the previous test pit data to find the test pit locations having the highest concentrations of VOCs, SVOCs, metals, and pesticides. Based on the review, 11 locations were identified to dig new test pits where the highest concentrations of each category of contaminant were expected to be found. The new pit locations were labeled A thru K and are shown on Figure 2-2. Soil samples were analyzed for one or more of the following parameters: SVOCs, TCLP SVOCs, VOCs, TCLP VOCs, Heptachlor, TCLP Pesticides, Metals, TCLP Metals.

On May 4, 2001, representatives of Clayton located and marked with flags all the test pit locations using a global positioning system (GPS) device. On May 10, 2001, representatives of Clayton and Illinois EPA performed the test pitting and sampling. Test pits were excavated with a track-mounted backhoe provided by the Illinois EPA from the adjacent Paxton II landfill. Clayton and the Illinois EPA samplers were in Level C protection, and air monitoring was performed continuously over the open pits using a calibrated photo ionization detector (PID). Sample bottles, chain of custody, refrigerated storage, and sample transportation were provided by the Illinois EPA. Twelve soil samples were submitted for analytical testing.

Samples were analyzed by the Illinois EPA laboratories in Springfield, Illinois and Champaign, Illinois. The Illinois EPA provided analytical data to Clayton on July 23, 2001. The TCLP results are included in Table 2-1.

2.2 SOIL CONTAMINATION SUMMARY

The methodology employed to analyze the distribution of soil contaminants listed in the tabular results of various investigations was the Inverse Distance Weighted method (IDW). A low (0.3) spatial correlation factor was calculated for all constituents, which makes the IDW method appropriate for this site. Contour maps were created from the data files using the Arc View Spatial Analyst Extension contouring tool. After contouring, a Triangulated Irregular Network (TIN) was constructed. From each TIN, the total volumes of contaminated soil were extracted to estimate the cubic volume of contaminated materials.

2.2.1 Metals

2.2.1.1 Ecology & Environment Investigation

During E & E's investigation in 1998 and 1999, one or more metals were detected above the Illinois EPA Tiered Approach to Corrective Action Objectives (TACO) (35 Illinois Administrative Code 742) Concentrations of Inorganic Chemicals in Background Soils over almost the entire site.

Arsenic, barium, cadmium, mercury, selenium, and silver were not detected at concentrations above the TACO Tier 1 Industrial-Commercial or Construction Worker Ingestion or Inhalation Soil Remediation Objectives (SROs).

Lead was detected at concentrations above TACO Tier 1 Industrial-Commercial and Construction Worker Ingestion SROs in 15 of the 150 soil samples analyzed. Lead concentrations were distributed across the site, but the highest concentrations were found towards the southern portion of the site.

Chromium was detected at concentrations above the TACO Tier 1 Industrial-Commercial Inhalation SRO in 20 of the 150 soil samples analyzed. Chromium was detected at concentrations above the

TACO Tier 1 Construction Worker Inhalation SRO in 14 of the 150 soil samples analyzed. Chromium impacts exceeding the Inhalation SRO were well distributed across the site.

TCLP analysis for metals indicated 3 of 68 soil sample locations with lead concentrations exceeding criteria for characteristically hazardous soils. These soils were located on the Unnamed Parcel near the southwest corner.

2.2.1.2 Illinois EPA Test Pit Investigation

Results from the Illinois EPA's test pit investigation were evaluated by Harza Environmental for the purpose of evaluating human health exposure risks. Metals exceeding the criteria established by Harza (TACO Tier 1 Industrial-Commercial/Construction Worker SROs) included antimony, arsenic, beryllium, chromium, lead, and manganese.

Metals exceeding SROs were widespread across the Cluster Site. The highest concentrations of metals were throughout the Alburn parcel; the northern tip, central and southern part of U.S. Drum parcel; and most of the north, west, and central Unnamed Parcel.

The Harza Human Health Risk Assessment (HHRA), (November 2001) identified arsenic as the only inorganic Contaminant of Potential Concern (COPC). As part of Clayton's remedial options presented in this report, removal of arsenic to prevent human exposure was evaluated. Removal of 3 feet of soil for addressing the ingestion pathway and 10 feet of soil for addressing the inhalation pathway were both considered.

The quantity of metals contaminated soil to be removed to meet the TACO Tier 1 Industrial-Commercial/Construction Worker Inhalation and Ingestion SROs is estimated to be 490 cubic yards from 0 to 3 feet and 1,600 cubic yards from 0 to 10 feet. The estimated extent of soil exceeding the inhalation and ingestion SROs for arsenic is presented in Figures 2-3 and 2-4.

2.2.1.3 Illinois EPA/Clayton Test Pit Investigation

TCLP analysis for metals did not indicate soil metals concentrations exceeding the criteria for characteristically hazardous soils in the three soil samples analyzed. Lead was detected at concentrations above TACO Tier 1 Industrial-Commercial and Construction Worker Ingestion SROs in all three soil samples analyzed. Other metals were not detected at concentrations above TACO Tier 1 Industrial-Commercial or Construction Worker Ingestion or Inhalation SROs.

2.2.2 Volatile Organic Compounds (VOCs)

2.2.2.1 Ecology & Environment Investigation

VOC detections above TACO Tier 1 Industrial-Commercial Inhalation and Ingestion SROs were detected in only a small percentage of the samples analyzed.

Benzene was detected at concentrations above the TACO Tier 1 Industrial-Commercial Inhalation SRO in 9 of the 146 soil samples analyzed.

Chlorobenzene was detected at concentrations above the TACO Tier 1 Construction Worker Inhalation SRO in 9 of the 146 soil samples analyzed.

Ethylbenzene was detected at concentrations above the TACO Tier 1 Construction Worker Inhalation SRO in 4 of the 146 soil samples analyzed. Ethylbenzene was detected at concentrations above the TACO Tier 1 Industrial-Commercial Inhalation SRO in 2 of the 146 soil samples analyzed.

Tetrachloroethene was detected at concentrations above the TACO Tier 1 Industrial-Commercial Inhalation SRO in 4 of the 146 soil samples analyzed. Tetrachloroethene was detected at concentrations above the TACO Tier 1 Construction Worker Inhalation SRO in 3 of the 146 soil samples analyzed. Tetrachloroethene was detected at a concentration above the TACO Tier 1 Industrial-Commercial Ingestion SRO in one of the 146 soil samples analyzed.

Toluene was detected at concentrations above the TACO Tier 1 Construction Worker and Industrial-Commercial Inhalation SROs in 2 of the 146 soil samples analyzed. Trichloroethene was detected at concentrations above the TACO Tier 1 Industrial-Commercial and Construction Worker Inhalation SROs in 6 of the 146 soil samples analyzed. Trichloroethene was detected at a concentration above the TACO Tier 1 Industrial-Commercial Ingestion SRO in one of the 146 soil samples analyzed.

Total xylenes were detected at concentrations above TACO Tier 1 Construction Worker and Industrial-Commercial Inhalation SROs in 2 of the 146 soil samples analyzed.

2.2.2.2 Illinois EPA Test Pit Investigation

VOCs exceeding SROs were widespread across the site; however, they were most concentrated in the central-western portion of the Alburn parcel, the central-eastern portion of U.S. Drum parcel, and the Unnamed Parcel.

The Harza HHRA (November 2001) identified benzene, vinyl chloride, and toluene as the only VOC COPC. As part of Clayton's remedial options presented in this report, removal of benzene, vinyl chloride, and toluene to prevent human exposure was evaluated. Removal of 3 feet of soil for addressing the ingestion pathway and 10 feet of soil for addressing the inhalation pathway were both considered.

Vinyl chloride was not detected at concentrations above the TACO Tier 1 Construction Worker and Industrial-Commercial Inhalation or Ingestion SROs.

The quantity of benzene-contaminated soil to be removed to meet the TACO Tier 1 Industrial-Commercial/Construction Worker Inhalation and Ingestion SROs is estimated to be 221,000 cubic yards from 0 to 3 feet and 683,000 cubic yards from 0 to 10 feet. The quantity of toluene-contaminated soil to be removed to meet the TACO Tier 1 Industrial-Commercial Inhalation SRO is estimated to be 22,000 cubic yards from 0 to 10 feet.

The estimated extent of soil exceeding the inhalation and ingestion SROs for benzene is presented in Figures 2-5 and 2-6. The estimated extent of soil exceeding the inhalation SRO for toluene is presented in Figure 2-7.

2.2.2.3 IEPA/Clayton Test Pit Investigation

One of the four soil samples analyzed for TCLP VOCs had a concentration of trichloroethene exceeding the criteria for characteristically hazardous soil. The remaining soil samples analyzed for TCLP VOCs had concentrations below the hazardous criteria.

VOCs were not detected at concentrations above TACO Tier 1 Industrial-Commercial or Construction Worker Ingestion or Inhalation SROs in any of the samples analyzed.

2.2.3 Semi-Volatile Organic Compounds (SVOCS)

2.2.3.1 Ecology & Environment Investigation

Of the SVOCs analyzed, benzo(a)pyrene was the most frequent compound detected above TACO Tier 1 Industrial-Commercial SROs. Benzo(a)pyrene was detected at concentrations above the TACO Tier 1 Industrial-Commercial Ingestion SRO in 59 of the 150 soil samples analyzed. Benzo(a)pyrene was widespread across the site, with the highest concentrations in the Alburn area, an area north of Alburn, and the southwest corner of the Cluster Site.

Benzo(a)anthracene was detected at concentrations above the TACO Tier 1 Industrial-Commercial Ingestion SRO in 2 of the 150 soil samples analyzed.

Benzo(b)fluoranthene was detected at concentrations above the TACO Tier 1 Industrial-Commercial Ingestion SRO in 3 of the 150 soil samples analyzed.

Dibenzo(a,h)anthracene was detected at concentrations above the TACO Tier 1 Industrial-Commercial Ingestion SRO in 16 of the 150 soil samples analyzed.

Bis(2-chloroethyl)ether was detected at concentrations above the TACO Tier 1 Industrial-Commercial Inhalation SROs or with detection limits exceeding the SRO in 30 of the 150 soil samples analyzed.

Naphthalene was detected at concentrations above the TACO Tier 1 Construction Worker Inhalation SRO or with detection limits exceeding the SRO in 17 of the 150 soil samples analyzed.

2.2.3.2 Illinois EPA Test Pit Investigation

SVOCs exceeding SROs were widespread across the Cluster Site. Of the SVOCs analyzed, benzo(a)pyrene was the most frequent compound detected above TACO Tier 1 Industrial-Commercial SROs.

The Harza HHRA (November 2001) identified benzo(a)pyrene and dibenzo(a,h)anthracene as the only SVOC COPC. As part of Clayton's remedial options presented in this report, removal of benzo(a)pyrene and dibenzo(a,h)anthracene to prevent human exposure was evaluated. Removal of 3 feet of soil for addressing the ingestion pathway was only considered because inhalation SROs have not been established by the Illinois Pollution Control Board (IPCB).

The quantity of benzo(a)pyrene-contaminated soil to be removed to meet the TACO Tier 1 Industrial-Commercial/Construction Worker Inhalation and Ingestion SROs is estimated to be 398,000 cubic yards from 0 to 3 feet. The quantity of dibenzo(a,h)anthracene-contaminated soil to be removed to meet the TACO Tier 1 Industrial-Commercial/Construction Worker Inhalation and Ingestion SROs is estimated to be 250,000 cubic yards from 0 to 3 feet.

The estimated extent of soil exceeding the ingestion SRO for benzo(a)pyrene is presented in Figure 2-8. The estimated extent of soil exceeding the ingestion SRO for dibenzo(a,h)anthracene is presented in Figure 2-9.

2.2.3.3 Illinois EPA/Clayton Test Pit Investigation

The one soil sample analyzed for TCLP SVOCs had concentrations below the hazardous criteria. In addition, SVOCs were not detected at concentrations above TACO Tier 1 Industrial-Commercial or Construction Worker Ingestion or Inhalation SROs in this sample.

2.2.4 Pesticides

2.2.4.1 Ecology & Environment Investigation

Dieldrin was detected above the TACO Tier 1 Industrial-Commercial Ingestion SRO in 3 of 150 soil samples analyzed. The highest Dieldrin concentration was in the southwest corner of the Unnamed Parcel.

The remainder of the pesticides analyzed were not detected above the TACO Tier 1 Industrial-Commercial Ingestion or Inhalation SROs.

2.2.4.2 Illinois EPA Test Pit Investigation

Alpha-BHC and heptachlor were detected at concentrations exceeding TACO Tier 1 Industrial-Commercial Ingestion and Inhalation SROs at one test pit near the western part of the Unnamed Parcel.

The remainder of the pesticides analyzed were not detected above the TACO Tier 1 Industrial-Commercial Ingestion or Inhalation SROs. The Harza HHRA (November 2001) did not identify any pesticides as COPC.

2.2.4.3 Illinois EPA/Clayton Test Pit Investigation

The two soil samples analyzed for TCLP pesticides had concentrations below the hazardous criteria. Pesticides were not detected at concentrations above TACO Tier 1 Industrial-Commercial or Construction Worker Ingestion or Inhalation SROs in two samples analyzed.

2.2.5 Polychlorinated Biphenyls (PCBs)

2.2.5.1 Ecology & Environment Investigation

PCBs were detected above TACO Tier 1 Industrial-Commercial and Construction Worker Ingestion SROs in 17 of 150 soil samples analyzed. Surface soil PCB impacts were well distributed across the site with larger areas at the northern and southern ends. Subsurface soil impacts from PCBs were predominantly in the southern portion of the site.

2.2.5.2 Illinois EPA Test Pit Investigation

Total PCBs exceeding the SROs were widespread across the U.S. Drum parcel, in the center of the Alburn parcel, and in the southwestern part of the Unnamed Parcel.

The Harza HHRA (November 2001) identified total PCBs as a COPC. As part of Clayton's remedial options presented in this report, removal of PCBs to prevent human exposure was evaluated. Removal of 3 feet of soil was considered for addressing the ingestion pathway. Removal of 10 feet of soil was not considered because inhalation SROs for PCBs have not been established by the IPCB. Clayton also evaluated the quantity of soil impacted by PCB exceeding 50 mg/kg, since this is an additional requirement for addressing ingestion and inhalation exposure routes.

The quantity of PCB-contaminated soil to be removed to meet the TACO Tier 1 Industrial-Commercial/Construction Worker Inhalation and Ingestion SROs is estimated to be 99,000 cubic yards from 0 to 3 feet. The quantity of PCB-contaminated soil to be removed that exceeds 50 mg/kg is estimated to be 2,360 cubic yards from 0 to 10 feet.

The estimated extent of soil exceeding the ingestion SROs for total PCBs is presented in Figure 2-10. The estimated extent of soil exceeding 50 mg/kg for total PCBs is presented in Figure 2-11.

2.2.5.3 Illinois EPA/Clayton Test Pit Investigation

The two soil samples analyzed for total PCBs had concentrations below the 50 mg/kg level. Total PCBs were detected at concentrations above TACO Tier 1 Industrial-Commercial and Construction Worker Ingestion SROs in both samples analyzed.

2.2.6 Dioxins

2.2.6.1 Illinois EPA Test Pit Investigation

Data were available on Dioxins from four soil samples from the Unnamed parcel and four soil samples from the U.S. Drum parcel. Based on Harza's analysis, all eight soil samples exceed the EPA Region 9 Preliminary Remediation Goals (PRGs) for industrial soil. However, none of the samples exceeded the USEPA cleanup action levels for industrial/commercial scenario.

2.2.7 Ecological Threat

2.2.7.1 Ecology & Environment Investigation

E & E also evaluated the ecological risk based on the Resource Conservation and Recovery Act (RCRA) Ecological Data Quality Levels (EDQLs). Based on this standard, metals concentrations across the site present a potentially significant ecological risk. Naphthalene was the most widespread (63 of 150 soil samples) of the SVOCs exceeding the RCRA EDQLs.

VOCs were not detected in the 120 surface soil samples collected at concentrations above RCRA EDQLs. Toluene and ethylbenzene were the most widespread in subsurface soils (9 of 30 samples) of VOCs exceeding the RCRA EDQLs.

Dieldrin was the most widespread (56 of 150 soil samples) of the pesticides analyzed exceeding the RCRA EDQLs. Dieldrin was detected at the Alburn parcel, the northern section of Paxton I, and across the U.S. Drum parcel at concentrations above the RCRA EDQL.

2.3 GROUNDWATER CONTAMINATION SUMMARY

Potential contaminant migration pathways were evaluated from past geologic studies and data collected during monitoring well installation performed by Patrick Engineering (Paxton II Landfill, 2000) and Ecology & Environment (Cluster Site, 1999). The layered geologic units for the site consist of waste fill materials at the ground surface as described in Section 1.1; the surficial deposits, the glacial deposits, and the surficial bedrock aquifer. The surficial deposits consist of silts, clays, and fine-grained sands that range from 10 to 15 feet. The glacial deposits consist of silts and highly impermeable clays as identified in area test boring logs for Paxton II landfill. The bedrock underlying the site is the Silurian Age Niagaran Dolomite Aquifer (Willman, 1970). A generalized geologic cross-section is shown in Figure 2-13.

Waste fill material was not penetrated in wells installed at the northern and southern edges of the site to a depth of 16 feet. Monitoring wells along the eastern edge of the site measured a medium-to-fine sand layer that ranged up to 7 feet thick overlying a silty clay layer. Other clay layers within the waste fill material were observed during well installation.

Regional groundwater flow of the Big Marsh, Indian Ridge Marsh, and the Cluster Site is generally predicted to be north to south towards the Calumet River. Determining groundwater flow directions within a particular area of the Cluster Site is very complicated due to the extreme variable content of waste fill material. Hydraulic conductivities of these waste fill sections appear to be several orders of magnitude greater than the surrounding undisturbed deposits (Roadcap et al. 1999).

Monitoring well data from the Ecology & Environment report (November 1999) appeared to indicate that groundwater flowed radially from the Alburn area northeast towards ponds LHL1 and LHL2 in Paxton I, east towards Indian Ridge Marsh, and southeast towards the pond located near the intersection of the railroad right-of-way and 122nd Street. George Roadcap also commented, as a result of his studies, that elevated levels of ammonia and nitrogen in groundwater along the eastern boundary of Indian Ridge Marsh was degrading water quality there, especially in the wintertime when the surface water bodies are ice covered.

Water level data collected by Patrick Engineering in September 2001 were used to prepare potentiometric surface maps of the leachate and shallow groundwater conditions for the completed Paxton II landfill cap. As predicted in previous reports, leachate reservoirs from the completed Paxton II landfill influence groundwater flow direction on the Southeast Chicago Cluster Site to the east and southeast as indicated in Figure 2-12. Leachate seeps along the eastern edge of the Paxton II landfill were observed in 1999 by Ecology & Environment. Additional effects from the surrounding marsh areas, seasonal precipitation, and runoff also influence groundwater flow patterns.

In accordance with the City of Chicago Potable Water Supply Ordinance 11-8-385, no groundwater well, cistern or other groundwater collection device installed may be used to supply any potable water supply system. Therefore all commercial and industrial customers in the area of the Cluster Site rely on potable water supplied from Lake Michigan.

Groundwater contaminant concentrations analyzed in the Ecology & Environment report were compared to TACO Class I: potable resource groundwater and Class II: general resource groundwater Remediation Objectives (ROs) as summarized in Appendix B. General resource groundwater is capable of agricultural, industrial, recreational, or other beneficial uses.

Benzene, iron, and lead exceeded both Class I and Class II ROs; and manganese exceeded Class I ROs in each of the areas of the Cluster Site (Alburn Incinerator, U.S. Drum II, and Unnamed Parcel).

The Alburn area contained the highest concentrations of Benzene, Ethylbenzene, Toluene, Xylene (BTEX) compounds exceeding Class I and Class II ROs from monitoring well LC07 near the former incinerator unit. Monitoring well LC07 samples also contained SVOCs: Naphthalene, 2,4-Dimethylphenol, and Bis(2-chloroethyl)ether that exceeded Class I and Class II ROs. U.S. Drum II and Unnamed Parcel areas exceeded Class I and Class II ROs for SVOCs.

Significant elevated concentrations of VOCs, SVOCs, and inorganics exceeding TACO Class I and Class II ROs were detected in wells LC01 and LC02 north of the Cluster Site.

2.4 STORMWATER RUNOFF

The cluster site, with the exception of the former Paxton Lagoons site (capped by the Illinois EPA with a clay cap), is generally flat with a slight overall grade from northwest to southeast. The slope, however, is not consistent; the surface is marked by frequent enclosed depressions that retain water seasonally. In addition, prior operations have resulted in several apparent stockpiles of soils scattered around the cluster site in the form of isolated mounds or berms. Based on visual observations, it is assumed that these stockpiles consist of soils, not waste materials.

Drainage of the whole area surrounding the cluster sites is generally poor, with a marked absence of man-made ditches with proper slope and culverts to collect and convey runoff to bodies of water. As a consequence, flooding of area roadways (in particular 122nd Street) and ponding of runoff on the cluster site occurs in periods of heavy or frequent precipitation. Existing landfills (Paxton II and Land & Lakes) abut the Cluster Site on the west and northwest. Drainage from the sideslopes of both facilities is collected by perimeter ditches and does not contribute directly to runoff onto the cluster site. Paxton I landfill, which lies directly north of the cluster site, is topographically indistinguishable, and the runoff from both sites generally flows to the east and south, some of it being retained in onsite ponds on the Paxton I facility. Preliminary calculations of stormwater runoff volumes from the cluster site performed by Patrick Engineering Co. for the Illinois EPA in 2001 conclude that the flow volume resulting from a 25-year, 24-hr. storm would be 188 cubic feet per second (cfs), and from a 100-year, 24-hour storm 281 cfs.

While surface drainage from the cluster site has been characterized as poor, there are two existing corrugated metal culverts (of unknown size) along the east perimeter of the site that pass beneath the Norfolk Southern railroad and discharge to Indian Ridge Marsh east of the tracks. These culverts are heavily obscured by brushy vegetation and of uncertain condition, both in terms of structural integrity and whether they are partly blocked by debris.

3.0 RISK ASSESSMENTS

3.1 HUMAN HEALTH RISK ASSESSMENT

The *Human Health Risk Assessment (HHRA) of the Cluster Site* was conducted by Montgomery Watson Harza in October 2001. The objective of the HHRA was to identify the potential adverse health effects that could occur to humans due to exposure to site contaminants in each medium (soil, sediment, surface water, and groundwater). Future use of the Cluster Site was evaluated as a potential solar power generating station with no access from the public. Human receptors and activities evaluated during the assessment were identified as follows:

- Onsite Worker: Maintenance work on the solar panel station equipment.
- Mower: Worker mows the entire site twice a year.
- Landscape Worker: Sows grass, conducts other landscape maintenance work.
- Industrial/Commercial: Worker performing maintenance activities on all sites.
- Construction Worker: Grading, excavating, construction for duration of contract.

The exposure and assessment of carcinogenic risk and noncarcinogenic hazards were performed separately at the three areas of the Cluster Site as summarized in Table 3-1. Human health risks were determined to be primarily due to exposure to soil. A copy of the *Human Health Risk Assessment Report for Lake Calumet Cluster Site* is provided in Appendix D.

3.2 ECOLOGICAL RISK ASSESSMENT

The Final Ecological Risk Assessment of the Lake Calumet Cluster Site was conducted by the USEPA and Lockheed Martin Technology Services in November 2001. In addition to Alburn Incinerator, Unnamed Parcel, and US Drum II areas, this assessment included chemical and toxicological analysis of soil, sediment, and surface water in the adjoining former Paxton I landfill to the north.

Chemicals of potential concern detected in the site surface water, sediment, and soil were compared to screening level toxicity benchmarks published by the USEPA Region III Biological Technical Assistance Group (Davis 1995).

The Hazard Quotient (HQ) method (Barnthouse et al. 1986; USEPA 1997) was used to compare exposure concentrations to toxicity reference values based on ecological endpoints such as mortality, reproductive failure, or reduced growth. The exposure concentrations and toxicity values were entered into the HQ equation expressed as a ratio of potential intake values to population effect levels as follows:

$$\textit{Hazard Quotient} = \frac{\textit{Exposure Concentraton (Maximum)}}{\textit{Chronic Effect Level (No or Lowest Observable Adverse Effect Level)}}$$

Species population effect levels for No Observable Adverse Effect Level (NOAEL) and Lowest Observable Adverse Effect Level (LOAEL) were based on published studies for each chemical of potential concern. A food chain model was used to determine the potential ingestion rate for each receptor species based on measured concentrations of each chemical of potential concern in food items collected at the site.

Using the NOAEL, a calculated HQ greater than 1.0 determined there was a chronic risk from that contaminant to the ecological receptor. Using the LOAEL, a calculated HQ greater than 1.0 determined the potential to produce an actual adverse effect on the survival, reproduction, or growth of the ecological receptor.

Assessment endpoints were selected based on habitat types present at or near the site, type of contaminants, and potentially present species. Table 3-2 summarizes assessment endpoint receptors, exposure pathways, and food chain model results for the Cluster Site.

4.0 REMEDIAL OPTIONS EVALUATION

4.1 REMEDIAL OPTIONS SCREENING PROCESS

The process of remedial option evaluation began with the review of the existing site information in relation to the current understanding of the probable future use for the property. As indicated by the site history and analytical results from several investigations, the site is essentially an unpermitted former landfill with widespread contamination generally to a depth of 30 feet.

The most likely future use of the property is either open space or open space with some possible location for a solar energy farm. This evaluation assumed the site would not be accessible for people with the exception of periodic onsite work related to an energy farm.

A first step in the development of remedial options was to conduct a screening of available and viable remedial technologies that could be applied to the site. One difficulty encountered during the screening of various remedial technologies was the fact that volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), and metals were all present and above acceptable risk levels at the site. Consequently, most technologies currently available are not able to address both organics and inorganics. Furthermore, the sheer volume of waste present at the site (in excess of 4.75 million cubic yards assuming a total depth of 30 feet) makes any option focused on removal or treatment of the total volume economically infeasible. Technologies that were considered, but eliminated during the initial screening include:

- Bioremediation
- Soil vapor extraction
- Electrical resistive heating
- Vitrification
- Chemical oxidation
- Stabilization
- Thermal desorption
- Soil Flushing

Although the site was not a permitted landfill, it has many of the same characteristics as an abandoned landfill. The cover is very permeable and allows substantial infiltration of water through the waste; contaminated shallow groundwater (leachate) is present due to this infiltration and regional shallow groundwater flow; wastes are not specific to a particular area due to widespread

dumping of many types of wastes. It is impossible to fully characterize, excavate, and/or treat the source areas within landfills, so uncertainty about specific landfill contents and their location is expected. Characterization of landfill contents is neither necessary or appropriate for selecting a remedial option; existing data are used to determine if the containment presumption is appropriate. Based on the similarities, the site is a prime candidate for evaluating the presumptive remedies developed by the United States Environmental Protection Agency (USEPA) for abandoned or inactive landfills. The USEPA, in its guidance document titled *Presumptive Remedy for CERCLA Municipal Landfill Sites (September, 1993)*, has indicated that the presumptive remedies for a landfill site include:

- Low permeability cap to limit water infiltration.
- Leachate collection and/or control to minimize impacts to surface water and groundwater.
- Gas collection and/control.
- Stormwater runoff management.

The screening process was completed by concluding that the remedial options to be evaluated for the site would be focused on the presumptive remedies for an inactive landfill.

4.1.1 Summary of Remedial Options

Combinations of approaches, principally an engineered cap combined with improved slopes for drainage using clean fill to create, together with groundwater interception and control, present the most viable, cost-effective, and practical remedial actions at the Cluster Site. A number of different variations of these elements are technically feasible and therefore have been included in the list of options evaluated. The general categories used to develop the final list of options evaluated included:

1. Excavation of a portion of the wastes with grading fill for drainage and a clay cap.
2. Consolidation of wastes to provide adequate grading for drainage with either a clay cap or a composite cap.
3. Capping of existing wastes with minimal re-grading of waste for drainage and a clay cap.

Detailed descriptions of the final remedial options evaluated in this report are included in Sections 4.2 through 4.12.

4.1.2 Independent Review of Remedial Options

George Roadcap, in a presentation on the environmental issues of the Lake Calumet region, (including the presently studied Cluster Site) presented three major groups of remedial treatments that may improve the water and habitat quality of the region. (See Appendix F for a copy of this presentation.) The three groups were:

I. Direct Water Treatment

- Natural attenuation/in situ treatment
- Groundwater extraction/interception
- Hydraulic control/mixing
- Phytoremediation

II. Containment/Source Removal

- Fill removal
- Fill consolidation
- Slag mining

III. Containment Source Isolation

- Engineered cap
- Native materials and reservoir dredgings
- Biosolids
- "Clean" fill

Of the items in Group I, Clayton Group Services, Inc. (Clayton) has evaluated in situ treatment and concluded it is impractical for the Cluster Site because of the wide range of contaminant categories, such as VOCs, SVOCs, metals, and polychlorinated biphenyls (PCBs). No conventional treatment procedures such as vapor extraction, air sparging, chemical oxidation, electrical resistive heating, or biodegradation will address, either alone or in combination, all the types of contamination at the Cluster Site. Hydraulic control/mixing may be applicable to other locations in the Lake Calumet region covered by his report, such as Big Marsh or Indian Ridge Marsh, but does not apply to the

cluster site. The reason is that the hydraulic control/mixing scenario is based on the regulation of surface water heads in order to drive and influence contaminant transport in groundwater through controlled infiltration. Firstly, surface water bodies are not predominant on the Cluster Site, and the engineered cap that is part of each option will mostly prevent surface water infiltration. Groundwater extraction and treatment on a comprehensive scale is impractical for the same reasons stated above. Groundwater interception (and treatment of the intercepted water) is a key element of all options included in this report. Groundwater management is targeted to minimize offsite migration of contaminated groundwater.

Phytoremediation is a useful and applicable technology for the Cluster Site. However, as an onsite treatment, it will not be very effective with any of the engineered caps, since access to the contaminated groundwater will be subsequently limited. It has been discussed by previous studies and reports in the context of Indian Ridge Marsh to treat contamination from the upgradient cluster site. A berm and a row of cottonwood trees were suggested along the western boundary of the marsh to promote uptake of groundwater there. The groundwater interceptor and collector trench along the eastern perimeter of the Cluster Site should make this unnecessary.

Under Group II, fill removal would obviously address all aspects of contamination at the cluster site. However, the site covers approximately 80 acres to a depth of 30 feet below ground surface (bgs). Removal to a secure landfill of all the wastes and replacement with clean fill is virtually prohibitive for economic considerations. Limited removal consistent with applicable established cleanup levels has been dealt with and priced out in this report. It is important to note that assumptions made regarding volumes of material to be removed and disposed of are a very significant factor impacting the cost of each option including waste removal, and including hot spots. Fill consolidation offers the aspect of reducing surface area and reducing infiltration into the waste mass, resulting in reduced quantities of contaminated groundwater. It is a key element in several options in this report, but not as an only action. Its effectiveness is not worth the cost of implementing, unless it is combined with some type of cap or cover to provide physical separation from human and ecological contacts and reduced infiltration. Slag mining is not a viable consideration on the cluster site because of high levels of contamination mingled with the buried slag. Separation would be virtually impossible and uneconomic if it were.

Group III includes the principal applicable remedial actions that have genuine potential for the site. These have all been evaluated and developed within the various options in this report. Various sources of fill, including biosolids, dredging spoils, and construction demolition waste, have been considered for use as structural fill materials to improve the existing lack of slope onsite for positive drainage of runoff. The distinction has been made between materials suitable for grading fill, and materials requiring specific performance characteristics such as low permeability. It should be noted that a layer of buried slag material seems to be present just below the existing surface over virtually all of the cluster site, based on the test pit investigations. This layer is extremely difficult to penetrate, even with a backhoe. Studies which have been done (i.e. Bob Koerner and David Daniel) show that such coarse aggregate layers act as barriers to plant root penetration as well as to burrowing animals. The options that do not involve waste removal will preserve this effective barrier layer beneath the cap. The potential exists also, based on material availability and cost, of using clean slag for a drainage/barrier layer in the clay or synthetic cap options. This is best addressed as a pre-design issue once a remedial option has been selected.

4.2 OPTION 2A – EXCAVATE SITE TO 3 FEET WITH CLAY CAP

(Note: **Option 1** is the default option; to perform no action at the cluster sites.)

4.2.1 Description of Remedial Option

Option 2A involves the physical removal of all onsite material to a depth of 3 feet bgs. Wastes removed would be transported as a non-hazardous waste to an offsite landfill permitted to accept the waste.

This option also includes backfilling and compaction of the excavation with clean soil, additional fill and grading to provide adequate drainage for stormwater runoff, construction of an impermeable clay cap, construction of a stormwater retention pond, a pipeline for stormwater discharge to the Calumet River, revegetation of the entire site with native plants and prairie grasses, and construction of a shallow groundwater containment system (described in Section 4.13) along the eastern and southern boundaries of the site.

4.2.1.1 Site Preparation

Site preparation must be performed before any disturbance of the existing surface is initiated. The purpose of this preparation is to control and collect runoff during construction. Runoff will be contaminated by contact with waste and with sediment from exposed soils. Temporary collection ponds must be built, and silt fencing or straw bales located along downstream perimeters to prevent sediment-laden water from flowing offsite.

Following implementation of these measures, clearing, grubbing, and removing existing vegetation onsite is necessary to facilitate further operations. Woody and brushy material can be chipped for volume reduction, and may be re-useable as mulch elsewhere. The vegetation removal would be done in phases preceding earthwork operations to minimize erosion impacts.

The toxicity characteristic leaching procedure (TCLP) results obtained by Ecology & Environment in 1999, Clayton and the Illinois Environmental Protection Agency (Illinois EPA) in 2001 indicate there are four sampling locations that contained wastes characteristically hazardous for either metals or VOCs. The Illinois EPA and USEPA will need to evaluate whether any of these materials will be regulated as hazardous waste. For information purposes, the costs of removal and offsite disposal have been included in the cost evaluation. It was assumed that wastes in a 50-foot diameter centered on each sample location would require removal to a depth of approximately 5 feet bgs. This equates to about 2,000 cubic yards of wastes for removal and offsite disposal as a hazardous waste.

4.2.1.2 Excavation of Wastes

The waste materials at the Cluster Site contain a large proportion of slag that, based on test pits excavated for waste characterization, is of uniform occurrence over the area of the site. The slag has formed a hard cemented layer quite resistant to disturbance. Consequently, general excavation onsite must be preceded by first ripping the slag surface with a bulldozer equipped with a ripper tooth.

General excavation and loading the waste into semi-trucks for hauling to the offsite landfill would then proceed. Pricing assumed that waste would be excavated by a large track-mounted backhoe and loaded with a front-end loader into trucks.

4.2.1.3 Waste Disposal

Review of the bulk of data generated from sampling and analysis suggests it is likely that excavated wastes will be disposable as non-hazardous special wastes under Illinois EPA regulations. Based on this, it is assumed for this option that the wastes would be trucked to the Waste Management CID landfill south of the cluster site and disposed of as special waste. CID is the closest and, therefore, most economical location for disposal. If, for any reason, a different landfill had to be used for disposal, transportation costs would clearly be higher than those used in Table 4-1 and in Appendix G.

4.2.1.4 Clay Cap and Vegetation

After waste removal, backfilling, and grading to provide adequate cover slope for drainage, an impermeable clay cap will be constructed. As necessary, additional clean fill to develop an acceptable degree of slope for good drainage will be imported and placed. The cap will consist of compacted, low-permeability clay cap constructed with clay and a topsoil layer for vegetation. Figure 4-1 illustrates the proposed cross section for this option. Figure 4-2 shows a plan view of the site following remedial action.

This and all remedial options result in steeper slopes on the site and low permeability surfaces. Runoff from precipitation events will therefore be greater in total volume, and will accumulate more rapidly than on the existing, poorly drained site. In terms of water quality, the runoff from the cap is considered uncontaminated, since it will not be in contact with the waste materials or contaminated media.

To collect and regulate the discharge rate of storm water from the capped site, this remedial option was designed with a detention pond in the southeast corner of the site. Runoff would flow overland as sheet flow toward the detention pond, with shallow swales along the east and south site

perimeters aiding in collecting and transporting the flow to the pond. The pond area was planned to be built above the cap and have a flexible membrane liner (FML) with a 60-mil high-density polyethylene (HDPE) liner underneath; and riprap protection in the waterline range to protect the soil above the FML. An outlet works to regulate discharge was also included.

From the discharge works, water would flow into a storm sewer constructed from the vicinity of the pond perimeter, underneath 122nd Street, and then by either enclosed sewer or open ditch parallel to the Norfolk Southern right-of-way to the Calumet River. An enclosed sewer was used for cost purposes, as that would be the more conservative (more expensive) assumption. Water could be easily regulated with little cost or effort from the discharge works if all, or a portion of, the runoff flow from the detention pond was routed into Indian Ridge Marsh, which presently receives Lake Calumet Cluster Site runoff. A new culvert would be required to be jacked or directionally bored under the Norfolk Southern railroad tracks for this purpose.

Native short rooted prairie grasses would be used for revegetation of the site based on their low maintenance requirements and their compatibility with a broad range of potential end uses for the site, including a solar energy farm. They also are complementary to surrounding areas in terms of attractiveness to birds and wildlife for habitat.

4.2.2 Effectiveness and Cost Evaluation

The two principal "functional" elements of this option are the compacted low-permeability clay cap and the groundwater management system. The clay cap will substantially reduce the infiltration of precipitation (combined with improved slope for rapid, positive drainage) into the waste. The volume and rate of flow of contaminated groundwater will consequently diminish. The groundwater management system will contain the groundwater at the downgradient site perimeters to prevent the impacted groundwater flow from moving offsite.

This option addresses the presence of contamination in the near surface materials through removal and replacement with clean fill. Since additional soil is required beyond that needed to fill the excavation for grading purposes, it places the cap, which is the hydraulic barrier layer, a minimum of 6 feet above remaining waste, with the average depth greater over most of the site area. The

significant separation from remaining waste provides low risk for future contact. It also provides a great deal of flexibility for potential uses of the land, since even shallow foundations would be entirely within the clean fill.

Stormwater runoff will increase with a low permeability cap at a positive degree of slope. However, the stormwater will be clean and free of contamination from contact with the waste materials. Modeling and calculating the flow volumes would be an integral function of designing the cap. This option includes cost estimates for constructing a stormwater detention pond onsite with a controlled discharge structure. It also assumes flow rates will be increased a substantial amount and, for that reason, allows for the construction of a large storm sewer to run parallel to Torrance Avenue through the Metropolitan Water Reclamation District of Greater Chicago (MWRDGC) property to the Calumet River for discharge.

Several disadvantages accompany this option, some of them known and predictable, and some unknown. Because of the large volume of wastes and even larger volumes of soil being transported, cost is high, construction time will be long, and road traffic from the trucks is very significant. Two unknown cost impacts relate to waste removal. The variability of waste characteristics is large on this site, so sampling and analysis before disposal will be a major cost. If wastes are found to be hazardous in some locations, the disposal cost will be steeply higher.

Finally, the extensive disturbance of the buried waste will likely have area-wide odor impacts and potentially problematic volatile organic vapor releases. This will require only small excavation areas be handled at one time to minimize vapor releases and impacts to downwind receptors and workers.

Removal of the upper 3 feet of materials and replacement with clean fill would be consistent with requirements under the Tiered Approach to Corrective Action Objective (TACO) for an engineering barrier for the soil ingestion exposure route. In addition, the proposed 2-foot low-permeability cap proposed under this option would meet requirements of an engineering barrier for the inhalation exposure route under TACO. An approved engineering barrier is one of the requirements under TACO to demonstrate that the soil ingestion and inhalation exposure routes can be excluded from consideration for contaminants of concern impacting human receptors.

Removal of the upper 3 feet of materials and replacement with clean fill would remove the contaminated surface water, sediment, and soil that exceeded the toxicity benchmarks used in the Ecological Risk Assessment (Lockheed Martin REAC, 2001) for all receptors evaluated. (Refer to Appendix E for a copy of this report.) The completed low-permeability cap and topsoil vegetative layer would eliminate all exposure routes to ecological receptors using the site as a food source.

The cost for this option is one of the most expensive primarily because wastes are excavated, transported offsite for disposal, and clean imported fill is used for backfill. The overall cost for this option is estimated at approximately $42,000,000. This cost is approximately 100% higher than consolidating waste with a clay cap (Options 3A and 3B), 15 to 30% higher than consolidating waste with a composite cap (Options 3C, 3D, and 3E), 125% higher than capping of existing wastes with clay cap (Options 4A and 4B), but is 110% less than the option to excavate 10 feet of waste (Options 2C and 2D). Table 4-1 summarizes the cost estimates for the remedial options. Detailed cost estimate tables for each option are included in Appendix G.

4.3 OPTION 2B – EXCAVATE TO 3 FEET WITH CLAY CAP/INTEGRATED WETLANDS

4.3.1 Description of Remedial Option

Option 2B involves the physical removal of all onsite material to a depth of 3 feet bgs. Wastes removed would be transported as a non-hazardous waste to an offsite landfill permitted to accept the waste.

This option also includes backfilling and compaction of the excavation with clean soil, additional fill and grading to provide adequate drainage for stormwater runoff, construction of an impermeable clay cap, construction of wetlands on the southeastern portion of the site, a pipeline for stormwater discharge to the Calumet River, revegetation of the entire site with native plants and short rooted prairie grasses, and construction of a shallow groundwater containment system (described in Section 4.13) along the eastern and southern boundaries of the site.

4.3.1.1 Site Preparation

Site preparation must be performed before any disturbance of the existing surface is initiated. The purpose of this preparation is to control and collect runoff during construction. Runoff will be contaminated by contact with waste and with sediment from exposed soils. Temporary collection ponds must be built, and silt fencing or straw bales located along downstream perimeters to prevent sediment-laden water from flowing offsite.

Following implementation of these measures, clearing, grubbing, and removing the existing vegetation onsite is necessary to facilitate further operations. Woody and brushy material can be chipped for volume reduction, and may be re-useable as mulch elsewhere. The vegetation removal would be done in phases preceding earthwork operations to minimize erosion impacts.

The TCLP results obtained by Ecology & Environment in 1999, Clayton and the Illinois EPA in 2001 indicate there are four sampling locations that contained wastes characteristically hazardous for either metals or VOCs. The Illinois EPA and USEPA will need to evaluate whether any of these materials will be regulated as hazardous waste. For information purposes, the cost of removal and offsite disposal has been included in the cost evaluation. It was assumed that wastes in a 50-foot diameter centered on each sample location would require removal to a depth of approximately 5 feet bgs. This equates to about 2,000 cubic yards of wastes for removal and offsite disposal as a hazardous waste.

4.3.1.2 Waste Excavation

The waste materials at the cluster site contain a large proportion of slag that, based on test pits excavated for waste characterization, is of uniform occurrence over the area of the site. The slag has formed a hard cemented layer quite resistant to disturbance. Consequently, general excavation onsite must be preceded by first ripping the slag surface with a bulldozer equipped with a ripper tooth.

General excavation and loading of the waste into semi-trucks for hauling to the offsite landfill would then proceed. Pricing assumed waste would be excavated by a large track-mounted backhoe and loaded with a front-end loader into trucks.

4.3.1.3 Waste Disposal

Review of the bulk of data generated from sampling and analysis suggests it is most likely that excavated wastes will be disposable as non-hazardous special wastes under Illinois EPA regulations. Based on this, it is assumed for this option that the wastes would be trucked to the Waste Management CID landfill south of the cluster site and disposed of as special waste. CID is the closest and, therefore, most economical location for disposal. If, for any reason, a different landfill had to be used for disposal, transportation costs would clearly be higher than those used in Table 4-1 and in Appendix G.

4.3.1.4 Clay Cap and Vegetation

After waste removal, backfilling, and grading to provide adequate cover slope for drainage, an impermeable clay cap will be constructed. As necessary, additional fill will be imported and placed to develop an acceptable degree of slope for good drainage. The cap will consist of a compacted, low-permeability cap constructed with clay, a layer of uncompacted soil, and a topsoil layer for vegetation. Figure 4-1 illustrates the proposed cross section for this option. Figure 4-7 shows a plan view of the site following remedial action.

Native short rooted prairie grasses would be used for revegetation of the site based on their low maintenance requirements and compatibility with a broad range of potential end uses for the site, including a solar energy farm. They also are complementary to surrounding areas in terms of attractiveness to birds and wildlife for habitat.

4.3.1.5 Integrated Wetlands

In lieu of construction of a stormwater retention pond at the site, a wetland area near the southeastern corner of the site will be constructed to manage the stormwater. The wetlands areas

would be vegetated with wetland grasses suitable for occasionally flooded, but mainly wet soil conditions. They provide a wildlife habitat in keeping with the region's original natural state, and provide enhanced evapotranspiration potential for removing ponded runoff. A more detailed discussion regarding the benefits of the construction of integrated wetlands as part of this option is included in Section 4.14.

4.3.2 Effectiveness and Cost Evaluation

The two principal "functional" elements of this option, in a performance context, are the compacted low-permeability clay cap and the groundwater management system. The clay cap will substantially reduce the infiltration of precipitation (combined with improved slope for rapid, positive drainage) into the waste. The volume and rate of flow of contaminated groundwater will consequently diminish. The groundwater management system will control gradients at the downgradient site perimeters to prevent the diminished groundwater flow from moving offsite.

This option addresses the presence of contamination in the near surface materials through removal and replacement with clean fill. Since additional soil is required beyond that needed to fill the excavation for grading purposes, it places the cap, which is the hydraulic barrier layer, a minimum of 6 feet above remaining waste, with the average depth greater over most of the site area. The significant separation from remaining waste provides a low risk for future contact. It also provides a great deal of flexibility for potential uses of the land, since even shallow foundations would be entirely within the clean fill.

As with all the remedial options, storm water runoff will increase with a less permeable cap at a positive degree of slope. However, the storm water will also be clean and free of contamination from contact with the waste materials. Modeling and calculating the flow volumes would be an integral function of designing the cap. This option provides for constructed wetlands onsite, probably covering the eastern 30% of the site, to collect and store runoff from the surface. Direct evaporation and evapotranspiration from the wetland vegetation will maintain offsite discharge of runoff to below present levels. Discharge from major storm events will be managed through culverts beneath the railroad right-of-way to Indian Ridge Marsh on the east. The additional detention time provided by

the wetlands, as well as filtration by the wetland vegetation, will result in runoff of very high quality and clarity.

Several disadvantages accompany this option, some of them known and predictable, and some unknown. Because of the large volume of wastes and even larger volumes of soil being transported, cost is high, construction time will be long, and road traffic from the trucks is very significant. Two unknown cost impacts relate to waste removal. The variability of waste characteristics is large on this site, so sampling and analysis prior to disposal will be a major cost. If wastes are found to be hazardous in some locations, the disposal cost will be steeply higher. Finally, the extensive disturbance of the buried waste will likely have area-wide odor impacts and potentially problematic volatile organic vapor releases.

Removal of the upper 3 feet of materials and replacement with clean fill would be consistent with the requirements under TACO for an engineering barrier for the soil ingestion exposure route. In addition, the low-permeability clay cap proposed under this option would meet the requirements of an engineering barrier for the inhalation exposure route under TACO. An approved engineering barrier is one of the requirements under TACO to demonstrate that the soil ingestion and inhalation exposure routes can be excluded from consideration for contaminants of concern impacting human receptors.

Removal of the upper 10 feet of materials and replacement with clean fill would remove the contaminated surface water, sediment, and soil that exceeded the toxicity benchmarks used in the Ecological Risk Assessment for all receptors evaluated. The combination of clean fill material, 2-foot low-permeability cap, and 1-foot topsoil vegetative layer would eliminate all exposure routes to ecological receptors using the site as a food source.

The cost for this option is one of the most expensive primarily because wastes are excavated, transported offsite for disposal and clean, and imported fill is used for backfill. The overall cost for this option is estimated at approximately $42,000,000. This cost is approximately 100% higher than consolidating waste with a clay cap (Options 3A and 3B), 15 to 30% higher than consolidating waste with a composite cap (Options 3C, 3D, and 3E), 125% higher than capping of existing wastes with clay cap (Options 4A and 4B), but is 110% less than the option to excavate 10 feet of waste

(Options 2C and 2D). Table 4-1 summarizes the cost estimates for the remedial options. Detailed cost estimate tables for each option are included in Appendix G.

4.4 OPTION 2C – EXCAVATE SITE TO 10 FEET WITH CLAY CAP

4.4.1 Description of Remedial Option

Option 2C involves physical removal of all onsite material to a depth of 10 feet bgs. Wastes removed would be transported as a non-hazardous waste to an offsite landfill permitted to accept the waste.

This option also includes backfilling and compaction of the excavation with clean soil, additional fill and grading to provide adequate drainage for stormwater runoff, construction of an impermeable clay cap, construction of a stormwater retention pond, a pipeline for stormwater discharge to the Calumet River, revegetation of the entire site with native plants and prairie grasses, and construction of a shallow groundwater containment system (described in Section 4.13) along the eastern and southern boundaries of the site.

4.4.1.1 Site Preparation

Site preparation must be performed before any disturbance of the existing surface is initiated. The purpose of this preparation is to control and collect runoff during construction. Runoff will be contaminated by contact with waste and sediment from exposed soils. Temporary collection ponds must be built, and silt fencing or straw bales located along downstream perimeters to prevent sediment-laden water from flowing offsite.

Following implementation of these measures, clearing, grubbing, and removing the existing vegetation onsite is necessary to facilitate further operations. Woody and brushy material can be chipped for volume reduction, and may be re-useable as mulch elsewhere. The vegetation removal would be done in phases, preceding earthwork operations, to minimize erosion impacts.

The TCLP results obtained by Ecology & Environment in 1999, Clayton and the Illinois EPA in 2001 indicate there are four sampling locations that contained wastes characteristically hazardous for

either metals or VOCs. The Illinois EPA and USEPA will need to evaluate whether any of these materials will be regulated as hazardous waste. For information purposes, the cost of removal and offsite disposal has been included in the cost evaluation. It was assumed that wastes in a 50-foot diameter centered on each sample location would require removal to a depth of approximately 5 feet bgs. This equates to about 2,000 cubic yards of wastes for removal and offsite disposal as a hazardous waste.

4.4.1.2 Excavation of Wastes

The waste materials at the cluster site contain a large proportion of slag that, based on test pits excavated for waste characterization, is of uniform occurrence over the area of the site. The slag has formed a hard cemented layer quite resistant to disturbance. Consequently, general excavation onsite must be preceded by first ripping the slag surface with a bulldozer equipped with a ripper tooth.

General excavation and loading the waste into semi-trucks for hauling to the offsite landfill would then proceed. Pricing assumed that waste would be excavated by a large track-mounted backhoe and loaded with a front-end loader into trucks.

4.4.1.3 Waste Disposal

Review of the bulk of data generated from sampling and analysis suggests it is most likely that excavated wastes will be disposable as non-hazardous special wastes under Illinois EPA regulations. Based on this, it is assumed for this option that the wastes would be trucked to the Waste Management CID landfill south of the site and disposed of as special waste. CID is the closest and, therefore, the most economical location for disposal. If, for any reason, a different landfill had to be used for disposal, transportation costs would clearly be higher than those used in Table 4-1 and in Appendix G.

4.4.1.4 Clay Cap and Vegetation

After waste removal, backfilling, and grading to provide adequate cover slope for drainage, an impermeable clay cap will be constructed. As necessary, additional fill will be imported and placed to develop an acceptable degree of slope for good drainage. The clay cap will consist of a compacted, low-permeability cap constructed with clay, and a topsoil layer for vegetation. Figure 4-3 illustrates the proposed cross section for this option. Figure 4-2 shows a plan view of the site following remedial action.

This and all remedial options result in steeper slopes on the site and low permeability surfaces. Runoff from precipitation events will therefore be greater in total volume, and will accumulate more rapidly than on the existing, poorly drained site. In terms of water quality, the runoff from the cap is considered uncontaminated, since it will not be in contact with the waste materials or contaminated media.

To collect and regulate the discharge rate of storm water from the capped site, this remedial option was designed with a detention pond in the southeast corner of the site. Runoff would flow overland as sheet flow toward the detention pond, with shallow swales along the east and south site perimeters aiding in collecting and transporting the flow to the pond. The pond area was planned to be built above the cap and have an FML (60 mil HDPE) liner underneath, and riprap protection in the waterline range to protect the soil above the FML. An outlet works to regulate discharge was also included.

From the discharge works, water would flow into a storm sewer constructed from the vicinity of the pond perimeter, underneath 122nd Street, and then by either enclosed sewer or open ditch parallel to the Norfolk Southern right-of-way to the Calumet River. An enclosed sewer was used for cost purposes, as that would be the more conservative (more expensive) assumption. With little cost or effort, water could be easily regulated from the discharge works if all, or a portion of, the runoff flow from the detention pond were routed into Indian Ridge Marsh, which presently receives Cluster Site runoff. A new culvert would be required to be jacked or directionally bored under the Norfolk Southern railroad tracks for this purpose.

Native short rooted prairie grasses would be used for revegetation of the site based on their low maintenance requirements and compatibility with a broad range of potential end uses for the site, including a solar energy farm. They also are complementary to surrounding areas in terms of attractiveness to birds and wildlife for habitat.

4.4.2 Effectiveness and Cost Evaluation

The two principal "functional" elements of this option are the compacted low-permeability clay cap and the groundwater management system. The clay cap will substantially reduce infiltration of precipitation (combined with improved slope for rapid, positive drainage) into the waste. The volume and rate of flow of contaminated groundwater will consequently diminish. The groundwater management system will control gradients at the downgradient site perimeters to prevent the diminished groundwater flow from moving offsite.

This option addresses the presence of contamination in the waste materials through removal and replacement with clean fill. Since additional soil is required beyond that needed to fill the excavation for grading purposes, it places the cap, which is the hydraulic barrier layer, a minimum of 13 feet above remaining waste, with the average depth greater over most of the site area. The significant separation from remaining waste provides a very low risk for future contact. It also provides a great deal of flexibility for potential uses of the land, since most foundations would be entirely within the clean fill.

As with all the remedial options, storm water runoff will increase with a less permeable cap at a positive degree of slope. However, the storm water will also be clean and free of contamination from contact with waste materials. Modeling and calculating the flow volumes would be an integral function of designing the cap. This option includes cost estimates for constructing a storm water detention pond onsite with a controlled discharge structure. It also assumes flow rates will be increased a substantial amount and, for that reason, allows for construction of a large storm sewer to run parallel to Torrance Avenue through the MWRDGC property to the Calumet River for discharge.

Several disadvantages accompany this option, some of them known and predictable, and some unknown. Because of the large volume of wastes and even larger volumes of soil being transported,

cost is high, construction time will be long, and road traffic from the trucks is very significant. Two unknown cost impacts relate to waste removal. The variability of waste characteristics is large on this site, so sampling and analysis before disposal will be a major cost. If wastes are found to be hazardous in some locations, the disposal cost will be steeply higher.

Finally, the extensive disturbance of the buried waste will likely have area-wide odor impacts and potentially problematic volatile organic vapor releases. This will require only small excavation areas be handled at one time to minimize vapor releases and impacts to downwind receptors and workers.

Removal of the upper 10 feet of materials and replacement with clean fill would be consistent with requirements under TACO for an engineering barrier for the soil ingestion and inhalation exposure route. An approved engineering barrier is one of the requirements under TACO to demonstrate that the soil ingestion and inhalation exposure routes can be excluded from consideration for contaminants of concern impacting human receptors.

Removal of the upper 10 feet of materials and replacement with clean fill would remove the contaminated surface water, sediment, and soil that exceeded the toxicity benchmarks used in the Ecological Risk Assessment (Lockheed Martin REAC, 2001) for all receptors evaluated. The combination of clean fill material, low-permeability clay cap, and topsoil vegetative layer would eliminate all exposure routes to ecological receptors using the site as a food source.

The cost for this option is the most expensive because wastes are excavated/transported offsite for disposal, and clean imported fill is used for backfill. The overall cost for this option is estimated at approximately $87,000,000. This cost is approximately 110% higher than excavating 3 feet of wastes and clay capping (Options 2A and 2B), 330% higher than consolidating waste with a clay cap (Options 3A and 3B), 140 to 190% higher than consolidating waste with a composite cap (Options 3C, 3D, and 3E), and 380% higher than capping of existing wastes with clay cap (Options 4A and 4B). Table 4-1 summarizes the cost estimates for the remedial options. Detailed cost estimate tables for each option are included in Appendix G.

4.5 OPTION 2D – EXCAVATE TO 10 FEET WITH CLAY CAP/INTEGRATED WETLANDS

4.5.1 Description of Remedial Option

Option 2D involves physical removal of all onsite material to a depth of 10 feet bgs. Wastes removed would be transported as a non-hazardous waste to an offsite landfill permitted to accept the waste. This option also includes backfilling and compaction of the excavation with clean soil, additional fill and grading to provide adequate drainage for stormwater runoff, construction of an impermeable clay cap, construction of wetlands on the southeastern portion of the site, revegetation of the entire site with native plants and prairie grasses, and construction of a shallow groundwater containment system (described in Section 4.13) along the eastern and southern boundaries of the site.

4.5.1.1 Site Preparation

Site preparation must be performed before any disturbance of the existing surface is initiated. The purpose of this preparation is to control and collect runoff during construction. Runoff will be contaminated by contact with waste and sediment from exposed soils. Temporary collection ponds must be built, and silt fencing or straw bales located along downstream perimeters to prevent sediment-laden water from flowing offsite.

Following implementation of these measures, clearing, grubbing, and removing existing vegetation onsite is necessary to facilitate further operations. Woody and brushy material can be chipped for volume reduction, and may be re-useable as mulch elsewhere. The vegetation removal would be done in phases preceding earthwork operations to minimize erosion impacts.

The TCLP results obtained by Ecology & Environment in 1999, Clayton and the Illinois EPA in 2001 indicate there are four sampling locations that contained wastes characteristically hazardous for either metals or VOCs. The Illinois EPA and USEPA will need to evaluate whether any of these materials will be regulated as hazardous waste. For information purposes, the cost of removal and offsite disposal has been included in the cost evaluation. It was assumed that wastes in a 50-foot diameter centered on each sample location would require removal to a depth of approximately 5 feet

bgs. This equates to about 2,000 cubic yards of wastes for removal and offsite disposal as a hazardous waste.

4.5.1.2 Waste Excavation

The waste materials at the cluster site contain a large proportion of slag that, based on test pits excavated for waste characterization, is of uniform occurrence over the area of the site. The slag has formed a hard cemented layer quite resistant to disturbance. Consequently, general excavation onsite must be preceded by first ripping the slag surface with a bulldozer equipped with a ripper tooth.

General excavation and loading the waste into semi-trucks for hauling to the offsite landfill would then proceed. Pricing assumed waste would be excavated by a large track-mounted backhoe and loaded with a front-end loader into trucks.

4.5.1.3 Waste Disposal

Review of the bulk of data generated from sampling and analysis suggests it is most likely that excavated wastes will be disposable as non-hazardous special wastes under Illinois EPA regulations. Based on this, it is assumed for this option that the wastes would be trucked to the Waste Management CID landfill south of the cluster site and disposed of as special waste. CID is the closest and, therefore, the most economical location for disposal. If, for any reason, a different landfill had to be used for disposal, transportation costs would clearly be higher than those used in Table 4-1 and in Appendix G.

4.5.1.4 Clay Cap and Vegetation

After waste removal, backfilling, and grading to provide adequate cover slope for drainage, an impermeable clay cap will be constructed. As necessary, additional fill will be imported and placed to develop an acceptable degree of slope for good drainage. The cap will consist of a compacted, low-permeability cap constructed with clay, a layer of uncompacted soil, and a topsoil layer for

vegetation. Figure 4-3 illustrates the proposed cross section for this option. Figure 4-7 shows a plan view of the site following remedial action.

Native short rooted prairie grasses would be used for revegetation of the site based on their low maintenance requirements and compatibility with a broad range of potential end uses for the site, including a solar energy farm. They also are complementary to surrounding areas in terms of attractiveness to birds and wildlife for habitat.

4.5.1.5 Integrated Wetlands

In lieu of construction of a stormwater retention pond at the site, a wetland area near the southeastern corner of the site will be constructed to manage the stormwater. The wetlands areas would be vegetated with wetland grasses suitable for occasionally flooded, but mainly wet soil conditions. They provide a wildlife habitat in keeping with the region's original natural state, and provide enhanced evapotranspiration potential for removing ponded runoff. A more detailed discussion regarding benefits of the construction of integrated wetlands as part of this option is included in Section 4.14.

4.5.2 Effectiveness and Cost Evaluation

The two principal "functional" elements of this option are the compacted low-permeability clay cap and the groundwater management system. The clay cap will substantially reduce the infiltration of precipitation (combined with improved slope for rapid, positive drainage) into the waste. The volume and rate of flow of contaminated groundwater will consequently diminish. The groundwater management system will control gradients at the downgradient site perimeters to prevent the diminished groundwater flow from moving offsite.

This option addresses the presence of contamination in the waste materials through removal and replacement with clean fill. Since additional soil is required beyond that needed to fill the excavation for grading purposes, it places the cap, which is the hydraulic barrier layer, a minimum of 13 feet above remaining waste, with the average depth greater over most of the site area. The significant separation from remaining waste provides a very low risk for future contact. It also provides a great

deal of flexibility for potential uses of the land, since most foundations would be entirely within the clean fill.

As with all the remedial options, storm water runoff will increase with a less permeable cap at a positive degree of slope. However, the storm water will also be clean and free of contamination from contact with the waste materials. Modeling and calculating the flow volumes would be an integral function of designing the cap. This option provides for constructed wetlands onsite, probably covering the eastern 30% of the site, to collect and store runoff from the surface. Direct evaporation and evapotranspiration from the wetland vegetation will maintain offsite discharge of runoff to below present levels. Discharge from major storm events will be managed through culverts beneath the railroad right-of-way to Indian Ridge Marsh on the east. The additional detention time provided by the wetlands, as well as phytoremediation by the wetland vegetation, will result in runoff of very high quality and clarity.

Several disadvantages accompany this option, some of them known and predictable, and some unknown. Because of the large volume of wastes and even larger volumes of soil being transported, cost is high, construction time will be long, and road traffic from the trucks is very significant. Two unknown cost impacts relate to waste removal. The variability of waste characteristics is large on this site, so sampling and analysis prior to disposal will be a major cost. If wastes are found to be hazardous in some locations, the disposal cost will be steeply higher. Finally, the extensive disturbance of the buried waste will likely have area-wide odor impacts and potentially problematic volatile organic vapor releases.

Removal of the upper 10 feet of materials and replacement with clean fill would be consistent with the requirements under TACO for an engineering barrier for the soil ingestion and inhalation exposure route. An approved engineering barrier is one of the requirements under TACO to demonstrate that the soil ingestion and inhalation exposure routes can be excluded from consideration for contaminants of concern impacting human receptors.

Removal of the upper 10 feet of materials and replacement with clean fill would remove the contaminated surface water, sediment, and soil that exceeded the toxicity benchmarks used in the Ecological Risk Assessment for all receptors evaluated. The combination of clean fill material, low-

permeability clay cap, and topsoil vegetative layer would eliminate all exposure routes to ecological receptors using the site as a food source.

The cost for this option is the most expensive because wastes are excavated/transported offsite for disposal, and clean imported fill is used for backfill. The overall cost for this option is estimated at approximately $87,000,000. This cost is approximately 110% higher than excavating 3 feet of wastes and clay capping (Options 2A and 2B), 330% higher than consolidating waste with a clay cap (Options 3A and 3B), 140 to 190% higher than consolidating waste with a composite cap (Options 3C, 3D, and 3E), and 380% higher than capping of existing wastes with clay cap (Options 4A and 4B). Table 4-1 summarizes the cost estimates for the remedial options. Detailed cost estimate tables for each option are included in Appendix G.

4.6 OPTION 3A – CONSOLIDATE WASTE WITH CLAY CAP

4.6.1 Description of Remedial Option

Option 3A involves the consolidation of existing wastes to create appropriate grade allowing for adequate stormwater runoff. This option includes backfilling excavated waste areas with clean imported fill, the construction of an impermeable clay cap, a stormwater retention pond, revegetation of the entire site with native plants and prairie grasses, and construction of a groundwater containment system (described in Section 4.13) along the eastern and southern boundaries of the site.

4.6.1.1 Site Preparation

Site preparation must be performed before any disturbance of the existing surface is initiated. The purpose of this preparation is to control and collect runoff during construction. Runoff will be contaminated by contact with waste and sediment from exposed soils. Temporary collection ponds must be built, and silt fencing or straw bales located along downstream perimeters to prevent sediment-laden water from flowing offsite.

Following implementation of these measures, clearing, grubbing, and removing the existing vegetation onsite is necessary to facilitate further operations. Woody and brushy material can be chipped for volume reduction, and may be re-useable as mulch elsewhere. The vegetation removal would be done in phases, preceding earthwork operations, to minimize erosion impacts.

The TCLP results obtained by Ecology & Environment in 1999, Clayton and the Illinois EPA in 2001 indicate there are four sampling locations that contained wastes characteristically hazardous for either metals or VOCs. The Illinois EPA and USEPA will need to evaluate whether any of these materials will be regulated as hazardous waste. For information purposes, the costs of removal and offsite disposal have been included in the cost evaluation. It was assumed that wastes in a 50-foot diameter centered on each sample location would require removal to a depth of approximately 5 feet bgs. This equates to about 2,000 cubic yards of wastes for removal and offsite disposal as a hazardous waste.

4.6.1.2 Excavation for Reconsolidation

The waste materials at the cluster site contain a large proportion of slag that, based on test pits excavated for waste characterization, is of uniform occurrence over the area of the site. The slag has formed a hard cemented layer quite resistant to disturbance. Consequently, general excavation onsite must be preceded by first ripping the slag surface with a bulldozer equipped with a ripper tooth. General excavation would then proceed. Excavated wastes would be stockpiled until needed for fill and grading in other areas of the site.

4.6.1.3 Clay Cap and Vegetation

After waste consolidation and grading to provide adequate cover slope for drainage, an impermeable clay cap will be constructed. As necessary, additional fill will be imported and placed to develop an acceptable degree of slope for good drainage. The clay cap will consist of a compacted, low-permeability cap constructed with clay, and a topsoil layer for vegetation. Figure 4-4 illustrates the proposed cross section for this option. Figure 4-2 shows a plan view of the site following remedial action.

This and all remedial options result in steeper slopes on the site and low permeability surfaces. Runoff from precipitation events will therefore be greater in total volume and will accumulate more rapidly than on the existing, poorly drained site. In terms of water quality, the runoff from the cap is considered uncontaminated, since it will not be in contact with the waste materials or contaminated media.

To collect and regulate the discharge rate of storm water from the capped site, this remedial option was designed with a detention pond in the southeast corner of the site. Runoff would flow overland as sheet flow toward the detention pond, with shallow swales along the east and south site perimeters aiding in collecting and transporting the flow to the pond. The pond area was planned to be built above the cap and have an FML (60 mil HDPE) liner underneath, and riprap protection in the waterline range to protect the soil above the FML. An outlet works to regulate discharge was also included.

From the discharge works, water would flow into a storm sewer constructed from the vicinity of the pond perimeter, underneath 122nd Street, and then by either enclosed sewer or open ditch parallel to the Norfolk Southern right-of-way to the Calumet River. An enclosed sewer was used for cost purposes, as that would be the more conservative (more expensive) assumption. With little cost or effort, water could be easily regulated from the discharge works if all, or a portion of, the runoff flow from the detention pond were routed into Indian Ridge Marsh, which presently receives Cluster Site runoff. A new culvert would be required to be jacked or directionally bored under the Norfolk Southern railroad tracks for this purpose.

Native short rooted prairie grasses would be used for revegetation of the site based on their low maintenance requirements and compatibility with a broad range of potential end uses for the site, including a solar energy farm. They also are complementary to surrounding areas in terms of attractiveness to birds and wildlife for habitat.

4.6.2 Effectiveness and Cost Evaluation

The two principal “functional” elements of this option are the compacted low-permeability clay cap and the groundwater management system. The clay cap will substantially reduce the infiltration of

precipitation (combined with improved slope for rapid, positive drainage) into the waste. The volume and rate of flow of contaminated groundwater will consequently diminish. The groundwater management system will control gradients at the downgradient site perimeters to prevent the diminished groundwater flow from moving offsite.

This option addresses the presence of contamination in the near surface materials through covering and isolating them with a compacted clay cap. The top of the cap, which is the hydraulic barrier layer, would be a minimum of 3 feet above remaining waste, with the average depth greater over most of the site area. This separation from remaining waste provides reduced contact potential with the remaining waste materials. It does not provide a great deal of flexibility with respect for future land uses, since any excavation or drilling cannot disturb the compacted clay layer. Almost any "surface only" land use could be accommodated under this option.

This option is less costly than those involving disposal by eliminating that cost, the cost of fill soils to replace the waste volume, and associated hauling costs. A clear advantage over Options 2A and 2C is that no offsite landfill disposal eliminates extensive waste sampling and analysis, eliminates a huge volume of truck traffic from hauling fill, requires substantially shorter construction time, and eliminates the uncertainty of possible hazardous waste disposal costs.

As with all the remedial options, storm water runoff will increase with a less permeable cap at a positive degree of slope. However, the storm water will also be clean and free of contamination from contact with the waste materials. Modeling and calculating the flow volumes would be an integral function of designing the cap. This option includes cost estimates for constructing a storm water detention pond onsite with a controlled discharge structure. It also assumes flow rates will be increased a substantial amount and, for that reason, allows for construction of a large storm sewer to run parallel to Torrance Avenue through the MWRDGC property to the Calumet River for discharge.

Disadvantages to this option are related to the relatively shallow depth to remaining waste onsite, the reducing flexibility for future uses, and the extensive disturbance of the buried waste that will likely have area-wide odor impacts and potentially problematic volatile organic vapor releases. This will require that only small excavation areas be handled at one time to minimize vapor releases and impacts to downwind receptors and workers.

The proposed low-permeability cap proposed under this option would meet the requirements of an engineering barrier for the ingestion and inhalation exposure route under TACO. An approved engineering barrier is one of the requirements under TACO to demonstrate that the soil ingestion and inhalation exposure routes can be excluded from consideration for contaminants of concern impacting human receptors.

Initial consolidation of waste piles on the site would develop sufficient slope and grades to provide positive site drainage, therefore eliminating any surface water or sediment exposures to organisms due to ponding. The completed low-permeability cap and topsoil vegetative layer would eliminate all other exposure routes to ecological receptors using the site as a food source.

The cost for this option is one of the least expensive because wastes are not being excavated/transported offsite for disposal, and the impermeable cap is constructed of only clean imported soil. The overall cost for this option is estimated at approximately $21,000,000. This cost is approximately 100% lower than excavating 3 feet of wastes and clay capping (Options 2A and 2B), 310% lower than excavating 10 feet of waste and clay capping (Options 2C and 2D), 40 to 70% lower than consolidating waste with a composite cap (Options 3C, 3D, and 3E), and 15% higher than capping of existing wastes with clay cap (Options 4A and 4B). Table 4-1 summarizes cost estimates for the remedial options. Detailed cost estimate tables for each option are included in Appendix G.

4.7 OPTION 3B – CONSOLIDATE WASTE WITH CLAY CAP/INTEGRATED WETLANDS

4.7.1 Description of Remedial Option

Option 3B involves the consolidation of existing wastes to create appropriate grade to allow for adequate stormwater runoff. This option includes backfilling excavated waste areas with clean imported fill, construction of an impermeable clay cap, construction of wetlands on the southeastern portion of the site, revegetation of the entire site with native plants and prairie grasses, and construction of a groundwater containment system (described in Section 4.13) along the eastern and southern boundaries of the site.

4.7.1.1 Site Preparation

Site preparation must be performed before any disturbance of the existing surface is initiated. The purpose of this preparation is to control and collect runoff during construction. Runoff will be contaminated by contact with waste and sediment from exposed soils. Temporary collection ponds must be built, and silt fencing or straw bales located along downstream perimeters to prevent sediment-laden water from flowing offsite.

Following implementation of these measures, clearing, grubbing, and removing the existing vegetation onsite is necessary to facilitate further operations. Woody and brushy material can be chipped for volume reduction, and may be re-useable as mulch elsewhere. The vegetation removal would be done in phases preceding earthwork operations to minimize erosion impacts.

The TCLP results obtained by Ecology & Environment in 1999, Clayton and the Illinois EPA in 2001 indicate there are four sampling locations that contained wastes characteristically hazardous for either metals or VOCs. The Illinois EPA and USEPA will need to evaluate whether any of these materials will be regulated as hazardous waste. For information purposes, the cost of removal and offsite disposal has been included in the cost evaluation. It was assumed that wastes in a 50-foot diameter centered on each sample location would require removal to a depth of approximately 5 feet bgs. This equates to about 2,000 cubic yards of wastes for removal and offsite disposal as a hazardous waste.

4.7.1.2 Waste Excavation for Consolidation

The waste materials at the cluster site contain a large proportion of slag that, based on test pits excavated for waste characterization, is of uniform occurrence over the area of the site. The slag has formed a hard cemented layer quite resistant to disturbance. Consequently, general excavation onsite must be preceded by first ripping the slag surface with a bulldozer equipped with a ripper tooth. General excavation would then proceed. Excavated wastes would be stockpiled until needed for fill and grading in other areas of the site.

4.7.1.3 Clay Cap and Vegetation

After waste consolidation and grading to provide adequate cover slope for drainage, an impermeable clay cap will be constructed. As necessary, additional fill will be imported and placed to develop an acceptable degree of slope for good drainage. The clay cap will consist of a compacted, low-permeability cap constructed with clay, a layer of uncompacted soil, and a topsoil layer for vegetation. Figure 4-4 illustrates the proposed cross section for this option. Figure 4-7 shows a plan view of the site following remedial action.

Native short rooted prairie grasses would be used for revegetation of the site based on their low maintenance requirements and compatibility with a broad range of potential end uses for the site, including a solar energy farm. They also are complementary to surrounding areas in terms of attractiveness to birds and wildlife for habitat.

4.7.1.4 Integrated Wetlands

In lieu of construction of a stormwater retention pond at the site, a wetland area near the southeastern corner of the site will be constructed to manage the stormwater. The wetlands areas would be vegetated with wetland grasses suitable for occasionally flooded, but mainly wet soil conditions. They would enhance the wildlife habitat in keeping with the region's original natural state, and provide enhanced evapotranspiration potential for removing ponded runoff. A more detailed discussion regarding the benefits of the construction of integrated wetlands as part of this option is included in Section 4.14.

4.7.2 Effectiveness and Cost Evaluation

The two principal "functional" elements of this option are the compacted low-permeability clay cap and the groundwater management system. The clay cap will substantially reduce the infiltration of precipitation (combined with improved slope for rapid, positive drainage) into the waste. The volume and rate of flow of contaminated groundwater will consequently diminish. The groundwater management system will control gradients at the downgradient site perimeters to prevent the diminished groundwater flow from moving offsite.

This option addresses the presence of contamination in the near surface materials through covering and isolating them with a compacted clay cap. The top of the cap, which is the hydraulic barrier layer, would be a minimum of 3 feet above remaining waste, with the average depth greater over most of the site area. This separation from remaining waste provides reduced contact potential with the remaining waste materials. It does not provide a great deal of flexibility with respect for future land uses, since any excavation or drilling cannot disturb the compacted clay layer. Almost any "surface only" land use could be accommodated under this option.

This option is less costly than those involving disposal by eliminating that cost, the cost of fill soils to replace the waste volume, and associated hauling costs. A clear advantage over Options 2A and 2C is that no offsite landfill disposal eliminates extensive waste sampling and analysis, eliminates a huge volume of truck traffic from hauling fill, requires substantially shorter construction time, and eliminates the uncertainty of possible hazardous waste disposal costs.

As with all the remedial options, stormwater runoff will increase with a less permeable cap at a positive degree of slope. However, the stormwater will also be clean and free of contamination from contact with the waste materials. Modeling and calculating the flow volumes would be an integral function of designing the cap. This option provides for constructed wetlands onsite, probably covering the eastern 30% of the site, to collect and store runoff from the surface. Direct evaporation and evapotranspiration from the wetland vegetation will maintain offsite discharge of runoff to below present levels. Discharge from major storm events will be managed through culverts beneath the railroad right-of-way to Indian Ridge Marsh on the east. The additional detention time provided by the wetlands, as well as phytoremediation by the wetland vegetation, will result in runoff of very high quality and clarity.

Disadvantages of this option relate to the relatively shallow depth to remaining waste onsite, reducing flexibility for future uses, and the extensive disturbance of the buried waste will likely have area-wide odor impacts and potentially problematic volatile organic vapor releases.

The proposed low-permeability clay cap proposed under this option would meet the requirements of an engineering barrier for the ingestion and inhalation exposure route under TACO. An approved engineering barrier is one of the requirements under TACO to demonstrate that the soil ingestion and

inhalation exposure routes can be excluded from consideration for contaminants of concern impacting human receptors.

Initial consolidation of waste piles on the site would develop sufficient slope and grades to provide positive site drainage, therefore eliminating any surface water or sediment exposures to organisms due to ponding. The completed low-permeability cap and topsoil vegetative layer would eliminate all other exposure routes to ecological receptors using the site as a food source.

The cost for this option is one of the least expensive because wastes are not being excavated/transported offsite for disposal, and the impermeable cap is constructed of only clean imported soil. The overall cost for this option is estimated at approximately $21,000,000. This cost is approximately 110% higher than excavating 3 feet of wastes and clay capping (Options 2A and 2B), 330% higher than consolidating waste with a clay cap (Options 3A and 3B), 140 to 190% higher than consolidating waste with a composite cap (Options 3C, 3D, and 3E), and 380% higher than capping of existing wastes with clay cap (Options 4A and 4B). Table 4-1 summarizes the cost estimates for the remedial options. Detailed cost estimate tables for each option are included in Appendix G.

4.8 OPTION 3C – CONSOLIDATE WASTE WITH GCL CAP

4.8.1 Description of Remedial Option

Option 3C involves the consolidation of existing wastes to create appropriate grade allowing for adequate stormwater runoff. This option includes backfilling excavated waste areas with clean imported fill, construction of a composite soil and geosynthetic clay liner (GCL) cap, a stormwater retention pond, revegetation of the entire site with native plants and prairie grasses, and construction of a groundwater containment system (described in Section 4.13) along the eastern and southern boundaries of the site.

4.8.1.1 Site Preparation

Site preparation must be performed before any disturbance of the existing surface is initiated. The purpose of this preparation is to control and collect runoff during construction. Runoff will be contaminated by contact with waste and sediment from exposed soils. Temporary collection ponds must be built, and silt fencing or straw bales located along downstream perimeters to prevent sediment-laden water from flowing offsite.

Following implementation of these measures, clearing, grubbing, and removing the existing vegetation onsite is necessary to facilitate further operations. Woody and brushy material can be chipped for volume reduction, and may be re-useable as mulch elsewhere. The vegetation removal would be done in phases preceding earthwork operations to minimize erosion impacts.

The TCLP results obtained by Ecology & Environment in 1999, Clayton and the Illinois EPA in 2001 indicate there are four sampling locations that contained wastes characteristically hazardous for either metals or VOCs. The Illinois EPA and USEPA will need to evaluate whether any of these materials will be regulated as hazardous waste. For information purposes, the costs of removal and offsite disposal have been included in the cost evaluation. It was assumed that wastes in a 50-foot diameter centered on each sample location would require removal to a depth of approximately 5 feet bgs. This equates to about 2,000 cubic yards of wastes for removal and offsite disposal as a hazardous waste.

4.8.1.2 Excavation for Reconsolidation

The waste materials at the cluster site contain a large proportion of slag that, based on test pits excavated for waste characterization, is of uniform occurrence over the area of the site. The slag has formed a hard cemented layer quite resistant to disturbance. Consequently, general excavation onsite must be preceded by first ripping the slag surface with a bulldozer equipped with a ripper tooth. General excavation would then proceed. Excavated wastes would be stockpiled until needed for fill and grading in other areas of the site.

4.8.1.3 Composite Cap and Vegetation

After waste consolidation and grading to provide adequate cover slope for drainage, an impermeable composite cap will be constructed. As necessary, additional fill to develop an acceptable degree of slope for good drainage will be imported and placed. The cap will consist of a bedding layer for the GCL, a layer of GCL liner, a sand drainage layer above the GCL, a layer of low permeability protective soil above the drainage layer, and a topsoil layer for vegetation. Figure 4-5 illustrates the proposed cross section for this option. Figure 4-2 shows a plan view of the site following remedial action.

This and all remedial options result in steeper slopes on the site and low permeability surfaces. Runoff from precipitation events will therefore be greater in total volume, and will accumulate more rapidly than on the existing, poorly drained site. In terms of water quality, the runoff from the cap is considered uncontaminated, since it will not be in contact with the waste materials or contaminated media.

To collect and regulate the discharge rate of storm water from the capped site, this remedial option was designed with a detention pond in the southeast corner of the site. Runoff would flow overland as sheet flow toward the detention pond, with shallow swales along the east and south site perimeters aiding in collecting and transporting the flow to the pond. The pond area was planned to be built above the cap and have an FML (60 mil HDPE) liner underneath, and riprap protection in the waterline range to protect the soil above the FML. An outlet works to regulate discharge was also included.

From the discharge works, water would flow into a storm sewer constructed from the vicinity of the pond perimeter, underneath 122nd Street, and then by either enclosed sewer or open ditch parallel to the Norfolk Southern right-of-way to the Calumet River. An enclosed sewer was used for cost purposes, as that would be the more conservative (more expensive) assumption. With little cost or effort, water could be easily regulated from the discharge works if all, or a portion of, the runoff flow from the detention pond were routed into Indian Ridge Marsh, which presently receives Cluster Site runoff. A new culvert would be required to be jacked or directionally bored under the Norfolk Southern railroad tracks for this purpose.

Native short rooted prairie grasses would be used for revegetation of the site based on their low maintenance requirements and compatibility with a broad range of potential end uses for the site, including a solar energy farm. They also are complementary to surrounding areas in terms of attractiveness to birds and wildlife for habitat.

4.8.2 Effectiveness and Cost Evaluation

The two principal "functional" elements of this option are the GCL cap and the groundwater management system. The GCL cap will substantially reduce the infiltration of precipitation (combined with improved slope for rapid, positive drainage) into the waste. The advantage of a GCL over a low permeability compacted soil only cap is the very low hydraulic conductivity of the GCL (1×10^{-9} cm./sec. typically) and the consistent uniformity of manufactured product. Infiltration through the GCL cap would be nearly negligible, or de minimus. The volume and rate of flow of contaminated groundwater will consequently diminish as the vertical infiltration over the site area itself is eliminated. The groundwater management system will control gradients at the downgradient site perimeters to prevent the diminished groundwater flow from moving offsite.

This option addresses the presence of contamination in the near surface materials through covering and isolating them with a GCL cap. The top of the cap, which is the hydraulic barrier layer, would be a minimum of 3 feet above remaining waste, with the average depth greater over most of the site area. This separation from remaining waste provides reduced contact potential with the remaining waste materials. It does not provide a great deal of flexibility with respect for future land uses, since any excavation or drilling would destroy the integrity of the GCL. Almost any "surface only" land use could be accommodated under this option.

This option is less costly than those involving disposal by eliminating that cost, the cost of fill soils to replace the waste volume, and associated hauling costs. A clear advantage over Options 2A and 2C is that no offsite landfill disposal eliminates extensive waste sampling and analysis, eliminates a huge volume of truck traffic from hauling fill, requires substantially shorter construction time, and eliminates the uncertainty of possible hazardous waste disposal costs. A clear advantage over an all-clay cap, such as in Option 3A, is that there is less soil overall, less stringent engineering property requirements for the soils, and a reduction of hauling costs, road traffic, and construction time.

As with all the remedial options, stormwater runoff will increase with a less permeable cap at a positive degree of slope. However, the stormwater will also be clean and free of contamination from contact with the waste materials. Modeling and calculating the flow volumes would be an integral function of designing the cap. This option includes cost estimates for constructing a stormwater detention pond onsite with a controlled discharge structure. It also assumes flow rates will be increased a substantial amount and, for that reason, allows for construction of a large storm sewer to run parallel to Torrance Avenue through the MWRDGC property to the Calumet River for discharge.

Disadvantages to this option are related to the relatively shallow depth to remaining waste onsite, the reducing flexibility for future uses, and the extensive disturbance of the buried waste during regrading and slope shaping activities that will likely have area-wide odor impacts and potentially problematic volatile organic vapor releases.

The proposed low-permeability cap, consisting of a GCL covered by a drainage layer and protective soil, proposed under this option would meet the requirements of an engineering barrier for the ingestion and inhalation exposure route under TACO. An approved engineering barrier is one of the requirements under TACO to demonstrate that the soil ingestion and inhalation exposure routes can be excluded from consideration for contaminants of concern impacting human receptors.

Initial consolidation of waste piles on the site would develop sufficient slope and grades to provide positive site drainage, therefore eliminating any surface water or sediment exposures to organisms due to ponding. The low-permeability cap consisting of a GCL covered by a drainage layer, protective soil layer, and 1-foot topsoil vegetative layer would eliminate all other exposure routes to ecological receptors using the site as a food source.

The cost for this option is in the mid-range of the options evaluated. The overall cost for this option is estimated at approximately $30,000,000. This cost is approximately 40% lower than excavating 3 feet of wastes and clay capping (Options 2A and 2B), 190% lower than excavating 10 feet of wastes and clay capping (Options 2C and 2D), 40% higher than consolidating waste with a clay cap (Options 3A and 3B), 20% higher than consolidating waste with a composite cap (Options 3D and 3E), and 65% higher than capping of existing wastes with clay cap (Options 4A and 4B). Table 4-1

summarizes the cost estimates for the remedial options. Detailed cost estimate tables for each option are included in Appendix G.

4.9 OPTION 3D – CONSOLIDATE WASTE WITH FML CAP

4.9.1 Description of Remedial Option

Option 3D involves consolidation of existing wastes to create appropriate grade allowing for adequate stormwater runoff. This option includes backfilling excavated waste areas with clean imported fill, construction of a composite soil and a flexible membrane liner (FML) cap, a stormwater retention pond, revegetation of the entire site with native plants and prairie grasses, and construction of a groundwater containment system (described in Section 4.13) along the eastern and southern boundaries of the site.

4.9.1.1 Site Preparation

Site preparation must be performed before any disturbance of the existing surface is initiated. The purpose of this preparation is to control and collect runoff during construction. Runoff will be contaminated by contact with waste and sediment from exposed soils. Temporary collection ponds must be built, and silt fencing or straw bales located along downstream perimeters to prevent sediment-laden water from flowing offsite.

Following implementation of these measures, clearing, grubbing, and removing the existing vegetation onsite is necessary to facilitate further operations. Woody and brushy material can be chipped for volume reduction, and may be re-useable as mulch elsewhere. The vegetation removal would be done in phases preceding earthwork operations to minimize erosion impacts.

The TCLP results obtained by Ecology & Environment in 1999, Clayton and the Illinois EPA in 2001 indicate there are four sampling locations that contained wastes characteristically hazardous for either metals or VOCs. The Illinois EPA and USEPA will need to evaluate whether any of these materials will be regulated as hazardous waste. For information purposes, the costs of removal and offsite disposal have been included in the cost evaluation. It was assumed that wastes in a 50-foot

diameter centered on each sample location would require removal to a depth of approximately 5 feet bgs. This equates to about 2,000 cubic yards of wastes for removal and offsite disposal as a hazardous waste.

4.9.1.2 Excavation for Reconsolidation

The waste materials at the cluster site contain a large proportion of slag that, based on test pits excavated for waste characterization, is of uniform occurrence over the area of the site. The slag has formed a hard cemented layer quite resistant to disturbance. Consequently, general excavation onsite must be preceded by first ripping the slag surface with a bulldozer equipped with a ripper tooth. General excavation would then proceed. Excavated wastes would be stockpiled until needed for fill and grading in other areas of the site.

4.9.1.3 Composite Cap and Vegetation

After waste consolidation and grading to provide adequate cover slope for drainage, an impermeable composite cap will be constructed. As necessary, additional fill will be imported and placed to develop an acceptable degree of slope for good drainage. The cap will consist of a bedding layer for the FML, a layer of FML liner, a sand drainage layer above the FML liner, a layer of low permeability protective soil above the drainage layer, a layer of uncompacted soil, and a topsoil layer for vegetation. Figure 4-5 illustrates the proposed cross section for this option. Figure 4-2 shows a plan view of the site following remedial action.

This and all remedial options result in steeper slopes on the site and low permeability surfaces. Runoff from precipitation events will therefore be greater in total volume, and will accumulate more rapidly than on the existing, poorly drained site. In terms of water quality, the runoff from the cap is considered uncontaminated, since it will not be in contact with the waste materials or contaminated media.

To collect and regulate the discharge rate of storm water from the capped site, this remedial option was designed with a detention pond in the southeast corner of the site. Runoff would flow overland as sheet flow toward the detention pond, with shallow swales along the east and south site

perimeters aiding in collecting and transporting the flow to the pond. The pond area was planned to be built above the cap and have an FML (60 mil HDPE) liner underneath, and riprap protection in the waterline range to protect the soil above the FML. An outlet works to regulate discharge was also included.

From the discharge works, water would flow into a storm sewer constructed from the vicinity of the pond perimeter, underneath 122nd Street, and then by either enclosed sewer or open ditch parallel to the Norfolk Southern right-of-way to the Calumet River. An enclosed sewer was used for cost purposes, as that would be the more conservative (more expensive) assumption. With little cost or effort, water could be easily regulated from the discharge works if all, or a portion of, the runoff flow from the detention pond were routed into Indian Ridge Marsh, which presently receives Cluster Site runoff. A new culvert would be required to be jacked or directionally bored under the Norfolk Southern railroad tracks for this purpose.

Native short rooted prairie grasses would be used for revegetation of the site based on their low maintenance requirements and compatibility with a broad range of potential end uses for the site, including a solar energy farm. They also are complementary to surrounding areas in terms of attractiveness to birds and wildlife for habitat.

4.9.2 Effectiveness and Cost Evaluation

The two principal "functional" elements of this option are the FML cap and the groundwater management system. The FML cap will substantially reduce the infiltration of precipitation (combined with improved slope for rapid, positive drainage) into the waste. The advantage of a FML over a low permeability compacted soil-only cap is the extremely low hydraulic conductivity of the FML (1×10^{-13} cm./sec. typically) and the consistent uniformity of manufactured product. For purposes of pricing, a 60-mil HDPE membrane liner, fusion welded, was used, which is typical industry practice. Infiltration through the FML cap is essentially zero. The volume and rate of flow of contaminated groundwater will consequently diminish as the vertical infiltration over the site area itself is eliminated. The groundwater management system will control gradients at the downgradient site perimeters to prevent the diminished groundwater flow from moving offsite.

This option addresses the presence of contamination in the near surface materials through covering and isolating them with a FML cap. The top of the cap, which is the hydraulic barrier layer, would be a minimum of 3 feet above remaining waste, with the average depth greater over most of the site area. This separation from remaining waste provides reduced contact potential with the remaining waste materials. It does not provide a great deal of flexibility with respect to future land uses, since any excavation or drilling would destroy the integrity of the FML. Almost any "surface only" land use could be accommodated under this option.

This option is less costly than those involving disposal by eliminating that cost, the cost of fill soils to replace the waste volume, and associated hauling costs. A clear advantage over Options 2A and 2C is that no offsite landfill disposal eliminates extensive waste sampling and analysis, eliminates a huge volume of truck traffic from hauling fill, requires substantially shorter construction time, and eliminates the uncertainty of possible hazardous waste disposal costs. A clear advantage over an all-clay cap, such as in Option 3A, is that there is less soil overall, less stringent engineering property requirements for the soils, and a reduction of hauling costs, road traffic, and construction time. The 60-mil HDPE welded cap provides a virtually impermeable barrier to both liquid and gas. As such, it is a superb engineered barrier to the remaining waste as long as its integrity is undisturbed.

Disadvantages to this option are related to the relatively shallow depth to remaining waste onsite, the reducing flexibility for future uses, and the extensive disturbance of the buried waste during regrading and slope shaping activities that will likely have area-wide odor impacts and potentially problematic volatile organic vapor releases. The cost of both the materials and fusion welding, as well as quality control and assurance testing, makes the FML a more costly option than either a clay cap or a GCL cap.

As with all the remedial options, storm water runoff will increase with a less permeable cap at a positive degree of slope. However, the storm water will also be clean and free of contamination from contact with the waste materials. Modeling and calculating the flow volumes would be an integral function of designing the cap. This option includes cost estimates for constructing a storm water detention pond onsite with a controlled discharge structure. It also assumes that flow rates will be increased a substantial amount and, for that reason, it allows for construction of a large storm sewer

to run parallel to Torrance Avenue through the MWRDGC property to the Calumet River for discharge.

The proposed low-permeability cap, consisting of a FML covered by a drainage layer and protective soil, proposed under this option would meet the requirements of an engineering barrier for the ingestion and inhalation exposure route under TACO. An approved engineering barrier is one of the requirements under TACO to demonstrate that the soil ingestion and inhalation exposure routes can be excluded from consideration for contaminants of concern impacting human receptors.

Initial consolidation of waste piles on the site would develop sufficient slope and grades to provide positive site drainage, therefore eliminating any surface water or sediment exposures to organisms due to ponding. The low-permeability cap consisting of a FML covered by a drainage layer, protective soil layer, and topsoil vegetative layer would eliminate all other exposure routes to ecological receptors using the site as a food source.

The cost for this option is one of the more expensive options evaluated. The overall cost for this option is estimated at approximately $36,000,000. This cost is approximately 15% lower than excavating 3 feet of wastes and clay capping (Options 2A and 2B), 140% lower than excavating 10 feet of wastes and clay capping (Options 2C and 2D), 70% higher than consolidating waste with a clay cap (Options 3A and 3B), 20% higher than consolidating waste with a composite cap (Option 3C), and 100% higher than capping of existing wastes with clay cap (Options 4A and 4B). Table 4-1 summarizes the cost estimates for the remedial options. Detailed cost estimate tables for each option are included in Appendix G.

4.10 OPTION 3E – CONSOLIDATE WASTE WITH FML CAP/INTEGRATED WETLANDS

4.10.1 Description of Remedial Option

Option 3E involves the consolidation of existing wastes to create appropriate grade to allow for adequate stormwater runoff. This option includes backfilling excavated waste areas with clean imported fill, the construction of a composite soil and FML cap, construction of wetlands on the southeastern portion of the site, revegetation of the entire site with native plants and prairie grasses,

and construction of a groundwater containment system (described in Section 4.13) along the eastern and southern boundaries of the site.

4.10.1.1 Site Preparation

Site preparation must be performed before any disturbance of the existing surface is initiated. The purpose of this preparation is to control and collect runoff during construction. Runoff will be contaminated by contact with waste and sediment from exposed soils. Temporary collection ponds must be built, and silt fencing or straw bales located along downstream perimeters to prevent sediment-laden water from flowing offsite.

Following implementation of these measures, clearing, grubbing, and removing the existing vegetation onsite is necessary to facilitate further operations. Woody and brushy material can be chipped for volume reduction, and may be re-useable as mulch elsewhere. The vegetation removal would be done in phases preceding earthwork operations to minimize erosion impacts.

The TCLP results obtained by Ecology & Environment in 1999, Clayton and the Illinois EPA in 2001 indicate there are four sampling locations that contained wastes characteristically hazardous for either metals or VOCs. The Illinois EPA and USEPA will need to evaluate whether any of these materials will be regulated as hazardous waste. For information purposes, the cost of removal and offsite disposal has been included in the cost evaluation. It was assumed that wastes in a 50-foot diameter centered on each sample location would require removal to a depth of approximately 5 feet bgs. This equates to about 2,000 cubic yards of wastes for removal and offsite disposal as a hazardous waste.

4.10.1.2 Waste Excavation for Reconsolidation

The waste materials at the cluster site contain a large proportion of slag that, based on test pits excavated for waste characterization, is of uniform occurrence over the area of the site. The slag has formed a hard cemented layer quite resistant to disturbance. Consequently, general excavation onsite must be preceded by first ripping the slag surface with a bulldozer equipped with a ripper

tooth. General excavation would then proceed. Excavated wastes would be stockpiled until needed for fill and grading in other areas of the site.

4.10.1.3 Composite Cap and Vegetation

After waste consolidation and grading to provide adequate cover slope for drainage, an impermeable composite cap will be constructed. As necessary, additional fill will be imported and placed to develop an acceptable degree of slope for good drainage. The cap will consist of a bedding layer for the FML, a layer of FML liner, a sand drainage layer above the FML liner, a layer of low permeability protective soil above the drainage layer, a layer of uncompacted soil, and a topsoil layer for vegetation. Figure 4-4 illustrates the proposed cross section for this option. Figure 4-7 shows a plan view of the site following remedial action.

Native short rooted prairie grasses would be used for revegetation of the site based on their low maintenance requirements and compatibility with a broad range of potential end uses for the site, including a solar energy farm. They also are complementary to surrounding areas in terms of attractiveness to birds and wildlife for habitat.

4.10.1.4 Integrated Wetlands

In lieu of construction of a stormwater retention pond at the site, a wetland area near the southeastern corner of the site will be constructed to manage stormwater. The wetlands areas would be vegetated with wetland grasses suitable for occasionally flooded, but mainly wet soil conditions. They provide a wildlife habitat in keeping with the region's original natural state, and provide enhanced evapotranspiration potential for removing ponded runoff. A more detailed discussion regarding benefits of the construction of integrated wetlands as part of this option is included in Section 4.14.

4.10.2 Effectiveness and Cost Evaluation

The two principal "functional" elements of this option are the FML cap and the groundwater management system. The FML cap will substantially reduce the infiltration of precipitation (combined with improved slope for rapid, positive drainage) into the waste. The advantage of a FML over a low permeability compacted soil-only cap is the extremely low hydraulic conductivity of the FML (1×10^{-13} cm./sec. typically) and the consistent uniformity of manufactured product. For purposes of pricing, a 60-mil HDPE membrane liner, fusion-welded, was used, which is typical industry practice. Infiltration through the FML cap would be, essentially, zero. The volume and rate of flow of contaminated groundwater will consequently diminish as the vertical infiltration over the site area itself is eliminated. The groundwater management system will control gradients at the downgradient site perimeters to prevent the diminished groundwater flow from moving offsite.

This option addresses the presence of contamination in the near surface materials through covering and isolating them with a FML cap. The top of the cap, which is the hydraulic barrier layer, would be a minimum of 3 feet above remaining waste, with the average depth greater over most of the site area. This separation from remaining waste provides reduced contact potential with the remaining waste materials. It does not provide a great deal of flexibility with respect for future land uses, since any excavation or drilling would destroy the integrity of the FML. Almost any "surface only" land use could be accommodated under this option.

This option is less costly than those involving disposal by eliminating that cost, the cost of fill soils to replace the waste volume, and associated hauling costs. A clear advantage over Options 2A and 2C is that no offsite landfill disposal eliminates extensive waste sampling and analysis, eliminates a huge volume of truck traffic from hauling fill, requires substantially shorter construction time, and eliminates the uncertainty of possible hazardous waste disposal costs. A clear advantage over an all-clay cap, such as in Option 3A, is that there is less soil overall, less stringent engineering property requirements for the soils, and a reduction of hauling costs, road traffic, and construction time. The 60-mil HDPE welded cap provides a virtually impermeable barrier to both liquid and gas. As such, it is a superb engineered barrier to the remaining waste as long as its integrity is undisturbed.

As with all the remedial options, storm water runoff will increase with a less permeable cap at a positive degree of slope. However, the storm water will also be clean and free of contamination from contact with the waste materials. Modeling and calculating the flow volumes would be an integral function of designing the cap. This option provides for constructed wetlands onsite, probably covering the eastern 30% of the site, to collect and store runoff from the surface. Direct evaporation and evapotranspiration from the wetland vegetation will maintain offsite discharge of runoff to below present levels. Discharge from major storm events will be managed through culverts beneath the railroad right-of-way to Indian Ridge Marsh on the east. The additional detention time provided by the wetlands, as well as phytoremediation by the wetland vegetation, will result in runoff of very high quality and clarity.

Disadvantages to this option are related to the relatively shallow depth to remaining waste onsite, the reducing flexibility for future uses, and the extensive disturbance of the buried waste during regrading and slope shaping activities that will likely have area-wide odor impacts and potentially problematic volatile organic vapor releases. The cost of both the materials and fusion welding, as well as quality control and assurance testing, makes the FML a more costly option than either a clay cap or a GCL cap.

The proposed low-permeability cap, consisting of a FML covered by a drainage layer and protective soil, proposed under this option would meet the requirements of an engineering barrier for the ingestion and inhalation exposure route under TACO. An approved engineering barrier is one of the requirements under TACO to demonstrate that the soil ingestion and inhalation exposure routes can be excluded from consideration for contaminants of concern impacting human receptors.

Initial consolidation of waste piles on the site would develop sufficient slope and grades to provide positive site drainage, therefore eliminating any surface water or sediment exposures to organisms due to ponding. The low-permeability cap consisting of a FML covered by a drainage layer, protective soil layer, and topsoil vegetative layer would eliminate all other exposure routes to ecological receptors using the site as a food source.

The cost for this option is one of the more expensive because wastes are being consolidated and a composite cap is being constructed. The overall cost for this option is estimated at approximately

$36,000,000. This cost is approximately 15% lower than excavating 3 feet of wastes and clay capping (Options 2A and 2B), 140% lower than excavating 10 feet of wastes and clay capping (Options 2C and 2D), 70% higher than consolidating waste with a clay cap (Options 3A and 3B), 20% higher than consolidating waste with a composite cap (Option 3C), and 100% higher than capping of existing wastes with clay cap (Options 4A and 4B). Table 4-1 summarizes the cost estimates for the remedial options. Detailed cost estimate tables for each option are included in Appendix G.

4.11 OPTION 4A – COVER EXISTING WASTE CLAY CAP

4.11.1 Description of Remedial Option

Option 4A involves the construction of an impermeable clay cap over the existing wastes to create appropriate grade to allow for adequate stormwater runoff. This option includes backfilling excavated waste areas around the perimeter with clean imported fill, construction of a stormwater containment berm around the entire site, construction of an impermeable clay cap, a stormwater retention pond, revegetation of the entire site with native plants and prairie grasses, and construction of a groundwater containment system (described in Section 4.13) along the eastern and southern boundaries of the site.

4.11.1.1 Site Preparation

Site preparation must be performed before any disturbance of the existing surface is initiated. The purpose of this preparation is to control and collect runoff during construction. Runoff will be contaminated by contact with waste and sediment from exposed soils. Temporary collection ponds must be built, and silt fencing or straw bales located along downstream perimeters to prevent sediment-laden water from flowing offsite.

Following implementation of these measures, clearing, grubbing, and removing the existing vegetation onsite is necessary to facilitate further operations. Woody and brushy material can be

chipped for volume reduction, and may be re-useable as mulch elsewhere. The vegetation removal would be done in phases preceding earthwork operations to minimize erosion impacts.

The TCLP results obtained by Ecology & Environment in 1999, Clayton and the Illinois EPA in 2001 indicate there are four sampling locations that contained wastes characteristically hazardous for either metals or VOCs. The Illinois EPA and USEPA will need to evaluate whether any of these materials will be regulated as hazardous waste. For information purposes, the costs of removal and offsite disposal have been included in the cost evaluation. It was assumed that wastes in a 50-foot diameter centered on each sample location would require removal to a depth of approximately 5 feet bgs. This equates to about 2,000 cubic yards of wastes for removal and offsite disposal as a hazardous waste.

4.11.1.2 Excavation for Construction

The waste materials at the site contain a large proportion of slag that, based on test pits excavated for waste characterization, is of uniform occurrence over the area of the site. The slag has formed a hard cemented layer quite resistant to disturbance. Consequently, general excavation onsite must be preceded by first ripping the slag surface with a bulldozer equipped with a ripper tooth. General excavation would then proceed. Excavated wastes would be stockpiled until needed for fill and grading in other areas of the site. Excavation and relocating of wastes is anticipated in only limited portions of the site's perimeter under this option.

4.11.1.3 Clay Cap and Vegetation

After waste removal, backfilling, and grading to provide adequate cover slope for drainage, an impermeable clay cap will be constructed. As necessary, additional fill will be imported and placed to develop an acceptable degree of slope for good drainage. The clay cap will consist of a compacted, low-permeability cap constructed with clay, a layer of uncompacted soil, and a topsoil layer for vegetation. Figure 4-6 illustrates the proposed cross section for this option. Figure 4-2 shows a plan view of the site following remedial action.

This and all remedial options result in steeper slopes on the site and low permeability surfaces. Runoff from precipitation events will therefore be greater in total volume, and will accumulate more rapidly than on the existing, poorly drained site. In terms of water quality, the runoff from the cap is considered uncontaminated, since it will not be in contact with the waste materials or contaminated media.

To collect and regulate the discharge rate of storm water from the capped site, this remedial option was designed with a detention pond in the southeast corner of the site. Runoff would flow overland as sheet flow toward the detention pond, with shallow swales along the east and south site perimeters aiding in collecting and transporting the flow to the pond. The pond area was planned to be built above the cap and have an FML (60-mil HDPE) liner underneath, and riprap protection in the waterline range to protect the soil above the FML. An outlet works to regulate discharge was also included.

From the discharge works, water would flow into a storm sewer constructed from the vicinity of the pond perimeter, underneath 122nd Street, and then by either an enclosed sewer or open ditch parallel to the Norfolk Southern right-of-way to the Calumet River. An enclosed sewer was used for cost purposes, as that would be the more conservative (more expensive) assumption. With little cost or effort, water could be easily regulated from the discharge works if all, or a portion of, the runoff flow from the detention pond were routed into Indian Ridge Marsh, which presently receives Cluster Site runoff. A new culvert would be required to be jacked or directionally bored under the Norfolk Southern railroad tracks for this purpose.

Native short rooted prairie grasses would be used for revegetation of the site based on their low maintenance requirements and compatibility with a broad range of potential end uses for the site, including a solar energy farm. They also are complementary to surrounding areas in terms of attractiveness to birds and wildlife for habitat.

4.11.2 Effectiveness and Cost Evaluation

The two principal “functional” elements of this option are the compacted low-permeability clay cap and the groundwater management system. The clay cap will substantially reduce the infiltration of

precipitation (combined with improved slope for rapid, positive drainage) into the waste. The volume and rate of flow of contaminated groundwater will consequently diminish. The groundwater management system will control gradients at the downgradient site perimeters to prevent the diminished groundwater flow from moving offsite.

This option addresses the presence of contamination in the near surface materials through covering and isolating them with a compacted clay cap. The top of the cap, which is the hydraulic barrier layer, would be a minimum of 2 feet above remaining waste, with the average depth greater over most of the site area. This separation from remaining waste provides reduced contact potential with the remaining waste materials. It does not provide a great deal of flexibility with respect for future land uses, since any excavation or drilling cannot disturb the compacted clay layer. Almost any "surface only" land use could be accommodated under this option.

This option is less costly than those involving disposal by eliminating that cost, the cost of fill soils to replace the waste volume, and associated hauling costs. A clear advantage over Options 2A and 2C is that no offsite landfill disposal eliminates extensive waste sampling and analysis, eliminates a huge volume of truck traffic from hauling fill, requires substantially shorter construction time, and eliminates the uncertainty of possible hazardous waste disposal costs.

As with all the remedial options, storm water runoff will increase with a less permeable cap at a positive degree of slope. However, the storm water will also be clean and free of contamination from contact with the waste materials. Modeling and calculating the flow volumes would be an integral function of designing the cap. This option includes cost estimates for constructing a storm water detention pond onsite with a controlled discharge structure. It also assumes flow rates will be increased a substantial amount and, for that reason, allows for construction of a large storm sewer to run parallel to Torrance Avenue through the MWRDGC property to the Calumet River for discharge.

Disadvantages to this option are related to the relatively shallow depth to remaining waste onsite, the reducing flexibility for future uses, and the relatively large volumes of fill soils required from offsite sources to shape and contour the site for proper drainage. Hauling and truck traffic is one impact associated with the larger volumes; longer construction time is another.

Since the wastes are anticipated being left virtually undisturbed under this option, the general surface elevation of the site will be raised by cap construction, which necessitates the construction of berms around the perimeters to collect and control storm water runoff and prevent it from flowing overland offsite.

The proposed low-permeability clay cap proposed under this option would meet the requirements of an engineering barrier for the ingestion and inhalation exposure route under TACO. An approved engineering barrier is one of the requirements under TACO to demonstrate that the soil ingestion and inhalation exposure routes can be excluded from consideration for contaminants of concern impacting human receptors.
The completed low-permeability cap and topsoil vegetative layer would eliminate all other exposure routes to ecological receptors using the site as a food source.

The cost for this option is the least expensive because wastes are not being excavated/transported offsite for disposal, no waste consolidation, and the impermeable cap is constructed of only clean imported soil. The overall cost for this option is estimated at approximately $18,000,000. This cost is approximately 125% lower than excavating 3 feet of wastes and clay capping (Options 2A and 2B), 80% lower than consolidating waste with a clay cap (Options 3A and 3B), 60 to 100% lower than consolidating waste with a composite cap (Options 3C, 3D, and 3E), and 380% lower than excavating 10 feet of wastes and clay capping (Options 2C and 2D). Table 4-1 summarizes the cost estimates for the remedial options. Detailed cost estimate tables for each option are included in Appendix G.

4.12 OPTION 4B – COVER EXISTING WASTE WITH CLAY CAP/INTEGRATED WETLANDS

4.12.1 Description of Remedial Option

Option 4B involves construction of an impermeable clay cap over existing wastes to create appropriate grade to allow for adequate stormwater runoff. This option includes backfilling excavated waste areas around the perimeter with clean imported fill, construction of a stormwater containment berm around the entire site, construction of an impermeable clay cap, construction of wetlands on the southeastern portion of the site, revegetation of the entire site with native plants

and prairie grasses, and construction of a groundwater containment system (described in Section 4.13) along the eastern and southern boundaries of the site.

4.12.1.1 Site Preparation

Site preparation must be performed before any disturbance of the existing surface is initiated. The purpose of this preparation is to control and collect runoff during construction. Runoff will be contaminated by contact with waste and sediment from exposed soils. Temporary collection ponds must be built, and silt fencing or straw bales located along downstream perimeters to prevent sediment-laden water from flowing offsite.

Following implementation of these measures, clearing, grubbing, and removing the existing vegetation onsite is necessary to facilitate further operations. Woody and brushy material can be chipped for volume reduction, and may be re-useable as mulch elsewhere. The vegetation removal would be done in phases preceding earthwork operations to minimize erosion impacts.

The TCLP results obtained by Ecology & Environment in 1999, Clayton and the Illinois EPA in 2001 indicate there are four sampling locations that contained wastes characteristically hazardous for either metals or VOCs. The Illinois IEPA and USEPA will need to evaluate whether any of these materials will be regulated as hazardous waste. For information purposes, the cost of removal and offsite disposal has been included in the cost evaluation. It was assumed that wastes in a 50-foot diameter centered on each sample location would require removal to a depth of approximately 5 feet bgs. This equates to about 2,000 cubic yards of wastes for removal and offsite disposal as a hazardous waste.

4.12.1.2 Waste Excavation for Cap Construction

The waste materials at the cluster site contain a large proportion of slag that, based on test pits excavated for waste characterization, is of uniform occurrence over the area of the site. The slag has formed a hard cemented layer quite resistant to disturbance. Consequently, general excavation onsite must be preceded by first ripping the slag surface with a bulldozer equipped with a ripper tooth. General excavation would then proceed. Excavated wastes would be stockpiled until needed

for fill and grading in other areas of the site. Excavation and relocating of wastes is anticipated in only limited portions of the cluster site's perimeter under this option.

4.12.1.3 Clay Cap and Vegetation

After waste removal, backfilling, and grading to provide adequate cover slope for drainage, an impermeable clay cap will be constructed. As necessary, additional fill will be imported and placed to develop an acceptable degree of slope for good drainage. The clay cap will consist of a compacted, low-permeability cap constructed with clay, a layer of uncompacted soil, and a topsoil layer for vegetation. Figure 4-6 illustrates the proposed cross section for this option. Figure 4-7 shows a plan view of the site following remedial action.

Native short rooted prairie grasses would be used for revegetation of the site based on their low maintenance requirements and compatibility with a broad range of potential end uses for the site, including a solar energy farm. They also are complementary to surrounding areas in terms of attractiveness to birds and wildlife for habitat.

4.12.1.4 Integrated Wetlands

In lieu of construction of a stormwater retention pond at the site, a wetland area near the southeastern corner of the site will be constructed to manage stormwater. The wetlands areas would be vegetated with wetland grasses suitable for occasionally flooded, but mainly wet soil conditions. They provide a wildlife habitat in keeping with the region's original natural state, and provide enhanced evapotranspiration potential for removing ponded runoff. A more detailed discussion regarding benefits of the construction of integrated wetlands as part of this option is included in Section 4.14.

4.12.2 Effectiveness and Cost Evaluation

The two principal "functional" elements of this option are the compacted low-permeability clay cap and the groundwater management system. The clay cap will substantially reduce the infiltration of precipitation (combined with improved slope for rapid, positive drainage) into the waste. The volume and rate of flow of contaminated groundwater will consequently diminish. The groundwater

management system will control gradients at the downgradient site perimeters to prevent the diminished groundwater flow from moving offsite.

This option addresses the presence of contamination in the near surface materials through covering and isolating them with a compacted clay cap. The top of the cap, which is the hydraulic barrier layer, would be a minimum of 2 feet above remaining waste, with the average depth greater over most of the site area. This separation from remaining waste provides reduced contact potential with the remaining waste materials. It does not provide a great deal of flexibility with respect for future land uses, since any excavation or drilling cannot disturb the compacted clay layer. Almost any "surface only" land use could be accommodated under this option.

This option is less costly than those involving disposal by eliminating that cost, the cost of fill soils to replace the waste volume, and associated hauling costs. A clear advantage over Options 2A and 2C is that no offsite landfill disposal eliminates extensive waste sampling and analysis, eliminates a huge volume of truck traffic from hauling fill, requires substantially shorter construction time, and eliminates the uncertainty of possible hazardous waste disposal costs.

As with all the remedial options, storm water runoff will increase with a less permeable cap at a positive degree of slope. However, the storm water will also be clean and free of contamination from contact with the waste materials. Modeling and calculating the flow volumes would be an integral function of designing the cap. This option provides for constructed wetlands onsite, probably covering the eastern 30% of the site, to collect and store runoff from the surface. Direct evaporation and evapotranspiration from the wetland vegetation will maintain offsite discharge of runoff to below present levels. Discharge from major storm events will be managed through culverts beneath the railroad right-of-way to Indian Ridge Marsh on the east. The additional detention time provided by the wetlands, as well as phytoremediation by the wetland vegetation, will result in runoff of very high quality and clarity.

Disadvantages to this option are related to the relatively shallow depth to remaining waste onsite, the reducing flexibility for future uses, and the relatively large volume of fill soils required from offsite sources to shape and contour the site for proper drainage. Hauling and truck traffic is one impact associated with the larger volumes; longer construction time is another.

Since wastes are anticipated being left virtually undisturbed under this option, the general surface elevation of the site will be raised by cap construction, which necessitates construction of berms around the perimeters to collect and control storm water runoff and prevent it from flowing overland offsite.

The proposed low-permeability clay cap would meet the requirements of an engineering barrier for the ingestion and inhalation exposure route under TACO. An approved engineering barrier is one of the requirements under TACO to demonstrate that the soil ingestion and inhalation exposure routes can be excluded from consideration for contaminants of concern impacting human receptors.

The completed low-permeability cap and topsoil vegetative layer would eliminate all other exposure routes to ecological receptors using the site as a food source.

The cost for this option is the least expensive because wastes are not being excavated/transported offsite for disposal, no waste consolidation is being conducted, and the impermeable cap is constructed of only clean imported soil. The overall cost for this option is estimated at approximately $18,000,000. This cost is approximately 125% lower than excavating 3 feet of wastes and clay capping (Options 2A and 2B), 80% lower than consolidating waste with a clay cap (Options 3A and 3B), 60 to 100% lower than consolidating waste with a composite cap (Options 3C, 3D, and 3E), and 380% lower than excavating to 10 feet with clay cap (Options 2C and 2D). Table 4-1 summarizes the cost estimates for the remedial options. Detailed cost estimate tables for each option are included in Appendix G.

4.13 GROUNDWATER MANAGEMENT SYSTEM

As described earlier in the report, the buried waste impacts shallow groundwater at the Cluster Site. An element of this option is to perform additional evaluation of groundwater hydrology and characteristics to obtain design parameters for a system to control offsite movement of groundwater, as would be required if it were a pump and treat system that hydraulically controlled all the contaminated groundwater. Specifically, the following tasks and information must be performed or obtained:

- Regional groundwater flow direction and gradient must be confirmed by installing and sampling piezometers as required;

- A pumping test must be performed to establish initial and steady state flow volumes to achieve a gradient depression;

- Sampling and analysis must be conducted on the groundwater before and during the pump test to ascertain if it meets MWRDGC influent standards, and the appropriate pretreatment requirements, if any;

- Borings and test pits must be performed along the alignment of the slurry wall/ collection trench to determine engineering properties of the soils/waste and to confirm the depth to the underlying clay layer, which is thought to be fairly uniform at 28 to 30 ft. below grade based on previous investigations and regional geology studies.

All of these activities are required pre-design actions to ensure the effectiveness of the groundwater management system and to refine the actual capital and operating cost of the groundwater management system. Cost estimates for this remedial options study are based on best experience from similar projects, combined with the limited data available onsite specific soil and groundwater conditions at the Cluster Site. To be conservative, groundwater flow volumes into the perimeter trench collectors was assumed to be steady state over time, although over time and after the engineered cap is in place, flows typically decrease.

Various details of the groundwater management system necessary to estimate capital and operating cost, such as well sump spacing, types of pump, force main vs. gravity flow, pipe sizes, etc. were also based on best experience estimates from similar projects. It was also assumed that a force main will convey groundwater to an MWRDGC manhole at 122nd St. and Stoney Island Ave. for discharge.

The options include both additional onsite groundwater investigation, as well as the construction of a groundwater containment system. It is anticipated that the system will be essentially permanent, at the very least for 30 yrs. plus, until leachate quality becomes such that management can be suspended.

The cluster site does not present a classic landfill situation where a large portion of the waste mass is above grade, and the major cause of leachate is infiltration through the top of the site. Surface infiltration clearly is not a major contributor to groundwater contamination at the cluster site because of the lack of cover and the poor grading resulting in ponded water. However, the depth of the

wastes and the ambient high groundwater table suggest an effective cap will reduce, but not eliminate, groundwater movement through the waste.

The designed function of the groundwater management system is to reduce or eliminate offsite impacts of contaminated groundwater. The proposed groundwater management system is not designed to conduct comprehensive site restoration of the shallow groundwater. Enough groundwater will be extracted from the system to decrease the groundwater elevation sufficiently to eliminate migration offsite.

The shallow groundwater flow is regionally northwest to southeast. In order to minimize ongoing impact to adjacent properties (specifically Indian Ridge Marsh), the groundwater management system will be installed along the entire eastern and southern boundary of the site. The groundwater management system consists of a slurry wall installed to a depth of 30 feet below grade that will be tied into the existing natural clay aquitard. On the inside of the slurry wall and at least 30 feet away, a trench to a depth of 15 feet will be filled with a coarse, permeable aggregate. On approximately 200-foot centers, perforated riser sumps will be installed to the bottom of the trench. Each sump will be equipped with a submersible pump discharging to a force main. The force main will discharge to a packaged lift station near the southeastern corner of the property. From that point, the lift station will discharge the groundwater to the MWRDGC sewer on Stoney Island Avenue west of the site. It is assumed the groundwater collected from the system will be capable of direct discharge to the MWRDGC without pre-treatment based on the current agreement to accept leachate from the Paxton II landfill. Figure 4-8 shows the approximate location for the groundwater management system and discharge pipelines.

4.14 INTEGRATED WETLANDS

Improved wildlife habitat, increased biodiversity, enhanced storm water runoff quality, environmental education, recreational activities, and expanded open space are direct benefits of using ecological systems strategically in stormwater management. Wetlands onsite would not have any direct effect on soil or groundwater quality, either favorable or unfavorable.

Surface water flows are conveyed via contoured finish grades through a sequence of short stature (2 to 3 feet) mesic and wet prairie on upland knolls and swales, then through emergent wetland and open water ponds in bottomlands (see Figure 4-9). The sequence can be viewed as a series of measures designed to reduce runoff rates, runoff volumes, and pollutant loads associated with storm water leaving the Cluster Site. Such stormwater management will greatly enhance the quality and hydraulic character of surface water discharging into adjacent resources including Indian Ridge Marsh to the east.

The upland prairie elements and the bottomland wetland elements are equally important and, in concert, will increase runoff lag time, increase opportunities for pollutant removal through settling and bio-filtration, and reduce the rate and volume of runoff through enhanced infiltration of imported sand prairie soil. The infiltration will not penetrate the confining layer of the cap.

Large-scale upland prairie landscapes are included as a stormwater management feature of critical importance. Prairies greatly diffuse the energy and flow velocities of direct rainfall combined with overland flow from surrounding areas. The reduced stormwater velocities maximize the prairie's sedimentation, infiltration, and evaporative water treatment. The natural adsorption and absorption of the prairie soils enables the soil to hold many contaminants. The aerobic condition of the soil promotes hydrocarbon breakdown.

Wetlands provide both stormwater detention and biological treatment prior to runoff into open water ponds. The ponds provide stormwater detention, further solids settling, and biological treatment. The components of a wetland system designed to treat stormwater runoff improve water quality and reduce stormwater runoff peaks and volumes. By treating stormwater where it falls, wetlands and ponds reduce the contribution to downstream flooding and sedimentation, substantially benefiting downstream neighbors.

Commitment to establishing a healthy ecosystem benefits existing wildlife at the site. By buffering wildlife from the negative impacts resulting from previously developed areas and reincorporating elements characteristic of a healthy habitat, indigenous species are given a new opportunity to thrive in their favored environment; and rarer species are provided with suitable conditions to support their presence and promote increases in their population.

The proposed ±76 acre complex of restored wetland, ponds, and surrounding prairie will provide an adequately sized habitat for many rare grassland birds of both moist and dry land affinities (50 acres is the minimum-sized habitat for most rare grassland birds). This establishes a meaningful habitat objective. There is great confidence in the success of this large block of restored prairie habitat with integrated wetlands since it will act as a "best available" refuge within an otherwise urban setting. The large size of the integrated ecosystems and the targeted habitat diversity will provide suitable conditions for a large number of locally compromised grassland bird species. It will also be beneficial to those watch list species that have a higher affinity to increased soil moisture levels, such as Dickcissel and Bobolink. The presence of wetland species, such as great egret and blue heron, can also be predicted with some confidence. Additionally, the wetland would be suitable to the state-endangered Yellowheaded blackbird, although its presence is less easy to predict. Species from the snapping turtle, Blanding's turtle, garter snake, and red-tailed hawk to the rare Franklin's squirrel are just some of the other inhabitants that will solidify the site's effectiveness at providing a substantial habitat for varied wildlife to thrive.

Monitoring the habitat will provide general opportunities to collect data on plant and animal species as well as further those studies currently underway on more specific topics, such as the positive effects of willows and cottonwoods in phytoremediation.

4.15 EVALUATION OF LINER TYPES

Options 3C, 3D, and 3E address the use of geosynthetic clay liners (GCLs) and flexible membrane liners (FMLs) as elements of an engineered cap.

GCLs are made of powdered bentonite encapsulated between two sheets of fabric geotextiles to form a mat. The mat is delivered as a roll and deployed by unrolling onto a smooth bedding layer. Overlapping of each sheet with the next is all that is required for seaming. Bentonite swells when wet, and has an extremely low permeability to water when hydrated.

FMLs are thermoplastic sheets delivered as rolls, deployed onto a smooth bedding layer, and seamed with heat that fuses the two sheets of plastic together. FMLs for landfill liners and caps are typically

60-mil HDPE, which is what was used in developing these options. FMLs are virtually impervious to liquids when properly seamed.

At typical above grade landfills, the performance advantages of GCLs and FMLs over compacted clay are: lower permeability resulting in less infiltration through the cap, and consistent hydraulic performance over the complete project area because they are manufactured products of uniform quality. Permeability to gas is lower than compacted clay for both GCLs and FMLs, and especially for FMLs. This can have a favorable impact on vegetation on the cap by protecting it from stress caused by gas in the plant root zone. Less infiltration equates to less contaminated groundwater and reduced driving gradients to cause groundwater flow offsite. Non-performance advantages include shorter construction time than compacted clay and reduced truck-hauling traffic.

Disadvantages to using either GCLs or FMLs include higher capital cost of the products and installation. They also require the use of a drainage layer above them to carry-off infiltration from the soil layers above. GCLs can "heal" around penetrations caused by intrusions through the cap; FMLs do not. In either case, protection from punctures due to future activities onsite is more critical when using these materials than when using multiple feet of compacted, low permeability clay.

For the Cluster Site in particular, the performance advantages of GCLs and FMLs are less certain than for above grade landfill caps. Since the cluster site is below grade fill, there is a component of groundwater due to piezometric groundwater elevations being higher offsite to the west than offsite to the east. Groundwater originating offsite will continue to flow through the buried waste on the cluster site even with an impermeable cap on the site itself. Since the surface of the buried waste is nearly exposed on the cluster site, there is no question that an engineered cap will reduce the component of contaminated groundwater caused by direct infiltration. The relative contribution of direct infiltration to regional groundwater flow in causing contaminated groundwater flow from the site, however, is unknown.

The use of GCLs or FMLs need not be done on an "either/or" site-wide basis. For a remedial option that includes onsite wetlands, employing a GCL or an FML in the engineered cap beneath the wetlands area is desirable as a barrier to infiltration, since there will be prolonged saturation of the cap soils in that area; also beneath any storm water detention pond built onsite for the same reason.

The use of a 60 mil HDPE liner is proposed in the options for those applications, because the shallow burial depth and the shoreline erosion potential effect on pond liners justifies the cost of a durable liner which is resistant to puncture and damage.

4.15.1 Infiltration Analysis and HELP Model Results

When precipitation falls on a ground surface, some water will run off as storm water discharge, some will evaporate directly, some will be absorbed by plant roots as it infiltrates into the soil and be released through evapotranspiration, and some will infiltrate into the waste materials and form leachate.

Leachate results from the contact of water with waste materials, extracting chemical, mineral, and biological contaminants as it flows both vertically and laterally through the waste mass. Contamination can thus be transported offsite following the flow of groundwater.

A goal of containment for the Cluster Site is to prevent the infiltration of precipitation that ultimately results in leachate leaving the landfill. All leachate does not result from direct infiltration onsite; another cause of leachate is groundwater flow through the waste mass from offsite upgradient sources. The goal of an improved cap is to reduce the direct infiltration element of leachate generation.

The Hydrologic Evaluation of Landfill Performance (HELP) model developed by the US Army Corps of Engineers is a two-dimensional hydrologic model that conducts a water balance analysis for landfills. It is thus possible to quantify the amount of infiltration occurring through different caps. While there are too many variables to provide precise predictive volumes of leachate, the HELP model does provide a means of quantitative comparison between existing conditions and various alternate engineered cap designs.

Four selective conditions were modeled, representing a cross section of the options presented for capping the Cluster Site. Precipitation was based on Chicago data that used 10 years of synthetically generated weather conditions. The results are shown in the table below. These results generally indicate that a compacted clay cap with a layer of topsoil above and good vegetation reduced the

infiltration by about a factor of 10 over existing conditions. A clay cap combined with a synthetic membrane liner reduced infiltration over the Site surface to essentially zero. It may be an apparent anomaly that the thick, uncompacted soil cap representing the requirements of a phytoremediation situation results in slightly more infiltration than existing conditions. However, the thin surface soils and poor vegetation of the existing surface promotes a higher percentage of runoff to infiltration than the uncompacted soils, which tends to store water and prolong the contact time with the underlying waste layer. In addition, a significant portion of infiltration occurs with Spring snowmelt, when vegetation is still dormant. So in spite of the higher evapotranspiration occurring with top quality vegetation in a thick, uncompacted soil layer, the HELP model predicts a net annual infiltration rate higher than with the existing surface conditions.

SITE CONDITION	10 YR. ANNUAL AVERAGE VALUES	
	Infiltration	Total Volume
Existing conditions	8.2 inches	2,240,000 cu. ft.
2 ft. low permeability clay cap + 1ft. uncompacted soil	1.07 inches	338,000 cu. ft.
1 ft. uncompacted soil + 1 ft. topsoil (phytoremediation scenario)	9.05 inches	3,000,000 cu. ft.
2 ft. clay cap with drainage layer + 60 mil HDPE liner	.00025 inches	80 cu. ft.

4.16 GAS GENERATION ISSUES

None of the prior investigation activities at the cluster site specifically addressed the presence of, or analysis of, gas emissions from the cluster site (other than general, generic statements). In its present state and, if left undisturbed, no odors are present; and during Clayton/Illinois EPA's test pitting to obtain TCLP soil samples in spring of 2001, no organic vapors that registered on the PID were detected during background readings before excavation. However, several test pits caused high readings to occur on the PID after they were opened, suggesting the airborne presence of VOCs. Odors were present even in the absence of PID readings at the remaining test pits. These odors were of a "solvent/chemical" character. At no time during the extensive test pitting activities conducted onsite, was evidence of typical landfill (methane) gas noted.

The nature of materials comprising the buried wastes at the Cluster Site is primarily not biologically putrescible in nature. (See Site History, Sec. 1.1). Extensive research and study has been done on the generation and occurrence of landfill gas, due both to its economic benefit as a fuel source and the nuisance factors of odor, migration offsite, and vegetative stress. Literature based on these studies and research conclude that the optimum conditions for gas generation include a high proportion of putrescible material at high, but not saturated, moisture content. Other factors include the presence of other waste types toxic to methanogenic bacteria, pH, nutrients present, temperature, particle size, and oxidation-reduction potential. (D.R. Reinhart and T.G. Townsend). None of the site conditions at the cluster site are favorable to gas generation. The waste mass is saturated from just a few feet below ground surface. Capping and the operation of a perimeter groundwater control system will have a negligible effect on the static piezometric surface, except in the immediate vicinity of the collector trench. Test pits consistently showed a negligible percentage of putrescible waste. Soil and groundwater analysis documents a host of VOC, SVOC, and inorganic contents that would inhibit methanogenesis.

Consequently, it was concluded that methane gas generation, due to anaerobic decomposition of organic materials, can occur only at exceptionally low levels and slow rates at the cluster site. Measurements for methane levels have not been performed as part of any investigation at the site. Based on observations made during the test pit investigations, it is not expected that methane is present at levels that would cause physical damage to a FML cap, vegetative stress on a clay cap, or offsite migration underneath a cap. No methane gas venting or control features have been included in the remedial options. A methane evaluation program using an array of gas probes placed in the shallow waste materials; and subsequently, sampled and monitored for the presence and levels of methane should be done as a pre-design activity prior to the final design of any cap. If methane is present, a venting layer and vents can be designed into the cap system.

It can be reasonably concluded that odors and volatile emissions would, at a minimum, require monitoring and some type of abatement practice during excavation operations. A dust/odor suppressant would be applied periodically to the exposed waste surface. Excavation operations are assumed to be performed at Level C protection. From an operational standpoint, the area of excavation would need to be kept as small as practical before being backfilled with clean soil to keep

emissions at manageable levels. This has been allowed for in the operational aspects of the excavation as formerly described.

4.17 POTENTIAL COST SAVINGS

4.17.1 Alternative Materials Sources

The single, largest cost element for these remedial options is obtaining, placing, and compacting clean fill for either the excavations and caps or both. For cost estimate purposes, a conservative approach using commercially obtained fill was used since it provides a reliable basis for pricing. It was assumed that clean soil fill would be obtained at prevailing commercial prices and within a 20-mile radius of the Cluster Site.

However, significant cost savings **could** be realized in executing this project by innovative sourcing of suitable fill material that may be available in the time frame of construction. Several such sources were brought up for consideration, and they serve primarily as examples at this time:

- Dredging materials from planned Army Corps of Engineers (ACOE) extensive dredging of the Illinois River in an area known as Peoria Lakes. Primarily a very fine-grained sediment, the data provided to Clayton suggests it would be suitable both for low-permeability use and for topsoil when used uncompacted. Transportation to the Lake Calumet Cluster Site could potentially occur by barge to the Calumet River south of the site, or to Calumet Harbor, then be moved by a temporary conveyor system to the site.

- Excavated clay from the bottom of Lake Calumet. The Port Authority periodically deepens, by way of excavation, the shipping channels and slips. Native clay material results that must be spoiled on land. Generically, this type of fill would prove acceptable for low-permeability use and for general structural fill. If large-enough volumes were available, a temporary conveyor system could be used to move the material to the Lake Calumet Cluster Site.

- Existing piles of spoiled excavated material along the Sanitary & Ship Canal in the south suburban area. The removal of these stockpiles would be required for potential development of the parcels of land they occupy. The spoil has been represented as clay-type soils, but further testing would be required to assess their applicability at the Lake Calumet Cluster Site.

As all of these examples are of materials that must be managed offsite for the success of their projects, the material costs would be zero. The cost of transportation, placement, and compaction would remain, but the potential would be for reduction in the project costs of this option. Evaluation

of these or other such alternative sources is possible only when the timing of the cluster site project is identified. Some material could be delivered and stockpiled in advance on the site, but it is not anticipated that enough could be stockpiled for the full project.

Most of the remedial alternatives involve the use of large volumes of fill soil hauled in from offsite sources either to replace wastes removed, to develop sufficient surface grades for positive drainage without ponding, or to construct the cap and vegetative layer. Some of these uses require materials with a narrow range of specific properties such as low permeability for the clay cap or suitable grain size plus nutrient content for the vegetative layer. Other uses, however, have much less stringent specific properties and are primarily used for volumetric fill.

Based on cost for the procedure of import soil only, potential savings range from $500,000 for Options 3D and 3E to $8,000,000 for Options 2C and 2D. For Options 4A and 4B, the potential cost savings if materials were provided at no cost could amount to approximately $1,700,000.

4.17.2 Alternative Construction Materials

The issue has been raised regarding whether materials such as biosolids, construction demo materials, dredging spoils, and slag could be used for any of the remedial options; and thereby, reduce the final cost of the remedial option implementation accordingly. Some of the more specific alternative materials have been addressed within each option description. In a more general sense, proposed alternative materials would need to conform to the following guidelines:

- Any material used in the upper layers of the cap must be free of contamination potential. Since the objective is to remove or isolate contamination, it would clearly be counterproductive to add new sources. Any demolition or process debris, in particular, would have to be analyzed from the source, and then regularly thereafter during hauling it onsite, to assure it meets the definition of clean fill.

- Whatever is used must be structurally competent. General fill must provide a solid and stable base for the placement and compaction of the cap on top of it. Materials that consolidate under load, shrink upon drying, or do not compact adequately are unacceptable. Also, large debris or rock with large void space would cause overlying materials to “infill” with time and water flow, causing localized settlements at the surface, which would be unacceptable. Finally, any materials that are biologically active and would decompose can form methane gas and cause settlement and cracking of the cap. Consequently, they are unacceptable.

- Mixing volumes of different types of fill, such as biosolids with demolition debris, would ultimately settle and consolidate at different rates, potentially causing surface irregularity. Only very large volume sources should be considered so consistent that fill uniformity is achieved.

- The leaching characteristics of certain materials must be considered. For example, slag can leach mild sulfuric acids initially. Even competent structural materials should be evaluated for any leaching potential.

Biosolids have proven value in providing high nutrient strata for vegetation when used as a soil enhancement for the upper soil layers. Again, they should be analyzed and evaluated for chemical content, since potential uptake by plant root systems is at issue in this case. In addition, biosolids must be carefully evaluated if native plants are used, as they are not compatible with the high nutrient levels of biosolids.

4.18 POTENTIAL COST INCREASES

The options as described above either include a 2-foot thick compacted clay cap overlain by a 1-foot thick topsoil/vegetative soil layer, or a composite cap with a liner (FML/GCL) overlain by 1-foot thick clay and a 1-foot thick layer of topsoil. To provide more frost protection for the liners and clay caps, the placement of an additional 1-foot of uncompacted soil above the cap and beneath the topsoil layer could be added to each option. This additional layer would add approximately $900,000 to the overall option cost.

In the event remedial work needs to be conducted in strict accordance with the National Contingency Plan (NCP), there will be an added cost for completion and review of work plans and reports through the remedial action. The excavation options are more complex; therefore, the costs to strictly comply with the NCP would also be more costly. It is estimated that the overall remedial option cost for Options 2A, 2B, 2C, and 2D would be increased by about $500,000. The overall cost increase to the remaining options is expected to be approximately $200,000 to $300,000.

Volume estimates presented in Appendix G represent significantly large assumptions because of the unknown site parameters. Any changes from the assumed values could have significant impact on the final costs of the options.

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APPENDIX A

INVESTIGATION REPORT FOR LAKE CALUMET CLUSTER SITE *(Text Only)*

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THE NATURE AND EXTENT OF CONTAMINATION AT THE LAKE CALUMET CLUSTER SITE CHICAGO, COOK COUNTY, ILLINOIS

TDD: S05-9806-008
PAN: 8N0801SIXX

November 30, 1999

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Table of Contents

1. INTRODUCTION 1-1

2. SITE BACKGROUND 2-1
   - 2.1 Site Description 2-1
   - 2.2 Individual Site Histories 2-1
   - 2.3 Aerial Photographic Analysis 2-3
   - 2.4 Physical Characteristics of Site Soils 2-6

3. METHODS 3-1
   - 3.1 Phase I 3-1
   - 3.2 Phase II 3-3
   - 3.3 Phase III 3-5

4. EVALUATION CRITERIA 4-1
   - 4.1 Soil 4-1
   - 4.2 Sediment 4-2
   - 4.3 Surface Water 4-3
   - 4.4 Groundwater 4-3

5. RESULTS AND DISCUSSION 5-1
   - 5.1 Soil Results 5-1
     - 5.1.1 Toxicity Characteristic Leaching Procedure Results 5-12
     - 5.1.2 Dioxin Results 5-12
   - 5.2 Sediment Results 5-13
   - 5.3 Surface Water Results 5-15
     - 5.3.1 COPC Discussion 5-15
     - 5.3.2 Nitrogen 5-16
   - 5.4 Macroinvertebrate Results 5-17
   - 5.5 Groundwater Results 5-18
     - 5.5.1 Well Hydrogeology 5-18
     - 5.5.2 Shallow Well Data Analysis 5-20
     - 5.5.3 Dissolved Metals Versus Total Metals 5-24
     - 5.5.4 Deep Well Data Analysis 5-25
     - 5.5.5 Nitrogen 5-27
   - 5.6 Proposed Nature Center Sample Results 5-27

Table of Contents (continued)

6. SCREENING ECOLOGICAL RISK ASSESSMENT 6-1
6.1 Exposure Assessment 6-1
6.1.1 Fate and Transport 6-1
6.1.2 Characteristics for Select Chemicals 6-3
6.2 Exposure Pathways 6-6
6.3 Risk Characterization 6-8
6.3.1 Soil 6-8
6.3.2 Sediments 6-12
6.3.3 Surface Water 6-13

7. CONCLUSIONS AND RECOMMENDATIONS 7-1
7.1 Soil 7-1
7.2 Sediment 7-2
7.3 Surface Water 7-3
7.4 Groundwater 7-3
7.5 Summary 7-4

8. REFERENCES 8-1

List of Attachments

Attachment A: Figures — Page

Site Location Map A-1
Aerial Photograph with Site Features. A-2
Soil Sample Location Map A-3
Groundwater, Surface Water, Sediment and Macroinvertebrate Sample Location Map A-4
Arsenic Distribution in Soil A-5
Barium Distribution Soil A-6
Chromium Distribution in Soil A-7
Lead Distribution in Soil A-8
Mercury Distribution in Soil A-9
Aroclor 1254 Distribution in Soil A-10
beta-BHC Distribution in Soil A-11
Dieldrin Distribution in Soil A-12
Naphthalene Distribution in Soil A-13
Benzo(a)pyrene Distribution in Soil A-14
Benzo(a)anthracene Distribution in Surface Soil A-15
Dibenz(a,h,)anthracene Distribution in Surface Soil A-16
Sediment Contamination A-17
Surface Water Contamination A-18
Shallow Groundwater Elevation Contour Map A-19
Aluminum Distribution in Groundwater A-20
Iron Distribution in Groundwater A-21
Manganese Distribution in Groundwater A-22
Estimated Benzo(a)pyrene Distribution in Groundwater A-23
Estimated Benzene Distribution in Groundwater A-24
Estimated Ammonia Distribution in Groundwater A-25

Attachment B: Photodocumentation

Attachment C: Well Records — Section

Drilling Logs and Well Construction Reports for Installed Groundwater Wells (LC01 though LC07 and LC09 through LC13) C-1
Drilling Logs and Well Construction Reports for Existing Groundwater Wells (P01 Through P04) C-2

Attachment D: Summary Tables — Table

Summary of Surface Soil Samples Metal Results D-1
Summary of Surface Soil Samples Organic Results D-2
Summary of Subsurface Soil Samples (2-3 Feet Below Ground Surface) Metal Results D-3
Summary of Subsurface Soil Samples (2-3 Feet Below Ground Surface) Organic Results D-4
Summary of Subsurface Soil Samples (4-6 Feet Below Ground Surface) Metal Results D-5
Summary of Subsurface Soil Samples (4-6 Feet Below Ground Surface) Organic Results D-6
Summary of Sediment Samples Metal Results D-7
Summary of Sediment Samples Organic Results D-8
Summary of Surface Water Samples Metal Results D-9
Summary of Surface Water Samples Organic Results D-10
Summary of Groundwater Samples Metal Results D-11
Summary of Groundwater Samples Organic Results D-12

Attachment E: Phase I Tabulated Data — Table

Soil Samples S01 Through S90 Field Data E-1
Soil Samples S01 Through S18 Analytical Results E-2
Soil Samples S19 Through S36 Analytical Results E-3
Soil Samples S37 Through S54 Analytical Results E-4
Soil Samples S55 Through S71 Analytical Results E-5
Soil Samples S72 Through S90 Analytical Results E-6
Sediment Field Data E-7
Sediment Analytical Results E-8
Surface Water Field Data E-9
Surface Water Analytical Results E-10
Macroinvertebrate Taxonomic Classification and Count E-11
Groundwater Field Data E-12
Groundwater Analytical Results E-13

Attachment F: Phase II and Phase III Tabulated Data — Table

Soil Samples 2S01 Through 2S39 Field Data F-1
Soil Samples 2S01 Through 2S18C Analytical Results F-2
Soil Samples 2S19 Through 2S28C Analytical Results F-3
Soil Samples 2S29 Through 2S35C Analytical Results F-4
Soil Samples 2S36 Through 2S39 Analytical Results F-5
Soil Samples 2S01 Through 2S39 TCLP Results F-6
Analytical Results For Dioxin Soil Sample F-7
Sediment Samples 2SED1 Through 2SED7 Analytical Results F-8
Sediment Samples 2SED1 Through 2SED7 TCLP Results F-9
Surface Water Analytical Results F-10
Groundwater Field Data F-11
Groundwater Samples Analytical Results F-12
Water Nitrogen Results F-13

Attachment G: Screening Ecological Risk Assessment Tables — Table

Wildlife Contaminant Exposure Model for Surface Soil G-1
Exposure Parameters and Assumptions for Representative Wildlife Species G-2
Comparison of Chemical Effects Studies on Terrestrial Infaunal Invertebrates Versus Site Characteristics G-3
Hazard Quotients for Potential Sublethal Effects to Wildlife Species Associated with Chemical Exposure Concentrations in Soil G-4

Attachment H: U.S. EPA Map of the Lake Calumet Cluster Sites

List of Acronyms and Abbreviations

ADD	Average Daily Dose
Alburn	Alburn Incinerator
BAF	Bioaccumulation Factor
BGS	Below Ground Surface
BOD	Biological Oxygen Demand
BTEX	Benzene, Toluene and Xylene
CCC	Criterion Continuous Concentration
CDD	Chlorinated Dibenzo-*p*-dioxins
CDF	Chlorinated Dibenzofurans
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CLP	Contract Laboratory Program
CMC	Criteria Maximum Concentration
COPC	Chemical of Potential Concern
CRL	Central Regional Laboratory
DO	Dissolved Oxygen
E & E	Ecology and Environment, Inc.
EcoTox	Ecological and Toxicological Threshold
EDQL	Ecological Data Quality Level
ERL	Effects Range-Low
ERM	Effects Range-Median
ERS	Environmental Reclamation Study
FBI	Family Biotic Index
FID	Flame Ionization Detector
GPS	Global Positioning System
HRS	Hazardous Ranking System
HQ	Hazard Quotient
Illinois EPA	Illinois Environmental Protection Agency
K_{ow}	Octanol/Water Partition Coefficient
L_{50}	Lethal Concentration for 50% of a Population
E_{50}	Concentration Causing a Given Effect in 50% of a Population
LCC	Lake Calumet Cluster
LEL	Lowest Effect Level
MCL	Maximum Contaminant Level
mg/kg	Milligrams per Kilogram
mg/L	Milligrams per Liter
µg/L	Micrograms per Liter
µg/cm^2	Micrograms per Cubic Centimeter

List of Acronyms and Abbreviations (cont.)

MSD	Municipal Sanitary District
NOAA	National Oceanic and Atmospheric Administration
NOAEL	No Observable Apparent Effects Level
ORNL	Oak Ridge National Laboratory
ORP	Oxidation-Reduction Potential
OSWER	Office of Solid Waste and Emergency Response
PAHs	Polycyclic Aromatic Hydrocarbons
PCBs	Polychlorinated Biphenyls
PCE	Tetrachloroethene
PID	Photoionization Detector
ppm	Parts Per Million
ppt	Parts Per Trillion
PQL	Practical Quantitation Limit
QA/QC	Quality Assurance/Quality Control
RBC	Risk-based Screening Concentration
RCRA	Resource Conservation and Recovery Act
Redox	Oxidation-Reduction Potential
SEL	Severe Effect Level
SFF	Site Foraging Factor
SMCL	Secondary Maximum Contaminant Level
SOP	Standard Operating Procedure
SQRT	Screening Quick Reference Tables
START	Superfund Technical Assessment and Response Team
SVOC	Semivolatile Organic Compound
TCE	Trichloroethene
TCLP	Toxicity Characteristic Leaching Procedure
TDD	Technical Direction Document
TKN	Total Kjeldahl Nitrogen
TICs	Tentatively Identified Compounds
TRV	Threshold Risk Value
TSCA	Toxic Substance and Control Act
TV	Tolerance value
U.S. EPA	United States Environmental Protection Agency
VOC	Volatile Organic Compound
XRF	X-ray Fluorescence

1. INTRODUCTION

The Ecology and Environment, Inc. (E & E), Superfund Technical Assessment and Response Team (START) was tasked by the United States Environmental Protection Agency (U.S. EPA), under Technical Direction Document (TDD) S05-9806-008, to perform a site assessment for the Lake Calumet Cluster (LCC) site in Chicago, Cook County, Illinois. In April 1996, several local community groups approached U.S. EPA through the Chicago Legal Clinic, and requested that eight disposal sites in the Indian Ridge Marsh area be clustered together for two purposes: ranking as a single cluster site by the Hazardous Ranking System (HRS) for potential listing on the National Priorities List; and for remediation and long-term responses. The community groups' concerns about these sites include the potential impact on human health from the prior disposal of hazardous materials at the sites, as well as the potential impact of contamination on the sensitive ecological resources in the area.

U.S. EPA has deferred decisions to undertake formal Superfund action under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) in favor of an alternative approach. U.S. EPA has been working as a facilitator in conjunction with community groups to complete an Environmental Reclamation Study (ERS) as the first step in the evaluation of potential health and ecological impact in the Lake Calumet area. The ERS report was prepared by compiling and summarizing information regarding the existing conditions of the individual sites. No sampling was conducted for the ERS. The ERS report, finalized by Roy F. Weston in February 1998, determined that ecological reclamation of these individual disposal sites would be possible as a single cluster site. A public meeting was held in June 1998 to present the ERS findings and propose future actions to community members. The ERS report recommended detailed sampling to address data gaps and to focus on the ecological reclamation design, as well as to evaluate the need for any remedial actions and assess risk levels for human health and the ecosystem. As a result, E & E was tasked by U.S. EPA to perform

site assessment activities at the LCC site to address the data gaps. The report that follows summarizes the activities and findings of this assessment.

The ERS and E & E site assessment activities are the first steps of the planning process that will further promote the coalition of local interests and will pursue the voluntary implementation of an ecological reclamation plan for the area. It is envisioned that over the long term, other adjacent properties may voluntarily join this cluster site initiative, improving the ecological resources in the Lake Calumet area.

2. SITE BACKGROUND

2.1 Site Description

The LCC site is a group of landfills and waste storage/disposal facilities located in southeastern Chicago, Cook County, Illinois. The geographic coordinates at the Paxton II property are latitude 41°41'15" North and longitude 87°34'35" West, which is in the northwestern corner of the LCC site. The site is approximately 200 acres in size and is bordered by the Interlake/Big Marsh property to the north, Stony Island Avenue to the west, the Norfolk and Western Railroad right-of-way to the east, and 122nd Street to the south. The LCC site includes the following individual areas: Paxton I, Paxton II, Paxton Lagoons, Alburn Incinerator (Alburn), U.S. Drum II (U.S. Drum), Land and Lakes #3, Municipal Sanitary District (MSD) #4 (south of 122nd Street), and an unnamed parcel (Unnamed Parcel). A site location map is presented in Attachment A, Figure A-1, and an aerial photograph of the site with area features is presented in Attachment A, Figure A-2. Photodocumentation of site features and site assessment activities conducted by E & E is presented in Attachment B. A map of LCC site developed by U.S. EPA is presented in Attachment H.

2.2 Individual Site Histories

Alburn. The Alburn area operated as a landfill from 1967 through 1977. Wastes were disposed in excavated pits and trenches. No details are available on the types and quantities of wastes buried during this period. In 1977, Alburn initiated hazardous waste incineration and hazardous waste storage/transfer operations. In 1979, U.S. EPA issued a Resource Conservation and Recovery Act (RCRA) permit to Alburn for the operation of an incinerator. Alburn incinerated/stored hazardous wastes and sludges, including paints, thinners, varnishes, chlorinated solvents, styrene, ink, adhesives, waste oils, antifreeze, petroleum, naphtha, coal tar, and waste solvents. Site storage and disposal methods included landfilling, incineration, operation of a surface impoundment, and bulk liquid waste storage. In 1982, Alburn had

their permit revoked due to several RCRA violations. Alburn continued to accept bulk waste until January 1983. On July 5, 1985, two on-site drums exploded from heat expansion and a subsequent chemical reaction. U.S. EPA ordered an immediate removal action of all visible sources of hazardous materials from the site, including bulk storage tanks, drums, 5-gallon pails, and lagoon sludge. In addition, the top 6 inches of soil, assumed to be the most contaminated, were excavated.

U.S. Drum. Since the 1940s, U.S. Drum and adjacent areas were used as a dump for municipal and industrial wastes. During the mid to late 1970s, the site was used as a hazardous waste transfer and petroleum recovery facility, until a fire occurred in July 1975. Operations at the facility were abandoned temporarily in 1976. In 1979, a waste drum temporary storage and transfer facility operated at the site. The waste transfer facility was shut down in 1979. An estimated 34,100 gallons of liquid and semisolid wastes were removed between October and December 1979. An estimated 1,750 drums were left on site inside earthen berms. A U.S. EPA removal action occurred at the site from December 1984 through July 1985. During construction of a new access road, approximately 1,500 buried drums were discovered. The drums had their ends cut off or punctured to allow the contents to drain into the ground prior to or at the time of burial. All observable drums, 435 cubic yards of contaminated soil, and 62,000 gallons of standing water were removed during the removal action.

Unnamed Parcel. The Unnamed Parcel is approximately 38 acres in size and is located south and west of Alburn. No previous removal actions or studies have been conducted on this property.

Paxton I. This site operated from 1971 through 1976. The landfill accepted general refuse, industrial wastes, and sludges under special waste permits authorized by the Illinois Environmental Protection Agency (Illinois EPA). Special wastes, listed as hazardous and nonhazardous, were accepted at Paxton I. Two ponds, LHL1 and LHL2, are located on the Paxton I property.

The four areas of the LCC site which were not sampled during this site assessment are Paxton II, Land and Lakes #3, Paxton Lagoons, and MSD #4. Both Paxton II (which is being addressed by Illinois EPA) and Land and Lakes #3 are currently in the process of implementing closure activities. The Paxton Lagoons site was not sampled because a removal action was previously completed on this area. MSD #4 was also omitted because the study area only included sites north of 122nd Street. Since no sampling

occurred at these sites during this assessment, they are not discussed in detail in subsequent sections of this report.

2.3 Aerial Photographic Analysis

The following is a summary of the aerial photographic analysis created for the LCC site by Lockheed Environmental Systems & Technologies Co., Environmental Sciences Division, Las Vegas, Nevada, under contract to U.S. EPA. This analysis allows for a greater understanding of historical site uses and conditions. Ten aerial photographs were analyzed dating from 1949 to 1998. Copies of the analysis are stored in the site local repository at Chicago State University. A brief summary of this analysis, organized by date and then by each area of interest at the LCC site, is presented below.

April 20, 1949: There was no evidence of a fill area. The LCC site consisted mostly of wetlands. Probable residential areas, spread out along the western boundary of the LCC site near Lake Calumet and along the northeastern and eastern borders of the LCC site, are evident. No drainage patterns can be determined due to the relative flatness of the entire area.

May 6, 1958: A fill area covered approximately one-fourth of the LCC site in the northwestern portion, in the Paxton II area. Probable liquid wastes were noted in this fill area. Trucks are noted dumping wastes along a southern edge of the fill area. Surface drainage flowed in three different directions from the fill area; to the west, east, and south. Fill and several pools of standing liquid are noted in the Alburn and U.S. Drum areas.

November 12, 1960: The fill area had been enlarged to reach 122nd, which is the southern boundary of the LCC site. The fill area encompassed approximately one-third of the LCC site, including a portion of the Unnamed Parcel and Paxton Lagoon areas. Two pits are found in the fill area, one of which contains standing liquid. The existing pits south of the fill area have expanded into one larger area. Fill and extraction pits are now located in the Alburn area. From the southern portion of the fill area, drainage flowed to the wetlands in the east. On the west side of the fill area, drainage flowed west and eventually to Lake Calumet. The probable residential area along the western portion of the LCC site had been removed.

January 26, 1964: The fill area extended a little further east on the southern edge only. One of the pits was reduced in size. The smaller of the two pits developed into two separate pits. Mounds of fill are observed in several areas, especially in the Alburn area. Drainage along the northeast side of the fill area flowed east into the wetland. Drainage in the southern corner flowed to an extraction pit. Drainage from the western side of the fill area drained into the wetland on the western portion of the LCC site. Drainage also flowed offsite through a culvert which empties into Lake Calumet.

December 3, 1967: The fill area grew and now encompassed the southeast corner of the LCC site, occupying approximately one-half of the site. The two smaller pits became three pits. A probable channelized draining system was noted. Standing liquid was noted in the large pit, and it seemed inactive with overgrown vegetation. There are two berms noted, one of which was breached. A cloud of either dust or smoke was exiting one berm in the Paxton Lagoon area. Several piles of fill and rubble are scattered throughout the LCC site. In particular, fill material is now more pronounced in the Alburn area. The Alburn landfill initiated operations in 1967. Activity is also noted in the U.S. Drum area. Two additional pits containing standing liquid are observed. A probable residential area seen since 1949 on the northern portion of the site was now a pile of debris. In the southern portion of the LCC site, drainage flowed south to one berm, which contained liquid, and along the east boundary of the study area into a pit containing liquid. In the northwest portion of the LCC site, outside the fill area, a probable residence or business existed. Fill continued to be used for the buildup of a land-based dock on Lake Calumet. Drainage flowed in two main directions from the fill area: to the west into the wetland and Lake Calumet; and to the east into a wetland. Drainage also flowed into the southeast portion of the LCC site.

April 22, 1975: The fill area grew east to the Paxton I area and occupied approximately three-fourths of the LCC site. There was a waste disposal area with several trucks noted in the north central portion of the fill area. This was the Paxton I Landfill which was in operation during this time. Two breached berm areas existed containing standing liquid, one in the Paxton I area and one in the northern Paxton Lagoon area. Nine horizontal and three vertical tanks are observed near the center of the fill area near Alburn. A new, small industrial facility emanating smoke was noted. East of the facility was a large storage area with some square containers present and some fill evident. Drainage flowed along several channels into the wetland on the west side of the LCC site. Drainage from the industrial facility also

flowed west to the wetland. Most of the wetlands on the eastern side of the LCC site have been covered with fill. Off the site, additional fill has been placed along the perimeter of Lake Calumet. Buildings, tanks, and numerous other features are noted along the edges of Lake Calumet.

March 24, 1986: Previous to this date, a large developed landfill was not noted on the LCC site. At this time, Paxton II has been developed in the northwest portion of the LCC site, and a smaller landfill, Land and Lakes #3, was beginning to be developed just south of Paxton II. The Paxton II landfill was developed on a wetland area and was active in the photograph, with visible trucks and a bulldozer. The Land and Lakes #3 landfill contained many small pockets of standing liquid. A new building was noted near the access road entrance. At Alburn, the industrial facility and the vertical and horizontal tanks were removed since 1975. A fence line and a building are observed where the industrial facility once stood. Two vertical tanks are located southeast of the fenced area. To the northwest of the fenced area are two piles of used tires. Between the two piles of tires was a horizontal tank. On the southeast corner of the LCC site, in the Unnamed Parcel, a stained area and a pool of standing liquid were noted.

March 20, 1990: The Paxton II landfill continued to be developed with additional fill. Old waste disposal areas have been closed and covered with fill and new ones have been developed. The main access road to the landfill branched out to provide access to areas in and around the large landfill. On the west side of the LCC site, fill was being used to increase the size of the large landfill. In the Paxton Lagoon area, a drum storage area, a fill operation with horizontal and vertical tanks, two mounds of fill, and some stained soils were observed.

April 14, 1995: A road was constructed along the western boundary of the LCC site. Construction was ongoing along Lake Calumet. The Paxton II landfill looked to be inactive as evidenced by vents visible on the landfill and the covering of several waste disposal areas with fill. An impoundment and a trench from 1990 remained on the landfill. Drainage from the Land and Lakes #3 landfill flowed to the southeast and then into a narrow channel parallel to the southern boundary of the LCC site and then heads west offsite. The tire piles have been removed. A fence has been erected to surround the main building property; throughout this property several mounds of solid waste are noted. Drainage from Paxton I flowed toward LHL1. Several new impoundments are noted on the southern portion of the LCC

site. The open storage area, stained soil, several horizontal tanks, and the fill facility have all been removed since 1990. In addition, the Paxton Lagoon removal and grading was completed since 1990.

April 5, 1998: The trench from 1990, on the northwest corner of Paxton II, was covered and overgrown with vegetation. Drainage flowed from every side of the large landfill. Several mounds of fill have been removed from the Paxton I area since 1995. Drainage from this area flowed to a surface impoundment. A new extraction pit has been developed in the Land and Lakes property with a pile of tires located near it. The Land and Lakes #3 landfill has been partially overgrown with vegetation. Construction continues to the west of the LCC site along Lake Calumet.

2.4 Physical Characteristics of Site Soils

This section describing the physical characteristics of the LCC site soils is a combination of observations made by E & E, as well as information received from a geologist contracted by Northwestern University. The majority of observations were made from a series of test pits and soil borings completed within the Alburn, U.S. Drum, and the Unnamed Parcel sections the site. All of the test pits and borings correspond with locations from the Spring 1999 sampling event. Additional geologic information is reported in the drilling logs and well construction records included in Attachment C, while descriptions of the collected soil samples are presented in Attachments E and F.

The soils on the site have been significantly altered throughout the historical usage of the various properties and areas, and the majority of the site is covered with slag. Soil boring and test pit observations indicate that a relatively thick layer of human-made fill overlies native soil throughout the study area. Fill thicknesses of borings LC01 through LC13 and P01 through P04 range from approximately 3.5 feet at boring LC02 to greater than 20 feet at P02. Fill material varies in composition and texture from boring to boring, but generally includes materials that are by-products of industrial or commercial activities. Descriptions of fill material commonly include slag, cinders, and general rubbish such as wood, plastic, metal, paper, and bricks. Some natural fill materials such as silty clay, sand, and gravel are also noted on boring logs. The above-referenced soil borings rarely penetrated more than the uppermost portion of native soils that underlie the non-native fill materials. Only three borings for which logs are available were advanced more than three feet into native soils. The soils encountered at two of

those borings (LC11 and P04) included six feet of sand overlying silty clay. Each of these two borings contained 13 feet of fill over the native soil and was terminated one foot into the clay. At the third of these borings (LC02), approximately 3.5 feet of fill was present. Native soils below the fill in this location included approximately 4.5 feet of sand overlying 8 feet of interbedded peat and silty clay. Literature indicates that native soils of the Lake Calumet area generally are quiet-water lake sediments dominated by well bedded silt that is locally laminated and contains thin beds of clay. Also, local lenses of sand and gravel are not uncommon. A large portion of the site is also covered with standing water. Descriptions of the observations made during the excavation of the test pits at each of the site area are provided below.

Alburn. The Alburn site contains several areas of standing water, and slag material comprises most of the material on the site. Test pits 2S16 and 2S21 in the central portion of the site and near standing water had reed growth in a layer of topsoil. Below the surface layer, a cemented slag layer was found from 2-3 feet below ground surface (BGS). Under the slag layer was a black layer consisting of organic soils or organic-coated material, as well as the top of the water table. Grey clay material appeared at the surface at test pit S16, and near the water table at test pits S18 and S21. These soils also showed evidence of iron depletion, which may occur through leaching of saturated soils. Drier test pits such as S20 did not show signs of iron depletion. On the western portion of the Alburn site, impermeable slag and concrete material was encountered at a depth of approximately 1 foot BGS at test pits 2S15 and 2S17.

Based on the information gathered from the test pits, it appears that the presence of standing water on the Alburn site may be due to impermeable "popcorn" slag material, which is present at shallow depths below the surface. This material creates a perched water table that saturates the surface soil, and does not allow for infiltration. In areas of the site with some soil cover, the soil most likely originated from the decay of reeds.

U.S. Drum. In the northern section of the U.S. Drum site, slag material was uncovered in the test pits within 2 feet of the surface. At test pit location 2S34, the slag material was impenetrable. At 2S35, the slag material was breached, to reveal a second, less compacted slag layer below the first one. In the central section of the U.S. Drum site, test pit 2S33 revealed a clay surface soil layer, followed by rocky slag, and finally a thick clay layer at 4 to 5 feet BGS. A well drilled at U.S. Drum (LC11) encountered

debris at 6-8 feet BGS, which may indicate that the clay layer is a cap covering garbage or other materials. The mixture of slag and clay allows for little water infiltration in this area, and these test pits were notably drier than those in the Alburn area.

Unnamed Parcel. The southwestern corner of the Unnamed Parcel is covered by a thick layer of vegetation. Test pits 2S29, 2S30, 2S31, and 2S32 dug in this area revealed between 1 to 1.5 feet of surface soil, which consisted of a brown soil covering a darker black soil layer near the water table. The water table is very shallow in this area (2-3 feet BGS) and recharges rapidly. Below the surface soil layer, the test pits indicated layers of municipal garbage, extending to at least 15 feet BGS. The majority of the garbage appeared to be household waste, with some industrial or construction debris found at 2S31. The northern area of the Unnamed Parcel site (2S36) consists of rocky slag material with little to no vegetation. Test pits in this area also revealed buried garbage at 2 feet BGS.

Paxton I. The surface soils on the Paxton I Landfill site are mainly comprised of slag material, and support less plant life than other areas of the LCC site. The soil is rocky in nature and poor in organic quality. However, the Illinois EPA is currently closing the landfill, which includes adding several additional soil layers and adding surface vegetation for soil stabilization. Consequently, the final soil layers at Paxton I will be different than the conditions observed during this sampling event.

3. METHODS

As proposed in E & E's Quality Assurance/Quality Control (QA/QC) Sampling Plan (August 18, 1998), the site assessment sampling occurred in three phases: Phase I was an initial multimedia sampling; Phase II was the construction and sampling of groundwater monitoring wells; and Phase III was follow-up sampling to fill in data gaps and to address any questions raised by the Phase I results. Attachment A, Figure A-3 presents the locations of the surface and subsurface soil samples collected during the three phases of the site assessment, while the locations of all the groundwater, surface water, sediment, and macroinvertebrate samples are shown in Figure A-4.

3.1 Phase I

Phase I sampling activities were conducted from August 24, 1998, through September 3, 1998. Sampling activities included determining the location of site features and potential sample locations using global positioning systems (GPS), screening metal concentrations in surface soils using X-ray fluorescence (XRF), and collecting samples of various environmental media. The following media were sampled throughout the LCC site (excluding Alburn): surface soils, subsurface soils, sediments, surface water, groundwater, and macroinvertebrates. Alburn was not included in Phase I due to a locked fence that prohibited access. Additionally, original plans called for the collection of soil samples in 1-acre intervals. However, this strategy was not feasible due to physical constraints, including rough terrain, extremely thick vegetation (especially *Phragmites*), and fencing.

The sampling team consisted of personnel from the following agencies: E & E START; U.S. EPA; and Illinois EPA. START provided the majority of the sampling equipment and Illinois EPA provided the XRF, GPS, Geoprobe®, and boat.

The geographic locations of site features (parking lot, roads, fence lines) and potential sample locations were determined by Illinois EPA using GPS. Approximately 140 potential sample locations were demarcated with flags. These locations were selected based on 1) geography - locations spread throughout site; 2) potential contamination - locations in areas where vegetation was absent, where runoff flowed, or where moss grew (potential metal contamination indicator); 3) accessibility - locations where tall vegetation and other obstructions did not limit access of personnel and equipment; and 4) diversity - locations in a variety of habitats.

XRF screening was conducted by Illinois EPA at the same locations the GPS data was collected. The XRF screened for the following metals: molybdenum, strontium, rubidium, lead, arsenic, mercury, zinc, copper, nickel, cobalt, manganese, and chromium.

Approximately 68% of the locations screened by XRF were chosen as soil sample locations. Specific sample locations were selected based on 1) geography - locations throughout the site; 2) diversity - locations in a variety of habitats; and 3) potential contamination - locations in areas where XRF readings of metals were relatively high as compared to other readings. This selection process attempted to identify the most contaminated areas, not to obtain a random, unbiased representation of site conditions.

Eighty-four surface soil samples (S01 through S84, see Figure A-3) and four duplicate samples were collected throughout the LCC site, excluding the Alburn property, using stainless steel spoons, which were decontaminated prior to sampling. Five subsurface soil samples, including one duplicate, and three groundwater samples were collected by Illinois EPA using a Geoprobe®. A Geoprobe® is a compact, hydraulically-powered, vehicle-mounted device used to collect subsurface samples, typically by pushing a small-diameter rod through the strata being sampled. During the LCC Phase I sampling, the Geoprobe® was used to collect composite soil samples from a depth of zero to two feet BGS at sample locations S21, S22, S24 and S25; and a depth of two to four feet BGS at sample location S23. A duplicate composite soil sample, D21, was also collected from sample location S21. The Geoprobe® was equipped with a 4-foot Macro-Core® sampler with plastic sleeve liners and was advanced using 4-foot rods. A Screen Point 15 groundwater sampler was used with the Geoprobe® to collect groundwater samples at GW1, GW2, and GW3 (see Figure A-4). The sampler, which has a disposable tip and contains a 41-inch long wire-wound well screen, was advanced to the required depth, then retracted to

expose the well screen and allow for sample collection. An Illinois EPA-supplied boat was used to collect sediment, surface water, and macroinvertebrate samples from eleven locations in Indian Ridge Marsh and eight locations in the three ponds located on LCC site. Sediment samples were collected using a ponar dredge. Surface water samples were collected by directly immersing the sample jars into the water at the appropriate sample locations. Macroinvertebrate samples were collected either from submerged objects or sieved from sediments collected with the ponar dredge. Samples were collected in accordance with E & E START Standard Operating Procedures (SOPs), as described in E & E's August 18, 1998, QA/QC Sampling Plan.

Inorganic analyses of soils and macroinvertebrate identification were performed by U.S. EPA Region 5 Central Regional Laboratory (CRL). Other analyses were performed by assigned Contract Laboratory Program (CLP) laboratories. The analyses conducted on the samples included the following: total metals, toxicity characteristic leaching procedure (TCLP) metals (soils only), volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), pesticides, polychlorinated biphenyls (PCBs), pH, and percent moisture. The Phase I sampling results delineated several discrete areas in which multiple samples contained concentrations of more than one contaminant exceeding the human health standard, the ecological threshold, or both standards. These areas of the site were identified as "hot spots". The results of the Phase I sampling activities were summarized in E & E's interim report, titled *Site Assessment Report: November 16, 1999 for Lake Calumet Cluster Site* (March 10, 1999), and are discussed further in Section 5 of this report.

3.2 Phase II

The groundwater phase of the LCC site assessment began in the summer of 1998, when the need for groundwater data was expressed and additional groundwater monitoring well locations were proposed. A number of monitoring wells already existed onsite. Subsequent to the identification of contamination in the Phase I report, additional well locations were finalized, and E & E completed the Monitoring Well Construction Work Plan (March 16, 1999). E & E subcontracted Patrick Drilling to construct twelve new groundwater monitoring wells, under E & E's and U.S. EPA's supervision. Construction and development of the wells occurred from April 19 through April 30, 1999. As required by the Monitoring Well Construction Work Plan, Patrick Drilling used the rotary drilling method and hollow stem augers

with an inner diameter of 4.25 inches to produce an 8-inch borehole for each monitoring well. With the exception of the boreholes for wells LC09 and LC11, which were drilled to 20 feet BGS, boreholes were drilled to a depth of 14 to 16 feet BGS. Stainless steel well screens and casings, each with a diameter of 2 inches, were placed in each borehole, followed by sand (to create a filter pack around each well screen), a 1-foot layer of bentonite chips (to create a hydraulic seal above the filter pack) and bentonite slurry (to prevent vertical migration of contaminants). Each well was constructed so that the sand filter pack extends from the bottom of the borehole to 2 feet above the top of the well screen, while the bentonite slurry extends from the top of the bentonite seal to within two feet of ground surface. Except for the well casings of LC09 and LC11, which had 5-foot long well screens, each well casing had a 10-foot long wire-wound stainless steel well screen. At three locations, a pair of wells were constructed within five feet of other, but were drilled to different depths, creating nested well clusters at these locations: P05/LC07, LC09/LC10, and LC11/LC12. A nested well cluster allows groundwater samples to be collected from different depths at essentially the same location, thereby allowing for the evaluation of vertical contaminant migration through the soil or aquifer.

At the location of each newly constructed monitoring well or well cluster location, a record was made of the geologic material through which the borehole was drilled. This information, along with collected field data and observations noted during the well installation phase, was used to create a drilling log for each groundwater well location. Copies of these drilling logs are presented in Attachment C, as well as copies of the available groundwater well construction records created for the monitoring wells (labeled P01 through P04) that were previously installed at the LCC site and sampled during the Phase II sampling event. No groundwater well construction records or drilling logs were found for wells P05 and G21S.

Of the 17 monitoring wells which have well construction records, two were screened entirely within native soils (LC02 and LC11); six have screens that are completely within fill material (LC01, LC03, LC06, LC10, LC13, and P02); and eight have screens that are completed across the fill/native soil interface. Generally, monitoring wells are completed at depths of approximately 15, 20, or 25 feet below the ground surface. In each of the monitoring wells, the depth to water is within several feet of the ground surface and is at an elevation within the non-native fill material.

From May 10 through May 12, 1999, the twelve new wells (labeled LC01 through LC07 and LC09 through LC13) and six existing wells (labeled P01 through P05 and G21S) were sampled (Attachment A, Figure A-4). When a monitoring well cap was initially opened, the well's head space was monitored with a flame ionization detector (FID). The static water level was then determined with a water level indicator. Based on the water level and the depth of the well, the volume of water in the well was calculated. Using a bailer, three well volumes of groundwater were purged into buckets prior to sampling. This ensured that only freshly recharged groundwater was sampled. The following information was collected from the purged groundwater: temperature, dissolved oxygen, specific conductivity, oxidation/reduction potential, pH, and qualitative observations, such as color, odor, and the presence of a sheen. Water was then collected from the well using a dedicated, polyvinyl chloride bailer and placed into uniquely labeled sample containers. Following sample collection, each bailer was discarded. Sample containers were then preserved and placed on ice before being shipped to the laboratory. Each groundwater sample was analyzed for the following parameters: total metals, VOCs, SVOCs, pesticides, PCBs, nitrogen, and pH.

3.3 Phase III

The objectives of the Phase III assessment included filling in data gaps in the surface soil data from Phase I (e.g., Alburn Incinerator); obtaining additional surface and subsurface soil data near areas of elevated contaminant concentrations, or hot spots, that were identified in Phase I; collecting additional surface water and sediment samples at or near Alburn; and collecting surface water samples from prior locations so that nitrogen information could be obtained. E & E's Phase II and Phase III QA/QC Sampling Plan (April 16, 1999) may be consulted for a more detailed methodology.

Phase III sampling was conducted from May 3 through June 2, 1999. Initially, flags were placed in the ground to demarcate locations of new surface soil sample points to fill in data gaps. GPS coordinates of the sample locations were collected by Illinois EPA. The samples were collected using decontaminated stainless steel spoons and trowels and all soils were screened with a photoionization detector (PID). Sample locations near the previously identified hot spots were selected and marked to assist in defining the nature and extent of the contamination preliminarily characterized in Phase I. At locations in or near Alburn and at locations near previously identified hot spots, both surface and subsurface soil samples

were collected. Because of the difficulty in penetrating the subsurface soils (slag, debris, etc.) with the Geoprobe during Phase I, E & E subcontracted a trackhoe and operator from Independent Environmental to assist with the subsurface soil sampling. Following the collection of a surface soil sample, the trackhoe dug a trench at the sample location. The excavated soil was placed temporarily next to the trench. When a depth of 2 to 3 feet was obtained, the operator collected soil in the bucket and placed the contents on the ground so that the samplers could obtain material for the sample jars. Similarly, at 5 to 6 feet, an additional sample was collected. Following sample collection, the trench was refilled with the excess material and compacted. During this phase, 39 surface soil samples, 15 subsurface soil samples from between 2 and 3 feet, and 15 subsurface soil samples from between 4 and 6 feet were collected. Phase III soil samples are identified with a 2S at the beginning of the sample number. Soil samples taken from a depth of between 2 and 3 feet end with a "B". Samples taken between 4 and 6 feet end with a "C". Each soil sample was analyzed for the following parameters: total metals, VOCs, SVOCs, pesticides, PCBs, pH, and percent moisture.

Four surface water samples (AW1 through AW4) were collected in and near Alburn from ponded water. Samples were collected by direct immersion of the sample jars. These samples were preserved, placed on ice, and shipped to the laboratory for total metal, VOC, SVOC, pesticide, PCB, and pH analyses.

In addition to the nineteen groundwater samples were collected during Phase II activities for nitrogen analysis, 16 surface water samples were collected for nitrogen analysis during Phase III activities. The samples included the four surface water samples collected from ponded water in and near Alburn (AW1 through AW4). In addition, eight surface water samples were collected in Indian Ridge Marsh (IRP1 through IRP8), and four surface water samples (including one duplicate) were collected from the three large on-site ponds (L1W through L3W and duplicate sample L1WD). The samples were preserved, placed on ice, and shipped to the laboratory for nitrogen analysis. These samples were analyzed for ammonia, total cyanide, total Kjeldahl nitrogen (TKN), and nitrates-nitrites.

Seven sediment samples (2SED1 through 2SED7), including one duplicate (2SED4), were collected from below ponded water in and near Alburn on June 2, 1999. A hand auger was used to collect the material. At all locations, there was an impenetrable layer between 0.5 and 4 inches below the sediment. Because of this, composite samples were necessary in order to obtain enough material. Each sediment sample

was analyzed for the following parameters: total metals, VOCs, SVOCs, pesticides, PCBs, and percent moisture/percent solids.

4. EVALUATION CRITERIA

The analytical results from samples collected at the LCC site were sorted by media (surface soil, groundwater, etc.) and type of chemical (inorganic and organic), then entered into a database, checked for accuracy, and sorted. Analytical summary tables were created for each media and type of chemical (Attachment D, Tables D-1 through D-12). Only chemicals that were detected in at least one sample are included in these tables. The tables list the chemicals detected; the frequency at which they were detected; the minimum, average, and maximum detected concentration; various screening criteria or thresholds (described below); and the frequency with which these criteria were exceeded for each chemical within each media. The chemical concentrations detected in environmental media at the LCC site were compared to various screening criteria to determine if they could potentially cause adverse effects on human health or ecological receptors. Validated data from the laboratories are tabulated in Attachment E (Phase I) and Attachment F (Phase II and Phase III).

Screening criteria were selected based on their acceptance among human health and ecological risk assessors from the involved agencies and consultants, their relevance to site characteristics, and their completeness. The various criteria used to assess the level of contamination in the site soils, sediment, and water are described below. These criteria are used as the basis for discussion of the site assessment analytical results, which is provided in Section 5 of this report.

4.1 Soil

Soil Background Concentrations. The Illinois Pollution Control Board's *Concentrations of Inorganic Chemicals in Background Soils for Counties Within Metropolitan Statistical Areas* (Illinois EPA, 1998) were used as benchmarks for background concentrations of metals in soil.

Human Health Effects. U.S. EPA Region 3 human health risk-based screening concentrations (RBCs) for soil for commercial or industrial land use (U.S. EPA, 1998b) were used. These concentrations are based on potential adult worker exposure to soil contaminants through incidental ingestion of soil and inhalation of vapors and airborne particles from the soil, and correspond to a lifetime cancer risk of 1.0×10^{-6} for carcinogens (i.e., one person in one million), or a hazard quotient of 0.1 for noncarcinogens. A hazard quotient is the ratio of the potential average daily dose of a chemical to its reference dose, which is the dose not expected to result in any adverse effects. Screening concentrations are equal to $1/10^{th}$ of the actual concentrations.

Adult Worker Screening Level. U.S. EPA Region 5 soil lead screening level for adult workers (VanLeeuwen, 1999).

RCRA EDQL. U.S. EPA Region 5 RCRA Division's April 1998 Ecological Data Quality Levels (EDQLs) (U.S. EPA, 1998c). EDQLs are used by RCRA as a media-specific screening comparison to site-specific information. Exceedances of these levels trigger concern and generally warrant further investigation at sites. EDQLs are conservative levels that are protective of ecological receptors, and are obtained from the lowest available federal, state, and, in some cases, international criteria, or from toxicological data extrapolated for selected ecological receptors.

Oak Ridge. The study conducted by Oak Ridge National Laboratory (ORNL) for the United States Department of Energy (Efroymson *et al.*, 1997) developed screening benchmarks for the toxicity of chemicals to earthworms and to soil microorganisms and microbial processes.

4.2 Sediment

Sediment Background. National Oceanic and Atmospheric Administration's (NOAA) 1998 Screening Quick Reference Tables (SQRT) freshwater sediment background levels (metals only) (Buchman, 1998).

Ontario. Ontario Ministry of the Environment 1994 guidelines for the protection and management of aquatic sediment quality in Ontario (Persaud *et al.*, 1993). The Lowest Effect Level (LEL) indicates the level of contamination that can be tolerated by the majority of the sediment-dwelling organisms. The

Severe Effect Level (SEL) indicates the level of contamination at which pronounced disturbance of the sediment-dwelling community can be expected. This is the sediment concentration of a compound that would be detrimental to the majority of benthic species.

NOAA ERL and ERM. NOAA thresholds for contaminant concentration in sediments (Long *et al.*, 1995). ERL (Effects Range-Low is the concentration above which adverse effects may begin or are predicted among sensitive life stages and/or species. ERM (Effects Range-Median) is the concentration above which effects are frequently or always observed or predicted among most species.

RCRA EDQL. U.S. EPA Region 5 RCRA Division's April 1998 EDQLs (U.S. EPA, 1998c). See the text in Section 4.1 for further description.

4.3 Surface Water

U.S. EPA's December 1998 National Recommended Water Quality Criteria (U.S. EPA, 1998a). The Criterion Continuous Concentration (CCC) is an estimate of the highest concentration of a material in surface water to which an aquatic community can be exposed indefinitely without resulting in an unacceptable effect. The Criteria Maximum Concentration (CMC) is an estimate of the highest concentration of a material in surface water to which an aquatic community can be exposed briefly without resulting in an unacceptable effect.

OSWER EcoTox. U.S. EPA Office of Solid Waste and Emergency Response (OSWER) January 1996 ecological and toxicological (EcoTox) thresholds (U.S. EPA, 1996a).

RCRA EDQL. U.S. EPA Region 5 RCRA Division's April 1998 EDQLs (U.S. EPA, 1998c). See the text in Section 4.1 for further description.

4.4 Groundwater

MCL, SMCL. U.S. EPA Office of Water, National Primary and Secondary Drinking Water Regulations (U.S. EPA, 1996b). The 1986 Amendments to the Safe Drinking Water Act established enforceable

(MCL-maximum contaminant level) and non-enforceable (SMCL-secondary maximum contaminant level) guidelines for contaminant concentrations in drinking water delivered by public water systems.

R3 Tap. U.S. EPA Region 3 risk-based concentrations for tap water (U.S. EPA, 1998b).

These screening criteria were used to create the data summary tables presented in Attachment D. Based on an evaluation of the data presented in the summary tables, chemicals of potential concern (COPCs) were identified for each medium. COPCs were determined based on the percentage of samples detected and the percentage of exceedances for the various criteria. In general, contaminants that were detected in most of the samples and that had more than one exceedance of either the human health or ecological threshold were identified as COPCs.

5. RESULTS AND DISCUSSION

A review of Tables D-1 through D-12 in Attachment D indicate that metals, VOCs, PCBs, and polycyclic aromatic hydrocarbons (PAHs) are the primary COPCs for soils; that metals and PAHs are the COPCs for sediments; that metals and pesticides are the COPCs for surface water; and that metals, VOCs, and PAHs are the COPCs for groundwater.

This section is organized by media: soil, sediment, surface water, macroinvertebrates, and groundwater. The discussion provided in this section rely considerably on graphical presentations of data in Attachment A and the summary tables presented in Attachment D. Complete tabulated data set for the Phase I sampling are presented in Attachment E, and Phase II and Phase III data are presented in Attachment F.

5.1 Soil Results

Approximately 135 compounds were analyzed by the laboratory and summarized. Using summary tables D-1 through D-6, 12 COPCs were identified for surface and subsurface soils (5 metals, 1 VOC, 3 PAHs, 1 PCB, and 2 pesticides). These COPCs were selected to be most representative of surface and subsurface contamination levels. Contour maps were prepared showing COPC concentrations in soils from the LCC site for the 12 COPCs (Attachment A, Figures A-5 through A-16). Concentration contours were created using the linear Kriging method in Surfer®, version 6 (Golden Software 1997). When contamination was present in both surface and subsurface samples, multi-layer (stacked) concentration contour maps were created to simultaneously show the distribution of contaminants by soil strata. In order to make the maps as representative as possible, values reported as not detected at the nominal sample quantitation limit ("U" flagged values) were replaced by ½ of the lowest detected concentration for that chemical. Values rejected in the data validation process ("R" flagged values)

were not used. For many of the COPCs, detected concentrations well below the nominal sample quantitation limit were reported as estimated values ("J" flagged values). The lowest "J" flagged value for a chemical was considered to be its practical quantitation limit (PQL).

There were significantly fewer samples collected for subsurface soils than for surface soil samples. To prevent the program from extrapolating contamination into areas not sampled, the same number of points was input to develop the surface and subsurface maps. For the subsurface contour maps, points not sampled were assigned a default value less than ½ the lowest detected concentration (the value used for the nominal sample quantitation limit). This value displays as a "no sample collected" category, resulting in blank (white) areas on the maps. It is important to note that only points actually sampled appear on the maps. The benefit of this model is that is that it limits the assumptions in areas of the site that were not sampled. However, because the no "sample collected" category is assigned the smallest value, concentration contours between sampled points and the "no sample collected" areas show decreasing contamination levels. While this is accurate for some COPC concentrations, it may not be for all. It should therefore be noted that the presence of sample points on the maps must be considered to determine whether or not the contamination level displayed on the map is a true analytical value or a model-extrapolated value. It should also be noted that four soil samples (S21, S22, S24, and S25) were not included in the contour map data because these samples were composites collected between 0 to 2 feet or 0 to 4 feet and, therefore, did not fit either the surface or subsurface data category.

The model contours were filled with different colors and color intensities to convey the various concentration ranges and their significance as described below:

Shading	Meaning
Red	Concentration above background or the PQL and the human health screening criteria.
Yellow	Concentration above background or the PQL and the ecological screening criteria, but below the human health criteria.

Green	Concentration above background or the PQL, but below both human health and ecological screening criteria.
Gray	Concentration below state-wide background levels for inorganic chemicals, or below the PQL for organic chemicals.
White	No samples collected.

A brief summary of each soil COPC, based upon the analytical data and the generated contaminant concentration map, is presented below.

Arsenic (Attachment A, Figure A-5). The lower and upper threshold values selected to evaluate arsenic contamination at the LCC site were the U.S. EPA Region 3 RBC (4.0 milligrams per kilogram [mg/kg]) and the Illinois Urban Background concentration (7.2 mg/kg), respectively, with the RCRA EDQL serving as an intermediate threshold. Since the human health and ecological screening criteria fell below background, or the PQL (as in the case of arsenic), the screening criteria value is indicated by a red or yellow line, respectively, rather than by shading. Detectable arsenic concentrations reported for the collected soil samples ranged from 0.8 mg/kg to 63.5 mg/kg, with the highest reported concentration detected in a subsurface sample collected from 2S21B on the Alburn property. In general, surface soil arsenic concentrations detected in samples at the LCC site approximated the Illinois Urban Background concentration, and contamination was distributed across the majority of the LCC site. Large areas where arsenic concentrations exceeded the Illinois Urban Background concentration (red shading) at the LCC site are located in the north on the Paxton I property, and in the south on the Unnamed Parcel property. Subsurface arsenic contamination was found in a hot spot located in the Alburn area.

Approximately half of all the soil arsenic concentrations at the LCC site were above the U.S. EPA Region 3 RBC. Generally, contamination was more pronounced in the subsurface soils and the highest concentration was found at a subsurface sample location. However, the surface soils generally did not exceed the U.S. EPA RBC. Subsurface arsenic concentrations are not known throughout the site, but

based on the data developed during this site assessment, it could be concluded that arsenic contamination is moderate threat at the LCC site.

Barium (Attachment A, Figure A-6). The RCRA EDQL (1.04 mg/kg) and the U.S. EPA Region 3 RBC (14,000 mg/kg) were selected as the lower and upper thresholds, respectively, to evaluate barium contamination at the LCC site. The Illinois Urban Background concentration was used as an intermediate threshold. All of the reported detectable concentrations exceeded the RCRA EDQL; however, the reported concentrations were all significantly below the U.S. EPA Region 3 RBC. Detectable barium concentrations ranged from 16.8 mg/kg to 1,200 mg/kg, with the highest concentration reported for the surface sample collected at sample location S64. Higher levels of contamination at the LCC site were found in surface soils than in subsurface soils. The higher levels of contamination were found near the southwestern hot spot, which is centered around sample S64 on the southern edge of the Unnamed Parcel.

Barium levels above the Illinois Urban Background cover the majority of the site; however, a comparison of the highest reported concentration to the U.S. EPA Region 3 RBC revealed that the threshold is more than 110 times greater than the highest concentration. There is a large difference between the RCRA EDQL and the U.S. EPA Region 3 RBC. Therefore, the barium contamination at the LCC site does occur throughout the site, but at levels that may threaten the ecology, not humans.

Chromium (Attachment A, Figure A-7). The RCRA EDQL (0.4 mg/kg) and the U.S. EPA Region 3 RBC (1,000,000 mg/kg) were selected as the respective lower and upper thresholds for evaluating chromium contamination at the LCC site. The Illinois Urban Background concentration was used as an intermediate threshold. All detectable concentrations of chromium in samples at the LCC site were above the RCRA EDQL, but significantly below the U.S. EPA Region 3 RBC. The reported range of concentrations was from 3.96 mg/kg to 2,200 mg/kg, with the highest detected concentration found at sample location S26, which is located on the southern edge of the Paxton I property. Chromium concentrations for surficial soils were consistently above the Illinois Urban Background limit and the RCRA EDQL across the LCC site. The southeastern corner of the LCC site, where only low concentrations of the other COPCs were detected, contained elevated levels of chromium.

It is important to note the large discrepancy between the U.S. EPA Region 3 RBC and the ecological threshold for chromium. The U.S. EPA Region 3 RBC for chromium is 1,000,000 mg/kg, or 100%. This risk value indicates that 100% chromium would be permissible, based on the assumptions for human exposure pathways. The assumptions for industrial areas include a worker on site for 8 hours a day, with a dust inhalation rate of 50 mg of soil per day, and working 250 days per year. The ecological thresholds for chromium are much lower. Therefore, due to the extent of chromium contamination across the majority of the LCC site, chromium is considered a low to moderate ecological threat at the LCC site, and not a human health threat.

Lead (Attachment A, Figure A-8). The selected upper and lower thresholds for evaluating lead contamination at the LCC site were the RCRA EDQL (0.45 mg/kg) and the U.S. EPA Region 5 Adult Worker Screening Level (750 mg/kg), respectively. The Illinois Urban Background concentration was used as an intermediate threshold. The reported range of detectable concentrations was 7.73 mg/kg to 2,950 mg/kg. The highest concentration was found in a subsurface sample collected at sample location 2S30C on the Unnamed Parcel property. Contaminant concentrations for lead at the LCC site were similar to those for chromium, in that they are distributed across the site. All of the reported concentrations exceeded the RCRA EDQL, and the majority are below the upper threshold value. However, unlike with the chromium concentrations, there were samples (three surface and one subsurface) where the detected concentrations exceeded the upper threshold to produce hot spots. The surface hot spots are located around sample location S64, and the area surrounding sample locations 2S16, 2S19 and 2S20. These samples correspond the southwestern hot spot area on the Unnamed Parcel and Alburn area, respectively. The subsurface hot spot exists around sample locations 2S30 and 2S32 (also part of the southwestern hot spot area), which were both samples of black, silty material. Although elevated lead concentrations were distributed across the LCC site, the hot spots are all located towards the southern end of the site.

Except for the hot spots in Alburn and the Unnamed Parcel described above, lead contamination did not pose a human health threat. However, since 142 out of 150 total soil samples exceeded the RCRA EDQL, lead contamination may pose a considerable ecological threat to the site.

Mercury (Attachment A, Figure A-9). For mercury contamination at the LCC site, the RCRA EDQL (0.0079 mg/kg) and the U.S. EPA Region 3 RBC (610 mg/kg) were selected as the lower and upper evaluation thresholds, respectively. The Illinois Urban Background concentration was used as an intermediate threshold. The reported detectable concentrations for mercury samples collected at the LCC site ranged from 0.012 mg/kg to 73.5 mg/kg, with the highest concentration found in a subsurface sample collected at 2S29B within the southwestern hot spot area on the Unnamed Parcel property. While being significantly lower than the U.S. EPA Region 3 RBC, the reported mercury concentrations all exceeded the RCRA EDQL. The majority of mercury concentrations approximated the Illinois Urban Background concentration, and subsurface contamination was distributed across the LCC site. The higher levels of mercury contamination in surface soils at the LCC site were distributed across the site.

A comparison of the highest detected mercury concentration to the U.S. EPA Region 3 RBC showed that the threshold is more than eight times greater than the maximum detected concentration. Subsequently, the contaminant levels for mercury at the LCC site are a fairly low human health threat.

Aroclor 1254 (Attachment A, Figure A-10). The selected upper and lower thresholds for evaluating the PCB Aroclor 1254 contamination at the LCC site were the PQL (0.0068 mg/kg) and the Toxic Substance and Control Act (TSCA) regulatory limit (50.0 mg/kg), respectively. The U.S. EPA Region 3 RBC was used as an intermediate threshold. The reported range of detectable concentrations was 0.007 mg/kg to 68.8 mg/kg, with the highest concentration collected at surface sample location S66. Sample S66 was collected in the location of the southwestern hot spot on the Unnamed Parcel property. The majority of reported Aroclor 1254 concentrations were below the PQL. Of those concentrations that exceeded the PQL, most were between the PQL and the U.S. EPA Region 3 RBC; however, there is one instance where the TSCA regulatory limit was exceeded (68.8 mg/kg at S66). For surface soils, Aroclor 1254 levels above the PQL were distributed across the LCC site, with two larger areas of contamination at the northern and southern ends of the LCC site. The detectable concentrations of Aroclor 1254 contamination from subsurface samples were generally located towards the southern end of the site.

Aroclor 1254 concentrations for the LCC site reveal that, with the exception of samples S64 and S66 in the southwestern hot spot area of the Unnamed Parcel, all concentrations are less than 4 parts per million (ppm), or mg/kg. The TSCA regulatory limit is more than 12 times the maximum typical concentration. Therefore, Aroclor 1254 contamination at the LCC site is generally present at low levels and is distributed across most of the LCC site.

beta-BHC (Attachment A, Figure A-11). The selected upper and lower thresholds for evaluating beta-BHC contamination at the LCC site were the PQL (0.00094 mg/kg) and the U.S. EPA Region 3 RBC (3.2 mg/kg), respectively. The RCRA EDQL was used as an intermediate threshold. The reported range of detectable beta-BHC concentrations was 0.001 mg/kg to 0.38 mg/kg, with the highest concentration being from a subsurface sample collected at sample location 2S31C, which is located within the southwestern hot spot area on the Unnamed Parcel site. For both surface and subsurface soils, the majority of beta-BHC concentrations were below the PQL, and all concentrations were below the U.S. EPA Region 3 RBC. Similarly to Aroclor 1254, beta-BHC surface contamination at levels above the PQL were present in two large areas across the Paxton I property at the northern end of the site, and the Unnamed Parcel area at the southern end of the site. However, unlike Aroclor 1254, subsurface beta-BHC contamination is distributed across the site.

A comparison of the U.S. EPA Region 3 RBC to the maximum reported beta-BHC concentration revealed that the threshold is approximately 10 times greater than the maximum concentration. Consequently, beta-BHC contamination at the LCC site exists at low levels and is distributed across the site.

Dieldrin (Attachment A, Figure A-12). The lower and upper thresholds selected for evaluating dieldrin contamination at the LCC site were the PQL (0.00056 mg/kg) and the U.S. EPA Region 3 RBC (0.36 mg/kg), respectively. The RCRA EDQL was used as an intermediate threshold. Detectable dieldrin concentrations at the LCC site ranged from 0.001 mg/kg to 1.8 mg/kg. The highest concentration reported for a surface sample collected from sample location S66, which is located in the southwestern hot spot on the Unnamed Parcel property. Dieldrin was detected in 85 out of 150 soil samples. In general, the samples with concentrations above the PQL were below the U.S. EPA Region 3 RBC. There were, however, reported contaminant concentrations that exceeded the U.S. EPA Region 3

RBC. Dieldrin concentration above the RCRA EDQL were detected at Alburn, the northern section of Paxton I, and across the U.S. Drum site. Dieldrin concentrations above both the RCRA EDQL and the U.S. EPA Region 3 RBC were detected at the southern edge of the Unnamed Parcel in the southwestern hot spot. The subsurface soil samples indicated that the dieldrin contamination extends to at least six feet in Alburn (sample location 2S19 and 2S20) and the southwestern hot spot in the Unnamed Parcel (2S30 and 2S32).

The southwestern hot spot area samples exceeded the human health and ecological standards, and samples at Alburn estimated the ecological standard. Also, dieldrin levels above the RCRA EDQL standard were found to a depth of at least six feet on site. Therefore, dieldrin contamination may pose a significant ecological threat, particularly in the Alburn and Unnamed Parcel areas.

Naphthalene (Attachment A, Figure A-13). The lower and upper thresholds selected for evaluating naphthalene contamination at the LCC site were the PQL (0.035 mg/kg) and the U.S. EPA Region 3 RBC (41,000 mg/kg), respectively. The RCRA EDQL was used as an intermediate threshold. Naphthalene concentrations at the LCC site ranged from 0.022 mg/kg to 90 mg/kg, with the highest concentration reported for a subsurface sample collected from sample location 2S16C in the Alburn area. All naphthalene concentrations reported for the LCC site were significantly lower than the U.S. EPA Region 3 RBC. Additionally, the majority of all the reported concentrations were below the RCRA EDQL, with a large percentage of this concentration subset being below the PQL. In the Alburn area, however, fifteen naphthalene surface soil concentrations exceeded the RCRA EDQL, as well as two sample locations at the west-central boundary of the site (2S10 and 2S11), and three in the southwestern hot spot area of the LCC site (2S08, 2S09 and 2S30). Overall, the highest levels of subsurface naphthalene contamination were located in the Alburn area and in the southwestern hot spot area on the Unnamed Parcel.

A comparison of the U.S. EPA Region 3 RBC and the maximum detected naphthalene concentrations reveals that the threshold value is more than 450 times greater than the highest detected concentration value. It can therefore be asserted that naphthalene contamination at the LCC site exists at mainly low levels, except in the Alburn area, where it is slightly elevated.

Benzo(a)pyrene (Attachment A, Figure A-14). The PQL (0.033 mg/kg) and the RCRA EDQL (1.52 mg/kg) were selected as the lower and upper thresholds, respectively, for the evaluation of benzo(a)pyrene contamination at the LCC site. The U.S. EPA Region 3 RBC was selected as an intermediate threshold. The range of detectable benzo(a)pyrene concentrations reported for soil samples collected at the LCC site was 0.034 mg/kg to 11.0 mg/kg, with the highest concentration reported for a subsurface sample at sample location 2S20C on the Alburn property. Detectable concentrations of benzo(a)pyrene were reported for sample locations across the LCC site. A large percentage of those detected benzo(a)pyrene concentrations exceeded the upper threshold, forming at least five distinct surface hot spots. The largest of these hot spots was formed around sample locations S06, S88, 2S20, 2S24 and 2S30. These samples correspond with the Alburn area, an area to the north of Alburn, and the southwestern hot spot area. In the subsurface samples, elevated concentrations are found in Alburn. Benzo(a)pyrene contamination in several hot spots could pose a moderate threat to both human health and the ecology.

Benzo(a)anthracene (Attachment A, Figure A-15). The selected lower and upper threshold for evaluating benzo(a)anthracene contamination at the LCC site were the PQL (0.049 mg/kg) and the U.S. EPA Region 3 RBC (7.8 mg/kg), respectively. The RCRA EDQL was selected as the intermediate threshold. Detectable benzo(a)anthracene concentrations at the LCC site ranged from 0.029 mg/kg to 12.0 mg/kg, with the highest concentration reported for subsurface sample 2S20C collected in the Alburn area. However, a stacked contour concentration map was not created because there was only one instance of a screening threshold (the RCRA EDQL) being exceeded by a subsurface sample. The majority of surface detectable benzo(a)anthracene concentrations at the LCC site are between the PQL and the RCRA EDQL. The only instance of a surface soil sample having a benzo(a)anthracene concentration that exceeds the RCRA EDQL is found at sample location S06. Low concentration benzo(a)anthracene contamination in surface soils is distributed across the site, with this compound detected in 145 of the 150 soil samples analyzed.

Dibenz(a,h)anthracene (Attachment A, Figure A-16). The lower and upper thresholds selected for evaluating dibenz(a,h)anthracene contamination at the LCC site were the PQL (0.038 mg/kg) and the U.S. EPA Region 3 RBC (0.78 mg/kg), respectively. The range of detectable dibenz(a,h)anthracene concentrations reported for the LCC site was 0.029 mg/kg to 2.2 mg/kg, with the highest reported

concentration found at a surface sample from sample location S88. The majority of dibenz(a,h)anthracene concentrations for the LCC site were between the PQL and the U.S. EPA Region 3 RBC. However, there are four spots across the LCC site where contaminant concentrations exceed the U.S. EPA Region 3 RBC. These hot spots are located in the vicinity of sample locations S06 and 2S37 (Paxton II), and sample locations S88 and S64 (Unnamed Parcel). Dibenz(a,h)anthracene concentrations are distributed across the LCC site; however, the hot spots are found towards the central and southern portions of the site.

Summary. For the analyzed soil samples, overall COPC concentrations generally approximate or were only moderately elevated above background or PQL levels. This is supported by the overall patterns established by the contaminant contours created for each soil COPC map. Although contours corresponding to slightly or moderately elevated contaminant concentrations are generally distributed across the LCC site, areas of significantly elevated concentrations are typically discrete, especially for inorganic COPCs. These areas where COPC concentrations exceed the selected upper threshold, or are significantly elevated above the selected lower threshold are defined as hot spots, and are visually depicted by red-colored areas. This pattern is consistent with localized spills and releases of contaminants that are typically associated with the historical use of the area for various waste disposal and/or management activities.

Based on the data interpretation presented in Figures A-5 through A-16, the most consistently contaminated portion of the LCC site is the former Alburn Incinerator. This conclusion is especially evident when observing the visual representation of subsurface analytical results. However, two other areas of the site also consistently showed contamination: the southwestern hot spot area centered around sample location S64 on the Unnamed Parcel property, and the area just south of the Alburn Incinerator centered around sample location S84 (see Figure A-3).

Based on human health criteria, arsenic was the inorganic chemical which most frequently exceeded the Region 3 RBC. Seventy-eight out of 150 total soil samples exhibited concentrations above the human health standard. Based on ecological criteria, the inorganic chemicals found in significant ecological concentrations across the site were barium, chromium, lead, and mercury. All of the 150 surface and subsurface soil samples collected exceeded the RCRA EDQL for barium and chromium. Similarly, lead

and mercury exceeded the RCRA EDQL for 142 and 143 samples, respectively. It is important to note that the ecological threshold is often lower than the Illinois Urban Background level for metal contaminants. For instance, although barium exceeded the RCRA EDQL for all of the samples, it exceeded the Illinois Urban Background level for only 97 out of 150 samples. This does indicate there may be a significant ecological threat on the site; however, it may not be much higher than other urban areas in Illinois. Ecological threats are further discussed in Section 6.

In general, a smaller number of organic contaminants exceeded the human health and ecological standards than inorganic contaminants. The organic soil contaminant that most frequently exceeded the Region 3 RBC was benzo(a)pyrene, which was above the human health standard in 59 of the total 150 samples collected. The pesticides dieldrin and beta-BHC, as well as the PAHs napthalene and benzo(a)pyrene were the organic chemicals which most frequently exceeded the RCRA EDQL.

Qualitative field observations recorded during the collection of Phase I samples S01 through S90 were tabulated and presented in Attachment E, Table E-1. Attachment E also contains the reported analytical results from the Phase I soil samples in tabular form. Qualitative field observations recorded during the collection of Phase III samples 2S01 through 2S39 are presented in Attachment F, Table F-1. The complete Phase III analytical data results are also presented in tabular form in Attachment F. The data presented in Tables F-2 through F-5 include analytical results for pH and percent moisture.

The soil samples collected during Phase III were also analyzed for two general chemistry parameters: pH and percent moisture. Reported pH values ranged from 6.6 standard units (sample 2S13) to 11.7 standard units (sample 2S33B). These values indicate that leachate generated from individual soil samples would exhibit characteristics ranging from slightly acidic to moderately caustic. However, the reported pH values for the majority of the samples (46 of 68) are within the neutral range of 7.0 to 9.0 standard units, with 21 of the remaining 22 samples having pH values greater than 9.0 standard units. The percent moisture values reported for the Phase III soil samples range from 8 percent (%) for sample 2S33B through 76% for sample 2S31B. The majority of the Phase III soil samples had % moisture values between 15% and 30% (53 of 68). Percent moisture values of 15% or less were reported for eleven of the remaining fifteen samples.

5.1.1 Toxicity Characteristic Leaching Procedure Results

The soil samples collected during Phase I and Phase III were submitted for TCLP analysis. The Phase I samples were analyzed for TCLP barium, cadmium, chromium, lead, and silver by CRL. No detectable TCLP levels were reported for any of the contaminants for the Phase I analysis, consequently, there is no table for these TCLP results within this report. The Phase III samples were analyzed by Trans-Enviro Analytical Services for the same five metals as Phase I, as well as arsenic, mercury, and selenium. The Phase III analysis did not detect any TCLP levels for arsenic or selenium, but did have detections for the other contaminants. Detectable concentrations of TCLP barium were reported for each sample. However, the highest detected concentration was 3.87 milligrams per liter (mg/L), well below the U.S. EPA regulatory level of 100 mg/L. For cadmium, chromium, mercury, and silver, fewer than 15% of the samples contained detectable TCLP levels of the contaminants. The highest detected concentrations for these contaminants were all less than 18% of the regulatory level for each respective contaminant. TCLP lead was not detected in approximately 75% of the samples. All of the detected lead concentrations, with three exceptions, were below the 5.0 mg/L regulatory level. The samples that exceeded the TCLP lead regulatory level were 2S29B (96.1 mg/L), 2S30C (414 mg/L), and 2S32B (5.47 mg/L). All three of these samples were taken near the southwestern hot spot, near monitoring well LC13. As noted in the soil discussion above, the highest total lead concentration (2,950 mg/kg) was detected from sample 2S30C, which correlates with the location of the highest TCLP lead concentrations in the area near LC13. These tabulated TCLP concentrations are presented in Attachment F, Table F-6.

5.1.2 Dioxin Results

Elevated dioxin levels are sometimes associated with hazardous waste incinerator activities, therefore, one composite soil sample was collected at the Alburn site and analyzed for dioxin. The results of the dioxin analysis are presented in Attachment F, Table F-7. Results were converted using the toxicity equivalency factor method. In this method, the complex mixtures of chlorinated dibenzo-*p*-dioxins and dibenzofurans (CDDs and CDFs) are related to the toxicity of the highly studied 2,3,7,8-tetrachlorodibenzo-*p*-dioxin (2,3,7,8-TCDD). The 2,3,7,8 TCDD equivalent values were added to obtain a total of TCDD equivalent value of 83.546 parts per trillion (ppt). A commonly accepted U.S.

EPA action level for dioxin is 1,000 ppt in residential areas and 20,000 ppt in industrial areas. The RCRA EDQL for 2,3,7,8 TCDD is 199 ppm. The calculated dioxin equivalency of 83.456 ppt is significantly below both action level and the EDQL, and therefore, based on only one composite sample, does not appear to be a contaminant of concern within the Alburn portion of the LCC site.

5.2 Sediment Results

Using Summary Tables B-7 and B-8, 12 COPCs were initially identified (eight inorganics and four organics) for sediment samples. For evaluation purposes, these 12 COPCs were reduced to six representative contaminants: arsenic, chromium, lead, manganese, benzo(a)anthracene, and chrysene. For graphical representation, symbols were assigned to each contaminant and placed inside a box for each sediment sample location. The colors inside each symbol represent the level of contamination as follows: green shades represent levels of contamination below the lowest threshold (LEL); yellow shades represent contaminant levels between the lower and upper thresholds (LEL and SEL); and red shades represent levels that exceed the SEL. Figure A-17 qualitatively summarizes sediment COPC contamination at each sample location.

As shown in Figure A-17, the majority of the representative contaminant symbols are shaded yellow, indicating COPC concentrations between the respective lower and upper thresholds. The most highly contaminated sediments collected at the LCC site were collected from the Alburn area (2SED1 through 2SED7). It should be noted that the seven sediment samples (including one duplicate sample) collected in the Alburn area were composite samples. A thin layer (less than 6 inches thick) of sediment, underlain by an impenetrable surface, was encountered throughout the Alburn area. This surface is suspected to be a former parking lot. Consequently, a hand auger was used to scrape along the impenetrable surface and collect the necessary sample volume. Five samples (2SED1 through 2SED5), including the duplicate sample 2SED4, were collected around the building located at the northern end of the Alburn area. The other two samples (2SED6 and 2SED7) were collected in a marshy area at the southwest corner of the Alburn area. It should be noted that the sediment samples collected in vicinity of Alburn were not analyzed for manganese.

The SEL for chromium (110 ppm) was exceeded in all six samples collected (333 ppm at 2SED1, 366 ppm at 2SED2, 157 ppm at 2SED3, 157 ppm at 2SED5, 537 ppm at 2SED6 and 173 ppm at 2SED7), while chrysene levels exceed the SEL (460 ppm) in five of the six samples collected (820 ppm at 2SED2, 1,100 ppm at 2SED3, 650 ppm at 2SED5, 930 ppm at 2SED6 and 470 ppm at 2SED7). The SEL for lead (250 ppm) was exceeded in four of the six samples (725 ppm at 2SED2, 600 ppm at 2SED3, 491 ppm at 2SED5 and 288 ppm at 2SED6). The arsenic SEL (33 ppm) was exceeded in two samples (104 ppm at 2SED2 and 83 ppm at 2SED3) and is near the SEL in a third sample (27.3 ppm at 2SED5).

Sediment samples collected from Indian Ridge Marsh showed that five of eleven samples (1,110 ppm at SED03, 1,190 ppm at SED05, 1,670 ppm at SED06, 1,370 at SED07 and 1,350 ppm at SED10) exceeded the SEL for manganese (1,100 ppm). Only two of the samples collected at Indian Ridge Marsh had contaminant concentrations that were all below the LEL.

The sediment samples collected from the three ponds found at the LCC site (LHL1, LHL2, and the southeast pond) had the lowest overall levels of contamination. In eleven of a possible 48 instances (eight sample points, six COPCs per sample point), the COPC concentration was below the respective LEL, and there was no instance of a contaminant exceeding the respective SEL. All organic sample concentrations for LHL1 were below the respective LELs. The southeast pond contained moderate to low levels of contamination. A further analysis of the ecological significance of site sediment contamination is contained in Section 6.

The qualitative field notes recorded during the Phase I sediment sample event (samples SED01 through SED20) are tabulated and presented in Attachment E, Table E-7, while the tabulated analytical results are presented in Attachment E, Table E-8. The tabulated analytical results from the Phase III sediment sampling (2SED1 through 2SED7) are presented in Attachment F, Table F-8. Percent moisture was the only general chemistry parameter recorded for the Phase III sediment samples, with reported values ranging from 18% (2SED1) to 68% (2SED3).

TCLP analysis was performed on the collected sediment samples to determine the leachability of the following metals: arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver. No

detectable TCLP concentrations were reported for any analytes. Attachment F, Table F-9 contains the tabulated TCLP analytical results for sediment samples 2SED1 through 2SED7.

5.3 Surface Water Results

5.3.1 COPC Discussion

Using summary Tables D-9 and D-10, 6 COPCs were identified (four inorganics and two organics) for surface water samples. Of note, pesticides were identified as COPCs only in surface water and not in any other media. As with the sediment samples, different symbols were selected to represent each COPC, and a box containing each representative symbol was created for each sample location (Figure A-18). Although several screening criteria were used to select the COPCs, only one screening criterion for each contaminant was used in developing the sample results map. Different shades were used to represent the degree to which the threshold value was exceeded, with yellow representing a concentration slightly higher than the threshold and red representing a concentration significantly higher than the threshold. As with previous sample types, shades of green were used to represent concentrations below the lowest threshold value. The recorded field data and tabulated analytical results for the Phase I surface water samples (SW01 through SW20) are presented in Attachment E as Tables E-9 and E-10. Attachment F, Table F-10 contains the tabulated analytical results from the Phase III surface water sampling (samples AW1 through AW4) collected in the Alburn area. Data presented in Table F-10 includes pH values for samples AW1 through AW4. The reported values range from 7.8 standard units (AW1) to 8.1 standard units (AW2).

In all of the collected samples, barium concentrations (both dissolved and total) exceeded the representative threshold value of 0.004 ppm. Total barium concentrations in these samples ranged from 0.049 ppm to 0.358 ppm. As with the collected sediment samples, the most contaminated surface water samples were collected in vicinity of Alburn (AW1 through AW4). For these samples, the concentration for each COPC was below the respective threshold value in only five of a possible 24 instances (four sample locations, six COPCs per sample location). Five of the six COPC concentrations for sample AW1 in the Alburn area were significantly higher than the respective ecological toxicity threshold value (barium - 0.358 ppm vs. 0.004 ppm, iron - 6.580 ppm vs. 1 ppm,

lead - 0.107 ppm vs. 0.002 ppm, manganese - 2.790 ppm vs. 0.08 ppm and heptachlor - 0.00029 ppm vs. 6.9×10^{-6} ppm), marking the sample as the overall most contaminated surface water sample collected at the LCC site. The surface water samples collected during Phase I from Indian Ridge Marsh (SW01 through SW11) demonstrate significant barium and manganese contamination. Barium and manganese were detected in all eleven samples at concentrations generally at least an order of magnitude higher than the ecological toxicity threshold value (barium - 0.089 to 0.123 ppm vs. 0.004 ppm, manganese - 0.480 to 0.900 ppm vs. 0.08 ppm). The only other threshold exceedances noted in the samples collected from Indian Ridge Marsh were for iron (three samples), lead (one sample), and 4,4'-DDD (one sample).

The eight surface water samples collected from the ponds at the LCC site (SW12 through SW19) generally contained the lowest overall levels of contamination at the site. Overall, 33 of the 48 COPC symbols (eight sample locations, six COPCs per sample location) denote concentrations below the respective ecological toxicity threshold values. However, water quality varies across the LCC site from north to south. Samples collected from ponds LHL1 and LHL2, which are located at the northern portion of the LCC site, show 30 of the 36 COPC concentrations below the respective threshold values, with barium being the only COPC with elevated concentrations. In comparison, the samples collected from the southeast pond to contain only three of the 12 COPC symbols at concentrations below the respective threshold values. The southeast pond contained significant levels of barium, as well as elevated levels of lead and pesticides.

5.3.2 Nitrogen

A total of 17 surface water samples, including two duplicate samples (L1WD and AW3D), were analyzed for ammonia, total cyanide, total Kjeldahl nitrogen (TKN), and nitrates-nitrites. The results of the nitrogen sampling are presented in Attachment F, Table F-13.

Ammonia. Eleven surface water samples were found to contain ammonia (as N) at concentrations above the detection limit. The majority of on-site surface water samples revealed only low levels of ammonia. The exceptions were the southeast pond sample L3W and Alburn sample AW2, which showed ammonia levels of 71.5 mg/L and 49.2 mg/L, respectively. Ammonia was only detected in

trace amounts in Indian Ridge Marsh, with the highest ammonia concentration collected at IRP-5 in the center of the marsh (0.702 mg/L). All of the surface water samples from Indian Ridge Marsh were below the Illinois EPA standard for general use water and the U.S. EPA's suggested Criteria Maximum Concentration (CMC) most conservative standard for ammonia in freshwater, which is based upon the pH of the water and the presence of salmonid species.

Total Cyanide. Total cyanide was present in nine out of 17 surface water samples. Only two of the Indian Ridge Marsh samples contained cyanide.

Total Kjeldahl Nitrogen. TKN was detected in the majority of surface water samples, however, all except two of the results were below 10 mg/L. Sample L3W collected from the southeast pond showed the highest concentration of TKN (87.6 mg/L).

Nitrate-Nitrite. The results of nitrate-nitrite sampling showed low levels in Indian Ridge Pond and the on site ponds. However, 4 of the 5 samples collected from ponded water on the Alburn site did not reveal nitrate-nitrite levels above the detection limit.

Ecological risks posed by site surface water contamination are further discussed in Section 6.

5.4 Macroinvertebrate Results

Macroinvertebrates were classified in Indian Ridge Marsh and the on-site ponds. The results are presented in Attachment E, Table E-11. Tolerance values (TVs) were developed for different taxonomic levels, and are listed next to the organism classification when available. The TVs range from 0 to 10, with 0 being the least tolerant organisms that require pristine conditions and 10 being the most tolerant organisms that can tolerate most water quality conditions. Each sample location is summarized with the total number of taxa found at that location, the total number of organisms, the lowest TV assigned to organisms at that location, and the Family Biotic Index (FBI). The FBI is calculated by multiplying the number of organisms in each taxon by the TV for that taxon, summing the products, and dividing by the total number of organisms in the sample. For taxa with ranges of

TVs, the average was used, and taxa with no known TV (e.g. *Hemiptera*) were not included in the equation.

For samples MAC01, MAC02, and MAC13, a ponar dredge was used to obtain bottom sediment; however, no identifiable organisms were found. In samples MAC03 through MAC11 (Indian Ridge Marsh), the amphipod *Hyalella azteca* was the dominant taxa, but it was absent in the other samples. Based on the TVs and FBIs, pond LHL1 and the two most southern samples of Indian Ridge Marsh are the areas with both the least number of organisms, as well as the lowest benthic species diversity. Only four total organisms were found in pond LHL1 (samples MAC12 through MAC14). Although pond LHL2 contained a higher number of organisms than pond LHL1, only two taxa were found in pond LHL2 (samples MAC15 through MAC17). The southeast pond contained levels of species diversity comparable to the Indian Ridge Marsh samples, with samples MAC18 and MAC19 having TV values of six.

In conclusion, the macroinvertebrate analysis suggests that organisms with TVs lower than 5 may not be able to survive in the existing sediment and water conditions at the LCC site. Furthermore, the fact that only more tolerant species exist on the LCC site exemplifies the ecological impact that is suggested by the screening level exceedances consistent throughout this report. Ecological risks posed by the LCC site contamination are further discussed in Section 6.

5.5 Groundwater Results

5.5.1 Well Hydrogeology

As stated previously, 12 groundwater wells were installed in the study area during the Phase II field activities. The elevations of the wells were surveyed on May 26, 1999, and June 3, 1999, and depth to water measurements were taken at the time of sampling. During the initial survey, a groundwater well installed by Patrick Engineering on the Paxton I property was used as a benchmark for determining the elevation of the newly installed wells. Upon reviewing the surveyed elevations and comparing them to the Patrick Engineering elevations, a discrepancy was found. E & E re-surveyed the well locations on October 26, 1999, and recalculated the groundwater elevations (Attachment A, Figure A-19). The

updated elevations were not surveyed relative to the original Patrick Engineering elevations because a verifiable benchmark was not available nearby and the Patrick Engineering well was not accessible. Instead, the new well elevations were surveyed relative to each other using an arbitrary benchmark of 100 established at well LC10. The settling over time of the benchmark that was established by Patrick Engineering is one possible explanation for the discrepancy in previously reported well elevations. The updated survey elevations did not change the flow direction pattern shown in the previous reports, but did slightly lessen the magnitude of the gradient.

During the Phase II sampling event, groundwater was documented within three feet of ground surface for all but four of the shallow wells (LC01, LC05, P03 and P04). As seen in Figure A-19, the water table in the study area is highest around new monitoring well location LC07. The groundwater level is between 1 and 7.5 feet higher compared to the other new monitoring wells, resulting in an average horizontal hydraulic gradient of 0.004 across the site. At the time of sampling, water levels measured in the new wells suggest that groundwater flow was from the Alburn site toward the northeast, east and southeast. Well LC07 is located in a low lying area of the Alburn portion of the study area. Included in this low lying area are several areas of ponded water, which most likely are the result of rainfall and stormwater runoff from Alburn and other parts of the LCC site. Therefore, there is an apparent potential for groundwater to flow radially outward from location LC07 in the Alburn area to the locations of ponds LHL1 and LHL2 to the northeast, Indian Ridge Marsh to the east, and toward the southeast pond. The Paxton II landfill located to the northwest of the Alburn site and the area directly west of Alburn may also contribute as a source of runoff for this area.

The boring logs for each of the new monitoring wells show that there is no significant obstruction, e.g., continuous clay from the surface down, preventing the flow of groundwater from location LC07 to any other monitoring well location on site. Thus, any contamination present in groundwater at the Alburn site is likely to migrate to the other monitoring wells, and, possibly, intervening surface water bodies. Based on the single round of water level data, groundwater apparently discharges to Indian Ridge Marsh to the east and Big Marsh to the north.

Several factors may influence groundwater elevations and flow directions in the study area. Seasonal variations in precipitation, runoff, and potential effects from the surrounding marsh areas may

influence the depth to groundwater and subsequent groundwater flow patterns. The presence of two landfills located to the northwest and southwest of the study area may also be impacting groundwater flow directions. It is possible that the waste masses and leachate reservoirs contained in each landfill are influencing local groundwater elevations in the vicinity of the study area. Several leachate seeps have been seen along the eastern edge of the Paxton II landfill. These seeps discharge onto the Paxton I component of the LCC site, which gently slopes towards the east, or north of the Alburn area. It is important to note that only one round of water level measurements was collected during the investigation, and no data on groundwater elevation was collected west of LC07 or west of Paxton I in the northwest portion of the study area; therefore, seasonal variations and potential impacts of surrounding landfills on groundwater flow directions in the study area are unknown.

5.5.2 Shallow Well Data Analysis

The LCC site has shallow groundwater that has the potential to discharge to surface water in the area. Only three groundwater samples (GW1, GW2, and GW3) were collected during Phase I. The summarized field data and the tabulated analytical results from the Phase I groundwater samples are presented as Attachment E, Tables E-12 and Table E-13, respectively. All three samples exceeded the OSWER EcoTox threshold for barium, iron, and manganese. None of the three samples exceeded any of the organic contaminant thresholds. Phase I groundwater samples were not filtered, so the samples may have contained small amounts of suspended sediments, which may have artificially increased the concentration of these metals in the water sample.

During Phase II, samples were collected from the 12 groundwater wells that were installed (LC01 through LC07 and LC09 through LC13), as well as from six previously installed groundwater wells (P01 through P05, which are located in the Alburn area, and G21S, which is located in the eastern portion of the U.S. Drum area). Of the 18 wells, there were 3 nested pairs: LC07 and P05 (deep), LC10 and LC09 (deep), and LC12 and LC11 (deep). Phase II sampling protocol required that double the typical sample volume be collected for inorganic analysis in order to submit both filtered and unfiltered samples for analysis.

Field data collected during the construction and development of the installed groundwater wells and during sample collection is summarized in Attachment F, Table F-11. The information presented in this table includes the recorded values for the general chemistry parameters pH, dissolved oxygen (DO), oxidation-reduction potential (ORP), temperature, and specific conductivity. Reported values for these parameters range from 5.72 (LC01) to 8.89 (LC05) standard units for pH, 1.56 (LC06) to 7.42 mg/L (G21S) for DO, 2.89 (LC03) to 521 (LC04) electronvolts for ORP, 11.5 (LC11) to 14.89 (LC13) degrees Celsius for temperature, and 1,955 (LC03) to 14,974 (P05) microohms for specific conductivity. The pH values for samples LC01 (5.72 standard units), LC05 (8.89 standard units) and LC07 (6.34 standard units) are outside of the suggested range of 6.5 to 8.5 standard units presented in the National Secondary Drinking Water Standards of the Safe Drinking Water Act. No applicable federal standards are available for the other general chemistry parameters. Attachment F, Table F-12 contains the tabulated analytical results from the Phase II groundwater samples. pH was the only general chemistry parameter that was analyzed by the laboratory, with the reported values ranging from 6.0 standard units (LC01) to 8.7 standard units (LC05).

Analytical data from both rounds of sampling were compiled, sorted, then compared to various ecological and human health screening criteria to develop summary tables similar to those developed to describe soil contamination at the LCC site. These summary tables are presented as Attachment D, Tables D-11 and D12. Again, using a similar protocol to that used for soil contamination, five COPCs (three inorganic and two organic) were selected to evaluate groundwater quality at the LCC site. The COPCs selected as being most representative of groundwater contamination at the LCC site were aluminum, iron, manganese, benzo(a)pyrene, and benzene.

The COPC concentrations at the 15 shallow wells from the Phase II sampling were used to develop contaminant concentration maps to describe site conditions. Analytical results from deep wells P05, LC09 and LC11 (nested with LC07, LC10 and LC12, respectively) were not used in developing these contaminant concentration maps. However, there is no information to suggest that the aquifer is not continuous between the shallow and deep wells. The analytical results for the samples collected from groundwater wells P05, LC09 and LC11 are discussed in Section 5.5.4 of this report. Unlike the case with soil contamination, in which intermediate threshold values were included in the evaluation, only upper and lower thresholds were used for comparison in developing the groundwater contaminant

concentration maps (Attachment A, Figures A-20 through A-24). A color scale, similar to that used for soil contamination, was developed to represent varying ranges of contaminant concentrations. The contaminant concentration maps that were developed for the COPC metals (aluminum, iron and manganese) contain a side-by-side comparison of total and dissolved contaminant concentrations. A brief analysis of each groundwater COPC is presented below.

Aluminum (Attachment A, Figure A-20). The lower and upper thresholds selected for evaluating total aluminum concentrations in the LCC groundwater were the SMCL (200 micrograms per liter [μg/L]) and the U.S. EPA Region 3 RBC (37,000 μg/L), respectively. The range of total aluminum groundwater concentrations that are presented in the map was 314 μg/L (P03) to 50,500 μg/L, with the highest concentration reported for P02 and a non-detect concentration reported for well LC07.

For dissolved aluminum, detected concentrations range from 59.8 μg/L (LC05) to 401 μg/L, with the highest concentration reported at well LC01, on the north side of Paxton I Landfill. Non-detect concentrations were reported for twelve of the fifteen sampled wells. The detection limit (38.2 μg/L) and the SMCL were used as the lower and upper thresholds, respectively, for evaluating dissolved aluminum concentrations in groundwater at the LCC site.

Based on Attachment D, Table D-11, nineteen of twenty-one total aluminum concentrations exceeded the SMCL, while only one of eighteen detected dissolved aluminum concentrations exceeded the SMCL.

Iron (Attachment A, Figure A-21). The selected lower and upper thresholds used to evaluate iron concentrations in study area groundwater were the SMCL (300 μg/L) and the U.S. EPA Region 3 RBC (11,000 μg/L), respectively. Reported concentrations for total iron ranged from 1,610 μg/L (P03) to 1,370,000 μg/L, with the highest concentration reported at well LC01.

The range of dissolved iron concentrations is from 101 μg/L (LC04) to 1,420,000 μg/L (LC01). The OSWER EcoTox and the SMCL were also used as medium and lower threshold, respectively, for evaluating the dissolved iron concentrations.

The OSWER EcoTox was exceeded by twenty-one of twenty-one reported total iron concentrations, while nine of eighteen dissolved iron concentrations exceeded the OSWER EcoTox criterion.

Manganese (Attachment A, Figure A-22). Total manganese concentrations in groundwater at the LCC site were evaluated using the OSWER EcoTox (80 μg/L) and the U.S. EPA Region 3 RBC (730 μg/L) as the lower and upper thresholds, respectively. The reported sample concentrations ranged from 179 μg/L (G21S) to 12,700 μg/L, with the highest concentration again reported for well location LC01.

Dissolved manganese concentrations range from 107 μg/L (LC10) to 13,700 μg/L (LC01). Again, the OSWER EcoTox and the U.S. EPA Region 3 RBC were used as the lower and upper evaluation thresholds, respectively.

A review of Attachment D, Table D-11 reveals that twenty-one of twenty-one reported total manganese concentrations exceeded the OSWER EcoTox, while sixteen of eighteen dissolved manganese concentrations exceeded the OSWER EcoTox limit.

Benzo(a)pyrene (Attachment A, Figure A-23). The selected lower and upper thresholds for evaluating benzo(a)pyrene groundwater concentrations in the study area were the U.S. EPA Region 3 RBC (0.0092 μg/L) and the OSWER EcoTox (0.014 μg/L), respectively. Reported detected benzo(a)pyrene concentrations in the shallow wells ranged from 0.5 μg/L (LC05) to 8 μg/L, with the highest reported concentration being at well LC10, which is located to the east of the Alburn area. The reported concentrations for wells LC01 and LC07 were rejected for use in developing the contaminant concentration map. Due to the large number of and high concentrations of Tentatively Identified Compounds (TICs) found in these samples, the laboratory had to dilute both samples repeatedly. This resulted in elevated detection limits, which prevented the laboratory from identifying the presence or absence of benzo(a)pyrene in samples LC01 or LC07. In samples where benzo(a)pyrene was positively identified, all concentrations exceed the U.S. EPA Region 3 RBC.

With the exception of an area of elevated concentrations in the vicinity of LC10 and LC12, the highest areas of benzo(a)pyrene in the study area are located in wells in the north (LC02, LC03) and south

(LC06,LC13) ends of the site. An elevated concentration of benzo(a)pyrene (3μg/L) was also detected west of Alburn in well P01

Benzene (Attachment A, Figure A-24). The U.S. EPA Region 3 RBC (0.4 μg/L) and the OSWER EcoTox (50.0 μg/L) were selected as the respective lower and upper thresholds for evaluating benzene concentrations in groundwater at the LCC site. Detectable concentrations of benzene from the collected samples range from 1 μg/L (LC04) to 2,400 μg/L, with the highest concentration reported for LC07, located near the center of the Alburn area. In nineteen of twenty-one groundwater samples collected from the study area and analyzed for benzene, the reported concentration exceeded the U.S. EPA Region 3 RBC. Additionally, for eight of the nineteen samples where benzene was detected, the reported concentration also exceeded the OSWER EcoTox.

The areas of highest benzene concentration at the LCC site were generally located at the Alburn site around LC07. In addition to benzene, well LC07 had significant concentrations of ethylbenzene (5,800 μg/L), toluene (38,000 μg/L), and xylene (18,000 μg/L), indicative of a petroleum release at the Alburn site. These compounds were also detected at LC01, LC13, LC12, and P02.

It should be noted that, in addition to the petroleum related compounds benzene, ethylbenzene, toluene and xylene, other volatile organic compounds including chlorinated solvents were detected in well LC01, north of Paxton I landfill. This well contained tetrachloroethene (PCE) at 130 μg/L, and trichloroethene (TCE) at 270 μg/L, as well as degradation products 1,1-dichloroethane (1,1-DCA) at 1,400 μg/L, 1,2-dichloroethene (1,2-DCE) at 750 μg/L, chloroethane at 190 μg/L, and vinyl chloride at 84 μg/L. All of the concentrations for each of these compounds far exceed their respective EPA Region 3 RBC values. No other well in the study area contained these chlorinated compounds, although the detection limits for the LC07 sample were significantly elevated, leaving their presence or absence at this location undetermined.

5.5.3 Dissolved Metals Versus Total Metals

During Phase II and Phase III, all water samples were filtered for an additional set of metals analysis (dissolved metals). The filtering process removes suspended particulate matter from the water, and

consequently, any contaminants bound to soils or sediment particles. Therefore, only metals dissolved in the water fraction are detected. A total of 4 surface water samples and 18 groundwater samples were analyzed for both dissolved and total metals. The effects of filtering water samples can be found in Tables F-10 and F-12 of Attachment F. A review of the total and dissolved inorganic concentrations presented in these tables reveals that, in general, the dissolved contaminant concentration for a sample is significantly lower than the corresponding total contaminant concentration. This can be seen in reviewing the data for aluminum. In all fifteen samples collected from shallow groundwater wells during the Phase II sample event, the reported dissolved aluminum concentration was at least one order of magnitude smaller than the reported total concentration. Similar trends are notable in the data presented for iron and barium, although in one instance (LC01) the dissolved iron concentration was greater than the total iron concentration. A review of the data for the Phase II surface water samples reveals the same general trend.

5.5.4 Deep Well Data Analysis

Of the groundwater monitoring wells sampled at the LCC site from May 10 through 12, 1999, three were at deeper intervals in the unconsolidated water-bearing zone in nested pairs. These wells (LC09, LC11, and P05) were sampled as part of the Phase II activities. The analytical results from wells LC09, LC11 and P05 were included with the tabulated data contained in Attachment F, Table F-12.

Data from these wells were compared to the same human health and ecological thresholds used to evaluate the analytical results from the shallow wells. The following general conclusions were reached as a result of this comparison.

- Well LC09 contained the highest levels of contamination, both in terms of the number of detected contaminants and the reported contaminant concentrations in the deep groundwater wells. Well LC11 was the least contaminated deep groundwater well.
- Inorganic contaminant levels were significantly elevated. The highest concentration reported was sodium, which was detected at 2,760,000 µg/L in the sample collected from well P05. Levels of dissolved (18 µg/L) and total (22.9 µg/L) arsenic were reported in well P05 which exceed the U.S. EPA Region 3 RBC of 0.045 µg/L.

- For the majority of organic contaminants, analysis revealed that contamination was either not detected or estimated concentrations were reported. The highest reported concentration for an organic contaminant was total xylenes (360 µg/L) in a sample collected from well LC09. Detectable concentrations of benzene (6 µg/L), ethylbenzene (81 µg/L), toluene (7 µg/L) and xylenes (360 µg/L) were noted in well LC09. The presence of these BTEX compounds are indicative of a petroleum product or spill. Detectable levels of benzene, toluene and xylene were identified in well P05. No PCBs were detected, and only very low levels of pesticides and SVOCs were reported. Typical detected VOC concentrations ranged from very low to moderately elevated. Benzene, di-n-butylphthalate, delta-BHC, and heptachlor were the only contaminants that were reported in all three wells.

A similar hydraulic gradient pattern to that observed in the shallow wells is seen in the groundwater elevations for the deep wells, although the same radial pattern was not observed due to the limited number of deep wells at the site. Generally, based on the available data, groundwater flow moves from west to east. The groundwater at P05 is the most shallow, followed by the groundwater elevation at LC09, and the groundwater elevation at LC11 is the deepest of the three. When comparing these groundwater elevations to the elevations at their respective associated shallow well, it was observed that the groundwater elevations at the deeper-screened wells are slightly lower. For example the water elevation at LC11 (deep) is 93.91, while the water elevation at shallow well LC12 is 94.28. This suggests that there is a slight downward, vertical component to the gradient. A comparison of contaminant concentrations within nested pairs (Attachment E, Table E-13) reveals that LC07 (shallow) is more contaminated than P05, LC09 (deep) is slightly more contaminated than LC10, and LC11 (deep) and LC12 have similar contaminant levels. Generally, contaminant concentrations at the LCC site are elevated in Alburn soils, sediments, and water. Since the general groundwater flow direction is east, and a slight downward vertical gradient exists, it could be expected that greater contamination exists deeper in areas to the east. This pattern is seen in the LC09 and LC10 nested wells. At the easternmost nest (LC11 and LC12), contamination is more similar between the wells. However, additional data would need to be collected to further substantiate this analysis and to determine if a similar pattern exists in other portions of the study area.

5.5.5 Nitrogen

A total of 18 groundwater samples were collected and were analyzed for ammonia, total cyanide, total Kjeldahl nitrogen (TKN), and nitrates-nitrites. The tabluated results of the nitrogen sampling are presented in Attachment F, Table F-13.

Ammonia (Attachment A, Figure A-25). The majority of the groundwater samples contained significant levels of ammonia (as N). All of the groundwater samples were found to exceed the U.S. EPA Region 3 RBC of 1 mg/L for ammonia in tap water, as well as the Illinois EPA standard of 15 mg/L for general use water, or waters that do not fall under a specific designation category. The highest concentration of ammonia was 540 mg/L (sample LC01), which is located at the far north end of the LCC site.

Total Cyanide. Total cyanide was present in all of the groundwater samples analyzed. However, all of the samples contained concentrations below the U.S. EPA Region 3 RBC of 0.73 mg/L for cyanide in tap water. The highest detection for total cyanide was groundwater sample LC10 (0.255 mg/L), which was an order of magnitude greater than any other detected value.

Total Kjeldahl Nitrogen. The highest TKN value was 517 mg/L found at monitoring well LC01. The Alburn area groundwater also showed elevated TKN levels, with levels ranging from 98.1 mg/L to 321 mg/L. The only groundwater sample which did not contain TKN was a deep monitoring well (LC09), although the shallow monitoring well in the same nested pair (LC10) revealed a TKN level of 417 mg/L.

Nitrate-Nitrites. Only one of groundwater sample (LC11) revealed the presence of nitrate or nitrite above the detection limit for this analysis.

5.6 Proposed Nature Center Sample Results

One sediment sample (SED20), one water sample (SW20), and one macroinvertebrate sample (MAC20) were collected east of the LCC site, in the pond at the northwest corner of Torrence Avenue

and 122nd Street, at the site of the proposed nature center. The results are presented in Tables E-8, E-10, and E-11 of Attachment E. Results indicate that high metals contamination exists at this location. Among the sediment samples, sample SED20 exhibited the highest level detected for the following nine inorganics: aluminum, arsenic, beryllium, copper, iron, lead, nickel, selenium, and vanadium. For the water samples, sample SW20 contained the highest level of all metals, except potassium, sodium, and thallium; and exhibited the highest levels of 4,4'-DDD, 4,4'-DDE, and 4,4'-DDT. Based on the macroinvertebrate analysis, the lowest TV and FBI for sample MAC20 were relatively high. Since many of these contamination levels exceed those found on the LCC site, contamination probably originated from past land use activities at the pond at the northwest corner of Torrence Avenue and 122nd Street.

6. SCREENING ECOLOGICAL RISK ASSESSMENT

One overall conclusion of the LCC site assessment data is that due to low to moderate levels of contamination throughout site, human health threats are not as much of a concern as ecological threats. Therefore, to begin to better identify the threats to the ecology of the area, a screening ecological risk assessment was conducted. This section presents a starting point for the forthcoming ecological risk assessment to be conducted by U.S. EPA.

The LCC site contains numerous flora and fauna native to the northwestern Illinois region. Cursory field surveys have noted the occurrence of piscivorous birds such as heron, egrets, and killdeer, utilizing the water bodies and associated riparian habitat. Terrestrial species such as passerine birds and small mammals are also found at the site. Canadian geese utilize fields within the LCC, and migratory ducks have also been observed within the wetlands on site. The Black-crowned Night-heron, an Illinois-listed endangered species, has also been observed at the site. The ecological threats posed to these and other animals by contamination at the LCC site is outlined in this section.

6.1 Exposure Assessment

6.1.1 Fate and Transport

Surface soil across the site consists of a mixture of silt, clay, sand, and slag (especially in the northern portion of the site). This soil type is typically low in organic material with medium to low permeability. These factors most likely limit development of a microbial community, thereby reducing the likelihood of microbial decomposition of sorbed organic contaminants. The fate of these contaminants then will be expected to: 1) remain in the soil to undergo degradation and/or 2) migrate downward.

In addition, contaminants sorbed to surface soil conceivably could be transported via air or surface water runoff. However, both of these pathways are unlikely as major routes. Contaminants are not expected to spread far via surface runoff due to the permeable nature of the substrate across much of the site. The physical adsorption of contaminants to soil particles and available organic material also limits horizontal migration. Migration via air pathways could be significant only as it relates to dispersal of upper soil layer particles during high winds. Paxton II, Land and Lakes #3, and sections of Paxton I and the Unnamed Parcel are not currently covered by vegetation, and may be particularly susceptible to soil dispersion via air pathways.

Contaminant movement and availability in sediments can be difficult to assess. Variables such as organic carbon, grain size, and sulfides are critical to sediment loading capacities. In addition, specific contaminant characteristics such as molecular weight, or sediment/water partition coefficients can affect adsorption or chemical degradation rates and potentials. For metals, adsorption potentials for sediments are related to grain size, and to a lesser extent, to organic carbon. Fine-grained particles, particularly aluminosilicate clays, provide a greater surface area and a crystalline microstructure conducive to the adsorption of inorganic contaminants. Mobilization of metals in sediments is a function of pH, temperature, and the oxidation-reduction potential (redox). Organic contaminants, particularly hydrophobic compounds, tend to sorb to water-borne particulates (clays, colloids, humic substances) that eventually end up as bottom deposits.

In water, the likelihood that a dissolved contaminant will be retained within the medium is dependent on that chemical's fugacity, or escaping tendency. The fugacity potential is based on both the chemical specific traits and medium thermodynamic influences. The partitioning coefficient of a chemical is an indication of that chemical's affinity for water or another medium (sediment, tissue, suspended particles). Under ideal conditions, the partitioning coefficient for a chemical is constant, but the environmental parameters (light attentuation, pH, redox) that can influence partitioning vary with site conditions.

6.1.2 Characteristics for Select Chemicals

Inorganics

In general, heavy metals adversely affect survival, growth, reproduction, development, and metabolism of both terrestrial and aquatic invertebrate species, but effects are substantially modified by physical, chemical, and biological variables. Pascoe *et al.* (1994) observed that, in general, bioavailability of metals and arsenic in soil to small mammals was limited. The study also suggests that metal and arsenic intake for higher tropic species may be similarly limited. Most heavy metals do not biomagnify.

The following summarizes the toxicological effects and physical and chemical characteristics of inorganic COPCs identified at the LCC site.

Arsenic. Arsenic naturally occurs and, with respect to cycling in the environment, is constantly changing. Many inorganic arsenicals are known teratogens and are more toxic than organic arsenicals (Eisler, 1988). Soil biota appear to be capable of tolerating and metabolizing relatively high concentrations (microbiota to 1,600 mg/kg) of arsenic (Wang *et al.*, 1984). But adverse effects to aquatic organisms have been reported at concentrations of 19 to 48 μg/L in water. Arsenic does not appear to magnify along the aquatic food chain.

Cadmium. Cadmium is a relatively rare heavy metal. It is a known teratogen and carcinogen and probably a mutagen, and has been implicated as the cause of severe deleterious effects on fish and wildlife (Eisler, 1985). Birds and mammals are comparatively resistant to the biocidal properties of cadmium. Freshwater organisms appear to be the most susceptible group to cadmium toxicity and this is modified significantly by water hardness. Adsorption and desorption processes are likely to be major factors in controlling cadmium concentrations in natural waters. Adsorption and desorption rates of cadmium are rapid on mud solids and particles of clay, silica, humic material, and other naturally occurring solids.

Chromium. Hexavalent chromium (Cr VI) produces more adverse effects to biota than does the trivalent phase.. In clayey sediments, trivalent chromium dominates and benthic invertebrate

bioaccumulation is limited (Neff, *et al.*, 1978). The solubility and potential bioavailability of waste chromium added to soil through sewage sludge are modified by soil pH and organic complexing substances (James and Bartlett, 1983).

Lead. In soil, lead concentrates in organic-rich surface horizons (NRCC, 1973). Estimated residence time of lead in soil is about 20 years (Nriagu, 1978). In sediments lead is primarily found in association with iron and manganese hydroxides and may also form associations with clays and organic matter. Under oxidizing conditions, lead tends to remain tightly bound to sediments, but is released into the water column under reducing conditions. Lead may accumulate to relatively high concentrations in aquatic biota.

Mercury. Mercury is a known mutagen, teratogen, and carcinogen. It adversely affects reproduction, growth and development, motor coordination, and metabolism. Mercury has a high potential for bioaccumulation and biomagnification. Organomercury compounds produce more adverse effects than inorganic mercury compounds. Inorganic mercury can be modified to organic mercury compounds through biological transformation processes.

Zinc. In natural waters, zinc speciates into the toxic aquo ion ($Zn(H_2O)^{6})^{2+}$), other dissolved chemical species, and various inorganic and organic complexes, and, in addition, it is readily transported. Most zinc introduced into aquatic environments is eventually partitioned into the sediments. Reduced conditions enhance zinc's bioavailability.

No information was available on the toxicological effects associated with other inorganics in soil, sediment, or water.

Organics

The following summarizes the toxicological effects, as well as the physical and chemical characteristics of organic COPCs identified at the LCC site.

PAHs. PAHs vary by molecular weight. With increasing molecular weight, aqueous solubility decreases and the log of the octanol/water partition coefficient (K_{ow}) increases, suggesting increased solubility in fats, a decrease in resistance to oxidation and reduction, and a decrease in vapor pressure (Eisler, 1987a). Accordingly, PAHs of different molecular weight vary substantially in their behavior and distribution in the environment and in their biological effects. In water, PAHs either evaporate, disperse into the water column, become incorporated into sediments, or undergo degradative processes such a photooxidation, chemical oxidation, and biological transformation by bacteria and animals (Neff, 1979).

Most environmental concern has focused on PAHs that range in molecular weight from 128.16 (naphthalene) to 300.36 (coronene). Generally, lower molecular weight PAH compounds containing two or three aromatic rings exhibit significant acute toxicity but are not carcinogenic. Higher molecular weight PAH compounds with four to seven rings (e.g., benzo(a)pyrene, benzo(a)anthracene, dibenz(a,h)anthracene), are significantly less toxic, but are demonstrably carcinogenic, mutagenic, or teratogenic to aquatic species. PAHs show little tendency to biomagnify in food chains because most are rapidly metabolized (Eisler, 1987a). Very little information is available on food chain adverse effects as a result of soil PAH contamination.

DDD, DDE, DDT. Organochlorine pesticides have been used extensively in the United States since the 1940s. They appear to be ubiquitous in the environment, being found in surface water, sediment, and biological tissues. They are readily absorbed by warm-blooded species, and degradatory products are frequently more toxic than the parent form. Food chain biomagnification is usually low, except in some marine mammals. In soil invertebrates, organochlorine pesticides can accumulate to concentrations higher than those in the surrounding soil, and residues may in turn be ingested by birds and other animals feeding on earthworms (Beyer and Gish, 1980). Most environmental effects studies have been directed at mammals and birds.

PCBs. PCBs are distributed worldwide, with measurable concentrations recorded in fishery and wildlife resources from numerous locations (Eisler, 1986). They are known to bioaccumulate and to biomagnify within the food chain and to elicit biological effects such as death, birth defects, tumors, and a wasting syndrome. In terrestrial environments, PCBs are rapidly metabolized from the soil into

the terrestrial food chain (McKee, 1992). Subsoil-dwelling organisms may directly absorb PCBs and food chain transfer to lower-level vertebrate species may occur.

6.2 Exposure Pathways

Analytical results have shown that soil, water, and sediment at the LCC site each have contaminant concentrations above ecological screening benchmarks, and that impacts could occur to receptors if they are exposed. A conceptual model showing exposure pathways from either direct media exposure or transfer through food chains is shown as follows:

SOIL	➡	**SOIL DWELLING BIOTA**	➡	CARNIVOROUS BIRDS
SOIL	➡	PLANTS	➡	**HERBIVOROUS MAMMALS**
WATER	➡	**AQUATIC ORGANISMS**	➡	**FISH/AQUATIC ORGANISM EATING BIRDS**
WATER	➡	SEDIMENT	➡	**BENTHIC ORGANISMS** ➡
		AQUATIC ORGANISMS	➡	FISH ➡
		FISH/AQUATIC ORGANISM EATING BIRDS		

Receptor groups that are addressed in this screening assessment are bolded.

Infaunal (soil-dwelling) Invertebrates

The primary exposure pathway evaluated for infaunal invertebrates will be via direct contact with surface soil. An assessment endpoint of a well-balanced soil infaunal community will be quantitatively and qualitatively measured by comparing actual soil concentrations to 1) soil screening values, and 2) literature data on toxic effects to infaunal organisms and communities, respectively.

Terrestrial Wildlife

For terrestrial wildlife species, exposure pathways include direct dermal contact, ingestion of soil particles, and food-chain transfer. Small mammals could contact contaminated soil if the area is used as a migratory corridor or if animals burrow into it. The contact time, and thus exposure, will be limited when animals are crossing the area, but could be lengthy if burrows are established. Dermal contact by small reptiles and amphibians would be similar to that for mammals. For insect populations, direct exposure to ground-dwelling species could provide a link for contaminant transfer to higher-level predators.

The assessment endpoint selected for terrestrial wildlife is the maintenance of well-balanced terrestrial wildlife populations and communities. As a measure of the assessment endpoint selected, results of laboratory toxicity studies in literature that relate the oral dose of a contaminant with adverse response to growth, reproduction, or survival were used. Selected representative wildlife species evaluated through this comparison include: American robin (*Turdus migratorius*), and Eastern cottontail rabbit (*Sylvilagus floridanus*).

To assess biotransfer of contaminants along food chains the average daily dose (ADD) has been modeled for representative wildlife species at LCC. ADDs are calculated based on predicted concentrations of the chemical of potential concern (COPC) in food items that the species would consume, the amount of soil it would ingest, the relative amount of different food items in its diet, body weight, and food ingestion rate (Appendix G, Table G-1). The concentrations of COPCs in food items are estimated based upon chemical-specific, literature-reported, bioaccumulation factors (BAFs). BAFs are a ratio of the COPC concentration in dietary items to the concentration in soil. The BAFs reported for avian and mammalian species are reported ratios of COPCs in the tissue of the animals, to the concentrations of COPCs in their diets.

Exposure parameters and assumptions for representative species were used to calculate food contaminant concentrations (Appendix G, Table G-2). ADD values were obtained using the model for prediction of contaminant exposure presented in Appendix G, Table G-1.

The site foraging factor (SFF), included in the ADD model (Appendix G, Table G-1), considers the frequency of feeding at the site. This factor is generated by dividing the receptors feeding range by the acreage of the site (cannot exceed 1). The fraction of the year the receptor would be exposed to site contaminants (i.e., months per year found at site) is also considered in the exposure model. For conservative purposes of this screening assessment, it is assumed that each representative wildlife species will forage at the LCC site 100% of the year, and will consume 100% of its diet from sample areas represented by mean or maximum concentrations. Also, no assimilation factor (percentage of chemical that is biologically processed by animal) for contaminants has been applied in the uptake models. For this screening assessment, it is assumed that 100% of the contaminant concentration used in the model will be assimilated by the animal.

Aquatic Wildlife

Exposure to water and sediment-borne contamination includes direct exposure through respiratory organs (gills) and dermis (skin). Primary exposure to second, third, and fourth order trophic levels would include ingestion and bio-uptake of contaminants. Exposure scenarios addressed in this assessment focus on direct exposure to wildlife from in-situ (water-borne) contamination.

6.3 Risk Characterization

6.3.1 Soil

Impacts to receptors from soil contamination may result from direct exposure, or from bioaccumulation and biotransfer to upper level trophic species (see Conceptual Model). To assess the impacts from direct exposure, results from approximately 120 surface soil (0-1 foot BGS) samples collected during this site assessment (Table D-2) were compared to established RCRA EDQL and ORNL screening levels for effects to earthworms and microorganisms. In addition, concentrations observed were compared to those cited in the literature causing acute or chronic effects to infaunal organisms or communities (Appendix G, Table G-3).

Infaunal Invertebrates

Exceedances of RCRA and ORNL screening levels for organic constituents detected in surface soils at the LCC site were minimal and none, respectively. Most toxicological information reviewed for the

infaunal invertebrates dealt with earthworms and other infaunal species. It is important to note that soils found at LCC may not support these specific-type organisms (i.e. slag and debris found throughout the site). Although infaunal species found at the site may not be the same as those dealt with in the literature, the ecological niche (role) which they occupy will be similar, therefore, comparison to toxicological concentrations should apply.

Metals. Most studies on metals toxicity to terrestrial receptors have been directed at infaunal ecosystems or avian biology. Information on relative metal toxicities to earthworms was provided by Roberts and Dorough (1984) where, along with 90 other chemicals, three metal salts (cadmium chloride, copper sulfate, and lead nitrate) were tested. The results showed that these heavy metal salts fell into the "very toxic" category, with LC_{50} values in the 10 to 100 micrograms per square centimeter ($\mu g/cm^2$) range. Although these concentrations (more specifically, application doses) may be relative to earthworms, it is improper to apply them to upper-level trophic species. Studies indicate that some degradation products become increasingly more toxic to earthworms and less toxic to upper-level vertebrates. Other studies on toxicities of metal salts to earthworms have been conducted by Neuhauser et al. (1986), and Malecki *et al.* (1982). In the former study, metal nitrate compounds were relatively toxic to earthworms in this order: copper > zinc > nickel > cadmium > lead. Mean LC_{50} values were 643, 662, 757, 1,843 and 6,000 mg/kg, respectively. In the latter study, six chemical forms of each metal were chosen to cover a broad range of solubility and to represent the forms likely to be found in the soil. Overall, cadmium was most toxic, followed by nickel, copper, zinc, and lead. It appears obvious from the results of these two studies that the form of the metal in soil is a major consideration in judging effects of its concentration on soil biota.

Soil metals concentrations across the site were generally an order of magnitude lower than effect levels observed by Neuhauser *et al.*(1986) and Malecki *et al.* (1982) (Appendix G, Table G-3). Although the form of the metal found (i.e., salt) was not specifically identified at LCC, it is presumed that analytical results, for each metal detected, represent accumulative (total) concentrations. Based on this assumption, no risk is predicted to infaunal organisms or communities from the metal concentrations observed.

Semivolatiles. Although some semivolatiles in soil are considered carcinogenic to mammals, very few field studies exist on their toxicity to terrestrial infauna. Generally, PAHs break down in natural

systems via photodegradation and microbial transformation. Neuhauser *et al.* (1986) found that specific phenol compounds (4-nitrophenol, 2,4,6-trichlorophenol, and phenol) were somewhat toxic to earthworms, with PAHs being relatively less toxic than other semivolatile compounds studied. Artificial soil tests produced LC_{50} (concentration lethal to 50% of the tested population) values for fluorene and phenol near 200 mg/kg and 400 mg/kg, respectively (Appendix G, Table G-3). Callahan *et al.* (1994) found similar results in their study on toxicity of 62 chemicals to several earthworm species. However, SVOC soil concentrations observed at LCC were significantly below those reported in the literature (See Table G-2: Neuhauser *et al.*, 1986). All maximum and mean PAH concentrations were less than 4 ppm, and phenolic compounds were less than 1 ppm.

Pesticides. Most toxicological studies on terrestrial infaunal organisms have been directed at measuring pesticide effects. Earthworm toxicology and response information is the most prevalent. In a study by Beyer and Gish (1980), persistence of DDT, dieldrin, and heptachlor were observed in earthworms from field study plots. Investigators agree that earthworms can accumulate pesticides to concentrations found in residence soil. Callahan, *et al.* (1991), showed very good soil-to-tissue correlation R = 0.725), with accumulation of DDT in single earthworms up to 22 mg/kg. Beyer and Gish (1980) found that earthworms accumulated DDT to 32 mg/kg. Barker (1958) associated poisoning (lethality) of robins with 60 mg/kg DDT in earthworms, and Collett and Harrison (1968) found that blackbirds and thrushes were impacted at residues near 20 mg/kg. At concentrations observed in their study, Callahan *et al.* (1991) suggested that a feeding rate by robins of 10 to 12 earthworms in as many minutes (as observed by MacDonald, 1983) could provide a sufficient concentration of contamination for impacts to robins. Callahan *et al.* (1991), also found that chlordane, as with other pesticides, was taken up rapidly by earthworms. In Callahan *et al.* (1991), total DDT concentrations greater than 1,000 mg/kg in soil, along with documented long half-life information (5.7 years DDT), indicated a long-term significant risk to receptors. Mean organochlorine soil concentrations observed at the LCC site (DDT = 0.026 mg/kg; DDE = 0.049 mg/kg; DDD = 0.016 mg/kg) were significantly below those reported in the literature as causing direct impacts to soil communities, however, both mean and maximum levels were in the range for concern of impacts from biotransfer of these compounds within food chains.

PCBs. Risk factors associated with PCBs are similar to those for pesticides. After acute mortality, food chain biomagnification and transfer are the most important issues to be considered when assessing long-term risk. Paine *et al.* (1993) suggested a benchmark value between 100 to 300 mg/kg PCB for mortality (acute impact) in terrestrial insects. Also, Rhett *et al.* (1988) observed LC_{50} values for earthworms treated with PCBs at 240 mg/kg. McKee (1992) reported that soil invertebrate community structure was not reduced by exposure to PCB-contaminated soil (maximum concentrations to 120,000 mg/kg wet weight), based on family-level classification of invertebrates. A single maximum value of approximately 69 ppm for Aroclor 1254 was the only concentration close to reported literature effects levels (see Table G-2: Rhett *et al.*, 1988). Mean concentrations for all PCB congeners identified during this site assessment were less than 2 ppm.

Terrestrial Wildlife

The risk to representative wildlife species from potential ingestion of surface soil and food are quantitatively evaluated using the hazard quotient (HQ) approach. For select COPCs, the average daily dose (ADD) is divided by a toxicological threshold risk value (TRV) to produce the HQ. When the estimated ADD is less than the NOAEL (no observable apparent effects level) -based TRV, an HQ less than 1 is derived, and the contaminant exposure is assumed to fall below a level considered to be associated with adverse effects for growth, reproduction, and survival (i.e., chronic effect), thus no risk to the wildlife populations at LCC is predicted. When the HQ is greater than one (1), risk is assumed and the ecological significance of each exceedance is discussed.

For representative terrestrial wildlife species, ADDs were calculated for benzo(a)pyrene, 4,4'-DDE, 4,4'-DDT, and Aroclor 1254.

Table G-4 provides the results of the modeling effort for soil contaminants effects to American robin and Eastern cottontail rabbit. Because a TRV for benzo(a)pyrene was unavailable in the literature reviewed (Sample *et al.*, 1996), predicted impacts to robin from maximum concentrations were inconclusive. An HQ derived for predicted effects to Eastern cottontail rabbit from benzo(a)pyrene was below one (HQ = 1.4E-01).

For all three organochlorine compounds, DDE, DDT, and Aroclor 1254, both maximum and mean concentrations produced HQs above one for American robin (Appendix G, Table G-4). However, based on the conservative nature of the exposure model (SFF = 1), and with the additional assumption that food sources are actually available at the LCC site, it is suspected that potential risks to passerine birds found at the LCC site are low to moderate. To determine if the model is accurate, it would be necessary to field verify food resources and use of the site by passerine birds. In addition, direct measurement of earthworm tissue for organochlorine concentrations would provide a better predictor for potential risk via bio-uptake.

For the rabbit, only the maximum PCB value produced a HQ above one. Based upon this limited screening assessment, it is predicted that no risk to mammalian herbivores is present at the LCC site.

6.3.2 Sediments

Aquatic Wildlife

Sediment samples for organic compounds revealed a diverse assortment of VOCs, SVOCs, and pesticides/PCBs. Detected concentrations of SVOCs (particularly PAHs) and pesticide/PCBs consistently exceeded lower threshold screening levels (Ontario-LEL and NOAA-ERL), but exceeded upper thresholds only a limited number of times.

Overall, sediment organic concentrations were consistent with the historical use of the site (i.e., PAHs are typically associated with industrial activities). For the two organic groups, PAHs and pesticides/PCBs, total concentrations were at levels which might suggest long-term impacts to aquatic life. LELs and ERLs are generally based on lowest observed effects levels (typically chronic in nature) for many different aquatic organisms. The exceedance of these levels suggests that there may be impacts to indigenous organisms from concentrations above these levels. That upper screening levels were not exceeded does not eliminate the risk potential, but in fact, requires that a more defined analysis of the potential for impacts be conducted.

Water sample results for these two organic groups showed low frequency of occurrences (Appendix G, Table G-3). This suggests that continual sediment contribution to water-borne contamination is minimal, and, as these organics are highly hydrophobic in nature, they may be cycling through a biotic phase via

pore-water. Thus an assessment of biotic tissue concentrations would provide a better perspective as to the fate of these contaminants within the aquatic community.

Benthos

Macroinvertebrate samples from 20 wetland locations were sorted, identified, and enumerated. Results of benthic macroinvertebrate sampling (primarily species with relatively high tolerance values-TV, and high family biotic indices-FBI) revealed assemblages typically associated with poor water quality conditions. The low species diversity and richness, which is typically exhibited by a preponderance of tolerant organisms or communities, is another indication of environmental impairment within the waterbodies at the LCC site. In general, healthy ecosystems exhibit a diverse and balanced faunal community, with all trophic levels proportionally represented, and with no obvious population imbalance. It is not clear that the chemical constituents observed in sediments at the LCC site are responsible for the modified macroinvertebrate community. Environmental factors such as sediment grain size, dissolved oxygen, pH, alkalinity, turbidity, chloride, biological oxygen demand (BOD), sulfates, or nitrates, may also be limiting factors. A more detailed study of these factors in association with observed chemical contamination, along with a comparison to a reference site, is needed before a conclusion as to cause and effect can be made.

6.3.3 Surface Water

Aquatic Wildlife

Except for barium and manganese, most surface water concentrations did not exceed screening levels Table B-9). Silting-out, due to suspended solids in the water column, may be one reason for low concentrations observed for total metals. Typically higher concentrations are observed in analyses for total metals due to the metal's affinity for suspended solids within the water column. Although this was typically the case with the LCC data, the dissolved fraction is ecologically most significant as it is more easily assimilated by aquatic organisms. In general, when ratios for 'frequency of detection' for total versus dissolved metals were compared, the dissolved fraction was consistently found more often. Also, hydrophobic tendencies of organic constituents, resulting in binding with suspended organic carbon particles, may be occurring. Through both the silting-out and hydrophobic mechanisms, an increase in sediment loading and decrease in water-borne contaminant concentrations is likely to occur.

Piscivorous Wildlife

Elevated risk potentials to piscivorous wildlife species such as herons, egrets, and killdeer would primarily be related to biouptake/biotransfer of organochlorine contaminants such as DDT (+metabolites) and PCBs by aquatic organisms. Studies (Macek and Korn, 1970) have shown that fish accumulate approximately 10 times more DDT from food than from water, and thus, the food chain is the major source of DDT for fish. Although surface water results did not reveal substantial concentrations of these organics, DDT and PCBs were ubiquitous in sediments at the LCC site, and are potentially available to benthic organisms, and subsequently to species that feed on them. Therefore, wildlife species which prey on aquatic organisms may be at risk from the organochlorine contamination found in sediments at the LCC site. As discussed for sediments, assessment of fish tissue would be critical for determining if piscivorous wildlife are at risk.

7. CONCLUSIONS AND RECOMMENDATIONS

7.1 Soil

The COPC concentration maps revealed a diverse level of contaminants present at the LCC site. For surface soils, inorganic contamination is distributed across the LCC site, although typically at low levels. In general, the COPC metals selected (arsenic, barium, chromium, lead, and mercury) did not indicate the presence of a human health threat. The only metals which exceeded the human health standards for any samples were arsenic and lead. The highest exceedance in the arsenic data of the U.S. EPA Region 3 RBC (5.7 ppm) was found below the surface. Lead concentrations above the human health standard were found in small hot spots contained in the Alburn area and in the southwestern hot spot location. Although the human health threat from metal contamination is considered minimal, most of the surface samples and many of the subsurface soil samples exceeded the ecological RCRA standard. However, it is important to note that the RCRA EDQL standard for all five of the metal COPCs was below the Illinois Urban Background Level for each respective analyte. Therefore, while the data shows a potentially significant ecological risk, the majority of the metal concentration maps show values which approximate the background levels for each analyte.

Organic contamination is distributed across the LCC site at slightly to moderately elevated concentrations in surface soils. Benzo(a)pyrene exceeded the Region 3 RBC human health standard across approximately ¼ of the site, with largest contaminated area appearing at the Alburn site. Aroclor 1254, dieldrin, and dibenz(a,h)anthracene also exceeded the human health standard in small hot spot areas. Three additional organic chemicals (beta-BHC, dieldrin, and naphthalene) exceeded the RCRA EDQL across approximately ¼ of the site. Subsurface sampling results for dieldrin, naphthalene, and benzo(a)pyrene also showed that subsurface soil contamination at concentrations above the respective ecological threshold extends to a depth of at least 6 feet BGS.

Other analyses conducted on soils samples were TCLP metals, dioxin, and pH. High levels of TCLP contaminants are only present for lead, and restricted to a hot spot area at the south-central edge of the LCC site. Based on analytical results from the one dioxin composite sample, dioxins and furans do not appear to be a contaminant of concern at the LCC site. pH results from the Phase III soil samples indicated that most values were within normal range. Two-thirds of the reported pH values were within the neutral range of 7.0 to 9.0 standard units, and all pH values were between 6.6 standard units to 11.7 standard units.

Subsurface soil data was primarily collected in the Alburn area and in the southwestern hot spot area, which were the areas delineated as the most contaminated during the Phase I surface soil sampling. In general, the subsurface samples revealed a significant amount of contamination extending below the ground surface. However, it is important to note that subsurface soil sampling was not conducted throughout the entire LCC site, and that the extent of subsurface soil contamination is still unknown across the majority of the site.

Based on an evaluation of the analytical results and the COPC concentration maps, the majority of high contaminant concentrations are limited to the Alburn area of the site and the southwestern hot spot area. Due to the generally low levels of surface and subsurface soil contamination at the LCC site, a site-wide removal action would not be recommended. If it is determined that a removal action is necessary for the LCC site, soil excavation or in-situ treatment would likely be limited to the identified hot spots.

7.2 Sediment

Sediment quality varies across the LCC site. Sediment samples collected from the three on-site ponds were relatively uncontaminated, with most contaminant concentrations in the sediments either approximating or below the Ontario LEL. Sediment samples collected from the Alburn area showed the most significant levels of contamination, particularly for chromium, lead, and chrysene. Sediments from Indian Ridge Marsh are slightly contaminated, with manganese exceeding the Ontario SEL at almost half of the sample locations.

The results of benthic macroinvertebrate sampling revealed assemblages typically associated with poor sediment or water quality conditions. The low species diversity and richness is another indication of environmental impairment within the ponds at the LCC site. However, it is not clear that the chemical constituents observed in sediments at the LCC site are responsible for the modified macroinvertebrate community, or if other environmental factors are limiting the diversity of the community. A more detailed study of these factors in association with observed chemical contamination would be required to before a conclusion as to cause and effect can be made.

7.3 Surface Water

Surface water samples collected at the LCC site generally contain low levels of contamination; barium and manganese were the only contaminants consistently detected at elevated concentrations. In the three on-site ponds, barium was the only COPC which consistently exceeded the ecological threshold. One sample collected in the Alburn area was clearly the most contaminated, with five of the six selected COPCs showing very high concentrations. All of the samples collected from Indian Ridge Marsh revealed elevated levels of manganese and barium.

Sample results for dissolved metals showed significantly less contamination than results for total metals in groundwater. Silting-out, due to suspended solids in the water column, may be one reason for the generally low concentrations observed for dissolved metals. Typically higher concentrations are observed in analyses for total metals due to the metal's affinity for suspended solids within the water column.

7.4 Groundwater

Several conclusions may be made from a review of piezometric data and contaminant concentrations for shallow screened groundwater wells at the LCC site. On the measurement date, groundwater flowed radially outwards from LC07 (the monitoring well with the highest elevation) towards the other groundwater wells. Possible explanations for this pattern included a recharge effect from ponded water in low lying areas on the Alburn site and/or hydraulic impacts from nearby landfills. Elevated contaminant concentrations were generally observed in two portions of the study area. In the north at

monitoring well LC01, between Paxton I Landfill and the Big Marsh, dissolved metals and organic COPCs were consistently above threshold values. This well also contained the lowest pH measured at the site and significant concentrations of chlorinated organics including PCE, TCE, and vinyl chloride, suggesting an impact from Paxton I or other nearby landfills. The second area is the Alburn site, where petroleum constituents and dissolved metals were also detected at concentrations above human health and ecological thresholds. Four out of the five selected COPCs exceeded the human health threshold for drinking water over most or all of the LCC site. The LCC site groundwater was also found to contain elevated levels of ammonia; however, this has not appeared to affected the surface water quality of the site ponds or Indian Ridge Marsh at this time.

In conclusion, groundwater contaminant levels at the LCC site exceeds the OSWER EcoTox and the U.S. EPA Region 3 RBCs for tap water thresholds in several instances. Iron, manganese, and benzene appear to be the most significant contaminants in groundwater, having levels orders of magnitudes greater than the respective comparison criteria. For similar reasons, chlorinated organic concentrations in well LC01 are also significant. Given the groundwater flow pattern relative to the surrounding marsh areas, contaminated groundwater can infiltrate into surface water where humans and wildlife may be exposed. Also, future land use changes could increase the potential exposure to humans. Chronic overexposure to these contaminants can lead to human health and ecological effects.

7.5 Summary

Based on this analysis, Alburn exhibits the highest levels of contamination overall. Multi-media sampling consistently indicated that concentrations of metals and PAHs found in Alburn may pose a threat to human health and the ecology. Other more specific contamination could pose similar threats, including soil contamination near S88 (PAHs) and in the southwestern hot spot (lead and PCBs); sediment contamination in Indian Ridge Marsh (manganese); and surface water contamination in Indian Ridge Marsh (barium and manganese). Groundwater contamination (iron, benzo(a)pyrene, and benzene) could also infiltrate into surface water and threaten human health and the ecology.

Based on current land use, the exposure threats to humans are limited. However, future land use scenarios increasing human activity on site would increase the likelihood of effects. The site and

nearby area serves as home to a rich array of ecological treasures, including the black-crowned night heron and other important wetland species. The macroinvertebrate analysis and screening ecological risk assessment indicate that the ecology could be impacted by contamination on site. More analysis including a full-scale ecological risk assessment and tissue analyses would better quantify the contamination's direct impact on the ecology. Furthermore, additional information from areas west of the site would be needed to determine the source of contamination. Likewise, additional water level measurements would more accurately determine the effect of the contaminated groundwater on the surface water bodies and would further enhance the overall understanding of how site is related to its surrounding areas.

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APPENDIX B

DRAFT COMPREHENSIVE SITE INVESTIGATION REPORT FOR LAKE CALUMET CLUSTER SITE

HARZA (MAY 2001)

COMPREHENSIVE SITE INVESTIGATION REPORT

LAKE CALUMET CLUSTER SITE: ALBURN, U.S. DRUM AND UNNAMED PARCEL AREAS

Prepared for

City of Chicago Department of Environment
Chicago, Illinois

By

HARZA
Engineering Company

MAY 2001

TABLE OF CONTENTS

EXECUTIVE SUMMARY **ES-1**

1.0 SITE CHARACTERIZATION **1-1**

1.1 INTRODUCTION 1-1
1.2 SITE LOCATION 1-1
1.3 SITE DESCRIPTION 1-2
1.4 SITE HISTORY 1-2
1.4.1 Alburn *1-2*
1.4.2 U.S. Drum *1-2*
1.4.3 Unnamed Parcel *1-3*
1.5 GEOLOGY/HYDROGEOLOGY 1-3
1.5.1 Regional Geology *1-3*
1.5.2 Regional Hydrogeology *1-4*
1.5.3 Site Geology *1-4*
1.5.4 Site Hydrogeology *1-5*
1.6 PREVIOUS INVESTIGATIONS 1-6
1.6.1 Field Activity *1-6*
1.6.2 Analytical Results *1-8*

2.0 SITE-SPECIFIC SAMPLING PLAN **2-1**

2.1 SITE-SPECIFIC SAMPLING PLAN 2-1
2.2 BACK HOE EXCAVATION 2-1
2.3 EQUIPMENT DECONTAMINATION 2-1
2.4 LABORATORY ANALYSIS 2-2

3.0 DOCUMENTATION OF FIELD ACTIVITIES **3-1**

4.0 ENDANGERMENT ASSESSMENT **4-1**

4.1 REMEDIATION OBJECTIVES 4-1
4.2 SOLID WASTE 4-1
4.3 NATURE AND EXTENT OF SOIL IMPACT 4-1
4.3.1 Inorganics *4-2*
4.3.2 VOCs *4-5*
4.3.3 SVOCs *4-9*
4.3.4 Pesticides/Herbicides *4-13*
4.3.5 PCBs *4-14*
4.3.6 Dioxins *4-14*

TABLE OF CONTENTS

4.4 NATURE AND EXTENT OF GROUNDWATER IMPACT.....4-14

5.0 CONCLUSION.....5-1

6.0 REFERENCES.....6-1

FIGURES

APPENDICES

TABLE OF CONTENTS

LIST OF TABLES

Section 1

Table 1-1 Monitoring Well Construction Data
Table 1-2 SEL Exceedances in Sediment Samples
Table 1-3 Ecological Toxicity Threshold Exceedances in Surface Water Samples (mg/L)

Section 3

Table 3-1 Test Pit Location Identification by Area

Section 4

Table 4-1 Inorganics Exceeding Soil ROs by Area and Pathway
Table 4-2 Inorganics Exceeding Ingestion Or Inhalation Soil ROs
Table 4-3 VOCs Exceeding Soil ROs by Area and Pathway
Table 4-4 VOCs Exceeding Ingestion or Inhalation Soil ROs
Table 4-5 SVOCs Exceeding Soil ROs by Area and Pathway
Table 4-6 SVOCs Exceeding Ingestion or Inhalation Soil ROs
Table 4-7 Pesticides/Herbicides Exceeding Soil ROs by Area and Pathway
Table 4-8 Locations and Concentrations of Pesticides/Herbicides Exceeding TACO Tier I I/C Ingestion or Inhalation Soil ROs

TABLE OF CONTENTS

LIST OF FIGURES

Figure 1 Site Location Map

Figure 2 Test Pit Locations

Figure 3 Wetland Map

Figure 4 Hydrostratigraphic Units

Figure 5 Test Pits, Monitoring Wells, Soil Borings, Sediment and Surface Water Sample Locations

Figure 6 Geologic Cross Sections Location Map

Figure 7 Geologic Cross Section A-A'

Figure 8 Geologic Cross Section B-B'

Figure 9 Geologic Cross Section C-C'

Figure 10 Groundwater Potentiometric Contours - April 1999

Figure 11 Inorganics Above Minimum Industrial and Commercial Tier 1 Soil Remediation Objective; Soil Ingestion, Inhalation, and Soil Component of Groundwater Ingestion Pathways

Figure 12 Arsenic (0-3 Feet) Above the Industrial and Commercial Tier 1 Soil Remediation Objectives; Soil Ingestion, Inhalation, and Soil Component of Groundwater Ingestion Pathways

Figure 13 Arsenic (>3 Feet) Above the Industrial and Commercial Tier 1 Soil Remediation Objectives; Soil Ingestion, Inhalation, and Soil Component of Groundwater Ingestion Pathways

Figure 14 Lead (0-3 Feet) Above the Industrial and Commercial Tier 1 Soil Remediation Objectives; Soil Ingestion, Inhalation, and Soil Component of Groundwater Ingestion Pathways

Figure 15 Lead (>3 Feet) Above the Industrial and Commercial Tier 1 Soil Remediation Objectives; Soil Ingestion, Inhalation, and Soil Component of Groundwater Ingestion Pathways

Figure 16 VOCs Above Minimum Industrial and Commercial Tier 1 Soil Remediation Objective; Soil Ingestion, Inhalation, and Soil Component of Groundwater Ingestion Pathways

TABLE OF CONTENTS

LIST OF FIGURES

Figure 17 VOCs Above Minimum Industrial and Commercial Tier 1 Soil Remediation Objective; Soil Ingestion and Inhalation Pathways

Figure 18 Benzene (0-3 Feet) Above the Industrial and Commercial Tier 1 Soil Remediation Objectives; Soil Ingestion, Inhalation, and Soil Component of Groundwater Ingestion Pathways

Figure 19 Benzene (>3 Feet) Above the Industrial and Commercial Tier 1 Soil Remediation Objectives; Soil Ingestion, Inhalation, and Soil Component of Groundwater Ingestion Pathways

Figure 20 TCE (0-3 Feet) Above the Minimum Industrial and Commercial Tier 1 Soil Remediation Objective; Soil Ingestion, Inhalation, and Soil Component of Groundwater Ingestion Pathways

Figure 21 TCE (>3 Feet) Above the Minimum Industrial and Commercial Tier 1 Soil Remediation Objective; Soil Ingestion, Inhalation, and Soil Component of Groundwater Ingestion Pathways

Figure 22 SVOCs Above Minimum Industrial and Commercial Tier 1 Soil Remediation Objective; Soil Ingestion, Inhalation, and Soil Component of Groundwater Ingestion Pathways

Figure 23 SVOCs Above Minimum Industrial and Commercial Tier 1 Soil Remediation Objective; Soil Ingestion and Inhalation Pathways

Figure 24 Benzo(a)pyrene (0-3 Feet) Above the Industrial and Commercial Tier 1 Soil Remediation Objectives; Soil Ingestion, Inhalation, and Soil Component of Groundwater Ingestion Pathways

Figure 25 Benzo(a)pyrene (>3 Feet) Above the Minimum Industrial and Commercial Tier 1 Soil Remediation Objective; Soil Ingestion, Inhalation, and Soil Component of Groundwater Ingestion Pathways

Figure 26 Pesticides/Herbicides Above Minimum Industrial and Commercial Tier 1 Soil Remediation Objective; Soil Ingestion, Inhalation, and Soil Component of Groundwater Ingestion Pathways

Figure 27 Pesticides/Herbicides Above Minimum Industrial and Commercial Tier 1 Soil Remediation Objectives; Soil Ingestion and Inhalation Pathways

TABLE OF CONTENTS

LIST OF FIGURES

Figure 28 PCBs Above Minimum Industrial and Commercial Tier 1 Soil Remediation Objectives; Soil Ingestion and Inhalation Pathways

Figure 29 Estimated Lateral Extent of Benzene in Groundwater

Figure 30 Estimated Lateral Extent of Manganese in Groundwater

Figure 31 Estimated Lateral Extent of Lead in Groundwater

Figure 32 Estimated Lateral Extent of Iron in Groundwater

TABLE OF CONTENTS

APPENDICES

APPENDIX A	TEST PIT LOGS
APPENDIX B	SOIL BORING LOGS (E & E, NOVEMBER 1999)
APPENDIX C	PHOTOGRAPHIC LOGS
APPENDIX D	TABLES OF EXCEEDANCES OF REMEDIATION OBJECTIVES
APPENDIX E	RESULTS OF LABORATORY ANALYSES

EXECUTIVE SUMMARY

This Comprehensive Site Investigation (CSI) Report summarizes data obtained during Site Investigation (SI) of the Alburn Incinerator (Alburn), U.S. Drum II (U.S. Drum), and Unnamed Parcel areas, referred to collectively as the Lake Calumet Cluster Site (Cluster Site), in Chicago, Cook County, Illinois. The SI was conducted to determine the nature and extent of site-related environmental or public health concerns at the request of the City of Chicago Department of Environment (DOE).

The Cluster Site is located in the southeastern edge of Chicago, Illinois (Township 37 North Range 14 East, Section 24). The property is in the Lake Calumet region, a heavily industrialized area of southeast Chicago where historic waste disposal and construction practices have altered the environment. Land and Lakes Landfill is located to the west of the property. Paxton I Landfill is north of the property. The Norfolk and Western Railroad right-of-way is the eastern boundary, and 122nd Street is the southern boundary.

The most dominant environmental feature of the Cluster Site is the solid waste that was encountered in test pits throughout, except one high area in the central part of Unnamed Parcel. The solid waste varied from industrial/demolition debris (i.e., metal pieces, bricks, tires, wood, concrete, cinders, etc.) to household wastes (i.e., garbage bags, newspapers, clothing, shoes, rags, etc.). Medical wastes, such as empty syringes, were found in one test pit in the Alburn area Many possible drum remnants were located throughout the site and drums containing product were encountered in one test pit along the west side of the Unnamed Parcel. The solid waste extended beyond the limits of the site and the SI.

The SI comprised sampling of soils from test pits. Two or more samples were collected from each of 134 test pit locations in the three areas. Samples were analyzed for inorganics, volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), pesticides/herbicides, polychlorinated biphenyls (PCBs) and, in some locations, dioxins. Analytical results, except for dioxins, were compared to Tier 1 Soil Remediation Objectives (ROs) in Appendix B of Title 35 of the Illinois Administrative Code (IAC) Part 742, *Tiered Approach to Corrective Action Objectives* (TACO), effective January 6, 2001. Dioxins were compared to U.S. Environmental Protection Agency (EPA) Region 9 Preliminary Remedial Goals (PRGs). The site has been identified for future land use as an industrial park to be developed for production of solar energy. Therefore, the analytical data were compared to ROs for industrial and commercial (I/C) properties.

Samples from all test pit locations except two contain contaminant concentrations above soil ROs. Inorganics and SVOCs exceeding soil ROs were observed over most of the Cluster Site. VOC concentrations exceeded soil ROs in various locations throughout the Cluster Site, notably in the central western part of Alburn, central-eastern part of U.S. Drum, and in the Unnamed Parcel where drums containing product were found. Pesticide concentrations exceeded the soil component of the groundwater ingestion route across most of Alburn and Unnamed Parcel, with the highest concentrations in the western part of Unnamed Parcel. PCBs were observed throughout the site but are most frequent and have the highest concentrations in U.S. Drum.

The vertical extent of contamination is not defined. Solid waste extends deeper than the test pits performed during this investigation. Contamination is observed both in surface soils (0-3 ft bgs) and in deeper soils (greater than 3 ft bgs).

Inorganics exceeding ingestion and inhalation soil ROs are: antimony, arsenic, beryllium, chromium (total), lead, and manganese. The inorganics with the highest concentrations relative to ROs and the most frequent occurrences are arsenic and lead. Additional inorganics exceeding the soil component of groundwater ingestion ROs are barium, cadmium, mercury, nickel, selenium, silver, and thallium.

VOCs exceeding ingestion and inhalation soil ROs are: benzene, chlorobenzene, ethylbenzene, toluene, xylenes, 1,1,1-trichloroethane, 1,1-dichloroethane, 1,2-dichloroethane, 1,2-dibromo-3-chloropropane, carbon disulfide, chloroform, methylene chloride, tetrachloroethene, trichloroethene, and vinyl chloride. Additional VOCs exceeding the soil component of groundwater ingestion ROs are: acetone, styrene, dibromochloromethane, cis-1,2-dichloroethene, and trans-1,2-dichloroethene.

SVOCs exceeding ingestion and inhalation soil ROs are: benzo(a)anthracene, benzo(a)pyrene, benzo(b)flouanthene, benzo(k)fluoranthene, dibenz(a,h)anthracene, indeno(1,2,3-CD)pyrene, bis(2-chloroethyl)ether, and bis(2-ethylhexyl)phthalate. Additional SVOCs exceeding the soil component of groundwater ingestion ROs are 2,4-dinitrotoluene, 2,6-dinitrotoluene, 2-methylphenol, 2,4-dimethylphenol, 4-chloroaniline, 1,4-dichlorobenzene, 2-methylnaphthalene, acenaphthylene, carbazole, isophorone, naphthalene, nitrobenzene, N-nitrosodiphenylamine, pentachlorophenol, and phenanthrene.

Pesticides/herbicides exceeding ingestion and inhalation soil ROs are alpha-BHC and heptachlor. Additional pesticides exceeding the soil component of groundwater ingestion ROs are gamma-BHC and dieldrin.

Principal arochlors contributing to PCB contamination are arochlor 1242, arochlor 1248, arochlor 1254, and arochlor 1260.

Detected dioxins and furans exceeded EPA Region 9 PRGs. However, USEPA guidance recommends action for dioxin at levels higher than those present.

Groundwater under the entire Cluster Site also appears to contain benzene, iron, lead, and manganese above TACO Class I Groundwater Remediation Objectives, based upon evaluation of data collected in a previous investigation by others.

1.0 SITE CHARACTERIZATION

1.1 INTRODUCTION

This document summarizes activities conducted and data obtained during the Site Investigation (SI) of the Alburn Incinerator (Alburn), U.S. Drum II (U.S. Drum), and Unnamed Parcel areas, referred to collectively as the Lake Calumet Cluster Site (Cluster Site), located in Chicago, Cook County, Illinois. The SI was conducted to determine the nature and extent of environmental or public health concerns at the site at the request of the City of Chicago Department of Environment (DOE). The SI encompasses several investigations completed previously and soil sampling from test pits performed by the Illinois Environmental Protection Agency (IEPA). Documentation of previous investigations include:

- Ecology and Environment, Inc. (E & E), 1999, Results of Phase I Sampling Activities for Lake Calumet Site, Chicago, Illinois, March 10, 1999.

- Ecology and Environment, Inc. (E & E), 1999, The Nature and Extent of Contamination at the Lake Calumet Cluster Site, Chicago, Illinois, November 30, 1999.

- Roadcap GS, and Kelly WR. 1994. *Shallow Ground-Water Quality and Hydrogeology of the Lake Calumet Area, Chicago, Illinois*. Illinois Department of Energy and Natural Resources and United States Environmental Protection Agency: Springfield, Ill. Interim Report.

The purpose of this SI Report is to: (1) fulfill the requirements of the comprehensive site investigation section of the Site Remediation Program, 35 Illinois Administrative Code (IAC) 740, Section 740.420, and (2) evaluate site data in accordance with 35 IAC 742, entitled *Tiered Approach to Corrective Action Objectives* (TACO), effective January 6, 2001.

1.2 SITE LOCATION

The Cluster Site is located in the southeastern edge of Chicago, Illinois (Township 37 North Range 14 East, Section 24). The property is in the Lake Calumet region, a heavily industrialized area of southeast Chicago where different waste disposal and construction practices have altered the environment. Land and Lakes Landfill is located to the west of the property. Paxton I Landfill is north of the property. The Norfolk and Western Railroad right-of-way is the eastern boundary, and 122nd Street is the southern boundary. A site location map is presented as Figure 1. Figure 2 shows the division of the Cluster Site into Alburn, U.S. Drum and Unnamed Parcel.

1.3 SITE DESCRIPTION

The Cluster site is approximately 87 acres and consists of unimproved upland with several depressional areas that are seasonally flooded. The National Wetland Inventory Map has identified approximately two acres within the lower depressional areas on site (Figure 3) as palustrine permanently flooded open water wetlands. The relatively flat dry upland dips gently from west to east and is made up of grasses, weeds, bushes, trees, and paved roadways and yard areas.

1.4 SITE HISTORY

The Lake Calumet region, prior to development in the late 1800s, was composed of wetlands, marshes, bogs, and shallow lakes. To make this region suitable for development, large areas of wetlands were filled in with slag wastes from steel production, dredgings from the Calumet River, fly ash, solid industrial wastes, demolition debris, and household trash (Roadcap and Kelly 1994). The histories of the three areas within the Cluster site are discussed below. The site histories are adapted from E & E (November 1999).

1.4.1 Alburn

Based on observations from aerial photographs, fill and pools of standing liquid were noted at Alburn as early as 1958, fill and extraction pits were evident in 1960, fill material was mounded on site in 1964, and fill material was more pronounced in 1967. The Alburn area was operated as a landfill from 1967 to 1977 with unknown types and quantities of wastes disposed in excavated pits and trenches. An industrial facility and vertical and horizontal tanks were removed in 1975. In 1977, hazardous waste incineration and hazardous waste storage/transfer operations were initiated in Alburn. In 1979, the United States Environmental Protection Agency (USEPA) issued a Resource Conservation and Recovery Act (RCRA) permit to Alburn for the operation of an incinerator. Alburn incinerated/stored hazardous wastes and sludges including paints, thinners, varnishes, chlorinated solvents, styrene, ink, adhesives, waste oils, antifreeze, petroleum, naptha, coal tar, and waste solvents. Site storage and disposal methods included landfilling, incineration, operation of a surface impoundment, and bulk liquid waste storage. In 1982, the Alburn area's RCRA permit was revoked due to several violations. Bulk waste was accepted in the Alburn area until January 1983. On July 5, 1985, two drums, located at Alburn, exploded. USEPA ordered an immediate removal action of all visible sources of hazardous materials from the site, including bulk storage tanks, drums, 5-gallon pails, and lagoon sludge. In addition, the top six inches of soil were assumed to be contaminated and were excavated. In a 1986 aerial photograph, a fence line and building stood in the place of the former industrial facility.

1.4.2 U.S. Drum

U.S. Drum area was used as a dump for municipal and industrial wastes since the 1940s. Fill extended into the southeast corner of the area by 1967. During the 1970s the site was used as a

hazardous waste transfer and petroleum recovery facility, until a fire occurred in July 1975. A waste drum temporary storage and transfer facility operated at the site until it was shut down in 1979. An estimated 34,100 gallons of waste were removed between October and December 1979. An estimated 1,750 drums were left on site inside earthen berms. A USEPA removal action occurred at the site from December 1984 through July 1985. During construction of a new access road, approximately 1,500 buried drums were discovered. All observable drums, 435 cubic yards of contaminated soil, and 62,000 gallons of standing water were removed during the removal action. An aerial photograph from 1986 showed a stained area and a pool of standing liquid in the southeast corner of the Cluster Site.

1.4.3 Unnamed Parcel

Prior to the investigation conducted by E & E (November 1999), discussed in Section 1.4, no investigations had been conducted at the Unnamed Parcel. A 1960 aerial photograph shows fill extending into the Unnamed Parcel from other parts of the site.

1.5 GEOLOGY/HYDROGEOLOGY

The following sections describe the regional and site-specific geology and hydrogeology at the Cluster Site. The regional information is derived from geologic literature and available water well drilling logs obtained from the Illinois State Water Survey (ISWS). The site-specific geology and hydrogeology is based on test pits conducted during this site investigation and information obtained from previous site activities, including boring logs and monitoring well data.

1.5.1 Regional Geology

The site is located within the Chicago/Calumet Lacustrine Plain, which is a glacially formed, low, crescent-shaped flat surface that slopes gently to Lake Michigan. The Plain extends from the Wilmette, Illinois area to the Indiana-Michigan border and continues northward in a narrow band along the Michigan shore (Chrzastowski and Thompson, 1993). The Chicago/Calumet Lacustrine Plain surface is primarily a wave-scoured ground moraine with fine lake silts and clays covering the surface in former back-barrier settings. The prominent depositional features on the plain are sand and gravelly sand relict spits, mainland beaches, and beach-ridge/dune complexes. This lowland region drains into Lake Michigan. The bedrock geology of the region consists of Precambrian-age crystalline rock overlain by gently dipping Paleozoic sedimentary bedrock units. The uppermost bedrock unit consists of eastward gently dipping Silurian dolomite. The Racine formation, the youngest formation of the Silurian period, underlies the area due to the eastward dip of the rock strata. The Racine formation includes a number of organic reefs, which consist of a core of massive, high-purity dolomite flanked by dipping dolomite beds. The bedrock surface topography is an undulating plain as a result of glacial and some lake erosion, in which scattered steep valleys and low bedrock hills occur. Mapping by Piskin and Bergstrom (1975) indicates that the bedrock is overlain by approximately 50 to 100 feet of unconsolidated Quaternary age deposits. According to Chrzastowski and Thompson (1993), the

site is filled with a dark gray, silty clay till that is correlative to the Wadsworth Formation. This till unit intertongues with bedded sands and silt, which are assigned to the Henry and Equality Formation.

1.5.2 Regional Hydrogeology

According to Suter et al. (1959), the four primary aquifers recognized in the Chicago area are the Sand and Gravel Aquifers within the glacial drift, the Shallow Bedrock Aquifers mainly Silurian in age, the Cambrian-Ordovician Aquifer, and the Mt. Simon Aquifer. The generalized relationship between regional geology and the above- mentioned hydrostratigraphic units is summarized in Figure 4.

The uppermost bedrock aquifer underlying the Lake Calumet region is composed of Silurian dolomites. Suter et al. (1959) indicate that groundwater in the shallow dolomite occurs in joints, fissures, and solution cavities. Therefore, yields at any given location are unpredictable. The openings in the dolomite mainly occur in the upper part of the rock. Therefore, it is likely there is good connection between the shallow bedrock aquifers and the overlying glacial drift. It follows that where fractured dolomite is overlain by sand and gravel deposits there will be more immediate recharge of the shallow dolomite aquifer than in areas where glacial till rests on the bedrock.

The uppermost aquifer system identified in the vicinity of the Cluster Site is the glacial drift aquifer, composed of unconsolidated Quaternary deposits. In the vicinity of the site, the glacial drift aquifer consists of sands overlying and interbedded with glacial till.

1.5.3 Site Geology

Test pit locations along with the soil sampling locations and monitoring wells from previous investigations are identified on Figure 5. Based on site investigations, the near surface geology consists of unconsolidated glacial deposits overlain by various fill materials over most of the site. From bottom to top, the following geologic materials, were encountered:

- Gray/Brown silty clay
- Gray silty sand
- Fill

Figures 6 through 9 are geologic cross sections that show the lateral and vertical relationships of these materials. Descriptions of the test pits from this investigation and the soil boring logs from E&E (November 1999) are included in Appendix A and Appendix B, respectively.

The gray/brown silty clay unit is the lowermost unit encountered at the site and is composed of silty clay with a trace of fine sand and gravel. The silty clay was encountered only in wells LC02, LC09, LC11, P01, and P03 at depths ranging from 14.5 to 24 feet. In well LC02, black

organic peat was interbedded with the gray silty clay in three distinct peat layers of 0.5 feet to 2.5 feet thick. The silty clay was not encountered in any of the test pit locations with the exception of test pit 11B in the central section of Unnamed Parcel.

The sand unit is composed of varying percentages of medium to fine grained sand with silt, and exhibits brown to gray color variations. The sand is present at wells LC02, LC04, LC05, LC11, and P04. Where present, the sand unit varies in thickness from about 3 feet in P04 to 7 feet in LC02. The sand was not fully penetrated in wells LC04 and LC05, where drilling was terminated in the sand layer. The top of sand was encountered at a depth between 4 feet in well LC02 and 13 feet in well LC11.

Fill material is present at all sampling locations except test pit 11B (Unnamed Parcel). The fill is composed of various and household wastes. The maximum thickness of fill encountered during the monitoring well installation was 23 ft at monitoring well PO3, located in the west-central part of the site (Alburn). The fill was not fully penetrated in any of the test pits with the deepest test pits (2B, 10B, 27B, and 34B) being approximately 30 feet below ground surface. A further description of the fill encountered during the test pit sampling is found in Section 4.2.

1.5.4 Site Hydrogeology

The hydrogeology of the site was described using data collected during monitoring well installation performed by Ecology and Environment, Inc. in 1999 (E & E 1999). Groundwater was encountered in all twelve wells at different elevation within the landfill fill. Well locations are shown on Figure 5.

Fill was not fully penetrated in wells located at the northern and southern edges of the site (LC01-north of Paxton 1, LC03, LC06 and LC13) to depth about 16 feet. Four wells located close to the eastern edge of the site (LC02, LC04, LC05 and LC11) encountered a medium to fine sand layer, which underlies fill and overlies silty clay. Sand was also encountered in boring P04 at the western part of the site. Boring LC02, located north of U.S. Drum, indicates maximum sand thickness of about 7 feet.

Data collected during monitoring well installation suggest that the aquifer is semi-confined with a head between 1 to 4 feet. Slightly confined conditions may be the result of clay layers within the fill material.

Groundwater in monitoring wells installed by E & E and in test pits performed during this investigation stabilized between ground surface and 10 feet below ground surface. In some low areas, the water table in the pits was encountered about 2 feet above ground surface.

Generalized potentiometric contours for fill and sand were developed using data collected during monitoring well installation and presented in Figure 10. The contours demonstrate that flow

onto the site is from the west and flow within the site is northeast, east, and southeast. Groundwater probably discharges to Indian Ridge Marsh to the east and Big Marsh to the north. Two landfills located northwest and southwest of the site may influence groundwater flow direction. Hydraulic gradients estimated from the contours are 0.004 ft/ft and are similar in all direction suggesting almost radial flow from well LC07. It should be noted that the interaction between groundwater and surface water on the site is very complicated due to the extreme heterogeneity of the fill material and local flow direction may differ from general flow direction on the site.

No hydraulic conductivity tests were performed on site. The value of hydraulic conductivity cited in the literature for fine and medium sand is between $1x10^{-3}$ cm/s and $1x10^{-2}$ cm/s.

1.6 PREVIOUS INVESTIGATIONS

Activities at the Cluster Site were conducted in three phases by E & E, USEPA, and IEPA in 1998 and 1999. In addition to Alburn, U.S. Drum, and Unnamed Parcel, the investigations included Paxton I, Paxton II, Paxton Lagoons and the western edge of Indian Ridge Marsh. The information in this section was summarized from E & E (November 1999).

1.6.1 Field Activity

Phase I

Phase I sampling activities were conducted from August 24, 1998 to September 3, 1998 by E & E, USEPA, and IEPA. Sampling included determining the location of site features and potential sample locations using global positioning systems (GPS), screening metal concentrations in surface soils using X-ray fluorescence (XRF), and collecting samples of surface soils, subsurface soils, sediments, surface water, groundwater, and macroinvertebrates. Access was not available to the Alburn area, which was not sampled.

The geographic locations of site features, including parking lots, roads and fence lines, and potential sample locations were demarcated using GPS and screened using XRF. Screening was conducted for molybdenum, strontium, rubidium, lead, arsenic, mercury, zinc, copper, nickel, cobalt, manganese, and chromium.

Sampling included:

- Eighty four surface soil samples and four duplicate samples;
- Five subsurface soil samples and one duplicate;
- Three groundwater samples collected; and
- Eight surface water, sediment, and macroinvertebrate samples.

Samples were analyzed for total metals, toxicity characteristic leaching procedure (TCLP) metals (soils only), volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), pesticides, polychlorinated biphenyls (PCBs), pH, and percent moisture. Sample results indicated several discrete areas with contaminant concentrations exceeding human health standards, the ecological threshold, or both.

Phase II

Twelve monitoring wells (LC01 to LC07 and LC09 to LC13) were installed in April 1999. Five wells were installed in October 1990 (P01 to P05). Wells were completed to depths of 14 to 16 feet below ground surface (bgs) except LC09 and LC11, which were completed to 20 feet bgs. Pairs of wells were constructed within five feet of each other creating nested well clusters at the following locations: LC09/LC10, and LC11/LC12. E&E (November 1999) listed P05/LC07 as a well pair. No construction details are available in the report for P05; however, the other four wells constructed at the same time were placed 10 ft bgs or deeper. The nested wells allow groundwater to be collected from different depths in the same area. Well construction details are summarized in Table 1-1. Well locations are shown on Figure 5.

Table 1-1. Monitoring Well Construction Data

Well ID	Location	Screen Length (ft)	Top of Screen (ft bgs)	Paired Well	Ground Elevation	TOC Elevation
LC01	North of Paxton I	10	5		96.21	98.40
LC02	North of US Drum	10	4		93.38	95.69
LC03	North of US Drum	10	5		95.85	98.34
LC04	US Drum	10	5		96.36	98.47
LC05	US Drum	10	5	P05	98.83	100.30
LC06	US Drum	10	5		94.64	96.51
LC07	Alburn	10	4		98.51	100.33
LC09	Alburn	5	15	LC10	97.76	100.03
LC10	Alburn	10	5	LC9	97.72	100.00
LC11	US Drum	5	14	LC12	96.10	98.52
LC12	US Drum	10	5	LC11	96.05	97.74
LC13	Unnamed Parcel	10	5		97.14	99.16
P01	Alburn	10	10.4		NA	NA
P02	Alburn	10	10.5		NA	NA
P03	Alburn	10	14.9		NA	NA
P04	Alburn	10	10.2		NA	NA
P05	Alburn	NA	NA	LC07	NA	NA
G21S	US Drum	NA	NA		NA	NA

NA = Not Available.

- - - - TOC = Top of inner casing.

The 12 new wells and 6 existing wells were sampled in May 1999 for total metals, VOCs, SVOCs, pesticides, PCBs, nitrogen, and pH. Field parameters were also collected including temperature, dissolved oxygen, specific conductivity, oxidation/reduction potential, and pH.

Phase III

Phase III sampling was performed in May-June 1999 and included: sampling at Alburn to address data gaps from Phase I; obtaining additional surface and subsurface soil data near areas of elevated concentrations identified in Phase I; collecting additional surface water and sediment samples at or near Alburn; and collecting nitrogen data from previous surface water locations. Soil samples included 39 surface samples, 15 subsurface samples between 2 and 3 ft bgs, and 15 subsurface samples between 4 and 6 ft bgs. Samples were analyzed for total metals, VOCs, SVOCs, pesticides, PCBs, pH, and percent moisture. Four surface water samples collected from ponded water in and near Alburn were analyzed for total metals, VOCs, SVOCs, pesticides, PCBs, and pH. Sixteen surface water samples were collected for nitrogen analysis (four in Alburn, eight in Indian Ridge Marsh, and four from large ponds). Seven sediment samples in and near Alburn were analyzed for total metals, VOCs, SVOCs, pesticides, PCBs, and percent moisture/percent solids.

1.6.2 Analytical Results

Soils

Based on the Phase I, II, and III investigations, twelve chemicals of potential concern (COPCs) were identified for surface and subsurface soil, including:

- Arsenic
- Barium
- Chromium
- Lead
- Mercury
- Aroclor 1254
- Beta-BHC
- Dieldrin
- Napthalene
- Benzo(a)pyrene
- Benzo(a)anthracene
- Dibenz(a,h)anthracene

The area of the former Alburn incinerator was the most consistently contaminated portion of the Cluster Site. Two other areas that consistently showed contamination were the southwestern hot spot area in the Unnamed Parcel and the area just south of the incinerator in the Alburn area.

Of the inorganic chemicals, arsenic most frequently exceeded human health risk criteria; barium, chromium, lead and mercury most frequently exceeded ecological risk criteria. However, ecological criteria are often lower than Illinois Urban Background levels and ecological threat may not be significantly higher than other urban areas.

Of the organic chemicals, benzo(a)pyrene most frequently exceeded the human health risk criteria; dieldrin, beta-BHC, naphthalene and benzo(a)pyrene most frequently exceeded the ecological risk criteria.

The majority of samples (46 of 68) showed pH values within the neutral range of 7.0 to 9.0 standard units. Twenty-one samples had pH values between 9.0 and 11.7, indicating moderately caustic characteristics. TCLP test results indicated no detections above U.S. EPA regulatory levels. No dioxins were found to exceed regulatory levels.

Sediments

Sediment samples were compared to various criteria including the Ontario Ministry of the Environment's 1994 guidelines for the protection and management of aquatic sediment quality (Persaud et al., 1993). Six COPCs were evaluated as representative contaminants in sediment: arsenic, chromium, lead manganese, benzo(a)anthracene, and chrysene. Exceedances of the Ontario Severe Effect Level (SEL), the level of contamination at which pronounced disturbance of the sediment dwelling community can be expected, are discussed in this section.

Seven samples were collected in Alburn, two in U.S. Drum, six in ponds in the north of Alburn (LHL1) and north of U.S. Drum (LHL2), and eleven just east of the Cluster Site in Indian Ridge Marsh. Sample locations are shown in Figure 5. The samples from the Alburn area (2SED1 through 2SED7) were composite samples scraped with a hand auger along an impenetrable surface suspected to be a former parking lot. The SEL was exceeded for chromium, chrysene, lead and arsenic in various samples in the Alburn area. The exceedances are summarized in Table 1-2.

Table 1-2. SEL Exceedances in Sediment Samples

		Arsenic	Lead	Chromium	Chrysene
	SEL	*33 mg/kg*	*250 mg/kg*	*110 mg/kg*	*460 µg/kg*
Sample ID	**Location**				
2SED1	Alburn	8.9	148	**333**	430

Table 1-2. SEL Exceedances in Sediment Samples					
		Arsenic	Lead	Chromium	Chrysene
	SEL	*33 mg/kg*	*250 mg/kg*	*110 mg/kg*	*460 µg/kg*
Sample ID	**Location**				
2SED2	Alburn	**104**	**725**	**366**	**820**
2SED3	Alburn	**83**	**600**	**157**	**1,100**
2SED4 (dup)	Alburn	**39.7**	216	66.9	**880 J**
2SED5	Alburn	27.3	**491**	**157**	**650**
2SED6	Alburn	9.4	**288**	**537**	**930**
2SED7	Alburn	4.9	126	**173**	**470**

Bold indicates exceedances.
J = Estimated value.

No COPC concentration exceeded the SEL in samples collected in the ponds. The SEL for manganese (1,100 mg/kg) was exceeded for Indian Ridge Marsh in five of eleven samples (concentrations ranged from 1,110 to 1,670 mg/kg). No detectable TCLP concentrations were reported for any analyte.

Surface Water

Five COPC concentrations exceeded the USEPA Office of Solid Waste and Emergency Response (OSWER) January 1996 ecological and toxicological (EcoTox) thresholds (USEPA 1996) in the Alburn area: barium, iron, lead, manganese, and heptachlor. The same COPCs exceeded ecological toxicity threshold values in the pond in the southeast corner of U.S. Drum, except iron. In addition, various additional pesticides exceeded RCRA Ecological Data Quality Levels (EDQL) (USEPA 1998a) in U.S. Drum. Exceedances are summarized in Table 1-3. Surface water sampling locations are presented in Figure 5.

Table 1-3. Ecological Toxicity Threshold Exceedances in Surface Water (mg/L)							
Analyte	**Ecological Toxicity Threshold**	**Alburn**				**U.S. Drum**	
		AW1	**AW2**	**AW3**	**AW4**	**SW18**	**SW19**
Barium	***0.004***[a]	0.358	0.244			0.144	0.153
Iron	***1***[a]	6.58	1.9		1.09		
Lead	***0.002***[a]	0.107	0.0119	0.0225	0.0064	0.0037	0.0026
Manganese	***0.08***[a]	2.79	1.14	0.316	0.388	0.139	0.145
Heptachlor	***0.0000069***[a]	0.0003				0.00001 J	0.00002 J
4,4'-DDD	***0.0000011***[b]					0.00003 J	
4,4'-DDE	***4.96E-12***[b]					0.000004 J	0.00001 J
Endrin	***0.000006***[b]					0.00002 J	0.00002 J

J = Estimated value.

a = USEPA Office of Solid Waste and Emergency Response (OSWER) January 1996 ecological and toxicological (EcoTox) thresholds (USEPA 1996).
b = RCRA Ecological Data Quality Levels (EDQL) (USEPA 1998a).

Ammonia levels were elevated in the Alburn area and the southeast pond. Total cyanide was present and total Kjeldahl nitrogen was highest in the southeast pond (87.6 mg/L). Surface water samples collected from the western edge of Indian Ridge Marsh demonstrate barium and manganese contamination.

Groundwater

Based on E & E (November 1999) evaluation of the groundwater data from 18 wells in the general Cluster Site area, elevated contaminant concentrations were observed in two areas, one was between Paxton I Landfill and Big Marsh (north of Alburn and U.S. Drum) and the other was in Alburn. Five COPCs were selected for comparison with human health (USEPA Region 3 Risk Based Concentrations (RBCs) and ecological thresholds (OSWER EcoTox). Of these, iron, manganese, benzene and benzo(a)pyrene exceeded the human health threshold for drinking water over most or all of the Cluster Site. Aluminum exceeded human health RBCs in wells P02 and LC09 in the Alburn area and LC13 in the Unnamed Parcel area. The well (LC01) in the Paxton I area contained the lowest pH (5.72) measured in the area and significant concentrations of chlorinated organics including tetrachloroethene (PCE), trichloroethene (TCE), and vinyl chloride. The pH in LC07 in the Alburn area was 6.34. Groundwater was also found to contain elevated levels of ammonia.

Groundwater data collected by E & E is compared to IEPA Tier I Groundwater Objectives in Section 4.4 of this report.

2.0 SITE-SPECIFIC SAMPLING PLAN

2.1 SITE-SPECIFIC SAMPLING PLAN

The IEPA prepared a Redevelopment Assessment Work Plan in June 2000. Approximately 150 test pits were to be completed with a backhoe and soil samples collected by the IEPA. The test pit locations were determined based on historical and observed areas of potential contamination and at other locations to ensure that the entire site was adequately sampled to characterize the property. All soil samples were collected and analyzed in accordance with the IEPA Work Plan. The IEPA Work Plan was prepared and submitted to the Region V offices of the USEPA for review. Prior to mobilization to the site to collect samples, Chicago DIGGER and other relevant utilities and services were contacted to locate underground utilities onsite.

2.2 BACK HOE EXCAVATION

Test pits were completed using a backhoe operated and maintained by National Construction of Chicago, Illinois. Each test pit was sampled directly from the excavated area or from the backhoe bucket. Soil samples were collected using stainless steel trowels or En Core™ sampling devices. Two subsurface soil samples were collected at each location, including one 0 to 5 feet below surface and the other at 5 to 30 feet below surface, and analyzed for the USEPA target compound list. Certified USEPA Federal Contract Labs analyzed all samples. At each sample location the safety officer continuously monitored the breathing zone of the soil samplers with a Foxboro Toxic Vapor Analyzer (TVA). Physical descriptions, pictures, and TVA results of each test pit were recorded in the field notebook.

Upon completion of sampling, each test pit was abandoned by backfilling with the soil cuttings. The location of the boring was flagged in the field for later identification and reference during surveying. Following completion of field activities, a description of each test pit was tabulated and is provided in Appendix A. The pictures were compiled and presented in the *Photographic Documentation of Site Investigation-Summer of 2000, Lake Calumet Cluster Site, Chicago, Illinois* (Harza, 2000). A select group of representative pictures are presented in Appendix C.

2.3 EQUIPMENT DECONTAMINATION

Decontamination of all field and sampling equipment was conducted in accordance with the Work Plan for all sampling activities. Sampling equipment (e.g., stainless steel trowels and En Core™ sampling devices) was decontaminated before the equipment were used and between each sample location. Decontamination of sampling equipment was performed using a potable water and Alconox™ solution wash, followed by a potable water rinse, and a distilled water rinse.

2.4 LABORATORY ANALYSIS

Samples were analyzed for the USEPA target compound list, which includes VOCs, SVOCs, pesticides, PCBs, TAL inorganic analytes, and cyanide. Some soil samples were analyzed for dioxins and furans. All samples collected for chemical analysis were analyzed by a certified USEPA Federal Contract Lab. Analytical methods used are listed below:

Parameter	Method Number
TAL Inorganics	6010B/7471A
VOCs	5035B/8260B
SVOCs	8270C/8315
Pesticides/PCBs	8081A/8082/8141A
Total Cyanide	9010A
Dixons/Furans	8290

Summary results of analyses are presented in Section 4.0, Endangerment Assessment. Data comparison to appropriate remediation objectives are detailed in Appendix D and complete analytical data are in Appendix E.

3.0 DOCUMENTATION OF FIELD ACTIVITIES

IEPA conducted soil investigation activities at Alburn from June 19 through 22, 2000; Unnamed Parcel from July 17 through 20, 2000; and U.S. Drum from August 21 through 25, 2000. The investigative activities consisted of using a backhoe to sample 44 test pits within Alburn, 39 test pits in Unnamed Parcel, and 51 test pits in U.S. Drum (total of 134). The locations of the test pits are identified on Figure 2.

Nomenclature used to identify test pits is summarized in Table 3-1.

Table 3-1. Test Pit Location Identification by Area

Area	Test Pit Identification	Total Number
Alburn	1 – 5, 7 – 21, 23 – 31, 33 – 35, 37 – 45, 1B, Pit 52, Pit 53	44
Unnamed Parcel	2B – 39B, 42B	39
U.S. Drum	pit 1 – pit 51	51

At each test pit a Toxic Vapor Analyzer (TVA) probe was used to obtain both Photo-ionization Detector (PID) and Flame-ionization Detector (FID) readings directly from the test pit and to monitor the breathing zone. From each test pit, at least one soil sample was collected at a depth of 2 to 5 feet and one at a depth of 4 to 30 feet for laboratory analysis of inorganics, VOCs, SVOCs, pesticides/herbicides, and PCBs. In addition, 13 samples (Alburn: X101, X116, X173, X179, and X184; Unnamed: X103, X127, X152, and X165; U.S. Drum: X108, X110, X126, and X186) were analyzed for dioxins and furans. Appendix A tabulates all soil samples including test pit number, depth of test pit, sample number, depth of sample, visual description, depth to water, and PID/FID reading. Appendix C is a summary of photo documentation collected at the site. Test pits were abandoned after completion by backfilling with contents from the test pit. Deviations from the Work Plan included:

- Alburn test pits 6, 22, 32, and 36 could not be sampled due to standing water.
- Unnamed Parcel test pits 40B and 41B were not sampled. However, the IEPA survey data indicated a test pit 40B, but no test pit 38B. The sample identification number and location of sample 38B requires clarification and has not been determined at the time of this report. For this report, it is assumed 38B was sampled and is located as shown on Figure 2 and that 40B was not sampled.

Most of the test pits were required to be sampled in Level C personal protective equipment (PPE), due to elevated PID and FID readings. Test pit 19, in the north-central area of U.S. Drum

was sampled in Level B personal protective equipment due to a PID reading of 300 ppm. The FID readings at each test pit ranged from 0 ppm to above 10,000 ppm and PID readings ranged from 0 ppm to 300 ppm. In general, the FID readings were above 150 ppm at each test pit and the PID readings were at background. A hydrogen sulfide meter was introduced during the sampling of U.S. Drum. Only test pit 2, in the north part of U.S. Drum, had a 1-ppm reading on the hydrogen sulfide meter.

4.0 ENDANGERMENT ASSESSMENT

4.1 REMEDIATION OBJECTIVES

Analytical results were compared to Tier 1 Soil Remediation Objectives (ROs) in Appendix B of Title 35 of the Illinois Administrative Code (IAC) Part 742, *Tiered Approach to Corrective Action Objectives* (TACO), effective January 6, 2001. The site has been identified for future land use as an industrial park for production of solar energy. Therefore, the analytical data were compared to ROs for industrial/commercial (I/C) properties. The lowest Tier I value among the ingestion and inhalation objectives for industrial-commercial and for the construction worker was selected as the screening criteria for comparison to chemical concentrations. In addition, the data was compared to the Class I soil component of the groundwater ingestion exposure route. No RO values are available for dioxins and furans in TACO. Therefore, dioxin and furan concentrations are compared to EPA Region 9 Preliminary Remediation Goals (PRGs) for industrial soil.

4.2 SOLID WASTE

The most dominant environmental feature observed at the Cluster Site is solid waste encountered in each test pit, except 11B. In general, materials encountered in the test pits comprised 1 to 3 feet of topsoil overlying solid waste, which extended beyond the test pit depth (4 feet to 30 feet below grade). The solid waste generally varied from industrial/demolition debris (i.e., metal pieces, bricks, tires, wood, concrete, cinders, etc.) to household waste (i.e., garbage bags, newspapers, clothing, shoes, rags, etc.). Identifiable medical wastes, such as empty syringes, were found in test pit 27 in Alburn. Many possible drum remnants were located throughout the site. Six fifty-five gallon drums filled with residue were observed in test pit 21B along the west side of the Unnamed Parcel. The residue appeared to be sticky and viscous. One drum was labeled trichloroethene on the outside and there were various paint cans and metal debris also uncovered in the test pit. Additional areas were excavated around test pit 21B (Area 1, Area 2 and Area 3 on Figure 2) but no further drums were found. The character of the solid waste is extremely variable over very short horizontal or vertical distances. Test pit 11B in the central part of the Unnamed Parcel was the only test pit where no waste was encountered. Test pit 11B was located at the top of a high area within the relatively flat site and extended to a depth of 30 feet. The mound may have been clay fill from activities to the west or north of the site.

4.3 NATURE AND EXTENT OF SOIL IMPACT

All test pit locations contained contaminants with concentrations exceeding Soil ROs except pit 49 in U.S. Drum and 42B in Unnamed Parcel. Inorganics, VOCs, SVOCs, pesticides, PCBs, and dioxins were found at variable concentrations exceeding Soil ROs as summarized in this section.

Contaminant exceedances of both the ingestion/inhalation and soil component of the groundwater ingestion pathways are detailed in Appendix D. Complete results of analytes tested at all locations are presented in Appendix E.

4.3.1 Inorganics

Inorganics exceeding soil ROs in one or more samples are listed in Table 4-1.

Table 4-1. Inorganics Exceeding Soil ROs by Area and Pathway

Area	Alburn		U.S. Drum		Unnamed Parcel	
Pathway	Ing/Inh	GW	Ing/Inh	GW	Ing/Inh	GW
Antimony	✓	✓	✓	✓		✓
Arsenic	✓	✓	✓	✓	✓	✓
Beryllium	✓		✓		✓	
Barium						✓
Cadmium				✓		✓
Chromium, Total	✓	NA	✓	NA	✓	NA
Lead	✓	NA	✓	NA	✓	NA
Manganese	✓	NA	✓	NA	✓	NA
Mercury		✓		✓		✓
Nickel				✓		
Selenium		✓		✓		✓
Silver		✓		✓		✓
Thallium		✓				✓

Ing/Inh = ingestion or inhalation pathway, whichever value is lower.
GW= soil component of groundwater ingestion pathway (Class I).
NA = no TACO values available for soil component of groundwater ingestion route.

No values for the soil component of the groundwater ingestion pathway are available in TACO for total chromium, lead, and manganese. Beryllium is the only inorganic exceeding ingestion/inhalation soil ROs but not exceeding the soil component of the groundwater ingestion pathway. In proposed rule changes to TACO, the ingestion and inhalation pathway ROs for beryllium would be two orders of magnitude greater than the promulgated ROs. The beryllium results observed at the Cluster Site are orders of magnitude below this proposed value.

Inorganic contaminants, frequency of exceedance, concentration range by area and depth (shallow or deep), and key contaminant locations are summarized in Table 4-2.

Table 4-2. Inorganics Exceeding Ingestion or Inhalation Soil ROs					
Contaminant	RO (mg/kg)	Area (Depth – ft bgs)	Frequency	Concentration Range (mg/kg)	Key Locations
Antimony	82	Alburn (0-3)	2	770 - 1020	16
		Alburn (>3-10)	1	130	16
		U.S. Drum (0-3)	1	105	pit 19
		U.S. Drum (>3-10)	2	113 – 218	pits 15, 47
Arsenic	13	Alburn (0-3)	18	13.8 – 151	43, 31, 30, 21, 42, 18, 12, 24, 13, 2, 41, 27, pit 52, 33, 11, 3
		Alburn (>3-10)	15	13.8 – 37.1	16, 18, 10, 17, 44, 24, 11, 29, pit 53, pit 52, 14, 31, 12, 19, 23
		U.S. Drum (0-3)	12	13.7 –82.5	pits 23, 20, 25, 34, 33, 7, 21, 3752, 38, 44, 11, 10
		U.S. Drum (>3-15)	29	13.1 – 40.7	pits 42, 30, 48, 18, 40, 11, 46, 25, 45, 30, 10, 36, 50, 24, 1, 44, 23, 21, 32, 20, 16, 31, 17, 34, 26, 42, 33
		Unnamed Parcel (0-3)	26	13.1 – 46.1	15B, 14B, 6B, 12B, 36B, 29B, 18B, 39B, 20B, 23B, 27B, 34B, 7B, 19B, 24B, 16B, 30B, 33B, 17B, 5B, 26B, 32B, 28B, 9B
		Unnamed Parcel (>3-30)	29	13.3 – 99.9	13B, 14B, 15B, 33B, 35B, 8B, 34B, 22B, 7B, 6B, 19B, 37B, 18B, 38B, 29B, 39B, 2B, 21B, 32B, 30B, 9B, 25B, 23B, 10B, 16B, 3B, 20B
Beryllium	1	Alburn (0-3)	29 6	1.1–6.7	9, 33, 27, 3, 25, 26, 4, 3, pit 52, 31, 19, 18, 10, pit 53, 2, 45, 42, 24, 41, 21, 17, 15, 12, 8, 1B, 43, 1
		Alburn (>3-10)	14	1.1 – 8.4	9, 4, 25, 29, 16, 8, 3, 42, 33, 18, 10, 31, pit 53, 24
		U.S. Drum (0-3)	5 7	1.3 – 2.5	pits 20, 5, 33, 42, 34, 25
		U.S. Drum (>3-10)	11	1.1–2.3	pits 33, 22, 45, 47, 25, 24, 37, 17, 4, 48, 19
		Unnamed Parcel (0-3)	20 1	1.1–1.9	23B, 6B, 32B, 16B, 26B, 19B, 36B, 27B, 18B, 13B, 9B, 39B, 24B, 20B, 28B, 22B, 17B, 15B, 12B
		Unnamed Parcel (>3-30)	14	1.1–3.0	13B, 38B, 10B, 19B, 2B, 32B, 29B, 18B, 34B, 23B, 8B, 4B, 37B, 7B

Table 4-2. Inorganics Exceeding Ingestion or Inhalation Soil ROs					
Contaminant	RO (mg/kg)	Area (Depth – ft bgs)	Frequency	Concentration Range (mg/kg)	Key Locations
Chromium (Total)	420	Alburn (0-3)	10	448–1730	26, 16, 12, 28, 21, 19, 27
		Alburn (>3-10)	1	808	35
		U.S. Drum (0-3)	2	581-735	pits 12, 8
		U.S. Drum (>3-13)	7	430-1070	pits 5, 1, 14, 46, 15
		Unnamed Parcel (0-3)	2	453-490	pits 5, 30
		Unnamed Parcel (>3-30)	4	461-1620	34B, 14B, 15B, 32B
Lead	400	Alburn (0-3)	14	403-2440	30, 21, 28, pit 52, 12, 31, 18, 13, 24, 20, 43, 3
		Alburn (>3-10)	20	418-6730	34, 23, 18, 24, 10, 11, 44, 14, 30, 35, pit 53, 27, pit 52, 38, 3, 28, 19, 31, 17, 16
		U.S. Drum (0-3)	13	417-4350	pits 24, 10, 33,52, 25, 5, 21, 19, 2, 26, 44, 37, 28, 34
		U.S. Drum (>3-15)	28	451-5090	pits 11, 1, 42, 47, 43, 18, 48, 21, 45, 10, 20, 23, 25, 30, 32, 42, 40, 46, 39, 26, 51, 38, 50, 36, 16, 19
		Unnamed Parcel (0-3)	24	432-3890	12B, 33B, 23B, 29B, 19B, 16B, 7B, 2B, 6B, 36B, 34B, 24B, 27B, 14B, 21B, 39B, 30B, 32B, 15B, 17B, 5B, 13B, 18B
		Unnamed Parcel (>3-30)	29	411-5710	14B, 37B, 34B, 3B, 27B, 21B, 38B, 13B, 15B, 29B, 20B, 30B, 9B, 18B, 8B, 6B, 33B, 12B, 35B, 7B, 36B, 10B, 39B, 17B, 19B
Manganese	8700	Alburn (0-3)	6	11400-40500	26, 16, 28, pit 53, 27
		Alburn (>3-10)	2	10600-11000	44, 27
		U.S. Drum (0-3)	2	11500-29700	pits 12, 19
		U.S. Drum (>3-13)	4	16400-30600	pits 14, 15, 5, 1
		Unnamed Parcel (0-3)	1	13000	33B

Key locations are ordered from most to least significant.

Inorganics in exceedance of soil ROs, including all exposure routes, are present in 39 of 44 test pit locations in Alburn, 42 of 51 in U.S. Drum, and 36 of 39 in Unnamed Parcel. Locations with inorganic concentrations above soil ROs for the ingestion, inhalation and soil component of the groundwater ingestion pathway are shown in Figure 11. There is no change in location of

inorganic contaminants when the soil component of the groundwater ingestion pathway is not considered.

ROs for the soil component of the groundwater ingestion pathway for inorganics are pH dependent. The ROs for the soil component of the groundwater ingestion pathway for inorganics are detailed in Appendix D. Each inorganic was compared to the appropriate soil RO, based on pH. The pH in site soil ranged from 5 to 12.4; pH values for each inorganic sample are listed in Appendix E. Generally, the soil RO value increases as the pH increases because less of the chemical partitions into the groundwater at higher pHs. Selenium is the only inorganic with soil ROs that decrease as the pH increases.

Inorganic contaminant concentrations exceed soil ROs throughout the Cluster Site. Contamination is observed in both shallow samples (0-3 ft bgs) and deeper samples (greater than 3 ft bgs). Principal contaminants are arsenic and lead, and secondarily chromium (total) and manganese. Almost half the test pit locations in Alburn and U.S. Drum, and over two thirds of test pit locations in Unnamed Parcel, contain inorganic contaminants with concentrations greater than twice the soil ROs. In Alburn, the locations of highest concentrations are 12, 16, 18, 21, 23, 24, 26, 28, 30, 31, 34, and 43 most of which are in the area of the former incinerator in the center of Alburn. Locations of highest concentrations in U.S. Drum are pits 1, 10, 11, 12, 14, 15, 18, 20, 21, 23, 24, 25, 30, 33, 42, 43, 45, 47, and 48. These pits are located in the central (directly east of Alburn) and southern parts of U.S Drum, except for pit 1, which is at the northernmost tip. Locations of highest concentration in Unnamed Parcel are 3B, 7B, 12B, 13B, 14B, 15B, 19B, 23B, 27B, 29B, 33B, 34B, 35B and 37B. These locations are dispersed throughout the Unnamed Parcel area.

Representative figures present arsenic concentrations (Figures 12 and 13) and lead concentrations (Figures 14 and 15) grouped to indicate degree of contamination in samples from 0-3 feet bgs and >3 ft bgs, respectively.

4.3.2 VOCs

VOCs exceeding soil ROs in one or more samples are listed in Table 4-3.

Table 4-3. VOCs Exceeding Soil ROs by Area and Pathway

Area	Alburn		U.S. Drum		Unnamed Parcel	
Pathway	Ing/Inh	GW	Ing/Inh	GW	Ing/Inh	GW
1,1,1-Trichloroethane		✓		✓	✓	✓
1,1-Dichloroethane					✓	✓
1,2-Dibromo-3-Chloropropane					✓	✓
1,2-Dichloroethane		✓	✓	✓	✓	✓
Acetone				✓		

Table 4-3. VOCs Exceeding Soil ROs by Area and Pathway						
Area	Alburn		U.S. Drum		Unnamed Parcel	
Pathway	Ing/Inh	GW	Ing/Inh	GW	Ing/Inh	GW
Benzene	✓	✓	✓	✓	*	✓
Carbon disulfide	✓					
Chlorobenzene	✓	✓	✓	✓	✓	✓
Chloroform			✓	✓		
cis-1,2-Dichloroethene		✓		✓		
Dibromochloromethane						✓
Ethylbenzene	✓	✓	✓	✓	✓	✓
Methylene chloride	✓	✓		✓	✓	✓
Styrene				✓		
Tetrachloroethene	✓	✓	✓	✓		
Toluene	✓	✓	✓	✓	✓	✓
trans-1,2-Dichloroethene				✓		
Trichloroethene	✓	✓		✓	✓	✓
Vinyl chloride	✓	✓	✓	✓		
Xylenes	✓	✓	✓	✓	✓	✓

Ing/Inh = ingestion or inhalation pathway, whichever value is lower.
GW= soil component of groundwater ingestion pathway (Class I).
*Benzene in Unnamed Parcel is discussed below.

Although benzene was not observed above the ingestion or inhalation pathway in Unnamed Parcel, it is not unreasonable to assume the presence of benzene in 21B. High concentrations of toluene, ethylbenzene, and xylenes as well as other VOCs were observed in 21B and benzene detection levels in samples from 21B ranged from 1500 to 2000 mg/kg as a result of high dilution factors.

Contaminants, frequency of exceedance, concentration range by area and depth (shallow or deep), and key contaminant locations are summarized in Table 4-4.

Table 4-4. VOCs Exceeding Ingestion or Inhalation Soil ROs					
Contaminant	RO (mg/kg)	Area (Depth - ft bgs)	Frequency	Concentration Range (mg/kg)	Key Locations
1,1,1-Trichloroethane (1,1,1-TCA)	1200	Unnamed Parcel (>3-10)	2	12000-52000	21B
1,1-Dichloroethane (1,1-DCA)	130	Unnamed Parcel (>3-10)	1	440	21B
1,2-Dibromo-3-Chloropropane	0.11	Unnamed Parcel (>3-10)	2	0.57-470	21B, 25B

Table 4-4. VOCs Exceeding Ingestion or Inhalation Soil ROs					
Contaminant	**RO (mg/kg)**	**Area (Depth - ft bgs)**	**Frequency**	**Concentration Range (mg/kg)**	**Key Locations**
1,2-Dichloroethane (1,2-DCA)	0.7	U.S. Drum (0-3)	2	1.7-12	pits 19, 16
		U.S. Drum (>3-10)	7	0.87-14	pits 17, 19, 15, 13, 16
		Unnamed Parcel (>3-10)	2	270-720	21B
Benzene	1.5	Alburn (0-3)	3	2.5-92	28, 31, 37
		Alburn (>3-10)	10	2-64	28,18,3,5,31,40,43, 19, 8, 39
		U.S. Drum (0-3)	2	2.3-4.8	pits 19, 16
		U.S. Drum (>3-15)	7	1.7-20	pits 19, 17, 15, 18
		Unnamed Parcel	*	*	*
Carbon disulfide	9	Alburn (>3-10)	1	14	28
Chlorobenzene	1.3	Alburn (0-3)	4	1.9-47	28,24,27,21
		Alburn (>3-10)	1	1.4	27
		U.S. Drum (0-3)	4	2.4-18	pits 38, 43, 28, 33
		U.S. Drum (>3-10)	5	1.7-120	pits 4, 27, 28, 1
		Unnamed Parcel (>3-10)	3	2.6-180	21B, 33B, 12B
Chloroform	0.54	U.S. Drum (0-3)	1	6	Pit 19
		U.S. Drum (>3-10)	2	1-4.4	pits 19, 15
Ethylbenzene	58	Alburn (0-3)	2	1200-1400	28, 24
		Alburn (>3-10)	5	75-5000	29, 28, 3, 17, 19
		U.S. Drum (0-3)	2	62-190	pits 32, 19
		U.S. Drum (>3-10)	2	120-260	pits 19, 15
		Unnamed Parcel (0-3)	1	820	21B
		Unnamed Parcel (>3-10)	2	1100-1800	21B
Methylene chloride	24	Alburn (0-3)	2	45-400	28, 24
		Alburn (>3-10)	2	32-200	29, 28
		Unnamed Parcel (>3-10)	1	470	21B
Tetrachloroethene (PCE)	20	Alburn (0-3)	1	360	28
		Alburn (>3-10)	1	83	29
		U.S. Drum (>3-10)	1	28	pit 15

Table 4-4. VOCs Exceeding Ingestion or Inhalation Soil ROs					
Contaminant	RO (mg/kg)	Area (Depth - ft bgs)	Frequency	Concentration Range (mg/kg)	Key Locations
Toluene	42	Alburn (0-3)	3	120-3700	28, 24, 31
		Alburn (>3-10)	5	43-750	28, 29, 2, 33, 3
		U.S. Drum (0-3)	1	260	pit 19
		U.S. Drum (>3-10)	2	100-730	pits 19, 15
		Unnamed Parcel (0-3)	1	8900	21B
		Unnamed Parcel (>3-10)	2	4200-7800	21B
Trichloroethene (TCE)	8.9	Alburn (0-3)	1	260	28
		Alburn (>3-10)	2	19-370	2, 3
		Unnamed Parcel (0-3)	1	220	21B
		Unnamed Parcel (>3-10)	2	390-460	21B
Vinyl chloride	0.06	Alburn (>3-10)	1	0.26	14
		U.S. Drum (>3-10)	1	0.23	pit 17
Xylenes	410	Alburn (0-3)	2	3700-4500	28, 24
		Alburn (>3-10)	2	1500-25000	29, 28
		U.S. Drum (0-3)	1	950	pit 32
		U.S. Drum (>3-10)	2	620-820	pits 19, 15
		Unnamed Parcel (0-3)	1	3000	21B
		Unnamed Parcel (>3-10)	2	3500-5600	21B

Key locations are ordered from most to least significant.
*Refer to discussion about benzene in Unnamed Parcel following Table 4-3.

VOCs in exceedance of soil ROs, including all exposure routes, are present in 41 out of 44 test pit locations in Alburn, 43 of 51 in U.S. Drum, and 15 of 39 in Unnamed Parcel. Locations with VOC concentrations above soil ROs for the ingestion, inhalation and soil component of the groundwater ingestion pathway are shown in Figure 16. Much of the eastern part of Alburn, the west-central and the southeastern parts of U.S Drum, and most of the Unnamed Parcel do not exceed ROs for VOCs if the soil component of the groundwater ingestion pathway is excluded. Excluding the soil component of the groundwater ingestion pathway, VOC exceedances occur in 20 out of 44 test pit locations in Alburn, 13 of 51 in U.S. Drum, and 4 of 39 in Unnamed Parcel. VOCs above ROs for only the ingestion or inhalation pathways are shown in Figure 17.

VOC contaminant concentrations are generally higher in Alburn and Unnamed Parcel than in U.S. Drum. Contamination is somewhat greater and more frequent in the deeper samples (greater

than 3 ft bgs) than in the shallower samples (0-3 ft bgs). The location where drums were found in the northwestern part of Unnamed Parcel, 21B, had the highest VOC concentrations at the Cluster Site. Principal contaminants in samples from 21B are 1,1,1-TCA, 1,1-DCA, 1,2-dibromo-3-chloropropane, 1,2-DCA, toluene, ethylbenzene, xylenes, chlorobenzene, and TCE. Contamination in 21B was greatest in the deeper samples (greater than 3 ft bgs). Test pit locations with highest VOC concentrations in Alburn were 2, 3, 5, 18, 24, 28, 29, and 31. The principal contaminants are BTEX, PCE, and TCE. Most locations are in the south-central part of Alburn in the vicinity of the former incinerator. Locations 2 and 3 are along the northwestern edge of the Alburn area. Principle contaminants in U.S. Drum include benzene, toluene, ethylbenzene, toluene (BTEX), and chlorobenzene. The highest BTEX concentrations in U.S. Drum were observed in pits 19, 17, 15, and 32. Pits 19, 17 and 15 are in the northern portion of U.S. Drum to the west of the Norfolk and Western Railway. Pit 32 is near the U.S. Drum/Alburn border in the middle part of U.S. Drum. Chlorobenzene contamination is present in both northern and southern U.S. Drum with the highest concentration in pit 4 in the northwestern part of U.S. Drum.

Representative figures present benzene concentrations (Figures 18 and 19) and TCE concentrations (Figures 20 and 21) grouped to indicate degree of contamination in samples from 0-3 feet bgs and >3 ft bgs, respectively.

4.3.3 SVOCs

SVOCs exceeding soil ROs in one or more samples are listed in Table 4-5.

Table 4-5. SVOCs Exceeding Soil ROs by Area and Pathway

Area	Alburn		U.S. Drum		Unnamed Parcel	
Pathway	Ing/Inh	GW	Ing/Inh	GW	Ing/Inh	GW
1,4-Dichlorobenzene		✓		✓		✓
2,4-Dimethylphenol		✓		✓		
2,4-Dinitrotoluene		✓				
2,6-Dinitrotoluene				✓		
2-Methylnaphthalene		✓		✓		✓
2-Methylphenol (O-Creosol)						✓
4-Chloroaniline		✓		✓		
Acenaphthylene		✓				
Benzo(a)anthracene	✓	✓	✓	✓	✓	✓
Benzo(a)pyrene	✓	✓	✓	✓	✓	✓
Benzo(b)fluoranthene	✓	✓	✓	✓	✓	✓
Benzo(k)fluoranthene				✓	✓	✓
Bis(2-Chloroethyl) Ether	✓	✓				

Table 4-5. SVOCs Exceeding Soil ROs by Area and Pathway						
Area	**Alburn**		**U.S. Drum**		**Unnamed Parcel**	
Pathway	**Ing/Inh**	**GW**	**Ing/Inh**	**GW**	**Ing/Inh**	**GW**
Bis(2-Ethylhexyl) Phthalate			✓			
Carbazole		✓		✓		✓
Dibenz(a,h)Anthracene	✓	✓	✓	✓	✓	✓
Indeno(1,2,3-CD)pyrene	✓	✓	✓	✓	✓	✓
Isophorone				✓		
N-Nitrosodiphenylamine		✓		✓		✓
Naphthalene		✓		✓		✓
Nitrobenzene				✓		
Pentachlorophenol				✓		✓
Phenanthrene		✓		✓		✓

Ing/Inh = ingestion or inhalation pathway, whichever value is lower.
GW= soil component of groundwater ingestion pathway (Class I).

SVOC contaminants, frequency of exceedance, concentration range by area and depth (shallow or deep), and key contaminant locations (with most significant locations listed first) are summarized in Table 4-6.

Table 4-6. SVOCs Exceeding Ingestion or Inhalation Soil ROs					
Contaminant	**RO (mg/kg)**	**Area (Depth – ft bgs)**	**Frequency**	**Concentration Range (mg/kg)**	**Key Locations**
Benzeno(a)anthracene	8	Alburn (0-3)	2	11 - 33	35, 12
		Alburn (>3-10)	4	67 - 11	28, 19, 24, 1
		U.S. Drum (0-3)	1	14	pit 16
		U.S. Drum (>3-12)	6	100 – 8.1	pits 13, 18, 33, 1, 5, 43
		Unnamed Parcel (0-3)	1	21	17B
		Unnamed Parcel (>3-13)	5	310 - 11	37B, 10B, 30B, 39B, 8B

Table 4-6. SVOCs Exceeding Ingestion or Inhalation Soil ROs					
Contaminant	RO (mg/kg)	Area (Depth – ft bgs)	Frequency	Concentration Range (mg/kg)	Key Locations
Benzo(a)pyrene	0.8	Alburn (0-3)	26	35 - 0.83	35, 12, pit 52, 11, 23, 7, 18, 10, 1, 44, 42, 24, 9, 25, 8, 39, 34, 1B, pit 53, 4, 43, 29, 33, 20, 21
		Alburn (>3-11)	24	37 – 0.84	28, 19, 24, 42, 20, 43, 1, pit 52, 9, 4, 1B, 21, 40, 25, 29, 8, 11, 35, 27, 44, 16, 23, 30, 14
		U.S. Drum (0-3)	17	8.4 – 0.98	pits 16, 44, 11, 21, 43, 3, 32, 28, 37, 5, 7, 24, 51, 8, 20, 33
		U.S. Drum (>3-13)	31	55 – 0.91	pits 18, 13, 33, 43, 1, 5, 23, 51, 45, 44, 20, 4, 2, 6, 10, 24, 22, 8, 26, 3, 29, 42, 14, 7, 37, 17
		Unnamed Parcel (0-3)	15	19 – 0.82	17B, 29B, 4B, 13B, 26B, 28B, 16B, 2B, 27B, 6B, 8B, 32B, 18B, 31B, 12B
		Unnamed Parcel (>3-30)	21	250 – 0.82	37B, 10B, 30B, 39B, 8B, 34B, 17B, 28B, 16B, 38B, 21B, 19B, 27B, 20B, 18B, 9B, 29B, 11B
Benzo(b)fluoranthene	8	Alburn (0-3)	3	45 – 8.7	35, 12, pit 52
		Alburn (>3-10)	4	72 - 12	28, 19, 24, 1
		U.S. Drum (0-3)	1	11	pit 16
		U.S. Drum (>3-12)	4	71 - 13	pits 13, 18, 33, 43
		Unnamed Parcel (0-3)	2	19 - 11	17B, 29B
		Unnamed Parcel (>3-30)	6	350 – 8.8	37B, 10B, 30B, 39B, 8B, 34B
Benzo(k)fluoranthene	78	Unnamed Parcel (>3-13)	1	150	37B
Bis(2-Chloroethyl)ether	0.47	Alburn (0-3)	1	0.68	28
Bis(2-Ethylhexyl)phthalate	410	U.S. Drum (>3-10)	1	480	pit 1

Table 4-6. SVOCs Exceeding Ingestion or Inhalation Soil ROs					
Contaminant	RO (mg/kg)	Area (Depth – ft bgs)	Frequency	Concentration Range (mg/kg)	Key Locations
Dibenz(a,h)anthracene	0.8	Alburn (0-3)	9	11 – 0.86	35, 11, pit 52, 12, 7, 23, 10, 18
		Alburn (>3-10)	8	7.3 – 1.1	28, 24, 19, 42, 9, 43, 1, 1B
		U.S. Drum (0-3)	4	2.3 – 0.89	pits 16, 44, 11, 32
		U.S. Drum (>3-13)	11	9.1 – 1.1	pits 13, 18, 43, 33, 5, 1, 45, 51, 5, 23, 44
		Unnamed Parcel (0-3)	6	4.3 – 0.85	17B, 4B, 13B, 26B, 16B, 29B
		Unnamed Parcel (>3-30)	7	59 – 0.9	37B, 10B, 30B, 39B, 8B, 17B, 34B,
Indeno(1,2,3-CD)pyrene	8	Alburn (0-3)	1	13	35
		Alburn (>3-10)	3	24 - 10	28, 19, 24
		U.S. Drum (>3-12)	4	22 – 9.4	pits 18, 13, 43, 33
		Unnamed Parcel (0-3)	1	10	17B
		Unnamed Parcel (>3-13)	3	140 - 12	37B, 10B, 30B

Key locations are ordered from most to least significant.

SVOC concentrations exceed ROs throughout the Cluster Site. SVOCs in exceedance of soil ROs, including all exposure routes, are present in 35 out of 44 test pit locations in Alburn, 36 of 51 in U.S. Drum, and 28 of 39 in Unnamed Parcel. Locations with SVOC concentrations above ROs for the ingestion, inhalation and soil component of the groundwater ingestion pathway are shown in Figure 22. Excluding the soil component of the groundwater ingestion pathway, SVOC exceedances occur in 32 out of 44 test pit locations in Alburn, 31 of 51 in U.S. Drum, and 26 of 39 in Unnamed Parcel. SVOCs above ROs for only the ingestion or inhalation pathways are shown in Figure 23. As shown in Figures 22 and 23, locations of the exceedances of the inhalation/ingestion pathway and the soil component of the groundwater ingestion pathway are similar although there are 10 additional contaminated test pit locations if the soil component of the groundwater ingestion pathway is considered.

Generally, SVOC contamination is greater and more frequent in the deeper samples (greater than 3 ft bgs) than in the shallower samples (0-3 ft bgs). Principal contaminants are benzo(a)anthracene, benzo(a)pyrene, benzo(b)flouanthene, benzo(b)fluoranthene, dibenz(a,h)anthracene, indeno(1,2,3-CD)pyrene, bis(2-chloroethyl)ether and bis(2-ethylhexyl)phthalate. These chemicals, except bis(2-chloroethyl)ether and bis(2-ethylhexyl)phthalate, are carcinogenic polynuclear aromatic hydrocarbons (PAHs). They tend to sorb to soils resulting in ingestion and inhalation soil RO values close to or, in some cases, lower than soil component of the groundwater ingestion pathway values. The most significant SVOC

contaminant is benzo(a)pyrene with an ingestion soil RO of 0.8 mg/kg and a soil component of the groundwater ingestion pathway value is 8 mg/kg.

SVOC concentrations were highest in the Unnamed parcel in location 37B, especially in the deeper samples (13 ft bgs). This test pit is located near the middle of the southern edge of the Unnamed Parcel. Test pit locations with highest SVOC concentrations in Alburn were 28 and 19, in the south-central part of Alburn near the former incinerator, and 35 in the north-central part of Alburn. The highest SVOC concentrations in U.S. Drum were found in pit 13 and 18, in the northern portion of U.S. Drum and west of the Norfolk and Western Railway, and 33 in the central part of U.S. Drum. The locations with the highest concentrations in Alburn and U.S. Drum are generally an order of magnitude lower than those observed in 37B in Unnamed Parcel. Other locations in Unnamed Parcel with high SVOCs were 10B, 17B and 30B.

Representative figures present benzo(a)pyrene concentrations (Figures 24 and 25) grouped to indicate degree of contamination in samples from 0-3 feet bgs and >3 ft bgs, respectively.

4.3.4 Pesticides/Herbicides

Pesticide exceeding soil ROs in one or more samples are listed in Table 4-7.

Table 4-7. Pesticides/Herbicides Exceeding Soil ROs by Area and Pathway

Area	Alburn		U.S. Drum		Unnamed Parcel	
Pathway	Ing/Inh	GW	Ing/Inh	GW	Ing/Inh	GW
alpha-BHC		✓		✓	✓	✓
gamma-BHC		✓		✓		✓
Dieldrin		✓		✓		✓
Heptachlor					✓	

Ing/Inh = ingestion or inhalation pathway, whichever value is lower.
GW= soil component of groundwater ingestion pathway (Class I).

Pesticide/herbicide contaminants, locations of exceedances, and concentrations are summarized in Table 4-8.

Table 4-8. Locations and Concentrations of Pesticides/Herbicides Exceeding TACO Tier I I/C Ingestion or Inhalation Soil ROs

Contaminant	Location		Concentration	Ing/Inh. Soil RO	Units
alpha-BHC	Unnamed Parcel	23B	17	1	mg/kg
Heptachlor	Unnamed Parcel	23B	2.8	0.9	mg/kg

Pesticide/herbicide concentrations exceeded soil ROs for the ingestion/inhalation pathway only for alpha-BHC and heptachlor in 23B, in the western part of Unnamed Parcel (Figure 26). Dieldrin, alpha-BHC, gamma-BHC, and heptachlor concentrations also exceeded the soil component of the groundwater ingestion pathway ROs. The location with pesticide/herbicide concentrations above ROs for the ingestion, inhalation and soil component of the groundwater ingestion pathway are shown in Figure 27. The most frequent detections were of dieldrin and alpha-BHC in the Alburn and Unnamed Parcel areas. Most boring locations in Alburn and Unnamed Parcel contained at least one pesticide that exceeded the soil component of the groundwater ingestion pathway ROs. Detections occurred in both 0-3 ft bgs and greater than 3 ft bgs depth intervals, with greater frequency in the deeper samples. Gamma-BHC exceeded ROs in Alburn in one 3 ft bgs sample (20) and in one 10 ft bgs sample (10) and in the southwestern part of the Unnamed Parcel in one 4 ft bgs sample (35B) and one 13 ft bgs sample (37B). The only heptachlor exceedance was in the Unnamed Parcel at 3 ft bgs (23B).

4.3.5 PCBs

Arochlor concentrations detected in the samples were summed and compared to the ingestion/inhalation soil RO for PCBs (1 mg/kg). No soil component of the groundwater ingestion pathway is available for PCBs. Exceedance of 1 mg/kg is widespread over U.S. Drum, in the center of Alburn, and in the southwestern part of Unnamed Parcel. Principal arochlors contributing to PCB contamination are arochlor 1242, arochlor 1248, arochlor 1254, and arochlor 1260. The highest PCB concentrations are in pit 50, the southernmost test pit in U.S. Drum. Locations of PCB exceedances are shown on Figure 28.

4.3.6 Dioxins

Data was available for 8 of the 13 dioxin samples collected, 4 from locations in U.S. Drum (pits 15, 38, 46, 47) and 4 from Unnamed Parcel (12B, 15B, 26B, 33B). Based on EPA Region 9 protocol, dioxin and furan toxicity values were equalized to tetrachlorodibenzo-p-dioxin (2,3,7,8-TCDD) by multiplying the toxicity equivalence factor (TEF) by the dioxin and furan concentrations (Tables D-12 and D-13 in Appendix D). The equivalent 2,3,7,8-TCDD values were summed and compared to the EPA Region 9 PRG for industrial soil (2.7E-05 mg/kg). All 8 dioxin samples exceeded the PRG. However, USEPA (1998b) recommends initiation of cleanup action under the industrial/commercial scenario at levels between 5 and 20 µg/kg. None of the equivalent 2,3,7,8-TCDD concentrations exceed this specified range.

4.4 NATURE AND EXTENT OF GROUNDWATER IMPACT

Groundwater data in the E & E Report (November 1999) were compared to TACO Class I and Class II Groundwater ROs. VOC, SVOC and inorganic compounds exceedances of groundwater

ROs are summarized in Appendix D. Based upon data collected in 1998 and 1999, benzene, iron, lead, and manganese exceed Class I groundwater ROs in virtually the entire Cluster Site. The estimated lateral extent of contamination is shown on Figures 29 through 32 for benzene, manganese, lead, and iron, respectively. Benzene, as well as toluene, ethylbenzene, and xylenes, contamination is most significant in Alburn, in LC07 near the former incinerator. This area also has SVOC and inorganic contamination, in addition to iron, lead, and manganese. Groundwater in the southern portions of U.S. Drum (LC06 and LC05) and Unnamed Parcel (LC13) areas and groundwater in the Alburn area to the east of LC07 also contain other elevated inorganics.

Concentrations of groundwater contaminants in the shallower wells (screened 5 to 15 ft bgs) tend to be greater than in the deeper wells (screened 15 to 20 ft bgs) as evidenced by wells LC12 and LC07 compared to LC11 and PO5, respectively. However, contamination levels in well pair LC10/LC09 are higher in the shallow well (LC10) for SVOCs and some inorganics.

Available groundwater data also indicate elevated levels of SVOCs and inorganics north of U.S. Drum (LC02) and VOCs, SVOCs and inorganics north of Paxton I (LC01).

5.0 CONCLUSION

Principal conclusions generated as a result of the Lake Calumet Cluster SI are as follows:

1. The Alburn, U.S. Drum, and Unnamed Parcel areas contain large quantities of solid waste including locally identified medical waste and drums. Solid waste depths are greater than test pit depths, which range from 10 to 30 ft bgs.

2. The lateral extent of soil contamination is widespread and extends beyond the Cluster Site borders. Only two locations (pit 49 in U.S. Drum and 42B in Unnamed Parcel) do not contain contaminant concentrations exceeding TACO Tier I Soil ROs. Areas with highest contaminant concentrations are:

    a. Inorganics throughout Alburn sample locations, the northern tip, central, and southern parts of U.S Drum; and most of north, west, and central Unnamed Parcel.

    b. SVOCs in test pit locations 28 and 35 in central Alburn; pits 13 and 18 in the central-eastern part of U.S. Drum, and 37B along the south-central border of Unnamed Parcel.

    c. VOCs in the central-western and western parts of Alburn (locations in area of 2, 3, 18, 28, 29, 31), the central-eastern part of U.S. Drum (pits 15, 17, 19); and in 21B in Unnamed Parcel where drums were found.

    d. Pesticides in 23B in Unnamed Parcel.

    e. PCBs in the southern part of U.S. Drum (especially pits 50, 44 and 40) and in 33B and 37B in Unnamed Parcel.

3. The vertical extent of contamination is not defined. Solid waste extends below the test pits performed during this investigation. Contamination is observed both in surface soils (0-3 ft bgs) and in deeper soils (greater than 3 ft bgs).

4. Principal contaminants of concern are:

    a. Inorganics exceeding ingestion and inhalation soil ROs are: antimony, arsenic, beryllium, chromium (total), lead, and manganese. Additional inorganics exceeding the soil

b. VOCs exceeding ingestion and inhalation soil ROs are: benzene, chlorobenzene, ethylbenzene, toluene, xylenes, 1,1,1-trichloroethane, 1,1-dichloroethane, 1,2-dichloroethane, 1,2-dibromo-3-chloropropane, carbon disulfide, chloroform, methylene chloride, tetrachloroethene, trichloroethene, and vinyl chloride. Additional VOCs exceeding the soil component of groundwater ingestion ROs are: acetone, styrene, dibromochloromethane, cis-1,2-dichloroethene, and trans-1,2-dichloroethene.

c. SVOCs exceeding ingestion and inhalation soil ROs are benzo(a)anthracene, benzo(a)pyrene, benzo(b)flouanthene, benzo(k)fluoranthene, dibenz(a,h)anthracene, indeno(1,2,3-CD)pyrene, bis(2-chloroethyl)ether, and bis(2-ethylhexyl)phthalate. Additional SVOCs exceeding the soil component of groundwater ingestion ROs are 2,4-dinitrotoluene, 2,6-dinitrotoluene, 2-methylphenol, 2,4-dimethylphenol, 4-chloroaniline, 1,4-dichlorobenzene, 2-methylnaphthalene, acenaphthylene, carbazole, isophorone, naphthalene, nitrobenzene, n-nitrosodiphenylamine, pentachlorophenol, and phenanthrene.

d. Pesticides/herbicides exceeding ingestion and inhalation soil ROs are alpha-BHC and heptachlor. Additional pesticides exceeding the soil component of groundwater ingestion ROs are gamma-BHC and dieldrin.

e. Principal arochlors contributing to PCB contamination are arochlor 1242, arochlor 1248, arochlor 1254, and arochlor 1260.

f. Detected dioxins and furans exceeded EPA Region 9 PRGs. However, USEPA guidance recommends action for dioxin at levels higher than those present.

5. Groundwater under the entire Cluster Site appears contaminated with benzene, manganese, lead, and iron above TACO Class I Groundwater Remediation Objectives, based upon evaluation of data collected in a previous investigation.

6.0 REFERENCES

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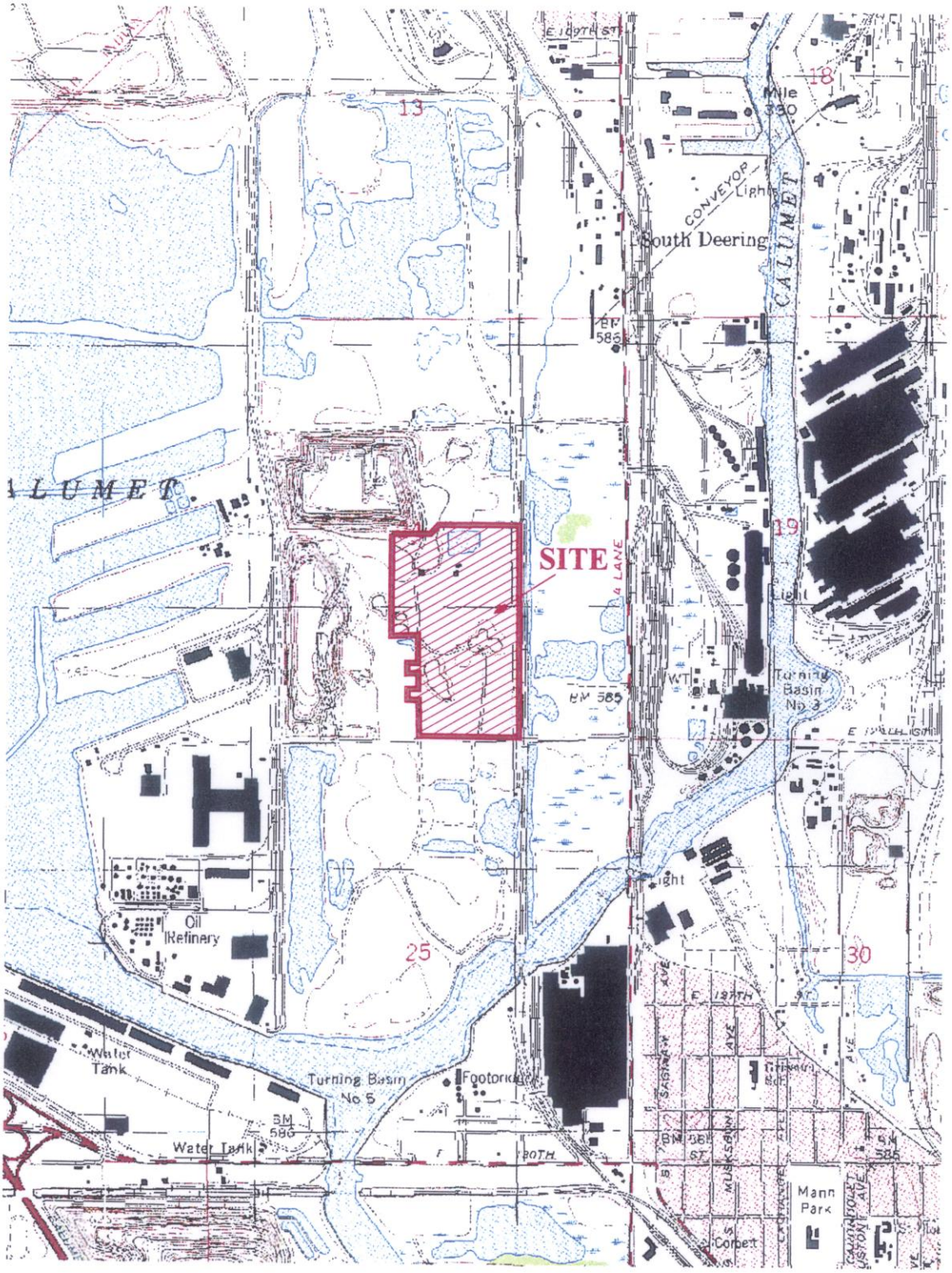
FIGURES



SOURCE:
USGS Lake Calumet, Illinois,
7.5 Minute Quadrangle, 1965, Revised 1997

Figure 1

SITE LOCATION MAP

LAKE CALUMET CLUSTER SITE
Chicago, Illinois

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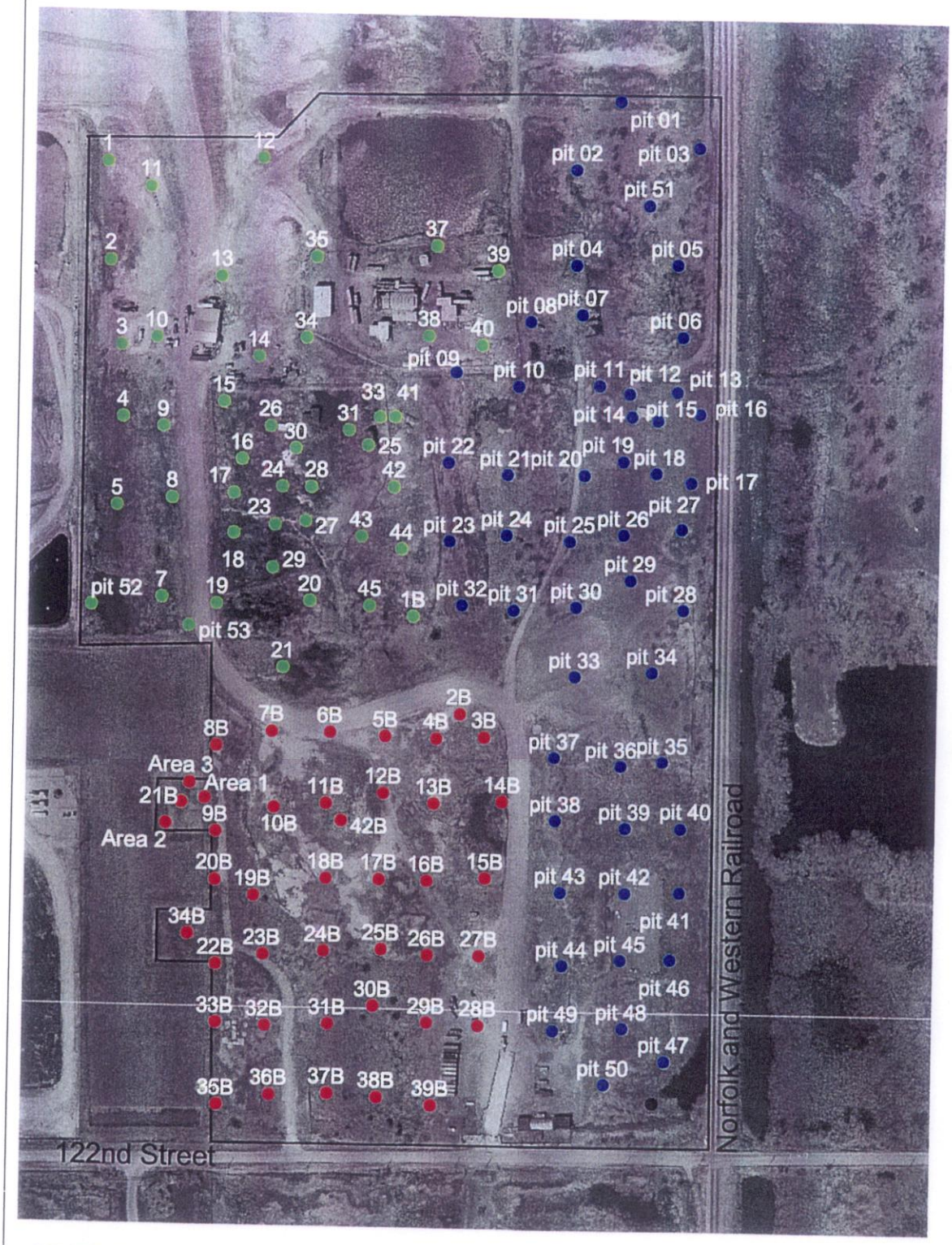

LEGEND

- U.S. Drum II
- Unnamed Parcel
- Alburn Incinerator

0 300 600 Feet

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Figure 2

TEST PIT LOCATION

LAKE CALUMET CLUSTER SITE

Chicago, Illinois

SOURCE

U.S. Fish and Wildlife Service, Illinois Department of Natural Resources, 199604, Illinois Wetlands Inventory in Illinois by County-Polygons: IDNR GIS Database *path_name_suppressed*/wtldspy, Illinois Natural History Survey, Champaign, Illinois.

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0 300 600 Feet

Figure 3
WETLANDS MAP
LAKE CALUMET CLUSTER SITE
Chicago, Illinois

SYSTEM	SERIES	GROUP OR FORMATION	HYDROLOGIC UNITS	LOG	THICKNESS (FT.)	DESCRIPTION	DRILLING AND CASING CONDITIONS	WATER-YIELDING PROPERTIES	CHEMICAL QUALITY OF WATER	WATER TEMPERATURE °F
Quaternary	Pleistocene		Glacial drift aquifers		0-350+	Unconsolidated glacial deposits - pebbly clay (till), silt, and gravel. Alluvial silts and sands along streams.	Boulders, heaving sand locally; sand and gravel wells usually require screens and development; casing required in wells into bedrock.	Sand and gravel, permeable. Some wells yield more than 1000 gpm. Specific capacities from 2.1 to 66 gpm/ft, av. 12 gpm/ft. Coefficient of trans. from 3400 to 100,000 gpd/ft, av. 25,000 gpd/ft.	McHenry County, hardness from 100 to 450 ppm., av. 275. Other counties, see Silurian below and text.	46° min. 52° av. 54° max.
Pennsylvanian		Carbondale Tradewater			0-175	Shale; sandstones, fine-grained; limestones; coal; clay.	Shale requires casing.	Jointed beds yield small supplies locally.		
Mississippian	Kinderhook				0-365	Shale, green and brown, dolomitic; dolomite, silty.		Limited areal extent; not used as aquifer.		
Devonian					0-25	Shale, calcareous; limestone beds, thin.		Not consistent; some wells yield more than 1000 gpm. Crevices and solution channels more abundant near surface. Specific capacities from 0.1 to 550 gpm/ft. Highest av. specific capacities (54.4 gpm/ft) in Du Page Co. wells, lowest (5 gpm/ft) in Lake Co. Coefficient of trans. averages 100,000 gpd/ft in Du Page Co., 9000 gpd/ft in Lake Co.	Variable. Hardness, <100 to >1000 ppm. Iron >0.3 ppm in 80% of analyses.	
Silurian	Niagaran	Port Byron Racine Waukesha Joliet	Silurian	Shallow dolomite aquifs	0-465	Dolomite, silty at base, locally cherty.	Upper part usually weathered and broken; extent of crevicing varies widely.			54°
	Alexandrian	Kankakee Edgewood						Shales, generally not water yielding, act as barriers between shallow and deep aquifers. Crevices in dolomite yield small amounts of water.		
Ordovician	Cincinnatian	Maquoketa	Maquoketa		0-250	Shale, gray or brown; locally dolomite and/or limestone, argillaceous.	Shale requires casing.			
	Mohawkian	Galena Decorah Platteville	Galena-Platteville		220-350+	Dolomite and/or limestone, cherty. Dolomite, shale partings, speckled. Dolomite and/or limestone, cherty, sandy at base.	Crevicing common only where formations underlie drift. Top of Galena usually selected for hole reduction and seating of casing.	Where formation lies below shales, development and yields of crevices are small; where not capped by shales, dolomites are fairly permeable.	Hardness < 100 ppm. H_2S often present.	54° to 55°
	Chazyan	Glenwood St. Peter	Glenwood-St. Peter	Cambrian-Ordovician Aquifer	100-650	Sandstone, fine- and coarse-grained; little dolomite; shale at top. Sandstone, fine- to medium-grained; locally cherty red shale at base.	Lower cherty shales cave and are usually cased. Friable sand may slough.	Small to moderate quantities of water. Trans. probably about 15% of that of Cam.-Ord. Aquif.	Water similar in quality or slightly harder than that in Ironton-Galesville Sandstone.	53° to 56° 56° to 58° (Lake Co.)
	Prairie du Chien	Shakopee New Richmond Oneota	Prairie du Chien		0-340	Dolomite, sandy, cherty (oolitic); sandstone. Sandstone, interbedded with dolomite. Dolomite, white to pink, coarse-grained, cherty (oolitic), sandy at base.	Crevices encountered locally in the dolomite, especially in Trempealeau. Casing not required.	Crevices in dolomite and sandstone generally yield small amounts of water. Trempealeau locally well creviced and partly responsible for exceptionally high yields of several deep wells.		
Cambrian	St. Croixian	Trempealeau	Trempealeau		0-225	Dolomite, white, fine-grained, gecdic quartz, sandy at base.				
		Franconia	Franconia		45-175	Dolomite, sandstone, and shale, glauconitic, green to red, micaceous.				
		Ironton Galesville	Ironton-Galesville		105-270	Sandstone, fine- to medium-grained, well sorted, upper part dolomitic.	Amount of cementation variable. Lower part more friable. Sometimes sloughs.	Most productive unit of Cam.-Ord. Aquif; trans. probably about 80% its total. Coefficients of trans. and storage of the Cam.-Ord. Aquif. av. 17,400 gpd/ft and 0.00035.	Hardness 200 to 250 ppm in northwest part of area, increasing toward east and south. Iron usually <0.4 ppm.	56° - 58° to 62° - 64°
		Eau Claire	Eau Claire (upper and middle beds)		235-450	Shale and siltstone, dolomitic, glauconitic; sandstone, dolomitic, glauconitic.	Casing not usually necessary. Locally weak shales may require casing.	Shales, generally not water yielding, act as barrier between Ironton-Galesville and Mt. Simon.	Water soft in upper 100'; hardness increases downward (4000 ppm at elev. -2100'); chlorides 400 ppm at elev. -1600', increase at rate of 400 ppm each additional 25' depth.	66° at elev. -1300', increasing 1° with each additional 100' depth. Influenced by water from upper formations.
		Mt. Simon	Sandstones Eau Claire (lower) & Mt. Simon	Mt. Simon	2000±	Sandstone, coarse-grained, white, red in lower half; lenses of shale and siltstone, red, micaceous.	Casing not required.	Moderate amounts of water; permeability intermediate between that of Glenwood-St. Peter and Ironton-Galesville.		
Precambrian crystalline rocks										

SOURCE:
Suter et al., 1959.

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Figure 4
GENERALIZED HYDROSTRATIGRAPHIC COLUMN
LAKE CALUMET CLUSTER SITE
Chicago, Illinois

O:\chicago\indian-ridge\FIGURE3.cdr

LEGEND

- Groundwater (E&E, November 1999)
- Sediment (E&E, November 1999)
- Sediment & Surface Water (E&E, November 1999)
- Surface Water (E&E, November 1999)
- Test Pit

Figure 5

TEST PITS, MONITORING WELLS, SOIL BORINGS, SEDIMENT AND SURFACE WATER SAMPLE LOCATIONS

LAKE CALUMET CLUSTER SITE

Chicago, Illinois

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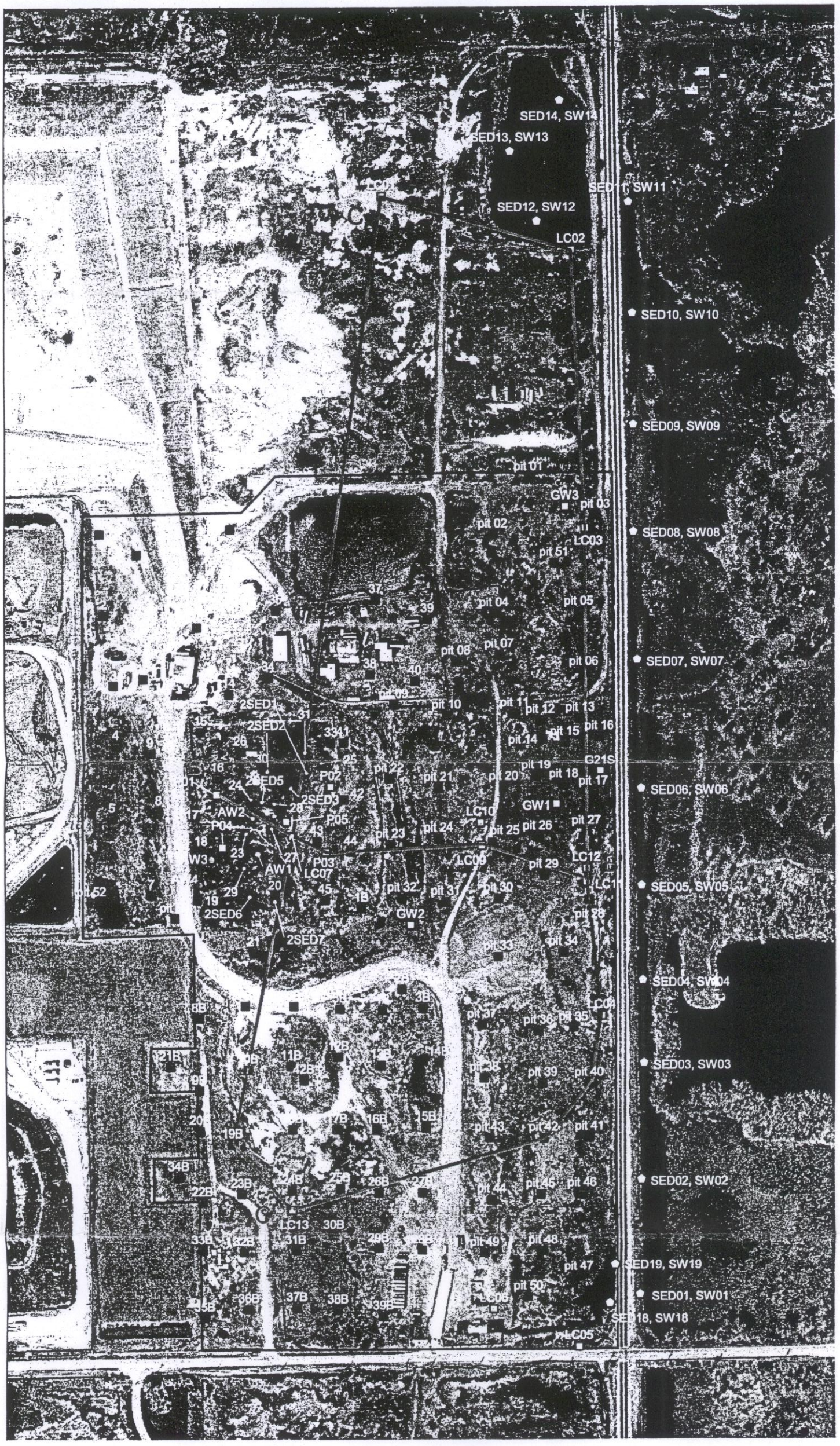

LEGEND

- Cross-Section
- Groundwater (E&E, November 1999)
- Sediment (E&E, November 1999)
- Sediment & Surface Water (E&E, November 1999)
- Surface Water (E&E, November 1999)
- Test Pit

0 500 Feet

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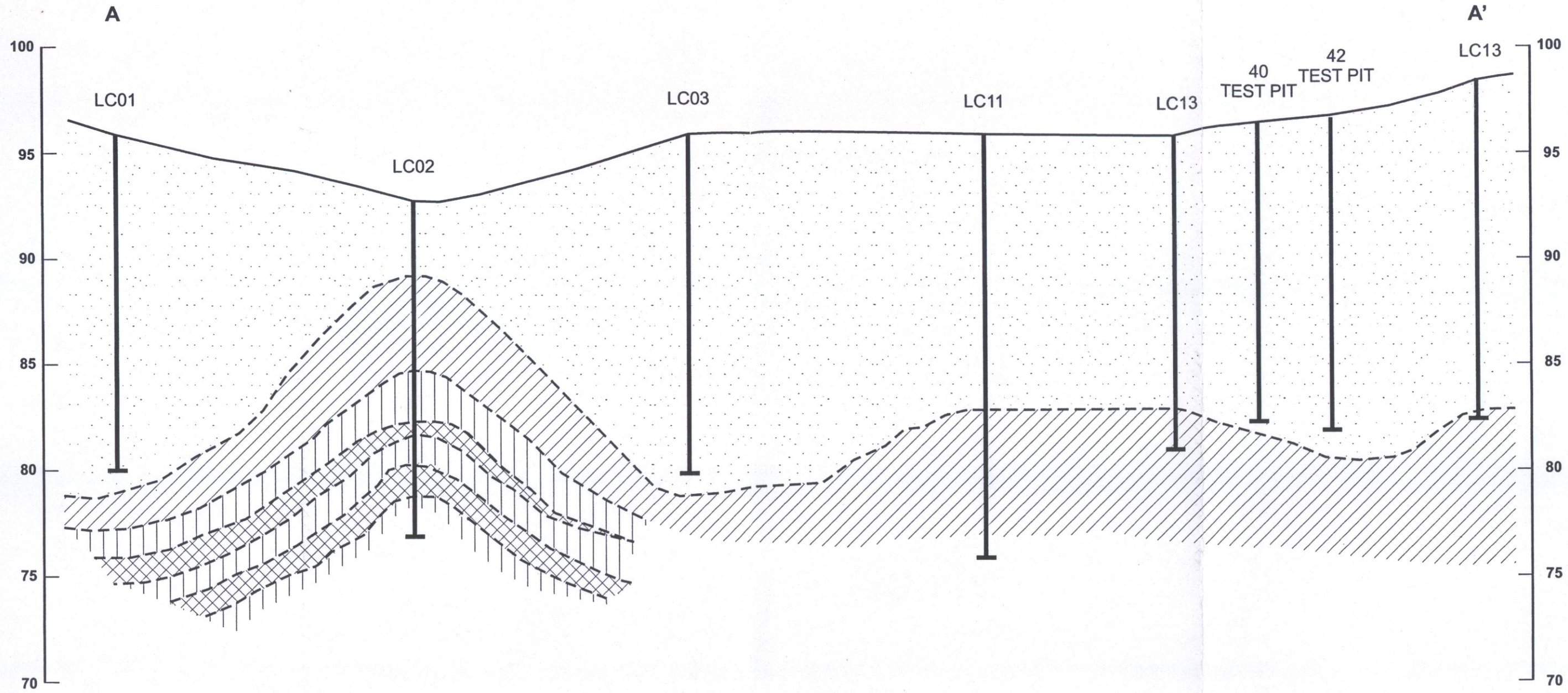
Figure 6
GEOLOGIC CROSS-SECTIONS LOCATION MAP
LAKE CALUMET CLUSTER SITE
Chicago, Illinois



LEGEND

- Fill
- Sand
- Clay
- Peat

0 250 500 Feet
HORIZONTAL SCALE

0 5 10 Feet
VERTICAL SCALE

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Figure 7
GEOLOGIC CROSS-SECTION A-A'
LAKE CALUMET CLUSTER SITE
Chicago , Illinois

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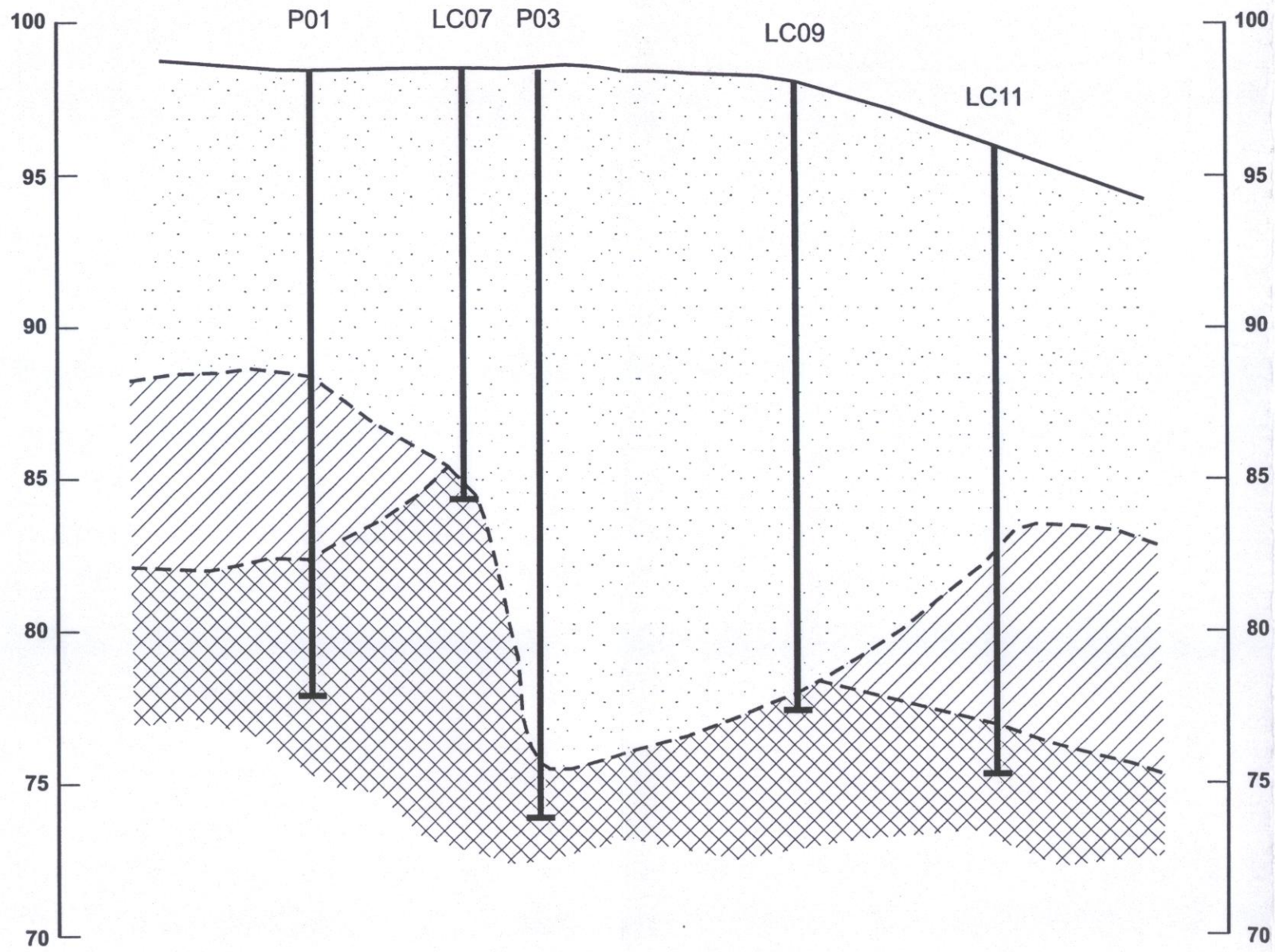

LEGEND

- Fill
- Sand
- Clay

0 250 500 Feet

HORIZONTAL SCALE

0 5 10 Feet

VERTICAL SCALE

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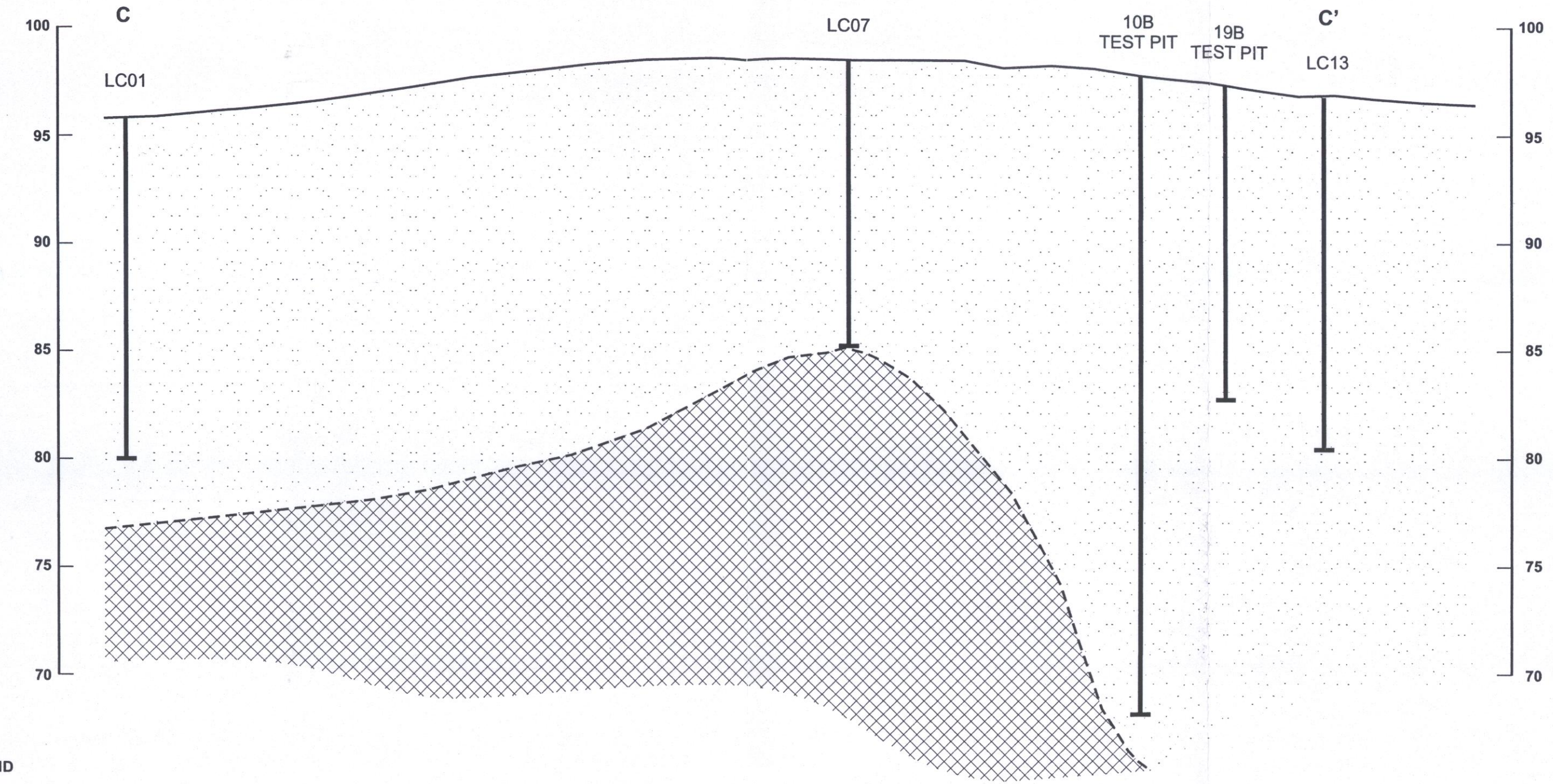
Figure 8
GEOLOGIC CROSS-SECTION B-B'
LAKE CALUMET CLUSTER SITE
Chicago , Illinois



0 250 500 Feet

HORIZONTAL SCALE

0 5 10 Feet

VERTICAL SCALE

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Figure 9
GEOLOGIC CROSS-SECTION C-C'
LAKE CALUMET CLUSTER SITE
Chicago , Illinois

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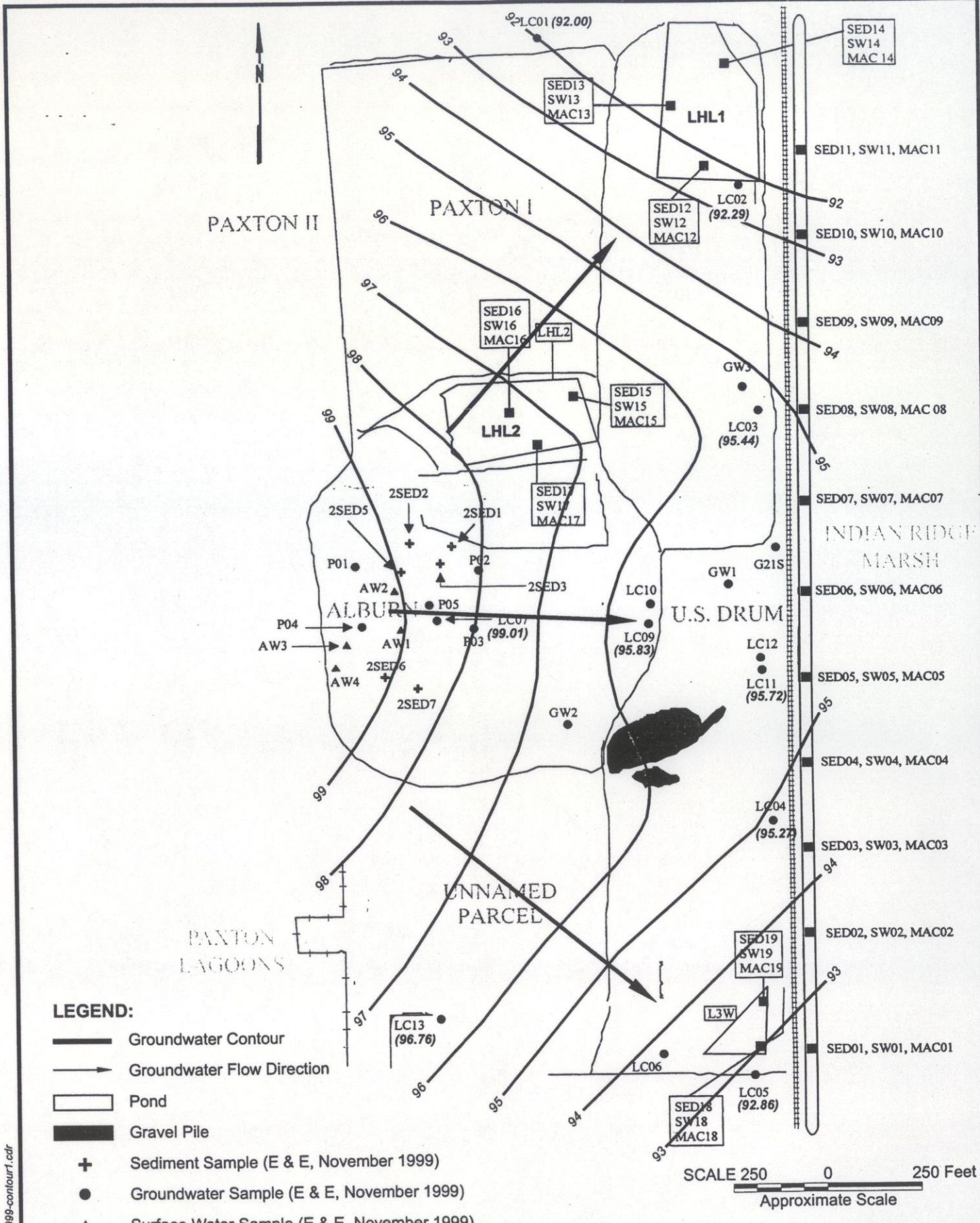

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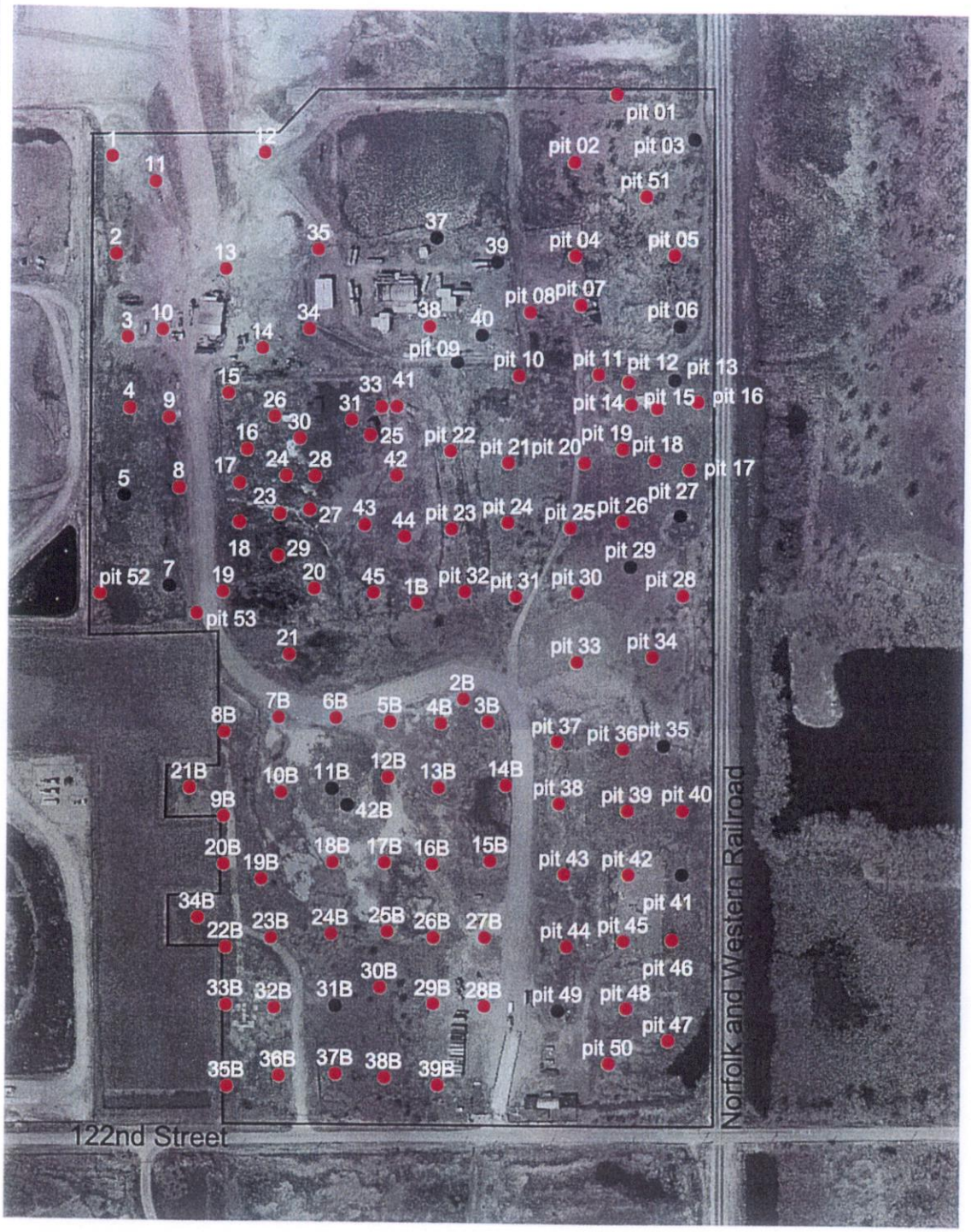
Figure 10
GROUNDWATER POTENTIOMETRIC CONTOURS - APRIL 1999
LAKE CALUMET CLUSTER SITE
City of Chicago, Illinois



LEGEND

- Exceeds Tier 1 RO
- Less than Tier 1 RO

0 300 600 Feet

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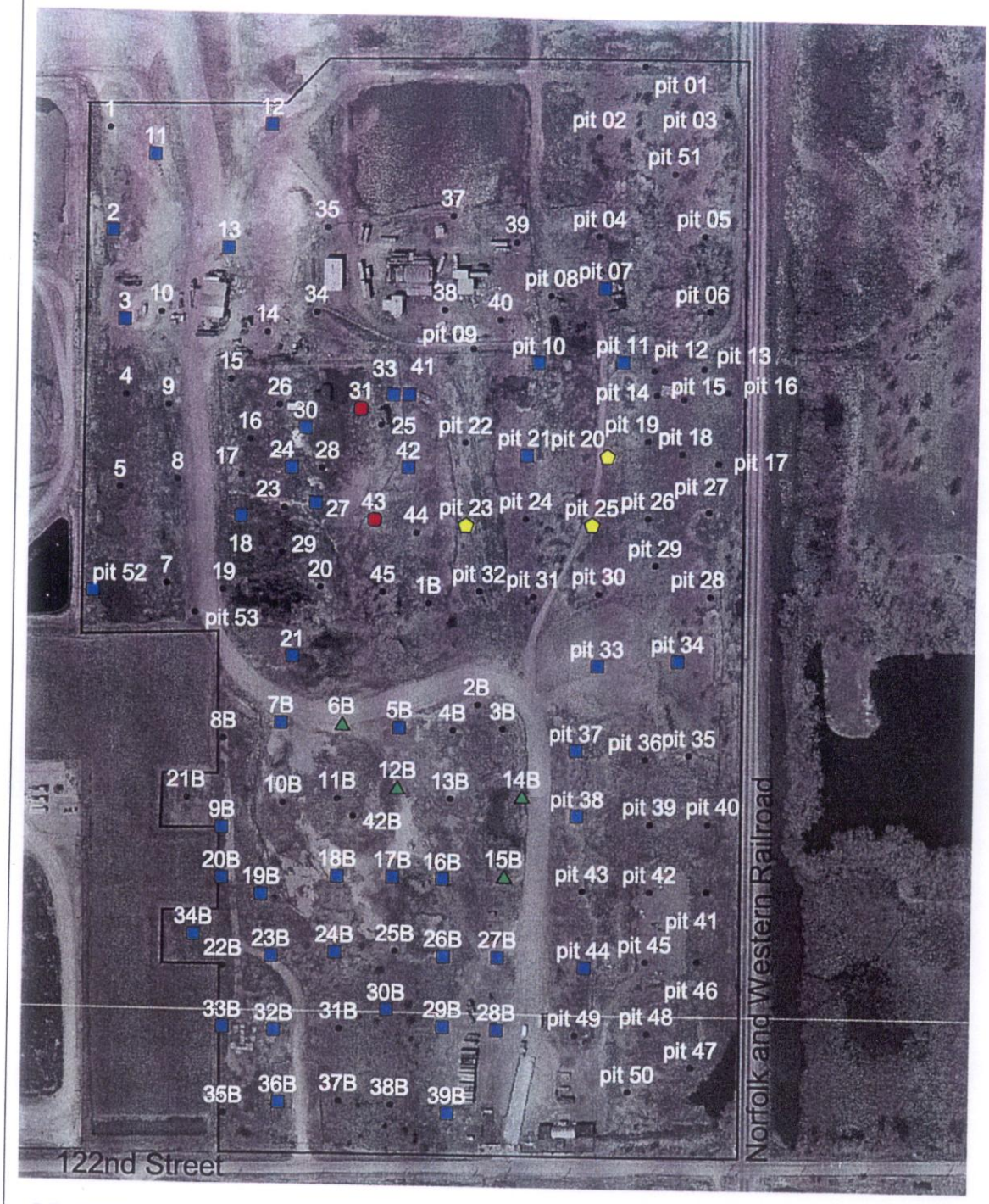
Figure 11

INORGANICS ABOVE THE MINIMUM INDUSTRIAL AND COMMERCIAL TIER 1 SOIL REMEDIATION OBJECTIVES

SOIL INGESTION, INHALATION, AND SOIL COMPONENT OF THE GROUNDWATER INGESTION PATHWAYS

LAKE CALUMET CLUSTER SITE
Chicago, Illinois



LEGEND

- ■ 13-32.9 mg/kg (Exceeds the Maximum pH Soil Component of the Groundwater Ingestion Pathway)
- △ 33-60.9 mg/kg (Exceeds the I/C Ingestion Pathway)
- ⬠ 61- 99.9mg/kg (Exceeds the CW Ingestion Pathway)
- ● 100-151 mg/kg (151 mg/kg highest concentration)
- ● Less than Tier 1 RO

0 300 600 Feet

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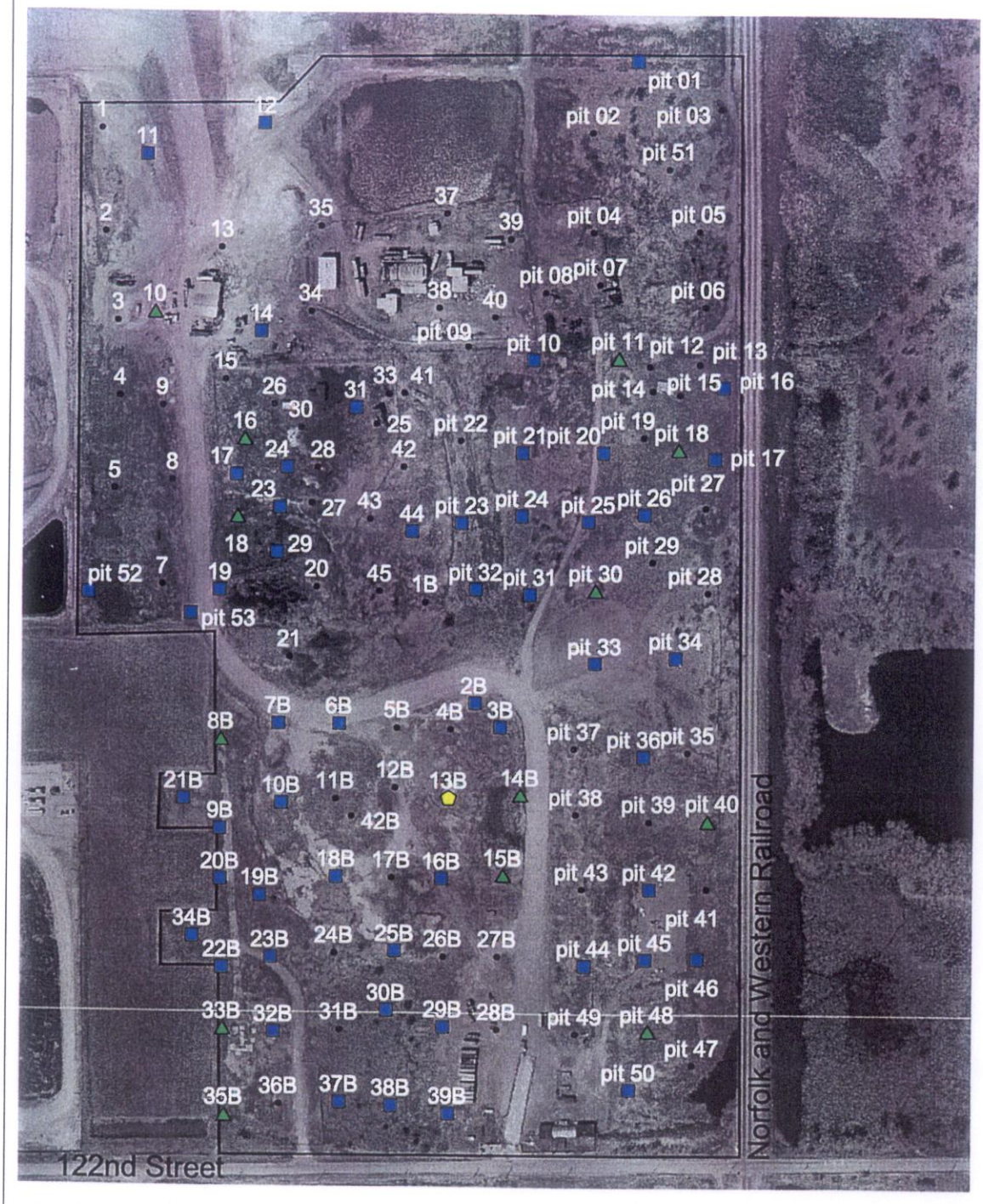
Figure 12

ARSENIC (0-3 FEET) ABOVE THE INDUSTRIAL AND COMMERCIAL TIER 1 SOIL REMEDIATION OBJECTIVES

SOIL INGESTION, INHALATION, AND SOIL COMPONENT OF THE GROUNDWATER INGESTION PATHWAYS

LAKE CALUMET CLUSTER SITE

Chicago, Illinois



LEGEND

- ■ 13-32.9 mg/kg (Exceeds the Maximum pH Soil Component of the Groundwater Ingestion Pathway)
- △ 33-60.9 mg/kg (Exceeds the I/C Ingestion Pathway)
- ⬠ 61-99.9 mg/kg (Exceeds the CW Ingestion Pathway)
- ● 100 -151 mg/kg
- ● Less than Tier 1 RO

0 300 600 Feet

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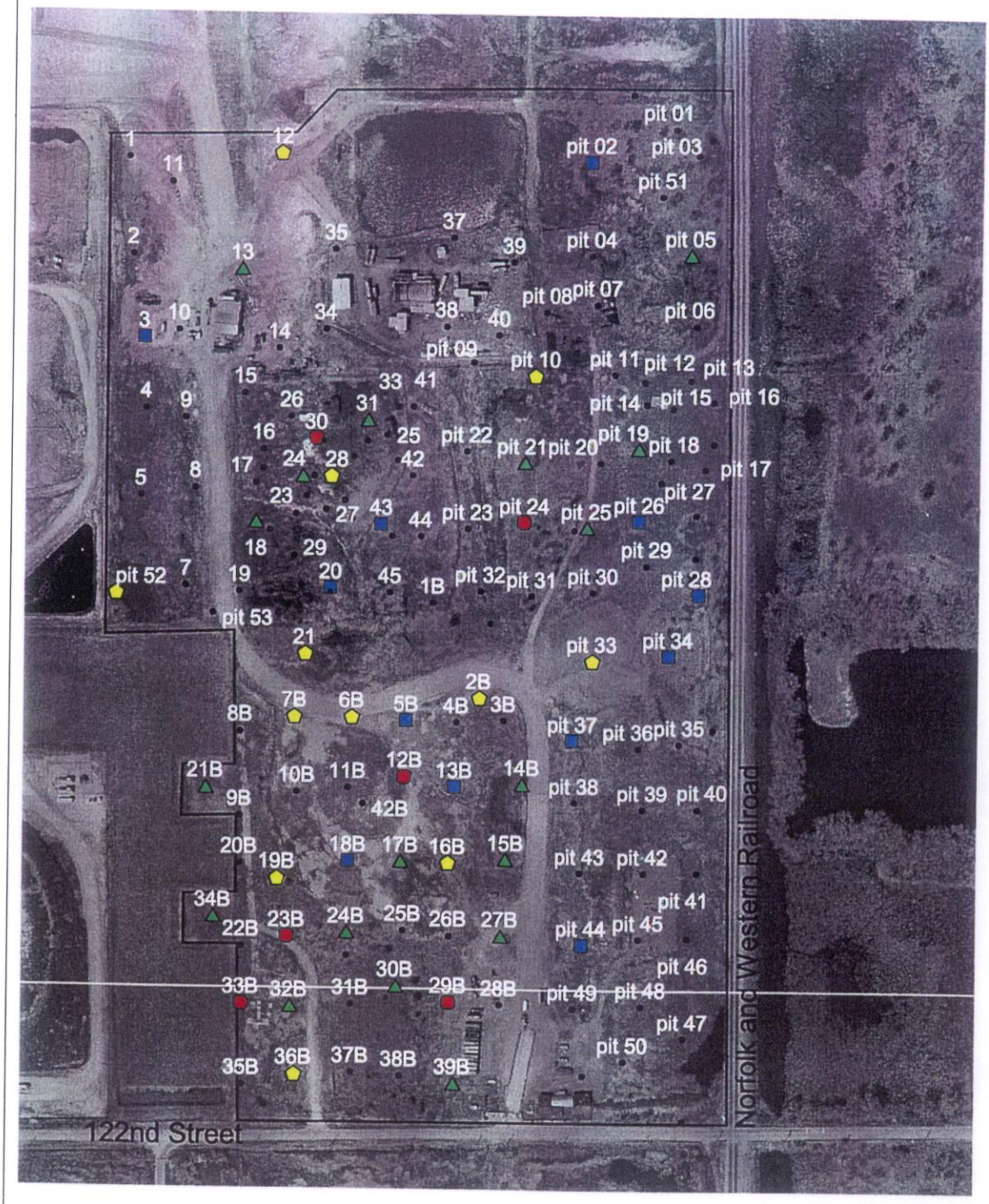
Figure 13

ARSENIC (>3 FEET) ABOVE THE INDUSTRIAL AND COMMERCIAL TIER 1 SOIL REMEDIATION OBJECTIVES

SOIL INGESTION, INHALATION, AND SOIL COMPONENT OF THE GROUNDWATER INGESTION PATHWAYS

LAKE CALUMET CLUSTER SITE

Chicago, Illinois



LEGEND

- ■ 400-599.9 mg/kg (RO = 400 mg/kg)
- ▲ 600-999.9 mg/kg
- ⬠ 1000-1999.9 mg/kg
- ● 2000-4350 mg/kg
- ● Less than Tier 1 RO

0 300 600 Feet

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Figure 14

LEAD (0-3 FEET) ABOVE THE INDUSTRIAL AND COMMERCIAL TIER 1 SOIL REMEDIATION OBJECTIVES

SOIL INGESTION, INHALATION, AND SOIL COMPONENT OF THE GROUNDWATER INGESTION PATHWAYS

LAKE CALUMET CLUSTER SITE

Chicago, Illinois

LEGEND

- ■ 400-599.9 mg/kg (RO = 400 mg/kg)
- △ 600-999.9 mg/kg
- ⬠ 1000-1999.9 mg/kg
- ■ 2000-6730 mg/kg
- ● Less than Tier 1 RO

0 300 600 Feet

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Figure 15

LEAD (>3 FEET) ABOVE THE INDUSTRIAL AND COMMERCIAL TIER 1 SOIL REMEDIATION OBJECTIVES

SOIL INGESTION, INHALATION, AND SOIL COMPONENT OF THE GROUNDWATER INGESTION PATHWAYS

LAKE CALUMET CLUSTER SITE

Chicago, Illinois

LEGEND

- Exceeds Tier 1 RO
- Less than Tier 1 RO

0 300 600 Feet

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Figure 16

VOCs ABOVE THE MINIMUM INDUSTRIAL AND COMMERCIAL TIER 1 SOIL REMEDIATION OBJECTIVES
SOIL INGESTION, INHALATION, AND SOIL COMPONENT OF THE GROUNDWATER INGESTION PATHWAYS
LAKE CALUMET CLUSTER SITE
Chicago, Illinois

LEGEND

- Exceeds Tier 1 RO
- Less than Tier 1 RO

0 300 600 Feet

Figure 17

VOCs ABOVE THE MINIMUM INDUSTRIAL AND COMMERCIAL TIER 1 SOIL REMEDIATION OBJECTIVES
SOIL INGESTION AND INHALATION PATHWAYS
LAKE CALUMET CLUSTER SITE
Chicago, Illinois

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LEGEND

- ■ 0.03-1.49 mg/kg (Exceeds the Soil Component of the Groundwater Ingestion Pathway)
- △ 1.5-2.19 mg/kg (Exceeds the Inhalation Pathways)
- ⬠ 2.2-24.9 mg/kg
- ● 25-92 mg/kg (92 mg/kg highest concentration)
- ● Less than Tier 1 RO

Note: Dilution Factor of 21B too high to confirm presence of benzene.

0 300 600 Feet

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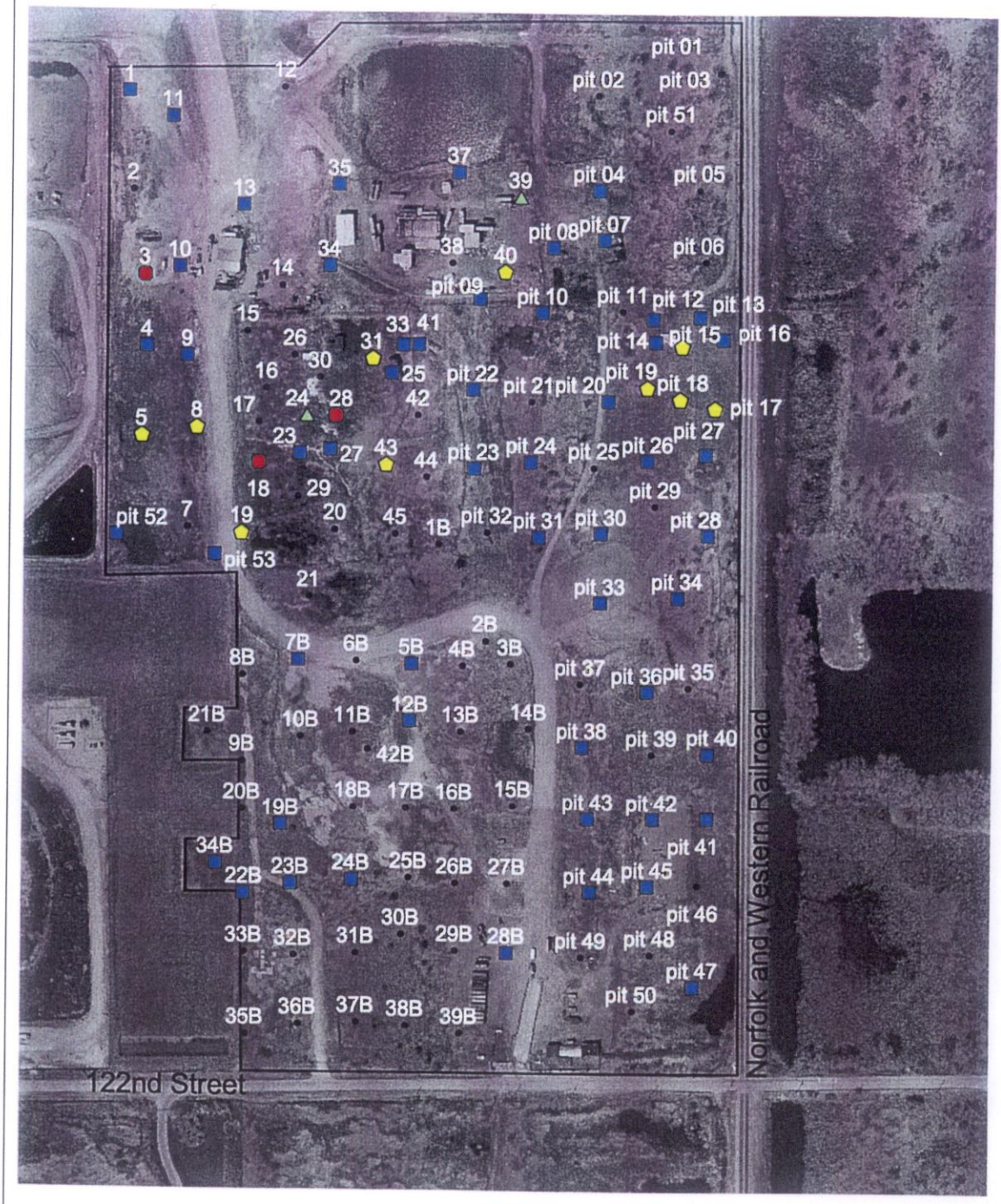
Figure 18

BENZENE (0-3 FEET) ABOVE THE INDUSTRIAL AND COMMERCIAL TIER 1 SOIL REMEDIATION OBJECTIVES

SOIL INGESTION, INHALATION, AND SOIL COMPONENT OF THE GROUNDWATER INGESTION PATHWAYS

LAKE CALUMET CLUSTER SITE
Chicago, Illinois



LEGEND

- ■ 0.03-1.49 mg/kg (Exceeds the Soil Component of the Groundwater Ingestion Pathway)
- △ 1.5-2.19 mg/kg (Exceeds the Inhalation Pathways)
- ⬠ 2.2-24.9 mg/kg
- ● 25-64 mg/kg (64 mg/kg highest concentration)
- ● Less than Tier 1 RO

Note: Dilution factor of 21B too high to confirm presence of benzene

0 300 600 Feet

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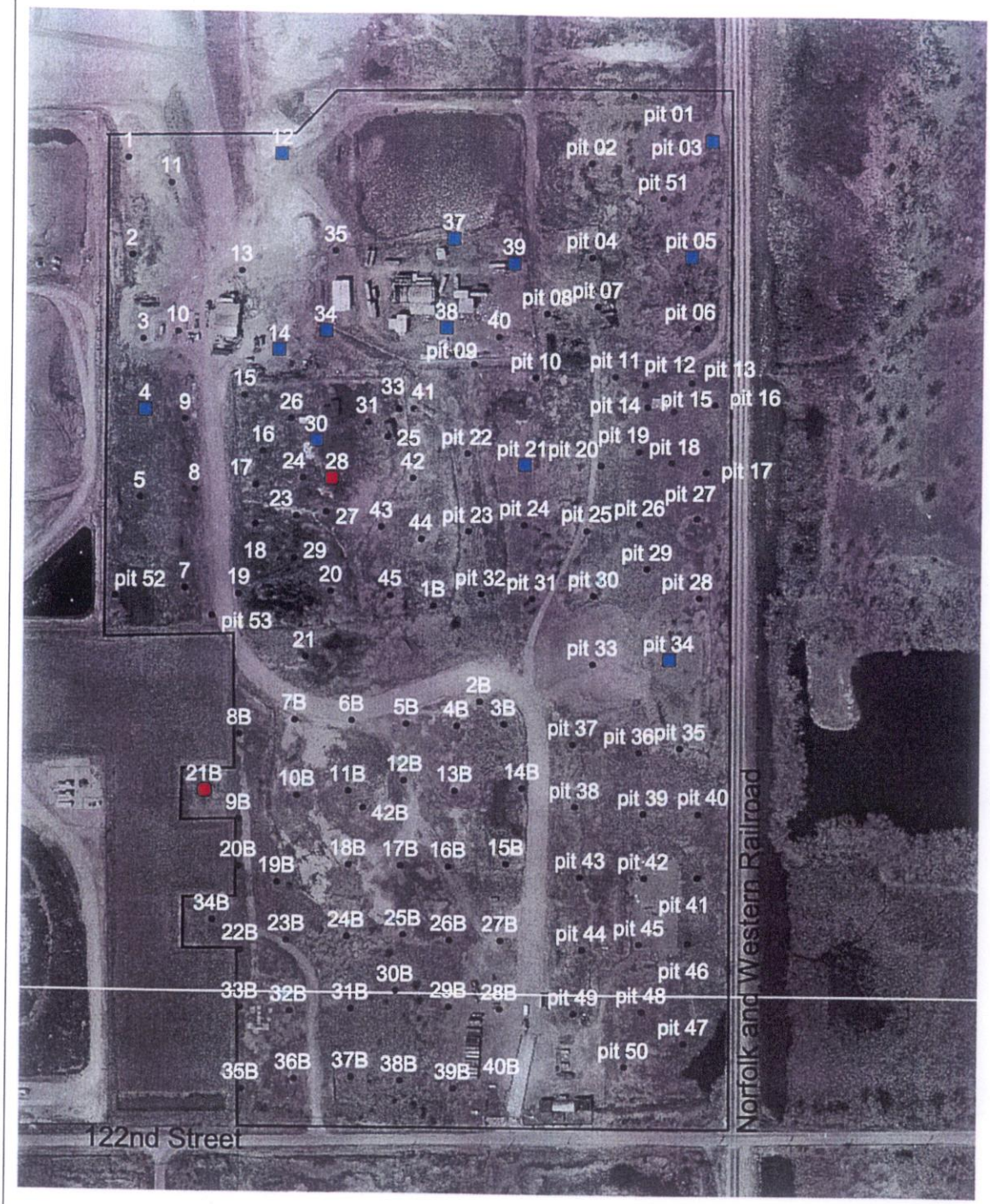
Figure 19

BENZENE (>3FEET) ABOVE THE INDUSTRIAL AND COMMERCIAL TIER 1 SOIL REMEDIATION OBJECTIVES

SOIL INGESTION, INHALATION, AND SOIL COMPONENT OF THE GROUNDWATER INGESTION PATHWAYS

LAKE CALUMET CLUSTER SITE
Chicago, Illinois



LEGEND

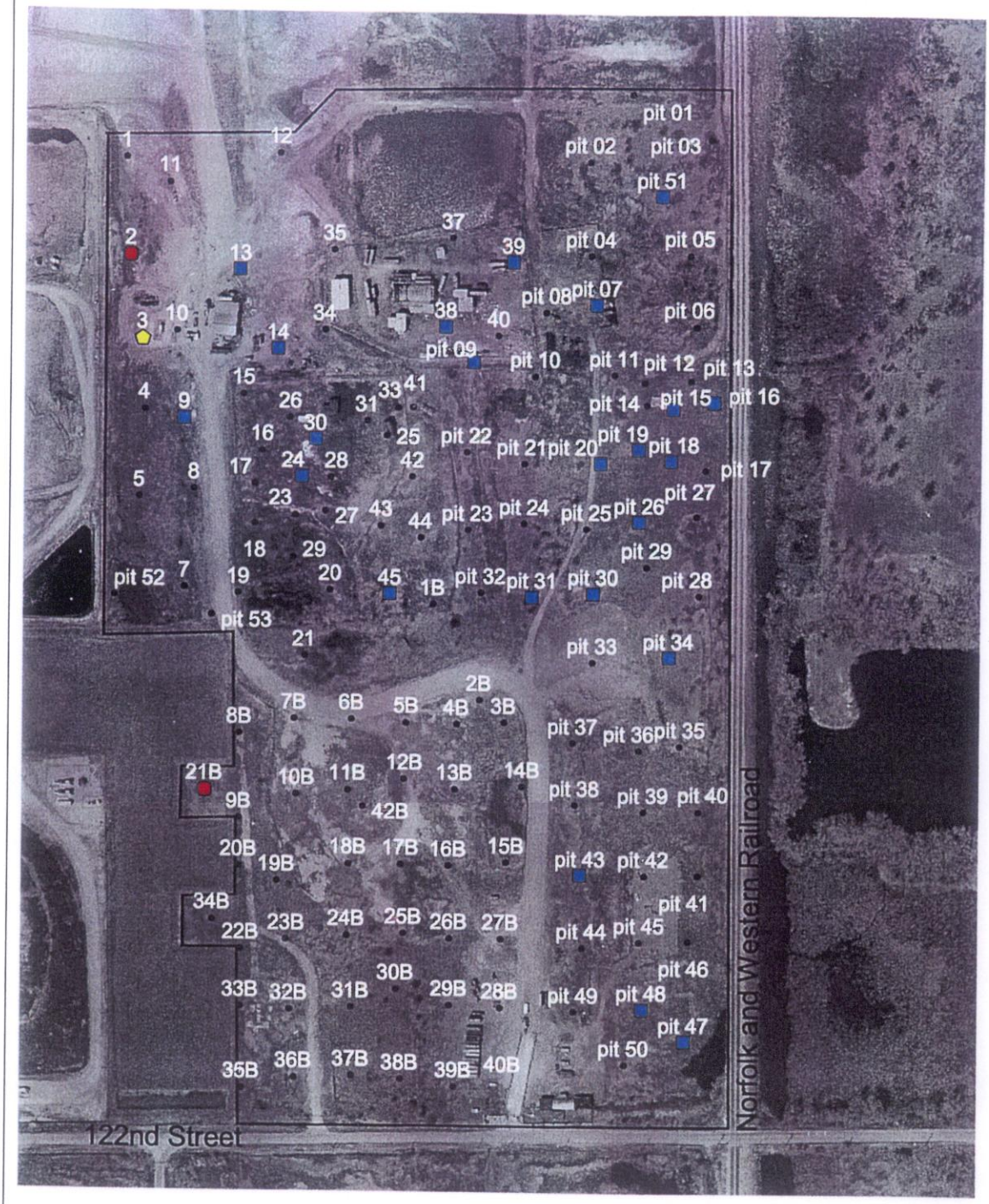
- 0.06-8.9 mg/kg (Exceeds the Soil Component of the Groundwater Ingestion Pathway)
- 8.9-12 mg/kg (Exceeds the Inhalation Pathways)
- 12-25 mg/kg
- 25-260 mg/kg (260 mg/kg highest concentration)
- Less than Tier 1 RO

0 300 600 Feet

HARZA ENGINEERING COMPANY
WATER & ENVIRONMENT

Figure 20

TRICHLOROETHENE (0-3 FEET) ABOVE THE INDUSTRIAL AND COMMERCIAL TIER 1 SOIL REMEDIATION OBJECTIVES
SOIL INGESTION, INHALATION, AND SOIL COMPONENT OF THE GROUNDWATER INGESTION PATHWAYS
LAKE CALUMET CLUSTER SITE
Chicago, Illinois



LEGEND

- ■ 0.06-8.9 mg/kg (Exceeds the Soil Component of the Groundwater Ingestion Pathway)
- △ 8.9-12 mg/kg (Exceeds the Inhalation Pathways)
- ⬠ 12-25 mg/kg
- ■ 25-390 mg/kg (390 mg/kg highest concentration)
- ● Less than Tier 1 RO

0 300 600 Feet

Figure 21

TRICHLOROETHENE (>3 FEET) ABOVE THE INDUSTRIAL AND COMMERCIAL TIER 1 SOIL REMEDIATION OBJECTIVES

SOIL INGESTION, INHALATION, AND SOIL COMPONENT OF THE GROUNDWATER INGESTION PATHWAYS

LAKE CALUMET CLUSTER SITE
Chicago, Illinois

HARZA ENGINEERING COMPANY
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LEGEND

- Exceeds Tier 1 RO
- Less than Tier 1 RO

0 300 600 Feet

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Figure 22

SVOCs ABOVE THE MINIMUM INDUSTRIAL AND COMMERCIAL TIER 1 SOIL REMEDIATION OBJECTIVES

SOIL INGESTION, INHALATION, AND SOIL COMPONENT OF THE GROUNDWATER INGESTION PATHWAYS

LAKE CALUMET CLUSTER SITE

Chicago, Illinois

LEGEND

- Exceeds Tier 1 RO
- Less than Tier 1 RO

0 300 600 Feet

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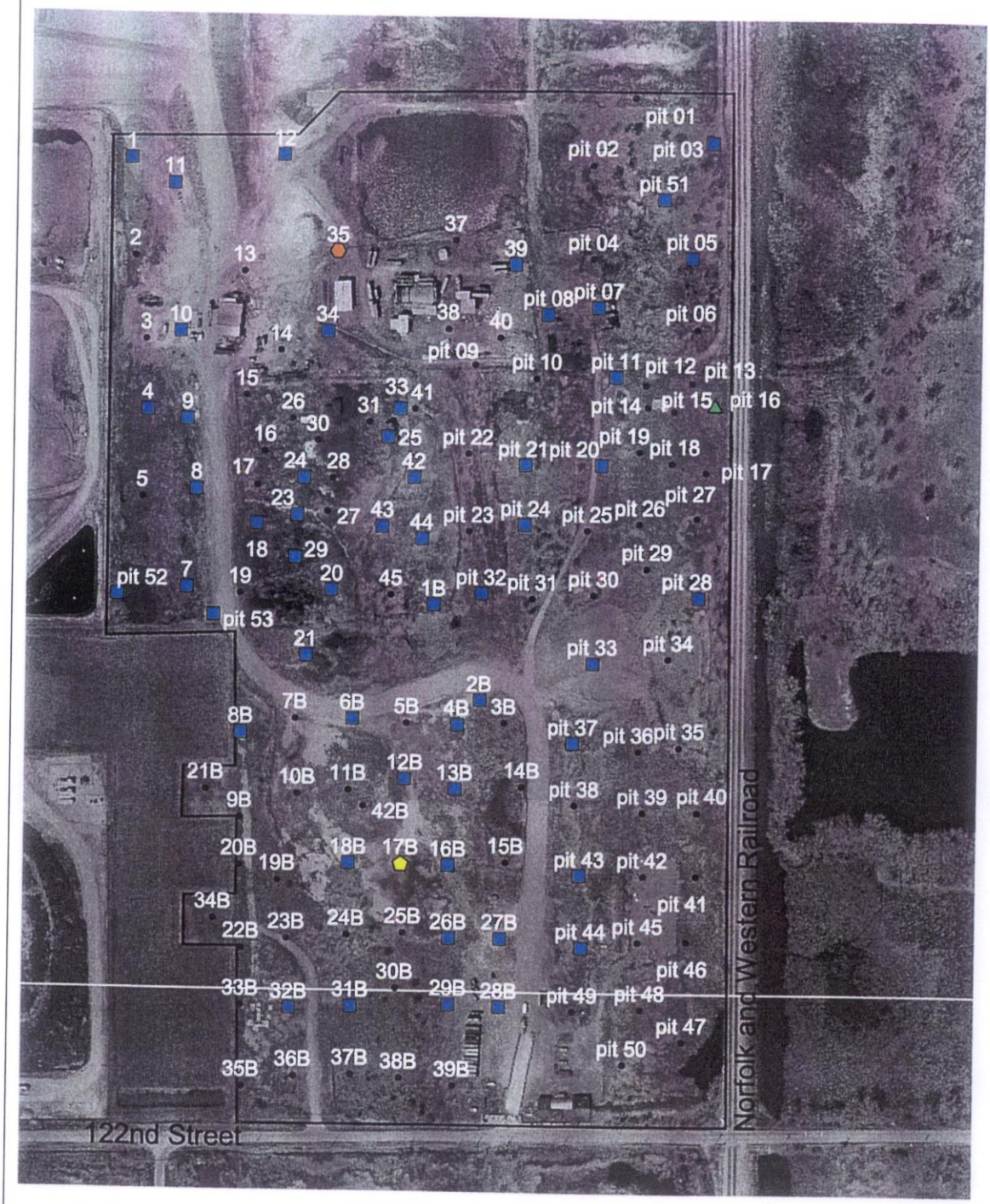
Figure 23

SVOCs ABOVE THE MINIMUM INDUSTRIAL AND COMMERCIAL TIER 1 SOIL REMEDIATION OBJECTIVES

SOIL INGESTION AND INHALATION PATHWAYS

LAKE CALUMET CLUSTER SITE

Chicago, Illinois



LEGEND

- 0.8-7.9 mg/kg (Exceeds the I/C Ingestion Pathway)
- 8-16.9 mg/kg (Exceeds the Soil Component of the Groundwater Pathway)
- 17-24.9 mg/kg (Exceeds the CW Ingestion Pathway)
- 25-49.9 mg/kg
- 50-250 mg/kg
- Less than Tier 1 RO

0 300 600 Feet

HARZA ENGINEERING COMPANY
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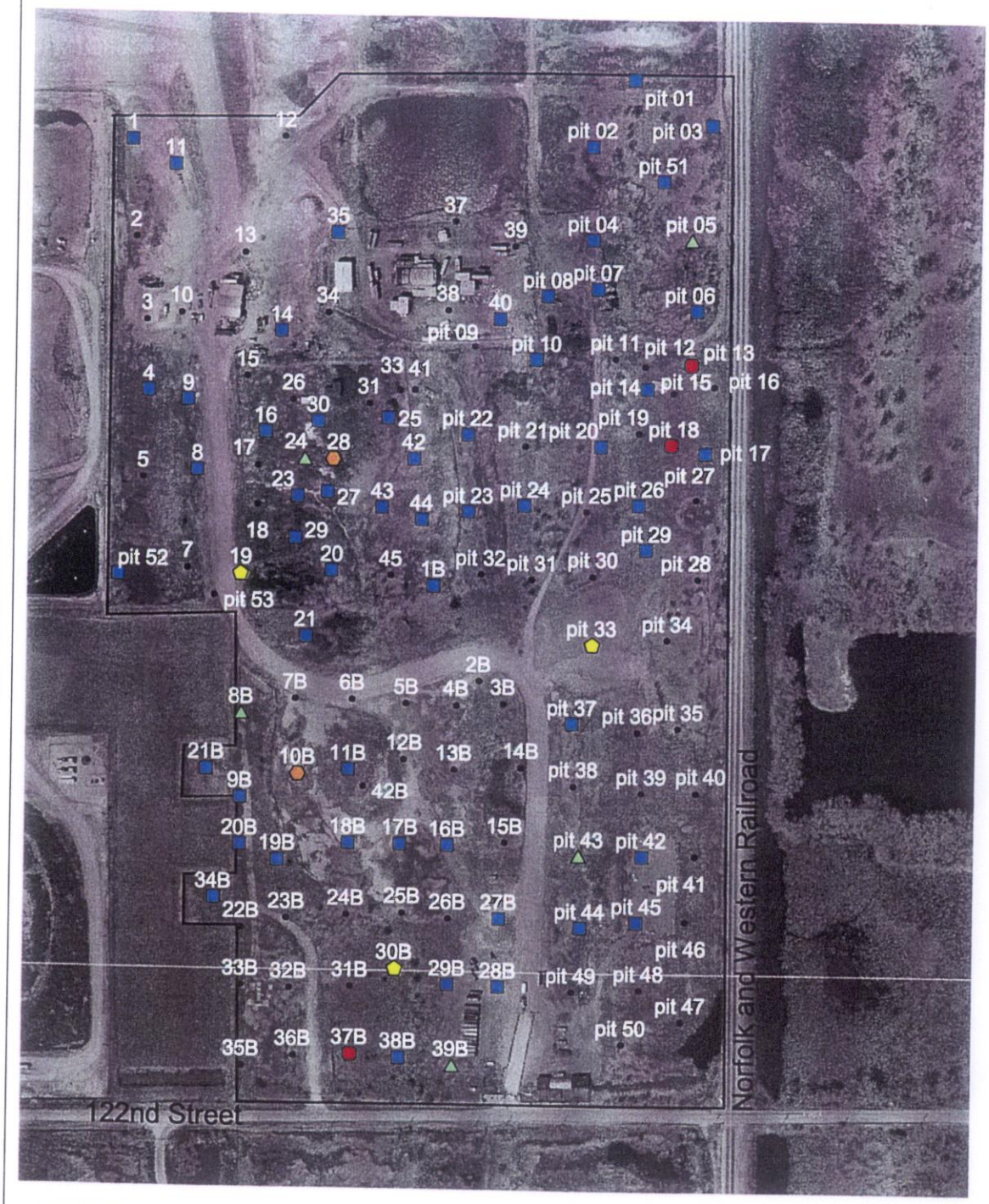
Figure 24

BENZO(A)PYRENE (0-3 FEET) ABOVE THE INDUSTRIAL AND COMMERCIAL TIER 1 SOIL REMEDIATION OBJECTIVES

SOIL INGESTION, INHALATION, AND SOIL COMPONENT OF THE GROUNDWATER INGESTION PATHWAYS

LAKE CALUMET CLUSTER SITE

Chicago, Illinois



LEGEND

- ■ 0.8-7.9 mg/kg (Exceeds the I/C Ingestion Pathway)
- △ 8-16.9 mg/kg (Exceeds the Soil Component of the Groundwater Pathway)
- ⬠ 17-24.9 mg/kg (Exceeds the CW Ingestion Pathway)
- ⬢ 25-49.9 mg/kg
- ● 50-250 mg/kg (250 mg/kg highest concentration)
- ● Less than Tier 1 RO

0 300 600 Feet

HARZA ENGINEERING COMPANY
WATER & ENVIRONMENT

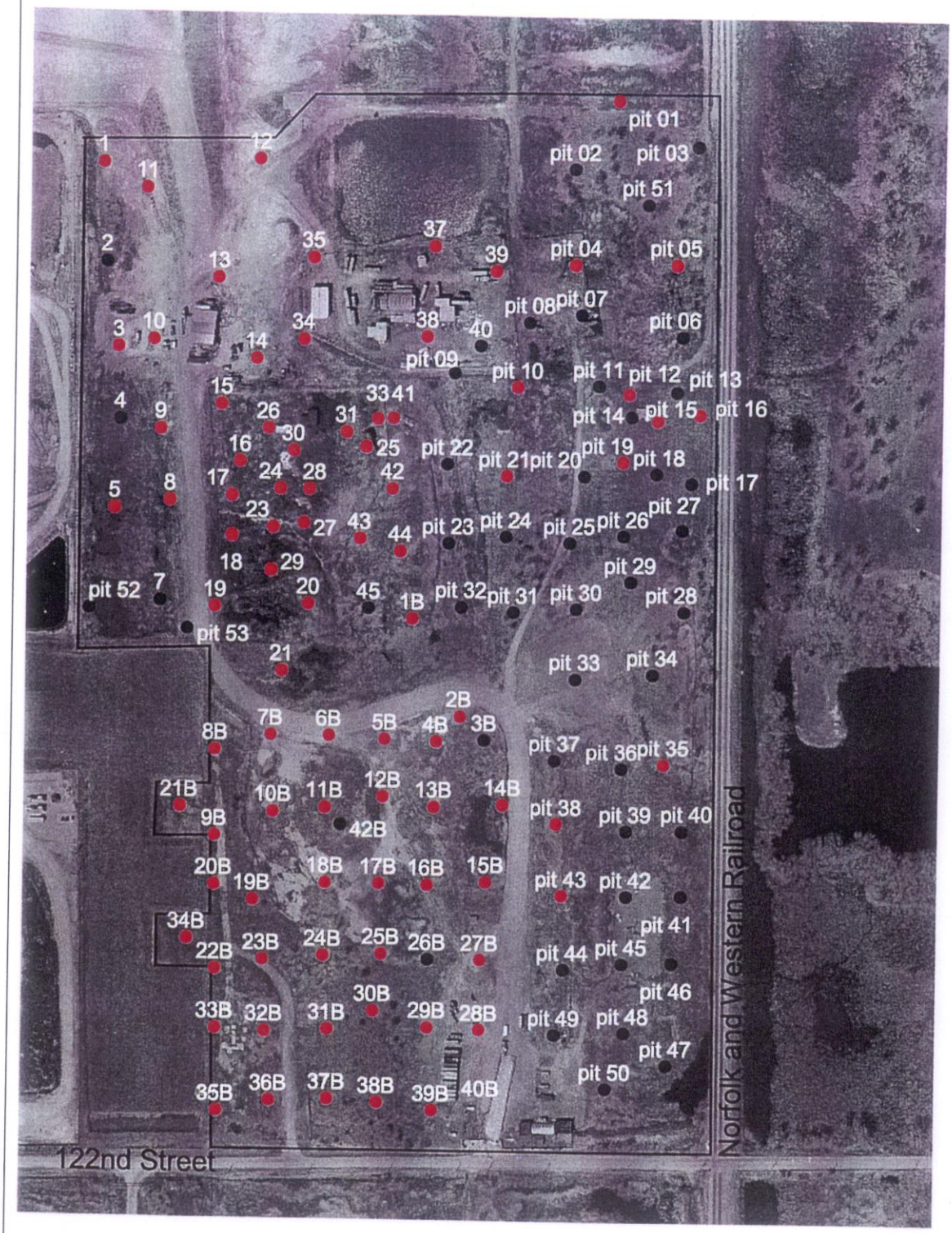
Figure 25

BENZO(A)PYRENE (>3 FEET) ABOVE THE INDUSTRIAL AND COMMERCIAL TIER 1 SOIL REMEDIATION OBJECTIVES

SOIL INGESTION, INHALATION, AND SOIL COMPONENT OF THE GROUNDWATER INGESTION PATHWAYS

LAKE CALUMET CLUSTER SITE

Chicago, Illinois



LEGEND

- Exceeds Tier 1 RO
- Less than Tier 1 RO

0 300 600 Feet

HARZA ENGINEERING COMPANY
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Figure 26

PESTICIDES/HERBICIDES ABOVE THE MINIMUM INDUSTRIAL AND COMMERCIAL TIER 1 SOIL REMEDIATION OBJECTIVES

SOIL INGESTION, INHALATION, AND SOIL COMPONENT OF THE GROUNDWATER INGESTION PATHWAYS

LAKE CALUMET CLUSTER SITE

Chicago, Illinois

LEGEND

- Exceeds Tier 1 RO
- Less than Tier 1 RO

0 300 600 Feet

Figure 27

PESTICIDES/HERBICIDES ABOVE THE MINIMUM INDUSTRIAL AND COMMERCIAL TIER 1 SOIL REMEDIATION OBJECTIVES
SOIL INGESTION AND INHALATION PATHWAYS
LAKE CALUMET CLUSTER SITE
Chicago, Illinois

HARZA ENGINEERING COMPANY
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LEGEND

- Exceeds Tier 1 RO
- Less than Tier 1 RO

0 300 600 Feet

Figure 28

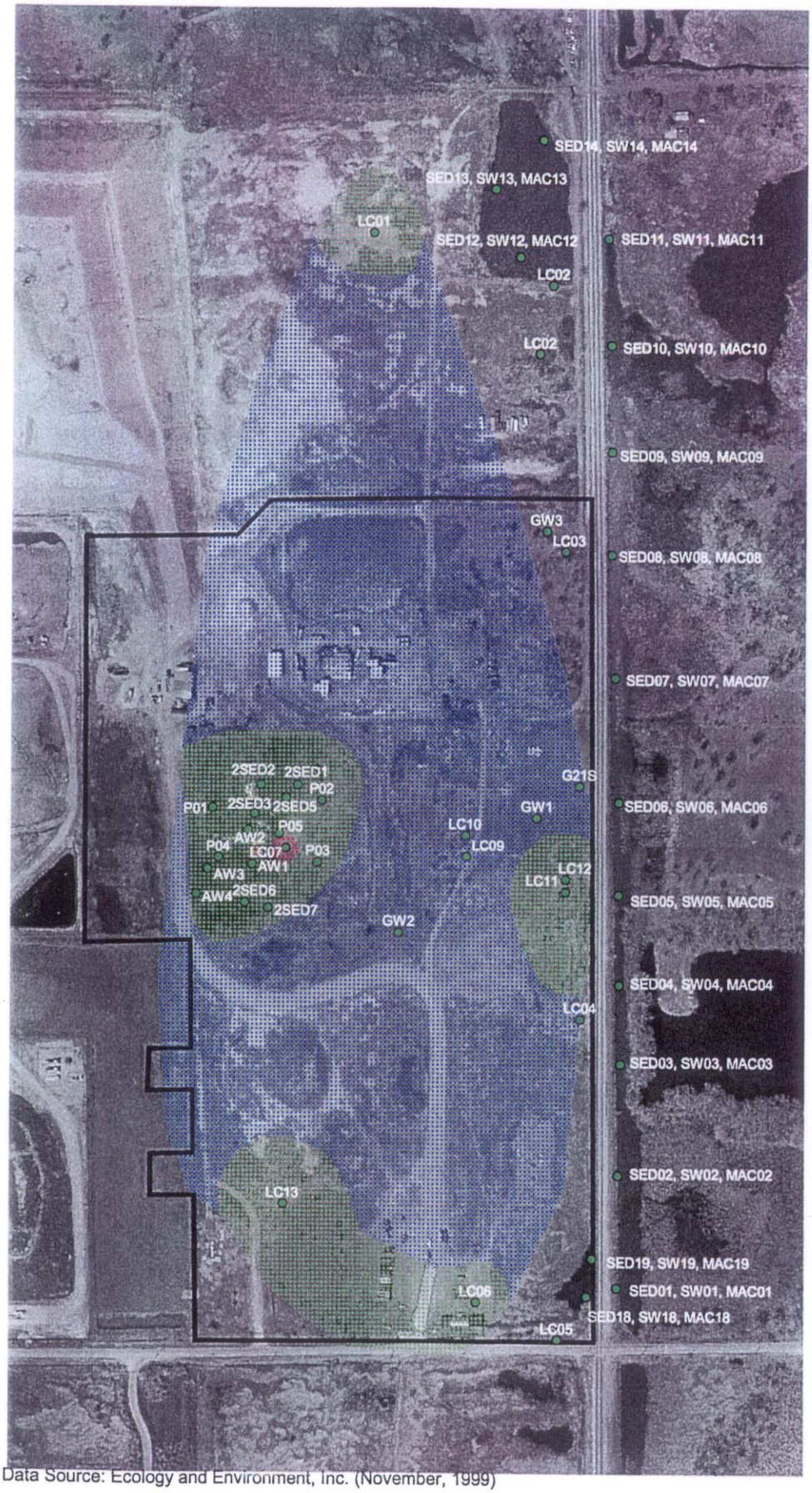
PCBs ABOVE THE MINIMUM INDUSTRIAL AND COMMERCIAL TIER 1 SOIL REMEDIATION OBJECTIVES

SOIL INGESTION AND INHALATION PATHWAYS

LAKE CALUMET CLUSTER SITE

Chicago, Illinois

HARZA ENGINEERING COMPANY
WATER & ENVIRONMENT



Data Source: Ecology and Environment, Inc. (November, 1999)

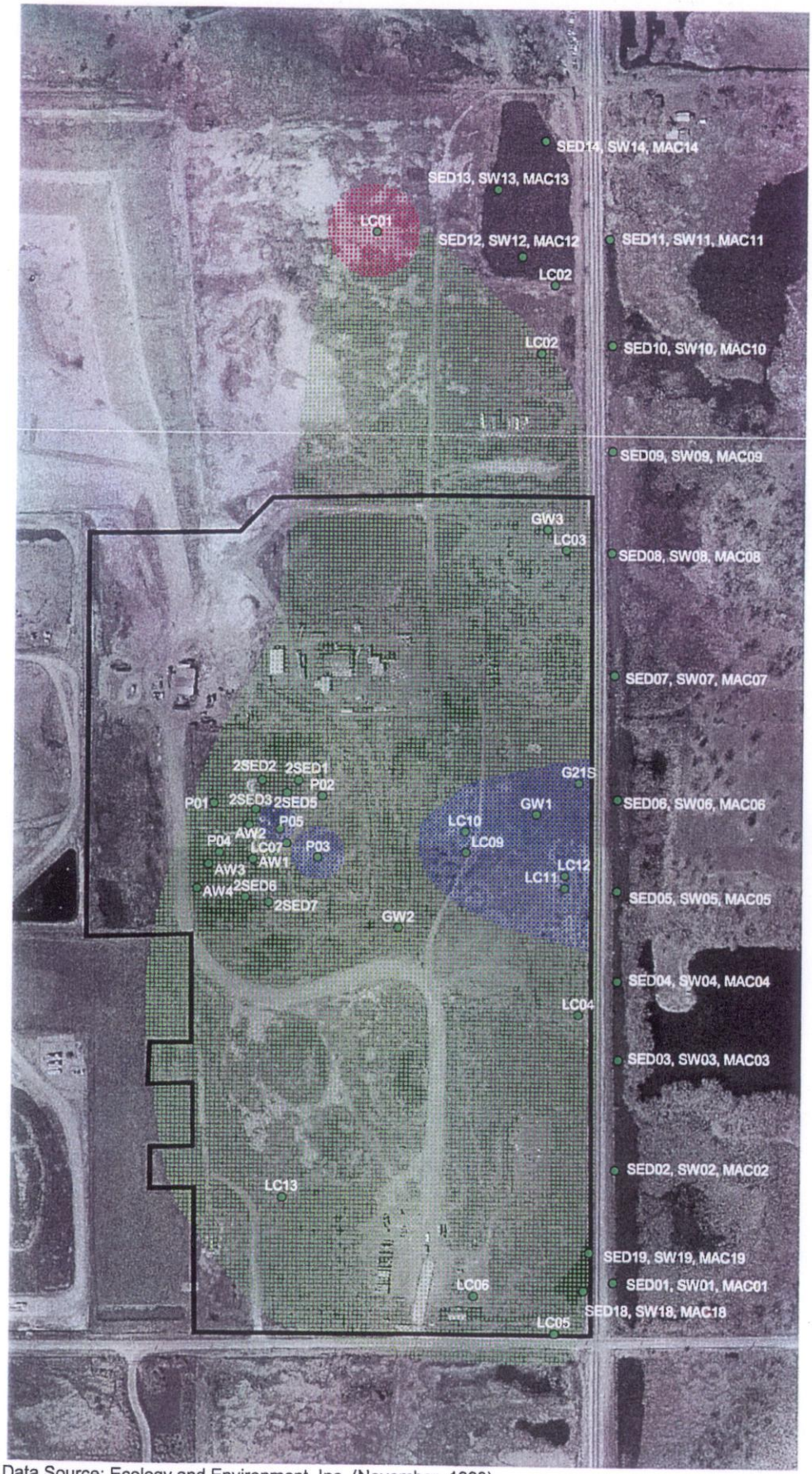
0 500 Feet

Figure 29

ESTIMATED LATERAL EXTENT OF BENZENE IN GROUNDWATER

LAKE CALUMET CLUSTER SITE
Chicago, Illinois

HARZA ENGINEERING COMPANY
WATER & ENVIRONMENT



Data Source: Ecology and Environment, Inc. (November, 1999)

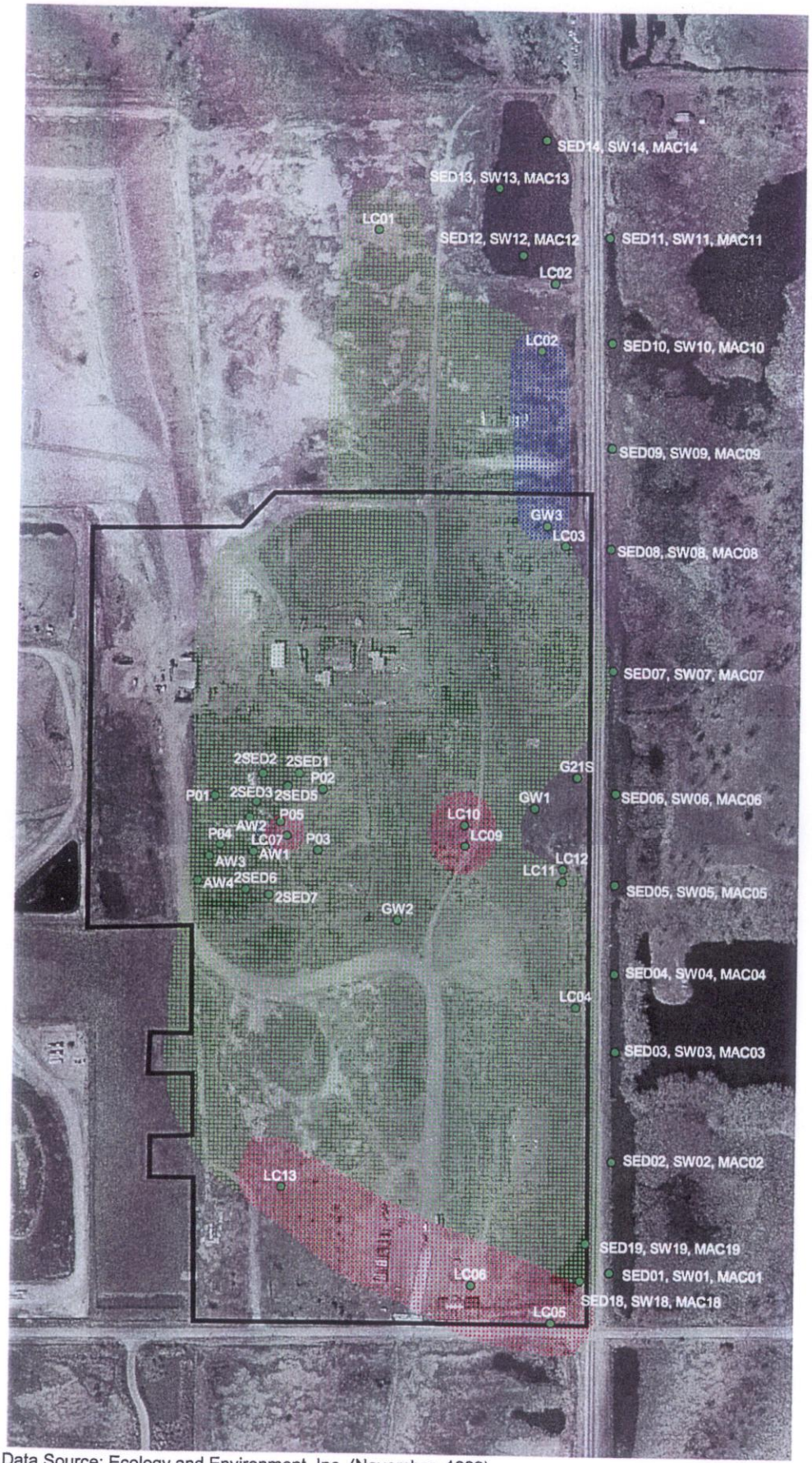
0 500 Feet

Figure 30

ESTIMATED LATERAL EXTENT OF MANGANESE IN GROUNDWATER

LAKE CALUMET CLUSTER SITE
Chicago, Illinois

HARZA ENGINEERING COMPANY
WATER & ENVIRONMENT



Data Source: Ecology and Environment, Inc. (November, 1999)

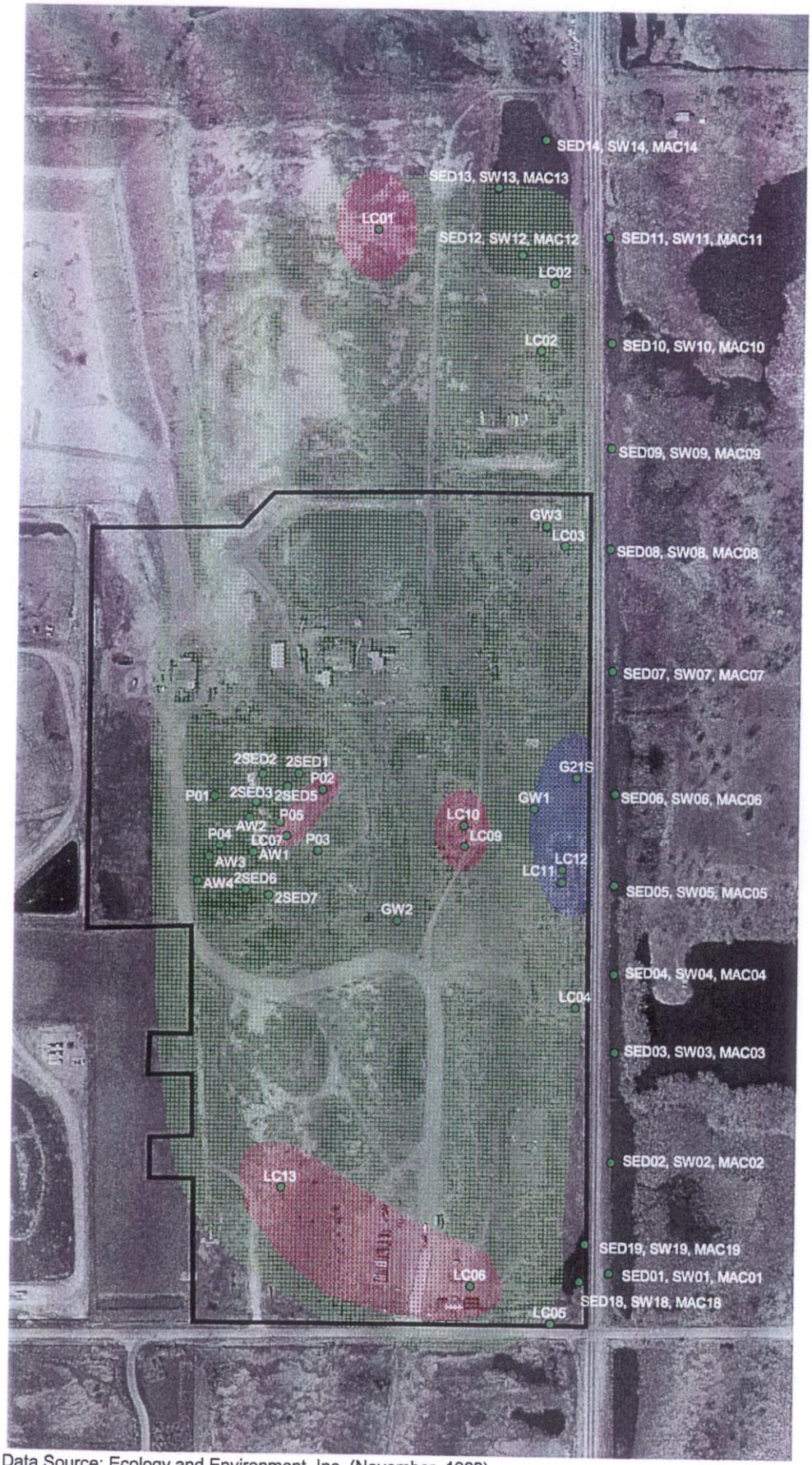
0 500 Feet

Figure 31

ESTIMATED LATERAL EXTENT OF LEAD IN GROUNDWATER

LAKE CALUMET CLUSTER SITE
Chicago, Illinois

HARZA ENGINEERING COMPANY
WATER & ENVIRONMENT



Data Source: Ecology and Environment, Inc. (November, 1999)

0 500 Feet

Figure 32

ESTIMATED LATERAL EXTENT OF IRON IN GROUNDWATER

LAKE CALUMET CLUSTER SITE
Chicago, Illinois

HARZA ENGINEERING COMPANY
WATER & ENVIRONMENT

Appendix A

Test Pit Logs

Alburn Incinerator
Unnamed Parcel
U.S. Drum

TEST PIT DESCRIPTIONS FROM ALBURN INCINERATOR AREA

Test Pit Number	Total Depth	Depth to Water	Sample Number	Sample Depth	PID/FID Reading	Description
1	8 feet	7.5 feet	x101	3 feet	25ppm	0-3 feet, bricks, concrete, wire, silty clay, moist
			x102	7.5 feet	46ppm	3-8 feet, bricks, concrete, wire, silty clay, water at 7.5 feet
2	8 feet	7.5 feet	x103	3 feet	>100ppm	0-4 feet, gray, brittle, hard shale-like material with small amounts of white material, sweet odor
			x104	7 feet	>150ppm	4-8 feet, debris, records, rags, sandy silty clay, metal and clay pipes, possible remnants of drum, water bubbling
3	7 feet	4 feet	x105	2 feet	10ppm	0-3 feet, gray, brittle, hard shale-like material, moist
			x106	Black layer (8 to 10 in)	50ppm	2 feet below ground surface, black layer, 8-10 inches in depth
			x107	7 feet	>150ppm	Black to gray material, metal pipes, glass, possible fuel odor and a sweet odor, water bubbling
4	6 feet	2 feet	x108	Black layer (4 feet)	12ppm	0-3 feet, clayey sand/sandy clay bricks, wet
			x109	Black layer (4 feet)	12ppm	3 feet, black layer, wet
			x110	6 feet	12ppm	Black, possible fuel odor, bricks, wet
5	4 feet	1-2 feet	x111	4 feet	NA	Gray to black silty clay material, bricks, metal debris, wood fragments, a possible foundation at 3 feet, wet
6	-	-	-	-	-	Unable to sample due to amount of standing water at the desired location.
7	3 feet	1-2 feet	x112	2 feet	NA	Gray sandy silty clay material, bricks, metal debris, metal pipes, concrete blocks, rebarb, a possible foundation at 2 feet, wet
8	4 feet	4 feet	x113	3 feet	0ppm	0-3 feet, sandy silty clay, medat debris, bricks, moist
			x114	4 feet	>150ppm	3.5-4.0 feet, black silty clay material, strong fuel odor, wet
9	4 feet	4 feet	x115	3 feet	30ppm	0-3 feet, gray/brown silty clay material, bricks, metal debris, moist
			x116	4 feet	30ppm	3.5-4.0 feet, black sandy material, bricks, large concrete blocks, metal debris, wet
10	8 feet	3 feet	x117	3 feet	15ppm	0-3 feet, gray, brittle shale-like material, obstruction at 2 feet
			x118	7 feet	>150ppm	3-8 feet, black, wood, metal debris, car rim, glass, wet
11	8 feet	6 feet	x119	3 feet	50ppm	0-3 feet, concrete slab until 2 feet, then gray sandy silty clay material
			x120	8 feet	>150ppm	3-8 feet, black material, bricks, glass, concrete, difficult digging, trace of water flowing in from the sides of the pit
12	9 feet	4 feet	x159	3 feet	50ppm	0-3 feet, large concrete blocks, wood, bricks, gray with some black areas of sandy silty clay material, moist
			x160	3 feet	-	Field duplicate of sample x159
			x161	9 feet	50ppm	3-9 feet, gray sandy silty clay, wire, metal debris, wet
13	10 feet	Not encountered	x145	3 feet	10ppm	0-3 feet, gray/brown clay, stiff, moist
			x146	10 feet	700ppm	3-10 feet, gray/brown clay until 8 feet, then plastic debris, rags, and household waste, moist

TEST PIT DESCRIPTIONS FROM ALBURN INCINERATOR AREA						
Test Pit Number	**Total Depth**	**Depth to Water**	**Sample Number**	**Sample Depth**	**PID/FID Reading**	**Description**
14	9 feet	2 feet	x147	3 feet	0ppm	0-3 feet, black, gravel, large concrete blocks, wire debris, wet, obstruction at 3-4 feet
			x148	9 feet	>150ppm	4-9 feet, wood, plastic bags, rags, wire debris, possible crushed drum, wet
15	3 feet	1-2 feet	x121	3 feet	60ppm	0-3 feet, soft black clay material, gravel, bricks, metal and glass debris, wet
16	9 feet	*	x142	3 feet	20ppm	0-3 feet, obstruction 6 inches bgs, then dark brown/black gravel, bricks, metal debris, wet
			x143	3 feet	-	Field duplicate of sample x142
			x144	9 feet	>150ppm	4-9 feet, black rocky material, metal debris, possible red and yellow paint waste, black sheen on water, water bubbling
17	6 feet	1-2 feet	x122	3 feet	50ppm	0-3 feet, obstruction at 1 foot bgs, then black, brittle shale-like material, metal debris, concrete blocks, bricks, rags, wet
			x123	6 feet	100ppm	4-6 feet, black, glass, metal, municipal waste, water bubbling
18	6 feet	1-2 feet	x124	3 feet	>150ppm	0-3 feet, obstruction at 1 to 2 feet bgs, then black, wood, glass, concrete cores, strong odor, wet
			x125	6 feet	>150ppm	3-6 feet, metal debris, glass, wire cables, strong odor, wet
19	8 feet	*	x168	3 feet	6ppm	0-3 feet, obstruction at 2 feet bgs, then gravel, trace of clay material, plastic sheeting, wet
			x169	8 feet	90ppm	3-8 feet, gravel, wood, glass, metal debris, wet
20	8 feet	*	x173	3 feet	90ppm	0-3 feet, trace of clay material, tires, bottles, glass, metal debris, wet
			x174	8 feet	500ppm	3-8 feet, trace of clay material, metal chair, wood, glass, concrete cores, wet
21	11 feet	3 feet	x170	3 feet	>150ppm	0-3 feet, obstruction 1 foot bgs, then plastic sheeting, glass, metal debris, trace of clay material, wet
			x171	3 feet	-	Field duplicate of x170
			x172	11 feet	90ppm	3-11 feet, glass, wood, metal debris, plastic, shoes, had to continue to 11 feet due to all debris nothing to sample, wet
22	-	-	-		-	Unable to sample due to amount of standing water at the location.
23	7 feet	3 feet	x126	3 feet	80ppm	0-3 feet, obstruction at 2 feet bgs, then black, concrete, metal debris, glass, wood, soft clay material
			x127	6 feet	>150ppm	3-7 feet, bricks, glass, wood, soft clay material, water bubbling
24	9 feet	1-2 feet	x138	3 feet	>150ppm	0-3 feet, dark gray to black soft clay, wood, metal debris, rags, plastic bags, wet
			x139	9 feet	>150ppm	3-9 feet, metal debris, rags, plastic, glass, wet
25	8 feet	3 feet	x132	2.5 feet	6ppm	0-3 feet, obstruction 1 foot bgs, then metal debris, bricks, possible drum remnants, possible sheen on water
			x133	8 feet	30ppm	3-8 feet, metal debris, bricks, wet

TEST PIT DESCRIPTIONS FROM ALBURN INCINERATOR AREA						
Test Pit Number	Total Depth	Depth to Water	Sample Number	Sample Depth	PID/FID Reading	Description
-26-	9 feet	1-2 feet	x140	3 feet	20ppm	0-3 feet, obstruction 1 foot bgs, black gravel, metal debris, rags, paper, plastic sheeting, wet
			x141	9 feet	20ppm	3-9 feet, black, glass, gravel, concrete, plastic, wood, very difficult digging all the way to 9 feet, orange clayish material at 9 feet, wet
27	9 feet	1-2 feet	x137	3 feet	35ppm	0-3 feet, black, blocky material, metal debris, bricks, gravel, wet
			x136	9 feet	>150ppm	3-9 feet, black, metal debris, rags, bricks, gravel, plastic sheeting, wood, syringes, possible medical waste, bottles, flatten drum, wet
28	10 feet	*	x164	3 feet	600ppm	0-3 feet, black, gravel, metal debris, wet
			x165	10 feet	500ppm	3-10 feet, black, gravel, metal debris, tires, plastic sheeting, wet
29	4.5 feet	1 foot	x128	3 feet	>150ppm	0-3 feet, black, bricks, wood, trace soft clay, drum lid, black sheen, strong odor, wet
			x129	4 feet	>150ppm	3-4.5 feet, possible drum remnants, gravel, trace of soft clay, large cement blocks, paint odor, black and red sheen on water
30	9 feet	0 feet*	x166	3 feet	15ppm	0-3 feet, sandy silty clay material, glass, metal debris, wet
			x167	9 feet	>150ppm	3-9 feet, metal debris, gravel, glass, wood, plastic sheets, wet
31	6 feet	2 feet	x130	3 feet	>150ppm	0-3 feet, obstruction 1 foot bgs, then black, gravel, trace of clay material, wood, strong odor, wet
			x131	6 feet	>150ppm	3-6 feet, black, gravel, trace of clay material, wood, strong odor, wet
32	-	-	-		-	Unable to sample due to amount of standing water at the desired location.
33	8 feet	0 feet*	x134	3 feet	>150ppm	0-3 feet, strong odor, black, bricks, trace of soft clay material, large gravel, wet
			x135	8 feet	>150ppm	3-8 feet, strong odor, black, bricks, trace of soft clay material, large gravel, wet
34	9 feet	1-2 feet	x162	3 feet	0ppm	0-3 feet, hard digging at surface, possibly concrete pad, rebar, bricks, trace of brown/gray stiff clay material, wet
			x163	9 feet	50ppm	3-9 feet, bricks, trace of brown/gray stiff clay material, drum lid, wet
35	9 feet	1-2 feet	x149	3 feet	>150ppm	0-3feet, brown/gray stiff clay, metal debris, wood, wet
			x150	9 feet	4000ppm	3-9 feet, as above until 7 feet bgs then rags, plastic bags, household debris, metal debris with possible blue staining, wet
36	-	-	-	-	-	Unable to sample due to amount of standing water at the desired location.
37	9 feet	Not encountered	x151	3 feet	>150ppm	0-3 feet, plastic bags, tires, plastic debris, rags, black clay material, possible petroleum odor, moist
			x152	9 feet	1600ppm	3-9 feet, crushed drum, tires, plastic debris, rags, moist

TEST PIT DESCRIPTIONS FROM ALBURN INCINERATOR AREA						
Test Pit Number	**Total Depth**	**Depth to Water**	**Sample Number**	**Sample Depth**	**PID/FID Reading**	**Description**
- -38- -	10 feet	Not encountered	x157	3 feet	30ppm	0-3 feet, brown/gray stiff clay material, moist
			x158	10 feet	30ppm	3-10 feet, as above until 7 feet bgs then rags, plastic sheets, wood, metal debris, moist
39	9 feet	2-3 feet	x153	3 feet	>150ppm	0-3 feet, obstruction at 1 foot bgs then bricks, large concrete blocks, gravel, wood, strong odor, wet
			x154	9 feet	15ppm	3-9 feet, black, wood, metal debris, wood, plastic sheets, demolition debris, wet
40	11 feet	1 foot	x155	3 feet	1.6ppm	0-3 feet, large concrete blocks, bricks, wet
			x156	11 feet	90ppm	3-11 feet, wood, plyboard, demolition/construction debris, wet
41	9 feet	1 foot	x182	3 feet	>400ppm	0-3 feet, dark brown to black silty clay material, wet
			x183	9 feet	>150ppm	3-9 feet, as above until 4 feet bgs then glass, gravel, plastic bags, plywood, garbage bag, strong odor, wet
42	9 feet	5 feet	x179	3 feet	100ppm	0-3 feet, brown silty clay, at 1 foot bgs black silty clay, bricks, metal debris, at 2 feet bgs gray clay, moist
			x180	9 feet	60ppm	3-9 feet, as above until 4 feet bgs then wood, plastic, rags, paper, tires, metal debris, wet
43	8 feet	*	x175	3 feet	>150ppm	0-3 feet, black, clay material, tires, plastic, rags, paper, wet
			x176	8 feet	>150ppm	3-8 feet, black, clay, plastic, plastic bags, wood, metal, glass, wet
44	9 feet	5 feet	x184	3 feet	3ppm	0-3 feet, stiff brown clay material, moist
			x185	9 feet	60ppm	3-9 feet, obstruction 3 feet bgs then black, concrete, wood, rope, metal debris, wet
45	8 feet	4 feet	x177	3 feet (gray material)	NA	0-3 feet, silty clay, wood, plastic, gray clay like material, moist
			x178	8 feet	NA	3-8 feet, black, silty clay, bricks, plastic, wood, glass, wet

* The sampling location was approximately under 2 feet of water.

TEST PITS FROM THE UNNAMED PARCEL

Test Pit Number	Total Depth	Approx. Depth to Water	Sample Number	Sample Depth	FID & PID Readings	Description
1B	20 feet	3 feet	x101	3 feet	FID: 30ppm PID: Background	0-3 feet: dark brown topsoil for 1-foot, then gray silty clay material with gravel, 6 to 8-inch black layer with pieces of wood at 3-feet, begin to see water
			x102	6 feet	FID: >150ppm PID: Background	4-20 feet: garbage, wire, plastic, wood, paper
2B	30 feet	3 feet	x103	3 feet	FID: >150ppm PID: Background	0-3 feet: topsoil and gravel for 1-foot, then wood, metal, trash, concrete, with some black clay material, water bubbling
			x104	6 feet	FID: >150ppm PID: Background	4-20 feet: debris, paper, tires, metal debris, wood, plastic, tire rims, possible drum remnants, water bubbling
3B	6 feet	6 feet	x105	3 feet	FID: 74ppm PID: Background	0-3 feet: brown silty clay, bricks, metal debris, at 3 feet begin to see black soil/material
			x106	6 feet	FID: 3ppm PID: Background	3-6 feet: paper, concrete blocks, wood, metal, silty clay material, not as much debris as Test Pits 1 and 2, water bubbling
4B	8 feet	4 feet	x107	3 feet	FID: >150ppm PID: Background	0-3 feet: 1inch of concrete, brown silty clay with gravel, at 3 feet black silty clay material with bricks and wood
			x108	8 feet	FID: 96ppm PID: Background	3-8 feet: metal debris, rubber, possible crushed drum, increase in debris at 5 feet, glass, paper, metal pipes, wood, rubber
5B	8 feet	3 feet	x109	3 feet	FID: >150ppm PID: Background	0-3 feet: brown topsoil for 1 foot, then black silty clay material, glass, metal, wood, and paper. At 3 feet a gray to purple powder material, possible paint debris
			x110	3 feet	FID: >150ppm PID: Background	Field duplicate of sample x109
			x111	8 feet	FID: >150ppm PID: Background	3-8 feet: wood, metal pipes, glass, concrete blocks, tires, metal debris, possible crushed drum
6B	8 feet	3 feet	x112	3 feet	FID: 96ppm PID: Background	0-3 feet: brown topsoil for 1 foot, then black glass, wood, metal, paper, some clay material, water bubbling
6B	8 feet	3 feet	x113	8 feet	FID: 96ppm PID: Background	3-8 feet: bottles, wood, metal debris, paper, and rubber
7B	8 feet	6 feet	x114	3 feet	FID: >150ppm PID: Background	0-3 feet: brown topsoil for 2.5 feet, then garbage, wood, paper, metal debris, black/blue fine sand or cinders
			x115	8 feet	FID: 96ppm PID: Background	3-8 feet: glass, metal pipes, paper, wood, rubber, bricks, and tires
8B	8 feet	3 feet	x116	3 feet	FID: 98ppm PID: Background	0-3 feet: concrete/slag for 1 foot, then wood, metal, glass, tires, and plastic
			x117	8 feet	FID: >150ppm PID: Background	3-8 feet: Metal, paper, wood, wire mesh concrete cores
9B	8 feet	5 feet	x118	3 feet	FID: >150ppm PID: Background	0-3 feet: brown topsoil for 2 feet, then wood, tires, bricks, glass, slag, some silty clay material
			x119	8 feet	FID: >150ppm PID: Background	3-8 feet: black, glass, wood, metal debris, bricks, wood timbers, tires, concrete blocks
10B	30 feet	6 feet	x120	3 feet	FID: 46ppm PID: Background	0-3 feet: brown topsoil with bricks, sewer pipe fragments, at 3 feet black, garbage, paper, tires, hard digging

TEST PITS FROM THE UNNAMED PARCEL						
Test Pit Number	Total Depth	Approx. Depth to Water	Sample Number	Sample Depth	FID & PID Readings	Description
			x121	8 feet	FID: 3ppm PID: Background	3-30 feet: obstruction 3.5-4 feet, then black, garbage, plastic, paper, metal debris, possible drum remnants, wood, water bubbling
11B	30 feet	Not encountered	x122	3 feet	FID: 0ppm PID: Background	0-3 feet: brown topsoil with trace of bricks for 2 feet, then brown/gray silty clay, trace of bricks and construction debris
			x123	8 feet	FID: 0ppm PID: Background	3-8 feet: brown/gray silty clay, trace of cobbles, stiff, moist
			x125	30 feet	FID: 96ppm PID: Background	8-30 feet: brown/gray silty clay, trace of cobbles, stiff, moist
12B	8 feet	6 feet	x127	3 feet	FID: 100 PID: Background	0-3 feet: brown topsoil for 1 foot, then garbage, black, wood, glass, plastic, and bricks
			x128	8 feet	FID: >150ppm PID: Background	3-8 feet, municipal waste, possible drum remnants, glass, cardboard, metal, tires, and plastic
13B	8 feet	6 feet	x129	3 feet	FID: >150ppm PID: Background	0-3 feet: brown/gray silty clay, bricks, turns black at 3 feet
			x130	8 feet	FID: 90ppm PID: Background	3-8 feet: glass, paper, wood, tires, cardboard, water flowing into pit at 6 feet
14B	8 feet	Water at surface	x131	3 feet	FID: >150ppm PID: Background	0-3 feet: brown topsoil, soil is moist at 2 feet, water perched, soil turns black and begin to see garbage at 3 feet
			x132	8 feet	FID: >150ppm PID: Background	4-8 feet: paper , wood, plastic bags, bottles, rubber, and cardboard
15B	8 feet	4 feet	x133	3 feet	FID: 90ppm PID: Background	0-3 feet: brown sandy silty clay for 2 feet, then tires, wood, cardboard, paper, some black sandy material
			x134	8 feet	FID: >150ppm PID: Background	0-8 feet: black, glass, cardboard, possible drum remnants
16B	8 feet	5 feet	x135	3 feet	FID: 75ppm PID: Background	0-3 feet: brown/gray silty clay with some sand, gravel, bricks, and garbage, at 3 feet possible red paint waste
			x136	8 feet	FID: 75ppm PID: Background	3-8 feet: black, glass, bottles, wire, metal debris, paper, wood, cardboard, and rubber
17B	11 feet	6 feet	x137	3 feet	FID: NA PID: NA	0-3 feet: brown sandy silty clay, trace of gravel, stiff, moist, begin to see paper, plastic containers and glass debris at 3 feet
			x138	11 feet	FID: NA PID: NA	4-11 feet, black, garbage bags, plastic, metal debris, cardboard, slag, newspapers, a July 1965 Chicago Tribune was identified
18B	10 feet	6 feet	x139	3 feet	FID: >150ppm PID: Background	0-3 feet: brown sandy silty clay for 6 inches to 1 foot, then plastic bags, metal debris, wood, black, water seeping into pit at 3 feet
			x140	10 feet	FID: >150ppm PID: Background	3-10 feet: bricks, wood, metal debris, slag, possible drum remnants
19B	14 feet	6 feet	x141	3 feet	FID: >150ppm PID: Background	0-3 feet: 6 inches of brown sandy silty clay, then wood debris, plastic bags, flattened drum, reddish/brown and black

TEST PITS FROM THE UNNAMED PARCEL						
Test Pit Number	Total Depth	Approx. Depth to Water	Sample Number	Sample Depth	FID & PID Readings	Description
			x142	14 feet	FID: 200ppm PID: Background	3-14 feet: glass, shingles, plastic bags, bottles, wood, slag, 4 possibly more drum remnants, slag, hard to collect a sample due to the amount of slag, concrete cores, and porcelain
20B	7 feet	5 feet	x143	3 feet	FID: >150ppm PID: Background	0-3 feet: 6 inches of brown sandy silty clay, then paper bags, glass, concrete cores, at 3 feet material turns black
			x144	3 feet	FID: >150ppm PID: Background	Field duplicate of sample x143
			x145	7 feet	FID: 250ppm PID: Background	3-7 feet: black, wood, glass, metal debris, tires, plastic bags, white powder material, blocky, IEPA sampler noted the material was similar to caulk
21B	10 feet	Not encountered	x146	2 feet	FID: 250ppm PID: 150ppm	0-3 feet: 6 inches to 1 foot of brown sandy silty clay, then obstruction. At 2 feet uncover complete drums with some contents still in drums. The drums contents consisted of sticky, viscous material.
			x147	5 feet	FID: 250ppm PID: 150ppm	3-7 feet: continue to uncover drums, one drum had trichloroethene written on the outside of the drum
			x148	10 feet	FID: 250ppm PID: 150ppm	7-10 feet, continue to uncover drums
22B	18 feet	4 feet	x160	3 feet	FID: Background PID: Background	0-3 feet: brown sandy silt for 18 inches, then glass bottles, plastic bags, metal debris, and bricks
			x161	10 feet	FID: 30ppm PID: Background	3-18 feet: black, glass, wood, concrete cores, tires, plastic bags, and metal debris
23B	25 feet	4 feet	x158	3 feet	FID: >150ppm PID: Background	0-3 feet: gravel for 6 inches, then paper, wood, metal debris, possible drum remnants, black
			x159	10 feet	FID: >150ppm PID: Background	3-25 feet, plastic, rags, cardboard, metal debris, water bubbling
24B	8 feet	3 feet	x156	3 feet	FID: 150ppm PID: Background	0-3 feet: tires, rags, cardboard, reddish brown wood debris, tire rims, material turns black at 3 feet
			x157	8 feet	FID: 150ppm PID: Background	3-8 feet: wire, wood, glass bottles, paper, traces of white caulk material, legos, water bubbling
25B	8 feet	3 feet	x154	3 feet	FID: >150ppm PID: Background	0-3 feet: drum remnants scattered throughout surface area, as begin to dig cardboard, rags, wood debris, brownish red
25B	8 feet	3 feet	x155	6 feet	FID: >150ppm PID: Background	3-8 feet: black, wire debris, bottles, metal debris, and wood
26B	12 feet	6 feet	x152	3 feet	FID: >150ppm PID: Background	0-3 feet: 6 inches of brown sandy silty clay, then black, metal debris, paper, and rubber
			x153	6 feet	FID: >150ppm PID: Background	3-12 feet: paper, plastic, wood, metal debris, bottles, bricks, possible drum remnants, white caulk or powder type material
27B	30 feet	6 feet	x149	3 feet	FID: >150ppm PID: Background	0-3 feet: 6 inches of sandy sitly clay, then debris consisting of paper, metal debris, and wood, black

TEST PITS FROM THE UNNAMED PARCEL						
Test Pit Number	Total Depth	Approx. Depth to Water	Sample Number	Sample Depth	FID & PID Readings	Description
			x150	10 feet	FID: 150ppm PID: Background	3-10 feet: glass, paper, wood, metal debris, at 6 feet a gray sandy silty clay approx. 4 feet in thickness
			x151	30 feet	FID: 30ppm PID: Background	10-30 feet: beneath gray clay demolition debris, tires, wood, cables, paper, and shoes. At 30 feet a black sandy type of material
28B	15 feet	3 feet	x175	3 feet	FID: 150ppm PID: Background	0-3 feet: 2 feet of dark gray silty clay with gravel, then tires, glass, bricks, shoes, shredded paper, black, municipal debris
			x176	6 feet	FID: 150ppm PID: 7ppm	3-15 feet, metal cans, approx. at 5 feet a gray ash type material with an odor of moth balls, wood, plastic bags, and metal debris
29B	13 feet	3 feet	x173	3 feet	FID: NA PID: NA	0-3 feet, black, glass, wood, paper, metal debris, trace of white material, water bubbling, trace of blue paint
			x174	10 feet	FID: NA PID: NA	3-13 feet, bricks, shredded paper, tires, white or silver caulk/powder material, wood, rubber, cardboard, stacks of newspaper, possible sheen on water
30B	8 feet	3 feet	x171	3 feet	FID: >200ppm PID: Background	0-3 feet: paper, wood, plastic, obstruction from 2 to 2.5 feet, then metal debris, rope, plastic bags, paper, and slag
			x172	6 feet	FID: >200ppm PID: Background	3-8 feet: cardboard, wood, paper, plastic, garbage bags, water bubbling with possible sheen
31B	12 feet	3 feet	x169	3 feet	FID: 6ppm PID: Background	0-3 feet: plastic, metal, garbage bags, paper, reddish brown
			x170	6 feet	FID: >150ppm PID: Background	3-12 feet: black, garbage bags, paper, cardboard, wood, foundry sand, white brittle material, when the white material gets wet turns into a paste,
32B	9 feet	4 feet	x167	3 feet	FID: >150ppm PID: Background	0-3 feet: large gravel for 2.5 feet, then black silty clay with bottles, paper, and wood
32B	9 feet	4 feet	x168	6 feet	FID: >150ppm PID: Background	3-9 feet: a 2 inch copper water line at 5 feet, no water in line but sand around the water line, continue to have glass, wood, and metal debris
33B	11 feet	7 feet	x165	3 feet	FID: 150ppm PID: 200ppm	0-3 feet: brown/gray silty clay for 1 foot, then black silty clay with plastic, wood, and paper
			x166	6 feet	FID: 150ppm PID: 200ppm	3-8 feet: wire, wood, metal debris, very hard digging at 5 feet, tires, plastic sheets and bags, and some type of possible printing plates
34B	30 feet	10 feet	x162	3 feet	FID: >150ppm PID: Background	0-3 feet: brown sandy silt, at 2 feet gray/black sand – cinder looking, at 3 feet a greasy rust/red clay
			x163	10 feet	FID: >150ppm PID: Background	3-10 feet: at 4 feet paper, metal, possible concrete blocks, and wire
			x164	30 feet	FID: >150ppm PID: Background	10-30 feet: tires, possible drum remnants, glass, wood, and plastic
35B	NA	6 feet	x185	4 feet	FID: 670ppm PID: 0.3ppm	0-4 feet: brown silty clay with gravel for 3 feet, then black silty clay with glass bottles, wire, metal, rubber, tires, and plastic

TEST PITS FROM THE UNNAMED PARCEL						
Test Pit Number	Total Depth	Approx. Depth to Water	Sample Number	Sample Depth	FID & PID Readings	Description
			-	-	FID: 1300ppm PID: 3ppm	4-NA feet, black, wood, plastic, tires, metal, rubber, drum remnants at 6.5 feet, slag
36B	14 feet	3 feet	x183	3 feet	FID: 3800ppm PID: 1.5ppm	0-3 feet: brown silty clay with trace of glass and metal
			x184	6 feet	FID: 3800ppm PID: 1.5ppm	3-14 feet: black, gravel, glass, plastic bags, metal, bricks, tires, wire, crushed drums at 8 feet
37B	13 feet	6 feet	x181	3 feet	FID: 650ppm PID: 0.5ppm	0-3 feet: metal, paper, tires, and rubber
37B	13 feet	6 feet	x182	13 feet	FID: 1000ppm PID: 1ppm	3-13 feet: metal containers, paper, and general metal debris
38B	10 feet	3 feet	x179	4 feet	FID: 2500ppm PID: 6.5ppm	0-3 feet: brown/gray silty clay with metal debris, glass, paper, rubber, cardboard, and wire
			x180	7 feet	FID: 800ppm PID: 7ppm	3-10 feet: black, wire, wood, plastic, drum lid
39B	10 feet	3 feet	x177	3 feet	FID: 3000ppm PID: 7ppm	0-3 feet: 6 inches of brown sandy silty clay, then cardboard, wood, glass, paper, at 3 feet a black greasy layer, water bubbling
39B	10 feet	3 feet	x178	8 feet	FID: 3000ppm PID: 7ppm	3-10 feet: black, tires, wood, paper, glass, a viscous looking liquid flowing from sidewall into pit, obstruction at 10 feet
42B	12 feet	Not encountered	x124	3 feet	FID: Background PID: Background	0-3 feet: brown/gray silty clay with trace of sand and gravel, stiff, moist
			x126	12 feet	FID: Background PID: Background	3-12 feet: as above until 12 feet, then black, wood, and slag
Area 1 (east of Test Pit #21)	8 feet	6 feet	-	-	FID: 6000ppm PID: NA	0-8 feet: black/brown sitly clay, drum lid, approx. a 4 inch rubber hose with brown liquid material draining from the hose.
Area 2 (south of Test Pit #21)	7 feet	6 feet	-	-	FID: 8000ppm PID: 150ppm	0-7 feet: difficult digging, gravel, slag, and concrete blocks for 3 feet, then cardboard, wood, metal debris, sweet odor
Area 3 (northeast of Test Pit #21)	15 feet	6 feet	-	-	FID: 1500ppm PID: 500ppm	0-15 feet: black/brown silty clay, possible drum remnants, large cement and slag blocks, metal, wood, bricks, 3 inch diameter clay or metal piping, tires, brownish red/black sticky material on some of the debris.

Key:
NA = Not available

TEST PITS FROM U.S. DRUM						
Test Pit Number	Total Depth	Approx. Depth to Water	Sample Number	Sample Depth	FID & PID Readings	Description
pit 1	13 feet	6 feet	x207	4 feet	FID: NA PID: Background	0-4 feet: brown sandy clayey silt, bricks, and gravel
			x208	9 feet	FID: NA PID: Background	4-9 feet: yellow and white granular powdery material, plastic, and wood
			x209	13 feet	FID: NA PID: 200ppm	9-13 feet: as above, at 11 feet a dark black tar substance with red brown fluff material
pit 2	11 feet	5 feet	x205	3 feet	FID: >150ppm PID: Background	0-3 feet: brown loam, trace of plastic, metal, and bricks. At 3 feet a cohesive fine grain white and pink chalk material
			x206	9 feet	FID: 1500ppm PID: Background	3-11 feet: large pieces of wood debris, black at 5 feet, metal, brick, and concrete intermixed with silty clay. At 7 feet a 1-foot thick silty clay layer. Underneath clay more debris. Hydrogen sulfide at 1 ppm
pit 3	11 feet	6 feet	x201	3 feet	FID: 60ppm PID: Background	0-3 feet: brown loam, bricks, concrete, plastic, in general less debris than other pits
			x202	8 feet	FID: >150ppm PID: Background	3-11 feet: brown loam, bricks, concrete, metal, from approx. 7.5-8 feet a pink fine grain chalk material, then large concrete blocks, wood, metal debris, and gravel
pit 4	13 feet	3 feet	x177	4 feet	FID: >150ppm PID: Background	0-4 feet: brown silty clay with gravel, concrete, and bricks. At 2 feet, metal, wood, and brick debris
			x178	8 feet	FID: >150ppm PID: 2ppm	3-8 feet: plastic, wood, bricks, concrete, wire, metal, gravel, fabric, some sand and clay. At 8 feet a gray granular material
pit 5	11 feet	3 feet	x198	2.5 feet	FID: NA PID: NA	0-2.5 feet: brown silty loam to 2.5 feet, then silt with wood and concrete
			x199	8 feet	FID: NA PID: NA	2.5-8 feet: as above, at 7 feet primarily slag with a fine grain material, some organic
			x200	8 feet	FID: NA PID: NA	Field duplicate of sample x199
pit 6	12 feet	NA	x196	4 feet	FID: NA PID: NA	0-4 feet: brown silty sand with bricks, general debris at 4 feet
			x197	8 feet	FID: NA PID: NA	4-12: wood, slag, concrete, bricks, and gravel, some silty sand
pit 7	10 feet	3 feet	x175	3 feet	FID: >150ppm PID: Background	0-3 feet: dark gray silty loam with gravel for 1 foot then mixed with metal, paper, and wood. 2 feet from ground surface a 6-8 inch thick pink possible paint layer smeared around pit
			x176	8 feet	FID: >150ppm PID: Background	3-10 feet: large concrete blocks, wood, gravel, wire, part of a telephone pole or tree, some gray clay intermixed with wood
pit 8	8 feet	3 feet	x173	2.5 feet	FID: 600ppm PID: Background	0-3 feet: brown silty loam for 1 foot, then intermixed with bricks, wood, a possible crushed drum
			x174	8 feet	FID: 600ppm PID: Background	3-8 feet: as above intermixed with a gray/brown sandy clay material, at 8 feet a large amount of water gushed into pit
pit 9	7 feet	3 feet	x168	3 feet	FID: >150ppm PID: 1ppm	0-3 feet: 6 inches of loam then gray clay with gravel and concrete at 3 feet obstruction with water rushing into pit.

TEST PITS FROM U.S. DRUM						
Test Pit Number	Total Depth	Approx. Depth to Water	Sample Number	Sample Depth	FID & PID Readings	Description
			x169	6.5 feet	FID: >150ppm PID: 1ppm	3-7 feet: 3 feet of slag and concrete then gray/black silty clay
			x170	6.5 feet	FID: >150ppm PID: 1ppm	Field duplicate of sample x169
pit 10	11 feet	3 feet	x171	3 feet	FID: >150ppm PID: Background	0-3 feet: 1 foot of large gravel and concrete, then wood, bottles, metal, glass, paper, plastic, possible white or silver paint waste, some brown/black silty clay
			x172	8 feet	FID: 3500ppm PID: 60ppm	3-11 feet: glass, wood, metal, sand and gravel, at 8 feet rolls of film negatives with debris
pit 11	12 feet	3 feet	x190	3 feet	FID: 1200ppm PID: 4ppm	0-3 feet: brown silty clay loam for 1 foot, then black cardboard, paper, tires, plastic, wood, bricks, drywall
			x191	12 feet	FID: 1200ppm PID: 4ppm	3-12 feet: black, wood, metal, paper, tires, plastic, cardboard
pit 12	10 feet	8 feet	x192	3 feet	FID: NA PID: NA	0-3 feet: brown silty loam for 6 inches then dark gray silty clay
			x193	8 feet	FID: NA PID: NA	3-8 feet: a 6 inch slag layer then 3 feet of dark gray/black clay, beneath clay plastic, wood, metal, tire rims, and sandy silt.
pit 13	12 feet	5 feet	x194	4 feet	FID: NA PID: NA	NA
			x195	12 feet	FID: NA PID: NA	NA
pit 14	9 feet	3 feet	x184	3 feet	FID: 850ppm PID: 60ppm	0-3 feet: dark brown silty clay for 2 feet, then black cinder/slag material and metal
			x185	9 feet	FID: >150ppm PID: 5ppm	4-9 feet: very hard digging, metal debris, wood, slag, and paper, water bubbling
pit 15	10 feet	3 feet	x186	4 feet	FID: >150ppm PID: 80ppm	0-3 feet: dark brown/gray silty clay for 3 feet, drum remnants throughout
			x187	8 feet	FID: >150ppm PID: 80ppm	0-10 feet: gray concrete/gravel and slag, at 6 feet cinders and wood, at 7 feet rags, paper, plastic, some slag and cinders, water bubbling
pit 16	9 feet	3 feet	x188	4 feet	FID: NA PID: NA	NA
			x189	9 feet	FID: NA PID: NA	NA
pit 17	13 feet	7 feet	x181	3 feet	FID: >150ppm PID: Background	0-3 feet: dark gray silty clay for 1 foot, then 3 feet of gray clay with areas of black clay material, some sand or cinder material, samplers noted hearing a hissing noise from pit
			x182	7 feet	FID: >150ppm PID: Background	3-7 feet: as above, at 4 feet a fine grain white material – similar to white material found on Unnamed Parcel
			x183	13 feet	FID: 3000ppm PID: 2ppm	7-13 feet: as above, at 8 feet paper, tires, metal, possible drum remnants with red coloring on it, golden sheen on all material, foam that appears to be expanding floating on the water
pit 18	13 feet	5 feet	x179	3.5 feet	FID: 30ppm PID: Background	0-3.5 feet: dark gray/brown silty clay with gravel and sand, concrete at 2 feet, at 3 feet dark gray loam material intermixed with brown silty clay

TEST PITS FROM U.S. DRUM						
Test Pit Number	**Total Depth**	**Approx. Depth to Water**	**Sample Number**	**Sample Depth**	**FID & PID Readings**	**Description**
			x180	7 feet	FID: >150ppm PID: Background	3.5-13 feet: brittle gravel and slag with some cinders, very hard digging, at 7 feet plastic, paper, wood, rags, and wire
pit 19	12 feet	8 feet	x166	3 feet	FID: >150ppm PID: 250ppm	0-3 feet: 2 feet of brown/gray silty loam, a crushed drum, then gray/black silty clay
19	12 feet	8 feet	x167	9 feet	FID: >150ppm PID: 300ppm	3-12 feet: as above, at 5 feet black slag and wood, rope, drinking straws, water and steam bubbling up from pit, sampler in level B
pit 20	17 feet	6 feet	x164	3 feet	FID: 400ppm PID: Background	0-3 feet: 2 feet of brown silty loam, then black metal, paper, cardboard, sand, gravel, clay, and ashes
			x165	9 feet	FID: 400ppm PID: Background	3-17 feet: rags, wood, metal, cardboard, possible drum remnants, carpet, possible plastic drum, water bubbling
pit 21	12 feet	8 feet	x162	2 feet	FID: 400ppm PID: Not working	0-3 feet: brown silty loam for 1 foot then debris, cardboard, paper, wood, cinders, plastic, and metal
			x163	9 feet	FID: >10000ppm PID: Not working	3-12 feet: tires, wood, metal, wire, pieces of syringes and medical waste, newspaper dated 1967
pit 22	11 feet	8 feet	x160	3.5 feet	FID: >150ppm PID: Not working	0-3 feet: brown silty loam for 1 foot, then slag, gravel, brown/gray silty clay
			x161	8 feet	FID: >10000ppm PID: Not working	3-11 feet: slag and gravel, at 7 feet gray/brown clay, at 8 feet plastic, slag, cardboard, slag, oily sand
pit 23	13 feet	9 feet	x157	2.5 feet	FID: >150ppm PID: Background	0-3 feet: brown/gray silty clay, stiff
			x158	9 feet	FID: >150ppm PID: Background	3-9 feet: as above, at 6.5 feet black debris, glass, slag, wood, metal, plastic, sand, gravel, tires
			x159	13 feet	FID: 6000ppm PID: 30ppm	9-13 feet: as above, oily
pit 24	8 feet	5 feet	x155	3 feet	FID: >10000ppm PID: 3ppm	0-3 feet: debris with some brown silty loam, paper, cardboard, shoes, wood, and metal
			x156	8 feet	FID: >10000ppm PID: 3ppm	3-8 feet: black, drum remnants, wood, glass, wire, possible printing plates, sheen on water
pit 25	11 feet	5 feet	x153	3 feet	FID: 4500ppm PID: Background	0-3 feet: brown silty loam for 1 foot, then black debris, metal, wood, crushed drum with possible paint waste, glass, and ash material
			x154	9.5 feet	FID: >10000ppm PID: 10ppm	3-11 feet: cardboard, paper, metal, wire, wood, slag, sand and gravel
pit 26	11 feet	7 feet	x151	3.5 feet	FID: 10000ppm PID: 40ppm	0-3.5 feet: 6 inches brown silt loam, then 12 inches of brown clay, then tan/reddish granular layer, at 3.5 feet black debris
			x152	9 feet	FID: 10000ppm PID: 40ppm	3.5-11 feet: plastic, concrete, metal, at 5 feet gray clay, at 7 feet thin styrofoam sheets with the debris
pit 27	10 feet	3.5 feet	x149	3 feet	FID: >150ppm PID: Background	0-3 feet: 2 feet of brown/gray silty clay with gravel, then 1.5 feet of stiff gray clay at 3.5 feet on bottom of clay a black stain layer of ash or sand
			x150	10 feet	FID: 150ppm PID: Background	3-10 feet: black, metal, bricks, concrete, gravel, glass, pipes, plastic, difficult to obtain a sample due to the amount of debris

TEST PITS FROM U.S. DRUM

Test Pit Number	Total Depth	Approx. Depth to Water	Sample Number	Sample Depth	FID & PID Readings	Description
pit 28	11 feet	3 feet	x147	3 feet	FID: 400ppm PID: Background	0-3 feet: brown/black silty clay loam, bricks, concrete blocks, water bubbling
			x148	8 feet	FID: 4900ppm PID: 3ppm	3-11 feet: large concrete blocks, wire, wood, metal, possible sheen on water, water bubbling
pit 29	12 feet	5 feet	x145	3 feet	FID: 6ppm PID: Background	0-3 feet: brown silty clay loam, bricks, gravel, areas of possible black staining
			x146	8 feet	FID: >150ppm PID: Background	3-12 feet: glass, plastic, metal, drum remnants, wire mesh, wood, tires, bottles, concrete cores, slag, steam and water bubbling from pit
pit 30	12 feet	6 feet	x143	3 feet	FID: 300ppm PID: Background	0-3 feet: brown silty loam for 1 foot, then black loam, at 3 feet metal and wood debris
			x144	8 feet	FID: 300ppm PID: Background	3-12 feet: black, glass, cardboard, slag, and metal
pit 31	16 feet	6 feet	x141	4 feet	FID: 350ppm PID: Background	0-3 feet: brown/gray silty clay loam, gray ash, and shingles
			x142	9 feet	FID: 2900ppm PID: Background	3-16 feet: black, concrete, wire, and metal
pit 32	9 feet	4 feet	x139	3 feet	FID: >150ppm PID: Background	0-3 feet: dark gray clay with cinders and metal debris
			x140	9 feet	FID: >150ppm PID: Background	3-9 feet: metal, wire, possible drum remnants, water bubbling
pit 33	12 feet	8 feet	x137	3 feet	FID: >150ppm PID: Background	0-3 feet: gravel, metal, plastic, silty clay with sand, tires, and slag
33	12 feet	8 feet	x138	9 feet	FID: >150ppm PID: Background	3-12 feet: black, paper, cardboard, metal, a yellow material, bricks, wire, possible drum remnants and printing plates at 12 feet
pit 34	11 feet	4 feet	x135	3 feet	FID: >150ppm PID: Background	0-3 feet: brown/red/black silt loam, debris, paper, plastic, metal, wood, possible drum remnants, black sandy cinders, glass, cardboard, wire, tires, purple and yellow stained rags
			x136	10 feet	FID: >150ppm PID: Background	3-11 feet: possible drum remnants, wire, steel, animal bones
pit 35	10 feet	7 feet	x133	4 feet	FID: >150ppm PID: Background	0-4 feet: brown silt loam, debris, plastic, drum remnants, and metal
			x134	10 feet	FID: >150ppm PID: Background	4-10 feet: metal signs, drum remnants, black/gray clay, wood, rubber, paper, and sand
pit 36	11 feet	7 feet	x131	4 feet	FID: >150ppm PID: Background	0-4 feet: brown silt loam, at 2.5 feet glass, metal, black tar like substance
			x132	9 feet	FID: >150ppm PID: Background	4-11 feet: tires, drum fragments, slag, newspapers, glass, and cinders
pit 37	8 feet	5 feet	x128	3 feet	FID: >150ppm PID: Background	0-3 feet: brown silt loam, moist
			x129	3 feet	FID: >150ppm PID: Background	
			x130	8 feet	FID: >150ppm PID: Background	3-8 feet: black, debris, plastic, rags, wood, paper, cardboard, metal, and glass
pit 38	10 feet	5 feet	x126	3 feet	FID: >150ppm PID: Background	0-3 feet: brown silt loam for 1 foot, then glass, metal, ash, plastic, rags, wood, rolls of film negatives, tires, plyboard, sand, and animal bones
			x127	10 feet	FID: >150ppm PID: Background	3-10 feet: glass, metal, ash, plastic, rags, wood, rolls of film negatives, and tires

TEST PITS FROM U.S. DRUM

Test Pit Number	Total Depth	Approx. Depth to Water	Sample Number	Sample Depth	FID & PID Readings	Description
pit 39	12 feet	11 feet	x124	3 feet	FID: >150ppm PID: Background	0-3 feet: brown silty clay with sand, stiff, and plastic bags
			x125	10 feet	FID: >150ppm PID: Background	3-12 feet: as above, at 5 feet dark gray silty clay with a trace of debris, at 10 feet begin to see the debris again
pit 40	14 feet	7 feet	x122	4 feet	FID: >200ppm PID: Background	0-4 feet: dark brown silty clay with sand, at 3 feet white material and debris, foam like substance coming out of sidewall
40	14 feet	7 feet	x123	9 feet	FID: 5100ppm PID: Background	3-14 feet: tires, wood, plastic, rags, glass, rope, bead necklace, newspaper dated June 22, 1968
pit 41	13 feet	7 feet	x120	3 feet	FID: 1400ppm PID: Background	0-3 feet: brown silty clay, trace of sand, stiff, trace of metal and rag debris
			x121	8 feet	FID: 1400ppm PID: Background	3-13 feet: rags, wire, wood, black, tar like substance with black pellets, possible drum remnants
pit 42	15 feet	13 feet	x117	9 feet	FID: 250ppm PID: Background	0-9 feet: gravel, at 5.5 feet brown/gray silty clay until 8 feet then paper, plastic, wood, wire, metal, and tires
			x118	15 feet	FID: 250ppm PID: Background	9-15 feet: as above with intermittent 1 foot layers of clay
pit 43	16 feet	4 feet	x115	3 feet	FID: >150ppm PID: Background	0-3 feet: 2 feet of brown/gray/red silty clay, then glass, plastic, tires, and wood
			x116	9 feet	FID: 360ppm PID: 4ppm	3-16 feet: black, plastic, glass, wood, metal, rubber, paper, at 7 feet a 1 foot layer of clay followed by debris
pit 44	9 feet	4 feet	x113	3 feet	FID: >150ppm PID: Background	0-3 feet: gravel, slag, dark brown silty clay, rags
			x114	9 feet	FID: 1500ppm PID: 0.9ppm	3-9 feet: as above, at 4 feet plastic, paper, wood, metal, glass bottles, hard to obtain a sample with all the debris
pit 45	10 feet	9 feet	x111	4 feet	FID: >150ppm PID: Background	0-4 feet: gravel, dark brown/gray silty clay
			x112	10 feet	FID: 700ppm PID: Background	4-10 feet: glass, wood, plastic, metal, oily residue
pit 46	11 feet	7 feet	x109	3 feet	FID: 300ppm PID: Background	0-3 feet: gray/brown silty clay material, at 3 feet a red fine grain material
			x110	9 feet	FID: >150ppm PID: Background	3-11 feet: as above, at 6 feet plastic, paper, wood, metal, cobalt blue gel material, oil filter, and newspapers
pit 47	9 feet	7 feet	x107	3 feet	FID: 40ppm PID: Background	0-3 feet: dark brown silt loam, at 3 feet black silty clay
			x108	9 feet	FID: >1000ppm PID: Background	3-9 feet: plastic, wood, metal, cardboard, paper, rubber, and glass
pit 48	11 feet	8 feet	x105	3 feet	FID: 40ppm PID: Background	0-3 feet: gray/brown silty clay
			x106	9 feet	FID: 40ppm PID: Background	3-11 feet: slag, tires, wood, metal, and glass
pit 49	10 feet	9 feet	x103	3 feet	FID: 2ppm PID: Background	0-3 feet: brown/gray silty clay, metal, slag, and gravel
49	10 feet	9 feet	x104	10 feet	FID: 200ppm PID: Background	3-10 feet: as above, at 9 feet gray sandy silty clay, at 10 feet, plastic, white chalk material similar to white material at Unnamed Parcel
pit 50	9 feet	7 feet	x101	3 feet	FID: 40ppm PID: 0.4ppm	0-3 feet: brown silty clay, bricks, concrete, metal and paper
			x102	9 feet	FID: 170ppm PID: 1.6ppm	3-9 feet: newspaper, plastic, glass, and metal
pit 51	11 feet	6 feet	x203	3 feet	FID: >150ppm PID: Background	0-3 feet: brown silt loam, bricks, gravel, and metal

TEST PITS FROM U.S. DRUM						
Test Pit Number	Total Depth	Approx. Depth to Water	Sample Number	Sample Depth	FID & PID Readings	Description
			x204	8 feet	FID: 350ppm PID: Background	3-11 feet: wood, large metal sheets, gravel, bricks, glass, sand, organics, pink chalk material
pit 52	11 feet	2 feet	x210	2.5 feet	FID: >150ppm PID: Background	0-3 feet: dark brown silty clay, bricks, concrete, crawfish, fine grain organics
			x211	9 feet	FID: >150ppm PID: Background	3-11 feet: slag, bricks, less organics, all water after 9 feet
pit 53	12 feet	3 feet	x212	3 feet	FID: 37ppm PID: Background	0-3 feet: brown clayey sand
			x213	7 feet	FID: 800ppm PID: 80ppm	3-12 feet: gravel, concrete, at 7 feet increase in organics, at 10 feet white chalk material, glass, concrete, gravel, concrete cores, white material turns blue the longer it is exposed to air, water has foam and is bubbling

Key:
NA = Not available

Appendix B
Soil Boring Logs
(E & E, November 1999)

ecology & environment, inc.
DRILLING LOGS

LEGEND

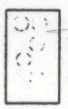
SAND & GRAVEL

FILL

SAND

SILTY CLAY

ORGANIC PEAT


GRAVEL

ecology & environment, inc.
DRILLING LOG

Site Name: Lake Calumet Cluster Site
Location: Chicago, Cook County, Illinois
TDD: S05-9806-008
Drilling Firm: Patrick Drilling
Type of Rig: CME-75
Driller/Helper: Kevin Hathaway
Geologist: Joseph Klemp
Well Casing(type & qty.): 2-inch stainless
Screened interval(type & size): 2-inch stainless / 10 foot
Annular Material:
Grout- Bentonite
Seal- Bentonite Chips
Filter Pack- Sand
Well Development Comments:

Boring Number: LC-01
Start Date: 4/22/99
Completion Date: 4/22/99
Boring Location: North end of site
Ground Elevation: 96.21 feet
T.O.I.C. Elevation: 98.40 feet
Depth of Boring: 16 feet
Lock Number: N/A
Drilling Method: Rotary w/Hollow stem auger

Depth to Groundwater
While drilling: 7.5 feet (t.o.i.c) bgs
at completion: 6.4 feet (t.o.i.c) bgs
after development: n/a bgs

Log	Elev. (feet)	Blow Count	Recovery (inches)	Material Description	PID (ppm)	OVA (ppm)	Remarks
	0.0						
	0.5	2		FILL: Gray silty CLAY, some c-f gravel, little m-f sand.			
	1.0	3					
	1.5	3			0	0	
	2.0	5	16	Black Organic silty CLAY.			
	2.5	2		FILL: Brown silty CLAY, little m-f sand, trace m-f gravel.			
	3.0	3					
	3.5	3		FILL: Debris material, wood, paper, glass, metal shavings.	0	0	
	4.0	3	16				
	4.5	4					
	5.0	4					
	5.5	4			0	1	
	6.0	4	14				
	6.5	12					
	7.0	8	—				
	7.5	12					
	8.0	7	10		1	90	Wet
?	8.5	16					
?	9.0	6		(No Recovery)			
?	9.5	7					
?	10.0	9	0				
	10.5	12		FILL: Debris material, wood, plastic, glass, metal shavings, ceramics			
	11.0	22					
	11.5	14			3	60	Wet
	12.0	27	5				

ecology & environment, inc.
DRILLING LOG

Log	Elev. (feet)	Blow Count	Recovery (inches)	Material Description	PID (ppm)	OVA (ppm)	Remarks
	12.5	15		FILL: Debris material, paper, wood chips, rubber, glass, plastic.	10	20	
	13.0	7					
	13.5	7					
	14.0	5	6				
	14.5	4					Wood is "smoking" at removal from split spoon sampler. (venting methane?)
	15.0	12					
	15.5	11			20	100	
	16.0	7	10				
	16.5			Boring Terminated at 16.0 feet.			
	17.0						
	17.5						
	18.0						
	18.5						
	19.0						
	19.5						
	20.0						
	20.5						
	21.0						
	21.5						
	22.0						
	22.5						
	23.0						
	23.5						
	24.0						
	24.5						

Additional Comments: Methane noted to be bubbling out of ground surface. OVA readings are above 100 ppm at the ground surface and at 0 ppm in ambient air (over 6-inches above ground). Headsapce on the boring hole during drilling reads 70 ppm on OVA.

ecology & environment, inc.
DRILLING LOG

Site Name: Lake Calumet Cluster Site
Location: Chicago, Cook County, Illinois
TDD: S05-9806-008
Drilling Firm: Patrick Drilling
Type of Rig: CME-75
Driller/Helper: Kevin Hathaway /
Geologist Joseph Klemp
Well Casing(type & qty.): 2-inch stainless
Screened interval(type & size) 2-inch stainless / 10 foot
Annular Material:

Grout- Bentonite Slurry
Seal- Bentonite Chips
Filter Pack- Sand

Well Development Comments: Pumps dry; recharges at approx. 1 ft/min

Boring Number: LC-02
Start Date: 4/23/99
Completion Date: 4/24/99
Boring Location: Northeast Corner of Site
Southeast corner of pond LHL1

Ground Elevation: 93.38 feet
T.O.I.C. Elevation: 95.69 feet
Depth of Boring: 16 feet
Lock Number: n/a
Drilling Method: Rotary w/Hollow stem augers.

Depth to Groundwater

While drilling:	n/a	bgs
at completion:	3.4 feet (t.o.i.c)	bgs
after development:	n/a	bgs

Log	Elev. (feet)	Blow Count	Recovery (inches)	Material Description	PID (ppm)	OVA (ppm)	Remarks
	0.0						
		4		FILL: 0 to 2 inch diameter GRAVEL (slag).			
	0.5			FILL: Brown to gray silty CLAY, little c-f sand, trace m-f gravel.	0	0	Moist
	1.0	4					
		7					
	1.5						
	2.0	5	18				
	2.5	3					
		4					
	3.0						
	3.5	4					
	4.0	4	12	Gray m-f SAND, shells noted.	0	0	Wet
	4.5	2		Gray silty SAND.			
		3					
	5.0						
	5.5	3			0	0	1-inch clay lense noted at 5.6 feet.
	6.0	3	18				
	6.5	4					
		2					
	7.0						
	7.5	2		(1-inch Black organic material noted at 7.5 feet)			
		2			0	0	
	8.0	3	6				Dry
	8.5	1		Black Organic Peat.			
		1					
	9.0						
	9.5	4			0	0	
	10.0	2	10				
	10.5	2					
		1		Gray silty CLAY.			
	11.0						
	11.5	1		Black Organic Peat.			
		1					
	12.0	2	20		0	0	

ecology & environment, inc.
DRILLING LOG

Log	Elev. (feet)	Blow Count	Recovery (inches)	Material Description	PID (ppm)	OVA (ppm)	Remarks
	12.5	1		Black Organic Peat			Dry
	13.0	1		Gray CLAY-trace-SILT	0	0	
	13.5	1					
	14.0	1	19				
	14.5	1		Black Organic Peat			
	15.0	2		Gray silty CLAY, trace c-f sand.	0	0	Dry
	15.5	3					
	16.0	5	20				
	16.5			Boring terminated at 16.0 feet			
	17.0						
	17.5						
	18.0						
	18.5						
	19.0						
	19.5						
	20.0						
	20.5						
	21.0						
	21.5						
	22.0						
	22.5						
	23.0						
	23.5						
	24.0						
	24.5						

Additional Comments: Rain saturated ground in area at surface.

ecology & environment, inc.
DRILLING LOG

Site Name: Lake Calumet Cluster Site
Location: Chicago, Cook County, Illinois
TDD: S05-9806-008
Drilling Firm: Patrick Drilling
Type of Rig: CME-75
Driller/Helper: Kevin Hathaway /
Geologist Joseph Klemp
Well Casing(type & qty.): 2-inch stainless
Screened interval(type & size) 2-inch stainless / 10 feet
Annular Material:
Grout- bentonite slurry
Seal- bentonite chips
Filter Pack- sand

Well Development Comments:

Boring Number: LC-03
Start Date: 4/23/99
Completion Date: 4/23/99
Boring Location: Northeast central part of site.

Ground Elevation: 95.85 feet
T.O.I.C. Elevation: 98.34 feet
Depth of Boring: 15.0 feet
Lock Number: n/a
Drilling Method: Rotary w/ hollow stem augers

Depth to Groundwater

While drilling:	5.0 feet	bgs
at completion:	2.9 feet (T.O.I.C)	bgs
after development:	3.1 feet (T.O.I.C.)	bgs

Log	Elev. (feet)	Blow Count	Recovery (inches)	Material Description	PID (ppm)	OVA (ppm)	Remarks
	0.0			FILL: Gray silty CLAY, some c-f gravel, trace m-f sand.			
	0.5	2			0	0	
	1.0	2					
	1.5	3					
	2.0	7	6				
	2.5	3		FILL: Gray silty CLAY, trace m-f gravel, trace c-f sand.	0	0	
	3.0	4					
	3.5	6					
	4.0	7	13				
	4.5	2		FILL: Black Gravel (Slag material), wood chips.	0	0	Wet
	5.0	2					
	5.5	3					
	6.0	2	2				
	6.5	5		FILL: Black SAND and GRAVEL, wood noted. (Slag material)	0	0	
	7.0	9					
	7.5	8					
	8.0	40	12				
	8.5	8			3	0	Wet
	9.0	50					
	9.5						
	10.0		8				
	10.5	3					
	11.0	24					
	11.5	49					
	12.0	40		FILL: Brown c-f SAND	0	0	Arkose appearance; Odor noted.

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Log	Elev. (feet)	Blow Count	Recovery (inches)	Material Description	PID (ppm)	OVA (ppm)	Remarks
	12.5	1		FILL: SAND and GRAVEL with wood chips.	0	0	
	13.0	1					
	13.5	7					
	14.0	2	2				
?	14.5			Not sampled.			Not sampled at 14-15 feet.
	15.0						
	15.5			Boring terminated at 15.0 feet.			
	16.0						
	16.5						
	17.0						
	17.5						
	18.0						
	18.5						
	19.0						
	19.5						
	20.0						
	20.5						
	21.0						
	21.5						
	22.0						
	22.5						
	23.0						
	23.5						
	24.0						
	24.5						

Additional Comments: OVA reads 100 ppm at boring opening with auger at 6-8' depth.
PID reads zero ppm at boring opening with auger at 6-8' depth.

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DRILLING LOG

Site Name: Lake Calumet Cluster Site
Location: Chicago, Cook County, Illinois
TDD: S05-9806-008
Drilling Firm: Patrick Drilling
Type of Rig: CME-75
Driller/Helper: Kevin Hathaway /
Geologist Joseph Klemp
Well Casing(type & qty.): 2-inch stainless
Screened interval(type & size) 2-inch stainless / 10 foot
Annular Material:
Grout- Bentonite Slurry
Seal- Bentonite Chips
Filter Pack- Sand

Well Development Comments:

Boring Number: LC-04
Start Date: 4/21/99
Completion Date: 4/21/99
Boring Location: South central on east side.

Ground Elevation: 96.36 feet
T.O.I.C. Elevation: 98.47 feet
Depth of Boring: 16.0 feet
Lock Number: n/a
Drilling Method: Rotary w/ Hollow stem augers

Depth to Groundwater

While drilling:	5.0	bgs
at completion:	3.2 (T.O.I.C.)	bgs
after development:	n/a	bgs

Log	Elev. (feet)	Blow Count	Recovery (inches)	Material Description	PID (ppm)	OVA (ppm)	Remarks
	0.0			Brown silty CLAY, roots and organics noted.			
	0.5	2					
	1.0	2		FILL: Black slag material, some plastic.	2	2	
	1.5	8					
	2.0	23	8				
	2.5	12					
	3.0	11					
	3.5	3			0-5	3	Water in splitspoon gravel size material
	4.0	3	6				
	4.5	5					
	5.0	24					
	5.5	19					
	6.0	13	3		0	0	
	6.5	5					
	7.0	9					
	7.5	7					
	8.0	5	4		0	0	
	8.5	7					
	9.0	2					
	9.5	2					
	10.0	3	1		0	0	
	10.5	4					
	11.0	2					
	11.5	2					1"recovery of 1" diameter rock (Slag)
	12.0	2	1				

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Log	Elev. (feet)	Blow Count	Recovery (inches)	Material Description	PID (ppm)	OVA (ppm)	Remarks
	12.5	5		FILL: Black Plastic, wood chips, other debris.			
	13.0	4					PID acting up High humidity.
	13.5	5		Gray m-f SAND.	--	0	
	14.0	10	14				
	14.5	4					
	15.0	4					
	15.5	3					Large stone noted.
	16.0	5	16		10	7	1" diameter.
	16.5			Boring terminated at 16.0 feet.			
	17.0						
	17.5						
	18.0						
	18.5						
	19.0						
	19.5						
	20.0						
	20.5						
	21.0						
	21.5						
	22.0						
	22.5						
	23.0						
	23.5						
	24.0						
	24.5						

Additional Comments:

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DRILLING LOG

Site Name: Lake Calumet Cluster Site
Location: Chicago, Cook County, Illinois
TDD: S05-9806-008
Drilling Firm: Patrick Drilling
Type of Rig: CME-75
Driller/Helper: Kevin Hathaway /
Geologist Joseph Klemp
Well Casing(type & qty.): 2-inch stainless
Screened interval(type & size) 2-inch stainless / 10 foot
Annular Material:
Grout- Bentonite Slurry
Seal- Bentonnite chips
Filter Pack- Sand
Well Development Comments: Well goes dry, but recharges quickly.

Boring Number: LC-05
Start Date: 4/26/99
Completion Date: 4/26/99
Boring Location: Southeast corner of site near RR & 122nd St.
Ground Elevation: 98.83 feet
T.O.I.C. Elevation: 100.30 feet
Depth of Boring: 16.0 feet
Lock Number: n/a
Drilling Method: Rotary w/ Hollow stem augers

Depth to Groundwater
While drilling: 10.0 feet bgs
at completion: 7.44 feet (T.O.I.C.) bgs
after development: 9.8 feet (T.O.I.C.) bgs

Log	Elev. (feet)	Blow Count	Recovery (inches)	Material Description	PID (ppm)	OVA (ppm)	Remarks
	0.0						
	0.5	8		FILL: Gray SAND and GRAVEL	0	0	
	1.0	3					
	1.5	2					
	2.0	2	13				
	2.5	5					
	3.0	2					
	3.5	2		FILL: Brown silty CLAY, some c-f sand, some m-f gravel.	0	0	
	4.0	10	10	FILL: Black SAND and GRAVEL			
	4.5	6					
	5.0	11					
	5.5	11			0	0	
	6.0	13	14	FILL: Brown silty CLAY, some c-f sand. some m-f gravel.			Moist
	6.5	5		FILL: Brown SAND, trace c-f gravel.			
	7.0	14					
	7.5	27			0	0	
	8.0	30	18	FILL: BLACK silty SAND, little c-f gravel.			Wet
	8.5	5		FILL: Gray to Brown SAND and GRAVEL.			
	9.0	12		(Slag and Brick)	0	0	
	9.5	9					Wet
	10.0	4	8				
	10.5	7					
	11.0	50					
	11.5						
	12.0		6		0	0	

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Log	Elev. (feet)	Blow Count	Recovery (inches)	Material Description	PID (ppm)	OVA (ppm)	Remarks
	12.5						
?	13.0			(Not Sampled)			
	13.5						
	14.0						
	14.5	11		FILL: Gray to Brown SAND & GRAVEL (Slag & Brick)			
	15.0	8			0	0	
	15.5	7					
	16.0	9		Gray SAND, little m-f gravel.			
	16.5			Boring terminated at 16.0 feet.			
	17.0						
	17.5						
	18.0						
	18.5						
	19.0						
	19.5						
	20.0						
	20.5						
	21.0						
	21.5						
	22.0						
	22.5						
	23.0						
	23.5						
	24.0						
	24.5						

Additional Comments:

ecology & environment, inc.
DRILLING LOG

Site Name: Lake Calumet Cluster Site
Location: Chicago, Cook County, Illinois
TDD: S05-9806-008
Drilling Firm: Patrick Drilling
Type of Rig: CME-75
Driller/Helper: Kevin Hathaway /
Geologist Joseph Klemp
Well Casing(type & qty.): 2-inch stainless
Screened interval(type & size) 2-inch stainless / 10 feet
Annular Material:
Grout- N/A
Seal- Bentonite chips
Filter Pack- Sand
Well Development Comments:

Boring Number: LC-06
Start Date: 4/26/99
Completion Date: 4/26/99
Boring Location: Southeast central part of site north of fence.
Ground Elevation: 94.64 feet
T.O.I.C. Elevation: 96.51 feet
Depth of Boring: 15.0 feet
Lock Number: n/a
Drilling Method: Rotary w/ Hollow stem augers

Depth to Groundwater

While drilling:	10 feet	bgs
at completion:	n/a	bgs
after development:	n/a	bgs

Log	Elev. (feet)	Blow Count	Recovery (inches)	Material Description	PID (ppm)	OVA (ppm)	Remarks
	0.0						
	0.5	4		FILL: Gray SAND and GRAVEL.	0	0	Gravel material appears to be slag
	1.0	50	12				
	1.5						
	2.0						
?	2.5						
	3.0			(No Recovery)			Drilled through slag.
	3.5						
	4.0		0				
	4.5	2		FILL: Black Debris, sand and gravel, little glass, plastic, cloth, wood.	4	100	Moist
	5.0	7					
	5.5	7					
	6.0	6	12				
	6.5	4					
	7.0	4			0	0	Methane noted, OVA reads 100 ppm and drops quickly to zero.
	7.5	2					
	8.0	1	1				
	8.5	2		FILL: SAND & GRAVEL, debris, some plastic, glass.	0	0	Moist
	9.0	3					
	9.5	3		(1" gray silty clay lens notes at 9.5 feet)			
	10.0	15	10				
	10.5	27		FILL: Black SAND and GRAVEL (Slag material), little silt.	0	0	
	11.0	16					
	11.5	15					
	12.0	10	12				

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Log	Elev. (feet)	Blow Count	Recovery (inches)	Material Description	PID (ppm)	OVA (ppm)	Remarks
	12.5	6		FILL: Black SAND and GRAVEL (Slag material).	0	0	
	13.0	4					
	13.5	6					
	14.0	6	4				1" Rock in Splitspoon
?	14.5			(No Recovery)			
	15.0						
				Boring terminated at 15.0 feet.			
	15.5						
	16.0						
	16.5						
	17.0						
	17.5						
	18.0						
	18.5						
	19.0						
	19.5						
	20.0						
	20.5						
	21.0						
	21.5						
	22.0						
	22.5						
	23.0						
	23.5						
	24.0						
	24.5						

Additional Comments: OVA and PID headspace readings are zero at completion of boring.

ecology & environment, inc.
DRILLING LOG

Site Name: Lake Calumet Cluster Site
Location: Chicago, Cook County, Illinois
TDD: S05-9806-008
Drilling Firm: Patrick Drilling
Type of Rig: CME-75
Driller/Helper: Kevin Hathaway /
Geologist Joseph Klemp
Well Casing(type & qty.): 2-inch stainless
Screened interval(type & size) 2-inch stainless / 10 foot
Annular Material:
Grout- N/A
Seal- Bentonite Chips
Filter Pack- Sand
Well Development Comments:

Boring Number: LC-07
Start Date: 4/21/99
Completion Date: 4/21/99
Boring Location: Alburn incinerator next to existing well P-5
Ground Elevation: 98.51 feet
T.O.I.C. Elevation: 100.33 feet
Depth of Boring: 14.0 feet
Lock Number: n/a
Drilling Method: Rotary w/ Hollow stem augers

Depth to Groundwater
While drilling: 2.5 feet bgs
at completion: 1.32 feet (T.O.I.C.) bgs
after development: N/A bgs

Log	Elev. (feet)	Blow Count	Recovery (inches)	Material Description	PID (ppm)	OVA (ppm)	Remarks
	0.0			FILL: Brown silty CLAY, some m-f sand, some m-f gravel.	9	4	CGI read zero for O2 and LEL.
	0.5	32					
	1.0	27					
	1.5	50		FILL: Black GRAVEL (slag material), plastic, other debris.	2	1	Water noted in splitspoon
	2.0		16				
▼	2.5	11					Hit large boulder
	3.0	13					
	3.5	13					
	4.0	8	1	glass noted at 4.0 feet	2	1	
	4.5	5					
	5.0	2					
	5.5	1					
	6.0	1	0.5	slag material noted at 6.0 feet			
	6.5	2					
	7.0	1					
?	7.5	1					
	8.0	3	0				
	8.5	3		FILL: Black glass, plastic, wood, other debris.	20	3.5	
	9.0	5					
	9.5	3					
	10.0	1	4				
	10.5	1					
	11.0	2			15	2	
	11.5	2					
	12.0	2	2				

Log	Elev. (feet)	Blow Count	Recovery (inches)	Material Description	PID (ppm)	OVA (ppm)	Remarks
	12.5	1		FILL: Black plastic, wood, glass, other debris.			
	13.0	1					
	13.5	1					
	14.0			Black Organic silty CLAY, roots noted, some black sand.	1	1	
				Boring terminated at 14.0 feet.			
	14.5						
	15.0						
	15.5						
	16.0						
	16.5						
	17.0						
	17.5						
	18.0						
	18.5						
	19.0						
	19.5						
	20.0						
	20.5						
	21.0						
	21.5						
	22.0						
	22.5						
	23.0						
	23.5						
	24.0						
	24.5						

Additional Comments: All readings taken with CGI were zero, throughout boring.
At completion OVA read 7 ppm and PID read 6 ppm at boring opening.

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DRILLING LOG

Site Name: Lake Calumet Cluster Site
Location: Chicago, Cook County, Illinois
TDD: S05-9806-008
Drilling Firm: Patrick Drilling
Type of Rig: CME-75
Driller/Helper: Kevin Hathaway /
Geologist Joseph Klemp
Well Casing(type & qty.): 2-inch stainless
Screened interval(type & size) 2-inch stainless / 10 foot
Annular Material:
Grout- Bentonite Grout
Seal- Bentonite chips
Filter Pack- Sand
Well Development Comments:

Boring Number: LC-09
Start Date: 4/20/99
Completion Date: 4/20/99
Boring Location: Central part of site.
Ground Elevation: 97.76 feet
T.O.I.C. Elevation: 100.03 feet
Depth of Boring: 20.0 feet
Lock Number: n/a
Drilling Method: Rotary w/ Hollow stem augers.

Depth to Groundwater
While drilling: 7.0 feet bgs
at completion: 4.2 feet (T.O.I.C.) bgs
after development: 3.9 feet (T.O.I.C.) bgs

Log	Elev. (feet)	Blow Count	Recovery (inches)	Material Description	PID (ppm)	CGI (LEL)	Remarks
	0.0			FILL: Brown to Black silty CLAY, some wood chips, glass, metal shavings.	1.5	0	
	0.5	2					
	1.0	2					
	1.5	3					
	2.0	2	12				
	2.5	5					
	3.0	4					
	3.5	3					
	4.0	3	2				
	4.5	2					
	5.0	2					
	5.5	3					
	6.0	2	6		0.5	0	
?	6.5	1		(No Recovery)			
	7.0	2					
	7.5	1					
	8.0	1	0				
	8.5	4		FILL: Cloth, wood, plastic material, and other debris.	0		100% of LEL Wet
	9.0	6					
	9.5	4					
	10.0	9	6				
?	10.5	5		(No Recovery)			
	11.0	6					
	11.5	3					
	12.0	3	0				

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Drilling Log

Log	Elev. (feet)	Blow Count	Recovery (inches)	Material Description	PID (ppm)	OVA (ppm)	Remarks
	12.5	5		FILL: Debris; plastic, wood, ceramics.	2	0	
	13.0	3					
	13.5	50					
	14.0		6				
	14.5	9					
	15.0	8					
	15.5	4					
	16.0	3	8				
	16.5	8		FILL: Debris; wood, plastic, paper.			
	17.0	10					
	17.5	9					
	18.0	11	12	Gray m-f SAND			
	18.5	12		FILL: Debris; wood, metal, paper.			
	19.0	7					
	19.5	6					
	20.0	6	16	Gray silty CLAY, trace m-f sand.			
	20.5						
	21.0						
	21.5						
	22.0						
	22.5						
	23.0						
	23.5						
	24.0						
	24.5						

Additional Comments:

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DRILLING LOG

Site Name: Lake Calumet Cluster Site
Location: Chicago, Cook County, Illinois
TDD: S05-9806-008
Drilling Firm: Patrick Drilling
Type of Rig: CME-75
Driller/Helper: Kevin Hathaway /
Geologist Joseph Klemp
Well Casing(type & qty.): 2-inch stainless
Screened interval(type & size) 2-inch stainless / 10 foot
Annular Material:
Grout- Bentonite
Seal- Bentonite Chips
Filter Pack- Sand
Well Development Comments:

Boring Number: LC-10
Start Date: 4/20/99
Completion Date: 4/20/99
Boring Location: Central part of site East of Album incinerator area.
Ground Elevation: 100.00 feet
T.O.I.C. Elevation: 97.72 feet
Depth of Boring: 15.0 feet
Lock Number: n/a
Drilling Method: Rotary w/ Hollow stem augers.

Depth to Groundwater

While drilling:	7.0 feet	bgs
at completion:	n/a	bgs
after development:	3.3 feet (T.O.I.C.)	bgs

Log	Elev. (feet)	Blow Count	Recovery (inches)	Material Description	PID (ppm)	OVA (ppm)	Remarks
	0.0						
	0.5						
	1.0						
	1.5						
	2.0						
	2.5						
	3.0						
	3.5						
	4.0						
	4.5						
	5.0			Blind drilled to 15.0 feet depth.			
	5.5						
	6.0						
	6.5						
▼	7.0						
	7.5						
	8.0						
	8.5						
	9.0						
	9.5						
	10.0						
	10.5						
	11.0						
	11.5						
	12.0						

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DRILLING LOG

Log	Elev. (feet)	Blow Count	Recovery (inches)	Material Description	PID (ppm)	OVA (ppm)	Remarks
	12.5						
	13.0						
	13.5						
	14.0						
	14.5						
	15.0						
	15.5			Boring terminated at 15.0 feet.			
	16.0						
	16.5						
	17.0						
	17.5						
	18.0						
	18.5						
	19.0						
	19.5						
	20.0						
	20.5						
	21.0						
	21.5						
	22.0						
	22.5						
	23.0						
	23.5						
	24.0						
	24.5						

Additional Comments: Boring LC-09; 3 feet south was fill material including garbage to 19.5 feet bgs.

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DRILLING LOG

Site Name: Lake Calumet Cluster Site
Location: Chicago, Cook County, Illinois
TDD: S05-9806-008
Drilling Firm: Patrick Drilling
Type of Rig: CME-75
Driller/Helper: Kevin Hathaway /
Geologist Joseph Klemp
Well Casing(type & qty.): 2-inch stainless
Screened interval(type & size) 2-inch stainless / 10 foot
Annular Material:
Grout- Bentonite
Seal- Bentonite chips
Filter Pack- Sand
Well Development Comments: Methane bubbles noted w/ 45% of LEL read on CGI.

Boring Number: LC-11
Start Date: 4/19/99
Completion Date: 4/19/99
Boring Location: East central part of site (South of U.S. Drum Pad area)
Ground Elevation: 96.10 feet
T.O.I.C. Elevation: 98.52 feet
Depth of Boring: 20.0 feet
Lock Number: n/a
Drilling Method: Rotary w/ hollow stem augers

Depth to Groundwater
While drilling: 8 feet bgs
at completion: 2.8 feet (T.O.I.C.) bgs
after development: 4.92 feet (T.O.I.C.) bgs

Log	Elev. (feet)	Blow Count	Recovery (inches)	Material Description	PID (ppm)	OVA (ppm)	Remarks
	0.0						
	0.5	2		Black Organic silty CLAY, roots noted.	0	0	
	1.0	2					
	1.5	3		FILL: Gray silty CLAY, trace c-f sand, some m-f gravel.			
	2.0	2	18				
	2.5	3					
	3.0	7					
	3.5	11			0	0	
	4.0		18	FILL: White Claylike material.			
	4.5	4			0	0	
?	5.0	8		(No Recovery)			
	5.5	10					
	6.0	12	0				
	6.5	56		FILL: Black Debris; m-f gravel, metal shavings, wood chips.	0	0	
	7.0	14					
	7.5	4					
	8.0	5	6		0	0	
	8.5	4					
	9.0	3					
	9.5	2					
?	10.0	2	0	(No Recovery)			Large Limestone Rock only recovery
	10.5	3					
	11.0	1					
	11.5	1					
	12.0	1	1				

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DRILLING LOG

Log	Elev. (feet)	Blow Count	Recovery (inches)	Material Description	PID (ppm)	OVA (ppm)	Remarks
?	12.5	5			0	0	
	13.0	9					
	13.5	8		m-f Gray SAND			
	14.0	8	12		0	0	
	14.5	3					
	15.0	4					
	15.5	7					
	16.0	6	18		0	0	
	16.5	3		m-f Gray to Black SAND			
	17.0	2					
	17.5	2					
	18.0	3	10		0	0	
	18.5	2					
	19.0	3					
	19.5	6		Gray silty CLAY, trace c-f sand, trace m-f gravel.	0	0	
	20.0	8	14				
	20.5			Boring terminated at 20.0 feet.			
	21.0						
	21.5						
	22.0						
	22.5						
	23.0						
	23.5						
	24.0						
	24.5						

Additional Comments:

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DRILLING LOG

Site Name: Lake Calumet Cluster Site
Location: Chicago, Cook County, Illinois
TDD: S05-9806-008
Drilling Firm: Patrick Drilling
Type of Rig: CME-75
Driller/Helper: Kevin Hathaway /
Geologist Joseph Klemp
Well Casing(type & qty.): 2-inch stainless
Screened interval(type & size) 2-inch stainless / 10 foot
Annular Material:

Grout- Bentonite
Seal- Bentonite chips
Filter Pack- Sand

Well Development Comments:

Boring Number: LC-12
Start Date: 4/20/99
Completion Date: 4/20/99
Boring Location: East central part of site (South of U.S. Drum pad area)
Ground Elevation: 96.05 feet
T.O.I.C. Elevation: 97.74 feet
Depth of Boring: 15.0 feet
Lock Number: n/a
Drilling Method: Rotary w/ hollow stem augers

Depth to Groundwater

While drilling:	10.0 feet	bgs
at completion:	3.6 feet (T.O.I.C.)	bgs
after development:	3.3 feet(T.O.I.C.)	bgs

Log	Elev. (feet)	Blow Count	Recovery (inches)	Material Description	PID (ppm)	OVA (ppm)	Remarks
	0.0						
	0.5						
	1.0			Blind Drilled to 15.0 feet bgs.			
	1.5			(All cuttings are Brown to Gray silty Clay)			
	2.0						
	2.5						
	3.0						
	3.5						
	4.0						
	4.5						
	5.0						
	5.5						
	6.0						
	6.5						
	7.0						
	7.5						
	8.0						
	8.5						
	9.0						
	9.5						
	10.0						
	10.5						
	11.0						
	11.5						
	12.0						

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DRILLING LOG

Log	Elev. (feet)	Blow Count	Recovery (inches)	Material Description	PID (ppm)	OVA (ppm)	Remarks
	12.5						
	13.0						
	13.5						
	14.0						
	14.5						
	15.0			Boring Terminated at 15.0 feet.			
	15.5						
	16.0						
	16.5						
	17.0						
	17.5						
	18.0						
	18.5						
	19.0						
	19.5						
	20.0						
	20.5						
	21.0						
	21.5						
	22.0						
	22.5						
	23.0						
	23.5						
	24.0						
	24.5						

Additional Comments: Headspace at end of boring is at 20% of LEL as indicated by CGI.

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DRILLING LOG

Site Name: Lake Calumet Cluster Site
Location: Chicago, Cook County, Illinois
TDD: S05-9806-008
Drilling Firm: Patrick Drilling
Type of Rig: CME-75
Driller/Helper: Kevin Hathaway /
Geologist Joseph Klemp
Well Casing(type & qty.): 2-inch stainless
Screened interval(type & size) 2-inch stainless / 10 foot
Annular Material:
Grout- Bentonite
Seal- Bentonite Chips
Filter Pack- Sand
Well Development Comments:

Boring Number: LC-13
Start Date: 4/21/99
Completion Date: 4/21/99
Boring Location: Southwest corner of site.
Ground Elevation: 97.14 feet
T.O.I.C. Elevation: 99.16 feet
Depth of Boring: 16.0 feet
Lock Number: n/a
Drilling Method: Rotary w/ Hollow stem augers

Depth to Groundwater

While drilling:	2.5 feet	bgs
at completion:	2.4 feet (T.O.I.C.)	bgs
after development:	n/a	bgs

Log	Elev. (feet)	Blow Count	Recovery (inches)	Material Description	PID (ppm)	OVA (ppm)	Remarks
	0.0						
	0.5	1		FILL: Black to Brown Debris; Wood, plastic, glass.	0	0	
	1.0	1					
	1.5	1					
	2.0	1	2		0	2	Wet
▼	2.5						
	3.0	?					
	3.5						
	4.0		4		0	0	Wet
	4.5	8					Piece of rubber noted.
	5.0	4					
	5.5	3					
	6.0	3	5		0	2	Mostly paper.
	6.5	6					
	7.0	4					
	7.5	13					
	8.0	11	11				
	8.5	6					
	9.0	3					
	9.5	3					
	10.0	2	4				
	10.5	3		(No Recovery)			
	11.0	7					
	11.5	5					
	12.0	3	0				

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DRILLING LOG

Log	Elev. (feet)	Blow Count	Recovery (inches)	Material Description	PID (ppm)	OVA (ppm)	Remarks
	12.5	3			0	0	
	13.0	1		FILL: Debris; plastic, gravel, glass, wood.			
	13.5	1					
	14.0	1	1				
	14.5	4					
	15.0	3					Glass, wood,
	15.5	1			0	1	fine gravel.
	16.0	1	2				
	16.5			Boring terminated at 16.0 feet.			
	17.0						
	17.5						
	18.0						
	18.5						
	19.0						
	19.5						
	20.0						
	20.5						
	21.0						
	21.5						
	22.0						
	22.5						
	23.0						
	23.5						
	24.0						
	24.5						

Additional Comments:

LC-01

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MONITORING WELL AS-BUILT DIAGRAM

SITE Lake Calumet Cluster

TDD/PAN S05-9806-008 / BNO80151XX

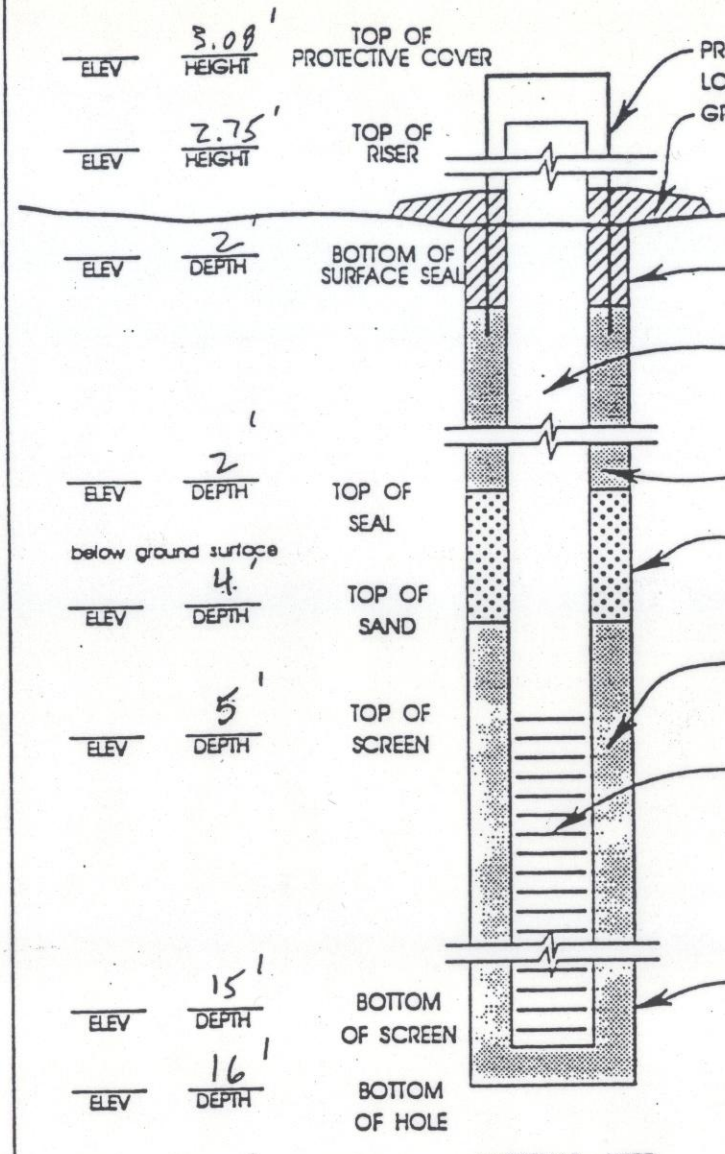
WELL DRILLING CONTRACTOR Patrick Drilling

GEOLOGIST Joseph Kemp

DATE COMPLETED 4/28/99

LOCATION OF WELL North End of Site

DATE INSTALLED 4/22/99



PROTECTIVE COVER: _____

LOCK NUMBER: _____

GROUND ELEVATION (MSL): _____ FT.

SURFACE SEAL: Concrete

RISER TYPE: Stainless

DIAMETER: 2.0 IN.

GROUT: Bentonite Grout

ANNULAR SEAL: Bentonite Chips

FILTER PACK: SAND

SCREEN DIA.: 2.0 IN. LENGTH: 10 FT.

TYPE: Stainless

SLOT SIZE: 0.01 IN.

BOREHOLE DIAMETER: 4.25 IN.

DRILL METHOD: Rotary w/ Hollow Stem Augers

DATE DEVELOPED: 4/29/99

METHOD OF DEVELOPEMENT: Surge/Pump

MATERIALS USED

ITEM	QUANTITY
Well Screen	10 ft
Well Casing	7 ft
SAND	5 bags
Grout	
Bentonite Chips	± 1 bag

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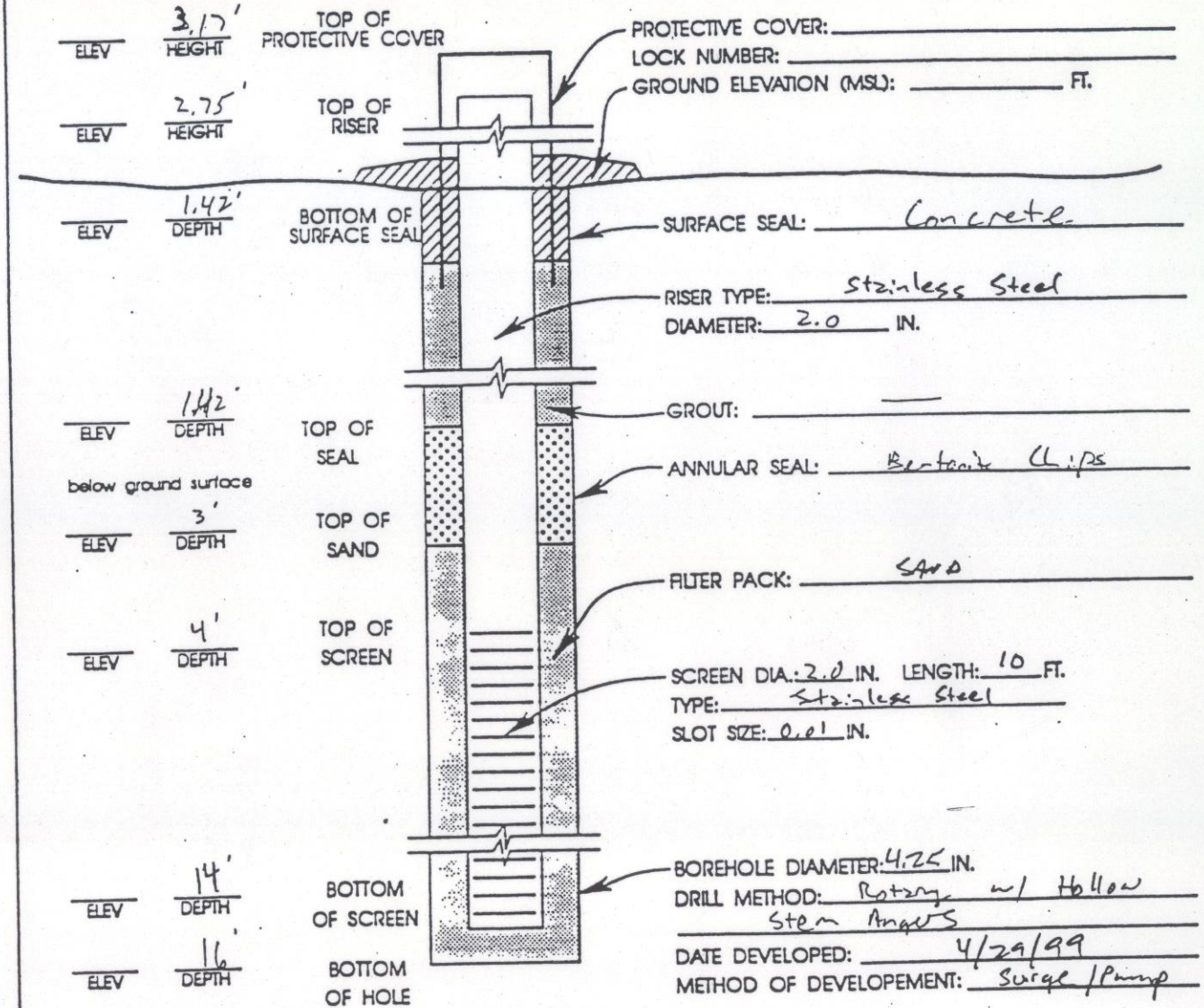
MONITORING WELL AS-BUILT DIAGRAM

SITE Lake Calumet Cluster
TDD/PAN 505-9806-008 / 8N0801.SIXX
WELL DRILLING CONTRACTOR Patrick Drilling
GEOLOGIST Joseph Klemp
DATE COMPLETED 4/28/99
LOCATION OF WELL Northeast corner of Site; South east corner of LHL 1.

DATE INSTALLED 4/27/99



PROTECTIVE COVER: ____
LOCK NUMBER: ____
GROUND ELEVATION (MSL): ____ FT.
SURFACE SEAL: Concrete
RISER TYPE: Stainless Steel
DIAMETER: 2.0 IN.
GROUT: ____
ANNULAR SEAL: Bentonite Chips
FILTER PACK: SAND
SCREEN DIA.: 2.0 IN. LENGTH: 10 FT.
TYPE: Stainless Steel
SLOT SIZE: 0.01 IN.
BOREHOLE DIAMETER: 4.25 IN.
DRILL METHOD: Rotary w/ Hollow Stem Augers
DATE DEVELOPED: 4/29/99
METHOD OF DEVELOPEMENT: Surge / Pump

MATERIALS USED

ITEM	QUANTITY
well Screen	10 ft
well Casing	7 ft
filter Sand	bags
Bentonite Chips	bags
Bentonite Grout	bags

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LC-03

recycled paper

MONITORING WELL AS-BUILT DIAGRAM

SITE: Lake Calumet Cluster Site

TDD/PAN: S05-9806-008 / 8N0801 SIXX

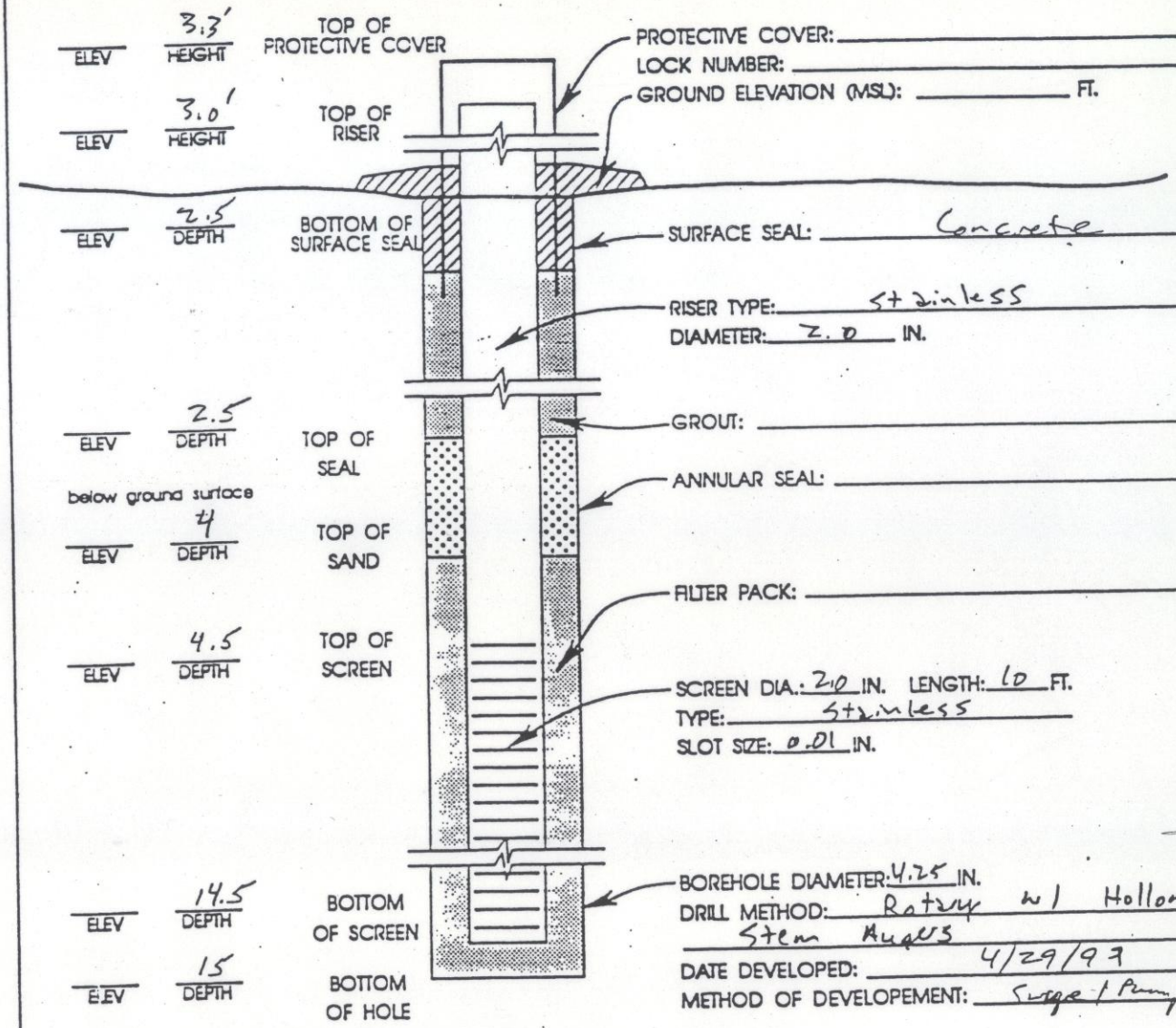
WELL DRILLING CONTRACTOR: Patrick Drilling

GEOLOGIST: Joseph Klemp

DATE COMPLETED: 4/29/99

LOCATION OF WELL: Northeast Central Part of Site

DATE INSTALLED: 4/23/99



MATERIALS USED

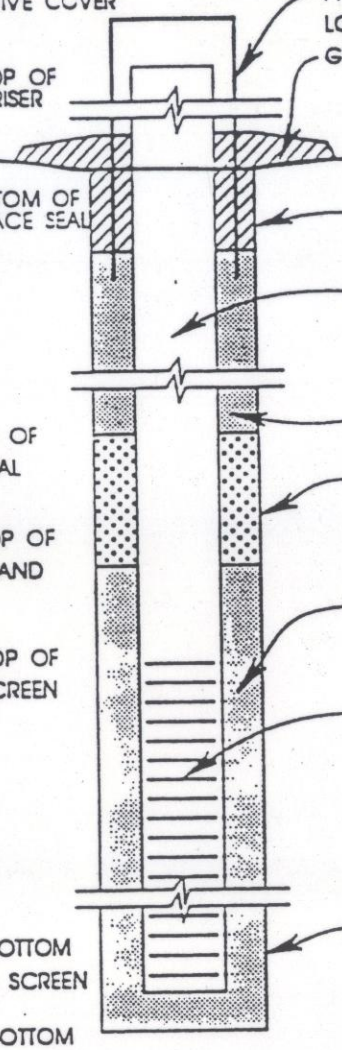
ITEM	QUANTITY
Well Screen	10 ft
Well Casing	7 ft
Filter Sand	3 bags
Bentonite Chips	

LC-04

MONITORING WELL AS-BUILT DIAGRAM

SITE Lake Calumet Cluster
TDD/PAN S05-9806-008 / 8N0801SIXY
WELL DRILLING CONTRACTOR Patrick Drilling
GEOLOGIST Joseph Klemp
DATE COMPLETED 4/28/99
LOCATION OF WELL South Central on East Side

DATE INSTALLED 4/21/99



ELEV	HEIGHT	
	3.0'	TOP OF PROTECTIVE COVER
	2.7'	TOP OF RISER
	2	BOTTOM OF SURFACE SEAL
	2	TOP OF SEAL
below ground surface		
	4	TOP OF SAND
	5	TOP OF SCREEN
	15'	BOTTOM OF SCREEN
	16'	BOTTOM OF HOLE

PROTECTIVE COVER:
LOCK NUMBER:
GROUND ELEVATION (MSL): FT.

SURFACE SEAL: Concrete

RISER TYPE: Stainless
DIAMETER: 2.0 IN.

GROUT: ?

ANNULAR SEAL: Bentonite Chips

FILTER PACK: SAND

SCREEN DIA.: 2.0 IN. LENGTH: 10 FT.
TYPE: Stainless
SLOT SIZE: 0.01 IN.

BOREHOLE DIAMETER: 2.0 IN.
DRILL METHOD: Hollow Stem Auger / Rotary
DATE DEVELOPED:
METHOD OF DEVELOPEMENT:

MATERIALS USED

ITEM	QUANTITY
Well Casing	7 ft
Well Screen	10 ft

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LC-05

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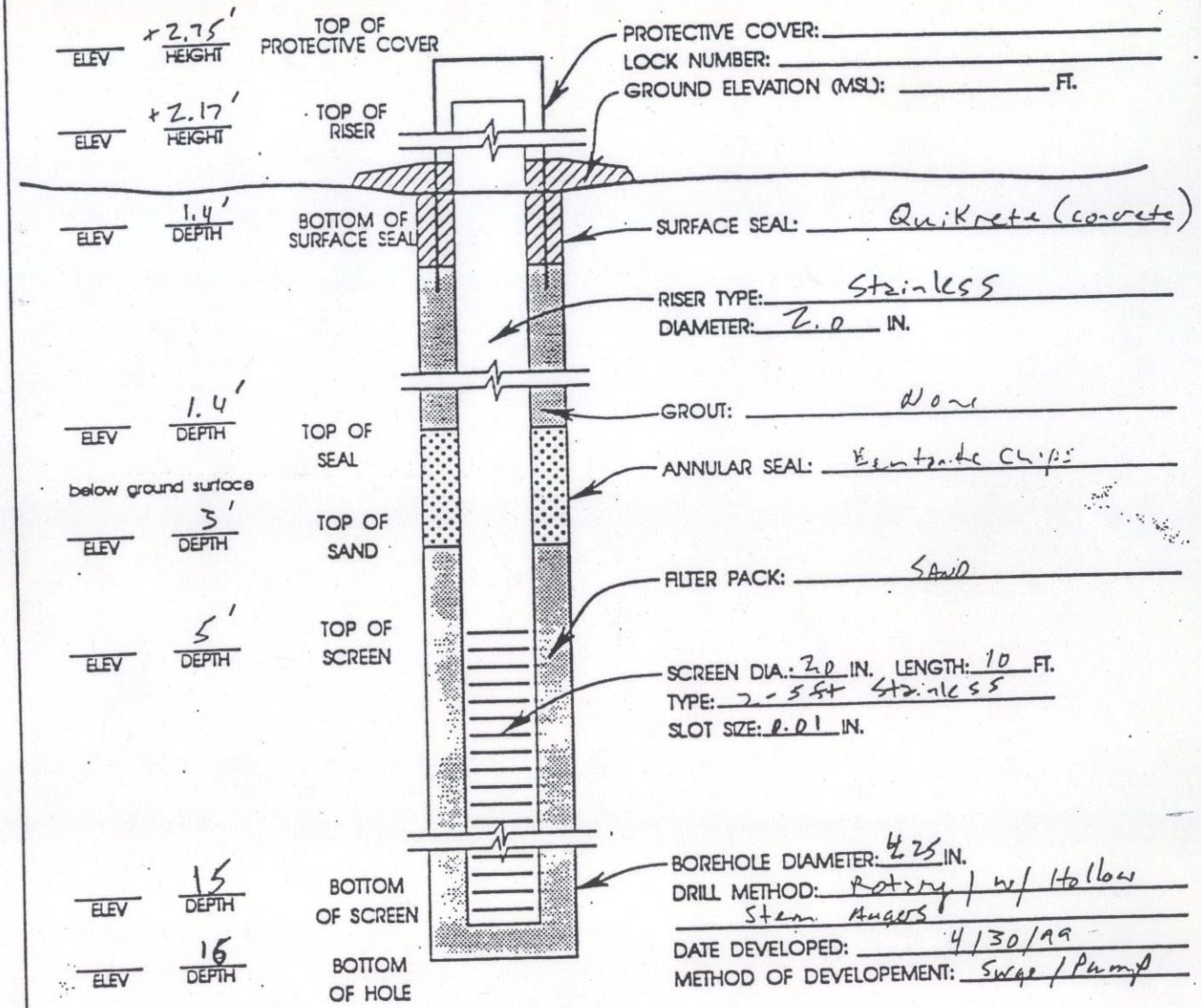
MONITORING WELL AS-BUILT DIAGRAM

SITE: Lake Calumet Cluster Sites
TDD/PAN: 505-9806-008 / 1. BNOBOI SIXX
WELL DRILLING CONTRACTOR: Patrick Drilling
GEOLOGIST: Joseph Klemp
DATE COMPLETED: 4/26/99
LOCATION OF WELL: Southeast Corner of Site near RR #122nd St Crossing

DATE INSTALLED: 4/26/99



MATERIALS USED

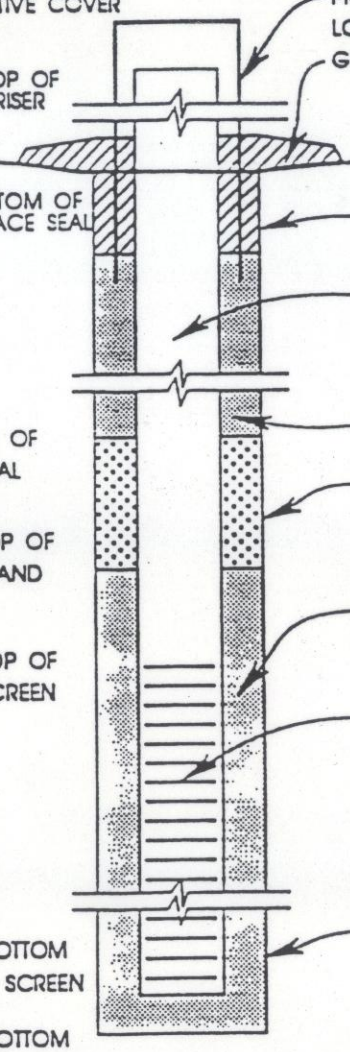
ITEM	QUANTITY
Well Screen (5ft)	2
Well Casing	7 ft
filter Sand	3 Bags
Bentonite Chips	½ Bag

LC-06

MONITORING WELL AS-BUILT DIAGRAM

SITE: Lake Calumet Cluster.
TDD/PAN: S05-9806-008 / 8N08.01 SIXY
WELL DRILLING CONTRACTOR: Patrick Drilling
GEOLOGIST: Joseph Klemp
DATE COMPLETED: 4/26/99
LOCATION OF WELL: Southeast Central Part of Site - North of fence

DATE INSTALLED: 4/26/99



ELEV	HEIGHT	
	2.75'	TOP OF PROTECTIVE COVER
	2.5'	TOP OF RISER
	2.75'	BOTTOM OF SURFACE SEAL
	2.75'	TOP OF SEAL
below ground surface		
	4'	TOP OF SAND
	5'	TOP OF SCREEN
	15'	BOTTOM OF SCREEN
	15'	BOTTOM OF HOLE

PROTECTIVE COVER:
LOCK NUMBER:
GROUND ELEVATION (MSL): _____ FT.

SURFACE SEAL: Concrete

RISER TYPE: Stainless
DIAMETER: 2.0 IN.

GROUT: None

ANNULAR SEAL: Bentonite Chips

FILTER PACK: SAND

SCREEN DIA.: 2.0 IN. LENGTH: 10 FT.
TYPE: Stainless
SLOT SIZE: 0.01 IN.

BOREHOLE DIAMETER: 4.25 IN.
DRILL METHOD: Rotary / Hollow Stem Auger.
DATE DEVELOPED:
METHOD OF DEVELOPEMENT:

MATERIALS USED

ITEM	QUANTITY
Well Casing	7 ft
Well Screen	10 ft
Bentonite Chips	½ Bag
SAND	3-4 Bags

LC-07

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MONITORING WELL AS-BUILT DIAGRAM

SITE Lake Calumet Cluster Site

TDD/PAN SO5-9806-008 / BNO801SIXY

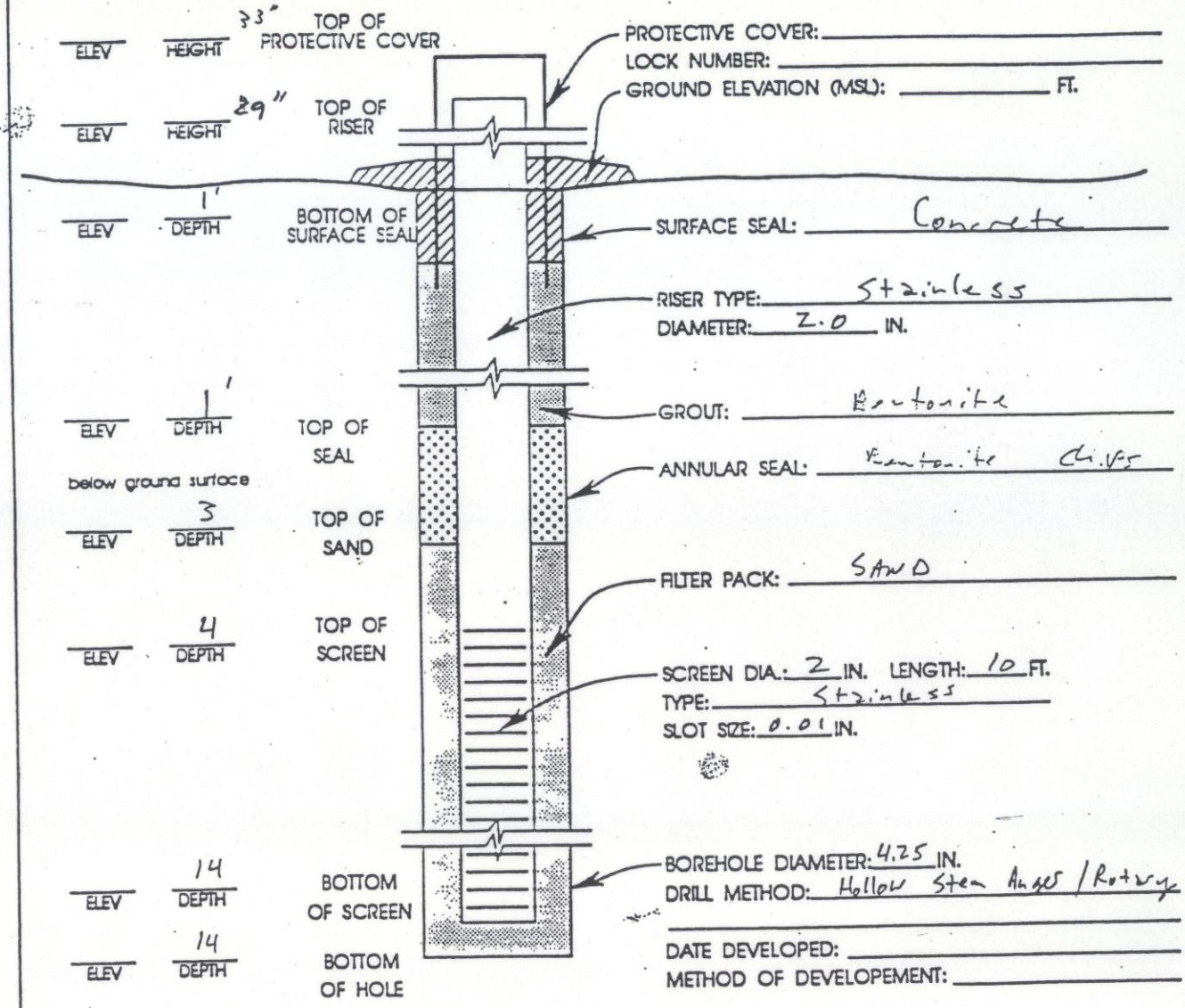
WELL DRILLING CONTRACTOR Patrick Drilling

GEOLOGIST Joseph Klemp

DATE COMPLETED 4/27/99

LOCATION OF WELL Alburn Incinerator next to existing well R-5

DATE INSTALLED 4/21/99



MATERIALS USED

ITEM	QUANTITY
well screen	10 ft
well casing	5 ft
filter sand	4 bags
Bentonite Grout	
Bentonite Chips	1 bag

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WELL NUMBER: LC-09

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MONITORING WELL AS-BUILT DIAGRAM

SITE: Lake Calumet Cluster

TDD/PAN: 505-9806-008 / 8N0801.SIX4

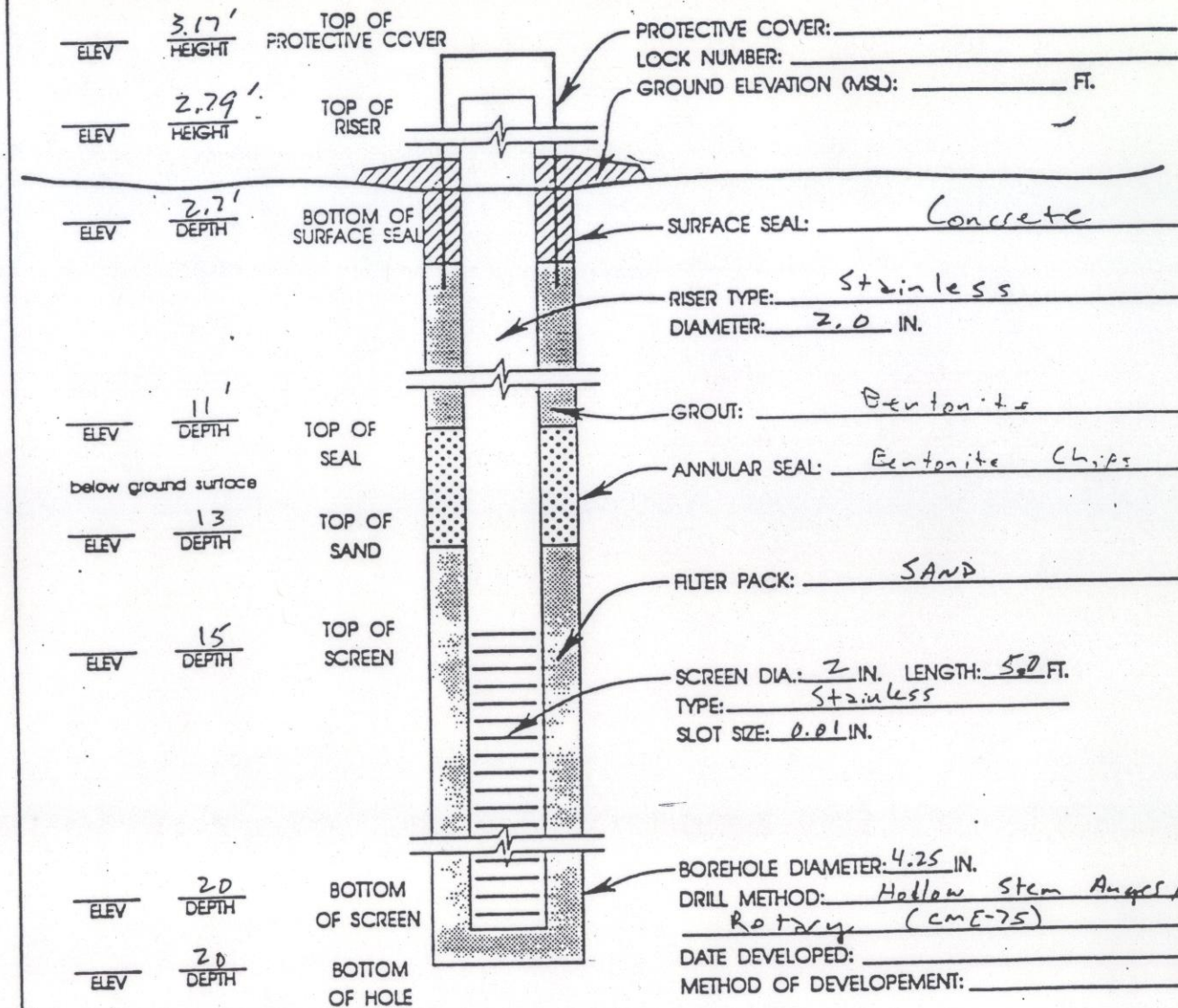
WELL DRILLING CONTRACTOR: Patrick Drilling

GEOLOGIST: Joseph Klemp

DATE COMPLETED: 4/27/99

LOCATION OF WELL: Central Part of Site East of Milburn PAD

DATE INSTALLED: 4/20/99



MATERIALS USED

ITEM	QUANTITY
Well Screen	5 ft
well Casing	17 ft
Filter Sand	2 bags
Bentonite Chips	1 bag
Bentonite Grout	2 bags

ecology and environment inc.

WELL NUMBER: LC-10

MONITORING WELL AS-BUILT DIAGRAM

SITE: Lake Calumet Cluster Site

TDD/PAN: 505-9806-008

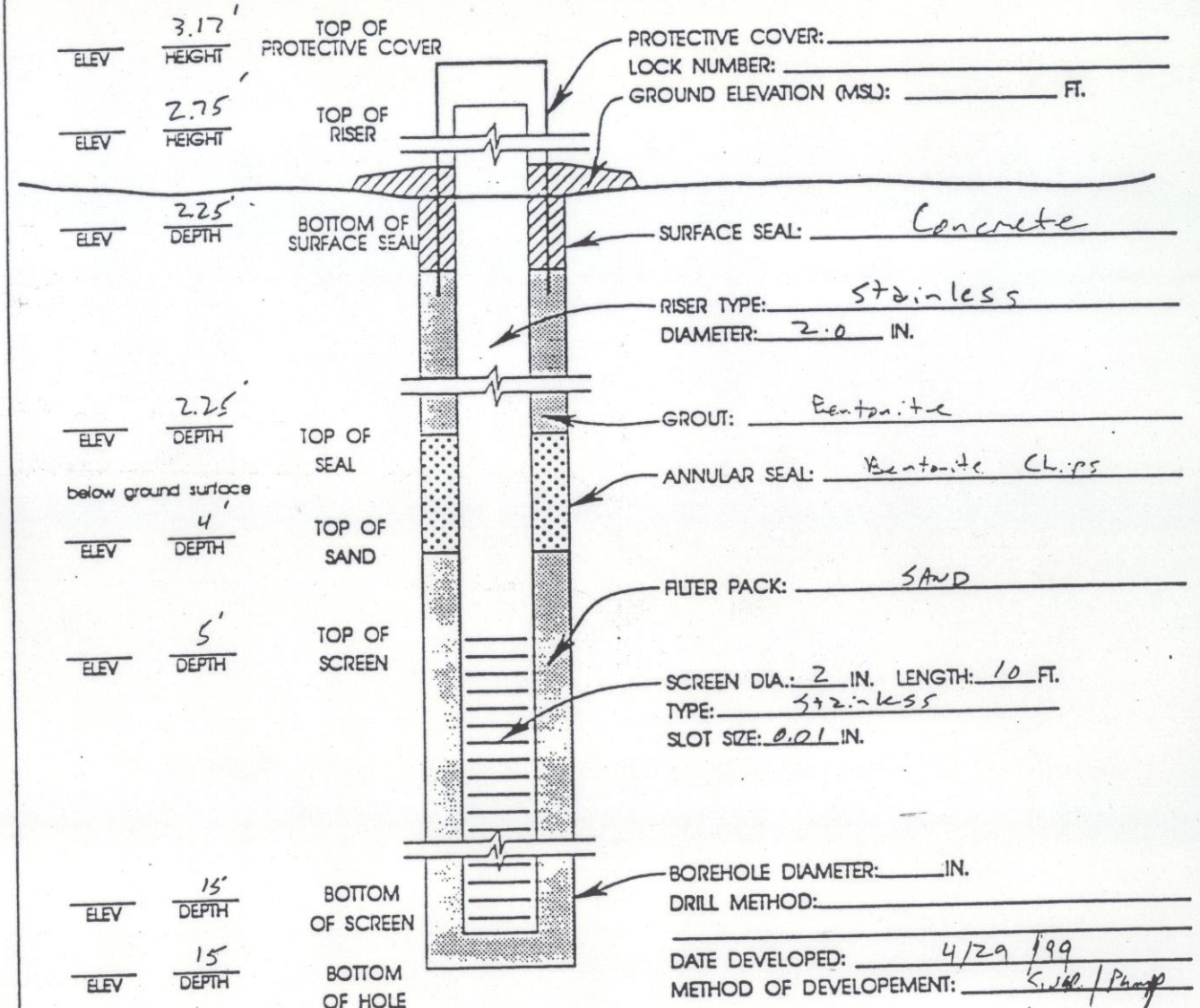
WELL DRILLING CONTRACTOR: Patrick Drilling

GEOLOGIST: Joseph Klemp

DATE COMPLETED: 4/27/99

LOCATION OF WELL: Central Part of Site East of Albam Incinerator Pad

DATE INSTALLED: 4/20/99



MATERIALS USED

ITEM	QUANTITY
Well Casing	7 ft
Well Screen	10 ft
Filter Sand	5 bags
Bentonite Chips	bags
Bentonite Slurry	bags

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International Specialists in the Environment

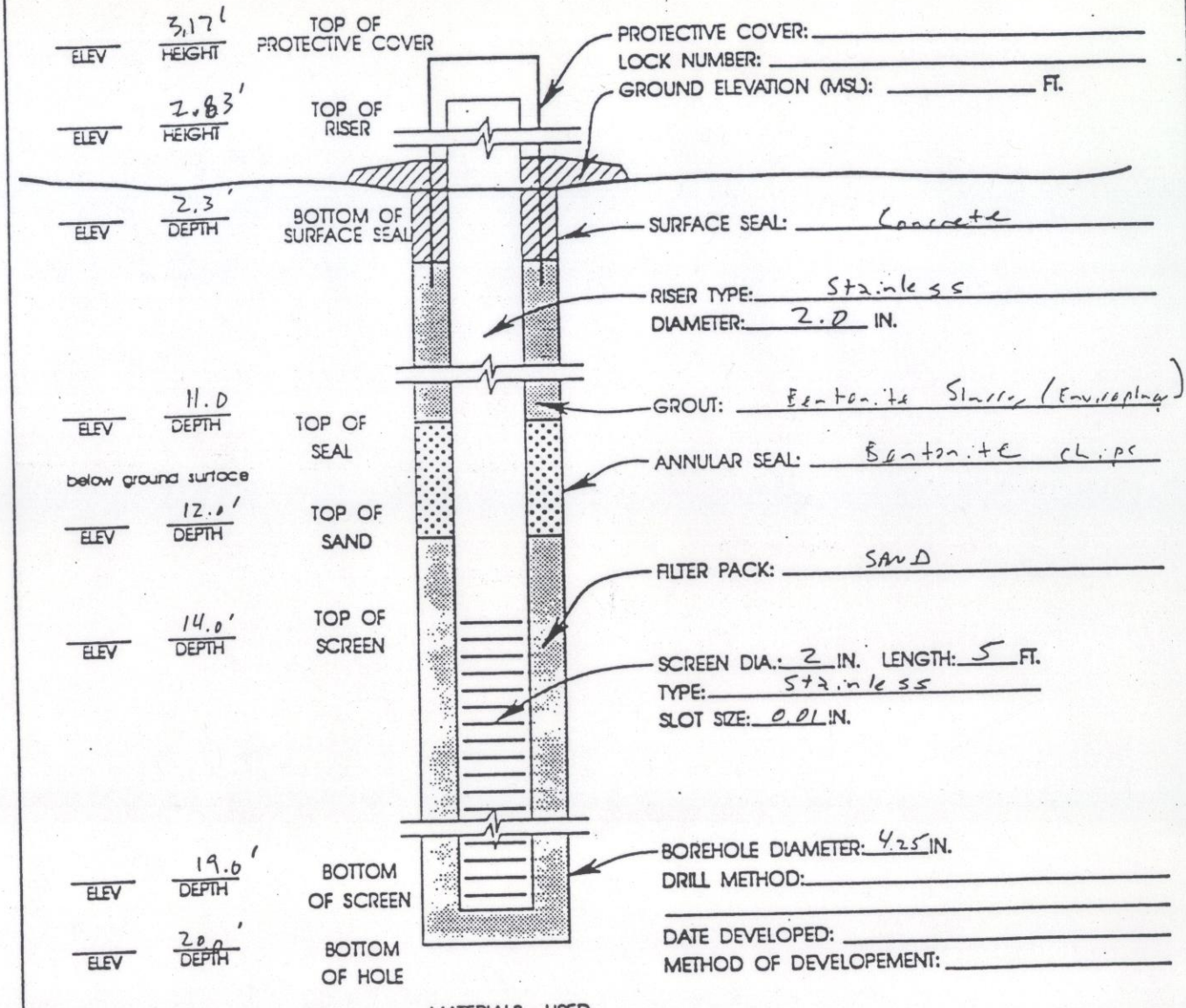
LC-11

recycled paper

MONITORING WELL AS-BUILT DIAGRAM

SITE: Lake Calumet Cluster Site
TDD/PAN: S05-9806-008 / BNOB01 SIXX
WELL DRILLING CONTRACTOR: Patrick Drilling
GEOLOGIST: Joseph Klemp
DATE COMPLETED: 4/28/99
LOCATION OF WELL: East Central Part of Site

DATE INSTALLED: 4/19/99



MATERIALS USED

ITEM	QUANTITY
filter Sand	6.0 ft
Bentonite chips	1 ft
Well Screen	5 ft
Well Casing	15 ft
Bentonite Slurry	

LC-12

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MONITORING WELL AS-BUILT DIAGRAM

SITE Lake Calumet Cluster Site.

TDD/PAN S05-9806-008 / 8N0801SIXY

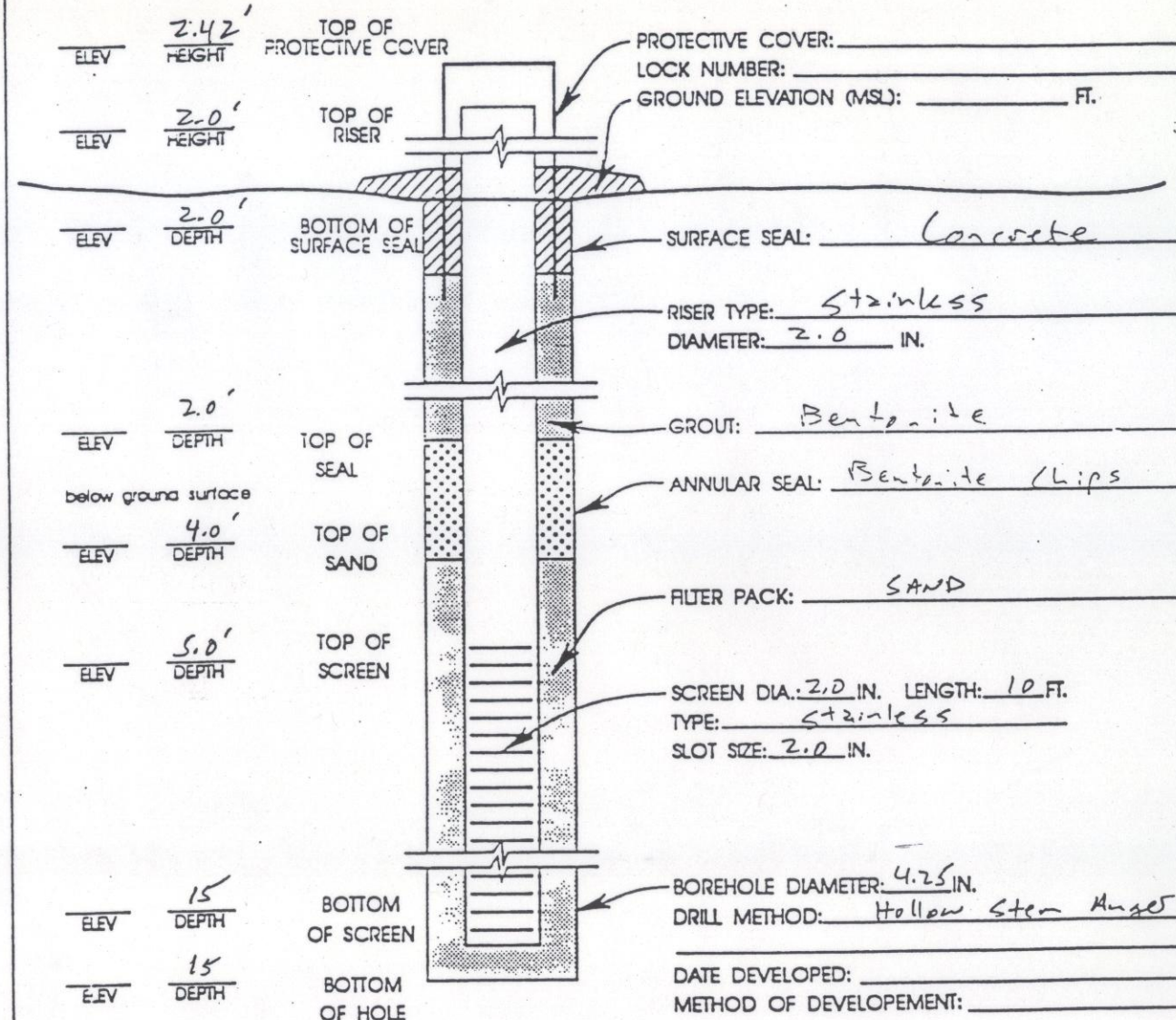
WELL DRILLING CONTRACTOR Patrick Drilling

GEOLOGIST Joseph Klemp

DATE COMPLETED 4/28/99

LOCATION OF WELL East Central Part of Site

DATE INSTALLED 4/19/99



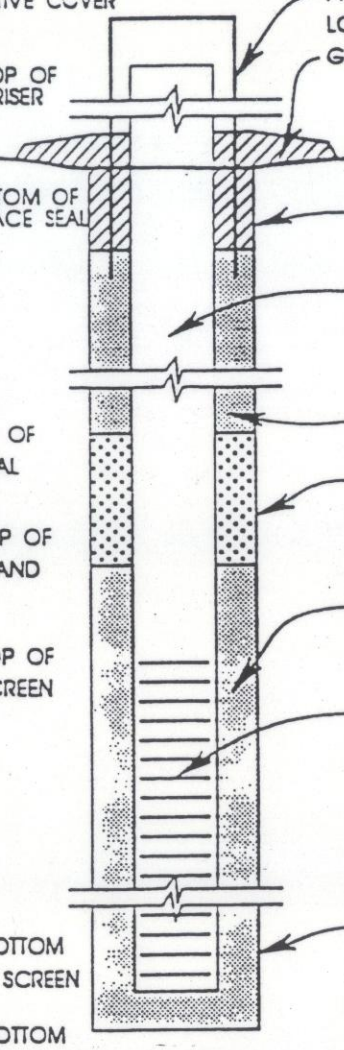
MATERIALS USED

ITEM	QUANTITY
Well Casing	7 ft
Well Screen	10 ft
filter Sand	bags
Bentonite Chips	bags
Bentonite Grout	bags

MONITORING WELL AS-BUILT DIAGRAM

SITE: Lake Calumet Clusters
TDD/PAN: 505-9806-008 / 8N080 ST XV
WELL DRILLING CONTRACTOR: Patrick Drilling
GEOLOGIST: Joseph Klemp
DATE COMPLETED: 4/28/99
LOCATION OF WELL: South west Corner of Site

DATE INSTALLED: 4/21/99



ELEV	HEIGHT	
	34"	TOP OF PROTECTIVE COVER
	30"	TOP OF RISER
	2	BOTTOM OF SURFACE SEAL
	2'	TOP OF SEAL
below ground surface		
	4	TOP OF SAND
	5	TOP OF SCREEN
	15	BOTTOM OF SCREEN
	16	BOTTOM OF HOLE

PROTECTIVE COVER:
LOCK NUMBER:
GROUND ELEVATION (MSL): _____ FT.

SURFACE SEAL: Concrete

RISER TYPE: Stainless
DIAMETER: 2.0 IN.

GROUT:

ANNULAR SEAL: Bentonite Chips

FILTER PACK: SAND

SCREEN DIA.: 2 IN. LENGTH: 10 FT.
TYPE: Stainless
SLOT SIZE: 0.01 IN.

BOREHOLE DIAMETER: 4.25 IN.
DRILL METHOD: Hollow Stem Auger, Rotary
DATE DEVELOPED:
METHOD OF DEVELOPEMENT:

MATERIALS USED

ITEM	QUANTITY
Well Screen	10 ft
Well Casing	7 ft

Drilling Logs and Well Construction Reports For Existing Groundwater Wells
(P01 through P04)

ecology and environment, inc.
111 WEST JACKSON BLVD., CHICAGO, ILLINOIS 60604

Alburn Incinerator
Chicago, IL
IP8020

Drilling Firm: Fox Drilling Inc.
Type of Drill: Mobile B40F
Driller/Helper: Barry Urban / Bernie Crachy
Geologist:

ing Number: P1
rt Date: 10-2-90
pletion Date: 10-2-90
ing Location: Northwest Corner of Site

Ground Elevation:
T.O.I.C. Elevation:
Depth of Boring:
Lock Number:
Drilling Methods: Hollow Stem Augers 3 3/4 ID

Depth to Groundwater		Date
while drilling		
at completion	(TOIC)	
after days	(TOIC)	

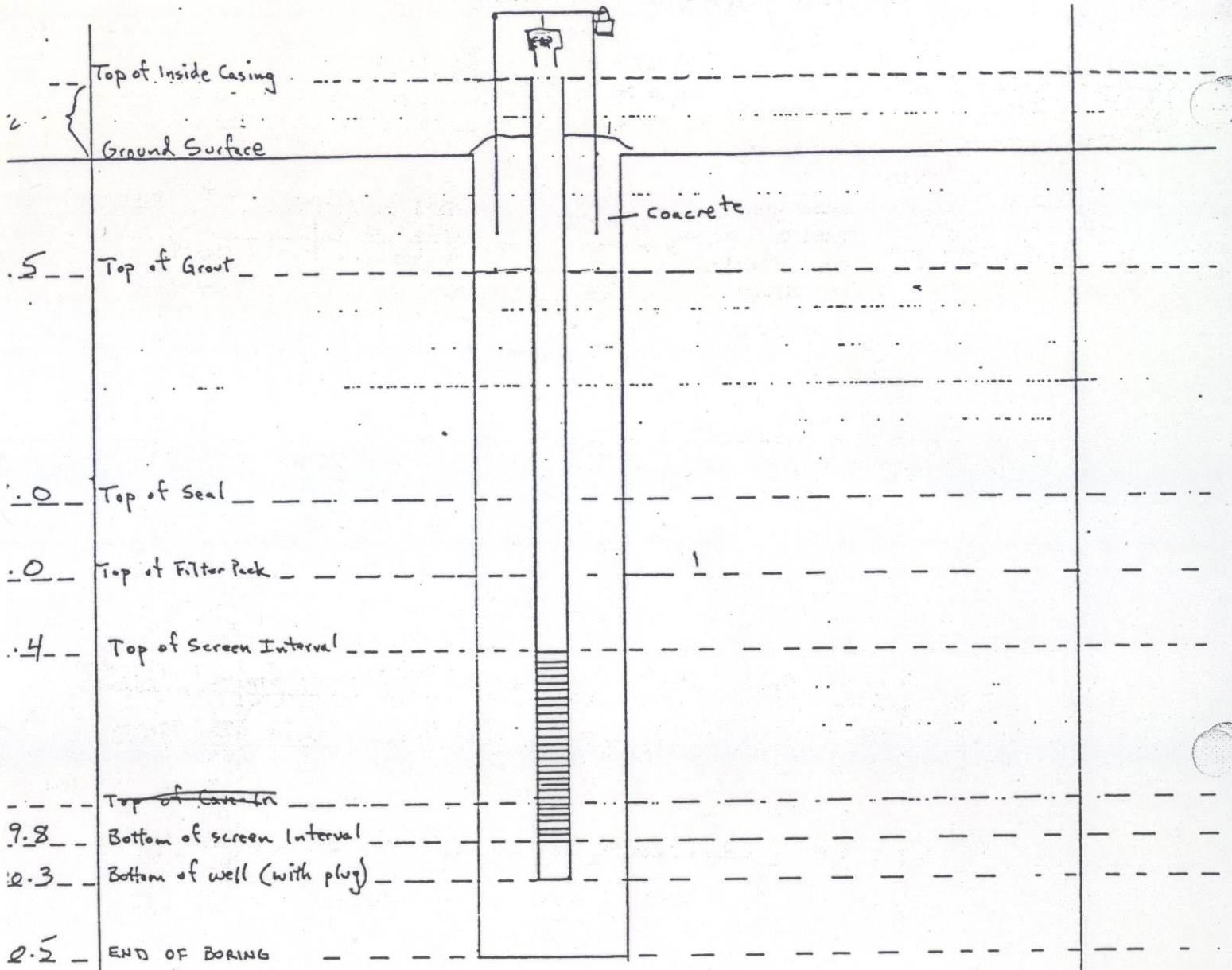
l Casing (Type & Qty.): 2" Sch. 40 PVC
een Interval (Type & Qty.): 10' Sch 40 PVC 10 slot
ulus Material Above Seal: Volclay Grout
Seal: Bentonite Pellets
Screen: Silica Sand

l Development Comments:

0850 Begin drilling Level B
0925 finish Level B

Above bkg
OVA READINGS
BH = Borehole
SS = Split Spoon
Remarks
BZ Breathing Zone

Sample Number	Sample Depth From - To	Blow Count	Rec. (in.)	Hydrostratigraphic Unit From - To	Description of Material	Remarks
~~01~~	~~3-5~~			Blind Drill 0-3' Ground Surface Gray Gravel		bkg 2-6 (methane)
	3-5	1 5 7 5	8	FILL	Black Gravel, Cinders, Paper Same	SS 10 ppm
					Med Sand) Saturated	BH Not Recorded HCN 0 RAD BKG
02	8-10	3 8 9 4	2	FILL	Wood, Brick, Black, Saturated.	BH > 1000 Meth Cl. 0
					Wood stuck in nose of SS -	BZ 3 SS 0
03	13-15	1 1 2 2	2	FILL	Black Coarse to Med Sand some red	BH 200 BZ 20
					brick fragments. Saturated	SS 0
04	18-20	4 2 5 8	14	7"	As Above	SS 0
				7"	Light Gray Clay Trace Silt Trace	BZ ~~Samp~~ 4 BH 10
					small Gravel Moist	
Auger to 20.5'				Begin to set well pipe - 2-5' 10 slot Screen		
				2-10' risers Sand Filter Pack 20.5' to 9'		
				while pulling augers incrementally, Bentonite Pellets 9' to 7'		
				The hole caved from ~7' to 5½' while removing augers		
				to remedy bentonite blockage in augers. Volclay grout 5½'-1½'		
				1½'-ground surface concrete		


Top of Inside Casing
Ground Surface
concrete
Top of Grout
Top of Seal
Top of Filter Pack
Top of Screen Interval
Top of Casing
Bottom of screen Interval
Bottom of well (with plug)
END OF BORING

Name > Alburn Incinerator
Number > IP8020

Boring Well No. > P 1

BH = Borehole
BZ = Breathing zone
SS = Split spoon

Sample No.	Sample Depth From – To (ft)	Blow Count	Recov. (in.)	Description	Remarks
	SURFACE	N/A		Gray gravel	OVA background 2-6 ppm
SS1	3.0-5.0	1-5-7-5	8	Fill consisting of black gravel, cinders, paper, some medium sand, saturated	BH - N/A BZ - background SS - 10 ppm
SS2	8.0-10.0	3-8-9-4	2	Fill consisting of wood, brick, saturated (Wood stuck in tip of SS)	BH - > 1,000 ppm BZ - background SS - 0 ppm
SS3	13.0-15.0	1-1-2-2	2	Fill consisting of black, medium to coarse sand, some red brick fragments, saturated	BH - 200 ppm BZ - 20 ppm SS - 0 ppm
SS4	18.0-20.0	4-2-5-8	14	7 inches: same as above 7 inches: Light gray clay, trace silt, trace fine gravel, moist	BH - 10 ppm BZ - background SS - 0 ppm
	20.5	N/A		END OF BORING	

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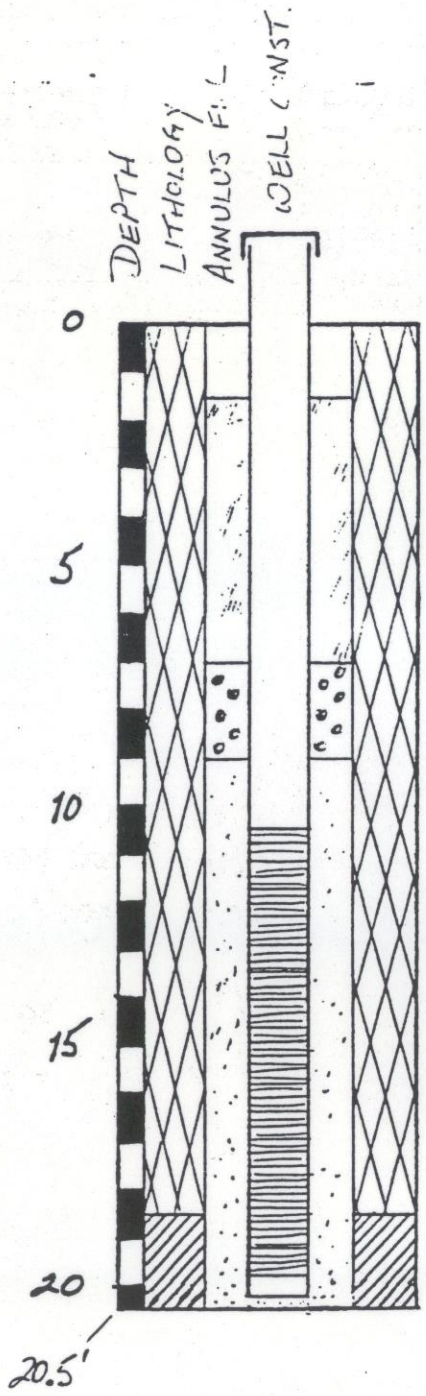
6
ZF010(12/06/89)



Bottom of well 20.3'
bottom of screen 19.8' top of screen 10.4'

top of filter pack 9.0'
top of seal 7.0'
top of grout 1.5'
0 - 1.5' concrete

ecology and environment, inc.
111 WEST JACKSON BLVD., CHICAGO, ILLINOIS 60604

Alburn Incinerator
ion Chicago, IL
IP8020

Drilling Firm: Fox Drilling Inc.
Type of Drill: B
Driller/Helper: BARRY / BERNIE
Geologist: TP

g Number: P2
: Date: 10-3-90
letion Date: 10-3-90
g Location: ~115' S of N fence
10' W of East fence

Ground Elevation:
T.O.I.C. Elevation:
Depth of Boring:
Lock Number:
Drilling Methods: Hollow Stem Augers

Depth to Groundwater		Date
while drilling		
at completion	(TOIC)	
after days	(TOIC)	

Casing (Type & Qty.): 2" Sch. 40 PVC
en Interval (Type & Qty.): 10' Sch 40 PVC 10 slot
lus Material Above Seal:
Seal:
Screen:

Development Comments:
0150 Begin Drilling Level B

windy conditions
BKG OVA
2 → 20 ppm

Sample Number	Sample Depth From - To	Blow Count	Rec. (in.)	Hydrostratigraphic Unit From - To	Description of Material	Remarks
Ground Surface				Weeds	Brown/Black Topsoil mixed with gravel	
01	3-5	5 8 7 7	18	Fill	Black and Brownish Gray Clay occasional cinders, small gravel moist	SS 9 ppm BZ 0 BH 8
02	8-10	8 3 7 10	8	FILL	Black Clayey Gravel Some Plastic, Wood, Cinders Saturated.	BH > 1000 Meth Cl. 50 Borehole SS 4
* ~12' Augers get tangled up in something, maybe wire. Pull plug - "OK" Pull string of augers "OK" OVA in open hole ~ 120 Redrill to 13'						
03	13-15	99 1 25	18	Fill	Dark Gray to Black Clay Some Cardboard, wood, fibers. Saturated	BH 20 ppm SS 4
04	15-20	10 [illegible]	11	Fill	As above	BH 120 SS [illegible]
Drill to 20.5'				Set well. Bottom of Augers are plugged w/ something - Maybe Wood		

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Name Alburn Incinerator Boring Number P2

Sample Depth From - To	Blow Count	Rec. (in.)	Hydrostratigraphic Unit From - To	Description of Material	Remarks
				pull well screen & riser.	
				put plug in augers pound w/ hammer on rig.	
			210	Return from lunch-drillers	
				continue to pound out obstruction	
				to no avail.	
			220	Drillers pull the entire string	
				of augers. A steel cable ~1" diameter	
				is wrapped up around the lead auger flight	
				Dismantle Auger is remove cable	
				Hole stayed open place well	
				in hole sand in hole bottom of	
				boring to 6' bgs.	
			3:00	Begin Mixing Grout	
				Volclay grout to g.s. from 6	
				No pellets were used	

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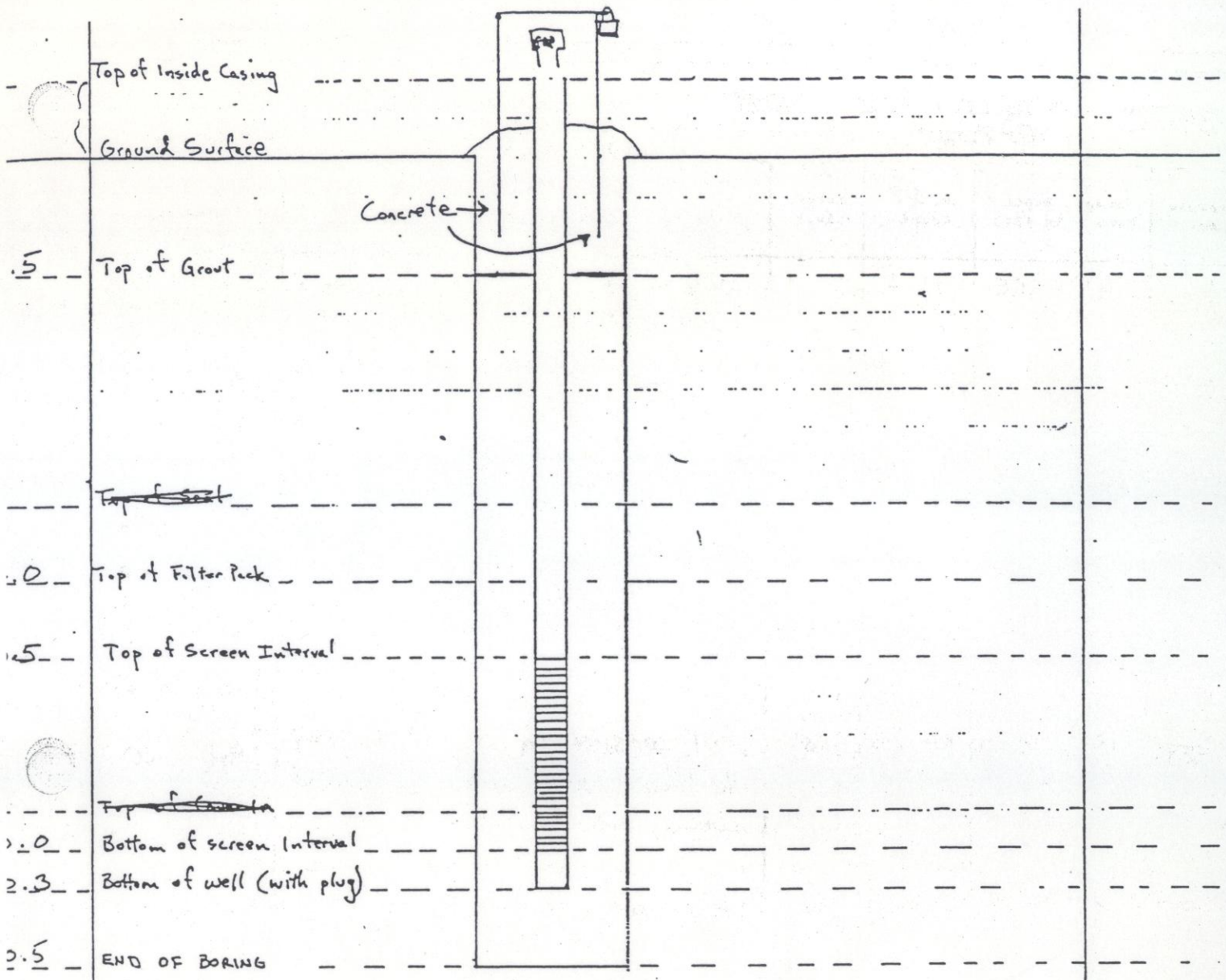
Page of


Top of Inside Casing
Ground Surface
Concrete
.5 Top of Grout
Top of Seal
.0 Top of Filter Pack
.5 Top of Screen Interval
Top of Screen
.0 Bottom of screen Interval
2.3 Bottom of well (with plug)
2.5 END OF BORING

Project Name > Alburn Incinerator
Project Number > IP8020

Boring Well No. > P2

BH = Borehole
BZ = Breathing Zone
SS = Split spoon

Sample No.	Sample Depth From – To (ft)	Blow Count	Recov. (in.)	Description	Remarks
	SURFACE	N/A		Brown / black topsoil mixed with gravel, vegetation	OVA background 2-20 ppm (windy conditions)
SS1	3.0-5.0	5-8-7-7	18	Fill consisting of black and brownish gray clay, occasional cinders, fine gravel, moist	BH - 8 ppm BZ - background SS - 9 ppm
SS2	8.0-10.0	8-3-7-10	8	Fill consisting of black clayey gravel, some plastic, wood, cinders, saturated	BH - > 1,000 ppm 50 ppm methyler chloride. BZ - background SS - 4 ppm
SS3	13.0-15.0	99-1-2-5	18	Fill consisting of dark gray to black clay, some cardboard, wood, fibers, saturated.	BH - 20 ppm BZ - background SS - 4 ppm
SS4	18.0-20.0	10-5-5-4	4	Fill as above	BH - 120 ppm BZ - background SS - 100 ppm
	20.5	N/A		END OF BORING	

* NOTE: Augers become tangled up in something at ~12' and again at ~20'. Drillers pulled entire 20' of augers to find a 1" diameter steel cable wrapped around lead auger flight.

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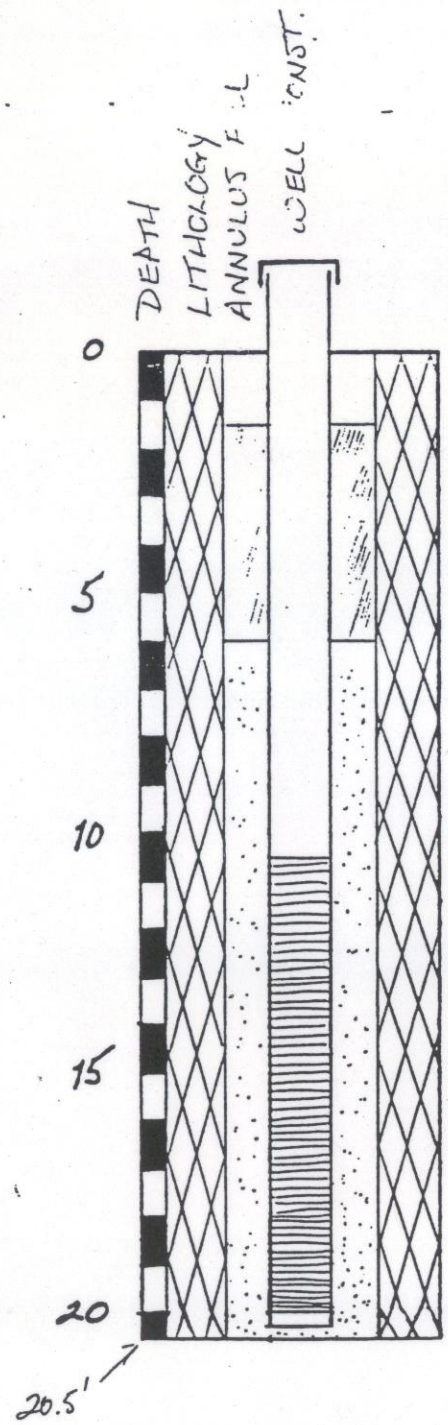
ZF010(12/06/89)



DESCRIPTION

F.11

bottom of well 20.3'

bottom of screen 20.0' top of screen 10.5'

top of filter pack ~~6.0~~ 6.0

Seal ?

top of grout 1.5'

0 - 1.5' concrete

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111 WEST JACKSON BLVD., CHICAGO, ILLINOIS 60604

Alburn Incinerator
Chicago, IL
IP8020

Drilling Firm Fox Drilling Inc.
Type of Drill
Driller/Helper Barry Urban/Bernie Crachy
Geologist ID

ng Number P3
t Date 10-4-90
letion Date 10-4-90
ng Location 130'S

Ground Elevation
T.O.I.C. Elevation
Depth of Boring
Lock Number
Drilling Methods Hollow Stem Augers 3¼" ID

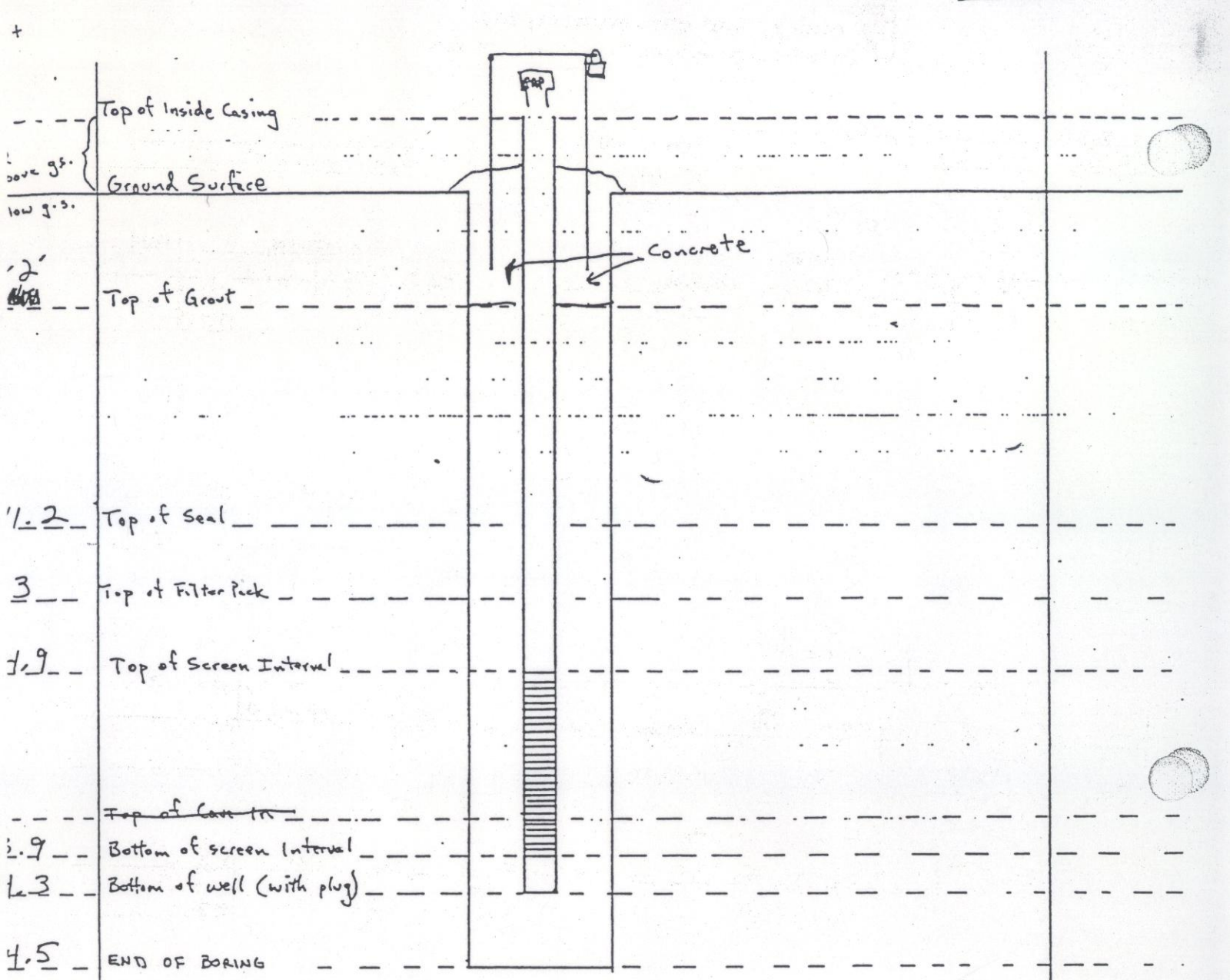
Depth to Groundwater		Date
while drilling		
at completion	(TOIC)	
after days	(TOIC)	

Casing (Type & Qty.) 2" Sch. 40 PVC
en Interval (Type & Qty.) 10' Sch 40 PVC 10 Slot
lus Material Above Seal:
Seal:
Screen:
Development Comments:

BKG 2-3
occ. peaks 20

Begin Drilling Level B @ 10:30 11:40 Augers to 2-4'

Sample Number	Sample Depth From - To	Blow Count	Rec. (in.)	Hydrostratigraphic Unit From - To	Description of Material	OVA Remarks
Ground Surface				Weeds, Fill Brown Sandy Gravelly Topsoil		BH 8'
	3-5	2 2 3 3	0	No Recovery		
02	8-10	20 11 6 8	14	while drilling to 8' Black stained rags are		
				being brought to the surface on the augers		BH 5'
				FILL Gray and Black Clay, some Wood, Paper		SS 2
				Plastic, Glass Moist		BZ
03	13-15	2 3 4 5	10	FILL Brownish Gray, Silty Clay trace Sm gravel		BH 200 peak ≈ 20
				trace fine to med sand Moist		SS 4
04	18-20	4 6 9 7	10	FILL Dark Gray to Black, Silty Clay, Some		BH 20
				wood, some gravel saturated		SS 2
05	23-25	45 69	15	3" Fill AS ABOVE		
				12" Grayish Brown Silty Clay trace fine		BH 10
				to med sand occ small gravel wet.		SS 2
Advance Augers to 24' bgs				place well in augers sand in		
augers pulling augers incrementally						


Top of Inside Casing
Ground Surface
Concrete
Top of Grout
Top of Seal
Top of Filter Pack
Top of Screen Interval
Bottom of screen Interval
Bottom of well (with plug)
END OF BORING

ct Name: Albyrn Incinerator Boring Well No.: F5

ct Number: ~~EP8020~~

BH = Borehole
BZ = Breathing zone SS = Split spoon

Sample No.	Sample Depth From – To (ft)	Blow Count	Recov. (in.)	Description	Remarks
	SURFACE	N/A		Brown, sandy, gravelly topsoil, vegetation	OVA background 2–3 ppm
SS1	3.0 – 5.0	2-2-3-3	0	No recovery	
SS2	8.0 – 10.0	20-11-6-8	14	Fill consisting of gray and black clay, some wood, paper, plastic, glass, rags moist	BH - 5 ppm BZ - background SS - 2 ppm
SS3	13.0 – 15.0	2-3-4-5	10	Fill consisting of brownish-gray, silty clay, trace fine gravel, trace fine to medium sand, moist	BH - 200 ppm BZ - background SS - 4 ppm
SS4	18.0 – 20.0	4-6-9-7	10	Fill consisting of dark gray to black silty clay, some wood, some gravel, saturated	BH - 20 ppm BZ - background SS - 2 ppm
SS5	23.0 – 25.0	4-5-6-9	15	3 inches: same as above 12 inches: Grayish brown silty clay, trace fine to medium sand, occasional fine gravel, wet	BH - 10 ppm BZ - background SS - 2 ppm
	24.5	N/A		END OF BORING (FINAL AUGER ADVANCE)	

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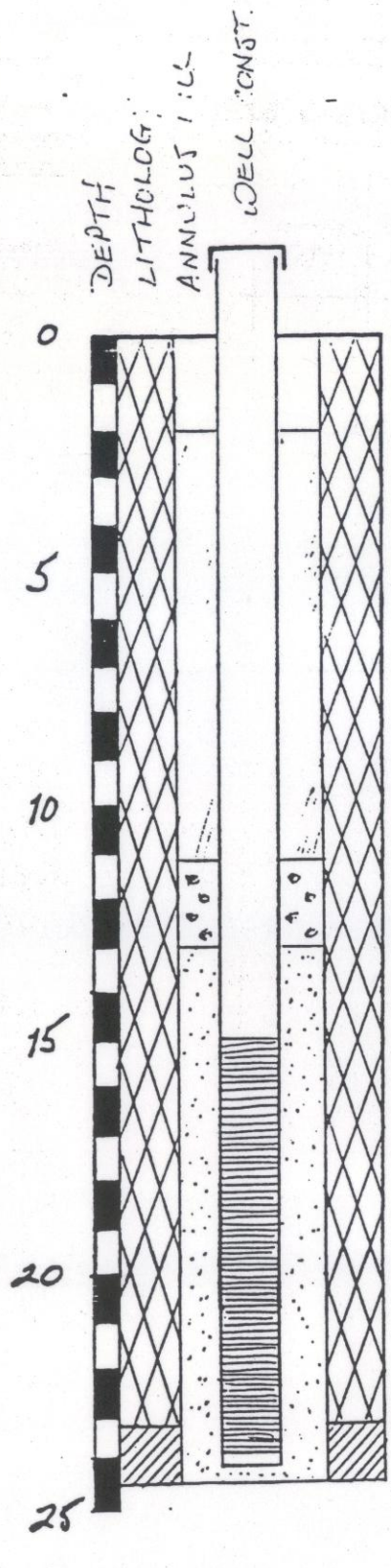
P3



DESCRIPTION

bottom of well 24.3'

bottom of screen 23.9' top of screen 14.9

top of filter pack 13.0'

top of seal 11.2'

top of grout 2.0' 0-2.0' concrete

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ecology and environment, inc.
111 WEST JACKSON BLVD., CHICAGO, ILLINOIS 60604

Name Alburn Incinerator
Chicago, IL
IP8020

Drilling Firm Fox Drilling Inc.
Type of Drill
Driller/Helper
Geologist

ng Number P4
: Date 10-5-90
etion Date 10-5-90
ng Location ~100 N of S Fence
10' east of W Fence

Ground Elevation
T.O.I.C. Elevation
Depth of Boring
Lock Number
Drilling Methods Hollow Stem Augers

Depth to Groundwater		Date
while drilling		
at completion	(TOIC)	
after days	(TOIC)	

Casing (Type & Qty.) 2" Sch. 40 PVC
en Interval (Type & Qty.) 10' Sch 40 PVC 10 slot
lus Material Above Seal:
Seal:
Screen:
Development Comments:

WINDY BKG 3-5

Begin Drilling @ 8:00 Level B

Sample Number	Sample Depth From - To	Blow Count	Rec. (in.)	Hydrostratigraphic Unit From - To	Description of Material	OVA Remarks
Ground Surface					Crushed Gravel No Vegetation	BZ 3-5
	3-5	3766	6	FILL	Black Gravel, Wood, Paper	SS BKG BH BKG
					Glass, SATURATED w/ BLACK WATER	
02	8-10	2345	7	FILL	Gray Silty Clay and Gravel, Some	SS 7
					Wood Some Paper Saturated w/ Black	BH 200.
					Water	BZ BKG
03	13-15	6879	14		Gray Fine Well sorted Sand	SS BKG
					Saturated	BH >1000 BZ BKG
						meth Cl @ BH 0
04	18-20	39111	24	10"	As Above Saturated	BH 50 SS BKG
				14"	Grayish Brown and Brownish	
					Orange Very Silty Clay Wet	
Drill to 20.5'					Set Well (08:40) Augers out of hole @ 910	
					Begin mixing grout 915 Mast Down 915	
					920 Hole is granted OK to downgrade	
					to Level D.	

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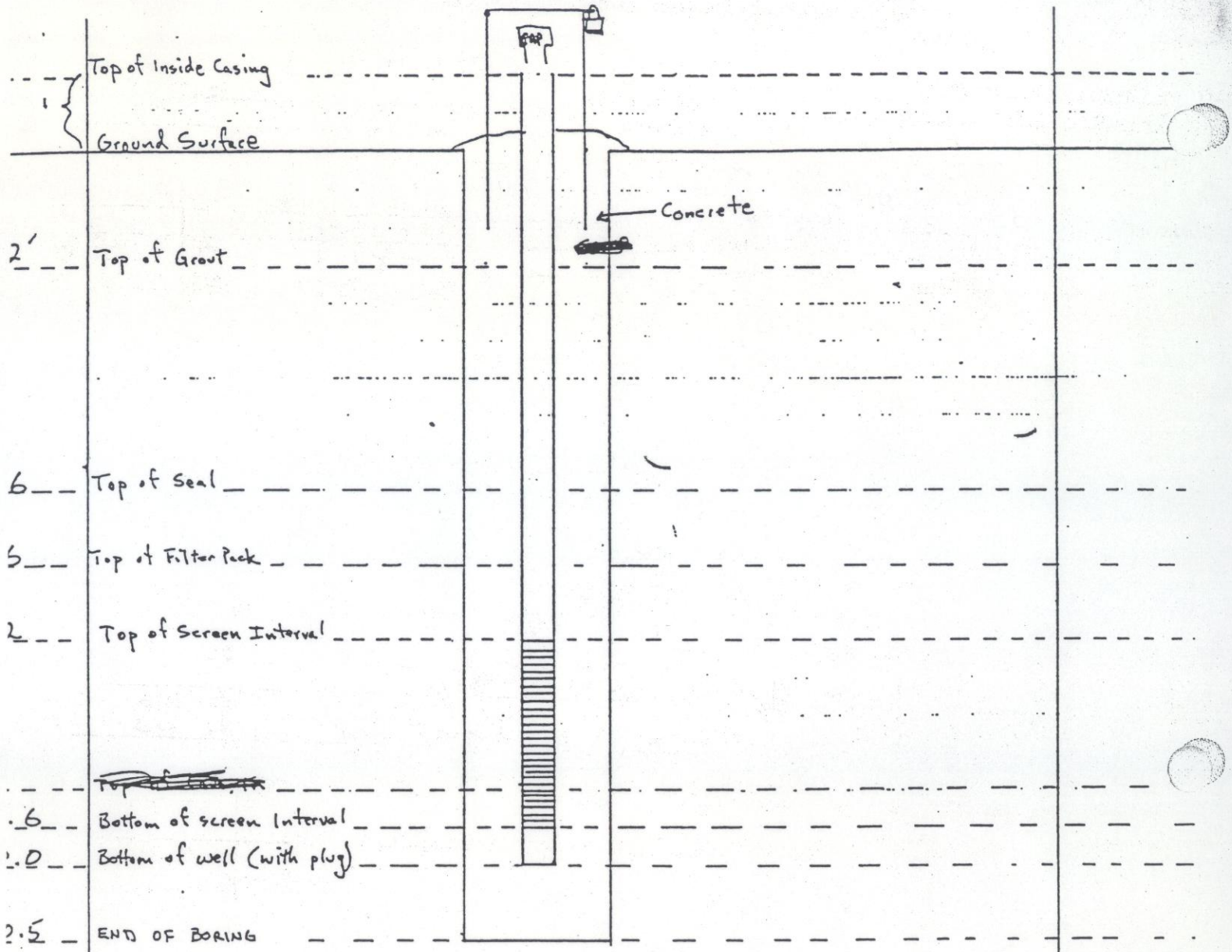
Page


Top of Inside Casing
1
Ground Surface
Concrete
2'
Top of Grout
6
Top of Seal
5
Top of Filter Pack
2
Top of Screen Interval
.6
Bottom of screen Interval
.0
Bottom of well (with plug)
2.5
END OF BORING

oject Name: Albyrn Incinerator Boring Well No.: P4

oject Number: ~~EP8020~~

BH = Borehole
BZ = Breathing zone SS = Split spoon

Sample No.	Sample Depth From – To (ft)	Blow Count	Recov. (in.)	Description	Remarks
	SURFACE	N/A		Crushed gravel	OVA background 3-5 ppm
SS1	3.0 - 5.0	3-7-6-6	6	Fill consisting of black gravel, wood, paper, glass, saturated	BH - 0 ppm BZ - background SS - 0 ppm
SS2	8.0 - 10.0	7-3-4-5	7	Fill consisting of gray silty clay and gravel, some wood, paper, saturated	BH - 200 ppm BZ - background SS - 7 ppm
SS3	13.0 - 15.0	6-8-7-9	14	Gray, fine, well-sorted sand, saturated	BH - > 1,000 ppm BZ - background SS - 0 ppm
SS4	18.0 - 20.0	3-9-11-11	24	10 inches: same as above 14 inches: grayish-brown and brownish-orange very silty clay, wet	BH - 50 ppm BZ - background SS - 0 ppm
	20.5	N/A		END OF BORING	

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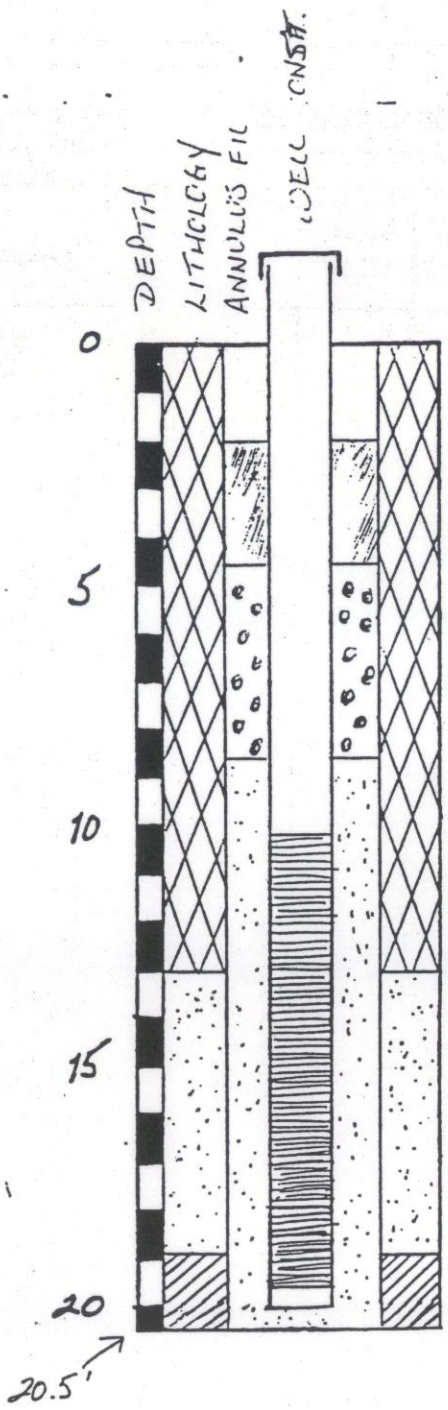


DESCRIPTION

bottom of well 20.0'
bottom of screen 19.6' top of screen 10.
top of filter pack 8.6'
top of seal 4.6'
top of grout 2.0'
0-2.0' concrete

Appendix C
Photographic Logs

PHOTO LOG FORM

Project: Lake Calumet Cluster Site, City of Chicago, Department of Environment

DATE: June 2000

COMMENTS:

Alburn Pit 24

0-3 feet, dark gray to black soft clay, wood, metal debris, rags, plastic bags, wet

3-9 feet, metal debris, rags, plastic, glass and wet

PHOTO # 51

DATE: June 2000

COMMENTS:

Alburn Pit 28

0-3 feet: Black gravel, metal debris, wet

3-10 feet: black, gravel, metal debris, tires, plastic sheeting, wet

PHOTO # 78

PHOTO LOG FORM

Project: Lake Calumet Cluster Site, City of Chicago, Department of Environment

DATE: June 2000

COMMENTS:

Alburn Pit 29

0-3 feet: black, bricks. wood, trace soft clay, drum lid, black sheen, strong odor, wet.

3-4.5 feet: possible drum remnants, gravel, trace of soft clay, large cement blocks, paint odor, black and red sheen on water.

PHOTO # 40

DATE: June 2000

COMMENTS:

Alburn Pit 29

0-3 feet: black, bricks. wood, trace soft clay, drum lid, black sheen, strong odor, wet.

3-4.5 feet: possible drum remnants, gravel, trace of soft clay, large cement blocks, paint odor, black and red sheen on water.

PHOTO # 41

PHOTO LOG FORM

Project: Lake Calumet Cluster Site, City of Chicago, Department of Environment

DATE: June 2000

COMMENTS:

Alburn Pit 29

0-3 feet: black, bricks. wood, trace soft clay, drum lid, black sheen, strong odor, wet.

3-4.5 feet: possible drum remnants, gravel, trace of soft clay, large cement blocks, paint odor, black and red sheen on water.

PHOTO # 42

DATE: August 2000

COMMENTS:

U.S. Drum Pit 15

0-3 feet: dark brown/gray silty clay for 3 feet, drum remnants throughout.

0-10 feet: gray concrete/gravel and slag, at 6 feet cinders and wood, at 7 feet rags, paper, plastic, some slag and cinders, water bubbling.

PHOTO # 53

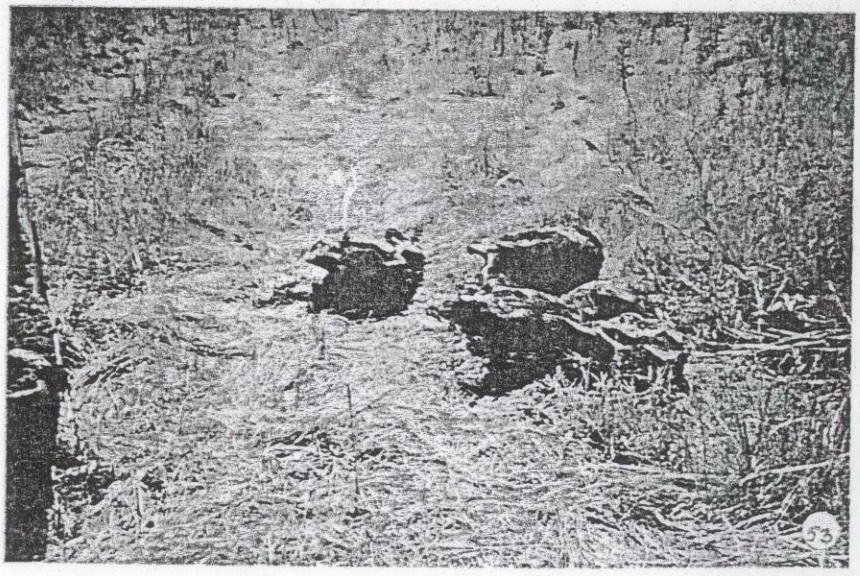


PHOTO LOG FORM

Project: Lake Calumet Cluster Site, City of Chicago, Department of Environment

DATE: August 2000

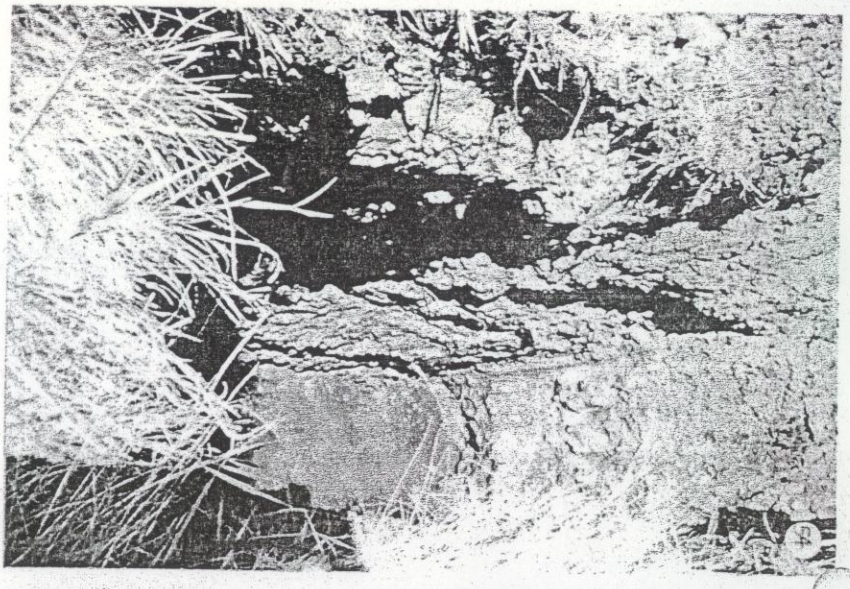
COMMENTS:

U.S. Drum Pit 15

0-3 feet: dark brown/gray silty clay for 3 feet, drum remnants throughout.

0-10 feet: gray concrete/gravel and slag, at 6 feet cinders and wood, at 7 feet rags, paper, plastic, some slag and cinders, water bubbling.

PHOTO # 54



DATE: August 2000

COMMENTS:

US. Drum Pit15

0-3 feet: dark brown/gray silty clay for 3 feet, drum remnants throughout.

0-10 feet: gray concrete/gravel and slag, at 6 feet cinders and wood, at 7 feet rags, paper, plastic, some slag and cinders, water bubbling.

PHOTO # 55

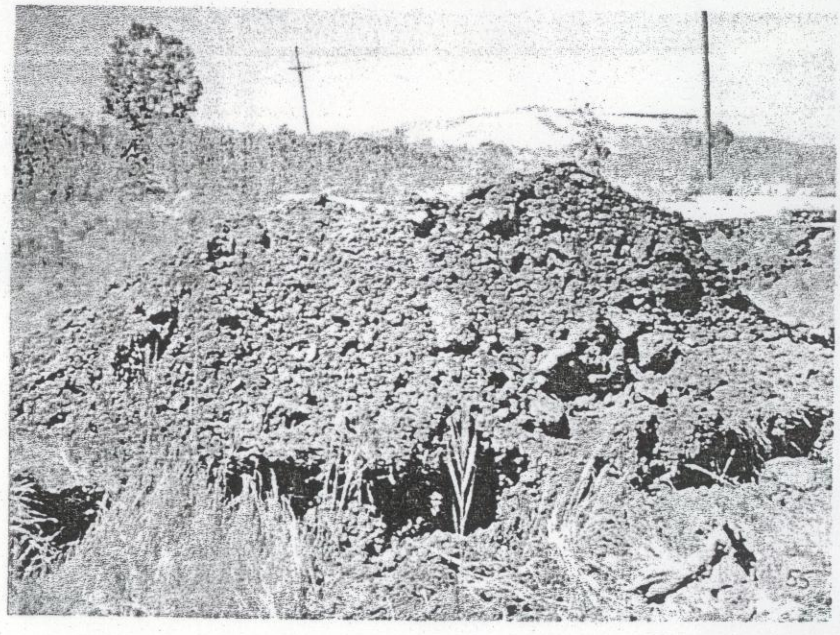


PHOTO LOG FORM

Project: Lake Calumet Cluster Site, City of Chicago, Department of Environment

DATE: August 2000

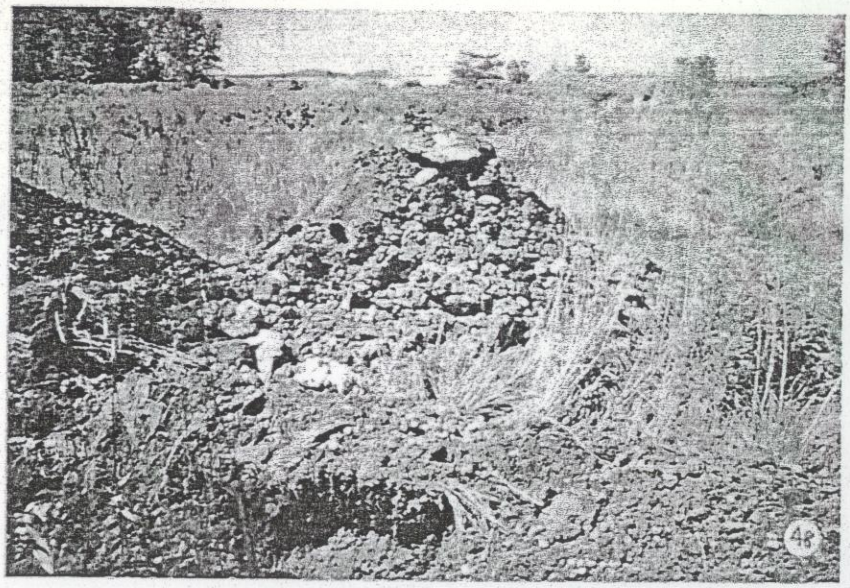
COMMENTS:

U.S. Drum Pit 17

0-3 feet: dark gray silty clay for 1 foot, then 3 feet of gray clay with areas of black clay material, some sand or cinder material, samplers noted hearing a hissing noise from pit.

3-7 feet: as above, at 4 feet a fine grain white material-similar to white material found on Unnamed Parcel.

PHOTO # 48



DATE: August 2000

COMMENTS:

U.S. Drum Pit 17

0-3 feet: dark gray silty clay for 1 foot, then 3 feet of gray clay with areas of black clay material, some sand or cinder material, samplers noted hearing a hissing noise from pit.

3-7 feet: as above, at 4 feet a fine grain white material-similar to white material found on Unnamed Parcel.

PHOTO # 49

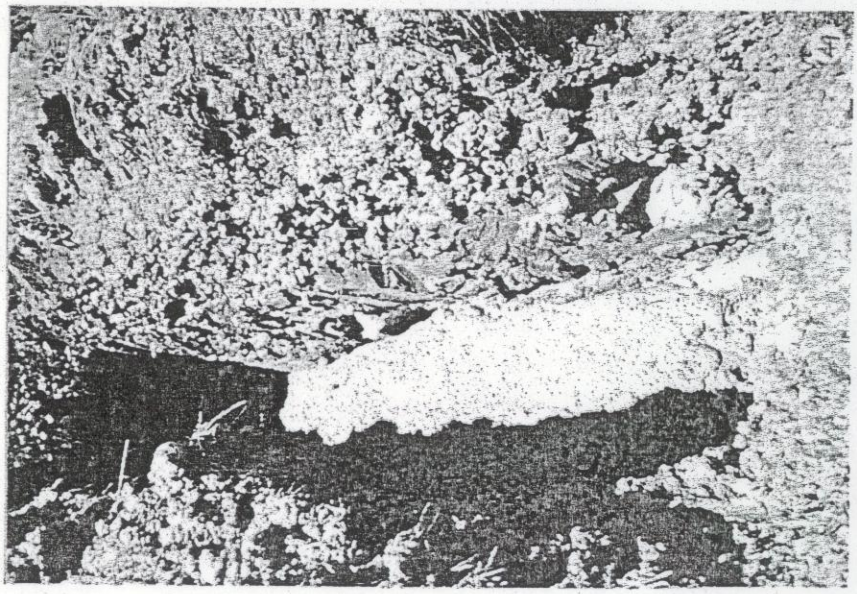


PHOTO LOG FORM

Project: Lake Calumet Cluster Site, City of Chicago, Department of Environment

DATE: August 2000

COMMENTS:

U.S Drum Pit 17

0-3 feet: dark gray silty clay for 1 foot, then 3 feet of gray clay with areas of black clay material, some sand or cinder material, samplers noted hearing a hissing noise from pit.

7-13 feet: as above, at 8 feet paper, tires, metal, possible drum remnants with red coloring on it, golden sheen on all material, foam that appears to be expanding floating on the water.

PHOTO # 50

DATE: August 2000

COMMENTS:

U.S. Drum Pit 19

0-3 feet: 2 feet of brown/gray silty loam, a crushed drum, then gray/black silty clay.

3-12 feet: as above, at 5 feet black slag and wood, rope, drinking straws, water and stream bubbling up from pit, sampler in lever B.

PHOTO # 41

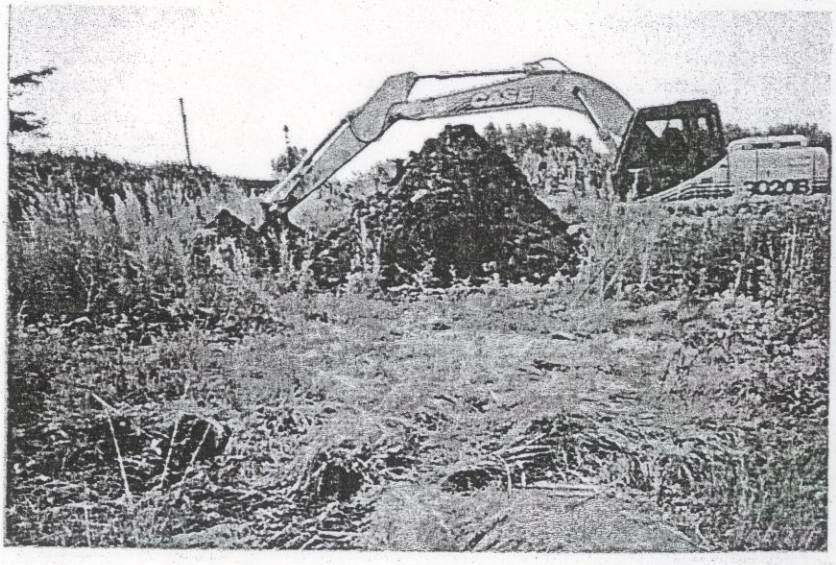


PHOTO LOG FORM

Project: Lake Calumet Cluster Site, City of Chicago, Department of Environment

DATE: August 2000

COMMENTS:

U.S. Drum, Pit 19

0-3 feet: 2 feet of brown/gray silty loam, a crushed drum, then gray/black silty clay.

3-12 feet: as above, at 5 feet black slag and wood, rope, drinking straws, water and stream bubbling up from pit, sampler in lever B.

PHOTO # 42

DATE: August 2000

COMMENTS:

U.S. Drum, Pit 19

0-3 feet: 2 feet of brown/gray silty loam, a crushed drum, then gray/black silty clay.

3-12 feet: as above, at 5 feet black slag and wood, rope, drinking straws, water and stream bubbling up from pit, sampler in lever B.

PHOTO # 43

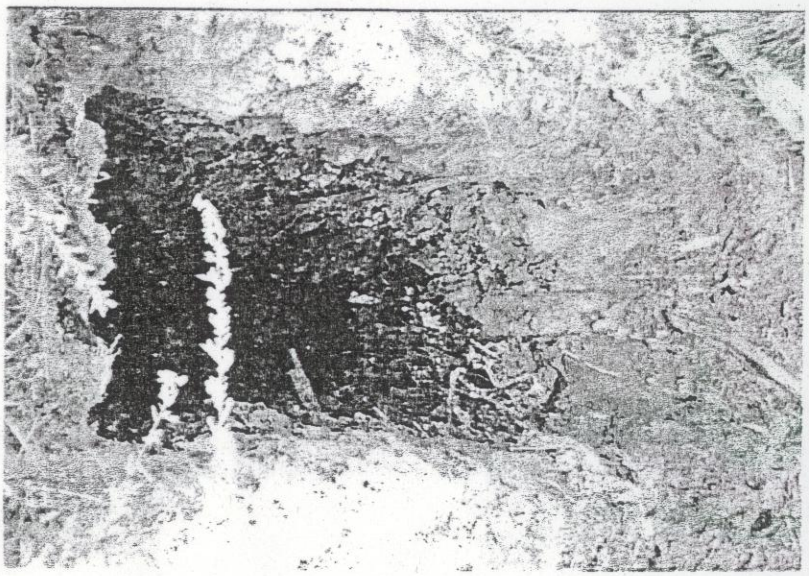


PHOTO LOG FORM

Project: Lake Calumet Cluster Site, City of Chicago, Department of Environment

DATE: August 2000

COMMENTS:

U.S. Drum Pit 19

0-3 feet: 2 feet of brown/gray silty loam, a crushed drum, then gray/black silty clay.

3-12 feet: as above, at 5 feet black slag and wood, rope, drinking straws, water and stream bubbling up from pit, sampler in lever B.

PHOTO # 44

DATE: July 2000

COMMENTS:

Unnamed Parcel Pit 21B

0-3 feet: 6 inches to 1 foot of brown sandy silty clay, then obstruction. At 2 feet uncover complete drums with some contents still in drums. The drums contents consisted of sticky, viscous material.

3-7 feet: Continue to uncover drums, one drum had trichloroethene written on the outside of the drum.

7-10 feet: continue to uncover drums.

PHOTO # 28

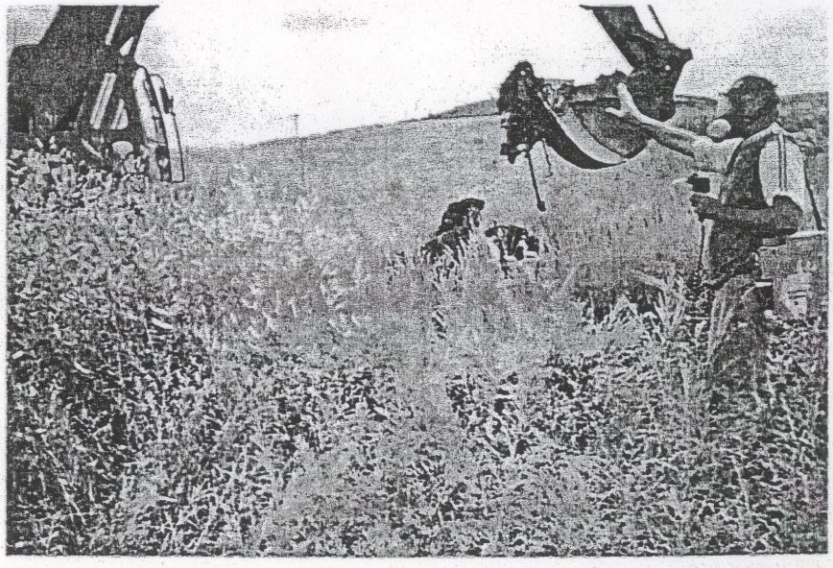


PHOTO LOG FORM

Project: Lake Calumet Cluster Site, City of Chicago, Department of Environment

DATE: July 2000

COMMENTS:

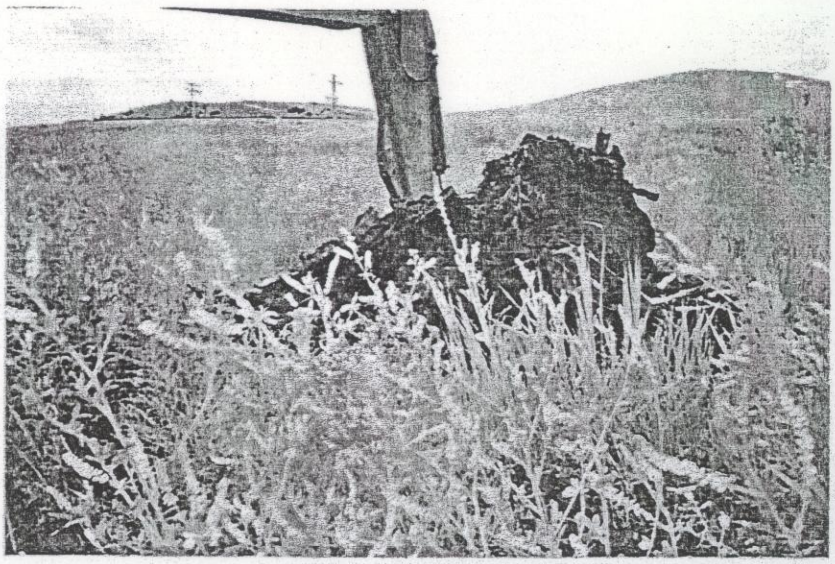
Unnamed Parcel, Pit 21B

0-3 feet: 6 inches to 1 foot of brown sandy silty clay, then obstruction. At 2 feet uncover complete drums with some contents still in drums. The drums contents consisted of sticky, viscous material.

3-7 feet: Continue to uncover drums, one drum had trichloroethene written on the outside of the drum.

7-10 feet: continue to uncover drums.

PHOTO # 29



DATE: July 2000

COMMENTS:

Unnamed Parcel Pit 21B

0-3 feet: 6 inches to 1 foot of brown sandy silty clay, then obstruction. At 2 feet uncover complete drums with some contents still in drums. The drums contents consisted of sticky, viscous material.

3-7 feet: Continue to uncover drums, one drum had trichloroethene written on the outside of the drum.

7-10 feet: continue to uncover drums.

PHOTO # 30

PHOTO LOG FORM

Project: Lake Calumet Cluster Site, City of Chicago, Department of Environment

DATE: July 2000

COMMENTS:

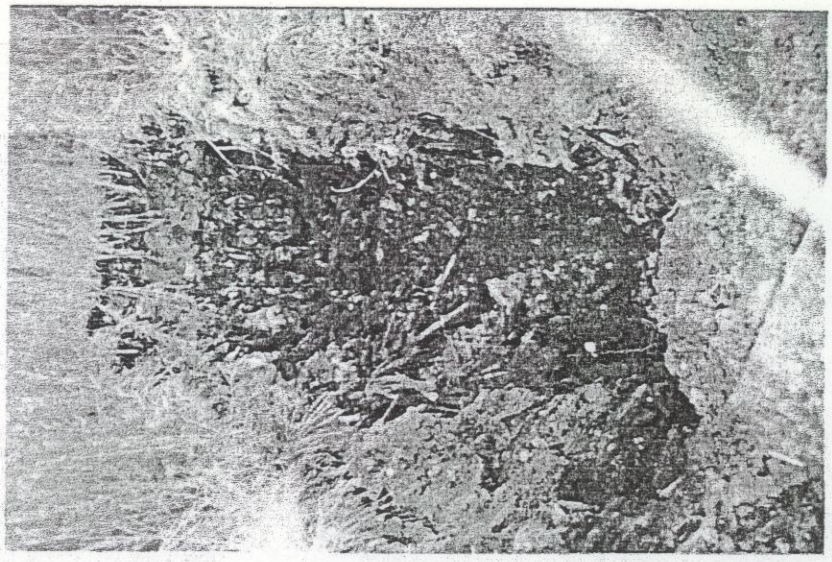
Unnamed Parcel, Pit 21B

0-3 feet: 6 inches to 1 foot of brown sandy silty clay, then obstruction. At 2 feet uncover complete drums with some contents still in drums. The drums contents consisted of sticky, viscous material.

3-7 feet: Continue to uncover drums, one drum had trichloroethene written on the outside of the drum.

7-10 feet: continue to uncover drums.

PHOTO # 31



DATE: July 2000

COMMENTS:

Unnamed Parcel Pit 37B

0-3 feet: metal, paper, tires, and rubber

3-13 feet: metal containers, paper, and general metal debris.

PHOTO # 56

Appendix D

Tables of Exceedances of Remediation Objectives

List of Tables

Table D-1. Inorganic Exceedances of Soil ROs in Alburn

Table D-2. Inorganic Exceedances of Soil ROs in U.S. Drum

Table D-3. Inorganic Exceedances of Soil ROs in Unnamed Parcel

Table D-4. VOC Exceedances of Soil ROs in Alburn

Table D-5. VOC Exceedances of Soil ROs in U.S. Drum

Table D-6. VOC Exceedances of Soil ROs in Unnamed Parcel

Table D-7. SVOC Exceedances of Soil ROs in Alburn

Table D-8. SVOC Exceedances of Soil ROs in U.S. Drum

Table D-9. SVOC Exceedances of Soil ROs in Unnamed Parcel

Table D-10. Pesticide/Herbicide Exceedances of Soil ROs

Table D-11. Total PCB Exceedances of Soil ROs

Table D-12. PCB Exceedances of Soil ROs in U.S. Drum

Table D-13. PCB Exceedances of Soil ROs in Unnamed Parcel

Table D-14. Exceedances of Class I and II Groundwater Remediation Objectives

Table D-1. Inorganic Exceedances of Soil ROs in Alburn (mg/kg)

Industrial/Commercial ROs			Antimony	Arsenic		Beryllium		Chromium (Total)	Lead	Manganese	Mercury		Selenium		Silver		Thallium	
Ingestion or inhalation			*82*	*13*		*1*		*420*	*400*	*8700*	*61*		*1000*		*1000*		*160*	
Soil Component of GW (Class I)			*5*	*25-33*		*1.1-8000*		*No Data*	*No Data*	*No Data*	*0.01-8.0*		*1.3-24*		*0.24-110*		*1.6-4.9*	
Station ID	Sample Depth	pH			*		*					*		*		*		*
1	2.5	8.5				1.1	8000											
01B	3	9.6				1.3	8000											
2	2	11.8		16.4	33	2	8000						2.2	1.3				
3	0.5	11.9				2.3	8000		403				3.3	1.3				
3	2.5	11.9		13.8	33	2.8	8000						3.2	1.3				
3	6	10.7				1.9	8000		650				4.3	1.3				
4	3	8.8				2.3	8000											
4	6	9.8				3.7	8000											
8	2.5	7.2				1.3	1000											
8	4	8.6	6.1			2.1	8000						2.2	1.8				
9	2.5	9.5	7.1			6.7	8000						2.4	1.3				
9	6	8.7				8.4	8000						3.4	1.8				
10	2.5	9.1				2.2	8000						1.6	1.3				
10	6	7.7	10.5	33.1	30	1.4	1000		1210				6.3	3.3			10.2	3.4
11	2.5	8.4		14	32													
11	6	8.3	5.3	20.9	32				1110				2.8	1.8				
12	3	9.0	11.2	23.5	33	1.3	8000	1400	1070				2.9	1.3				
12	9	9.0		15.3	33								2.5	2.4			3.9	3.8
13	3	7.5	8.3	18.4	30				772				4.6	3.3			11.4	3.4
14	9	8.1	16.7	16.1	31				1040				5.2	2.4			13.3	3.8
15	3	7.9	7.4			1.4	1000											
16	3	8.3	1020					1550		27700			6.2	1.8				
16	9	7.7	130	37.1	30	2.4	1000		418				4.0	3.3			6.3	3.4
17	3	7.7				1.4	1000											
17	6	8.2		26.3	31				467									
18	3	7.8	13.8	25.4	31	2.2	8000		778									
18	6	8.4	39	36	32	1.4	8000		2140				4.2	1.8			6.5	4.4
19	3	10.8				2.2	8000	594					3.5	1.3				
19	8	8.2		15.1	31				595									
20	3	8.2	7.2						599				2.8	2.4			6.6	3.8

Table D-1. Inorganic Exceedances of Soil ROs in Alburn (mg/kg)

Industrial/Commercial ROs			Antimony	Arsenic		Beryllium		Chromium (Total)	Lead	Manganese	Mercury		Selenium		Silver		Thallium	
Ingestion or inhalation			*82*	*13*		*1*		*420*	*400*	*8700*	*61*		*1000*		*1000*		*160*	
Soil Component of GW (Class I)			*5*	*25-33*		*1.1-8000*		*No Data*	*No Data*	*No Data*	*0.01-8.0*		*1.3-24*		*0.24-110*		*1.6-4.9*	
Station ID	Sample Depth	pH			*		*					*		*		*		*
21	3	8.9	8.4	**31.3**	33	**1.5**	8000	**622**	**1480**				5.2	1.3			5.7	4.9
23	3	8.4	7.9															
23	7	8.1	11.8	**13.8**	31				**5580**				5.3	2.4			8.3	3.8
24	3	7.3	8.9	**22**	30	**1.7**	1000		**632**								4.3	3.4
24	9	7.9	7.2	**21**	31	**1.1**	8000		**1550**				3.2	2.4				
25	2.5	7.9	38.4			**2.7**	8000											
25	8	10.0				**2.8**	8000											
26	3	10.1	6.5			**2.5**	8000	**1730**		**40500**								
26	9	5.1									0.18	0.01			1.4	0.33		
27	3	9.4	5.8	**16**	33	**3**	8000	**448**		**11400**								
27	9	8.1	7.1						**852**	**10600**			3.3	2.4				
28	3	7.7	39.8					**686**	**1390**	**18000**			4.5	3.3				
28	10	7.5	16.5						**607**									
29	4.5	8.6		**17.2**	32	**2.5**	8000						1.9	1.8				
30	3	8.7	24.1	**32.1**	32				**2440**				2.0	1.8				
30	9	9.1	7.4						**911**				2.8	1.3				
31	3	9.7	14.7	**132**	33	**2.2**	8000		**978**				9.7	1.3				
31	6	7.8	6.9	**15.5**	31	**1.3**	8000		**543**				2.8	2.4				
33	3	8.7	56.1	**14.9**	32	**3.9**	8000						1.9	1.8				
33	8	8.5				**1.4**	8000											
34	9	10.2							**6730**				1.6	1.3				
35	9	8.0	7.3					**808**	**879**								3.9	3.8
38	9	8.5							**658**									
41	3	9.0		**16.1**	33	**1.6**	8000											
42	3	8.4		**29.8**	32	**1.7**	8000						2.3	1.8				
42	9	8.3				**1.8**	8000											
43	3	8.1	14.8	**151**	31	**1.2**	8000		**590**				8.2	2.4			12.2	3.8
44	3	8.5	5.7															
44	8			**22.3**					**1050**	**11000**								
45	3	7.7				**1.7**	1000											

Table D-1. Inorganic Exceedances of Soil ROs in Alburn (mg/kg)

Industrial/Commercial ROs			Antimony	Arsenic		Beryllium		Chromium (Total)	Lead	Manganese	Mercury		Selenium		Silver		Thallium	
Ingestion or inhalation			*82*	*13*		*1*		*420*	*400*	*8700*	*61*		*1000*		*1000*		*160*	
Soil Component of GW (Class I)			*5*	*25-33*		*1.1-8000*		*No Data*	*No Data*	*No Data*	*0.01-8.0*		*1.3-24*		*0.24-110*		*1.6-4.9*	
Station ID	**Sample Depth**	**pH**			*		*					*		*		*		*
Pit 52	3	7.0		**15.1**	29	**2.2**	140		**1120**									
Pit 52	5	7.5		**16.5**	30				**773**									
Pit 53	3	9.9				**2.1**	8000			**11500**								
Pit 53	7	7.7		**16.7**	30	**1.1**	1000		**862**									

Bold indicates exceedance of ingestion or inhalation pathways.

Empty boxes indicate non-detects or concentrations below ROs

If duplicate samples were collected, the higher concentration and its pH are reported.

* The Soil to Groundwater RO is pH dependent and is listed to the right of affected concentrations (column marked with *).

"No data" means that no TACO values are available for comparison with the soil component of the groundwater ingestion route.

Table D-2. Inorganic Exceedances of Soil ROs in U.S. Drum (mg/kg)

Industrial/Commercial ROs			Antimony	Arsenic		Beryllium		Cadmium		Chromium (Total)	Lead	Manganese	Mercury		Nickel		Selenium		Silver	
Ingestion or inhalation			*82*	*13*		*1*		*200*		*420*	*400*	*8700*	*61*		*4100*		*1000*		*1000*	
*Soil Component of GW (Class I)**			*5*	*25-33*		*1.1-8000*		*1-430*		*No Data*	*No Data*	*No Data*	*0.01-8.0*		*20-3800*		*1.3-24*		*0.24-110*	
Station ID	**Sample Depth**	**pH**			*		*		*					*		*		*		*
Pit 01	4.0	8.3								**489**							1.9	1.8		
Pit 01	9.0	8.6															2.5	1.8		
Pit 01	13.0	8.1		**20.2**	31					**925**	**3360**	**16400**					8.4	2.4		
Pit 02	3.0	7.5									**526**									
Pit 04	4.0	8.6				**1.3**	8000													
Pit 05	2.5	7.8									**775**									
Pit 05	8.0	10.1								**1070**		**22800**					4.1	1.3		
Pit 07	3.0	7.8		**18.6**	31															
Pit 08	2.5	8.4								**581**							3.1	1.8		
Pit 10	3.0	7.5		**13.7**	30						**1540**									
Pit 10	8.0	7.0		**22.4**	29			12.8	11		**1250**						5.3	4.5	19.3	13
Pit 11	2.0	7.3		**14.2**	30															
Pit 11	8.0	6.9		**33.7**	29						**5090**									
Pit 12	3.0	11.0								**735**		**29700**					5.0	1.3		
Pit 12	8.0	8.5															2.0	1.8		
Pit 14	4.0	10.3								**590**		**30600**					5.0	1.3		
Pit 15	4.0	10.8	**218**							**430**		**28500**					4.8	1.3		
Pit 15	8.0	8.5	42.2																	
Pit 16	7.0	7.5		**17.5**	30						**467**									
Pit 17	7.0	11.2															1.4	1.3		
Pit 17	13.0	8.8		**16**	33	**1.3**	8000										1.5	1.3		
Pit 18	3.5	6.4		**35.6**	29						**1790**				470	100	7.4	6.3	8.3	4.4
Pit 18	7.0	8.4															2.1	1.8		
Pit 19	3.0	10.0	**105**								**616**	**11600**					2.0	1.3		
Pit 19	9.0	9.5				**1.2**	8000				**451**						2.0	1.3		
Pit 20	3.0	7.8		**82.3**	31	**2.5**	8000										11.2	2.4		
Pit 20	9.0	8.5		**18**	33						**1220**						3.6	1.8		
Pit 21	2.0	7.0	15	**18.4**	29			14.5	11		**750**		6.0	3.3			4.7	4.5		
Pit 21	9.0	7.0	9.9	**19.2**	29			12.1	11		**1470**									
Pit 22	3.5	10.0			33												1.8	1.3		
Pit 22	8.0	8.5			32	**2.1**	8000										2.3	1.8		

Table D-2. Inorganic Exceedances of Soil ROs in U.S. Drum (mg/kg)

Industrial/Commercial ROs			Antimony	Arsenic		Beryllium		Cadmium		Chromium (Total)	Lead	Manganese	Mercury		Nickel		Selenium		Silver	
Ingestion or inhalation			*82*	*13*		*1*		*200*		*420*	*400*	*8700*	*61*		*4100*		*1000*		*1000*	
*Soil Component of GW (Class I)**			*5*	*25-33*		*1.1-8000*		*1-430*		*No Data*	*No Data*	*No Data*	*0.01-8.0*		*20-3800*		*1.3-24*		*0.24-110*	
Station ID	**Sample Depth**	**pH**			*		*		*					*		*		*		*
Pit 23	2.5	7.9		**82.5**	31															
Pit 23	9.0	8.6	5.1		32												2.2	1.8		
Pit 23	13.0	8.1		**19.9**	31						**1210**									
Pit 24	2.5	7.5	24.4		30						**4350**									
Pit 24	8.5	8.3		**21**	32	**1.4**	8000													
Pit 25	3.0	7.7	7.1	**79.9**	30	**1.3**	140				**784**						3.7	3.3		
Pit 25	9.5	7.9	6.9	**25.6**	31	**1.5**	8000				**1150**						2.7	2.4		
Pit 26	3.0	8.7									**503**									
Pit 26	9.0	7.9		**15.2**	31						**592**									
Pit 27	10.0	7.5	9.0																	
Pit 28	3.0	8.3									**433**									
Pit 29	8.0	7.9	5.9																	
Pit 30	4.0	7.4		**37.1**	30						**674**									
Pit 30	6.0	7.9	9.2	**22.7**	31						**1050**						2.6	2.4		
Pit 31	4.0	8.7		**16.4**	32												2.8	1.8		
Pit 32	9.0	8.1		**19**	31						**1030**						3.2	2.4		
Pit 33	3.0	8.1		**19.3**	31	**1.5**	8000				**1200**						2.8	2.4		
Pit 33	9.0	9.0		**13.1**	33	**2.3**	8000										2.7	1.3		
Pit 34	3.0	7.8		**25.9**	31	**1.3**	8000				**417**						4.9	2.4		
Pit 34	10.0	7.2		**15.7**	29														24.2	13
Pit 36	4.0	7.0		**21.8**	29						**486**						6.4	4.5		
Pit 36	11.0	8.2		**16.4**	31												2.9	2.4		
Pit 37	3.0	7.6		**16**	30						**465**									
Pit 37	8.0	8.0				**1.3**	8000													
Pit 38	3.0	7.6		**14.5**	30												3.4	3.3		
Pit 38	10.0	7.9			31						**517**						2.6	2.4		
Pit 39	10.0	8.1			31						**598**						2.9	2.4		
Pit 40	9.0	8.5		**34.5**	32						**819**						4.7	1.8		
Pit 41	8.0	5.7											0.46	0.03					3.5	0.62
Pit 42	2.0	10.3				**1.3**	8000										6.5	1.3		
Pit 42	9.0	8.3	15.4	**40.7**	32						**3130**						3.7	1.8		

Table D-2. Inorganic Exceedances of Soil ROs in U.S. Drum (mg/kg)

Industrial/Commercial ROs			Antimony	Arsenic		Beryllium		Cadmium		Chromium (Total)	Lead	Manganese	Mercury		Nickel		Selenium		Silver	
Ingestion or inhalation			*82*	*13*		*1*		*200*		*420*	*400*	*8700*	*61*		*4100*		*1000*		*1000*	
*Soil Component of GW (Class I)**			*5*	*25-33*		*1.1-8000*		*1-430*		*No Data*	*No Data*	*No Data*	*0.01-8.0*		*20-3800*		*1.3-24*		*0.24-110*	
Station ID	**Sample Depth**	**pH**			*		*		*					*		*		*		*
Pit 42	15.0	8.4		**14.9**	32						**874**						2.1	1.8		
Pit 43	9.0	8.1									**1850**									
Pit 44	3.0	8.3		**14.4**	32						**467**						2.7	1.8		
Pit 44	9.0	8.3		**19.9**	32												3.4	1.8		
Pit 45	3.5	8.7	6.3	**24.1**	32	**1.6**	8000				**1290**						4.4	1.8		
Pit 46	4.0	8.5		**26.6**	32					**460**	**783**						2.7	1.8		
Pit 46	9.0	8.5		**25.4**	32					**484**	**726**						3.4	1.8		
Pit 47	9.0	7.0	**113.0**			**1.5**	140	161	11		**2660**								20.1	13
Pit 48	9.0	8.5	11.4	**36**	32	**1.2**	8000				**1700**						3.9	1.8		
Pit 50	9.0	8.3		**21.6**	32						**508**						3.1	1.8		
Pit 51	8.0	7.8									**577**									

Bold indicates exceedance of ingestion or inhalation pathways.

Empty boxes indicate non-detects or concentrations below ROs

If duplicate samples were collected, the higher concentration and its pH are reported.

* The Soil to Groundwater RO is pH dependent and is listed to the right of affected concentrations (column marked with *).

"No data" means that no TACO values are available for comparison with the soil component of the groundwater ingestion route.

Table D-3. Inorganic Exceedances of Soil ROs in Unnamed Parcel (mg/kg)

Industrial/Commercial ROs			Antimony	Arsenic		Barium		Beryllium		Cadmium		Chromium (Total)	Lead	Manganese	Mercury		Selenium		Silver		Thallium	
Ingestion or inhalation			*82*	*13*		*14000*		*1*		*200*		*420*	*400*	*8700*	*61*		*1000*		*1000*		*160*	
Soil Component of GW (Class I)			*5*	*25-33*		*160-2100*		*1.1-8000*		*1-430*		*No Data*	*No Data*	*No Data*	*0.01-8.0*		*1.3-24*		*0.24-110*		*1.6-4.9*	
Station ID	Sample Depth	pH			*		*		*		*					*		*		*		*
2B	3	7.9	15.2										**1170**				2.9	2.4				
2B	6	7.6		**17.9**	30			**1.9**	1000								4.4	3.3				
3B	6	7.4	11.6	**13.8**	30								**3510**				3.8	3.3			8.7	3.4
4B	8	8.0						**1.2**	8000													
5B	3	7.4	11.1	**14.8**	30	9380	1800					**490**	**549**				3.8	3.3			5.6	3.4
6B	3	8.1	7.9	**38.1**	31	2720	2100	**1.9**	8000				**1150**				6.4	2.4			6.6	3.8
6B	8	8.0	32.8	**23.9**	31								**753**				4.9	2.4			6.6	3.8
7B	3	7.5	20.4	**21.7**	30					60.8	59		**1400**				20.0	3.3			11.4	3.8
7B	8	7.9	5.7	**25.9**	31			**1.1**	8000				**639**				2.9	2.4			5.3	3.8
8B	3	7.7																			3.5	3.4
8B	8	7.8	20.2	**33.1**	31			**1.3**	8000				**780**				4.0	2.4			6.3	3.8
9B	3	7.4	5.8	**13.1**	30			**1.4**	1000													
9B	8	7.4	7.4	**15.7**	30								**825**									
10B	8	5.7		**14.2**	27			**2**	3.4				**504**		0.93	0.03			3.8	0.62	2.8	2.0
12B	3	7.9	21.9	**36.4**	31			**1.2**	8000				**3890**				5.6	2.4			7.4	3.8
12B	6	7.7	6.1										**740**								3.7	3.4
13B	3	7.6	20.1					**1.4**	1000				**511**								4.1	3.4
13B	8	8.0	17.3	**99.9**	31			**3**	8000				**1150**				10.6	2.4			10.5	3.8
14B	3	7.0		**45.1**	29								**795**								3.3	3.0
14B	8	8.2	33.4	**49.8**	31	5240	2100					**1160**	**5710**				3.4	2.4			14.5	3.8
15B	3	8.3	15.8	**46.1**	32			**1.2**	8000				**636**				5.9	1.8			11.7	4.4
15B	8	7.9	16.8	**39.5**	31							**472**	**1120**				3.2	2.4			8.7	3.8
16B	3	7.8	15.9	**17.7**	31			**1.7**	8000				**1490**									
16B	6	7.2	15.7	**14**	29																6.2	3.0
17B	3	7.2	11.1	**16.3**	29			**1.2**	140				**602**									
17B	11	8.1	6.7										**467**				2.5	2.4				
18B	3	8.8	10	**26.5**	33			**1.4**	8000				**432**				3.3	1.3			7.1	4.9
18B	10	7.7	11.8	**21.8**	30			**1.6**	1000				**808**								4.3	3.4
19B	3	7.8	27.5	**18.4**	31			**1.6**	8000				**1810**				2.7	2.4			5.1	3.8

Table D-3. Inorganic Exceedances of Soil ROs in Unnamed Parcel (mg/kg)

Industrial/Commercial ROs			Antimony	Arsenic		Barium		Beryllium		Cadmium		Chromium (Total)	Lead	Manganese	Mercury		Selenium		Silver		Thallium	
Ingestion or inhalation			*82*	*13*		*14000*		*1*		*200*		*420*	*400*	*8700*	*61*		*1000*		*1000*		*160*	
Soil Component of GW (Class I)			*5*	*25-33*		*160-2100*		*1.1-8000*		*1-430*		*No Data*	*No Data*	*No Data*	*0.01-8.0*		*1.3-24*		*0.24-110*		*1.6-4.9*	
Station ID	Sample Depth	pH			*		*		*		*					*		*		*		*
19B	14	8.2	7.8	**23.3**	31			**1.9**	8000				**411**								5.1	3.8
20B	3	7.6	7.7	**23.3**	30			**1.3**	1000								3.3	2.4			10.3	3.4
20B	7	9.8	15.2	**13.3**	33								**998**				3.0	1.3				
21B	3	8.4	5.5										**720**									
21B	5	7.9	28	**15**	31	2300	2100						**971**								5.1	3.8
21B	10	7.0	25.7	**17.3**	29								**1230**								6.5	3.0
22B	3	7.6	9.5					**1.2**	1000												3.9	3.4
22B	10	7.5	12.5	**25.9**	30												3.5	3.3			23.1	3.4
23B	3	7.8	12.2	**22.9**	31			**1.9**	8000				**2300**				3.9	2.4			8.6	3.8
23B	10	8.6		**14.7**				**1.3**	8000												7.9	4.4
24B	3	8.1	8.6	**18.2**	31			**1.3**	8000				**836**				4.6	2.4			10.7	3.8
24B	8	8.2	5.7																		9.7	3.8
25B	8	9.5	9.9	**14.9**	*												2.6	1.3			9.7	4.9
26B	3	8.4		**14.3**				**1.6**	8000								3.3	1.8				
26B	6	5.0	10.9																			
27B	3	7.9	19.9	**22.7**	31			**1.4**	8000				**807**				2.9	2.4			4.8	3.8
27B	8	5.0													0.19	0.01						
27B	30	8.3											**2350**									
28B	3	8.0		**13.5**	31			**1.2**	8000													
29B	3	8.5	30.6	**30.6**	32								**2270**				2.8	1.8			10.5	4.4
29B	10	7.8	15.5	**20.9**	31			**1.8**	8000				**1060**				3.8	2.4			12.4	3.8
30B	3	8.2	18.4	**17.6**	31							453	**658**				4.9	2.4			11.5	3.8
30B	7.5	8.2	7.9	**15.8**	31								**910**								9.3	3.8
32B	3	8.3	8.4	**13.5**	32			**1.7**	8000				**641**									
32B	6	8.4	5.4	**16.4**	32			**1.8**	8000			461									5.5	4.4
33B	3	7.9	17	**17.1**	31								**2710**	13000			4.5	2.4			26.0	3.8
33B	7	8.3	15.4	**38.2**	32								**749**				2.6	1.8			11.0	4.4
34B	3	8.7	16.7	**22.3**	32								**993**				4.1	1.8			25.5	4.4
34B	10	7.7	9.3										**933**								10.6	3.4

Table D-3. Inorganic Exceedances of Soil ROs in Unnamed Parcel (mg/kg)

Industrial/Commercial ROs			Antimony	Arsenic		Barium		Beryllium		Cadmium		Chromium (Total)	Lead	Manganese	Mercury		Selenium		Silver		Thallium	
Ingestion or inhalation			*82*	*13*		*14000*		*1*		*200*		*420*	*400*	*8700*	*61*		*1000*		*1000*		*160*	
Soil Component of GW (Class I)			*5*	*25-33*		*160-2100*		*1.1-8000*		*1-430*		*No Data*	*No Data*	*No Data*	*0.01-8.0*		*1.3-24*		*0.24-110*		*1.6-4.9*	
Station ID	Sample Depth	pH			*		*		*		*					*		*		*		*
34B	30	8.2	13.2	**30.6**	31			**1.4**	8000			**1620**	**3790**				5.2	2.4			11.0	3.8
35B	4	7.8	6.1	**19.9**	31								**676**								4.4	3.8
35B	10	8.2	10	**34.5**	31								**642**				4.5	2.4			7.6	3.8
36B	3	8.0	6.8	**32**	31			**1.5**	8000				**1000**				2.8	2.3			6.3	3.8
36B	6	8.1	15.5										**589**								8.2	3.8
37B	13	8.1	31.9	**21.8**	31			**1.1**	8000				**3970**									
38B	4	7.9	5.2					**2.7**	8000				**1160**									
38B	6.5	7.9	8.8	**21.3**	31								**524**				9.7	2.4			17.8	3.8
39B	3	7.8	25.4	**25.5**	31			**1.3**	8000				**684**									
39B	8	8.1	7.6	**19.7**	31								**488**								5.1	3.8

Bold indicates exceedance of ingestion or inhalation pathways.

Empty boxes indicate non-detects or concentrations below ROs

If duplicate samples were collected, the higher concentration and its pH are reported.

* The Soil to Groundwater RO is pH dependent and is listed to the right of affected concentrations (column marked with *).

"No data" means that no TACO values are available for comparison with the soil component of the groundwater ingestion route.

Table D-4. VOC Exceedances of Soil ROs in Alburn (mg/kg)

Industrial/Commerical ROs		1,1,1-Trichloroethane	1,1,2-Trichloroethane	1,2-Dichloroethane	Benzene	Carbon disulfide	Chlorobenzene	cis-1,2-Dichloroethene	Ethylbenzene	Methylene chloride	Tetrachloroethene	Toluene	Trichloroethene	Vinyl chloride	Xylenes
Ingestion or Inhalation		*1200*	*1800*	*0.7*	*1.5*	*9*	*1.3*	*1200*	*58*	*24*	*20*	*42*	*8.9*	*0.06*	*410*
Soil Component of GW (Class I)		*2*	*0.02*	*0.02*	*0.03*	*32*	*1*	*0.4*	*13*	*0.02*	*0.06*	*12*	*0.06*	*0.01*	*150*
Station ID	**Depth (ft)**														
1	7.5		0.48		0.9					0.23					
2	6	340							17	12		**95**	**370**		
3	6	16			**31**				**210**		9.8	**43**	**19**		330
4	3				1.1			0.58		0.21			0.49		
4	6				0.04					0.03					
5	5				**7.9**			2.4							
8	4				**2.8**					2.4					
9	6				1.1								0.2		
10	6				0.46					2.8					
11	6				0.54					3.2		17			
12	3				0.22					1.2			0.37		
13	9				1.1			0.86			1.1		1.7		
14	3				0.37			3.2			4.2	35	1.5		
14	9							1.3		0.6	1.1	28	0.62	**0.26**	
16	3				0.17					3					
17	6								**82**	8.9					280
18	3				0.1										
18	6				**42**				53	12	1.5	20			300
19	3				0.065										
19	8				**2.9**				**75**	2.1					250
20	3				0.31										
20	8						1.3			0.54					
21	3						**1.9**			1.5					
23	3									1.4					
23	7				0.41					1.7					
24	3						**19**		**1200**	**45**		**550**			**3700**
24	9				1.5			0.61			2		1.2		
25	2.5									0.84					
25	8				0.18					0.34	0.32				
26	3									0.19	0.98				
26	9								17	2.3					
27	3				0.33		**5.4**	0.58	23	0.31	13				
27	9				0.26		**1.4**			0.38					

Table D-4. VOC Exceedances of Soil ROs in Alburn (mg/kg)

Industrial/Commerical ROs		1,1,1-Trichloroethane	1,1,2-Trichloroethane	1,2-Dichloroethane	Benzene	Carbon disulfide	Chlorobenzene	cis-1,2-Dichloroethene	Ethylbenzene	Methylene chloride	Tetrachloroethene	Toluene	Trichloroethene	Vinyl chloride	Xylenes
Ingestion or Inhalation		*1200*	*1800*	*0.7*	*1.5*	*9*	*1.3*	*1200*	*58*	*24*	*20*	*42*	*8.9*	*0.06*	*410*
Soil Component of GW (Class I)		*2*	*0.02*	*0.02*	*0.03*	*32*	*1*	*0.4*	*13*	*0.02*	*0.06*	*12*	*0.06*	*0.01*	*150*
28	3	380			**92**		47	51	**1400**	**400**	**360**	**3700**	**260**		**4500**
28	10				**64**	14			**410**	**32**		**750**			**1500**
29	3				1.3				24						
29	4.5								**5000**	**200**	**83**	**700**			**25000**
30	3				0.54					0.91	0.26		1.2		
30	9									2.4			0.95		
31	3				**34**				26			**120**			250
31	6				**7.8**										
33	3						74		34	2.3					190
33	8				0.97				19			**79**			
34	3				0.23						1.3	14	0.38		
34	9				0.14					0.81	0.13				
35	9				0.36			1.3		0.38	0.12				
37	3				**2.5**			0.64		1.4	2.4	14	1.5		
37	9				0.46					0.22					
38	3				1.1			1.7		0.27			0.77		
38	9							4.5		1.2	0.7	42	1.1		
39	3							0.74		0.53	6.1	20	5.4		
39	9				2				18		0.51		0.22		
40	10				**6.8**				32						
41	3									0.7					
41	9				0.35					0.73					
42	3									0.79					
42	9									1					
43	3				0.045										
43	8				**4.3**					0.8					
44	8									1.6					
45	8							1.1		1.4	1.9		0.37		
Pit 52	3			0.1											
Pit 52	5				0.08										
Pit 53	7				0.18										

Bold indicates exceedance of ingestion or inhalation pathways.

Empty boxes indicate non-detects or concentrations below ROs

Table D-5. VOC Exceedances of Soil ROs in U.S. Drum (mg/kg)

Industrial/Commerical ROs		1,1,1-Trichloroethane	1,2-Dichloroethane	Acetone	Benzene	Chlorobenzene	Chloroform	cis-1,2-Dichloroethene	Ethylbenzene	Methylene chloride	Styrene	Tetrachloroethene	Toluene	trans-1,2-Dichloroethene	Trichloroethene	Vinyl chloride	Xylenes
Ingestion or Inhalation		*1200*	*0.7*	*100000*	*1.5*	*1.3*	*0.54*	*1200*	*58*	*24*	*430*	*20*	*42*	*3100*	*8.9*	*0.06*	*410*
Soil Component of GW (Class I)		*2*	*0.02*	*16*	*0.03*	*1*	*0.6*	*0.4*	*13*	*0.02*	*4*	*0.06*	*12*	*0.7*	*0.06*	*0.01*	*150*
Station ID	**Depth (ft)**																
Pit 01	9					1.7											
Pit 01	13			18					35								310
Pit 03	3														0.8		
Pit 04	4					23											
Pit 04	8				0.5	120											
Pit 05	2.5				0.098										0.15		
Pit 07	8				0.28										0.087		
Pit 08	8				0.12												
Pit 09	3								17								
Pit 09	6.5				0.12							0.065			0.096		
Pit 10	8				0.1												
Pit 11	2											0.099					
Pit 11	8											0.2					
Pit 12	3									0.076							
Pit 12	8				0.21	1.3				0.085							
Pit 13	3.5		2.2		0.23					0.11							
Pit 14	4											0.4					
Pit 14	9		0.11		0.69							0.42					
Pit 15	4	3.3	3.4		4.4				120			28	100		5.5		620
Pit 15	8		3.3		1.8		1		48	0.8		7	42		2.2		240
Pit 16	3		1.7		2.3					0.065							
Pit 16	7		1.1		0.093							0.15			0.071		
Pit 17	3.5		14		11												
Pit 17	7		0.87		3.2					1.2						0.23	
Pit 17	13				1.7												
Pit 18	3.5		0.3		0.1							0.31			0.099		
Pit 18	7				2.3												
Pit 19	3	4.2	12		4.8		6		62	8.9		4	260				250
Pit 19	9	6.3	10		20		4.4	4.5	260	10		20	730		3.7		820
Pit 20	3				0.74												
Pit 20	9				0.092							0.39			0.1		

Table D-5. VOC Exceedances of Soil ROs in U.S. Drum (mg/kg)

Industrial/Commerical ROs		1,1,1-Trichloroethane	1,2-Dichloroethane	Acetone	Benzene	Chlorobenzene	Chloroform	cis-1,2-Dichloroethene	Ethylbenzene	Methylene chloride	Styrene	Tetrachloroethene	Toluene	trans-1,2-Dichloroethene	Trichloroethene	Vinyl chloride	Xylenes
Ingestion or Inhalation		*1200*	*0.7*	*100000*	*1.5*	*1.3*	*0.54*	*1200*	*58*	*24*	*430*	*20*	*42*	*3100*	*8.9*	*0.06*	*410*
Soil Component of GW (Class I)		*2*	*0.02*	*16*	*0.03*	*1*	*0.6*	*0.4*	*13*	*0.02*	*4*	*0.06*	*12*	*0.7*	*0.06*	*0.01*	*150*
Station ID	**Depth (ft)**																
Pit 21	2														0.56		
Pit 22	3.5											0.099					
Pit 22	8				0.079												
Pit 23	2.5				0.068												
Pit 23	9				0.96				30								160
Pit 23	13				0.54				21								
Pit 24	8.5				0.13												
Pit 25	3											0.17					
Pit 26	3				0.22							0.15					
Pit 26	9				0.21							0.12			0.13		
Pit 27	3.5				0.033												
Pit 27	10				0.23	**3.1**											
Pit 28	3				0.26	**2.7**						0.2					
Pit 28	8				0.41	**3**											
Pit 30	6				0.12							0.39			0.13		
Pit 31	4				0.093					0.25		0.2			0.14		
Pit 32	3				0.5				**190**				19				**950**
Pit 33	3					**2.4**			28								200
Pit 33	9				0.4												
Pit 34	3				0.16							1.4			0.18		
Pit 34	10				0.31							0.38			0.31		
Pit 36	11				0.11												
Pit 37	3				0.034												
Pit 37	8											0.56					
Pit 38	3				0.1	**18**						0.63					
Pit 38	10				0.59												
Pit 40	9				0.09												
Pit 41	3				0.18												
Pit 41	8				0.12				19								
Pit 42	9				0.035												
Pit 42	15				0.036							0.087				0.031	

Table D-5. VOC Exceedances of Soil ROs in U.S. Drum (mg/kg)

Industrial/Commerical ROs		1,1,1-Trichloroethane	1,2-Dichloroethane	Acetone	Benzene	Chlorobenzene	Chloroform	cis-1,2-Dichloroethene	Ethylbenzene	Methylene chloride	Styrene	Tetrachloroethene	Toluene	trans-1,2-Dichloroethene	Trichloroethene	Vinyl chloride	Xylenes
Ingestion or Inhalation		*1200*	*0.7*	*100000*	*1.5*	*1.3*	*0.54*	*1200*	*58*	*24*	*430*	*20*	*42*	*3100*	*8.9*	*0.06*	*410*
Soil Component of GW (Class I)		*2*	*0.02*	*16*	*0.03*	*1*	*0.6*	*0.4*	*13*	*0.02*	*4*	*0.06*	*12*	*0.7*	*0.06*	*0.01*	*150*
Station ID	**Depth (ft)**																
Pit 43	3				0.074	4.2			17								
Pit 43	9				0.23					0.084		0.11			0.11		
Pit 44	9				0.063												
Pit 45	3.5				0.13												
Pit 45	10				0.045					0.1							
Pit 47	9				0.18				33	0.1	4.6		35		0.084		
Pit 48	9											0.4			0.074		
Pit 51	8							3.2						2.7	2.9		

Bold indicates exceedance of ingestion or inhalation pathways.
Empty boxes indicate non-detects or concentrations below ROs

Table D-6. VOC Exceedancs of Soil ROs in Unnamed Parcel (mg/kg)

Industrial/Commerical ROs		1,1,1-Trichloroethane	1,1-Dichloroethane	1,2-Dibromo-3-Chloropropane	1,2-Dichloroethane	Benzene	Chlorobenzene	Dibromochloromethane	Ethylbenzene	Methylene chloride	Toluene	Trichloroethene	Xylenes
Ingestion or Inhalation		*1200*	*130*	*0.11*	*0.7*	*1.5*	*1.3*	*1300*	*58*	*24*	*42*	*8.9*	*410*
Soil Componenet of GW (Class I)		*2*	*23*	*0.002*	*0.02*	*0.03*	*1*	*0.4*	*13*	*0.02*	*12*	*0.06*	*150*
Station ID	**Depth (ft)**												
02B	3				0.59	0.077							
05B	8					0.257							
07B	8					0.077							
12B	3					0.13							
12B	6					0.55	**2.6**	0.86					
18B	3									0.13			
19B	14					0.11							
21B	3								**820**		**8900**	**220**	**3000**
21B	5	**12000**			**270**		**180**		**1800**	**470**	**7800**	**390**	**5600**
21B	10	**52000**	**440**	**470**	**720**				**1100**		**4200**	**460**	**3500**
22B	10					0.28							
23B	10					0.068							
24B	8					0.21							
25B	8			**0.57**									
28B	3					0.065							
33B	7						**48**			0.39			
34B	10					0.075							
39B	3					0.045							

Bold indicates exceedance of ingestion or inhalation pathways.
Empty boxes indicate non-detects or concentrations below ROs.

Table D-7. SVOC Exceedances of Soil ROs in Alburn (mg/kg)

Industrial/Commercial ROs		1,4-Dichlorobenzene	2,4-Dimethylphenol	2,4-Dinitrotoluene	2-Methylnaphthalene	4-Chloroaniline	Acenaphthylene	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Bis(2-Chloroethyl) Ether	Carbazole	Dibenz(a,h)Anthracene	Indeno(1,2,3-CD)pyrene	N-Nitrosodiphenylamine	Naphthalene	Phenanthrene
Ingestion or Inhalation		*340*	*41000*	*8.4*	*61000*	*820*	*61000*	*8*	*0.8*	*8*	*0.47*	*290*	*0.8*	*8*	*1200*	*8200*	*61000*
Soil Component of GW (Class I)		*2*	*9*	*0.0008*	*29*	*0.7*	*15*	*2*	*8*	*5*	*0.0004*	*0.6*	*2.0*	*14*	*1*	*84*	*140*
Station ID	**Sample Depth**																
1	2.5							2.8	**2.6**			1.5					
1	7.5							**11**	**3.8**	**12**		2.3	**1.1**				
01B	3								**1.3**								
01B	6							2.6	**2.7**			1	**0.9**			120	
4	3								**1.0**								
4	6				30		25	2.9	**2.9**								
7	3							6.1	**4.5**			0.72	**1.2**				
8	2.5								**1.6**								
8	4							2.1	**1.9**								
9	2.5								**1.8**								
9	6							2.1	**2.9**				**1.3**				
10	2.5							3	**3.0**				**1.1**				
11	2.5							6.2	**5.2**	6.1		2.1	**1.6**				
11	6								**1.7**			0.93					
12	3							**11**	**7.9**	**14**		2.2	**1.3**				
14	9		51			5.2			**0.8**								
16	9							2.4	**1.1**			3.1					
18	3							4.2	**3.4**				**0.86**				
18	6	3.9															
19	8				95			**23**	**23.0**	**40**		13.0	**1.7**	**12**		670	150
20	3							0	**0.8**								

Table D-7. SVOC Exceedances of Soil ROs in Alburn (mg/kg)

Industrial/Commercial ROs		1,4-Dichlorobenzene	2,4-Dimethylphenol	2,4-Dinitrotoluene	2-Methylnaphthalene	4-Chloroaniline	Acenaphthylene	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Bis(2-Chloroethyl) Ether	Carbazole	Dibenz(a,h)Anthracene	Indeno(1,2,3-CD)pyrene	N-Nitrosodiphenylamine	Naphthalene	Phenanthrene
Ingestion or Inhalation		*340*	*41000*	*8.4*	*61000*	*820*	*61000*	*8*	*0.8*	*8*	*0.47*	*290*	*0.8*	*8*	*1200*	*8200*	*61000*
Soil Component of GW (Class I)		*2*	*9*	*0.0008*	*29*	*0.7*	*15*	*2*	*8*	*5*	*0.0004*	*0.6*	*2.0*	*14*	*1*	*84*	*140*
Station ID	**Sample Depth**																
20	8				40			5.8	**4.9**			3.7					
21	3							0	**0.8**								
21	11							3.1	**2.7**								
23	3							7.7	**4.7**	5.1			**1.1**				
23	7								**0.9**								
24	3							2.5	**2.2**							91	
24	9							**18**	**15.0**	**20**		2.1	**3.8**	**10**			
25	2.5								**1.7**								
25	8							2.5	**2.2**			1.1					
27	9								**1.4**								
28	3										**0.68**						
28	10				72		19	**67**	**37.0**	**72**		35.0	**7.3**	**24**		450	360
29	3								**0.9**								
29	4.5							2.3	**2.2**								
30	9								**0.9**								
31	6											1.4					
33	3								**0.9**								
34	3								**1.4**								
35	3							**33**	**35.0**	**45**		9.7	**11**	**13**			
35	9								**1.6**								
37	3											3.0					

Table D-7. SVOC Exceedances of Soil ROs in Alburn (mg/kg)

Industrial/Commercial ROs		1,4-Dichlorobenzene	2,4-Dimethylphenol	2,4-Dinitrotoluene	2-Methylnaphthalene	4-Chloroaniline	Acenaphthylene	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Bis(2-Chloroethyl) Ether	Carbazole	Dibenz(a,h)Anthracene	Indeno(1,2,3-CD)pyrene	N-Nitrosodiphenylamine	Naphthalene	Phenanthrene
Ingestion or Inhalation		*340*	*41000*	*8.4*	*61000*	*820*	*61000*	*8*	*0.8*	*8*	*0.47*	*290*	*0.8*	*8*	*1200*	*8200*	*61000*
Soil Component of GW (Class I)		*2*	*9*	*0.0008*	*29*	*0.7*	*15*	*2*	*8*	*5*	*0.0004*	*0.6*	*2.0*	*14*	*1*	*84*	*140*
Station ID	**Sample Depth**																
37	9											1.3					
38	9														2.8		
39	3								**1.7**								
40	10							2.7	**2.4**								
42	3							2.9	**2.4**			1.2					
42	9							6.5	**6.1**	7.2		2.4	**1.5**				
43	3								**1.0**								
43	8							5.4	**3.9**			0.75	**1.1**				
44	3								**2.5**								
44	8							2.8	**1.1**			1.2					
Pit 52	3							3.2	**6.5**	**8.7**			**1.4**		1.2		
Pit 52	5			0.12				4.4	**3.4**								
Pit 53	3								**1.2**								
Pit 53	7			0.98											1.2		

Bold indicates exceedance of ingestion or inhalation pathways.

Empty boxes indicate non-detects or concentrations below ROs.

ROs are IEPA Tiered Approach to Corrective Action Objectives Title 35 IAC Part 742

Table D-8. SVOC Exceedances of Soil ROs in U.S. Drum (mg/kg)

Industrial/Commercial ROs		1,4-Dichlorobenzene	2,4-Dimethylphenol	2,6-Dinitrotoluene	2-Methylnaphthalene	4-Chloroaniline	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(k)fluoranthene	Bis(2-Ethylhexyl) Phthalate	Carbazole	Dibenz(a,h)Anthracene	Indeno(1,2,3-CD)pyrene	Isophorone	N-Nitrosodiphenylamine	Naphthalene	Nitrobenzene	Pentachlorophenol	Phenanthrene
Ingestion or Inhalation		*340*	*41000*	*8.4*	*61000*	*820*	*8*	*0.8*	*8*	*78*	*410*	*290*	*0.8*	*8*	*4600*	*1200*	*8200*	*9.4*	*24*	*61000*
Soil Component of GW (Class I)		*2*	*9*	*0.0007*	*29*	*0.7*	*2*	*8*	*5*	*49*	*3600*	*0.6*	*2*	*14*	*8*	*1*	*84*	*0.1*	*0.03*	*140*
Station ID	**Sample Depth**																			
Pit 01	4						11	**8.9**	7.5			2.1	**1.5**							
Pit 01	9	2.3	12								**480**					36	90			
Pit 01	13							**0.97**												
Pit 02	9						3.3	**2.8**												
Pit 03	3						4.6	**3.4**												
Pit 03	8							**1.4**												
Pit 04	4	9.9						**1.8**												
Pit 04	8	130				1	3.7	**3**												
Pit 05	2.5						2.3	**2**												
Pit 05	8						**9.1**	**8.4**	7.5			2.1	**1.7**							
Pit 06	8						3.3	**2.2**												
Pit 07	3					6.5		**1.5**												
Pit 07	8							**1**												
Pit 08	2.5							**1.3**												
Pit 08	8						2.1	**1.7**												
Pit 10	8						2.8	**2.2**								1.5				
Pit 11	2						6.1	**4.3**	5.2			1.7	**0.94**							
Pit 13	3.5							**0.91**												
Pit 13	12						**100**	**50**	**71**	65		2.6	**9.1**	**21**						
Pit 14	4																	0.22		
Pit 14	9							**1**												

Table D-8. SVOC Exceedances of Soil ROs in U.S. Drum (mg/kg)

Industrial/Commercial ROs		1,4-Dichlorobenzene	2,4-Dimethylphenol	2,6-Dinitrotoluene	2-Methylnaphthalene	4-Chloroaniline	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(k)fluoranthene	Bis(2-Ethylhexyl) Phthalate	Carbazole	Dibenz(a,h)Anthracene	Indeno(1,2,3-CD)pyrene	Isophorone	N-Nitrosodiphenylamine	Naphthalene	Nitrobenzene	Pentachlorophenol	Phenanthrene
Ingestion or Inhalation		*340*	*41000*	*8.4*	*61000*	*820*	*8*	*0.8*	*8*	*78*	*410*	*290*	*0.8*	*8*	*4600*	*1200*	*8200*	*9.4*	*24*	*61000*
Soil Component of GW (Class I)		*2*	*9*	*0.0007*	*29*	*0.7*	*2*	*8*	*5*	*49*	*3600*	*0.6*	*2*	*14*	*8*	*1*	*84*	*0.1*	*0.03*	*140*
Station ID	Sample Depth																			
Pit 16	3						**14**	**8.4**	**11**				**2.3**							
Pit 17	3.5																	2.5		
Pit 17	7				36			**0.92**												
Pit 18	7						**52**	**55**	**51**			8.2	**5.7**	**22**						170
Pit 19	3														11					
Pit 20	3							**1.3**												
Pit 20	9						3.5	**3.2**				0.95								
Pit 21	2						7	**3.9**												
Pit 22	8						2.4	**2**				0.91								
Pit 23	9											1.1								
Pit 23	13						7.8	**7.1**	5.7			2.6	**1.1**							
Pit 24	2.5							**1.4**								3.5				
Pit 24	8.5						2.6	**2.1**												
Pit 25	3				41															
Pit 26	9				76		2.1	**1.6**				1.1								
Pit 28	3						3	**2.6**												
Pit 29	4.5							**1.3**												
Pit 29	8							**1.3**				1.2								
Pit 32	3						2.7	**2.8**				1.5	**0.89**							
Pit 33	3							**0.98**											0.31	
Pit 33	9						**17**	**18**	**14**			4.4	**2.9**	**9.4**						

Table D-8. SVOC Exceedances of Soil ROs in U.S. Drum (mg/kg)

Industrial/Commercial ROs		1,4-Dichlorobenzene	2,4-Dimethylphenol	2,6-Dinitrotoluene	2-Methylnaphthalene	4-Chloroaniline	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(k)fluoranthene	Bis(2-Ethylhexyl) Phthalate	Carbazole	Dibenz(a,h)Anthracene	Indeno(1,2,3-CD)pyrene	Isophorone	N-Nitrosodiphenylamine	Naphthalene	Nitrobenzene	Pentachlorophenol	Phenanthrene
Ingestion or Inhalation		*340*	*41000*	*8.4*	*61000*	*820*	*8*	*0.8*	*8*	*78*	*410*	*290*	*0.8*	*8*	*4600*	*1200*	*8200*	*9.4*	*24*	*61000*
Soil Component of GW (Class I)		*2*	*9*	*0.0007*	*29*	*0.7*	*2*	*8*	*5*	*49*	*3600*	*0.6*	*2*	*14*	*8*	*1*	*84*	*0.1*	*0.03*	*140*
Station ID	**Sample Depth**																			
Pit 37	3			0.33			3.8	**2.6**				1.2								
Pit 37	8							**0.93**								4.8	110			
Pit 38	3	7.2																		
Pit 39	10															2.2				
Pit 40	9	2.9																		
Pit 41	8	11																		
Pit 42	9							**1.1**												
Pit 43	3	2.3					4.5	**3.8**				2.5								
Pit 43	9						**8.1**	**14**	**13**			1.1	**3.7**	**9.6**						
Pit 44	3						5	**5.8**	5.1				**1.7**							
Pit 44	9						3.4	**3.9**					**1.1**							
Pit 45	3.5						6.9	**6.2**	6.1			1.9	**1.3**							
Pit 45	10															1.4				
Pit 46	9															6.6				
Pit 47	9	7.9					2.7													
Pit 51	3							**1.3**												
Pit 51	8						7.6	**6.9**	5.9			2.1	**1.2**							

Bold indicates exceedance of ingestion or inhalation pathways.

Empty boxes indicate non-detects or concentrations below ROs.

ROs are IEPA Tiered Approach to Corrective Action Objectives Title 35 IAC Part 742

Table D-9. SVOC Exceedances of Soil ROs in Unnamed Parcel (mg/kg)

Industrial/Commercial ROs		1,4-Dichlorobenzene	2-Methylnaphthalene	2-Methylphenol (O-Cresol)	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(k)fluoranthene	Carbazole	Chrysene	Dibenz(a,h)Anthracene	Indeno(1,2,3-CD)pyrene	N-Nitrosodiphenylamine	Naphthalene	Pentachlorophenol	Phenanthrene
Ingestion or Inhalation		*340*	*61000*	*100000*	*8*	*0.8*	*8*	*78*	*290*	*780*	*0.8*	*8*	*1200*	*8200*	*24*	*61000*
Soil Component of GW (Class I)		*2*	*29*	*15*	*2*	*8*	*5*	*49*	*0.6*	*160*	*2*	*14*	*1*	*84*	*0.03*	*140*
Station ID	**Sample Depth**															
2B	3				2.6	**2.3**										
4B	3				4.4	**4.6**	6				**1.2**					
6B	3				2.1	**1.8**			0.76							
7B	3		44													
8B	3					**1.5**										
8B	8				**11**	**8.7**	**8.9**		4.2		**2.1**		1.5			
9B	8					**1.1**										
10B	8				**28**	**28**	**53**		10		**5.8**	**13**				
11B	30					**0.82**										
12B	3					**0.82**										
13B	3				3	**3.7**	6.6				**1.1**					
16B	3				3.6	**3.2**					**0.96**					
16B	6				2.8	**3**										
17B	3				**21**	**19**	**19**		3.5		**4.3**	**10**				
17B	11				6	**5**	7.3		4		**1.4**					
18B	3					**0.88**										
18B	10					**1.2**										
19B	14					**1.5**			0.61							
20B	7					**1.2**										
21B	3														9.6	
21B	5	210													7.6	
21B	10			68		**1.5**										

Table D-9. SVOC Exceedances of Soil ROs in Unnamed Parcel (mg/kg)

Industrial/Commercial ROs		1,4-Dichlorobenzene	2-Methylnaphthalene	2-Methylphenol (O-Cresol)	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(k)fluoranthene	Carbazole	Chrysene	Dibenz(a,h)Anthracene	Indeno(1,2,3-CD)pyrene	N-Nitrosodiphenylamine	Naphthalene	Pentachlorophenol	Phenanthrene
Ingestion or Inhalation		*340*	*61000*	*100000*	*8*	*0.8*	*8*	*78*	*290*	*780*	*0.8*	*8*	*1200*	*8200*	*24*	*61000*
Soil Component of GW (Class I)		*2*	*29*	*15*	*2*	*8*	*5*	*49*	*0.6*	*160*	*2*	*14*	*1*	*84*	*0.03*	*140*
Station ID	**Sample Depth**															
23B	3												4.8			
26B	3				3.9	**3.5**					**0.99**					
27B	3					**1.9**							1.6			
27B	30					**1.2**										
28B	3				3	**3.2**										
28B	6				5.1	**4.3**	6		3.4					330		
29B	3				4.1	**6.8**	**11**		0.78		**0.85**					
29B	10					**0.84**									0.11	
30B	7.5				**22**	**20**	**26**		2.4		**3.2**	**12**				
31B	2.5					**0.86**								160		
32B	3					**0.99**										
33B	7	22														
34B	10					**1.4**										
34B	30				7.8	**6.7**	**8.8**		3.3		**1.1**					
37B	4					**1.2**										
37B	13				**310**	**250**	**350**	**150**	23	310	**59**	**140**				210
38B	4					**0.82**										
38B	6.5				3.8	**2.5**			1.2							
39B	8				**17**	**14**	**16**				**2.1**					

Bold indicates exceedance of ingestion or inhalation pathways.

Empty boxes indicate non-detects or concentrations below ROs.

ROs are IEPA Tiered Approach to Corrective Action Objectives Title 35 IAC Part 742

Table D-10. Pesticide/Herbicide Exceedances of Soil ROs (mg/kg)

ALBURN											
Tier I I/C ROs		alpha-BHC	Dieldrin	gamma-BHC	Heptachlor	*Tier I I/C ROs*		alpha-BHC	Dieldrin	gamma-BHC	Heptachlor
Ingestion or Inhalation		0.9	0.4	4	1	*Ingestion or Inhalation*		0.9	0.4	4	1
Soil to Groundwater Migration (Class I)		0.0005	0.004	0.009	23	*Soil to Groundwater Migration (Class I)*		0.0005	0.004	0.009	23
Station ID	Sample Depth					Station ID	Sample Depth				
1	2.5		0.0041			25	2.5		0.022		
01B	3	0.0014				26	3		0.024		
01B	6		0.0063			26	9	0.0027			
2	2		0.045	0.019		27	3		0.018		
3	6	0.04				27	9		0.29		
5	5		0.0048			28	3	0.012	0.055		
8	4		0.012			28	10	0.023	0.096		
9	6		0.028			29	3		0.01		
10	2.5		0.018			29	4.5	0.0049	0.075		
10	6	0.041	0.058	0.015		30	9		0.033		
11	6		0.03			31	3		0.086		
12	3	0.063	0.068			31	6	0.024	0.047		
12	9	0.003				33	3		0.025		
13	9	0.012	0.035			34	3	0.0017			
14	9		0.039			35	9		0.026		
15	3		0.035	0.016		37	3	0.00078	0.068		
16	3	0.0035	0.035	0.012		38	9	0.0034	0.01		
16	9	0.17	0.082			39	3	0.001			
17	6	0.003	0.037			39	9	0.00082			
18	3	0.0068	0.033			41	3	0.0024	0.0051		
18	6	0.036	0.062			41	9		0.0066		
19	8	0.0034	0.034			42	3		0.035		
20	3	0.017	0.12	0.011		42	9		0.019		
20	8		0.097			43	3		0.021		
21	3		0.0052			44	8		0.0046		
23	7		0.0099								
24	3	0.017	0.067								
24	9	0.013	0.084								

Empty boxes indicate non-detects or concentrations below ROs.
Bold indicates exceedance of ingestion or inhalation pathway.

Table D-10. Pesticide/Herbicide Exceedances of Soil ROs (mg/kg)

U.S. DRUM					
Tier I I/C ROs		alpha-BHC	Dieldrin	gamma-BHC	Heptachlor
Ingestion or Inhalation		**0.9**	**0.4**	**4**	**1**
Migration (Class I)		**0.0005**	**0.004**	**0.009**	**23**
Station ID	**Sample Depth**				
Pit 01	9	0.0072			
Pit 01	13		0.054	0.016	
Pit 04	4		0.0082		
Pit 05	2.5	0.0026	0.01	0.011	
Pit 10	3	0.0043			
Pit 12	8		0.013		
Pit 15	4	0.0013			
Pit 16	7		0.016		
Pit 18	3.5		0.0063		
Pit 19	3		0.067		
Pit 19	9	0.0047	0.024		
Pit 21	2	0.024			
Pit 35	10		0.027		
Pit 38	10	0.0039			
Pit 39	3		0.034	0.014	
Pit 43	9		0.0095		
Pit 50	3		0.029	0.012	

Empty boxes indicate non-detects or concentrations below ROs.
Bold indicates exceedance of ingestion or inhalation pathway.

Table D-10. Pesticide/Herbicide Exceedances of Soil ROs (mg/kg)

UNNAMED PARCEL

Tier I I/C ROs		alpha-BHC	Dieldrin	gamma-BHC	Heptachlor
Ingestion or Inhalation		0.9	0.4	4	1
Soil to Groundwater Migration		0.0005	0.004	0.009	23
Station ID	Sample Depth				
2B	3		0.063		
4B	8	0.0017	0.0044		
5B	3		0.0066		
6B	3	0.0048	0.0097		
6B	8		0.039		
7B	3		0.17		
7B	8		0.066	0.016	
8B	3		0.01		
88B	8		0.017		
9B	8		0.029		
10B	8		0.02		
11B	8		0.0074		
12B	6		0.04		
13B	3		0.036		
13B	8	0.0038	0.02		
14B	3		0.015		
14B	8	0.0021	0.0056		
15B	3	0.0014	0.025		
15B	8	0.0099	0.013		
16B	3		0.11		
17B	3	0.01			
17B	11		0.019		
18B	3		0.012		
18B	10	0.024	0.045		
19B	3	0.0058	0.0051		
19B	14	0.012			
20B	3	0.008			
20B	7	0.0028	0.018		

Tier I I/C ROs		alpha-BHC	Dieldrin	gamma-BHC	Heptachlor
Ingestion or Inhalation		0.9	0.4	4	1
Soil to Groundwater		0.0005	0.004	0.009	23
Station ID	Sample Depth				
21B	5		0.014		
21B	10	0.012	0.021		
22B	10	0.02	0.021		
23B	3	**17**			**2.8**
23B	10	0.039	0.0058		
24B	3	0.0025			
24B	8	0.0032			
25B	8		0.025		
27B	3	0.0068	0.05		
27B	8	0.0011			
28B	6		0.02		
29B	3		0.087		
30B	3		0.0093		
30B	7.5		0.03		
31B	2.5	0.0011	0.019		
32B	3	0.0045			
33B	3		0.0067		
34B	3	0.0017	0.0082		
34B	10	0.0091	0.049		
35B	4	0.0045	0.01	0.022	
35B	10		0.01		
36B	3	0.0014			
37B	4	0.049	0.018		
37B	13	0.028	0.046	0.022	
38B	6.5	0.02	0.038		
39B	8	0.0099	0.02		

Empty boxes indicate non-detects or concentrations below ROs.
Bold indicates exceedance of ingestion or inhalation pathway.

Table D-11. Total PCB Exceedances of Soil ROs

ALBURN			U.S. DRUM						UNNAMED PARCEL		
Station ID	Sample Depth	Total (mg/kg)	Station ID	Sample Depth	Total (mg/kg)	Station ID	Sample Depth	Total (mg/kg)	Station ID	Sample Depth	Total (mg/kg)
10	6.0	17.90	pit 01	9.0	2.30	pit 31	4.0	12.00	2B	3.0	5.00
11	6.0	1.63	pit 01	13.0	14.21	pit 31	9.0	6.50	7B	3.0	4.00
12	3.0	2.10	pit 03	3.0	2.01	pit 32	3.0	1.51	7B	8.0	4.30
13	9.0	2.15	pit 06	8.0	1.12	pit 32	9.0	4.80	9B	3.0	1.73
14	9.0	1.30	pit 10	3.0	1.42	pit 33	3.0	3.07	9B	8.0	7.02
16	3.0	1.15	pit 10	8.0	5.60	pit 34	3.0	1.04	12B	6.0	1.51
18	3.0	1.14	pit 11	2.0	3.93	pit 34	10.0	7.98	13B	3.0	1.54
18	6.0	2.46	pit 11	8.0	1.14	pit 35	10.0	2.80	13B	8.0	1.33
19	8.0	2.14	pit 14	4.0	3.70	pit 36	4.0	6.40	14B	8.0	1.14
20	3.0	6.80	pit 14	9.0	34.30	pit 36	11.0	1.10	15B	3.0	1.78
20	8.0	3.50	pit 15	4.0	2.24	pit 37	3.0	4.01	15B	8.0	1.14
24	3.0	4.00	pit 18	3.5	4.38	pit 37	3.0	4.53	16B	6.0	12.00
24	9.0	1.99	pit 18	7.0	1.20	pit 37	8.0	3.68	17B	3.0	1.88
27	9.0	10.50	pit 19	9.0	9.00	pit 38	3.0	21.26	20B	3.0	1.44
29	4.5	6.80	pit 20	3.0	11.00	pit 38	10.0	11.47	21B	3.0	1.40
31	3.0	2.70	pit 20	9.0	6.20	pit 39	3.0	2.80	21B	5.0	2.50
33	3.0	1.20	pit 21	2.0	37.00	pit 39	10.0	2.20	21B	10.0	2.10
37	3.0	2.00	pit 21	9.0	15.30	pit 40	4.0	10.60	22B	10.0	1.91
pit 52	5.0	3.14	pit 22	8.0	2.80	pit 40	9.0	72.90	24B	3.0	1.84
pit 53	7.0	14.80	pit 23	9.0	1.76	pit 41	8.0	5.27	28B	6.0	1.61
			pit 23	13.0	5.30	pit 42	9.0	17.00	29B	3.0	2.10
			pit 24	2.5	16.90	pit 42	15.0	1.87	29B	10.0	3.28
			pit 24	8.5	1.43	pit 44	3.0	3.30	30B	3.0	2.26
			pit 25	3.0	3.70	pit 44	9.0	30.60	32B	3.0	3.48
			pit 25	9.5	4.90	pit 45	3.5	2.60	33B	7.0	62.00
			pit 26	9.0	7.00	pit 45	10.0	8.60	34B	10.0	1.50
			pit 27	3.5	1.69	pit 46	9.0	1.94	34B	30.0	13.75
			pit 28	8.0	4.00	pit 47	9.0	18.60	37B	4.0	38.59
			pit 29	8.0	16.90	pit 48	9.0	7.62	38B	4.0	5.04
			pit 30	4.0	15.80	pit 49	3.0	1.23	38B	6.5	2.20
			pit 30	6.0	3.90	pit 50	9.0	173.00			

Notes:

Soil Remediation Objective = 1 mg/kg

Concentrations of all arochlors were summed and compared to IEPA Tiered Approach to Corrective Action Objectives Title 35 IAC Part 742 (TACO) Tier I ingestion/inhalation value for PCBs (1 mg/kg). No soil component of groundwater ingestion is available.

Table D-12. PCB Exceedences of Soil ROs in U.S. Drum (mg/kg)

	TEF	*U.S. Drum*											
Station ID		Pit 15		TCDD	Pit 38		TCDD	Pit 46		TCDD	Pit 47		TCDD
Sample ID		X186			X126			X110			X108		
Depth (ft.)		4			3			9			9		
EPA Region 9 Preliminary Remediation Goal for Dioxins and Furans as TCDD - 2.7 E-05 (mg/kg).													
Dioxins													
1,2,3,4,6,7,8-Heptachlorodibenzo-P-Dioxin	0.01	0.002455	=	2.5E-05	0.003521	=	3.52E-05	0.003726	=	3.73E-05	0.003757	=	0.00003757
1,2,3,4,7,8-Hexachlorodibenzo-P-Dioxin	0.1	0.001655	U	8.3E-05	0.002068	U	1.71E-06	0.002189	U	0.000109	0.002024	U	0.0001012
1,2,3,6,7,8-Hexachlorodibenzo-P-Dioxin	0.1	0.001583	X	0.00016	0.001979	=	0.000198	0.002095	=	0.00021	0.001937	U	0.00009685
1,2,3,7,8,9-Hexachlorodibenzo-P-Dioxin	0.1	0.001556	=	0.00016	0.001945	=	0.000195	0.002059	X	0.000206	0.001903	U	0.00009515
1,2,3,7,8-Pentachlorodibenzo-P-Dioxin	1	0.00179	U	0.0009	0.00295	U	0.001475	0.002445	U	0.001223	0.003959	U	0.0019795
2,3,7,8-Tetrachlorodibenzo-P-Dioxin	1	0.000988	U	0	0.002201	U	0	0.00244	U	0	0.001872	U	0
Octachlorodibenzo-P-Dioxin	0.0001	0.00239	B	0	0.002519	B	0	0.003116	B	0	0.004196	B	0
Furans													
1,2,3,4,6,7,8-Heptachlorodibenzofuran	0.01	0.001186	=	1.2E-05	0.001927	=	1.93E-05	0.001254	=	1.25E-05	0.002171	=	0.00002171
1,2,3,4,7,8,9-Heptachlorodibenzofuran	0.01	0.00164	=	1.6E-05	0.002667	=	2.67E-05	0.001736	=	1.74E-05	0.003003	=	0.00003003
1,2,3,4,7,8-Hexachlorodibenzofuran	0.1	0.001545	X	0.00015	0.001607	=	0.000161	0.002444	X	0.000244	0.005505	X	0.0005505
1,2,3,6,7,8-Hexachlorodibenzofuran	0.1	0.001553	U	7.8E-05	0.001615	U	8.08E-05	0.002455	U	0.000123	0.005531	=	0.0005531
1,2,3,7,8,9-Hexachlorodibenzofuran	0.1	0.001986	U	9.9E-05	0.002065	U	0.000103	0.00314	U	0.000157	0.007074	U	0.0003537
1,2,3,7,8-Pentachlorodibenzofuran	0.05	0.001127	X	5.6E-05	0.002038	X	0.000102	0.002235	U	5.59E-05	0.002478	U	0.00006195
2,3,4,6,7,8-Hexachlorodibenzofuran	0.1	0.001555	U	7.8E-05	0.001617	=	0.000162	0.002459	U	0.000123	0.005539	X	0.0005539
2,3,4,7,8-Pentachlorodibenzofuran	0.5	0.001105	X	0.00055	0.001998	X	0.000999	0.002192	U	0.000548	0.00243	U	0.0006075
2,3,7,8-Tetrachlorodibenzofuran	0.1	0.000938	U	4.7E-05	0.00214	CX	0.000214	0.001277	CX	0.000128	0.002013	CX	0.0002013
Octachlorodibenzofuran	0.0001	0.002756	B	1.4E-07	0.004324	B	2.16E-07	0.002891	B	1.45E-07	0.009845	=	9.845E-07
Total TCDD				**0.00241**			**0.0037718**			**0.0031933**			**0.005244945**

Notes:

Bold indicates exceedance of Region 9 PRG.

TCDD: Tetrachlorodibenzo-P-Dioxin

TEF: Toxicity Equivalence Factor

=: sample concentration is detected at level reported

U: sample concentration is under detection limit

X: user define flag

C: sample concentration is confirmed

B: sample concentration is found in blank sample

Dioxin and furan concentrations were equalized in toxicity to TCDD by multiplying the TEF by the dioxin or furan contaminant concentration. Half of the undetected concentrations were used in calculations if there was a detection of the specific contaminant in any of the samples from U.S. Drum or Unnamed Parcel.

Table D-13. PCBs Exceedences of Soil ROs in Unnamed Parcel (mg/kg)

	TEF	*Unnamed Parcel*											
Station ID		Pit 15		TCDD	Pit 12		TCDD	Pit 26		TCDD	Pit 33		TCDD
Sample ID		X186			X127			X152			X165		
Depth (ft.)		4			3			3			3		
EPA Region 9 Preliminary Remediation Goal for Dioxins and Furans as TCDD - 2.7 E-05 (mg/kg).													
Dioxins													
1,2,3,4,6,7,8-Heptachlorodibenzo-P-Dioxin	0.01	0.002455	=	0.00002455	0.001902	=	1.9E-05	0.000901	=	9.01E-06	0.001381	=	0.00001381
1,2,3,4,7,8-Hexachlorodibenzo-P-Dioxin	0.1	0.001655	U	0.00008275	0.001398	X	0.00014	0.000566	=	0.0000566	0.000506	=	0.0000506
1,2,3,6,7,8-Hexachlorodibenzo-P-Dioxin	0.1	0.001583	X	0.0001583	0.001338	=	0.000134	0.000541	=	0.0000541	0.000484	=	0.0000484
1,2,3,7,8,9-Hexachlorodibenzo-P-Dioxin	0.1	0.001556	=	0.0001556	0.001315	=	0.000132	0.000532	=	0.0000532	0.000476	X	0.0000476
1,2,3,7,8-Pentachlorodibenzo-P-Dioxin	1	0.00179	U	0.000895	0.002085	U	0.001043	0.000826	U	0.000413	0.000674	=	0.000674
2,3,7,8-Tetrachlorodibenzo-P-Dioxin	1	0.000988	U	0	0.001358	U	0	0.000256	U	0	0.000535	U	0
Octachlorodibenzo-P-Dioxin	0.0001	0.00239	B	0	0.002148	B	0	0.000941	B	0	0.000456	B	0
Furans													
1,2,3,4,6,7,8-Heptachlorodibenzofuran	0.01	0.001186	=	0.00001186	0.000376	=	3.76E-06	0.000961	X	9.61E-06	0.001187	=	0.00001187
1,2,3,4,7,8,9-Heptachlorodibenzofuran	0.01	0.00164	=	0.0000164	0.00052	X	5.2E-06	0.00133	=	0.0000133	0.001642	=	0.00001642
1,2,3,4,7,8-Hexachlorodibenzofuran	0.1	0.001545	X	0.0001545	0.001433	I	0.000143	0.002355	I	0.0002355	0.003178	I	0.0003178
1,2,3,6,7,8-Hexachlorodibenzofuran	0.1	0.001553	U	0.00007765	0.00144	=	0.000144	0.002366	U	0.0001183	0.003193	X	0.0003193
1,2,3,7,8,9-Hexachlorodibenzofuran	0.1	0.001986	U	0.0000993	0.001841	U	9.21E-05	0.003026	U	0.0001513	0.004083	=	0.0004083
1,2,3,7,8-Pentachlorodibenzofuran	0.05	0.001127	X	0.00005635	0.000926	U	2.32E-05	0.000554	U	1.385E-05	0.000337	=	0.00001685
2,3,4,6,7,8-Hexachlorodibenzofuran	0.1	0.001555	U	0.00007775	0.001442	=	0.000144	0.002369	U	0.0001185	0.003197	=	0.0003197
2,3,4,7,8-Pentachlorodibenzofuran	0.5	0.001105	X	0.0005525	0.000908	=	0.000454	0.000544	U	0.000136	0.000331	=	0.0001655
2,3,7,8-Tetrachlorodibenzofuran	0.1	0.000938	U	0.0000469	0.000271	C	2.71E-05	0.000584	C	0.0000584	0.001677	C	0.0001677
Octachlorodibenzofuran	0.0001	0.002756	B	1.378E-07	0.001816	=	1.82E-07	0.001747	=	1.747E-07	0.000791	=	7.91E-08
Total TCDD				**0.002409548**			**0.0025036**			**0.00144079**			**0.002577929**

Notes:

Bold indicates exceedance of Region 9 PRG.

TCDD: Tetrachlorodibenzo-P-Dioxin

TEF: Toxicity Equivalence Factor

=: sample concentration is detected at level reported

U: sample concentration is under detection limit

R: sample concentration value is rejected

X: user define flag

C: sample concentration is confirmed

B: sample concentration is found in blank sample

Dioxin and furan concentrations were equalized in toxicity to TCDD by multiplying the TEF by the dioxin or furan contaminant concentration. Half of the undetected concentrations were used in calculations if there was a detection of the specific contaminant in any of the samples from U.S. Drum or Unnamed Parcel.

Table D-14. Exceedances of Class I and II Groundwater Remediation Objectives (ug/L)

	TACO Tier I Groundwater ROs		Alburn								
Analyte	*Class I*	*Class II*	**GW2**	**P01**	**P02**	**P03**	**P04**	**P05**	**LC07**	**LC09**	**LC10**
Date			**Sep-98**	**May-99**							
VOCs											
Acetone	*700*	*700*									
Benzene	*5*	*25*	**8 J**	55 J	95 J	**14**	68	65 J	2400 J	**6 J**	**7 J**
Chlorobenzene	*100*	*500*			**170**						
1,1-Dichloroethane	*700*	*3500*									
Ethylbenzene	*700*	*1000*							5800 J		
Methylene chloride	*5*	*50*		**13 J**	170 J	**17 J**	**19 J**				
Tetrachloroethene	*5*	*25*									
Toluene	*1000*	*2500*			1600				38000 J		
Trichloroethene	*5*	*25*									
Vinyl chloride	*2*	*10*									
Xylenes	*10000*	*10000*							18000 J		
SVOCs											
Benzo[a]anthracene	*0.13*	*0.65*		3 J							8 J
Benzo[a]pyrene	*0.2*	*2*		3 J							8 J
Benzo[b]fluoranthene	*0.18*	*0.9*		2 J							10 J
Benzo[k]fluoranthene	*0.17*	*0.85*		3 J							9 J
Bis(2-chloroethyl)ether	*10*	*10*						23	260 J		
Bis(2-ethylhexyl)phthalate	*6*	*60*									79
Chrysene	*1.5*	*7.5*		**3 J**							8 J
Dibenz[a,h]anthracene	*0.3*	*1.5*									**0.8 J**
2,4-Dimethylphenol	*140*	*140*							320		
Indeno[1,2,3-cd]pyrene	*0.43*	*2.15*		**1 J**							**2 J**
2-Methylphenol	*350*	*350*									
N-Nitrosodiphenylamine	*3.2*	*16*							**6 J**		
Naphthalene	*140*	*220*							420 J		
Phenol	*100*	*100*									
Inorganics											
Antimony, Total	*6*	*24*	**6.6**						64.1 B		
Arsenic, Total	*50*	*200*							**122**		
Barium, Total	*2000*	*2000*			2160		4650		2980		
Beryllium, Total	*4*	*500*							**6.3**		
Cadmium, Total	*5*	*50*			**9.9**				**20.7**	**18.2**	**21.9**

Table D-14. Exceedances of Class I and II Groundwater Remediation Objectives (ug/L)

	TACO Tier I Groundwater ROs		Alburn								
Analyte	***Class I***	***Class II***	**GW2**	**P01**	**P02**	**P03**	**P04**	**P05**	**LC07**	**LC09**	**LC10**
Chromium, Total	*100*	*1000*			**160**				**268**	**352**	**352**
Copper, Total	*650*	*650*							1170		
Iron, Total	*5000*	*5000*	35400	57000	105000		64900	18900	217000	172000	151000
Lead, Total	*7.5*	*100*	251	740	422		594	**14.4**	3110	2100	1480
Manganese, Total	*150*	*10000*	**1410**	**1520**	**2250**	**359**	**1530**	**263**	**4070**	**1460**	**902**
Mercury, Total	*2*	*10*									**3.6**
Nickel, Total	*100*	*2000*	**110**		**106**				**216**	**151**	**133**
Thallium, Total	*2*	*20*				**2.6 B**					
Vanadium, Total	*49*	*NA*			95		65		254	83.3	53.9 B
Zinc, Total	*5000*	*10000*							**6940**		**5030**

Notes:

TACO = Tiered Approach to Corrective Action Objectives, 35 Illinois Administrative Code, Part 742.

NA = Not Available.

Empty boxes indicate concentrations below Class I GROs.

Bold concentrations exceed Class I GROs but do not exceed Class II GROs.

J = Estimated Value.

B = Contaminant also found in blank.

Table D-14. Exceedances of Class I and II Groundwater Remediation Objectives (ug/L)

	TACO Tier I Groundwater ROs		U.S. Drum									Unnamed Parcel	N. of Paxton I	N. of U.S.Drum
Analyte	*Class I*	*Class II*	GW1	G21S	LC04	LC05	LC06	LC11	LC12	LC03	GW3	LC13	LC01	LC02
Date			Sep-98	May-99							Sep-98	May-99	May-99	May-99
VOCs														
Acetone	*700*	*700*											5000	
Benzene	*5*	*25*	**6 J**	**21**			26 J	27 J	72 J	**9 J**	**6 J**	52 J	73 J	
Chlorobenzene	*100*	*500*												
1,1-Dichloroethane	*700*	*3500*											**1400**	
Ethylbenzene	*700*	*1000*												
Methylene chloride	*5*	*50*											22000	
Tetrachloroethene	*5*	*25*											130	
Toluene	*1000*	*2500*											3700	
Trichloroethene	*5*	*25*											270	
Vinyl chloride	*2*	*10*											84 J	
Xylenes	*10000*	*10000*												
SVOCs														
Benzo[a]anthracene	*0.13*	*0.65*				0.7 J	2 J		2 J	2 J		2 J		2 J
Benzo[a]pyrene	*0.2*	*2*				0.5 J	**2 J**		**2 J**	**2 J**		**2 J**		**2 J**
Benzo[b]fluoranthene	*0.18*	*0.9*					2 J		2 J	2 J		2 J		3 J
Benzo[k]fluoranthene	*0.17*	*0.85*					1 J		1 J	2 J		1 J		2 J
Bis(2-chloroethyl)ether	*10*	*10*												
Bis(2-ethylhexyl)phthalate	*6*	*60*										42 J		
Chrysene	*1.5*	*7.5*					**2 J**		**2 J**	**2 J**		**2 J**		**3 J**
Dibenz[a,h]anthracene	*0.3*	*1.5*												
2,4-Dimethylphenol	*140*	*140*												
Indeno[1,2,3-cd]pyrene	*0.43*	*2.15*					**0.6 J**		**0.7 J**	**1 J**		**0.6 J**		**2 J**
2-Methylphenol	*350*	*350*											370 J	
N-Nitrosodiphenylamine	*3.2*	*16*												
Naphthalene	*140*	*220*												
Phenol	*100*	*100*											3300	
Inorganics														
Antimony, Total	*6*	*24*					160							
Arsenic, Total	*50*	*200*					**52**					**72.7**		
Barium, Total	*2000*	*2000*					2530							
Beryllium, Total	*4*	*500*					**5 B**							
Cadmium, Total	*5*	*50*			**8.5**	**5.7 J**	**11**					148	**8 J**	

Table D-14. Exceedances of Class I and II Groundwater Remediation Objectives (ug/L)

	TACO Tier I Groundwater ROs		U.S. Drum									Unnamed Parcel	N. of Paxton I	N. of U.S.Drum
Analyte	***Class I***	***Class II***	**GW1**	**G21S**	**LC04**	**LC05**	**LC06**	**LC11**	**LC12**	**LC03**	**GW3**	**LC13**	**LC01**	**LC02**
Chromium, Total	*100*	*1000*				**288**	**150**					**299**	**341**	
Copper, Total	*650*	*650*										894		
Iron, Total	*5000*	*5000*	16400	6830	35700	88700	114000	9080	48200	70600		226000	1370000	42900
Lead, Total	*7.5*	*100*			154	1320	2720	**13.5**	320	364	**19.6**	2180	261	**64.5**
Manganese, Total	*150*	*10000*	**511**	**179**	**1010**	**8520**	**3560**	**173**	**625**	**1400**	**241**	**2290**	12700	**1430**
Mercury, Total	*2*	*10*					**2.8**					**9.3**		
Nickel, Total	*100*	*2000*					**105**		**111**			**248**	**1860**	**170 J**
Thallium, Total	*2*	*20*											**16.3 J**	
Vanadium, Total	*49*	*NA*				192	107					97.7	74.3	69.9
Zinc, Total	*5000*	*10000*										10200	47900	

Notes:

TACO = Tiered Approach to Corrective Action Object

NA = Not Available.

Empty boxes indicate concentrations below Class I GR

Bold concentrations exceed Class I GROs but do not e

J = Estimated Value.

B = Contaminant also found in blank.

APPENDIX E

Results of Laboratory Analyses

Table E-1. Inorganics in Alburn (mg/kg)

Station ID	Sample ID	pH	Depth (ft.)	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium	Cobalt	Copper	Cyanide	Iron
		Ing			*820*	*13*	*140000*	*1*	*2000*		*10000*	*120000*	*82000*	*41000*	
Industrial/ Commercial		*Inh*				*1200*	*910000*	*2100*	*2800*		*420*				
		Ing			*82*	*61*	*14000*	*29*	*200*		*4100*	*12000*	*8200*	*4100*	
Construction Worker		*Inh*				*25000*	*870000*	*44000*	*59000*		*8800*				
		I													
Soil Component of GW		*II*													
Pit 01	X101	8.5	2.5	10300 =	1.9 J	9.6 =	128 =	1.1 =	0.79 =	72100 =	55.4 =	10.2 =	95.8 J	0.56 =	27500 =
Pit 01	X102	8.3	7.5	4920 =	3.7 J	11.8 =	269 =	0.54 =	0.79 =	69800 =	47.5 =	0.63 J	167 J	0.2 =	49700 =
Pit 01B	X101	9.6	3	9530 =	1.9 J	9 J	150 =	1.3 =	1.3 =	103000 =	38.7 =	9.6 =	113 =		28900 =
Pit 01B	X102	5.0	6	9770 =	5 =	8.5 J	160 =	0.83 =	2.4 =	150000 =	40.3 =	8.1 =	71.8 =		23500 =
Pit 02	X103	11.8	2	9770 =	0.87 J	16.4 =	29.4 =	2 =	0.31 =	315000 =	22.1 =	0.58 J	14 J	0.35 =	9900 =
Pit 02	X104	12.1	6	8310 =	1.4 J	5 =	28.9 =	0.99 =	0.42 =	346000 =	36.4 =	0.6 U	17.6 J	5 =	10100 =
Pit 03	X105	11.9	2.5	31900 =	3.3 J	13.8 =	156 =	2.8 =	2.2 =	320000 =	82 =	0.68 J	309 J	2.7 =	23200 =
Pit 03	X106	11.9	0.5	16300 =	1.9 J	10.1 =	65.3 =	2.3 =	1.6 =	250000 =	47.4 =	8.7 J	111 J	1.4 =	16600 =
Pit 03	X107	10.7	6	14100 =	4.6 J	11.7 =	130 =	1.9 =	38.1 =	189000 =	95.4 =	0.71 J	149 J	7.5 =	20500 =
Pit 04	X108	8.8	3	12600 =	1.6 J	5.7 =	324 =	2.3 =	0.94 =	83400 =	50.1 =	0.47 U	41.7 J	1.6 =	22700 =
Pit 04	X109	8.6	3	10400 =	1.9 J	7 =	296 =	1.8 =	1.4 =	75200 =	67.6 =	0.48 U	72.9 J	3.2 =	31300 =
Pit 04	X110	9.8	6	14600 =	4.2 J	4.9 =	309 =	3.7 =	3.7 =	122000 =	120 =	3.6 J	49.4 J	14.3 =	18100 =
Pit 05	X111	8.6	5	6920 =	0.93 J	6.3 =	93.8 =	0.46 =	0.23 U	48300 =	27.3 =	0.57 J	28.5 J	0.87 =	18300 =
Pit 07	X112	8.6	3	7370 =	0.93 J	7.5 =	160 =	0.97 =	0.76 =	86500 =	33.5 =	0.59 J	35.1 J	0.43 =	18000 =
Pit 08	X113	7.2	2.5	10800 =	2.9 J	10 J	148 =	1.3 =	0.82 =	47100 =	20.2 =	5.8 J	52.5 =	0.21 J	31600 =
Pit 08	X114	8.6	4	9680 =	6.1 J	9.6 J	405 =	2.1 =	1.7 =	83500 =	51.5 =	6.1 J	94.5 =	1.3 J	26700 =
Pit 09	X115	9.5	2.5	31500 =	7.1 J	4 J	429 =	6.7 =	0.53 =	191000 =	69.7 =	3.7 J	86.7 =	3.8 =	23700 =
Pit 09	X116	8.7	6	35900 =	2.3 J	3.6 J	457 =	8.4 =	0.29 =	223000 =	37.5 =	2.9 J	48.5 =	3.2 =	28300 =
Pit 10	X117	9.1	2.5	13600 =	2.3 J	5.3 J	185 =	2.2 =	0.68 =	117000 =	191 =	6.2 J	88.4 =	1.6 J	39700 =
Pit 10	X118	7.7	6	8670 =	10.5 J	33.1 J	754 =	1.4 =	4.7 =	26400 =	58.8 =	16.1 =	502 =	0.51 J	123000 =
Pit 11	X119	8.4	2.5	7000 =	1.6 J	14 J	45.6 =	0.63 =	0.22 U	58800 =	154 =	12.5 =	54.6 =	0.71 J	33800 =
Pit 11	X120	8.3	6	8510 =	5.3 J	20.9 J	380 =	0.91 =	3.5 =	53200 =	80.8 =	5.8 J	187 =	2.1 =	46300 =
Pit 12	X159	9.0	3	19900 J	11.2 =	23.5 J	794 =	1.3 J	142 =	43800 =	1400 J	11.8 =	1560 =	4.1 =	30900 J
Pit 12	X160	9.0	3	22300 J	6.5 =	13.9 J	378 =	1 J	60.1 =	40100 =	731 J	10.3 =	1240 =	7 =	58300 J
Pit 12	X161	8.1	9	5890 J	2.9 J	15.3 J	77.9 =	0.45 =	3.5 J	47600 =	45.4 J	8.5 =	142 J	0.18 U	56100 J
Pit 13	X145	7.5	3	7100 J	8.3 =	18.4 J	160 =	0.88 J	0.23 R	57100 =	331 J	24.6 =	202 =	0.24 =	187000 J
Pit 13	X146	7.5	9	8700 J	3.3 =	8.9 J	308 =	0.52 J	2.7 =	90800 =	25.7 J	6.2 =	124 =	1.2 =	28300 J
Pit 14	X147	11.8	3	7950 J	2.2 =	4.4 J	102 =	0.97 J	0.27 U	160000 =	177 J	5.7 =	49.4 =	1.4 =	28300 J
Pit 14	X148	8.1	9	18000 J	16.7 =	16.1 J	250 =	0.59 J	8.8 =	54800 =	299 J	9.3 =	802 =	13.3 =	190000 J
Pit 15	X121	7.9	3	10000 =	7.4 J	11.3 J	227 =	1.4 =	3.1 =	26600 =	50 =	9.1 J	204 =	0.87 J	30700 =
Pit 16	X142	8.3	3	6570 J	1020 =	9.4 J	195 =	0.7 J	7.4 =	188000 =	1550 J	4.3 =	112 =	1 =	79300 J
Pit 16	X143	9.2	3	6560 J	770 =	7.3 J	226 =	0.86 J	7.6 =	141000 =	1010 J	4.5 =	86.8 =	1 =	49400 J
Pit 16	X144	7.7	9	11300 J	130 =	37.1 J	730 =	2.4 =	0.64 =	25700 =	57.1 J	12.7 =	172 =	0.89 =	87500 J

Table E-1. Inorganics in Alburn (mg/kg)

Station ID	Sample ID	pH	Depth (ft.)	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium	Cobalt	Copper	Cyanide	Iron
		Ing			*820*	*13*	*140000*	*1*	*2000*		*10000*	*120000*	*82000*	*41000*	
Industrial/ Commercial		*Inh*				*1200*	*910000*	*2100*	*2800*		*420*				
		Ing			*82*	*61*	*14000*	*29*	*200*		*4100*	*12000*	*8200*	*4100*	
Construction Worker		*Inh*				*25000*	*870000*	*44000*	*59000*		*8800*				
		I													
Soil Component of GW		*II*													
Pit 17	X122	7.7	3	18600 =	1.2 UJ	11.2 J	58.3 =	1.4 =	1.1 =	250000 =	27.3 =	6.5 J	22.1 =	1.1 J	10100 =
Pit 17	X123	8.2	6	8560 =	4 J	26.3 J	1580 =	0.93 =	1.5 =	196000 =	323 =	7 J	50 =	1 J	46200 =
Pit 18	X124	7.8	3	13300 =	13.8 J	25.4 J	1340 =	2.2 =	6.6 =	112000 =	157 =	7.3 J	163 =	2.3 =	42900 =
Pit 18	X125	8.4	6	10900 =	39 J	36 J	2860 =	1.4 =	22.9 =	42600 =	61.1 =	13.2 J	2270 =	1.4 J	86200 =
Pit 19	X168	10.8	3	13500 J	3.8 J	4.6 J	235 =	2.2 =	0.26 J	978000 R	594 J	4.1 =	28.9 J	0.47 =	71700 R
Pit 19	X169	8.2	8	4400 J	3.2 J	15.1 J	177 =	0.4 =	32.8 J	54300 =	39.8 J	5.3 =	288 J	2.9 =	44400 J
Pit 20	X173	8.2	3	15400 J	7.2 J	9.8 J	405 =	0.52 =	5.3 J	96900 =	57.3 J	10 =	331 J	1.4 =	108000 J
Pit 20	X174	8.9	8	6450 J	1.6 J	7.8 J	115 =	0.57 =	0.96 J	36600 =	24 J	5.9 =	80 J	0.31 =	20100 J
Pit 21	X170	8.9	3	9390 J	8 J	31.3 J	558 =	1.5 =	2.5 J	50000 =	622 J	12.6 =	398 J	218 J	89400 J
Pit 21	X171	8.4	3	10800 J	8.4 J	17.7 J	381 =	1.1 =	5.8 J	56800 =	582 J	9.4 =	351 J	193 J	121000 J
Pit 21	X172	8.2	11	7780 J	0.49 UJ	6.3 J	37.9 =	0.53 =	0.25 J	57500 =	15.4 J	8.1 =	20 J	0.26 =	16900 J
Pit 23	X126	8.4	3	9050 =	7.9 J	12.5 J	331 =	0.85 =	1.4 =	56000 =	269 =	8.8 J	486 =	1 J	47700 =
Pit 23	X127	8.1	7	6930 =	11.8 J	13.8 J	264 =	0.96 =	0.73 =	86200 =	231 =	11.7 J	103 =	1.6 J	16400 =
Pit 24	X138	7.3	3	9950 =	8.9 J	22 =	444 =	1.7 =	3.5 =	120000 =	108 =	10.7 =	328 J	1.4 =	74400 =
Pit 24	X139	7.9	9	6890 =	7.2 J	21 =	759 =	1.1 =	4.8 =	47800 =	83.3 =	11.2 =	192 J	1 =	28800 =
Pit 25	X132	7.9	2.5	15200 =	38.4 J	12.9 =	470 =	2.7 =	1.9 =	128000 =	176 =	84.2 =	217 J	3.5 =	34200 =
Pit 25	X133	10.0	8	15000 =	0.88 J	6.9 =	202 =	2.8 =	0.26 U	99700 =	21.3 =	8 J	23.4 J	2 =	18300 =
Pit 26	X140	10.1	3	17200 =	6.5 J	3 J	321 =	2.5 =	1.1 =	262000 =	1730 =	3.2 J	55 =	0.19 UJ	75500 =
Pit 26	X141	5.1	9	3890 J	3.2 =	3.3 J	102 =	0.95 J	1.3 =	8080 =	13.2 J	4.4 =	30.2 =	0.61 =	34000 J
Pit 27	X136	8.1	9	8160 =	7.1 J	12.4 =	236 =	1 =	1.8 =	94500 =	399 =	7.5 J	219 J	0.58 =	104000 =
Pit 27	X137	9.4	3	15400 =	5.8 J	16 =	247 =	3 =	0.6 =	150000 =	448 =	2.7 J	32 J	2.5 =	93300 =
Pit 28	X164	7.7	3	8830 J	39.8 J	4.6 J	943 =	0.99 =	18.8 J	149000 =	686 J	12.1 =	343 J	2.9 =	51300 J
Pit 28	X165	7.5	10	6350 J	16.5 J	10.6 J	265 =	0.73 =	4.7 J	39900 =	126 J	13.9 =	139 J	0.86 =	57200 J
Pit 29	X128	8.0	3	12400 =	4.4 J	11.7 J	194 =	0.86 =	2.1 =	66400 =	197 =	10.9 J	51.2 =	1.6 J	34600 =
Pit 29	X129	8.6	4.5	12700 =	2.7 J	17.2 J	241 =	2.5 =	0.81 =	174000 =	236 =	13.8 =	34.8 =	1.1 J	33000 =
Pit 30	X166	8.7	3	8720 J	24.1 J	32.1 J	191 =	1 =	4.8 J	51800 =	42.7 J	9.4 =	5010 J	0.29 U	37500 J
Pit 30	X167	9.1	9	4510 J	7.4 J	12.7 J	187 =	0.64 =	0.28 J	43900 =	206 J	6.7 =	129 J	0.99 =	79500 J
Pit 31	X130	9.7	3	14800 =	14.7 J	132 J	343 =	2.2 =	22.9 =	116000 =	330 =	17 =	162 =	8.5 =	62800 =
Pit 31	X131	7.8	6	10200 =	6.9 J	15.5 J	315 =	1.3 =	3.8 =	57700 =	55.5 =	11.5 J	490 =	0.79 J	50400 =
Pit 33	X134	8.7	3	14300 =	56.1 J	14.9 =	275 =	3.9 =	0.91 =	127000 =	269 =	5.7 J	27.3 J	1.9 =	35600 =
Pit 33	X135	8.5	8	12200 =	0.8 J	9.6 =	112 =	1.4 =	0.25 U	74600 =	25.7 =	11 =	30.2 J	0.44 =	25500 =
Pit 34	X162	10.2	3	10200 J	0.72 J	6.8 J	59.2 =	0.74 =	0.24 J	63600 =	66.8 J	11.4 =	41.1 J	5.1 =	27900 J
Pit 34	X163	10.2	9	5490 J	3.3 J	7.9 J	83.7 =	0.35 =	10.7 J	43500 =	71.5 J	7.4 =	965 J	1.6 =	30400 J
Pit 35	X149	7.7	3	7450 J	1 =	11.3 J	35.8 =	0.62 J	0.25 U	53600 =	15.1 J	12.7 =	39.9 =	0.18 U	23000 J

Table E-1. Inorganics in Alburn (mg/kg)

Station ID	Sample ID	pH	Depth (ft.)	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium	Cobalt	Copper	Cyanide	Iron
		Ing			*820*	*13*	*140000*	*1*	*2000*		*10000*	*120000*	*82000*	*41000*	
Industrial/ Commercial		*Inh*				*1200*	*910000*	*2100*	*2800*		*420*				
		Ing			*82*	*61*	*14000*	*29*	*200*		*4100*	*12000*	*8200*	*4100*	
Construction Worker		*Inh*				*25000*	*870000*	*44000*	*59000*		*8800*				
		I													
Soil Component of GW		*II*													
Pit 35	X150	8.0	9	5370 J	7.3 =	11.6 J	419 =	0.57 J	1.6 =	56300 =	808 J	10.5 =	770 =	0.69 =	68700 J
Pit 37	X151	7.6	3	2670 J	3.3 =	7 J	63.7 =	0.58 J	1.7 =	110000 =	70.1 J	3.5 =	68.7 =	1.4 =	32000 J
Pit 37	X152	8.1	9	8940 J	2.2 =	7.4 J	31.9 =	0.69 J	0.25 U	42200 =	23.5 J	11.6 =	29.1 =	0.56 =	52700 J
Pit 38	X157	7.4	3	9030 J	1.1 =	7.4 J	48 =	0.7 J	0.22 U	62000 =	20.4 J	10.7 =	26.5 =	0.24 =	22200 J
Pit 38	X158	8.5	9	6480 J	2.5 =	10.6 J	378 =	0.69 J	1.9 =	84400 =	38.4 J	7.8 =	300 =	1 =	43500 J
Pit 39	X153	11.4	3	8420 J	0.93 =	7 J	51.7 =	0.69 J	0.24 U	85600 =	91.3 J	9.7 =	32.3 =	0.88 =	22500 J
Pit 39	X154	8.8	9	5220 J	0.72 U	6 J	1410 =	0.54 J	0.39 =	79800 =	16.4 J	5.2 =	20.3 =	0.3 =	13700 J
Pit 40	X155	7.8	3	3840 J	1.2 =	8.9 J	75.9 =	0.6 J	0.71 =	44600 =	22.7 J	5.1 =	32.3 =	0.71 =	14800 J
Pit 40	X156	8.1	10	9710 J	1.2 =	10.2 J	30.9 =	0.75 J	0.23 U	53900 =	18.6 J	12.8 =	33 =	0.32 =	24200 J
Pit 41	X181	8.4	9	14000 =	2 J	11.8 =	89.8 =	0.89 =	0.26 U	62300 =	41.8 =	17.9 J	47.2 J	1.3 J	38000 =
Pit 41	X182	9.0	3	14500 =	3.3 J	16.1 =	140 =	1.6 =	0.26 U	84500 =	76.6 =	19.9 =	59.2 J	5.2 =	62600 =
Pit 42	X179	8.4	3	14500 J	3.4 J	29.8 J	225 =	1.7 =	2.1 J	100000 =	222 J	13.8 =	112 J	2.9 =	45300 J
Pit 42	X180	8.3	9	10800 J	0.95 J	4.3 J	180 =	1.8 =	0.85 J	156000 =	36.3 J	4.5 =	52.5 J	2.6 =	28600 J
Pit 43	X175	8.1	3	12100 J	14.8 J	151 J	116 =	1.2 =	3 J	84700 =	339 J	0.8 R	176 J	2.5 =	247000 J
Pit 43	X176	8.3	8	8060 J	1 J	5.4 J	64.6 =	0.86 =	0.44 J	116000 =	16.1 J	4.6 =	36.6 J	0.39 =	20000 J
Pit 44	X183	8.5	3	10800 =	5.7 J	9.8 =	100 =	0.81 =	0.25 U	70300 =	194 =	27.2 =	117 J	1.2 J	117000 =
Pit 44	X184		8	4720 =	19.3 J	22.3 =	52.6 =	0.61 =	0.31 R	106000 =	340 =	76 J	292 J	4.1 =	405000 =
Pit 45	X177	7.7	3	16500 J	0.84 UJ	6.7 J	42.1 =	1.7 =	0.6 J	45400 R	29.4 J	8 =	20.3 J	0.54 =	10100 R
Pit 45	X178	12.3	8	8280 J	0.6 UJ	4.7 J	32.9 =	0.89 =	0.44 J	239000 =	18.8 J	4.5 =	19.1 J	2.1 =	7970 J
Pit 52	X210	7.0	3	15000 =	2.4 J	15.1 =	361 =	2.2 =	3.2 =	65600 J	272 =	11.7 =	228 J	1 J	46600 =
Pit 52	X211	7.5	5	7910 =	1.6 UJ	16.5 =	1050 =	0.75 =	7.9 =	37000 J	43 =	10.2 =	232 J	0.22 R	65100 =
Pit 53	X212	9.9	3	12800 =	1.1 UJ	7 =	264 =	2.1 =	1.4 =	121000 J	360 =	6.8 =	138 J	0.49 J	73700 =
Pit 53	X213	7.7	7	8490 =	1.3 UJ	16.7 =	293 =	1.1 =	2.7 =	37100 J	57.4 =	11.3 =	418 J	0.18 R	103000 =

Notes:

=:	sample concentration is detected at level reported
U:	sample concentration is under detection limit
J:	sample concentration is estimated value
R:	sample concentration value is rejected
DL:	sample is diluted
RE:	sample is re-extracted
Ing.:	Ingestion
Inh.:	Inhalation
I:	Class I
II:	Class II

Table E-1. Inorganics in Alburn (mg/kg)

Station ID	Sample ID	pH	Depth (ft.)	Lead	Magnesium	Manganese	Mercury	Nickel	Potassium	Selenium	Silver	Sodium	Thallium	Vanadium	Zinc
		Ing		*400*		*96000*	*610*	*41000*		*10000*	*10000*		*160*	*14000*	*610000*
Industrial/ Commercial		*Inh*				*91000*	*540000*	*21000*							
		Ing		*400*		*9600*	*61*	*4100*		*1000*	*1000*		*160*	*1400*	*61000*
Construction Worker		*Inh*				*8700*	*52000*	*440000*							
		I													
Soil Component of GW		*II*													
Pit 01	X101	8.5	2.5	115 =	28800 =	1380 J	0.11 =	35.1 =	2150 =	1 J	0.24 U	879 =	1.6 J	30 =	189 J
Pit 01	X102	8.3	7.5	225 =	24200 =	684 J	0.47 =	47.7 =	920 =	0.92 J	0.78 =	934 =	3.4 J	15.9 =	274 J
Pit 01B	X101	9.6	3	282 =	22900 =	960 J	0.13 =	37.6 =	3850 J	1.2 J	0.52 =	2250 J	1.1 =	22.2 =	349 J
Pit 01B	X102	5.0	6	317 =	16000 =	502 J	1.2 =	30.7 =	2600 =	1.1 J	0.39 =	1270 J	1.7 =	43.6 =	618 J
Pit 02	X103	11.8	2	40.4 =	31700 =	156 J	0.12 =	23.7 =	117 =	2.2 J	0.29 U	655 =	0.58 J	29.5 =	61.3 J
Pit 02	X104	12.1	6	166 =	8300 =	319 J	0.19 =	16.1 =	314 =	0.9 U	0.3 U	867 =	0.6 J	21.6 =	84.6 J
Pit 03	X105	11.9	2.5	264 =	10100 =	674 J	0.99 =	49.8 =	2140 =	3.2 J	0.34 U	1380 =	1.2 J	54.2 =	460 J
Pit 03	X106	11.9	0.5	403 =	9100 =	357 J	0.52 =	33.7 =	438 =	3.3 J	0.31 U	814 =	0.8 J	49.9 =	221 J
Pit 03	X107	10.7	6	650 =	5270 =	501 J	0.17 =	56.5 =	7980 =	4.3 J	1.4 =	2670 =	1.3 J	49.3 =	965 J
Pit 04	X108	8.8	3	130 =	21100 =	1470 J	0.15 =	17.2 =	1450 =	1.3 J	0.24 U	1190 =	0.65 J	24.3 =	155 J
Pit 04	X109	8.6	3	209 =	21600 =	1360 J	0.19 =	29.6 =	1180 =	1.8 J	0.31 =	918 =	1.6 J	29.2 =	226 J
Pit 04	X110	9.8	6	327 =	31000 =	1890 J	0.17 =	32.1 =	1220 =	1.2 J	0.36 U	1330 =	0.72 U	18.7 =	712 J
Pit 05	X111	8.6	5	181 =	20900 =	1140 J	0.12 =	21.5 =	1560 =	0.68 U	0.23 U	512 =	0.86 J	22.9 =	104 J
Pit 07	X112	8.6	3	324 =	31400 =	1060 J	0.21 =	14.8 =	1300 =	0.72 U	0.24 U	764 =	0.67 J	22.2 =	224 J
Pit 08	X113	7.2	2.5	213 =	15800 =	909 =	0.4 =	24 =	1090 =	1.6 =	0.31 =	949 =	2.5 J	23 =	180 J
Pit 08	X114	8.6	4	326 =	28000 =	1320 =	0.42 =	21.4 =	1120 =	2.2 =	0.28 U	1030 =	1.8 J	24.2 =	425 J
Pit 09	X115	9.5	2.5	99.7 =	40100 =	3940 =	0.11 =	19.2 =	2010 =	2.4 =	0.24 U	1810 =	0.49 U	25.2 =	281 J
Pit 09	X116	8.7	6	113 =	44000 =	3270 =	0.11 =	13.3 =	3240 =	3.4 =	0.26 U	2040 =	0.53 U	15 =	82.8 J
Pit 10	X117	9.1	2.5	181 =	24100 =	3840 =	0.21 =	28.5 =	1670 =	1.6 =	0.25 =	871 =	1 J	84.9 =	201 J
Pit 10	X118	7.7	6	1210 =	5220 =	602 =	1 =	58.8 =	1170 =	6.3 =	5 =	2010 =	10.2 =	48.6 =	961 J
Pit 11	X119	8.4	2.5	177 =	28700 =	2560 =	0.08 =	36.2 =	1970 =	1.2 =	0.22 U	747 =	2.3 J	61.7 =	123 J
Pit 11	X120	8.3	6	1110 =	20400 =	782 =	0.43 =	29.1 =	1690 =	2.8 =	2 =	1600 =	3.5 J	26.5 =	864 J
Pit 12	X159	9.0	3	1070 J	14400 =	805 J	3.8 J	202 =	5950 J	2.9 J	37.1 =	11900 J	3 =	25.6 =	2910 J
Pit 12	X160	9.0	3	659 J	16200 =	1240 J	0.63 J	143 =	4500 J	1.7 J	18.8 =	6900 J	4 =	36.9 =	1600 J
Pit 12	X161	8.1	9	153 J	20400 =	577 J	0.09 =	25.6 =	1600 =	2.5 J	0.95 =	3410 =	3.9 J	14.8 =	399 J
Pit 13	X145	7.5	3	772 J	19100 =	3400 J	0.11 J	87.9 =	1060 J	4.6 =	0.89 =	895 J	11.4 =	61 =	262 J
Pit 13	X146	7.5	9	296 J	43900 =	359 J	0.74 J	23 =	1070 J	1.1 =	0.75 =	1300 J	1.2 =	14.6 =	432 J
Pit 14	X147	11.8	3	395 J	30200 =	2460 J	0.77 J	34.9 =	1020 J	1 =	0.27 U	687 J	0.66 =	42.9 =	117 J
Pit 14	X148	8.1	9	1040 J	4730 =	2130 J	0.09 J	119 =	1560 J	5.2 =	2.8 =	4130 J	13.3 =	22.4 =	1730 J
Pit 15	X121	7.9	3	337 =	2060 =	733 =	0.26 =	28.8 =	615 =	1.9 =	2.1 =	1300 =	2.9 J	37.6 =	440 J
Pit 16	X142	8.3	3	224 J	10700 =	27700 J	0.15 J	59.1 =	536 J	6.2 J	0.28 U	861 J	0.55 UJ	302 =	270 J
Pit 16	X143	9.2	3	269 J	18600 =	17700 J	0.15 J	20.6 =	598 J	3.9 J	0.26 U	926 J	0.52 U	174 =	303 J
Pit 16	X144	7.7	9	418 J	2960 =	630 J	1.5 J	38.8 =	1400 J	4 =	1.5 =	2030 J	6.3 =	39.3 =	513 J

Table E-1. Inorganics in Alburn (mg/kg)

Station ID	Sample ID	pH	Depth (ft.)	Lead	Magnesium	Manganese	Mercury	Nickel	Potassium	Selenium	Silver	Sodium	Thallium	Vanadium	Zinc
		Ing		*400*		*96000*	*610*	*41000*		*10000*	*10000*		*160*	*14000*	*610000*
Industrial/ Commercial		*Inh*				*91000*	*540000*	*21000*							
		Ing		*400*		*9600*	*61*	*4100*		*1000*	*1000*		*160*	*1400*	*61000*
Construction Worker		*Inh*				*8700*	*52000*	*440000*							
		I													
Soil Component of GW		*II*													
Pit 17	X122	7.7	3	59.8 =	9290 =	200 =	0.2 =	22.2 =	3140 =	2.4 =	0.4 U	1770 =	1.7 J	22 =	120 J
Pit 17	X123	8.2	6	467 =	11700 =	3230 =	0.37 =	79.4 =	1430 =	1.3 =	2.1 =	1420 =	2.1 J	46.3 =	684 J
Pit 18	X124	7.8	3	778 =	13200 =	3830 =	0.35 =	31.9 =	2330 =	2.2 =	1.3 =	1200 =	1.5 J	54.1 =	562 J
Pit 18	X125	8.4	6	2140 =	13000 =	741 =	1.7 =	56.6 =	1400 =	4.2 =	3.4 =	1210 =	6.5 =	39.5 =	1370 J
Pit 19	X168	10.8	3	78.7 J	26900 =	11200 R	0.11 =	13.7 =	1120 =	3.5 J	0.26 U	1280 =	0.77 UJ	296 =	147 R
Pit 19	X169	8.2	8	595 J	3740 =	431 J	0.42 =	25.4 =	650 =	1.4 J	0.64 =	2430 =	2.8 J	13.7 =	801 J
Pit 20	X173	8.2	3	599 J	3620 =	1160 J	0.64 =	50.1 =	707 =	2.8 J	0.7 =	1250 =	6.6 J	13.3 =	1800 J
Pit 20	X174	8.9	8	174 J	13300 =	428 J	0.17 =	17.9 =	1760 =	0.59 J	0.43 =	2450 =	1.5 J	20.5 =	199 J
Pit 21	X170	8.9	3	1480 J	20000 =	1320 J	0.38 =	567 =	2350 =	5.2 J	1.6 =	1600 =	5.7 J	62.5 =	608 J
Pit 21	X171	8.4	3	790 J	18700 =	7090 J	1.1 =	350 =	1510 =	5.6 J	1.3 =	1310 =	4.9 J	320 =	724 J
Pit 21	X172	8.2	11	35.1 J	28000 =	362 J	0.09 =	19.5 =	2090 =	0.49 R	0.25 U	504 =	1.6 J	18.3 =	58.6 J
Pit 23	X126	8.4	3	287 =	12900 =	4130 =	0.38 =	29.6 =	2090 =	1.7 =	0.7 =	837 =	2.2 J	77.9 =	383 J
Pit 23	X127	8.1	7	5580 =	13500 =	5640 =	0.18 =	27.4 =	771 =	5.3 =	1.6 =	814 =	8.3 J	95.7 =	414 J
Pit 24	X138	7.3	3	632 =	6350 =	2980 J	0.55 =	55.1 =	1630 =	2.5 J	1.9 =	1710 =	4.3 J	56.5 =	1310 J
Pit 24	X139	7.9	9	1550 =	17400 =	342 J	3.4 =	34 =	1250 =	3.2 J	4.4 =	1400 =	2.4 J	33.9 =	719 J
Pit 25	X132	7.9	2.5	382 =	24200 =	3590 J	0.25 =	137 =	2530 =	2 J	0.75 =	1920 =	0.48 U	45.3 =	2240 J
Pit 25	X133	10.0	8	27.2 =	28600 =	1240 J	0.12 =	21.4 =	2570 =	0.77 J	0.26 U	1530 =	0.67 J	18.9 =	444 J
Pit 26	X140	10.1	3	88.1 =	27700 =	40500 =	0.17 =	29.2 =	1050 =	7.9 R	0.26 U	1820 =	16 U	343 =	215 J
Pit 26	X141	5.1	9	51.6 J	883 =	268 J	0.18 J	13.2 =	573 J	1.5 J	1.4 =	1370 J	1.2 =	13.1 =	148 J
Pit 27	X136	8.1	9	852 =	16300 =	10600 J	0.23 =	153 =	1320 =	3.3 J	0.63 =	1960 =	3.3 J	86.6 =	836 J
Pit 27	X137	9.4	3	47 =	42300 =	11400 J	0.06 U	21.4 =	1030 =	6.4 =	0.26 U	1070 =	0.98 J	90.4 =	193 J
Pit 28	X164	7.7	3	1390 J	18800 =	18000 J	1.1 =	22.7 =	1120 =	4.5 J	1.5 =	916 =	0.82 UJ	190 =	1160 J
Pit 28	X165	7.5	10	607 J	7290 =	3500 J	0.71 =	43 =	1020 =	2.3 J	4.8 =	1920 =	3.3 J	87.1 =	1800 J
Pit 29	X128	8.0	3	86.9 =	21700 =	4050 =	0.09 =	34.6 =	2880 =	1.4 =	0.27 =	663 =	1.4 J	60.9 =	782 J
Pit 29	X129	8.6	4.5	120 =	22100 =	6950 =	0.5 =	18.7 =	1600 =	1.9 =	0.26 U	1310 =	0.53 U	61.7 =	325 J
Pit 30	X166	8.7	3	2440 J	8540 =	520 J	0.52 =	150 =	709 =	2 J	3.2 =	1560 =	2.8 J	102 =	708 J
Pit 30	X167	9.1	9	911 J	6330 =	2980 J	0.14 =	28.8 =	374 =	2.8 J	2 =	953 =	4.8 J	44.4 =	276 J
Pit 31	X130	9.7	3	978 =	23500 =	3090 =	0.15 =	40.8 =	2190 =	9.7 =	1.9 =	945 =	2.7 J	52.7 =	1420 J
Pit 31	X131	7.8	6	543 =	10100 =	581 =	0.97 =	58 =	2020 =	2.8 =	2.1 =	1620 =	3.6 J	30.9 =	4350 J
Pit 33	X134	8.7	3	70.2 =	24500 =	8560 J	0.19 =	12.9 =	1740 =	1.9 J	0.25 U	1520 =	0.5 U	64.7 =	640 J
Pit 33	X135	8.5	8	28.8 =	27300 =	777 J	0.12 =	28.3 =	2660 =	0.75 U	0.25 U	914 =	1.4 J	24.6 =	133 J
Pit 34	X162	10.2	3	66.7 J	25900 =	891 J	0.13 =	40.9 =	2910 =	0.57 J	0.24 U	761 =	1.7 J	30 =	297 J
Pit 34	X163	10.2	9	6730 J	7400 =	629 J	0.8 =	70.7 =	931 =	1.6 J	4.9 =	1320 =	1.8 J	12.2 =	299 J
Pit 35	X149	7.7	3	23.1 J	26100 =	371 J	0.09 J	35.4 =	1560 J	0.8 =	0.25 U	517 J	1.8 =	17.3 =	60 J

Table E-1. Inorganics in Alburn (mg/kg)

Station ID	Sample ID	pH	Depth (ft.)	Lead	Magnesium	Manganese	Mercury	Nickel	Potassium	Selenium	Silver	Sodium	Thallium	Vanadium	Zinc
		Ing		*400*		*96000*	*610*	*41000*		*10000*	*10000*		*160*	*14000*	*610000*
Industrial/ Commercial		*Inh*				*91000*	*540000*	*21000*							
		Ing		*400*		*9600*	*61*	*4100*		*1000*	*1000*		*160*	*1400*	*61000*
Construction Worker		*Inh*				*8700*	*52000*	*440000*							
		I													
Soil Component of GW		*II*													
Pit 35	X150	8.0	9	879 J	17000 =	1110 J	0.46 J	568 =	855 J	2.3 =	2.4 =	1530 J	3.9 =	48.2 =	718 J
Pit 37	X151	7.6	3	245 J	52300 =	1130 J	0.14 J	32.6 =	411 J	0.68 U	0.69 =	754 J	1.7 =	16.6 =	369 J
Pit 37	X152	8.1	9	21.2 J	24800 =	859 J	0.08 J	33.8 =	2360 J	0.74 U	0.25 U	1170 J	3.8 =	19.9 =	107 J
Pit 38	X157	7.4	3	17.2 J	28300 =	482 J	0.07 J	30.4 =	2180 J	0.67 U	0.22 U	648 J	1.3 =	20.5 =	104 J
Pit 38	X158	8.5	9	658 J	20100 =	560 J	0.25 J	42.1 =	2020 J	0.82 J	0.9 =	3250 J	3 =	18.1 =	560 J
Pit 39	X153	11.4	3	44.9 J	41800 =	1220 J	0.1 J	33.4 =	2480 J	0.73 U	0.24 U	1230 J	0.83 =	37.9 =	68 J
Pit 39	X154	8.8	9	88.8 J	22800 =	345 J	0.09 J	13.9 =	1240 J	0.72 U	0.24 U	892 J	1.1 =	13.4 =	768 J
Pit 40	X155	7.8	3	87.8 J	16400 =	431 J	0.1 J	23.2 =	770 J	0.77 J	0.25 U	531 J	1.1 =	17.6 =	393 J
Pit 40	X156	8.1	10	15.3 J	24500 =	391 J	0.07 J	38.1 =	2540 J	0.69 U	0.23 U	682 J	2.2 =	19.8 =	54.4 J
Pit 41	X181	8.4	9	57.3 J	26300 =	871 J	0.06 =	45.6 =	4210 =	0.52 U	0.42 J	1250 J	0.78 U	34 =	292 J
Pit 41	X182	9.0	3	153 J	26300 =	1920 J	0.08 =	41 =	3110 =	0.52 U	0.62 J	1490 J	1.2 =	38.8 =	584 J
Pit 42	X179	8.4	3	206 J	20700 =	4120 J	1.2 =	44.9 =	2420 =	2.3 J	0.46 =	1690 =	0.88 J	49.7 =	3400 J
Pit 42	X180	8.3	9	97.9 J	10600 =	1520 J	0.26 =	19.2 =	915 =	1.8 J	0.36 =	2850 =	1.4 J	11.8 =	138 J
Pit 43	X175	8.1	3	590 J	18800 =	6070 J	0.21 =	81.7 J	3060 =	8.2 J	3.7 =	1580 =	12.2 J	65.2 =	2040 J
Pit 43	X176	8.3	8	69.6 J	46700 =	766 J	0.2 =	15.3 =	1390 =	0.63 J	0.24 U	837 =	0.73 UJ	18 =	165 J
Pit 44	X183	8.5	3	348 J	16800 =	4750 J	0.21 =	68.2 =	2680 =	0.51 U	1.2 J	1830 J	3.6 =	42.6 =	1200 J
Pit 44	X184		8	1050 J	12400 =	11000 J	0.12 =	105 =	1150 =	1.7 =	4.4 =	2370 J	13.7 =	77.8 =	4150 J
Pit 45	X177	7.7	3	86.7 J	9830 =	181 R	0.13 =	27.4 =	1230 =	1.4 R	0.42 U	977 =	1.3 J	37.3 =	107 R
Pit 45	X178	12.3	8	108 J	6040 =	188 J	0.14 =	16.3 =	765 =	0.94 J	0.3 U	1150 =	1.3 J	16.8 =	88 J
Pit 52	X210	7.0	3	1120 =	14000 =	1720 J	0.33 =	41 =	3700 =	2.4 =	2.6 =	680 =	1 U	18.2 =	2000 =
Pit 52	X211	7.5	5	773 =	6440 =	456 J	0.7 =	41.2 =	946 =	2.2 =	18.4 =	577 =	1.3 UJ	19.3 =	1020 =
Pit 53	X212	9.9	3	331 =	22600 =	11500 J	0.37 =	79 =	1500 =	2.9 J	2.8 =	581 =	0.91 R	152 =	303 =
Pit 53	X213	7.7	7	862 =	6910 =	975 J	0.8 =	46.7 =	654 =	3.4 =	12.7 =	505 =	1 UJ	15.7 =	651 =

Notes:

=:	sample concentration is detected at level reported
U:	sample concentration is under detection limit
J:	sample concentration is estimated value
R:	sample concentration value is rejected
DL:	sample is diluted
RE:	sample is re-extracted
Ing.:	Ingestion
Inh.:	Inhalation
I:	Class I
II:	Class II

Table E-2. Inorganics in U.S. Drum (mg/kg)

Station ID	Sampe ID	pH	Depth (ft.)	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium	Cobalt	Copper	Cyanide	Iron
Industrial/ Commercial		*Ing*			*820*	*13*	*140000*	*1*	*2000*		*10000*	*120000*	*82000*	*41000*	
		Inh				*1200*	*910000*	*2100*	*2800*		*420*				
Construction Worker		*Ing*			*82*	*61*	*14000*	*29*	*200*		*4100*	*12000*	*8200*	*4100*	
		Inh				*25000*	*870000*	*44000*	*59000*		*8800*				
Soil Component of GW		*I*			*0.006*	*0.05*	*2*	*0.004*	*0.005*		*0.1*	*1*	*0.65*	*0.2*	*5*
		II			*0.024*	*0.2*	*2*	*0.5*	*0.05*		*1*	*1*	*0.65*	*0.6*	*5*
Pit 01	X207	8.3	4	9020 =	1.1 UJ	5.5 =	127 =	0.56 =	2.2 =	86100 J	489 =	5.3 =	87.3 J	0.15 R	30200 =
Pit 01	X208	8.6	9	6810 =	1.8 UJ	4.8 J	196 =	0.16 =	4 =	59500 J	96.2 =	7.4 =	106 J	0.24 R	79200 =
Pit 01	X209	8.1	13	5560 =	2.1 UJ	20.2 =	386 =	0.18 =	6.3 =	49000 J	925 =	16.8 =	444 J	1.6 J	242000 =
Pit 02	X205	7.5	3	8770 =	1.3 UJ	3.6 J	215 =	0.42 =	0.22 =	98400 J	90.3 =	8.3 =	24.6 J	0.17 R	16300 =
Pit 02	X206	8	9	1710 =	1.1 UJ	1.1 J	39 =	0.07 =	0.19 =	2080 J	8 =	1.5 =	24.8 J	0.15 R	9040 =
Pit 03	X201	7.8	3	2780 =	1.1 UJ	1.9 J	37.1 =	0.11 =	0.25 =	9260 J	12 =	1.5 =	208 J	4.9 J	14800 =
Pit 03	X202	8.6	8	2120 =	2 UJ	1.4 J	180 =	0.26 =	0.35 U	154000 J	4.3 =	1.4 U	47.3 J	0.27 R	3700 =
Pit 04	X177	8.6	4	11700 =	1.2 R	8.6 =	132 =	1.3 =	0.71 =	40700 =	25.5 =	10.6 =	44.5 =	0.19 J	21500 J
Pit 04	X178	7.9	8	7490 =	1.2 R	7 =	75.4 =	0.47 =	0.68 =	57400 =	31.7 =	9.6 =	35.1 =	1.1 J	29100 J
Pit 05	X198	7.8	2.5	3360 =	2.7 J	2.5 =	460 =	0.2 =	0.44 =	87000 J	10.4 J	2.4 =	145 =	0.15 U	7040 J
Pit 05	X199	9.6	8	8770 =	1.1 R	7.9 =	111 =	0.69 =	0.29 =	43700 J	123 J	6.8 =	28.1 =	0.15 U	21600 J
Pit 05	X200	10.1	8	8460 =	1.1 R	6.8 =	81.7 =	0.52 =	0.35 =	94000 J	1070 J	5.6 =	28 =	0.15 U	57800 J
Pit 06	X196	7.5	3	5250 =	1.1 R	5.5 =	87.1 =	0.79 =	0.51 =	41200 J	17.6 J	5.5 =	68.7 =	0.15 U	18300 J
Pit 06	X197	8.2	8	4720 =	1.3 R	5.1 =	124 =	0.47 =	1.6 =	53100 J	17.9 J	4.9 =	95.6 =	0.18 U	15700 J
Pit 07	X175	7.8	3	5300 =	3.5 R	18.6 =	303 =	0.43 U	1.7 =	179000 =	13.9 =	2.4 =	68.1 =	0.46 J	19600 J
Pit 07	X176	8.7	8	10000 =	1.2 R	6.6 =	42.8 =	0.46 =	0.21 U	51000 =	18.3 =	9.2 =	19.5 =	0.28 J	18300 J
Pit 08	X173	8.4	2.5	9620 =	1.1 R	11.8 =	152 =	0.75 =	2.5 =	56300 =	581 =	10.9 =	168 =	0.37 J	96300 J
Pit 08	X174	8	8	2570 =	1.1 R	4 =	971 =	0.12 =	0.2 =	62000 =	9.3 =	5.2 =	10.7 =	0.16 J	8790 J
Pit 09	X168	9.3	3	7780 =	1.1 R	6.6 =	43.3 =	0.44 =	0.26 =	50500 J	15.4 =	10.3 =	22.4 =	0.14 U	18300 =
Pit 09	X169	9	6.5	8700 =	1.1 R	8.2 =	49.2 =	0.5 =	0.19 U	51100 J	16.5 =	11.1 =	20.9 =	0.15 U	18400 =
Pit 09	X170	8.8	6.5	10900 =	1.1 R	5.9 =	62.1 =	0.58 =	0.19 U	59400 J	20.8 =	10.5 =	80.1 =	0.15 U	20600 =
Pit 10	X171	7.5	3	13000 =	1.7 R	13.7 =	273 =	0.22 =	6.5 =	15900 =	34.5 =	7.7 =	200 =	0.36 J	63800 J
Pit 10	X172	7	8	11600 =	2 R	22.4 =	469 =	0.98 =	12.8 =	37800 =	143 =	14.1 =	1980 =	0.31 J	111000 J
Pit 11	X190	7.3	2	7150 =	1.4 R	14.2 =	326 =	0.56 =	0.8 =	84600 J	17.2 J	5.1 =	43.3 =	0.19 U	45500 J
Pit 11	X191	6.9	8	22500 =	1.3 R	33.7 =	202 =	0.77 =	6.6 =	13800 J	102 J	18.8 =	242 =	0.17 U	54600 J
Pit 12	X192	11	3	9930 =	1.1 R	3.8 =	263 =	0.42 =	0.21 =	165000 J	735 J	2.9 =	14.3 =	0.15 U	78900 J
Pit 12	X193	8.5	8	7490 =	1.9 R	10.8 =	189 =	0.3 =	2.4 =	42100 J	25 J	7 =	58.3 =	0.19 U	23800 J
Pit 13	X194	8.4	3.5	7920 =	1.1 R	4.4 =	70.9 =	0.58 =	0.19 =	47100 J	14.6 J	8.8 =	30.2 =	0.15 U	16200 J
Pit 13	X195	7.5	12	3200 =	1.7 R	0.84 =	82.1 =	0.11 U	0.29 U	134000 J	3.3 J	1.1 U	29.4 =	0.23 U	13400 J
Pit 14	X184	10.3	4	7550 =	1 R	3.9 =	187 =	0.07 =	0.18 U	168000 J	590 J	2.5 =	15.8 =	0.14 U	101000 J
Pit 14	X185	8.4	9	5580 =	2.1 R	7.6 =	142 =	0.54 =	1.3 =	25900 J	21.7 J	4.6 =	32.3 =	0.28 U	14900 J
Pit 15	X186	10.8	4	12400 =	218 J	6.5 =	465 =	1 =	1.6 =	162000 J	430 J	5.4 =	34.7 =	0.46 =	70500 J
Pit 15	X187	8.5	8	7780 =	42.2 J	9.3 =	131 =	0.56 =	0.96 =	56500 J	70.4 J	6.4 =	56 =	0.16 =	29300 J

Table E-2. Inorganics in U.S. Drum (mg/kg)

Station ID	Sampe ID	pH	Depth (ft.)	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium	Cobalt	Copper	Cyanide	Iron
Industrial/ Commercial		*Ing*			*820*	*13*	*140000*	*1*	*2000*		*10000*	*120000*	*82000*	*41000*	
		Inh				*1200*	*910000*	*2100*	*2800*		*420*				
Construction Worker		*Ing*			*82*	*61*	*14000*	*29*	*200*		*4100*	*12000*	*8200*	*4100*	
		Inh				*25000*	*870000*	*44000*	*59000*		*8800*				
Soil Component of GW		*I*			*0.006*	*0.05*	*2*	*0.004*	*0.005*		*0.1*	*1*	*0.65*	*0.2*	*5*
		II			*0.024*	*0.2*	*2*	*0.5*	*0.05*		*1*	*1*	*0.65*	*0.6*	*5*
Pit 16	X188	8.7	3	9270 =	1.1 R	6.7 =	44.3 =	0.52 =	0.19 U	56400 J	18.3 J	10.9 =	21.6 =	0.15 U	20500 J
Pit 16	X189	7.5	7	7880 =	2.3 R	17.5 =	219 =	0.98 =	1.4 =	16100 J	73.1 J	6.5 =	63.9 =	0.3 U	105000 J
Pit 17	X181	8.4	3.5	9770 =	1.3 R	7.3 =	63 =	0.63 =	0.22 U	114000 J	53.9 J	9 =	21 =	0.17 U	21000 J
Pit 17	X182	11.2	7	8700 =	1.4 R	5.9 =	60.2 =	0.83 =	0.36 =	186000 J	21.2 J	5.6 =	21.8 =	0.18 U	12400 J
Pit 17	X183	8.8	13	9510 =	1.1 R	16 =	207 =	1.3 =	1.8 =	77300 J	25 J	6 =	44.5 =	0.35 =	13500 J
Pit 18	X179	6.4	3.5	1060 =	0.96 R	35.6 =	29 =	0.06 U	1.1 =	14400 =	295 =	32.6 =	550 =	0.19 J	257000 J
Pit 18	X180	8.4	7	10200 =	1.4 R	11 =	409 =	0.54 =	1.1 =	77600 =	289 =	9.7 =	419 =	0.7 J	37100 J
Pit 19	X166	10	3	9570 =	105 J	8 =	230 =	0.72 =	5.1 =	99100 J	297 =	12 =	61.3 =	0.23 =	43100 =
Pit 19	X167	9.5	9	12400 =	4.2 J	12.3 =	252 =	1.2 =	2.3 =	83500 J	93.2 =	9.4 =	139 =	0.18 U	50300 =
Pit 20	X164	7.8	3	15500 =	1.3 R	82.3 =	1740 =	2.5 =	3.2 =	25400 J	78.8 =	26.3 =	482 =	0.19 =	99100 =
Pit 20	X165	8.5	9	8420 =	2 R	18 =	608 =	0.91 =	12.1 =	62400 J	62.9 =	9.3 =	174 =	0.54 =	70700 =
Pit 21	X162	7	2	8620 J	15 J	18.4 =	396 J	0.36 U	14.5 =	35300 J	82.1 J	9.6 =	369 J	0.4 J	150000 J
Pit 21	X163	7	9	15000 J	9.9 J	19.2 =	354 J	0.33 U	12.1 =	23400 J	149 J	17.9 =	353 J	0.26 J	182000 J
Pit 22	X160	10	3.5	10700 J	1.8 UJ	7 =	185 J	0.69 =	0.64 U	82300 J	145 J	9 =	31.8 J	0.17 UJ	21800 J
Pit 22	X161	8.5	8	15700 J	2.4 J	10.9 =	412 J	2.1 =	1.5 =	97600 J	33.8 J	6.1 =	72.2 J	0.17 UJ	21500 J
Pit 23	X157	7.9	2.5	10100 J	1.6 J	82.5 =	60 J	0.19 U	0.54 U	50600 J	23.9 J	15.2 =	30.1 J	0.15 UJ	19100 J
Pit 23	X158	8.6	9	9790 J	5.1 J	11.9 =	181 J	0.21 U	2 =	56400 J	297 J	9.9 =	114 J	0.16 UJ	62100 J
Pit 23	X159	8.1	13	8840 J	4.7 J	19.9 =	277 J	0.31 U	4.7 =	54600 J	107 J	11.1 =	213 J	0.24 UJ	75800 J
Pit 24	X155	7.5	2.5	4720 J	24.4 J	10.5 =	331 J	0.26 U	4.5 =	20100 J	96.1 J	13.8 =	134 J	0.21 UJ	87300 J
Pit 24	X156	8.3	8.5	13800 J	1.5 UJ	21 =	169 J	1.4 =	0.99 =	14400 J	34.1 J	7.8 =	151 J	0.21 UJ	43900 J
Pit 25	X153	7.7	3	13000 J	7.1 J	79.9 =	1050 J	1.3 =	8.5 =	60000 J	54.3 J	9 =	295 J	0.23 UJ	57700 J
Pit 25	X154	7.9	9.5	7580 J	6.9 J	25.6 =	383 J	1.5 =	4.1 =	14400 J	29.8 J	7.5 =	150 J	0.17 UJ	32800 J
Pit 26	X151	8.7	3	5450 J	2.2 J	9.5 =	84.4 J	0.19 U	2.5 =	57000 J	74.8 J	7.2 =	49.4 J	0.15 UJ	55900 J
Pit 26	X152	7.9	9	9610 J	4.8 J	15.2 =	238 J	0.77 =	6.3 =	34200 J	66.8 J	9.7 =	479 J	0.16 UJ	52800 J
Pit 27	X149	7.9	3.5	11500 J	2.4 UJ	6.3 =	120 J	0.35 =	1 =	208000 J	34.1 J	6.7 =	21.3 J	0.24 UJ	45900 J
Pit 27	X150	7.5	10	5820 J	9 J	10.6 =	154 J	0.4 =	3.6 =	30300 J	44.2 J	6.4 =	113 J	0.5 J	43500 J
Pit 28	X147	8.3	3	5970 J	1.9 UJ	7.2 =	81.9 J	0.26 =	0.85 =	105000 J	20.5 J	4.6 =	74 J	0.19 UJ	14400 J
Pit 28	X148	7.7	8	5410 J	2.7 UJ	7.9 =	71.3 J	0.34 U	1.9 =	20400 J	24.1 J	5.1 =	67.3 J	0.26 UJ	39500 J
Pit 29	X145	8.1	4.5	5490 J	2.1 J	10.7 =	53.1 J	0.19 U	3.1 =	64100 J	149 J	7.5 =	65 J	0.18 J	98900 J
Pit 29	X146	7.9	8	11700 J	5.9 J	12.6 =	170 J	0.72 =	3.4 =	29100 J	45.7 J	9.9 =	104 J	0.18 UJ	34300 J
Pit 30	X143	7.4	4	12000 =	3 J	37.1 =	954 =	0.58 =	3.8 =	13500 J	72.9 =	14.2 =	228 =	0.92 J	48900 =
Pit 30	X144	7.9	6	9000 J	9.2 J	22.7 =	577 J	0.3 U	5.9 =	25300 J	182 J	12.8 =	492 J	0.23 UJ	58900 J
Pit 31	X141	8.7	4	6810 =	1.6 R	16.4 =	57.5 =	0.59 =	3.1 =	43000 =	44.5 =	13 =	195 =	0.29 J	62500 J

Table E-2. Inorganics in U.S. Drum (mg/kg)

Station ID	Sampe ID	pH	Depth (ft.)	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium	Cobalt	Copper	Cyanide	Iron
Industrial/ Commercial		*Ing*			*820*	*13*	*140000*	*1*	*2000*		*10000*	*120000*	*82000*	*41000*	
		Inh				*1200*	*910000*	*2100*	*2800*		*420*				
Construction Worker		*Ing*			*82*	*61*	*14000*	*29*	*200*		*4100*	*12000*	*8200*	*4100*	
		Inh				*25000*	*870000*	*44000*	*59000*		*8800*				
Soil Component of GW		*I*			*0.006*	*0.05*	*2*	*0.004*	*0.005*		*0.1*	*1*	*0.65*	*0.2*	*5*
		II			*0.024*	*0.2*	*2*	*0.5*	*0.05*		*1*	*1*	*0.65*	*0.6*	*5*
Pit 31	X142	8.6	9	9900 =	1.5 R	5.4 =	46.9 =	0.78 =	0.33 =	182000 =	14.6 =	6.3 =	11.7 =	0.31 J	7840 J
Pit 32	X139	8	3	5160 =	1.4 R	10.7 =	138 =	0.44 =	1 =	46000 =	39.1 =	7.1 =	130 =	0.35 J	34800 J
Pit 32	X140	8.1	9	17000 =	2.4 R	19 =	986 =	0.52 =	6.3 =	25100 =	111 =	7.3 =	1420 =	0.57 J	62200 J
Pit 33	X137	8.1	3	6970 =	4.1 J	19.3 =	285 =	1.5 =	4.1 =	38100 =	84.4 =	10.4 =	272 =	0.84 J	55100 J
Pit 33	X138	9	9	15500 =	1.1 R	13.1 =	179 =	2.3 =	1 =	105000 =	48.2 =	6.1 =	77.9 =	1.5 J	24100 J
Pit 34	X135	7.8	3	14700 =	1.6 R	25.9 =	290 =	1.3 =	2.2 =	36200 =	57 =	7.7 =	206 =	2.1 J	87700 J
Pit 34	X136	7.2	10	8640 =	1.7 R	15.7 =	1410 =	0.56 =	2.6 =	20800 =	37.3 =	6.5 =	134 =	0.66 J	58100 J
Pit 35	X133	8.3	4	1950 =	1.1 R	4.2 =	20.5 =	0.1 =	0.2 U	53700 =	6.4 =	3.1 =	12.3 =	0.43 J	9450 J
Pit 35	X134	7.9	10	5840 =	1.3 R	8.1 =	81 =	0.41 =	0.81 =	52800 =	18.1 =	7.5 =	51.7 =	0.2 J	26900 J
Pit 36	X131	7	4	10800 =	3.7 R	21.8 =	291 =	0.86 =	2.2 =	19800 J	66.2 =	14.2 =	131 =	0.5 U	183000 =
Pit 36	X132	8.2	11	4580 =	1.5 R	16.4 =	182 =	0.26 =	5.5 =	9920 J	94.7 =	15.1 =	468 =	0.2 U	138000 =
Pit 37	X128	7.7	3	6000 =	3.1 R	8.8 =	597 =	0.52 =	10.3 =	16200 J	47.8 =	8.5 =	219 =	0.42 U	52900 =
Pit 37	X129	7.6	3	9500 =	3.1 R	16 =	1060 =	0.66 =	16.4 =	36900 J	73.5 =	13 =	239 =	0.43 U	73700 =
Pit 37	X130	8	8	6740 =	1.3 R	10.9 =	271 =	1.3 =	2.1 =	20800 J	30.6 =	9.5 =	167 =	0.25 =	60100 =
Pit 38	X126	7.6	3	6910 =	2.3 R	14.5 =	333 =	0.56 =	5.1 =	15700 J	56.2 =	8.9 =	174 =	0.32 U	95700 =
Pit 38	X127	7.9	10	4620 =	1.7 R	8.8 =	174 =	0.46 =	2.4 =	26400 J	44.9 =	12.5 =	172 =	0.24 U	117000 =
Pit 39	X124	7.9	3	6860 =	1.1 R	11.3 =	39 =	0.44 =	0.41 =	47500 J	32.1 =	11.4 =	47.7 =	0.15 U	27000 =
Pit 39	X125	8.1	10	14500 =	1.8 R	12.2 =	711 =	0.53 =	4.9 =	15300 J	47.9 =	7.7 =	326 =	0.51 =	90500 =
Pit 40	X122	12.4	4	4650 =	1.4 R	9.1 =	74.1 =	0.24 =	2.3 =	177000 J	88.7 =	4.6 =	57.5 =	14.7 =	59600 =
Pit 40	X123	8.5	9	7970 =	2.4 R	34.5 =	340 =	0.91 =	3.3 =	29600 J	375 =	25.5 =	1030 =	0.33 U	97800 =
Pit 41	X120	8	3	10400 =	1.1 R	5.2 =	58.4 =	0.53 =	0.2 =	53000 J	19.9 =	10.5 =	20.2 =	0.16 U	19300 =
Pit 41	X121	5.7	8	6220 =	2.2 R	8.4 =	203 =	0.39 =	2.1 =	12100 J	135 =	3.8 =	77.6 =	0.29 U	58100 =
Pit 42	X117	10.3	2	11000 =	1.2 UJ	9.9 =	89.7 =	1.3 =	0.58 U	59100 J	24.4 =	13.2 =	35.3 =	2.9 J	25700 =
Pit 42	X118	8.3	9	9840 =	15.4 J	40.7 =	281 =	0.91 =	7.2 =	21600 J	103 =	22.4 =	271 =	0.67 J	122000 =
Pit 42	X119	8.4	15	8680 =	2.1 J	14.9 =	385 =	0.59 =	27.4 =	32600 J	116 =	10.4 =	205 =	1 J	53200 =
Pit 43	X115	8.1	3	13400 =	1.3 UJ	9 =	62.5 =	0.66 =	0.64 U	53600 J	23.8 =	13.4 =	38.5 =	0.17 UJ	30000 =
Pit 43	X116	8.1	9	7070 =	4.1 J	9.2 =	515 =	0.79 =	4.3 =	41600 J	109 =	7 =	603 =	8.9 J	26900 =
Pit 44	X113	8.3	3	7580 =	2.3 J	14.4 =	360 =	0.82 =	7.2 =	53700 J	186 =	8.6 =	780 =	0.16 UJ	59400 =
Pit 44	X114	8.3	9	6240 =	1.9 UJ	19.9 =	151 =	0.6 =	40.9 =	39000 J	46.3 =	8 =	121 =	8 J	69600 =
Pit 45	X111	8.7	3.5	13000 =	6.3 J	24.1 =	1100 =	1.6 =	12.5 =	30000 J	107 =	52.5 =	641 =	3.4 J	55900 =
Pit 45	X112	8.5	10	5370 =	1.3 UJ	7.1 =	101 =	0.32 =	2.6 =	175000 J	32.7 =	1.1 =	316 =	4.6 J	25300 =
Pit 46	X109	8.5	4	11900 =	1.9 J	26.6 =	60.5 =	0.8 =	18.9 =	105000 J	460 =	12.8 =	181 =	1.3 J	259000 =
Pit 46	X110	8.5	9	11200 =	2.8 J	25.4 =	291 =	0.69 =	20.9 =	89900 J	484 =	15.4 =	308 =	5.5 J	256000 =

Table E-2. Inorganics in U.S. Drum (mg/kg)

Station ID	Sampe ID	pH	Depth (ft.)	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium	Cobalt	Copper	Cyanide	Iron
Industrial/ Commercial		*Ing*			*820*	*13*	*140000*	*1*	*2000*		*10000*	*120000*	*82000*	*41000*	
		Inh				*1200*	*910000*	*2100*	*2800*		*420*				
Construction Worker		*Ing*			*82*	*61*	*14000*	*29*	*200*		*4100*	*12000*	*8200*	*4100*	
		Inh				*25000*	*870000*	*44000*	*59000*		*8800*				
Soil Component of GW		*I*			*0.006*	*0.05*	*2*	*0.004*	*0.005*		*0.1*	*1*	*0.65*	*0.2*	*5*
		II			*0.024*	*0.2*	*2*	*0.5*	*0.05*		*1*	*1*	*0.65*	*0.6*	*5*
Pit 47	X107	8.5	3.5	6610 =	1.3 UJ	4.7 =	59.7 =	0.45 =	0.65 U	84800 J	13.8 =	5.6 =	18 =	1.5 J	14700 =
Pit 47	X108	7	9	19100 =	113 J	11.1 =	1200 =	1.5 =	161 =	16400 J	110 =	13.3 =	6010 =	3.9 J	85000 =
Pit 48	X105	8.7	3	11500 =	1.1 UJ	6.2 =	58.7 =	0.55 =	0.53 U	59500 J	26.5 =	9.4 =	19.6 =	0.14 UJ	19400 =
Pit 48	X106	8.5	9	15200 =	11.4 J	36 =	598 =	1.2 =	17.7 =	52900 J	104 =	20.5 =	554 =	0.26 UJ	184000 =
Pit 49	X103	8.4	3	9420 =	1.1 UJ	5.1 =	46 =	0.47 =	0.54 U	67500 J	31.5 =	9.4 =	27.6 =	0.15 UJ	19000 =
Pit 49	X104	10	10	6020 =	1.3 UJ	5.2 =	33.6 =	0.3 =	0.63 U	67200 J	11.3 J	7.8 =	15.2 =	0.17 UJ	13900 =
Pit 50	X101	8.1	3	11600 =	1.2 UJ	4.8 =	138 =	1 =	1.2 =	159000 J	38 =	4.3 =	24.5 =	0.4 J	22500 =
Pit 50	X102	8.3	9	11200 =	3.3 J	21.6 =	423 =	0.81 =	5.1 =	19800 J	178 =	17.1 =	2200 =	6.6 J	95300 =
Pit 51	X203	7.9	3	5950 =	1.1 UJ	7.5 =	173 =	0.69 =	0.87 =	34500 J	22.7 =	5.4 =	38.1 J	0.14 R	18400 =
Pit 51	X204	7.8	8	4840 =	2.8 J	8 =	191 =	0.46 =	1.1 =	78900 J	16.9 =	4.6 =	57.8 J	0.17 R	17900 =

Notes:

=:	sample concentration is detected at level reported
U:	sample concentration is under detection limit
J:	sample concentration is estimated value
R:	sample concentration value is rejected
DL:	sample is diluted
RE:	sample is re-extracted
Ing.:	Ingestion
Inh.:	Inhalation
I:	Class I
II:	Class II

Table E-2. Inorganics in U.S. Drum (mg/kg)

Station ID	Sampe ID	pH	Depth (ft.)	Lead	Magnesium	Manganese	Mercury	Nickel	Potassium	Selenium	Silver	Sodium	Thallium	Vanadium	Zinc
Industrial/ Commercial		*Ing*		*400*		*96000*	*610*	*41000*		*10000*	*10000*		*160*	*14000*	*610000*
		Inh				*91000*	*540000*	*21000*							
Construction Worker		*Ing*		*400*		*9600*	*61*	*4100*		*1000*	*1000*		*160*	*1400*	*61000*
		Inh				*8700*	*52000*	*440000*							
Soil Component of GW		*I*		*0.0075*		*0.15*	*0.002*	*0.1*		*0.05*	*0.05*		*0.002*	*0.049*	*5*
		II		*0.1*		*10*	*0.01*	*2*		*0.05*			*0.02*		*10*
Pit 01	X207	8.3	4	139 =	29900 =	5280 J	0.35 =	23.8 =	1210 =	1.9 =	1.4 =	523 =	0.9 R	55.1 =	212 =
Pit 01	X208	8.6	9	369 =	24100 =	1590 J	0.43 =	45.4 =	1630 =	2.5 =	7.7 =	2330 =	1.5 UJ	9.7 =	979 =
Pit 01	X209	8.1	13	3360 =	9720 =	16400 J	0.45 =	120 =	1350 =	8.4 =	11.5 =	1760 =	1.7 R	32.4 =	2020 =
Pit 02	X205	7.5	3	526 =	27200 =	433 J	0.08 =	25.6 =	4000 =	0.77 =	0.56 =	415 =	1 U	14.9 =	108 =
Pit 02	X206	8	9	40.5 =	1170 =	110 J	0.06 U	7.6 J	243 =	0.45 U	4.7 =	272 =	0.88 U	2.1 =	147 =
Pit 03	X201	7.8	3	28.7 =	1810 =	293 J	0.06 U	10.2 J	468 =	0.66 =	0.87 =	208 =	0.85 U	4 =	45.1 =
Pit 03	X202	8.6	8	45 =	10600 =	517 J	0.11 U	2.6 J	511 =	0.83 U	0.48 U	468 =	1.6 U	3.9 =	44.6 =
Pit 04	X177	8.6	4	157 J	13600 =	633 J	0.14 =	33.4 =	2900 J	1.6 J	1.1 =	442 =	0.94 U	24.4 =	668 J
Pit 04	X178	7.9	8	59.9 J	22700 =	557 J	0.21 =	27.7 =	2190 J	1.4 J	1.2 =	341 =	0.96 U	17.8 =	310 J
Pit 05	X198	7.8	2.5	775 J	13600 =	235 J	0.06 U	6.7 =	498 =	0.46 U	1.1 =	689 =	0.9 U	12.8 J	570 =
Pit 05	X199	9.6	8	85.8 J	14500 =	3020 J	0.15 =	22.5 =	1700 =	1.7 =	0.98 =	390 =	0.91 U	46.4 J	94.2 =
Pit 05	X200	10.1	8	47.4 J	17800 =	22800 J	0.42 =	18.8 =	1630 =	4.1 J	3.2 =	399 =	0.91 R	237 J	92.1 =
Pit 06	X196	7.5	3	62.4 J	16400 =	579 J	0.06 =	14.6 =	1070 =	1.1 =	0.79 =	394 =	0.86 U	16.1 J	87.4 =
Pit 06	X197	8.2	8	97.2 J	14100 =	300 J	0.42 =	18.8 =	1300 =	0.88 =	1.2 =	726 =	1.1 U	12.4 J	939 =
Pit 07	X175	7.8	3	197 J	19100 =	508 J	0.41 =	13.7 =	1410 J	1.8 =	1.7 U	789 J	1.5 J	11.4 =	337 J
Pit 07	X176	8.7	8	10.3 J	24600 =	400 J	0.07 U	24 =	3390 J	0.81 J	0.75 =	299 =	0.95 U	19.5 =	47.6 J
Pit 08	X173	8.4	2.5	380 J	16700 =	4870 J	0.33 =	116 =	1160 J	3.1 J	3.8 =	225 =	0.9 R	61 =	826 J
Pit 08	X174	8	8	34.6 J	25100 =	303 J	0.1 =	8.8 =	660 J	0.47 U	0.27 U	238 =	0.91 U	8.6 =	503 J
Pit 09	X168	9.3	3	14.7 J	24400 =	399 J	0.06 U	25.7 =	2420 =	0.55 =	0.53 =	347 =	0.87 UJ	16.4 =	49.7 =
Pit 09	X169	9	6.5	14.2 J	23700 =	361 J	0.06 U	27.3 =	2400 =	0.45 U	0.5 =	432 =	0.88 UJ	16.1 =	72.5 =
Pit 09	X170	8.8	6.5	14.6 J	27000 =	408 J	0.47 =	27.7 =	3420 =	0.61 =	0.55 =	523 =	0.89 U	21.8 =	66.9 =
Pit 10	X171	7.5	3	1540 J	4940 =	605 J	0.25 =	34.4 =	647 J	3 J	5.7 =	498 =	1.4 UJ	6.5 =	1370 J
Pit 10	X172	7	8	1250 J	9120 =	1050 J	1.1 =	59.4 =	1540 J	5.3 J	19.3 =	816 =	1.6 UJ	16.7 =	1750 J
Pit 11	X190	7.3	2	202 J	11500 =	480 J	0.24 =	25.6 =	955 =	1.5 =	1.9 =	790 =	1.1 U	17.2 J	162 =
Pit 11	X191	6.9	8	5090 J	2860 =	438 J	0.27 =	67.4 =	778 =	1.5 =	3.4 =	489 =	1 U	15.1 J	2260 =
Pit 12	X192	11	3	54.4 J	26300 =	29700 J	0.06 U	10.3 =	1290 =	5 J	3.3 =	257 =	0.86 R	253 J	33.6 =
Pit 12	X193	8.5	8	366 J	15000 =	669 J	0.22 =	20.6 =	1540 =	2 J	0.93 U	743 =	2 J	20 J	253 =
Pit 13	X194	8.4	3.5	62.5 J	22800 =	369 J	0.1 =	21.3 =	2050 =	0.82 =	0.58 =	426 =	0.89 U	16.8 J	80.7 =
Pit 13	X195	7.5	12	15.4 J	5840 =	230 J	0.09 U	3.9 =	286 =	0.7 U	0.4 U	235 =	1.4 U	1.6 J	32.1 =
Pit 14	X184	10.3	4	39.9 J	27800 =	30600 J	0.06 U	11.9 =	438 =	5 J	3.8 =	138 =	0.83 R	243 J	23.6 =
Pit 14	X185	8.4	9	122 J	7750 =	433 J	0.11 U	15 =	1440 =	1.6 =	0.85 =	575 =	1.7 U	17.7 J	224 =
Pit 15	X186	10.8	4	302 J	31700 =	28500 J	1 =	17.2 =	1040 =	4.8 J	3.1 =	449 =	0.92 R	200 J	266 =
Pit 15	X187	8.5	8	201 J	18500 =	3060 J	0.27 =	20 =	1220 =	1.4 =	1.1 =	378 =	0.87 U	39.1 J	243 =

Table E-2. Inorganics in U.S. Drum (mg/kg)

Station ID	Sampe ID	pH	Depth (ft.)	Lead	Magnesium	Manganese	Mercury	Nickel	Potassium	Selenium	Silver	Sodium	Thallium	Vanadium	Zinc
Industrial/ Commercial		*Ing*		*400*		*96000*	*610*	*41000*		*10000*	*10000*		*160*	*14000*	*610000*
		Inh				*91000*	*540000*	*21000*							
Construction Worker		*Ing*		*400*		*9600*	*61*	*4100*		*1000*	*1000*		*160*	*1400*	*61000*
		Inh				*8700*	*52000*	*440000*							
Soil Component of GW		*I*		*0.0075*		*0.15*	*0.002*	*0.1*		*0.05*	*0.05*		*0.002*	*0.049*	*5*
		II		*0.1*		*10*	*0.01*	*2*		*0.05*			*0.02*		*10*
Pit 16	X188	8.7	3	13.5 J	23600 =	363 J	0.06 U	29.1 =	2920 =	0.89 =	0.64 =	393 =	0.87 U	18.8 J	53.9 =
Pit 16	X189	7.5	7	467 J	2820 =	576 J	0.63 =	17.1 =	781 =	3.3 =	4.8 =	648 =	1.8 U	14.7 J	1720 =
Pit 17	X181	8.4	3.5	30.6 J	19700 =	2090 J	0.07 U	31.8 =	2810 =	0.9 =	0.71 =	661 =	1 U	36.9 J	50.6 =
Pit 17	X182	11.2	7	191 J	8890 =	250 J	0.09 =	35.2 =	2140 =	1.4 =	0.33 U	977 =	1.1 U	18.4 J	105 =
Pit 17	X183	8.8	13	221 J	32600 =	1740 J	0.08 =	15.8 =	1770 =	1.5 =	0.54 =	466 =	0.92 U	16.6 J	249 =
Pit 18	X179	6.4	3.5	1790 J	3090 =	3590 J	0.05 U	470 =	240 J	7.4 =	8.3 =	86.3 U	0.77 R	10.1 =	42.8 J
Pit 18	X180	8.4	7	369 J	18100 =	4360 J	0.23 =	32.5 =	2180 J	2.1 J	2.2 =	526 =	1.1 UJ	44.7 =	315 J
Pit 19	X166	10	3	616 J	21500 =	11600 J	0.85 =	18.8 =	1810 =	2 J	1.7 =	916 =	0.95 R	120 =	452 =
Pit 19	X167	9.5	9	451 J	13100 =	4980 J	0.99 =	51.1 =	1270 =	2 J	2 =	1280 =	1.1 UJ	51.6 =	453 =
Pit 20	X164	7.8	3	329 J	3750 =	634 J	0.35 =	77.3 =	891 =	11.2 =	16.7 =	623 =	1 UJ	33.4 =	2150 =
Pit 20	X165	8.5	9	1220 J	10900 =	421 J	0.93 =	49.4 =	1250 =	3.6 =	8.6 =	1020 =	1.6 UJ	17.5 =	1800 =
Pit 21	X162	7	2	750 J	3320 J	740 J	0.73 J	48.5 =	540 =	4.7 J	4.1 =	854 =	1.3 J	21.2 =	856 J
Pit 21	X163	7	9	1470 J	4010 J	1160 J	6 J	67.9 =	1860 =	4.1 J	5.2 =	1750 =	1.7 J	14.2 =	1720 J
Pit 22	X160	10	3.5	85.9 J	25200 J	1520 J	0.07 UJ	53.4 =	3060 =	1.8 J	0.86 U	1160 =	0.56 UJ	23.4 =	227 J
Pit 22	X161	8.5	8	271 J	24800 J	1550 J	0.24 J	29.2 =	2930 =	2.3 J	0.84 U	2940 =	0.54 U	16.9 =	278 J
Pit 23	X157	7.9	2.5	31.3 J	25000 J	386 J	0.06 UJ	36.9 =	3200 =	0.63 J	3.3 =	716 =	0.47 UJ	23.5 =	73.3 J
Pit 23	X158	8.6	9	130 J	15000 J	2660 J	0.31 J	30.5 =	2550 =	2.2 J	0.81 U	2120 =	0.53 UJ	39.1 =	255 J
Pit 23	X159	8.1	13	1210 J	17500 J	1240 J	0.34 J	59.7 =	2940 =	2.1 J	4.4 =	4480 =	0.8 J	29 =	654 J
Pit 24	X155	7.5	2.5	4350 J	3380 J	493 J	0.85 J	29 =	447 =	2.5 J	2.2 =	511 =	0.82 J	13.9 =	1610 J
Pit 24	X156	8.3	8.5	220 J	6470 J	332 J	0.12 J	32.8 =	2930 =	1.7 =	2.9 =	922 =	1.2 U	26.3 =	748 J
Pit 25	X153	7.7	3	784 J	4610 J	463 J	0.09 UJ	40.5 =	1240 =	3.7 J	3.9 =	1680 =	0.75 UJ	35.3 =	1650 J
Pit 25	X154	7.9	9.5	1150 J	1720 J	206 J	0.29 J	19.6 =	861 =	2.7 J	1.1 =	977 =	0.73 J	24.8 =	499 J
Pit 26	X151	8.7	3	503 J	15300 J	1440 J	0.06 UJ	38 =	1400 =	1.8 J	0.81 =	873 =	1.4 J	25.7 =	720 J
Pit 26	X152	7.9	9	592 J	10900 J	469 J	1.1 J	36.9 =	1330 =	2.4 J	1.9 =	1260 =	0.91 J	21.4 =	1160 J
Pit 27	X149	7.9	3.5	116 J	10100 J	1290 J	0.1 UJ	48.3 =	2430 =	1.9 J	1.2 U	2120 =	0.76 UJ	19.4 =	73.2 J
Pit 27	X150	7.5	10	345 J	4030 J	499 J	0.19 J	21.5 =	905 =	2.4 J	4.4 =	1440 =	1.4 J	16.4 =	705 J
Pit 28	X147	8.3	3	433 J	17400 J	322 J	0.11 J	26.2 =	1580 =	0.82 J	0.93 U	935 =	0.6 UJ	17.9 =	141 J
Pit 28	X148	7.7	8	120 J	2730 J	285 J	2.1 J	21.1 =	583 =	1.3 J	1.3 U	1020 =	1.2 J	7.8 =	179 J
Pit 29	X145	8.1	4.5	347 J	14600 J	3230 J	0.11 J	63.6 =	1500 =	1.5 J	1.1 =	770 =	0.48 UJ	43.6 =	1520 J
Pit 29	X146	7.9	8	237 J	7490 J	297 J	0.12 J	19.5 =	1110 =	1.1 J	0.91 =	926 =	0.56 UJ	14.7 =	403 J
Pit 30	X143	7.4	4	674 =	3360 =	264 J	2.6 J	35.1 =	749 =	2.6 =	3.5 =	374 =	1.2 U	13.4 =	1030 J
Pit 30	X144	7.9	6	1050 J	4330 J	543 J	0.51 J	37.9 =	895 =	2.6 J	6.3 =	1200 =	2.4 J	25.8 =	1260 J
Pit 31	X141	8.7	4	272 J	4650 =	512 J	1.1 =	133 =	754 J	2.8 J	4.4 =	594 =	1.3 UJ	10.2 =	641 J

Table E-2. Inorganics in U.S. Drum (mg/kg)

Station ID	Sampe ID	pH	Depth (ft.)	Lead	Magnesium	Manganese	Mercury	Nickel	Potassium	Selenium	Silver	Sodium	Thallium	Vanadium	Zinc
Industrial/ Commercial		*Ing*		*400*		*96000*	*610*	*41000*		*10000*	*10000*		*160*	*14000*	*610000*
		Inh				*91000*	*540000*	*21000*							
Construction Worker		*Ing*		*400*		*9600*	*61*	*4100*		*1000*	*1000*		*160*	*1400*	*61000*
		Inh				*8700*	*52000*	*440000*							
Soil Component of GW		*I*		*0.0075*		*0.15*	*0.002*	*0.1*		*0.05*	*0.05*		*0.002*	*0.049*	*5*
		II		*0.1*		*10*	*0.01*	*2*		*0.05*			*0.02*		*10*
Pit 31	X142	8.6	9	17.3 J	15200 =	232 J	0.08 U	20.5 =	1800 J	1.8 J	0.36 U	531 =	1.2 U	15 =	74.6 J
Pit 32	X139	8	3	189 J	9030 =	552 J	0.18 =	30 =	1340 J	1.1 J	2.2 =	3210 J	1.2 U	13.8 =	377 J
Pit 32	X140	8.1	9	1030 J	5190 =	389 J	0.34 =	76.9 =	1310 J	3.2 J	6.6 =	1600 =	1.9 UJ	34.2 =	1690 J
Pit 33	X137	8.1	3	1200 J	15900 =	1010 J	0.59 =	98.7 =	806 J	2.8 J	3.7 =	452 =	1.1 UJ	35 =	787 J
Pit 33	X138	9	9	175 J	17800 =	2760 J	0.21 =	33.8 =	1820 J	2.7 J	1.6 =	1270 =	0.91 U	19.8 =	218 J
Pit 34	X135	7.8	3	417 J	2410 =	432 J	0.36 =	51.6 =	1010 J	4.9 =	4.6 =	8530 J	1.3 UJ	49.8 =	448 J
Pit 34	X136	7.2	10	348 J	3330 =	348 J	0.92 =	28.1 =	531 J	2.2 J	24.2 =	732 =	1.4 UJ	10.4 =	1460 J
Pit 35	X133	8.3	4	38.3 J	26700 =	269 J	0.06 U	8.3 =	463 J	0.47 U	0.59 =	201 =	0.91 U	6.7 =	67.5 J
Pit 35	X134	7.9	10	206 J	20000 =	363 J	0.19 =	20.8 =	1340 J	1.3 J	1.3 =	305 =	1.1 UJ	12.4 =	289 J
Pit 36	X131	7	4	486 J	2900 =	907 J	0.67 =	61.8 =	906 =	6.4 =	9.4 =	1580 =	3 UJ	9.4 =	690 =
Pit 36	X132	8.2	11	306 J	1780 =	820 J	0.36 =	80.6 =	520 =	2.9 =	6.3 =	634 =	1.2 UJ	5.2 =	488 =
Pit 37	X128	7.7	3	329 J	3940 =	539 J	1.1 =	202 =	853 =	1.6 =	4.4 =	1080 =	2.5 U	13.8 =	740 =
Pit 37	X129	7.6	3	465 J	12000 =	706 J	0.92 =	248 =	1550 =	1.4 =	6.1 =	1160 =	2.5 U	20.6 =	831 =
Pit 37	X130	8	8	268 J	2700 =	449 J	0.41 =	45.8 =	549 =	1.7 =	4.1 =	653 =	1 UJ	16.7 =	448 =
Pit 38	X126	7.6	3	384 J	2270 =	663 J	0.5 =	34.4 =	439 =	3.4 =	6.5 =	739 =	1.9 UJ	7.3 =	975 =
Pit 38	X127	7.9	10	517 J	2220 =	561 J	0.44 =	51 =	593 =	2.6 =	7.6 =	1010 =	1.4 UJ	6.7 =	667 =
Pit 39	X124	7.9	3	33 J	21700 =	584 J	0.26 =	51.4 =	1860 =	0.56 =	0.86 =	276 =	0.88 U	15.4 =	94.6 =
Pit 39	X125	8.1	10	598 J	2910 =	546 J	0.8 =	67.7 =	1640 =	2.9 =	6 =	1930 =	1.5 UJ	11.2 =	1580 =
Pit 40	X122	12.4	4	211 J	12900 =	1340 J	0.15 =	39.2 =	1110 =	1.1 =	2 =	1450 =	1.1 UJ	13.3 =	1550 =
Pit 40	X123	8.5	9	819 J	3960 =	896 J	0.48 =	102 =	2700 =	4.7 =	5.6 =	8070 =	1.9 UJ	58.9 =	1010 =
Pit 41	X120	8	3	12.8 J	23800 =	341 J	0.06 U	27.4 =	2900 =	0.48 =	0.6 =	850 =	0.92 UJ	19.4 =	49.3 =
Pit 41	X121	5.7	8	212 J	1580 =	1520 J	0.46 =	11.5 =	1840 =	2 =	3.5 =	2640 =	1.8 U	23.7 =	1470 =
Pit 42	X117	10.3	2	39 =	22200 =	602 J	0.36 J	31.4 =	2820 =	6.5 =	0.78 U	346 =	0.9 J	23.4 =	49.6 J
Pit 42	X118	8.3	9	3130 =	6870 =	818 J	0.49 J	116 =	1720 =	3.7 =	7.9 J	1860 =	2.3 J	23 =	524 J
Pit 42	X119	8.4	15	874 =	10100 =	452 J	0.47 J	51.2 =	3060 =	2.1 J	4.3 J	5850 =	1.5 J	36.1 =	954 J
Pit 43	X115	8.1	3	31.8 =	26200 =	461 J	0.07 UJ	35.9 =	4410 =	0.66 =	0.86 U	486 =	0.55 U	27.8 =	137 J
Pit 43	X116	8.1	9	1850 =	14300 =	661 J	1.3 J	29.8 =	1520 =	1.3 =	0.94 =	651 =	0.59 U	14.1 =	615 J
Pit 44	X113	8.3	3	467 =	12000 =	3870 J	0.82 J	61.8 =	1280 =	2.7 =	2.9 J	654 =	0.51 U	83.6 =	507 J
Pit 44	X114	8.3	9	337 =	12700 =	491 J	1.3 J	38.1 =	1240 =	3.4 =	2.7 =	1040 =	2.1 J	41.3 =	9250 J
Pit 45	X111	8.7	3.5	1290 =	5950 =	545 J	4.9 J	44.1 =	1680 =	4.4 =	6.7 J	2010 =	0.74 J	29.1 =	1230 J
Pit 45	X112	8.5	10	109 =	63800 =	637 J	0.2 J	17.5 =	797 =	0.41 =	0.9 U	965 =	0.58 U	13.4 =	1370 J
Pit 46	X109	8.5	4	783 =	11300 =	5720 J	0.25 J	161 =	2010 =	2.7 =	4.7 J	1790 =	0.64 U	48.8 =	7050 J
Pit 46	X110	8.5	9	726 =	13800 =	5890 J	0.15 J	209 =	2120 =	3.4 =	7 J	2460 =	0.69 U	74.9 =	7860 J

Table E-2. Inorganics in U.S. Drum (mg/kg)

Station ID	Sampe ID	pH	Depth (ft.)	Lead	Magnesium	Manganese	Mercury	Nickel	Potassium	Selenium	Silver	Sodium	Thallium	Vanadium	Zinc
Industrial/ Commercial		*Ing*		*400*		*96000*	*610*	*41000*		*10000*	*10000*		*160*	*14000*	*610000*
		Inh				*91000*	*540000*	*21000*							
Construction Worker		*Ing*		*400*		*9600*	*61*	*4100*		*1000*	*1000*		*160*	*1400*	*61000*
		Inh				*8700*	*52000*	*440000*							
Soil Component of GW		*I*		*0.0075*		*0.15*	*0.002*	*0.1*		*0.05*	*0.05*		*0.002*	*0.049*	*5*
		II		*0.1*		*10*	*0.01*	*2*		*0.05*			*0.02*		*10*
Pit 47	X107	8.5	3.5	40.6 =	24200 =	354 J	0.07 UJ	15.3 =	2070 =	0.57 =	0.88 U	1750 =	0.57 U	17 =	69.1 J
Pit 47	X108	7	9	2660 =	4740 =	494 J	1.1 J	53.6 =	1970 =	2.5 =	20.1 =	2170 =	1.9 J	22.9 =	6040 J
Pit 48	X105	8.7	3	17.7 =	27000 =	420 J	0.06 UJ	27.3 =	3330 =	0.3 =	0.71 U	334 =	0.46 U	23.7 =	61.9 J
Pit 48	X106	8.5	9	1700 =	9890 =	1100 J	0.74 J	74.1 =	2870 =	3.9 =	5.7 J	3390 =	2.2 J	25 =	1880 J
Pit 49	X103	8.4	3	15.6 =	28300 =	597 J	0.06 UJ	27.5 =	2690 =	0.3 U	0.73 U	284 =	0.47 U	32.8 =	53.5 J
Pit 49	X104	10	10	13.3 =	26800 =	327 J	0.07 UJ	19.9 =	1880 =	0.36 U	0.85 U	412 =	0.55 U	14.7 =	42 J
Pit 50	X101	8.1	3	81.4 =	18900 =	773 J	0.11 J	18.7 =	2090 =	0.59 =	0.83 U	1180 =	0.54 U	21.9 =	113 J
Pit 50	X102	8.3	9	508 =	3370 =	903 J	3 J	212 =	2140 =	3.1 =	13.7 =	2840 =	0.81 U	21.8 =	2020 J
Pit 51	X203	7.9	3	180 =	13600 =	881 J	0.27 =	16.1 =	1070 =	1.4 =	0.92 =	336 =	0.85 U	19.4 =	254 =
Pit 51	X204	7.8	8	577 =	17100 =	498 J	0.66 =	15.8 =	1240 =	0.87 =	0.76 =	569 =	1 U	16.4 =	224 =

Notes:

=:	sample concentration is detected at level reported
U:	sample concentration is under detection limit
J:	sample concentration is estimated value
R:	sample concentration value is rejected
DL:	sample is diluted
RE:	sample is re-extracted
Ing.:	Ingestion
Inh.:	Inhalation
I:	Class I
II:	Class II

Table E-3. Inorganics in Unnamed Parcel (mg/kg)

Station ID	Sample ID	pH	Depth (ft.)	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium	Cobalt	Copper	Iron	Lead
		Ing			*820*	*13*	*140000*	*1*	*2000*		*10000*	*120000*	*82000*		*400*
Industrial/ Commercial		*Inh*				*1200*	*910000*	*2100*	*2800*		*420*				
		Ing			*82*	*61*	*14000*	*29*	*200*		*4100*	*12000*	*8200*		*400*
Construction Worker		*Inh*				*25000*	*870000*	*44000*	*59000*		*8800*				
Soil		*I*			*0.006*	*0.05*	*2*	*0.004*	*0.005*		*0.1*	*1*	*0.65*	*5*	*0.0075*
Component of GW		*II*			*0.024*	*0.2*	*2*	*0.5*	*0.05*		*1*	*1*	*0.65*	*5*	*0.1*
Pit 02	X103	7.9	3	10400 =	15.2 =	11.6 J	125 =	1 =	10.4 =	13200 =	53.6 =	7.9 =	1490 =	32800 =	1170 =
Pit 02	X104	7.6	6	5600 =	4.4 J	17.9 J	203 =	1.9 =	2.8 =	23500 =	11.7 =	5.5 =	83.7 =	27500 =	220 =
Pit 03	X105	8.2	3	5670 =	1 J	7.3 J	49.3 =	0.51 =	0.47 =	38900 =	14.4 =	8.1 =	76.7 =	15400 =	135 =
Pit 03	X106	7.4	6	5210 =	11.6 =	13.8 J	743 =	0.87 =	40.9 =	50500 =	36.6 =	8.5 =	124 =	135000 =	3510 =
Pit 04	X107	7.5	3	5350 =	4 =	11 J	95.8 =	0.59 =	1.4 =	104000 =	61.2 =	7.1 =	70.5 =	39300 =	218 =
Pit 04	X108	8.0	8	5690 =	1.1 J	5.2 J	117 =	1.2 =	1.1 =	13900 =	9.8 =	4.5 =	39.3 =	30200 =	84 =
Pit 05	X109	7.4	3	4090 =	11.1 =	14.8 J	858 =	0.3 =	4.4 =	130000 =	490 =	18.7 =	297 =	256000 =	492 =
Pit 05	X110	7.4	3	2060 =	5.9 =	13.1 J	9380 J	0.35 U	6 =	323000 =	109 =	13.1 =	174 =	83400 =	549 =
Pit 05	X111	8.0	8	4680 =	4.9 J	7.2 J	224 =	0.55 =	4.5 =	144000 =	31.8 =	5 =	562 =	23100 =	313 =
Pit 06	X112	8.1	3	10000 =	7.9 =	38.1 J	2720 =	1.9 =	4.8 =	53900 =	105 =	24.1 =	1600 =	132000 =	1150 =
Pit 06	X113	8.0	8	11700 =	32.8 =	23.9 J	366 =	1 =	6.2 =	31600 =	88.5 =	13 =	6540 J	119000 =	753 =
Pit 07	X114	7.5	3	697 =	20.4 =	21.7 J	291 =	0.28 U	60.8 =	9770 =	290 =	26.8 =	332 =	231000 =	1400 =
Pit 07	X115	7.9	8	7600 =	5.7 =	25.9 J	419 =	1.1 =	7 =	13200 =	85.1 =	12.1 =	263 =	82800 =	639 =
Pit 08	X116	7.7	3	3630 =	5.5 =	10.5 J	176 =	0.46 =	2.9 =	11700 =	61.2 =	6.1 =	153 =	59700 =	223 =
Pit 08	X117	7.8	8	7200 =	20.2 =	33.1 J	346 =	1.3 =	7.9 =	62200 =	96.4 =	16.2 =	442 =	120000 =	780 =
Pit 09	X118	7.4	3	9200 =	5.8 =	13.1 J	214 =	1.4 =	3.3 =	36300 =	123 =	6.8 =	155 =	62100 =	381 =
Pit 09	X119	7.4	8	5200 =	7.4 =	15.7 J	238 =	0.73 =	5.8 =	41300 =	98.8 =	8.7 =	320 =	65400 =	825 =
Pit 10	X120	7.7	3	11500 =	1 =	9.3 =	54.9 =	0.77 =	0.24 U	40100 =	22.9 =	16.6 =	40.9 =	28900 =	20.4 =
Pit 10	X121	5.7	8	7460 =	4.9 =	14.2 =	399 =	2 =	2.2 =	13500 =	45.5 =	7.7 =	285 =	44300 =	504 =
Pit 11	X122	12.4	3	8770 =	1 =	10.5 =	50.1 =	0.69 =	0.23 U	44300 =	17.8 =	13 =	41.7 =	22800 =	38.1 =
Pit 11	X123	8.5	8	7520 =	1.1 =	8.5 =	78.3 =	0.73 =	0.56 =	38900 =	17.6 =	9.8 =	57.2 =	20700 =	92.6 =
Pit 11	X125	8.1	30	10500 =	1 =	10.2 =	46.6 =	0.73 =	0.22 U	55300 =	20.1 =	14.9 =	45.6 =	24800 =	24.7 =
Pit 12	X127	7.9	3	8900 =	21.9 =	36.4 =	335 =	1.2 =	7.8 =	32000 =	126 =	14.8 =	992 =	131000 =	3890 J
Pit 12	X128	7.7	6	4530 =	6.1 =	5.1 =	154 =	1 =	0.6 U	6950 =	17.6 =	7.3 =	336 =	48300 =	740 =
Pit 13	X129	7.6	3	13100 =	20.1 =	12.4 =	262 =	1.4 =	2.7 =	65800 =	238 =	11.8 =	235 =	138000 =	511 =
Pit 13	X130	8.0	8	12800 =	17.3 =	99.9 =	1240 =	3 =	11.1 =	30000 =	93.2 =	19.6 =	1350 =	116000 =	1150 =
Pit 14	X131	7.0	3	9910 =	4.1 =	45.1 =	269 =	0.95 =	3.1 =	24100 =	37.9 =	6.9 =	83.2 =	35300 =	795 =
Pit 14	X132	8.2	8	10100 J	33.4 J	49.8 J	5240 J	0.98 =	36.4 =	28500 J	1160 J	19.5 =	602 J	198000 J	5710 J
Pit 15	X133	8.3	3	15300 =	15.8 =	46.1 =	384 =	1.2 =	4.6 =	82600 =	346 =	17.6 =	1460 =	271000 =	636 =
Pit 15	X134	7.9	8	4690 =	16.8 =	39.5 =	394 =	0.75 =	5.8 =	29700 =	472 =	27.2 =	327 =	141000 =	1120 =
Pit 16	X135	7.8	3	9860 =	15.9 =	17.7 =	851 =	1.7 =	6.4 =	45400 =	304 =	12 =	227 =	57100 =	1490 =
Pit 16	X136	7.2	6	5250 =	15.7 =	14 =	239 =	0.66 =	4.7 =	25300 =	72.1 =	11.4 =	234 =	123000 =	360 =
Pit 17	X137	7.2	3	9160 =	11.1 =	16.3 =	403 =	1.2 =	4.9 =	46200 =	128 =	10.4 =	330 =	61100 =	602 =
Pit 17	X138	8.1	11	6530 =	6.7 =	11.6 =	289 =	0.98 =	1.8 =	51500 =	40.7 =	7.6 =	90.8 =	114000 =	467 =
Pit 18	X139	8.8	3	9050 =	10 =	26.5 =	285 =	1.4 =	3 =	54400 =	94.6 =	13 =	253 =	128000 =	432 =

Table E-3. Inorganics in Unnamed Parcel (mg/kg)

Station ID	Sample ID	pH	Depth (ft.)	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium	Cobalt	Copper	Iron	Lead
		Ing			*820*	*13*	*140000*	*1*	*2000*		*10000*	*120000*	*82000*		*400*
Industrial/ Commercial		*Inh*				*1200*	*910000*	*2100*	*2800*		*420*				
		Ing			*82*	*61*	*14000*	*29*	*200*		*4100*	*12000*	*8200*		*400*
Construction Worker		*Inh*				*25000*	*870000*	*44000*	*59000*		*8800*				
Soil		*I*			*0.006*	*0.05*	*2*	*0.004*	*0.005*		*0.1*	*1*	*0.65*	*5*	*0.0075*
Component of GW		*II*			*0.024*	*0.2*	*2*	*0.5*	*0.05*		*1*	*1*	*0.65*	*5*	*0.1*
Pit 18	X140	7.7	10	10500 =	11.8 =	21.8 =	436 =	1.6 =	4.8 =	48400 =	181 =	14.9 =	409 =	87500 =	808 =
Pit 19	X141	7.8	3	42500 J	27.5 J	18.4 J	1040 J	1.6 =	5.6 =	35200 J	71.5 J	10 =	424 J	75300 J	1810 J
Pit 19	X142	8.2	14	10000 J	7.8 J	23.3 J	279 J	1.9 =	3.2 =	48400 J	91 J	8.4 =	258 J	83800 J	411 J
Pit 20	X143	7.6	3	6320 J	7.7 J	23.3 J	140 J	1.3 =	2.7 =	21500 J	86.3 J	18.8 =	223 J	119000 J	359 J
Pit 20	X144	8.2	3	8090 J	8.3 J	19.5 J	273 J	1.1 =	3.3 =	46300 J	64.4 J	13 =	432 J	105000 J	331 J
Pit 20	X145	9.8	7	9130 J	15.2 J	13.3 J	2540 J	1 =	8.9 =	49500 J	87.6 J	7.7 =	207 J	69200 J	998 J
Pit 21	X146	8.4	3	9920 J	5.5 J	8.1 J	10800 J	0.32 =	4 =	18300 J	60.7 J	6 =	197 J	59600 J	720 J
Pit 21	X147	7.9	5	6850 J	28 J	15 J	2300 J	0.78 =	2.4 =	45500 J	200 J	8.7 =	185 J	94900 J	971 J
Pit 21	X148	7.0	10	7090 J	25.7 J	17.3 J	669 J	0.88 =	4.7 =	39900 J	307 J	10.1 =	1040 J	89700 J	1230 J
Pit 22	X160	7.6	3	12600 =	9.5 =	13 J	332 =	1.2 =	1.9 =	23100 =	36.1 J	12.3 =	136 J	40200 =	313 =
Pit 22	X161	7.5	10	8450 =	12.5 =	25.9 J	332 =	0.73 =	5.6 =	32600 =	114 J	10 =	326 J	228000 =	380 =
Pit 23	X158	7.8	3	14200 =	12.2 =	22.9 J	501 =	1.9 =	4.1 =	122000 =	381 J	10.8 =	276 J	130000 =	2300 =
Pit 23	X159	8.6	10	27300 =	4 J	14.7 J	158 =	1.3 =	1.2 =	18300 =	70.2 J	10.3 =	127 J	85200 =	291 =
Pit 24	X156	8.1	3	22500 =	8.6 J	18.2 J	444 =	1.3 =	4.4 =	52200 =	96.3 J	16.9 =	451 J	109000 =	836 =
Pit 24	X157	8.2	8	8460 =	5.7 =	9.7 J	221 =	0.61 =	3.3 =	15600 =	44.7 J	8.2 =	134 J	107000 =	226 =
Pit 25	X154	8.4	3	4850 =	4.4 =	8.5 J	123 =	0.4 =	2.8 =	57200 =	22.6 J	7.8 =	96.3 J	25300 =	189 =
Pit 25	X155	9.5	8	6070 =	9.9 =	14.9 J	199 =	0.74 =	2.9 J	85800 =	225 J	9.4 =	161 J	146000 =	297 =
Pit 26	X152	8.4	3	12600 =	3.2 J	14.3 J	158 =	1.6 =	2.3 =	186000 =	71.2 J	10.4 =	101 J	31000 =	238 =
Pit 26	X153	5.0	6	1470 =	10.9 =	1.7 J	4 =	0.41 U	0.41 U	451000 =	5.9 J	1.6 U	3.9 J	1440 =	197 =
Pit 27	X149	7.9	3	9750 =	19.9 =	22.7 J	303 =	1.4 J	8.9 =	38000 =	132 J	9.3 =	215 J	63600 =	807 =
Pit 27	X150	5.0	8	4740 =	3.3 J	5.8 J	104 =	0.51 =	1.1 =	78500 =	15.1 J	5.4 =	35.8 J	16300 =	194 =
Pit 27	X151	8.3	30	6860 =	2.9 J	10.5 J	1030 =	0.53 =	1.2 =	28500 =	29 J	7.7 =	53.9 J	21700 =	2350 =
Pit 28	X175	8.0	3	11000 J	2.8 J	13.5 J	260 =	1.2 =	0.73 =	198000 J	170 J	9.6 =	77.3 J	63100 J	60.9 =
Pit 28	X176	11.3	6	4110 J	1.2 J	4.3 J	110 =	0.41 =	1.9 =	143000 J	99.3 J	2.4 =	117 J	20300 J	118 =
Pit 29	X173	8.5	3	7100 J	30.6 J	30.6 J	601 J	0.62 =	6.4 =	25900 J	317 J	12.9 =	533 J	123000 J	2270 J
Pit 29	X174	7.8	10	34100 J	15.5 J	20.9 J	968 J	1.8 =	8 =	107000 J	163 J	20.7 =	571 J	151000 J	1060 J
Pit 30	X171	8.2	3	9050 J	18.4 J	17.6 J	480 J	0.58 U	11.2 =	16400 J	453 J	20.2 =	338 J	156000 J	658 J
Pit 30	X172	8.2	7.5	14400 J	7.9 J	15.8 J	211 J	0.58 =	3.5 =	33800 J	278 J	12.9 =	150 J	140000 J	910 J
Pit 31	X169	7.9	2.5	7160 J	3.2 J	8.2 J	179 J	0.7 =	2.8 =	15200 J	48.7 J	4.3 =	192 J	25100 J	351 J
Pit 31	X170	8.4	6	966 J	0.91 J	1.2 J	20 J	0.31 U	0.34 =	44600 J	6.1 J	1.2 U	27.5 J	36000 J	29.9 J
Pit 32	X167	8.3	3	9860 =	8.4 =	13.5 J	496 =	1.7 =	5.2 =	62200 =	136 J	7.6 =	324 J	46400 =	641 =
Pit 32	X168	8.4	6	12500 =	5.4 =	16.4 J	196 =	1.8 =	4.3 =	40500 =	461 J	11.3 =	372 J	59000 =	299 =
Pit 33	X165	7.9	3	917 =	17 =	17.1 J	32.5 =	0.49 U	17.1 =	73800 =	345 J	9.3 =	221 J	424000 =	2710 =
Pit 33	X166	8.3	7	37100 =	15.4 =	38.2 J	414 =	0.44 J	7 =	30000 =	47.2 J	16.6 =	820 J	138000 =	749 =
Pit 34	X162	8.7	3	8090 =	16.7 =	22.3 J	126 =	2.7 U	10.4 =	96500 =	285 J	10.7 =	311 J	430000 =	993 =

Table E-3. Inorganics in Unnamed Parcel (mg/kg)

Station ID	Sample ID	pH	Depth (ft.)	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium	Cobalt	Copper	Iron	Lead
		Ing			*820*	*13*	*140000*	*1*	*2000*		*10000*	*120000*	*82000*		*400*
Industrial/ Commercial		*Inh*				*1200*	*910000*	*2100*	*2800*		*420*				
		Ing			*82*	*61*	*14000*	*29*	*200*		*4100*	*12000*	*8200*		*400*
Construction Worker		*Inh*				*25000*	*870000*	*44000*	*59000*		*8800*				
Soil		*I*			*0.006*	*0.05*	*2*	*0.004*	*0.005*		*0.1*	*1*	*0.65*	*5*	*0.0075*
Component of GW		*II*			*0.024*	*0.2*	*2*	*0.5*	*0.05*		*1*	*1*	*0.65*	*5*	*0.1*
Pit 34	X163	7.7	10	6990 =	9.3 =	11 J	351 =	0.66 J	3.3 =	20900 =	43.6 J	7.2 =	123 J	117000 =	933 =
Pit 34	X164	8.2	30	11200 =	13.2 =	30.6 J	683 =	1.4 J	11.4 =	43600 =	1620 J	22.7 =	3780 J	106000 =	3790 =
Pit 35	X185	7.8	4	6100 J	6.1 =	19.9 J	560 =	0.67 =	7 =	44800 J	62.4 J	8.7 =	269 J	61800 J	676 =
Pit 35	X186	8.2	10	6210 J	10 =	34.5 J	322 =	0.95 =	3.4 =	95000 J	119 J	10.3 =	288 J	105000 J	642 =
Pit 36	X183	8.0	3	9710 J	6.8 =	32 J	618 =	1.5 =	10.5 =	57300 J	54.3 J	11.5 =	343 J	79600 J	1000 =
Pit 36	X184	8.1	6	10800 J	15.5 =	11.2 J	158 =	1 =	1.6 J	28200 J	51.5 J	10.5 =	151 J	90200 J	589 =
Pit 37	X181	8.0	4	1190 J	1.9 J	1.1 J	80.9 =	0.3 U	0.79 =	337000 J	14.4 J	4.7 =	49 J	35700 J	44.8 =
Pit 37	X182	8.1	13	7000 J	31.9 =	21.8 J	398 =	1.1 =	5 =	30100 J	52 J	10.1 =	215 J	37600 J	3970 =
Pit 38	X179	7.9	4	19300 J	5.2 =	8.3 J	842 =	2.7 =	2 =	56400 J	131 J	5.3 =	87.7 J	44000 J	1160 =
Pit 38	X180	7.9	6.5	3640 J	8.8 =	21.3 J	156 =	0.79 =	0.43 UJ	15000 J	101 J	9.9 =	392 J	186000 J	524 =
Pit 39	X177	7.8	3	11300 J	25.4 =	25.5 J	619 =	1.3 =	10.9 =	43300 J	59.9 J	16.2 =	502 J	48300 J	684 =
Pit 39	X178	8.1	8	6390 J	7.6 J	19.7 J	501 =	0.54 =	6.1 =	227000 J	54.2 J	13.4 =	392 J	124000 J	488 =
Pit 42	X126	7.6	12	11200 =	0.83 =	8.6 =	60.3 =	0.74 =	0.24 U	57400 =	21.2 =	13.8 =	36.9 =	25000 =	20.9 =

Notes:

=:	sample concentration is detected at level reported
U:	sample concentration is under detection limit
J:	sample concentration is estimated value
R:	sample concentration value is rejected
DL:	sample is diluted
RE:	sample is re-extracted
Ing.:	Ingestion
Inh.:	Inhalation
I:	Class I
II:	Class II

Table E-3. Inorganics in Unnamed Parcel (mg/kg)

Station ID	Sample ID	pH	Depth (ft.)	Magnesium	Manganese	Mercury	Nickel	Potassium	Selenium	Silver	Sodium	Thallium	Vanadium	Zinc
		Ing			*96000*	*610*	*41000*		*10000*	*10000*		*160*	*14000*	*610000*
Industrial/ Commercial		*Inh*			*91000*	*540000*	*21000*							
		Ing			*9600*	*61*	*4100*		*1000*	*1000*		*160*	*1400*	*61000*
Construction Worker		*Inh*			*8700*	*52000*	*440000*							
Soil		*I*			*0.15*	*0.002*	*0.1*		*0.05*	*0.05*		*0.002*	*0.049*	*5*
Component of GW		*II*			*10*	*0.01*	*2*		*0.05*			*0.02*		*10*
Pit 02	X103	7.9	3	2360 =	485 J	0.36 =	203 =	442 =	2.9 J	4.1 =	725 J	2.3 =	21.8 =	4050 J
Pit 02	X104	7.6	6	10400 =	205 J	0.49 =	13.8 =	484 =	4.4 =	0.58 =	906 J	2.1 =	17.1 =	201 J
Pit 03	X105	8.2	3	20600 =	324 J	0.14 =	21.6 =	1070 =	0.46 U	0.23 U	752 J	1.6 =	16.9 =	101 J
Pit 03	X106	7.4	6	2390 =	1150 J	1.1 =	23.5 =	441 =	3.8 J	2.1 =	1110 J	8.7 =	17.2 =	740 J
Pit 04	X107	7.5	3	9850 =	497 J	0.27 =	23.7 =	846 =	2.3 J	0.25 U	739 J	1.3 =	19.1 =	152 J
Pit 04	X108	8.0	8	751 =	163 J	0.17 =	28.8 =	541 =	0.61 U	0.31 U	747 J	2.1 =	17.5 =	66 J
Pit 05	X109	7.4	3	4840 =	3040 J	0.65 =	137 =	461 =	3.8 =	1.4 =	1180 J	5.6 =	40.9 =	996 J
Pit 05	X110	7.4	3	5240 =	657 J	0.3 =	52.4 =	448 =	0.88 J	4.3 =	1480 J	2.5 =	8.7 =	7070 J
Pit 05	X111	8.0	8	3580 =	345 J	0.63 =	48.7 =	858 =	0.86 U	2.7 =	1950 J	1.3 U	15.3 =	1130 J
Pit 06	X112	8.1	3	6570 =	1680 J	0.44 =	57 =	806 =	6.4 =	2.3 =	1930 J	6.6 =	30.7 =	3890 J
Pit 06	X113	8.0	8	2380 =	651 J	0.47 =	61.7 =	1340 =	4.9 =	3.5 =	2230 J	6.6 =	35.1 =	1630 J
Pit 07	X114	7.5	3	1720 =	1200 J	0.86 =	72.8 =	175 =	20 =	0.48 =	1340 J	11.4 =	3.1 =	2000 J
Pit 07	X115	7.9	8	2050 =	398 J	0.2 =	45.6 =	505 =	2.9 =	1.1 =	1070 J	5.3 =	13.7 =	1230 J
Pit 08	X116	7.7	3	2290 =	382 J	0.93 =	35.5 =	321 =	2.5 =	1.6 =	729 J	3.5 =	10.3 =	315 J
Pit 08	X117	7.8	8	21300 =	1650 J	0.3 =	85.8 =	660 =	4 =	2.6 =	799 J	6.3 =	33.1 =	866 J
Pit 09	X118	7.4	3	8280 =	2110 J	0.44 =	64.7 =	772 =	2.4 =	1.5 =	725 J	2.7 =	28.8 =	527 J
Pit 09	X119	7.4	8	6010 =	1000 J	0.78 =	78.4 =	555 =	1.7 =	1.8 =	995 J	3.2 =	16.7 =	654 J
Pit 10	X120	7.7	3	21800 =	383 =	0.07 =	42.2 =	2610 J	0.74 J	0.24 U	563 J	2.3 =	23.6 =	59.3 J
Pit 10	X121	5.7	8	2060 =	339 =	0.93 =	37.7 =	566 =	2 J	3.8 =	1080 J	2.8 =	21.8 =	428 J
Pit 11	X122	12.4	3	23100 =	504 =	0.3 =	31.9 =	1800 =	0.47 U	0.23 U	575 J	1.1 =	22 =	94 J
Pit 11	X123	8.5	8	19400 =	344 =	0.24 =	27.2 =	1560 =	0.52 J	0.24 U	619 J	0.79 =	24.6 =	146 J
Pit 11	X125	8.1	30	29500 =	427 =	0.07 =	39.5 =	3380 J	0.52 J	0.22 U	979 J	1.5 =	23 =	76.8 J
Pit 12	X127	7.9	3	8900 =	1870 =	0.55 =	76.6 =	660 =	5.6 =	5.7 =	917 J	7.4 =	65.2 =	1390 J
Pit 12	X128	7.7	6	2830 =	200 =	3.8 =	14.7 =	879 =	2.6 J	0.85 =	2880 J	3.7 =	13.7 =	621 J
Pit 13	X129	7.6	3	12800 =	2620 J	0.05 U	74.7 =	1400 =	2.1 J	1.6 =	1330 J	4.1 =	57.1 =	731 J
Pit 13	X130	8.0	8	7440 =	804 =	0.85 =	190 =	1400 =	10.6 =	3.6 =	1850 J	10.5 =	38.6 =	2720 J
Pit 14	X131	7.0	3	11600 =	373 =	0.64 =	25.8 =	1370 =	3.8 J	1.2 =	1100 J	3.3 =	33 =	1210 J
Pit 14	X132	8.2	8	10300 =	1180 J	0.97 J	127 J	621 =	3.4 J	34.4 J	1440 J	14.5 =	25.4 =	926 J
Pit 15	X133	8.3	3	8070 =	5380 J	0.45 =	86 =	631 =	5.9 J	16.8 =	1350 J	11.7 =	73.4 =	1880 J
Pit 15	X134	7.9	8	6560 =	1810 =	0.95 =	266 =	466 =	3.2 J	6 =	1060 J	8.7 =	28.1 =	1950 J
Pit 16	X135	7.8	3	16900 =	1070 =	0.11 =	49.1 =	1160 =	1.9 J	0.9 =	760 J	3.1 =	33.6 =	851 J
Pit 16	X136	7.2	6	3910 =	1120 =	0.87 =	61.5 =	544 =	3.2 J	1.9 =	841 J	6.2 =	13.1 =	1820 J
Pit 17	X137	7.2	3	11600 =	2010 =	0.84 =	66.3 =	804 =	1.9 J	5.1 =	743 J	2.8 =	37.1 =	928 J
Pit 17	X138	8.1	11	23100 =	1010 =	0.97 =	25.8 =	1140 =	2.5 J	2.7 =	1580 J	3.3 =	19.2 =	535 J
Pit 18	X139	8.8	3	8130 =	1100 =	1.4 =	85 =	815 =	3.3 J	3.5 =	1200 J	7.1 =	24.3 =	1430 J

Table E-3. Inorganics in Unnamed Parcel (mg/kg)

Station ID	Sample ID	pH	Depth (ft.)	Magnesium	Manganese	Mercury	Nickel	Potassium	Selenium	Silver	Sodium	Thallium	Vanadium	Zinc
		Ing			*96000*	*610*	*41000*		*10000*	*10000*		*160*	*14000*	*610000*
Industrial/ Commercial		*Inh*			*91000*	*540000*	*21000*							
		Ing			*9600*	*61*	*4100*		*1000*	*1000*		*160*	*1400*	*61000*
Construction Worker		*Inh*			*8700*	*52000*	*440000*							
Soil		*I*			*0.15*	*0.002*	*0.1*		*0.05*	*0.05*		*0.002*	*0.049*	*5*
Component of GW		*II*			*10*	*0.01*	*2*		*0.05*			*0.02*		*10*
Pit 18	X140	7.7	10	10700 =	1860 =	0.79 =	115 =	765 =	2.5 J	6.8 =	982 J	4.3 =	33.8 =	920 J
Pit 19	X141	7.8	3	3870 =	625 J	0.69 J	46.6 J	1110 =	2.7 J	5.8 J	1640 J	5.1 =	26.9 =	1020 J
Pit 19	X142	8.2	14	13000 =	1380 J	1.4 J	85 J	1230 =	2.3 J	1.3 J	1320 J	5.1 =	23.6 =	681 J
Pit 20	X143	7.6	3	6150 =	1000 J	0.62 J	65.4 J	374 =	2.5 J	4.9 J	730 J	10.3 =	17.7 =	479 J
Pit 20	X144	8.2	3	6200 =	1240 J	0.78 J	61.6 J	457 =	3.3 J	2.6 J	862 J	8.2 =	19.1 =	533 J
Pit 20	X145	9.8	7	7730 =	673 J	0.77 J	34.3 J	714 =	3 J	1.8 J	1480 J	3.1 =	15.3 =	1120 J
Pit 21	X146	8.4	3	3230 =	421 J	0.27 J	23.1 J	1080 =	1.3 J	639 J	1190 J	4 =	12.3 =	1140 J
Pit 21	X147	7.9	5	9580 =	2370 J	0.68 J	153 J	1030 =	1.4 J	0.88 J	2030 J	5.1 =	29.9 =	3820 J
Pit 21	X148	7.0	10	9740 =	1440 J	1 J	106 J	1160 =	1.4 J	4.6 J	1940 J	6.5 =	32.5 =	5730 J
Pit 22	X160	7.6	3	10100 =	268 J	0.15 =	38.7 =	1560 J	2 =	1.4 =	689 J	3.9 =	32.4 =	294 =
Pit 22	X161	7.5	10	7500 =	1200 J	0.77 =	38.1 =	1110 J	3.5 =	2.5 =	1930 J	23.1 =	16.8 =	690 =
Pit 23	X158	7.8	3	12400 =	1240 J	0.23 =	53.8 =	628 J	3.9 =	2.1 =	1200 J	8.6 =	15.5 =	771 =
Pit 23	X159	8.6	10	5400 =	589 J	0.21 =	39 =	679 J	1.7 =	0.48 =	1160 J	7.9 =	19.7 =	238 =
Pit 24	X156	8.1	3	4780 =	914 J	1.5 =	135 =	1060 J	4.6 =	5 =	7650 J	10.7 =	25.4 =	944 =
Pit 24	X157	8.2	8	2840 =	491 J	0.35 =	75 =	711 J	1.6 =	0.55 =	1470 J	9.7 =	17 =	285 =
Pit 25	X154	8.4	3	23700 =	362 J	0.23 =	23.4 =	1020 J	0.89 =	1.4 =	708 J	1.7 J	13.5 =	246 =
Pit 25	X155	9.5	8	28800 =	2140 J	0.47 =	82.4 =	833 J	2.6 =	0.72 =	1010 J	9.7 J	27.2 =	345 =
Pit 26	X152	8.4	3	5600 =	717 J	0.22 =	61.1 =	2880 J	3.3 =	0.83 =	1860 J	1.7 J	31.5 =	499 =
Pit 26	X153	5.0	6	8390 =	112 J	0.09 U	4.8 =	162 J	0.81 U	0.41 U	1260 J	1.2 U	2.4 =	18.7 =
Pit 27	X149	7.9	3	8900 =	1400 J	0.81 =	73.8 =	942 J	2.9 =	2 =	1000 J	4.8 =	45.9 =	1020 =
Pit 27	X150	5.0	8	16300 =	272 J	0.19 =	16.5 =	1340 J	0.55 =	0.26 =	1480 J	0.86 J	11.7 =	169 =
Pit 27	X151	8.3	30	11000 =	298 J	0.44 =	30.8 =	2210 J	1.2 =	2.2 =	3230 J	1.6 J	17 =	605 =
Pit 28	X175	8.0	3	10800 J	1310 J	0.11 =	52.5 J	1140 =	2 J	0.29 U	1090 J	2.2 =	32 =	164 J
Pit 28	X176	11.3	6	8720 J	1380 J	0.31 =	15.1 J	335 =	0.56 U	2.3 =	870 J	0.85 U	17.1 =	225 J
Pit 29	X173	8.5	3	1630 =	628 J	2.1 J	66.3 J	213 =	2.8 J	3.8 J	765 J	10.5 =	16.1 =	1400 J
Pit 29	X174	7.8	10	4800 =	1170 J	0.7 J	112 J	1220 =	3.8 J	3.7 J	2880 J	12.4 =	38.2 =	2010 J
Pit 30	X171	8.2	3	2960 =	4070 J	1.6 J	427 J	484 =	4.9 J	14.8 J	994 J	11.5 =	25 =	1500 J
Pit 30	X172	8.2	7.5	7760 =	2500 J	0.42 J	37.5 J	440 =	1.7 J	1.3 J	1020 J	9.3 =	32.8 =	672 J
Pit 31	X169	7.9	2.5	2650 =	486 J	0.22 J	25.5 J	692 =	1.2 J	0.59 J	819 J	2 =	22.9 =	302 J
Pit 31	X170	8.4	6	807 =	193 J	0.09 J	30.2 J	212 =	0.63 J	0.31 UJ	1040 J	2.7 =	14.4 =	269 J
Pit 32	X167	8.3	3	9870 =	1000 J	0.11 =	51.3 =	786 J	1.7 =	3.4 =	824 J	3.2 J	23.4 =	690 =
Pit 32	X168	8.4	6	4780 =	649 J	0.54 =	50.6 =	990 J	1.6 =	6.8 =	1040 J	5.5 =	32.9 =	523 =
Pit 33	X165	7.9	3	6710 =	13000 J	0.2 =	110 =	330 J	4.5 J	6.9 =	1450 J	26 J	70 =	9990 =
Pit 33	X166	8.3	7	4690 =	1360 J	0.41 =	73.5 =	2390 J	2.6 =	1.6 =	23600 J	11 =	16.2 =	1430 =
Pit 34	X162	8.7	3	6680 =	7960 J	0.26 =	78.8 =	887 J	4.1 =	4.8 =	1210 J	25.5 =	54.3 =	6620 =

Table E-3. Inorganics in Unnamed Parcel (mg/kg)

Station ID	Sample ID	pH	Depth (ft.)	Magnesium	Manganese	Mercury	Nickel	Potassium	Selenium	Silver	Sodium	Thallium	Vanadium	Zinc
		Ing			*96000*	*610*	*41000*		*10000*	*10000*		*160*	*14000*	*610000*
Industrial/ Commercial		*Inh*			*91000*	*540000*	*21000*							
		Ing			*9600*	*61*	*4100*		*1000*	*1000*		*160*	*1400*	*61000*
Construction Worker		*Inh*			*8700*	*52000*	*440000*							
Soil		*I*			*0.15*	*0.002*	*0.1*		*0.05*	*0.05*		*0.002*	*0.049*	*5*
Component of GW		*II*			*10*	*0.01*	*2*		*0.05*			*0.02*		*10*
Pit 34	X163	7.7	10	4370 =	517 J	0.65 =	30.5 =	625 J	3.3 =	2 =	1280 J	10.6 =	17 =	471 =
Pit 34	X164	8.2	30	9460 =	792 J	1.6 =	669 =	2230 J	5.2 =	9.7 =	4720 J	11 =	27.8 =	4080 =
Pit 35	X185	7.8	4	15600 J	1070 J	0.72 =	49.6 J	526 =	1.6 J	11.7 =	650 J	4.4 =	21.7 =	637 J
Pit 35	X186	8.2	10	4610 J	676 J	1.8 =	80.3 J	519 =	4.5 =	1.6 =	1280 J	7.6 =	13.5 =	917 J
Pit 36	X183	8.0	3	9540 J	635 J	0.71 =	68.5 J	594 =	2.8 J	2.3 =	920 J	6.3 =	25.1 =	937 J
Pit 36	X184	8.1	6	5400 J	605 J	0.76 =	42 J	991 =	1.7 J	1.4 =	1530 J	8.2 J	19.4 =	919 J
Pit 37	X181	8.0	4	3670 J	204 J	0.18 =	8.1 J	206 =	0.6 U	0.92 =	1800 J	1.9 =	1.8 =	304 J
Pit 37	X182	8.1	13	6830 J	513 J	0.87 =	33.8 J	1230 =	1.7 J	3.6 =	2190 J	2.5 =	23.2 =	3020 J
Pit 38	X179	7.9	4	8800 J	1470 J	0.83 =	33.8 J	1620 =	1.1 J	1.6 =	1320 J	2 =	16.1 =	409 J
Pit 38	X180	7.9	6.5	3030 J	1040 J	0.42 =	22.6 J	522 =	9.7 =	4.8 =	2720 J	17.8 J	15.1 =	464 J
Pit 39	X177	7.8	3	2250 J	446 J	0.58 =	39.6 J	857 =	2.1 J	3.2 =	1750 J	3.2 =	29.2 =	3120 J
Pit 39	X178	8.1	8	138000 J	1850 J	1.2 =	370 J	240 =	0.91 U	9.1 =	1900 J	5.1 =	13.4 =	4560 J
Pit 42	X126	7.6	12	29100 =	458 =	0.09 =	36.2 =	2600 J	0.47 U	0.24 U	714 J	0.71 U	24.5 =	78.4 J

Notes:

=:	sample concentration is detected at level reported
U:	sample concentration is under detection limit
J:	sample concentration is estimated value
R:	sample concentration value is rejected
DL:	sample is diluted
RE:	sample is re-extracted
Ing.:	Ingestion
Inh.:	Inhalation
I:	Class I
II:	Class II

Table E-4. VOCs in Alburn (mg/kg)

Station ID	Sample ID	Depth (ft.)	1,1,1-Trichloroethane	1,1,2,2-Tetrachloroethane	1,1,2-Trichloro-1,2,2-Trifluoroethane	1,1,2-Trichloroethane	1,1-Dichloroethane	1,1-Dichloroethene	1,2,4-Trichlorobenzene	1,2-Dibromo-3-Chloropropane	1,2-Dibromoethane	1,2-Dichlorobenzene	1,2-Dichloroethane	1,2-Dichloropropane	1,3-Dichlorobenzene	1,4-Dichlorobenzene	2-Hexanone	Acetone
Industrial/ Commercial		*Ing*				*8200*	*200000*	*18000*	*20000*	*4*	*0.07*	*180000*	*63*	*84*				*200000*
		Inh	*1200*			*1800*	*1700*	*1500*	*3200*	*17*	*0.32*	*560*	*0.7*	*23*		*17000*		*100000*
Construction Worker		*Ing*				*8200*	*200000*	*1800*	*2000*	*89*	*1.5*	*18000*	*1400*	*1800*				*200000*
		Inh	*1200*			*1800*	*130*	*1500*	*920*	*0.11*	*0.45*	*310*	*0.99*	*0.5*		*340*		*100000*
Soil Component of GW		*I*	*2*			*0.02*	*23*	*0.06*	*5*	*0.002*	*0.0004*	*17*	*0.02*	*0.03*		*2*		*16*
		II	*9.6*			*0.3*	*110*	*0.3*	*53*	*0.002*	*0.004*	*43*	*0.1*	*0.15*		*11*		*16*
Pit 01	X101	2.5	0.009 U	0.009 U	0.009 U	0.009 U	0.009 U	0.009 U	0.009 U	0.009 U	0.009 U	0.009 U	0.009 U	0.009 U	0.009 U	0.009 U	0.009 UJ	0.023 U
Pit 01	X102	7.5	1.1 U	1.1 U	1.1 U	0.48 J	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 UJ	1.1 U
Pit 01B	X101	3	0.011 U	0.011 U	0.011 UJ	0.011 U	0.011 U	0.011 U	0.011 U	0.011 UJ	0.011 U	0.001 J	0.011 U	0.011 U	0.011 U	0.005 J	0.011 UJ	0.028 U
Pit 01B	X101RE	3	0.01 J	0.016 UJ	0.016 U	0.016 UJ	0.016 U	0.016 U	0.016 UJ	0.016 UJ	0.016 UJ	0.016 UJ	0.016 U	0.016 UJ	0.016 UJ	0.016 UJ	0.016 UJ	0.068 J
Pit 01B	X102	6	1.8 U	1.8 U	1.8 UJ	1.8 U	1.8 U	1.8 U	1.8 U	3.2 UJ	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	2.7 UJ	4.2 UJ
Pit 02	X103	2	0.003 J	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U	0.014 R	0.057 =
Pit 02	X104	6	340 =	31 U	31 U	31 U	4 J	31 U	31 U	31 U	31 U	31 U	31 U	31 U	31 U	31 U	31 UJ	31 U
Pit 03	X105	2.5	0.016 U	0.016 UJ	0.016 U	0.016 U	0.016 U	0.016 U	0.016 U	0.016 UJ	0.016 U	0.016 U	0.016 U	0.016 U	0.016 U	0.016 U	0.016 U	0.23 =
Pit 03	X106	0.5	0.005 J	0.018 UJ	0.018 U	0.018 U	0.018 U	0.018 U	0.018 U	0.018 UJ	0.018 U	0.018 U	0.018 U	0.018 U	0.018 U	0.018 U	0.018 U	0.041 =
Pit 03	X107	6	16 J	43 U	43 U	43 U	43 U	43 U	43 U	43 U	43 U	43 U	43 U	43 U	43 U	43 U	43 UJ	43 U
Pit 04	X108	3	0.001 J	0.011 UJ	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 UJ	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.05 =
Pit 04	X109	3	1 U	1 U	1 U	1 U	0.13 J	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 UJ	1 U
Pit 04	X110	6	0.004 J	0.029 U	0.029 U	0.029 U	0.007 J	0.029 U	0.029 U	0.029 U	0.029 U	0.029 U	0.029 U	0.029 U	0.029 U	0.006 J	0.029 U	0.29 =
Pit 05	X111	5	0.91 U	0.91 U	0.91 U	0.91 U	0.91 U	0.91 U	0.91 U	0.91 U	0.91 U	0.91 U	0.91 U	0.91 U	0.91 U	0.91 U	0.91 UJ	0.91 U
Pit 07	X112	3	0.01 U	0.01 UJ	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 UJ	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.033 =
Pit 08	X113	2.5	0.012 U	0.012 UJ	0.012 U	0.012 U	0.012 U	0.012 UJ	0.012 U	0.012 UJ	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U
Pit 08	X114	4	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	0.54 J	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U
Pit 09	X115	2.5	0.011 U	0.011 UJ	0.011 U	0.011 U	0.011 U	0.011 UJ	0.011 U	0.011 UJ	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.019 U
Pit 09	X116	6	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U
Pit 10	X117	2.5	0.01 U	0.01 UJ	0.01 U	0.01 U	0.01 U	0.01 UJ	0.01 U	0.01 UJ	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.013 U
Pit 10	X118	6	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	0.59 J	1.8 U	1.8 U
Pit 11	X119	2.5	0.01 U	0.01 UJ	0.01 U	0.01 U	0.002 J	0.01 UJ	0.01 U	0.01 UJ	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.001 J	0.01 U	0.018 U
Pit 11	X120	6	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U
Pit 12	X159	3	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	0.19 J	1.4 U	1.4 U
Pit 12	X160	3	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 UJ	1.4 U	0.17 J	1.4 U	1.4 U	1.4 U	0.27 J	1.4 UJ	2.1 =
Pit 12	X161	9	0.01 U	0.01 U	0.01 U	0.01 U	0.008 J	0.01 U	0.01 U	0.01 UJ	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 UJ	0.043 U
Pit 13	X145	3	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 R	0.047 =
Pit 13	X146	9	1.1 U	1.1 U	1.1 U	1.1 U	4.3 =	1.1 U	1.1 UJ	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 UJ

Table E-4. VOCs in Alburn (mg/kg)

Station ID	Sample ID	Depth (ft.)	1,1,1-Trichloroethane	1,1,2,2-Tetrachloroethane	1,1,2-Trichloro-1,2,2-Trifluoroethane	1,1,2-Trichloroethane	1,1-Dichloroethane	1,1-Dichloroethene	1,2,4-Trichlorobenzene	1,2-Dibromo-3-Chloropropane	1,2-Dibromoethane	1,2-Dichlorobenzene	1,2-Dichloroethane	1,2-Dichloropropane	1,3-Dichlorobenzene	1,4-Dichlorobenzene	2-Hexanone	Acetone
Industrial/ Commercial		*Ing*				*8200*	*200000*	*18000*	*20000*	*4*	*0.07*	*180000*	*63*	*84*				*200000*
		Inh	*1200*			*1800*	*1700*	*1500*	*3200*	*17*	*0.32*	*560*	*0.7*	*23*		*17000*		*100000*
Construction Worker		*Ing*				*8200*	*200000*	*1800*	*2000*	*89*	*1.5*	*18000*	*1400*	*1800*				*200000*
		Inh	*1200*			*1800*	*130*	*1500*	*920*	*0.11*	*0.45*	*310*	*0.99*	*0.5*		*340*		*100000*
Soil Component of GW		*I*	2			*0.02*	*23*	*0.06*	*5*	*0.002*	*0.0004*	*17*	*0.02*	*0.03*		*2*		*16*
		II	*9.6*			*0.3*	*110*	*0.3*	*53*	*0.002*	*0.004*	*43*	*0.1*	*0.15*		*11*		*16*
Pit 14	X147	3	2.2 U	2.2 U	2.2 U	2.2 U	0.43 J	2.2 U	2.2 UJ	2.2 U	2.2 U	2.2 U	2.2 U	2.2 U	2.2 U	2.2 U	2.2 U	2.2 UJ
Pit 14	X148	9	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 UJ	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.3 J	1.9 U	1.9 UJ
Pit 15	X121	3	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U	0.014 R	0.075 J
Pit 16	X142	3	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U
Pit 16	X143	3	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U
Pit 16	X144	9	0.038 U	0.038 U	0.038 U	0.038 U	0.038 U	0.038 U	0.038 U	0.038 U	0.038 U	0.01 J	0.038 U	0.038 U	0.038 U	0.038 U	0.038 R	0.24 J
Pit 16	X144RE	9	0.032 U	0.032 U	0.032 U	0.032 U	0.032 U	0.032 U	0.032 U	0.032 UJ	0.032 U	0.005 J	0.032 U	0.032 U	0.032 U	0.032 U	0.032 UJ	0.048 U
Pit 17	X122	3	0.021 U	0.021 U	0.021 U	0.021 U	0.021 U	0.021 U	0.021 U	0.021 UJ	0.021 U	0.021 U	0.021 U	0.021 U	0.021 U	0.021 U	0.021 UJ	0.14 U
Pit 17	X123	6	22 U	22 U	22 U	22 U	22 U	22 U	22 U	22 U	22 U	22 U	22 U	22 U	22 U	22 U	22 U	22 U
Pit 18	X124	3	0.012 U	0.012 UJ	0.012 U	0.012 U	0.012 U	0.012 UJ	0.012 U	0.012 UJ	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.021 U
Pit 18	X125	6	13 U	13 U	13 U	13 U	13 U	13 U	13 U	13 U	13 U	13 U	13 U	13 U	13 U	3.9 J	13 U	13 U
Pit 19	X168	3	0.015 U	0.015 U	0.015 U	0.015 U	0.015 U	0.015 U	0.015 U	0.015 UJ	0.015 U	0.015 U	0.015 U	0.015 U	0.015 U	0.015 U	0.015 UJ	0.11 J
Pit 19	X169	8	7.6 U	7.6 U	7.6 U	7.6 U	7.6 U	7.6 U	7.6 U	7.6 U	7.6 U	7.6 U	7.6 U	7.6 U	7.6 U	7.6 U	7.6 U	7.6 U
Pit 20	X173	3	0.029 U	0.029 U	0.029 U	0.029 U	0.029 U	0.029 U	0.003 J	0.029 UJ	0.029 U	0.009 J	0.029 U	0.029 U	0.029 U	0.025 J	0.029 UJ	0.2 U
Pit 20	X174	8	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 UJ	1.3 UJ
Pit 21	X170	3	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 UJ	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.5 J	1.8 UJ	1.8 U
Pit 21	X171	3	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	0.49 J	1.8 U	1.8 U
Pit 21	X172	11	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 UJ	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 UJ	0.01 U
Pit 23	X126	3	0.97 U	0.97 U	0.97 U	0.97 U	0.97 U	0.97 U	0.97 U	0.97 UJ	0.97 U	0.97 U	0.97 U	0.97 U	0.97 U	0.97 U	0.97 UJ	0.43 J
Pit 23	X126RE	3	0.97 U	0.97 U	0.97 UJ	0.97 U	0.97 U	0.97 U	0.97 U	0.97 U	0.97 U	0.97 U	0.97 U	0.97 U	0.97 U	0.97 U	0.97 UJ	0.97 U
Pit 23	X127	7	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	0.88 J	1.8 U	1.8 U
Pit 24	X138	3	180 U	180 U	180 U	180 U	180 U	180 U	180 U	180 U	180 U	180 U	180 U	180 U	180 U	180 U	180 U	180 U
Pit 24	X139	9	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 UJ	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	0.43 J	1.2 U	1.2 UJ
Pit 25	X132	2.5	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 UJ	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 UJ	0.12 =
Pit 25	X132DL	2.5	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U
Pit 25	X133	8	1 U	1 U	1 U	1 U	1 U	1 U	1 UJ	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 UJ
Pit 26	X140	3	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U
Pit 26	X141	9	3.2 U	3.2 U	3.2 U	3.2 U	3.2 U	3.2 U	3.2 U	3.2 U	3.2 U	0.43 J	3.2 U	3.2 U	3.2 U	3.2 U	3.2 UJ	3.2 UJ

Table E-4. VOCs in Alburn (mg/kg)

Station ID	Sample ID	Depth (ft.)	1,1,1-Trichloroethane	1,1,2,2-Tetrachloroethane	1,1,2-Trichloro-1,2,2-Trifluoroethane	1,1,2-Trichloroethane	1,1-Dichloroethane	1,1-Dichloroethene	1,2,4-Trichlorobenzene	1,2-Dibromo-3-Chloropropane	1,2-Dibromoethane	1,2-Dichlorobenzene	1,2-Dichloroethane	1,2-Dichloropropane	1,3-Dichlorobenzene	1,4-Dichlorobenzene	2-Hexanone	Acetone
Industrial/ Commercial		*Ing*				*8200*	*200000*	*18000*	*20000*	*4*	*0.07*	*180000*	*63*	*84*				*200000*
		Inh	*1200*			*1800*	*1700*	*1500*	*3200*	*17*	*0.32*	*560*	*0.7*	*23*		*17000*		*100000*
Construction Worker		*Ing*				*8200*	*200000*	*1800*	*2000*	*89*	*1.5*	*18000*	*1400*	*1800*				*200000*
		Inh	*1200*			*1800*	*130*	*1500*	*920*	*0.11*	*0.45*	*310*	*0.99*	*0.5*		*340*		*100000*
Soil Component of GW		*I*	*2*			*0.02*	*23*	*0.06*	*5*	*0.002*	*0.0004*	*17*	*0.02*	*0.03*		*2*		*16*
		II	*9.6*			*0.3*	*110*	*0.3*	*53*	*0.002*	*0.004*	*43*	*0.1*	*0.15*		*11*		*16*
Pit 26	X141RE	9	3.2 U	3.2 U	3.2 U	3.2 U	3.2 U	3.2 U	3.2 U	3.2 UJ	3.2 U	0.44 J	3.2 U	3.2 U	3.2 U	0.33 J	3.2 UJ	3.2 U
Pit 27	X136	9	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	1.5 UJ	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	0.51 J	1.5 U	1.7 J
Pit 27	X137	3	0.35 J	1.5 U	1.5 U	1.5 U	0.67 J	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	0.22 J	1.5 U	1.5 U
Pit 28	X164	3	380 =	300 U	300 U	300 U	300 U	300 U	300 U	300 U	300 U	300 U	300 U	300 U	300 U	300 U	300 U	300 U
Pit 28	X165	10	49 U	49 U	49 U	49 U	49 U	49 U	49 U	49 U	49 U	49 U	49 U	49 U	49 U	49 U	49 UJ	49 UJ
Pit 28	X165RE	10	49 U	49 U	49 U	49 U	49 U	49 U	49 U	49 UJ	49 U	49 U	49 U	49 U	49 U	49 U	49 UJ	49 U
Pit 29	X128	3	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 UJ	5 U
Pit 29	X129	4.5	770 U	770 U	770 U	770 U	770 U	770 U	770 U	770 U	770 U	770 U	770 U	770 U	770 U	770 U	770 U	770 U
Pit 30	X166	3	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 UJ	1.2 UJ
Pit 30	X166RE	3	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 UJ	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 UJ	1.2 U
Pit 30	X167	9	1.6 U	1.6 U	1.6 UJ	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	1.6 UJ	1.6 U
Pit 31	X130	3	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 UJ	11 U
Pit 31	X131	6	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	0.24 J	1.4 UJ	1.4 U
Pit 33	X134	3	14 U	14 U	14 U	14 U	14 U	14 U	14 U	14 U	14 U	2.7 J	14 U	14 U	14 U	14 U	14 U	14 U
Pit 33	X135	8	5.3 U	5.3 U	5.3 U	5.3 U	5.3 U	5.3 U	5.3 UJ	5.3 U	5.3 U	5.3 U	5.3 U	5.3 U	5.3 U	5.3 U	5.3 U	5.3 UJ
Pit 34	X162	3	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	3.6 =	2 U	2 U	2 U	2 U	2 U	2 U
Pit 34	X163	9	0.93 U	0.93 U	0.93 U	0.93 U	0.93 U	0.93 U	0.93 UJ	0.93 U	0.93 U	0.24 J	0.93 U	0.93 U	0.93 U	0.19 J	0.93 U	0.93 UJ
Pit 35	X149	3	0.011 U	0.011 U	0.011 U	0.011 U	0.009 J	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 R	0.011 U
Pit 35	X150	9	1 U	1 U	1 U	1 U	1 U	1 U	1 UJ	1 U	1 U	1 U	1 U	1 U	1 U	0.68 J	1 U	1 UJ
Pit 37	X151	3	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 UJ	1.9 UJ
Pit 37	X151RE	3	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 UJ	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	0.71 J	1.9 UJ	1.9 U
Pit 37	X152	9	0.93 U	0.93 U	0.93 U	0.93 U	0.93 U	0.93 U	0.93 UJ	0.93 U	0.93 U	0.93 U	0.93 U	0.93 U	0.93 U	0.13 J	0.93 U	0.93 UJ
Pit 38	X157	3	0.96 U	0.96 U	0.96 U	0.96 U	0.7 J	0.96 U	0.96 UJ	0.96 U	0.96 U	0.96 U	0.96 U	0.96 U	0.96 U	0.96 U	0.96 U	0.96 UJ
Pit 38	X158	9	5.6 U	5.6 U	5.6 U	5.6 U	5.6 U	5.6 U	5.6 UJ	5.6 U	5.6 U	5.6 U	5.6 U	5.6 U	5.6 U	5.6 U	5.6 U	2.9 J
Pit 39	X153	3	2 U	2 U	2 U	2 U	0.69 J	2 U	2 UJ	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 UJ
Pit 39	X154	9	0.98 U	0.98 U	0.98 U	0.98 U	0.98 U	0.98 U	0.98 UJ	0.98 U	0.98 U	0.98 U	0.98 U	0.98 U	0.98 U	0.32 J	0.98 U	0.98 UJ
Pit 40	X155	3	0.01 U	0.01 U	0.01 U	0.01 U	0.003 J	0.01 U	0.01 U	0.01 UJ	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 UJ	0.03 U
Pit 40	X156	10	4.3 U	4.3 U	4.3 U	4.3 U	4.3 U	4.3 U	4.3 UJ	4.3 U	4.3 U	4.3 U	4.3 U	4.3 U	4.3 U	4.3 U	4.3 U	4.3 UJ

Table E-4. VOCs in Alburn (mg/kg)

Station ID	Sample ID	Depth (ft.)	1,1,1-Trichloroethane	1,1,2,2-Tetrachloroethane	1,1,2-Trichloro-1,2,2-Trifluoroethane	1,1,2-Trichloroethane	1,1-Dichloroethane	1,1-Dichloroethene	1,2,4-Trichlorobenzene	1,2-Dibromo-3-Chloropropane	1,2-Dibromoethane	1,2-Dichlorobenzene	1,2-Dichloroethane	1,2-Dichloropropane	1,3-Dichlorobenzene	1,4-Dichlorobenzene	2-Hexanone	Acetone
Industrial/ Commercial		*Ing*				*8200*	*200000*	*18000*	*20000*	*4*	*0.07*	*180000*	*63*	*84*				*200000*
		Inh	*1200*			*1800*	*1700*	*1500*	*3200*	*17*	*0.32*	*560*	*0.7*	*23*		*17000*		*100000*
Construction Worker		*Ing*				*8200*	*200000*	*1800*	*2000*	*89*	*1.5*	*18000*	*1400*	*1800*				*200000*
		Inh	*1200*			*1800*	*130*	*1500*	*920*	*0.11*	*0.45*	*310*	*0.99*	*0.5*		*340*		*100000*
Soil Component of GW		*I*	*2*			*0.02*	*23*	*0.06*	*5*	*0.002*	*0.0004*	*17*	*0.02*	*0.03*		*2*		*16*
		II	*9.6*			*0.3*	*110*	*0.3*	*53*	*0.002*	*0.004*	*43*	*0.1*	*0.15*		*11*		*16*
Pit 41	X181	9	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 UJ	1 U	1 U	1 U	1 U	1 U	0.69 J	1 UJ	1 U
Pit 41	X182	3	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 UJ	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	0.24 J	1.1 UJ	1.1 U
Pit 42	X179	3	0.99 U	0.99 U	0.99 U	0.99 U	0.99 U	0.99 U	0.11 J	0.99 UJ	0.99 U	0.99 U	0.99 U	0.99 U	0.99 U	0.99 U	0.99 UJ	0.99 U
Pit 42	X180	9	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 UJ	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	0.25 J	1.4 UJ	1.4 U
Pit 43	X175	3	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 UJ	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 UJ	0.018 U
Pit 43	X176	8	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 UJ	1 U	1 U	1 U	1 U	1 U	1 U	1 UJ	1 U
Pit 44	X183	3	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 UJ	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 UJ	0.01 UJ
Pit 44	X184	8	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 UJ	2 U	2 U	2 U	2 U	2 U	2 U	2 UJ	2 U
Pit 45	X177	3	0.023 U	0.023 U	0.023 U	0.023 U	0.023 U	0.023 U	0.023 U	0.023 UJ	0.023 U	0.023 U	0.023 U	0.023 U	0.023 U	0.023 U	0.023 UJ	0.023 UJ
Pit 45	X178	8	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 UJ	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 UJ	1.8 U
Pit 52	X210	3	0.79 U	0.79 U	0.79 U	0.79 U	0.79 U	0.79 U	0.79 U	0.79 U	0.79 U	0.79 U	0.1 J	0.79 U	0.79 U	0.79 U	0.79 U	0.77 J
Pit 52	X211	5	0.018 U	0.018 U	0.018 U	0.018 U	0.018 U	0.018 U	0.018 U	0.018 U	0.018 U	0.018 U	0.018 U	0.018 U	0.018 U	0.018 U	0.018 U	0.078 U
Pit 53	X212	3	0.013 U	0.013 U	0.013 U	0.013 U	0.013 U	0.013 U	0.013 U	0.013 U	0.013 U	0.013 U	0.013 U	0.013 U	0.013 U	0.013 U	0.002 J	0.097 J
Pit 53	X213	7	0.67 U	0.67 U	0.67 U	0.67 U	0.67 U	0.67 U	0.67 U	0.67 U	0.67 U	0.29 J	0.67 U	0.67 U	0.67 U	0.26 J	0.67 U	0.5 J

Notes:

=: sample concentration is detected at level reported
U: sample concentration is under detection limit
J: sample concentration is estimated value
R: sample concentration value is rejected
DL: sample is diluted
RE: sample is re-extracted
Ing.: Ingestion
Inh.: Inhalation
I: Class I
II: Class II
[1]Values in the proposed rules.
[2]TACO RO values shown for 1,3-dichloropropene are the combined values for cis and trans.

Table E-4. VOCs in Alburn (mg/kg)

Station ID	Sample ID	Depth (ft.)	Benzene	Bromodichloromethane	Bromoform	Bromomethane	Carbon disulfide	Carbon tetrachloride	Chlorobenzene	Chloroethane	Chloroform	Chloromethane	cis-1,2-Dichloroethene	cis-1,3-Dichloropropene[2]	Cyclohexane	Dibromochloromethane	Dichlorodifluoromethane	Ethylbenzene
Industrial/ Commercial		*Ing*	*200*	*92*	*720*	*2900*	*200000*	*44*	*41000*		*940*		*20000*	*33*		*41000*		*200000*
		Inh	*1.5*	*3000*	*100*	*15*	*720*	*0.64*	*210*		*0.54*		*1200*	*0.23*		*1300*		*400*
Construction Worker		*Ing*	*4300*	*2000*	*16000*	*1000*	*20000*	*410*	*4100*		*2000*		*20000*	*610*		*41000*		*20000*
		Inh	*2.1*	*3000*	*140*	*3.9*	*9*	*0.9*	*1.3*		*0.76*		*1200*	*0.33*		*1300*		*58*
Soil Component of GW		*I*	*0.03*	*0.6*	*0.8*	*0.2*	*32*	*0.07*	*1*		*0.6*		*0.4*	*0.004*		*0.4*		*13*
		II	*0.17*	*0.6*	*0.8*	*1.2*	*160*	*0.33*	*6.5*		*2.9*		*1.1*	*0.02*		*0.4*		*19*
Pit 01	X101	2.5	0.016 =	0.009 U	0.009 U	0.003 J	0.001 J	0.009 U	0.009 U	0.009 U	0.009 U	0.009 U	0.004 J	0.009 U	0.003 J	0.009 U	0.009 U	0.002 J
Pit 01	X102	7.5	0.9 J	1.1 U	1.1 U	1.1 U	0.2 J	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 UJ	0.35 J
Pit 01B	X101	3	0.008 J	0.011 U	0.011 U	0.011 UJ	0.007 J	0.011 U	0.011 U	0.011 UJ	0.011 U	0.011 UJ	0.004 J	0.011 U	0.049 J	0.011 U	0.011 UJ	0.25 J
Pit 01B	X101RE	3	0.008 J	0.016 UJ	0.016 UJ	0.016 U	0.007 J	0.016 UJ	0.016 UJ	0.016 UJ	0.016 U	0.016 U	0.005 J	0.016 UJ	0.01 J	0.016 UJ	0.016 U	0.047 J
Pit 01B	X102	6	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 UJ	1.8 U	1.8 U	1.8 U	1.8 U	1.8 UJ	1.8 U	1.8 U	2.8 =
Pit 02	X103	2	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U	0.001 J
Pit 02	X104	6	31 U	31 U	31 U	31 U	31 U	31 U	31 U	31 U	31 U	31 U	31 U	31 U	31 U	31 U	31 UJ	17 J
Pit 03	X105	2.5	0.005 J	0.016 U	0.016 UJ	0.016 UJ	0.016 U	0.016 U	0.016 U	0.016 U	0.016 U	0.016 U	0.016 U	0.016 U	0.016 U	0.016 U	0.016 U	0.032 =
Pit 03	X106	0.5	0.018 U	0.018 U	0.018 UJ	0.018 UJ	0.018 U	0.018 U	0.018 U	0.018 U	0.018 U	0.018 U	0.018 U	0.018 U	0.018 U	0.018 U	0.018 U	0.018 U
Pit 03	X107	6	31 J	43 U	43 U	43 U	43 U	43 U	43 U	43 U	43 U	43 U	43 U	43 U	43 U	43 U	43 UJ	210 =
Pit 04	X108	3	0.002 J	0.011 U	0.011 UJ	0.011 UJ	0.002 J	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.001 J
Pit 04	X109	3	1.1 J	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	0.58 J	1 U	1 U	1 U	1 UJ	0.62 J
Pit 04	X110	6	0.04 =	0.029 U	0.029 U	0.029 UJ	0.007 J	0.029 U	0.029 U	0.029 U	0.029 U	0.029 U	0.048 =	0.029 U	0.029 U	0.029 U	0.029 U	0.081 =
Pit 05	X111	5	7.9 =	0.91 U	0.91 U	0.91 U	0.25 J	0.91 U	0.91 U	0.91 U	0.91 U	0.91 U	2.4 =	0.91 U	0.91 U	0.91 U	0.91 UJ	8.3 =
Pit 07	X112	3	0.003 J	0.01 U	0.01 UJ	0.01 UJ	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Pit 08	X113	2.5	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U
Pit 08	X114	4	2.8 =	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	0.43 J	1.6 U	1.6 U	1.6 U	0.18 J	1.6 U	1.6 U	1.6 U	1.6 U	11 =
Pit 09	X115	2.5	0.011 U	0.011 U	0.011 U	0.011 U	0.001 J	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U
Pit 09	X116	6	1.1 J	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	2.8 =
Pit 10	X117	2.5	0.003 J	0.01 U	0.01 U	0.01 U	0.001 J	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.001 J	0.01 U	0.01 U	0.01 U	0.01 U	0.008 J
Pit 10	X118	6	0.46 J	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	2.4 =
Pit 11	X119	2.5	0.003 J	0.01 U	0.01 U	0.039 J	0.002 J	0.01 U	0.01 U	0.01 U	0.01 U	0.006 J	0.01 U	0.01 U	0.002 J	0.01 U	0.01 U	0.002 J
Pit 11	X120	6	0.54 J	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.5 J
Pit 12	X159	3	0.22 J	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	0.37 J	1.4 U	1.4 U	1.4 U	1.4 U	0.29 J
Pit 12	X160	3	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 UJ	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	0.34 J
Pit 12	X161	9	0.01 U	0.01 U	0.01 U	0.01 U	0.001 J	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.002 J	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Pit 13	X145	3	0.005 J	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.003 J	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.001 J	0.011 U	0.011 U	0.004 J
Pit 13	X146	9	1.1 =	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 UJ	1.1 U	1.1 U	0.86 J	1.1 U	1.1 U	1.1 U	1.1 U	1.3 =

Table E-4. VOCs in Alburn (mg/kg)

Station ID	Sample ID	Depth (ft.)	Benzene	Bromodichloromethane	Bromoform	Bromomethane	Carbon disulfide	Carbon tetrachloride	Chlorobenzene	Chloroethane	Chloroform	Chloromethane	cis-1,2-Dichloroethene	cis-1,3-Dichloropropene[2]	Cyclohexane	Dibromochloromethane	Dichlorodifluoromethane	Ethylbenzene
Industrial/ Commercial		*Ing*	*200*	*92*	*720*	*2900*	*200000*	*44*	*41000*		*940*		*20000*	*33*		*41000*		*200000*
		Inh	*1.5*	*3000*	*100*	*15*	*720*	*0.64*	*210*		*0.54*		*1200*	*0.23*		*1300*		*400*
Construction Worker		*Ing*	*4300*	*2000*	*16000*	*1000*	*20000*	*410*	*4100*		*2000*		*20000*	*610*		*41000*		*20000*
		Inh	*2.1*	*3000*	*140*	*3.9*	*9*	*0.9*	*1.3*		*0.76*		*1200*	*0.33*		*1300*		*58*
Soil Component of GW		*I*	*0.03*	*0.6*	*0.8*	*0.2*	*32*	*0.07*	*1*		*0.6*		*0.4*	*0.004*		*0.4*		*13*
		II	*0.17*	*0.6*	*0.8*	*1.2*	*160*	*0.33*	*6.5*		*2.9*		*1.1*	*0.02*		*0.4*		*19*
Pit 14	X147	3	0.37 J	2.2 U	2.2 U	2.2 U	2.2 U	2.2 U	2.2 U	2.2 UJ	2.2 U	2.2 U	3.2 =	2.2 U	2.2 U	2.2 U	2.2 U	5.6 =
Pit 14	X148	9	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 UJ	1.9 U	1.9 U	1.3 J	1.9 U	1.9 U	1.9 U	1.9 U	12 =
Pit 15	X121	3	0.008 J	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U
Pit 16	X142	3	0.17 J	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	1.9 =
Pit 16	X143	3	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	0.57 J
Pit 16	X144	9	0.013 J	0.038 U	0.038 U	0.038 U	0.006 J	0.038 U	0.038 U	0.038 U	0.038 U	0.038 U	0.038 U	0.038 U	0.018 J	0.038 U	0.038 U	0.038 U
Pit 16	X144RE	9	0.021 J	0.032 U	0.032 U	0.032 U	0.004 J	0.032 U	0.032 U	0.032 U	0.032 U	0.032 U	0.032 U	0.032 U	0.007 J	0.032 U	0.032 U	0.032 U
Pit 17	X122	3	0.005 J	0.021 U	0.021 U	0.021 U	0.005 J	0.021 U	0.021 U	0.021 U	0.021 U	0.021 U	0.021 U	0.021 U	0.021 U	0.021 U	0.021 U	0.021 U
Pit 17	X123	6	22 U	22 U	22 U	22 U	22 U	22 U	22 U	22 U	22 U	22 U	22 U	22 U	22 U	22 U	22 U	82 =
Pit 18	X124	3	0.1 =	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U
Pit 18	X125	6	42 =	13 U	13 U	13 U	13 U	13 U	13 U	13 U	13 U	13 U	13 U	13 U	13 U	13 U	13 U	53 =
Pit 19	X168	3	0.002 J	0.015 U	0.015 U	0.015 U	0.015 U	0.015 U	0.015 U	0.015 U	0.015 U	0.015 U	0.015 U	0.015 U	0.015 U	0.015 U	0.015 U	0.078 =
Pit 19	X169	8	2.9 J	7.6 U	7.6 U	7.6 U	7.6 U	7.6 U	7.6 U	7.6 U	7.6 U	7.6 U	7.6 U	7.6 U	7.6 U	7.6 U	7.6 U	75 =
Pit 20	X173	3	0.31 =	0.029 U	0.029 U	0.029 U	0.55 =	0.029 U	0.022 J	0.029 U	0.029 U	0.029 U	0.006 J	0.029 U	0.033 =	0.029 U	0.029 U	0.029 U
Pit 20	X174	8	1.3 U	1.3 U	1.3 U	1.3 U	0.36 J	1.3 U	1.3 =	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 UJ	3.9 =
Pit 21	X170	3	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.9 =	1.8 UJ	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U
Pit 21	X171	3	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.9 =
Pit 21	X172	11	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Pit 23	X126	3	0.97 U	0.97 U	0.97 U	0.97 U	0.97 U	0.97 U	0.97 U	0.97 UJ	0.97 U	0.97 U	0.97 U	0.97 U	0.97 U	0.97 U	0.97 U	1.4 J
Pit 23	X126RE	3	0.97 U	0.97 U	0.97 U	0.97 U	0.97 U	0.97 U	0.97 U	0.97 UJ	0.97 U	0.97 U	0.97 U	0.97 U	0.97 U	0.97 U	0.97 U	1.4 J
Pit 23	X127	7	0.41 J	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	0.77 J	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	4.8 =
Pit 24	X138	3	180 U	180 U	180 U	180 U	180 U	180 U	19 J	180 U	180 U	180 U	180 U	180 U	180 U	180 U	180 U	1200 =
Pit 24	X139	9	1.5 =	1.2 U	1.2 U	1.2 U	0.58 J	1.2 U	0.4 J	1.2 UJ	1.2 U	1.2 U	0.61 J	1.2 U	1.2 U	1.2 U	1.2 U	8.5 =
Pit 25	X132	2.5	0.006 J	0.011 U	0.011 U	0.011 U	0.011 =	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.014 =	0.011 U	0.011 U	0.011 U	0.011 U	0.004 J
Pit 25	X132DL	2.5	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	0.19 J
Pit 25	X133	8	0.18 J	1 U	1 U	1 U	1 U	1 U	1 U	1 UJ	1 U	1 U	0.17 J	1 U	1 U	1 U	1 U	2.2 =
Pit 26	X140	3	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	0.42 J	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	2.5 =
Pit 26	X141	9	3.2 U	3.2 U	3.2 U	3.2 U	3.2 U	3.2 U	3.2 U	3.2 U	3.2 U	3.2 U	3.2 U	3.2 U	3.2 U	3.2 U	3.2 UJ	17 J

Table E-4. VOCs in Alburn (mg/kg)

Station ID	Sample ID	Depth (ft.)	Benzene	Bromodichloromethane	Bromoform	Bromomethane	Carbon disulfide	Carbon tetrachloride	Chlorobenzene	Chloroethane	Chloroform	Chloromethane	cis-1,2-Dichloroethene	cis-1,3-Dichloropropene[2]	Cyclohexane	Dibromochloromethane	Dichlorodifluoromethane	Ethylbenzene
Industrial/ Commercial		*Ing*	*200*	*92*	*720*	*2900*	*200000*	*44*	*41000*		*940*		*20000*	*33*		*41000*		*200000*
		Inh	*1.5*	*3000*	*100*	*15*	*720*	*0.64*	*210*		*0.54*		*1200*	*0.23*		*1300*		*400*
Construction Worker		*Ing*	*4300*	*2000*	*16000*	*1000*	*20000*	*410*	*4100*		*2000*		*20000*	*610*		*41000*		*20000*
		Inh	*2.1*	*3000*	*140*	*3.9*	*9*	*0.9*	*1.3*		*0.76*		*1200*	*0.33*		*1300*		*58*
Soil Component of GW		*I*	*0.03*	*0.6*	*0.8*	*0.2*	*32*	*0.07*	*1*		*0.6*		*0.4*	*0.004*		*0.4*		*13*
		II	*0.17*	*0.6*	*0.8*	*1.2*	*160*	*0.33*	*6.5*		*2.9*		*1.1*	*0.02*		*0.4*		*19*
Pit 26	X141RE	9	3.2 U	3.2 U	3.2 U	3.2 U	3.2 U	3.2 U	0.51 J	3.2 UJ	3.2 U	3.2 U	3.2 U	3.2 U	3.2 U	3.2 U	3.2 U	16 J
Pit 27	X136	9	0.26 J	1.5 U	1.5 U	1.5 U	0.58 J	1.5 U	1.4 J	1.5 UJ	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	4.1 =
Pit 27	X137	3	0.33 J	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	5.4 =	1.5 U	1.5 U	1.5 U	0.58 J	1.5 U	1.5 U	1.5 U	1.5 U	23 =
Pit 28	X164	3	92 J	300 U	300 U	300 U	300 U	300 U	47 J	300 U	300 U	300 U	51 J	300 U	300 U	300 U	300 U	1400 =
Pit 28	X165	10	61 J	49 U	49 U	49 U	8.1 J	49 U	49 U	49 U	49 U	49 U	49 U	49 U	49 U	49 U	49 UJ	380 J
Pit 28	X165RE	10	64 J	49 U	49 U	49 U	14 J	49 U	49 U	49 UJ	49 U	49 U	49 U	49 U	49 U	49 U	49 U	410 J
Pit 29	X128	3	1.3 J	5 U	5 U	5 U	6.9 =	5 U	5 U	5 UJ	5 U	5 U	5 U	5 U	5 U	5 U	5 U	24 =
Pit 29	X129	4.5	770 U	770 U	770 U	770 U	770 U	770 U	770 U	770 U	770 U	770 U	770 U	770 U	770 U	770 U	770 U	5000 =
Pit 30	X166	3	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 UJ	2.1 J
Pit 30	X166RE	3	0.54 J	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	0.8 J	1.2 UJ	1.2 U	1.2 U	0.32 J	1.2 U	1.2 U	1.2 U	1.2 U	2.7 J
Pit 30	X167	9	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	1.6 UJ	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	1.6 =
Pit 31	X130	3	34 =	11 U	11 U	11 U	11 U	11 U	11 U	11 UJ	11 U	11 U	11 U	11 U	11 U	11 U	11 U	26 =
Pit 31	X131	6	7.8 =	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 UJ	9.9 =
Pit 33	X134	3	14 U	14 U	14 U	14 U	14 U	14 U	14 U	14 U	14 U	14 U	14 U	14 U	14 U	14 U	14 U	34 =
Pit 33	X135	8	0.97 J	5.3 U	5.3 U	5.3 U	0.68 J	5.3 U	5.3 U	5.3 UJ	5.3 U	5.3 U	5.3 U	5.3 U	5.3 U	5.3 U	5.3 U	19 =
Pit 34	X162	3	0.23 J	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	12 =
Pit 34	X163	9	0.14 J	0.93 U	0.93 U	0.93 U	0.49 J	0.93 U	0.93 U	0.93 UJ	0.93 U	0.93 U	0.93 U	0.93 U	0.93 U	0.93 U	0.93 U	3.3 =
Pit 35	X149	3	0.011 U	0.011 U	0.011 U	0.011 U	0.001 J	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.017 =	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U
Pit 35	X150	9	0.36 J	1 U	1 U	1 U	0.27 J	1 U	0.46 J	1 UJ	1 U	1 U	1.3 =	1 U	1 U	1 U	1 U	5.8 =
Pit 37	X151	3	2.5 J	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	0.38 J	1.9 U	1.9 U	1.9 U	0.64 J	1.9 U	1.9 U	1.9 U	1.9 UJ	12 J
Pit 37	X151RE	3	0.84 J	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 UJ	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	9.1 J
Pit 37	X152	9	0.46 J	0.93 U	0.93 U	0.93 U	0.22 J	0.93 U	0.93 U	0.93 UJ	0.93 U	0.93 U	0.93 U	0.93 U	0.93 U	0.93 U	0.93 U	4 =
Pit 38	X157	3	1.1 =	0.96 U	0.96 U	0.96 U	0.96 U	0.96 U	0.96 U	0.96 UJ	0.96 U	0.96 U	1.7 =	0.96 U	0.96 U	0.96 U	0.96 U	1.4 =
Pit 38	X158	9	5.6 U	5.6 U	5.6 U	5.6 U	5.6 U	5.6 U	5.6 U	5.6 UJ	5.6 U	5.6 U	4.5 J	5.6 U	5.6 U	5.6 U	5.6 U	4.5 J
Pit 39	X153	3	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 UJ	2 U	2 U	0.74 J	2 U	2 U	2 U	2 U	1.9 J
Pit 39	X154	9	2 =	0.98 U	0.98 U	0.98 U	0.51 J	0.98 U	0.11 J	0.98 UJ	0.98 U	0.98 U	0.98 U	0.98 U	0.93 J	0.98 U	0.98 U	18 =
Pit 40	X155	3	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Pit 40	X156	10	6.8 =	4.3 U	4.3 U	4.3 U	4.3 U	4.3 U	4.3 U	4.3 UJ	4.3 U	4.3 U	4.3 U	4.3 U	4.3 U	4.3 U	4.3 U	32 =

Table E-4. VOCs in Alburn (mg/kg)

Station ID	Sample ID	Depth (ft.)	Benzene	Bromodichloromethane	Bromoform	Bromomethane	Carbon disulfide	Carbon tetrachloride	Chlorobenzene	Chloroethane	Chloroform	Chloromethane	cis-1,2-Dichloroethene	cis-1,3-Dichloropropene[2]	Cyclohexane	Dibromochloromethane	Dichlorodifluoromethane	Ethylbenzene
Industrial/ Commercial		*Ing*	*200*	*92*	*720*	*2900*	*200000*	*44*	*41000*		*940*		*20000*	*33*		*41000*		*200000*
		Inh	*1.5*	*3000*	*100*	*15*	*720*	*0.64*	*210*		*0.54*		*1200*	*0.23*		*1300*		*400*
Construction Worker		*Ing*	*4300*	*2000*	*16000*	*1000*	*20000*	*410*	*4100*		*2000*		*20000*	*610*		*41000*		*20000*
		Inh	*2.1*	*3000*	*140*	*3.9*	*9*	*0.9*	*1.3*		*0.76*		*1200*	*0.33*		*1300*		*58*
Soil Component of GW		*I*	*0.03*	*0.6*	*0.8*	*0.2*	*32*	*0.07*	*1*		*0.6*		*0.4*	*0.004*		*0.4*		*13*
		II	*0.17*	*0.6*	*0.8*	*1.2*	*160*	*0.33*	*6.5*		*2.9*		*1.1*	*0.02*		*0.4*		*19*
Pit 41	X181	9	0.35 J	1 U	1 U	1 U	1 U	1 U	1 U	1 UJ	1 U	1 U	1 U	1 U	1 U	1 U	1 U	0.59 J
Pit 41	X182	3	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 UJ	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 =
Pit 42	X179	3	0.99 U	0.99 U	0.99 U	0.99 U	0.37 J	0.99 U	0.99 U	0.99 UJ	0.99 U	0.99 U	0.99 U	0.99 U	0.99 U	0.99 U	0.99 U	8.8 =
Pit 42	X180	9	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 UJ	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.7 =
Pit 43	X175	3	0.045 =	0.004 J	0.011 U	0.011 U	0.001 J	0.011 U	0.003 J	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.1 =	0.011 U	0.011 U	0.011 U
Pit 43	X176	8	4.3 =	1 U	1 U	1 U	1 U	1 U	1 U	1 UJ	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1.4 =
Pit 44	X183	3	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.001 J
Pit 44	X184	8	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 UJ	2 U	2 U	2 U	2 U	2 U	2 U	2 U	0.79 J
Pit 45	X177	3	0.023 U	0.023 U	0.023 U	0.023 U	0.023 U	0.023 U	0.023 U	0.023 U	0.023 U	0.023 U	0.023 U	0.023 U	0.023 U	0.023 U	0.023 U	0.023 U
Pit 45	X178	8	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 UJ	1.8 U	1.8 U	1.1 J	1.8 U	1.8 U	1.8 U	1.8 U	2.6 =
Pit 52	X210	3	0.79 U	0.79 U	0.79 UJ	0.79 U	0.79 U	0.79 U	0.79 U	0.79 U	0.79 U	0.79 U	0.79 U	0.79 U	0.79 U	0.79 U	0.79 U	0.79 U
Pit 52	X211	5	0.08 =	0.018 U	0.018 U	0.018 U	0.031 J	0.018 U	0.018 U	0.018 U	0.018 U	0.018 U	0.018 U	0.018 U	0.024 =	0.018 U	0.018 U	0.019 =
Pit 53	X212	3	0.009 J	0.013 U	0.013 U	0.013 U	0.013 J	0.013 U	0.013 U	0.013 U	0.013 U	0.013 U	0.005 J	0.013 U	0.04 =	0.013 U	0.013 U	0.005 J
Pit 53	X213	7	0.18 J	0.67 U	0.67 UJ	0.67 U	0.67 U	0.67 U	0.67 U	0.67 U	0.67 U	0.67 U	0.67 U	0.67 U	0.57 J	0.67 U	0.67 U	0.53 J

Notes:

=: sample concentration is detected at level reported
U: sample concentration is under detection limit
J: sample concentration is estimated value
R: sample concentration value is rejected
DL: sample is diluted
RE: sample is re-extracted
Ing.: Ingestion
Inh.: Inhalation
I: Class I
II: Class II

[1]Values in the proposed rules.

[2]TACO RO values shown for 1,3-dichloropropene are the combined values for cis and trans.

Table E-4. VOCs in Alburn (mg/kg)

Station ID	Sample ID	Depth (ft.)	Isopropylbenzene	Methyl acetate	Methyl ethyl ketone	Methyl isobutyl ketone	Methylcyclohexane	Methylene chloride	Styrene	Tert-Butyl Methyl Ether[1]	Tetrachloroethene	Toluene	trans-1,2-Dichloroethene	trans-1,3-Dichloropropene[2]	Trichloroethene	Trichlorofluoromethane	Vinyl chloride	Xylenes
Industrial/ Commercial		*Ing*						*760*	*410000*	*20000*	*110*	*410000*	*41000*	*33*	*520*		*3*	*1000000*
		Inh						*24*	*1500*	*8800*	*20*	*650*	*3100*	*0.23*	*8.9*		*0.06*	*410*
Construction Worker		*Ing*						*12000*	*41000*	*2000*	*2400*	*410000*	*41000*	*610*	*1200*		*65*	*410000*
		Inh						*34*	*430*	*140*	*28*	*42*	*3100*	*0.33*	*12*		*0.08*	*410*
Soil Component of GW		*I*						*0.02*	*4*	*0.32*	*0.06*	*12*	*0.7*	*0.004*	*0.06*		*0.01*	*150*
		II						*0.2*	*18*	*0.32*	*0.3*	*29*	*3.4*	*0.02*	*0.3*		*0.07*	*150*
Pit 01	X101	2.5	0.009 U	0.012 =	0.009 U	0.009 U	0.044 =	0.009 U	0.009 U	0.009 U	0.006 J	0.003 J	0.009 U	0.009 U	0.01 =	0.009 U	0.009 U	0.007 J
Pit 01	X102	7.5	1.1 U	1.1 U	1.1 U	1.1 U	1.2 =	0.23 J	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	0.49 J
Pit 01B	X101	3	0.01 J	0.011 UJ	0.005 J	0.011 UJ	0.022 J	0.016 U	0.011 U	0.011 U	0.004 J	0.034 J	0.011 U	0.011 UJ	0.005 J	0.011 UJ	0.002 J	0.46 J
Pit 01B	X101RE	3	0.016 UJ	0.016 U	0.011 J	0.016 UJ	0.016 UJ	0.016 U	0.016 UJ	0.016 U	0.016 UJ	0.01 J	0.016 U	0.016 UJ	0.002 J	0.016 U	0.016 U	0.098 J
Pit 01B	X102	6	0.34 J	2.4 UJ	4.8 U	2.2 UJ	1.8 UJ	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	12 =
Pit 02	X103	2	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U	0.005 J	0.014 U	0.014 U	0.021 =	0.014 U	0.014 U	0.016 =
Pit 02	X104	6	31 U	31 U	31 U	31 U	31 U	12 J	31 U	31 U	31 U	95 =	31 U	31 U	370 =	31 U	31 U	87 =
Pit 03	X105	2.5	0.024 =	0.016 U	0.018 =	0.016 U	0.004 J	0.016 =	0.057 =	0.016 U	0.016 U	0.085 =	0.016 U	0.016 U	0.003 J	0.016 U	0.016 U	0.11 =
Pit 03	X106	0.5	0.018 U	0.018 U	0.018 U	0.018 U	0.018 U	0.019 =	0.018 U	0.018 U	0.018 U	0.005 J	0.018 U	0.018 U	0.01 J	0.018 U	0.018 U	0.006 J
Pit 03	X107	6	76 =	43 U	43 U	43 U	350 =	43 U	43 U	43 U	9.8 J	43 =	43 U	43 U	19 J	43 U	43 U	330 =
Pit 04	X108	3	0.011 U	0.011 U	0.008 J	0.011 U	0.001 J	0.006 J	0.011 U	0.011 U	0.011 U	0.002 J	0.011 U	0.011 U	0.002 J	0.001 J	0.011 U	0.004 J
Pit 04	X109	3	1 U	1 U	1 U	1 U	1 U	0.21 J	1 U	1 U	1 U	1 U	1 U	1 U	0.49 J	1 U	1 U	1.3 =
Pit 04	X110	6	0.005 J	0.029 U	0.048 =	0.033 =	0.013 J	0.03 =	0.036 =	0.029 U	0.029 U	0.054 =	0.029 U	0.029 U	0.018 J	0.029 U	0.029 U	0.35 =
Pit 05	X111	5	0.91 U	0.91 U	0.91 U	0.91 U	0.41 J	0.91 U	0.91 U	0.91 U	0.91 U	0.91 U	0.096 J	0.91 U	0.91 U	0.91 U	0.91 U	36 =
Pit 07	X112	3	0.01 U	0.01 U	0.006 J	0.01 U	0.01 U	0.006 J	0.01 U	0.01 U	0.003 J	0.002 J	0.01 U	0.01 U	0.003 J	0.01 U	0.01 U	0.005 J
Pit 08	X113	2.5	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U
Pit 08	X114	4	1.7 =	1.6 U	1.6 U	1.6 U	0.74 J	2.4 =	1.6 U	1.6 U	1.6 U	2.1 =	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	39 =
Pit 09	X115	2.5	0.011 U	0.011 U	0.004 J	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U
Pit 09	X116	6	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	0.18 J	1.6 U	1.6 U	1 J	1.6 U	1.6 U	0.2 J	1.6 U	1.6 U	2.8 =
Pit 10	X117	2.5	0.001 J	0.01 U	0.01 U	0.01 U	0.003 J	0.01 U	0.01 U	0.01 U	0.01 U	0.008 J	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.019 =
Pit 10	X118	6	1.7 J	1.8 U	1.8 U	1.8 U	1.7 J	2.8 =	1.8 U	1.8 U	1.8 U	5.6 =	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	9.1 =
Pit 11	X119	2.5	0.01 U	0.063 =	0.01 U	0.01 U	0.004 J	0.01 U	0.01 U	0.01 U	0.003 J	0.006 J	0.01 U	0.01 U	0.001 J	0.01 U	0.003 J	0.01 =
Pit 11	X120	6	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	3.2 =	1.9 U	1.9 U	1.9 U	17 =	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	2.5 =
Pit 12	X159	3	1.4 U	1.4 U	1.4 U	1.4 U	0.23 J	0.71 J	1.4 U	1.4 U	1.4 U	2.4 =	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.5 =
Pit 12	X160	3	1.4 U	1.4 U	1.4 U	1.4 UJ	0.2 J	1.2 J	1.4 U	1.4 U	1.4 U	2.8 =	1.4 U	1.4 U	0.37 J	1.4 U	1.4 U	1.5 =
Pit 12	X161	9	0.01 U	0.01 U	0.01 U	0.01 U	0.012 =	0.01 U	0.01 U	0.01 U	0.01 U	0.003 J	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Pit 13	X145	3	0.002 J	0.011 U	0.011 U	0.011 U	0.004 J	0.011 U	0.011 U	0.011 U	0.011 U	0.009 J	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.028 =
Pit 13	X146	9	1.1 U	1.1 U	1.1 U	1.1 U	0.63 J	1.1 U	1.1 U	1.1 U	1.1 =	12 =	1.1 U	1.1 U	1.7 =	1.1 U	1.1 U	3 =

Table E-4. VOCs in Alburn (mg/kg)

Station ID	Sample ID	Depth (ft.)	Isopropylbenzene	Methyl acetate	Methyl ethyl ketone	Methyl isobutyl ketone	Methylcyclohexane	Methylene chloride	Styrene	Tert-Butyl Methyl Ether[1]	Tetrachloroethene	Toluene	trans-1,2-Dichloroethene	trans-1,3-Dichloropropene[2]	Trichloroethene	Trichlorofluoromethane	Vinyl chloride	Xylenes
Industrial/ Commercial		*Ing*						*760*	*410000*	*20000*	*110*	*410000*	*41000*	*33*	*520*		*3*	*1000000*
		Inh						*24*	*1500*	*8800*	*20*	*650*	*3100*	*0.23*	*8.9*		*0.06*	*410*
Construction Worker		*Ing*						*12000*	*41000*	*2000*	*2400*	*410000*	*41000*	*610*	*1200*		*65*	*410000*
		Inh						*34*	*430*	*140*	*28*	*42*	*3100*	*0.33*	*12*		*0.08*	*410*
Soil Component of GW		*I*						*0.02*	*4*	*0.32*	*0.06*	*12*	*0.7*	*0.004*	*0.06*		*0.01*	*150*
		II						*0.2*	*18*	*0.32*	*0.3*	*29*	*3.4*	*0.02*	*0.3*		*0.07*	*150*
Pit 14	X147	3	0.3 J	2.2 U	2.2 U	2.2 U	1.7 J	2.2 U	2.2 U	2.2 U	4.2 =	35 =	2.2 U	2.2 U	1.5 J	2.2 U	2.2 U	20 =
Pit 14	X148	9	1.4 J	1.9 U	1.9 U	1.9 U	1 J	0.6 J	1.9 U	1.9 U	1.1 J	28 =	1.9 U	1.9 U	0.62 J	1.9 U	0.26 J	40 =
Pit 15	X121	3	0.002 J	0.014 U	0.014 U	0.014 U	0.002 J	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U
Pit 16	X142	3	0.18 J	1.6 U	1.6 U	1.6 U	0.24 J	3 =	1.6 U	1.6 U	1.6 U	1 J	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	7.6 =
Pit 16	X143	3	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	2.9 J	1.7 U	1.7 U	1.7 U	0.44 J	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	2.4 =
Pit 16	X144	9	0.012 J	0.038 U	0.038 U	0.038 U	0.043 J	0.038 U	0.038 U	0.038 U	0.038 U	0.038 U	0.038 U	0.038 U	0.038 U	0.038 U	0.038 U	0.038 U
Pit 16	X144RE	9	0.032 U	0.032 U	0.032 U	0.032 U	0.052 J	0.032 U	0.032 U	0.032 U	0.032 U	0.032 U	0.032 U	0.032 U	0.032 U	0.032 U	0.032 U	0.032 U
Pit 17	X122	3	0.015 J	0.021 U	0.021 U	0.021 U	0.021 U	0.021 U	0.021 U	0.021 U	0.021 U	0.021 U	0.021 U	0.021 U	0.021 U	0.021 U	0.021 U	0.007 J
Pit 17	X123	6	11 J	22 U	22 U	22 U	22 U	8.9 J	22 U	22 U	22 U	22 U	22 U	22 U	22 U	22 U	22 U	280 =
Pit 18	X124	3	0.014 =	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.007 J
Pit 18	X125	6	24 =	13 U	13 U	13 U	1.8 J	12 J	13 U	13 U	1.5 J	20 =	13 U	13 U	13 U	13 U	13 U	300 =
Pit 19	X168	3	0.008 J	0.015 U	0.011 J	0.015 U	0.002 J	0.009 J	0.015 U	0.015 U	0.015 U	0.004 J	0.015 U	0.015 U	0.015 U	0.015 U	0.015 U	0.29 =
Pit 19	X169	8	3.8 J	7.6 U	7.6 U	7.6 U	7.6 U	2.1 J	7.6 U	7.6 U	7.6 U	7.6 U	7.6 U	7.6 U	7.6 U	7.6 U	7.6 U	250 =
Pit 20	X173	3	0.025 J	0.029 U	0.05 =	0.029 U	0.048 =	0.029 U	0.029 U	0.029 U	0.029 U	0.013 J	0.029 U	0.029 U	0.029 U	0.029 U	0.029 U	0.02 J
Pit 20	X174	8	2 =	1.3 U	1.3 U	1.3 U	0.17 J	0.54 J	1.3 U	1.3 U	1.3 U	0.33 J	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	18 =
Pit 21	X170	3	1.8 U	1.8 U	1.8 U	1.8 UJ	1.8 U	1.5 J	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	0.19 J
Pit 21	X171	3	0.33 J	1.8 U	1.8 U	1.8 U	1.8 U	1.5 J	1.8 U	1.8 U	1.8 U	0.69 J	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	4.2 =
Pit 21	X172	11	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Pit 23	X126	3	0.22 J	0.97 U	0.97 U	0.97 UJ	0.97 U	0.8 J	0.97 U	0.97 U	0.97 U	0.97 U	0.97 U	0.97 U	0.97 U	0.97 U	0.97 U	10 J
Pit 23	X126RE	3	0.97 U	0.97 U	0.97 U	0.97 U	0.97 U	1.4 J	0.97 U	0.97 U	0.97 U	0.47 J	0.97 U	0.97 U	0.97 U	0.97 U	0.97 U	9.6 J
Pit 23	X127	7	3.1 =	1.8 U	1.8 U	1.8 U	0.67 J	1.7 J	1.8 U	1.8 U	1.8 U	1.7 J	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	26 =
Pit 24	X138	3	57 J	180 U	180 U	180 U	180 U	45 J	180 U	180 U	180 U	550 =	180 U	180 U	180 U	180 U	180 U	3700 =
Pit 24	X139	9	1.1 J	1.2 U	1.2 U	1.2 U	0.14 J	1.2 U	1.2 U	1.2 U	2 =	8.6 =	0.14 J	1.2 U	1.2 =	1.2 U	1.2 U	26 =
Pit 25	X132	2.5	0.011 U	0.011 U	0.24 =	0.12 =	0.002 J	0.011 U	0.011 U	0.011 U	0.007 J	0.043 =	0.011 U	0.011 U	0.008 J	0.011 U	0.006 J	0.026 =
Pit 25	X132DL	2.5	1.1 U	1.1 U	0.71 J	1.1 U	1.1 U	0.84 J	1.1 U	1.1 U	1.1 U	0.97 J	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1 J
Pit 25	X133	8	0.73 J	1 U	1 U	1 U	0.28 J	0.34 J	1 U	1 U	0.32 J	2.5 =	1 U	1 U	1 U	1 U	1 U	12 =
Pit 26	X140	3	0.66 J	1.3 U	1.3 U	1.3 U	1.3 U	0.19 J	1.3 U	1.3 U	0.98 J	0.6 J	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	4 =
Pit 26	X141	9	3.1 J	3.2 U	3.2 U	3.2 U	3.2 U	1.1 J	3.2 U	3.2 U	3.2 U	3.2 U	3.2 U	3.2 U	3.2 U	3.2 U	3.2 U	83 J

Table E-4. VOCs in Alburn (mg/kg)

Station ID	Sample ID	Depth (ft.)	Isopropylbenzene	Methyl acetate	Methyl ethyl ketone	Methyl isobutyl ketone	Methylcyclohexane	Methylene chloride	Styrene	Tert-Butyl Methyl Ether[1]	Tetrachloroethene	Toluene	trans-1,2-Dichloroethene	trans-1,3-Dichloropropene[2]	Trichloroethene	Trichlorofluoromethane	Vinyl chloride	Xylenes
Industrial/ Commercial		*Ing*						*760*	*410000*	*20000*	*110*	*410000*	*41000*	*33*	*520*		*3*	*1000000*
		Inh						*24*	*1500*	*8800*	*20*	*650*	*3100*	*0.23*	*8.9*		*0.06*	*410*
Construction Worker		*Ing*						*12000*	*41000*	*2000*	*2400*	*410000*	*41000*	*610*	*1200*		*65*	*410000*
		Inh						*34*	*430*	*140*	*28*	*42*	*3100*	*0.33*	*12*		*0.08*	*410*
Soil Component of GW		*I*						*0.02*	*4*	*0.32*	*0.06*	*12*	*0.7*	*0.004*	*0.06*		*0.01*	*150*
		II						*0.2*	*18*	*0.32*	*0.3*	*29*	*3.4*	*0.02*	*0.3*		*0.07*	*150*
Pit 26	X141RE	9	3 J	3.2 U	3.2 U	3.2 UJ	1.2 J	2.3 J	3.2 U	3.2 U	3.2 U	1.4 J	3.2 U	3.2 U	3.2 U	3.2 U	3.2 U	82 J
Pit 27	X136	9	2.1 =	1.5 U	1.5 U	1.5 U	1.5 U	0.38 J	1.5 U	1.5 U	1.5 U	0.51 J	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	24 =
Pit 27	X137	3	7.7 =	1.5 U	1.5 U	1.5 U	3 =	0.31 J	1.5 U	1.5 U	13 =	1.7 =	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	21 =
Pit 28	X164	3	43 J	300 U	300 U	300 U	300 U	400 J	300 U	300 U	360 =	3700 =	300 U	300 U	260 J	300 U	300 U	4500 =
Pit 28	X165	10	49 U	49 U	49 U	49 U	16 J	49 U	49 U	49 U	49 U	660 J	49 U	49 U	49 U	49 U	49 U	1300 J
Pit 28	X165RE	10	49 U	49 U	49 U	49 UJ	17 J	32 J	49 U	49 U	49 U	750 J	49 U	49 U	49 U	49 U	49 U	1500 J
Pit 29	X128	3	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	120 =
Pit 29	X129	4.5	170 J	770 U	770 U	770 U	770 U	200 J	770 U	770 U	83 J	700 J	770 U	770 U	770 U	770 U	770 U	25000 =
Pit 30	X166	3	0.64 J	1.2 U	1.2 U	1.2 U	0.32 J	1.2 U	1.2 U	1.2 U	0.26 J	2.7 J	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	13 J
Pit 30	X166RE	3	1.3 J	1.2 U	1.2 U	1.2 UJ	0.75 J	0.91 J	1.2 U	1.2 U	1.2 U	0.9 J	1.2 U	1.2 U	1.2 J	1.2 U	1.2 U	4 J
Pit 30	X167	9	0.44 J	1.6 U	1.6 U	1.6 U	0.31 J	2.4 J	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	0.95 J	1.6 U	1.6 U	4.2 =
Pit 31	X130	3	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U	120 =	11 U	11 U	11 U	11 U	11 U	250 =
Pit 31	X131	6	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.7 =	1.4 U	1.4 U	12 =	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	31 =
Pit 33	X134	3	9.2 J	14 U	12 J	14 U	14 U	2.3 J	14 U	14 U	14 U	6.4 J	14 U	14 U	14 U	14 U	14 U	190 =
Pit 33	X135	8	2.4 J	5.3 U	5.3 U	5.3 U	5.3 U	5.3 U	5.3 U	5.3 U	5.3 U	79 =	5.3 U	5.3 U	5.3 U	5.3 U	5.3 U	110 =
Pit 34	X162	3	0.53 J	2 U	2 U	2 U	2 U	2 U	2 U	2 U	1.3 J	14 =	2 U	2 U	0.38 J	2 U	2 U	64 =
Pit 34	X163	9	0.24 J	0.93 U	0.93 U	0.93 U	1.9 =	0.81 J	0.93 U	0.93 U	0.13 J	1.2 =	0.93 U	0.93 U	0.93 U	0.93 U	0.93 U	5.1 =
Pit 35	X149	3	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.002 J	0.011 U	0.018 =	0.011 U	0.011 U	0.011 U
Pit 35	X150	9	0.44 J	1 U	1 U	1 U	1.9 =	0.38 J	1 U	1 U	0.12 J	10 =	0.21 J	1 U	1 U	1 U	1 U	20 =
Pit 37	X151	3	1.4 J	1.9 U	2.7 J	1.9 U	0.28 J	1.9 U	1.9 U	1.9 U	2.4 J	12 J	1.9 U	1.9 U	1.5 J	1.9 U	1.9 U	37 J
Pit 37	X151RE	3	17 J	1.9 U	1.9 U	1.9 UJ	10 J	1.4 J	1.9 U	1.9 U	1.9 U	14 J	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	58 J
Pit 37	X152	9	0.27 J	0.93 U	0.93 U	0.93 U	1.4 =	0.22 J	0.93 U	0.93 U	0.93 U	0.89 J	0.93 U	0.93 U	0.93 U	0.93 U	0.93 U	15 =
Pit 38	X157	3	0.76 J	0.96 U	0.96 U	0.96 U	1.4 =	0.27 J	0.96 U	0.96 U	0.96 U	1.4 =	0.14 J	0.96 U	0.77 J	0.96 U	0.96 U	1.4 =
Pit 38	X158	9	3.1 J	5.6 U	5.6 U	5.6 U	5.6 U	1.2 J	5.6 U	5.6 U	0.7 J	42 =	5.6 U	5.6 U	1.1 J	5.6 U	5.6 U	12 =
Pit 39	X153	3	2 U	2 U	2 U	2 U	2.3 =	0.53 J	2 U	2 U	6.1 =	20 =	2 U	2 U	5.4 =	2 U	2 U	5.6 =
Pit 39	X154	9	10 =	0.98 U	0.98 U	0.98 U	3.9 =	0.98 U	0.98 U	0.98 U	0.51 J	1.2 =	0.98 U	0.98 U	0.22 J	0.98 U	0.98 U	13 =
Pit 40	X155	3	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Pit 40	X156	10	5 =	4.3 U	4.3 U	4.3 U	1.4 J	4.3 U	4.3 U	4.3 U	4.3 U	7.6 =	4.3 U	4.3 U	4.3 U	4.3 U	4.3 U	78 =

Table E-4. VOCs in Alburn (mg/kg)

Station ID	Sample ID	Depth (ft.)	Isopropylbenzene	Methyl acetate	Methyl ethyl ketone	Methyl isobutyl ketone	Methylcyclohexane	Methylene chloride	Styrene	Tert-Butyl Methyl Ether[1]	Tetrachloroethene	Toluene	trans-1,2-Dichloroethene	trans-1,3-Dichloropropene[2]	Trichloroethene	Trichlorofluoromethane	Vinyl chloride	Xylenes
Industrial/ Commercial		*Ing*						*760*	*410000*	*20000*	*110*	*410000*	*41000*	*33*	*520*		*3*	*1000000*
		Inh						*24*	*1500*	*8800*	*20*	*650*	*3100*	*0.23*	*8.9*		*0.06*	*410*
Construction Worker		*Ing*						*12000*	*41000*	*2000*	*2400*	*410000*	*41000*	*610*	*1200*		*65*	*410000*
		Inh						*34*	*430*	*140*	*28*	*42*	*3100*	*0.33*	*12*		*0.08*	*410*
Soil Component of GW		*I*						*0.02*	*4*	*0.32*	*0.06*	*12*	*0.7*	*0.004*	*0.06*		*0.01*	*150*
		II						*0.2*	*18*	*0.32*	*0.3*	*29*	*3.4*	*0.02*	*0.3*		*0.07*	*150*
Pit 41	X181	9	1 U	1 U	1 U	1 UJ	1 U	0.73 J	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2.7 =
Pit 41	X182	3	0.21 J	1.1 U	1.1 U	1.1 UJ	1.1 U	0.7 J	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	2.7 =
Pit 42	X179	3	0.95 J	0.99 U	0.99 U	0.99 UJ	0.99 U	0.79 J	0.99 U	0.99 U	0.99 U	0.99 U	0.99 U	0.99 U	0.99 U	0.99 U	0.99 U	2.6 =
Pit 42	X180	9	0.38 J	1.4 U	1.4 U	1.4 UJ	1.4 U	1 J	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.7 =
Pit 43	X175	3	0.003 J	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.002 J
Pit 43	X176	8	1 U	1 U	1 U	1 UJ	1 U	0.8 J	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1.8 =
Pit 44	X183	3	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.013 =	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.004 J
Pit 44	X184	8	2 U	2 U	2 U	2 UJ	2 U	1.6 J	2 U	2 U	0.4 J	2	2 U	2 U	2 U	2 U	2 U	4.9
Pit 45	X177	3	0.023 U	0.023 U	0.023 U	0.023 U	0.023 U	0.01 J	0.023 U	0.023 U	0.023 U	0.023 U	0.023 U	0.023 U	0.023 U	0.023 U	0.023 U	0.023 U
Pit 45	X178	8	1.8 U	1.8 U	1.8 U	1.8 UJ	0.41 J	1.4 J	1.8 U	1.8 U	1.9 =	1.8 U	1.8 U	1.8 U	0.37 J	1.8 U	1.8 U	3.7 =
Pit 52	X210	3	0.79 U	0.13 J	0.79 U	0.79 U	0.79 U	0.79 U	0.79 U	0.79 U	0.79 U	0.51 J	0.79 U	0.79 U	0.79 U	0.79 U	0.79 U	0.43 J
Pit 52	X211	5	0.1 =	0.018 U	0.024 =	0.022 =	0.04 =	0.018 U	0.018 U	0.018 U	0.018 U	0.038 =	0.018 U	0.018 U	0.018 U	0.018 U	0.018 U	0.051 =
Pit 53	X212	3	0.013 U	0.013 U	0.031 =	0.004 J	0.058 =	0.002 J	0.013 U	0.013 U	0.007 J	0.19 =	0.013 U	0.013 U	0.003 J	0.013 U	0.013 U	0.027 =
Pit 53	X213	7	6.9 =	0.22 J	0.24 J	0.67 U	1 =	0.67 U	0.67 U	0.67 U	0.67 U	0.17 J	0.67 U	0.67 U	0.67 U	0.67 U	0.67 U	1.6 =

Notes:

=: sample concentration is detected at level reported
U: sample concentration is under detection limit
J: sample concentration is estimated value
R: sample concentration value is rejected
DL: sample is diluted
RE: sample is re-extracted
Ing.: Ingestion
Inh.: Inhalation
I: Class I
II: Class II

[1]Values in the proposed rules.

[2]TACO RO values shown for 1,3-dichloropropene are the combined values for cis and trans.

Table E-5. VOCs in U.S. Drum (mg/kg)

Station ID	Sample ID	Depth (ft.)	1,1,1-Trichloroethane	1,1,2,2-Tetrachloroethane	1,1,2-Trichloro-1,2,2-Trifluor	1,1,2-Trichloroethane	1,1-Dichloroethane	1,1-Dichloroethene	1,2,4-Trichlorobenzene	1,2-Dibromo-3-Chloropropan	1,2-Dibromoethane	1,2-Dichlorobenzene	1,2-Dichloroethane	1,2-Dichloropropane	1,3-Dichlorobenzene	1,4-Dichlorobenzene	2-Hexanone	Acetone
Industrial/		*Ing*				*8200*	*200000*	*18000*	*20000*	*4*	*0.07*	*180000*	*63*	*84*				*200000*
Commercial		*Inh*	*1200*			*1800*	*1700*	*1500*	*3200*	*17*	*0.32*	*560*	*0.7*	*23*		*17000*		*100000*
Construction		*Ing*				*8200*	*200000*	*1800*	*2000*	*89*	*1.5*	*18000*	*1400*	*1800*				*200000*
Worker		*Inh*	*1200*			*1800*	*130*	*1500*	*920*	*0.11*	*0.45*	*310*	*0.99*	*0.5*		*340*		*100000*
Soil Component		*I*	*2*			*0.02*	*23*	*0.06*	*5*	*0.002*	*0.0004*	*17*	*0.02*	*0.03*		*2*		*16*
of GW		*II*	*9.6*			*0.3*	*110*	*0.3*	*53*	*0.002*	*0.004*	*43*	*0.1*	*0.15*		*11*		*16*
Pit 01	X207	4	0.011 UJ	0.011 UJ	0.011 UJ	0.011 UJ	0.011 UJ	0.011 UJ	0.011 UJ	0.011 UJ	0.011 UJ	0.011 UJ	0.011 UJ	0.011 UJ	0.011 UJ	0.011 UJ	0.011 UJ	0.011 U
Pit 01	X208	9	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	2.3 =	1.6 U	1.8 =
Pit 01	X209	13	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	0.37 J	1.4 U	1.5 =
Pit 01	X209DL	13	14 U	14 U	14 U	14 U	14 U	14 U	14 U	14 UJ	14 U	14 U	14 U	14 U	14 U	14 U	14 UJ	18 =
Pit 02	X205	3	0.013 UJ	0.013 UJ	0.013 UJ	0.013 UJ	0.007 J	0.013 UJ	0.013 U	0.002 J	0.013 UJ	0.013 UJ	0.013 UJ	0.013 UJ	0.013 UJ	0.013 UJ	0.013 UJ	0.017 U
Pit 02	X206	9	0.62 U	0.62 U	0.62 U	0.62 U	0.62 U	0.62 U	0.62 U	0.62 U	0.62 U	0.62 U	0.62 U	0.62 U	0.62 U	0.62 U	0.62 U	0.68 =
Pit 03	X201	3	0.59 U	0.59 U	0.59 U	0.59 U	0.59 U	0.59 U	0.59 U	0.59 U	0.59 U	0.59 U	0.59 U	0.59 U	0.59 U	0.59 U	0.59 U	0.63 J
Pit 03	X202	8	0.018 U	0.018 U	0.018 U	0.018 U	0.018 U	0.018 U	0.018 U	0.018 U	0.018 U	0.018 U	0.018 U	0.018 U	0.018 U	0.018 U	0.018 U	0.043 U
Pit 04	X177	4	3.2 UJ	3.2 U	3.2 U	3.2 U	3.2 U	3.2 U	1.2 J	3.2 U	3.2 U	0.74 J	3.2 U	3.2 U	8.2 =	9.9 =	3.2 U	3.2 UJ
Pit 04	X178	8	2.4 U	2.4 U	2.4 U	2.4 U	2.4 U	2.4 U	2 J	2.4 U	2.4 U	3.2 =	2.4 U	2.4 U	120 =	130 =	2.4 U	2.4 UJ
Pit 04	X178DL	8	24 UJ	24 U	24 U	24 U	24 U	24 U	24 U	24 U	24 U	3 J	24 U	24 U	110 =	110 =	24 U	24 UJ
Pit 05	X198	2.5	0.61 U	0.61 U	0.61 U	0.61 U	0.61 U	0.61 U	0.61 U	0.61 U	0.61 U	0.61 U	0.61 U	0.61 U	0.61 U	0.61 U	0.61 U	0.19 J
Pit 05	X199	8	0.012 U	0.012 U	0.012 U	0.012 U	0.002 J	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.1 UJ
Pit 05	X200	8	0.012 U	0.012 U	0.012 U	0.012 U	0.004 J	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.051 UJ
Pit 06	X196	3	0.012 U	0.012 U	0.012 U	0.012 U	0.001 J	0.012 UJ	0.002 J	0.002 J	0.012 U	0.001 J	0.012 U	0.012 U	0.001 J	0.002 J	0.012 U	0.055 UJ
Pit 06	X197	8	0.012 U	0.012 U	0.012 U	0.012 U	0.001 J	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.031 UJ
Pit 07	X175	3	0.016 U	0.016 U	0.016 U	0.016 U	0.016 U	0.016 U	0.016 U	0.016 U	0.016 U	0.016 U	0.016 U	0.016 U	0.016 U	0.016 U	0.016 U	0.04 U
Pit 07	X176	8	0.013 U	0.013 U	0.013 U	0.013 U	0.002 J	0.013 U	0.013 U	0.013 U	0.013 U	0.013 U	0.013 U	0.01 J	0.013 U	0.013 U	0.013 U	0.042 U
Pit 07	X176DL	8	0.66 U	0.66 U	0.66 U	0.66 U	0.66 U	0.66 U	0.66 U	0.66 U	0.66 U	0.66 U	0.66 U	0.66 U	0.66 U	0.66 U	0.66 U	0.66 UJ
Pit 08	X173	2.5	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.076 U
Pit 08	X174	8	0.63 U	0.63 U	0.63 U	0.63 U	0.63 U	0.63 U	0.63 U	0.63 U	0.63 U	0.63 U	0.63 U	0.63 U	0.63 U	0.63 U	0.63 U	0.24 J
Pit 09	X168	3	29 U	29 U	29 U	29 U	29 U	29 U	29 U	29 U	29 U	29 U	29 U	29 U	29 U	29 U	29 U	29 UJ
Pit 09	X169	6.5	0.63 U	0.63 U	0.63 U	0.63 U	0.63 U	0.63 U	0.63 U	0.63 U	0.63 U	0.17 J	0.63 U	0.63 U	0.63 U	0.63 U	0.63 U	0.63 UJ
Pit 09	X170	6.5	0.013 U	0.013 U	0.013 U	0.013 U	0.013 U	0.013 U	0.013 U	0.013 U	0.013 U	0.013 U	0.013 U	0.013 U	0.013 U	0.013 U	0.013 U	0.031 U
Pit 10	X171	3	0.015 U	0.015 U	0.015 U	0.015 U	0.015 U	0.015 U	0.015 U	0.015 U	0.015 U	0.015 U	0.015 U	0.015 U	0.015 U	0.007 J	0.015 U	0.21 J
Pit 10	X172	8	0.98 U	0.98 U	0.98 U	0.98 U	0.98 U	0.98 U	0.98 U	0.98 U	0.98 U	0.98 U	0.98 U	0.98 U	0.98 U	0.13 J	0.98 U	1.3 UJ
Pit 10	X172DL	8	2 UJ	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2.4 J
Pit 11	X190	2	0.74 UJ	0.74 U	0.74 U	0.74 U	0.74 U	0.74 U	0.74 U	0.74 U	0.74 U	0.74 U	0.74 U	0.74 U	0.74 U	0.21 J	0.74 U	0.74 UJ

Table E-5. VOCs in U.S. Drum (mg/kg)

Station ID	Sample ID	Depth (ft.)	1,1,1-Trichloroethane	1,1,2,2-Tetrachloroethane	1,1,2-Trichloro-1,2,2-Trifluor	1,1,2-Trichloroethane	1,1-Dichloroethane	1,1-Dichloroethene	1,2,4-Trichlorobenzene	1,2-Dibromo-3-Chloropropan	1,2-Dibromoethane	1,2-Dichlorobenzene	1,2-Dichloroethane	1,2-Dichloropropane	1,3-Dichlorobenzene	1,4-Dichlorobenzene	2-Hexanone	Acetone
Industrial/		*Ing*				*8200*	*200000*	*18000*	*20000*	*4*	*0.07*	*180000*	*63*	*84*				*200000*
Commercial		*Inh*	*1200*			*1800*	*1700*	*1500*	*3200*	*17*	*0.32*	*560*	*0.7*	*23*		*17000*		*100000*
Construction		*Ing*				*8200*	*200000*	*1800*	*2000*	*89*	*1.5*	*18000*	*1400*	*1800*				*200000*
Worker		*Inh*	*1200*			*1800*	*130*	*1500*	*920*	*0.11*	*0.45*	*310*	*0.99*	*0.5*		*340*		*100000*
Soil Component		*I*	*2*			*0.02*	*23*	*0.06*	*5*	*0.002*	*0.0004*	*17*	*0.02*	*0.03*		*2*		*16*
of GW		*II*	*9.6*			*0.3*	*110*	*0.3*	*53*	*0.002*	*0.004*	*43*	*0.1*	*0.15*		*11*		*16*
Pit 11	X191	8	0.67 UJ	0.67 U	0.67 U	0.67 U	0.67 U	0.67 U	0.67 U	0.67 U	0.67 U	0.67 U	0.67 U	0.67 U	0.67 U	0.67 U	0.67 U	0.67 UJ
Pit 12	X192	3	0.57 UJ	0.57 U	0.57 U	0.57 U	0.57 U	0.57 U	0.57 U	0.57 U	0.57 U	0.57 U	0.57 U	0.57 U	0.57 U	0.57 U	0.57 U	0.57 UJ
Pit 12	X193	8	0.61 U	0.61 U	0.61 U	0.61 U	0.61 U	0.61 U	0.61 U	0.61 U	0.61 U	0.22 J	0.61 U	0.61 U	0.61 U	0.38 J	0.61 U	0.34 J
Pit 13	X194	3.5	0.59 U	0.59 U	0.59 U	0.59 U	0.59 U	0.59 U	0.59 U	0.59 U	0.59 U	0.59 U	2.2 =	0.59 U	0.59 U	0.59 U	0.59 U	0.24 J
Pit 13	X195	12	0.016 U	0.016 U	0.016 U	0.016 U	0.016 U	0.016 U	0.016 U	0.016 U	0.016 U	0.016 U	0.002 J	0.016 U	0.016 U	0.003 J	0.016 U	0.037 J
Pit 14	X184	4	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 UJ
Pit 14	X185	9	0.72 U	0.72 U	0.72 U	0.72 U	0.72 U	0.72 U	0.72 U	0.72 U	0.72 U	0.72 U	0.11 J	0.72 U	0.72 U	0.72 U	0.72 U	0.72 UJ
Pit 15	X186	4	3.3 J	30 U	30 U	30 U	30 U	30 U	30 U	30 U	30 U	30 U	3.4 J	30 U	30 U	30 U	30 U	30 UJ
Pit 15	X187	8	1.9 J	6.2 U	6.2 U	6.2 U	0.88 J	6.2 U	6.2 U	6.2 U	6.2 U	6.2 U	3.3 J	6.2 U	6.2 U	6.2 U	6.2 U	6.2 UJ
Pit 16	X188	3	0.57 UJ	0.57 U	0.57 U	0.57 U	0.57 U	0.57 U	0.57 U	0.57 U	0.57 U	0.57 U	1.7 =	0.57 U	0.57 U	0.57 U	0.57 U	0.57 UJ
Pit 16	X189	7	0.57 UJ	0.57 U	0.57 U	0.57 U	0.57 U	0.57 UJ	0.57 U	0.57 U	0.57 U	0.57 U	1.1 =	0.57 U	0.57 U	0.57 U	0.57 U	0.57 UJ
Pit 17	X181	3.5	3.3 U	3.3 U	3.3 U	3.3 U	3.3 U	3.3 U	3.3 U	3.3 U	3.3 U	3.3 U	14 =	3.3 U	3.3 U	3.3 U	3.3 U	3.3 UJ
Pit 17	X182	7	0.71 U	0.71 U	0.71 U	0.71 U	0.71 U	0.71 U	0.71 U	0.71 U	0.71 U	0.71 U	0.87 =	0.71 U	0.71 U	0.71 U	0.71 U	0.93 UJ
Pit 17	X183	13	0.63 U	0.63 U	0.63 U	0.63 U	0.63 U	0.63 U	0.63 U	0.63 U	0.63 U	0.63 U	0.63 U	0.63 U	0.63 U	0.63 U	0.63 U	0.63 UJ
Pit 18	X179	3.5	0.57 U	0.57 U	0.57 U	0.57 U	0.28 J	0.57 U	0.57 U	0.57 U	0.57 U	0.57 U	0.3 J	0.57 U	0.57 U	0.57 U	0.57 U	0.61 UJ
Pit 18	X180	7	0.77 U	0.77 U	0.77 U	0.77 U	0.77 U	0.77 U	0.77 U	0.77 U	0.77 U	0.77 U	0.77 U	0.77 U	0.77 U	0.77 U	0.77 U	0.77 UJ
Pit 19	X166	3	4.2 J	30 U	30 U	30 U	30 U	30 U	30 U	30 U	30 U	30 U	12 J	30 U	30 U	30 U	30 U	31 UJ
Pit 19	X167	9	6.3 =	3.2 U	3.2 U	3.2 U	3.6 =	3.2 U	3.2 U	3.2 U	3.2 U	3.2 U	10 =	3.2 U	3.2 U	3.2 U	3.2 U	3.2 UJ
Pit 19	X167DL	9	79 U	79 U	79 U	79 U	79 U	79 U	79 U	79 U	79 U	79 U	11 J	79 U	79 U	79 U	79 U	79 UJ
Pit 20	X164	3	0.62 U	0.62 U	0.62 U	0.62 U	0.62 U	0.62 U	0.62 U	0.62 U	0.62 U	0.62 U	0.62 U	0.62 U	0.62 U	0.62 U	0.62 U	0.62 UJ
Pit 20	X165	9	0.68 U	0.68 U	0.68 U	0.68 U	0.68 U	0.68 U	0.68 U	0.68 U	0.68 U	0.11 J	0.68 U	0.68 U	0.68 U	0.5 J	0.68 U	0.68 UJ
Pit 21	X162	2	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	0.49 J	1 U	1 UJ
Pit 21	X163	9	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	0.34 J	1 U	1 UJ
Pit 22	X160	3.5	0.65 U	0.65 U	0.65 U	0.65 U	0.65 U	0.65 U	0.65 U	0.65 U	0.65 U	0.65 U	0.65 U	0.65 U	0.65 U	0.65 U	0.65 U	0.65 UJ
Pit 22	X161	8	0.7 U	0.7 U	0.7 U	0.7 U	0.7 U	0.7 U	0.7 U	0.7 U	0.7 U	0.073 J	0.7 U	0.7 U	0.7 U	0.42 J	0.7 U	0.7 UJ
Pit 23	X157	2.5	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U	0.6 UJ
Pit 23	X158	9	9.6 U	9.6 U	9.6 U	9.6 U	9.6 U	9.6 U	9.6 U	9.6 U	9.6 U	9.6 U	9.6 U	9.6 U	9.6 U	1.6 J	9.6 U	10 UJ
Pit 23	X159	13	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	0.86 J	5 U	5.4 UJ

Table E-5. VOCs in U.S. Drum (mg/kg)

Station ID	Sample ID	Depth (ft.)	1,1,1-Trichloroethane	1,1,2,2-Tetrachloroethane	1,1,2-Trichloro-1,2,2-Trifluor	1,1,2-Trichloroethane	1,1-Dichloroethane	1,1-Dichloroethene	1,2,4-Trichlorobenzene	1,2-Dibromo-3-Chloropropan	1,2-Dibromoethane	1,2-Dichlorobenzene	1,2-Dichloroethane	1,2-Dichloropropane	1,3-Dichlorobenzene	1,4-Dichlorobenzene	2-Hexanone	Acetone
Industrial/		*Ing*				*8200*	*200000*	*18000*	*20000*	*4*	*0.07*	*180000*	*63*	*84*				*200000*
Commercial		*Inh*	*1200*			*1800*	*1700*	*1500*	*3200*	*17*	*0.32*	*560*	*0.7*	*23*		*17000*		*100000*
Construction		*Ing*				*8200*	*200000*	*1800*	*2000*	*89*	*1.5*	*18000*	*1400*	*1800*				*200000*
Worker		*Inh*	*1200*			*1800*	*130*	*1500*	*920*	*0.11*	*0.45*	*310*	*0.99*	*0.5*		*340*		*100000*
Soil Component		*I*	*2*			*0.02*	*23*	*0.06*	*5*	*0.002*	*0.0004*	*17*	*0.02*	*0.03*		*2*		*16*
of GW		*II*	*9.6*			*0.3*	*110*	*0.3*	*53*	*0.002*	*0.004*	*43*	*0.1*	*0.15*		*11*		*16*
Pit 24	X155	2.5	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	0.84 J	1.3 U	0.56 J
Pit 24	X156	8.5	0.93 U	0.93 U	0.93 U	0.93 U	0.93 U	0.93 U	0.93 U	0.93 U	0.93 U	0.93 U	0.93 U	0.93 U	0.93 U	0.93 U	0.93 U	0.76 J
Pit 25	X153	3	0.85 U	0.85 U	0.85 U	0.85 U	0.85 U	0.85 U	0.85 U	0.85 U	0.85 U	0.15 J	0.85 U	0.85 U	0.85 U	1.4 =	0.85 U	0.49 J
Pit 25	X154	9.5	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	0.87 J	1.3 U	1.3 UJ
Pit 26	X151	3	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 UJ
Pit 26	X152	9	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.31 J	0.75 U	0.61 J
Pit 27	X149	3.5	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.005 J	0.017 U	0.082 UJ
Pit 27	X150	10	0.96 U	0.96 U	0.96 U	0.96 U	0.96 U	0.96 UJ	0.96 U	0.96 U	0.96 U	0.96 U	0.96 U	0.96 U	0.96 U	0.8 J	0.96 U	0.84 J
Pit 28	X147	3	0.68 U	0.68 U	0.68 U	0.68 U	0.68 U	0.68 U	0.68 U	0.68 U	0.68 U	0.68 U	0.68 U	0.68 U	0.68 U	0.68 U	0.68 U	0.47 J
Pit 28	X148	8	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	0.11 J	1.1 U	1.1 U	0.12 J	0.66 J	1.1 U	0.85 J
Pit 29	X145	4.5	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.039 UJ
Pit 29	X146	8	2.3 U	2.3 U	2.3 U	2.3 U	2.3 U	2.3 U	2.3 U	2.3 U	2.3 U	2.3 U	2.3 U	2.3 U	2.3 U	2.3 U	2.3 U	2.3 UJ
Pit 30	X143	4	0.031 U	0.031 U	0.031 U	0.031 U	0.031 U	0.031 U	0.031 U	0.031 U	0.031 U	0.031 U	0.031 U	0.031 U	0.031 U	0.031 U	0.031 U	0.36 J
Pit 30	X144	6	0.88 U	0.88 U	0.88 U	0.88 U	0.88 U	0.88 U	0.88 U	0.88 U	0.88 U	0.1 J	0.88 U	0.88 U	0.88 U	0.18 J	0.88 U	0.71 J
Pit 31	X141	4	0.78 U	0.78 U	0.78 U	0.78 U	0.78 U	0.78 U	0.78 U	0.78 U	0.78 U	0.78 U	0.78 U	0.78 U	0.78 U	0.57 J	0.78 U	0.99 J
Pit 31	X142	9	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.06 UJ
Pit 32	X139	3	3.6 U	3.6 U	3.6 UJ	3.6 U	3.6 U	3.6 U	3.6 U	3.6 U	3.6 U	3.6 U	3.6 U	3.6 U	3.6 U	1.1 J	3.6 U	3.6 UJ
Pit 32	X139DL	3	36 U	36 U	36 U	36 U	36 U	36 U	36 U	36 U	36 U	36 U	36 U	36 U	36 U	36 U	36 U	36 U
Pit 32	X140	9	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	0.42 J	1.6 U	1.6 U	1.6 U	2 =	1.6 U	1.7 J
Pit 33	X137	3	16 U	16 U	16 UJ	16 U	16 U	16 U	16 U	16 U	16 U	16 U	16 U	16 U	16 U	16 U	16 U	16 UJ
Pit 33	X138	9	0.65 U	0.65 U	0.65 UJ	0.65 U	0.65 U	0.65 U	0.65 U	0.65 U	0.65 U	0.65 U	0.65 U	0.65 U	0.65 U	0.65 U	0.65 U	0.73 UJ
Pit 34	X135	3	0.85 U	0.85 U	0.85 UJ	0.85 U	0.85 U	0.85 UJ	0.85 U	0.85 U	0.85 U	0.85 U	0.85 U	0.85 U	0.85 U	0.85 U	0.85 U	1 UJ
Pit 34	X136	10	0.83 U	0.83 U	0.83 UJ	0.83 U	0.83 U	0.83 U	0.83 U	0.83 U	0.83 U	0.83 U	0.83 U	0.83 U	0.83 J	0.83 U	0.83 U	1.1 UJ
Pit 35	X133	4	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.065 UJ
Pit 35	X134	10	0.016 U	0.016 U	0.016 U	0.016 U	0.016 U	0.016 U	0.016 U	0.016 U	0.016 U	0.003 J	0.016 U	0.016 U	0.016 U	0.007 J	0.016 U	0.082 UJ
Pit 36	X131	4	2.1 U	2.1 U	2.1 U	2.1 U	2.1 U	2.1 U	2.1 U	2.1 U	2.1 U	2.1 U	2.1 U	2.1 U	2.1 U	1.5 J	2.1 U	3.2 UJ
Pit 36	X132	11	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U	0.043 =	0.014 U	0.014 U	0.014 U	0.12 =	0.014 U	0.16 J
Pit 37	X128	3	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	0.21 J	1.4 U	1.6 UJ

Table E-5. VOCs in U.S. Drum (mg/kg)

Station ID	Sample ID	Depth (ft.)	1,1,1-Trichloroethane	1,1,2,2-Tetrachloroethane	1,1,2-Trichloro-1,2,2-Trifluor	1,1,2-Trichloroethane	1,1-Dichloroethane	1,1-Dichloroethene	1,2,4-Trichlorobenzene	1,2-Dibromo-3-Chloropropan	1,2-Dibromoethane	1,2-Dichlorobenzene	1,2-Dichloroethane	1,2-Dichloropropane	1,3-Dichlorobenzene	1,4-Dichlorobenzene	2-Hexanone	Acetone
Industrial/		*Ing*				*8200*	*200000*	*18000*	*20000*	*4*	*0.07*	*180000*	*63*	*84*				*200000*
Commercial		*Inh*	*1200*			*1800*	*1700*	*1500*	*3200*	*17*	*0.32*	*560*	*0.7*	*23*		*17000*		*100000*
Construction		*Ing*				*8200*	*200000*	*1800*	*2000*	*89*	*1.5*	*18000*	*1400*	*1800*				*200000*
Worker		*Inh*	*1200*			*1800*	*130*	*1500*	*920*	*0.11*	*0.45*	*310*	*0.99*	*0.5*		*340*		*100000*
Soil Component		*I*	*2*			*0.02*	*23*	*0.06*	*5*	*0.002*	*0.0004*	*17*	*0.02*	*0.03*		*2*		*16*
of GW		*II*	*9.6*			*0.3*	*110*	*0.3*	*53*	*0.002*	*0.004*	*43*	*0.1*	*0.15*		*11*		*16*
Pit 37	X129	3	0.022 U	0.022 U	0.022 U	0.022 U	0.022 U	0.022 U	0.022 U	0.022 U	0.022 U	0.022 U	0.022 U	0.022 U	0.022 U	0.017 J	0.022 U	0.15 UJ
Pit 37	X130	8	0.83 U	0.83 U	0.83 U	0.83 U	0.83 U	0.83 U	0.83 U	0.83 U	0.83 U	0.83 U	0.83 U	0.83 U	0.83 U	0.83 U	0.83 U	0.96 UJ
Pit 38	X126	3	0.86 U	0.86 U	0.86 U	0.86 U	0.86 U	0.86 U	0.86 U	0.86 U	0.86 U	0.86 U	0.86 U	0.86 U	0.86 U	6.8 J	0.86 U	1.3 J
Pit 38	X126DL	3	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	7.2 =	1.7 U	2.2 UJ
Pit 38	X127	10	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	0.2 J	1.1 U	1.1 U	0.6 J	1.1 U	1.1 U	1.1 U	1.3 =	1.1 U	2 UJ
Pit 39	X124	3	0.012 U	0.012 U	0.012 U	0.012 U	0.001 J	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.038 UJ
Pit 39	X125	10	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	0.54 J	1.2 U	1.2 UJ
Pit 40	X122	4	0.019 U	0.019 U	0.019 U	0.019 U	0.019 U	0.019 U	0.019 U	0.019 U	0.019 U	0.019 U	0.019 U	0.019 U	0.019 U	0.003 J	0.019 U	0.16 UJ
Pit 40	X123	9	0.026 U	0.026 UJ	0.026 U	0.026 U	0.003 J	0.026 U	0.026 UJ	0.026 UJ	0.026 UJ	0.054 J	0.026 U	0.026 U	0.026 UJ	1.1 J	0.026 UJ	0.24 J
Pit 40	X123DL	9	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	2.9 =	1.3 U	1.6 J
Pit 41	X120	3	0.62 U	0.62 U	0.62 U	0.62 U	0.62 U	0.62 U	0.62 U	0.62 U	0.62 U	0.62 U	0.62 U	0.62 U	0.62 U	0.62 U	0.62 U	0.62 UJ
Pit 41	X121	8	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	8.7 J	1.1 U	1.6 J
Pit 41	X121DL	8	2.1 U	2.1 U	2.1 U	2.1 U	2.1 U	2.1 U	2.1 U	2.1 U	2.1 U	0.48 J	2.1 U	2.1 U	2.1 U	11 =	2.1 U	4.1 UJ
Pit 42	X117	2	0.013 U	0.013 U	0.013 U	0.013 U	0.004 J	0.013 U	0.013 U	0.013 U	0.013 U	0.013 U	0.013 U	0.013 U	0.013 U	0.013 U	0.013 U	0.029 UJ
Pit 42	X118	9	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.004 J	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.052 UJ
Pit 42	X119	15	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 UJ	0.003 J	0.017 U	0.017 U	0.015 J	0.017 U	0.017 U	0.017 U	0.082 J	0.023 J	0.95 J
Pit 42	X119DL	15	0.85 U	0.85 U	0.85 U	0.85 U	0.85 U	0.85 U	0.85 U	0.85 U	0.85 U	0.086 J	0.85 U	0.85 U	0.85 U	0.32 J	0.85 U	4 U
Pit 43	X115	3	0.016 U	0.016 U	0.016 U	0.016 U	0.016 U	0.016 U	0.004 J	0.016 U	0.016 U	0.019 =	0.016 U	0.016 U	0.016 U	0.63 =	0.016 U	0.045 UJ
Pit 43	X115DL	3	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	2.3 =	1.6 U	1.6 U
Pit 43	X116	9	0.016 U	0.016 UJ	0.016 U	0.016 U	0.016 U	0.016 U	0.016 UJ	0.016 UJ	0.016 UJ	0.14 J	0.016 U	0.016 U	0.016 UJ	0.016 UJ	0.016 UJ	0.11 UJ
Pit 43	X116DL	9	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.68 J	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U
Pit 44	X113	3	0.013 U	0.013 U	0.013 U	0.013 U	0.013 U	0.013 U	0.013 U	0.013 U	0.013 U	0.013 U	0.013 U	0.013 U	0.013 U	0.003 J	0.013 U	0.07 U
Pit 44	X114	9	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.054 =	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.023 U
Pit 45	X111	3.5	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U	0.004 J	0.014 U	0.014 U	0.068 =	0.014 U	0.014 U	0.014 U	0.14 =	0.014 U	0.072 UJ
Pit 45	X112	10	0.019 U	0.019 U	0.019 U	0.019 U	0.019 U	0.019 U	0.019 U	0.019 U	0.019 U	0.067 J	0.019 U	0.019 U	0.019 U	0.46 J	0.019 U	0.11 UJ
Pit 45	X112DL	10	0.93 U	0.93 U	0.93 U	0.93 U	0.93 U	0.93 U	0.93 U	0.93 U	0.93 U	0.15 J	0.93 U	0.93 U	0.93 U	0.98 =	0.93 U	0.93 U
Pit 46	X109	4	0.016 U	0.016 U	0.016 U	0.016 U	0.016 U	0.016 U	0.016 U	0.016 U	0.016 U	0.016 U	0.016 U	0.016 U	0.016 U	0.016 U	0.016 U	0.054 U
Pit 46	X110	9	0.018 U	0.018 U	0.018 U	0.018 U	0.009 J	0.018 U	0.018 U	0.018 U	0.018 U	0.018 U	0.018 U	0.018 U	0.018 U	0.018 U	0.018 U	0.059 UJ

Table E-5. VOCs in U.S. Drum (mg/kg)

Station ID	Sample ID	Depth (ft.)	1,1,1-Trichloroethane	1,1,2,2-Tetrachloroethane	1,1,2-Trichloro-1,2,2-Trifluor	1,1,2-Trichloroethane	1,1-Dichloroethane	1,1-Dichloroethene	1,2,4-Trichlorobenzene	1,2-Dibromo-3-Chloropropan	1,2-Dibromoethane	1,2-Dichlorobenzene	1,2-Dichloroethane	1,2-Dichloropropane	1,3-Dichlorobenzene	1,4-Dichlorobenzene	2-Hexanone	Acetone
Industrial/ Commercial		*Ing*				*8200*	*200000*	*18000*	*20000*	*4*	*0.07*	*180000*	*63*	*84*				*200000*
		Inh	*1200*			*1800*	*1700*	*1500*	*3200*	*17*	*0.32*	*560*	*0.7*	*23*		*17000*		*100000*
Construction Worker		*Ing*				*8200*	*200000*	*1800*	*2000*	*89*	*1.5*	*18000*	*1400*	*1800*				*200000*
		Inh	*1200*			*1800*	*130*	*1500*	*920*	*0.11*	*0.45*	*310*	*0.99*	*0.5*		*340*		*100000*
Soil Component of GW		*I*	*2*			*0.02*	*23*	*0.06*	*5*	*0.002*	*0.0004*	*17*	*0.02*	*0.03*		*2*		*16*
		II	*9.6*			*0.3*	*110*	*0.3*	*53*	*0.002*	*0.004*	*43*	*0.1*	*0.15*		*11*		*16*
Pit 47	X107	3.5	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U	0.08 UJ
Pit 47	X108	9	0.83 U	0.83 U	0.83 U	0.83 U	0.83 U	0.83 U	0.52 J	0.83 U	0.83 U	1.2 =	0.83 U	0.83 U	0.83 U	6.3 =	0.83 U	0.96 U
Pit 47	X108DL	9	3.3 U	3.3 U	3.3 U	3.3 U	3.3 U	3.3 U	0.88 J	3.3 U	3.3 U	1.6 J	3.3 U	3.3 U	8.3 =	7.9 =	3.3 U	4 U
Pit 48	X105	3	0.011 U	0.011 U	0.011 U	0.011 U	0.006 J	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.021 U
Pit 48	X106	9	0.014 U	0.014 U	0.014 U	0.014 U	0.048 =	0.014 U	0.002 J	0.014 U	0.014 U	0.008 J	0.014 U	0.014 U	0.014 U	0.03 =	0.014 U	0.029 UJ
Pit 48	X106DL	9	0.68 U	0.68 U	0.68 U	0.68 U	0.68 U	0.68 U	0.68 U	0.68 U	0.68 U	0.2 J	0.68 U	0.68 U	0.68 U	1.4 =	0.68 U	0.68 U
Pit 49	X103	3	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.06 UJ
Pit 49	X104	10	0.013 U	0.013 U	0.013 U	0.013 U	0.013 U	0.013 U	0.013 U	0.013 U	0.013 U	0.013 U	0.013 U	0.013 U	0.013 U	0.03 =	0.013 U	0.033 UJ
Pit 50	X101	3	0.011 U	0.011 UJ	0.011 U	0.011 U	0.002 J	0.011 U	0.011 UJ	0.011 UJ	0.011 UJ	0.011 UJ	0.011 U	0.011 U	0.011 UJ	0.011 UJ	0.011 UJ	0.028 UJ
Pit 50	X102	9	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.005 J	0.02 U	0.02 U	0.016 J	0.02 U	0.02 U	0.02 U	0.15 =	0.02 U	0.05 UJ
Pit 50	X102DL	9	0.98 U	0.98 U	0.98 U	0.98 U	0.98 U	0.98 U	0.98 U	0.98 U	0.98 U	0.98 U	0.98 U	0.98 U	0.98 U	0.38 J	0.98 U	0.98 U
Pit 51	X203	3	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.03 U
Pit 51	X204	8	0.67 U	0.67 U	0.67 U	0.67 U	0.67 U	0.67 U	0.67 U	0.67 U	0.67 U	0.67 U	0.67 U	0.67 U	0.67 U	0.67 U	0.67 U	0.78 J

Notes:

=: sample concentration is detected at level reported
U: sample concentration is under detection limit
J: sample concentration is estimated value
R: sample concentration value is rejected
DL: sample is diluted
RE: sample is re-extracted
Ing.: Ingestion
Inh.: Inhalation
I: Class I
II: Class II

[1]Values in the proposed rules.

[2]TACO RO values shown for 1,3-dichloropropene are the combined values for cis and trans.

Table E-5. VOCs in U.S. Drum (mg/kg)

Station ID	Sample ID	Depth (ft.)	Benzene	Bromodichloromethane	Bromoform	Bromomethane	Carbon disulfide	Carbon tetrachloride	Chlorobenzene	Chloroethane	Chloroform	Chloromethane	cis-1,2-Dichloroethene	cis-1,3-Dichloropropene[2]	Cyclohexane	Dibromochloromethane	Dichlorodifluoromethane	Ethylbenzene
Industrial/		*Ing*	*200*	*92*	*720*	*2900*	*200000*	*44*	*41000*		*940*		*20000*	*33*		*41000*		*200000*
Commercial		*Inh*	*1.5*	*3000*	*100*	*15*	*720*	*0.64*	*210*		*0.54*		*1200*	*0.23*		*1300*		*400*
Construction		*Ing*	*4300*	*2000*	*16000*	*1000*	*20000*	*410*	*4100*		*2000*		*20000*	*610*		*41000*		*20000*
Worker		*Inh*	*2.1*	*3000*	*140*	*3.9*	*9*	*0.9*	*1.3*		*0.76*		*1200*	*0.33*		*1300*		*58*
Soil Component		*I*	*0.03*	*0.6*	*0.8*	*0.2*	*32*	*0.07*	*1*		*0.6*		*0.4*	*0.004*		*0.4*		*13*
of GW		*II*	*0.17*	*0.6*	*0.8*	*1.2*	*160*	*0.33*	*6.5*		*2.9*		*1.1*	*0.02*		*0.4*		*19*
Pit 01	X207	4	0.011 UJ	0.011 UJ	0.011 UJ	0.011 UJ	0.011 U	0.011 UJ	0.011 UJ	0.011 UJ	0.011 UJ	0.011 UJ	0.011 UJ	0.011 UJ	0.011 UJ	0.011 UJ	0.011 UJ	0.011 UJ
Pit 01	X208	9	1.6 U	1.6 U	1.6 UJ	1.6 U	1.6 U	1.6 U	1.7 =	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	2.4 =	1.6 U	1.6 U	11 =
Pit 01	X209	13	1.4 U	1.4 U	1.4 UJ	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	25 =
Pit 01	X209DL	13	14 U	14 U	14 U	14 U	14 U	14 U	14 U	14 U	14 U	14 U	14 U	14 U	14 U	14 U	14 U	35 =
Pit 02	X205	3	0.002 J	0.013 UJ	0.013 UJ	0.013 UJ	0.013 U	0.013 UJ	0.013 UJ	0.013 UJ	0.013 UJ	0.013 UJ	0.002 J	0.013 UJ	0.013 UJ	0.013 UJ	0.013 UJ	0.004 J
Pit 02	X206	9	0.62 U	0.62 U	0.62 U	0.62 U	0.62 U	0.62 U	0.62 U	0.62 U	0.62 U	0.62 U	0.62 U	0.62 U	0.62 U	0.62 U	0.62 U	0.62 U
Pit 03	X201	3	0.59 U	0.59 U	0.59 U	0.59 U	0.59 U	0.59 U	0.59 U	0.59 U	0.59 U	0.59 U	0.26 J	0.59 U	0.59 U	0.59 U	0.59 U	0.59 U
Pit 03	X202	8	0.003 J	0.004 J	0.018 U	0.018 U	0.046 J	0.018 U	0.018 U	0.018 U	0.018 U	0.018 U	0.018 U	0.018 U	0.018 U	0.018 U	0.002 J	0.018 U
Pit 04	X177	4	3.2 U	3.2 U	3.2 UJ	3.2 U	0.69 J	3.2 U	23 =	3.2 UJ	3.2 U	3.2 U	3.2 U	3.2 U	3.2 U	3.2 U	3.2 U	3.2 U
Pit 04	X178	8	0.5 J	2.4 U	2.4 UJ	2.4 U	2.4 U	2.4 U	120 =	2.4 UJ	2.4 U	2.4 U	2.4 U	2.4 U	2.4 U	2.4 UJ	2.4 U	2.4 U
Pit 04	X178DL	8	24 U	24 U	24 UJ	24 U	24 U	24 U	100 =	24 UJ	24 U	24 U	24 U	24 U	24 U	24 U	24 U	24 U
Pit 05	X198	2.5	0.098 J	0.61 U	0.61 U	0.61 UJ	0.61 U	0.61 U	0.61 U	0.61 U	0.61 U	0.61 UJ	0.065 J	0.61 U	0.61 U	0.61 U	0.61 U	0.14 J
Pit 05	X199	8	0.009 J	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.005 J	0.012 U	0.012 U	0.003 J
Pit 05	X200	8	0.015 =	0.012 U	0.012 U	0.012 UJ	0.033 =	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.005 J	0.012 U	0.012 U	0.005 J
Pit 06	X196	3	0.013 J	0.012 U	0.012 U	0.012 U	0.002 J	0.012 U	0.012 UJ	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.006 J	0.012 U	0.012 U	0.002 J
Pit 06	X197	8	0.022 =	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.005 J	0.012 U	0.012 U	0.008 J
Pit 07	X175	3	0.006 J	0.016 U	0.016 U	0.016 U	0.012 J	0.016 U	0.016 U	0.016 U	0.016 U	0.016 U	0.016 U	0.016 U	0.016 U	0.016 U	0.016 U	0.016 U
Pit 07	X176	8	0.28 =	0.013 U	0.013 U	0.013 U	0.01 J	0.013 U	0.005 J	0.013 U	0.013 U	0.013 U	0.005 J	0.013 U	0.046 =	0.013 U	0.013 U	0.042 =
Pit 07	X176DL	8	0.21 J	0.66 U	0.66 UJ	0.66 U	0.66 U	0.66 U	0.66 U	0.66 UJ	0.66 U	0.66 U	0.66 U	0.66 U	0.2 J	0.66 UJ	0.66 U	0.66 U
Pit 08	X173	2.5	0.003 J	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U
Pit 08	X174	8	0.12 J	0.63 U	0.63 UJ	0.63 U	0.31 J	0.63 U	0.63 U	0.63 UJ	0.63 U	0.63 U	0.63 U	0.63 U	0.63 U	0.63 UJ	0.63 U	0.63 U
Pit 09	X168	3	29 U	29 U	29 U	29 UJ	29 U	29 U	29 U	29 U	29 U	29 UJ	29 U	29 U	29 U	29 U	29 U	17 J
Pit 09	X169	6.5	0.12 J	0.63 U	0.63 U	0.63 UJ	0.63 U	0.63 U	0.63 U	0.63 U	0.63 U	0.63 UJ	0.63 U	0.63 U	0.63 U	0.63 U	0.63 U	1 =
Pit 09	X170	6.5	0.002 J	0.013 U	0.013 U	0.013 UJ	0.002 J	0.013 U	0.013 UJ	0.013 U	0.013 U	0.013 U	0.013 U	0.013 U	0.002 J	0.013 U	0.013 U	0.001 J
Pit 10	X171	3	0.006 J	0.015 U	0.015 U	0.015 UJ	0.093 =	0.015 U	0.03 =	0.015 U	0.015 U	0.015 U	0.015 U	0.015 U	0.004 J	0.015 U	0.015 U	0.002 J
Pit 10	X172	8	0.1 J	0.98 U	0.98 UJ	0.98 UJ	0.98 U	0.98 U	0.31 J	0.98 UJ	0.98 U	0.98 U	0.98 U	0.98 U	0.98 U	0.98 UJ	0.98 U	7.6 =
Pit 10	X172DL	8	2 U	2 U	2 UJ	2 U	2 U	2 U	0.32 J	2 UJ	2 U	2 U	2 U	2 U	2 U	2 U	2 U	7.3 =
Pit 11	X190	2	0.74 U	0.74 U	0.74 UJ	0.74 U	0.74 U	0.74 U	0.12 J	0.74 UJ	0.74 U	0.74 U	0.74 U	0.74 U	0.74 U	0.74 U	0.74 U	0.25 J

Table E-5. VOCs in U.S. Drum (mg/kg)

Station ID	Sample ID	Depth (ft.)	Benzene	Bromodichloromethane	Bromoform	Bromomethane	Carbon disulfide	Carbon tetrachloride	Chlorobenzene	Chloroethane	Chloroform	Chloromethane	cis-1,2-Dichloroethene	cis-1,3-Dichloropropene[2]	Cyclohexane	Dibromochloromethane	Dichlorodifluoromethane	Ethylbenzene
Industrial/		*Ing*	*200*	*92*	*720*	*2900*	*200000*	*44*	*41000*		*940*		*20000*	*33*		*41000*		*200000*
Commercial		*Inh*	*1.5*	*3000*	*100*	*15*	*720*	*0.64*	*210*		*0.54*		*1200*	*0.23*		*1300*		*400*
Construction		*Ing*	*4300*	*2000*	*16000*	*1000*	*20000*	*410*	*4100*		*2000*		*20000*	*610*		*41000*		*20000*
Worker		*Inh*	*2.1*	*3000*	*140*	*3.9*	*9*	*0.9*	*1.3*		*0.76*		*1200*	*0.33*		*1300*		*58*
Soil Component		*I*	*0.03*	*0.6*	*0.8*	*0.2*	*32*	*0.07*	*1*		*0.6*		*0.4*	*0.004*		*0.4*		*13*
of GW		*II*	*0.17*	*0.6*	*0.8*	*1.2*	*160*	*0.33*	*6.5*		*2.9*		*1.1*	*0.02*		*0.4*		*19*
Pit 11	X191	8	0.67 U	0.67 U	0.67 UJ	0.67 U	0.67 U	0.67 U	0.67 U	0.67 UJ	0.67 U	0.67 U	0.67 U	0.67 U	0.67 U	0.67 U	0.67 U	0.4 J
Pit 12	X192	3	0.57 U	0.57 U	0.57 UJ	0.57 U	0.57 U	0.57 U	0.57 U	0.57 UJ	0.57 U	0.57 U	0.57 U	0.57 U	0.57 U	0.57 U	0.57 U	0.088 J
Pit 12	X193	8	0.21 J	0.61 U	0.61 U	0.61 U	0.61 U	0.61 U	1.3 =	0.61 U	0.61 U	0.61 U	0.61 U	0.61 U	0.61 U	0.61 U	0.61 U	0.77 =
Pit 13	X194	3.5	0.23 J	0.59 U	0.59 U	0.59 U	0.59 U	0.59 U	0.59 U	0.59 U	0.59 U	0.59 U	0.59 U	0.59 U	0.59 U	0.59 U	0.59 U	0.59 U
Pit 13	X195	12	0.004 J	0.016 U	0.016 U	0.016 U	0.012 J	0.016 U	0.003 J	0.016 U	0.016 U	0.016 U	0.016 U	0.016 U	0.016 U	0.016 U	0.016 U	0.016 U
Pit 14	X184	4	1.1 U	1.1 U	1.1 U	1.1 UJ	1.1 UJ	1.1 U	1.1 U	1.1 UJ	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.6 =
Pit 14	X185	9	0.69 J	0.72 U	0.72 U	0.72 UJ	0.72 UJ	0.72 U	0.72 U	0.72 UJ	0.2 J	0.72 U	0.72 U	0.72 U	0.72 U	0.72 U	0.72 U	1.6 =
Pit 15	X186	4	4.4 J	30 U	30 U	30 UJ	30 UJ	30 U	30 U	30 UJ	30 U	30 U	30 U	30 U	30 U	30 U	30 U	120 =
Pit 15	X187	8	1.8 J	6.2 U	6.2 UJ	6.2 U	6.2 U	6.2 U	6.2 U	6.2 UJ	1 J	6.2 U	6.2 U	6.2 U	6.2 U	6.2 U	6.2 U	48 =
Pit 16	X188	3	2.3 =	0.57 U	0.57 UJ	0.57 U	0.31 J	0.57 U	0.57 U	0.57 UJ	0.57 U	0.57 U	0.57 U	0.57 U	0.57 U	0.57 U	0.57 U	0.57 U
Pit 16	X189	7	0.093 J	0.57 U	0.57 UJ	0.57 U	0.57 U	0.57 U	0.57 U	0.57 UJ	0.058 J	0.57 U	0.08 J	0.57 U	0.57 U	0.57 U	0.57 U	0.071 J
Pit 17	X181	3.5	11 =	3.3 U	3.3 U	3.3 UJ	3.3 UJ	3.3 U	3.3 U	3.3 UJ	3.3 U	3.3 U	3.3 U	3.3 U	3.3 U	3.3 U	3.3 U	3.3 U
Pit 17	X182	7	3.2 =	0.71 U	0.71 U	0.71 UJ	0.71 UJ	0.71 U	0.71 U	0.71 UJ	0.71 U	0.71 U	0.71 U	0.71 U	0.18 J	0.71 U	0.71 U	1.9 =
Pit 17	X183	13	1.7 =	0.63 U	0.63 U	0.63 UJ	0.63 UJ	0.63 U	0.63 U	0.63 UJ	0.63 U	0.63 U	0.63 U	0.63 U	0.11 J	0.63 U	0.63 U	0.63 U
Pit 18	X179	3.5	0.1 J	0.57 U	0.57 U	0.57 UJ	0.57 UJ	0.57 U	0.57 U	0.57 UJ	0.57 U	0.57 U	0.57 U	0.57 U	0.57 U	0.57 U	0.57 U	0.12 J
Pit 18	X180	7	2.3 =	0.77 U	0.77 U	0.77 UJ	0.77 UJ	0.77 U	0.77 U	0.77 UJ	0.77 U	0.77 U	0.77 U	0.77 U	0.77 U	0.77 U	0.77 U	0.37 J
Pit 19	X166	3	4.8 J	30 U	30 UJ	30 U	30 U	30 U	30 U	30 UJ	6 J	30 U	30 U	30 U	30 U	30 UJ	30 U	62 =
Pit 19	X167	9	20 =	3.2 U	3.2 U	3.2 U	3.2 U	3.2 U	3.2 U	3.2 U	4.4 =	3.2 U	4.5 =	3.2 U	5.3 =	3.2 U	3.2 U	260 =
Pit 19	X167DL	9	14 J	79 U	79 UJ	79 U	79 U	79 U	79 U	79 UJ	79 U	79 U	79 U	79 U	79 U	79 U	79 U	190 =
Pit 20	X164	3	0.74 =	0.62 U	0.62 U	0.62 UJ	0.62 U	0.62 U	0.62 U	0.62 U	0.62 U	0.62 UJ	0.62 U	0.62 U	0.62 U	0.62 U	0.62 U	1.1 =
Pit 20	X165	9	0.092 J	0.68 U	0.68 U	0.68 UJ	0.095 J	0.68 U	0.28 J	0.68 U	0.68 U	0.68 UJ	0.093 J	0.68 U	0.68 U	0.68 U	0.68 U	0.55 J
Pit 21	X162	2	1 U	1 U	1 U	1 UJ	1 U	1 U	0.26 J	1 U	1 U	1 UJ	1 U	1 U	1 U	1 U	1 U	0.59 J
Pit 21	X163	9	1 U	1 U	1 U	1 UJ	1 U	1 U	0.35 J	1 U	1 U	1 UJ	1 U	1 U	0.13 J	1 U	1 U	0.2 J
Pit 22	X160	3.5	0.65 U	0.65 U	0.65 U	0.65 UJ	0.65 U	0.65 U	0.65 U	0.65 U	0.65 U	0.65 UJ	0.65 U	0.65 U	0.65 U	0.65 U	0.65 U	0.12 J
Pit 22	X161	8	0.079 J	0.7 U	0.7 U	0.7 UJ	0.076 J	0.7 U	0.7 U	0.7 U	0.7 U	0.7 UJ	0.7 U	0.7 U	0.7 U	0.7 U	0.7 U	1.6 =
Pit 23	X157	2.5	0.068 J	0.6 U	0.6 U	0.6 UJ	0.6 UJ	0.6 U	0.6 U	0.6 UJ	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U	1.3 =
Pit 23	X158	9	0.96 J	9.6 U	9.6 UJ	9.6 U	9.6 U	9.6 U	9.6 U	9.6 UJ	9.6 U	9.6 U	9.6 U	9.6 U	9.6 U	9.6 U	9.6 U	30 =
Pit 23	X159	13	0.54 J	5 U	5 UJ	5 U	5 U	5 U	5 U	5 UJ	5 U	5 U	5 U	5 U	5 U	5 UJ	5 U	21 =

Table E-5. VOCs in U.S. Drum (mg/kg)

Station ID	Sample ID	Depth (ft.)	Benzene	Bromodichloromethane	Bromoform	Bromomethane	Carbon disulfide	Carbon tetrachloride	Chlorobenzene	Chloroethane	Chloroform	Chloromethane	cis-1,2-Dichloroethene	cis-1,3-Dichloropropene[2]	Cyclohexane	Dibromochloromethane	Dichlorodifluoromethane	Ethylbenzene
Industrial/		*Ing*	*200*	*92*	*720*	*2900*	*200000*	*44*	*41000*		*940*		*20000*	*33*		*41000*		*200000*
Commercial		*Inh*	*1.5*	*3000*	*100*	*15*	*720*	*0.64*	*210*		*0.54*		*1200*	*0.23*		*1300*		*400*
Construction		*Ing*	*4300*	*2000*	*16000*	*1000*	*20000*	*410*	*4100*		*2000*		*20000*	*610*		*41000*		*20000*
Worker		*Inh*	*2.1*	*3000*	*140*	*3.9*	*9*	*0.9*	*1.3*		*0.76*		*1200*	*0.33*		*1300*		*58*
Soil Component		*I*	*0.03*	*0.6*	*0.8*	*0.2*	*32*	*0.07*	*1*		*0.6*		*0.4*	*0.004*		*0.4*		*13*
of GW		*II*	*0.17*	*0.6*	*0.8*	*1.2*	*160*	*0.33*	*6.5*		*2.9*		*1.1*	*0.02*		*0.4*		*19*
Pit 24	X155	2.5	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	0.13 J
Pit 24	X156	8.5	0.13 J	0.93 U	0.93 U	0.93 U	0.93 U	0.93 U	0.93 U	0.93 U	0.93 U	0.93 U	0.93 U	0.93 U	0.93 U	0.93 U	0.93 U	0.14 J
Pit 25	X153	3	0.85 U	0.85 U	0.85 U	0.85 U	0.85 U	0.85 U	0.51 J	0.85 U	0.85 U	0.85 U	0.85 U	0.85 U	0.85 U	0.85 U	0.85 U	0.39 J
Pit 25	X154	9.5	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	3.7 =
Pit 26	X151	3	0.22 J	1.2 U	1.2 U	1.2 UJ	1.2 UJ	1.2 U	1.2 U	1.2 UJ	1.2 U	1.2 U	1.2 U	1.2 U	0.19 J	1.2 U	1.2 U	8.3 =
Pit 26	X152	9	0.21 J	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.099 J	0.75 U	0.75 U	0.75 U	0.75 U	2 =
Pit 27	X149	3.5	0.033 =	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.092 =	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.009 J	0.017 U	0.017 U	0.002 J
Pit 27	X150	10	0.23 J	0.96 U	0.96 U	0.96 U	0.96 U	0.96 U	3.1 =	0.96 U	0.96 U	0.96 U	0.96 U	0.96 U	0.12 J	0.96 U	0.96 U	0.58 J
Pit 28	X147	3	0.26 J	0.68 U	0.68 U	0.68 U	0.68 U	0.68 U	2.7 =	0.68 U	0.68 U	0.68 U	0.68 U	0.68 U	0.68 U	0.68 U	0.68 U	0.68 U
Pit 28	X148	8	0.41 J	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	3 =	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U
Pit 29	X145	4.5	0.029 J	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.003 J	0.012 U	0.012 U	0.002 J
Pit 29	X146	8	2.3 U	2.3 U	2.3 U	2.3 U	2.3 U	2.3 U	2.3 U	2.3 U	2.3 U	2.3 U	2.3 U	2.3 U	2.3 U	2.3 U	2.3 U	1 J
Pit 30	X143	4	0.024 J	0.031 U	0.031 U	0.031 U	0.021 J	0.031 U	0.005 J	0.031 U	0.031 U	0.031 U	0.031 U	0.031 U	0.007 J	0.031 U	0.031 U	0.031 U
Pit 30	X144	6	0.12 J	0.88 U	0.88 U	0.88 U	0.88 U	0.88 U	0.23 J	0.88 U	0.88 U	0.88 U	0.11 J	0.88 U	0.88 U	0.88 U	0.88 U	0.13 J
Pit 31	X141	4	0.093 J	0.78 U	0.78 U	0.78 U	0.78 U	0.78 U	0.78 U	0.78 U	0.78 U	0.78 U	0.78 U	0.78 U	0.78 U	0.78 U	0.78 U	0.49 J
Pit 31	X142	9	0.015 =	0.012 U	0.012 U	0.012 U	0.008 J	0.012 U	0.012 U	0.005 J	0.012 U	0.012 U	0.004 J	0.012 U	0.01 J	0.012 U	0.012 U	0.004 J
Pit 32	X139	3	0.5 J	3.6 U	3.6 U	3.6 U	3.6 U	3.6 UJ	3.6 U	3.6 U	3.6 U	3.6 U	3.6 U	3.6 U	3.6 U	3.6 U	3.6 U	180 =
Pit 32	X139DL	3	36 U	36 U	36 U	36 U	36 U	36 U	36 U	36 U	36 U	36 U	36 U	36 U	36 U	36 U	36 U	190 =
Pit 32	X140	9	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	0.42 J
Pit 33	X137	3	16 U	16 U	16 U	16 U	16 U	16 UJ	2.4 J	16 U	16 U	16 U	16 U	16 U	16 U	16 U	16 U	28 =
Pit 33	X138	9	0.4 J	0.65 U	0.65 U	0.65 U	0.65 U	0.65 UJ	0.65 U	0.65 U	0.65 U	0.65 U	0.65 U	0.65 U	0.65 U	0.65 U	0.65 U	2.9 =
Pit 34	X135	3	0.16 J	0.85 U	0.85 U	0.85 U	0.85 U	0.85 UJ	0.26 J	0.85 U	0.85 U	0.85 U	0.85 U	0.85 U	0.85 U	0.85 U	0.85 U	1.7 =
Pit 34	X136	10	0.31 J	0.83 U	0.83 U	0.83 U	0.83 U	0.83 UJ	0.67 J	0.83 U	0.83 U	0.83 U	0.83 U	0.83 U	0.24 J	0.83 U	0.83 U	0.26 J
Pit 35	X133	4	0.007 J	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.001 J	0.012 U	0.006 J	0.012 U	0.012 U	0.002 J
Pit 35	X134	10	0.01 J	0.016 U	0.016 U	0.016 U	0.021 =	0.016 U	0.005 J	0.016 U	0.016 U	0.016 U	0.016 U	0.016 U	0.02 =	0.016 U	0.016 U	0.019 =
Pit 36	X131	4	2.1 U	2.1 U	2.1 U	2.1 U	2.1 U	2.1 U	0.74 J	2.1 U	2.1 U	2.1 U	2.1 U	2.1 U	2.1 U	2.1 U	2.1 U	2.1 U
Pit 36	X132	11	0.11 =	0.014 U	0.014 U	0.014 U	0.057 =	0.014 U	0.029 =	0.014 U	0.014 U	0.014 U	0.003 J	0.014 U	0.003 J	0.014 U	0.014 U	0.018 =
Pit 37	X128	3	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	0.46 J	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	0.26 J

Table E-5. VOCs in U.S. Drum (mg/kg)

Station ID	Sample ID	Depth (ft.)	Benzene	Bromodichloromethane	Bromoform	Bromomethane	Carbon disulfide	Carbon tetrachloride	Chlorobenzene	Chloroethane	Chloroform	Chloromethane	cis-1,2-Dichloroethene	cis-1,3-Dichloropropene[2]	Cyclohexane	Dibromochloromethane	Dichlorodifluoromethane	Ethylbenzene
Industrial/		*Ing*	*200*	*92*	*720*	*2900*	*200000*	*44*	*41000*		*940*		*20000*	*33*		*41000*		*200000*
Commercial		*Inh*	*1.5*	*3000*	*100*	*15*	*720*	*0.64*	*210*		*0.54*		*1200*	*0.23*		*1300*		*400*
Construction		*Ing*	*4300*	*2000*	*16000*	*1000*	*20000*	*410*	*4100*		*2000*		*20000*	*610*		*41000*		*20000*
Worker		*Inh*	*2.1*	*3000*	*140*	*3.9*	*9*	*0.9*	*1.3*		*0.76*		*1200*	*0.33*		*1300*		*58*
Soil Component		*I*	*0.03*	*0.6*	*0.8*	*0.2*	*32*	*0.07*	*1*		*0.6*		*0.4*	*0.004*		*0.4*		*13*
of GW		*II*	*0.17*	*0.6*	*0.8*	*1.2*	*160*	*0.33*	*6.5*		*2.9*		*1.1*	*0.02*		*0.4*		*19*
Pit 37	X129	3	0.034 =	0.022 U	0.022 U	0.022 U	0.024 =	0.022 U	0.063 =	0.022 U	0.022 U	0.022 U	0.004 J	0.022 U	0.024 =	0.022 U	0.022 U	0.006 J
Pit 37	X130	8	0.83 U	0.83 U	0.83 U	0.83 U	0.83 U	0.83 U	0.83 U	0.83 U	0.83 U	0.83 U	0.83 U	0.83 U	0.83 U	0.83 U	0.83 U	0.16 J
Pit 38	X126	3	0.1 J	0.86 U	0.86 U	0.86 U	0.86 U	0.86 U	18 J	0.86 U	0.86 U	0.86 U	0.86 U	0.86 U	0.86 U	0.86 U	0.86 U	0.93 J
Pit 38	X126DL	3	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 UJ	18 =	1.7 U	1.7 U	1.7 UJ	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	0.97 J
Pit 38	X127	10	0.59 J	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	0.32 J	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	0.36 J	1.1 U	1.1 U	9.1 =
Pit 39	X124	3	0.003 J	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.004 J	0.012 U	0.012 U	0.012 U
Pit 39	X125	10	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	0.66 J
Pit 40	X122	4	0.016 J	0.019 U	0.019 U	0.019 U	0.036 =	0.019 U	0.018 J	0.019 U	0.019 U	0.006 J	0.007 J	0.019 U	0.007 J	0.019 U	0.019 U	0.032 =
Pit 40	X123	9	0.09 J	0.026 U	0.026 U	0.026 U	0.095 J	0.026 U	0.46 J	0.026 U	0.026 U	0.026 U	0.012 J	0.026 U	0.084 J	0.026 U	0.026 U	1.7 J
Pit 40	X123DL	9	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	0.7 J	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.1 J
Pit 41	X120	3	0.18 J	0.62 U	0.62 U	0.62 U	0.62 U	0.62 U	0.62 U	0.62 U	0.62 U	0.62 U	0.62 U	0.62 U	0.62 U	0.62 U	0.62 U	0.15 J
Pit 41	X121	8	0.12 J	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	17 J
Pit 41	X121DL	8	2.1 U	2.1 U	2.1 U	2.1 U	2.1 U	2.1 UJ	2.1 U	2.1 U	2.1 U	2.1 UJ	2.1 U	2.1 U	2.1 U	2.1 U	2.1 U	19 =
Pit 42	X117	2	0.003 J	0.013 U	0.013 U	0.013 UJ	0.025 =	0.013 U	0.013 U	0.013 U	0.013 U	0.013 U	0.013 U	0.013 U	0.003 J	0.013 U	0.013 U	0.002 J
Pit 42	X118	9	0.035 =	0.017 U	0.017 U	0.017 UJ	0.019 U	0.017 U	0.013 J	0.017 U	0.017 U	0.017 U	0.002 J	0.017 U	0.021 =	0.017 U	0.017 U	0.046 =
Pit 42	X119	15	0.036 J	0.017 U	0.017 U	0.017 UJ	0.045 J	0.017 U	0.013 J	0.017 U	0.017 U	0.017 U	0.16 J	0.017 U	0.027 J	0.017 U	0.017 U	0.37 J
Pit 42	X119DL	15	0.85 U	0.85 U	0.85 U	0.85 U	0.85 U	0.85 U	0.85 U	0.85 U	0.85 U	0.85 U	0.4 J	0.85 U	0.85 U	0.85 U	0.85 U	0.83 J
Pit 43	X115	3	0.074 =	0.016 U	0.016 U	0.016 UJ	0.026 =	0.016 U	1 =	0.016 U	0.016 U	0.016 U	0.016 U	0.016 U	0.021 =	0.016 U	0.016 U	0.36 =
Pit 43	X115DL	3	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	4.2 =	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	0.24 J	1.6 U	1.6 U	17 =
Pit 43	X116	9	0.1 J	0.016 U	0.016 U	0.016 UJ	0.04 J	0.016 U	0.016 UJ	0.016 U	0.016 U	0.016 U	0.009 J	0.016 U	0.016 U	0.016 U	0.016 U	0.89 J
Pit 43	X116DL	9	0.23 J	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	2.2 =
Pit 44	X113	3	0.019 =	0.013 U	0.013 U	0.013 U	0.013 U	0.013 U	0.013 U	0.013 UJ	0.013 U	0.013 U	0.002 J	0.013 U	0.006 J	0.013 U	0.013 U	0.004 J
Pit 44	X114	9	0.063 =	0.02 U	0.02 U	0.02 U	0.032 =	0.02 U	0.042 =	0.02 UJ	0.02 U	0.02 U	0.02 U	0.02 U	0.044 =	0.02 U	0.02 U	0.01 J
Pit 45	X111	3.5	0.13 =	0.014 U	0.014 U	0.014 UJ	0.028 =	0.014 U	0.088 =	0.014 U	0.014 U	0.014 U	0.002 J	0.014 U	0.009 J	0.014 U	0.014 U	0.047 =
Pit 45	X112	10	0.045 J	0.019 U	0.019 U	0.019 UJ	0.082 J	0.019 U	0.19 J	0.019 U	0.019 U	0.019 U	0.003 J	0.019 U	0.024 J	0.019 U	0.019 U	0.67 J
Pit 45	X112DL	10	0.93 U	0.93 U	0.93 U	0.93 U	0.93 U	0.93 U	0.64 J	0.93 U	0.93 U	0.93 U	0.93 U	0.93 U	0.93 U	0.93 U	0.93 U	0.9 J
Pit 46	X109	4	0.02 =	0.016 U	0.016 U	0.016 U	0.016 U	0.016 U	0.002 J	0.016 UJ	0.016 U	0.016 U	0.016 U	0.016 U	0.003 J	0.016 U	0.016 U	0.002 J
Pit 46	X110	9	0.02 =	0.018 U	0.018 U	0.018 UJ	0.018 U	0.018 U	0.003 J	0.018 U	0.018 U	0.018 U	0.01 J	0.018 U	0.009 J	0.018 U	0.018 U	0.032 =

Table E-5. VOCs in U.S. Drum (mg/kg)

Station ID	Sample ID	Depth (ft.)	Benzene	Bromodichloromethane	Bromoform	Bromomethane	Carbon disulfide	Carbon tetrachloride	Chlorobenzene	Chloroethane	Chloroform	Chloromethane	cis-1,2-Dichloroethene	cis-1,3-Dichloropropene[2]	Cyclohexane	Dibromochloromethane	Dichlorodifluoromethane	Ethylbenzene
Industrial/ Commercial		*Ing*	*200*	*92*	*720*	*2900*	*200000*	*44*	*41000*		*940*		*20000*	*33*		*41000*		*200000*
		Inh	*1.5*	*3000*	*100*	*15*	*720*	*0.64*	*210*		*0.54*		*1200*	*0.23*		*1300*		*400*
Construction Worker		*Ing*	*4300*	*2000*	*16000*	*1000*	*20000*	*410*	*4100*		*2000*		*20000*	*610*		*41000*		*20000*
		Inh	*2.1*	*3000*	*140*	*3.9*	*9*	*0.9*	*1.3*		*0.76*		*1200*	*0.33*		*1300*		*58*
Soil Component of GW		*I*	*0.03*	*0.6*	*0.8*	*0.2*	*32*	*0.07*	*1*		*0.6*		*0.4*	*0.004*		*0.4*		*13*
		II	*0.17*	*0.6*	*0.8*	*1.2*	*160*	*0.33*	*6.5*		*2.9*		*1.1*	*0.02*		*0.4*		*19*
Pit 47	X107	3.5	0.021 =	0.014 U	0.014 U	0.014 U	0.026 =	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U	0.003 J	0.014 U	0.015 =	0.014 U	0.014 U	0.009 J
Pit 47	X108	9	0.18 J	0.83 U	0.83 U	0.83 U	0.83 U	0.83 U	0.83 U	0.83 U	0.83 U	0.83 U	0.83 U	0.83 U	0.83 U	0.83 U	0.83 U	29 =
Pit 47	X108DL	9	3.3 U	3.3 U	3.3 U	3.3 U	3.3 U	3.3 U	3.3 U	3.3 U	3.3 U	3.3 U	3.3 U	3.3 U	3.3 U	3.3 U	3.3 U	33 =
Pit 48	X105	3	0.006 J	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 UJ	0.011 U	0.011 U	0.006 J	0.011 U	0.003 J	0.011 U	0.011 U	0.008 J
Pit 48	X106	9	0.028 =	0.014 U	0.014 U	0.014 U	0.035 =	0.014 U	0.007 J	0.014 U	0.014 U	0.014 U	0.004 J	0.014 U	0.009 J	0.014 U	0.014 U	0.16 =
Pit 48	X106DL	9	0.68 U	0.68 U	0.68 U	0.68 U	0.68 U	0.68 U	0.68 U	0.68 U	0.68 U	0.68 U	0.071 J	0.68 U	0.68 U	0.68 U	0.68 U	2.7 =
Pit 49	X103	3	0.014 =	0.012 U	0.012 U	0.012 UJ	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.002 J	0.012 U	0.005 J	0.012 U	0.012 U	0.003 J
Pit 49	X104	10	0.017 =	0.013 U	0.013 U	0.013 UJ	0.013 U	0.013 U	0.022 =	0.013 U	0.013 U	0.013 U	0.013 U	0.013 U	0.009 J	0.013 U	0.013 U	0.008 J
Pit 50	X101	3	0.003 J	0.011 U	0.011 U	0.011 UJ	0.011 U	0.011 U	0.011 UJ	0.011 U	0.011 U	0.011 U	0.003 J	0.011 U	0.005 J	0.011 U	0.011 U	0.004 J
Pit 50	X102	9	0.026 =	0.02 U	0.02 U	0.02 U	0.037 =	0.02 U	0.013 J	0.02 U	0.02 U	0.02 U	0.006 J	0.02 U	0.15 =	0.02 U	0.02 U	2.5 =
Pit 50	X102DL	9	0.98 U	0.98 U	0.98 U	0.98 U	0.98 U	0.98 U	0.98 U	0.98 U	0.98 U	0.98 U	0.98 U	0.98 U	0.13 J	0.98 U	0.98 U	8.6 =
Pit 51	X203	3	0.003 J	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.004 J	0.012 U	0.012 U	0.012 U
Pit 51	X204	8	0.67 U	0.67 U	0.67 U	0.67 U	0.44 J	0.67 U	0.67 U	0.67 U	0.67 U	0.67 U	3.2 =	0.67 U	0.67 U	0.67 U	0.67 U	0.67 U

Notes:

=: sample concentration is detected at level reported
U: sample concentration is under detection limit
J: sample concentration is estimated value
R: sample concentration value is rejected
DL: sample is diluted
RE: sample is re-extracted
Ing.: Ingestion
Inh.: Inhalation
I: Class I
II: Class II

[1]Values in the proposed rules.

[2]TACO RO values shown for 1,3-dichloropropene are the combined values for cis and trans.

Table E-5. VOCs in U.S. Drum (mg/kg)

Station ID	Sample ID	Depth (ft.)	Isopropylbenzene	Methyl acetate	Methyl ethyl ketone	Methyl isobutyl ketone	Methylcyclohexane	Methylene chloride	Styrene	Tert-Butyl Methyl Ether [1]	Tetrachloroethene	Toluene	trans-1,2-Dichloroethene	trans-1,3-Dichloropropene [2]	Trichloroethene	Trichlorofluoromethane	Vinyl chloride	Xylenes
Industrial/ Commercial		*Ing*						*760*	*410000*	*20000*	*110*	*410000*	*41000*	*33*	*520*		*3*	*1000000*
		Inh						*24*	*1500*	*8800*	*20*	*650*	*3100*	*0.23*	*8.9*		*0.06*	*410*
Construction Worker		*Ing*						*12000*	*41000*	*2000*	*2400*	*410000*	*41000*	*610*	*1200*		*65*	*410000*
		Inh						*34*	*430*	*140*	*28*	*42*	*3100*	*0.33*	*12*		*0.08*	*410*
Soil Component of GW		*I*						*0.02*	*4*	*0.32*	*0.06*	*12*	*0.7*	*0.004*	*0.06*		*0.01*	*150*
		II						*0.2*	*18*	*0.32*	*0.3*	*29*	*3.4*	*0.02*	*0.3*		*0.07*	*150*
Pit 01	X207	4	0.011 UJ	0.011 UJ	0.011 UJ	0.011 UJ	0.011 UJ	0.003 J	0.011 UJ	0.011 UJ	0.011 UJ	0.011 U	0.011 UJ	0.011 UJ	0.011 UJ	0.011 UJ	0.011 UJ	0.011 UJ
Pit 01	X208	9	1.1 J	1.9 =	0.45 J	1.6 U	0.44 J	1.6 U	1.6 U	1.6 U	1.6 U	7.6 =	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	56 =
Pit 01	X209	13	2.4 =	0.4 J	0.59 J	1.4 U	5.6 =	1.4 U	1.4 U	1.4 U	1.4 U	0.23 J	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	200 =
Pit 01	X209DL	13	3.5 J	14 UJ	14 U	14 UJ	9.6 J	14 U	14 U	14 U	14 U	14 U	14 U	14 U	14 U	14 U	14 U	310 =
Pit 02	X205	3	0.013 UJ	0.013 UJ	0.013 UJ	0.013 UJ	0.001 J	0.005 J	0.013 UJ	0.013 UJ	0.002 J	0.013 U	0.013 UJ	0.013 UJ	0.013 UJ	0.013 UJ	0.013 UJ	0.003 J
Pit 02	X206	9	0.62 U	0.25 J	0.62 U	0.62 U	0.16 J	0.62 U	0.62 U	0.62 U	0.62 U	0.34 J	0.62 U	0.62 U	0.62 U	0.62 U	0.62 U	0.38 J
Pit 03	X201	3	0.59 U	0.18 J	0.59 U	0.59 U	0.59 U	0.59 U	0.59 U	0.59 U	0.59 U	0.59 U	0.077 J	0.59 U	0.8 =	0.59 U	0.59 U	0.59 U
Pit 03	X202	8	0.018 U	0.018 U	0.009 J	0.018 U	0.003 J	0.002 J	0.018 U	0.018 U	0.018 U	0.002 J	0.018 U	0.018 U	0.018 U	0.018 U	0.018 U	0.018 U
Pit 04	X177	4	3.2 U	0.42 J	3.2 UJ	3.2 U	0.89 J	3.2 U	3.2 U	3.2 UJ	3.2 U	0.32 J	3.2 U	3.2 U	3.2 U	3.2 UJ	3.2 U	0.77 J
Pit 04	X178	8	0.28 J	2.4 U	2.4 UJ	2.4 U	2.4 U	2.4 U	2.4 U	2.4 U	2.4 U	2.4 U	2.4 U	2.4 U	2.4 U	2.4 UJ	2.4 U	2.4 U
Pit 04	X178DL	8	24 U	24 UJ	24 UJ	24 U	24 U	24 U	24 U	24 UJ	24 U	24 U	24 U	24 U	24 U	24 UJ	24 U	24 U
Pit 05	X198	2.5	0.61 U	0.1 J	0.083 J	0.61 U	0.61 U	0.61 U	0.61 U	0.61 U	0.61 U	0.15 J	0.61 U	0.61 U	0.15 J	0.61 U	0.61 U	0.2 J
Pit 05	X199	8	0.012 U	0.012 U	0.041 =	0.009 J	0.004 J	0.012 U	0.012 U	0.012 U	0.012 U	0.01 J	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.009 J
Pit 05	X200	8	0.012 U	0.012 U	0.019 J	0.007 J	0.004 J	0.014 =	0.012 U	0.012 U	0.002 J	0.02 =	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.011 J
Pit 06	X196	3	0.012 U	0.012 U	0.012 U	0.001 J	0.008 J	0.002 J	0.012 U	0.012 U	0.001 J	0.005 J	0.012 U	0.012 U	0.012 UJ	0.012 U	0.012 U	0.004 J
Pit 06	X197	8	0.005 J	0.012 U	0.012 U	0.001 J	0.004 J	0.012 U	0.012 U	0.012 U	0.012 U	0.01 J	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.008 J
Pit 07	X175	3	0.016 U	0.016 U	0.016 U	0.016 U	0.002 J	0.016 U	0.016 U	0.016 U	0.016 U	0.007 J	0.016 U	0.016 U	0.016 U	0.005 J	0.016 U	0.003 J
Pit 07	X176	8	0.007 J	0.013 U	0.013 U	0.013 U	0.033 =	0.013 U	0.013 U	0.013 U	0.017 =	0.078 =	0.002 J	0.013 U	0.087 =	0.013 U	0.013 U	0.12 =
Pit 07	X176DL	8	0.66 U	0.66 U	0.66 UJ	0.66 U	0.068 J	0.66 U	0.66 U	0.66 U	0.66 U	0.66 U	0.66 U	0.66 U	0.66 U	0.66 UJ	0.66 U	0.66 U
Pit 08	X173	2.5	0.012 U	0.012 U	0.018 U	0.012 U	0.008 J	0.012 U	0.012 U	0.012 U	0.012 U	0.004 J	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.002 J
Pit 08	X174	8	0.084 J	0.36 J	0.63 UJ	0.63 U	0.56 J	0.63 U	0.63 U	0.63 U	0.63 U	0.63 U	0.63 U	0.63 U	0.63 U	0.63 UJ	0.63 U	0.63 U
Pit 09	X168	3	29 U	29 U	29 U	29 U	29 U	29 U	29 U	29 U	29 U	29 U	29 U	29 U	29 U	29 U	29 U	12 J
Pit 09	X169	6.5	0.63 U	0.13 J	0.63 U	0.63 U	0.11 J	0.63 U	0.63 U	0.63 U	0.065 J	0.42 J	0.63 U	0.63 U	0.096 J	0.63 U	0.63 U	2.2 =
Pit 09	X170	6.5	0.013 U	0.013 U	0.013 U	0.002 J	0.002 J	0.004 J	0.013 U	0.013 U	0.013 U	0.01 J	0.013 U	0.013 U	0.013 U	0.013 U	0.013 U	0.003 J
Pit 10	X171	3	0.015 U	0.003 J	0.081 =	0.002 J	0.003 J	0.012 J	0.015 U	0.015 U	0.015 U	0.012 J	0.015 U	0.015 U	0.015 U	0.015 U	0.015 U	0.005 J
Pit 10	X172	8	0.59 J	0.36 J	0.53 J	0.98 U	0.98 U	0.98 U	0.98 U	0.98 U	0.98 U	0.29 J	0.98 U	0.98 U	0.98 U	0.98 U	0.98 U	50 =
Pit 10	X172DL	8	0.6 J	0.46 J	0.7 J	2 U	2 U	2 U	2 U	2 UJ	2 U	0.27 J	2 U	2 U	2 U	2 UJ	2 U	51 =
Pit 11	X190	2	0.38 J	0.21 J	0.74 U	0.74 U	0.74 U	0.74 U	0.74 U	0.74 UJ	0.099 J	0.76 =	0.74 U	0.74 U	0.74 U	0.74 UJ	0.74 U	0.89 =

Table E-5. VOCs in U.S. Drum (mg/kg)

Station ID	Sample ID	Depth (ft.)	Isopropylbenzene	Methyl acetate	Methyl ethyl ketone	Methyl isobutyl ketone	Methylcyclohexane	Methylene chloride	Styrene	Tert-Butyl Methyl Ether[1]	Tetrachloroethene	Toluene	trans-1,2-Dichloroethene	trans-1,3-Dichloropropene[2]	Trichloroethene	Trichlorofluoromethane	Vinyl chloride	Xylenes
Industrial/ Commercial		*Ing*						*760*	*410000*	*20000*	*110*	*410000*	*41000*	*33*	*520*		*3*	*1000000*
		Inh						*24*	*1500*	*8800*	*20*	*650*	*3100*	*0.23*	*8.9*		*0.06*	*410*
Construction Worker		*Ing*						*12000*	*41000*	*2000*	*2400*	*410000*	*41000*	*610*	*1200*		*65*	*410000*
		Inh						*34*	*430*	*140*	*28*	*42*	*3100*	*0.33*	*12*		*0.08*	*410*
Soil Component of GW		*I*						*0.02*	*4*	*0.32*	*0.06*	*12*	*0.7*	*0.004*	*0.06*		*0.01*	*150*
		II						*0.2*	*18*	*0.32*	*0.3*	*29*	*3.4*	*0.02*	*0.3*		*0.07*	*150*
Pit 11	X191	8	0.33 J	0.28 J	0.45 J	0.67 U	0.67 U	0.67 U	0.67 U	0.67 UJ	0.2 J	0.87 =	0.67 U	0.67 U	0.67 U	0.67 UJ	0.67 U	3.1 =
Pit 12	X192	3	0.57 U	0.57 UJ	0.57 U	0.11 J	0.57 U	0.076 J	0.57 U	0.57 UJ	0.57 U	0.13 J	0.57 U	0.57 U	0.57 U	0.57 UJ	0.57 U	0.41 J
Pit 12	X193	8	0.21 J	0.47 J	0.61 U	0.61 U	0.61 U	0.085 J	0.61 U	0.61 U	0.61 U	0.45 J	0.61 U	0.61 U	0.61 U	0.61 UJ	0.61 U	7.1 =
Pit 13	X194	3.5	0.59 U	0.59 U	0.59 U	0.59 U	0.59 U	0.11 J	0.59 U	0.59 U	0.59 U	0.59 U	0.59 U	0.59 U	0.59 U	0.59 UJ	0.59 U	0.59 U
Pit 13	X195	12	0.016 U	0.016 U	0.008 J	0.016 U	0.016 U	0.007 J	0.016 U	0.016 U	0.016 U	0.005 J	0.016 U	0.016 U	0.016 U	0.002 J	0.016 U	0.003 J
Pit 14	X184	4	0.14 J	0.29 J	1.1 U	1.1 U	0.17 J	1.1 U	1.1 U	1.1 UJ	0.4 J	1.2 =	1.1 U	1.1 U	1.1 U	1.1 UJ	1.1 UJ	10 =
Pit 14	X185	9	0.22 J	0.45 J	0.72 U	0.72 U	0.12 J	0.72 U	0.72 U	0.72 UJ	0.42 J	1.4 =	0.72 U	0.72 U	0.72 U	0.72 UJ	0.72 UJ	8.6 =
Pit 15	X186	4	5.1 J	30 U	30 U	30 U	4.8 J	30 U	30 U	30 UJ	28 J	100 =	30 U	30 U	5.5 J	30 UJ	30 UJ	620 =
Pit 15	X187	8	2.5 J	6.2 UJ	1.1 J	6.2 U	1.7 J	0.8 J	6.2 U	6.2 UJ	7 =	42 =	6.2 U	6.2 U	2.2 J	6.2 UJ	6.2 U	240 =
Pit 16	X188	3	0.57 U	0.19 J	0.57 U	0.57 U	0.091 J	0.065 J	0.57 U	0.57 UJ	0.57 U	1 =	0.57 U	0.57 U	0.57 U	0.57 UJ	0.57 U	0.17 J
Pit 16	X189	7	0.57 U	0.16 J	0.57 U	0.57 U	0.073 J	0.57 U	0.57 U	0.57 UJ	0.15 J	0.09 J	0.57 U	0.57 U	0.071 J	0.57 UJ	0.57 U	0.21 J
Pit 17	X181	3.5	3.3 U	3.3 U	3.3 U	3.3 U	3.3 U	3.3 U	3.3 U	3.3 UJ	3.3 U	2.1 J	3.3 U	3.3 U	3.3 U	3.3 UJ	3.3 UJ	3.3 U
Pit 17	X182	7	0.29 J	0.71 U	0.71 U	0.71 U	0.28 J	1.2 =	0.71 U	0.71 UJ	0.71 U	0.17 J	0.71 U	0.71 U	0.71 U	0.71 UJ	0.23 J	1.2 =
Pit 17	X183	13	0.63 U	0.17 J	0.63 U	0.63 U	0.1 J	0.63 U	0.63 U	0.63 UJ	0.63 U	0.087 J	0.63 U	0.63 U	0.63 U	0.63 UJ	0.63 UJ	0.14 J
Pit 18	X179	3.5	0.57 U	0.31 J	0.25 J	0.57 U	0.57 U	0.57 U	0.57 U	0.57 UJ	0.31 J	0.67 =	0.57 U	0.57 U	0.099 J	0.57 UJ	0.57 UJ	0.64 =
Pit 18	X180	7	0.47 J	0.16 J	0.77 U	0.77 U	0.15 J	0.77 U	0.77 U	0.77 UJ	0.77 U	0.19 J	0.77 U	0.77 U	0.77 U	0.77 UJ	0.77 UJ	1 =
Pit 19	X166	3	30 U	30 U	30 UJ	30 U	30 U	8.9 J	30 U	30 U	4 J	260 =	30 U	30 U	30 U	30 UJ	30 U	250 =
Pit 19	X167	9	8.2 =	31 =	1.2 J	3.2 U	14 =	3.1 J	3.2 U	3.2 U	20 =	560 =	3.2 U	3.2 U	3.7 =	3.2 UJ	3.2 U	820 =
Pit 19	X167DL	9	79 U	30 J	79 U	79 U	79 U	10 J	79 U	79 U	12 J	730 =	79 U	79 U	79 U	79 UJ	79 U	780 =
Pit 20	X164	3	0.24 J	0.19 J	0.24 J	0.62 U	0.62 U	0.62 U	0.62 U	0.62 U	0.62 U	0.48 J	0.62 U	0.62 U	0.62 U	0.62 U	0.62 U	3.8 =
Pit 20	X165	9	0.23 J	0.27 J	0.2 J	0.092 J	0.68 U	0.68 U	0.68 U	0.68 U	0.39 J	0.81 =	0.68 U	0.68 U	0.1 J	0.097 J	0.68 U	1.8 =
Pit 21	X162	2	0.43 J	0.31 J	1 U	1 U	1 U	1 U	1 U	1 U	1 U	0.91 J	1 U	1 U	0.56 J	1 U	1 U	2.7 =
Pit 21	X163	9	0.28 J	0.38 J	0.21 J	1 U	1.9 =	1 U	1 U	1 U	1 U	0.13 J	1 U	1 U	1 U	1 U	1 U	0.23 J
Pit 22	X160	3.5	0.65 U	0.14 J	0.23 J	1 =	0.65 U	0.65 U	0.65 U	0.65 U	0.099 J	0.8 =	0.65 U	0.65 U	0.65 U	0.65 U	0.65 U	0.67 =
Pit 22	X161	8	0.18 J	0.18 J	0.2 J	0.7 U	0.7 U	0.7 U	0.7 U	0.7 U	0.7 U	0.24 J	0.7 U	0.7 U	0.7 U	0.7 U	0.7 U	2.2 =
Pit 23	X157	2.5	0.37 J	0.25 J	0.6 U	0.6 U	0.075 J	0.6 U	0.6 U	0.6 UJ	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U	0.6 UJ	0.6 UJ	0.61 =
Pit 23	X158	9	2 J	9.6 U	9.6 U	9.6 U	9.6 U	9.6 U	9.6 U	9.6 U	9.6 U	9.6 U	9.6 U	9.6 U	9.6 U	9.6 UJ	9.6 U	160 =
Pit 23	X159	13	1 J	0.95 J	1.5 J	5 U	5 U	5 U	5 U	5 U	5 U	7.3 =	5 U	5 U	5 U	5 UJ	5 U	110 =

Table E-5. VOCs in U.S. Drum (mg/kg)

Station ID	Sample ID	Depth (ft.)	Isopropylbenzene	Methyl acetate	Methyl ethyl ketone	Methyl isobutyl ketone	Methylcyclohexane	Methylene chloride	Styrene	Tert-Butyl Methyl Ether[1]	Tetrachloroethene	Toluene	trans-1,2-Dichloroethene	trans-1,3-Dichloropropene[2]	Trichloroethene	Trichlorofluoromethane	Vinyl chloride	Xylenes
Industrial/ Commercial		*Ing*						*760*	*410000*	*20000*	*110*	*410000*	*41000*	*33*	*520*		*3*	*1000000*
		Inh						*24*	*1500*	*8800*	*20*	*650*	*3100*	*0.23*	*8.9*		*0.06*	*410*
Construction Worker		*Ing*						*12000*	*41000*	*2000*	*2400*	*410000*	*41000*	*610*	*1200*		*65*	*410000*
		Inh						*34*	*430*	*140*	*28*	*42*	*3100*	*0.33*	*12*		*0.08*	*410*
Soil Component of GW		*I*						*0.02*	*4*	*0.32*	*0.06*	*12*	*0.7*	*0.004*	*0.06*		*0.01*	*150*
		II						*0.2*	*18*	*0.32*	*0.3*	*29*	*3.4*	*0.02*	*0.3*		*0.07*	*150*
Pit 24	X155	2.5	5.7 =	0.69 J	1.3 U	1.3 U	0.94 J	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 UJ	1.3 U	1.3 U
Pit 24	X156	8.5	0.28 J	0.59 J	0.93 U	0.93 U	0.11 J	0.93 U	0.93 U	0.93 U	0.93 U	0.15 J	0.93 U	0.93 U	0.93 U	0.93 UJ	0.93 U	0.65 J
Pit 25	X153	3	0.85 U	0.31 J	0.85 U	0.85 U	0.85 U	0.85 U	0.85 U	0.85 U	0.17 J	0.66 J	0.85 U	0.85 U	0.85 U	0.85 UJ	0.85 U	0.99 =
Pit 25	X154	9.5	2.5 =	0.23 J	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	0.3 J	1.3 U	1.3 U	1.3 U	1.3 UJ	1.3 U	29 =
Pit 26	X151	3	0.63 J	1.2 U	0.4 J	1.2 U	0.47 J	1.2 U	1.2 U	1.2 UJ	0.15 J	1.1 J	1.2 U	1.2 U	1.2 U	1.2 UJ	1.2 UJ	20 =
Pit 26	X152	9	0.71 J	0.38 J	0.73 J	0.75 U	0.15 J	0.75 U	0.75 U	0.75 U	0.12 J	1.7 =	0.75 U	0.75 U	0.13 J	0.75 UJ	0.75 U	13 =
Pit 27	X149	3.5	0.008 J	0.017 U	0.023 =	0.017 U	0.022 =	0.003 J	0.017 U	0.017 U	0.017 U	0.012 J	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.009 J
Pit 27	X150	10	0.59 J	0.48 J	0.96 U	0.96 U	0.11 J	0.96 U	0.96 U	0.96 U	0.96 U	0.2 J	0.96 U	0.96 U	0.96 U	0.96 UJ	0.96 U	2.3 =
Pit 28	X147	3	0.077 J	0.2 J	0.68 U	0.68 U	0.68 U	0.68 U	0.68 U	0.68 U	0.2 J	0.52 J	0.68 U	0.68 U	0.68 U	0.68 UJ	0.68 U	0.13 J
Pit 28	X148	8	0.41 J	0.6 J	1.1 U	1.1 U	0.16 J	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 UJ	1.1 U	0.29 J
Pit 29	X145	4.5	0.012 U	0.012 U	0.011 J	0.012 U	0.003 J	0.003 J	0.012 U	0.012 U	0.012 U	0.005 J	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.005 J
Pit 29	X146	8	2.3 U	2.3 U	2.3 U	2.3 U	2.3 U	2.3 U	2.3 U	2.3 U	2.3 U	2.3 U	2.3 U	2.3 U	2.3 U	2.3 UJ	2.3 U	5.3 =
Pit 30	X143	4	0.024 J	0.015 J	0.077 J	0.031 U	0.01 J	0.031 U	0.031 U	0.031 U	0.031 U	0.009 J	0.031 U	0.031 U	0.031 U	0.031 U	0.031 U	0.009 J
Pit 30	X144	6	1.6 =	0.35 J	0.88 U	0.88 U	0.88 U	0.88 U	0.88 U	0.88 U	0.39 J	0.26 J	0.88 U	0.88 U	0.13 J	0.88 UJ	0.88 U	0.38 J
Pit 31	X141	4	0.71 J	0.36 J	0.84 =	0.78 U	0.78 U	0.25 J	0.78 U	0.78 U	0.2 J	1.8 =	0.78 U	0.78 U	0.14 J	0.78 UJ	0.78 U	2 =
Pit 31	X142	9	0.016 =	0.012 U	0.015 =	0.002 J	0.007 J	0.003 J	0.012 U	0.012 U	0.003 J	0.013 =	0.001 J	0.012 U	0.012 U	0.012 U	0.012 U	0.017 =
Pit 32	X139	3	6.5 =	3.6 U	2.8 J	3.6 U	3.6 U	3.6 U	3.6 U	3.6 U	3.6 U	19 =	3.6 U	3.6 U	3.6 U	3.6 U	3.6 U	790 =
Pit 32	X139DL	3	6.3 J	36 U	36 U	36 U	36 U	36 U	36 U	36 U	36 U	19 J	36 U	36 U	36 U	36 U	36 U	950 =
Pit 32	X140	9	3.7 =	1.2 J	1.6 U	1.6 U	1 J	1.6 U	1.6 U	1.6 U	1.6 U	0.45 J	1.6 U	1.6 U	1.6 U	1.6 UJ	1.6 U	3.8 =
Pit 33	X137	3	16 U	16 U	16 U	16 U	16 U	16 U	16 U	16 U	16 U	4.3 J	16 U	16 U	16 U	16 U	16 U	200 =
Pit 33	X138	9	0.19 J	0.52 J	0.65 U	0.65 U	0.15 J	0.65 U	0.65 U	0.65 U	0.65 U	0.18 J	0.65 U	0.65 U	0.65 U	0.65 U	0.65 U	2.5 =
Pit 34	X135	3	1 =	0.43 J	0.85 U	0.85 U	0.85 U	0.85 U	0.85 U	0.85 U	1.4 =	1.3 =	0.85 U	0.85 U	0.18 J	0.85 U	0.85 U	6.7 =
Pit 34	X136	10	5.3 J	0.37 J	0.52 J	0.83 U	1.2 J	0.83 U	0.83 U	0.83 U	0.38 J	0.46 J	0.83 U	0.83 U	0.31 J	0.83 U	0.83 U	0.83 U
Pit 35	X133	4	0.012 U	0.012 U	0.011 J	0.012 U	0.007 J	0.007 J	0.012 U	0.012 U	0.002 J	0.012 =	0.012 U	0.012 U	0.001 J	0.012 U	0.012 U	0.005 J
Pit 35	X134	10	0.008 J	0.016 U	0.03 =	0.016 U	0.026 =	0.01 J	0.016 U	0.016 U	0.016 U	0.013 J	0.016 U	0.016 U	0.016 U	0.016 U	0.016 U	0.042 =
Pit 36	X131	4	2.1 U	1.4 J	2.1 U	2.1 U	2.1 U	2.1 U	2.1 U	2.1 U	2.1 U	2.1 U	2.1 U	2.1 U	2.1 U	2.1 U	2.1 U	2.1 U
Pit 36	X132	11	0.15 =	0.014 U	0.077 =	0.015 =	0.005 J	0.011 J	0.014 U	0.014 U	0.011 J	0.062 =	0.002 J	0.014 U	0.004 J	0.014 U	0.014 U	0.094 =
Pit 37	X128	3	0.21 J	0.64 J	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	0.22 J	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	0.78 J

Table E-5. VOCs in U.S. Drum (mg/kg)

Station ID	Sample ID	Depth (ft.)	Isopropylbenzene	Methyl acetate	Methyl ethyl ketone	Methyl isobutyl ketone	Methylcyclohexane	Methylene chloride	Styrene	Tert-Butyl Methyl Ether [1]	Tetrachloroethene	Toluene	trans-1,2-Dichloroethene	trans-1,3-Dichloropropene [2]	Trichloroethene	Trichlorofluoromethane	Vinyl chloride	Xylenes
Industrial/ Commercial		*Ing*						*760*	*410000*	*20000*	*110*	*410000*	*41000*	*33*	*520*		*3*	*1000000*
		Inh						*24*	*1500*	*8800*	*20*	*650*	*3100*	*0.23*	*8.9*		*0.06*	*410*
Construction Worker		*Ing*						*12000*	*41000*	*2000*	*2400*	*410000*	*41000*	*610*	*1200*		*65*	*410000*
		Inh						*34*	*430*	*140*	*28*	*42*	*3100*	*0.33*	*12*		*0.08*	*410*
Soil Component of GW		*I*						*0.02*	*4*	*0.32*	*0.06*	*12*	*0.7*	*0.004*	*0.06*		*0.01*	*150*
		II						*0.2*	*18*	*0.32*	*0.3*	*29*	*3.4*	*0.02*	*0.3*		*0.07*	*150*
Pit 37	X129	3	0.042 =	0.022 U	0.034 =	0.022 U	0.029 =	0.014 J	0.022 U	0.022 U	0.012 J	0.017 J	0.022 U	0.022 U	0.006 J	0.022 U	0.022 U	0.019 J
Pit 37	X130	8	0.2 J	0.19 J	0.83 U	0.83 U	0.83 U	0.83 U	0.83 U	0.83 U	0.56 J	0.23 J	0.83 U	0.83 U	0.83 U	0.83 U	0.83 U	0.61 J
Pit 38	X126	3	1.3 J	0.8 J	0.45 J	0.86 U	0.86 U	0.86 U	0.86 U	0.86 U	0.58 J	0.66 J	0.86 U	0.86 U	0.86 U	0.86 U	0.86 U	3.6 J
Pit 38	X126DL	3	1.3 J	0.78 J	0.58 J	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	0.63 J	0.7 J	1.7 U	1.7 U	1.7 U	1.7 UJ	1.7 U	3.7 =
Pit 38	X127	10	1.1 =	1.1 =	1.1 U	1.1 U	0.57 J	1.1 U	1.1 U	1.1 U	1.1 U	1.7 =	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	20 =
Pit 39	X124	3	0.012 U	0.012 U	0.012 U	0.012 U	0.004 J	0.008 J	0.012 U	0.012 U	0.004 J	0.005 J	0.012 U	0.012 U	0.002 J	0.012 U	0.012 U	0.003 J
Pit 39	X125	10	0.28 J	1.3 =	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	0.54 J	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	2.7 =
Pit 40	X122	4	0.004 J	0.019 U	0.037 =	0.004 J	0.01 J	0.02 =	0.019 U	0.019 U	0.003 J	0.024 =	0.019 U	0.019 U	0.002 J	0.019 U	0.019 U	0.14 =
Pit 40	X123	9	0.19 J	0.026 U	0.046 J	0.048 J	0.21 J	0.02 J	0.026 UJ	0.026 U	0.026 UJ	0.98 J	0.026 U	0.026 U	0.005 J	0.026 U	0.026 U	3.9 J
Pit 40	X123DL	9	0.38 J	9.5 =	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	0.39 J	1.3 U	1.3 U	1.3 U	1.3 UJ	1.3 U	4.7 =
Pit 41	X120	3	0.62 U	0.62 U	0.62 U	0.62 U	0.62 U	0.62 U	0.62 U	0.62 U	0.62 U	2.1 =	0.62 U	0.62 U	0.62 U	0.62 U	0.62 U	0.69 =
Pit 41	X121	8	2.4 J	0.61 J	0.89 J	1.1 U	0.22 J	1.1 U	1.1 U	1.1 U	1.1 U	2.6 J	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	67 J
Pit 41	X121DL	8	2.8 =	0.84 U	2.1 U	2.1 U	2.1 U	2.1 U	2.1 U	2.1 U	2.1 U	2.6 =	2.1 U	2.1 U	2.1 U	2.1 UJ	2.1 U	79 =
Pit 42	X117	2	0.001 J	0.013 U	0.013 UJ	0.001 J	0.005 J	0.017 =	0.013 U	0.013 U	0.007 J	0.008 J	0.013 U	0.013 U	0.009 J	0.013 U	0.013 U	0.006 J
Pit 42	X118	9	0.1 =	0.017 U	0.018 UJ	0.017 U	0.026 =	0.019 =	0.017 U	0.017 U	0.003 J	0.015 J	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.083 =
Pit 42	X119	15	0.066 J	0.017 U	0.84 J	0.17 J	0.09 J	0.019 J	0.017 U	0.017 U	0.023 J	0.76 J	0.011 J	0.017 U	0.018 J	0.017 U	0.031 J	1.1 J
Pit 42	X119DL	15	0.15 J	0.82 J	3.2 =	0.85 U	0.13 J	0.85 U	0.85 U	0.85 U	0.087 J	2.4 =	0.85 U	0.85 U	0.85 U	0.85 U	0.85 U	2.5 =
Pit 43	X115	3	0.2 =	0.016 U	0.016 UJ	0.016 U	0.043 =	0.018 =	0.016 U	0.016 U	0.016 U	0.061 =	0.016 U	0.016 U	0.016 U	0.016 U	0.016 U	1.5 =
Pit 43	X115DL	3	0.77 J	0.2 J	1.6 U	1.6 U	0.73 J	1.6 U	1.6 U	1.6 U	1.6 U	2.7 =	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	67 =
Pit 43	X116	9	0.51 J	0.016 U	0.03 UJ	0.016 UJ	0.43 J	0.024 J	0.016 UJ	0.016 U	0.016 UJ	0.35 J	0.011 J	0.016 U	0.009 J	0.016 U	0.016 U	3.3 J
Pit 43	X116DL	9	2.3 =	0.82 U	0.82 U	0.82 U	0.7 J	0.084 J	0.82 U	0.82 U	0.11 J	1.3 =	0.82 U	0.82 U	0.11 J	0.82 U	0.82 U	7.7 =
Pit 44	X113	3	0.008 J	0.013 U	0.018 =	0.013 U	0.01 J	0.007 J	0.013 U	0.013 U	0.002 J	0.01 J	0.003 J	0.013 U	0.013 U	0.013 U	0.013 U	0.027 =
Pit 44	X114	9	0.11 =	0.02 U	0.02 U	0.02 U	0.05 =	0.012 J	0.02 U	0.02 U	0.02 U	0.02 =	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.067 =
Pit 45	X111	3.5	0.1 =	0.014 U	0.025 J	0.005 J	0.012 J	0.014 =	0.014 U	0.014 U	0.002 J	0.097 =	0.002 J	0.014 U	0.014 U	0.014 U	0.014 U	0.21 =
Pit 45	X112	10	0.14 J	0.019 U	0.029 J	0.004 J	0.006 J	0.031 J	0.019 U	0.019 U	0.019 U	0.065 J	0.019 U	0.019 U	0.019 U	0.019 U	0.019 U	2.8 J
Pit 45	X112DL	10	0.25 J	0.81 J	0.93 U	0.93 U	0.93 U	0.1 J	0.93 U	0.93 U	0.93 U	0.13 J	0.93 U	0.93 U	0.93 U	0.93 U	0.93 U	5.2 =
Pit 46	X109	4	0.005 J	0.016 U	0.011 J	0.016 U	0.004 J	0.008 J	0.016 U	0.016 U	0.016 U	0.007 J	0.016 U	0.016 U	0.016 U	0.016 U	0.016 U	0.016 U
Pit 46	X110	9	0.01 J	0.018 U	0.012 J	0.018 U	0.011 J	0.018 U	0.018 U	0.018 U	0.006 J	0.024 =	0.002 J	0.018 U	0.009 J	0.018 U	0.018 U	0.1 =

Table E-5. VOCs in U.S. Drum (mg/kg)

Station ID	Sample ID	Depth (ft.)	Isopropylbenzene	Methyl acetate	Methyl ethyl ketone	Methyl isobutyl ketone	Methylcyclohexane	Methylene chloride	Styrene	Tert-Butyl Methyl Ether [1]	Tetrachloroethene	Toluene	trans-1,2-Dichloroethene	trans-1,3-Dichloropropene [2]	Trichloroethene	Trichlorofluoromethane	Vinyl chloride	Xylenes
Industrial/ Commercial		*Ing*						*760*	*410000*	*20000*	*110*	*410000*	*41000*	*33*	*520*		*3*	*1000000*
		Inh						*24*	*1500*	*8800*	*20*	*650*	*3100*	*0.23*	*8.9*		*0.06*	*410*
Construction Worker		*Ing*						*12000*	*41000*	*2000*	*2400*	*410000*	*41000*	*610*	*1200*		*65*	*410000*
		Inh						*34*	*430*	*140*	*28*	*42*	*3100*	*0.33*	*12*		*0.08*	*410*
Soil Component of GW		*I*						*0.02*	*4*	*0.32*	*0.06*	*12*	*0.7*	*0.004*	*0.06*		*0.01*	*150*
		II						*0.2*	*18*	*0.32*	*0.3*	*29*	*3.4*	*0.02*	*0.3*		*0.07*	*150*
Pit 47	X107	3.5	0.002 J	0.014 U	0.025 =	0.014 U	0.014 =	0.014 U	0.014 U	0.014 U	0.014 U	0.015 =	0.014 U	0.014 U	0.002 J	0.014 U	0.014 U	0.02 =
Pit 47	X108	9	3.3 =	0.45 J	0.83 U	0.83 U	0.34 J	0.1 J	4 =	0.83 U	0.83 U	32 =	0.83 U	0.83 U	0.084 J	0.83 U	0.83 U	120 =
Pit 47	X108DL	9	4.1 =	0.6 J	3.3 U	3.3 U	0.45 J	3.3 U	4.6 =	3.3 U	3.3 U	35 =	3.3 U	3.3 U	3.3 U	3.3 U	3.3 U	150 J
Pit 48	X105	3	0.011 U	0.011 U	0.011 U	0.011 U	0.003 J	0.003 J	0.011 U	0.011 U	0.011 U	0.003 J	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.008 J
Pit 48	X106	9	0.031 =	0.014 U	0.009 J	0.003 J	0.01 J	0.014 U	0.014 U	0.014 U	0.005 J	0.061 =	0.014 U	0.014 U	0.003 J	0.014 U	0.014 U	0.76 =
Pit 48	X106DL	9	0.65 J	0.21 J	0.45 J	0.68 U	0.68 U	0.68 U	0.68 U	0.68 U	0.4 J	0.5 J	0.68 U	0.68 U	0.074 J	0.68 U	0.68 U	9.5 =
Pit 49	X103	3	0.002 J	0.012 U	0.016 UJ	0.002 J	0.011 J	0.007 J	0.012 U	0.012 U	0.012 U	0.011 J	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 =
Pit 49	X104	10	0.016 =	0.013 U	0.013 UJ	0.013 U	0.01 J	0.005 J	0.013 U	0.013 U	0.013 U	0.011 J	0.013 U	0.013 U	0.013 U	0.013 U	0.013 U	0.015 =
Pit 50	X101	3	0.011 UJ	0.011 U	0.011 UJ	0.011 UJ	0.005 J	0.006 J	0.011 UJ	0.011 U	0.011 UJ	0.006 J	0.011 U	0.011 U	0.011 UJ	0.011 U	0.011 U	0.013 J
Pit 50	X102	9	0.44 =	0.02 U	0.013 J	0.003 J	0.043 =	0.02 U	0.065 =	0.02 U	0.002 J	0.14 =	0.02 U	0.02 U	0.002 J	0.02 U	0.02 U	4.3 =
Pit 50	X102DL	9	0.64 J	0.24 J	0.98 U	0.98 U	0.13 J	0.98 U	0.98 U	0.98 U	0.98 U	0.13 J	0.98 U	0.98 U	0.98 U	0.98 U	0.98 U	29 =
Pit 51	X203	3	0.012 U	0.012 U	0.005 J	0.012 U	0.004 J	0.001 J	0.012 U	0.012 U	0.004 J	0.003 J	0.012 U	0.012 U	0.012 U	0.002 J	0.012 U	0.002 J
Pit 51	X204	8	0.26 J	0.67 U	0.67 U	0.67 U	0.13 J	0.67 U	0.67 U	0.67 U	0.67 U	0.67 U	2.7 =	0.67 U	2.9 =	0.67 U	0.67 U	0.3 J

Notes:

=: sample concentration is detected at level reported
U: sample concentration is under detection limit
J: sample concentration is estimated value
R: sample concentration value is rejected
DL: sample is diluted
RE: sample is re-extracted
Ing.: Ingestion
Inh.: Inhalation
I: Class I
II: Class II

[1]Values in the proposed rules.

[2]TACO RO values shown for 1,3-dichloropropene are the combined values for cis and trans.

Table E-6. VOCs in Unnamed Parcel (mg/kg)

Station ID	Sample ID	Depth (ft.)	1,1,1-Trichloroethane	1,1,2,2-Tetrachloroethane	1,1,2-Trichloro-1,2,2-Trifluoroethane	1,1,2-Trichloroethane	1,1-Dichloroethane	1,1-Dichloroethene	1,2,4-Trichlorobenzene	1,2-Dibromo-3-Chloropropane	1,2-Dibromoethane	1,2-Dichlorobenzene	1,2-Dichloroethane	1,2-Dichloropropane	1,3-Dichlorobenzene	1,4-Dichlorobenzene	2-Hexanone	Acetone
Industrial/ Commercial		*Ing*				*8200*	*200000*	*18000*	*20000*	*4*	*0.07*	*180000*	*63*	*84*				*200000*
		Inh	*1200*			*1800*	*1700*	*1500*	*3200*	*17*	*0.32*	*560*	*0.7*	*23*		*17000*		*100000*
Construction Worker		*Ing*				*8200*	*200000*	*1800*	*2000*	*89*	*1.5*	*18000*	*1400*	*1800*				*200000*
		Inh	*1200*			*1800*	*130*	*1500*	*920*	*0.11*	*0.45*	*310*	*0.99*	*0.5*		*340*		*100000*
Soil Component of GW		*I*	*2*			*0.02*	*23*	*0.06*	*5*	*0.002*	*0.0004*	*17*	*0.02*	*0.03*		*2*		*16*
		II	*9.6*			*0.3*	*110*	*0.3*	*53*	*0.002*	*0.004*	*43*	*0.1*	*0.15*		*11*		*16*
Pit 02	X103	3	0.015 UJ	0.015 UJ	0.015 UJ	0.015 UJ	0.015 UJ	0.015 UJ	0.015 UJ	0.015 UJ	0.015 UJ	0.007 J	0.22 J	0.015 UJ	0.015 UJ	0.015 UJ	0.015 UJ	0.071 UJ
Pit 02	X103RE	3	0.016 U	0.016 UJ	0.016 UJ	0.016 U	0.016 U	0.016 U	0.016 UJ	0.016 UJ	0.016 UJ	0.02 J	0.59 J	0.016 U	0.016 UJ	0.006 J	0.016 UJ	0.11 J
Pit 02	X104	6	0.014 U	0.014 U	0.014 UJ	0.014 U	0.014 UJ	0.014 U	0.014 U	0.014 U	0.014 U	0.004 J	0.007 J	0.014 U	0.014 U	0.014 U	0.014 UJ	0.029 UJ
Pit 03	X105	3	0.01 U	0.01 U	0.01 UJ	0.01 U	0.01 UJ	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 UJ	0.013 UJ
Pit 03	X106	6	0.013 U	0.013 U	0.013 U	0.013 U	0.013 U	0.013 U	0.013 U	0.013 U	0.013 U	0.013 U	0.013 U	0.013 U	0.013 U	0.013 U	0.013 U	0.022 J
Pit 04	X107	3	0.015 U	0.015 U	0.015 U	0.015 U	0.015 U	0.015 U	0.015 U	0.015 U	0.015 U	0.003 J	0.015 U	0.015 U	0.015 U	0.002 J	0.015 U	0.31 J
Pit 04	X107RE	3	1.2 U	1.2 U	1.2 UJ	1.2 U	1.2 U	1.2 U	1.2 U	1.2 UJ	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 UJ	1.2 UJ
Pit 04	X108	8	0.019 U	0.019 U	0.019 UJ	0.019 U	0.019 U	0.019 U	0.019 U	0.019 UJ	0.019 U	0.003 J	0.003 J	0.019 U	0.019 U	0.005 J	0.019 UJ	0.059 U
Pit 05	X109	3	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.008 J	0.012 U	0.012 U	0.012 U	0.006 J	0.012 U	0.096 J
Pit 05	X110	3	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U	0.021 =	0.014 U	0.014 U	0.014 U	0.013 J	0.014 U	0.091 J
Pit 05	X111	8	0.03 U	0.03 U	0.03 U	0.03 U	0.03 U	0.03 U	0.03 U	0.03 U	0.03 U	0.004 J	0.03 U	0.03 U	0.03 U	0.028 J	0.03 U	0.36 J
Pit 06	X112	3	0.016 U	0.016 U	0.016 U	0.016 U	0.016 U	0.016 U	0.016 U	0.016 U	0.016 U	0.016 U	0.016 U	0.016 U	0.016 U	0.003 J	0.016 U	0.076 J
Pit 06	X113	8	0.016 U	0.016 U	0.016 U	0.016 U	0.016 U	0.016 U	0.016 U	0.016 U	0.016 U	0.016 U	0.016 U	0.016 U	0.016 U	0.003 J	0.016 U	0.073 J
Pit 07	X114	3	0.014 U	0.014 UJ	0.014 UJ	0.014 U	0.014 U	0.014 U	0.003 J	0.014 UJ	0.014 UJ	0.11 J	0.014 U	0.014 U	0.014 UJ	0.008 J	0.014 UJ	0.23 J
Pit 07	X114RE	3	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U	0.007 J	0.014 U	0.014 U	0.014 U	0.002 J	0.014 U	0.09 J
Pit 07	X115	8	0.18 =	0.082 U	0.082 U	0.082 U	0.082 U	0.082 U	0.011 J	0.082 U	0.082 U	0.038 J	0.009 J	0.082 U	0.01 J	0.29 =	0.082 U	0.49 J
Pit 08	X116	3	0.012 U	0.012 UJ	0.012 UJ	0.012 U	0.012 U	0.012 U	0.012 UJ	0.012 UJ	0.012 UJ	0.012 UJ	0.012 U	0.012 U	0.012 UJ	0.001 J	0.012 UJ	0.25 J
Pit 08	X116RE	3	0.013 U	0.013 UJ	0.013 U	0.013 U	0.013 U	0.013 U	0.013 UJ	0.013 UJ	0.013 UJ	0.013 UJ	0.013 U	0.013 U	0.013 UJ	0.013 UJ	0.013 UJ	0.063 UJ
Pit 08	X117	8	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	0.36 J
Pit 09	X118	3	0.011 UJ	0.011 UJ	0.011 UJ	0.011 UJ	0.011 UJ	0.011 UJ	0.011 UJ	0.011 UJ	0.011 UJ	0.011 UJ	0.011 UJ	0.011 UJ	0.011 UJ	0.011 UJ	0.011 UJ	0.084 J
Pit 09	X118RE	3	0.013 UJ	0.013 UJ	0.013 U	0.013 UJ	0.013 U	0.013 U	0.013 UJ	0.013 UJ	0.013 UJ	0.013 UJ	0.013 U	0.013 UJ	0.013 UJ	0.013 UJ	0.013 UJ	0.023 UJ
Pit 09	X119	8	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.003 J	0.017 U	0.017 U	0.017 U	0.005 J	0.017 U	0.048 J
Pit 10	X120	3	0.013 U	0.013 UJ	0.013 UJ	0.013 U	0.013 U	0.013 U	0.013 UJ	0.013 UJ	0.013 UJ	0.013 UJ	0.013 U	0.013 U	0.013 UJ	0.013 UJ	0.013 UJ	0.27 J
Pit 10	X120RE	3	0.013 UJ	0.013 UJ	0.013 UJ	0.013 UJ	0.013 UJ	0.013 UJ	0.001 J	0.013 UJ	0.013 UJ	0.013 UJ	0.013 UJ	0.013 UJ	0.013 UJ	0.013 UJ	0.013 UJ	0.11 J
Pit 10	X121	8	0.002 J	0.012 R	0.012 UJ	0.012 UJ	0.012 UJ	0.012 UJ	0.012 R	0.012 R	0.012 R	0.003 J	0.012 UJ	0.012 UJ	0.012 R	0.007 J	0.012 R	0.068 J
Pit 10	X121RE	8	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U	0.014 UJ	0.014 U	0.014 U	0.003 J	0.014 U	0.014 UJ	0.014 UJ	0.005 J	0.014 U	0.076 J

Table E-6. VOCs in Unnamed Parcel (mg/kg)

Station ID	Sample ID	Depth (ft.)	1,1,1-Trichloroethane	1,1,2,2-Tetrachloroethane	1,1,2-Trichloro-1,2,2-Trifluoroethane	1,1,2-Trichloroethane	1,1-Dichloroethane	1,1-Dichloroethene	1,2,4-Trichlorobenzene	1,2-Dibromo-3-Chloropropane	1,2-Dibromoethane	1,2-Dichlorobenzene	1,2-Dichloroethane	1,2-Dichloropropane	1,3-Dichlorobenzene	1,4-Dichlorobenzene	2-Hexanone	Acetone
Industrial/ Commercial		*Ing*				*8200*	*200000*	*18000*	*20000*	*4*	*0.07*	*180000*	*63*	*84*				*200000*
		Inh	*1200*			*1800*	*1700*	*1500*	*3200*	*17*	*0.32*	*560*	*0.7*	*23*		*17000*		*100000*
Construction Worker		*Ing*				*8200*	*200000*	*1800*	*2000*	*89*	*1.5*	*18000*	*1400*	*1800*				*200000*
		Inh	*1200*			*1800*	*130*	*1500*	*920*	*0.11*	*0.45*	*310*	*0.99*	*0.5*		*340*		*100000*
Soil Component of GW		*I*	*2*			*0.02*	*23*	*0.06*	*5*	*0.002*	*0.0004*	*17*	*0.02*	*0.03*		*2*		*16*
		II	*9.6*			*0.3*	*110*	*0.3*	*53*	*0.002*	*0.004*	*43*	*0.1*	*0.15*		*11*		*16*
Pit 11	X122	3	0.002 J	0.009 R	0.009 UJ	0.009 UJ	0.009 UJ	0.009 UJ	0.009 R	0.009 R	0.009 R	0.009 R	0.009 UJ	0.009 UJ	0.009 R	0.009 R	0.009 R	0.01 U
Pit 11	X122RE	3	0.01 UJ	0.01 UJ	0.01 U	0.01 UJ	0.01 U	0.01 U	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 U	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 U
Pit 11	X123	8	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.021 U
Pit 11	X123RE	8	0.01 UJ	0.01 R	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 R	0.01 R	0.01 R	0.01 R	0.01 UJ	0.01 UJ	0.01 R	0.01 R	0.01 R	0.039 J
Pit 11	X125	30	0.001 J	0.01 R	0.01 UJ	0.01 R	0.01 UJ	0.01 UJ	0.002 J	0.01 R	0.01 R	0.01 R	0.01 UJ	0.01 R	0.01 R	0.001 J	0.01 R	0.021 U
Pit 11	X125RE	30	0.011 UJ	0.011 R	0.011 UJ	0.011 UJ	0.011 UJ	0.011 UJ	0.011 R	0.011 R	0.011 R	0.011 R	0.011 UJ	0.011 UJ	0.011 R	0.011 R	0.011 R	0.015 U
Pit 12	X127	3	0.014 U	0.014 UJ	0.014 U	0.014 U	0.014 U	0.014 U	0.002 J	0.014 UJ	0.014 UJ	0.006 J	0.014 U	0.014 UJ	0.014 UJ	0.003 J	0.014 UJ	0.43 J
Pit 12	X127RE	3	0.016 U	0.016 UJ	0.016 U	0.016 U	0.016 U	0.016 U	0.016 UJ	0.016 UJ	0.016 UJ	0.004 J	0.016 U	0.016 U	0.016 UJ	0.005 J	0.016 UJ	0.15 J
Pit 12	X128	6	3.2 U	3.2 U	3.2 U	3.2 U	3.2 U	3.2 U	3.2 U	3.2 U	3.2 U	3.2 U	3.2 U	3.2 U	3.2 U	3.2 U	3.2 UJ	4.3 U
Pit 13	X129	3	0.002 J	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 UJ	0.011 U	0.011 U	0.011 UJ	0.011 U	0.011 U	0.011 UJ	0.011 UJ	0.011 U	0.054 J
Pit 13	X130	8	0.003 J	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 UJ	0.025 U	0.025 U	0.003 J	0.025 U	0.025 U	0.025 UJ	0.005 J	0.025 UJ	0.13 U
Pit 14	X131	3	0.029 U	0.029 U	0.029 U	0.029 U	0.029 U	0.029 U	0.005 J	0.029 U	0.029 U	0.037 J	0.029 U	0.029 U	0.029 UJ	0.36 J	0.029 U	0.073 J
Pit 14	X131DL	3	0.042 J	0.043 U	0.043 U	0.043 U	0.043 U	0.043 U	0.043 UJ	0.043 U	0.043 U	0.047 J	0.043 U	0.043 U	0.007 J	0.38 J	0.043 U	0.052 U
Pit 14	X132	8	0.019 U	0.019 U	0.019 U	0.019 U	0.019 U	0.019 U	0.019 UJ	0.019 U	0.019 U	0.007 J	0.019 U	0.019 U	0.003 J	0.056 J	0.019 U	0.14 J
Pit 15	X133	3	0.02 U	0.02 UJ	0.02 U	0.02 U	0.02 U	0.02 U	0.02 UJ	0.02 UJ	0.02 UJ	0.018 J	0.02 U	0.02 U	0.002 J	0.095 J	0.02 UJ	0.12 U
Pit 15	X133RE	3	0.005 J	0.019 UJ	0.019 U	0.019 U	0.019 U	0.019 U	0.019 UJ	0.019 UJ	0.019 UJ	0.012 J	0.019 U	0.019 U	0.019 UJ	0.073 J	0.019 UJ	0.25 J
Pit 15	X134	8	0.005 J	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 UJ	0.02 U	0.02 U	0.033 J	0.02 U	0.02 U	0.005 J	0.24 J	0.02 UJ	0.19 J
Pit 16	X135	3	0.016 U	0.016 U	0.016 U	0.016 U	0.016 U	0.016 U	0.016 UJ	0.016 U	0.016 U	0.016 UJ	0.016 U	0.016 U	0.016 UJ	0.016 UJ	0.016 U	0.066 J
Pit 16	X136	6	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 UJ	0.02 U	0.02 U	0.02 UJ	0.02 U	0.02 U	0.02 UJ	0.006 J	0.02 U	0.061 J
Pit 17	X137	3	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 UJ	0.012 U	0.012 U	0.012 UJ	0.012 U	0.012 U	0.012 UJ	0.012 UJ	0.012 U	0.075 J
Pit 17	X138	11	0.013 U	0.013 U	0.013 U	0.013 U	0.013 U	0.013 U	0.013 UJ	0.013 U	0.013 U	0.008 J	0.013 U	0.013 U	0.013 UJ	0.008 J	0.013 U	0.091 J
Pit 17	X138DL	11	1.6 UJ	1.6 UJ	1.6 UJ	1.6 UJ	1.6 UJ	1.6 UJ	1.6 U	1.6 U	1.6 UJ	1.6 U	1.6 UJ	1.6 UJ	1.6 UJ	1.6 U	1.6 UJ	2.1 U
Pit 18	X139	3	0.016 =	0.016 U	0.016 U	0.016 U	0.016 U	0.016 U	0.016 UJ	0.016 U	0.016 U	0.008 J	0.016 U	0.016 U	0.016 UJ	0.016 J	0.016 U	0.19 J
Pit 18	X140	10	0.016 U	0.016 U	0.016 U	0.016 U	0.016 U	0.016 U	0.016 UJ	0.016 U	0.016 U	0.016 UJ	0.016 U	0.016 U	0.016 UJ	0.016 UJ	0.016 U	0.071 J
Pit 19	X141	3	0.015 J	0.013 UJ	0.013 UJ	0.013 UJ	0.013 UJ	0.013 UJ	0.013 R	0.013 UJ	0.013 UJ	0.013 R	0.013 UJ	0.013 UJ	0.013 R	0.013 R	0.013 UJ	0.012 J
Pit 19	X142	14	0.004 J	0.018 U	0.018 U	0.018 U	0.018 U	0.018 U	0.018 UJ	0.018 U	0.018 U	0.02 J	0.018 U	0.018 U	0.018 UJ	0.023 J	0.018 UJ	0.097 U

Table E-6. VOCs in Unnamed Parcel (mg/kg)

Station ID	Sample ID	Depth (ft.)	1,1,1-Trichloroethane	1,1,2,2-Tetrachloroethane	1,1,2-Trichloro-1,2,2-Trifluoroethane	1,1,2-Trichloroethane	1,1-Dichloroethane	1,1-Dichloroethene	1,2,4-Trichlorobenzene	1,2-Dibromo-3-Chloropropane	1,2-Dibromoethane	1,2-Dichlorobenzene	1,2-Dichloroethane	1,2-Dichloropropane	1,3-Dichlorobenzene	1,4-Dichlorobenzene	2-Hexanone	Acetone
Industrial/ Commercial		*Ing*				*8200*	*200000*	*18000*	*20000*	*4*	*0.07*	*180000*	*63*	*84*				*200000*
		Inh	*1200*			*1800*	*1700*	*1500*	*3200*	*17*	*0.32*	*560*	*0.7*	*23*		*17000*		*100000*
Construction Worker		*Ing*				*8200*	*200000*	*1800*	*2000*	*89*	*1.5*	*18000*	*1400*	*1800*				*200000*
		Inh	*1200*			*1800*	*130*	*1500*	*920*	*0.11*	*0.45*	*310*	*0.99*	*0.5*		*340*		*100000*
Soil Component of GW		*I*	2			*0.02*	*23*	*0.06*	*5*	*0.002*	*0.0004*	*17*	*0.02*	*0.03*		*2*		*16*
		II	*9.6*			*0.3*	*110*	*0.3*	*53*	*0.002*	*0.004*	*43*	*0.1*	*0.15*		*11*		*16*
Pit 20	X143	3	0.004 J	0.013 U	0.013 U	0.013 U	0.013 U	0.013 U	0.013 UJ	0.013 U	0.013 U	0.006 J	0.013 U	0.013 U	0.013 UJ	0.024 J	0.013 U	0.14 J
Pit 20	X144	3	0.015 U	0.015 U	0.015 U	0.015 U	0.015 U	0.015 U	0.015 UJ	0.015 U	0.015 U	0.015 UJ	0.015 U	0.015 U	0.013 J	0.015 UJ	0.015 U	0.12 J
Pit 20	X144RE	3	0.004 J	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U	0.014 UJ	0.014 U	0.014 U	0.002 J	0.014 U	0.014 U	0.014 UJ	0.018 J	0.014 U	0.13 J
Pit 20	X145	7	1.2 J	2.3 U	2.3 U	2.3 U	2.3 U	2.3 U	2.3 UJ	2.3 U	2.3 U	2.3 UJ	2.3 U	2.3 U	2.3 UJ	2.3 UJ	2.3 UJ	2.3 U
Pit 21	X146	3	2000 U	2000 U	2000 U	2000 U	2000 U	2000 U	2000 UJ	2000 U	2000 U	2000 UJ	2000 U	2000 U	2000 UJ	2000 UJ	2000 UJ	2000 UJ
Pit 21	X147	5	12000 J	1500 U	1500 U	1500 U	1500 U	1500 U	1500 UJ	1500 U	1500 U	1500 UJ	270 J	1500 U	1500 UJ	1500 UJ	1500 UJ	1500 UJ
Pit 21	X147RE	5	12000 J	1500 U	1500 U	1500 U	1500 U	1500 U	1500 UJ	1500 U	1500 U	1500 UJ	270 J	1500 U	1500 UJ	210 J	1500 UJ	1500 UJ
Pit 21	X148	10	52000 =	230 J	1700 U	1700 U	440 J	1700 U	1700 UJ	470 J	1700 U	1700 UJ	630 J	1700 U	1700 UJ	1700 UJ	330 J	1700 U
Pit 21	X148DL	10	46000 J	3400 UJ	3400 UJ	3400 UJ	410 J	3400 UJ	3400 UJ	3400 UJ	3400 UJ	3400 UJ	720 J	3400 UJ	3400 UJ	3400 UJ	3400 UJ	3400 U
Pit 22	X160	3	0.018 U	0.018 U	0.018 U	0.018 U	0.018 U	0.018 U	0.018 UJ	0.018 U	0.018 U	0.018 UJ	0.018 U	0.018 U	0.018 UJ	0.018 UJ	0.018 U	0.014 J
Pit 22	X161	10	0.027 U	0.024 U	0.024 U	0.024 U	0.024 U	0.024 U	0.024 UJ	0.024 U	0.024 U	0.035 J	0.024 U	0.024 U	0.003 J	0.097 J	0.024 U	0.39 J
Pit 23	X158	3	0.019 U	0.019 U	0.019 U	0.019 U	0.019 U	0.019 U	0.019 UJ	0.019 U	0.019 U	0.002 J	0.019 U	0.019 U	0.019 UJ	0.022 J	0.019 U	0.16 J
Pit 23	X158RE	3	0.005 J	0.02 UJ	0.02 U	0.02 U	0.02 U	0.02 U	0.02 UJ	0.02 UJ	0.02 UJ	0.009 J	0.02 U	0.02 U	0.02 UJ	0.034 J	0.02 UJ	0.46 J
Pit 23	X159	10	0.003 J	0.019 U	0.019 U	0.019 U	0.019 U	0.019 U	0.019 UJ	0.019 U	0.019 U	0.004 J	0.019 U	0.019 U	0.019 UJ	0.019 UJ	0.019 U	0.13 J
Pit 23	X159RE	10	0.006 J	0.016 UJ	0.016 UJ	0.016 UJ	0.016 UJ	0.016 UJ	0.016 UJ	0.016 UJ	0.016 UJ	0.002 J	0.016 UJ	0.016 UJ	0.016 UJ	0.016 UJ	0.016 UJ	0.18 J
Pit 24	X156	3	0.005 J	0.027 U	0.027 U	0.027 U	0.027 U	0.027 U	0.027 UJ	0.027 U	0.027 U	0.027 UJ	0.027 U	0.027 U	0.027 UJ	0.027 UJ	0.027 U	0.11 U
Pit 24	X156RE	3	0.029 =	0.026 UJ	0.026 U	0.026 U	0.026 U	0.026 U	0.026 UJ	0.026 UJ	0.026 UJ	0.026 UJ	0.026 U	0.026 U	0.026 UJ	0.026 UJ	0.026 UJ	0.13 U
Pit 24	X157	8	0.006 J	0.032 U	0.032 U	0.032 U	0.032 U	0.032 U	0.032 UJ	0.032 U	0.032 U	0.012 J	0.032 U	0.032 U	0.032 UJ	0.03 J	0.032 U	0.19 J
Pit 24	X157RE	8	0.02 J	0.031 UJ	0.031 U	0.031 U	0.031 U	0.031 U	0.031 UJ	0.031 UJ	0.031 UJ	0.014 J	0.031 U	0.031 U	0.031 UJ	0.033 J	0.031 UJ	0.29 J
Pit 25	X154	3	0.003 J	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 UJ	0.011 U	0.011 U	0.003 J	0.011 U	0.011 U	0.011 UJ	0.007 J	0.011 U	0.053 U
Pit 25	X155	8	0.078 U	0.078 U	0.078 U	0.078 U	0.078 U	0.078 U	0.078 UJ	0.078 U	0.078 U	0.011 J	0.078 U	0.078 U	0.078 UJ	0.012 J	0.078 UJ	0.18 U
Pit 25	X155RE	8	2.1 UJ	0.34 J	2.1 UJ	2.1 UJ	2.1 UJ	2.1 UJ	2.1 R	0.57 J	2.1 UJ	2.1 R	2.1 UJ	2.1 UJ	2.1 R	2.1 R	0.59 J	2.1 U
Pit 26	X152	3	0.008 J	0.015 U	0.015 U	0.015 U	0.015 U	0.015 U	0.015 UJ	0.015 UJ	0.015 U	0.015 UJ	0.015 U	0.015 U	0.015 UJ	0.015 UJ	0.015 UJ	0.17 J
Pit 26	X153	6	0.014 J	0.026 U	0.026 U	0.026 U	0.026 U	0.026 U	0.026 UJ	0.026 U	0.026 U	0.026 UJ	0.026 U	0.026 U	0.026 UJ	0.026 UJ	0.026 U	0.06 U
Pit 27	X149	3	0.004 J	0.016 U	0.016 U	0.016 U	0.016 U	0.016 U	0.016 UJ	0.016 U	0.016 U	0.016 UJ	0.016 U	0.016 U	0.016 UJ	0.016 UJ	0.016 U	0.071 U
Pit 27	X149RE	3	0.007 J	0.016 UJ	0.016 U	0.016 U	0.016 U	0.016 U	0.016 UJ	0.016 UJ	0.016 UJ	0.016 UJ	0.016 U	0.016 U	0.016 UJ	0.016 UJ	0.016 UJ	0.31 J

Table E-6. VOCs in Unnamed Parcel (mg/kg)

Station ID	Sample ID	Depth (ft.)	1,1,1-Trichloroethane	1,1,2,2-Tetrachloroethane	1,1,2-Trichloro-1,2,2-Trifluoroethane	1,1,2-Trichloroethane	1,1-Dichloroethane	1,1-Dichloroethene	1,2,4-Trichlorobenzene	1,2-Dibromo-3-Chloropropane	1,2-Dibromoethane	1,2-Dichlorobenzene	1,2-Dichloroethane	1,2-Dichloropropane	1,3-Dichlorobenzene	1,4-Dichlorobenzene	2-Hexanone	Acetone
Industrial/ Commercial		*Ing*				*8200*	*200000*	*18000*	*20000*	*4*	*0.07*	*180000*	*63*	*84*				*200000*
		Inh	*1200*			*1800*	*1700*	*1500*	*3200*	*17*	*0.32*	*560*	*0.7*	*23*		*17000*		*100000*
Construction Worker		*Ing*				*8200*	*200000*	*1800*	*2000*	*89*	*1.5*	*18000*	*1400*	*1800*				*200000*
		Inh	*1200*			*1800*	*130*	*1500*	*920*	*0.11*	*0.45*	*310*	*0.99*	*0.5*		*340*		*100000*
Soil Component of GW		*I*	*2*			*0.02*	*23*	*0.06*	*5*	*0.002*	*0.0004*	*17*	*0.02*	*0.03*		*2*		*16*
		II	*9.6*			*0.3*	*110*	*0.3*	*53*	*0.002*	*0.004*	*43*	*0.1*	*0.15*		*11*		*16*
Pit 27	X150	8	0.004 J	0.017 UJ	0.017 UJ	0.017 UJ	0.017 UJ	0.017 UJ	0.017 UJ	0.017 UJ	0.017 UJ	0.017 UJ	0.017 UJ	0.017 UJ	0.017 UJ	0.017 UJ	0.017 UJ	0.029 U
Pit 27	X150RE	8	0.004 J	0.015 UJ	0.015 U	0.015 U	0.015 U	0.015 U	0.015 UJ	0.015 UJ	0.015 UJ	0.015 UJ	0.015 U	0.015 U	0.015 UJ	0.015 UJ	0.015 UJ	0.043 U
Pit 27	X151	30	0.004 J	0.018 U	0.018 U	0.018 U	0.018 U	0.018 U	0.018 UJ	0.018 U	0.018 U	0.018 UJ	0.018 U	0.018 U	0.018 UJ	0.007 J	0.018 U	0.053 U
Pit 28	X175	3	0.036 =	0.013 U	0.013 U	0.013 U	0.013 U	0.013 U	0.013 UJ	0.013 U	0.013 U	0.002 J	0.013 U	0.013 U	0.013 UJ	0.002 J	0.013 U	0.03 J
Pit 28	X176	6	0.016 U	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U	0.014 UJ	0.014 U	0.014 U	0.002 J	0.014 U	0.014 U	0.014 UJ	0.024 J	0.014 U	0.23 J
Pit 28	X176DL	6	0.015 J	0.066 U	0.066 U	0.066 U	0.066 U	0.066 U	0.066 UJ	0.066 U	0.066 U	0.066 UJ	0.066 U	0.066 U	0.066 UJ	0.012 J	0.066 U	0.26 J
Pit 29	X173	3	0.005 J	0.018 UJ	0.018 UJ	0.018 UJ	0.018 UJ	0.018 UJ	0.018 R	0.018 UJ	0.018 UJ	0.002 J	0.018 UJ	0.018 UJ	0.018 R	0.008 J	0.018 UJ	0.024 U
Pit 29	X173DL	3	0.091 UJ	0.091 UJ	0.091 UJ	0.091 UJ	0.091 UJ	0.091 UJ	0.091 R	0.091 UJ	0.091 UJ	0.091 R	0.091 UJ	0.091 UJ	0.091 R	0.091 R	0.091 UJ	0.091 U
Pit 29	X174	10	0.023 UJ	0.023 UJ	0.023 UJ	0.023 UJ	0.023 UJ	0.023 UJ	0.023 R	0.023 UJ	0.023 UJ	0.003 J	0.023 UJ	0.023 UJ	0.023 R	0.013 J	0.023 UJ	0.084 U
Pit 30	X171	3	0.033 U	0.016 U	0.016 U	0.016 U	0.016 U	0.016 U	0.016 UJ	0.016 U	0.016 U	0.016 UJ	0.016 U	0.016 U	0.016 UJ	0.016 UJ	0.016 U	0.007 J
Pit 30	X172	7.5	0.018 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 UJ	0.017 U	0.017 U	0.036 J	0.017 U	0.017 U	0.005 J	0.11 J	0.017 U	0.07 J
Pit 30	X172DL	7.5	0.01 J	0.081 U	0.081 U	0.081 U	0.081 U	0.081 U	0.081 UJ	0.081 U	0.081 U	0.048 J	0.081 U	0.081 U	0.081 UJ	0.12 J	0.081 U	0.23 J
Pit 31	X169	2.5	0.005 J	0.024 U	0.024 U	0.024 U	0.024 U	0.024 U	0.024 UJ	0.024 U	0.024 U	0.024 UJ	0.024 U	0.024 U	0.024 UJ	0.024 UJ	0.024 U	0.17 J
Pit 31	X170	6	0.05 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 UJ	0.025 U	0.025 U	0.025 UJ	0.025 U	0.025 U	0.025 UJ	0.025 UJ	0.025 U	0.24 J
Pit 31	X170RE	6	0.019 J	0.029 U	0.029 U	0.029 U	0.029 U	0.029 U	0.029 U	0.029 U	0.029 U	0.013 J	0.029 U	0.029 U	0.029 UJ	0.053 J	0.029 U	1 J
Pit 32	X167	3	0.013 U	0.013 U	0.013 U	0.013 U	0.013 U	0.013 U	0.013 UJ	0.013 U	0.013 U	0.013 UJ	0.013 U	0.013 U	0.013 UJ	0.013 UJ	0.013 U	0.27 J
Pit 32	X167RE	3	0.003 J	0.013 UJ	0.013 UJ	0.013 UJ	0.013 UJ	0.013 UJ	0.013 R	0.013 UJ	0.013 UJ	0.013 R	0.013 UJ	0.013 UJ	0.013 R	0.013 R	0.013 UJ	0.014 J
Pit 32	X168	6	0.006 J	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 UJ	0.012 UJ	0.012 U	0.012 UJ	0.012 U	0.012 U	0.012 UJ	0.012 UJ	0.012 UJ	0.1 J
Pit 33	X165	3	0.015 U	0.013 U	0.013 U	0.013 U	0.013 U	0.013 U	0.013 UJ	0.013 U	0.013 U	0.013 UJ	0.013 U	0.013 U	0.013 UJ	0.001 J	0.013 U	0.26 J
Pit 33	X165RE	3	0.002 J	0.013 U	0.013 U	0.013 U	0.013 U	0.013 U	0.013 UJ	0.013 U	0.013 U	0.013 UJ	0.013 U	0.013 U	0.013 UJ	0.013 UJ	0.013 U	0.033 J
Pit 33	X166	7	2.6 U	2.6 U	2.6 U	2.6 U	2.6 U	2.6 U	0.32 J	2.6 U	2.6 U	0.28 J	2.6 U	2.6 U	3.6 J	22 J	2.6 UJ	1.9 J
Pit 34	X162	3	0.017 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 UJ	0.012 U	0.012 U	0.012 UJ	0.012 U	0.012 U	0.012 UJ	0.012 UJ	0.012 U	0.012 U
Pit 34	X163	10	0.023 U	0.023 U	0.023 U	0.023 U	0.023 U	0.023 U	0.023 UJ	0.023 U	0.023 U	0.014 J	0.023 U	0.023 U	0.003 J	0.072 J	0.023 U	0.19 J
Pit 34	X164	30	2.6 U	2.6 U	2.6 U	2.6 U	2.6 U	2.6 U	2.6 UJ	2.6 U	2.6 U	0.42 J	2.6 U	2.6 U	2.6 UJ	1.5 J	2.6 UJ	0.68 J
Pit 35	X185	4	0.004 J	0.013 U	0.013 U	0.013 U	0.013 U	0.013 U	0.013 UJ	0.013 UJ	0.013 U	0.013 UJ	0.013 U	0.013 U	0.013 UJ	0.013 UJ	0.013 U	0.021 J
Pit 35	X186	10	0.008 J	0.015 U	0.015 U	0.015 U	0.015 U	0.015 U	0.015 UJ	0.015 UJ	0.015 U	0.003 J	0.015 U	0.015 U	0.015 UJ	0.005 J	0.015 U	0.085 J

Table E-6. VOCs in Unnamed Parcel (mg/kg)

Station ID	Sample ID	Depth (ft.)	1,1,1-Trichloroethane	1,1,2,2-Tetrachloroethane	1,1,2-Trichloro-1,2,2-Trifluoroethane	1,1,2-Trichloroethane	1,1-Dichloroethane	1,1-Dichloroethene	1,2,4-Trichlorobenzene	1,2-Dibromo-3-Chloropropane	1,2-Dibromoethane	1,2-Dichlorobenzene	1,2-Dichloroethane	1,2-Dichloropropane	1,3-Dichlorobenzene	1,4-Dichlorobenzene	2-Hexanone	Acetone
Industrial/ Commercial		*Ing*				*8200*	*200000*	*18000*	*20000*	*4*	*0.07*	*180000*	*63*	*84*				*200000*
		Inh	*1200*			*1800*	*1700*	*1500*	*3200*	*17*	*0.32*	*560*	*0.7*	*23*		*17000*		*100000*
Construction Worker		*Ing*				*8200*	*200000*	*1800*	*2000*	*89*	*1.5*	*18000*	*1400*	*1800*				*200000*
		Inh	*1200*			*1800*	*130*	*1500*	*920*	*0.11*	*0.45*	*310*	*0.99*	*0.5*		*340*		*100000*
Soil Component of GW		*I*	*2*			*0.02*	*23*	*0.06*	*5*	*0.002*	*0.0004*	*17*	*0.02*	*0.03*		*2*		*16*
		II	*9.6*			*0.3*	*110*	*0.3*	*53*	*0.002*	*0.004*	*43*	*0.1*	*0.15*		*11*		*16*
Pit 36	X183	3	0.018 =	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 UJ	0.017 UJ	0.017 U	0.017 UJ	0.017 U	0.017 U	0.017 UJ	0.017 UJ	0.017 U	0.13 J
Pit 36	X184	6	0.013 J	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U	0.014 UJ	0.014 UJ	0.014 U	0.014 UJ	0.014 U	0.014 U	0.014 UJ	0.014 UJ	0.014 U	0.13 J
Pit 37	X181	4	0.009 J	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 UJ	0.025 UJ	0.025 U	0.025 UJ	0.025 U	0.025 U	0.025 UJ	0.004 J	0.025 U	0.25 J
Pit 37	X182	13	0.013 J	0.023 U	0.023 U	0.023 U	0.023 U	0.023 U	0.023 UJ	0.023 UJ	0.023 U	0.023 UJ	0.023 U	0.023 U	0.023 UJ	0.019 J	0.023 U	0.2 J
Pit 38	X179	4	0.042 U	0.042 U	0.042 U	0.042 U	0.042 U	0.042 U	0.042 UJ	0.042 UJ	0.042 U	0.036 J	0.042 U	0.042 U	0.042 UJ	0.018 J	0.042 U	0.22 J
Pit 38	X180	6.5	0.004 J	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 UJ	0.025 UJ	0.025 U	0.002 J	0.025 U	0.025 U	0.025 UJ	0.008 J	0.025 U	0.24 J
Pit 39	X177	3	0.032 J	0.064 R	0.064 R	0.064 R	0.064 R	0.064 R	0.064 U	0.064 R	0.064 R	0.083 J	0.064 R	0.064 R	0.006 J	0.064 J	0.064 R	3.9 J
Pit 39	X177DL	3	0.27 R	0.27 R	0.27 R	0.27 R	0.27 R	0.27 R	0.27 R	0.27 R	0.27 R	0.048 J	0.27 R	0.27 R	0.27 R	0.029 J	0.27 R	1.9 J
Pit 39	X178	8	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	0.15 J	1.3 U	1.3 U	0.32 J	1.3 U	1.3 U	1.3 UJ	0.61 J	1.3 UJ	1.3 UJ
Pit 42	X124	3	0.01 UJ	0.01 UJ	0.01 U	0.01 UJ	0.01 U	0.01 U	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 U	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 U
Pit 42	X126	12	0.001 J	0.009 R	0.009 UJ	0.009 UJ	0.009 UJ	0.009 UJ	0.001 J	0.009 R	0.009 R	0.009 R	0.009 UJ	0.009 UJ	0.009 R	0.009 R	0.009 R	0.02 U
Pit 42	X126RE	12	0.01 UJ	0.01 R	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 R	0.01 R	0.01 R	0.01 R	0.01 UJ	0.01 UJ	0.01 R	0.01 R	0.01 R	0.023 U

Notes:

=: sample concentration is detected at level reported
U: sample concentration is under detection limit
J: sample concentration is estimated value
R: sample concentration value is rejected
DL: sample is diluted
RE: sample is re-extracted
Ing.: Ingestion
Inh.: Inhalation
I: Class I
II: Class II

[1]Values in the proposed rules.

[2]TACO RO values shown for 1,3-dichloropropene are the combined values for cis and trans.

Table E-6. VOCs in Unnamed Parcel (mg/kg)

Station ID	Sample ID	Depth (ft.)	Benzene	Bromodichloromethane	Bromoform	Bromomethane	Carbon disulfide	Carbon tetrachloride	Chlorobenzene	Chloroethane	Chloroform	Chloromethane	cis-1,2-Dichloroethene	cis-1,3-Dichloropropene[2]	Cyclohexane	Dibromochloromethane	Dichlorodifluoromethane	Ethylbenzene
Industrial/ Commercial		*Ing*	*200*	*92*	*720*	*2900*	*200000*	*44*	*41000*		*940*		*20000*	*33*		*41000*		*200000*
		Inh	*1.5*	*3000*	*100*	*15*	*720*	*0.64*	*210*		*0.54*		*1200*	*0.23*		*1300*		*400*
Construction Worker		*Ing*	*4300*	*2000*	*16000*	*1000*	*20000*	*410*	*4100*		*2000*		*20000*	*610*		*41000*		*20000*
		Inh	*2.1*	*3000*	*140*	*3.9*	*9*	*0.9*	*1.3*		*0.76*		*1200*	*0.33*		*1300*		*58*
Soil Component of GW		*I*	*0.03*	*0.6*	*0.8*	*0.2*	*32*	*0.07*	*1*		*0.6*		*0.4*	*0.004*		*0.4*		*13*
		II	*0.17*	*0.6*	*0.8*	*1.2*	*160*	*0.33*	*6.5*		*2.9*		*1.1*	*0.02*		*0.4*		*19*
Pit 02	X103	3	0.038 J	0.015 UJ	0.015 UJ	0.015 UJ	0.031 J	0.015 UJ	0.007 J	0.015 UJ	0.015 UJ	0.015 UJ	0.005 J	0.015 UJ	0.025 J	0.015 UJ	0.015 UJ	0.02 J
Pit 02	X103RE	3	0.077 J	0.016 U	0.016 U	0.016 UJ	0.024 J	0.016 U	0.022 J	0.016 UJ	0.016 U	0.003 J	0.011 J	0.016 U	0.035 J	0.016 U	0.016 UJ	0.051 J
Pit 02	X104	6	0.016 =	0.014 U	0.014 U	0.014 U	0.013 J	0.014 UJ	0.012 J	0.014 UJ	0.014 U	0.014 U	0.014 U	0.014 U	0.01 J	0.014 U	0.014 UJ	0.001 J
Pit 03	X105	3	0.001 J	0.01 U	0.01 U	0.01 U	0.005 J	0.01 UJ	0.01 U	0.01 UJ	0.01 U	0.01 U	0.01 U	0.01 U	0.003 J	0.01 U	0.01 UJ	0.01 U
Pit 03	X106	6	0.002 J	0.013 U	0.013 U	0.013 UJ	0.003 J	0.013 U	0.013 U	0.013 U	0.013 U	0.013 U	0.013 U	0.013 U	0.013 U	0.013 U	0.013 U	0.013 U
Pit 04	X107	3	0.007 J	0.015 U	0.015 U	0.015 UJ	0.006 J	0.015 U	0.006 J	0.015 U	0.015 U	0.015 U	0.002 J	0.015 U	0.003 J	0.015 U	0.015 U	0.015 U
Pit 04	X107RE	3	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 UJ	1.2 U	1.2 U	1.2 U	1.2 U	1.2 UJ	1.2 U	1.2 U	1.2 U
Pit 04	X108	8	0.028 =	0.019 U	0.019 U	0.019 UJ	0.013 J	0.019 U	0.017 J	0.019 UJ	0.019 U	0.019 UJ	0.012 J	0.019 U	0.006 J	0.019 U	0.019 UJ	0.004 J
Pit 05	X109	3	0.007 J	0.012 U	0.012 U	0.012 UJ	0.003 J	0.012 U	0.031 =	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 =
Pit 05	X110	3	0.011 J	0.014 U	0.014 U	0.014 UJ	0.02 =	0.014 U	0.04 =	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U	0.004 J
Pit 05	X111	8	0.25 =	0.03 U	0.03 U	0.03 UJ	0.026 J	0.03 U	0.065 =	0.03 U	0.03 U	0.03 U	0.03 U	0.03 U	0.015 J	0.03 U	0.03 U	0.005 J
Pit 06	X112	3	0.019 =	0.016 U	0.016 U	0.016 UJ	0.009 J	0.016 U	0.008 J	0.016 U	0.016 U	0.016 U	0.016 U	0.016 U	0.023 =	0.016 U	0.016 U	0.003 J
Pit 06	X113	8	0.018 =	0.016 U	0.016 U	0.016 UJ	0.009 J	0.016 U	0.002 J	0.016 U	0.016 U	0.016 U	0.016 U	0.016 U	0.004 J	0.016 U	0.016 U	0.016 U
Pit 07	X114	3	0.013 J	0.014 U	0.014 U	0.014 UJ	0.018 J	0.014 U	0.044 J	0.014 UJ	0.014 U	0.014 UJ	0.001 J	0.014 U	0.012 J	0.014 U	0.014 UJ	0.11 J
Pit 07	X114RE	3	0.009 J	0.014 U	0.014 U	0.014 UJ	0.006 J	0.014 U	0.008 J	0.014 UJ	0.014 U	0.014 U	0.014 U	0.014 U	0.005 J	0.014 U	0.014 UJ	0.013 J
Pit 07	X115	8	0.077 J	0.082 U	0.082 U	0.082 UJ	0.33 =	0.082 U	0.13 =	0.082 UJ	0.082 U	0.082 U	0.082 U	0.082 U	0.018 J	0.082 U	0.082 UJ	0.064 J
Pit 08	X116	3	0.003 J	0.012 U	0.012 U	0.012 UJ	0.012 U	0.012 U	0.005 J	0.012 UJ	0.012 U	0.012 UJ	0.003 J	0.012 U	0.004 J	0.012 U	0.012 UJ	0.002 J
Pit 08	X116RE	3	0.002 J	0.013 U	0.013 U	0.013 UJ	0.002 J	0.013 U	0.013 UJ	0.013 UJ	0.013 U	0.013 U	0.013 U	0.013 U	0.004 J	0.013 U	0.013 UJ	0.002 J
Pit 08	X117	8	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	0.21 J	1.7 UJ	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 UJ	0.5 J
Pit 09	X118	3	0.011 UJ	0.011 UJ	0.011 UJ	0.011 UJ	0.002 J	0.011 UJ	0.011 UJ	0.011 UJ	0.011 UJ	0.011 UJ	0.011 UJ	0.011 UJ	0.011 UJ	0.011 UJ	0.011 UJ	0.011 UJ
Pit 09	X118RE	3	0.013 UJ	0.013 UJ	0.013 UJ	0.013 UJ	0.013 U	0.013 UJ	0.013 UJ	0.013 UJ	0.013 U	0.013 U	0.013 U	0.013 UJ	0.013 UJ	0.013 UJ	0.013 UJ	0.013 UJ
Pit 09	X119	8	0.026 =	0.017 U	0.017 U	0.017 UJ	0.006 J	0.017 U	0.01 J	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.006 J	0.017 U	0.017 U	0.017 U
Pit 10	X120	3	0.001 J	0.013 U	0.013 U	0.013 UJ	0.018 J	0.013 U	0.013 UJ	0.013 UJ	0.013 U	0.013 UJ	0.003 J	0.013 U	0.004 J	0.013 U	0.013 UJ	0.013 UJ
Pit 10	X120RE	3	0.002 J	0.013 UJ	0.013 UJ	0.013 UJ	0.004 J	0.013 UJ	0.013 UJ	0.013 UJ	0.013 UJ	0.013 UJ	0.004 J	0.013 UJ	0.003 J	0.013 UJ	0.013 UJ	0.013 UJ
Pit 10	X121	8	0.003 J	0.012 UJ	0.012 UJ	0.012 UJ	0.008 J	0.012 UJ	0.012 R	0.012 UJ	0.012 UJ	0.012 UJ	0.012 UJ	0.012 UJ	0.008 J	0.012 UJ	0.012 UJ	0.11 J
Pit 10	X121RE	8	0.004 J	0.014 U	0.014 U	0.014 U	0.009 J	0.014 U	0.014 UJ	0.014 UJ	0.014 U	0.014 U	0.014 U	0.014 U	0.008 J	0.014 U	0.014 U	0.01 J

Table E-6. VOCs in Unnamed Parcel (mg/kg)

Station ID	Sample ID	Depth (ft.)	Benzene	Bromodichloromethane	Bromoform	Bromomethane	Carbon disulfide	Carbon tetrachloride	Chlorobenzene	Chloroethane	Chloroform	Chloromethane	cis-1,2-Dichloroethene	cis-1,3-Dichloropropene[2]	Cyclohexane	Dibromochloromethane	Dichlorodifluoromethane	Ethylbenzene
Industrial/ Commercial		*Ing*	*200*	*92*	*720*	*2900*	*200000*	*44*	*41000*		*940*		*20000*	*33*		*41000*		*200000*
		Inh	*1.5*	*3000*	*100*	*15*	*720*	*0.64*	*210*		*0.54*		*1200*	*0.23*		*1300*		*400*
Construction Worker		*Ing*	*4300*	*2000*	*16000*	*1000*	*20000*	*410*	*4100*		*2000*		*20000*	*610*		*41000*		*20000*
		Inh	*2.1*	*3000*	*140*	*3.9*	*9*	*0.9*	*1.3*		*0.76*		*1200*	*0.33*		*1300*		*58*
Soil Component of GW		*I*	*0.03*	*0.6*	*0.8*	*0.2*	*32*	*0.07*	*1*		*0.6*		*0.4*	*0.004*		*0.4*		*13*
		II	*0.17*	*0.6*	*0.8*	*1.2*	*160*	*0.33*	*6.5*		*2.9*		*1.1*	*0.02*		*0.4*		*19*
Pit 11	X122	3	0.002 J	0.009 UJ	0.009 UJ	0.009 UJ	0.001 J	0.009 UJ	0.009 R	0.009 UJ	0.009 UJ	0.009 UJ	0.009 UJ	0.009 UJ	0.009 UJ	0.009 UJ	0.009 UJ	0.001 J
Pit 11	X122RE	3	0.003 J	0.01 UJ	0.01 UJ	0.01 U	0.01 U	0.01 UJ	0.01 UJ	0.01 UJ	0.01 U	0.01 U	0.01 U	0.01 UJ	0.01 UJ	0.01 UJ	0.01 U	0.01 UJ
Pit 11	X123	8	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.001 J	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ
Pit 11	X123RE	8	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.002 J	0.01 UJ	0.01 R	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 R
Pit 11	X125	30	0.001 J	0.01 R	0.01 R	0.01 UJ	0.003 J	0.01 R	0.01 R	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 R	0.002 J	0.01 R	0.01 UJ	0.003 J
Pit 11	X125RE	30	0.011 UJ	0.011 UJ	0.011 UJ	0.011 UJ	0.001 J	0.011 UJ	0.011 R	0.011 UJ	0.011 UJ	0.011 UJ	0.011 UJ	0.011 UJ	0.011 UJ	0.011 UJ	0.011 UJ	0.011 R
Pit 12	X127	3	0.13 J	0.014 U	0.014 U	0.014 U	0.036 J	0.014 U	0.003 J	0.014 UJ	0.014 U	0.014 U	0.014 U	0.014 U	0.11 J	0.014 U	0.017 J	0.014 UJ
Pit 12	X127RE	3	0.11 J	0.016 U	0.016 U	0.016 U	0.006 J	0.016 U	0.005 J	0.016 UJ	0.016 U	0.016 U	0.016 U	0.016 U	0.039 =	0.016 U	0.016 U	0.016 UJ
Pit 12	X128	6	0.55 J	3.2 U	3.2 U	3.2 U	3.2 U	3.2 U	2.6 J	3.2 U	3.2 U	3.2 U	3.2 U	3.2 U	3.2 U	3.2 U	3.2 U	0.46 J
Pit 13	X129	3	0.011 UJ	0.011 U	0.011 U	0.011 U	0.001 J	0.011 U	0.011 UJ	0.011 UJ	0.011 U	0.011 U	0.011 U	0.011 U	0.001 J	0.011 U	0.011 U	0.011 UJ
Pit 13	X130	8	0.004 J	0.025 U	0.025 U	0.025 U	0.01 J	0.025 U	0.008 J	0.025 UJ	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 UJ
Pit 14	X131	3	0.023 J	0.029 U	0.029 U	0.029 U	0.011 J	0.029 U	0.79 J	0.029 UJ	0.029 U	0.029 U	0.029 U	0.029 U	0.008 J	0.029 U	0.029 U	0.006 J
Pit 14	X131DL	3	0.007 J	0.043 U	0.043 U	0.043 U	0.015 J	0.043 U	0.44 J	0.043 UJ	0.043 U	0.043 U	0.043 U	0.043 U	0.043 U	0.043 U	0.043 U	0.008 J
Pit 14	X132	8	0.018 J	0.019 U	0.019 U	0.019 U	0.019 =	0.019 U	0.09 J	0.019 UJ	0.019 U	0.019 U	0.019 U	0.019 U	0.065 =	0.019 U	0.019 U	0.019 UJ
Pit 15	X133	3	0.009 J	0.02 U	0.02 U	0.02 U	0.008 J	0.02 U	0.074 J	0.02 UJ	0.02 U	0.02 U	0.02 U	0.02 U	0.004 J	0.02 U	0.02 U	0.005 J
Pit 15	X133RE	3	0.003 J	0.019 U	0.019 U	0.019 U	0.007 J	0.019 U	0.021 J	0.019 UJ	0.019 U	0.019 U	0.019 U	0.019 U	0.019 U	0.019 U	0.019 U	0.005 J
Pit 15	X134	8	0.022 J	0.02 U	0.02 U	0.02 U	0.012 J	0.02 U	0.3 J	0.02 UJ	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.016 J
Pit 16	X135	3	0.006 J	0.016 U	0.016 U	0.016 U	0.003 J	0.016 U	0.016 UJ	0.016 UJ	0.016 U	0.016 U	0.016 U	0.016 U	0.014 J	0.016 U	0.016 U	0.016 UJ
Pit 16	X136	6	0.004 J	0.02 U	0.02 U	0.02 U	0.006 J	0.02 U	0.02 UJ	0.02 UJ	0.02 U	0.02 U	0.02 U	0.02 U	0.008 J	0.02 U	0.02 U	0.02 UJ
Pit 17	X137	3	0.012 UJ	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 UJ	0.012 UJ	0.012 U	0.012 U	0.001 J	0.012 U	0.001 J	0.012 U	0.012 U	0.012 UJ
Pit 17	X138	11	0.017 J	0.013 U	0.013 U	0.013 U	0.016 =	0.013 U	0.013 UJ	0.013 UJ	0.013 U	0.013 U	0.003 J	0.013 U	0.026 =	0.013 U	0.013 U	1.6 J
Pit 17	X138DL	11	1.6 UJ	1.6 UJ	1.6 UJ	1.6 U	1.6 UJ	1.6 UJ	1.6 UJ	1.6 UJ	1.6 UJ	1.6 UJ	1.6 UJ	1.6 UJ	1.6 UJ	1.6 UJ	1.6 UJ	0.84 J
Pit 18	X139	3	0.008 J	0.016 U	0.016 U	0.016 U	0.003 J	0.016 U	0.045 J	0.016 UJ	0.016 U	0.016 U	0.016 U	0.016 U	0.016 U	0.016 U	0.016 U	0.004 J
Pit 18	X140	10	0.016 UJ	0.016 U	0.016 U	0.016 U	0.016 U	0.016 U	0.016 UJ	0.016 UJ	0.016 U	0.016 U	0.016 U	0.016 U	0.016 U	0.016 U	0.016 U	0.016 UJ
Pit 19	X141	3	0.013 R	0.013 UJ	0.013 UJ	0.013 UJ	0.013 UJ	0.013 UJ	0.013 R	0.013 UJ	0.002 J	0.013 UJ	0.013 UJ	0.013 UJ	0.013 UJ	0.013 UJ	0.013 UJ	0.013 R
Pit 19	X142	14	0.11 J	0.018 U	0.018 U	0.018 UJ	0.008 J	0.018 U	0.035 J	0.018 UJ	0.018 U	0.018 U	0.018 U	0.018 U	0.084 =	0.018 U	0.018 U	0.016 J

Table E-6. VOCs in Unnamed Parcel (mg/kg)

Station ID	Sample ID	Depth (ft.)	Benzene	Bromodichloromethane	Bromoform	Bromomethane	Carbon disulfide	Carbon tetrachloride	Chlorobenzene	Chloroethane	Chloroform	Chloromethane	cis-1,2-Dichloroethene	cis-1,3-Dichloropropene[2]	Cyclohexane	Dibromochloromethane	Dichlorodifluoromethane	Ethylbenzene
Industrial/ Commercial		*Ing*	*200*	*92*	*720*	*2900*	*200000*	*44*	*41000*		*940*		*20000*	*33*		*41000*		*200000*
		Inh	*1.5*	*3000*	*100*	*15*	*720*	*0.64*	*210*		*0.54*		*1200*	*0.23*		*1300*		*400*
Construction Worker		*Ing*	*4300*	*2000*	*16000*	*1000*	*20000*	*410*	*4100*		*2000*		*20000*	*610*		*41000*		*20000*
		Inh	*2.1*	*3000*	*140*	*3.9*	*9*	*0.9*	*1.3*		*0.76*		*1200*	*0.33*		*1300*		*58*
Soil Component of GW		*I*	*0.03*	*0.6*	*0.8*	*0.2*	*32*	*0.07*	*1*		*0.6*		*0.4*	*0.004*		*0.4*		*13*
		II	*0.17*	*0.6*	*0.8*	*1.2*	*160*	*0.33*	*6.5*		*2.9*		*1.1*	*0.02*		*0.4*		*19*
Pit 20	X143	3	0.006 J	0.013 U	0.013 U	0.013 U	0.009 J	0.013 U	0.013 UJ	0.013 UJ	0.013 U	0.013 U	0.013 U	0.013 U	0.031 =	0.013 U	0.013 U	0.006 J
Pit 20	X144	3	0.006 J	0.015 U	0.015 U	0.015 U	0.006 J	0.015 U	0.015 UJ	0.015 UJ	0.015 U	0.015 U	0.015 U	0.015 U	0.026 =	0.015 U	0.015 U	0.015 UJ
Pit 20	X144RE	3	0.005 J	0.014 U	0.014 U	0.014 U	0.007 J	0.014 U	0.014 UJ	0.014 UJ	0.014 U	0.014 U	0.014 U	0.014 U	0.024 U	0.014 U	0.014 U	0.007 J
Pit 20	X145	7	2.3 UJ	2.3 U	2.3 U	2.3 U	2.3 U	2.3 U	2.3 UJ	2.3 U	2.3 U	2.3 U	2.3 U	2.3 U	2.3 U	2.3 U	2.3 U	2.3 UJ
Pit 21	X146	3	2000 UJ	2000 U	2000 U	2000 U	2000 U	2000 U	2000 UJ	2000 U	2000 U	2000 U	2000 U	2000 U	5400 =	2000 U	2000 U	820 J
Pit 21	X147	5	1500 UJ	1500 U	1500 U	1500 U	1500 U	1500 U	180 J	1500 U	1500 U	1500 U	1500 U	1500 U	1500 U	1500 U	1500 U	1800 J
Pit 21	X147RE	5	1500 UJ	1500 U	1500 U	1500 U	1500 U	1500 U	1500 UJ	1500 U	1500 U	1500 U	1500 U	1500 U	1500 U	1500 U	1500 U	1600 J
Pit 21	X148	10	1700 UJ	1700 U	1700 U	1700 U	1700 U	1700 U	1700 UJ	1700 U	1700 U	1700 U	1700 U	1700 U	1700 U	1700 U	1700 U	1100 J
Pit 21	X148DL	10	3400 UJ	3400 UJ	3400 UJ	3400 UJ	3400 UJ	3400 UJ	3400 UJ	3400 UJ	3400 UJ	3400 UJ	3400 UJ	3400 UJ	3400 UJ	3400 UJ	3400 UJ	1100 J
Pit 22	X160	3	0.018 UJ	0.018 U	0.018 U	0.018 U	0.018 U	0.018 U	0.018 UJ	0.018 U	0.018 U	0.018 UJ	0.018 U	0.018 U	0.018 U	0.018 U	0.018 UJ	0.018 UJ
Pit 22	X161	10	0.28 J	0.024 U	0.024 U	0.024 U	0.028 =	0.024 U	0.15 J	0.024 U	0.024 U	0.024 UJ	0.024 U	0.024 U	0.2 =	0.024 U	0.024 UJ	0.024 U
Pit 23	X158	3	0.019 UJ	0.019 U	0.019 U	0.019 U	0.023 J	0.019 U	0.019 UJ	0.019 UJ	0.019 U	0.019 U	0.019 U	0.019 U	0.019 U	0.019 U	0.019 U	0.003 J
Pit 23	X158RE	3	0.013 J	0.02 U	0.02 U	0.02 UJ	0.011 J	0.02 U	0.017 J	0.02 UJ	0.02 U	0.02 U	0.02 U	0.02 U	0.15 =	0.02 U	0.02 U	0.005 J
Pit 23	X159	10	0.068 J	0.019 U	0.019 U	0.019 U	0.009 J	0.019 U	0.019 UJ	0.041 J	0.019 U	0.019 U	0.019 U	0.019 U	0.063 J	0.019 U	0.019 U	0.011 J
Pit 23	X159RE	10	0.037 J	0.016 UJ	0.016 UJ	0.016 UJ	0.005 J	0.016 UJ	0.016 UJ	0.045 J	0.016 UJ	0.016 UJ	0.003 J	0.016 UJ	0.019 J	0.016 UJ	0.016 UJ	0.01 J
Pit 24	X156	3	0.007 J	0.027 U	0.027 U	0.027 U	0.016 J	0.027 U	0.027 UJ	0.027 UJ	0.027 U	0.027 U	0.006 J	0.027 U	0.027 U	0.027 U	0.027 U	0.004 J
Pit 24	X156RE	3	0.003 J	0.026 U	0.026 U	0.026 U	0.012 J	0.026 U	0.026 UJ	0.026 UJ	0.026 U	0.026 U	0.003 J	0.026 U	0.026 U	0.026 U	0.026 U	0.026 UJ
Pit 24	X157	8	0.21 J	0.032 U	0.032 U	0.032 U	0.03 J	0.032 U	0.064 J	0.032 UJ	0.032 U	0.032 U	0.032 U	0.032 U	0.12 J	0.032 U	0.032 U	0.009 J
Pit 24	X157RE	8	0.18 J	0.031 U	0.031 U	0.031 U	0.026 J	0.031 U	0.064 J	0.031 UJ	0.031 U	0.031 U	0.031 U	0.031 U	0.07 =	0.031 U	0.031 U	0.008 J
Pit 25	X154	3	0.008 J	0.011 U	0.011 U	0.011 U	0.005 J	0.011 U	0.011 UJ	0.011 UJ	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.11 J
Pit 25	X155	8	0.078 UJ	0.078 U	0.078 U	0.078 U	0.048 J	0.078 U	0.078 UJ	0.078 UJ	0.078 U	0.078 U	0.078 U	0.078 U	0.95 =	0.078 U	0.078 U	0.078 UJ
Pit 25	X155RE	8	2.1 R	2.1 UJ	2.1 UJ	2.1 U	2.1 UJ	2.1 UJ	2.1 R	2.1 UJ	2.1 UJ	0.26 J	2.1 UJ	2.1 UJ	2.1 UJ	2.1 UJ	2.1 UJ	2.1 R
Pit 26	X152	3	0.015 UJ	0.015 U	0.015 U	0.015 U	0.002 J	0.015 U	0.003 J	0.015 U	0.015 U	0.015 UJ	0.015 U	0.015 U	0.015 U	0.015 U	0.015 UJ	0.015 UJ
Pit 26	X153	6	0.026 UJ	0.026 U	0.026 U	0.026 U	0.026 U	0.026 U	0.026 UJ	0.026 UJ	0.026 U	0.026 U	0.026 U	0.026 U	0.026 U	0.026 U	0.026 U	0.004 J
Pit 27	X149	3	0.007 J	0.016 U	0.016 U	0.016 U	0.01 J	0.016 U	0.006 J	0.016 UJ	0.016 U	0.016 U	0.016 U	0.016 U	0.066 =	0.016 U	0.016 U	0.003 J
Pit 27	X149RE	3	0.003 J	0.016 U	0.016 U	0.016 U	0.005 J	0.016 U	0.006 J	0.016 UJ	0.016 U	0.016 U	0.016 U	0.016 U	0.016 U	0.016 U	0.016 U	0.002 J

Table E-6. VOCs in Unnamed Parcel (mg/kg)

Station ID	Sample ID	Depth (ft.)	Benzene	Bromodichloromethane	Bromoform	Bromomethane	Carbon disulfide	Carbon tetrachloride	Chlorobenzene	Chloroethane	Chloroform	Chloromethane	cis-1,2-Dichloroethene	cis-1,3-Dichloropropene[2]	Cyclohexane	Dibromochloromethane	Dichlorodifluoromethane	Ethylbenzene
Industrial/ Commercial		*Ing*	*200*	*92*	*720*	*2900*	*200000*	*44*	*41000*		*940*		*20000*	*33*		*41000*		*200000*
		Inh	*1.5*	*3000*	*100*	*15*	*720*	*0.64*	*210*		*0.54*		*1200*	*0.23*		*1300*		*400*
Construction Worker		*Ing*	*4300*	*2000*	*16000*	*1000*	*20000*	*410*	*4100*		*2000*		*20000*	*610*		*41000*		*20000*
		Inh	*2.1*	*3000*	*140*	*3.9*	*9*	*0.9*	*1.3*		*0.76*		*1200*	*0.33*		*1300*		*58*
Soil Component of GW		*I*	*0.03*	*0.6*	*0.8*	*0.2*	*32*	*0.07*	*1*		*0.6*		*0.4*	*0.004*		*0.4*		*13*
		II	*0.17*	*0.6*	*0.8*	*1.2*	*160*	*0.33*	*6.5*		*2.9*		*1.1*	*0.02*		*0.4*		*19*
Pit 27	X150	8	0.003 J	0.017 UJ	0.017 UJ	0.017 UJ	0.006 J	0.017 UJ	0.017 UJ	0.017 UJ	0.017 UJ	0.017 UJ	0.017 UJ	0.017 UJ	0.017 U	0.017 UJ	0.017 UJ	0.013 J
Pit 27	X150RE	8	0.015 UJ	0.015 U	0.015 U	0.015 U	0.004 J	0.015 U	0.015 UJ	0.015 UJ	0.015 U	0.015 U	0.015 U	0.015 U	0.015 U	0.015 U	0.015 U	0.004 J
Pit 27	X151	30	0.008 J	0.018 U	0.018 U	0.018 U	0.012 J	0.018 U	0.018 UJ	0.018 UJ	0.018 U	0.018 U	0.018 U	0.018 U	0.018 U	0.018 U	0.018 U	0.013 J
Pit 28	X175	3	0.003 J	0.013 U	0.013 U	0.013 U	0.013 U	0.013 U	0.013 UJ	0.013 U	0.013 U	0.013 UJ	0.013 U	0.013 U	0.013 U	0.013 U	0.013 UJ	0.013 U
Pit 28	X176	6	0.065 J	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U	0.003 J	0.014 U	0.014 U	0.014 UJ	0.005 J	0.014 U	0.014 U	0.014 U	0.014 UJ	0.52 J
Pit 28	X176DL	6	0.055 J	0.066 U	0.066 U	0.066 UJ	0.079 =	0.066 U	0.066 UJ	0.066 U	0.066 U	0.066 UJ	0.011 J	0.066 U	0.066 U	0.066 U	0.066 UJ	0.33 J
Pit 29	X173	3	0.018 R	0.018 UJ	0.018 UJ	0.018 UJ	0.005 J	0.018 UJ	0.018 R	0.018 UJ	0.018 UJ	0.018 UJ	0.018 UJ	0.018 UJ	0.003 J	0.018 UJ	0.018 UJ	0.005 J
Pit 29	X173DL	3	0.091 R	0.091 UJ	0.091 UJ	0.091 UJ	0.091 UJ	0.091 UJ	0.091 R	0.091 UJ	0.091 UJ	0.091 UJ	0.091 UJ	0.091 UJ	0.091 UJ	0.091 UJ	0.091 UJ	0.091 R
Pit 29	X174	10	0.003 J	0.023 UJ	0.023 UJ	0.023 UJ	0.003 J	0.023 UJ	0.008 J	0.023 UJ	0.023 UJ	0.023 UJ	0.023 UJ	0.023 UJ	0.023 UJ	0.023 UJ	0.023 UJ	0.023 R
Pit 30	X171	3	0.016 UJ	0.016 U	0.016 U	0.016 U	0.016 U	0.016 U	0.002 J	0.016 U	0.016 U	0.016 UJ	0.016 U	0.016 U	0.016 U	0.016 U	0.016 UJ	0.016 U
Pit 30	X172	7.5	0.013 J	0.017 U	0.017 U	0.017 U	0.017 =	0.017 U	0.58 J	0.017 U	0.017 U	0.017 UJ	0.017 U	0.017 U	0.017 =	0.017 U	0.017 UJ	0.017 U
Pit 30	X172DL	7.5	0.013 J	0.081 U	0.081 U	0.008 J	0.11 =	0.081 U	0.37 J	0.081 U	0.081 U	0.081 UJ	0.081 U	0.081 U	0.012 J	0.081 U	0.081 UJ	0.081 UJ
Pit 31	X169	2.5	0.024 UJ	0.024 U	0.024 U	0.024 U	0.004 J	0.024 U	0.024 UJ	0.024 UJ	0.024 U	0.024 U	0.024 U	0.024 U	0.024 U	0.024 U	0.024 U	0.003 J
Pit 31	X170	6	0.006 J	0.025 U	0.025 U	0.025 U	0.004 J	0.025 U	0.025 UJ	0.025 U	0.025 U	0.025 UJ	0.025 U	0.025 U	0.025 U	0.025 U	0.025 UJ	0.025 U
Pit 31	X170RE	6	0.019 J	0.029 U	0.029 U	0.029 UJ	0.029 =	0.029 U	0.029 UJ	0.029 U	0.029 U	0.029 UJ	0.029 U	0.029 U	0.029 U	0.029 U	0.029 UJ	0.029 UJ
Pit 32	X167	3	0.001 J	0.013 U	0.013 U	0.013 U	0.004 J	0.013 U	0.013 UJ	0.013 U	0.013 U	0.013 UJ	0.013 U	0.013 U	0.013 U	0.013 U	0.013 UJ	0.013 UJ
Pit 32	X167RE	3	0.002 J	0.013 UJ	0.013 UJ	0.013 UJ	0.004 J	0.013 UJ	0.013 R	0.013 UJ	0.013 UJ	0.013 UJ	0.013 UJ	0.013 UJ	0.013 UJ	0.013 UJ	0.013 UJ	0.013 R
Pit 32	X168	6	0.003 J	0.012 U	0.012 U	0.012 U	0.003 J	0.012 U	0.001 J	0.012 U	0.012 U	0.012 UJ	0.012 U	0.012 U	0.002 J	0.012 U	0.012 UJ	0.012 UJ
Pit 33	X165	3	0.003 J	0.013 U	0.013 U	0.013 U	0.006 J	0.013 U	0.013 UJ	0.013 U	0.013 U	0.013 UJ	0.013 U	0.013 U	0.013 U	0.013 U	0.013 UJ	0.013 U
Pit 33	X165RE	3	0.013 UJ	0.013 U	0.013 U	0.013 UJ	0.013 U	0.013 U	0.013 UJ	0.013 U	0.013 U	0.013 UJ	0.013 U	0.013 U	0.013 U	0.013 U	0.013 UJ	0.013 UJ
Pit 33	X166	7	2.6 UJ	2.6 U	2.6 U	2.6 U	2.6 U	2.6 U	48 J	2.6 U	2.6 U	2.6 U	2.6 U	2.6 U	2.6 U	2.6 U	2.6 U	2.6 J
Pit 34	X162	3	0.012 UJ	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 UJ	0.012 U	0.012 U	0.012 UJ	0.012 U	0.012 U	0.012 U	0.012 U	0.012 UJ	0.012 UJ
Pit 34	X163	10	0.075 J	0.023 U	0.023 U	0.023 U	0.023 =	0.023 U	0.23 J	0.023 U	0.023 U	0.023 UJ	0.023 U	0.023 U	0.023 U	0.023 U	0.023 UJ	0.023 U
Pit 34	X164	30	2.6 UJ	2.6 U	2.6 U	2.6 U	2.6 U	2.6 U	2.6 UJ	2.6 U	2.6 U	2.6 U	2.6 U	2.6 U	2.6 U	2.6 U	2.6 U	0.88 J
Pit 35	X185	4	0.013 UJ	0.013 U	0.013 U	0.013 U	0.013 U	0.013 U	0.013 UJ	0.013 UJ	0.013 U	0.013 UJ	0.013 U	0.013 U	0.013 U	0.013 U	0.013 UJ	0.013 UJ
Pit 35	X186	10	0.01 J	0.015 U	0.015 U	0.015 U	0.015 J	0.015 U	0.081 J	0.015 UJ	0.015 U	0.015 UJ	0.015 U	0.015 U	0.002 J	0.015 U	0.015 UJ	0.015 UJ

Table E-6. VOCs in Unnamed Parcel (mg/kg)

Station ID	Sample ID	Depth (ft.)	Benzene	Bromodichloromethane	Bromoform	Bromomethane	Carbon disulfide	Carbon tetrachloride	Chlorobenzene	Chloroethane	Chloroform	Chloromethane	cis-1,2-Dichloroethene	cis-1,3-Dichloropropene[2]	Cyclohexane	Dibromochloromethane	Dichlorodifluoromethane	Ethylbenzene
Industrial/ Commercial		*Ing*	*200*	*92*	*720*	*2900*	*200000*	*44*	*41000*		*940*		*20000*	*33*		*41000*		*200000*
		Inh	*1.5*	*3000*	*100*	*15*	*720*	*0.64*	*210*		*0.54*		*1200*	*0.23*		*1300*		*400*
Construction Worker		*Ing*	*4300*	*2000*	*16000*	*1000*	*20000*	*410*	*4100*		*2000*		*20000*	*610*		*41000*		*20000*
		Inh	*2.1*	*3000*	*140*	*3.9*	*9*	*0.9*	*1.3*		*0.76*		*1200*	*0.33*		*1300*		*58*
Soil Component of GW		*I*	*0.03*	*0.6*	*0.8*	*0.2*	*32*	*0.07*	*1*		*0.6*		*0.4*	*0.004*		*0.4*		*13*
		II	*0.17*	*0.6*	*0.8*	*1.2*	*160*	*0.33*	*6.5*		*2.9*		*1.1*	*0.02*		*0.4*		*19*
Pit 36	X183	3	0.017 UJ	0.017 U	0.017 U	0.017 UJ	0.017 U	0.017 U	0.017 UJ	0.017 U	0.017 U	0.017 UJ	0.017 U	0.017 U	0.003 J	0.017 U	0.017 UJ	0.017 UJ
Pit 36	X184	6	0.014 J	0.014 U	0.014 U	0.014 UJ	0.014 U	0.014 U	0.002 J	0.014 U	0.014 U	0.014 UJ	0.014 U	0.014 U	0.012 J	0.014 U	0.014 UJ	0.004 J
Pit 37	X181	4	0.006 J	0.025 U	0.025 U	0.025 UJ	0.025 U	0.025 U	0.005 J	0.025 U	0.025 U	0.025 UJ	0.025 U	0.025 U	0.1 =	0.025 U	0.025 UJ	0.025 UJ
Pit 37	X182	13	0.013 J	0.023 U	0.023 U	0.023 UJ	0.023 U	0.023 U	0.026 J	0.023 U	0.023 U	0.023 UJ	0.023 U	0.023 U	0.023 U	0.023 U	0.023 UJ	0.003 J
Pit 38	X179	4	0.005 J	0.042 U	0.042 U	0.042 UJ	0.042 U	0.042 U	0.042 UJ	0.042 U	0.042 U	0.042 UJ	0.042 U	0.042 U	0.042 U	0.042 U	0.042 UJ	0.005 J
Pit 38	X180	6.5	0.014 J	0.025 U	0.025 U	0.025 UJ	0.025 U	0.025 U	0.025 UJ	0.025 U	0.025 U	0.025 UJ	0.025 U	0.025 U	0.011 J	0.025 U	0.025 UJ	0.005 J
Pit 39	X177	3	0.045 J	0.064 R	0.064 R	0.064 R	0.6 J	0.064 R	0.089 J	0.064 R	0.064 R	0.064 R	0.064 R	0.064 R	0.089 J	0.064 R	0.064 R	0.005 J
Pit 39	X177DL	3	0.27 R	0.27 R	0.27 R	0.27 R	0.34 J	0.27 R	0.27 R	0.27 R	0.27 R	0.27 R	0.27 R	0.27 R	0.13 J	0.27 R	0.27 R	0.27 R
Pit 39	X178	8	1.3 UJ	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	0.51 J	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	0.57 J
Pit 42	X124	3	0.01 UJ	0.01 UJ	0.01 UJ	0.01 U	0.01 U	0.01 UJ	0.01 UJ	0.01 UJ	0.01 U	0.01 U	0.01 U	0.01 UJ	0.01 UJ	0.01 UJ	0.01 U	0.01 UJ
Pit 42	X126	12	0.002 J	0.009 UJ	0.009 UJ	0.009 UJ	0.002 J	0.009 UJ	0.009 R	0.009 UJ	0.009 UJ	0.009 UJ	0.009 UJ	0.009 UJ	0.009 UJ	0.009 UJ	0.009 UJ	0.009 R
Pit 42	X126RE	12	0.004 J	0.01 UJ	0.01 UJ	0.01 UJ	0.002 J	0.01 UJ	0.01 R	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 R

Notes:

=: sample concentration is detected at level reported
U: sample concentration is under detection limit
J: sample concentration is estimated value
R: sample concentration value is rejected
DL: sample is diluted
RE: sample is re-extracted
Ing.: Ingestion
Inh.: Inhalation
I: Class I
II: Class II

[1]Values in the proposed rules.

[2]TACO RO values shown for 1,3-dichloropropene are the combined values for cis and trans.

Table E-6. VOCs in Unnamed Parcel (mg/kg)

Station ID	Sample ID	Depth (ft.)	Isopropylbenzene	Methyl acetate	Methyl ethyl ketone	Methyl isobutyl ketone	Methylcyclohexane	Methylene chloride	Styrene	Tert-Butyl Methyl Ether[1]	Tetrachloroethene	Toluene	trans-1,2-Dichloroethene	trans-1,3-Dichloropropene[2]	Trichloroethene	Trichlorofluoromethane	Vinyl chloride	Xylenes
Industrial/ Commercial		*Ing*						*760*	*410000*	*20000*	*110*	*410000*	*41000*	*33*	*520*		*3*	*1000000*
		Inh						*24*	*1500*	*8800*	*20*	*650*	*3100*	*0.23*	*8.9*		*0.06*	*410*
Construction Worker		*Ing*						*12000*	*41000*	*2000*	*2400*	*410000*	*41000*	*610*	*1200*		*65*	*410000*
		Inh						*34*	*430*	*140*	*28*	*42*	*3100*	*0.33*	*12*		*0.08*	*410*
Soil Component of GW		*I*						*0.02*	*4*	*0.32*	*0.06*	*12*	*0.7*	*0.004*	*0.06*		*0.01*	*150*
		II						*0.2*	*18*	*0.32*	*0.3*	*29*	*3.4*	*0.02*	*0.3*		*0.07*	*150*
Pit 02	X103	3	0.042 J	0.015 UJ	0.012 J	0.007 J	0.077 J	0.015 UJ	0.015 UJ	0.015 UJ	0.004 J	0.073 J	0.003 J	0.015 UJ	0.005 J	0.015 UJ	0.003 J	0.07 J
Pit 02	X103RE	3	0.11 J	0.016 UJ	0.033 J	0.016 UJ	0.082 J	0.021 U	0.016 UJ	0.016 U	0.011 J	0.27 J	0.006 J	0.016 UJ	0.01 J	0.016 UJ	0.007 J	0.18 J
Pit 02	X104	6	0.021 =	0.014 UJ	0.007 J	0.014 UJ	0.045 =	0.016 U	0.014 U	0.014 U	0.014 U	0.008 J	0.014 U	0.014 U	0.014 U	0.014 UJ	0.014 U	0.009 J
Pit 03	X105	3	0.01 U	0.01 UJ	0.001 J	0.01 UJ	0.005 J	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 UJ	0.01 U	0.01 U
Pit 03	X106	6	0.013 U	0.013 U	0.013 U	0.013 U	0.013 U	0.016 U	0.013 U	0.013 U	0.013 U	0.003 J	0.013 U	0.013 U	0.013 U	0.013 U	0.013 U	0.013 U
Pit 04	X107	3	0.015 U	0.015 U	0.005 J	0.015 U	0.015 U	0.016 U	0.015 U	0.015 U	0.015 U	0.003 J	0.015 U	0.015 U	0.015 U	0.015 U	0.015 U	0.015 U
Pit 04	X107RE	3	1.2 U	1.2 UJ	1.2 UJ	1.2 UJ	1.2 UJ	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U
Pit 04	X108	8	0.026 =	0.019 UJ	0.019 UJ	0.019 UJ	0.012 J	0.026 U	0.019 U	0.019 U	0.025 =	0.019 U	0.019 U	0.019 UJ	0.006 J	0.003 J	0.002 J	0.013 J
Pit 05	X109	3	0.037 =	0.012 U	0.026 =	0.012 U	0.047 =	0.012 U	0.012 U	0.012 U	0.012 U	0.003 J	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.088 =
Pit 05	X110	3	0.072 =	0.014 U	0.03 =	0.014 U	0.084 =	0.021 U	0.014 U	0.014 U	0.014 U	0.006 J	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U	0.023 =
Pit 05	X111	8	0.12 =	0.03 U	0.11 =	0.03 U	0.018 J	0.039 U	0.03 U	0.03 U	0.03 U	0.006 J	0.03 U	0.03 U	0.03 U	0.03 U	0.03 U	0.013 J
Pit 06	X112	3	0.024 =	0.016 U	0.02 =	0.016 U	0.062 =	0.026 U	0.016 U	0.016 U	0.016 U	0.004 J	0.016 U	0.016 U	0.016 U	0.016 U	0.016 U	0.003 J
Pit 06	X113	8	0.048 =	0.016 U	0.026 =	0.016 U	0.011 J	0.023 U	0.016 U	0.016 U	0.016 U	0.005 J	0.016 U	0.016 U	0.016 U	0.016 U	0.016 U	0.006 J
Pit 07	X114	3	0.14 J	0.014 UJ	0.046 J	0.014 UJ	0.034 J	0.015 U	0.014 UJ	0.014 U	0.001 J	0.026 J	0.014 U	0.014 UJ	0.002 J	0.014 UJ	0.014 U	0.61 J
Pit 07	X114RE	3	0.064 J	0.014 UJ	0.027 J	0.003 J	0.016 J	0.015 U	0.014 U	0.014 U	0.014 U	0.008 J	0.014 U	0.014 UJ	0.014 U	0.001 J	0.014 U	0.068 J
Pit 07	X115	8	0.082 U	0.082 UJ	0.096 J	0.017 J	0.13 =	0.11 U	0.082 U	0.082 U	0.082 U	0.13 J	0.082 U	0.082 UJ	0.082 U	0.082 UJ	0.082 U	0.32 =
Pit 08	X116	3	0.003 J	0.012 UJ	0.072 J	0.012 UJ	0.007 J	0.025 U	0.012 UJ	0.012 U	0.002 J	0.01 J	0.012 U	0.012 UJ	0.002 J	0.002 J	0.006 J	0.008 J
Pit 08	X116RE	3	0.005 J	0.013 UJ	0.017 J	0.013 UJ	0.009 J	0.013 U	0.013 UJ	0.013 U	0.013 UJ	0.005 J	0.013 U	0.013 UJ	0.013 U	0.013 UJ	0.002 J	0.007 J
Pit 08	X117	8	21 =	1.7 U	1.7 U	1.7 U	1 J	1.7 U	1.7 U	1.7 U	1.7 U	1.3 J	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.6 J
Pit 09	X118	3	0.017 J	0.011 UJ	0.011 J	0.011 UJ	0.011 UJ	0.014 U	0.011 UJ	0.011 UJ	0.011 UJ	0.002 J	0.011 UJ	0.011 UJ	0.011 UJ	0.011 UJ	0.011 UJ	0.011 UJ
Pit 09	X118RE	3	0.013 UJ	0.013 UJ	0.007 J	0.013 UJ	0.013 UJ	0.013 U	0.013 UJ	0.013 U	0.003 J	0.002 J	0.013 U	0.013 UJ	0.013 UJ	0.002 J	0.013 U	0.013 UJ
Pit 09	X119	8	0.033 =	0.017 U	0.011 J	0.017 U	0.008 J	0.042 U	0.017 U	0.017 U	0.017 U	0.006 J	0.017 U	0.017 U	0.017 U	0.003 J	0.017 U	0.004 J
Pit 10	X120	3	0.001 J	0.013 UJ	0.021 J	0.013 UJ	0.004 J	0.035 U	0.013 UJ	0.013 U	0.001 J	0.008 J	0.013 U	0.013 UJ	0.013 U	0.013 UJ	0.013 U	0.013 UJ
Pit 10	X120RE	3	0.013 UJ	0.013 UJ	0.027 J	0.013 UJ	0.004 J	0.019 U	0.013 UJ	0.013 UJ	0.002 J	0.006 J	0.013 UJ	0.013 UJ	0.002 J	0.002 J	0.001 J	0.013 UJ
Pit 10	X121	8	0.015 J	0.012 UJ	0.021 J	0.012 R	0.022 J	0.038 U	0.012 R	0.012 UJ	0.002 J	1.2 J	0.012 UJ	0.012 UJ	0.012 UJ	0.005 J	0.012 UJ	0.43 J
Pit 10	X121RE	8	0.017 J	0.014 U	0.035 J	0.014 U	0.014 J	0.014 U	0.014 UJ	0.014 U	0.014 U	0.088 J	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U	0.035 J

Table E-6. VOCs in Unnamed Parcel (mg/kg)

Station ID	Sample ID	Depth (ft.)	Isopropylbenzene	Methyl acetate	Methyl ethyl ketone	Methyl isobutyl ketone	Methylcyclohexane	Methylene chloride	Styrene	Tert-Butyl Methyl Ether[1]	Tetrachloroethene	Toluene	trans-1,2-Dichloroethene	trans-1,3-Dichloropropene[2]	Trichloroethene	Trichlorofluoromethane	Vinyl chloride	Xylenes
Industrial/ Commercial		*Ing*						*760*	*410000*	*20000*	*110*	*410000*	*41000*	*33*	*520*		*3*	*1000000*
		Inh						*24*	*1500*	*8800*	*20*	*650*	*3100*	*0.23*	*8.9*		*0.06*	*410*
Construction Worker		*Ing*						*12000*	*41000*	*2000*	*2400*	*410000*	*41000*	*610*	*1200*		*65*	*410000*
		Inh						*34*	*430*	*140*	*28*	*42*	*3100*	*0.33*	*12*		*0.08*	*410*
Soil Component of GW		*I*						*0.02*	*4*	*0.32*	*0.06*	*12*	*0.7*	*0.004*	*0.06*		*0.01*	*150*
		II						*0.2*	*18*	*0.32*	*0.3*	*29*	*3.4*	*0.02*	*0.3*		*0.07*	*150*
Pit 11	X122	3	0.009 R	0.009 UJ	0.003 J	0.009 R	0.009 UJ	0.028 U	0.009 R	0.009 UJ	0.009 R	0.007 J	0.009 UJ	0.009 UJ	0.009 UJ	0.004 J	0.009 UJ	0.004 J
Pit 11	X122RE	3	0.01 UJ	0.01 U	0.01 U	0.01 UJ	0.01 UJ	0.02 U	0.01 UJ	0.01 U	0.01 UJ	0.01 U	0.01 U	0.01 UJ	0.01 UJ	0.003 J	0.01 U	0.01 UJ
Pit 11	X123	8	0.01 UJ	0.01 UJ	0.006 J	0.01 UJ	0.01 UJ	0.025 U	0.01 UJ	0.01 UJ	0.01 UJ	0.004 J	0.01 UJ	0.01 UJ	0.01 UJ	0.001 J	0.01 UJ	0.01 UJ
Pit 11	X123RE	8	0.01 R	0.01 UJ	0.01 UJ	0.01 R	0.01 UJ	0.019 U	0.01 R	0.01 UJ	0.01 R	0.01 U	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 R
Pit 11	X125	30	0.01 R	0.01 UJ	0.005 J	0.01 R	0.003 J	0.028 U	0.01 R	0.01 UJ	0.002 J	0.008 J	0.01 UJ	0.01 R	0.01 R	0.002 J	0.01 UJ	0.008 J
Pit 11	X125RE	30	0.011 R	0.011 UJ	0.011 UJ	0.011 R	0.011 UJ	0.017 U	0.011 R	0.011 UJ	0.011 R	0.011 U	0.011 UJ	0.011 UJ	0.011 UJ	0.011 UJ	0.011 UJ	0.011 R
Pit 12	X127	3	0.092 J	0.014 U	0.17 J	0.014 UJ	0.32 J	0.014 U	0.014 UJ	0.014 U	0.014 UJ	0.009 J	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U	0.011 J
Pit 12	X127RE	3	0.048 J	0.016 UJ	0.075 J	0.016 UJ	0.13 J	0.018 U	0.016 UJ	0.016 U	0.016 UJ	0.009 J	0.016 U	0.016 U	0.016 U	0.004 J	0.016 U	0.005 J
Pit 12	X128	6	2.2 J	3.2 U	3.2 UJ	3.2 UJ	0.46 J	3.2 U	3.2 UJ	3.2 U	3.2 U	3.2 UJ	3.2 U	3.2 U	3.2 U	3.2 U	3.2 U	3.2 U
Pit 13	X129	3	0.011 UJ	0.011 UJ	0.018 J	0.011 U	0.003 J	0.011 U	0.011 UJ	0.011 U	0.011 U	0.003 J	0.011 U	0.011 U	0.011 U	0.003 J	0.011 U	0.005 J
Pit 13	X130	8	0.084 J	0.025 U	0.048 =	0.025 UJ	0.014 J	0.025 U	0.025 UJ	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.007 J
Pit 14	X131	3	0.16 J	0.029 UJ	0.026 J	0.029 U	0.052 J	0.033 U	0.029 UJ	0.029 U	0.029 U	0.012 J	0.029 U	0.029 U	0.029 U	0.029 U	0.029 U	0.11 J
Pit 14	X131DL	3	0.16 J	0.043 U	0.008 J	0.043 UJ	0.043 U	0.043 U	0.043 UJ	0.043 U	0.043 U	0.043 U	0.043 U	0.043 U	0.043 U	0.043 U	0.043 U	0.23 J
Pit 14	X132	8	0.039 J	0.019 UJ	0.069 J	0.019 U	0.012 J	0.028 U	0.019 UJ	0.019 U	0.019 U	0.007 J	0.019 U	0.019 U	0.019 U	0.019 U	0.019 U	0.012 J
Pit 15	X133	3	0.065 J	0.02 U	0.028 =	0.02 UJ	0.01 J	0.02 U	0.02 UJ	0.02 U	0.021 J	0.011 J	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.093 J
Pit 15	X133RE	3	0.05 J	0.019 U	0.078 =	0.019 UJ	0.016 J	0.019 U	0.019 UJ	0.019 U	0.006 J	0.019 U	0.019 U	0.019 U	0.002 J	0.019 U	0.019 U	0.027 J
Pit 15	X134	8	0.35 J	0.02 U	0.073 =	0.02 UJ	0.05 J	0.024 U	0.02 UJ	0.02 U	0.02 U	0.023 U	0.02 U	0.02 U	0.02 U	0.003 J	0.02 U	0.16 J
Pit 16	X135	3	0.003 J	0.016 UJ	0.016 J	0.016 U	0.027 J	0.016 U	0.016 UJ	0.016 U	0.016 U	0.002 J	0.016 U	0.016 U	0.016 U	0.003 J	0.016 U	0.016 UJ
Pit 16	X136	6	0.011 J	0.02 UJ	0.013 J	0.02 U	0.016 J	0.02 U	0.02 UJ	0.02 U	0.02 U	0.003 J	0.02 U	0.02 U	0.02 U	0.003 J	0.02 U	0.02 UJ
Pit 17	X137	3	0.012 UJ	0.012 UJ	0.022 J	0.012 U	0.002 J	0.012 U	0.012 UJ	0.012 U	0.012 U	0.002 J	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 UJ
Pit 17	X138	11	0.79 J	0.013 UJ	0.039 J	0.013 U	0.077 J	0.013 U	0.013 UJ	0.013 U	0.002 J	0.25 J	0.013 U	0.013 U	0.002 J	0.013 U	0.013 U	9.1 J
Pit 17	X138DL	11	0.49 J	1.6 U	1.6 U	1.6 UJ	1.6 UJ	1.6 U	1.6 UJ	1.6 UJ	1.6 UJ	0.16 J	1.6 UJ	1.6 UJ	1.6 UJ	1.6 UJ	1.6 UJ	12 J
Pit 18	X139	3	0.024 J	0.016 U	0.034 J	0.016 UJ	0.015 J	0.13 =	0.016 UJ	0.016 U	0.016 U	0.028 U	0.016 U	0.016 U	0.016 U	0.016 U	0.016 U	0.025 J
Pit 18	X140	10	0.003 J	0.016 UJ	0.02 J	0.016 U	0.016 U	0.016 U	0.016 UJ	0.016 U	0.005 J	0.004 J	0.016 U	0.016 U	0.016 U	0.016 U	0.016 U	0.012 J
Pit 19	X141	3	0.013 R	0.013 UJ	0.013 UJ	0.013 UJ	0.002 J	0.029 U	0.013 R	0.013 UJ	0.013 UJ	0.013 U	0.013 UJ	0.013 UJ	0.013 UJ	0.013 UJ	0.013 UJ	0.013 R
Pit 19	X142	14	0.3 J	0.018 U	0.032 =	0.018 U	0.33 =	0.018 U	0.018 UJ	0.018 U	0.018 U	0.018 U	0.018 U	0.018 U	0.018 U	0.018 U	0.018 U	0.04 J

Table E-6. VOCs in Unnamed Parcel (mg/kg)

Station ID	Sample ID	Depth (ft.)	Isopropylbenzene	Methyl acetate	Methyl ethyl ketone	Methyl isobutyl ketone	Methylcyclohexane	Methylene chloride	Styrene	Tert-Butyl Methyl Ether[1]	Tetrachloroethene	Toluene	trans-1,2-Dichloroethene	trans-1,3-Dichloropropene[2]	Trichloroethene	Trichlorofluoromethane	Vinyl chloride	Xylenes
Industrial/ Commercial		*Ing*						*760*	*410000*	*20000*	*110*	*410000*	*41000*	*33*	*520*		*3*	*1000000*
		Inh						*24*	*1500*	*8800*	*20*	*650*	*3100*	*0.23*	*8.9*		*0.06*	*410*
Construction Worker		*Ing*						*12000*	*41000*	*2000*	*2400*	*410000*	*41000*	*610*	*1200*		*65*	*410000*
		Inh						*34*	*430*	*140*	*28*	*42*	*3100*	*0.33*	*12*		*0.08*	*410*
Soil Component of GW		*I*						*0.02*	*4*	*0.32*	*0.06*	*12*	*0.7*	*0.004*	*0.06*		*0.01*	*150*
		II						*0.2*	*18*	*0.32*	*0.3*	*29*	*3.4*	*0.02*	*0.3*		*0.07*	*150*
Pit 20	X143	3	0.087 J	0.013 U	0.039 J	0.013 UJ	0.13 =	0.013 U	0.013 UJ	0.013 U	0.013 U	0.013 U	0.013 U	0.013 U	0.013 U	0.002 J	0.013 U	0.038 J
Pit 20	X144	3	0.082 J	0.015 UJ	0.045 J	0.015 U	0.1 =	0.015 U	0.015 UJ	0.015 U	0.015 U	0.012 J	0.015 U	0.015 U	0.015 U	0.015 U	0.015 U	0.02 J
Pit 20	X144RE	3	0.086 J	0.014 U	0.037 J	0.014 UJ	0.11 =	0.014 U	0.014 UJ	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U	0.033 J
Pit 20	X145	7	0.39 J	1.1 J	2.3 UJ	2.3 UJ	2.3 U	2.3 U	2.3 UJ	2.3 U	2.3 U	0.25 J	2.3 U	2.3 U	2.3 U	2.3 U	2.3 U	0.26 J
Pit 21	X146	3	2000 UJ	1100 J	2000 UJ	270 J	13000 =	2000 U	2000 UJ	2000 U	2000 U	8900 J	2000 U	2000 U	220 J	2000 U	2000 U	3000 J
Pit 21	X147	5	1500 UJ	1500 U	1500 UJ	270 J	4800 J	470 J	1500 UJ	1500 U	1500 U	7800 J	1500 U	1500 U	390 J	1500 U	1500 U	5600 J
Pit 21	X147RE	5	58 J	1500 U	1500 UJ	290 J	4400 J	460 J	1500 UJ	1500 U	1500 U	7200 J	1500 U	1500 U	360 J	1500 U	1500 U	5200 J
Pit 21	X148	10	1700 UJ	750 J	1300 J	480 J	3100 =	1900 U	1700 UJ	1700 U	1700 U	3900 J	1700 U	1700 U	460 J	1700 U	1700 U	3400 J
Pit 21	X148DL	10	3400 UJ	360 J	970 J	3400 UJ	3000 J	3400 U	3400 UJ	3400 UJ	3400 UJ	4200 J	3400 UJ	3400 UJ	390 J	3400 UJ	3400 UJ	3500 J
Pit 22	X160	3	0.018 UJ	0.018 U	0.018 U	0.018 U	0.018 U	0.018 U	0.018 UJ	0.018 U	0.002 J	0.018 U	0.018 U	0.018 U	0.018 U	0.004 J	0.018 U	0.018 UJ
Pit 22	X161	10	0.29 J	0.024 U	0.15 =	0.024 U	0.26 =	0.024 U	0.024 UJ	0.024 U	0.004 J	0.024 U	0.024 U	0.024 U	0.024 U	0.007 J	0.024 U	0.043 J
Pit 23	X158	3	0.043 J	0.019 U	0.063 J	0.005 J	0.088 J	0.019 U	0.019 UJ	0.019 U	0.019 U	0.024 U	0.019 U	0.019 U	0.019 U	0.019 U	0.019 U	0.019 U
Pit 23	X158RE	3	0.059 J	0.02 U	0.13 =	0.02 UJ	0.21 =	0.02 U	0.02 UJ	0.02 U	0.02 UJ	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.082 J
Pit 23	X159	10	0.1 J	0.019 U	0.059 J	0.007 J	0.091 J	0.019 U	0.019 UJ	0.019 U	0.019 U	0.049 U	0.019 U	0.019 U	0.019 U	0.019 U	0.019 U	0.043 J
Pit 23	X159RE	10	0.095 J	0.016 UJ	0.059 J	0.007 J	0.066 J	0.016 U	0.016 UJ	0.016 UJ	0.002 J	0.061 J	0.016 UJ	0.016 UJ	0.003 J	0.016 UJ	0.003 J	0.032 J
Pit 24	X156	3	0.027 UJ	0.027 U	0.038 J	0.027 UJ	0.027 U	0.027 U	0.027 UJ	0.027 U	0.027 U	0.029 U	0.027 U	0.027 U	0.027 U	0.027 U	0.027 U	0.027 U
Pit 24	X156RE	3	0.026 UJ	0.026 U	0.039 =	0.026 UJ	0.004 J	0.026 U	0.026 UJ	0.026 U	0.026 UJ	0.026 U	0.026 U	0.026 U	0.026 U	0.009 J	0.026 U	0.026 UJ
Pit 24	X157	8	0.27 J	0.032 U	0.093 J	0.032 UJ	0.19 J	0.032 U	0.032 UJ	0.032 U	0.032 U	0.041 U	0.032 U	0.032 U	0.032 U	0.032 U	0.032 U	0.073 J
Pit 24	X157RE	8	0.35 J	0.031 U	0.1 =	0.031 UJ	0.14 =	0.031 U	0.031 UJ	0.031 U	0.031 UJ	0.031 U	0.031 U	0.031 U	0.031 U	0.01 J	0.031 U	0.072 J
Pit 25	X154	3	0.097 J	0.011 U	0.022 J	0.011 UJ	0.061 =	0.011 U	0.011 UJ	0.011 U	0.011 U	0.016 U	0.011 U	0.011 U	0.011 U	0.002 J	0.011 U	0.52 J
Pit 25	X155	8	0.094 J	0.078 U	0.078 U	0.078 UJ	5.1 =	0.078 U	0.078 UJ	0.078 U	0.078 U	0.078 U	0.078 U	0.078 U	0.078 U	0.078 U	0.078 U	0.025 J
Pit 25	X155RE	8	2.1 R	0.88 J	1 J	0.5 J	2.1 UJ	2.1 U	2.1 R	2.1 UJ	2.1 UJ	2.1 R	2.1 UJ	2.1 UJ	2.1 UJ	2.1 UJ	2.1 UJ	0.28 J
Pit 26	X152	3	0.015 UJ	0.015 U	0.03 =	0.015 UJ	0.004 J	0.015 U	0.015 UJ	0.015 U	0.015 U	0.015 U	0.015 U	0.015 U	0.015 U	0.002 J	0.015 UJ	0.015 UJ
Pit 26	X153	6	0.026 UJ	0.026 U	0.019 J	0.005 J	0.026 U	0.026 U	0.026 UJ	0.026 U	0.026 U	0.026 U	0.026 U	0.026 U	0.026 U	0.006 J	0.026 U	0.026 U
Pit 27	X149	3	0.047 J	0.016 U	0.028 J	0.016 UJ	0.21 =	0.016 U	0.016 UJ	0.016 U	0.016 U	0.017 U	0.016 U	0.016 U	0.016 U	0.016 U	0.016 U	0.016 U
Pit 27	X149RE	3	0.016 J	0.016 U	0.097 J	0.016 UJ	0.032 J	0.016 U	0.016 UJ	0.016 U	0.016 UJ	0.016 U	0.016 U	0.016 U	0.016 U	0.006 J	0.016 U	0.01 J

Table E-6. VOCs in Unnamed Parcel (mg/kg)

Station ID	Sample ID	Depth (ft.)	Isopropylbenzene	Methyl acetate	Methyl ethyl ketone	Methyl isobutyl ketone	Methylcyclohexane	Methylene chloride	Styrene	Tert-Butyl Methyl Ether[1]	Tetrachloroethene	Toluene	trans-1,2-Dichloroethene	trans-1,3-Dichloropropene[2]	Trichloroethene	Trichlorofluoromethane	Vinyl chloride	Xylenes
Industrial/ Commercial		*Ing*						*760*	*410000*	*20000*	*110*	*410000*	*41000*	*33*	*520*		*3*	*1000000*
		Inh						*24*	*1500*	*8800*	*20*	*650*	*3100*	*0.23*	*8.9*		*0.06*	*410*
Construction Worker		*Ing*						*12000*	*41000*	*2000*	*2400*	*410000*	*41000*	*610*	*1200*		*65*	*410000*
		Inh						*34*	*430*	*140*	*28*	*42*	*3100*	*0.33*	*12*		*0.08*	*410*
Soil Component of GW		*I*						*0.02*	*4*	*0.32*	*0.06*	*12*	*0.7*	*0.004*	*0.06*		*0.01*	*150*
		II						*0.2*	*18*	*0.32*	*0.3*	*29*	*3.4*	*0.02*	*0.3*		*0.07*	*150*
Pit 27	X150	8	0.003 J	0.017 UJ	0.006 J	0.017 UJ	0.017 U	0.017 U	0.017 UJ	0.017 UJ	0.017 UJ	0.017 U	0.017 UJ	0.017 UJ	0.017 UJ	0.002 J	0.017 UJ	0.028 J
Pit 27	X150RE	8	0.015 UJ	0.015 U	0.015 U	0.015 UJ	0.01 J	0.015 U	0.015 UJ	0.015 U	0.015 UJ	0.015 U	0.015 U	0.015 U	0.015 U	0.002 J	0.015 U	0.007 J
Pit 27	X151	30	0.05 J	0.018 U	0.016 J	0.018 UJ	0.039 =	0.018 U	0.018 UJ	0.018 U	0.018 U	0.021 U	0.018 U	0.018 U	0.018 U	0.018 U	0.018 U	0.24 J
Pit 28	X175	3	0.006 J	0.013 U	0.008 J	0.013 U	0.013 U	0.013 U	0.013 UJ	0.013 U	0.013 U	0.013 U	0.013 U	0.013 U	0.013 U	0.005 J	0.013 U	0.013 U
Pit 28	X176	6	0.026 J	0.014 U	0.17 =	0.37 =	0.027 =	0.014 U	0.014 UJ	0.014 U	0.009 J	0.83 J	0.014 U	0.014 U	0.001 J	0.007 J	0.014 U	2.3 J
Pit 28	X176DL	6	0.033 J	0.057 J	0.2 =	0.27 =	0.08 =	0.066 U	0.066 UJ	0.066 U	0.018 J	0.64 J	0.066 U	0.066 U	0.066 U	0.066 U	0.066 U	1.7 J
Pit 29	X173	3	0.018 R	0.018 UJ	0.018 UJ	0.018 UJ	0.011 J	0.046 U	0.018 R	0.018 UJ	0.018 UJ	0.018 U	0.018 UJ	0.018 UJ	0.018 UJ	0.018 UJ	0.018 UJ	0.085 J
Pit 29	X173DL	3	0.091 R	0.091 UJ	0.091 UJ	0.091 UJ	0.018 J	0.091 U	0.091 R	0.091 UJ	0.091 UJ	0.091 U	0.091 UJ	0.091 UJ	0.091 UJ	0.091 UJ	0.091 UJ	0.082 J
Pit 29	X174	10	0.015 J	0.023 UJ	0.017 J	0.023 UJ	0.005 J	0.06 U	0.023 R	0.023 UJ	0.023 UJ	0.023 U	0.023 UJ	0.023 UJ	0.023 UJ	0.023 UJ	0.023 UJ	0.023 R
Pit 30	X171	3	0.016 UJ	0.016 U	0.003 J	0.016 U	0.016 U	0.016 U	0.016 UJ	0.016 U	0.017 =	0.016 U	0.016 U	0.016 U	0.002 J	0.007 J	0.016 U	0.016 U
Pit 30	X172	7.5	0.53 J	0.017 U	0.027 =	0.017 U	0.054 =	0.017 U	0.017 UJ	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.002 J	0.017 U	0.017 U
Pit 30	X172DL	7.5	0.47 J	0.023 J	0.053 J	0.081 U	0.056 J	0.081 U	0.081 UJ	0.081 U	0.081 U	0.081 U	0.081 U	0.081 U	0.081 U	0.081 U	0.081 U	0.029 J
Pit 31	X169	2.5	0.024 UJ	0.024 U	0.069 J	0.024 UJ	0.024 U	0.024 U	0.024 UJ	0.024 U	0.005 J	0.031 U	0.024 U	0.024 U	0.024 U	0.024 U	0.024 U	0.024 U
Pit 31	X170	6	0.24 J	0.025 U	0.076 J	0.004 J	0.029 J	0.025 U	0.025 UJ	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.011 J	0.025 U	0.025 U
Pit 31	X170RE	6	1.2 J	0.029 U	0.32 =	0.029 U	0.034 =	0.029 U	0.029 UJ	0.029 U	0.029 U	0.029 U	0.029 U	0.029 U	0.029 U	0.029 U	0.029 U	0.024 J
Pit 32	X167	3	0.013 UJ	0.013 U	0.057 =	0.013 U	0.013 U	0.013 U	0.013 UJ	0.013 U	0.013 U	0.013 U	0.013 U	0.013 U	0.013 U	0.003 J	0.013 U	0.013 UJ
Pit 32	X167RE	3	0.013 R	0.013 UJ	0.008 J	0.013 UJ	0.013 UJ	0.055 U	0.013 R	0.013 UJ	0.013 UJ	0.013 U	0.013 UJ	0.013 UJ	0.013 UJ	0.013 UJ	0.013 UJ	0.013 R
Pit 32	X168	6	0.004 J	0.012 U	0.012 =	0.012 UJ	0.006 J	0.012 U	0.012 UJ	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.002 J	0.012 UJ	0.012 UJ
Pit 33	X165	3	0.003 J	0.013 U	0.068 =	0.013 U	0.013 U	0.013 U	0.013 UJ	0.013 U	0.013 U	0.013 U	0.013 U	0.013 U	0.013 U	0.005 J	0.013 U	0.02 J
Pit 33	X165RE	3	0.013 UJ	0.013 U	0.013 U	0.013 U	0.013 U	0.062 U	0.013 UJ	0.013 U	0.013 U	0.013 U	0.013 U	0.013 U	0.013 U	0.013 UJ	0.013 UJ	0.006 J
Pit 33	X166	7	0.84 J	0.79 J	0.88 J	2.6 UJ	2.6 U	0.39 J	2.6 UJ	2.6 U	2.6 U	0.42 J	2.6 U	2.6 U	2.6 U	2.6 U	2.6 U	19 J
Pit 34	X162	3	0.012 UJ	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 UJ	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.003 J	0.012 U	0.012 UJ
Pit 34	X163	10	0.12 J	0.023 U	0.063 =	0.023 U	0.023 U	0.023 U	0.023 UJ	0.023 U	0.023 U	0.023 U	0.023 U	0.023 U	0.023 U	0.023 U	0.023 U	0.026 U
Pit 34	X164	30	0.51 J	0.77 J	0.53 J	2.6 UJ	2.6 U	2.6 U	2.6 UJ	2.6 U	2.6 U	1.1 J	2.6 U	2.6 U	2.6 U	2.6 U	2.6 U	5.8 J
Pit 35	X185	4	0.013 UJ	0.013 U	0.006 J	0.013 U	0.002 J	0.013 U	0.013 UJ	0.013 U	0.013 U	0.013 U	0.013 U	0.013 U	0.013 U	0.013 UJ	0.013 U	0.013 UJ
Pit 35	X186	10	0.011 J	0.015 U	0.029 J	0.015 U	0.007 J	0.015 J	0.015 UJ	0.015 U	0.015 U	0.015 U	0.015 U	0.015 U	0.015 U	0.015 UJ	0.015 U	0.015 UJ

Table E-6. VOCs in Unnamed Parcel (mg/kg)

Station ID	Sample ID	Depth (ft.)	Isopropylbenzene	Methyl acetate	Methyl ethyl ketone	Methyl isobutyl ketone	Methylcyclohexane	Methylene chloride	Styrene	Tert-Butyl Methyl Ether[1]	Tetrachloroethene	Toluene	trans-1,2-Dichloroethene	trans-1,3-Dichloropropene[2]	Trichloroethene	Trichlorofluoromethane	Vinyl chloride	Xylenes
Industrial/ Commercial		*Ing*						*760*	*410000*	*20000*	*110*	*410000*	*41000*	*33*	*520*		*3*	*1000000*
		Inh						*24*	*1500*	*8800*	*20*	*650*	*3100*	*0.23*	*8.9*		*0.06*	*410*
Construction Worker		*Ing*						*12000*	*41000*	*2000*	*2400*	*410000*	*41000*	*610*	*1200*		*65*	*410000*
		Inh						*34*	*430*	*140*	*28*	*42*	*3100*	*0.33*	*12*		*0.08*	*410*
Soil Component of GW		*I*						*0.02*	*4*	*0.32*	*0.06*	*12*	*0.7*	*0.004*	*0.06*		*0.01*	*150*
		II						*0.2*	*18*	*0.32*	*0.3*	*29*	*3.4*	*0.02*	*0.3*		*0.07*	*150*
Pit 36	X183	3	0.017 UJ	0.017 U	0.027 =	0.017 U	0.004 J	0.017 U	0.017 UJ	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.005 J	0.017 U	0.017 UJ
Pit 36	X184	6	0.011 J	0.014 U	0.024 =	0.014 U	0.016 =	0.014 U	0.014 UJ	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U	0.002 J	0.014 U	0.025 J
Pit 37	X181	4	0.02 J	0.025 U	0.055 =	0.025 U	0.038 =	0.025 U	0.025 UJ	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.005 J
Pit 37	X182	13	0.061 J	0.023 U	0.048 =	0.023 U	0.007 J	0.023 U	0.023 UJ	0.023 U	0.023 U	0.023 U	0.023 U	0.023 U	0.023 U	0.003 J	0.023 U	0.017 J
Pit 38	X179	4	0.05 J	0.042 U	0.024 J	0.042 U	0.05 =	0.042 U	0.042 UJ	0.042 U	0.042 U	0.042 U	0.042 U	0.042 U	0.042 U	0.042 U	0.042 U	0.25 J
Pit 38	X180	6.5	0.063 J	0.025 U	0.064 =	0.025 U	0.13 =	0.025 U	0.025 UJ	0.025 U	0.025 U	0.044 J	0.025 U	0.025 U	0.025 U	0.003 J	0.025 U	0.042 J
Pit 39	X177	3	0.42 J	0.064 R	1 J	0.064 R	0.2 J	0.064 U	0.064 R	0.064 R	0.064 R	0.064 U	0.064 R	0.064 R	0.064 R	0.01 J	0.064 R	0.03 J
Pit 39	X177DL	3	0.24 J	0.27 R	0.43 J	0.27 R	0.21 J	0.27 U	0.27 R	0.27 R	0.27 R	0.27 R	0.27 R	0.27 R	0.27 R	0.27 R	0.27 R	0.27 R
Pit 39	X178	8	1.2 J	0.41 J	1.3 UJ	1.3 UJ	0.56 J	1.3 U	1.3 UJ	1.3 U	1.3 U	0.27 J	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	2.6 J
Pit 42	X124	3	0.01 UJ	0.01 U	0.01 U	0.01 UJ	0.01 UJ	0.01 U	0.01 UJ	0.01 U	0.01 UJ	0.01 U	0.01 U	0.01 UJ	0.01 UJ	0.001 J	0.01 U	0.01 UJ
Pit 42	X126	12	0.009 R	0.009 UJ	0.003 J	0.009 R	0.009 UJ	0.026 U	0.009 R	0.009 UJ	0.009 R	0.004 J	0.009 UJ	0.009 UJ	0.009 UJ	0.002 J	0.009 UJ	0.009 R
Pit 42	X126RE	12	0.01 R	0.01 UJ	0.01 UJ	0.01 R	0.01 UJ	0.025 U	0.01 R	0.01 UJ	0.01 R	0.01 U	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 R

Notes:

=: sample concentration is detected at level reported
U: sample concentration is under detection limit
J: sample concentration is estimated value
R: sample concentration value is rejected
DL: sample is diluted
RE: sample is re-extracted
Ing.: Ingestion
Inh.: Inhalation
I: Class I
II: Class II

[1]Values in the proposed rules.

[2]TACO RO values shown for 1,3-dichloropropene are the combined values for cis and trans.

Table E-7. SVOCs in Alburn (mg/kg)

Station ID	Sample ID	Depth (ft.)	2,2'-Oxybis (1-Chloro) Propane	2,4,5-Trichlorophenol	2,4,6-Trichlorophenol	2,4-Dichlorophenol	2,4-Dimethylphenol	2,4-Dinitrophenol	2,4-Dinitrotoluene	2,6-Dinitrotoluene	2-Chloronaphthalene	2-Chlorophenol	2-Methylnaphthalene	2-Methylphenol	2-Nitroaniline	2-Nitrophenol	3,3'-Dichlorobenzidine	3-Nitroaniline	4,6-Dinitro-2-methylphenol
Industrial/ Commercial		*Ing*		*200000*	*520*	*6100*	*41000*	*4100*	*8.4*	*8.4*		*10000*	*61000*	*100000*			*13*		
		Inh			*390*							*53000*							
Construction Worker		*Ing*		*200000*	*11000*	*610*	*41000*	*410*	*180*	*180*		*10000*	*61000*	*100000*			*280*		
		Inh			*540*							*53000*							
Soil Component of GW		*I*		*270*	*0.2*	*1*	*9*	*0.2*	*0.0008*	*0.0007*		*4*	*29*	*15*			*0.007*		
		II		*1400*	*0.77*	*1*	*9*	*0.2*	*0.0008*	*0.0007*		*4*	*145*	*15*			*0.033*		
Pit 01	X101	2.5	0.37 UJ	0.94 U	0.37 U	0.37 U	0.37 U	0.94 U	0.37 U	0.37 U	0.37 U	0.37 U	0.58 =	0.37 U	0.94 U	0.37 U	0.37 U	0.94 U	0.94 U
Pit 01	X101DL	2.5	1.5 U	3.8 U	1.5 U	1.5 U	1.5 U	3.8 U	1.5 U	1.5 U	1.5 U	1.5 U	0.59 J	1.5 U	3.8 U	1.5 U	1.5 U	3.8 U	3.8 U
Pit 01	X102	7.5	0.38 U	0.96 U	0.38 U	0.38 U	0.38 U	0.96 U	0.38 U	0.38 U	0.38 U	0.38 U	1.2 =	0.38 U	0.96 U	0.38 U	0.38 U	0.96 U	0.96 U
Pit 01	X102DL	7.5	3.8 U	9.6 U	3.8 U	3.8 U	3.8 U	9.6 U	3.8 U	3.8 U	3.8 U	3.8 U	1.2 J	3.8 U	9.6 U	3.8 U	3.8 U	9.6 U	9.6 U
Pit 01B	X101	3	0.4 UJ	1 U	0.4 U	0.4 U	0.2 J	1 UJ	0.4 U	0.4 U	0.4 U	0.4 U	0.15 J	0.18 J	1 U	0.4 U	0.4 U	1 U	1 UJ
Pit 01B	X102	6	0.44 UJ	1.1 U	0.44 U	0.44 U	0.44 U	1.1 UJ	0.44 U	0.44 U	0.44 U	0.44 U	3.5 =	0.44 U	1.1 U	0.44 U	0.44 U	1.1 U	1.1 UJ
Pit 02	X103	2	0.48 UJ	1.2 U	0.48 U	0.48 U	0.48 U	1.2 U	0.48 U	0.48 U	0.48 U	0.48 U	0.48 U	0.48 U	1.2 U	0.48 U	0.48 U	1.2 U	1.2 U
Pit 02	X104	6	0.41 UJ	1 UJ	0.41 UJ	0.41 UJ	0.41 UJ	1 UJ	0.41 U	0.41 U	0.41 U	0.41 UJ	1.8 =	0.41 UJ	1 U	0.41 UJ	0.41 U	1 U	1 UJ
Pit 02	X104RE	6	0.43 U	1.1 R	0.43 R	0.43 R	0.43 R	1.1 R	0.43 U	0.43 U	0.43 U	0.43 R	2.8 =	0.43 R	1.1 U	0.43 R	0.43 UJ	1.1 U	1.1 R
Pit 03	X105	2.5	0.5 UJ	1.3 UJ	0.5 UJ	0.5 UJ	0.5 UJ	1.3 UJ	0.5 U	0.5 U	0.5 U	0.5 UJ	0.041 J	0.5 UJ	1.3 U	0.5 UJ	0.5 U	1.3 U	1.3 UJ
Pit 03	X105RE	2.5	0.54 U	1.4 UJ	0.54 UJ	0.54 UJ	0.54 UJ	1.4 UJ	0.54 U	0.54 U	0.54 U	0.54 UJ	0.073 J	0.54 UJ	1.4 U	0.54 UJ	0.54 UJ	1.4 U	1.4 UJ
Pit 03	X106	0.5	0.57 UJ	1.4 U	0.57 U	0.57 U	0.57 U	1.4 U	0.57 U	0.57 U	0.57 U	0.57 U	0.15 J	0.57 U	1.4 U	0.57 U	0.57 U	1.4 U	1.4 U
Pit 03	X107	6	0.56 UJ	1.4 U	0.56 U	0.56 U	0.56 U	1.4 U	0.56 U	0.56 U	0.56 U	0.56 U	5.4 =	0.56 U	1.4 U	0.56 U	0.56 U	1.4 U	1.4 U
Pit 03	X107DL	6	2.8 U	7.1 U	2.8 U	2.8 U	2.8 U	7.1 U	2.8 U	2.8 U	2.8 U	2.8 U	6.4 =	2.8 U	7.1 U	2.8 U	2.8 U	7.1 U	7.1 U
Pit 04	X108	3	0.37 UJ	0.94 U	0.37 U	0.37 U	0.37 U	0.94 U	0.37 U	0.37 U	0.37 U	0.37 U	0.028 J	0.37 U	0.94 U	0.37 U	0.37 U	0.94 U	0.94 U
Pit 04	X109	3	0.37 UJ	0.94 U	0.37 U	0.37 U	0.37 U	0.94 U	0.37 U	0.37 U	0.37 U	0.37 U	0.028 J	0.37 U	0.94 U	0.37 U	0.37 U	0.94 U	0.94 U
Pit 04	X110	6	8.9 U	22 U	8.9 U	8.9 U	8.9 U	22 U	8.9 U	8.9 U	8.9 U	8.9 U	30 =	8.9 U	22 U	8.9 U	8.9 U	22 U	22 U
Pit 05	X111	5	0.39 U	0.97 U	0.39 U	0.39 U	0.39 U	0.97 UJ	0.39 U	0.39 U	0.39 U	0.39 U	0.1 J	0.39 U	0.97 U	0.39 U	0.39 UJ	0.97 U	0.97 U
Pit 07	X112	3	0.39 U	0.99 U	0.39 U	0.39 U	0.39 U	0.99 UJ	0.39 U	0.39 U	0.39 U	0.39 U	0.44 =	0.39 U	0.99 U	0.39 U	0.39 UJ	0.99 U	0.99 U
Pit 07	X112DL	3	2 U	5 U	2 U	2 U	2 U	5 UJ	2 U	2 U	2 U	2 U	0.39 J	2 U	5 U	2 U	2 UJ	5 U	5 U
Pit 08	X113	2.5	0.39 U	0.98 U	0.39 U	0.39 U	0.39 U	0.98 UJ	0.39 U	0.39 U	0.39 U	0.39 U	0.4 =	0.39 U	0.98 U	0.39 U	0.39 UJ	0.98 U	0.98 U
Pit 08	X113RE	2.5	0.39 UJ	0.98 UJ	0.39 UJ	0.39 UJ	0.39 UJ	0.98 UJ	0.39 UJ	0.39 UJ	0.39 UJ	0.39 UJ	0.41 J	0.39 UJ	0.98 UJ	0.39 UJ	0.39 UJ	0.98 UJ	0.98 UJ
Pit 08	X114	4	0.36 UJ	0.9 U	0.36 U	0.36 U	0.36 U	0.9 U	0.36 U	0.36 U	0.36 U	0.36 U	0.75 =	0.36 U	0.9 U	0.36 U	0.36 U	0.9 U	0.9 U
Pit 08	X114DL	4	0.72 UJ	1.8 U	0.72 U	0.72 U	0.72 U	1.8 U	0.72 U	0.72 U	0.72 U	0.72 U	0.67 J	0.72 U	1.8 U	0.72 U	0.72 U	1.8 U	1.8 U
Pit 09	X115	2.5	0.35 U	0.87 U	0.35 U	0.35 U	0.35 U	0.87 U	0.35 U	0.35 U	0.35 U	0.35 U	0.066 J	0.35 U	0.87 U	0.35 U	0.35 UJ	0.87 U	0.87 U
Pit 09	X115DL	2.5	1.4 U	3.5 U	1.4 U	1.4 U	1.4 U	3.5 U	1.4 U	1.4 U	1.4 U	1.4 U	0.074 J	1.4 U	3.5 U	1.4 U	1.4 U	3.5 U	3.5 U
Pit 09	X115RE	2.5	0.35 U	0.87 U	0.35 U	0.35 U	0.35 U	0.87 UJ	0.35 U	0.35 U	0.35 U	0.35 U	0.07 J	0.35 U	0.87 U	0.35 U	0.35 UJ	0.87 U	0.87 UJ

Table E-7. SVOCs in Alburn (mg/kg)

Station ID	Sample ID	Depth (ft.)	2,2'-Oxybis (1-Chloro) Propane	2,4,5-Trichlorophenol	2,4,6-Trichlorophenol	2,4-Dichlorophenol	2,4-Dimethylphenol	2,4-Dinitrophenol	2,4-Dinitrotoluene	2,6-Dinitrotoluene	2-Chloronaphthalene	2-Chlorophenol	2-Methylnaphthalene	2-Methylphenol	2-Nitroaniline	2-Nitrophenol	3,3'-Dichlorobenzidine	3-Nitroaniline	4,6-Dinitro-2-methylphenol
Industrial/ Commercial		*Ing*		*200000*	*520*	*6100*	*41000*	*4100*	*8.4*	*8.4*		*10000*	*61000*	*100000*			*13*		
		Inh			*390*							*53000*							
Construction Worker		*Ing*		*200000*	*11000*	*610*	*41000*	*410*	*180*	*180*		*10000*	*61000*	*100000*			*280*		
		Inh			*540*							*53000*							
Soil Component of GW		*I*		*270*	*0.2*	*1*	*9*	*0.2*	*0.0008*	*0.0007*		*4*	*29*	*15*			*0.007*		
		II		*1400*	*0.77*	*1*	*9*	*0.2*	*0.0008*	*0.0007*		*4*	*145*	*15*			*0.033*		
Pit 09	X116	6	0.43 U	1.1 UJ	0.43 UJ	0.43 U	0.27 J	1.1 UJ	0.43 UJ	0.43 UJ	0.43 UJ	0.43 U	0.5 =	0.16 J	1.1 UJ	0.43 U	0.43 UJ	1.1 UJ	1.1 UJ
Pit 09	X116DL	6	1.7 U	4.3 UJ	1.7 UJ	1.7 U	0.16 J	4.3 UJ	1.7 UJ	1.7 UJ	1.7 UJ	1.7 U	0.47 J	0.14 J	4.3 UJ	1.7 U	1.7 UJ	4.3 UJ	4.3 UJ
Pit 09	X116RE	6	0.43 U	1.1 U	0.43 U	0.43 U	0.26 J	1.1 UJ	0.43 U	0.43 U	0.43 U	0.43 U	0.6 =	0.18 J	1.1 U	0.43 U	0.43 UJ	1.1 U	1.1 U
Pit 10	X117	2.5	0.39 U	0.97 UJ	0.39 UJ	0.39 U	0.39 U	0.97 UJ	0.39 UJ	0.39 UJ	0.39 UJ	0.39 U	0.88 =	0.39 U	0.97 UJ	0.39 U	0.39 UJ	0.97 UJ	0.97 UJ
Pit 10	X117DL	2.5	1.5 U	3.9 UJ	1.5 UJ	1.5 U	1.5 U	3.9 UJ	1.5 UJ	1.5 UJ	1.5 UJ	1.5 U	0.81 J	1.5 U	3.9 UJ	1.5 U	1.5 UJ	3.9 UJ	3.9 UJ
Pit 10	X117RE	2.5	0.39 U	0.97 U	0.39 U	0.39 U	0.39 U	0.97 UJ	0.39 U	0.39 U	0.39 U	0.39 U	1 =	0.39 U	0.97 U	0.39 U	0.39 UJ	0.97 U	0.97 U
Pit 10	X118	6	0.5 U	1.3 U	0.5 U	0.5 U	0.5 U	1.3 U	0.5 U	0.5 U	0.5 U	0.5 U	0.67 =	0.5 U	1.3 U	0.5 U	0.5 UJ	1.3 U	1.3 UJ
Pit 10	X118DL	6	2 U	5 U	2 U	2 U	2 U	5 U	2 U	2 U	2 U	2 U	0.6 J	2 U	5 U	2 U	2 UJ	5 U	5 U
Pit 10	X118RE	6	0.5 U	1.3 U	0.5 U	0.5 U	0.5 U	1.3 UJ	0.5 U	0.5 U	0.5 U	0.5 U	0.74 =	0.5 U	1.3 U	0.5 U	0.5 UJ	1.3 U	1.3 U
Pit 11	X119	2.5	0.39 U	0.97 U	0.39 U	0.39 U	0.41 =	0.97 U	0.39 U	0.39 U	0.39 U	0.39 U	1.6 =	0.21 J	0.97 U	0.39 U	0.39 UJ	0.97 U	0.97 U
Pit 11	X119DL	2.5	1.9 U	4.9 U	1.9 U	1.9 U	0.56 J	4.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.5 J	0.17 J	4.9 U	1.9 U	1.9 UJ	4.9 U	4.9 UJ
Pit 11	X119RE	2.5	0.39 U	0.97 U	0.39 U	0.39 U	0.37 J	0.97 UJ	0.39 U	0.39 U	0.39 U	0.39 U	1.8 =	0.25 J	0.97 U	0.39 U	0.39 UJ	0.97 U	0.97 U
Pit 11	X120	6	0.44 U	1.1 UJ	0.44 UJ	0.44 U	1.1 =	1.1 UJ	0.44 UJ	0.44 UJ	0.44 UJ	0.44 U	1.3 =	0.21 J	1.1 UJ	0.44 U	0.44 UJ	1.1 UJ	1.1 UJ
Pit 11	X120DL	6	1.8 U	4.4 UJ	1.8 UJ	1.8 UJ	0.96 J	4.4 UJ	1.8 UJ	1.8 UJ	1.8 UJ	1.8 U	1.4 J	1.8 U	4.4 UJ	1.8 UJ	1.8 UJ	4.4 UJ	4.4 UJ
Pit 11	X120RE	6	0.44 U	1.1 U	0.44 U	0.44 U	1.1 =	1.1 UJ	0.44 U	0.44 U	0.44 U	0.44 U	1.6 =	0.23 J	1.1 U	0.44 U	0.44 UJ	1.1 U	1.1 U
Pit 12	X159	3	4.7 U	12 U	4.7 U	4.7 U	4.7 U	12 U	4.7 U	4.7 U	4.7 U	4.7 U	5.7 =	4.7 U	12 U	4.7 U	4.7 U	12 U	12 U
Pit 12	X160	3	0.47 U	1.2 U	0.47 U	0.47 UJ	0.47 UJ	1.2 U	0.47 U	0.47 U	0.47 U	0.47 U	4 J	0.47 U	1.2 U	0.47 UJ	0.47 UJ	1.2 U	1.2 UJ
Pit 12	X160DL	3	2.3 U	5.9 U	2.3 U	2.3 U	2.3 U	5.9 U	2.3 U	2.3 U	2.3 U	2.3 U	3.4 =	2.3 U	5.9 U	2.3 U	2.3 UJ	5.9 U	5.9 U
Pit 12	X160RE	3	0.47 UJ	1.2 UJ	0.47 UJ	0.47 UJ	0.47 UJ	1.2 UJ	0.47 UJ	0.47 UJ	0.47 UJ	0.47 UJ	3.5 J	0.47 UJ	1.2 UJ	0.47 UJ	0.47 UJ	1.2 UJ	1.2 UJ
Pit 12	X161	9	0.4 U	1 U	0.4 U	0.4 U	0.4 U	1 U	0.4 U	0.4 U	0.4 U	0.4 U	0.13 J	0.4 U	1 U	0.4 U	0.4 U	1 U	1 U
Pit 13	X145	3	0.36 U	0.9 U	0.36 U	0.36 U	0.36 U	0.9 UJ	0.36 U	0.36 U	0.36 U	0.36 U	0.15 J	0.36 U	0.9 U	0.36 U	0.36 UJ	0.9 U	0.9 U
Pit 13	X145RE	3	0.36 U	0.9 U	0.36 U	0.36 U	0.36 U	0.9 UJ	0.36 U	0.36 U	0.36 U	0.36 U	0.12 J	0.36 U	0.9 U	0.36 U	0.36 UJ	0.9 UJ	0.9 UJ
Pit 13	X146	9	4.2 U	10 U	4.2 U	4.2 U	0.22 J	10 UJ	4.2 U	4.2 U	4.2 U	4.2 U	0.35 J	4.2 U	10 U	4.2 U	4.2 U	10 UJ	10 UJ
Pit 14	X147	3	0.43 U	1.1 U	0.43 U	0.43 U	0.12 J	1.1 U	0.43 U	0.43 U	0.43 U	0.43 U	0.28 J	0.43 U	1.1 U	0.43 U	0.43 R	1.1 U	1.1 UJ
Pit 14	X147RE	3	0.43 U	1.1 U	0.43 U	0.43 U	0.43 U	1.1 UJ	0.43 U	0.43 U	0.43 U	0.43 U	0.26 J	0.43 U	1.1 U	0.43 U	0.43 R	1.1 U	1.1 UJ
Pit 14	X148	9	4.3 U	11 U	4.3 U	4.3 U	51 =	11 UJ	4.3 U	4.3 U	4.3 U	4.3 U	1 J	4.3 U	11 U	4.3 U	4.3 UJ	11 U	11 U
Pit 14	X148DL	9	8.6 U	22 U	8.6 U	8.6 U	49 =	22 UJ	8.6 U	8.6 U	8.6 U	8.6 U	0.82 J	8.6 U	22 U	8.6 U	8.6 U	22 UJ	22 UJ

Table E-7. SVOCs in Alburn (mg/kg)

Station ID	Sample ID	Depth (ft.)	2,2'-Oxybis (1-Chloro) Propane	2,4,5-Trichlorophenol	2,4,6-Trichlorophenol	2,4-Dichlorophenol	2,4-Dimethylphenol	2,4-Dinitrophenol	2,4-Dinitrotoluene	2,6-Dinitrotoluene	2-Chloronaphthalene	2-Chlorophenol	2-Methylnaphthalene	2-Methylphenol	2-Nitroaniline	2-Nitrophenol	3,3'-Dichlorobenzidine	3-Nitroaniline	4,6-Dinitro-2-methylphenol
Industrial/		*Ing*		*200000*	*520*	*6100*	*41000*	*4100*	*8.4*	*8.4*		*10000*	*61000*	*100000*			*13*		
Commercial		*Inh*			*390*							*53000*							
Construction		*Ing*		*200000*	*11000*	*610*	*41000*	*410*	*180*	*180*		*10000*	*61000*	*100000*			*280*		
Worker		*Inh*			*540*							*53000*							
Soil Component		*I*		*270*	*0.2*	*1*	*9*	*0.2*	*0.0008*	*0.0007*		*4*	*29*	*15*			*0.007*		
of GW		*II*		*1400*	*0.77*	*1*	*9*	*0.2*	*0.0008*	*0.0007*		*4*	*145*	*15*			*0.033*		
Pit 14	X148RE	9	4.3 U	11 U	4.3 U	4.3 U	48 =	11 UJ	4.3 U	4.3 U	4.3 U	4.3 U	0.94 J	4.3 U	11 U	4.3 U	4.3 U	11 UJ	11 UJ
Pit 15	X121	3	0.45 U	1.1 U	0.45 U	0.45 U	0.45 U	1.1 U	0.45 U	0.45 U	0.45 U	0.45 U	0.048 J	0.45 U	1.1 U	0.45 U	0.45 U	1.1 U	1.1 U
Pit 16	X142	3	0.44 U	1.1 U	0.44 U	0.44 U	0.44 U	1.1 UJ	0.44 U	0.44 U	0.44 U	0.44 U	0.1 J	0.44 U	1.1 U	0.44 U	0.44 R	1.1 U	1.1 U
Pit 16	X142DL	3	1.8 U	4.4 U	1.8 U	1.8 U	1.8 U	4.4 UJ	1.8 U	1.8 U	1.8 U	1.8 U	0.11 J	1.8 U	4.4 U	1.8 U	1.8 U	4.4 UJ	4.4 UJ
Pit 16	X142RE	3	0.44 U	1.1 U	0.44 U	0.44 U	0.44 U	1.1 UJ	0.44 U	0.44 U	0.44 U	0.44 U	0.1 J	0.44 U	1.1 U	0.44 U	0.44 UJ	1.1 UJ	1.1 UJ
Pit 16	X143	3	0.4 U	1 U	0.4 U	0.4 U	0.4 U	1 UJ	0.4 U	0.4 U	0.4 U	0.4 U	0.08 J	0.4 U	1 U	0.4 U	0.4 R	1 U	1 U
Pit 16	X143DL	3	0.8 U	2 U	0.8 U	0.8 U	0.8 U	2 UJ	0.8 U	0.8 U	0.8 U	0.8 U	0.064 J	0.8 U	2 U	0.8 U	0.8 U	2 UJ	2 UJ
Pit 16	X144	9	0.85 U	2.1 UJ	0.85 UJ	0.85 U	0.85 U	2.1 UJ	0.85 UJ	0.85 UJ	0.85 UJ	0.85 U	8 =	0.062 J	2.1 UJ	0.85 U	0.85 R	2.1 UJ	2.1 R
Pit 16	X144DL	9	4.3 U	11 U	4.3 U	4.3 U	4.3 U	11 UJ	4.3 U	4.3 U	4.3 U	4.3 U	8.6 =	4.3 U	11 U	4.3 U	4.3 R	11 U	11 U
Pit 16	X144RE	9	0.85 U	2.1 UJ	0.85 UJ	0.85 U	0.85 U	2.1 UJ	0.85 UJ	0.85 UJ	0.85 UJ	0.85 U	7.4 J	0.85 U	2.1 UJ	0.85 U	0.85 UJ	2.1 UJ	2.1 UJ
Pit 17	X122	3	0.67 U	1.7 U	0.67 U	0.67 U	0.67 U	1.7 U	0.67 U	0.67 U	0.67 U	0.67 U	0.67 U	0.67 U	1.7 U	0.67 U	0.67 U	1.7 U	1.7 U
Pit 17	X123	6	0.58 U	1.4 U	0.58 U	0.58 U	0.58 U	1.4 UJ	0.58 U	0.58 U	0.58 U	0.58 U	5.4 =	0.58 U	1.4 U	0.58 U	0.58 U	1.4 U	1.4 U
Pit 17	X123DL	6	2.9 UJ	7.2 U	2.9 U	2.9 U	2.9 U	7.2 U	2.9 U	2.9 U	2.9 U	2.9 U	6 =	2.9 U	7.2 U	2.9 U	2.9 U	7.2 U	7.2 U
Pit 18	X124	3	0.45 U	1.1 U	0.45 U	0.45 U	0.45 U	1.1 UJ	0.45 U	0.45 U	0.45 U	0.45 U	0.27 J	0.45 U	1.1 U	0.45 U	0.45 U	1.1 U	1.1 U
Pit 18	X124DL	3	0.9 UJ	2.3 U	0.9 U	0.9 U	0.9 U	2.3 U	0.9 U	0.9 U	0.9 U	0.9 U	0.24 J	0.9 U	2.3 U	0.9 U	0.9 U	2.3 U	2.3 U
Pit 18	X125	6	0.45 U	1.1 U	0.45 U	0.45 U	0.45 U	1.1 UJ	0.45 U	0.45 U	0.45 U	0.45 U	1 =	0.14 J	1.1 U	0.45 U	0.45 U	1.1 U	1.1 U
Pit 18	X125DL	6	2.3 UJ	5.7 U	2.3 U	2.3 U	2.3 U	5.7 U	2.3 U	2.3 U	2.3 U	2.3 U	0.63 J	2.3 U	5.7 U	2.3 U	2.3 U	5.7 U	5.7 U
Pit 19	X168	3	0.43 U	1.1 U	0.43 U	0.43 U	0.027 J	1.1 U	0.43 U	0.43 U	0.43 U	0.43 U	0.4 J	0.022 J	1.1 U	0.43 U	0.43 UJ	1.1 U	1.1 U
Pit 19	X169	8	8.8 UJ	22 UJ	8.8 UJ	8.8 UJ	8.8 UJ	22 UJ	8.8 UJ	8.8 UJ	8.8 UJ	8.8 UJ	95 J	8.8 UJ	22 UJ	8.8 UJ	8.8 UJ	22 UJ	22 UJ
Pit 19	X169DL	8	88 UJ	220 UJ	88 UJ	88 UJ	88 UJ	220 UJ	88 UJ	88 UJ	88 UJ	88 UJ	73 J	88 UJ	220 UJ	88 UJ	88 UJ	220 UJ	220 UJ
Pit 20	X173	3	0.49 U	1.2 U	0.49 U	0.49 U	0.49 U	1.2 U	0.49 U	0.49 U	0.49 U	0.49 U	0.34 J	0.49 U	1.2 U	0.49 U	0.49 UJ	1.2 U	1.2 U
Pit 20	X173DL	3	2.4 U	6.2 U	2.4 U	2.4 U	2.4 U	6.2 U	2.4 U	2.4 U	2.4 U	2.4 U	0.31 J	2.4 UJ	6.2 U	2.4 U	2.4 U	6.2 U	6.2 U
Pit 20	X173RE	3	0.49 U	1.2 U	0.49 U	0.49 U	0.49 U	1.2 U	0.49 U	0.49 U	0.49 U	0.49 U	0.34 J	0.49 UJ	1.2 U	0.49 U	0.49 UJ	1.2 U	1.2 U
Pit 20	X174	8	4.3 U	11 U	4.3 U	4.3 U	4.3 U	11 U	4.3 U	4.3 U	4.3 U	4.3 U	40 =	4.3 U	11 U	4.3 U	4.3 UJ	11 U	11 U
Pit 20	X174DL	8	8.6 U	22 U	8.6 U	8.6 U	8.6 U	22 U	8.6 U	8.6 U	8.6 U	8.6 U	33 =	8.6 UJ	22 U	8.6 U	8.6 U	22 U	22 U
Pit 21	X170	3	4.5 U	11 U	4.5 U	0.26 J	4.5 U	11 U	4.5 U	4.5 U	4.5 U	4.5 U	1.1 J	4.5 UJ	11 U	4.5 U	4.5 U	11 U	11 U
Pit 21	X171	3	4.3 U	11 U	4.3 U	4.3 U	4.3 U	11 U	4.3 U	4.3 U	4.3 U	4.3 U	0.37 J	4.3 UJ	11 U	4.3 U	4.3 U	11 U	11 U

Table E-7. SVOCs in Alburn (mg/kg)

Station ID	Sample ID	Depth (ft.)	2,2'-Oxybis (1-Chloro) Propane	2,4,5-Trichlorophenol	2,4,6-Trichlorophenol	2,4-Dichlorophenol	2,4-Dimethylphenol	2,4-Dinitrophenol	2,4-Dinitrotoluene	2,6-Dinitrotoluene	2-Chloronaphthalene	2-Chlorophenol	2-Methylnaphthalene	2-Methylphenol	2-Nitroaniline	2-Nitrophenol	3,3'-Dichlorobenzidine	3-Nitroaniline	4,6-Dinitro-2-methylphenol
Industrial/		*Ing*		*200000*	*520*	*6100*	*41000*	*4100*	*8.4*	*8.4*		*10000*	*61000*	*100000*			*13*		
Commercial		*Inh*			*390*							*53000*							
Construction		*Ing*		*200000*	*11000*	*610*	*41000*	*410*	*180*	*180*		*10000*	*61000*	*100000*			*280*		
Worker		*Inh*			*540*							*53000*							
Soil Component		*I*		*270*	*0.2*	*1*	*9*	*0.2*	*0.0008*	*0.0007*		*4*	*29*	*15*			*0.007*		
of GW		*II*		*1400*	*0.77*	*1*	*9*	*0.2*	*0.0008*	*0.0007*		*4*	*145*	*15*			*0.033*		
Pit 21	X172	11	0.53 U	1.3 U	0.53 U	0.53 U	0.53 U	1.3 U	0.53 U	0.53 U	0.53 U	0.53 U	0.18 J	0.53 U	1.3 U	0.53 U	0.53 UJ	1.3 U	1.3 U
Pit 21	X172DL	11	1.1 U	2.7 U	1.1 U	1.1 U	1.1 U	2.7 U	1.1 U	1.1 U	1.1 U	1.1 U	0.14 J	1.1 UJ	2.7 U	1.1 U	1.1 U	2.7 U	2.7 U
Pit 23	X126	3	0.39 U	0.97 U	0.39 U	0.39 U	0.39 U	0.97 U	0.39 U	0.39 U	0.39 U	0.39 U	0.66 =	0.39 U	0.97 U	0.39 U	0.39 UJ	0.97 U	0.97 UJ
Pit 23	X126DL	3	1.9 UJ	4.8 UJ	1.9 UJ	1.9 UJ	1.9 UJ	4.8 UJ	1.9 UJ	1.9 UJ	1.9 UJ	1.9 UJ	0.63 J	1.9 UJ	4.8 UJ	1.9 UJ	1.9 UJ	4.8 UJ	4.8 UJ
Pit 23	X126RE	3	0.39 U	0.97 U	0.39 U	0.39 U	0.39 U	0.97 UJ	0.39 U	0.39 U	0.39 U	0.39 U	0.77 =	0.39 U	0.97 U	0.39 U	0.39 UJ	0.97 U	0.97 U
Pit 23	X127	7	0.5 U	1.2 U	0.5 U	0.5 U	0.5 U	1.2 U	0.5 U	0.5 U	0.5 U	0.5 U	0.44 J	0.5 U	1.2 U	0.5 U	0.5 UJ	1.2 U	1.2 UJ
Pit 23	X127RE	7	0.5 U	1.2 U	0.5 U	0.5 U	0.5 U	1.2 UJ	0.5 U	0.5 U	0.5 U	0.5 U	0.54 =	0.5 U	1.2 U	0.5 U	0.5 UJ	1.2 U	1.2 U
Pit 24	X138	3	4.9 U	12 U	4.9 U	4.9 U	4.9 U	12 UJ	4.9 U	4.9 U	4.9 U	4.9 U	16 =	4.9 U	12 U	4.9 U	4.9 U	12 UJ	12 UJ
Pit 24	X138DL	3	20 U	49 U	20 U	20 U	20 U	49 UJ	20 U	20 U	20 U	20 U	16 J	20 U	49 U	20 U	20 U	49 UJ	49 UJ
Pit 24	X138RE	3	4.9 U	12 U	4.9 U	4.9 U	4.9 U	12 U	4.9 U	4.9 U	4.9 U	4.9 U	25 =	4.9 U	12 U	4.9 U	4.9 UJ	12 U	12 UJ
Pit 24	X139	9	0.82 U	2.1 U	0.82 U	0.82 U	0.15 J	2.1 U	0.82 U	0.82 U	0.82 U	0.82 U	0.69 J	0.82 U	2.1 U	0.82 U	0.82 R	2.1 U	2.1 UJ
Pit 24	X139DL	9	8.2 U	21 U	8.2 U	8.2 U	8.2 U	21 UJ	8.2 U	8.2 U	8.2 U	8.2 U	0.79 J	8.2 U	21 U	8.2 U	8.2 U	21 UJ	21 UJ
Pit 24	X139RE	9	0.82 U	2.1 U	0.82 U	0.82 U	0.82 U	2.1 UJ	0.82 U	0.82 U	0.82 U	0.82 U	0.84 J	0.82 U	2.1 U	0.82 U	0.82 UJ	2.1 UJ	2.1 UJ
Pit 25	X132	2.5	0.4 U	1 U	0.4 U	0.4 U	0.4 U	1 UJ	0.4 U	0.4 U	0.4 U	0.4 U	0.63 =	0.4 U	1 U	0.4 U	0.4 UJ	1 U	1 UJ
Pit 25	X132DL	2.5	0.8 UJ	2 UJ	0.8 UJ	0.8 UJ	0.8 UJ	2 UJ	0.8 UJ	0.8 UJ	0.8 UJ	0.8 UJ	0.59 J	0.8 UJ	2 UJ	0.8 UJ	0.8 UJ	2 UJ	2 UJ
Pit 25	X132RE	2.5	0.4 UJ	1 UJ	0.4 UJ	0.4 UJ	0.4 UJ	1 UJ	0.4 UJ	0.4 UJ	0.4 UJ	0.4 UJ	0.61 J	0.4 UJ	1 UJ	0.4 UJ	0.4 R	1 UJ	1 R
Pit 25	X133	8	3.4 U	8.5 U	3.4 U	3.4 U	3.4 U	8.5 UJ	3.4 U	3.4 U	3.4 U	3.4 U	1.4 J	0.19 J	8.5 U	3.4 U	3.4 UJ	8.5 U	8.5 U
Pit 26	X140	3	0.37 U	0.93 U	0.37 U	0.37 U	0.37 U	0.93 UJ	0.37 U	0.37 U	0.37 U	0.37 U	0.075 J	0.37 U	0.93 U	0.37 U	0.37 UJ	0.93 U	0.93 U
Pit 26	X141	9	7.2 U	18 U	7.2 U	7.2 U	7.2 U	18 UJ	7.2 U	7.2 U	7.2 U	7.2 U	6.2 J	7.2 U	18 U	7.2 U	7.2 UJ	18 U	18 U
Pit 26	X141RE	9	7.2 U	18 U	7.2 U	7.2 U	7.2 U	18 UJ	7.2 U	7.2 U	7.2 U	7.2 U	6.5 J	7.2 U	18 U	7.2 U	7.2 UJ	18 UJ	18 UJ
Pit 27	X136	9	0.79 U	2 U	0.79 U	0.79 U	0.79 U	2 U	0.79 U	0.79 U	0.79 U	0.79 U	1.4 =	0.79 U	2 U	0.79 U	0.79 R	2 U	2 UJ
Pit 27	X136DL	9	1.6 U	4 U	1.6 U	1.6 U	1.6 U	4 UJ	1.6 U	1.6 U	1.6 U	1.6 U	1.6 =	1.6 U	4 U	1.6 U	1.6 UJ	4 U	4 U
Pit 27	X136RE	9	0.79 U	2 U	0.79 U	0.79 U	0.79 U	2 UJ	0.79 U	0.79 U	0.79 U	0.79 U	1.5 =	0.79 U	2 U	0.79 U	0.79 UJ	2 UJ	2 UJ
Pit 27	X137	3	0.39 U	0.97 UJ	0.39 UJ	0.39 U	0.39 U	0.97 UJ	0.39 UJ	0.39 UJ	0.39 UJ	0.39 U	1.4 =	0.39 U	0.97 UJ	0.39 U	0.39 R	0.97 UJ	0.97 UJ
Pit 27	X137DL	3	3.9 U	9.7 U	3.9 U	3.9 U	3.9 U	9.7 UJ	3.9 U	3.9 U	3.9 U	3.9 U	1.7 J	3.9 U	9.7 U	3.9 U	3.9 UJ	9.7 U	9.7 U
Pit 27	X137RE	3	0.39 U	0.97 UJ	0.39 UJ	0.39 U	0.39 U	0.97 UJ	0.39 UJ	0.39 UJ	0.39 UJ	0.39 U	1.7 J	0.39 U	0.97 UJ	0.39 U	0.39 R	0.97 UJ	0.97 UJ
Pit 28	X164	3	0.37 U	0.93 U	0.37 U	0.37 U	0.37 U	0.93 UJ	0.37 U	0.37 U	0.37 U	0.37 U	5.2 =	0.37 U	0.93 U	0.37 U	0.37 UJ	0.93 U	0.93 U

Table E-7. SVOCs in Alburn (mg/kg)

Station ID	Sample ID	Depth (ft.)	2,2'-Oxybis (1-Chloro) Propane	2,4,5-Trichlorophenol	2,4,6-Trichlorophenol	2,4-Dichlorophenol	2,4-Dimethylphenol	2,4-Dinitrophenol	2,4-Dinitrotoluene	2,6-Dinitrotoluene	2-Chloronaphthalene	2-Chlorophenol	2-Methylnaphthalene	2-Methylphenol	2-Nitroaniline	2-Nitrophenol	3,3'-Dichlorobenzidine	3-Nitroaniline	4,6-Dinitro-2-methylphenol
Industrial/		*Ing*		*200000*	*520*	*6100*	*41000*	*4100*	*8.4*	*8.4*		*10000*	*61000*	*100000*			*13*		
Commercial		*Inh*			*390*							*53000*							
Construction		*Ing*		*200000*	*11000*	*610*	*41000*	*410*	*180*	*180*		*10000*	*61000*	*100000*			*280*		
Worker		*Inh*			*540*							*53000*							
Soil Component		*I*		*270*	*0.2*	*1*	*9*	*0.2*	*0.0008*	*0.0007*		*4*	*29*	*15*			*0.007*		
of GW		*II*		*1400*	*0.77*	*1*	*9*	*0.2*	*0.0008*	*0.0007*		*4*	*145*	*15*			*0.033*		
Pit 28	X164DL	3	1.9 U	4.7 U	1.9 U	1.9 U	1.9 U	4.7 UJ	1.9 U	1.9 U	1.9 U	1.9 U	4.4 =	1.9 U	4.7 U	1.9 U	1.9 UJ	4.7 U	4.7 U
Pit 28	X165	10	6.2 U	16 U	6.2 U	6.2 U	6.2 U	16 U	6.2 U	6.2 U	6.2 U	6.2 U	72 =	6.2 U	16 U	6.2 U	6.2 U	16 U	16 U
Pit 28	X165DL	10	62 U	160 U	62 U	62 U	62 U	160 U	62 U	62 U	62 U	62 U	69 =	62 U	160 U	62 U	62 UJ	160 U	160 U
Pit 29	X128	3	0.41 U	1 U	0.41 U	0.41 U	0.92 =	1 UJ	0.41 U	0.41 U	0.41 U	0.41 U	0.43 =	0.41 U	1 U	0.41 U	0.41 U	1 U	1 U
Pit 29	X129	4.5	4 U	10 U	4 U	4 U	4 U	10 UJ	4 U	4 U	4 U	4 U	9.1 =	4 U	10 U	4 U	4 U	10 U	10 U
Pit 29	X129DL	4.5	7.9 UJ	20 U	7.9 U	7.9 U	7.9 U	20 U	7.9 U	7.9 U	7.9 U	7.9 U	8.2 =	7.9 U	20 U	7.9 U	7.9 U	20 U	20 U
Pit 30	X166	3	2 U	5 U	2 U	2 U	2 U	5 U	2 U	2 U	2 U	2 U	4.5 =	2 UJ	5 U	2 U	2 U	5 U	5 U
Pit 30	X166DL	3	4 U	10 U	4 U	4 U	4 U	10 U	4 U	4 U	4 U	4 U	4 =	4 U	10 U	4 U	4 UJ	10 U	10 U
Pit 30	X167	9	0.5 U	1.2 U	0.5 U	0.5 U	0.5 U	1.2 U	0.5 U	0.5 U	0.5 U	0.5 U	2.5 =	0.5 UJ	1.2 U	0.5 U	0.5 UJ	1.2 U	1.2 U
Pit 30	X167DL	9	0.99 U	2.5 U	0.99 U	0.99 U	0.99 U	2.5 U	0.99 U	0.99 U	0.99 U	0.99 U	2 =	0.99 U	2.5 U	0.99 U	0.99 UJ	2.5 U	2.5 U
Pit 30	X167RE	9	0.5 U	1.2 U	0.5 U	0.5 U	0.5 U	1.2 U	0.5 U	0.5 U	0.5 U	0.5 U	2.3 =	0.5 U	1.2 UJ	0.5 U	0.5 UJ	1.2 U	1.2 U
Pit 31	X130	3	0.38 U	0.96 U	0.38 U	0.38 U	0.38 U	0.96 UJ	0.38 U	0.38 U	0.38 U	0.38 U	1.3 =	0.38 U	0.96 U	0.38 U	0.38 U	0.96 U	0.96 U
Pit 31	X130DL	3	1.5 UJ	3.8 U	1.5 U	1.5 U	1.5 U	3.8 U	1.5 U	1.5 U	1.5 U	1.5 U	1 J	1.5 U	3.8 U	1.5 U	1.5 U	3.8 U	3.8 U
Pit 31	X131	6	0.43 U	1.1 U	0.43 U	0.43 U	0.96 =	1.1 U	0.43 U	0.43 U	0.43 U	0.43 U	1.5 =	0.43 U	1.1 U	0.43 U	0.43 UJ	1.1 U	1.1 U
Pit 31	X131DL	6	1.7 U	4.3 U	1.7 U	1.7 U	0.69 J	4.3 U	1.7 U	1.7 U	1.7 U	1.7 U	1.3 J	1.7 U	4.3 U	1.7 U	1.7 UJ	4.3 U	4.3 U
Pit 31	X131RE	6	0.43 U	1.1 U	0.43 U	0.43 U	1 =	1.1 UJ	0.43 U	0.43 U	0.43 U	0.43 U	1.8 =	0.43 U	1.1 U	0.43 U	0.43 UJ	1.1 U	1.1 U
Pit 33	X134	3	0.37 U	0.93 UJ	0.37 UJ	0.37 U	0.37 U	0.93 UJ	0.37 UJ	0.37 UJ	0.37 UJ	0.37 U	6 =	0.37 U	0.93 UJ	0.37 U	0.37 R	0.93 UJ	0.93 R
Pit 33	X134DL	3	7.4 U	19 U	7.4 U	7.4 U	7.4 U	19 UJ	7.4 U	7.4 U	7.4 U	7.4 U	7.9 =	7.4 U	19 U	7.4 U	7.4 UJ	19 U	19 U
Pit 33	X134RE	3	0.37 UJ	0.93 UJ	0.37 UJ	0.37 UJ	0.37 UJ	0.93 UJ	0.37 UJ	0.37 UJ	0.37 UJ	0.37 UJ	11 J	0.37 UJ	0.93 UJ	0.37 UJ	0.37 UJ	0.93 UJ	0.93 UJ
Pit 33	X135	8	0.41 U	1 U	0.41 U	0.41 U	0.23 J	1 UJ	0.41 U	0.41 U	0.41 U	0.41 U	0.54 =	0.18 J	1 U	0.41 U	0.41 UJ	1 U	1 U
Pit 33	X135RE	8	0.41 U	1 U	0.41 U	0.41 U	0.41 U	1 U	0.41 U	0.41 U	0.41 U	0.41 U	0.65 =	0.41 U	1 U	0.41 U	0.41 UJ	1 U	1 U
Pit 34	X162	3	0.43 U	1.1 U	0.43 U	0.43 U	0.43 U	1.1 U	0.43 U	0.43 U	0.43 U	0.43 U	7.9 =	0.033 J	1.1 U	0.43 U	0.43 U	1.1 U	1.1 U
Pit 34	X162DL	3	2.1 U	5.4 U	2.1 U	2.1 U	2.1 U	5.4 U	2.1 U	2.1 U	2.1 U	2.1 U	9.9 =	2.1 U	5.4 U	2.1 U	2.1 UJ	5.4 U	5.4 U
Pit 34	X162DLR	3	2.1 U	5.4 UJ	2.1 UJ	2.1 UJ	2.1 UJ	5.4 UJ	2.1 UJ	2.1 UJ	2.1 UJ	2.1 U	9.2 J	2.1 U	5.4 UJ	2.1 UJ	2.1 UJ	5.4 UJ	5.4 UJ
Pit 34	X163	9	0.81 U	2 U	0.81 U	0.81 U	1.1 =	2 U	0.81 U	0.81 U	0.81 U	0.81 U	0.95 =	0.81 U	2 U	0.81 U	0.81 U	2 U	2 U
Pit 35	X149	3	0.41 U	1 U	0.41 U	0.41 U	0.034 J	1 U	0.41 U	0.41 U	0.41 U	0.41 U	0.94 =	0.025 J	1 U	0.41 U	0.41 R	1 U	1 UJ
Pit 35	X149DL	3	12 U	31 U	12 U	12 U	12 U	31 UJ	12 U	12 U	12 U	12 U	1 J	12 U	31 U	12 U	12 U	31 UJ	31 UJ

Table E-7. SVOCs in Alburn (mg/kg)

Station ID	Sample ID	Depth (ft.)	2,2'-Oxybis (1-Chloro) Propane	2,4,5-Trichlorophenol	2,4,6-Trichlorophenol	2,4-Dichlorophenol	2,4-Dimethylphenol	2,4-Dinitrophenol	2,4-Dinitrotoluene	2,6-Dinitrotoluene	2-Chloronaphthalene	2-Chlorophenol	2-Methylnaphthalene	2-Methylphenol	2-Nitroaniline	2-Nitrophenol	3,3'-Dichlorobenzidine	3-Nitroaniline	4,6-Dinitro-2-methylphenol
Industrial/		*Ing*		*200000*	*520*	*6100*	*41000*	*4100*	*8.4*	*8.4*		*10000*	*61000*	*100000*			*13*		
Commercial		*Inh*			*390*							*53000*							
Construction		*Ing*		*200000*	*11000*	*610*	*41000*	*410*	*180*	*180*		*10000*	*61000*	*100000*			*280*		
Worker		*Inh*			*540*							*53000*							
Soil Component		*I*		*270*	*0.2*	*1*	*9*	*0.2*	*0.0008*	*0.0007*		*4*	*29*	*15*			*0.007*		
of GW		*II*		*1400*	*0.77*	*1*	*9*	*0.2*	*0.0008*	*0.0007*		*4*	*145*	*15*			*0.033*		
Pit 35	X149RE	3	0.41 U	1 U	0.41 U	0.41 U	0.036 J	1 UJ	0.41 U	0.41 U	0.41 U	0.41 U	1 =	0.031 J	1 U	0.41 U	0.41 UJ	1 UJ	1 UJ
Pit 35	X150	9	0.78 U	0.12 J	0.78 UJ	0.78 U	0.34 J	2 UJ	0.78 UJ	0.78 UJ	0.78 UJ	0.78 U	0.7 J	0.78 U	2 UJ	0.78 U	0.78 R	2 UJ	2 R
Pit 35	X150DL	9	1.6 U	3.9 U	1.6 U	1.6 U	1.6 U	3.9 UJ	1.6 U	1.6 U	1.6 U	1.6 U	0.8 J	0.088 J	3.9 U	1.6 U	1.6 UJ	3.9 U	3.9 U
Pit 35	X150RE	9	0.78 U	2 U	0.78 U	0.78 U	0.78 U	2 UJ	0.78 U	0.78 U	0.78 U	0.78 U	0.81 =	0.78 U	2 U	0.78 U	0.78 UJ	2 UJ	2 UJ
Pit 37	X151	3	0.74 U	1.9 U	0.74 U	0.74 UJ	0.74 UJ	1.9 U	0.74 U	0.74 U	0.74 U	0.74 U	16 J	0.74 U	1.9 U	0.74 UJ	0.74 UJ	1.9 U	1.9 UJ
Pit 37	X151DL	3	3 U	7.4 U	3 U	3 U	3 U	7.4 U	3 U	3 U	3 U	3 U	15 =	3 U	7.4 U	3 U	3 UJ	7.4 U	7.4 UJ
Pit 37	X151RE	3	0.74 UJ	1.9 UJ	0.74 UJ	0.74 UJ	0.74 UJ	1.9 UJ	0.74 UJ	0.74 UJ	0.74 UJ	0.74 UJ	16 J	0.74 UJ	1.9 UJ	0.74 UJ	0.74 UJ	1.9 UJ	1.9 UJ
Pit 37	X152	9	4 U	10 U	4 U	4 U	4 U	10 U	4 U	4 U	4 U	4 U	2.9 J	4 U	10 U	4 U	4 U	10 U	10 U
Pit 38	X157	3	0.38 U	0.97 U	0.38 U	0.38 U	0.38 U	0.97 U	0.38 U	0.38 U	0.38 U	0.38 U	0.098 J	0.38 U	0.97 U	0.38 U	0.38 U	0.97 U	0.97 U
Pit 38	X158	9	4.1 U	10 U	4.1 U	4.1 U	4.1 U	10 U	4.1 U	4.1 U	4.1 U	4.1 U	0.37 J	4.1 U	10 U	4.1 U	4.1 U	10 U	10 U
Pit 39	X153	3	0.42 U	1.1 U	0.42 U	0.42 U	0.42 U	1.1 U	0.42 U	0.42 U	0.42 U	0.42 U	1 =	0.42 U	1.1 U	0.42 U	0.42 UJ	1.1 U	1.1 UJ
Pit 39	X153DL	3	0.84 U	2.1 U	0.84 U	0.84 U	0.84 U	2.1 U	0.84 U	0.84 U	0.84 U	0.84 U	0.88 =	0.84 U	2.1 U	0.84 U	0.84 UJ	2.1 U	2.1 U
Pit 39	X153RE	3	0.42 U	1.1 U	0.42 U	0.42 U	0.42 U	1.1 U	0.42 U	0.42 U	0.42 U	0.42 U	0.89 =	0.42 U	1.1 UJ	0.42 U	0.42 UJ	1.1 U	1.1 U
Pit 39	X154	9	0.39 U	0.98 U	0.39 U	0.39 U	0.39 U	0.98 U	0.39 U	0.39 U	0.39 U	0.39 U	0.042 J	0.39 U	0.98 U	0.39 U	0.39 U	0.98 U	0.98 U
Pit 40	X155	3	0.39 UJ	0.98 R	0.39 R	0.39 R	0.39 R	0.98 R	0.39 UJ	0.39 UJ	0.39 UJ	0.39 R	0.39 UJ	0.39 R	0.98 UJ	0.39 R	0.39 UJ	0.98 UJ	0.98 R
Pit 40	X155RE	3	0.39 U	0.97 UJ	0.39 UJ	0.39 UJ	0.39 UJ	0.97 UJ	0.39 UJ	0.39 U	0.39 U	0.39 UJ	0.026 J	0.39 UJ	0.97 U	0.39 UJ	0.39 U	0.97 U	0.97 UJ
Pit 40	X156	10	0.39 U	0.98 U	0.39 U	0.39 U	0.39 U	0.98 U	0.39 U	0.39 U	0.39 U	0.39 U	0.32 J	0.39 U	0.98 U	0.39 U	0.39 U	0.98 U	0.98 U
Pit 40	X156DL	10	1.6 U	3.9 U	1.6 U	1.6 U	1.6 U	3.9 U	1.6 U	1.6 U	1.6 U	1.6 U	0.31 J	0.083 J	3.9 U	1.6 U	1.6 UJ	3.9 U	3.9 U
Pit 41	X181	9	0.43 U	1.1 U	0.43 U	0.43 U	0.52 =	1.1 U	0.43 U	0.43 U	0.43 U	0.43 U	0.25 J	0.061 J	1.1 U	0.43 U	0.43 UJ	1.1 U	1.1 U
Pit 41	X182	3	0.44 U	1.1 U	0.44 U	0.44 U	0.44 U	1.1 UJ	0.44 UJ	0.44 U	0.44 U	0.44 U	0.39 J	0.44 U	1.1 U	0.44 U	0.44 U	1.1 U	1.1 U
Pit 42	X179	3	4 U	10 U	4 U	4 U	4 U	10 UJ	4 UJ	4 U	4 U	4 U	9.7 =	4 U	10 U	4 U	4 U	10 U	10 U
Pit 42	X180	9	0.44 U	1.1 U	0.44 U	0.44 U	0.14 J	1.1 U	0.44 U	0.44 U	0.44 U	0.44 U	1.4 =	0.13 J	1.1 U	0.44 U	0.44 UJ	1.1 U	1.1 U
Pit 42	X180DL	9	4.4 U	11 U	4.4 U	4.4 U	4.4 U	11 U	4.4 U	4.4 U	4.4 U	4.4 U	1.2 J	4.4 U	11 U	4.4 U	4.4 UJ	11 U	11 U
Pit 42	X180RE	9	0.44 U	1.1 U	0.44 U	0.44 U	0.44 U	1.1 U	0.44 U	0.44 U	0.44 U	0.44 U	1.3 =	0.44 U	1.1 UJ	0.44 U	0.44 UJ	1.1 U	1.1 U
Pit 43	X175	3	7.3 UJ	18 UJ	7.3 UJ	7.3 UJ	7.3 UJ	18 UJ	7.3 UJ	7.3 UJ	7.3 UJ	7.3 UJ	2 J	7.3 UJ	18 UJ	7.3 UJ	7.3 UJ	18 UJ	18 UJ
Pit 43	X176	8	0.34 U	0.85 U	0.34 U	0.34 U	0.34 U	0.85 U	0.34 U	0.34 U	0.34 U	0.34 U	0.42 =	0.34 UJ	0.85 U	0.34 U	0.34 U	0.85 U	0.85 U
Pit 43	X176DL	8	3.4 U	8.5 U	3.4 U	3.4 U	3.4 U	8.5 U	3.4 U	3.4 U	3.4 U	3.4 U	0.38 J	3.4 UJ	8.5 U	3.4 U	3.4 U	8.5 U	8.5 U

Table E-7. SVOCs in Alburn (mg/kg)

Station ID	Sample ID	Depth (ft.)	2,2'-Oxybis (1-Chloro) Propane	2,4,5-Trichlorophenol	2,4,6-Trichlorophenol	2,4-Dichlorophenol	2,4-Dimethylphenol	2,4-Dinitrophenol	2,4-Dinitrotoluene	2,6-Dinitrotoluene	2-Chloronaphthalene	2-Chlorophenol	2-Methylnaphthalene	2-Methylphenol	2-Nitroaniline	2-Nitrophenol	3,3'-Dichlorobenzidine	3-Nitroaniline	4,6-Dinitro-2-methylphenol
Industrial/		*Ing*		*200000*	*520*	*6100*	*41000*	*4100*	*8.4*	*8.4*		*10000*	*61000*	*100000*			*13*		
Commercial		*Inh*			*390*							*53000*							
Construction		*Ing*		*200000*	*11000*	*610*	*41000*	*410*	*180*	*180*		*10000*	*61000*	*100000*			*280*		
Worker		*Inh*			*540*							*53000*							
Soil Component		*I*		*270*	*0.2*	*1*	*9*	*0.2*	*0.0008*	*0.0007*		*4*	*29*	*15*			*0.007*		
of GW		*II*		*1400*	*0.77*	*1*	*9*	*0.2*	*0.0008*	*0.0007*		*4*	*145*	*15*			*0.033*		
Pit 44	X183	3	0.39 U	0.98 U	0.39 U	0.39 U	0.057 J	0.98 U	0.39 U	0.39 U	0.39 U	0.39 U	0.11 J	0.39 U	0.98 U	0.39 U	0.39 UJ	0.98 U	0.98 U
Pit 44	X183DL	3	0.78 U	2 U	0.78 U	0.78 U	0.056 J	2 U	0.78 U	0.78 U	0.78 U	0.78 U	0.09 J	0.78 UJ	2 U	0.78 U	0.78 U	2 U	2 U
Pit 44	X184	8	0.55 U	1.4 U	0.55 U	0.55 U	0.46 J	1.4 UJ	0.55 UJ	0.55 U	0.55 U	0.55 U	3.9 =	0.037 J	1.4 U	0.55 U	0.55 U	1.4 U	1.4 U
Pit 44	X184DL	8	5.5 UJ	14 U	5.5 U	5.5 U	0.58 J	14 UJ	5.5 U	5.5 U	5.5 U	5.5 U	4.4 J	5.5 U	14 U	5.5 U	5.5 UJ	14 U	14 U
Pit 45	X177	3	0.64 U	1.6 U	0.64 U	0.64 U	0.64 U	1.6 U	0.64 U	0.64 U	0.64 U	0.64 U	0.033 J	0.64 U	1.6 U	0.64 U	0.64 UJ	1.6 U	1.6 U
Pit 45	X178	8	0.3 U	0.75 U	0.3 U	0.3 U	0.049 J	0.75 U	0.3 U	0.3 U	0.3 U	0.3 U	0.28 J	0.3 U	0.75 U	0.3 U	0.3 UJ	0.75 U	0.75 U
Pit 52	X210	3	2.1 U	5.3 U	2.1 U	2.1 U	0.11 J	5.3 UJ	2.1 U	2.1 U	2.1 U	2.1 U	3.7 =	0.11 J	5.3 U	2.1 U	2.1 U	5.3 U	5.3 U
Pit 52	X211	5	2.3 U	5.8 U	2.3 U	2.3 U	2.3 U	5.8 UJ	0.12 J	2.3 U	2.3 U	2.3 U	0.52 J	2.3 U	5.8 U	2.3 U	2.3 U	5.8 U	5.8 U
Pit 53	X212	3	1.7 U	4.2 U	1.7 U	1.7 U	1.7 U	4.2 UJ	1.7 U	1.7 U	1.7 U	1.7 U	0.099 J	1.7 U	4.2 U	1.7 U	1.7 U	4.2 U	4.2 U
Pit 53	X213	7	1.8 U	4.4 U	1.8 U	1.8 U	0.74 J	4.4 UJ	0.85 J	1.8 U	1.8 U	1.8 U	7.1 =	0.1 J	4.4 U	1.8 U	1.8 U	4.4 U	4.4 U
Pit 53	X213DL	7	18 U	44 U	18 U	18 U	18 U	44 UJ	0.98 J	18 U	18 U	18 U	7.1 J	18 U	44 U	18 U	18 U	44 U	44 U

Notes:

=: sample concentration is detected at level reported
U: sample concentration is under detection limit
J: sample concentration is estimated value
R: sample concentration value is rejected
DL: sample is diluted
RE: sample is re-extracted
Ing.: Ingestion
Inh.: Inhalation
I: Class I
II: Class II

Table E-7. SVOCs in Alburn (mg/kg)

Station ID	Sample ID	Depth (ft.)	4-Bromophenyl phenyl ether	4-Chloro-3-methylphenol	4-Chloroaniline	4-Chlorophenyl phenyl ether	4-Methylphenol	4-Nitroaniline	4-Nitrophenol	Acenaphthene	Acenaphthylene	Acetophenone	Anthracene	Benzaldehyde	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene
Industrial/ Commercial		*Ing*			*8200*					*120000*	*61000*		*610000*		*8*	*0.8*	*8*	*61000*	*78*
		Inh																	
Construction Worker		*Ing*			*820*					*120000*	*61000*		*610000*		*170*	*17*	*170*	*61000*	*1700*
		Inh																	
Soil Component of GW		*I*			*0.7*					*570*	*15*		*12000*		*2*	*8*	*5*	*16000*	*49*
		II			*0.7*					*2900*	*75*		*59000*		*8*	*82*	*25*	*81000*	*250*
Pit 01	X101	2.5	0.37 U	0.37 U	0.37 U	0.37 U	0.37 U	0.94 U	0.94 UJ	1.6 =	0.073 J	0.37 U	1.9 =	0.37 U	2.8 =	2.6 =	4.6 =	0.92 =	0.37 UJ
Pit 01	X101DL	2.5	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	3.8 U	3.8 U	1.6 =	1.5 U	1.5 U	1.8 =	1.5 U	2.8 =	2.6 =	4.4 =	0.99 J	1.5 U
Pit 01	X102	7.5	0.38 U	0.38 U	0.38 U	0.38 U	0.38 U	0.96 U	0.96 U	3.9 =	0.095 J	0.38 U	5.5 =	0.38 U	10 =	3.8 =	11 =	0.35 J	4.7 =
Pit 01	X102DL	7.5	3.8 U	3.8 U	3.8 U	3.8 U	3.8 U	9.6 U	9.6 U	4.1 =	0.39 J	3.8 U	5.7 =	3.8 U	11 =	3.8 =	12 =	0.46 J	3.8 =
Pit 01B	X101	3	0.4 U	0.4 U	0.4 U	0.4 U	0.17 J	1 UJ	1 U	0.15 J	0.33 J	0.071 J	0.82 =	0.4 U	1.3 =	1.3 =	0.95 =	0.56 =	1.2 =
Pit 01B	X102	6	0.44 U	0.44 U	0.44 U	0.44 U	0.38 J	1.1 UJ	1.1 U	9.4 =	0.19 J	0.44 U	1.5 =	0.44 U	2.6 =	2.7 =	2.4 =	1.6 =	2.1 =
Pit 02	X103	2	0.48 U	0.48 U	0.48 U	0.48 U	0.48 U	1.2 U	1.2 UJ	0.48 U	0.48 U	0.48 U	0.48 U	0.48 U	0.48 U	0.48 U	0.48 U	0.48 U	0.48 UJ
Pit 02	X104	6	0.41 U	0.41 UJ	0.41 U	0.41 U	0.41 UJ	1 U	1 UJ	0.17 J	0.13 J	0.41 U	0.16 J	0.41 U	0.25 J	0.15 J	0.32 J	0.21 J	0.12 J
Pit 02	X104RE	6	0.43 U	0.43 R	0.43 U	0.43 U	0.43 R	1.1 U	1.1 R	0.16 J	0.15 J	0.43 U	0.17 J	0.43 U	0.44 J	0.24 J	0.4 J	0.35 J	0.25 J
Pit 03	X105	2.5	0.5 U	0.5 UJ	0.5 U	0.5 U	0.5 UJ	1.3 U	1.3 UJ	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.031 J	0.044 J	0.077 J	0.071 J	0.5 UJ
Pit 03	X105RE	2.5	0.54 U	0.54 UJ	0.54 U	0.54 U	0.54 UJ	1.4 U	1.4 UJ	0.54 U	0.059 J	0.067 J	0.031 J	0.54 U	0.095 J	0.16 J	0.16 J	0.19 J	0.13 J
Pit 03	X106	0.5	0.57 U	0.57 U	0.57 U	0.57 U	0.57 U	1.4 U	1.4 UJ	0.57 U	0.57 U	0.57 U	0.044 J	0.57 U	0.045 J	0.03 J	0.065 J	0.06 J	0.034 J
Pit 03	X107	6	0.56 U	0.56 U	0.56 U	0.56 U	0.56 U	1.4 U	1.4 UJ	0.73 =	1.5 =	0.56 U	0.24 J	0.56 U	0.081 J	0.11 J	0.19 J	0.1 J	0.56 UJ
Pit 03	X107DL	6	2.8 U	2.8 U	2.8 U	2.8 U	2.8 U	7.1 U	7.1 U	0.89 J	1.6 J	2.8 U	0.18 J	2.8 U	2.8 U	0.18 J	0.2 J	2.8 U	2.8 U
Pit 04	X108	3	0.37 U	0.37 U	0.37 U	0.37 U	0.37 U	0.94 U	0.94 UJ	0.081 J	0.071 J	0.37 U	0.17 J	0.37 U	0.57 =	0.62 =	1.1 =	0.52 =	0.37 UJ
Pit 04	X109	3	0.37 U	0.37 U	0.37 U	0.37 U	0.37 U	0.94 U	0.94 UJ	0.069 J	0.18 J	0.37 U	0.53 =	0.37 U	1.1 =	1 =	1.4 =	0.71 =	0.48 J
Pit 04	X110	6	8.9 U	8.9 U	8.9 U	8.9 U	8.9 U	22 U	22 U	2 J	25 =	8.9 U	3.4 J	0.54 J	2.9 J	2.9 J	3.9 J	0.46 J	8.9 U
Pit 05	X111	5	0.39 U	0.39 U	0.39 U	0.39 U	0.023 J	0.97 U	0.97 U	0.076 J	0.074 J	0.39 U	0.25 J	0.39 U	0.67 =	0.52 =	0.47 =	0.3 J	0.46 =
Pit 07	X112	3	0.39 U	0.39 U	0.39 U	0.39 U	0.39 U	0.99 U	0.99 U	0.34 J	1.4 =	0.036 J	3 =	0.39 U	6.1 =	4.5 =	4.5 =	2.5 =	3.9 =
Pit 07	X112DL	3	2 U	2 U	2 U	2 U	2 U	5 U	5 U	0.26 J	1.2 J	2 U	2.3 =	2 U	5.5 =	4.1 =	4.3 =	2.1 =	3.6 =
Pit 08	X113	2.5	0.39 U	0.39 U	0.39 U	0.39 U	0.39 U	0.98 U	0.98 U	0.16 J	0.1 J	0.39 U	0.38 J	0.39 U	1.4 J	1.6 J	2.2 J	2 J	0.39 UJ
Pit 08	X113RE	2.5	0.39 UJ	0.39 UJ	0.39 UJ	0.39 UJ	0.39 UJ	0.98 UJ	0.98 UJ	0.17 J	0.095 J	0.39 UJ	0.38 J	0.39 UJ	1.3 J	1.5 J	2.4 J	1.8 J	0.39 UJ
Pit 08	X114	4	0.36 U	0.36 U	0.36 U	0.36 U	0.36 U	0.9 U	0.9 U	0.4 =	0.28 J	0.36 U	0.74 =	0.36 U	2.1 =	1.9 =	2.5 =	1.6 =	0.91 =
Pit 08	X114DL	4	0.72 U	0.72 U	0.72 U	0.72 U	0.14 J	1.8 U	1.8 U	0.36 J	0.26 J	0.72 U	0.65 J	0.72 U	1.9 =	1.6 =	2.2 =	1.3 =	0.86 =
Pit 09	X115	2.5	0.35 U	0.35 U	0.35 U	0.35 U	0.034 J	0.87 U	0.87 U	0.041 J	0.037 J	0.35 U	0.21 J	0.35 U	1.6 J	1.7 J	2.4 J	1.5 J	0.94 J
Pit 09	X115DL	2.5	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	3.5 U	3.5 U	1.4 U	1.4 U	1.4 U	0.23 J	1.4 U	1.8 =	1.9 J	2.8 J	1.5 J	1.2 J
Pit 09	X115RE	2.5	0.35 UJ	0.35 U	0.35 U	0.35 U	0.026 J	0.87 U	0.87 U	0.044 J	0.052 J	0.02 J	0.24 J	0.35 U	1.8 J	1.8 =	2.3 =	2.2 J	1 =

Table E-7. SVOCs in Alburn (mg/kg)

Station ID	Sample ID	Depth (ft.)	4-Bromophenyl phenyl ether	4-Chloro-3-methylphenol	4-Chloroaniline	4-Chlorophenyl phenyl ether	4-Methylphenol	4-Nitroaniline	4-Nitrophenol	Acenaphthene	Acenaphthylene	Acetophenone	Anthracene	Benzaldehyde	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene
Industrial/ Commercial		*Ing*			*8200*					*120000*	*61000*		*610000*		*8*	*0.8*	*8*	*61000*	*78*
		Inh																	
Construction Worker		*Ing*			*820*					*120000*	*61000*		*610000*		*170*	*17*	*170*	*61000*	*1700*
		Inh																	
Soil Component of GW		*I*			*0.7*					*570*	*15*		*12000*		*2*	*8*	*5*	*16000*	*49*
		II			*0.7*					*2900*	*75*		*59000*		*8*	*82*	*25*	*81000*	*250*
Pit 09	X116	6	0.43 UJ	0.43 U	0.43 U	0.43 UJ	0.22 J	1.1 UJ	1.1 UJ	0.19 J	1.2 J	0.43 U	0.92 J	0.43 U	1.9 J	2.7 J	3.3 J	6.7 J	1.1 J
Pit 09	X116DL	6	1.7 UJ	1.7 U	1.7 U	1.7 UJ	0.17 J	4.3 UJ	4.3 UJ	0.18 J	0.82 J	1.7 U	0.68 J	1.7 U	1.6 J	2.5 J	4.1 J	5.4 J	1.7 UJ
Pit 09	X116RE	6	0.43 U	0.43 U	0.43 U	0.43 U	0.26 J	1.1 U	1.1 U	0.2 J	1.1 =	0.061 J	0.91 =	0.43 U	2.1 J	2.9 =	4.1 =	7.8 J	0.43 U
Pit 10	X117	2.5	0.39 UJ	0.39 U	0.39 U	0.39 UJ	0.057 J	0.97 UJ	0.97 UJ	0.42 J	0.41 J	0.047 J	1.1 J	0.39 U	2.8 J	2.5 J	4.4 J	3.2 J	0.39 UJ
Pit 10	X117DL	2.5	1.5 UJ	1.5 U	1.5 U	1.5 UJ	1.5 U	3.9 UJ	3.9 UJ	0.41 J	0.31 J	1.5 U	0.89 J	1.5 U	2.3 J	2.4 J	3.3 J	2.3 J	1.2 J
Pit 10	X117RE	2.5	0.39 U	0.39 U	0.39 U	0.39 U	0.062 J	0.97 U	0.97 U	0.43 =	0.42 =	0.061 J	1.2 =	0.39 U	3 J	3 J	4.7 J	3.7 J	0.39 UJ
Pit 10	X118	6	0.5 UJ	0.5 U	0.5 U	0.5 U	1.4 =	1.3 U	1.3 U	0.23 J	0.044 J	0.1 J	0.34 J	0.5 U	0.6 J	0.57 J	1.1 J	0.66 J	0.5 UJ
Pit 10	X118DL	6	2 U	2 U	2 U	2 U	1 J	5 U	5 U	0.19 J	2 U	2 U	0.28 J	2 U	0.51 J	0.49 J	0.97 J	0.59 J	2 UJ
Pit 10	X118RE	6	0.5 U	0.5 U	0.5 U	0.5 U	1.4 =	1.3 U	1.3 U	0.25 J	0.071 J	0.5 U	0.38 J	0.5 U	0.67 J	0.65 =	1.1 =	0.85 J	0.5 U
Pit 11	X119	2.5	0.39 U	0.39 U	0.39 U	0.39 U	0.65 =	0.97 U	0.97 U	1.9 =	0.34 J	0.39 U	3.1 =	0.39 U	5.8 J	4.7 J	6.1 J	4.5 J	2.1 J
Pit 11	X119DL	2.5	1.9 UJ	1.9 U	1.9 U	1.9 U	0.53 J	4.9 U	4.9 U	2.1 =	0.25 J	1.9 U	3.2 J	1.9 U	5.3 J	4.8 J	6.7 J	3.7 J	1.9 J
Pit 11	X119RE	2.5	0.39 U	0.39 U	0.39 U	0.39 U	0.85 =	0.97 U	0.97 U	1.9 =	0.32 J	0.39 U	2.8 =	0.39 U	6.2 J	5.2 =	6.1 =	5.4 J	2.2 =
Pit 11	X120	6	0.44 UJ	0.44 U	0.44 U	0.44 UJ	7.8 =	1.1 UJ	1.1 UJ	1.3 J	0.45 J	0.17 J	1.4 J	0.9 =	1.6 J	1.4 J	2.3 J	1.3 J	0.44 UJ
Pit 11	X120DL	6	1.8 UJ	1.8 UJ	1.8 UJ	1.8 UJ	7.4 =	4.4 UJ	4.4 UJ	1.4 J	0.39 J	0.14 J	1.3 J	0.7 J	1.4 J	1.3 J	2.4 J	1.2 J	1.8 UJ
Pit 11	X120RE	6	0.44 U	0.44 U	0.44 U	0.44 U	8.6 =	1.1 U	1.1 U	1.3 =	0.49 =	0.2 J	1.5 =	0.91 =	1.9 J	1.7 J	2.7 J	1.3 J	0.44 UJ
Pit 12	X159	3	4.7 U	4.7 U	4.7 U	4.7 U	9.3 =	12 U	12 U	5.7 =	1.3 J	4.7 U	7.7 =	4.7 U	11 =	7.9 =	14 =	3.8 J	4.7 U
Pit 12	X160	3	0.47 UJ	0.47 UJ	0.47 UJ	0.47 U	4.7 J	1.2 U	1.2 U	3.1 =	0.63 =	0.47 U	4.7 J	0.47 U	5.6 J	4.6 J	5.2 J	3.6 J	2.6 J
Pit 12	X160DL	3	2.3 U	2.3 U	2.3 U	2.3 U	3.1 J	5.9 U	5.9 U	3 =	0.65 J	2.3 U	4.4 =	2.3 U	5.5 =	4.1 =	4.6 =	2.7 =	2.4 =
Pit 12	X160RE	3	0.47 UJ	0.47 UJ	0.47 UJ	0.47 UJ	4.7 J	1.2 UJ	1.2 UJ	3.4 J	0.56 J	0.47 UJ	4.7 J	0.47 UJ	5.5 J	4.5 J	5.2 J	2.3 J	3.4 J
Pit 12	X161	9	0.4 U	0.4 U	0.4 U	0.4 U	0.37 J	1 U	1 U	0.15 J	0.042 J	0.4 U	0.22 J	0.045 J	0.33 J	0.28 J	0.36 J	0.17 J	0.14 J
Pit 13	X145	3	0.36 U	0.36 U	0.36 UJ	0.36 U	0.36 U	0.9 U	0.9 U	0.028 J	0.36 U	0.36 U	0.36 U	0.36 U	0.03 J	0.023 J	0.069 J	0.044 J	0.36 UJ
Pit 13	X145RE	3	0.36 U	0.36 U	0.36 U	0.36 U	0.36 U	0.9 UJ	0.9 U	0.36 U	0.36 U	0.36 U	0.36 U	0.36 UJ	0.029 J	0.029 J	0.074 J	0.04 J	0.36 UJ
Pit 13	X146	9	4.2 U	4.2 U	4.2 U	4.2 U	0.73 J	10 UJ	10 U	0.27 J	4.2 U	4.2 U	0.45 J	4.2 UJ	0.89 J	0.75 J	1.4 J	0.27 J	4.2 U
Pit 14	X147	3	0.43 UJ	0.43 U	0.43 U	0.43 U	0.43 U	1.1 U	1.1 U	0.21 J	0.06 J	0.43 U	0.34 J	0.43 U	0.71 J	0.66 J	0.72 J	0.68 J	0.48 J
Pit 14	X147RE	3	0.43 UJ	0.43 U	0.43 UJ	0.43 U	0.13 J	1.1 U	1.1 U	0.24 J	0.062 J	0.43 U	0.37 J	0.43 U	0.79 J	0.71 J	1.2 J	0.69 J	0.43 R
Pit 14	X148	9	4.3 U	4.3 U	5.1 J	4.3 U	3.5 J	11 U	11 U	0.46 J	4.3 U	4.3 U	1.5 J	4.3 U	1.1 J	0.8 J	0.88 J	0.71 J	0.62 J
Pit 14	X148DL	9	8.6 U	8.6 U	4.5 J	8.6 U	3.3 J	22 UJ	22 U	8.6 U	8.6 U	8.6 U	1.3 J	8.6 UJ	0.94 J	0.67 J	0.77 J	0.43 J	0.47 J

Table E-7. SVOCs in Alburn (mg/kg)

Station ID	Sample ID	Depth (ft.)	4-Bromophenyl phenyl ether	4-Chloro-3-methylphenol	4-Chloroaniline	4-Chlorophenyl phenyl ether	4-Methylphenol	4-Nitroaniline	4-Nitrophenol	Acenaphthene	Acenaphthylene	Acetophenone	Anthracene	Benzaldehyde	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene
Industrial/ Commercial		*Ing*			*8200*					*120000*	*61000*		*610000*		*8*	*0.8*	*8*	*61000*	*78*
		Inh																	
Construction Worker		*Ing*			*820*					*120000*	*61000*		*610000*		*170*	*17*	*170*	*61000*	*1700*
		Inh																	
Soil Component of GW		*I*			*0.7*					*570*	*15*		*12000*		*2*	*8*	*5*	*16000*	*49*
		II			*0.7*					*2900*	*75*		*59000*		*8*	*82*	*25*	*81000*	*250*
Pit 14	X148RE	9	4.3 U	4.3 U	5.2 =	4.3 U	3.9 J	11 UJ	11 U	0.44 J	4.3 U	4.3 U	1.6 J	4.3 UJ	1.1 J	0.84 J	1.4 J	4.3 UJ	4.3 UJ
Pit 15	X121	3	0.45 U	0.45 U	0.45 U	0.45 U	0.04 J	1.1 U	1.1 U	0.049 J	0.45 U	0.45 U	0.039 J	0.083 J	0.11 J	0.096 J	0.26 J	0.13 J	0.45 U
Pit 16	X142	3	0.44 U	0.44 U	0.44 UJ	0.44 U	0.5 =	1.1 U	1.1 U	0.18 J	0.084 J	0.44 U	0.11 J	0.44 U	0.29 J	0.23 J	0.65 J	0.32 J	0.44 R
Pit 16	X142DL	3	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	4.4 UJ	4.4 U	0.16 J	1.8 U	1.8 U	1.8 U	1.8 UJ	0.26 J	0.21 J	0.59 J	0.14 J	1.8 UJ
Pit 16	X142RE	3	0.44 U	0.44 U	0.44 U	0.44 U	0.44 U	1.1 UJ	1.1 U	0.19 J	0.091 J	0.44 U	0.11 J	0.44 UJ	0.29 J	0.24 J	0.67 J	0.16 J	0.44 UJ
Pit 16	X143	3	0.4 U	0.4 U	0.4 UJ	0.4 U	0.4 U	1 U	1 U	0.24 J	0.13 J	0.4 U	0.096 J	0.4 U	0.24 J	0.25 J	0.53 J	0.28 J	0.4 R
Pit 16	X143DL	3	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	2 UJ	2 U	0.2 J	0.11 J	0.8 U	0.085 J	0.8 UJ	0.22 J	0.19 J	0.47 J	0.13 J	0.8 UJ
Pit 16	X144	9	0.85 R	0.85 U	0.85 U	0.85 UJ	0.87 =	2.1 UJ	2.1 UJ	22 J	0.85 UJ	0.85 U	2.1 J	0.85 U	2.2 J	0.95 J	1.7 J	0.95 J	0.85 R
Pit 16	X144DL	9	4.3 U	4.3 U	4.3 UJ	4.3 U	0.97 J	11 U	11 U	22 =	4.3 U	4.3 U	2 J	4.3 U	2.2 J	0.89 J	1.1 J	1.1 J	0.93 J
Pit 16	X144RE	9	0.85 UJ	0.85 U	0.85 U	0.85 UJ	1.3 =	2.1 UJ	2.1 UJ	27 J	0.85 UJ	0.85 U	2.3 J	0.85 UJ	2.4 J	1.1 J	2.3 J	0.63 J	0.85 R
Pit 17	X122	3	0.67 U	0.67 U	0.67 U	0.67 U	0.67 U	1.7 U	1.7 U	0.67 U	0.67 U	0.67 U	0.67 U	0.67 U	0.67 U	0.67 U	0.67 U	0.67 U	0.67 U
Pit 17	X123	6	0.58 U	0.58 U	0.58 U	0.58 U	0.58 U	1.4 U	1.4 U	0.22 J	0.099 J	0.58 U	0.22 J	0.58 U	0.34 J	0.29 J	0.43 J	0.34 J	0.58 U
Pit 17	X123DL	6	2.9 U	2.9 U	2.9 U	2.9 U	2.9 U	7.2 U	7.2 U	0.2 J	2.9 U	2.9 U	0.15 J	2.9 U	0.27 J	0.22 J	0.38 J	0.26 J	2.9 U
Pit 18	X124	3	0.45 U	0.45 U	0.45 U	0.45 U	0.22 J	1.1 U	1.1 U	0.15 J	0.25 J	0.046 J	1 =	0.45 U	4.2 =	3.4 =	3.9 =	2.7 J	1.6 =
Pit 18	X124DL	3	0.9 U	0.9 U	0.9 U	0.9 U	0.9 U	2.3 U	2.3 U	0.12 J	0.16 J	0.9 U	0.82 J	0.9 U	3.4 =	2.8 =	4.9 =	1.5 =	0.9 U
Pit 18	X125	6	0.45 U	0.45 U	0.45 U	0.45 U	0.9 =	1.1 U	1.1 U	0.51 =	0.45 U	0.45 U	0.92 =	0.45 U	0.88 =	0.69 =	1.2 =	0.77 J	0.45 U
Pit 18	X125DL	6	2.3 U	2.3 U	2.3 U	2.3 U	2.3 U	5.7 U	5.7 U	0.62 J	0.43 J	2.3 U	0.85 J	2.3 U	1.5 J	1.5 J	1.9 J	1.2 J	2.3 U
Pit 19	X168	3	0.43 U	0.43 U	0.43 U	0.43 U	0.43 U	1.1 U	1.1 U	0.19 J	0.071 J	0.07 J	0.081 J	0.43 U	0.15 J	0.13 J	0.17 J	0.11 J	0.097 J
Pit 19	X169	8	8.8 UJ	8.8 UJ	8.8 UJ	8.8 UJ	8.8 UJ	22 UJ	22 UJ	74 J	12 J	8.8 UJ	36 J	8.8 UJ	23 J	23 J	40 J	6.4 J	8.8 UJ
Pit 19	X169DL	8	88 UJ	88 UJ	88 UJ	88 UJ	88 UJ	220 UJ	220 UJ	66 J	12 J	88 UJ	34 J	88 UJ	23 J	21 J	29 J	10 J	88 UJ
Pit 20	X173	3	0.49 U	0.49 U	0.49 U	0.49 U	0.33 J	1.2 U	1.2 U	1.4 =	0.43 J	0.46 J	0.76 =	0.49 U	0.96 J	0.78 J	0.8 J	0.59 J	0.51 J
Pit 20	X173DL	3	2.4 U	2.4 U	2.4 U	2.4 U	0.27 J	6.2 U	6.2 U	1.2 J	0.37 J	2.4 U	0.66 J	2.4 U	0.8 J	0.67 J	0.62 J	0.44 J	0.54 J
Pit 20	X173RE	3	0.49 U	0.49 U	0.49 U	0.49 U	0.36 J	1.2 U	1.2 U	1.4 =	0.43 J	0.38 J	0.75 =	0.49 U	0.95 J	0.84 J	0.95 J	0.57 J	0.5 J
Pit 20	X174	8	4.3 U	4.3 U	4.3 U	4.3 U	4.3 U	11 U	11 U	9.1 =	5.8 =	4.3 U	8.7 =	4.3 U	5.8 =	4.9 =	4 J	2.4 J	3.4 J
Pit 20	X174DL	8	8.6 U	8.6 U	8.6 U	8.6 U	8.6 U	22 U	22 U	7.9 J	4.8 J	8.6 U	7.5 J	8.6 U	4.7 J	4.1 J	3.1 J	1.9 J	3.3 J
Pit 21	X170	3	4.5 U	4.5 U	0.66 J	4.5 U	4.5 U	11 U	11 U	0.48 J	4.5 U	2.3 J	0.55 J	4.5 U	0.88 J	0.58 J	0.71 J	0.36 J	0.55 J
Pit 21	X171	3	4.3 U	4.3 U	4.3 U	4.3 U	4.3 U	11 U	11 U	4.3 U	4.3 U	4.3 U	0.33 J	4.3 U	1 J	0.83 J	1 J	0.46 J	0.53 J

Table E-7. SVOCs in Alburn (mg/kg)

Station ID	Sample ID	Depth (ft.)	4-Bromophenyl phenyl ether	4-Chloro-3-methylphenol	4-Chloroaniline	4-Chlorophenyl phenyl ether	4-Methylphenol	4-Nitroaniline	4-Nitrophenol	Acenaphthene	Acenaphthylene	Acetophenone	Anthracene	Benzaldehyde	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene
Industrial/ Commercial		*Ing*			*8200*					*120000*	*61000*		*610000*		*8*	*0.8*	*8*	*61000*	*78*
		Inh																	
Construction Worker		*Ing*			*820*					*120000*	*61000*		*610000*		*170*	*17*	*170*	*61000*	*1700*
		Inh																	
Soil Component of GW		*I*			*0.7*					*570*	*15*		*12000*		*2*	*8*	*5*	*16000*	*49*
		II			*0.7*					*2900*	*75*		*59000*		*8*	*82*	*25*	*81000*	*250*
Pit 21	X172	11	0.53 U	0.53 U	0.53 U	0.53 U	0.53 U	1.3 U	1.3 U	0.38 J	0.21 J	0.09 J	1.1 =	0.12 J	3.1 =	2.7 =	2.8 =	1.4 =	1.8 =
Pit 21	X172DL	11	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	2.7 U	2.7 U	0.32 J	0.17 J	1.1 U	0.93 J	1.1 U	2.4 =	2.3 =	2.4 =	1.1 =	1.7 =
Pit 23	X126	3	0.39 UJ	0.39 U	0.39 U	0.39 U	0.2 J	0.97 U	0.97 U	0.69 =	0.91 =	0.39 U	3.1 J	0.39 U	6.8 J	4.7 =	5.1 =	3.1 =	1.7 =
Pit 23	X126DL	3	1.9 UJ	1.9 UJ	1.9 UJ	1.9 UJ	1.9 UJ	4.8 UJ	4.8 UJ	0.66 J	0.72 J	1.9 UJ	3 J	1.9 UJ	6.8 J	5.3 J	8.1 J	2.6 J	1.9 UJ
Pit 23	X126RE	3	0.39 U	0.39 U	0.39 U	0.39 U	0.22 J	0.97 U	0.97 U	0.69 =	0.72 =	0.39 U	2.7 =	0.39 U	7.7 J	5.7 J	6.4 J	3.5 J	1.9 J
Pit 23	X127	7	0.5 UJ	0.5 U	0.5 U	0.5 U	0.12 J	1.2 U	1.2 U	0.19 J	0.22 J	0.5 U	0.62 J	0.5 U	1.3 J	0.94 =	0.97 =	0.69 =	0.51 =
Pit 23	X127RE	7	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	1.2 U	1.2 U	0.19 J	0.21 J	0.5 U	0.66 =	0.5 U	1.4 J	1.1 J	1.7 J	0.76 J	0.5 UJ
Pit 24	X138	3	4.9 U	4.9 U	4.9 U	4.9 U	4.9 U	12 UJ	12 U	2.3 J	1.6 J	4.9 U	1.6 J	4.9 UJ	2.3 J	2.1 J	4.6 J	0.98 J	4.9 UJ
Pit 24	X138DL	3	20 U	20 U	20 U	20 U	20 U	49 UJ	49 U	2.2 J	1.5 J	20 U	1.4 J	20 UJ	2.2 J	2.1 J	3.5 J	20 U	20 U
Pit 24	X138RE	3	4.9 UJ	4.9 U	4.9 U	4.9 U	4.9 UJ	12 U	12 U	2.3 J	1.6 J	4.9 U	1.6 J	4.9 U	2.5 J	2.2 J	2.9 J	1 J	1.6 J
Pit 24	X139	9	0.82 UJ	0.33 J	0.82 U	0.82 U	2.7 =	2.1 U	2.1 U	1.5 =	0.82 U	0.82 U	7.4 J	0.82 U	17 J	13 J	17 J	9.1 J	7.3 J
Pit 24	X139DL	9	8.2 U	8.2 U	8.2 U	8.2 U	2.8 J	21 UJ	21 U	1.6 J	8.2 U	8.2 U	8.1 J	8.2 UJ	18 =	15 =	20 =	3.9 J	10 =
Pit 24	X139RE	9	0.82 U	0.82 U	0.82 U	0.82 U	2 =	2.1 UJ	2.1 U	1.7 J	0.043 J	0.82 U	8.6 J	0.82 UJ	19 J	16 J	28 J	6 J	0.82 R
Pit 25	X132	2.5	0.4 UJ	0.4 U	0.4 U	0.4 U	0.4 U	1 U	1 U	0.63 =	0.67 =	0.4 U	1.3 J	0.4 U	1.9 J	1.6 J	1.8 J	2 J	0.4 UJ
Pit 25	X132DL	2.5	0.8 UJ	0.8 UJ	0.8 UJ	0.8 UJ	0.8 UJ	2 UJ	2 UJ	0.68 J	0.51 J	0.8 UJ	1 J	0.8 UJ	1.5 J	1.6 J	2 J	1.6 J	0.8 UJ
Pit 25	X132RE	2.5	0.4 R	0.4 UJ	0.4 UJ	0.4 UJ	0.4 UJ	1 UJ	1 UJ	0.68 J	0.53 J	0.4 UJ	1.2 J	0.4 UJ	1.7 J	1.7 J	2.2 J	1.8 J	0.4 R
Pit 25	X133	8	3.4 U	3.4 U	3.4 UJ	3.4 U	1.8 J	8.5 U	8.5 U	0.49 J	4.8 =	3.4 U	2 J	3.4 U	2.5 J	2.2 J	2.4 J	0.86 J	1.6 J
Pit 26	X140	3	0.37 U	0.37 U	0.37 UJ	0.37 U	0.37 U	0.93 U	0.93 U	0.096 J	0.37 U	0.37 U	0.033 J	0.37 U	0.053 J	0.07 J	0.099 J	0.044 J	0.047 J
Pit 26	X141	9	7.2 U	7.2 U	7.2 UJ	7.2 U	23 =	18 U	18 U	7.2 U	7.2 U	7.2 U	7.2 U	7.2 U	7.2 UJ	7.2 UJ	7.2 UJ	7.2 UJ	7.2 UJ
Pit 26	X141RE	9	7.2 U	7.2 U	7.2 U	7.2 U	29 =	18 UJ	18 U	7.2 U	7.2 U	7.2 U	7.2 U	7.2 UJ	7.2 UJ	7.2 UJ	7.2 UJ	7.2 UJ	7.2 UJ
Pit 27	X136	9	0.79 UJ	0.79 U	0.79 U	0.79 U	1 =	2 U	2 U	1 =	0.21 J	0.79 U	0.95 J	0.79 U	1.2 J	1.2 J	1.4 J	1.1 J	0.88 J
Pit 27	X136DL	9	1.6 U	1.6 U	1.6 UJ	1.6 U	1 J	4 U	4 U	1 J	0.21 J	1.6 U	0.96 J	1.6 U	1.3 J	1.2 J	1.4 J	0.86 J	1.2 J
Pit 27	X136RE	9	0.79 U	0.79 U	0.79 U	0.79 U	1.2 =	2 UJ	2 U	1.2 =	0.26 J	0.79 U	1.1 =	0.79 UJ	1.3 J	1.4 J	2.5 J	0.66 J	0.79 R
Pit 27	X137	3	0.39 UJ	0.39 U	0.39 U	0.39 UJ	0.39 U	0.97 UJ	0.97 UJ	0.27 J	0.24 J	0.39 U	0.24 J	0.39 U	0.55 J	0.61 J	1.1 J	0.83 J	0.39 R
Pit 27	X137DL	3	3.9 U	3.9 U	3.9 UJ	3.9 U	3.9 U	9.7 U	9.7 U	0.28 J	0.23 J	3.9 U	0.22 J	3.9 U	0.64 J	0.76 J	1.2 J	0.66 J	3.9 R
Pit 27	X137RE	3	0.39 UJ	0.39 U	0.39 U	0.39 UJ	0.39 U	0.97 UJ	0.97 UJ	0.29 J	0.27 J	0.39 U	0.26 J	0.39 UJ	0.61 J	0.64 J	1.2 J	0.57 J	0.39 R
Pit 28	X164	3	0.37 U	0.37 U	0.37 U	0.37 U	0.46 =	0.93 U	0.93 U	0.41 =	0.12 J	0.37 U	0.16 J	0.37 U	0.2 J	0.1 J	0.18 J	0.12 J	0.14 J

Table E-7. SVOCs in Alburn (mg/kg)

Station ID	Sample ID	Depth (ft.)	4-Bromophenyl phenyl ether	4-Chloro-3-methylphenol	4-Chloroaniline	4-Chlorophenyl phenyl ether	4-Methylphenol	4-Nitroaniline	4-Nitrophenol	Acenaphthene	Acenaphthylene	Acetophenone	Anthracene	Benzaldehyde	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene
Industrial/ Commercial		*Ing*			*8200*					*120000*	*61000*		*610000*		*8*	*0.8*	*8*	*61000*	*78*
		Inh																	
Construction Worker		*Ing*			*820*					*120000*	*61000*		*610000*		*170*	*17*	*170*	*61000*	*1700*
		Inh																	
Soil Component of GW		*I*			*0.7*					*570*	*15*		*12000*		*2*	*8*	*5*	*16000*	*49*
		II			*0.7*					*2900*	*75*		*59000*		*8*	*82*	*25*	*81000*	*250*
Pit 28	X164DL	3	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	4.7 U	4.7 U	0.31 J	0.098 J	1.9 U	0.12 J	1.9 U	0.19 J	0.097 J	0.14 J	0.13 J	0.12 J
Pit 28	X165	10	6.2 U	6.2 U	6.2 U	6.2 U	2.3 J	16 U	16 U	120 =	19 =	6.2 U	56 =	6.2 U	67 =	37 =	72 =	26 =	30 =
Pit 28	X165DL	10	62 U	62 U	62 U	62 U	62 UJ	160 U	160 U	130 =	12 J	62 U	51 J	62 U	64 =	32 J	43 J	30 J	40 J
Pit 29	X128	3	0.41 U	0.41 U	0.41 U	0.41 U	0.41 U	1 U	1 U	0.37 J	0.15 J	0.41 U	0.53 =	0.41 U	1 =	0.94 =	1.5 =	1 J	0.41 U
Pit 29	X129	4.5	4 U	4 U	4 U	4 U	4 U	10 U	10 U	0.99 J	1.2 J	4 U	2.1 J	4 U	2.3 J	2.2 J	2.4 J	1.9 J	1.1 J
Pit 29	X129DL	4.5	7.9 U	7.9 U	7.9 U	7.9 U	7.9 U	20 U	20 U	0.81 J	0.98 J	7.9 U	7.9 U	7.9 U	1.9 J	1.8 J	2.3 J	1.2 J	0.7 J
Pit 30	X166	3	2 U	2 U	2 U	2 U	2 U	5 U	5 U	2.2 =	0.59 J	2 U	0.99 J	2 U	0.66 J	0.62 J	0.49 J	0.41 J	0.44 J
Pit 30	X166DL	3	4 U	4 U	4 U	4 U	4 UJ	10 U	10 U	1.9 J	0.44 J	4 U	0.81 J	4 U	0.57 J	0.55 J	0.42 J	0.28 J	0.41 J
Pit 30	X167	9	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	1.2 U	1.2 U	0.64 =	0.29 J	0.5 U	0.51 =	0.5 U	0.95 J	0.86 J	0.82 J	0.55 J	0.68 J
Pit 30	X167DL	9	0.99 U	0.99 U	0.99 U	0.99 U	0.99 UJ	2.5 U	2.5 U	0.46 J	0.16 J	0.99 U	0.36 J	0.99 U	0.74 J	0.65 J	0.69 J	0.3 J	0.51 J
Pit 30	X167RE	9	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	1.2 U	1.2 UJ	0.54 =	0.19 J	0.5 U	0.41 J	0.5 U	0.82 J	0.74 J	0.77 J	0.49 J	0.48 J
Pit 31	X130	3	0.38 U	0.38 U	0.38 U	0.38 U	0.19 J	0.96 U	0.96 U	0.53 =	0.26 J	0.38 U	0.63 =	0.38 U	0.33 J	0.25 J	0.41 =	0.25 J	0.38 U
Pit 31	X130DL	3	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	3.8 U	3.8 U	0.45 J	0.19 J	1.5 U	0.4 J	1.5 U	0.27 J	0.22 J	0.27 J	0.17 J	0.085 J
Pit 31	X131	6	0.43 U	0.43 U	0.43 U	0.43 U	0.64 =	1.1 U	1.1 U	0.77 =	0.2 J	0.43 U	0.69 =	0.43 U	0.45 J	0.44 J	0.61 J	0.46 J	0.19 J
Pit 31	X131DL	6	1.7 U	1.7 U	1.7 U	1.7 U	0.48 J	4.3 U	4.3 U	0.72 J	0.17 J	1.7 U	0.58 J	1.7 U	0.36 J	0.38 J	0.46 J	0.38 J	0.22 J
Pit 31	X131RE	6	0.43 U	0.43 U	0.43 U	0.43 U	0.65 =	1.1 U	1.1 U	0.86 =	0.23 J	0.43 U	0.75 =	0.43 U	0.49 J	0.49 =	0.77 =	0.58 J	0.43 U
Pit 33	X134	3	0.37 R	0.37 U	0.37 U	0.37 UJ	0.37 U	0.93 UJ	0.93 UJ	1.4 J	1.3 J	0.37 U	1.3 J	0.37 U	0.88 J	0.74 J	1.1 J	0.73 J	0.37 R
Pit 33	X134DL	3	7.4 U	7.4 U	7.4 UJ	7.4 U	7.4 U	19 U	19 U	1.3 J	1.2 J	7.4 U	1.3 J	7.4 U	0.89 J	0.79 J	0.8 J	0.44 J	0.48 J
Pit 33	X134RE	3	0.37 UJ	0.37 UJ	0.37 UJ	0.37 UJ	0.37 UJ	0.93 UJ	0.93 UJ	1.4 J	1.4 J	0.37 UJ	1.3 J	0.37 UJ	1 J	0.9 J	0.86 J	0.47 J	0.65 J
Pit 33	X135	8	0.41 U	0.41 U	0.41 UJ	0.41 U	0.28 J	1 U	1 U	0.33 J	0.16 J	0.41 U	0.35 J	0.41 U	0.31 J	0.27 J	0.31 J	0.17 J	0.24 J
Pit 33	X135RE	8	0.41 U	0.41 U	0.41 U	0.41 U	0.23 J	1 U	1 U	0.34 J	0.17 J	0.41 U	0.34 J	0.41 U	0.32 J	0.29 J	0.33 J	0.13 J	0.18 J
Pit 34	X162	3	0.43 U	0.43 U	0.43 U	0.43 U	0.19 J	1.1 U	1.1 U	2.6 =	4.3 =	0.43 U	2.4 =	0.43 U	1.6 =	1.4 =	2.1 =	0.66 =	0.43 U
Pit 34	X162DL	3	2.1 U	2.1 U	2.1 U	2.1 U	2.1 UJ	5.4 U	5.4 U	2.3 =	3.7 =	2.1 U	2.3 =	2.1 U	1.6 J	1.2 J	0.88 J	0.88 J	0.94 J
Pit 34	X162DLR	3	2.1 UJ	2.1 UJ	2.1 UJ	2.1 UJ	0.11 J	5.4 UJ	5.4 UJ	2.4 J	3.9 J	2.1 U	2.2 J	2.1 U	1.5 J	1.3 J	1.4 J	0.49 J	0.76 J
Pit 34	X163	9	0.81 U	0.81 U	0.81 U	0.81 U	0.43 J	2 U	2 U	0.62 J	0.32 J	0.81 U	0.83 =	0.96 =	0.9 =	0.77 J	1.1 =	0.44 J	0.42 J
Pit 35	X149	3	0.41 UJ	0.41 U	0.41 U	0.41 U	0.085 J	1 U	1 U	11 =	0.26 J	0.41 U	16 J	0.41 U	35 J	29 J	44 J	23 J	6.9 J
Pit 35	X149DL	3	12 U	12 U	12 U	12 U	12 U	31 UJ	31 U	12 =	12 U	12 U	20 =	12 UJ	33 =	35 =	45 =	8.8 J	21 =

Table E-7. SVOCs in Alburn (mg/kg)

Station ID	Sample ID	Depth (ft.)	4-Bromophenyl phenyl ether	4-Chloro-3-methylphenol	4-Chloroaniline	4-Chlorophenyl phenyl ether	4-Methylphenol	4-Nitroaniline	4-Nitrophenol	Acenaphthene	Acenaphthylene	Acetophenone	Anthracene	Benzaldehyde	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene
Industrial/ Commercial		*Ing*			*8200*					*120000*	*61000*		*610000*		*8*	*0.8*	*8*	*61000*	*78*
		Inh																	
Construction Worker		*Ing*			*820*					*120000*	*61000*		*610000*		*170*	*17*	*170*	*61000*	*1700*
		Inh																	
Soil Component of GW		*I*			*0.7*					*570*	*15*		*12000*		*2*	*8*	*5*	*16000*	*49*
		II			*0.7*					*2900*	*75*		*59000*		*8*	*82*	*25*	*81000*	*250*
Pit 35	X149RE	3	0.41 UJ	0.41 U	0.41 U	0.41 U	0.087 J	1 UJ	1 U	14 =	0.32 J	0.41 U	12 J	0.41 UJ	45 J	33 J	66 J	15 J	0.41 R
Pit 35	X150	9	0.78 R	0.78 U	0.78 U	0.78 UJ	1.6 =	2 UJ	2 UJ	0.43 J	0.12 J	0.78 U	0.74 J	0.78 U	1.3 J	1.3 J	0.97 J	1.2 J	1.4 J
Pit 35	X150DL	9	1.6 U	1.6 U	1.6 UJ	1.6 U	1.6 =	3.9 U	3.9 U	0.45 J	0.12 J	1.6 U	0.75 J	1.6 U	1.3 J	1.4 J	2.1 J	1.1 J	1.6 R
Pit 35	X150RE	9	0.78 UJ	0.78 U	0.78 U	0.78 U	1.8 =	2 UJ	2 U	0.51 J	0.13 J	0.78 U	0.86 J	0.78 UJ	1.5 J	1.6 J	2.9 J	0.79 J	0.78 R
Pit 37	X151	3	0.74 UJ	0.74 UJ	0.74 UJ	0.74 U	0.74 UJ	1.9 U	1.9 U	0.28 J	0.74 U	0.74 U	3.5 J	0.74 U	0.62 J	0.51 J	0.68 J	0.48 J	0.46 J
Pit 37	X151DL	3	3 UJ	3 U	3 U	3 U	3 UJ	7.4 U	7.4 U	3 U	3 U	3 U	3 J	3 U	0.58 J	0.51 J	0.64 J	0.33 J	0.53 J
Pit 37	X151RE	3	0.74 UJ	0.74 UJ	0.74 UJ	0.74 UJ	0.74 UJ	1.9 UJ	1.9 UJ	0.74 UJ	0.74 UJ	0.74 UJ	3.3 J	0.74 UJ	0.6 J	0.51 J	0.78 J	0.37 J	0.5 J
Pit 37	X152	9	4 U	4 U	4 U	4 U	4 U	10 U	10 U	1.6 J	4 U	4 U	0.44 J	4 U	0.23 J	0.2 J	0.28 J	4 U	4 U
Pit 38	X157	3	0.38 U	0.38 U	0.38 U	0.38 U	0.38 U	0.97 U	0.97 U	0.022 J	0.38 U	0.38 U	0.38 U	0.38 U	0.38 U	0.022 J	0.031 J	0.031 J	0.38 U
Pit 38	X158	9	4.1 U	4.1 U	4.1 U	4.1 U	1.3 J	10 U	10 U	4.1 U	4.1 U	4.1 U	0.38 J	4.1 U	0.65 J	0.57 J	0.73 J	0.44 J	0.33 J
Pit 39	X153	3	0.42 UJ	0.42 U	0.42 U	0.42 U	0.42 UJ	1.1 U	1.1 U	0.55 =	0.17 J	0.15 J	0.77 J	0.42 U	2.1 J	1.7 J	3 J	1.1 J	1.4 J
Pit 39	X153DL	3	0.84 U	0.84 U	0.84 U	0.84 U	0.3 J	2.1 U	2.1 U	0.51 J	0.15 J	0.84 U	0.71 J	0.84 U	1.9 =	1.5 J	2.2 J	0.93 J	1.7 J
Pit 39	X153RE	3	0.42 U	0.42 U	0.42 U	0.42 U	0.29 J	1.1 U	1.1 UJ	0.49 =	0.14 J	0.42 U	0.65 =	0.42 U	1.8 J	1.5 J	2.1 J	1.4 J	1.5 J
Pit 39	X154	9	0.39 U	0.39 U	0.39 U	0.39 U	0.39 U	0.98 U	0.98 U	0.065 J	0.021 J	0.39 U	0.046 J	0.39 U	0.079 J	0.075 J	0.12 J	0.065 J	0.39 U
Pit 40	X155	3	0.39 UJ	0.39 R	0.39 UJ	0.39 UJ	0.39 R	0.98 UJ	0.98 R	0.39 UJ	0.39 UJ	0.39 UJ	0.39 UJ	0.39 UJ	0.39 UJ	0.39 UJ	0.39 UJ	0.39 UJ	0.39 UJ
Pit 40	X155RE	3	0.39 U	0.39 UJ	0.39 UJ	0.39 U	0.39 UJ	0.97 UJ	0.97 UJ	0.39 U	0.39 U	0.39 U	0.39 U	0.39 U	0.39 U	0.39 U	0.39 U	0.39 U	0.39 U
Pit 40	X156	10	0.39 U	0.39 U	0.39 U	0.39 U	0.088 J	0.98 U	0.98 U	0.45 =	0.47 =	0.39 U	1.1 =	0.39 U	2.7 =	2.4 =	4.5 =	1.4 =	0.39 U
Pit 40	X156DL	10	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	3.9 U	3.9 U	0.35 J	0.34 J	1.6 U	0.97 J	1.6 U	2.6 =	2.1 =	2.6 =	1.4 J	1.6 =
Pit 41	X181	9	0.43 U	0.43 U	0.43 U	0.43 U	0.071 J	1.1 U	1.1 U	0.12 J	0.089 J	0.43 U	0.17 J	0.43 U	0.25 J	0.23 J	0.25 J	0.17 J	0.15 J
Pit 41	X182	3	0.44 U	0.44 U	0.44 UJ	0.44 U	0.44 U	1.1 UJ	1.1 UJ	0.62 =	0.12 J	0.44 U	0.32 J	0.44 U	0.48 =	0.39 J	0.42 J	0.24 J	0.29 J
Pit 42	X179	3	4 U	4 U	4 UJ	4 U	4 U	10 UJ	10 UJ	2.5 J	1.8 J	4 U	3.2 J	4 U	2.9 J	2.4 J	1.8 J	1.4 J	2.7 J
Pit 42	X180	9	0.44 U	0.44 U	0.44 U	0.44 U	0.16 J	1.1 U	1.1 U	2.9 =	0.97 =	0.44 U	5.2 =	0.44 U	7.4 J	7 J	7.7 J	4.2 J	3.9 J
Pit 42	X180DL	9	4.4 U	4.4 U	4.4 U	4.4 U	4.4 UJ	11 U	11 U	2.6 J	0.75 J	4.4 U	4.3 J	4.4 U	6.5 =	6.1 =	7.2 =	2.4 J	3.6 J
Pit 42	X180RE	9	0.44 U	0.44 U	0.44 U	0.44 U	0.1 J	1.1 U	1.1 UJ	2.7 =	0.72 =	0.44 U	4.3 =	0.44 U	6.6 J	6.3 J	6.6 J	4.5 J	3.9 J
Pit 43	X175	3	7.3 UJ	7.3 UJ	7.3 UJ	7.3 UJ	7.3 UJ	18 UJ	18 UJ	1.7 J	0.71 J	7.3 UJ	0.97 J	0.38 J	0.94 J	0.98 J	1.4 J	0.46 J	7.3 UJ
Pit 43	X176	8	0.34 U	0.34 U	0.34 U	0.34 U	0.12 J	0.85 U	0.85 U	1.3 =	0.62 =	0.34 U	2.4 =	0.34 U	5.4 =	3.9 =	4.6 =	2.3 =	3 =
Pit 43	X176DL	8	3.4 U	3.4 U	3.4 U	3.4 U	3.4 U	8.5 U	8.5 U	1.2 J	0.47 J	3.4 U	2 J	3.4 U	5 =	3.5 =	3.8 =	2 J	3 J

Table E-7. SVOCs in Alburn (mg/kg)

Station ID	Sample ID	Depth (ft.)	4-Bromophenyl phenyl ether	4-Chloro-3-methylphenol	4-Chloroaniline	4-Chlorophenyl phenyl ether	4-Methylphenol	4-Nitroaniline	4-Nitrophenol	Acenaphthene	Acenaphthylene	Acetophenone	Anthracene	Benzaldehyde	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene
Industrial/ Commercial		*Ing*			*8200*					*120000*	*61000*		*610000*		*8*	*0.8*	*8*	*61000*	*78*
		Inh																	
Construction Worker		*Ing*			*820*					*120000*	*61000*		*610000*		*170*	*17*	*170*	*61000*	*1700*
		Inh																	
Soil Component of GW		*I*			*0.7*					*570*	*15*		*12000*		*2*	*8*	*5*	*16000*	*49*
		II			*0.7*					*2900*	*75*		*59000*		*8*	*82*	*25*	*81000*	*250*
Pit 44	X183	3	0.39 U	0.39 U	0.39 U	0.39 U	0.05 J	0.98 U	0.98 U	0.17 J	0.59 =	0.044 J	0.93 =	0.39 U	2 =	2.5 =	2.1 =	1.6 =	1.6 =
Pit 44	X183DL	3	0.78 U	0.78 U	0.78 U	0.78 U	0.04 J	2 U	2 U	0.16 J	0.47 J	0.78 U	0.8 =	0.78 U	1.7 =	2.2 =	1.9 =	1.3 =	1.5 =
Pit 44	X184	8	0.55 U	0.55 U	0.55 UJ	0.55 U	0.21 J	1.4 UJ	1.4 UJ	7.6 =	0.24 J	0.55 U	2.5 =	0.55 U	2.8 =	1.1 =	1.2 =	0.42 J	1.2 =
Pit 44	X184DL	8	5.5 U	5.5 U	5.5 U	5.5 U	5.5 U	14 U	14 U	13 =	0.33 J	5.5 U	4 J	5.5 U	4 J	1.6 J	1.6 J	0.61 J	1.9 J
Pit 45	X177	3	0.64 U	0.64 U	0.64 U	0.64 U	0.64 U	1.6 U	1.6 U	0.64 U	0.64 U	0.64 U	0.64 U	0.04 J	0.64 U	0.64 U	0.64 U	0.64 U	0.64 U
Pit 45	X178	8	0.3 U	0.3 U	0.3 U	0.3 U	0.57 =	0.75 U	0.75 U	0.37 =	0.43 =	0.14 J	0.44 =	0.3 U	0.6 =	0.7 =	0.88 =	0.47 =	0.46 =
Pit 52	X210	3	2.1 U	2.1 U	2.1 U	2.1 U	2.1 U	5.3 U	5.3 U	0.68 J	1.2 J	0.43 J	1 J	0.31 J	3.2 =	6.5 =	8.7 =	6.4 =	4.5 =
Pit 52	X211	5	2.3 U	2.3 U	2.3 U	2.3 U	2.3 U	5.8 U	5.8 U	0.51 J	0.52 J	2.3 U	1.6 J	0.13 J	4.4 =	3.4 =	3.7 =	1.5 J	2.8 =
Pit 53	X212	3	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	4.2 U	4.2 U	1.7 U	0.17 J	1.7 U	0.23 J	1.7 U	0.77 J	1.2 J	1.2 J	1.8 =	0.91 J
Pit 53	X213	7	1.8 U	1.8 U	1.8 U	1.8 U	0.12 J	4.4 U	4.4 U	0.51 J	0.22 J	1.8 U	0.16 J	1.8 U	0.64 J	0.56 J	0.52 J	0.19 J	0.53 J
Pit 53	X213DL	7	18 U	18 U	18 U	18 U	18 U	44 U	44 U	18 U	18 U	18 U	18 U	18 U	18 U	18 U	18 U	18 U	18 U

Notes:

=:	sample concentration is detected at level reported
U:	sample concentration is under detection limit
J:	sample concentration is estimated value
R:	sample concentration value is rejected
DL:	sample is diluted
RE:	sample is re-extracted
Ing.:	Ingestion
Inh.:	Inhalation
I:	Class I
II:	Class II

Table E-7. SVOCs in Alburn (mg/kg)

Station ID	Sample ID	Depth (ft.)	Benzyl Butyl Phthalate	Biphenyl (Diphenyl)	Bis(2-Chloroethoxy) Methane	Bis(2-Chloroethyl) Ether	Bis(2-Ethylhexyl) Phthalate	Caprolactam	Carbazole	Chrysene	Di-N-Butyl Phthalate	Di-N-Octylphthalate	Dibenz(a,h) Anthracene	Dibenzofuran	Diethyl Phthalate	Dimethyl Phthalate	Fluoranthene	Fluorene	Hexachlorobenzene
Industrial/ Commercial		*Ing*	*410000*			*5*	*410*		*290*	*780*	*200000*	*41000*	*0.8*		*1000000*		*82000*	*82000*	*4*
		Inh	*930*			*0.47*	*31000*				*2300*	*10000*			*2000*				*1.8*
Construction Worker		*Ing*	*410000*			*75*	*4100*		*6200*	*17000*	*200000*	*4100*	*17*		*1000000*		*82000*	*82000*	*78*
		Inh	*930*			*0.66*	*31000*			*800*	*2300*	*10000*			*2000*				*2.6*
Soil Component of GW		*I*	*930*			*0.0004*	*3600*		*0.6*	*160*	*2300*	*10000*	*2*		*470*		*4300*	*560*	*2*
		II	*930*			*0.0004*	*31000*		*2.8*	*800*	*2300*	*10000*	*7.6*		*470*		*21000*	*2800*	*11*
Pit 01	X101	2.5	0.37 U	0.24 J	0.37 U	0.37 U	0.37 U	0.2 J	1.5 =	3 =	0.033 J	0.021 J	0.45 =	1.2 =	0.37 U	0.37 U	6.4 =	1.6 =	0.37 U
Pit 01	X101DL	2.5	1.5 U	0.21 J	1.5 U	1.5 U	1.5 U	1.5 U	1.2 J	2.8 =	1.5 U	1.5 U	0.35 J	1 J	1.5 U	1.5 U	6.2 =	1.5 =	1.5 U
Pit 01	X102	7.5	0.38 U	0.5 =	0.38 U	0.38 U	0.61 U	0.38 U	2.3 =	9.9 =	0.058 J	0.087 J	1.1 =	2.4 =	0.38 U	0.38 U	14 =	3.7 =	0.38 U
Pit 01	X102DL	7.5	3.8 U	0.45 J	3.8 U	3.8 U	5.6 U	3.8 U	2.2 J	10 =	3.8 U	3.8 U	1.2 J	2.3 J	3.8 U	3.8 U	20 =	3.9 =	3.8 U
Pit 01B	X101	3	0.4 U	0.091 J	0.4 U	0.4 U	0.31 J	0.4 U	0.15 J	1.3 =	0.4 U	0.4 U	0.18 J	0.24 J	0.4 U	0.4 U	3.2 =	0.37 J	0.4 U
Pit 01B	X102	6	2.5 =	0.84 =	0.44 U	0.44 U	31 =	0.44 U	1 =	2.8 =	0.066 J	0.095 J	0.9 =	2.1 =	0.44 U	0.44 U	6.1 =	2.3 =	0.44 U
Pit 02	X103	2	0.48 U	0.48 U	0.48 U	0.48 U	0.48 U	0.038 J	0.48 U	0.48 U	0.48 U	0.48 UJ	0.48 U	0.48 U	0.48 U	0.48 U	0.48 U	0.48 U	0.48 U
Pit 02	X104	6	0.41 U	0.26 J	0.41 U	0.41 U	0.41 U	0.41 U	0.087 J	0.36 J	0.41 U	0.41 UJ	0.048 J	0.22 J	0.41 U	0.41 U	0.68 =	0.23 J	0.41 U
Pit 02	X104RE	6	0.43 UJ	0.33 J	0.43 U	0.43 U	0.43 U	0.43 U	0.094 J	0.56 J	0.43 U	0.43 U	0.053 J	0.27 J	0.43 U	0.43 U	1.2 =	0.28 J	0.43 U
Pit 03	X105	2.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.034 J	0.5 U	0.5 UJ	0.5 U	0.5 U	0.5 U	0.5 U	0.043 J	0.5 U	0.5 U
Pit 03	X105RE	2.5	0.54 U	0.033 J	0.54 U	0.54 U	0.54 U	0.54 U	0.54 U	0.11 J	0.54 U	0.54 U	0.54 U	0.54 U	0.54 U	0.54 U	0.16 J	0.54 U	0.54 U
Pit 03	X106	0.5	0.57 U	0.57 U	0.57 U	0.57 U	0.57 U	0.079 J	0.57 U	0.059 J	0.033 J	0.57 UJ	0.57 U	0.57 U	0.57 U	0.57 U	0.12 J	0.57 U	0.57 U
Pit 03	X107	6	0.56 U	1.5 =	0.56 U	0.56 U	0.94 U	0.56 U	0.56 U	0.19 J	0.56 U	0.56 UJ	0.56 U	0.56 U	0.56 U	0.56 U	0.2 J	0.64 =	0.56 U
Pit 03	X107DL	6	2.8 U	1.6 J	2.8 U	2.8 U	4.1 U	2.8 U	2.8 U	0.25 J	2.8 U	2.8 U	2.8 U	2.8 U	2.8 U	2.8 U	0.25 J	0.75 J	2.8 U
Pit 04	X108	3	0.032 J	0.37 U	0.37 U	0.37 U	0.37 U	0.37 U	0.088 J	0.63 =	0.024 J	0.37 UJ	0.14 J	0.043 J	0.37 U	0.37 U	1 =	0.07 J	0.37 U
Pit 04	X109	3	0.023 J	0.37 U	0.37 U	0.37 U	0.37 U	0.37 U	0.11 J	1.1 =	0.024 J	0.37 UJ	0.19 J	0.067 J	0.37 U	0.37 U	2.5 =	0.17 J	0.37 U
Pit 04	X110	6	8.9 U	0.52 J	8.9 U	8.9 U	23 U	8.9 U	8.9 U	5.8 J	4.4 J	8.9 U	8.9 U	8.9 U	8.9 U	8.9 U	6.9 J	4.3 J	8.9 U
Pit 05	X111	5	0.39 U	0.025 J	0.39 U	0.39 U	0.43 U	0.39 U	0.058 J	0.64 =	0.39 U	0.39 U	0.05 J	0.057 J	0.39 U	0.39 U	1.4 =	0.13 J	0.39 U
Pit 07	X112	3	0.15 J	0.14 J	0.39 U	0.39 U	0.39 U	0.39 U	0.72 =	5.5 =	0.029 J	0.39 U	1.2 =	0.99 =	0.39 U	0.39 U	12 =	2.2 =	0.39 U
Pit 07	X112DL	3	0.12 J	0.11 J	2 U	2 U	2 U	2 U	0.63 J	5.1 =	2 U	2 U	0.54 J	0.89 J	2 U	2 U	12 =	2 =	2 U
Pit 08	X113	2.5	0.39 UJ	0.089 J	0.39 U	0.39 U	0.27 J	0.39 UJ	0.14 J	1.6 J	0.054 J	0.39 UJ	0.46 J	0.2 J	0.39 U	0.39 U	1.7 =	0.14 J	0.39 U
Pit 08	X113RE	2.5	0.39 UJ	0.088 J	0.39 UJ	0.39 UJ	1.1 J	0.39 UJ	0.13 J	1.6 J	0.058 J	0.39 UJ	0.44 J	0.21 J	0.39 UJ	0.39 UJ	1.9 J	0.16 J	0.39 UJ
Pit 08	X114	4	0.36 U	0.28 J	0.36 U	0.36 U	3.5 =	0.36 U	0.32 J	2.2 =	0.11 J	0.21 J	0.44 =	0.35 J	0.36 U	0.36 U	2.5 =	0.5 =	0.36 U
Pit 08	X114DL	4	0.1 J	0.23 J	0.72 U	0.72 U	4.1 =	0.72 U	0.28 J	2 =	0.092 J	0.24 J	0.25 J	0.3 J	0.72 U	0.72 U	3.1 =	0.46 J	0.72 U
Pit 09	X115	2.5	0.064 J	0.029 J	0.35 U	0.35 U	9.2 J	0.14 J	0.057 J	2.6 J	0.054 J	0.35 UJ	0.41 J	0.045 J	0.35 U	0.35 U	1.4 =	0.038 J	0.35 U
Pit 09	X115DL	2.5	1.4 U	1.4 U	1.4 U	1.4 U	7.8 =	1.4 U	1.4 U	3.2 =	1.4 U	1.4 UJ	0.39 J	1.4 U	1.4 U	1.4 U	2 =	1.4 U	1.4 UJ
Pit 09	X115RE	2.5	0.05 J	0.032 J	0.35 U	0.35 U	6.4 J	0.35 UJ	0.067 J	3.1 J	0.052 J	0.35 UJ	0.59 J	0.049 J	0.35 U	0.35 U	1.7 J	0.041 J	0.35 UJ

Table E-7. SVOCs in Alburn (mg/kg)

Station ID	Sample ID	Depth (ft.)	Benzyl Butyl Phthalate	Biphenyl (Diphenyl)	Bis(2-Chloroethoxy) Methane	Bis(2-Chloroethyl) Ether	Bis(2-Ethylhexyl) Phthalate	Caprolactam	Carbazole	Chrysene	Di-N-Butyl Phthalate	Di-N-Octylphthalate	Dibenz(a,h) Anthracene	Dibenzofuran	Diethyl Phthalate	Dimethyl Phthalate	Fluoranthene	Fluorene	Hexachlorobenzene
Industrial/ Commercial		*Ing*	*410000*			*5*	*410*		*290*	*780*	*200000*	*41000*	*0.8*		*1000000*		*82000*	*82000*	*4*
		Inh	*930*			*0.47*	*31000*				*2300*	*10000*			*2000*				*1.8*
Construction Worker		*Ing*	*410000*			*75*	*4100*		*6200*	*17000*	*200000*	*4100*	*17*		*1000000*		*82000*	*82000*	*78*
		Inh	*930*			*0.66*	*31000*			*800*	*2300*	*10000*			*2000*				*2.6*
Soil Component of GW		*I*	*930*			*0.0004*	*3600*		*0.6*	*160*	*2300*	*10000*	*2*		*470*		*4300*	*560*	*2*
		II	*930*			*0.0004*	*31000*		*2.8*	*800*	*2300*	*10000*	*7.6*		*470*		*21000*	*2800*	*11*
Pit 09	X116	6	0.43 UJ	0.13 J	0.43 U	0.43 U	2.1 J	0.43 UJ	0.35 J	2 J	0.11 J	0.43 UJ	1.2 J	0.4 J	0.03 J	0.43 UJ	2.5 J	0.3 J	0.43 UJ
Pit 09	X116DL	6	1.7 UJ	0.14 J	1.7 U	1.7 U	5.2 J	1.7 U	0.28 J	1.8 J	1.7 UJ	1.7 UJ	0.88 J	0.39 J	1.7 UJ	1.7 UJ	2.6 J	0.28 J	1.7 UJ
Pit 09	X116RE	6	0.43 UJ	0.16 J	0.43 U	0.43 U	1.7 J	0.43 UJ	0.37 J	2.3 J	0.11 J	0.43 UJ	1.3 J	0.46 =	0.029 J	0.43 U	2.1 =	0.33 J	0.43 U
Pit 10	X117	2.5	0.6 J	0.31 J	0.39 U	0.39 U	2.7 J	0.39 UJ	0.43 J	2.9 J	0.089 J	0.39 UJ	0.74 J	0.44 J	0.39 UJ	0.39 UJ	3.9 J	0.63 J	0.39 UJ
Pit 10	X117DL	2.5	1.5 UJ	1.5 UJ	1.5 U	1.5 U	4.6 J	1.5 U	0.37 J	2.6 J	1.5 UJ	1.5 UJ	0.55 J	0.42 J	1.5 UJ	1.5 UJ	4 J	0.65 J	1.5 UJ
Pit 10	X117RE	2.5	0.6 J	0.35 J	0.39 U	0.39 U	2.3 J	0.39 UJ	0.47 =	3.4 J	0.073 J	0.39 UJ	1.1 J	0.5 =	0.39 U	0.39 U	3.3 =	0.63 =	0.39 U
Pit 10	X118	6	0.5 UJ	0.18 J	0.5 U	0.5 U	7 J	1.5 J	0.13 J	0.94 J	0.48 J	0.5 UJ	0.13 J	0.16 J	0.35 J	0.5 U	0.79 J	0.32 J	0.5 UJ
Pit 10	X118DL	6	2 UJ	0.16 J	2 U	2 U	16 J	1.6 J	0.12 J	0.8 J	0.4 J	2 UJ	2 UJ	0.15 J	0.31 J	2 U	0.94 J	0.3 J	2 UJ
Pit 10	X118RE	6	0.5 UJ	0.2 J	0.5 U	0.5 U	9.1 J	0.5 UJ	0.15 J	1.1 J	0.46 J	0.5 UJ	0.18 J	0.18 J	0.35 J	0.5 U	0.96 =	0.36 J	0.5 U
Pit 11	X119	2.5	0.65 J	0.42 =	0.39 U	0.39 U	2.7 J	0.39 UJ	2 =	5.5 J	0.082 J	0.15 J	1.3 J	2 =	0.39 U	0.39 U	6.6 =	2.4 =	0.39 U
Pit 11	X119DL	2.5	0.41 J	0.38 J	1.9 U	1.9 U	5 J	1.9 U	1.8 J	5.5 J	1.9 UJ	0.12 J	0.76 J	2 =	1.9 U	1.9 U	11 J	2.5 =	1.9 UJ
Pit 11	X119RE	2.5	0.59 J	0.49 =	0.39 U	0.39 U	2.3 J	0.39 UJ	2.1 =	6.1 J	0.078 J	0.11 J	1.6 J	1.9 =	0.39 U	0.39 U	5.5 =	2.2 =	0.39 U
Pit 11	X120	6	1.1 J	0.55 J	0.44 U	0.44 U	2.7 J	0.3 J	0.84 J	1.7 J	0.14 J	0.44 UJ	0.18 J	1 J	0.44 UJ	0.44 UJ	3.9 J	1.5 J	0.44 UJ
Pit 11	X120DL	6	1.8 UJ	0.5 J	1.8 UJ	1.8 U	4.9 J	1.8 UJ	0.76 J	1.5 J	1.8 UJ	1.8 UJ	0.21 J	1.1 J	1.8 UJ	1.8 UJ	4.2 J	1.6 J	1.8 UJ
Pit 11	X120RE	6	0.83 J	0.6 =	0.44 U	0.44 U	2.3 J	0.44 UJ	0.93 =	2 J	0.15 J	0.44 UJ	0.44 UJ	1.2 =	0.44 U	0.44 U	3.9 =	1.6 =	0.44 U
Pit 12	X159	3	4.7 U	1.5 J	4.7 U	4.7 U	6.3 U	4.7 U	2.2 J	11 =	4.7 U	4.7 U	0.91 J	3.3 J	4.7 U	4.7 U	30 =	6.4 =	4.7 U
Pit 12	X160	3	0.47 UJ	0.86 =	0.47 UJ	0.47 U	3.8 J	0.47 UJ	1.1 J	5.5 J	0.47 UJ	0.47 UJ	1.3 J	2 =	0.47 U	0.47 U	16 J	3.6 =	0.47 UJ
Pit 12	X160DL	3	2.3 U	0.82 J	2.3 U	2.3 U	4.5 U	2.3 U	1 J	6 =	2.3 U	2.3 U	0.58 J	1.9 J	2.3 U	2.3 U	18 =	3.6 =	2.3 U
Pit 12	X160RE	3	0.47 UJ	0.94 J	0.47 UJ	0.47 UJ	2.5 U	0.47 UJ	1.1 J	6.3 J	0.47 UJ	0.47 UJ	0.87 J	2.2 J	0.47 UJ	0.47 UJ	17 J	3.6 J	0.47 UJ
Pit 12	X161	9	0.4 U	0.044 J	0.4 U	0.4 U	0.44 U	0.4 U	0.063 J	0.36 J	0.4 U	0.4 U	0.035 J	0.091 J	0.4 U	0.4 U	0.87 =	0.16 J	0.4 U
Pit 13	X145	3	0.041 J	0.024 J	0.36 U	0.36 U	0.59 U	0.36 U	0.02 J	0.055 J	0.044 J	0.36 UJ	0.36 UJ	0.033 J	0.36 U	0.36 U	0.064 J	0.031 J	0.36 U
Pit 13	X145RE	3	0.039 J	0.025 J	0.36 U	0.36 U	0.56 U	0.36 U	0.02 J	0.056 J	0.043 J	0.36 UJ	0.36 UJ	0.03 J	0.36 U	0.36 U	0.066 J	0.03 J	0.36 U
Pit 13	X146	9	0.23 J	0.48 J	4.2 U	4.2 U	21 =	4.2 U	0.3 J	1.1 J	4.2 U	4.2 U	4.2 U	0.33 J	4.2 U	4.2 U	1.9 J	0.59 J	4.2 U
Pit 14	X147	3	0.43 R	0.09 J	0.43 U	0.43 U	0.73 U	0.43 U	0.17 J	0.83 J	0.037 J	0.43 R	0.24 J	0.17 J	0.43 U	0.43 U	0.95 J	0.23 J	0.43 UJ
Pit 14	X147RE	3	0.43 R	0.099 J	0.43 U	0.43 U	0.67 U	0.43 U	0.2 J	0.9 J	0.037 J	0.43 R	0.22 J	0.19 J	0.43 U	0.43 U	1.2 J	0.26 J	0.43 UJ
Pit 14	X148	9	29 J	0.63 J	4.3 U	4.3 U	63 J	4.3 U	4.3 U	2.4 J	3 J	1.9 J	4.3 UJ	4.3 U	4.3 U	1 J	2 J	1.2 J	4.3 U
Pit 14	X148DL	9	20 =	0.51 J	8.6 U	8.6 U	48 =	8.6 U	8.6 U	1.9 J	2.4 J	1.3 J	8.6 U	8.6 U	8.6 U	0.78 J	2 J	1 J	8.6 U

Table E-7. SVOCs in Alburn (mg/kg)

Station ID	Sample ID	Depth (ft.)	Benzyl Butyl Phthalate	Biphenyl (Diphenyl)	Bis(2-Chloroethoxy) Methane	Bis(2-Chloroethyl) Ether	Bis(2-Ethylhexyl) Phthalate	Caprolactam	Carbazole	Chrysene	Di-N-Butyl Phthalate	Di-N-Octylphthalate	Dibenz(a,h) Anthracene	Dibenzofuran	Diethyl Phthalate	Dimethyl Phthalate	Fluoranthene	Fluorene	Hexachlorobenzene
Industrial/ Commercial		*Ing*	*410000*			*5*	*410*		*290*	*780*	*200000*	*41000*	*0.8*		*1000000*		*82000*	*82000*	*4*
		Inh	*930*			*0.47*	*31000*				*2300*	*10000*			*2000*				*1.8*
Construction Worker		*Ing*	*410000*			*75*	*4100*		*6200*	*17000*	*200000*	*4100*	*17*		*1000000*		*82000*	*82000*	*78*
		Inh	*930*			*0.66*	*31000*			*800*	*2300*	*10000*			*2000*				*2.6*
Soil Component of GW		*I*	*930*			*0.0004*	*3600*		*0.6*	*160*	*2300*	*10000*	*2*		*470*		*4300*	*560*	*2*
		II	*930*			*0.0004*	*31000*		*2.8*	*800*	*2300*	*10000*	*7.6*		*470*		*21000*	*2800*	*11*
Pit 14	X148RE	9	25 =	0.61 J	4.3 U	4.3 U	57 =	4.3 U	4.3 U	2.1 J	2.9 J	1.9 J	4.3 UJ	4.3 U	4.3 U	0.94 J	2.3 J	1.2 J	4.3 U
Pit 15	X121	3	0.45 U	0.027 J	0.45 U	0.45 U	0.22 J	0.45 UJ	0.031 J	0.14 J	0.07 J	0.45 U	0.45 U	0.038 J	0.03 J	0.45 U	0.16 J	0.053 J	0.45 U
Pit 16	X142	3	0.97 J	0.032 J	0.44 U	0.44 U	9.6 J	0.44 U	0.19 J	0.42 J	0.56 =	0.44 R	0.094 J	0.11 J	0.44 U	0.44 U	0.58 =	0.23 J	0.44 U
Pit 16	X142DL	3	0.61 J	1.8 U	1.8 U	1.8 U	7.1 =	1.8 U	0.17 J	0.37 J	0.48 J	1.8 UJ	1.8 UJ	0.096 J	1.8 U	1.8 U	0.63 J	0.2 J	1.8 U
Pit 16	X142RE	3	0.71 J	0.031 J	0.44 U	0.44 U	7.9 J	0.44 U	0.19 J	0.39 J	0.54 =	0.44 UJ	0.054 J	0.11 J	0.44 U	0.44 U	0.64 =	0.23 J	0.44 U
Pit 16	X143	3	0.4 R	0.032 J	0.4 U	0.4 U	3.3 J	0.4 U	0.2 J	0.35 J	0.082 J	0.4 R	0.12 J	0.13 J	0.4 U	0.4 U	0.47 J	0.27 J	0.4 U
Pit 16	X143DL	3	0.1 J	0.8 U	0.8 U	0.8 U	2.4 =	0.8 U	0.18 J	0.29 J	0.066 J	0.8 UJ	0.8 UJ	0.11 J	0.8 U	0.8 U	0.46 J	0.23 J	0.8 U
Pit 16	X144	9	4.6 J	0.98 J	0.85 U	0.85 U	5.2 J	0.85 U	2.8 J	3 J	0.41 J	0.85 R	0.24 J	14 J	0.85 UJ	0.85 UJ	6.9 J	10 J	0.85 R
Pit 16	X144DL	9	8.1 J	0.84 J	4.3 U	4.3 U	8.1 U	4.3 U	2.8 J	3.2 J	0.42 J	4.3 R	4.3 R	15 =	4.3 U	4.3 U	5.8 =	12 =	4.3 U
Pit 16	X144RE	9	6 J	1 J	0.85 U	0.85 U	5.3 J	0.85 U	3.1 J	3.5 J	0.43 J	0.85 R	0.17 J	18 J	0.85 UJ	0.85 UJ	8.7 J	15 J	0.85 UJ
Pit 17	X122	3	0.67 U	0.67 U	0.67 U	0.67 U	0.056 J	0.67 UJ	0.67 U	0.67 U	0.035 J	0.67 U	0.67 U	0.67 U	0.67 U	0.67 U	0.67 U	0.67 U	0.67 U
Pit 17	X123	6	0.56 J	4.6 =	0.58 U	0.58 U	14 J	0.58 UJ	0.13 J	0.52 J	0.69 =	0.11 J	0.083 J	0.16 J	0.58 U	0.58 U	0.65 =	0.33 J	0.58 U
Pit 17	X123DL	6	2.9 U	4.6 =	2.9 U	2.9 U	20 =	2.9 U	2.9 U	0.37 J	0.55 J	2.9 U	2.9 U	2.9 U	2.9 U	2.9 U	0.58 J	0.27 J	2.9 U
Pit 18	X124	3	0.21 J	0.14 J	0.45 U	0.45 U	2.6 J	0.45 UJ	0.34 J	3.9 =	0.2 J	0.45 UJ	0.86 J	0.18 J	0.049 J	0.45 U	3.7 =	0.28 J	0.45 U
Pit 18	X124DL	3	0.9 U	0.1 J	0.9 U	0.9 U	1.7 =	0.9 U	0.27 J	3.1 =	0.16 J	0.9 U	0.39 J	0.14 J	0.9 U	0.9 U	4.3 =	0.23 J	0.9 U
Pit 18	X125	6	13 =	0.32 J	0.45 U	0.45 U	8.3 J	0.45 UJ	0.4 J	1.1 =	0.58 =	0.45 UJ	0.19 J	0.44 J	0.12 J	0.45 U	1.3 =	1.1 =	0.45 U
Pit 18	X125DL	6	2.3 U	0.42 J	2.3 U	2.3 U	6.7 =	2.3 U	2.3 U	2.3 =	2.3 U	2.3 U	0.28 J	0.52 J	2.3 U	2.3 U	2.5 =	1.1 J	2.3 U
Pit 19	X168	3	0.054 J	0.11 J	0.43 U	0.43 U	0.59 U	0.43 U	0.027 J	0.16 J	0.025 J	0.43 U	0.026 J	0.057 J	0.43 U	0.43 U	0.32 J	0.15 J	0.43 U
Pit 19	X169	8	8.8 UJ	15 J	8.8 UJ	8.8 UJ	39 J	8.8 UJ	13 J	23 J	0.62 J	8.8 UJ	1.7 J	27 J	8.8 UJ	8.8 UJ	85 J	38 J	8.8 UJ
Pit 19	X169DL	8	88 UJ	14 J	88 UJ	88 UJ	88 U	88 UJ	13 J	22 J	88 UJ	88 UJ	88 UJ	25 J	88 UJ	88 UJ	84 J	35 J	88 UJ
Pit 20	X173	3	6.8 J	0.059 J	0.49 U	0.49 U	16 J	0.49 U	0.58 =	1.1 J	0.4 J	2.5 J	0.12 J	0.75 =	0.12 J	0.49 U	2.6 =	1.2 =	0.49 U
Pit 20	X173DL	3	5.5 =	2.4 U	2.4 U	2.4 U	17 =	2.4 U	0.5 J	1 J	2.4 U	1.2 J	2.4 U	0.68 J	2.4 U	2.4 U	2.5 =	1 J	2.4 U
Pit 20	X173RE	3	6.5 J	0.063 J	0.49 U	0.49 U	17 J	0.49 U	0.57 =	1.1 J	0.49 U	0.49 UJ	0.069 J	0.79 =	0.49 U	0.49 U	2.5 =	1.2 =	0.49 U
Pit 20	X174	8	4.3 U	3 J	4.3 U	4.3 U	4.9 U	4.3 U	3.7 J	5.6 =	0.65 J	4.3 U	0.43 J	6.9 =	4.3 U	4.3 U	18 =	9.8 =	4.3 U
Pit 20	X174DL	8	8.6 U	2.7 J	8.6 U	8.6 U	8.6 U	8.6 U	3.2 J	4.5 J	8.6 U	8.6 U	8.6 U	5.9 J	8.6 U	8.6 U	16 =	8.3 J	8.6 U
Pit 21	X170	3	4.5 U	4.5 U	4.5 U	4.5 U	4.5 U	4.5 U	4.5 U	0.94 J	4.5 U	4.5 U	4.5 U	4.5 U	4.5 U	4.5 U	2.6 J	0.38 J	4.5 U
Pit 21	X171	3	4.3 U	4.3 U	4.3 U	4.3 U	4.3 U	4.3 U	4.3 U	1 J	0.7 J	4.3 U	4.3 U	4.3 U	4.3 U	4.3 U	2 J	4.3 U	4.3 U

Table E-7. SVOCs in Alburn (mg/kg)

Station ID	Sample ID	Depth (ft.)	Benzyl Butyl Phthalate	Biphenyl (Diphenyl)	Bis(2-Chloroethoxy) Methane	Bis(2-Chloroethyl) Ether	Bis(2-Ethylhexyl) Phthalate	Caprolactam	Carbazole	Chrysene	Di-N-Butyl Phthalate	Di-N-Octylphthalate	Dibenz(a,h) Anthracene	Dibenzofuran	Diethyl Phthalate	Dimethyl Phthalate	Fluoranthene	Fluorene	Hexachlorobenzene
Industrial/ Commercial		*Ing*	*410000*			*5*	*410*		*290*	*780*	*200000*	*41000*	*0.8*		*1000000*		*82000*	*82000*	*4*
		Inh	*930*			*0.47*	*31000*				*2300*	*10000*			*2000*				*1.8*
Construction Worker		*Ing*	*410000*			*75*	*4100*		*6200*	*17000*	*200000*	*4100*	*17*		*1000000*		*82000*	*82000*	*78*
		Inh	*930*			*0.66*	*31000*			*800*	*2300*	*10000*			*2000*				*2.6*
Soil Component of GW		*I*	*930*			*0.0004*	*3600*		*0.6*	*160*	*2300*	*10000*	*2*		*470*		*4300*	*560*	*2*
		II	*930*			*0.0004*	*31000*		*2.8*	*800*	*2300*	*10000*	*7.6*		*470*		*21000*	*2800*	*11*
Pit 21	X172	11	0.11 J	0.053 J	0.53 U	0.53 U	0.78 U	0.53 U	0.34 J	2.9 =	0.051 J	0.53 U	0.44 J	0.26 J	0.53 U	0.53 U	5.3 =	0.5 J	0.53 U
Pit 21	X172DL	11	0.073 J	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	0.28 J	2.4 =	1.1 U	1.1 U	0.23 J	0.22 J	1.1 U	1.1 U	5 =	0.39 J	1.1 U
Pit 23	X126	3	0.39 UJ	0.2 J	0.39 U	0.39 U	1.5 J	0.39 UJ	0.34 J	5.9 J	0.28 J	0.39 U	1.1 =	0.56 =	0.39 U	0.39 U	6.8 J	1.2 =	0.39 UJ
Pit 23	X126DL	3	1.9 UJ	0.17 J	1.9 UJ	1.9 UJ	4.5 J	1.9 UJ	0.28 J	6.5 J	0.25 J	1.9 UJ	0.61 J	0.56 J	1.9 UJ	1.9 UJ	10 J	1.2 J	1.9 UJ
Pit 23	X126RE	3	0.39 UJ	0.21 J	0.39 U	0.39 U	1.8 J	0.39 UJ	0.36 J	7.1 J	0.31 J	0.39 UJ	1.3 J	0.64 =	0.39 U	0.39 U	4.9 =	1.2 =	0.39 U
Pit 23	X127	7	0.5 UJ	0.091 J	0.5 U	0.5 U	1.8 J	0.5 UJ	0.11 J	1.3 J	0.36 J	0.5 U	0.23 J	0.16 J	0.5 U	0.5 U	2.2 J	0.31 J	0.5 UJ
Pit 23	X127RE	7	0.5 UJ	0.098 J	0.5 U	0.5 U	2 J	0.5 UJ	0.11 J	1.5 J	0.38 J	0.5 UJ	0.25 J	0.19 J	0.5 U	0.5 U	2 =	0.34 J	0.5 U
Pit 24	X138	3	59 =	4.5 J	4.9 U	4.9 U	93 =	4.9 U	0.4 J	2.5 J	34 =	6.8 J	4.9 UJ	1.4 J	4.9 U	4.9 U	5.3 =	3.5 J	4.9 U
Pit 24	X138DL	3	48 =	4 J	20 U	20 U	92 =	20 U	20 U	2.5 J	33 =	4.3 J	20 U	1.3 J	20 U	20 U	5.4 J	3.4 J	20 U
Pit 24	X138RE	3	55 J	4.3 J	4.9 U	4.9 U	58 J	4.9 U	0.44 J	2.7 J	38 J	5.8 J	4.9 UJ	1.5 J	0.55 J	4.9 U	5.7 J	3.3 J	4.9 UJ
Pit 24	X139	9	0.71 J	0.4 J	0.82 U	0.82 U	60 J	0.82 U	1.7 J	17 J	0.57 J	0.09 J	3.8 J	1.3 =	0.14 J	0.82 U	21 J	2.7 =	0.82 UJ
Pit 24	X139DL	9	8.2 U	8.2 U	8.2 U	8.2 U	55 =	8.2 U	2.1 J	18 =	0.61 J	8.2 U	1.8 J	1.4 J	8.2 U	8.2 U	36 =	3.2 J	8.2 U
Pit 24	X139RE	9	0.73 J	0.43 J	0.82 U	0.82 U	51 J	0.82 U	2.1 J	17 J	0.61 J	0.82 R	2.7 J	1.5 J	0.16 J	0.82 U	28 J	3.3 J	0.82 U
Pit 25	X132	2.5	0.4 UJ	0.51 =	0.4 U	0.4 U	5.4 J	0.4 UJ	0.4 UJ	2.6 J	0.19 J	0.4 UJ	0.46 J	0.56 =	0.4 U	0.4 U	2.6 J	0.82 =	0.4 UJ
Pit 25	X132DL	2.5	0.8 UJ	0.48 J	0.8 UJ	0.8 UJ	4.9 J	0.8 UJ	0.8 UJ	2.4 J	0.8 UJ	0.8 UJ	0.3 J	0.56 J	0.8 UJ	0.8 UJ	2.6 J	1.1 J	0.8 UJ
Pit 25	X132RE	2.5	0.4 R	0.51 J	0.4 UJ	0.4 UJ	4.3 J	0.4 UJ	0.33 J	2.8 J	0.4 R	0.4 R	0.33 J	0.58 J	0.4 UJ	0.4 UJ	2.7 J	0.98 J	0.4 R
Pit 25	X133	8	3.4 U	0.88 J	3.4 U	3.4 U	3.4 U	3.4 U	1.1 J	2.2 J	3.4 U	3.4 U	0.31 J	2.9 J	3.4 U	3.4 U	7.4 =	3.5 =	3.4 U
Pit 26	X140	3	0.37 UJ	0.37 U	0.37 U	0.37 U	0.54 U	0.37 U	0.37 U	0.074 J	0.045 J	0.37 UJ	0.37 UJ	0.077 J	0.37 U	0.37 U	0.11 J	0.14 J	0.37 U
Pit 26	X141	9	7.2 UJ	7.2 U	7.2 U	7.2 U	7.2 UJ	7.2 U	7.2 U	7.2 UJ	7.2 U	7.2 UJ	7.2 UJ	7.2 U	7.2 U	7.2 U	7.2 U	7.2 U	7.2 U
Pit 26	X141RE	9	7.2 UJ	7.2 U	7.2 U	7.2 U	7.2 UJ	7.2 U	7.2 U	7.2 UJ	7.2 U	7.2 UJ	7.2 UJ	7.2 U	7.2 U	7.2 U	7.2 U	7.2 U	7.2 U
Pit 27	X136	9	0.71 J	0.43 J	0.79 U	0.79 U	11 J	0.79 U	0.44 J	1.5 J	0.22 J	0.79 R	0.31 J	0.67 J	0.79 U	0.79 U	2.2 J	0.91 =	0.79 UJ
Pit 27	X136DL	9	0.82 J	0.38 J	1.6 U	1.6 U	12 J	1.6 U	0.49 J	1.6 J	0.25 J	1.6 R	0.41 J	0.73 J	1.6 U	1.6 U	2.7 =	1 J	1.6 U
Pit 27	X136RE	9	0.65 J	0.43 J	0.79 U	0.79 U	11 J	0.79 U	0.52 J	1.5 J	0.25 J	0.79 R	0.2 J	0.82 =	0.79 U	0.79 U	3.1 =	1.1 =	0.79 U
Pit 27	X137	3	4.2 J	0.46 J	0.39 U	0.39 U	9 J	0.39 U	0.11 J	0.8 J	2.4 J	0.32 J	0.12 J	0.18 J	0.39 UJ	0.39 UJ	1 J	0.37 J	0.39 UJ
Pit 27	X137DL	3	5.9 J	0.37 J	3.9 U	3.9 U	13 J	3.9 U	3.9 U	0.79 J	2.5 J	0.72 J	3.9 R	3.9 U	3.9 U	3.9 U	1.2 J	0.42 J	3.9 U
Pit 27	X137RE	3	4.7 J	0.49 J	0.39 U	0.39 U	9.8 J	0.39 U	0.12 J	0.84 J	2.5 J	0.44 J	0.14 J	0.19 J	0.39 UJ	0.39 UJ	1.1 J	0.44 J	0.39 UJ
Pit 28	X164	3	5.2 =	0.43 =	0.37 U	0.68 =	8.6 =	0.37 U	0.093 J	0.23 J	1.6 =	0.85 =	0.022 J	0.26 J	0.37 U	0.37 U	0.77 =	0.53 =	0.37 U

Table E-7. SVOCs in Alburn (mg/kg)

Station ID	Sample ID	Depth (ft.)	Benzyl Butyl Phthalate	Biphenyl (Diphenyl)	Bis(2-Chloroethoxy) Methane	Bis(2-Chloroethyl) Ether	Bis(2-Ethylhexyl) Phthalate	Caprolactam	Carbazole	Chrysene	Di-N-Butyl Phthalate	Di-N-Octylphthalate	Dibenz(a,h) Anthracene	Dibenzofuran	Diethyl Phthalate	Dimethyl Phthalate	Fluoranthene	Fluorene	Hexachlorobenzene
Industrial/ Commercial		*Ing*	*410000*			*5*	*410*		*290*	*780*	*200000*	*41000*	*0.8*		*1000000*		*82000*	*82000*	*4*
		Inh	*930*			*0.47*	*31000*				*2300*	*10000*			*2000*				*1.8*
Construction Worker		*Ing*	*410000*			*75*	*4100*		*6200*	*17000*	*200000*	*4100*	*17*		*1000000*		*82000*	*82000*	*78*
		Inh	*930*			*0.66*	*31000*			*800*	*2300*	*10000*			*2000*				*2.6*
Soil Component of GW		*I*	*930*			*0.0004*	*3600*		*0.6*	*160*	*2300*	*10000*	*2*		*470*		*4300*	*560*	*2*
		II	*930*			*0.0004*	*31000*		*2.8*	*800*	*2300*	*10000*	*7.6*		*470*		*21000*	*2800*	*11*
Pit 28	X164DL	3	4.1 =	0.39 J	1.9 U	0.61 J	8.5 U	1.9 U	1.9 U	0.19 J	1.3 J	0.57 J	1.9 U	0.22 J	1.9 U	1.9 U	0.64 J	0.44 J	1.9 U
Pit 28	X165	10	5.7 J	26 =	6.2 U	6.2 U	25 U	6.2 U	35 =	74 =	5.3 J	6.2 U	7.3 =	77 =	6.2 U	6.2 U	160 =	96 =	6.2 U
Pit 28	X165DL	10	62 U	20 J	62 U	62 U	62 U	62 U	26 J	67 =	4.5 J	62 U	5.5 J	69 =	62 U	62 U	230 =	94 =	62 U
Pit 29	X128	3	0.083 J	0.11 J	0.41 U	0.41 U	1.2 J	0.41 UJ	0.2 J	1.2 =	0.22 J	0.41 UJ	0.24 J	0.28 J	0.41 U	0.41 U	1.8 =	0.4 J	0.41 U
Pit 29	X129	4.5	4 U	0.54 J	4 U	4 U	4.5 J	4 UJ	0.53 J	2.3 J	3.6 J	4 UJ	0.45 J	1.4 J	4 U	4 U	5.6 =	2.1 J	4 U
Pit 29	X129DL	4.5	7.9 U	0.46 J	7.9 U	7.9 U	7.2 J	7.9 U	7.9 U	1.9 J	2.8 J	7.9 U	7.9 U	1.2 J	7.9 U	7.9 U	5.9 J	1.9 J	7.9 U
Pit 30	X166	3	2 U	0.96 J	2 U	2 U	2 U	2 U	0.4 J	0.67 J	2 U	2 U	2 U	0.82 J	2 U	2 U	2.3 =	1.5 J	2 U
Pit 30	X166DL	3	4 U	0.81 J	4 U	4 U	4 U	4 U	0.33 J	0.56 J	4 U	4 U	4 U	0.72 J	4 U	4 U	1.9 J	1.2 J	4 U
Pit 30	X167	9	0.68 J	4.5 =	0.5 U	0.5 U	5.5 J	0.5 U	0.15 J	1 J	0.43 J	0.5 UJ	0.12 J	0.31 J	0.5 U	0.5 U	1.9 =	0.6 =	0.5 U
Pit 30	X167DL	9	0.99 U	3.4 =	0.99 U	0.99 U	3.6 U	0.99 U	0.11 J	0.77 J	0.32 J	0.99 U	0.059 J	0.26 J	0.99 U	0.99 U	1.4 =	0.48 J	0.99 U
Pit 30	X167RE	9	0.62 J	4.1 =	0.5 U	0.5 U	3.2 J	0.5 U	0.12 J	0.88 J	0.33 J	0.23 J	0.085 J	0.26 J	0.5 U	0.5 U	1.4 =	0.46 J	0.5 U
Pit 31	X130	3	0.38 U	0.34 J	0.38 U	0.38 U	3.9 J	0.38 UJ	0.3 J	0.42 =	0.059 J	0.38 UJ	0.06 J	0.58 =	0.38 U	0.38 U	0.87 =	0.66 =	0.38 U
Pit 31	X130DL	3	1.5 U	0.25 J	1.5 U	1.5 U	4 =	1.5 U	0.22 J	0.32 J	1.5 U	1.5 U	1.5 U	0.45 J	1.5 U	1.5 U	0.78 J	0.58 J	1.5 U
Pit 31	X131	6	0.43 UJ	0.35 J	0.43 U	0.43 U	2.3 J	0.26 J	1.3 =	0.54 J	0.17 J	0.43 UJ	0.11 J	0.61 =	0.43 U	0.43 U	0.71 =	1.3 =	0.43 U
Pit 31	X131DL	6	1.7 UJ	0.31 J	1.7 U	1.7 U	5 J	1.7 U	1.1 J	0.45 J	0.12 J	1.7 UJ	1.7 UJ	0.6 J	1.7 U	1.7 U	0.66 J	1.2 J	1.7 UJ
Pit 31	X131RE	6	0.43 UJ	0.41 J	0.43 U	0.43 U	1.9 J	0.43 UJ	1.4 =	0.6 J	0.16 J	0.43 UJ	0.12 J	0.72 =	0.43 U	0.43 U	0.8 =	1.4 =	0.43 U
Pit 33	X134	3	1.8 J	1.6 J	0.37 U	0.37 U	31 J	0.37 U	0.23 J	1.1 J	1.2 J	0.58 J	0.17 J	0.81 J	0.37 UJ	0.37 UJ	2 J	2.2 J	0.37 R
Pit 33	X134DL	3	1.9 J	1.2 J	7.4 U	7.4 U	34 =	7.4 U	7.4 U	1.1 J	1.3 J	0.78 J	7.4 UJ	0.76 J	7.4 U	7.4 U	2.6 J	2.4 J	7.4 U
Pit 33	X134RE	3	1.5 J	1.4 J	0.37 UJ	0.37 UJ	15 J	0.37 UJ	0.3 J	1.2 J	1.5 J	0.74 J	0.14 J	0.87 J	0.37 UJ	0.37 UJ	3 J	2.2 J	0.37 UJ
Pit 33	X135	8	0.41 UJ	0.16 J	0.41 U	0.41 U	2.1 J	0.41 U	0.12 J	0.34 J	0.1 J	0.41 R	0.043 J	0.32 J	0.41 U	0.41 U	0.85 =	0.42 =	0.41 U
Pit 33	X135RE	8	0.41 U	0.17 J	0.41 U	0.41 U	1.3 U	0.41 U	0.13 J	0.33 J	0.095 J	0.41 UJ	0.023 J	0.35 J	0.41 U	0.41 U	0.93 =	0.44 =	0.41 U
Pit 34	X162	3	0.43 U	2.4 =	0.43 U	0.43 U	2 U	0.43 U	0.36 J	1.6 =	0.2 J	0.095 J	0.13 J	0.42 J	0.43 U	0.43 U	4.7 =	3.8 =	0.43 U
Pit 34	X162DL	3	2.1 UJ	2.1 =	2.1 U	2.1 U	4.3 U	2.1 U	0.3 J	1.6 J	0.15 J	2.1 U	0.14 J	0.32 J	2.1 U	2.1 U	4 =	3.8 =	2.1 U
Pit 34	X162DLR	3	2.1 U	2.1 J	2.1 UJ	2.1 U	3.9 U	2.1 UJ	0.3 J	1.5 J	0.16 J	0.14 J	2.1 UJ	0.34 J	2.1 UJ	2.1 UJ	4.6 J	3.4 J	2.1 UJ
Pit 34	X163	9	0.81 U	0.33 J	0.81 U	0.81 U	2.9 U	0.81 U	0.35 J	1.2 =	0.2 J	0.81 U	0.09 J	0.34 J	0.81 U	0.81 U	3 =	0.91 =	0.81 U
Pit 35	X149	3	0.41 R	0.81 =	0.41 U	0.41 U	0.41 U	0.41 U	7.8 J	28 J	0.032 J	0.41 R	11 J	5.4 =	0.41 U	0.41 U	43 J	7.6 =	0.41 UJ
Pit 35	X149DL	3	12 U	0.7 J	12 U	12 U	12 U	12 U	9.7 J	33 =	12 U	12 U	3.6 J	5.9 J	12 U	12 U	77 =	9.7 J	12 U

Table E-7. SVOCs in Alburn (mg/kg)

Station ID	Sample ID	Depth (ft.)	Benzyl Butyl Phthalate	Biphenyl (Diphenyl)	Bis(2-Chloroethoxy) Methane	Bis(2-Chloroethyl) Ether	Bis(2-Ethylhexyl) Phthalate	Caprolactam	Carbazole	Chrysene	Di-N-Butyl Phthalate	Di-N-Octylphthalate	Dibenz(a,h) Anthracene	Dibenzofuran	Diethyl Phthalate	Dimethyl Phthalate	Fluoranthene	Fluorene	Hexachlorobenzene
Industrial/ Commercial		*Ing*	*410000*			*5*	*410*		*290*	*780*	*200000*	*41000*	*0.8*		*1000000*		*82000*	*82000*	*4*
		Inh	*930*			*0.47*	*31000*				*2300*	*10000*			*2000*				*1.8*
Construction Worker		*Ing*	*410000*			*75*	*4100*		*6200*	*17000*	*200000*	*4100*	*17*		*1000000*		*82000*	*82000*	*78*
		Inh	*930*			*0.66*	*31000*			*800*	*2300*	*10000*			*2000*				*2.6*
Soil Component of GW		*I*	*930*			*0.0004*	*3600*		*0.6*	*160*	*2300*	*10000*	*2*		*470*		*4300*	*560*	*2*
		II	*930*			*0.0004*	*31000*		*2.8*	*800*	*2300*	*10000*	*7.6*		*470*		*21000*	*2800*	*11*
Pit 35	X149RE	3	0.41 UJ	0.87 =	0.41 U	0.41 U	0.41 U	0.41 U	9.2 J	28 J	0.41 UJ	0.41 R	8 J	6.7 =	0.41 U	0.41 U	40 J	10 =	0.41 UJ
Pit 35	X150	9	1.6 J	0.33 J	0.78 U	0.78 U	11 J	0.78 U	0.27 J	1.5 J	1.6 J	0.52 J	0.35 J	0.34 J	0.32 J	0.78 UJ	2.2 J	0.55 J	0.78 R
Pit 35	X150DL	9	2.3 J	0.27 J	1.6 U	1.6 U	11 J	1.6 U	0.29 J	1.5 J	1.7 =	0.85 J	0.28 J	0.35 J	0.35 J	1.6 U	2.1 =	0.59 J	1.6 U
Pit 35	X150RE	9	2.4 J	0.31 J	0.78 U	0.78 U	12 J	0.78 U	0.33 J	1.5 J	1.9 J	0.78 R	0.13 J	0.41 J	0.37 J	0.78 U	2.7 J	0.67 J	0.78 UJ
Pit 37	X151	3	0.74 U	2.2 =	0.74 UJ	0.74 U	14 =	0.74 UJ	3 J	0.9 =	0.21 J	0.63 J	0.12 J	0.83 =	0.74 U	0.74 U	1.8 J	1.3 =	0.74 UJ
Pit 37	X151DL	3	3 UJ	2.3 J	3 U	3 U	11 U	3 U	2.7 J	0.86 J	0.16 J	0.62 J	3 UJ	0.89 J	3 U	3 U	1.5 J	1.3 J	3 UJ
Pit 37	X151RE	3	0.74 UJ	2.3 J	0.74 UJ	0.74 UJ	8.7 J	0.74 UJ	2.9 J	0.86 J	0.16 J	0.61 J	0.073 J	0.83 J	0.74 UJ	0.74 UJ	1.7 J	1.3 J	0.74 UJ
Pit 37	X152	9	4 U	1.1 J	4 U	4 U	6.2 U	4 U	1.3 J	0.24 J	4 U	4 U	4 U	1.4 J	1.3 J	4 U	0.77 J	1.6 J	4 U
Pit 38	X157	3	0.38 U	0.021 J	0.38 U	0.38 U	0.44 U	0.38 U	0.38 U	0.031 J	0.033 J	0.38 U	0.38 U	0.023 J	0.38 U	0.38 U	0.03 J	0.028 J	0.38 U
Pit 38	X158	9	2 J	4.1 U	4.1 U	4.1 U	24 J	4.1 U	0.28 J	0.76 J	6.7 =	4.1 U	4.1 U	4.1 U	4.1 U	4.1 U	1.6 J	0.32 J	4.1 U
Pit 39	X153	3	0.12 J	0.29 J	0.42 U	0.42 U	2.2 U	0.42 U	0.53 J	2.3 J	0.07 J	0.14 J	0.23 J	0.79 =	0.16 J	0.42 U	4 J	0.57 =	0.42 UJ
Pit 39	X153DL	3	0.12 J	0.27 J	0.84 U	0.84 U	2.3 U	0.84 U	0.48 J	2.1 =	0.064 J	0.14 J	0.2 J	0.7 J	0.15 J	0.84 U	4 =	0.54 J	0.84 U
Pit 39	X153RE	3	0.1 J	0.25 J	0.42 U	0.42 U	1.7 U	0.42 U	0.42 =	2 J	0.052 J	0.42 UJ	0.28 J	0.68 =	0.12 J	0.42 U	3.6 =	0.5 =	0.42 U
Pit 39	X154	9	0.39 U	0.39 U	0.39 U	0.39 U	0.39 U	0.39 U	0.043 J	0.092 J	0.026 J	0.39 U	0.39 U	0.036 J	0.39 U	0.39 U	0.18 J	0.049 J	0.39 U
Pit 40	X155	3	0.39 UJ	0.39 UJ	0.39 UJ	0.39 UJ	0.39 U	0.39 UJ	0.39 UJ	0.39 UJ	0.39 UJ	0.39 UJ	0.39 UJ	0.39 UJ	0.39 UJ	0.39 UJ	0.39 UJ	0.39 UJ	0.39 UJ
Pit 40	X155RE	3	0.39 U	0.39 U	0.39 U	0.39 U	0.39 U	0.39 UJ	0.39 U	0.39 U	0.39 U	0.39 U	0.39 U	0.39 U	0.39 UJ	0.39 U	0.022 J	0.39 U	0.39 U
Pit 40	X156	10	0.39 U	0.11 J	0.39 U	0.39 U	0.39 U	0.39 U	0.52 =	2.7 =	0.039 J	0.39 U	0.29 J	0.44 =	0.39 U	0.39 U	5.6 =	0.72 =	0.39 U
Pit 40	X156DL	10	1.6 U	0.079 J	1.6 U	1.6 U	1.6 U	1.6 U	0.45 J	2.7 =	1.6 U	1.6 U	0.46 J	0.4 J	1.6 U	1.6 U	6.1 =	0.66 J	1.6 U
Pit 41	X181	9	0.43 U	0.072 J	0.43 U	0.43 U	0.68 U	0.43 U	0.086 J	0.31 J	0.041 J	0.43 U	0.038 J	0.15 J	0.43 U	0.43 U	0.61 =	0.21 J	0.43 U
Pit 41	X182	3	0.14 J	0.13 J	0.44 U	0.44 U	1.7 =	0.44 UJ	0.22 J	0.53 =	0.24 J	0.063 J	0.072 J	0.39 J	0.44 UJ	0.44 U	1.3 =	0.56 =	0.44 U
Pit 42	X179	3	2 J	1.7 J	4 U	4 U	16 =	4 UJ	1.2 J	3.2 J	0.69 J	4 U	0.4 J	2.8 J	4 UJ	4 U	9.3 =	4.8 =	4 U
Pit 42	X180	9	0.36 J	0.44 =	0.44 U	0.44 U	2.5 U	0.44 U	2.4 =	7.6 J	0.096 J	0.44 UJ	1.5 J	2.1 =	0.44 U	0.44 U	19 =	3.4 =	0.44 U
Pit 42	X180DL	9	4.4 U	0.37 J	4.4 U	4.4 U	4.4 U	4.4 U	2.1 J	6.7 =	4.4 U	4.4 U	0.4 J	1.9 J	4.4 U	4.4 U	20 =	3.1 J	4.4 U
Pit 42	X180RE	9	0.3 J	0.39 J	0.44 U	0.44 U	1.5 U	0.44 U	1.9 =	7 J	0.079 J	0.44 UJ	1.4 J	1.9 =	0.44 U	0.44 U	15 =	3.2 =	0.44 U
Pit 43	X175	3	7.3 UJ	0.44 J	7.3 UJ	7.3 UJ	7.3 U	7.3 UJ	7.3 UJ	1 J	0.39 J	7.3 UJ	7.3 UJ	0.75 J	7.3 UJ	7.3 UJ	2.8 J	1.1 J	7.3 UJ
Pit 43	X176	8	0.34 U	0.18 J	0.34 U	0.34 U	0.9 U	0.34 U	0.75 =	5.7 =	0.34 U	0.34 U	1.1 =	0.85 =	0.34 U	0.34 U	11 =	1.5 =	0.34 U
Pit 43	X176DL	8	3.4 U	3.4 U	3.4 U	3.4 U	3.4 U	3.4 U	0.67 J	5.6 =	3.4 U	3.4 U	0.49 J	0.8 J	3.4 U	3.4 U	11 =	1.4 J	3.4 U

Table E-7. SVOCs in Alburn (mg/kg)

Station ID	Sample ID	Depth (ft.)	Benzyl Butyl Phthalate	Biphenyl (Diphenyl)	Bis(2-Chloroethoxy) Methane	Bis(2-Chloroethyl) Ether	Bis(2-Ethylhexyl) Phthalate	Caprolactam	Carbazole	Chrysene	Di-N-Butyl Phthalate	Di-N-Octylphthalate	Dibenz(a,h) Anthracene	Dibenzofuran	Diethyl Phthalate	Dimethyl Phthalate	Fluoranthene	Fluorene	Hexachlorobenzene
Industrial/ Commercial		*Ing*	*410000*			*5*	*410*		*290*	*780*	*200000*	*41000*	*0.8*		*1000000*		*82000*	*82000*	*4*
		Inh	*930*			*0.47*	*31000*				*2300*	*10000*			*2000*				*1.8*
Construction Worker		*Ing*	*410000*			*75*	*4100*		*6200*	*17000*	*200000*	*4100*	*17*		*1000000*		*82000*	*82000*	*78*
		Inh	*930*			*0.66*	*31000*			*800*	*2300*	*10000*			*2000*				*2.6*
Soil Component of GW		*I*	*930*			*0.0004*	*3600*		*0.6*	*160*	*2300*	*10000*	*2*		*470*		*4300*	*560*	*2*
		II	*930*			*0.0004*	*31000*		*2.8*	*800*	*2300*	*10000*	*7.6*		*470*		*21000*	*2800*	*11*
Pit 44	X183	3	0.39 U	0.069 J	0.39 U	0.39 U	0.43 U	0.39 U	0.24 J	2 =	0.39 U	0.39 U	0.34 J	0.35 J	0.39 U	0.39 U	3.6 =	0.43 =	0.39 U
Pit 44	X183DL	3	0.78 U	0.068 J	0.78 U	0.78 U	0.78 U	0.78 U	0.2 J	1.7 =	0.78 U	0.78 U	0.27 J	0.3 J	0.78 U	0.78 U	3.5 =	0.35 J	0.78 U
Pit 44	X184	8	0.55 U	1.3 =	0.55 U	0.55 U	0.55 U	0.55 UJ	1.2 =	2.6 =	0.55 U	0.55 U	0.18 J	6 =	0.55 UJ	0.55 U	12 =	7.5 =	0.55 U
Pit 44	X184DL	8	5.5 U	2 J	5.5 U	5.5 U	5.5 U	5.5 U	1.7 J	4 J	5.5 U	5.5 UJ	5.5 UJ	8.8 =	5.5 U	5.5 U	19 =	11 =	5.5 UJ
Pit 45	X177	3	0.64 U	0.64 U	0.64 U	0.64 U	0.64 U	0.64 U	0.64 U	0.64 U	0.64 U	0.64 U	0.64 U	0.64 U	0.64 U	0.64 U	0.053 J	0.64 U	0.64 U
Pit 45	X178	8	0.3 U	0.11 J	0.3 U	0.3 U	0.38 U	0.3 U	0.23 J	0.75 =	0.016 J	0.3 U	0.11 J	0.35 =	0.3 U	0.3 U	1.5 =	0.44 =	0.3 U
Pit 52	X210	3	6.8 =	0.19 J	2.1 U	2.1 U	5.2 =	2.1 U	0.32 J	4.7 =	2.4 =	2.1 U	1.4 J	2.1 U	2.1 U	2.1 U	4.8 =	0.94 J	2.1 U
Pit 52	X211	5	0.16 J	0.15 J	2.3 U	2.3 U	1.9 J	2.3 U	0.35 J	4 =	0.16 J	0.12 J	0.69 J	0.85 J	2.3 U	2.3 U	10 =	1.1 J	2.3 U
Pit 53	X212	3	1.7 U	1.7 U	1.7 U	1.7 U	0.44 J	1.7 U	1.7 U	0.83 J	0.12 J	1.7 U	0.35 J	1.7 U	1.7 U	1.7 U	0.95 J	1.7 U	1.7 U
Pit 53	X213	7	1.8 U	1.8 U	1.8 U	1.8 U	68 =	6.1 =	1.8 U	0.83 J	0.28 J	0.68 J	1.8 U	0.57 J	1.8 U	1.8 U	1.2 J	1.2 J	1.8 U
Pit 53	X213DL	7	18 U	18 U	18 U	18 U	61 =	4.6 J	18 U	1 J	18 U	18 U	18 U	18 U	18 U	18 U	0.99 J	1.2 J	18 U

Notes:

=:	sample concentration is detected at level reported
U:	sample concentration is under detection limit
J:	sample concentration is estimated value
R:	sample concentration value is rejected
DL:	sample is diluted
RE:	sample is re-extracted
Ing.:	Ingestion
Inh.:	Inhalation
I:	Class I
II:	Class II

Table E-7. SVOCs in Alburn (mg/kg)

Station ID	Sample ID	Depth (ft.)	Hexachlorobutadiene	Hexachlorocyclopentadiene	Hexachloroethane	Indeno(1,2,3-CD)pyrene	Isophorone	N-Nitrosodi-N-Propylamine	N-Nitrosodiphenylamine	Naphthalene	Nitrobenzene	Pentachlorophenol	Phenanthrene	Phenol	Pyrene
Industrial/ Commercial		*Ing*		*14000*	*2000*	*8*	*410000*	*0.8*	*1200*	*82000*	*1000*	*24*	*61000*	*1000000*	*61000*
		Inh		*16*			*4600*				*140*				
Construction Worker		*Ing*		*14000*	*2000*	*170*	*410000*	*18*	*25000*	*8200*	*1000*	*520*	*61000*	*120000*	*61000*
		Inh		*1.1*			*4600*				*9.4*				
Soil Component of GW		*I*		*400*	*0.5*	*14*	*8*	*0.00005*	*1*	*84*	*0.1*	*0.03*	*140*	*100*	*4200*
		II		*2200*	*2.6*	*69*	*8*	*0.00005*	*5.6*	*420*	*0.1*	*0.14*	*700*	*100*	*21000*
Pit 01	X101	2.5	0.37 U	0.37 U	0.37 U	1.6 =	0.37 U	0.37 UJ	0.37 UJ	2 =	0.37 U	0.94 U	5.8 =	0.037 J	4.3 J
Pit 01	X101DL	2.5	1.5 U	1.5 U	1.5 U	1.7 =	1.5 U	1.5 U	1.5 U	1.9 =	1.5 U	3.8 U	7.2 =	1.5 U	6.6 =
Pit 01	X102	7.5	0.38 U	0.38 U	0.38 U	2.9 =	0.38 U	0.38 U	0.38 U	2.7 =	0.38 U	0.96 U	14 =	0.38 U	9.3 =
Pit 01	X102DL	7.5	3.8 U	3.8 U	3.8 U	3.4 J	3.8 U	3.8 U	3.8 U	2.8 J	3.8 U	9.6 U	21 =	3.8 U	14 =
Pit 01B	X101	3	0.4 U	0.4 U	0.4 U	0.68 =	0.4 U	0.4 U	0.4 U	1.2 =	0.4 U	1 U	2.2 =	0.41 =	2.4 =
Pit 01B	X102	6	0.44 U	0.44 U	0.44 U	1.2 =	0.44 U	0.44 U	0.44 U	120 =	0.44 U	1.1 U	10 =	0.44 U	4 =
Pit 02	X103	2	0.48 U	0.48 U	0.48 U	0.48 U	0.48 U	0.48 UJ	0.48 UJ	0.024 J	0.48 U	1.2 U	0.031 J	0.48 U	0.48 UJ
Pit 02	X104	6	0.41 U	0.41 U	0.41 U	0.15 J	0.41 U	0.41 UJ	0.41 UJ	1.5 =	0.41 U	1 UJ	1.4 =	0.41 UJ	0.64 J
Pit 02	X104RE	6	0.43 U	0.43 U	0.43 U	0.35 J	0.43 U	0.43 U	0.43 U	1.9 =	0.43 U	1.1 R	2.2 =	0.43 R	1.3 J
Pit 03	X105	2.5	0.5 U	0.5 U	0.5 U	0.052 J	0.5 U	0.5 UJ	0.5 UJ	0.21 J	0.5 U	1.3 UJ	0.042 J	0.059 J	0.046 J
Pit 03	X105RE	2.5	0.54 U	0.54 U	0.54 U	0.21 J	0.54 U	0.54 U	0.54 U	0.18 J	0.54 U	1.4 UJ	0.11 J	0.54 UJ	0.17 J
Pit 03	X106	0.5	0.57 U	0.57 U	0.57 U	0.045 J	0.57 U	0.57 UJ	0.57 UJ	0.11 J	0.57 U	1.4 U	0.17 J	0.57 U	0.098 J
Pit 03	X107	6	0.56 U	0.56 U	0.56 U	0.07 J	0.56 U	0.56 UJ	0.56 UJ	13 =	0.56 U	1.4 U	0.67 =	0.56 U	0.33 J
Pit 03	X107DL	6	2.8 U	2.8 U	2.8 U	2.8 U	2.8 U	2.8 U	2.8 U	20 =	2.8 U	7.1 U	0.77 J	2.8 U	0.38 J
Pit 04	X108	3	0.37 U	0.37 U	0.37 U	0.46 =	0.37 U	0.37 UJ	0.37 UJ	0.041 J	0.37 U	0.94 U	0.58 =	0.37 U	0.77 J
Pit 04	X109	3	0.37 U	0.37 U	0.37 U	0.66 =	0.37 U	0.37 UJ	0.37 UJ	0.045 J	0.37 U	0.94 U	1.5 =	0.37 U	1.7 J
Pit 04	X110	6	8.9 U	8.9 U	8.9 U	0.83 J	8.9 U	8.9 U	8.9 U	3.3 J	8.9 U	22 U	5.4 J	8.9 U	19 =
Pit 05	X111	5	0.39 U	0.39 UJ	0.39 U	0.38 J	0.39 U	0.39 U	0.39 U	0.18 J	0.39 U	0.97 U	1.1 =	0.39 U	1.3 =
Pit 07	X112	3	0.39 U	0.39 UJ	0.39 U	3.3 =	0.39 U	0.39 U	0.39 U	0.72 =	0.39 U	0.99 U	10 =	0.39 U	10 =
Pit 07	X112DL	3	2 U	2 UJ	2 U	2.6 =	2 U	2 U	2 U	0.64 J	2 U	5 U	9.7 =	2 U	9 =
Pit 08	X113	2.5	0.39 U	0.39 UJ	0.39 U	1.2 J	0.39 U	0.39 U	0.39 U	0.32 J	0.39 U	0.98 U	1.7 =	0.39 U	2.8 J
Pit 08	X113RE	2.5	0.39 UJ	0.39 UJ	0.39 UJ	1.1 J	0.39 UJ	0.39 UJ	0.39 UJ	0.32 J	0.39 UJ	0.98 UJ	1.7 J	0.39 UJ	2.5 J
Pit 08	X114	4	0.36 U	0.36 UJ	0.36 U	1.3 =	0.36 U	0.36 U	0.36 U	1.5 =	0.36 U	0.9 U	2.4 =	0.36 U	3.3 =
Pit 08	X114DL	4	0.72 U	0.72 UJ	0.72 U	1.1 =	0.72 U	0.72 U	0.72 U	1.5 =	0.72 U	1.8 U	2.6 =	0.72 U	3.2 =
Pit 09	X115	2.5	0.35 U	0.35 U	0.35 U	1.2 J	0.033 J	0.35 U	0.35 U	0.13 J	0.35 U	0.87 U	0.56 =	0.35 U	1.8 J
Pit 09	X115DL	2.5	1.4 U	1.4 UJ	1.4 U	1.1 J	1.4 U	1.4 U	1.4 U	0.15 J	1.4 U	3.5 UJ	0.68 J	1.4 U	2.2 =
Pit 09	X115RE	2.5	0.35 U	0.35 UJ	0.35 U	1.6 J	0.032 J	0.35 U	0.35 UJ	0.14 J	0.35 U	0.87 UJ	0.62 J	0.35 U	1.7 J

Table E-7. SVOCs in Alburn (mg/kg)

Station ID	Sample ID	Depth (ft.)	Hexachlorobutadiene	Hexachlorocyclopentadiene	Hexachloroethane	Indeno(1,2,3-CD)pyrene	Isophorone	N-Nitrosodi-N-Propylamine	N-Nitrosodiphenylamine	Naphthalene	Nitrobenzene	Pentachlorophenol	Phenanthrene	Phenol	Pyrene
Industrial/ Commercial		*Ing*		*14000*	*2000*	*8*	*4i0000*	*0.8*	*1200*	*82000*	*1000*	*24*	*61000*	*1000000*	*61000*
		Inh		*16*			*4600*				*140*				
Construction Worker		*Ing*		*14000*	*2000*	*170*	*410000*	*18*	*25000*	*8200*	*1000*	*520*	*61000*	*120000*	*61000*
		Inh		*1.1*			*4600*				*9.4*				
Soil Component of GW		*I*		*400*	*0.5*	*14*	*8*	*0.00005*	*1*	*84*	*0.1*	*0.03*	*140*	*100*	*4200*
		II		*2200*	*2.6*	*69*	*8*	*0.00005*	*5.6*	*420*	*0.1*	*0.14*	*700*	*100*	*21000*
Pit 09	X116	6	0.43 U	0.43 UJ	0.43 U	5 J	0.065 J	0.43 U	0.43 UJ	1.6 =	0.43 U	1.1 UJ	2.3 J	0.22 J	3.2 J
Pit 09	X116DL	6	1.7 U	1.7 UJ	1.7 U	4 J	1.7 U	1.7 U	1.7 UJ	1.6 J	1.7 U	4.3 UJ	2.2 J	1.7 U	2.9 J
Pit 09	X116RE	6	0.43 U	0.43 UJ	0.43 U	5.7 J	0.068 J	0.43 U	0.43 U	1.6 =	0.43 U	1.1 U	2.3 =	0.24 J	3.6 J
Pit 10	X117	2.5	0.39 U	0.39 UJ	0.39 U	2.6 J	0.39 U	0.39 U	0.39 UJ	0.89 =	0.39 U	0.97 UJ	3.2 J	0.39 U	5.4 J
Pit 10	X117DL	2.5	1.5 U	1.5 UJ	1.5 U	1.9 J	1.5 U	1.5 U	1.5 UJ	0.85 J	1.5 U	3.9 UJ	3 J	1.5 U	4.9 J
Pit 10	X117RE	2.5	0.39 U	0.39 UJ	0.39 U	3 J	0.39 U	0.39 U	0.39 U	0.99 =	0.39 U	0.97 U	3.3 =	0.39 U	6.6 J
Pit 10	X118	6	0.5 U	0.5 U	0.5 U	0.49 J	0.5 U	0.5 U	0.5 UJ	0.9 =	0.5 U	1.3 UJ	1.3 J	0.5 U	1.3 J
Pit 10	X118DL	6	2 U	2 UJ	2 U	0.37 J	2 U	2 U	2 U	0.83 J	2 U	5 UJ	1.2 J	2 U	1.4 J
Pit 10	X118RE	6	0.5 U	0.5 UJ	0.5 U	0.59 J	0.5 U	0.5 U	0.5 U	0.98 =	0.5 U	1.3 U	1.5 =	0.25 J	1.3 J
Pit 11	X119	2.5	0.39 U	0.39 U	0.39 U	3.9 J	0.39 U	0.39 U	0.39 U	3 =	0.39 U	0.97 U	7.1 =	1.6 =	8.5 J
Pit 11	X119DL	2.5	1.9 U	1.9 UJ	1.9 U	3.2 J	1.9 U	1.9 U	1.9 UJ	3.5 =	1.9 U	4.9 UJ	12 J	1.5 J	11 J
Pit 11	X119RE	2.5	0.39 U	0.39 UJ	0.39 U	4.8 J	0.39 U	0.39 U	0.39 U	2.6 =	0.39 U	0.97 U	6.2 =	1.7 =	8.5 J
Pit 11	X120	6	0.44 U	0.44 UJ	0.44 U	0.86 J	0.33 J	0.44 U	0.44 UJ	4.3 =	0.44 U	1.1 UJ	5.5 J	2.1 =	3.4 J
Pit 11	X120DL	6	1.8 UJ	1.8 UJ	1.8 U	0.97 J	0.27 J	1.8 U	1.8 UJ	5.4 J	1.8 UJ	4.4 UJ	6.1 J	2 =	3.9 J
Pit 11	X120RE	6	0.44 U	0.44 UJ	0.44 U	0.44 UJ	0.36 J	0.44 U	0.44 U	4 =	0.44 U	1.1 U	5.3 =	2.2 =	3.7 J
Pit 12	X159	3	4.7 U	4.7 U	4.7 U	3.3 J	4.7 U	4.7 U	4.7 U	5.9 =	4.7 U	12 U	26 =	17 =	24 =
Pit 12	X160	3	0.47 UJ	0.47 U	0.47 U	4.1 J	0.47 UJ	0.47 U	0.47 UJ	4 J	0.47 UJ	1.2 UJ	15 J	12 =	16 J
Pit 12	X160DL	3	2.3 U	2.3 U	2.3 U	3 =	2.3 U	2.3 U	2.3 U	3.7 =	2.3 U	5.9 U	15 =	14 =	16 =
Pit 12	X160RE	3	0.47 UJ	0.47 UJ	0.47 UJ	2.6 J	0.47 UJ	0.47 UJ	0.47 UJ	3.6 J	0.47 UJ	1.2 UJ	16 J	11 J	15 J
Pit 12	X161	9	0.4 U	0.4 U	0.4 U	0.14 J	0.4 U	0.4 U	0.4 U	0.14 J	0.4 U	1 U	0.74 =	0.57 =	0.87 =
Pit 13	X145	3	0.36 U	0.36 U	0.36 U	0.02 J	0.36 U	0.36 U	0.36 U	0.082 J	0.36 U	0.9 U	0.17 J	0.36 U	0.11 J
Pit 13	X145RE	3	0.36 U	0.36 U	0.36 U	0.36 UJ	0.36 U	0.36 U	0.36 U	0.086 J	0.36 U	0.9 UJ	0.16 J	0.36 U	0.11 J
Pit 13	X146	9	4.2 U	4.2 U	4.2 U	0.29 J	4.2 U	4.2 U	4.2 U	1.1 J	4.2 U	10 UJ	2.1 J	4.2 U	1.8 J
Pit 14	X147	3	0.43 U	0.43 U	0.43 U	0.66 J	0.43 U	0.43 U	0.43 UJ	0.52 =	0.43 U	1.1 UJ	1.6 J	0.43 U	2.4 J
Pit 14	X147RE	3	0.43 U	0.43 U	0.43 U	0.66 J	0.43 U	0.43 U	0.43 UJ	0.47 =	0.43 U	1.1 UJ	1.8 J	0.24 J	3 J
Pit 14	X148	9	4.3 U	4.3 U	4.3 U	0.41 J	4.3 U	4.3 U	4.3 U	1.8 J	4.3 U	11 U	4.7 =	4.3 U	3.9 J
Pit 14	X148DL	9	8.6 U	8.6 U	8.6 U	8.6 U	8.6 U	8.6 U	8.6 U	1.6 J	8.6 U	22 UJ	4 J	8.6 U	2.4 J

Table E-7. SVOCs in Alburn (mg/kg)

Station ID	Sample ID	Depth (ft.)	Hexachlorobutadiene	Hexachlorocyclopentadiene	Hexachloroethane	Indeno(1,2,3-CD)pyrene	Isophorone	N-Nitrosodi-N-Propylamine	N-Nitrosodiphenylamine	Naphthalene	Nitrobenzene	Pentachlorophenol	Phenanthrene	Phenol	Pyrene
Industrial/ Commercial		*Ing*		*14000*	*2000*	*8*	*410000*	*0.8*	*1200*	*82000*	*1000*	*24*	*61000*	*1000000*	*61000*
		Inh		*16*			*4600*				*140*				
Construction Worker		*Ing*		*14000*	*2000*	*170*	*410000*	*18*	*25000*	*8200*	*1000*	*520*	*61000*	*120000*	*61000*
		Inh		*1.1*			*4600*				*9.4*				
Soil Component of GW		*I*		*400*	*0.5*	*14*	*8*	*0.00005*	*1*	*84*	*0.1*	*0.03*	*140*	*100*	*4200*
		II		*2200*	*2.6*	*69*	*8*	*0.00005*	*5.6*	*420*	*0.1*	*0.14*	*700*	*100*	*21000*
Pit 14	X148RE	9	4.3 U	4.3 U	4.3 U	0.27 J	4.3 U	4.3 U	4.3 U	1.9 J	4.3 U	11 UJ	4.8 =	4.3 U	3.2 J
Pit 15	X121	3	0.45 U	0.45 U	0.45 U	0.096 J	0.062 J	0.45 U	0.45 U	0.13 J	0.45 U	1.1 U	0.15 J	0.45 U	0.2 J
Pit 16	X142	3	0.44 U	0.44 U	0.44 U	0.27 J	0.44 U	0.44 U	0.44 U	0.23 J	0.44 U	1.1 U	0.66 =	0.44 U	1.3 J
Pit 16	X142DL	3	1.8 U	1.8 U	1.8 U	0.13 J	1.8 U	1.8 U	1.8 U	0.21 J	1.8 U	4.4 UJ	0.56 J	1.8 U	0.73 J
Pit 16	X142RE	3	0.44 U	0.44 U	0.44 U	0.16 J	0.44 U	0.44 U	0.44 U	0.24 J	0.44 U	1.1 UJ	0.67 =	0.44 U	0.93 J
Pit 16	X143	3	0.4 U	0.4 U	0.4 U	0.25 J	0.4 U	0.4 U	0.4 U	0.18 J	0.4 U	1 U	0.51 J	0.4 U	1.1 J
Pit 16	X143DL	3	0.8 U	0.8 U	0.8 U	0.12 J	0.8 U	0.8 U	0.8 U	0.19 J	0.8 U	2 UJ	0.42 J	0.8 U	0.71 J
Pit 16	X144	9	0.85 U	0.85 UJ	0.85 U	0.58 J	0.85 U	0.85 U	0.85 R	2.2 =	0.85 U	2.1 R	19 J	0.85 U	8.6 J
Pit 16	X144DL	9	4.3 U	4.3 U	4.3 U	0.63 J	4.3 U	4.3 U	4.3 U	1.7 J	4.3 U	11 U	19 =	4.3 U	14 J
Pit 16	X144RE	9	0.85 U	0.85 UJ	0.85 U	0.36 J	0.85 U	0.85 U	0.85 UJ	2.3 J	0.85 U	2.1 UJ	21 J	0.85 U	13 J
Pit 17	X122	3	0.67 U	0.67 U	0.67 U	0.67 U	0.67 U	0.67 U	0.67 U	0.2 J	0.67 U	1.7 U	0.67 U	0.67 U	0.67 U
Pit 17	X123	6	0.58 U	0.58 UJ	0.58 U	0.22 J	0.58 U	0.58 U	0.58 U	4.4 =	0.58 U	1.4 U	0.97 =	0.58 U	1.2 =
Pit 17	X123DL	6	2.9 U	2.9 UJ	2.9 U	0.16 J	2.9 U	2.9 U	2.9 U	5.7 =	2.9 U	7.2 U	0.74 J	2.9 U	0.9 J
Pit 18	X124	3	0.45 U	0.45 UJ	0.45 U	2.5 J	0.45 U	0.45 U	0.45 U	0.58 =	0.45 U	1.1 U	2.5 =	0.45 U	5.5 =
Pit 18	X124DL	3	0.9 U	0.9 UJ	0.9 U	1.4 =	0.9 U	0.9 U	0.9 U	0.5 J	0.9 U	2.3 U	2.3 =	0.9 U	4.7 =
Pit 18	X125	6	0.45 U	0.45 UJ	0.45 U	0.57 J	0.45 U	0.45 U	0.45 U	4.6 =	0.45 U	1.1 U	3.4 =	0.22 J	2.5 =
Pit 18	X125DL	6	2.3 U	2.3 UJ	2.3 U	0.74 J	2.3 U	2.3 U	2.3 U	0.77 J	2.3 U	5.7 U	2.6 =	2.3 U	4.9 =
Pit 19	X168	3	0.43 U	0.43 U	0.43 U	0.12 J	0.43 U	0.43 U	0.43 U	0.78 =	0.43 U	1.1 U	0.42 J	0.43 U	0.32 J
Pit 19	X169	8	8.8 UJ	8.8 UJ	8.8 UJ	7.7 J	8.8 UJ	8.8 UJ	8.8 UJ	240 J	8.8 UJ	22 UJ	150 J	8.8 UJ	97 J
Pit 19	X169DL	8	88 UJ	88 UJ	88 UJ	12 J	88 UJ	88 UJ	88 UJ	670 J	88 UJ	220 UJ	130 J	88 UJ	71 J
Pit 20	X173	3	0.49 U	0.49 U	0.49 U	0.65 J	0.49 U	0.49 U	0.49 U	3.3 =	0.49 U	1.2 U	2 =	0.49 U	2.6 J
Pit 20	X173DL	3	2.4 U	2.4 U	2.4 U	0.39 J	2.4 U	2.4 UJ	2.4 U	3 =	2.4 U	6.2 U	1.7 J	2.4 UJ	2.3 J
Pit 20	X173RE	3	0.49 U	0.49 U	0.49 U	0.57 J	0.49 U	0.49 UJ	0.49 U	3.3 =	0.49 U	1.2 U	2 =	0.49 UJ	2.9 J
Pit 20	X174	8	4.3 U	4.3 U	4.3 U	3.4 J	4.3 U	4.3 U	4.3 U	43 =	4.3 U	11 U	33 =	4.3 U	16 =
Pit 20	X174DL	8	8.6 U	8.6 U	8.6 U	2.4 J	8.6 U	8.6 UJ	8.6 U	41 =	8.6 U	22 U	29 =	8.6 UJ	13 =
Pit 21	X170	3	4.5 U	4.5 U	4.5 U	0.31 J	0.52 J	4.5 UJ	4.5 U	5.7 =	4.5 U	11 U	2.1 J	4.5 UJ	2.8 J
Pit 21	X171	3	4.3 U	4.3 U	4.3 U	0.49 J	0.28 J	4.3 UJ	4.3 U	1.2 J	4.3 U	11 U	0.99 J	4.3 UJ	1.9 J

Table E-7. SVOCs in Alburn (mg/kg)

Station ID	Sample ID	Depth (ft.)	Hexachlorobutadiene	Hexachlorocyclopentadiene	Hexachloroethane	Indeno(1,2,3-CD)pyrene	Isophorone	N-Nitrosodi-N-Propylamine	N-Nitrosodiphenylamine	Naphthalene	Nitrobenzene	Pentachlorophenol	Phenanthrene	Phenol	Pyrene
Industrial/		*Ing*		*14000*	*2000*	*8*	*410000*	*0.8*	*1200*	*82000*	*1000*	*24*	*61000*	*1000000*	*61000*
Commercial		*Inh*		*16*			*4600*				*140*				
Construction		*Ing*		*14000*	*2000*	*170*	*410000*	*18*	*25000*	*8200*	*1000*	*520*	*61000*	*120000*	*61000*
Worker		*Inh*		*1.1*			*4600*				*9.4*				
Soil Component		*I*		*400*	*0.5*	*14*	*8*	*0.00005*	*1*	*84*	*0.1*	*0.03*	*140*	*100*	*4200*
of GW		*II*		*2200*	*2.6*	*69*	*8*	*0.00005*	*5.6*	*420*	*0.1*	*0.14*	*700*	*100*	*21000*
Pit 21	X172	11	0.53 U	0.53 U	0.53 U	2 =	0.53 U	0.53 U	0.53 U	2.4 =	0.53 U	1.3 U	3.6 =	0.53 U	6 =
Pit 21	X172DL	11	1.1 U	1.1 U	1.1 U	1.4 =	1.1 U	1.1 UJ	1.1 U	2.1 =	1.1 U	2.7 U	3.2 =	1.1 UJ	4.4 =
Pit 23	X126	3	0.39 U	0.39 U	0.39 U	2.9 =	0.39 U	0.39 U	0.39 UJ	1.5 =	0.39 U	0.97 UJ	5.2 J	0.39 U	7.7 J
Pit 23	X126DL	3	1.9 UJ	1.9 UJ	1.9 UJ	2.4 J	1.9 UJ	1.9 UJ	1.9 UJ	1.4 J	1.9 UJ	4.8 UJ	6.8 J	1.9 UJ	12 J
Pit 23	X126RE	3	0.39 U	0.39 UJ	0.39 U	3.3 J	0.39 U	0.39 U	0.39 U	1.4 =	0.39 U	0.97 U	4.4 =	0.39 U	10 J
Pit 23	X127	7	0.5 U	0.5 U	0.5 U	0.6 =	0.5 U	0.5 U	0.5 UJ	0.81 =	0.5 U	1.2 UJ	1.6 J	0.5 U	1.6 J
Pit 23	X127RE	7	0.5 U	0.5 UJ	0.5 U	0.68 J	0.5 U	0.5 U	0.5 U	0.93 =	0.5 U	1.2 U	1.8 =	0.5 U	2.2 J
Pit 24	X138	3	4.9 U	4.9 U	4.9 U	1.1 J	4.9 U	4.9 U	4.9 U	44 =	4.9 U	12 UJ	9.1 =	4.9 U	6.8 =
Pit 24	X138DL	3	20 U	20 U	20 U	1.2 J	20 U	20 U	20 U	70 =	20 U	49 UJ	8 J	20 U	5.2 J
Pit 24	X138RE	3	4.9 U	4.9 U	4.9 U	1.1 J	4.9 U	4.9 U	4.9 UJ	91 =	4.9 U	12 UJ	9.1 J	4.9 U	5.3 J
Pit 24	X139	9	0.82 U	0.82 U	0.82 U	10 J	0.82 U	0.82 U	0.82 UJ	2.5 =	0.82 U	2.1 UJ	25 J	0.82 U	38 J
Pit 24	X139DL	9	8.2 U	8.2 U	8.2 U	5.1 J	8.2 U	8.2 U	8.2 U	2.8 J	8.2 U	21 UJ	27 =	8.2 U	32 =
Pit 24	X139RE	9	0.82 U	0.82 U	0.82 U	7.4 J	0.82 U	0.82 U	0.82 U	3.1 J	0.82 U	2.1 UJ	28 J	0.82 U	42 J
Pit 25	X132	2.5	0.4 U	0.4 UJ	0.4 U	1.2 J	0.4 U	0.4 U	0.4 UJ	0.71 =	0.4 U	1 UJ	3.4 J	0.4 U	5.8 J
Pit 25	X132DL	2.5	0.8 UJ	0.8 UJ	0.8 UJ	0.88 J	0.8 UJ	0.8 UJ	0.8 UJ	0.69 J	0.8 UJ	2 UJ	2.8 J	0.8 UJ	5.3 J
Pit 25	X132RE	2.5	0.4 UJ	0.4 UJ	0.4 UJ	1.1 J	0.4 UJ	0.4 UJ	0.4 R	0.73 J	0.4 UJ	1 R	3.1 J	0.4 UJ	5.5 J
Pit 25	X133	8	3.4 U	3.4 U	3.4 U	0.95 J	3.4 U	3.4 U	3.4 U	12 =	3.4 U	8.5 U	11 =	2.6 J	7.1 =
Pit 26	X140	3	0.37 U	0.37 U	0.37 U	0.039 J	0.37 U	0.37 U	0.37 U	0.063 J	0.37 U	0.93 U	0.23 J	0.37 U	0.22 J
Pit 26	X141	9	7.2 U	7.2 U	7.2 U	7.2 UJ	7.2 U	7.2 U	7.2 U	9.5 =	7.2 U	18 U	0.59 J	7.2 U	7.2 UJ
Pit 26	X141RE	9	7.2 U	7.2 U	7.2 U	7.2 UJ	7.2 U	7.2 U	7.2 U	10 =	7.2 U	18 UJ	7.2 U	7.2 U	7.2 UJ
Pit 27	X136	9	0.79 U	0.79 U	0.79 U	1 J	0.79 U	0.79 U	0.79 UJ	6.1 =	0.79 U	2 UJ	4.6 J	0.79 U	3.8 J
Pit 27	X136DL	9	1.6 U	1.6 U	1.6 U	0.95 J	1.6 U	1.6 U	1.6 U	5.6 =	1.6 U	4 U	4.7 =	1.6 U	5 J
Pit 27	X136RE	9	0.79 U	0.79 U	0.79 U	0.72 J	0.79 U	0.79 U	0.79 U	3.9 =	0.79 U	2 UJ	5.2 =	0.79 U	3.9 J
Pit 27	X137	3	0.39 U	0.39 UJ	0.39 U	0.7 J	0.39 U	0.39 U	0.39 UJ	9.9 =	0.39 U	0.97 UJ	1.4 J	0.39 U	2.2 J
Pit 27	X137DL	3	3.9 U	3.9 U	3.9 U	0.59 J	3.9 U	3.9 U	3.9 U	9.6 =	3.9 U	9.7 U	1.4 J	3.9 U	3 J
Pit 27	X137RE	3	0.39 U	0.39 UJ	0.39 U	0.52 J	0.39 U	0.39 U	0.39 UJ	4.3 J	0.39 U	0.97 UJ	1.5 J	0.39 U	2.6 J
Pit 28	X164	3	0.37 U	0.37 UJ	0.37 U	0.024 J	0.37 U	0.37 U	0.37 U	7.5 =	0.37 U	0.93 U	1.6 =	0.37 U	0.64 =

Table E-7. SVOCs in Alburn (mg/kg)

Station ID	Sample ID	Depth (ft.)	Hexachlorobutadiene	Hexachlorocyclopentadiene	Hexachloroethane	Indeno(1,2,3-CD)pyrene	Isophorone	N-Nitrosodi-N-Propylamine	N-Nitrosodiphenylamine	Naphthalene	Nitrobenzene	Pentachlorophenol	Phenanthrene	Phenol	Pyrene
Industrial/		*Ing*		*14000*	*2000*	*8*	*410000*	*0.8*	*1200*	*82000*	*1000*	*24*	*61000*	*1000000*	*61000*
Commercial		*Inh*		*16*			*4600*				*140*				
Construction		*Ing*		*14000*	*2000*	*170*	*410000*	*18*	*25000*	*8200*	*1000*	*520*	*61000*	*120000*	*61000*
Worker		*Inh*		*1.1*			*4600*				*9.4*				
Soil Component		*I*		*400*	*0.5*	*14*	*8*	*0.00005*	*1*	*84*	*0.1*	*0.03*	*140*	*100*	*4200*
of GW		*II*		*2200*	*2.6*	*69*	*8*	*0.00005*	*5.6*	*420*	*0.1*	*0.14*	*700*	*100*	*21000*
Pit 28	X164DL	3	1.9 U	1.9 UJ	1.9 U	0.11 J	0.41 J	1.9 U	1.9 U	7.8 =	1.9 U	4.7 U	1.4 J	1.5 J	0.52 J
Pit 28	X165	10	6.2 U	6.2 U	6.2 U	24 =	6.2 U	6.2 U	6.2 U	270 =	6.2 U	16 U	240 =	6.2 U	130 =
Pit 28	X165DL	10	62 U	62 U	62 U	38 J	62 U	62 U	62 U	450 =	62 U	160 U	360 =	62 U	170 =
Pit 29	X128	3	0.41 U	0.41 UJ	0.41 U	0.83 J	0.22 J	0.41 U	0.41 U	2.1 =	0.41 U	1 U	1.7 =	0.41 U	2.5 =
Pit 29	X129	4.5	4 U	4 UJ	4 U	1.6 J	4.4 =	4 U	4 U	32 =	4 U	10 U	7.2 =	4 U	6.8 =
Pit 29	X129DL	4.5	7.9 U	7.9 UJ	7.9 U	0.93 J	7.9 U	7.9 U	7.9 U	35 =	7.9 U	20 U	6.3 J	7.9 U	5.1 J
Pit 30	X166	3	2 U	2 U	2 U	0.47 J	2 U	2 UJ	2 U	18 =	2 U	5 U	4.3 =	2 UJ	2.1 =
Pit 30	X166DL	3	4 U	4 U	4 U	0.24 J	4 U	4 U	4 U	17 =	4 U	10 U	3.6 J	4 U	1.6 J
Pit 30	X167	9	0.5 U	0.5 U	0.5 U	0.6 J	0.5 U	0.5 UJ	0.5 U	4.3 =	0.5 U	1.2 U	2.3 =	0.5 UJ	1.8 J
Pit 30	X167DL	9	0.99 U	0.99 U	0.99 U	0.32 J	0.99 U	0.99 U	0.99 U	3.5 =	0.99 U	2.5 U	1.7 =	0.99 U	1.2 =
Pit 30	X167RE	9	0.5 U	0.5 U	0.5 U	0.55 J	0.5 U	0.5 U	0.5 U	3.8 =	0.5 U	1.2 U	1.9 =	0.5 U	1.6 J
Pit 31	X130	3	0.38 U	0.38 UJ	0.38 U	0.19 J	0.38 U	0.38 U	0.38 U	5.6 =	0.38 U	0.96 U	1.7 =	0.38 U	1.4 =
Pit 31	X130DL	3	1.5 U	1.5 UJ	1.5 U	0.11 J	1.5 U	1.5 U	1.5 U	8.9 =	1.5 U	3.8 U	1.5 =	1.5 U	0.86 J
Pit 31	X131	6	0.43 U	0.43 U	0.43 U	0.35 J	0.43 U	0.43 U	0.43 U	8.6 =	0.43 U	1.1 U	1.2 =	0.47 =	1.2 J
Pit 31	X131DL	6	1.7 U	1.7 UJ	1.7 U	0.25 J	1.7 U	1.7 U	1.7 U	13 =	1.7 U	4.3 UJ	1 J	0.38 J	1.1 J
Pit 31	X131RE	6	0.43 U	0.43 UJ	0.43 U	0.42 J	0.43 U	0.43 U	0.43 U	7.6 =	0.43 U	1.1 U	1.3 =	0.47 =	1.5 J
Pit 33	X134	3	0.37 U	0.37 UJ	0.37 U	0.66 J	0.37 U	0.37 U	0.37 R	19 =	0.37 U	0.93 R	6.3 J	0.37 U	3.5 J
Pit 33	X134DL	3	7.4 U	7.4 U	7.4 U	0.38 J	7.4 U	7.4 U	7.4 U	15 =	7.4 U	19 U	6.3 J	7.4 U	3.6 J
Pit 33	X134RE	3	0.37 UJ	0.37 UJ	0.37 UJ	0.49 J	0.37 UJ	0.37 UJ	0.37 UJ	14 J	0.37 UJ	0.93 UJ	6.7 J	0.37 UJ	2.9 J
Pit 33	X135	8	0.41 U	0.41 U	0.41 U	0.16 J	0.41 U	0.41 U	0.41 U	2.6 =	0.41 U	1 U	1.5 =	0.41 U	1.3 J
Pit 33	X135RE	8	0.41 U	0.41 U	0.41 U	0.14 J	0.41 U	0.41 U	0.41 U	2.4 =	0.41 U	1 U	1.5 =	0.41 U	0.79 =
Pit 34	X162	3	0.43 U	0.43 U	0.43 U	0.54 =	0.43 U	0.43 U	0.43 U	10 =	0.43 U	1.1 U	8.5 =	1.1 =	5.2 =
Pit 34	X162DL	3	2.1 U	2.1 U	2.1 U	0.95 J	2.1 U	2.1 U	2.1 U	14 =	2.1 U	5.4 U	10 =	1.1 J	7.4 J
Pit 34	X162DLR	3	2.1 UJ	2.1 UJ	2.1 U	0.57 J	2.1 UJ	2.1 U	2.1 UJ	14 J	2.1 UJ	5.4 UJ	10 J	0.85 J	5.3 =
Pit 34	X163	9	0.81 U	0.81 U	0.81 U	0.4 J	0.81 U	0.81 U	0.81 U	0.83 =	0.81 U	2 U	3.6 =	0.24 J	2.7 =
Pit 35	X149	3	0.41 U	0.41 U	0.41 U	29 J	0.41 U	0.41 U	0.41 UJ	7.8 =	0.41 U	1 UJ	61 J	0.41 U	70 J
Pit 35	X149DL	3	12 U	12 U	12 U	13 =	12 U	12 U	12 U	8.1 J	12 U	31 UJ	66 =	12 U	65 =

Table E-7. SVOCs in Alburn (mg/kg)

Station ID	Sample ID	Depth (ft.)	Hexachlorobutadiene	Hexachlorocyclopentadiene	Hexachloroethane	Indeno(1,2,3-CD)pyrene	Isophorone	N-Nitrosodi-N-Propylamine	N-Nitrosodiphenylamine	Naphthalene	Nitrobenzene	Pentachlorophenol	Phenanthrene	Phenol	Pyrene
Industrial/ Commercial		*Ing*		*14000*	*2000*	*8*	*410000*	*0.8*	*1200*	*82000*	*1000*	*24*	*61000*	*1000000*	*61000*
		Inh		*16*			*4600*				*140*				
Construction Worker		*Ing*		*14000*	*2000*	*170*	*410000*	*18*	*25000*	*8200*	*1000*	*520*	*61000*	*120000*	*61000*
		Inh		*1.1*			*4600*				*9.4*				
Soil Component of GW		*I*		*400*	*0.5*	*14*	*8*	*0.00005*	*1*	*84*	*0.1*	*0.03*	*140*	*100*	*4200*
		II		*2200*	*2.6*	*69*	*8*	*0.00005*	*5.6*	*420*	*0.1*	*0.14*	*700*	*100*	*21000*
Pit 35	X149RE	3	0.41 U	0.41 U	0.41 U	21 J	0.41 U	0.41 U	0.41 UJ	4.2 =	0.41 U	1 UJ	44 J	0.41 U	68 J
Pit 35	X150	9	0.78 U	0.78 UJ	0.78 U	1.3 J	0.78 U	0.78 U	0.78 R	2.1 =	0.78 U	2 R	3.2 J	0.78 U	3 J
Pit 35	X150DL	9	1.6 U	1.6 U	1.6 U	0.98 J	1.6 U	1.6 U	1.6 U	1.9 =	1.6 U	3.9 U	3.3 =	1.6 U	4.3 J
Pit 35	X150RE	9	0.78 U	0.78 U	0.78 U	0.83 J	0.78 U	0.78 U	0.78 UJ	2.1 =	0.78 U	2 UJ	3.6 J	0.78 U	4 J
Pit 37	X151	3	0.74 UJ	0.74 U	0.74 U	0.56 J	0.74 UJ	0.74 U	0.74 UJ	8.2 J	0.74 UJ	1.9 UJ	2.8 J	0.74 U	1.5 =
Pit 37	X151DL	3	3 U	3 U	3 U	0.34 J	3 U	3 U	3 UJ	8.3 =	3 U	7.4 UJ	2.5 J	3 U	1.4 J
Pit 37	X151RE	3	0.74 UJ	0.74 UJ	0.74 UJ	0.37 J	0.74 UJ	0.74 UJ	0.74 UJ	8.2 J	0.74 UJ	1.9 UJ	2.8 J	0.74 UJ	1.4 J
Pit 37	X152	9	4 U	4 U	4 U	4 U	4 U	4 U	4 U	7.7 =	4 U	10 U	2.8 J	4 U	0.79 J
Pit 38	X157	3	0.38 U	0.38 U	0.38 U	0.38 U	0.38 U	0.38 U	0.38 U	0.062 J	0.38 U	0.97 U	0.095 J	0.38 U	0.047 J
Pit 38	X158	9	4.1 U	4.1 U	4.1 U	0.4 J	4.1 U	4.1 U	2.8 J	0.3 J	4.1 U	10 U	1.7 J	0.28 J	1.5 J
Pit 39	X153	3	0.42 U	0.42 U	0.42 U	1.2 J	0.42 U	0.42 U	0.42 UJ	2.1 =	0.42 U	1.1 UJ	4.1 J	0.14 J	4.2 J
Pit 39	X153DL	3	0.84 U	0.84 U	0.84 U	1.1 J	0.84 U	0.84 U	0.84 U	2 =	0.84 U	2.1 U	3.9 =	0.84 U	3.8 =
Pit 39	X153RE	3	0.42 U	0.42 U	0.42 U	1.5 J	0.42 U	0.42 U	0.42 U	1.9 =	0.42 U	1.1 U	3.7 =	0.18 J	4.4 J
Pit 39	X154	9	0.39 U	0.39 U	0.39 U	0.039 J	0.39 U	0.39 U	0.39 U	0.026 J	0.39 U	0.98 U	0.18 J	0.39 U	0.17 J
Pit 40	X155	3	0.39 UJ	0.39 UJ	0.39 UJ	0.39 UJ	0.39 UJ	0.39 UJ	0.39 UJ	0.39 UJ	0.39 UJ	0.98 R	0.39 UJ	0.39 R	0.39 UJ
Pit 40	X155RE	3	0.39 U	0.39 U	0.39 U	0.39 U	0.39 U	0.39 U	0.39 U	0.39 U	0.39 U	0.97 UJ	0.046 J	0.39 UJ	0.02 J
Pit 40	X156	10	0.39 U	0.39 U	0.39 U	1.3 =	0.39 U	0.39 U	0.39 U	0.55 =	0.39 U	0.98 U	4.5 =	0.39 U	4.5 =
Pit 40	X156DL	10	1.6 U	1.6 U	1.6 U	1.9 =	1.6 U	1.6 U	1.6 U	0.54 J	1.6 U	3.9 U	4.7 =	1.6 U	5.5 =
Pit 41	X181	9	0.43 U	0.43 U	0.43 U	0.18 J	0.43 U	0.43 U	0.43 U	0.76 =	0.43 U	1.1 U	0.76 =	0.43 U	0.66 =
Pit 41	X182	3	0.44 U	0.44 U	0.44 U	0.19 J	0.12 J	0.44 U	0.44 U	1.9 =	0.44 U	1.1 UJ	1.5 =	0.44 U	1.1 =
Pit 42	X179	3	4 U	4 U	4 U	1.3 J	4 U	4 U	4 U	25 =	4 U	10 UJ	14 =	4 U	7.8 =
Pit 42	X180	9	0.44 U	0.44 U	0.44 U	5.1 J	0.44 U	0.44 UJ	0.44 U	21 =	0.44 U	1.1 U	18 =	0.094 J	18 J
Pit 42	X180DL	9	4.4 U	4.4 U	4.4 U	2.8 J	4.4 U	4.4 U	4.4 U	34 =	4.4 U	11 U	18 =	4.4 U	14 =
Pit 42	X180RE	9	0.44 U	0.44 U	0.44 U	5.2 J	0.44 U	0.44 U	0.44 U	18 =	0.44 U	1.1 U	16 =	0.44 U	17 J
Pit 43	X175	3	7.3 UJ	7.3 UJ	7.3 UJ	7.3 UJ	7.3 UJ	7.3 UJ	7.3 UJ	55 J	7.3 UJ	18 UJ	3.7 J	7.3 UJ	2.6 J
Pit 43	X176	8	0.34 U	0.34 U	0.34 U	2.9 =	0.34 U	0.34 UJ	0.34 U	2.2 =	0.34 U	0.85 U	11 =	0.34 UJ	11 =
Pit 43	X176DL	8	3.4 U	3.4 U	3.4 U	2.2 J	3.4 U	3.4 UJ	3.4 U	2.1 J	3.4 U	8.5 U	11 =	3.4 UJ	9.9 =

Table E-7. SVOCs in Alburn (mg/kg)

Station ID	Sample ID	Depth (ft.)	Hexachlorobutadiene	Hexachlorocyclopentadiene	Hexachloroethane	Indeno(1,2,3-CD)pyrene	Isophorone	N-Nitrosodi-N-Propylamine	N-Nitrosodiphenylamine	Naphthalene	Nitrobenzene	Pentachlorophenol	Phenanthrene	Phenol	Pyrene
Industrial/ Commercial		*Ing*		*14000*	*2000*	*8*	*410000*	*0.8*	*1200*	*82000*	*1000*	*24*	*61000*	*1000000*	*61000*
		Inh		*16*			*4600*				*146*				
Construction Worker		*Ing*		*14000*	*2000*	*170*	*410000*	*18*	*25000*	*8200*	*1000*	*520*	*61000*	*120000*	*61000*
		Inh		*1.1*			*4600*				*9.4*				
Soil Component of GW		*I*		*400*	*0.5*	*14*	*8*	*0.00005*	*1*	*84*	*0.1*	*0.03*	*140*	*100*	*4200*
		II		*2200*	*2.6*	*69*	*8*	*0.00005*	*5.6*	*420*	*0.1*	*0.14*	*700*	*100*	*21000*
Pit 44	X183	3	0.39 U	0.39 U	0.39 U	2.1 =	0.39 U	0.39 U	0.39 U	0.73 =	0.39 U	0.98 U	2.6 =	0.39 U	3.9 =
Pit 44	X183DL	3	0.78 U	0.78 U	0.78 U	1.5 =	0.78 U	0.78 UJ	0.78 U	0.63 J	0.78 U	2 U	2.3 =	0.78 UJ	3 =
Pit 44	X184	8	0.55 U	0.55 U	0.55 U	0.41 J	0.55 U	0.55 U	0.55 U	7.6 =	0.55 U	1.4 UJ	18 =	0.074 J	8.6 =
Pit 44	X184DL	8	5.5 UJ	5.5 U	5.5 U	0.71 J	5.5 U	5.5 U	5.5 U	14 =	5.5 U	14 U	33 =	5.5 U	17 =
Pit 45	X177	3	0.64 U	0.64 U	0.64 U	0.64 U	0.64 U	0.64 U	0.64 U	0.12 J	0.64 U	1.6 U	0.08 J	0.64 U	0.04 J
Pit 45	X178	8	0.3 U	0.3 U	0.3 U	0.59 =	0.13 J	0.3 U	0.3 U	1.8 =	0.3 U	0.75 U	1.7 =	0.35 =	1.4 =
Pit 52	X210	3	2.1 U	2.1 UJ	2.1 U	5 =	1.1 J	2.1 U	1.2 J	1 J	2.1 U	5.3 UJ	3.8 =	0.23 J	5.8 =
Pit 52	X211	5	2.3 U	2.3 UJ	2.3 U	1.6 J	2.3 U	2.3 U	0.16 J	2.6 =	2.3 U	5.8 UJ	5.5 =	2.3 U	4.2 =
Pit 53	X212	3	1.7 U	1.7 UJ	1.7 U	1.4 J	0.48 J	1.7 U	1.7 U	0.15 J	1.7 U	4.2 UJ	0.58 J	1.7 U	0.8 J
Pit 53	X213	7	1.8 U	1.8 UJ	1.8 U	0.15 J	1.8 U	1.8 U	1.1 J	1.1 J	1.8 U	4.4 U	2.6 =	1.8 U	0.9 J
Pit 53	X213DL	7	18 U	18 UJ	18 U	18 U	18 U	18 U	1.2 J	1.4 J	18 U	44 UJ	2.5 J	18 U	0.89 J

Notes:

=:	sample concentration is detected at level reported
U:	sample concentration is under detection limit
J:	sample concentration is estimated value
R:	sample concentration value is rejected
DL:	sample is diluted
RE:	sample is re-extracted
Ing.:	Ingestion
Inh.:	Inhalation
I:	Class I
II:	Class II

Table E-8. SVOCs in U.S. Drum (mg/kg)

Station ID	Sample ID	Depth (ft)	2,2'-Oxybis (1-Chloro)Propane	2,4,5-Trichlorophenol	2,4,6-Trichlorophenol	2,4-Dichlorophenol	2,4-Dimethylphenol	2,4-Dinitrophenol	2,4-Dinitrotoluene	2,6-Dinitrotoluene	2-Chloronaphthalene	2-Chlorophenol	2-Methylnaphthalene	2-Methylphenol	2-Nitroaniline	2-Nitrophenol	3,3'-Dichlorobenzidine	3-Nitroaniline
Industrial/ Commercial		*Ing*		*200000*	*520*	*6100*	*41000*	*4100*	*8.4*	*8.4*		*10000*	*61000*	*100000*			*13*	
		Inh			*390*							*53000*						
Construction Worker		*Ing*		*200000*	*11000*	*610*	*41000*	*410*	*180*	*180*		*10000*	*61000*	*100000*			*280*	
		Inh			*540*							*53000*						
Soil Component of GW		*I*		*270*	*0.2*	*1*	*9*	*0.2*	*0.0008*	*0.0007*		*4*	*29*	*15*			*0.007*	
		II		*1400*	*0.77*	*1*	*9*	*0.2*	*0.0008*	*0.0007*		*4*	*145*	*15*			*0.033*	
Pit 01	X207	4	7.6 U	19 U	7.6 U	7.6 U	7.6 U	19 UJ	7.6 U	7.6 U	7.6 U	7.6 U	2.3 J	7.6 U	19 U	7.6 U	7.6 U	19 U
Pit 01	X208	9	85 U	210 U	85 U	85 U	12 J	210 UJ	85 U	85 U	85 U	85 U	7 J	85 U	210 U	85 U	85 U	210 U
Pit 01	X209	13	14 U	36 U	14 U	14 U	2 J	36 UJ	14 U	14 U	14 U	14 U	1.4 J	14 U	36 U	14 U	14 U	36 U
Pit 02	X205	3	0.44 U	1.1 U	0.44 U	0.44 U	0.44 U	1.1 UJ	0.44 U	0.44 U	0.44 U	0.44 U	0.038 J	0.44 U	1.1 U	0.44 U	0.44 U	1.1 U
Pit 02	X206	9	1.2 U	3.1 U	1.2 U	1.2 U	1.2 U	3.1 UJ	1.2 U	1.2 U	1.2 U	1.2 U	0.12 J	1.2 U	3.1 U	1.2 U	1.2 U	3.1 U
Pit 03	X201	3	1.6 U	3.9 U	1.6 U	1.6 U	2.6 =	3.9 UJ	1.6 U	1.6 U	1.6 U	1.6 U	0.19 J	1.6 U	3.9 U	1.6 U	1.6 U	3.9 U
Pit 03	X202	8	1.2 U	2.9 U	1.2 U	1.2 U	1.2 U	2.9 UJ	1.2 U	1.2 U	1.2 U	1.2 U	0.061 J	1.2 U	2.9 U	1.2 U	1.2 U	2.9 U
Pit 04	X177	4	2.1 U	5.3 U	2.1 U	2.1 U	2.1 U	5.3 UJ	2.1 U	2.1 U	2.1 U	2.1 U	1.1 J	2.1 U	5.3 U	2.1 U	2.1 U	5.3 U
Pit 04	X178	8	0.79 U	2 U	0.79 U	0.31 J	0.79 U	2 UJ	0.79 U	0.79 U	0.79 U	0.79 U	0.085 J	0.13 J	2 U	0.79 U	0.79 U	2 U
Pit 04	X178DL	8	16 U	40 U	16 U	16 U	16 U	40 UJ	16 U	16 U	16 U	16 U	16 U	16 U	40 U	16 U	16 U	40 U
Pit 05	X198	2.5	2 U	5.1 U	2 U	2 U	2 U	5.1 UJ	2 U	2 U	2 U	2 U	0.28 J	2 U	5.1 U	2 U	2 U	5.1 U
Pit 05	X199	8	4.1 U	10 U	4.1 U	4.1 U	4.1 U	10 U	4.1 U	4.1 U	4.1 U	4.1 U	1.1 J	4.1 U	10 U	4.1 U	4.1 U	10 U
Pit 05	X200	8	1.9 U	4.8 U	1.9 U	1.9 U	1.9 U	4.8 UJ	1.9 U	1.9 U	1.9 U	1.9 U	0.87 J	1.9 U	4.8 U	1.9 U	1.9 U	4.8 U
Pit 05	X200DL	8	7.7 U	19 U	7.7 U	7.7 U	7.7 U	19 U	7.7 U	7.7 U	7.7 U	7.7 U	0.79 J	7.7 U	19 U	7.7 U	7.7 U	19 U
Pit 06	X196	3	0.4 UJ	1 U	0.4 UJ	0.4 U	0.4 U	1 UJ	0.4 U	0.4 U	0.4 U	0.4 U	0.63 =	0.4 U	1 U	0.4 U	0.4 U	1 U
Pit 06	X197	8	2 U	5.1 U	2 U	2 U	0.39 J	5.1 U	2 U	2 U	2 U	2 U	1.6 J	0.31 J	5.1 U	2 U	2 U	5.1 U
Pit 06	X197DL	8	8.1 UJ	20 U	8.1 UJ	8.1 U	8.1 U	20 UJ	8.1 U	8.1 U	8.1 U	8.1 U	1.6 J	8.1 U	20 U	8.1 U	8.1 U	20 U
Pit 07	X175	3	1.6 U	4 U	1.6 U	1.6 U	1.6 U	4 UJ	1.6 U	1.6 U	1.6 U	1.6 U	0.11 J	1.6 U	4 U	1.6 U	1.6 U	4 U
Pit 07	X176	8	1.3 U	3.3 U	1.3 U	1.3 U	1.3 U	3.3 UJ	1.3 U	1.3 U	1.3 U	1.3 U	0.079 J	1.3 U	3.3 U	1.3 U	1.3 U	3.3 U
Pit 08	X173	2.5	0.39 U	0.98 U	0.39 U	0.39 U	0.39 U	0.98 UJ	0.39 U	0.39 U	0.39 U	0.39 U	0.21 J	0.39 U	0.98 U	0.39 U	0.39 U	0.98 U
Pit 08	X173DL	2.5	1.2 U	2.9 U	1.2 U	1.2 U	1.2 U	2.9 UJ	1.2 U	1.2 U	1.2 U	1.2 U	0.24 J	1.2 U	2.9 U	1.2 U	1.2 U	2.9 U
Pit 08	X174	8	2.1 U	5.2 U	2.1 U	2.1 U	2.1 U	5.2 UJ	2.1 U	2.1 U	2.1 U	2.1 U	0.11 J	2.1 U	5.2 U	2.1 U	2.1 U	5.2 U
Pit 09	X168	3	0.38 U	0.97 U	0.38 U	0.076 J	0.21 J	0.97 UJ	0.38 U	0.38 U	0.38 U	0.38 U	0.62 =	0.38 U	0.97 U	0.38 U	0.38 U	0.97 U
Pit 09	X169	6.5	0.42 U	1.1 U	0.42 U	0.42 U	0.42 U	1.1 U	0.42 U	0.42 U	0.42 U	0.42 U	0.11 J	0.42 U	1.1 U	0.42 U	0.42 U	1.1 U
Pit 09	X170	6.5	0.41 U	1 U	0.41 U	0.41 U	0.059 J	1 U	0.41 U	0.41 U	0.41 U	0.41 U	0.73 =	0.41 U	1 U	0.41 U	0.41 U	1 U
Pit 10	X171	3	1 U	2.5 U	1 U	1 U	1 U	2.5 UJ	1 U	1 U	1 U	1 U	0.15 J	1 U	2.5 U	1 U	1 U	2.5 U
Pit 10	X171DL	3	5 U	13 U	5 U	5 U	5 U	13 UJ	5 U	5 U	5 U	5 U	5 U	5 U	13 U	5 U	5 U	13 U
Pit 10	X172	8	19 U	49 U	19 U	19 U	19 U	49 UJ	19 U	19 U	19 U	19 U	3.5 J	19 U	49 U	19 U	19 U	49 U

Table E-8. SVOCs in U.S. Drum (mg/kg)

Station ID	Sample ID	Depth (ft)	2,2'-Oxybis (1-Chloro)Propane	2,4,5-Trichlorophenol	2,4,6-Trichlorophenol	2,4-Dichlorophenol	2,4-Dimethylphenol	2,4-Dinitrophenol	2,4-Dinitrotoluene	2,6-Dinitrotoluene	2-Chloronaphthalene	2-Chlorophenol	2-Methylnaphthalene	2-Methylphenol	2-Nitroaniline	2-Nitrophenol	3,3'-Dichlorobenzidine	3-Nitroaniline
Industrial/ Commercial		*Ing*		*200000*	*520*	*6100*	*41000*	*4100*	*8.4*	*8.4*		*10000*	*61000*	*100000*			*13*	
		Inh			*390*							*53000*						
Construction Worker		*Ing*		*200000*	*11000*	*610*	*41000*	*410*	*180*	*180*		*10000*	*61000*	*100000*			*280*	
		Inh			*540*							*53000*						
Soil Component of GW		*I*		*270*	*0.2*	*1*	*9*	*0.2*	*0.0008*	*0.0007*		*4*	*29*	*15*			*0.007*	
		II		*1400*	*0.77*	*1*	*9*	*0.2*	*0.0008*	*0.0007*		*4*	*145*	*15*			*0.033*	
Pit 11	X190	2	2.4 U	6.1 U	2.4 U	2.4 U	2.4 U	6.1 U	2.4 U	2.4 U	2.4 U	2.4 U	0.45 J	2.4 U	6.1 U	2.4 U	2.4 U	6.1 U
Pit 11	X190DL	2	4.9 UJ	12 U	4.9 UJ	4.9 U	4.9 U	12 UJ	4.9 U	4.9 U	4.9 U	4.9 U	0.5 J	4.9 U	12 U	4.9 U	4.9 U	12 U
Pit 11	X191	8	0.88 U	2.2 U	0.88 U	0.88 U	0.88 U	2.2 UJ	0.88 U	0.88 U	0.88 U	0.88 U	0.17 J	0.88 U	2.2 U	0.88 U	0.88 U	2.2 U
Pit 12	X192	3	0.38 UJ	0.94 UJ	0.38 UJ	0.38 UJ	0.38 UJ	0.94 UJ	0.38 UJ	0.38 UJ	0.38 UJ	0.38 UJ	0.058 J	0.38 UJ	0.94 UJ	0.38 UJ	0.38 UJ	0.94 UJ
Pit 12	X193	8	0.8 U	2 U	0.8 U	0.8 U	0.8 U	2 UJ	0.8 U	0.8 U	0.8 U	0.8 U	0.21 J	0.8 U	2 U	0.8 U	0.8 U	2 U
Pit 13	X194	3.5	1.9 U	4.9 U	1.9 U	1.9 U	1.9 U	4.9 U	1.9 U	1.9 U	1.9 U	1.9 U	0.3 J	1.9 U	4.9 U	1.9 U	1.9 U	4.9 U
Pit 13	X195	12	5.4 U	14 U	5.4 U	5.4 U	5.4 U	14 U	5.4 U	5.4 U	5.4 U	5.4 U	5.4 U	5.4 U	14 U	5.4 U	5.4 U	14 U
Pit 13	X195DL	12	27 UJ	68 U	27 UJ	27 U	27 U	68 UJ	27 U	27 U	27 U	27 U	27 U	27 U	68 U	27 U	27 U	68 U
Pit 14	X184	4	0.76 U	1.9 U	0.76 U	0.76 U	0.76 U	1.9 UJ	0.76 U	0.76 U	0.76 U	0.76 U	0.14 J	0.76 U	1.9 U	0.76 U	0.76 U	1.9 U
Pit 14	X185	9	0.48 U	1.2 U	0.48 U	0.48 U	0.046 J	1.2 UJ	0.48 U	0.48 U	0.48 U	0.48 U	0.26 J	0.056 J	1.2 U	0.48 U	0.48 U	1.2 U
Pit 14	X185DL	9	0.96 U	2.4 U	0.96 U	0.96 U	0.96 U	2.4 U	0.96 U	0.96 U	0.96 U	0.96 U	0.28 J	0.067 J	2.4 U	0.96 U	0.96 U	2.4 U
Pit 15	X186	4	2 U	5.1 U	2 U	2 U	0.65 J	5.1 U	2 U	2 U	2 U	2 U	3 =	0.24 J	5.1 U	2 U	2 U	5.1 U
Pit 15	X187	8	0.81 U	2 U	0.81 U	0.81 U	0.3 J	2 UJ	0.81 U	0.81 U	0.81 U	0.81 U	0.53 J	0.34 J	2 U	0.81 U	0.81 U	2 U
Pit 16	X188	3	3.8 U	9.4 U	3.8 U	3.8 U	3.8 U	9.4 UJ	3.8 U	3.8 U	3.8 U	3.8 U	0.21 J	3.8 U	9.4 U	3.8 U	3.8 U	9.4 U
Pit 16	X188DL	3	7.5 U	19 U	7.5 U	7.5 U	7.5 U	19 U	7.5 U	7.5 U	7.5 U	7.5 U	7.5 U	7.5 U	19 U	7.5 U	7.5 U	19 U
Pit 16	X189	7	1.2 U	2.9 U	1.2 U	1.2 U	1.2 U	2.9 U	1.2 U	1.2 U	1.2 U	1.2 U	0.19 J	1.2 U	2.9 U	1.2 U	1.2 U	2.9 U
Pit 17	X181	3.5	2.2 UJ	5.5 UJ	2.2 UJ	2.2 UJ	2.2 UJ	5.5 UJ	2.2 UJ	2.2 UJ	2.2 UJ	2.2 UJ	0.78 J	2.2 UJ	5.5 UJ	2.2 UJ	2.2 UJ	5.5 UJ
Pit 17	X182	7	9.4 U	24 U	9.4 U	9.4 U	9.4 U	24 U	9.4 U	9.4 U	9.4 U	9.4 U	36 =	9.4 U	24 U	9.4 U	9.4 U	24 U
Pit 17	X183	13	0.41 UJ	1 U	0.41 UJ	0.41 U	0.41 U	1 UJ	0.41 U	0.41 U	0.41 U	0.41 U	0.36 J	0.41 U	1 U	0.41 U	0.41 U	1 U
Pit 18	X179	3.5	3.8 U	9.4 U	3.8 U	3.8 U	1.1 J	9.4 UJ	3.8 U	3.8 U	3.8 U	3.8 UJ	3.8 U	0.27 J	9.4 U	3.8 U	3.8 U	9.4 U
Pit 18	X179DL	3.5	7.5 U	19 U	7.5 U	7.5 U	1.2 J	19 U	7.5 U	7.5 U	7.5 U	7.5 U	7.5 U	7.5 U	19 U	7.5 U	7.5 U	19 U
Pit 18	X180	7	5.1 U	13 U	5.1 U	5.1 U	0.36 J	13 UJ	5.1 U	5.1 U	5.1 U	5.1 U	4.1 J	5.1 U	13 U	5.1 U	5.1 U	13 U
Pit 18	X180DL	7	30 U	77 U	30 U	30 U	30 U	77 U	30 U	30 U	30 U	30 U	3.8 J	30 U	77 U	30 U	30 U	77 U
Pit 19	X166	3	12 UJ	30 UJ	12 UJ	12 UJ	12 UJ	30 UJ	12 UJ	12 UJ	12 UJ	12 UJ	23 J	12 UJ	30 UJ	12 UJ	12 UJ	30 UJ
Pit 19	X167	9	1.6 U	4 U	1.6 U	1.6 U	1.6 U	4 U	1.6 U	1.6 U	1.6 U	1.6 U	1.4 J	1.6 U	4 U	1.6 U	1.6 U	4 U
Pit 20	X164	3	2.4 U	6.1 U	2.4 U	2.4 U	2.4 U	6.1 UJ	2.4 U	2.4 U	2.4 U	2.4 U	0.87 J	2.4 U	6.1 U	2.4 U	2.4 U	6.1 U
Pit 20	X165	9	14 UJ	34 UJ	14 UJ	14 UJ	14 UJ	34 UJ	14 UJ	14 UJ	14 UJ	14 UJ	1.2 J	14 UJ	34 UJ	14 UJ	14 UJ	34 UJ
Pit 21	X162	2	3.4 U	8.6 U	3.4 U	3.4 U	3.4 U	8.6 UJ	3.4 U	3.4 U	3.4 U	3.4 U	7.2 =	3.4 U	8.6 U	3.4 U	3.4 U	8.6 U

Table E-8. SVOCs in U.S. Drum (mg/kg)

Station ID	Sample ID	Depth (ft)	2,2'-Oxybis (1-Chloro)Propane	2,4,5-Trichlorophenol	2,4,6-Trichlorophenol	2,4-Dichlorophenol	2,4-Dimethylphenol	2,4-Dinitrophenol	2,4-Dinitrotoluene	2,6-Dinitrotoluene	2-Chloronaphthalene	2-Chlorophenol	2-Methylnaphthalene	2-Methylphenol	2-Nitroaniline	2-Nitrophenol	3,3'-Dichlorobenzidine	3-Nitroaniline
Industrial/ Commercial		*Ing*		*200000*	*520*	*6100*	*41000*	*4100*	*8.4*	*8.4*		*10000*	*61000*	*100000*			*13*	
		Inh			*390*							*53000*						
Construction Worker		*Ing*		*200000*	*11000*	*610*	*41000*	*410*	*180*	*180*		*10000*	*61000*	*100000*			*280*	
		Inh			*540*							*53000*						
Soil Component of GW		*I*		*270*	*0.2*	*1*	*9*	*0.2*	*0.0008*	*0.0007*		*4*	*29*	*15*			*0.007*	
		II		*1400*	*0.77*	*1*	*9*	*0.2*	*0.0008*	*0.0007*		*4*	*145*	*15*			*0.033*	
Pit 21	X163	9	48 UJ	120 UJ	48 UJ	48 UJ	48 UJ	120 UJ	48 UJ	48 UJ	48 UJ	48 UJ	48 UJ	48 UJ	120 UJ	48 UJ	48 UJ	120 UJ
Pit 22	X160	3.5	0.64 U	1.6 U	0.64 U	0.64 U	0.13 J	1.6 UJ	0.64 U	0.64 U	0.64 U	0.64 U	0.45 J	0.098 J	1.6 U	0.64 U	0.64 U	1.6 U
Pit 22	X161	8	2.3 U	5.8 U	2.3 U	2.3 U	2.3 U	5.8 UJ	2.3 U	2.3 U	2.3 U	2.3 U	0.91 J	2.3 U	5.8 U	2.3 U	2.3 U	5.8 U
Pit 23	X157	2.5	0.39 U	0.99 U	0.39 U	0.39 U	0.39 U	0.99 U	0.39 U	0.39 U	0.39 U	0.39 U	0.031 J	0.39 U	0.99 U	0.39 U	0.39 U	0.99 U
Pit 23	X158	9	19 U	48 U	19 U	19 U	19 U	48 U	19 U	19 U	19 U	19 U	1 J	19 U	48 U	19 U	19 U	48 U
Pit 23	X159	13	20 UJ	50 UJ	20 UJ	20 UJ	20 UJ	50 UJ	20 UJ	20 UJ	20 UJ	20 UJ	1.2 J	20 UJ	50 UJ	20 UJ	20 UJ	50 UJ
Pit 24	X155	2.5	26 U	66 U	26 U	26 U	26 U	66 U	26 U	26 U	26 U	26 U	1.8 J	26 U	66 U	26 U	26 U	66 U
Pit 24	X156	8.5	2.4 UJ	6.1 U	2.4 U	2.4 U	2.4 U	6.1 UJ	2.4 U	2.4 U	2.4 U	2.4 U	1.8 J	2.4 U	6.1 U	2.4 U	2.4 U	6.1 U
Pit 25	X153	3	17 U	42 U	17 U	17 U	17 U	42 U	17 U	17 U	17 U	17 U	41 =	17 U	42 U	17 U	17 U	42 U
Pit 25	X154	9.5	1.3 U	3.3 U	1.3 U	1.3 U	1.3 U	3.3 U	1.3 U	1.3 U	1.3 U	1.3 U	0.93 J	0.25 J	3.3 U	1.3 U	1.3 U	3.3 U
Pit 25	X154DL	9.5	2.6 UJ	6.6 U	2.6 U	2.6 U	2.6 U	6.6 UJ	2.6 U	2.6 U	2.6 U	2.6 U	0.81 J	2.6 U	6.6 U	2.6 U	2.6 U	6.6 U
Pit 26	X151	3	12 U	30 U	12 U	12 U	12 U	30 U	12 U	12 U	12 U	12 U	3.1 J	1.4 J	30 U	12 U	12 U	30 U
Pit 26	X152	9	15 U	37 U	15 U	15 U	15 U	37 U	15 U	15 U	15 U	15 U	76 =	15 U	37 U	15 U	15 U	37 U
Pit 27	X149	3.5	0.57 U	1.4 U	0.57 U	0.57 U	0.089 J	1.4 U	0.57 U	0.57 U	0.57 U	0.57 U	0.34 J	0.57 U	1.4 U	0.57 U	0.57 U	1.4 U
Pit 27	X150	10	19 U	48 U	19 U	19 U	19 U	48 U	19 U	19 U	19 U	19 U	19 U	19 U	48 U	19 U	19 U	48 U
Pit 28	X147	3	0.45 U	1.1 U	0.45 U	0.45 U	0.45 U	1.1 U	0.45 U	0.45 U	0.45 U	0.45 U	0.2 J	0.45 U	1.1 U	0.45 U	0.45 U	1.1 U
Pit 28	X147DL	3	1.8 U	4.5 U	1.8 U	1.8 U	1.8 U	4.5 U	1.8 U	1.8 U	1.8 U	1.8 U	0.16 J	1.8 U	4.5 U	1.8 U	1.8 U	4.5 U
Pit 28	X148	8	23 U	57 U	23 U	23 U	23 U	57 UJ	23 U	23 U	23 U	23 U	1.3 J	23 U	57 U	23 U	23 U	57 U
Pit 29	X145	4.5	0.8 UJ	2 U	0.8 U	0.8 U	0.8 U	2 UJ	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	2 U	0.8 U	0.8 U	2 U
Pit 29	X146	8	11 U	29 U	11 U	11 U	11 U	29 UJ	11 U	11 U	11 U	11 U	4.5 J	11 U	29 U	11 U	11 U	29 U
Pit 30	X143	4	31 U	78 U	31 U	31 U	31 U	78 U	31 U	31 U	31 U	31 U	31 U	31 U	78 U	31 U	31 U	78 U
Pit 30	X144	6	17 U	44 U	17 U	17 U	17 U	44 UJ	17 U	17 U	17 U	17 U	17 U	17 U	44 U	17 U	17 U	44 U
Pit 31	X141	4	0.52 U	1.3 U	0.52 U	0.52 U	0.058 J	1.3 U	0.52 U	0.52 U	0.037 J	0.52 U	1.6 =	0.52 U	1.3 U	0.52 U	0.52 U	1.3 U
Pit 31	X141DL	4	10 UJ	26 U	10 U	10 U	10 U	26 UJ	10 U	10 U	10 U	10 U	1.4 J	10 U	26 U	10 U	10 U	26 U
Pit 31	X142	9	0.4 U	1 U	0.4 U	0.4 U	0.17 J	1 U	0.4 U	0.4 U	0.4 U	0.4 U	0.37 J	0.021 J	1 U	0.4 U	0.4 U	1 U
Pit 32	X139	3	14 U	36 U	14 U	14 U	14 U	36 UJ	14 U	14 U	14 U	14 U	4.5 J	14 U	36 U	14 U	14 U	36 U
Pit 32	X140	9	31 U	78 U	31 U	31 U	31 U	78 UJ	31 U	31 U	31 U	31 U	2.5 J	31 U	78 U	31 U	31 U	78 U
Pit 33	X137	3	1.2 U	3.1 U	1.2 U	1.2 U	0.25 J	3.1 UJ	1.2 U	1.2 U	1.2 U	1.2 U	0.97 J	1.2 U	3.1 U	1.2 U	1.2 U	3.1 U

Table E-8. SVOCs in U.S. Drum (mg/kg)

Station ID	Sample ID	Depth (ft)	2,2'-Oxybis (1-Chloro)Propane	2,4,5-Trichlorophenol	2,4,6-Trichlorophenol	2,4-Dichlorophenol	2,4-Dimethylphenol	2,4-Dinitrophenol	2,4-Dinitrotoluene	2,6-Dinitrotoluene	2-Chloronaphthalene	2-Chlorophenol	2-Methylnaphthalene	2-Methylphenol	2-Nitroaniline	2-Nitrophenol	3,3'-Dichlorobenzidine	3-Nitroaniline
Industrial/ Commercial		*Ing*		*200000*	*520*	*6100*	*41000*	*4100*	*8.4*	*8.4*		*10000*	*61000*	*100000*			*13*	
		Inh			*390*							*53000*						
Construction Worker		*Ing*		*200000*	*11000*	*610*	*41000*	*410*	*180*	*180*		*10000*	*61000*	*100000*			*280*	
		Inh			*540*							*53000*						
Soil Component of GW		*I*		*270*	*0.2*	*1*	*9*	*0.2*	*0.0008*	*0.0007*		*4*	*29*	*15*			*0.007*	
		II		*1400*	*0.77*	*1*	*9*	*0.2*	*0.0008*	*0.0007*		*4*	*145*	*15*			*0.033*	
Pit 33	X137DL	3	3.7 U	9.3 U	3.7 U	3.7 U	0.31 J	9.3 U	3.7 U	3.7 U	3.7 U	3.7 U	1.2 J	3.7 U	9.3 U	3.7 U	3.7 U	9.3 U
Pit 33	X138	9	13 U	32 U	13 U	13 U	13 U	32 UJ	13 U	13 U	13 U	13 U	1.1 J	13 U	32 U	13 U	13 U	32 U
Pit 34	X135	3	0.56 U	1.4 U	0.56 U	0.56 U	0.046 J	1.4 UJ	0.56 U	0.56 U	0.56 U	0.56 U	0.72 =	0.56 U	1.4 U	0.56 U	0.56 U	1.4 U
Pit 34	X136	10	17 U	41 U	17 U	17 U	17 U	41 UJ	17 U	17 U	17 U	17 U	1.7 J	17 U	41 U	17 U	17 U	41 U
Pit 35	X133	4	0.4 U	1 U	0.4 U	0.4 U	0.4 U	1 UJ	0.4 U	0.4 U	0.4 U	0.4 U	0.047 J	0.4 U	1 U	0.4 U	0.4 U	1 U
Pit 35	X134	10	0.53 U	1.3 U	0.53 U	0.53 U	0.53 U	1.3 UJ	0.53 U	0.53 U	0.53 U	0.53 U	0.15 J	0.53 U	1.3 U	0.53 U	0.53 U	1.3 U
Pit 36	X131	4	41 R	100 R	41 R	41 R	41 R	100 R	41 R	41 R	41 R	41 R	41 R	41 R	100 R	41 R	41 R	100 R
Pit 36	X132	11	13 U	34 U	13 U	13 U	13 U	34 UJ	13 U	13 U	13 U	13 U	13 U	13 U	34 U	13 U	13 U	34 U
Pit 37	X128	3	28 U	71 U	28 U	28 U	28 U	71 UJ	28 U	28 U	28 U	28 U	28 U	28 U	71 U	28 U	28 U	71 U
Pit 37	X129	3	1.5 U	3.7 U	1.5 U	1.5 U	1.5 U	3.7 U	1.5 U	0.33 J	1.5 U	1.5 U	0.34 J	1.5 U	3.7 U	1.5 U	1.5 U	3.7 U
Pit 37	X130	8	17 U	41 U	17 U	17 U	17 U	41 UJ	17 U	17 U	17 U	17 U	24 =	17 U	41 U	17 U	17 U	41 U
Pit 38	X126	3	0.57 U	1.4 U	0.57 U	0.57 U	0.57 U	1.4 UJ	0.57 U	0.57 U	0.57 U	0.57 U	0.6 =	0.57 U	1.4 U	0.57 U	0.57 U	1.4 U
Pit 38	X126DL	3	2.8 U	7.2 U	2.8 U	2.8 U	2.8 U	7.2 U	2.8 U	2.8 U	2.8 U	2.8 U	0.82 J	2.8 U	7.2 U	2.8 U	2.8 U	7.2 U
Pit 38	X127	10	23 U	57 U	23 U	23 U	23 U	57 UJ	23 U	23 U	23 U	23 U	1.2 J	23 U	57 U	23 U	23 U	57 U
Pit 39	X124	3	0.39 U	0.98 U	0.39 U	0.39 U	0.39 U	0.98 UJ	0.39 U	0.39 U	0.39 U	0.39 U	0.055 J	0.39 U	0.98 U	0.39 U	0.39 U	0.98 U
Pit 39	X125	10	23 U	58 U	23 U	23 U	23 U	58 UJ	23 U	23 U	23 U	23 U	1.8 J	23 U	58 U	23 U	23 U	58 U
Pit 40	X122	4	0.63 U	1.6 U	0.63 U	0.63 U	0.081 J	1.6 UJ	0.63 U	0.63 U	0.63 U	0.63 U	0.12 J	0.63 U	1.6 U	0.63 U	0.63 U	1.6 U
Pit 40	X123	9	25 U	64 U	25 U	25 U	25 U	64 UJ	25 U	25 U	25 U	25 U	25 U	25 U	64 U	25 U	25 U	64 U
Pit 41	X120	3	0.41 U	1 U	0.41 U	0.41 U	0.41 U	1 UJ	0.41 U	0.41 U	0.41 U	0.41 U	0.11 J	0.41 U	1 U	0.41 U	0.41 U	1 U
Pit 41	X121	8	21 U	53 U	21 U	21 U	21 U	53 UJ	21 U	21 U	21 U	21 U	1.2 J	21 U	53 U	21 U	21 U	53 U
Pit 42	X117	2	0.42 U	1.1 U	0.42 U	0.42 U	0.42 U	1.1 UJ	0.42 U	0.42 U	0.42 U	0.42 U	0.026 J	0.42 U	1.1 U	0.42 U	0.42 U	1.1 U
Pit 42	X118	9	4.6 UJ	11 U	4.6 U	4.6 U	4.6 U	11 U	4.6 U	4.6 U	4.6 U	4.6 U	5.6 =	4.6 U	11 U	4.6 U	4.6 U	11 U
Pit 42	X118DL	9	9.1 U	23 U	9.1 U	9.1 U	9.1 U	23 UJ	9.1 U	9.1 U	9.1 U	9.1 U	5.2 J	9.1 U	23 U	9.1 U	9.1 U	23 U
Pit 42	X119	15	0.56 U	1.4 U	0.56 U	0.56 U	0.29 J	1.4 UJ	0.56 U	0.56 U	0.56 U	0.56 U	0.67 =	0.28 J	1.4 U	0.56 U	0.56 U	1.4 U
Pit 42	X119DL	15	11 U	28 U	11 U	11 U	11 U	28 U	11 U	11 U	11 U	11 U	0.98 J	11 U	28 U	11 U	11 U	28 U
Pit 43	X115	3	2.7 U	6.8 U	2.7 U	2.7 U	0.48 J	6.8 UJ	2.7 U	2.7 U	2.7 U	2.7 U	3.9 =	2.7 U	6.8 U	2.7 U	2.7 U	6.8 U
Pit 43	X116	9	1.6 U	4.1 U	1.6 U	1.6 U	0.31 J	4.1 UJ	1.6 U	1.6 U	1.6 U	1.6 U	5.6 =	1.6 U	4.1 U	1.6 U	1.6 U	4.1 U
Pit 43	X116DL	9	5.4 U	14 U	5.4 U	5.4 U	5.4 U	14 U	5.4 U	5.4 U	5.4 U	5.4 U	4.9 J	5.4 U	14 U	5.4 U	5.4 U	14 U

Table E-8. SVOCs in U.S. Drum (mg/kg)

Station ID	Sample ID	Depth (ft)	2,2'-Oxybis (1-Chloro)Propane	2,4,5-Trichlorophenol	2,4,6-Trichlorophenol	2,4-Dichlorophenol	2,4-Dimethylphenol	2,4-Dinitrophenol	2,4-Dinitrotoluene	2,6-Dinitrotoluene	2-Chloronaphthalene	2-Chlorophenol	2-Methylnaphthalene	2-Methylphenol	2-Nitroaniline	2-Nitrophenol	3,3'-Dichlorobenzidine	3-Nitroaniline
Industrial/ Commercial		*Ing*		*200000*	*520*	*6100*	*41000*	*4100*	*8.4*	*8.4*		*10000*	*61000*	*100000*			*13*	
		Inh			*390*							*53000*						
Construction Worker		*Ing*		*200000*	*11000*	*610*	*41000*	*410*	*180*	*180*		*10000*	*61000*	*100000*			*280*	
		Inh			*540*							*53000*						
Soil Component of GW		*I*		*270*	*0.2*	*1*	*9*	*0.2*	*0.0008*	*0.0007*		*4*	*29*	*15*			*0.007*	
		II		*1400*	*0.77*	*1*	*9*	*0.2*	*0.0008*	*0.0007*		*4*	*145*	*15*			*0.033*	
Pit 44	X113	3	2.1 U	5.4 U	2.1 U	2.1 U	2.1 U	5.4 U	2.1 U	2.1 U	2.1 U	2.1 U	0.93 J	2.1 U	5.4 U	2.1 U	2.1 U	5.4 U
Pit 44	X114	9	13 U	33 U	13 U	13 U	13 U	33 UJ	13 U	13 U	13 U	13 U	6.6 J	13 U	33 U	13 U	13 U	33 U
Pit 45	X111	3.5	14 U	36 U	14 U	14 U	14 U	36 UJ	14 U	14 U	14 U	14 U	1.1 J	14 U	36 U	14 U	14 U	36 U
Pit 45	X112	10	2.4 UJ	6.1 U	2.4 U	2.4 U	0.62 J	6.1 U	2.4 U	2.4 U	2.4 U	2.4 U	2.6 =	0.13 J	6.1 U	2.4 U	2.4 U	6.1 U
Pit 46	X109	4	0.53 UJ	1.3 U	0.53 U	0.53 U	0.031 J	1.3 U	0.53 U	0.53 U	0.53 U	0.53 U	0.53 U	0.53 U	1.3 U	0.53 U	0.53 U	1.3 U
Pit 46	X110	9	2.4 UJ	6 U	2.4 U	2.4 U	0.57 J	6 U	2.4 U	2.4 U	2.4 U	2.4 U	3.6 =	2.4 U	6 U	2.4 U	2.4 U	6 U
Pit 47	X107	3.5	0.45 UJ	1.1 U	0.45 U	0.45 U	0.45 U	1.1 U	0.45 U	0.45 U	0.45 U	0.45 U	0.058 J	0.45 U	1.1 U	0.45 U	0.45 U	1.1 U
Pit 47	X108	9	49 U	120 U	49 U	49 U	49 U	120 UJ	49 U	49 U	49 U	49 U	18 J	49 U	120 U	49 U	49 U	120 U
Pit 48	X105	3	0.38 UJ	0.94 U	0.38 U	0.38 U	0.38 U	0.94 U	0.38 U	0.38 U	0.38 U	0.38 U	0.041 J	0.38 U	0.94 U	0.38 U	0.38 U	0.94 U
Pit 48	X106	9	14 U	34 U	14 U	14 U	14 U	34 UJ	14 U	14 U	14 U	14 U	1.1 J	14 U	34 U	14 U	14 U	34 U
Pit 49	X103	3	0.38 UJ	0.97 U	0.38 U	0.38 U	0.38 U	0.97 U	0.38 U	0.38 U	0.38 U	0.38 U	0.27 J	0.38 U	0.97 U	0.38 U	0.38 U	0.97 U
Pit 49	X104	10	0.42 UJ	1.1 UJ	0.42 UJ	0.42 UJ	0.42 UJ	1.1 UJ	0.42 UJ	0.42 UJ	0.42 UJ	0.42 UJ	0.062 J	0.42 UJ	1.1 UJ	0.42 UJ	0.42 UJ	1.1 UJ
Pit 50	X101	3	0.38 UJ	0.94 U	0.38 U	0.38 U	0.022 J	0.94 U	0.38 U	0.38 U	0.38 U	0.38 U	0.077 J	0.38 U	0.94 U	0.38 U	0.38 U	0.94 U
Pit 50	X102	9	19 U	49 U	19 U	19 U	2.6 J	49 UJ	19 U	19 U	19 U	19 U	7.5 J	19 U	49 U	19 U	19 U	49 U
Pit 51	X203	3	0.8 U	2 U	0.8 U	0.8 U	0.8 U	2 UJ	0.8 U	0.8 U	0.8 U	0.8 U	0.084 J	0.8 U	2 U	0.8 U	0.8 U	2 U
Pit 51	X204	8	4.4 U	11 U	4.4 U	4.4 U	4.4 U	11 UJ	4.4 U	4.4 U	4.4 U	4.4 U	4.4 U	4.4 U	11 U	4.4 U	4.4 U	11 U

Notes:

=:	sample concentration is detected at level reported
U:	sample concentration is under detection limit
J:	sample concentration is estimated value
R:	sample concentration value is rejected
DL:	sample is diluted
RE:	sample is re-extracted
Ing.:	Ingestion
Inh.:	Inhalation
I:	Class I
II:	Class II

Table E-8. SVOCs in U.S. Drum (mg/kg)

Station ID	Sample ID	Depth (ft)	4,6-Dinitro-2-methylphenol	4-Bromophenyl phenyl ether	4-Chloro-3-methylphenol	4-Chloroaniline	4-Chlorophenyl phenyl ether	4-Methylphenol	4-Nitroaniline	4-Nitrophenol	Acenaphthene	Acenaphthylene	Acetophenone	Anthracene	Benzaldehyde	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene
Industrial/ Commercial		*Ing*				*8200*					*120000*	*61000*		*610000*		*8*	*0.8*	*8*
		Inh																
Construction Worker		*Ing*				*820*					*120000*	*61000*		*610000*		*170*	*17*	*170*
		Inh																
Soil Component of GW		*I*				*0.7*					*570*	*15*		*12000*		*2*	*8*	*5*
		II				*0.7*					*2900*	*75*		*59000*		*8*	*82*	*25*
Pit 01	X207	4	19 U	7.6 U	7.6 U	7.6 U	7.6 U	7.6 U	19 U	19 U	1.9 J	1.9 J	7.6 U	7.1 J	7.6 U	11 =	8.9 =	7.5 J
Pit 01	X208	9	210 U	85 U	85 U	85 U	85 U	85 U	210 U	210 U	85 U	85 U	85 U	6.2 J	85 U	85 U	85 U	85 U
Pit 01	X209	13	36 UJ	14 UJ	14 U	14 U	14 U	14 U	36 U	36 U	14 U	14 U	14 U	0.82 J	14 U	1.1 J	0.97 J	0.92 J
Pit 02	X205	3	1.1 U	0.44 U	0.44 U	0.44 U	0.44 U	0.44 U	1.1 U	1.1 U	0.076 J	0.026 J	0.44 U	0.13 J	0.44 U	0.3 J	0.29 J	0.29 J
Pit 02	X206	9	3.1 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	3.1 U	3.1 U	0.38 J	1.2 U	1.2 U	0.86 J	1.2 U	3.3 =	2.8 =	3 =
Pit 03	X201	3	3.9 U	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	3.9 U	3.9 U	0.51 J	0.12 J	1.6 U	1.6 =	1.6 U	4.6 =	3.4 =	3.8 =
Pit 03	X202	8	2.9 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	2.9 U	2.9 U	0.21 J	0.091 J	1.2 U	0.7 J	1.2 U	1.9 =	1.4 =	1.4 =
Pit 04	X177	4	5.3 U	2.1 U	2.1 U	2.1 U	2.1 U	2.1 U	5.3 U	5.3 U	2.1 =	2.1 U	2.1 U	0.67 J	2.1 U	1.9 J	1.8 J	1.9 J
Pit 04	X178	8	2 U	0.79 U	0.79 U	1 =	0.79 U	0.79 U	2 U	2 U	0.78 J	0.072 J	0.79 U	2.2 =	0.79 U	3.7 =	3 =	3.5 =
Pit 04	X178DL	8	40 U	16 U	16 U	16 U	16 U	16 U	40 U	40 U	0.82 J	16 U	16 U	1.8 J	16 U	3.5 J	3 J	3 J
Pit 05	X198	2.5	5.1 U	2 U	2 U	0.5 J	2 U	2 U	5.1 U	5.1 U	0.53 J	2 U	0.12 J	0.6 J	2 U	2.3 =	2 =	2.1 =
Pit 05	X199	8	10 U	4.1 U	4.1 U	4.1 U	4.1 U	4.1 U	10 U	10 U	1.2 J	0.51 J	4.1 U	6.8 =	4.1 U	8 =	6.3 =	5.4 =
Pit 05	X200	8	4.8 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	4.8 U	4.8 U	1.2 J	0.78 J	1.9 U	3.9 =	1.9 U	9.1 =	8.4 =	7.5 =
Pit 05	X200DL	8	19 U	7.7 U	7.7 U	7.7 U	7.7 U	7.7 U	19 U	19 U	1.1 J	0.76 J	7.7 U	3.6 J	7.7 U	8.4 =	7.7 =	6.4 J
Pit 06	X196	3	1 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	1 U	1 U	0.056 J	0.081 J	0.4 U	0.21 J	0.4 U	0.84 =	0.65 =	0.66 =
Pit 06	X197	8	5.1 U	2 U	2 U	0.23 J	2 U	0.52 J	5.1 U	5.1 U	1.4 J	0.21 J	0.44 J	1.5 J	2 U	3.3 =	2.2 =	1.6 J
Pit 06	X197DL	8	20 U	8.1 U	8.1 U	8.1 U	8.1 U	0.54 J	20 U	20 U	1.5 J	8.1 U	0.47 J	1.3 J	8.1 U	3.2 J	2.2 J	1.7 J
Pit 07	X175	3	4 U	1.6 U	1.6 U	6.5 =	1.6 U	1.6 U	4 U	4 U	0.37 J	1.6 U	1.6 U	0.86 J	1.6 U	1.6 =	1.5 J	1.5 J
Pit 07	X176	8	3.3 U	1.3 U	1.3 U	0.11 J	1.3 U	1.3 U	3.3 U	3.3 U	0.34 J	1.3 U	1.3 U	0.36 J	1.3 U	1.1 J	1 J	1.1 J
Pit 08	X173	2.5	0.98 U	0.39 U	0.39 U	0.39 U	0.39 U	0.02 J	0.98 U	0.98 U	0.17 J	0.086 J	0.033 J	0.48 =	0.087 J	1.3 =	1.2 =	1.1 =
Pit 08	X173DL	2.5	2.9 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	2.9 U	2.9 U	0.19 J	0.072 J	1.2 U	0.46 J	1.2 U	1.3 =	1.3 =	1.5 =
Pit 08	X174	8	5.2 U	2.1 U	2.1 U	2.1 U	2.1 U	2.1 U	5.2 U	5.2 U	0.23 J	0.16 J	2.1 U	0.78 J	2.1 U	2.1 =	1.7 J	1.8 J
Pit 09	X168	3	0.97 U	0.38 U	0.38 U	0.38 U	0.38 U	0.045 J	0.97 U	0.97 U	0.043 J	0.38 U	0.38 U	0.073 J	0.38 U	0.071 J	0.056 J	0.069 J
Pit 09	X169	6.5	1.1 U	0.42 U	0.42 U	0.42 U	0.42 U	0.42 U	1.1 U	1.1 U	0.42 U	0.42 U	0.42 U	0.42 U	0.42 U	0.42 U	0.025 J	0.42 U
Pit 09	X170	6.5	1 U	0.41 U	0.41 U	0.41 U	0.41 U	0.028 J	1 U	1 U	0.069 J	0.07 J	0.41 U	0.14 J	0.41 U	0.083 J	0.057 J	0.052 J
Pit 10	X171	3	2.5 U	1 U	1 U	1 U	1 U	0.12 J	2.5 U	2.5 U	0.21 J	1 U	1 U	1 U	0.35 J	1 U	0.26 J	0.64 J
Pit 10	X171DL	3	13 U	5 U	5 U	5 U	5 U	5 U	13 U	13 U	5 U	5 U	5 U	5 U	0.37 J	5 U	0.29 J	0.34 J
Pit 10	X172	8	49 U	19 U	19 U	19 U	19 U	4.8 J	49 U	49 U	2.2 J	19 U	19 U	1.7 J	19 U	2.8 J	2.2 J	2.7 J

Table E-8. SVOCs in U.S. Drum (mg/kg)

Station ID	Sample ID	Depth (ft)	4,6-Dinitro-2-methylphenol	4-Bromophenyl phenyl ether	4-Chloro-3-methylphenol	4-Chloroaniline	4-Chlorophenyl phenyl ether	4-Methylphenol	4-Nitroaniline	4-Nitrophenol	Acenaphthene	Acenaphthylene	Acetophenone	Anthracene	Benzaldehyde	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene
Industrial/ Commercial		*Ing*				*8200*					*120000*	*61000*		*610000*		*8*	*0.8*	*8*
		Inh																
Construction Worker		*Ing*				*820*					*120000*	*61000*		*610000*		*170*	*17*	*170*
		Inh																
Soil Component of GW		*I*				*0.7*					*570*	*15*		*12000*		*2*	*8*	*5*
		II				*0.7*					*2900*	*75*		*59000*		*8*	*82*	*25*
Pit 11	X190	2	6.1 U	2.4 U	2.4 U	2.4 U	2.4 U	0.27 J	6.1 U	6.1 U	0.69 J	0.23 J	2.4 U	2 J	2.4 U	6.1 =	4.3 =	5.2 =
Pit 11	X190DL	2	12 U	4.9 U	4.9 U	4.9 U	4.9 U	0.29 J	12 U	12 U	0.69 J	4.9 U	4.9 U	1.9 J	4.9 U	5.4 =	4.2 J	4.7 J
Pit 11	X191	8	2.2 U	0.88 U	0.88 U	0.88 U	0.88 U	0.72 J	2.2 U	2.2 U	0.88 U	0.88 U	0.88 U	0.045 J	0.88 U	0.13 J	0.096 J	0.092 J
Pit 12	X192	3	0.94 UJ	0.38 UJ	0.38 UJ	0.38 UJ	0.38 UJ	0.38 UJ	0.94 UJ	0.94 UJ	0.38 UJ	0.38 UJ	0.032 J	0.052 J	0.38 UJ	0.14 J	0.11 J	0.15 J
Pit 12	X193	8	2 U	0.8 U	0.061 J	0.8 U	0.8 U	0.16 J	2 U	2 U	0.088 J	0.041 J	0.8 U	0.2 J	0.8 U	0.48 J	0.37 J	0.4 J
Pit 13	X194	3.5	4.9 U	1.9 U	1.9 U	1.9 U	1.9 U	0.51 J	4.9 U	4.9 U	0.28 J	1.9 U	1.9 U	0.64 J	1.9 U	1.1 J	0.91 J	0.77 J
Pit 13	X195	12	14 U	5.4 U	5.4 U	5.4 U	5.4 U	5.4 U	14 U	14 U	1.6 J	5.4 U	5.4 U	5.4 =	5.4 U	100 =	50 =	71 =
Pit 13	X195DL	12	68 U	27 U	27 U	27 U	27 U	27 U	68 U	68 U	1.4 J	27 U	27 U	4.1 J	27 U	67 =	33 =	44 =
Pit 14	X184	4	1.9 U	0.76 U	0.76 U	0.76 U	0.76 U	0.76 U	1.9 U	1.9 U	0.76 U	0.76 U	0.76 U	0.76 U	0.76 U	0.066 J	0.76 U	0.14 J
Pit 14	X185	9	1.2 U	0.48 U	0.48 U	0.48 U	0.48 U	0.56 =	1.2 U	1.2 U	0.2 J	0.059 J	0.11 J	0.51 =	0.48 U	1.6 =	1 =	1.1 =
Pit 14	X185DL	9	2.4 U	0.96 U	0.96 U	0.96 U	0.96 U	0.56 J	2.4 U	2.4 U	0.96 U	0.066 J	0.16 J	0.49 J	0.96 U	1.6 =	0.88 J	0.83 J
Pit 15	X186	4	5.1 U	2 U	2 U	2 U	2 U	0.2 J	5.1 U	5.1 U	2 U	2 U	2 U	0.11 J	2 U	0.17 J	0.16 J	0.17 J
Pit 15	X187	8	2 U	0.81 U	0.81 U	0.81 U	0.81 U	0.61 J	2 U	2 U	0.12 J	0.07 J	0.81 U	0.18 J	0.81 U	0.46 J	0.41 J	0.34 J
Pit 16	X188	3	9.4 U	3.8 U	3.8 U	3.8 U	3.8 U	3.8 U	9.4 U	9.4 U	0.44 J	0.37 J	3.8 U	4.9 =	3.8 U	14 =	8.2 =	9.7 =
Pit 16	X188DL	3	19 U	7.5 U	7.5 U	7.5 U	7.5 U	7.5 U	19 U	19 U	0.44 J	0.41 J	7.5 U	5.3 J	7.5 U	14 =	8.4 =	11 =
Pit 16	X189	7	2.9 U	1.2 U	1.2 U	1.2 U	1.2 U	0.41 J	2.9 U	2.9 U	0.15 J	1.2 U	1.2 U	0.11 J	1.2 U	0.17 J	0.16 J	0.19 J
Pit 17	X181	3.5	5.5 UJ	2.2 UJ	2.2 UJ	0.2 J	2.2 UJ	2.2 UJ	5.5 UJ	5.5 UJ	2.2 UJ	2.2 UJ	0.19 J	2.2 UJ	2.2 UJ	2.2 UJ	2.2 UJ	2.2 UJ
Pit 17	X182	7	24 U	9.4 U	9.4 U	9.4 U	9.4 U	9.4 U	24 U	24 U	3.3 J	0.87 J	9.4 U	2.4 J	9.4 U	1.8 J	0.92 J	0.5 J
Pit 17	X183	13	1 U	0.41 U	0.41 U	0.41 U	0.41 U	0.41 U	1 U	1 U	0.088 J	0.052 J	0.043 J	0.16 J	0.41 U	0.75 =	0.65 =	0.66 =
Pit 18	X179	3.5	9.4 U	3.8 U	3.8 U	3.8 U	3.8 U	1.3 J	9.4 U	9.4 U	3.8 UJ	3.8 U	3.8 U	3.8 U	3.8 U	3.8 U	3.8 U	3.8 U
Pit 18	X179DL	3.5	19 U	7.5 U	7.5 U	7.5 U	7.5 U	1.4 J	19 U	19 U	7.5 U	7.5 U	7.5 U	7.5 U	7.5 U	7.5 U	7.5 U	7.5 U
Pit 18	X180	7	13 U	5.1 U	5.1 U	5.1 U	5.1 U	0.68 J	13 U	13 U	27 =	8.4 =	5.1 U	68 =	5.1 U	52 =	55 =	51 =
Pit 18	X180DL	7	77 U	30 U	30 U	30 U	30 U	30 U	77 U	77 U	17 J	6.5 J	30 U	45 =	30 U	34 =	33 =	24 J
Pit 19	X166	3	30 UJ	12 UJ	12 UJ	12 UJ	12 UJ	12 UJ	30 UJ	30 UJ	12 UJ	12 UJ	12 UJ	12 UJ	12 UJ	12 UJ	12 UJ	12 UJ
Pit 19	X167	9	4 U	1.6 U	1.6 U	0.17 J	1.6 U	0.24 J	4 U	4 U	0.15 J	1.6 U	1.6 U	0.13 J	1.6 U	0.31 J	0.26 J	0.35 J
Pit 20	X164	3	6.1 U	2.4 U	2.4 U	2.4 U	2.4 U	0.35 J	6.1 U	6.1 U	0.79 J	0.35 J	2.4 U	1.7 J	2.4 U	1.5 J	1.3 J	1.1 J
Pit 20	X165	9	34 UJ	14 UJ	14 UJ	14 UJ	14 UJ	14 UJ	34 UJ	34 UJ	1.2 J	14 UJ	14 UJ	2 J	14 UJ	3.5 J	3.2 J	3.3 J
Pit 21	X162	2	8.6 U	3.4 U	3.4 U	3.4 U	3.4 U	0.94 J	8.6 U	8.6 U	1.7 J	0.26 J	3.4 U	2.4 J	3.4 U	7 =	3.9 =	4.6 =

Table E-8. SVOCs in U.S. Drum (mg/kg)

Station ID	Sample ID	Depth (ft)	4,6-Dinitro-2-methylphenol	4-Bromophenyl phenyl ether	4-Chloro-3-methylphenol	4-Chloroaniline	4-Chlorophenyl phenyl ether	4-Methylphenol	4-Nitroaniline	4-Nitrophenol	Acenaphthene	Acenaphthylene	Acetophenone	Anthracene	Benzaldehyde	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene
Industrial/ Commercial		*Ing*				*8200*					*120000*	*61000*		*610000*		*8*	*0.8*	*8*
		Inh																
Construction Worker		*Ing*				*820*					*120000*	*61000*		*610000*		*170*	*17*	*170*
		Inh																
Soil Component of GW		*I*				*0.7*					*570*	*15*		*12000*		*2*	*8*	*5*
		II				*0.7*					*2900*	*75*		*59000*		*8*	*82*	*25*
Pit 21	X163	9	120 UJ	48 UJ	48 UJ	48 UJ	48 UJ	48 UJ	120 UJ	120 UJ	48 UJ	48 UJ	48 UJ	48 UJ	48 UJ	48 UJ	48 UJ	48 UJ
Pit 22	X160	3.5	1.6 U	0.64 U	0.64 U	0.64 U	0.64 U	0.26 J	1.6 U	1.6 U	0.14 J	0.23 J	0.097 J	0.4 J	0.64 U	0.87 =	0.76 =	0.78 =
Pit 22	X161	8	5.8 U	2.3 U	2.3 U	2.3 U	2.3 U	0.36 J	5.8 U	5.8 U	1.1 J	0.57 J	2.3 U	2.7 =	2.3 U	2.4 =	2 J	1.8 J
Pit 23	X157	2.5	0.99 U	0.39 U	0.39 U	0.39 U	0.39 U	0.39 U	0.99 U	0.99 U	0.39 U	0.39 U	0.39 U	0.39 U	0.39 U	0.39 U	0.39 U	0.02 J
Pit 23	X158	9	48 U	19 U	19 U	19 U	19 U	19 U	48 U	48 U	0.99 J	19 U	19 U	19 U	19 U	19 U	19 U	19 U
Pit 23	X159	13	50 UJ	20 UJ	20 UJ	20 UJ	20 UJ	20 UJ	50 UJ	50 UJ	5.5 J	20 UJ	20 UJ	10 J	20 UJ	7.8 J	7.1 J	5.7 J
Pit 24	X155	2.5	66 U	26 U	26 U	26 U	26 U	26 U	66 U	66 U	26 U	26 U	26 U	26 U	26 U	1.8 J	1.4 J	1.5 J
Pit 24	X156	8.5	6.1 U	2.4 U	2.4 U	2.4 U	2.4 U	0.54 J	6.1 U	6.1 U	0.2 J	0.41 J	2.4 U	1.3 J	2.4 U	2.6 =	2.1 J	1.9 J
Pit 25	X153	3	42 U	17 U	17 U	17 U	17 U	17 U	42 U	42 U	7.2 J	17 U	17 U	17 U	17 U	17 U	17 U	17 U
Pit 25	X154	9.5	3.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.4 =	3.3 U	3.3 U	0.19 J	1.3 U	1.3 U	0.35 J	1.3 U	0.5 J	0.29 J	0.31 J
Pit 25	X154DL	9.5	6.6 U	2.6 U	2.6 U	2.6 U	2.6 U	1.2 J	6.6 U	6.6 U	0.16 J	2.6 U	2.6 U	0.37 J	2.6 U	0.43 J	0.26 J	0.3 J
Pit 26	X151	3	30 U	12 U	12 U	12 U	12 U	1.5 J	30 U	30 U	12 U	12 U	12 U	12 U	12 U	12 U	12 U	12 U
Pit 26	X152	9	37 U	15 U	15 U	15 U	15 U	1.9 J	37 U	37 U	3.9 J	15 U	15 U	2.9 J	15 U	2.1 J	1.6 J	1.7 J
Pit 27	X149	3.5	1.4 U	0.57 U	0.57 U	0.57 U	0.57 U	0.047 J	1.4 U	1.4 U	0.47 J	0.064 J	0.57 U	0.45 J	0.57 U	0.51 J	0.26 J	0.33 J
Pit 27	X150	10	48 U	19 U	19 U	19 U	19 U	19 U	48 U	48 U	19 U	19 U	19 U	19 U	19 U	19 U	19 U	19 U
Pit 28	X147	3	1.1 U	0.45 U	0.45 U	0.45 U	0.45 U	0.067 J	1.1 U	1.1 U	2.5 =	0.38 J	0.45 U	2.7 =	0.45 U	3 =	2.6 =	3.2 =
Pit 28	X147DL	3	4.5 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	4.5 U	4.5 U	2 =	0.34 J	1.8 U	2.1 =	1.8 U	2.4 =	2.3 =	2.1 =
Pit 28	X148	8	57 U	23 U	23 U	23 U	23 U	23 U	57 U	57 U	1.1 J	23 U	23 U	23 U	23 U	23 U	23 U	23 U
Pit 29	X145	4.5	2 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	2 U	2 U	0.8 U	0.15 J	0.8 U	0.38 J	0.8 U	1.4 =	1.3 =	0.96 =
Pit 29	X146	8	29 U	11 U	11 U	11 U	11 U	11 U	29 U	29 U	3.9 J	11 U	11 U	1.4 J	11 U	1.4 J	1.3 J	1.1 J
Pit 30	X143	4	78 U	31 U	31 U	31 U	31 U	31 U	78 U	78 U	31 U	31 U	31 U	31 U	31 U	31 U	31 U	31 U
Pit 30	X144	6	44 U	17 U	17 U	17 U	17 U	17 U	44 U	44 U	17 U	17 U	17 U	17 U	17 U	17 U	17 U	17 U
Pit 31	X141	4	1.3 U	0.52 U	0.52 U	0.52 U	0.52 U	2.2 =	1.3 U	1.3 U	0.18 J	0.053 J	0.52 U	0.22 J	0.52 U	0.36 J	0.33 J	0.37 J
Pit 31	X141DL	4	26 U	10 U	10 U	10 U	10 U	1.9 J	26 U	26 U	10 U	10 U	10 U	10 U	10 U	0.57 J	10 U	10 U
Pit 31	X142	9	1 U	0.4 U	0.4 U	0.4 U	0.4 U	1.3 =	1 U	1 U	0.17 J	0.085 J	0.4 U	0.39 J	0.4 U	1.3 =	0.7 =	1 =
Pit 32	X139	3	36 U	14 U	14 U	14 U	14 U	0.76 J	36 U	36 U	3.3 J	14 U	14 U	2.4 J	14 U	2.7 J	2.8 J	2.1 J
Pit 32	X140	9	78 U	31 U	31 U	31 U	31 U	31 U	78 U	78 U	31 U	31 U	31 U	31 U	31 U	31 U	31 U	31 U
Pit 33	X137	3	3.1 U	1.2 U	0.54 J	1.2 U	1.2 U	0.61 J	3.1 U	3.1 U	0.26 J	1.2 U	1.2 U	0.23 J	1.2 U	1.2 =	0.74 J	1.2 =

Table E-8. SVOCs in U.S. Drum (mg/kg)

Station ID	Sample ID	Depth (ft)	4,6-Dinitro-2-methylphenol	4-Bromophenyl phenyl ether	4-Chloro-3-methylphenol	4-Chloroaniline	4-Chlorophenyl phenyl ether	4-Methylphenol	4-Nitroaniline	4-Nitrophenol	Acenaphthene	Acenaphthylene	Acetophenone	Anthracene	Benzaldehyde	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene
Industrial/ Commercial		*Ing*				*8200*					*120000*	*61000*		*610000*		*8*	*0.8*	*8*
		Inh																
Construction Worker		*Ing*				*820*					*120000*	*61000*		*610000*		*170*	*17*	*170*
		Inh																
Soil Component of GW		*I*				*0.7*					*570*	*15*		*12000*		*2*	*8*	*5*
		II				*0.7*					*2900*	*75*		*59000*		*8*	*82*	*25*
Pit 33	X137DL	3	9.3 U	3.7 U	3.7 U	3.7 U	3.7 U	0.75 J	9.3 U	9.3 U	0.37 J	3.7 U	3.7 U	0.41 J	3.7 U	1.5 J	0.98 J	1.8 J
Pit 33	X138	9	32 U	13 U	13 U	13 U	13 U	13 U	32 U	32 U	8.7 J	4.2 J	13 U	13 =	13 U	17 =	18 =	14 =
Pit 34	X135	3	1.4 U	0.56 U	0.56 U	0.028 J	0.56 U	0.18 J	1.4 U	1.4 U	1.7 =	0.56 U	0.56 U	0.099 J	0.56 U	0.091 J	0.062 J	0.08 J
Pit 34	X136	10	41 U	17 U	17 U	17 U	17 U	17 U	41 U	41 U	17 U	17 U	17 U	17 U	17 U	17 U	17 U	17 U
Pit 35	X133	4	1 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	1 U	1 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.071 J	0.082 J	0.079 J
Pit 35	X134	10	0.79 J	0.53 U	0.53 U	0.53 U	0.53 U	0.075 J	1.3 U	1.3 U	0.095 J	0.53 U	0.53 U	0.076 J	0.07 J	0.29 J	0.26 J	0.23 J
Pit 36	X131	4	100 R	41 R	41 R	41 R	41 R	41 R	100 R	100 R	41 R	41 R	41 R	41 R	41 R	41 R	41 R	41 R
Pit 36	X132	11	34 U	13 U	13 U	13 U	13 U	13 U	34 U	34 UJ	13 U	13 U	13 U	13 U	13 U	13 U	13 U	13 U
Pit 37	X128	3	71 U	28 U	28 U	28 U	28 U	28 U	71 U	71 U	3 J	28 U	28 U	2.2 J	28 U	2.5 J	2 J	2.1 J
Pit 37	X129	3	3.7 U	1.5 U	1.5 U	1.5 U	1.5 U	0.58 J	3.7 U	3.7 U	2.5 =	1.5 U	1.5 U	3.8 =	0.44 J	3.8 =	2.6 =	2.4 =
Pit 37	X130	8	41 U	17 U	17 U	17 U	17 U	17 U	41 U	41 UJ	17 U	17 U	17 U	17 U	17 U	1.3 J	0.93 J	0.95 J
Pit 38	X126	3	1.4 U	0.57 U	0.57 U	0.57 U	0.57 U	0.39 J	1.4 U	1.4 U	0.41 J	0.57 U	0.57 U	0.29 J	0.57 U	0.66 =	0.34 J	0.34 J
Pit 38	X126DL	3	7.2 U	2.8 U	2.8 U	2.8 U	2.8 U	2.8 U	7.2 U	7.2 U	0.61 J	2.8 U	2.8 U	0.46 J	2.8 U	0.78 J	0.5 J	0.69 J
Pit 38	X127	10	57 U	23 U	23 U	23 U	23 U	23 U	57 U	57 UJ	23 U	23 U	23 U	23 U	23 U	23 U	23 U	23 U
Pit 39	X124	3	0.98 U	0.39 U	0.39 U	0.39 U	0.39 U	0.022 J	0.98 U	0.98 U	0.39 U	0.39 U	0.39 U	0.055 J	0.39 U	0.22 J	0.36 J	0.35 J
Pit 39	X125	10	58 U	23 U	23 U	23 U	23 U	23 U	58 U	58 UJ	23 U	23 U	23 U	23 U	23 U	23 U	23 U	23 U
Pit 40	X122	4	1.6 U	0.63 U	0.63 U	0.041 J	0.63 U	0.23 J	1.6 U	1.6 U	0.044 J	0.63 U	0.63 U	0.087 J	0.63 U	0.27 J	0.27 J	0.25 J
Pit 40	X123	9	64 U	25 U	25 U	25 U	25 U	25 U	64 U	64 UJ	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U
Pit 41	X120	3	1 U	0.41 U	0.41 U	0.41 U	0.41 U	0.41 U	1 U	1 U	0.41 U	0.41 U	0.41 U	0.022 J	0.41 U	0.41 U	0.41 U	0.021 J
Pit 41	X121	8	53 U	21 U	21 U	21 U	21 U	13 J	53 U	53 UJ	21 U	21 U	21 U	21 U	21 U	1.2 J	21 U	21 U
Pit 42	X117	2	1.1 U	0.42 U	0.42 U	0.42 U	0.42 U	0.42 U	1.1 U	1.1 U	0.42 U	0.025 J	0.42 U	0.045 J	0.42 U	0.11 J	0.093 J	0.11 J
Pit 42	X118	9	11 U	4.6 U	4.6 U	4.6 U	4.6 U	2.3 J	11 U	11 U	0.93 J	4.6 U	4.6 U	0.86 J	4.6 U	1.6 J	1.1 J	1.2 J
Pit 42	X118DL	9	23 U	9.1 U	9.1 U	9.1 U	9.1 U	2.1 J	23 U	23 U	0.76 J	9.1 U	9.1 U	0.69 J	18 =	1.5 J	1 J	1 J
Pit 42	X119	15	1.4 U	0.56 U	0.56 U	0.56 U	0.56 U	40 =	1.4 U	1.4 U	0.68 =	0.066 J	0.56 U	0.56 U	1.6 =	0.93 =	0.5 J	0.14 J
Pit 42	X119DL	15	28 U	11 U	11 U	11 U	11 U	30 =	28 U	28 U	11 U	11 U	11 U	0.49 J	0.89 J	0.73 J	0.63 J	11 U
Pit 43	X115	3	6.8 U	2.7 U	2.7 U	2.7 U	2.7 U	2.7 U	6.8 U	6.8 U	2.4 J	2.7 U	2.7 U	2.4 J	0.52 J	4.5 =	3.8 =	3.3 =
Pit 43	X116	9	4.1 U	1.6 U	1.6 U	1.6 U	1.6 U	0.83 J	4.1 U	4.1 U	2 =	0.2 J	1.3 J	1.4 J	0.82 J	8.1 =	14 =	13 =
Pit 43	X116DL	9	14 U	5.4 U	5.4 U	5.4 U	5.4 U	0.67 J	14 U	14 U	1.8 J	5.4 U	1.3 J	1.3 J	0.29 J	7.1 =	12 =	10 =

Table E-8. SVOCs in U.S. Drum (mg/kg)

Station ID	Sample ID	Depth (ft)	4,6-Dinitro-2-methylphenol	4-Bromophenyl phenyl ether	4-Chloro-3-methylphenol	4-Chloroaniline	4-Chlorophenyl phenyl ether	4-Methylphenol	4-Nitroaniline	4-Nitrophenol	Acenaphthene	Acenaphthylene	Acetophenone	Anthracene	Benzaldehyde	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene
Industrial/ Commercial		*Ing*				*8200*					*120000*	*61000*		*610000*		*8*	*0.8*	*8*
		Inh																
Construction Worker		*Ing*				*820*					*120000*	*61000*		*610000*		*170*	*17*	*170*
		Inh																
Soil Component of GW		*I*				*0.7*					*570*	*15*		*12000*		*2*	*8*	*5*
		II				*0.7*					*2900*	*75*		*59000*		*8*	*82*	*25*
Pit 44	X113	3	5.4 U	2.1 U	2.1 U	2.1 U	2.1 U	0.79 J	5.4 U	5.4 U	0.54 J	0.37 J	2.1 U	1.3 J	2.1 U	5 =	5.8 =	5.1 =
Pit 44	X114	9	33 U	13 U	13 U	13 U	13 U	13 U	33 U	33 U	0.86 J	13 U	2 J	0.95 J	1.2 J	3.4 J	3.9 J	3.8 J
Pit 45	X111	3.5	36 U	14 U	14 U	14 U	14 U	1.6 J	36 U	36 UJ	1.3 J	14 U	14 U	3.2 J	14 U	6.9 J	6.2 J	6.1 J
Pit 45	X112	10	6.1 U	2.4 U	2.4 U	2.4 U	2.4 U	0.92 J	6.1 U	6.1 U	0.48 J	2.4 U	2.4 U	0.35 J	2.4 U	0.65 J	0.47 J	0.49 J
Pit 46	X109	4	1.3 U	0.53 U	0.53 U	0.53 U	0.53 U	0.036 J	1.3 U	1.3 U	0.53 U	0.53 U	0.53 U	0.53 U	0.53 U	0.037 J	0.035 J	0.038 J
Pit 46	X110	9	6 U	2.4 U	2.4 U	2.4 U	2.4 U	0.77 J	6 U	6 U	0.74 J	2.4 U	2.4 U	0.24 J	2.4 U	0.55 J	0.36 J	0.36 J
Pit 47	X107	3.5	1.1 U	0.45 U	0.45 U	0.45 U	0.45 U	0.45 U	1.1 U	1.1 U	0.45 U	0.026 J	0.45 U	0.034 J	0.45 U	0.071 J	0.063 J	0.066 J
Pit 47	X108	9	120 U	49 U	49 U	49 U	49 U	49 U	120 U	120 U	49 U	49 U	49 U	49 U	49 U	2.7 J	49 U	49 U
Pit 48	X105	3	0.94 U	0.38 U	0.38 U	0.38 U	0.38 U	0.38 U	0.94 U	0.94 U	0.05 J	0.02 J	0.38 U	0.067 J	0.38 U	0.14 J	0.12 J	0.15 J
Pit 48	X106	9	34 U	14 U	14 U	14 U	14 U	14 U	34 U	34 UJ	14 U	14 U	14 U	1.1 J	14 U	1.7 J	0.8 J	14 U
Pit 49	X103	3	0.97 U	0.38 U	0.38 U	0.38 U	0.38 U	0.38 U	0.97 U	0.97 U	0.38 U	0.38 U	0.38 U	0.35 J	0.022 J	0.59 =	0.7 =	0.74 =
Pit 49	X104	10	0.18 J	0.42 UJ	0.42 UJ	0.42 UJ	0.42 UJ	0.087 J	1.1 UJ	1.1 UJ	0.42 UJ	0.42 UJ	0.42 UJ	0.42 UJ	0.42 UJ	0.056 J	0.048 J	0.043 J
Pit 50	X101	3	0.94 U	0.38 U	0.38 U	0.38 U	0.38 U	0.036 J	0.94 U	0.94 U	0.38 U	0.38 U	0.38 U	0.38 U	0.38 U	0.38 U	0.38 U	0.38 U
Pit 50	X102	9	49 U	19 U	1.8 J	19 U	19 U	19 U	49 U	49 UJ	1.4 J	19 U	19 U	19 U	19 U	19 U	19 U	19 U
Pit 51	X203	3	2 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	2 U	2 U	0.2 J	0.063 J	0.8 U	0.51 J	0.8 U	1.4 =	1.3 =	1 =
Pit 51	X204	8	11 U	4.4 U	4.4 U	0.35 J	4.4 U	4.4 U	11 U	11 U	0.55 J	0.3 J	4.4 U	3.3 J	4.4 U	7.6 =	6.9 =	5.9 =

Notes:

=:	sample concentration is detected at level reported
U:	sample concentration is under detection limit
J:	sample concentration is estimated value
R:	sample concentration value is rejected
DL:	sample is diluted
RE:	sample is re-extracted
Ing.:	Ingestion
Inh.:	Inhalation
I:	Class I
II:	Class II

Table E-8. SVOCs in U.S. Drum (mg/kg)

Station ID	Sample ID	Depth (ft)	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Benzyl Butyl Phthalate	Biphenyl (Diphenyl)	Bis(2-Chloroethoxy) Methane	Bis(2-Chloroethyl) Ether	Bis(2-Ethylhexyl) Phthalate	Caprolactam	Carbazole	Chrysene	Di-N-Butyl Phthalate	Di-N-Octylphthalate	Dibenz(a,h)Anthracene	Dibenzofuran	Diethyl Phthalate	Dimethyl Phthalate
Industrial/ Commercial		*Ing*	*61000*	*78*	*410000*			*5*	*410*		*290*	*780*	*200000*	*41000*	*0.8*		*1000000*	
		Inh			*930*			*0.47*	*31000*				*2300*	*10000*			*2000*	
Construction Worker		*Ing*	*61000*	*1700*	*410000*			*75*	*4100*		*6200*	*17000*	*200000*	*4100*	*17*		*1000000*	
		Inh			*930*			*0.66*	*31000*			*800*	*2300*	*10000*			*2000*	
Soil Component of GW		*I*	*16000*	*49*	*930*			*0.0004*	*3600*		*0.6*	*160*	*2300*	*10000*	*2*		*470*	
		II	*81000*	*250*	*930*			*0.0004*	*31000*		*2.8*	*800*	*2300*	*10000*	*7.6*		*470*	
Pit 01	X207	4	4.7 J	8.1 =	7.6 U	0.48 J	7.6 U	7.6 U	7.6 U	7.6 U	2.1 J	11 =	7.6 U	7.6 U	1.5 J	3.3 J	7.6 U	7.6 U
Pit 01	X208	9	85 U	85 U	85 U	4.6 J	85 U	85 U	480 =	85 U	85 U	85 U	9.7 J	85 U	85 U	85 U	85 U	85 U
Pit 01	X209	13	1.1 J	0.79 J	7.2 J	14 U	14 U	14 U	330 =	14 U	14 UJ	1.2 J	17 J	6.1 J	14 U	14 U	14 U	14 U
Pit 02	X205	3	0.16 J	0.27 J	0.038 J	0.023 J	0.44 U	0.44 U	0.37 J	0.033 J	0.074 J	0.31 J	0.028 J	0.44 U	0.072 J	0.08 J	0.44 U	0.44 U
Pit 02	X206	9	1.4 =	2.4 =	1.2 U	1.2 U	1.2 U	1.2 U	0.12 J	1.2 U	0.5 J	3.3 =	1.2 U	1.2 U	0.52 J	0.24 J	1.2 U	1.2 U
Pit 03	X201	3	1.8 =	2.9 =	1.6 U	1.6 U	1.6 U	1.6 U	0.14 J	1.6 U	0.35 J	4.4 =	1.6 U	1.6 U	0.62 J	0.31 J	1.6 U	1.6 U
Pit 03	X202	8	0.72 J	1.4 =	1.2 U	1.2 U	1.2 U	1.2 U	0.11 J	1.2 U	0.32 J	2 =	1.2 U	1.2 U	0.28 J	0.22 J	1.2 U	1.2 U
Pit 04	X177	4	0.47 J	1.7 J	2.1 U	2.1 U	2.1 U	2.1 U	2.1 U	2.1 U	0.29 J	2 J	2.1 U	2.1 U	2.1 U	2.1 U	2.1 U	2.1 U
Pit 04	X178	8	1.3 =	2.5 =	0.79 U	0.19 J	0.79 U	0.79 U	40 =	0.35 J	0.41 J	3.5 =	0.79 U	0.79 U	0.47 J	0.35 J	0.79 U	0.79 U
Pit 04	X178DL	8	1.5 J	2.2 J	1.8 J	16 U	16 U	16 U	78 =	16 U	16 U	4.8 J	16 U	16 U	16 U	16 U	16 U	16 U
Pit 05	X198	2.5	1.2 J	2 =	2 U	0.11 J	2 U	2 U	2 U	2 U	0.3 J	2.5 =	0.12 J	2 U	0.56 J	0.36 J	2 U	2 U
Pit 05	X199	8	2.6 J	5.8 =	4.1 U	0.23 J	4.1 U	4.1 U	0.65 J	4.1 U	2.1 J	7.8 =	4.1 U	4.1 U	1.1 J	1.4 J	4.1 U	4.1 U
Pit 05	X200	8	5.2 =	6.3 =	1.9 U	0.16 J	1.9 U	1.9 U	0.47 J	1.9 U	1.5 J	8.9 =	0.19 J	1.9 U	1.7 J	1.2 J	1.9 U	1.9 U
Pit 05	X200DL	8	5.2 J	6.7 J	7.7 U	7.7 U	7.7 U	7.7 U	0.58 J	7.7 U	1.3 J	8.8 =	7.7 U	7.7 U	1.5 J	1 J	7.7 U	7.7 U
Pit 06	X196	3	0.39 J	0.49 =	0.4 U	0.053 J	0.4 U	0.4 U	0.041 J	0.4 U	0.072 J	0.81 =	0.03 J	0.4 UJ	0.084 J	0.24 J	0.4 U	0.4 U
Pit 06	X197	8	0.47 J	1.6 J	63 =	0.33 J	2 U	2 U	54 =	2 U	0.53 J	3.6 =	4.7 =	2 U	0.23 J	0.67 J	2 U	2 U
Pit 06	X197DL	8	1 J	1.7 J	39 =	0.43 J	8.1 U	8.1 U	30 =	8.1 U	0.59 J	3.5 J	3.5 J	8.1 UJ	8.1 U	0.71 J	8.1 U	8.1 U
Pit 07	X175	3	0.83 J	1.2 J	1.6 U	0.14 J	1.6 U	1.6 U	1.6 U	1.6 U	0.46 J	1.6 =	1.6 U	1.6 U	0.27 J	0.26 J	1.6 U	1.6 U
Pit 07	X176	8	0.65 J	0.95 J	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	0.28 J	1.3 =	1.3 U	1.3 U	0.2 J	0.19 J	1.3 U	1.3 U
Pit 08	X173	2.5	0.74 =	1.1 =	0.39 U	0.038 J	0.39 U	0.39 U	0.39 U	0.39 U	0.15 J	1.5 =	0.091 J	0.39 U	0.3 J	0.17 J	0.39 U	0.39 U
Pit 08	X173DL	2.5	0.88 J	0.93 J	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	0.18 J	1.4 =	0.13 J	1.2 U	0.27 J	0.16 J	1.2 U	1.2 U
Pit 08	X174	8	1.1 J	1.6 J	0.4 J	2.1 U	2.1 U	2.1 U	2.1 U	2.1 U	0.2 J	2.2 =	2.1 U	2.1 U	0.38 J	0.22 J	2.1 U	2.1 U
Pit 09	X168	3	0.099 J	0.056 J	0.38 U	0.059 J	0.38 U	0.38 U	0.68 =	0.38 U	0.38 U	0.1 J	0.094 J	0.38 U	0.38 U	0.068 J	0.38 U	0.38 U
Pit 09	X169	6.5	0.054 J	0.42 U	0.42 U	0.42 U	0.42 U	0.42 U	0.42 U	0.42 U	0.42 U	0.042 J	0.42 U	0.42 U	0.42 U	0.024 J	0.42 U	0.42 U
Pit 09	X170	6.5	0.067 J	0.048 J	0.41 U	0.07 J	0.41 U	0.41 U	0.79 =	0.41 U	0.11 J	0.11 J	0.41 U	0.41 U	0.41 U	0.17 J	0.41 U	0.41 U
Pit 10	X171	3	0.17 J	1 U	1 U	1 U	1 U	1 U	14 =	1 U	1 U	0.94 J	1 U	1 U	1 U	0.11 J	1 U	1 U
Pit 10	X171DL	3	0.55 J	5 U	5 U	5 U	5 U	5 U	15 =	5 U	5 U	0.64 J	5 U	0.31 J	5 U	5 U	5 U	5 U
Pit 10	X172	8	1.7 J	1.3 J	19 U	19 U	19 U	19 U	140 =	19 U	19 U	2.9 J	4.5 J	2.2 J	19 U	19 U	1.4 J	19 U

Table E-8. SVOCs in U.S. Drum (mg/kg)

Station ID	Sample ID	Depth (ft)	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Benzyl Butyl Phthalate	Biphenyl (Diphenyl)	Bis(2-Chloroethoxy) Methane	Bis(2-Chloroethyl) Ether	Bis(2-Ethylhexyl) Phthalate	Caprolactam	Carbazole	Chrysene	Di-N-Butyl Phthalate	Di-N-Octylphthalate	Dibenz(a,h)Anthracene	Dibenzofuran	Diethyl Phthalate	Dimethyl Phthalate
Industrial/ Commercial		*Ing*	*61000*	*78*	*410000*			*5*	*410*		*290*	*780*	*200000*	*41000*	*0.8*		*1000000*	
		Inh			*930*			*0.47*	*31000*				*2300*	*10000*			*2000*	
Construction Worker		*Ing*	*61000*	*1700*	*410000*			*75*	*4100*		*6200*	*17000*	*200000*	*4100*	*17*		*1000000*	
		Inh			*930*			*0.66*	*31000*			*800*	*2300*	*10000*			*2000*	
Soil Component of GW		*I*	*16000*	*49*	*930*			*0.0004*	*3600*		*0.6*	*160*	*2300*	*10000*	*2*		*470*	
		II	*81000*	*250*	*930*			*0.0004*	*31000*		*2.8*	*800*	*2300*	*10000*	*7.6*		*470*	
Pit 11	X190	2	2.7 =	4.3 =	2.4 U	0.15 J	2.4 U	2.4 U	2.2 J	2.4 U	1.7 J	6.1 =	0.37 J	2.4 U	0.94 J	0.7 J	2.4 U	2.4 U
Pit 11	X190DL	2	2.2 J	4.2 J	4.9 U	4.9 U	4.9 U	4.9 U	2.3 J	4.9 U	1.5 J	6 =	0.25 J	4.9 UJ	0.82 J	0.73 J	4.9 U	4.9 U
Pit 11	X191	8	0.062 J	0.069 J	0.4 J	0.13 J	0.88 U	0.88 U	4.4 =	0.88 U	0.88 U	0.12 J	0.26 J	0.88 U	0.88 U	0.05 J	0.047 J	0.88 U
Pit 12	X192	3	0.088 J	0.12 J	0.38 UJ	0.38 UJ	0.38 UJ	0.38 UJ	0.38 UJ	0.38 UJ	0.38 UJ	0.19 J	0.38 UJ	0.38 UJ	0.028 J	0.38 UJ	0.38 UJ	0.38 UJ
Pit 12	X193	8	0.25 J	0.36 J	0.16 J	0.047 J	0.8 U	0.8 U	4.5 =	0.8 U	0.077 J	0.59 J	0.8 U	0.8 U	0.11 J	0.088 J	0.8 U	0.8 U
Pit 13	X194	3.5	0.41 J	0.86 J	1.9 U	1.9 U	1.9 U	1.9 U	0.24 J	1.9 U	0.23 J	1.1 J	1.9 U	1.9 U	0.27 J	0.18 J	1.9 U	1.9 U
Pit 13	X195	12	16 =	65 =	5.4 U	5.4 U	5.4 U	5.4 U	4.7 J	5.4 U	2.6 J	100 =	0.56 J	5.4 U	9.1 =	0.29 J	5.4 U	5.4 U
Pit 13	X195DL	12	15 J	35 =	27 U	27 U	27 U	27 U	5.9 J	27 U	1.9 J	59 =	27 U	27 UJ	7.5 J	27 U	27 U	27 U
Pit 14	X184	4	0.079 J	0.062 J	0.76 U	0.25 J	0.76 U	0.76 U	5.1 =	0.76 U	0.76 U	0.14 J	0.76 U	0.28 J	0.76 U	0.76 U	0.76 U	0.76 U
Pit 14	X185	9	0.36 J	0.9 =	1.1 =	0.067 J	0.48 U	0.48 U	0.67 =	0.48 U	0.18 J	1.2 =	0.48 U	0.48 U	0.15 J	0.17 J	0.48 U	0.48 U
Pit 14	X185DL	9	0.52 J	0.86 J	1 =	0.058 J	0.96 U	0.96 U	0.67 J	0.96 U	0.18 J	1.1 =	0.11 J	0.96 U	0.16 J	0.17 J	0.96 U	0.96 U
Pit 15	X186	4	0.13 J	0.11 J	2 U	0.92 J	2 U	2 U	13 =	2 U	2 U	0.17 J	2 U	2 U	2 U	0.14 J	2 U	2 U
Pit 15	X187	8	0.2 J	0.33 J	0.17 J	0.17 J	0.81 U	0.81 U	4.9 =	0.81 U	0.059 J	0.43 J	0.81 U	0.074 J	0.077 J	0.14 J	0.81 U	0.81 U
Pit 16	X188	3	3.9 =	8 =	3.8 U	3.8 U	3.8 U	3.8 U	3.8 U	3.8 U	0.42 J	15 =	3.8 U	3.8 U	2.2 J	0.57 J	3.8 U	3.8 U
Pit 16	X188DL	3	4.3 J	7.4 J	7.5 U	7.5 U	7.5 U	7.5 U	7.5 U	7.5 U	0.49 J	15 =	7.5 U	7.5 U	2.3 J	0.61 J	7.5 U	7.5 U
Pit 16	X189	7	0.2 J	0.15 J	1.2 U	1.2 U	1.2 U	1.2 U	7.2 =	1.2 U	0.078 J	0.19 J	0.13 J	1.2 U	1.2 U	0.07 J	1.2 U	1.2 U
Pit 17	X181	3.5	2.2 UJ	2.2 UJ	2.2 UJ	0.38 J	2.2 UJ	2.2 UJ	0.42 J	2.2 UJ	2.2 UJ	0.12 J	2.2 UJ	2.2 UJ	2.2 UJ	2.2 UJ	2.2 UJ	2.2 UJ
Pit 17	X182	7	0.88 J	9.4 U	9.4 U	1.4 J	9.4 U	9.4 U	9.4 U	9.4 U	9.4 U	2.3 J	9.4 U	9.4 U	9.4 U	2.3 J	9.4 U	9.4 U
Pit 17	X183	13	0.34 J	0.62 =	0.41 U	0.027 J	0.41 U	0.41 U	0.38 J	0.41 U	0.095 J	0.81 =	0.41 U	0.41 UJ	0.12 J	0.1 J	0.41 U	0.41 U
Pit 18	X179	3.5	3.8 U	3.8 U	3.8 U	3.8 U	3.8 U	3.8 U	55 =	3.8 U	3.8 U	3.8 U	3.8 U	3.8 U	3.8 U	3.8 U	3.8 U	3.8 U
Pit 18	X179DL	3.5	7.5 U	7.5 U	7.5 U	7.5 U	7.5 U	7.5 U	39 =	7.5 U	7.5 U	7.5 U	7.5 U	7.5 U	7.5 U	7.5 U	7.5 U	7.5 U
Pit 18	X180	7	20 =	34 =	5.1 U	3 J	5.1 U	5.1 U	1.4 J	5.1 U	8.2 =	44 =	5.1 U	5.1 U	5.7 =	15 =	5.1 U	5.1 U
Pit 18	X180DL	7	16 J	26 J	30 U	2.6 J	30 U	30 U	1.7 J	30 U	7.4 J	30 =	30 U	30 U	4.1 J	11 J	30 U	30 U
Pit 19	X166	3	12 UJ	12 UJ	1.8 J	25 J	12 UJ	12 UJ	69 J	12 UJ	12 UJ	0.67 J	17 J	21 J	12 UJ	12 UJ	12 UJ	12 UJ
Pit 19	X167	9	0.33 J	0.25 J	1.6 U	2.7 =	1.6 U	1.6 U	7.7 =	1.6 U	0.083 J	0.48 J	0.5 J	1.2 J	0.11 J	0.091 J	1.6 U	1.6 U
Pit 20	X164	3	0.8 J	1.2 J	1.7 J	0.15 J	2.4 U	2.4 U	5.7 =	2.4 U	0.52 J	1.6 J	0.27 J	2.4 U	0.23 J	0.73 J	0.17 J	2.4 U
Pit 20	X165	9	2 J	2.3 J	14 UJ	14 UJ	14 UJ	14 UJ	12 J	14 UJ	0.95 J	3.5 J	0.74 J	14 UJ	0.71 J	0.9 J	14 UJ	14 UJ
Pit 21	X162	2	2.2 J	4.2 =	3.4 U	0.31 J	3.4 U	3.4 U	6.9 =	3.4 U	0.55 J	7.1 =	0.44 J	3.4 U	0.68 J	2.3 J	3.4 U	3.4 U

Table E-8. SVOCs in U.S. Drum (mg/kg)

Station ID	Sample ID	Depth (ft)	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Benzyl Butyl Phthalate	Biphenyl (Diphenyl)	Bis(2-Chloroethoxy) Methane	Bis(2-Chloroethyl) Ether	Bis(2-Ethylhexyl) Phthalate	Caprolactam	Carbazole	Chrysene	Di-N-Butyl Phthalate	Di-N-Octylphthalate	Dibenz(a,h)Anthracene	Dibenzofuran	Diethyl Phthalate	Dimethyl Phthalate
Industrial/ Commercial		*Ing*	*61000*	*78*	*410000*			*5*	*410*		*290*	*780*	*200000*	*41000*	*0.8*		*1000000*	
		Inh			*930*			*0.47*	*31000*				*2300*	*10000*			*2000*	
Construction Worker		*Ing*	*61000*	*1700*	*410000*			*75*	*4100*		*6200*	*17000*	*200000*	*4100*	*17*		*1000000*	
		Inh			*930*			*0.66*	*31000*			*800*	*2300*	*10000*			*2000*	
Soil Component of GW		*I*	*16000*	*49*	*930*			*0.0004*	*3600*		*0.6*	*160*	*2300*	*10000*	*2*		*470*	
		II	*81000*	*250*	*930*			*0.0004*	*31000*		*2.8*	*800*	*2300*	*10000*	*7.6*		*470*	
Pit 21	X163	9	48 UJ	48 UJ	48 UJ	48 UJ	48 UJ	48 UJ	34 J	48 UJ	48 UJ	48 UJ	48 UJ	48 UJ	48 UJ	48 UJ	48 UJ	48 UJ
Pit 22	X160	3.5	0.43 J	0.63 J	0.64 U	0.095 J	0.64 U	0.64 U	1 =	0.64 U	0.19 J	0.83 =	0.64 U	0.64 U	0.15 J	0.28 J	0.64 U	0.64 U
Pit 22	X161	8	1.2 J	1.7 J	5.3 =	0.36 J	2.3 U	2.3 U	4.4 =	2.3 U	0.91 J	2.6 =	0.32 J	2.3 U	0.37 J	1.4 J	2.3 U	2.3 U
Pit 23	X157	2.5	0.057 J	0.39 U	0.39 U	0.39 U	0.39 U	0.39 U	0.39 U	0.39 U	0.39 U	0.027 J	0.39 U	0.39 U	0.39 U	0.39 U	0.39 U	0.39 U
Pit 23	X158	9	19 U	19 U	19 U	19 U	19 U	19 U	8 J	19 U	1.1 J	19 U	19 U	19 U	19 U	19 U	19 U	19 U
Pit 23	X159	13	3.7 J	5.6 J	20 UJ	20 UJ	20 UJ	20 UJ	4.6 J	20 UJ	2.6 J	7.4 J	20 UJ	20 UJ	1.1 J	3.8 J	20 UJ	20 UJ
Pit 24	X155	2.5	26 U	26 U	26 U	26 U	26 U	26 U	83 =	26 U	26 U	2.4 J	26 U	26 U	26 U	26 U	26 U	26 U
Pit 24	X156	8.5	0.97 J	1.7 J	0.82 J	0.42 J	2.4 U	2.4 U	11 =	2.4 U	0.32 J	2.5 =	0.86 J	2.4 U	0.3 J	2.4 U	0.12 J	2.4 U
Pit 25	X153	3	1.1 J	17 U	17 U	4.9 J	17 U	17 U	4.7 J	17 U	17 U	17 U	17 U	17 U	17 U	17 U	17 U	17 U
Pit 25	X154	9.5	0.29 J	0.29 J	0.88 J	0.15 J	1.3 U	1.3 U	14 =	1.3 U	0.18 J	0.62 J	0.88 J	1.3 U	1.3 U	0.2 J	0.48 J	1.3 U
Pit 25	X154DL	9.5	0.25 J	0.26 J	1 J	2.6 U	2.6 U	2.6 U	15 =	2.6 U	0.15 J	0.61 J	0.89 J	2.6 U	2.6 U	0.15 J	0.34 J	2.6 U
Pit 26	X151	3	12 U	12 U	1.4 J	12 U	12 U	12 U	2.7 J	12 U	12 U	0.69 J	8 J	50 =	12 U	12 U	12 U	12 U
Pit 26	X152	9	1.3 J	0.94 J	15 U	2.5 J	15 U	15 U	6.3 J	15 U	1.1 J	3.2 J	15 U	15 U	15 U	15 U	15 U	15 U
Pit 27	X149	3.5	0.13 J	0.28 J	0.57 U	0.14 J	0.57 U	0.57 U	0.57 U	0.57 U	0.2 J	0.68 =	0.57 U	0.57 U	0.044 J	0.5 J	0.57 U	0.57 U
Pit 27	X150	10	19 U	19 U	19 U	19 U	19 U	19 U	3.3 J	19 U	19 U	19 U	19 U	19 U	19 U	19 U	19 U	19 U
Pit 28	X147	3	0.98 =	1.5 =	0.054 J	0.077 J	0.45 U	0.45 U	0.3 J	0.45 U	0.4 J	3 =	0.45 U	0.45 U	0.33 J	1.6 =	0.034 J	0.45 U
Pit 28	X147DL	3	1.4 J	2 =	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	0.32 J	2.7 =	1.8 U	1.8 U	0.41 J	1.3 J	1.8 U	1.8 U
Pit 28	X148	8	23 U	23 U	23 U	23 U	23 U	23 U	17 J	23 U	23 U	23 U	23 U	23 U	23 U	23 U	23 U	23 U
Pit 29	X145	4.5	0.89 =	1.5 =	0.8 U	0.8 U	0.8 U	0.8 U	1.4 =	0.8 U	0.083 J	1.4 =	0.8 U	0.8 U	0.21 J	0.046 J	0.8 U	0.8 U
Pit 29	X146	8	0.76 J	1.1 J	11 U	11 U	11 U	11 U	9.8 J	11 U	1.2 J	1.6 J	11 U	11 U	11 U	2.3 J	11 U	11 U
Pit 30	X143	4	31 U	31 U	31 U	31 U	31 U	31 U	45 =	31 U	31 U	31 U	31 U	31 U	31 U	31 U	31 U	31 U
Pit 30	X144	6	17 U	17 U	0.9 J	17 U	17 U	17 U	65 =	17 U	17 U	17 U	1.5 J	17 U	17 U	17 U	17 U	17 U
Pit 31	X141	4	0.3 J	0.22 J	0.14 J	0.11 J	0.52 U	0.52 U	32 =	0.52 U	0.11 J	0.66 =	0.34 J	0.52 U	0.097 J	0.13 J	0.71 =	0.52 U
Pit 31	X141DL	4	10 U	10 U	10 U	10 U	10 U	10 U	62 =	10 U	10 U	0.56 J	10 U	10 U	10 U	10 U	0.57 J	10 U
Pit 31	X142	9	0.42 =	0.4 U	0.4 U	0.21 J	0.4 U	0.4 U	2 =	0.4 U	0.12 J	1.7 =	0.1 J	0.4 U	0.13 J	0.17 J	0.19 J	0.4 U
Pit 32	X139	3	2 J	1.9 J	14 U	1.1 J	14 U	14 U	7.7 J	14 U	1.5 J	3.3 J	14 U	14 U	0.89 J	2 J	14 U	14 U
Pit 32	X140	9	31 U	31 U	31 U	31 U	31 U	31 U	150 =	31 U	31 U	31 U	31 U	31 U	31 U	31 U	31 U	31 U
Pit 33	X137	3	0.77 J	0.75 J	1 J	0.39 J	1.2 U	1.2 U	17 =	1.2 U	0.2 J	1.5 =	0.22 J	0.084 J	0.29 J	0.15 J	1.7 =	0.14 J

Table E-8. SVOCs in U.S. Drum (mg/kg)

Station ID	Sample ID	Depth (ft)	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Benzyl Butyl Phthalate	Biphenyl (Diphenyl)	Bis(2-Chloroethoxy) Methane	Bis(2-Chloroethyl) Ether	Bis(2-Ethylhexyl) Phthalate	Caprolactam	Carbazole	Chrysene	Di-N-Butyl Phthalate	Di-N-Octylphthalate	Dibenz(a,h)Anthracene	Dibenzofuran	Diethyl Phthalate	Dimethyl Phthalate
Industrial/ Commercial		*Ing*	*61000*	*78*	*410000*			*5*	*410*		*290*	*780*	*200000*	*41000*	*0.8*		*1000000*	
		Inh			*930*			*0.47*	*31000*				*2300*	*10000*			*2000*	
Construction Worker		*Ing*	*61000*	*1700*	*410000*			*75*	*4100*		*6200*	*17000*	*200000*	*4100*	*17*		*1000000*	
		Inh			*930*			*0.66*	*31000*			*800*	*2300*	*10000*			*2000*	
Soil Component of GW		*I*	*16000*	*49*	*930*			*0.0004*	*3600*		*0.6*	*160*	*2300*	*10000*	*2*		*470*	
		II	*81000*	*250*	*930*			*0.0004*	*31000*		*2.8*	*800*	*2300*	*10000*	*7.6*		*470*	
Pit 33	X137DL	3	1.6 J	0.83 J	1.7 J	0.53 J	3.7 U	3.7 U	24 =	3.7 U	0.31 J	2.3 J	0.3 J	3.7 U	0.38 J	0.21 J	2.1 J	0.19 J
Pit 33	X138	9	9.8 J	15 =	13 U	13 U	13 U	13 U	2.1 J	13 U	4.4 J	17 =	13 U	13 U	2.9 J	6.1 J	13 U	13 U
Pit 34	X135	3	0.081 J	0.043 J	0.33 J	0.19 J	0.56 U	0.56 U	1.2 =	0.56 U	0.053 J	0.14 J	0.13 J	0.56 U	0.56 U	1.2 =	0.088 J	0.56 U
Pit 34	X136	10	17 U	17 U	17 U	17 U	17 U	17 U	94 =	17 U	17 U	17 U	17 U	17 U	17 U	17 U	17 U	17 U
Pit 35	X133	4	0.079 J	0.057 J	0.4 U	0.4 U	0.4 U	0.4 U	0.18 J	0.4 U	0.4 U	0.1 J	0.024 J	0.4 U	0.02 J	0.4 U	0.4 U	0.4 U
Pit 35	X134	10	0.24 J	0.24 J	0.059 J	0.53 U	0.53 U	0.53 U	3 =	0.53 U	0.53 U	0.33 J	0.084 J	0.53 U	0.067 J	0.072 J	0.53 U	0.53 U
Pit 36	X131	4	41 R	41 R	41 R	41 R	41 R	41 R	26 J	41 R	41 R	41 R	41 R	41 R	41 R	41 R	41 R	41 R
Pit 36	X132	11	13 U	13 U	13 U	13 U	13 U	13 U	4.9 J	13 U	13 U	13 U	13 U	13 U	13 U	13 U	13 U	13 U
Pit 37	X128	3	28 U	28 U	28 U	28 U	28 U	28 U	4.8 J	28 U	28 U	2.4 J	28 U	28 U	28 U	2.7 J	28 U	28 U
Pit 37	X129	3	2.3 =	2 =	0.33 J	0.13 J	1.5 U	1.5 U	6.3 =	1.5 U	1.2 J	3.3 =	0.33 J	1.5 U	0.64 J	2 =	0.22 J	1.5 U
Pit 37	X130	8	17 U	0.86 J	1.1 J	17 U	17 U	17 U	10 J	17 U	17 U	1.6 J	0.86 J	17 U	17 U	17 U	17 U	17 U
Pit 38	X126	3	0.31 J	0.39 J	0.71 =	0.26 J	0.57 U	0.57 U	15 =	0.57 U	0.26 J	0.86 =	0.29 J	0.094 J	0.079 J	0.28 J	0.24 J	0.57 U
Pit 38	X126DL	3	0.46 J	0.45 J	1 J	0.4 J	2.8 U	2.8 U	21 =	2.8 U	0.4 J	1.1 J	0.6 J	2.8 U	2.8 U	0.38 J	0.36 J	2.8 U
Pit 38	X127	10	23 U	23 U	23 U	23 U	23 U	23 U	40 J	23 U	23 U	23 U	23 U	23 U	23 U	23 U	23 U	23 U
Pit 39	X124	3	0.43 =	0.25 J	0.077 J	0.39 U	0.39 U	0.39 U	0.37 J	0.39 U	0.023 J	0.28 J	0.04 J	0.39 U	0.098 J	0.39 U	0.39 U	0.39 U
Pit 39	X125	10	23 U	23 U	23 U	23 U	23 U	23 U	2.8 J	23 U	23 U	23 U	23 U	23 U	23 U	23 U	23 U	23 U
Pit 40	X122	4	0.28 J	0.21 J	0.11 J	0.034 J	0.63 U	0.63 U	1.8 =	0.63 U	0.042 J	0.37 J	0.038 J	0.63 U	0.071 J	0.039 J	0.63 U	0.053 J
Pit 40	X123	9	25 U	25 U	1.3 J	25 U	25 U	25 U	16 J	25 U	25 U	25 U	1.7 J	25 U	25 U	25 U	25 U	25 U
Pit 41	X120	3	0.078 J	0.41 U	0.024 J	0.021 J	0.41 U	0.41 U	0.15 J	0.41 U	0.41 U	0.04 J	0.027 J	0.41 U	0.41 U	0.41 U	0.41 U	0.41 U
Pit 41	X121	8	21 U	21 U	3.1 J	22 =	21 U	21 U	11 J	21 U	21 U	1.3 J	3.9 J	1.4 J	21 U	21 U	21 U	21 U
Pit 42	X117	2	0.097 J	0.087 J	0.42 U	0.42 U	0.42 U	0.42 U	0.12 J	0.075 J	0.42 U	0.13 J	0.42 U	0.42 U	0.033 J	0.025 J	0.42 U	0.42 U
Pit 42	X118	9	0.84 J	0.99 J	4.6 UJ	0.5 J	4.6 U	4.6 U	41 =	1.2 J	0.57 J	1.9 J	0.49 J	4.6 UJ	0.34 J	4.6 U	4.6 U	4.6 U
Pit 42	X118DL	9	0.91 J	1.1 J	9.1 U	0.48 J	9.1 U	9.1 U	38 =	0.91 J	0.52 J	1.9 J	0.53 J	9.1 U	9.1 U	9.1 U	9.1 U	9.1 U
Pit 42	X119	15	0.31 J	1.2 =	1.5 =	1.1 =	0.56 U	0.56 U	19 =	0.47 J	0.56 U	0.73 =	10 =	0.56 U	0.099 J	0.4 J	0.41 J	0.56 U
Pit 42	X119DL	15	11 U	11 U	1.5 J	1.1 J	11 U	11 U	18 =	0.68 J	11 U	0.88 J	14 =	11 U	11 U	11 U	11 U	11 U
Pit 43	X115	3	2.7 =	3.4 =	0.18 J	0.45 J	2.7 U	2.7 U	2.7 =	0.33 J	2.5 J	4.7 =	0.27 J	2.7 U	0.64 J	2.8 =	0.32 J	0.3 J
Pit 43	X116	9	10 =	7.9 =	1.6 U	1.7 =	1.6 U	1.6 U	1.4 J	3.1 =	1.1 J	9.1 =	0.12 J	1.6 U	3.7 =	1.1 J	0.2 J	1.6 U
Pit 43	X116DL	9	9.5 =	9.1 =	5.4 U	1.5 J	5.4 U	5.4 U	1.2 J	2.9 J	0.95 J	8.6 =	5.4 U	5.4 U	3 J	1.1 J	5.4 U	5.4 U

Table E-8. SVOCs in U.S. Drum (mg/kg)

Station ID	Sample ID	Depth (ft)	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Benzyl Butyl Phthalate	Biphenyl (Diphenyl)	Bis(2-Chloroethoxy) Methane	Bis(2-Chloroethyl) Ether	Bis(2-Ethylhexyl) Phthalate	Caprolactam	Carbazole	Chrysene	Di-N-Butyl Phthalate	Di-N-Octylphthalate	Dibenz(a,h)Anthracene	Dibenzofuran	Diethyl Phthalate	Dimethyl Phthalate
Industrial/ Commercial		*Ing*	*61000*	*78*	*410000*			*5*	*410*		*290*	*780*	*200000*	*41000*	*0.8*		*1000000*	
		Inh			*930*			*0.47*	*31000*				*2300*	*10000*			*2000*	
Construction Worker		*Ing*	*61000*	*1700*	*410000*			*75*	*4100*		*6200*	*17000*	*200000*	*4100*	*17*		*1000000*	
		Inh			*930*			*0.66*	*31000*			*800*	*2300*	*10000*			*2000*	
Soil Component of GW		*I*	*16000*	*49*	*930*			*0.0004*	*3600*		*0.6*	*160*	*2300*	*10000*	*2*		*470*	
		II	*81000*	*250*	*930*			*0.0004*	*31000*		*2.8*	*800*	*2300*	*10000*	*7.6*		*470*	
Pit 44	X113	3	5 =	4.4 =	0.17 J	0.22 J	2.1 U	2.1 U	0.9 J	2.1 U	0.53 J	6.6 =	0.63 J	2.1 U	1.7 J	0.64 J	2.1 U	2.1 U
Pit 44	X114	9	3 J	2.5 J	13 U	13 U	13 U	13 U	77 =	1.6 J	13 U	4.1 J	13 U	13 U	1.1 J	13 U	13 U	13 U
Pit 45	X111	3.5	4.4 J	5.2 J	14 U	14 U	14 U	14 U	10 J	0.89 J	1.9 J	7.2 J	14 U	14 U	1.3 J	1.2 J	1.1 J	14 U
Pit 45	X112	10	0.36 J	0.5 J	3.8 J	1.6 J	2.4 U	2.4 U	45 =	2.4 U	0.33 J	0.89 J	1.3 J	2.4 UJ	0.15 J	0.36 J	0.16 J	2.4 U
Pit 46	X109	4	0.037 J	0.033 J	0.53 UJ	0.53 U	0.53 U	0.53 U	0.31 J	0.53 U	0.53 U	0.054 J	0.53 U	0.53 UJ	0.53 UJ	0.53 U	0.53 U	0.53 U
Pit 46	X110	9	0.32 J	0.33 J	2.2 J	0.58 J	2.4 U	2.4 U	15 =	2.4 U	0.22 J	0.77 J	4.3 =	2.4 UJ	2.4 UJ	0.58 J	2.4 U	2.4 U
Pit 47	X107	3.5	0.073 J	0.058 J	0.45 UJ	0.45 U	0.45 U	0.45 U	0.092 J	0.45 U	0.45 U	0.091 J	0.45 U	0.45 UJ	0.03 J	0.45 U	0.45 U	0.45 U
Pit 47	X108	9	49 U	49 U	18 J	2.8 J	49 U	49 U	310 =	49 U	49 U	5.8 J	26 J	49 U	49 U	49 U	2.6 J	49 U
Pit 48	X105	3	0.13 J	0.11 J	0.38 UJ	0.38 U	0.38 U	0.38 U	0.37 J	0.38 U	0.033 J	0.29 J	0.039 J	0.38 UJ	0.029 J	0.032 J	0.021 J	0.02 J
Pit 48	X106	9	14 U	0.81 J	14 U	14 U	14 U	14 U	84 J	14 U	14 U	1.6 J	14 U	14 U	14 U	14 U	14 U	14 U
Pit 49	X103	3	0.66 J	0.51 =	0.38 UJ	0.19 J	0.38 U	0.38 U	2.1 =	0.38 U	0.16 J	0.71 =	0.38 U	0.38 UJ	0.2 J	0.38 U	0.38 U	0.38 U
Pit 49	X104	10	0.058 J	0.03 J	0.037 J	0.42 UJ	0.42 UJ	0.42 UJ	0.42 UJ	0.074 J	0.42 UJ	0.088 J	0.1 J	0.42 UJ	0.42 UJ	0.42 UJ	0.42 UJ	0.42 UJ
Pit 50	X101	3	0.037 J	0.38 U	0.38 UJ	0.38 U	0.38 U	0.38 U	0.062 J	0.38 U	0.38 U	0.033 J	0.045 J	0.38 UJ	0.38 UJ	0.021 J	0.38 U	0.38 U
Pit 50	X102	9	19 U	19 U	19 U	3.4 J	19 U	19 U	19 J	3.7 J	19 U	19 U	19 U	19 U	19 U	19 U	19 U	19 U
Pit 51	X203	3	0.84 =	0.98 =	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	0.093 J	1.5 =	0.8 U	0.8 U	0.24 J	0.055 J	0.8 U	0.8 U
Pit 51	X204	8	3.8 J	6 =	4.4 U	4.4 U	4.4 U	4.4 U	0.29 J	4.4 U	2.1 J	7.5 =	4.4 U	4.4 U	1.2 J	0.86 J	4.4 U	4.4 U

Notes:

=:	sample concentration is detected at level reported
U:	sample concentration is under detection limit
J:	sample concentration is estimated value
R:	sample concentration value is rejected
DL:	sample is diluted
RE:	sample is re-extracted
Ing.:	Ingestion
Inh.:	Inhalation
I:	Class I
II:	Class II

Table E-8. SVOCs in U.S. Drum (mg/kg)

Station ID	Sample ID	Depth (ft)	Fluoranthene	Fluorene	Hexachlorobenzene	Hexachlorobutadiene	Hexachlorocyclopentadiene	Hexachloroethane	Indeno(1,2,3-CD)pyrene	Isophorone	N-Nitrosodi-N-Propylamine	N-Nitrosodiphenylamine	Naphthalene	Nitrobenzene	Pentachlorophenol	Phenanthrene	Phenol	Pyrene
Industrial/ Commercial		*Ing*	*82000*	*82000*	*4*		*14000*	*2000*	*8*	*410000*	*0.8*	*1200*	*82000*	*1000*	*24*	*61000*	*1000000*	*61000*
		Inh			*1.8*		*16*			*4600*				*140*				
Construction Worker		*Ing*	*82000*	*82000*	*78*		*14000*	*2000*	*170*	*410000*	*18*	*25000*	*8200*	*1000*	*520*	*61000*	*120000*	*61000*
		Inh			*2.6*		*1.1*			*4600*				*9.4*				
Soil Component of GW		*I*	*4300*	*560*	*2*		*400*	*0.5*	*14*	*8*	*0.00005*	*1*	*84*	*0.1*	*0.03*	*140*	*100*	*4200*
		II	*21000*	*2800*	*11*		*2200*	*2.6*	*69*	*8*	*0.00005*	*5.6*	*420*	*0.1*	*0.14*	*700*	*100*	*21000*
Pit 01	X207	4	21 =	5.3 J	7.6 U	7.6 U	7.6 UJ	7.6 U	4.6 J	7.6 U	7.6 U	7.6 U	4.6 J	7.6 U	19 U	34 =	7.6 U	18 =
Pit 01	X208	9	9 J	85 U	85 U	85 U	85 UJ	85 U	85 U	85 U	85 U	36 J	90 =	85 U	210 U	24 J	85 U	8.3 J
Pit 01	X209	13	1.8 J	14 U	14 UJ	14 U	14 UJ	14 U	14 U	14 U	14 U	14 UJ	3.4 J	14 U	36 UJ	2.1 J	14 U	1.7 J
Pit 02	X205	3	0.58 =	0.099 J	0.44 U	0.44 U	0.44 UJ	0.44 U	0.16 J	0.44 U	0.44 U	0.024 J	0.05 J	0.44 U	1.1 UJ	0.52 =	0.44 U	0.42 J
Pit 02	X206	9	8.3 =	0.45 J	1.2 U	1.2 U	1.2 UJ	1.2 U	1.4 =	1.2 U	1.2 U	1.2 U	0.34 J	1.2 U	3.1 U	4 =	1.2 U	4.8 =
Pit 03	X201	3	9.6 =	0.63 J	1.6 U	1.6 U	1.6 UJ	1.6 U	1.7 =	1.6 U	1.6 U	1.6 U	0.24 J	1.6 U	3.9 U	7.6 =	1.6 U	8.3 =
Pit 03	X202	8	5.2 =	0.48 J	1.2 U	1.2 U	1.2 UJ	1.2 U	0.69 J	1.2 U	1.2 U	1.2 U	0.11 J	1.2 U	2.9 U	3.9 =	1.2 U	3.9 =
Pit 04	X177	4	4.4 =	1.7 J	2.1 U	2.1 U	2.1 UJ	2.1 U	0.52 J	2.1 U	2.1 U	2.1 U	1.1 J	2.1 U	5.3 UJ	2.1 =	2.1 U	1.7 J
Pit 04	X178	8	14 =	0.81 =	0.069 J	0.79 U	0.79 UJ	0.79 U	1.5 =	0.79 U	0.79 U	0.79 U	0.14 J	0.79 U	2 UJ	1.5 =	0.79 U	6.1 =
Pit 04	X178DL	8	7.6 J	16 U	16 U	16 U	16 UJ	16 U	1.4 J	16 U	16 U	16 U	16 U	16 U	40 U	1.1 J	16 U	6.9 J
Pit 05	X198	2.5	4.6 =	0.4 J	2 U	2 U	2 UJ	2 U	1.2 J	2 U	2 UJ	2 U	0.99 J	2 U	5.1 UJ	2.4 =	2 UJ	3.3 J
Pit 05	X199	8	17 =	3.1 J	4.1 U	4.1 U	4.1 UJ	4.1 U	2.9 J	4.1 U	4.1 U	4.1 U	1.6 J	4.1 U	10 U	20 =	0.35 J	14 =
Pit 05	X200	8	20 =	2.3 =	1.9 U	1.9 U	1.9 UJ	1.9 U	4.9 =	1.9 U	1.9 U	0.13 J	1.3 J	1.9 U	4.8 UJ	13 =	0.37 J	17 =
Pit 05	X200DL	8	18 =	2.2 J	7.7 U	7.7 U	7.7 U	7.7 U	4.7 J	7.7 U	7.7 U	7.7 U	1.3 J	7.7 U	19 U	12 =	7.7 U	15 =
Pit 06	X196	3	1.3 =	0.4 U	0.4 U	0.4 UJ	0.4 UJ	0.4 U	0.19 J	0.4 U	0.4 U	0.4 U	0.48 =	0.4 U	1 U	1.7 =	0.4 U	1.4 =
Pit 06	X197	8	7.1 =	1.3 J	2 U	2 U	2 UJ	2 U	0.48 J	2 U	2 U	0.33 J	2.2 =	2 U	5.1 U	8.2 =	0.24 J	7 =
Pit 06	X197DL	8	4.2 J	1.3 J	8.1 U	8.1 UJ	8.1 UJ	8.1 U	0.87 J	8.1 U	8.1 U	0.97 J	2.2 J	8.1 U	20 U	6.6 J	8.1 U	7.8 J
Pit 07	X175	3	3.9 =	0.44 J	1.6 U	1.6 U	1.6 UJ	1.6 U	0.81 J	1.6 U	1.6 U	1.6 U	0.098 J	1.6 U	4 UJ	3.7 =	1.6 U	2.6 =
Pit 07	X176	8	3.3 =	0.32 J	1.3 U	1.3 U	1.3 UJ	1.3 U	0.56 J	1.3 U	1.3 U	1.3 U	0.084 J	1.3 U	3.3 UJ	1.3 =	1.3 U	2.3 =
Pit 08	X173	2.5	3.6 =	0.25 J	0.39 U	0.39 U	0.39 UJ	0.39 U	0.73 =	0.39 U	0.39 U	0.39 U	0.17 J	0.39 U	0.98 UJ	2.3 =	0.39 U	2 =
Pit 08	X173DL	2.5	2.6 =	0.19 J	1.2 U	1.2 U	1.2 UJ	1.2 U	0.8 J	1.2 U	1.2 U	1.2 U	0.15 J	1.2 U	2.9 UJ	2.1 =	1.2 U	1.8 =
Pit 08	X174	8	5 =	0.33 J	2.1 U	2.1 U	2.1 UJ	2.1 U	1 J	2.1 U	2.1 U	2.1 U	0.14 J	2.1 U	5.2 UJ	3.2 =	2.1 U	3.4 =
Pit 09	X168	3	0.19 J	0.072 J	0.38 U	0.38 U	0.38 UJ	0.38 U	0.041 J	0.38 U	0.38 U	0.38 U	1.5 =	0.38 U	0.97 UJ	0.37 J	0.38 U	0.15 J
Pit 09	X169	6.5	0.046 J	0.023 J	0.42 U	0.42 U	0.42 U	0.42 U	0.42 U	0.42 U	0.42 U	0.42 U	0.077 J	0.42 U	1.1 U	0.12 J	0.42 U	0.05 J
Pit 09	X170	6.5	0.33 J	0.23 J	0.41 U	0.41 U	0.41 U	0.41 U	0.034 J	0.41 U	0.41 U	0.41 U	0.39 J	0.41 U	1 U	1.1 =	0.41 U	0.24 J
Pit 10	X171	3	0.64 J	0.15 J	1 U	1 U	1 UJ	1 U	0.091 J	1 U	1 U	1 U	0.22 J	1 U	2.5 UJ	0.2 J	1 U	1.1 =
Pit 10	X171DL	3	0.45 J	5 U	5 U	5 U	5 UJ	5 U	5 U	5 U	5 U	5 U	5 U	5 U	13 U	5 U	5 U	0.65 J
Pit 10	X172	8	8.2 J	1.9 J	19 U	19 U	19 UJ	19 U	1.3 J	19 U	19 U	1.5 J	5.4 J	19 U	49 UJ	5.6 J	19 U	3.3 J

Table E-8. SVOCs in U.S. Drum (mg/kg)

Station ID	Sample ID	Depth (ft)	Fluoranthene	Fluorene	Hexachlorobenzene	Hexachlorobutadiene	Hexachlorocyclopentadiene	Hexachloroethane	Indeno(1,2,3-CD)pyrene	Isophorone	N-Nitrosodi-N-Propylamine	N-Nitrosodiphenylamine	Naphthalene	Nitrobenzene	Pentachlorophenol	Phenanthrene	Phenol	Pyrene
Industrial/ Commercial		*Ing*	*82000*	*82000*	*4*		*14000*	*2000*	*8*	*410000*	*0.8*	*1200*	*82000*	*1000*	*24*	*61000*	*1000000*	*61000*
		Inh			*1.8*		*16*			*4600*				*140*				
Construction Worker		*Ing*	*82000*	*82000*	*78*		*14000*	*2000*	*170*	*410000*	*18*	*25000*	*8200*	*1000*	*520*	*61000*	*120000*	*61000*
		Inh			*2.6*		*1.1*			*4600*				*9.4*				
Soil Component of GW		*I*	*4300*	*560*	*2*		*400*	*0.5*	*14*	*8*	*0.00005*	*1*	*84*	*0.1*	*0.03*	*140*	*100*	*4200*
		II	*21000*	*2800*	*11*		*2200*	*2.6*	*69*	*8*	*0.00005*	*5.6*	*420*	*0.1*	*0.14*	*700*	*100*	*21000*
Pit 11	X190	2	28 =	1.8 J	2.4 U	2.4 U	2.4 UJ	2.4 U	2.6 =	2.4 U	2.4 U	2.4 U	0.72 J	2.4 U	6.1 U	18 =	0.41 J	17 =
Pit 11	X190DL	2	15 =	1.6 J	4.9 U	4.9 UJ	4.9 UJ	4.9 U	2.2 J	4.9 U	4.9 U	4.9 U	0.68 J	4.9 U	12 U	15 =	0.4 J	16 =
Pit 11	X191	8	0.23 J	0.067 J	0.88 U	0.88 U	0.88 UJ	0.88 U	0.88 U	0.88 U	0.88 U	0.072 J	0.19 J	0.88 U	2.2 U	0.28 J	0.27 J	0.21 J
Pit 12	X192	3	0.33 J	0.38 UJ	0.38 UJ	0.38 UJ	0.38 UJ	0.38 UJ	0.073 J	0.38 UJ	0.38 UJ	0.38 UJ	0.38 UJ	0.38 UJ	0.94 UJ	0.25 J	0.38 UJ	0.28 J
Pit 12	X193	8	1 =	0.14 J	0.8 U	0.8 U	0.8 U	0.8 U	0.24 J	0.8 U	0.8 U	0.41 J	0.8 =	0.8 U	2 U	0.86 =	0.8 U	1 =
Pit 13	X194	3.5	2.5 =	0.31 J	1.9 U	1.9 U	1.9 UJ	1.9 U	0.51 J	1.9 U	1.9 U	0.24 J	0.67 J	1.9 U	4.9 U	2.6 =	0.61 J	2.1 =
Pit 13	X195	12	340 =	2.6 J	5.4 U	5.4 U	5.4 UJ	5.4 U	21 =	5.4 U	5.4 U	5.4 U	5.4 U	5.4 U	14 U	4.7 J	5.4 U	160 =
Pit 13	X195DL	12	150 =	2 J	27 U	27 UJ	27 UJ	27 U	16 J	27 U	27 U	27 U	27 U	27 U	68 U	3.9 J	27 U	150 =
Pit 14	X184	4	1.7 =	0.76 U	0.76 U	0.33 J	0.76 UJ	0.76 U	0.056 J	0.76 U	0.76 U	0.76 U	0.087 J	0.22 J	1.9 U	0.24 J	0.76 U	0.17 J
Pit 14	X185	9	4.2 =	0.23 J	0.48 U	0.028 J	0.48 UJ	0.48 U	0.34 J	0.48 U	0.48 U	0.48 U	1.1 =	0.48 U	1.2 U	3.2 =	0.13 J	1.9 =
Pit 14	X185DL	9	2.9 =	0.29 J	0.96 U	0.96 U	0.96 UJ	0.96 U	0.43 J	0.96 U	0.96 U	0.96 U	1.2 =	0.96 U	2.4 U	2.2 =	0.96 U	1.8 =
Pit 15	X186	4	2.2 =	0.2 J	2 U	5.9 =	2 UJ	2 U	2 U	1.4 J	2 U	2 U	12 =	2 U	5.1 U	0.54 J	0.81 J	0.28 J
Pit 15	X187	8	0.97 =	0.16 J	0.81 U	0.76 J	0.81 UJ	0.81 U	0.2 J	0.56 J	0.81 U	0.81 U	1.6 =	0.81 U	2 U	0.76 J	2.1 =	0.77 J
Pit 16	X188	3	34 =	1.5 J	3.8 U	3.8 U	3.8 UJ	3.8 U	4.6 =	3.8 U	3.8 U	3.8 U	3.8 U	3.8 U	9.4 U	31 =	3.8 U	32 =
Pit 16	X188DL	3	29 =	1.8 J	7.5 U	7.5 U	7.5 UJ	7.5 U	4.7 J	7.5 U	7.5 U	0.39 J	7.5 U	7.5 U	19 U	26 =	7.5 U	20 =
Pit 16	X189	7	0.55 J	0.12 J	1.2 U	1.2 U	1.2 UJ	1.2 U	0.14 J	1.2 U	1.2 U	1.2 U	0.41 J	1.2 U	2.9 U	0.56 J	1.2 U	0.33 J
Pit 17	X181	3.5	6.3 J	2.2 UJ	2.2 UJ	2.2 UJ	2.2 UJ	2.2 UJ	2.2 UJ	2.2 UJ	2.2 UJ	2.2 UJ	0.29 J	2.5 J	5.5 UJ	0.37 J	2.2 UJ	2.2 UJ
Pit 17	X182	7	1.3 J	4.1 J	9.4 U	9.4 U	9.4 UJ	9.4 U	9.4 U	9.4 U	9.4 U	9.4 U	4.8 J	9.4 U	24 U	18 =	9.4 U	4.7 J
Pit 17	X183	13	1.6 =	0.12 J	0.41 U	0.41 UJ	0.41 UJ	0.41 U	0.32 J	0.41 U	0.41 U	0.41 U	0.19 J	0.41 U	1 U	1.3 =	0.41 U	1.6 =
Pit 18	X179	3.5	3.8 U	3.8 U	3.8 U	0.53 J	3.8 UJ	3.8 U	3.8 U	3.8 U	3.8 UJ	3.8 U	3.8 U	3.8 U	9.4 R	3.8 U	1.2 J	0.24 J
Pit 18	X179DL	3.5	7.5 U	7.5 U	7.5 U	0.54 J	7.5 UJ	7.5 U	7.5 U	7.5 U	7.5 U	7.5 U	7.5 U	7.5 U	19 U	7.5 U	1.4 J	7.5 U
Pit 18	X180	7	130 =	28 =	5.1 U	5.1 U	5.1 UJ	5.1 U	22 =	5.1 U	5.1 U	5.1 U	19 =	5.1 U	13 U	170 =	0.89 J	92 =
Pit 18	X180DL	7	95 =	23 J	30 U	30 U	30 UJ	30 U	16 J	30 U	30 U	30 U	17 J	30 U	77 U	150 =	30 U	90 =
Pit 19	X166	3	1.8 J	12 UJ	12 UJ	3.6 J	12 R	12 UJ	12 UJ	11 J	12 UJ	12 UJ	43 J	12 UJ	30 UJ	1.2 J	3.8 J	12 UJ
Pit 19	X167	9	1.2 J	0.18 J	1.6 U	0.25 J	1.6 UJ	1.6 U	0.25 J	0.24 J	1.6 U	1.6 U	3.9 =	1.6 U	4 U	0.76 J	1.6 U	0.63 J
Pit 20	X164	3	5.8 =	1.4 J	2.4 U	2.4 U	2.4 UJ	2.4 U	0.71 J	2.4 U	2.4 U	0.37 J	0.77 J	2.4 U	6.1 UJ	7.4 =	2.4 U	3.2 =
Pit 20	X165	9	8.5 J	1.7 J	14 UJ	14 UJ	14 R	14 UJ	1.8 J	14 UJ	14 UJ	14 UJ	0.88 J	14 UJ	34 UJ	8.9 J	14 UJ	7.5 J
Pit 21	X162	2	22 =	3.9 =	3.4 U	3.4 U	3.4 UJ	3.4 U	2.1 J	3.4 U	3.4 U	3.4 U	1.6 J	3.4 U	8.6 UJ	18 =	3.4 U	11 =

Table E-8. SVOCs in U.S. Drum (mg/kg)

Station ID	Sample ID	Depth (ft)	Fluoranthene	Fluorene	Hexachlorobenzene	Hexachlorobutadiene	Hexachlorocyclopentadiene	Hexachloroethane	Indeno(1,2,3-CD)pyrene	Isophorone	N-Nitrosodi-N-Propylamine	N-Nitrosodiphenylamine	Naphthalene	Nitrobenzene	Pentachlorophenol	Phenanthrene	Phenol	Pyrene
Industrial/ Commercial		*Ing*	*82000*	*82000*	*4*		*14000*	*2000*	*8*	*410000*	*0.8*	*1200*	*82000*	*1000*	*24*	*61000*	*1000000*	*61000*
		Inh			*1.8*		*16*			*4600*				*140*				
Construction Worker		*Ing*	*82000*	*82000*	*78*		*14000*	*2000*	*170*	*410000*	*18*	*25000*	*8200*	*1000*	*520*	*61000*	*120000*	*61000*
		Inh			*2.6*		*1.1*			*4600*				*9.4*				
Soil Component of GW		*I*	*4300*	*560*	*2*		*400*	*0.5*	*14*	*8*	*0.00005*	*1*	*84*	*0.1*	*0.03*	*140*	*100*	*4200*
		II	*21000*	*2800*	*11*		*2200*	*2.6*	*69*	*8*	*0.00005*	*5.6*	*420*	*0.1*	*0.14*	*700*	*100*	*21000*
Pit 21	X163	9	2.5 J	48 UJ	48 UJ	48 UJ	48 R	48 UJ	48 UJ	48 UJ	48 UJ	48 UJ	48 UJ	48 UJ	120 UJ	48 UJ	48 UJ	2.5 J
Pit 22	X160	3.5	2 =	0.31 J	0.64 U	0.64 U	0.64 UJ	0.64 U	0.38 J	0.42 J	0.64 U	0.64 U	0.8 =	0.64 U	1.6 U	1.6 =	0.17 J	1.1 =
Pit 22	X161	8	8.5 =	2.3 =	2.3 U	2.3 U	2.3 UJ	2.3 U	1.2 J	2.3 U	2.3 U	2.3 U	2.3 =	2.3 U	5.8 UJ	12 =	2.3 U	6.1 =
Pit 23	X157	2.5	0.39 U	0.39 U	0.39 U	0.39 U	0.39 UJ	0.39 U	0.39 U	0.39 U	0.39 U	0.39 U	0.39 U	0.39 U	0.99 U	0.053 J	0.39 U	0.03 J
Pit 23	X158	9	1.9 J	19 U	19 U	19 U	19 UJ	19 U	19 U	19 U	19 U	19 U	31 =	19 U	48 U	3.4 J	19 U	1.7 J
Pit 23	X159	13	27 J	5.7 J	20 UJ	20 UJ	20 R	20 UJ	4.1 J	20 UJ	20 UJ	20 UJ	15 J	20 UJ	50 UJ	34 J	20 UJ	19 J
Pit 24	X155	2.5	5 J	26 U	26 U	26 U	26 UJ	26 U	26 U	26 U	26 U	3.5 J	59 =	26 U	66 U	5.3 J	26 U	4.6 J
Pit 24	X156	8.5	5.9 =	0.52 J	2.4 U	2.4 UJ	2.4 UJ	2.4 U	0.91 J	2.4 U	2.4 U	2.4 U	0.99 J	2.4 U	6.1 U	4.1 =	2.4 U	3.9 =
Pit 25	X153	3	17 U	2.5 J	17 U	17 U	17 UJ	17 U	17 U	17 U	17 U	17 U	17 U	17 U	42 U	17 U	17 U	17 U
Pit 25	X154	9.5	1.1 J	0.3 J	1.3 U	1.3 U	1.3 UJ	1.3 U	0.15 J	1.3 U	1.3 U	0.25 J	2.3 =	1.3 U	3.3 U	1.5 =	1.3 U	1.3 =
Pit 25	X154DL	9.5	1.1 J	0.25 J	2.6 U	2.6 UJ	2.6 UJ	2.6 U	0.14 J	0.28 J	2.6 U	0.63 J	1.9 J	2.6 U	6.6 U	1.3 J	2.6 U	1 J
Pit 26	X151	3	1.4 J	12 U	12 U	12 U	12 UJ	12 U	12 U	12 U	12 U	12 U	3.6 J	12 U	30 U	1.7 J	12 U	1 J
Pit 26	X152	9	5.6 J	5.8 J	15 U	15 U	15 UJ	15 U	15 U	15 U	15 U	15 U	47 =	15 U	37 U	18 =	15 U	5.7 J
Pit 27	X149	3.5	1.9 =	0.77 =	0.57 U	0.57 U	0.57 UJ	0.57 U	0.57 U	0.076 J	0.57 U	0.15 J	1.8 =	0.57 U	1.4 U	1.1 =	0.03 J	1.5 =
Pit 27	X150	10	19 U	19 U	19 U	19 U	19 UJ	19 U	19 U	19 U	19 U	19 U	2.9 J	19 U	48 U	19 U	19 U	19 U
Pit 28	X147	3	8.7 =	2.4 =	0.45 U	0.45 U	0.45 UJ	0.45 U	1.1 =	0.45 U	0.45 U	0.45 U	0.79 =	0.45 U	1.1 U	5.6 =	0.45 U	6.1 =
Pit 28	X147DL	3	8.1 =	1.9 =	1.8 U	1.8 U	1.8 U	1.8 U	1.4 J	1.8 U	1.8 U	1.8 U	0.66 J	1.8 U	4.5 U	4.8 =	1.8 U	5.9 =
Pit 28	X148	8	23 U	23 U	23 U	23 U	23 UJ	23 U	23 U	23 U	23 U	23 U	49 =	23 U	57 UJ	1.2 J	23 U	23 U
Pit 29	X145	4.5	3.3 =	0.078 J	0.8 U	0.8 UJ	0.8 UJ	0.8 U	0.72 J	0.8 U	0.8 U	0.8 U	0.056 J	0.8 U	2 U	1.6 =	0.8 U	2.8 =
Pit 29	X146	8	5.2 J	3.2 J	11 U	11 U	11 UJ	11 U	0.77 J	11 U	11 U	11 U	50 =	11 U	29 UJ	7.6 J	11 U	4.5 J
Pit 30	X143	4	31 U	31 U	31 U	31 U	31 UJ	31 U	31 U	31 U	31 U	31 U	31 U	31 U	78 U	31 U	31 U	31 U
Pit 30	X144	6	1 J	17 U	17 U	17 U	17 UJ	17 U	17 U	17 U	17 U	17 U	17 U	17 U	44 UJ	17 U	17 U	1.3 J
Pit 31	X141	4	0.83 =	0.26 J	0.52 U	0.52 U	0.52 UJ	0.52 U	0.2 J	0.52 U	0.52 U	0.52 =	1.7 =	0.52 U	1.3 U	1.1 =	0.7 =	1 =
Pit 31	X141DL	4	0.91 J	10 U	10 U	10 UJ	10 UJ	10 U	10 U	10 U	10 U	10 U	1.4 J	10 U	26 U	1 J	10 U	0.93 J
Pit 31	X142	9	1.1 =	0.33 J	0.4 U	0.4 U	0.4 UJ	0.4 U	0.28 J	0.4 U	0.4 U	0.4 U	0.29 J	0.4 U	1 U	1.2 =	0.4 U	2.4 =
Pit 32	X139	3	6.2 J	2.5 J	14 U	14 U	14 UJ	14 U	1.4 J	14 U	14 U	14 U	14 =	14 U	36 UJ	10 J	14 U	6.1 J
Pit 32	X140	9	31 U	31 U	31 U	31 U	31 UJ	31 U	31 U	31 U	31 U	31 U	2.2 J	31 U	78 UJ	31 U	31 U	31 U
Pit 33	X137	3	2.6 =	0.38 J	1.2 U	1.2 U	1.2 R	1.2 U	0.66 J	0.23 J	1.2 U	1.2 U	0.6 J	1.2 U	0.31 J	3.3 =	0.43 J	3.7 =

Table E-8. SVOCs in U.S. Drum (mg/kg)

Station ID	Sample ID	Depth (ft)	Fluoranthene	Fluorene	Hexachlorobenzene	Hexachlorobutadiene	Hexachlorocyclopentadiene	Hexachloroethane	Indeno(1,2,3-CD)pyrene	Isophorone	N-Nitrosodi-N-Propylamine	N-Nitrosodiphenylamine	Naphthalene	Nitrobenzene	Pentachlorophenol	Phenanthrene	Phenol	Pyrene
Industrial/ Commercial		*Ing*	*82000*	*82000*	*4*		*14000*	*2000*	*8*	*410000*	*0.8*	*1200*	*82000*	*1000*	*24*	*61000*	*1000000*	*61000*
		Inh			*1.8*		*16*			*4600*				*140*				
Construction Worker		*Ing*	*82000*	*82000*	*78*		*14000*	*2000*	*170*	*410000*	*18*	*25000*	*8200*	*1000*	*520*	*61000*	*120000*	*61000*
		Inh			*2.6*		*1.1*			*4600*				*9.4*				
Soil Component of GW		*I*	*4300*	*560*	*2*		*400*	*0.5*	*14*	*8*	*0.00005*	*1*	*84*	*0.1*	*0.03*	*140*	*100*	*4200*
		II	*21000*	*2800*	*11*		*2200*	*2.6*	*69*	*8*	*0.00005*	*5.6*	*420*	*0.1*	*0.14*	*700*	*100*	*21000*
Pit 33	X137DL	3	4 =	0.5 J	3.7 U	3.7 U	3.7 R	3.7 U	0.97 J	0.32 J	3.7 U	0.25 J	0.8 J	3.7 U	9.3 U	4.1 =	3.7 U	4.5 =
Pit 33	X138	9	40 =	9.1 J	13 U	13 U	13 UJ	13 U	9.4 J	13 U	13 U	13 U	13 =	13 U	32 UJ	30 =	13 U	32 =
Pit 34	X135	3	0.28 J	1.1 =	0.56 U	0.56 U	0.56 R	0.56 U	0.046 J	0.56 U	0.56 U	0.56 U	1.3 =	0.56 U	1.4 U	0.98 =	0.052 J	0.26 J
Pit 34	X136	10	17 U	17 U	17 U	17 U	17 UJ	17 U	17 U	17 U	17 U	17 U	0.83 J	17 U	41 UJ	1.2 J	17 U	1.2 J
Pit 35	X133	4	0.11 J	0.4 U	0.4 U	0.4 U	0.4 UJ	0.4 U	0.042 J	0.4 U	0.4 U	0.4 U	0.029 J	0.4 U	1 UJ	0.068 J	0.4 U	0.14 J
Pit 35	X134	10	0.35 J	0.13 J	0.53 U	0.53 U	0.53 R	0.53 U	0.19 J	0.53 U	0.53 U	0.14 J	0.15 J	0.53 U	1.3 U	0.23 J	0.53 U	0.4 J
Pit 36	X131	4	3.2 J	2.1 J	41 R	41 R	41 R	41 R	41 R	41 R	41 R	41 R	2.4 J	41 R	100 R	6 J	41 R	2.7 J
Pit 36	X132	11	0.91 J	13 U	13 U	13 U	13 UJ	13 U	13 U	1 J	13 U	13 U	0.75 J	13 U	34 UJ	0.84 J	13 U	0.97 J
Pit 37	X128	3	6.3 J	3.2 J	28 U	28 U	28 UJ	28 U	28 U	28 U	28 U	28 U	1.5 J	28 U	71 UJ	9.1 J	28 U	5.1 J
Pit 37	X129	3	8.3 =	3.1 =	1.5 U	1.5 U	1.5 R	1.5 U	1.7 =	1.5 U	1.5 U	0.17 J	0.48 J	1.5 U	3.7 U	11 =	1.5 U	7.6 =
Pit 37	X130	8	2.9 J	17 U	17 U	17 U	17 UJ	17 U	17 U	17 U	17 U	4.8 J	110 =	17 U	41 UJ	3.7 J	17 U	2.5 J
Pit 38	X126	3	1.6 =	0.5 J	0.57 U	0.57 U	0.57 R	0.57 U	0.2 J	0.57 U	0.57 U	0.57 =	1 =	0.57 U	1.4 U	2.6 =	0.57 U	2.2 =
Pit 38	X126DL	3	3.1 =	0.79 J	2.8 U	2.8 U	2.8 R	2.8 U	0.26 J	2.8 U	2.8 U	0.81 J	1.4 J	2.8 U	7.2 U	3.6 =	2.8 U	2.7 J
Pit 38	X127	10	1.3 J	23 U	23 U	23 U	23 UJ	23 U	23 U	23 U	23 U	23 U	1.3 J	23 U	57 UJ	1.6 J	23 U	1.7 J
Pit 39	X124	3	0.27 J	0.39 U	0.39 U	0.39 U	0.39 UJ	0.39 U	0.32 J	0.39 U	0.39 U	0.39 U	0.042 J	0.39 U	0.98 UJ	0.24 J	0.39 U	0.32 J
Pit 39	X125	10	23 U	23 U	23 U	23 U	23 UJ	23 U	23 U	23 U	23 U	2.2 J	6.8 J	23 U	58 UJ	23 U	23 U	23 U
Pit 40	X122	4	0.52 J	0.066 J	0.63 U	0.63 U	0.63 R	0.63 U	0.21 J	0.63 U	0.63 U	0.039 J	0.28 J	0.63 U	1.6 U	0.46 J	0.089 J	0.55 J
Pit 40	X123	9	25 U	25 U	25 U	25 U	25 UJ	25 U	25 U	25 U	25 U	25 U	1.7 J	25 U	64 UJ	25 U	25 U	25 U
Pit 41	X120	3	0.021 J	0.41 U	0.41 U	0.41 U	0.41 UJ	0.41 U	0.41 U	0.41 U	0.41 U	0.41 U	0.039 J	0.41 U	1 UJ	0.14 J	0.41 U	0.095 J
Pit 41	X121	8	5.4 J	21 U	21 U	21 U	21 UJ	21 U	21 U	21 U	21 U	21 U	3.4 J	21 U	53 UJ	3.3 J	21 U	4.7 J
Pit 42	X117	2	0.2 J	0.022 J	0.42 U	0.42 U	0.42 UJ	0.42 U	0.072 J	0.42 U	0.42 U	0.42 U	0.033 J	0.42 U	1.1 UJ	0.16 J	0.42 U	0.18 J
Pit 42	X118	9	5.1 =	1.1 J	4.6 U	4.6 U	4.6 UJ	4.6 U	0.62 J	4.6 U	4.6 U	0.85 J	4.2 J	4.6 U	11 U	5.2 =	4.6 U	3.8 J
Pit 42	X118DL	9	4.6 J	1.1 J	9.1 U	9.1 U	9.1 UJ	9.1 U	0.68 J	9.1 U	9.1 U	0.67 J	3.8 J	9.1 U	23 UJ	4.8 J	9.1 U	3.6 J
Pit 42	X119	15	1.7 =	0.77 =	0.56 U	0.56 U	0.56 UJ	0.56 U	0.2 J	0.56 U	0.56 U	0.17 J	1.1 =	0.56 U	1.4 UJ	3.6 =	7.6 =	1.9 =
Pit 42	X119DL	15	2.6 J	0.79 J	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U	1.5 J	11 U	28 U	2.8 J	5.9 J	1.7 J
Pit 43	X115	3	13 =	3.8 =	2.7 U	2.7 U	2.7 UJ	2.7 U	2.1 J	2.7 U	2.7 U	2.7 U	14 =	2.7 U	6.8 UJ	16 =	2.7 U	10 =
Pit 43	X116	9	9.7 =	1.5 J	1.6 U	1.6 U	1.6 UJ	1.6 U	9.6 =	1.6 U	1.6 U	0.26 J	5.9 =	1.6 U	4.1 UJ	7 =	0.17 J	9.7 =
Pit 43	X116DL	9	11 =	1.4 J	5.4 U	5.4 U	5.4 U	5.4 U	8.6 =	5.4 U	5.4 U	0.29 J	4.8 J	5.4 U	14 U	6.1 =	5.4 U	8.7 =

Table E-8. SVOCs in U.S. Drum (mg/kg)

Station ID	Sample ID	Depth (ft)	Fluoranthene	Fluorene	Hexachlorobenzene	Hexachlorobutadiene	Hexachlorocyclopentadiene	Hexachloroethane	Indeno(1,2,3-CD)pyrene	Isophorone	N-Nitrosodi-N-Propylamine	N-Nitrosodiphenylamine	Naphthalene	Nitrobenzene	Pentachlorophenol	Phenanthrene	Phenol	Pyrene
Industrial/ Commercial		*Ing*	*82000*	*82000*	*4*		*14000*	*2000*	*8*	*410000*	*0.8*	*1200*	*82000*	*1000*	*24*	*61000*	*1000000*	*61000*
		Inh			*1.8*		*16*			*4600*				*140*				
Construction Worker		*Ing*	*82000*	*82000*	*78*		*14000*	*2000*	*170*	*410000*	*18*	*25000*	*8200*	*1000*	*520*	*61000*	*120000*	*61000*
		Inh			*2.6*		*1.1*			*4600*				*9.4*				
Soil Component of GW		*I*	*4300*	*560*	*2*		*400*	*0.5*	*14*	*8*	*0.00005*	*1*	*84*	*0.1*	*0.03*	*140*	*100*	*4200*
		II	*21000*	*2800*	*11*		*2200*	*2.6*	*69*	*8*	*0.00005*	*5.6*	*420*	*0.1*	*0.14*	*700*	*100*	*21000*
Pit 44	X113	3	8.4 =	0.91 J	2.1 U	2.1 U	2.1 U	2.1 U	4 =	2.1 U	2.1 U	0.15 J	1.3 J	2.1 U	5.4 U	5.7 =	2.1 U	6.9 =
Pit 44	X114	9	5.3 J	1.1 J	13 U	13 U	13 UJ	13 U	2.4 J	13 U	13 U	13 U	4.5 J	13 U	33 UJ	5.1 J	13 U	4.7 J
Pit 45	X111	3.5	15 =	2.4 J	14 U	14 U	14 UJ	14 U	3.5 J	14 U	14 U	14 U	1.7 J	14 U	36 UJ	14 =	14 U	13 J
Pit 45	X112	10	2.2 J	0.56 J	2.4 U	2.4 U	2.4 UJ	2.4 U	0.27 J	2.4 U	2.4 U	1.4 J	5.7 =	2.4 U	6.1 U	2.5 =	0.88 J	1.7 J
Pit 46	X109	4	0.063 J	0.53 U	0.53 U	0.53 U	0.53 UJ	0.53 U	0.028 J	0.53 U	0.53 U	0.53 U	0.53 U	0.53 U	1.3 U	0.04 J	0.53 U	0.064 J
Pit 46	X110	9	1.5 J	0.61 J	2.4 U	2.4 U	2.4 UJ	2.4 U	0.21 J	2.4 U	2.4 U	6.6 =	5.8 =	2.4 U	6 U	2 J	2.4 U	1.3 J
Pit 47	X107	3.5	0.15 J	0.037 J	0.45 U	0.45 U	0.45 UJ	0.45 U	0.051 J	0.45 U	0.45 U	0.45 U	0.11 J	0.45 U	1.1 U	0.16 J	0.45 U	0.12 J
Pit 47	X108	9	5.7 J	4.7 J	49 U	49 U	49 UJ	49 U	49 U	49 U	49 U	49 U	38 J	49 U	120 UJ	15 J	49 U	8.4 J
Pit 48	X105	3	0.3 J	0.046 J	0.38 U	0.38 U	0.38 UJ	0.38 U	0.091 J	0.38 U	0.38 U	0.38 U	0.027 J	0.38 U	0.94 U	0.3 J	0.38 U	0.24 J
Pit 48	X106	9	3.4 J	14 U	14 U	14 U	14 UJ	14 U	14 U	14 U	14 U	14 U	4.2 J	14 U	34 UJ	4.9 J	14 U	4.4 J
Pit 49	X103	3	0.93 =	0.48 =	0.38 U	0.38 U	0.38 UJ	0.38 U	0.56 J	0.38 U	0.38 U	0.38 U	0.17 J	0.38 U	0.97 U	1 =	0.38 U	1 =
Pit 49	X104	10	0.097 J	0.42 UJ	0.42 UJ	0.42 UJ	0.42 UJ	0.42 UJ	0.028 J	0.06 J	0.42 UJ	0.055 J	0.082 J	0.42 UJ	1.1 UJ	0.12 J	0.42 UJ	0.082 J
Pit 50	X101	3	0.38 U	0.38 U	0.38 U	0.38 U	0.38 UJ	0.38 U	0.38 UJ	0.022 J	0.38 U	0.38 U	0.042 J	0.38 U	0.94 R	0.1 J	0.38 U	0.033 J
Pit 50	X102	9	2.1 J	1.2 J	19 U	19 U	19 UJ	19 U	19 U	19 U	19 U	1 J	7.5 J	19 U	49 UJ	3.7 J	19 U	2.1 J
Pit 51	X203	3	2.5 =	0.2 J	0.8 U	0.8 U	0.8 UJ	0.8 U	0.63 J	0.8 U	0.8 U	0.8 U	0.056 J	0.8 U	2 U	3 =	0.8 U	3 =
Pit 51	X204	8	19 =	1.7 J	4.4 U	4.4 U	4.4 UJ	4.4 U	3.5 J	4.4 U	4.4 U	4.4 U	0.35 J	4.4 U	11 U	21 =	4.4 U	16 =

Notes:

=:	sample concentration is detected at level reported
U:	sample concentration is under detection limit
J:	sample concentration is estimated value
R:	sample concentration value is rejected
DL:	sample is diluted
RE:	sample is re-extracted
Ing.:	Ingestion
Inh.:	Inhalation
I:	Class I
II:	Class II

Table E-9. SVOCs in Unnamed Parcel (mg/kg)

Station ID	Sample ID	Depth (ft.)	2,2'-Oxybis(1-Chloro)Propane	2,4,5-Trichlorophenol	2,4,6-Trichlorophenol	2,4-Dichlorophenol	2,4-Dimethylphenol	2,4-Dinitrophenol	2,4-Dinitrotoluene	2,6-Dinitrotoluene	2-Chloronaphthalene	2-Chlorophenol	2-Methylnaphthalene	2-Methylphenol	2-Nitroaniline	2-Nitrophenol	3,3'-Dichlorobenzidine	3-Nitroaniline
Industrial/ Commercial		*Ing*		*200000*	*520*	*6100*	*41000*	*4100*	*8.4*	*8.4*		*10000*	*61000*	*100000*			*13*	
		Inh			*390*							*53000*						
Construction Worker		*Ing*		*200000*	*11000*	*610*	*41000*	*410*	*180*	*180*		*10000*	*61000*	*100000*			*280*	
		Inh			*540*							*53000*						
Soil Component of GW		*I*		*270*	*0.2*	*1*	*9*	*0.2*	*0.0008*	*0.0007*		*4*	*29*	*15*			*0.007*	
		II		*1400*	*0.77*	*1*	*9*	*0.2*	*0.0008*	*0.0007*		*4*	*145*	*15*			*0.033*	
Pit 02	X103	3	0.42 UJ	1.1 U	0.42 U	0.42 U	0.42 U	1.1 UJ	0.42 U	0.42 U	0.42 U	0.42 U	18 =	0.15 J	1.1 U	0.42 U	0.42 U	1.1 U
Pit 02	X104	6	0.41 UJ	1 U	0.41 U	0.41 U	0.41 U	1 UJ	0.41 U	0.41 U	0.41 U	0.41 U	0.056 J	0.41 U	1 U	0.41 U	0.41 U	1 U
Pit 03	X105	3	0.4 UJ	1 U	0.4 U	0.4 U	0.4 U	1 UJ	0.4 U	0.4 U	0.4 U	0.4 U	0.06 J	0.4 U	1 U	0.4 U	0.4 U	1 U
Pit 03	X106	6	0.17 J	1.3 U	0.52 U	0.52 U	0.52 U	1.3 UJ	0.52 U	0.52 U	0.52 U	0.52 U	1.3 =	0.52 U	1.3 U	0.52 U	0.52 U	1.3 U
Pit 03	X106DL	6	3.1 UJ	7.8 U	3.1 U	3.1 U	3.1 U	7.8 UJ	3.1 U	3.1 U	3.1 U	3.1 U	1.1 J	3.1 U	7.8 U	3.1 U	3.1 U	7.8 U
Pit 04	X107	3	0.46 UJ	1.2 U	0.46 U	0.46 U	0.46 U	1.2 UJ	0.46 U	0.46 U	0.46 U	0.46 U	0.3 J	0.46 U	1.2 U	0.46 U	0.46 U	1.2 U
Pit 04	X107DL	3	1.4 UJ	3.5 U	1.4 U	1.4 U	1.4 U	3.5 UJ	1.4 U	1.4 U	1.4 U	1.4 U	0.29 J	1.4 U	3.5 U	1.4 U	1.4 U	3.5 U
Pit 04	X108	8	0.49 UJ	1.2 U	0.49 U	0.49 U	0.49 U	1.2 UJ	0.49 U	0.49 U	0.49 U	0.49 U	0.49 U	0.49 U	1.2 U	0.49 U	0.49 U	1.2 U
Pit 05	X109	3	2.8 UJ	7.1 U	2.8 U	2.8 U	2.8 U	7.1 UJ	2.8 U	2.8 U	2.8 U	2.8 U	7.5 =	2.8 U	7.1 U	2.8 U	2.8 U	7.1 U
Pit 05	X110	3	0.46 UJ	1.2 U	0.46 U	0.46 U	0.46 U	1.2 UJ	0.46 U	0.46 U	0.46 U	0.46 U	13 =	0.46 U	1.2 U	0.46 U	0.46 U	1.2 U
Pit 05	X110DL	3	2.3 UJ	5.8 U	2.3 U	2.3 U	2.3 U	5.8 UJ	2.3 U	2.3 U	2.3 U	2.3 U	10 =	2.3 U	5.8 U	2.3 U	2.3 U	5.8 U
Pit 05	X111	8	0.66 UJ	1.7 U	0.66 U	0.66 U	0.66 U	1.7 UJ	0.66 U	0.66 U	0.66 U	0.66 U	0.55 J	0.66 U	1.7 U	0.66 U	0.66 U	1.7 U
Pit 05	X111DL	8	5.3 UJ	13 U	5.3 U	5.3 U	5.3 U	13 UJ	5.3 U	5.3 U	5.3 U	5.3 U	5.3 U	5.3 U	13 U	5.3 U	5.3 U	13 U
Pit 06	X112	3	0.52 UJ	1.3 U	0.52 U	0.52 U	0.52 U	1.3 UJ	0.52 U	0.52 U	0.52 U	0.52 U	0.97 =	0.52 U	1.3 U	0.52 U	0.52 U	1.3 U
Pit 06	X112DL	3	1.5 UJ	3.9 U	1.5 U	1.5 U	1.5 U	3.9 UJ	1.5 U	1.5 U	1.5 U	1.5 U	0.96 J	1.5 U	3.9 U	1.5 U	1.5 U	3.9 U
Pit 06	X113	8	0.52 UJ	1.3 U	0.52 U	0.52 U	0.52 U	1.3 UJ	0.52 U	0.52 U	0.52 U	0.52 U	0.11 J	0.52 U	1.3 U	0.52 U	0.52 U	1.3 U
Pit 07	X114	3	0.45 UJ	1.1 U	0.45 U	0.45 U	0.45 U	1.1 UJ	0.45 U	0.45 U	0.45 U	0.45 U	44 =	0.45 U	1.1 U	0.45 U	0.45 U	1.1 U
Pit 07	X115	8	0.54 UJ	1.4 U	0.54 U	0.54 U	0.54 U	1.4 UJ	0.54 U	0.54 U	0.54 U	0.54 U	0.42 J	0.54 U	1.4 U	0.54 U	0.54 U	1.4 U
Pit 07	X115DL	8	3.8 UJ	9.5 U	3.8 U	3.8 U	3.8 U	9.5 UJ	3.8 U	3.8 U	3.8 U	3.8 U	0.43 J	3.8 U	9.5 U	3.8 U	3.8 U	9.5 U
Pit 08	X116	3	0.41 UJ	1 U	0.41 U	0.41 U	0.41 U	1 UJ	0.41 U	0.41 U	0.41 U	0.41 U	0.088 J	0.41 U	1 U	0.41 U	0.41 U	1 U
Pit 08	X117	8	5.3 UJ	13 U	5.3 U	5.3 U	5.3 U	13 UJ	5.3 U	5.3 U	5.3 U	5.3 U	1.5 J	5.3 U	13 U	5.3 U	5.3 U	13 U
Pit 08	X117DL	8	5.3 UJ	13 U	5.3 U	5.3 U	5.3 U	13 UJ	5.3 U	5.3 U	5.3 U	5.3 U	1.5 J	5.3 U	13 U	5.3 U	5.3 U	13 U
Pit 09	X118	3	0.41 UJ	1 U	0.41 U	0.41 U	0.41 U	1 UJ	0.41 U	0.41 U	0.41 U	0.41 U	0.41 U	0.41 U	1 U	0.41 U	0.41 U	1 U
Pit 09	X119	8	0.54 UJ	1.4 U	0.54 U	0.54 U	0.54 U	1.4 UJ	0.54 U	0.54 U	0.54 U	0.54 U	0.075 J	0.54 U	1.4 U	0.54 U	0.54 U	1.4 U
Pit 10	X120	3	0.41 U	1 U	0.41 U	0.41 U	0.41 UJ	1 U	0.41 U	0.41 U	0.41 U	0.41 U	0.41 U	0.41 U	1 U	0.41 U	0.41 U	1 U
Pit 10	X121	8	1.4 UJ	3.4 U	1.4 U	1.4 U	0.15 J	3.4 U	1.4 U	1.4 U	1.4 U	1.4 U	3.4 =	1.4 U	3.4 U	1.4 U	1.4 U	3.4 U

Table E-9. SVOCs in Unnamed Parcel (mg/kg)

Station ID	Sample ID	Depth (ft.)	2,2'-Oxybis(1-Chloro)Propane	2,4,5-Trichlorophenol	2,4,6-Trichlorophenol	2,4-Dichlorophenol	2,4-Dimethylphenol	2,4-Dinitrophenol	2,4-Dinitrotoluene	2,6-Dinitrotoluene	2-Chloronaphthalene	2-Chlorophenol	2-Methylnaphthalene	2-Methylphenol	2-Nitroaniline	2-Nitrophenol	3,3'-Dichlorobenzidine	3-Nitroaniline
Industrial/ Commercial		*Ing*		*200000*	*520*	*6100*	*41000*	*4100*	*8.4*	*8.4*		*10000*	*61000*	*100000*			*13*	
		Inh			*390*							*53000*						
Construction Worker		*Ing*		*200000*	*11000*	*610*	*41000*	*410*	*180*	*180*		*10000*	*61000*	*100000*			*280*	
		Inh			*540*							*53000*						
Soil Component of GW		*I*		*270*	*0.2*	*1*	*9*	*0.2*	*0.0008*	*0.0007*		*4*	*29*	*15*			*0.007*	
		II		*1400*	*0.77*	*1*	*9*	*0.2*	*0.0008*	*0.0007*		*4*	*145*	*15*			*0.033*	
Pit 11	X122	3	0.39 UJ	0.98 U	0.39 U	0.39 U	0.39 U	0.98 U	0.39 U	0.39 U	0.39 U	0.39 U	0.055 J	0.39 U	0.98 U	0.39 U	0.39 U	0.98 U
Pit 11	X123	8	0.4 UJ	1 U	0.4 U	0.4 U	0.4 U	1 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	1 U	0.4 U	0.4 U	1 U
Pit 11	X125	30	0.39 UJ	0.98 U	0.39 U	0.39 U	0.39 U	0.98 U	0.39 U	0.39 U	0.39 U	0.39 U	0.072 J	0.39 U	0.98 U	0.39 U	0.39 U	0.98 U
Pit 12	X127	3	0.47 UJ	1.2 U	0.47 U	0.47 U	0.47 U	1.2 U	0.47 U	0.47 U	0.47 U	0.47 U	0.26 J	0.47 U	1.2 U	0.47 U	0.47 U	1.2 U
Pit 12	X128	6	0.87 UJ	2.2 U	0.87 U	0.87 U	0.87 U	2.2 U	0.87 U	0.87 U	0.87 U	0.87 U	3.1 =	0.87 U	2.2 U	0.87 U	0.87 U	2.2 U
Pit 13	X129	3	0.83 UJ	2.1 U	0.83 U	0.83 U	0.83 U	2.1 U	0.83 U	0.83 U	0.83 U	0.83 U	0.2[illegible] J	0.83 U	2.1 U	0.83 U	0.83 U	2.1 U
Pit 13	X130	8	0.69 UJ	1.7 U	0.69 U	0.69 U	0.69 U	1.7 U	0.69 U	0.69 U	0.69 U	0.69 U	2.1 =	0.69 U	1.7 U	0.69 U	0.69 U	1.7 U
Pit 14	X131	3	0.83 UJ	2.1 U	0.83 U	0.83 U	0.83 U	2.1 U	0.83 U	0.83 U	0.83 U	0.83 U	0.14 J	0.83 U	2.1 U	0.83 U	0.83 U	2.1 U
Pit 14	X132	8	0.51 UJ	1.3 U	0.51 U	0.51 U	0.51 U	1.3 U	0.51 U	0.51 U	0.51 U	0.51 U	0.3 J	0.51 U	1.3 U	0.51 U	0.51 U	1.3 U
Pit 15	X133	3	2.2 U	5.4 U	2.2 U	2.2 U	2.2 U	5.4 UJ	2.2 U	2.2 U	2.2 U	2.2 U	0.55 J	2.2 U	5.4 U	2.2 U	2.2 U	5.4 U
Pit 15	X134	8	0.52 UJ	1.3 U	0.52 U	0.52 U	0.52 U	1.3 U	0.52 U	0.52 U	0.52 U	0.52 U	0.76 =	0.52 U	1.3 U	0.52 U	0.52 U	1.3 U
Pit 16	X135	3	2.2 UJ	5.6 U	2.2 U	2.2 U	2.2 U	5.6 U	2.2 U	2.2 U	2.2 U	2.2 U	2.2 U	2.2 U	5.6 U	2.2 U	2.2 U	5.6 U
Pit 16	X136	6	0.75 UJ	1.9 U	0.75 U	0.75 U	0.75 U	1.9 UJ	0.75 U	0.75 U	0.75 U	0.75 U	0.62 J	0.75 U	1.9 U	0.75 U	0.75 UJ	1.9 U
Pit 17	X137	3	4 UJ	10 U	4 U	4 U	4 U	10 UJ	4 U	4 U	4 U	4 U	1.9 J	4 U	10 U	4 U	4 UJ	10 U
Pit 17	X138	11	4.3 UJ	11 U	4.3 U	4.3 U	4.3 U	11 UJ	4.3 U	4.3 U	4.3 U	4.3 U	3.8 J	4.3 U	11 U	4.3 U	4.3 UJ	11 U
Pit 18	X139	3	1 UJ	2.6 U	1 U	1 U	1 U	2.6 UJ	1 U	1 U	1 U	1 U	0.34 J	1 U	2.6 U	1 U	1 U	2.6 U
Pit 18	X140	10	0.47 UJ	1.2 U	0.47 U	0.47 U	0.47 U	1.2 UJ	0.47 U	0.47 U	0.18 J	0.47 U	0.17 J	0.47 U	1.2 U	0.47 U	0.47 UJ	1.2 U
Pit 19	X141	3	0.44 U	1.1 U	0.44 U	0.44 U	0.44 U	1.1 U	0.44 U	0.44 U	0.44 U	0.44 U	0.75 =	0.44 U	1.1 U	0.44 U	0.44 U	1.1 U
Pit 19	X142	14	0.53 U	1.3 U	0.53 U	0.53 U	0.53 U	1.3 U	0.53 U	0.53 U	0.53 U	0.53 U	0.62 =	0.53 U	1.3 U	0.53 U	0.53 U	1.3 U
Pit 20	X143	3	0.45 U	1.1 U	0.45 U	0.45 U	0.45 U	1.1 U	0.45 U	0.45 U	0.45 U	0.45 U	15 =	0.45 U	1.1 U	0.45 U	0.45 U	1.1 U
Pit 20	X144	3	0.49 U	1.2 U	0.49 U	0.49 U	0.49 U	1.2 U	0.49 U	0.49 U	0.49 U	0.49 U	19 =	0.49 U	1.2 U	0.49 U	0.49 U	1.2 U
Pit 20	X145	7	0.62 U	1.6 U	0.62 U	0.62 U	0.62 U	1.6 UJ	0.62 U	0.62 U	0.62 U	0.62 U	1.1 =	0.62 U	1.6 U	0.62 U	0.62 U	1.6 U
Pit 21	X146	3	2 U	5.1 U	2 U	2 U	4.2 =	5.1 U	2 U	2 U	2 U	2 U	1.3 J	2 U	5.1 U	2 U	2 U	5.1 U
Pit 21	X147	5	4.2 U	11 U	4.2 U	4.2 U	4.2 U	11 UJ	4.2 U	4.2 U	4.2 U	4.2 U	4.8 =	4.2 U	11 U	4.2 U	4.2 U	11 U
Pit 21	X148	10	14 UJ	36 U	14 U	14 U	14 U	36 UJ	14 U	14 U	14 U	14 U	3.3 J	68 =	36 U	14 U	14 U	36 U
Pit 22	X160	3	0.5 UJ	1.3 U	0.5 U	0.5 U	0.5 U	1.3 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	1.3 U	0.5 U	0.5 UJ	1.3 UJ

Table E-9. SVOCs in Unnamed Parcel (mg/kg)

Station ID	Sample ID	Depth (ft.)	2,2'-Oxybis(1-Chloro)Propane	2,4,5-Trichlorophenol	2,4,6-Trichlorophenol	2,4-Dichlorophenol	2,4-Dimethylphenol	2,4-Dinitrophenol	2,4-Dinitrotoluene	2,6-Dinitrotoluene	2-Chloronaphthalene	2-Chlorophenol	2-Methylnaphthalene	2-Methylphenol	2-Nitroaniline	2-Nitrophenol	3,3'-Dichlorobenzidine	3-Nitroaniline
Industrial/ Commercial		*Ing*		*200000*	*520*	*6100*	*41000*	*4100*	*8.4*	*8.4*		*10000*	*61000*	*100000*			*13*	
		Inh			*390*							*53000*						
Construction Worker		*Ing*		*200000*	*11000*	*610*	*41000*	*410*	*180*	*180*		*10000*	*61000*	*100000*			*280*	
		Inh			*540*							*53000*						
Soil Component of GW		*I*		*270*	*0.2*	*1*	*9*	*0.2*	*0.0008*	*0.0007*		*4*	*29*	*15*			*0.007*	
		II		*1400*	*0.77*	*1*	*9*	*0.2*	*0.0008*	*0.0007*		*4*	*145*	*15*			*0.033*	
Pit 22	X161	10	0.62 UJ	1.6 U	0.62 U	0.62 U	0.62 U	1.6 U	0.62 U	0.62 U	0.62 U	0.62 U	0.64 =	0.62 U	1.6 U	0.62 U	0.62 UJ	1.6 UJ
Pit 22	X161DL	10	1.2 UJ	3.1 U	1.2 U	1.2 U	1.2 U	3.1 U	1.2 U	1.2 U	1.2 U	1.2 U	0.52 J	1.2 U	3.1 U	1.2 U	1.2 U	3.1 U
Pit 23	X158	3	15 U	38 U	15 U	15 U	15 U	38 UJ	15 U	15 U	120 =	15 U	15 U	15 U	38 U	15 U	15 U	38 U
Pit 23	X159	10	0.99 U	2.5 U	0.99 U	0.99 U	0.99 U	2.5 UJ	0.99 U	0.99 U	0.99 U	0.99 U	0.21 J	0.99 U	2.5 U	0.99 U	0.99 U	2.5 U
Pit 24	X156	3	0.75 U	1.9 U	0.75 U	0.75 U	0.75 U	1.9 UJ	0.75 U	0.75 U	0.75 U	0.75 U	0.87 =	0.75 U	1.9 U	0.75 U	0.75 U	1.9 U
Pit 24	X157	8	0.79 U	2 U	0.79 U	0.79 U	0.79 U	2 UJ	0.79 U	0.79 U	0.099 J	0.79 U	0.19 J	0.79 U	2 U	0.79 U	0.79 U	2 U
Pit 25	X154	3	0.41 U	1 U	0.41 U	0.41 U	0.41 U	1 UJ	0.41 U	0.41 U	0.41 U	0.41 U	0.12 J	0.41 U	1 U	0.41 U	0.41 U	1 U
Pit 25	X155	8	0.57 U	1.4 U	0.57 U	0.57 U	0.57 U	1.4 UJ	0.57 U	0.57 U	0.57 U	0.57 U	0.13 J	0.57 U	1.4 U	0.57 U	0.57 U	1.4 U
Pit 26	X152	3	0.46 U	1.2 U	0.46 U	0.46 U	0.46 U	1.2 UJ	0.46 U	0.46 U	0.46 U	0.46 U	0.4 J	0.46 U	1.2 U	0.46 U	0.46 U	1.2 U
Pit 26	X153	6	0.75 U	1.9 U	0.75 U	0.75 U	0.75 U	1.9 UJ	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	1.9 U	0.75 U	0.75 U	1.9 U
Pit 27	X149	3	2.7 U	6.8 U	2.7 U	2.7 U	2.7 U	6.8 UJ	2.7 U	2.7 U	2.7 U	2.7 U	0.73 J	2.7 U	6.8 U	2.7 U	2.7 U	6.8 U
Pit 27	X150	8	0.5 U	1.3 U	0.5 U	0.5 U	0.5 U	1.3 UJ	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	1.3 U	0.5 U	0.5 U	1.3 U
Pit 27	X151	30	0.57 U	1.4 U	0.57 U	0.57 U	0.57 U	1.4 UJ	0.57 U	0.57 U	0.57 U	0.57 U	0.21 J	0.57 U	1.4 U	0.57 U	0.57 U	1.4 U
Pit 28	X175	3	0.44 UJ	1.1 U	0.44 U	0.44 U	0.44 U	1.1 U	0.44 U	0.44 U	0.44 U	0.44 U	0.46 =	0.44 U	1.1 U	0.44 U	0.44 U	1.1 U
Pit 28	X176	6	4.8 UJ	12 U	4.8 U	4.8 U	4.8 U	12 U	4.8 U	4.8 U	4.8 U	4.8 U	15 =	4.8 U	12 U	4.8 U	4.8 U	12 U
Pit 29	X173	3	1.8 UJ	4.5 U	1.8 U	1.8 U	1.8 U	4.5 U	1.8 U	1.8 U	1.8 U	1.8 U	2.1 =	1.8 U	4.5 U	1.8 U	1.8 UJ	4.5 U
Pit 29	X174	10	0.77 UJ	1.9 U	0.77 U	0.77 U	0.77 U	1.9 U	0.77 U	0.77 U	0.77 U	0.77 U	0.57 J	0.77 U	1.9 U	0.77 U	0.77 U	1.9 U
Pit 30	X171	3	0.51 UJ	1.3 U	0.51 U	0.51 U	0.51 U	1.3 U	0.51 U	0.51 U	0.51 U	0.51 U	0.51 U	0.51 U	1.3 U	0.51 U	0.51 U	1.3 U
Pit 30	X172	7.5	11 UJ	27 U	11 U	11 U	11 U	27 U	11 U	11 U	11 U	11 U	11 U	11 U	27 U	11 U	11 UJ	27 U
Pit 31	X169	2.5	2.5 U	6.4 U	2.5 U	2.5 U	2.5 U	6.4 UJ	2.5 U	2.5 U	2.5 U	2.5 U	0.32 J	2.5 U	6.4 U	2.5 U	2.5 U	6.4 U
Pit 31	X170	6	0.72 UJ	1.8 U	0.72 U	0.72 U	0.72 U	1.8 U	0.72 U	0.72 U	0.72 U	0.72 U	0.33 J	0.72 U	1.8 U	0.72 U	0.72 UJ	1.8 U
Pit 32	X167	3	0.7 UJ	1.8 U	0.7 U	0.7 U	0.7 U	1.8 U	0.7 U	0.7 U	0.7 U	0.7 U	0.7 U	0.7 U	1.8 U	0.7 U	0.7 U	1.8 U
Pit 32	X168	6	0.41 UJ	1 U	0.41 U	0.41 U	0.41 U	1 U	0.41 U	0.41 U	0.41 U	0.41 U	0.083 J	0.41 U	1 U	0.41 U	0.41 UJ	1 UJ
Pit 33	X165	3	0.88 UJ	2.2 U	0.88 U	0.88 U	0.88 U	2.2 U	0.88 U	0.88 U	0.88 U	0.88 U	1.2 =	0.88 U	2.2 U	0.88 U	0.88 UJ	2.2 U
Pit 33	X166	7	11 UJ	26 U	11 U	11 U	11 U	26 U	11 U	11 U	11 U	11 U	11 U	11 U	26 U	11 U	11 UJ	26 U
Pit 34	X162	3	0.46 UJ	1.2 U	0.46 U	0.46 U	0.46 U	1.2 U	0.46 U	0.46 U	0.46 U	0.46 U	0.46 U	0.46 U	1.2 U	0.46 U	0.46 UJ	1.2 UJ

Table E-9. SVOCs in Unnamed Parcel (mg/kg)

Station ID	Sample ID	Depth (ft.)	2,2'-Oxybis(1-Chloro)Propane	2,4,5-Trichlorophenol	2,4,6-Trichlorophenol	2,4-Dichlorophenol	2,4-Dimethylphenol	2,4-Dinitrophenol	2,4-Dinitrotoluene	2,6-Dinitrotoluene	2-Chloronaphthalene	2-Chlorophenol	2-Methylnaphthalene	2-Methylphenol	2-Nitroaniline	2-Nitrophenol	3,3'-Dichlorobenzidine	3-Nitroaniline
Industrial/ Commercial		*Ing*		*200000*	*520*	*6100*	*41000*	*4100*	*8.4*	*8.4*		*10000*	*61000*	*100000*			*13*	
		Inh			*390*							*53000*						
Construction Worker		*Ing*		*200000*	*11000*	*610*	*41000*	*410*	*180*	*180*		*10000*	*61000*	*100000*			*280*	
		Inh			*540*							*53000*						
Soil Component of GW		*I*		*270*	*0.2*	*1*	*9*	*0.2*	*0.0008*	*0.0007*		*4*	*29*	*15*			*0.007*	
		II		*1400*	*0.77*	*1*	*9*	*0.2*	*0.0008*	*0.0007*		*4*	*145*	*15*			*0.033*	
Pit 34	X163	10	0.66 UJ	1.7 U	0.66 U	0.66 U	0.66 U	1.7 U	0.66 U	0.66 U	0.66 U	0.66 U	0.18 J	0.66 U	1.7 U	0.66 U	0.66 UJ	1.7 UJ
Pit 34	X164	30	4.3 UJ	11 U	4.3 U	4.3 U	4.3 U	11 U	4.3 U	4.3 U	4.3 U	4.3 U	3.9 J	4.3 U	11 U	4.3 U	4.3 UJ	11 U
Pit 35	X185	4	0.43 U	1.1 U	0.43 U	0.43 U	0.43 U	1.1 UJ	0.43 U	0.43 U	0.43 U	0.43 U	0.35 J	0.43 U	1.1 U	0.43 U	0.43 U	1.1 U
Pit 35	X186	10	0.45 U	1.1 U	0.45 U	0.45 U	0.45 U	1.1 UJ	0.45 U	0.45 U	0.45 U	0.45 U	0.66 =	0.45 U	1.1 U	0.45 U	0.45 U	1.1 U
Pit 36	X183	3	0.57 U	1.4 U	0.57 U	0.57 U	0.57 U	1.4 UJ	0.57 U	0.57 U	0.57 U	0.57 U	0.15 J	0.57 U	1.4 U	0.57 U	0.57 U	1.4 U
Pit 36	X184	6	0.46 U	1.2 U	0.46 U	0.46 U	0.46 U	1.2 UJ	0.46 U	0.46 U	0.46 U	0.46 U	0.23 J	0.46 U	1.2 U	0.46 U	0.46 U	1.2 U
Pit 37	X181	4	0.72 U	1.8 U	0.72 U	0.72 U	0.72 U	1.8 UJ	0.72 U	0.72 U	0.72 U	0.72 U	1.9 =	0.72 U	1.8 U	0.72 U	0.72 U	1.8 U
Pit 37	X182	13	6.1 U	15 U	6.1 U	6.1 U	6.1 U	15 UJ	6.1 U	6.1 U	6.1 U	6.1 U	0.95 J	6.1 U	15 U	6.1 U	6.1 U	15 U
Pit 38	X179	4	5.5 UJ	14 U	5.5 U	5.5 U	5.5 U	14 U	5.5 U	5.5 U	5.5 U	5.5 U	1.4 J	5.5 U	14 U	5.5 U	5.5 U	14 U
Pit 38	X180	6.5	6.9 UJ	17 U	6.9 U	6.9 U	6.9 U	17 U	6.9 U	6.9 U	6.9 U	6.9 U	8.5 =	6.9 U	17 U	6.9 U	6.9 U	17 U
Pit 39	X177	3	2.9 UJ	7.2 U	2.9 U	2.9 U	2.9 U	7.2 U	2.9 U	2.9 U	2.9 U	2.9 U	1.3 J	2.9 U	7.2 U	2.9 U	2.9 UJ	7.2 U
Pit 39	X178	8	7.3 UJ	18 U	7.3 U	7.3 U	7.3 U	18 U	7.3 U	7.3 U	7.3 U	7.3 U	19 =	7.3 U	18 U	7.3 U	7.3 U	18 U
Pit 42	X124	3	0.39 UJ	0.99 U	0.39 U	0.39 U	0.39 U	0.99 U	0.39 U	0.39 U	0.39 U	0.39 U	0.39 U	0.39 U	0.99 U	0.39 U	0.39 U	0.99 U
Pit 42	X126	12	0.39 UJ	0.99 U	0.39 U	0.39 U	0.39 U	0.99 U	0.39 U	0.39 U	0.39 U	0.39 U	0.39 U	0.39 U	0.99 U	0.39 U	0.39 U	0.99 U

Notes:

- =: sample concentration is detected at level reported
- U: sample concentration is under detection limit
- J: sample concentration is estimated value
- R: sample concentration value is rejected
- DL: sample is diluted
- RE: sample is re-extracted
- Ing.: Ingestion
- Inh.: Inhalation
- I: Class I
- II: Class II

Table E-9. SVOCs in Unnamed Parcel (mg/kg)

Station ID	Sample ID	Depth (ft.)	4,6-Dinitro-2-methylphenol	4-Bromophenyl phenyl ether	4-Chloro-3-methylphenol	4-Chloroaniline	4-Chlorophenyl phenyl ether	4-Methylphenol	4-Nitroaniline	4-Nitrophenol	Acenaphthene	Acenaphthylene	Acetophenone	Anthracene	Benzaldehyde	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene
Industrial/ Commercial		*Ing*				*8200*					*120000*	*61000*		*610000*		*8*	*0.8*	*8*
		Inh																
Construction Worker		*Ing*				*820*					*120000*	*61000*		*610000*		*170*	*17*	*170*
		Inh																
Soil Component of GW		*I*				*0.7*					*570*	*15*		*12000*		*2*	*8*	*5*
		II				*0.7*					*2900*	*75*		*59000*		*8*	*82*	*25*
Pit 02	X103	3	1.1 UJ	0.42 U	0.42 U	0.42 U	0.42 U	0.88 =	1.1 UJ	1.1 U	5.2 =	0.78 =	0.42 U	1.1 =	0.42 U	2.6 =	2.3 =	4 =
Pit 02	X104	6	1 UJ	0.41 U	0.41 U	0.41 U	0.41 U	0.41 U	1 UJ	1 U	0.41 U	0.41 U	0.41 U	0.41 U	0.41 U	0.1 J	0.094 J	0.044 J
Pit 03	X105	3	1 UJ	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	1 UJ	1 U	0.17 J	0.069 J	0.4 U	0.32 J	0.4 U	0.62 =	0.69 =	0.56 =
Pit 03	X106	6	1.3 UJ	0.52 U	0.52 U	0.52 U	0.52 U	0.72 =	1.3 UJ	1.3 U	0.36 J	0.52 U	0.52 U	0.52 U	0.52 U	0.38 J	0.22 J	0.28 J
Pit 03	X106DL	6	7.8 U	3.1 U	3.1 U	3.1 U	3.1 U	0.52 J	7.8 UJ	7.8 U	0.37 J	3.1 U	3.1 U	3.1 U	3.1 U	3.1 U	3.1 U	3.1 U
Pit 04	X107	3	1.2 UJ	0.46 U	0.46 U	0.46 U	0.46 U	0.46 U	1.2 UJ	1.2 U	0.41 J	1.4 =	0.19 J	1.2 =	0.46 U	4.4 =	4.6 =	3.8 =
Pit 04	X107DL	3	3.5 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	3.5 UJ	3.5 U	0.41 J	1.5 =	0.18 J	1.1 J	1.4 U	4.1 =	4.2 =	6 =
Pit 04	X108	8	1.2 UJ	0.49 U	0.49 U	0.49 U	0.49 U	0.094 J	1.2 UJ	1.2 U	0.49 U	0.49 U	0.49 U	0.49 U	0.49 U	0.49 U	0.49 U	0.49 U
Pit 05	X109	3	7.1 U	2.8 U	2.8 U	2.8 U	2.8 U	2.8 U	7.1 UJ	7.1 U	0.57 J	2.8 U	2.8 U	0.29 J	2.8 U	0.38 J	2.8 U	0.32 J
Pit 05	X110	3	1.2 UJ	0.46 U	0.46 U	0.46 U	0.46 U	0.46 U	1.2 UJ	1.2 U	0.46 J	0.46 U	0.46 U	0.46 U	0.46 U	0.45 J	0.26 J	0.46 =
Pit 05	X110DL	3	5.8 U	2.3 U	2.3 U	2.3 U	2.3 U	2.3 U	5.8 UJ	5.8 U	0.6 J	2.3 U	2.3 U	0.41 J	2.3 U	0.37 J	0.28 J	0.28 J
Pit 05	X111	8	1.7 UJ	0.66 U	0.66 U	0.66 U	0.66 U	0.45 J	1.7 UJ	1.7 U	0.14 J	0.071 J	0.66 U	0.15 J	0.66 U	0.29 J	0.23 J	0.42 J
Pit 05	X111DL	8	13 U	5.3 U	5.3 U	5.3 U	5.3 U	5.3 U	13 UJ	13 U	5.3 U	5.3 U	5.3 U	5.3 U	5.3 U	5.3 U	5.3 U	5.3 U
Pit 06	X112	3	1.3 UJ	0.52 U	0.52 U	0.52 U	0.52 U	0.15 J	1.3 UJ	1.3 U	0.99 =	0.21 J	0.52 U	1.2 =	0.52 U	1.9 =	1.8 =	3.8 =
Pit 06	X112DL	3	3.9 U	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	3.9 UJ	3.9 U	0.96 J	0.23 J	1.5 U	1.3 J	1.5 U	2.1 =	1.8 =	1.7 =
Pit 06	X113	8	1.3 UJ	0.52 U	0.52 U	0.52 U	0.52 U	0.52 U	1.3 UJ	1.3 U	0.52 U	0.52 U	0.52 U	0.52 U	0.52 U	0.52 U	0.52 U	0.52 U
Pit 07	X114	3	1.1 UJ	0.45 U	0.45 U	0.45 U	0.45 U	0.45 U	1.1 UJ	1.1 U	0.45 U	0.45 U	0.45 U	0.091 J	0.45 U	0.45 U	0.45 UJ	0.45 UJ
Pit 07	X115	8	1.4 UJ	0.54 U	0.54 U	0.54 U	0.54 U	0.54 U	1.4 UJ	1.4 U	0.21 J	0.54 U	0.54 U	0.3 J	0.54 U	0.4 J	0.35 J	0.4 J
Pit 07	X115DL	8	9.5 U	3.8 U	3.8 U	3.8 U	3.8 U	3.8 U	9.5 UJ	9.5 U	3.8 U	3.8 U	3.8 U	3.8 U	3.8 U	0.55 J	0.46 J	0.72 J
Pit 08	X116	3	1 U	0.41 U	0.41 U	0.41 U	0.41 U	0.042 J	1 UJ	1 U	0.1 J	0.094 J	0.41 U	0.34 J	0.052 J	1.2 =	1.5 =	1.6 =
Pit 08	X117	8	13 U	5.3 U	5.3 U	5.3 U	5.3 U	5.3 U	13 UJ	13 U	2.7 J	5.3 U	5.3 U	6.2 =	5.3 U	11 =	8.7 =	8.9 =
Pit 08	X117DL	8	13 U	5.3 U	5.3 U	5.3 U	5.3 U	5.3 U	13 UJ	13 U	2.7 J	5.3 U	5.3 U	6.2 =	5.3 U	11 =	8.7 =	8.9 =
Pit 09	X118	3	1 U	0.41 U	0.41 U	0.41 U	0.41 U	0.41 U	1 UJ	1 U	0.41 U	0.049 J	0.41 U	0.11 J	0.41 U	0.45 =	0.52 =	0.55 =
Pit 09	X119	8	1.4 U	0.54 U	0.54 U	0.54 U	0.54 U	0.098 J	1.4 UJ	1.4 U	0.15 J	0.067 J	0.54 U	0.19 J	0.54 U	0.84 =	1.1 =	1.3 =
Pit 10	X120	3	1 U	0.41 U	0.41 U	0.41 U	0.41 U	0.082 J	1 U	1 U	0.41 U	0.41 U	0.41 U	0.41 U	0.41 U	0.41 U	0.41 U	0.41 U
Pit 10	X121	8	3.4 U	1.4 U	1.4 U	1.4 U	1.4 U	0.5 J	3.4 UJ	3.4 U	11 =	0.61 J	1.4 U	20 =	1.4 U	28 =	28 =	53 =

Table E-9. SVOCs in Unnamed Parcel (mg/kg)

Station ID	Sample ID	Depth (ft.)	4,6-Dinitro-2-methylphenol	4-Bromophenyl phenyl ether	4-Chloro-3-methylphenol	4-Chloroaniline	4-Chlorophenyl phenyl ether	4-Methylphenol	4-Nitroaniline	4-Nitrophenol	Acenaphthene	Acenaphthylene	Acetophenone	Anthracene	Benzaldehyde	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene
Industrial/ Commercial		*Ing*				*8200*					*120000*	*61000*		*610000*		*8*	*0.8*	*8*
		Inh																
Construction Worker		*Ing*				*820*					*120000*	*61000*		*610000*		*170*	*17*	*170*
		Inh																
Soil Component of GW		*I*				*0.7*					*570*	*15*		*12000*		*2*	*8*	*5*
		II				*0.7*					*2900*	*75*		*59000*		*8*	*82*	*25*
Pit 11	X122	3	0.98 U	0.39 U	0.39 U	0.39 U	0.39 U	0.39 U	0.98 UJ	0.98 U	0.39 U	0.048 J	0.39 U	0.081 J	0.39 U	0.28 J	0.33 J	0.29 J
Pit 11	X123	8	1 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	1 UJ	1 U	0.4 U	0.4 U	0.4 U	0.1 J	0.4 U	0.37 J	0.33 J	0.28 J
Pit 11	X125	30	0.98 U	0.39 U	0.39 U	0.39 U	0.39 U	0.39 U	0.98 UJ	0.98 U	0.13 J	0.071 J	0.39 U	0.28 J	0.39 U	0.85 =	0.82 =	0.87 =
Pit 12	X127	3	1.2 U	0.47 U	0.47 U	0.47 U	0.47 U	0.15 J	1.2 UJ	1.2 U	0.16 J	0.051 J	0.21 J	0.31 J	0.79 =	0.88 =	0.82 =	1 =
Pit 12	X128	6	2.2 U	0.87 U	0.87 U	0.87 U	0.87 U	0.87 U	2.2 UJ	2.2 U	0.61 J	0.87 U	0.87 U	0.11 J	0.58 J	0.18 J	0.13 J	0.26 J
Pit 13	X129	3	2.1 U	0.83 U	0.83 U	0.83 U	0.83 U	0.83 U	2.1 UJ	2.1 U	0.18 J	0.9 =	0.83 U	1.1 =	0.83 U	3 =	3.7 =	6.6 =
Pit 13	X130	8	1.7 U	0.69 U	0.69 U	0.69 U	0.69 U	0.69 U	1.7 UJ	1.7 U	0.36 J	0.13 J	0.69 U	0.69 U	0.69 U	0.97 =	0.44 J	1.4 =
Pit 14	X131	3	2.1 U	0.83 U	0.23 J	0.83 U	0.83 U	0.26 J	2.1 UJ	2.1 U	0.83 U	0.83 U	0.83 U	0.15 J	0.32 J	0.5 J	0.48 J	0.68 J
Pit 14	X132	8	1.3 U	0.51 U	0.51 U	0.51 U	0.51 U	0.066 J	1.3 UJ	1.3 U	0.11 J	0.51 U	0.51 U	0.053 J	0.51 U	0.19 J	0.18 J	0.31 J
Pit 15	X133	3	5.4 UJ	2.2 U	2.2 U	2.2 U	2.2 U	2.2 U	5.4 U	5.4 U	2.2 U	2.2 U	2.2 U	2.2 U	2.2 U	0.3 J	0.39 J	0.33 J
Pit 15	X134	8	1.3 U	0.52 U	0.52 U	0.52 U	0.52 U	0.52 U	1.3 UJ	1.3 U	0.13 J	0.077 J	0.52 U	0.23 J	0.52 U	0.67 =	0.54 =	0.71 =
Pit 16	X135	3	5.6 U	2.2 U	2.2 U	2.2 U	2.2 U	2.2 U	5.7 J	5.6 U	0.26 J	2.2 U	2.2 U	1 J	2.2 U	3.6 =	3.2 =	3.6 =
Pit 16	X136	6	1.9 UJ	0.75 U	0.75 U	0.75 U	0.75 U	0.15 J	1.9 UJ	1.9 U	0.75 U	0.32 J	0.75 U	1.8 =	0.75 U	2.8 =	3 =	3.3 =
Pit 17	X137	3	10 UJ	4 U	4 U	4 U	4 U	4 U	10 UJ	10 U	3 J	1.6 J	4 U	15 =	4 U	21 =	19 =	19 =
Pit 17	X138	11	11 UJ	4.3 U	4.3 U	4.3 U	4.3 U	4.3 U	11 UJ	11 U	3.6 J	0.56 J	4.3 U	6.1 =	4.3 U	6 =	5 =	7.3 =
Pit 18	X139	3	2.6 U	1 U	1 U	1 U	1 U	0.14 J	2.6 UJ	2.6 U	0.32 J	1 U	1 U	0.46 J	1 U	0.87 J	0.88 J	0.88 J
Pit 18	X140	10	1.2 UJ	0.47 U	0.47 U	0.47 U	0.47 U	0.11 J	1.2 UJ	1.2 U	0.47 U	0.082 J	0.47 U	0.27 J	0.47 U	0.84 =	1.2 =	1.1 =
Pit 19	X141	3	1.1 U	0.44 U	0.44 U	0.44 U	0.44 U	0.22 J	1.1 U	1.1 U	0.44 U	0.44 U	0.44 U	0.047 J	0.44 U	0.24 J	0.21 J	0.23 J
Pit 19	X142	14	1.3 U	0.53 U	0.53 U	0.53 U	0.53 U	0.17 J	1.3 U	1.3 U	0.63 =	0.53 U	0.53 U	0.49 J	0.53 U	1.5 =	1.5 =	1.6 =
Pit 20	X143	3	1.1 U	0.45 U	0.45 U	0.45 U	0.45 U	0.45 U	1.1 U	1.1 U	0.45 U	0.45 U	0.45 U	0.45 U	0.45 U	0.4 J	0.31 J	0.31 J
Pit 20	X144	3	1.2 U	0.49 U	0.49 U	0.49 U	0.49 U	0.49 U	1.2 U	1.2 U	1.6 =	0.49 U	0.49 U	0.41 J	0.49 U	0.7 =	0.5 =	0.56 =
Pit 20	X145	7	1.6 U	0.62 U	0.62 U	0.62 U	0.62 U	0.28 J	1.6 U	1.6 U	0.43 J	0.62 U	0.62 U	0.53 J	0.62 U	1.4 =	1.2 =	1.6 =
Pit 21	X146	3	5.1 U	2 U	2 U	2 U	2 U	2.7 =	5.1 U	5.1 U	2 U	2 U	2 U	2 U	2 U	0.6 J	0.59 J	0.69 J
Pit 21	X147	5	11 U	4.2 U	4.2 U	4.2 U	4.2 U	4.2 =	11 U	11 U	4.2 U	4.2 U	4.2 U	0.55 J	4.2 U	1.1 J	0.79 J	0.95 J
Pit 21	X148	10	36 U	14 U	14 U	14 U	14 U	25 =	36 UJ	36 U	14 U	14 U	14 U	14 U	14 U	2 J	1.5 J	2.1 J
Pit 22	X160	3	1.3 U	0.5 U	0.5 U	0.5 UJ	0.5 U	0.5 U	1.3 UJ	1.3 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U

Table E-9. SVOCs in Unnamed Parcel (mg/kg)

Station ID	Sample ID	Depth (ft.)	4,6-Dinitro-2-methylphenol	4-Bromophenyl phenyl ether	4-Chloro-3-methylphenol	4-Chloroaniline	4-Chlorophenyl phenyl ether	4-Methylphenol	4-Nitroaniline	4-Nitrophenol	Acenaphthene	Acenaphthylene	Acetophenone	Anthracene	Benzaldehyde	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene
Industrial/ Commercial		*Ing*				*8200*					*120000*	*61000*		*610000*		*8*	*0.8*	*8*
		Inh																
Construction Worker		*Ing*				*820*					*120000*	*61000*		*610000*		*170*	*17*	*170*
		Inh																
Soil Component of GW		*I*				*0.7*					*570*	*15*		*12000*		*2*	*8*	*5*
		II				*0.7*					*2900*	*75*		*59000*		*8*	*82*	*25*
Pit 22	X161	10	1.6 U	0.62 U	0.62 U	0.62 UJ	0.62 U	0.62 U	1.6 UJ	1.6 U	0.088 J	0.62 U	0.62 U	0.62 U	0.62 U	0.12 J	0.14 J	0.15 J
Pit 22	X161DL	10	3.1 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	3.1 U	3.1 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	0.2 J
Pit 23	X158	3	38 UJ	15 U	15 U	15 U	15 U	15 U	38 U	38 U	15 U	15 U	15 U	15 U	15 U	15 U	15 U	15 U
Pit 23	X159	10	2.5 UJ	0.99 U	0.99 U	0.99 U	0.99 U	0.15 J	2.5 U	2.5 U	0.99 U	0.99 U	0.99 U	0.99 U	0.99 U	0.12 J	0.11 J	0.11 J
Pit 24	X156	3	1.9 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	1.9 U	1.9 U	0.11 J	0.75 U	0.75 U	0.13 J	0.75 U	0.3 J	0.28 J	0.27 J
Pit 24	X157	8	2 U	0.79 U	0.79 U	0.79 U	0.79 U	0.12 J	2 U	2 U	0.16 J	0.79 U	0.79 U	0.24 J	0.19 J	0.72 J	0.64 J	0.74 J
Pit 25	X154	3	1 U	0.41 U	0.41 U	0.41 U	0.41 U	0.41 U	1 U	1 U	0.081 J	0.41 U	0.41 U	0.098 J	0.41 U	0.27 J	0.34 J	0.37 J
Pit 25	X155	8	1.4 U	0.57 U	0.57 U	0.57 U	0.57 U	0.13 J	1.4 U	1.4 U	0.06 J	0.57 U	0.57 U	0.57 U	0.57 U	0.33 J	0.47 J	0.45 J
Pit 26	X152	3	1.2 U	0.46 U	0.46 U	0.46 U	0.46 U	0.13 J	1.2 U	1.2 U	0.54 =	0.46 U	0.46 U	1.6 =	0.46 U	3.9 =	3.5 =	4.1 =
Pit 26	X153	6	1.9 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	1.9 U	1.9 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
Pit 27	X149	3	6.8 U	2.7 U	2.7 U	2.7 U	2.7 U	0.39 J	6.8 U	6.8 U	2.7 U	2.7 U	2.7 U	0.43 J	2.7 U	1.4 J	1.9 J	2.2 J
Pit 27	X150	8	1.3 U	0.5 U	0.5 U	0.5 U	0.5 U	0.17 J	1.3 U	1.3 U	0.055 J	0.5 U	0.5 U	0.073 J	0.5 U	0.14 J	0.15 J	0.15 J
Pit 27	X151	30	1.4 U	0.57 U	0.57 U	0.57 U	0.57 U	0.061 J	1.4 U	1.4 U	0.23 J	0.19 J	0.57 U	0.59 =	0.57 U	1.3 =	1.2 =	1.2 =
Pit 28	X175	3	1.1 U	0.44 U	0.44 U	0.44 U	0.44 U	0.074 J	1.1 U	1.1 U	0.63 =	0.46 =	0.44 U	1.8 =	0.44 U	3 =	3.2 =	4.6 =
Pit 28	X176	6	12 U	4.8 U	4.8 U	4.8 U	4.8 U	4.8 U	12 U	12 U	1.4 J	11 =	4.8 U	4.6 J	4.8 U	5.1 =	4.3 J	6 =
Pit 29	X173	3	4.5 U	1.8 UJ	1.8 U	1.8 U	1.8 UJ	1.8 U	4.5 U	4.5 UJ	0.97 J	0.32 J	1.8 U	1.4 J	1.8 U	4.1 =	6.8 =	11 =
Pit 29	X174	10	1.9 U	0.77 U	0.77 U	0.77 U	0.77 U	0.77 U	1.9 U	1.9 U	0.16 J	0.77 U	0.77 U	0.16 J	0.77 U	0.68 J	0.84 =	1.1 =
Pit 30	X171	3	1.3 U	0.51 U	0.51 U	0.51 U	0.51 U	0.51 U	1.3 U	1.3 U	0.51 U	0.51 U	0.51 U	0.077 J	0.51 U	0.3 J	0.42 J	0.6 =
Pit 30	X172	7.5	27 U	11 UJ	11 U	11 U	11 UJ	11 U	27 U	27 UJ	2.7 J	11 U	11 U	9.2 J	11 U	22 =	20 =	26 =
Pit 31	X169	2.5	6.4 UJ	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	6.4 U	6.4 U	2.5 U	2.5 U	2.5 U	0.27 J	2.5 U	0.75 J	0.86 J	0.99 J
Pit 31	X170	6	1.8 U	0.72 UJ	0.72 U	0.72 U	0.72 UJ	0.44 J	1.8 U	1.8 UJ	0.72 U	0.72 U	0.72 U	0.72 U	0.1 J	0.32 J	0.72 U	0.45 J
Pit 32	X167	3	1.8 U	0.7 U	0.7 U	0.7 U	0.7 U	0.7 U	1.8 U	1.8 U	0.078 J	0.7 U	0.7 U	0.22 J	0.7 U	1.1 =	0.99 =	0.95 =
Pit 32	X168	6	1 U	0.41 U	0.41 U	0.41 UJ	0.41 U	0.076 J	1 UJ	1 U	0.41 U	0.41 U	0.41 U	0.051 J	0.41 U	0.17 J	0.17 J	0.29 J
Pit 33	X165	3	2.2 U	0.88 UJ	0.88 U	0.88 U	0.88 UJ	0.88 U	2.2 U	2.2 UJ	1.9 =	0.88 U	0.88 U	0.24 J	0.88 U	0.22 J	0.17 J	0.31 J
Pit 33	X166	7	26 U	11 UJ	11 U	11 U	11 UJ	11 U	26 U	26 UJ	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U
Pit 34	X162	3	1.2 U	0.46 U	0.46 U	0.46 UJ	0.46 U	0.46 U	1.2 UJ	1.2 U	0.46 U	0.46 U	0.46 U	0.46 U	0.46 U	0.095 J	0.12 J	0.19 J

Table E-9. SVOCs in Unnamed Parcel (mg/kg)

Station ID	Sample ID	Depth (ft.)	4,6-Dinitro-2-methylphenol	4-Bromophenyl phenyl ether	4-Chloro-3-methylphenol	4-Chloroaniline	4-Chlorophenyl phenyl ether	4-Methylphenol	4-Nitroaniline	4-Nitrophenol	Acenaphthene	Acenaphthylene	Acetophenone	Anthracene	Benzaldehyde	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene
Industrial/ Commercial		*Ing*				*8200*					*120000*	*61000*		*610000*		*8*	*0.8*	*8*
		Inh																
Construction Worker		*Ing*				*820*					*120000*	*61000*		*610000*		*170*	*17*	*170*
		Inh																
Soil Component of GW		*I*				*0.7*					*570*	*15*		*12000*		*2*	*8*	*5*
		II				*0.7*					*2900*	*75*		*59000*		*8*	*82*	*25*
Pit 34	X163	10	1.7 U	0.66 U	0.66 U	0.66 UJ	0.66 U	0.66 U	1.7 UJ	1.7 U	0.45 J	0.66 U	0.66 U	0.44 J	0.66 U	1.6 =	1.4 =	2.3 =
Pit 34	X164	30	11 U	4.3 UJ	4.3 U	4.3 U	4.3 UJ	4.3 U	11 U	11 UJ	3.5 J	4.3 U	4.3 U	4.4 =	0.47 J	7.8 =	6.7 =	8.8 =
Pit 35	X185	4	1.1 UJ	0.43 U	0.43 U	0.43 U	0.43 U	0.38 J	1.1 U	1.1 UJ	0.43 U	0.43 U	0.43 U	0.081 J	0.43 U	0.24 J	0.26 J	0.24 J
Pit 35	X186	10	1.1 UJ	0.45 U	0.45 U	0.45 U	0.45 U	0.2 J	1.1 U	1.1 UJ	0.16 J	0.45 U	0.074 J	0.12 J	0.45 U	0.26 J	0.22 J	0.34 J
Pit 36	X183	3	1.4 UJ	0.57 U	0.57 U	0.57 U	0.57 U	0.57 U	1.4 U	1.4 UJ	0.57 U	0.57 U	0.32 J	0.57 U	0.57 U	0.18 J	0.2 J	0.16 J
Pit 36	X184	6	1.2 UJ	0.46 U	0.46 U	0.46 U	0.46 U	0.077 J	1.2 U	1.2 UJ	0.15 J	0.46 U	0.46 U	0.35 J	0.46 U	0.43 J	0.42 J	0.39 J
Pit 37	X181	4	1.8 UJ	0.72 U	0.72 U	0.72 U	0.72 U	0.72 U	1.8 U	1.8 UJ	0.57 J	0.72 U	0.72 U	0.4 J	0.13 J	1.5 =	1.2 =	1.5 =
Pit 37	X182	13	15 UJ	6.1 U	6.1 U	6.1 U	6.1 U	6.1 U	15 U	15 UJ	3.8 J	1.2 J	6.1 U	75 =	6.1 U	310 =	250 =	350 =
Pit 38	X179	4	14 U	5.5 U	5.5 U	5.5 U	5.5 U	5.5 U	14 U	14 U	0.79 J	5.5 U	5.5 U	5.5 U	5.5 U	0.61 J	0.82 J	0.97 J
Pit 38	X180	6.5	17 U	6.9 U	6.9 U	6.9 U	6.9 U	6.9 U	17 U	17 U	1.8 J	6.9 U	6.9 U	1.5 J	6.9 U	3.8 J	2.5 J	4 J
Pit 39	X177	3	7.2 U	2.9 UJ	2.9 U	2.9 U	2.9 UJ	0.66 J	7.2 U	7.2 UJ	0.42 J	2.9 U	2.9 U	2.9 U	2.9 U	2.9 U	2.9 U	2.9 U
Pit 39	X178	8	18 U	7.3 U	7.3 U	7.3 U	7.3 U	7.3 U	18 U	18 U	4.2 J	7.3 U	7.3 U	3.2 J	7.3 U	17 =	14 =	16 =
Pit 42	X124	3	0.99 U	0.39 U	0.39 U	0.39 U	0.39 U	0.39 U	0.99 UJ	0.99 U	0.39 U	0.39 U	0.39 U	0.39 U	0.39 U	0.095 J	0.092 J	0.11 J
Pit 42	X126	12	0.99 U	0.39 U	0.39 U	0.39 U	0.39 U	0.39 U	0.99 UJ	0.99 U	0.39 U	0.39 U	0.39 U	0.39 U	0.39 U	0.081 J	0.074 J	0.094 J

Notes:

- =: sample concentration is detected at level reported
- U: sample concentration is under detection limit
- J: sample concentration is estimated value
- R: sample concentration value is rejected
- DL: sample is diluted
- RE: sample is re-extracted
- Ing.: Ingestion
- Inh.: Inhalation
- I: Class I
- II: Class II

Table E-9. SVOCs in Unnamed Parcel (mg/kg)

Station ID	Sample ID	Depth (ft.)	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Benzyl Butyl Phthalate	Biphenyl (Diphenyl)	Bis(2-Chloroethoxy) Methane	Bis(2-Chloroethyl) Ether	Bis(2-Ethylhexyl) Phthalate	Caprolactam	Carbazole	Chrysene	Di-N-Butyl Phthalate	Di-N-Octylphthalate	Dibenz(a,h)Anthracene	Dibenzofuran	Diethyl Phthalate	Dimethyl Phthalate
Industrial/ Commercial		*Ing*	*61000*	*78*	*410000*			*5*	*410*		*290*	*780*	*200000*	*41000*	*0.8*		*1000000*	
		Inh			*930*			*0.47*	*31000*				*2300*	*10000*			*2000*	
Construction Worker		*Ing*	*61000*	*1700*	*410000*			*75*	*4100*		*6200*	*17000*	*200000*	*4100*	*17*		*1000000*	
		Inh			*930*			*0.66*	*31000*			*800*	*2300*	*10000*			*2000*	
Soil Component of GW		*I*	*16000*	*49*	*930*			*0.0004*	*3600*		*0.6*	*160*	*2300*	*10000*	*2*		*470*	
		II	*81000*	*250*	*930*			*0.0004*	*31000*		*2.8*	*800*	*2300*	*10000*	*7.6*		*470*	
Pit 02	X103	3	0.92 =	4.7 =	0.42 U	0.82 =	0.42 U	0.42 U	0.78 =	0.42 U	0.5 =	2.7 =	0.42 U	0.046 J	0.43 =	1.3 =	0.084 J	0.42 U
Pit 02	X104	6	0.091 J	0.41 U	0.41 U	0.41 U	0.41 U	0.41 U	0.64 =	0.41 U	0.41 U	0.2 J	0.081 J	0.41 U	0.41 U	0.41 U	0.41 U	0.41 U
Pit 03	X105	3	0.39 J	0.69 =	0.4 U	0.4 U	0.4 U	0.4 U	2.2 =	0.4 U	0.11 J	0.88 =	0.4 U	0.4 U	0.14 J	0.11 J	0.4 U	0.4 U
Pit 03	X106	6	0.12 J	0.32 J	1.1 =	0.095 J	0.52 U	0.52 U	16 =	0.52 U	0.52 U	0.65 =	0.92 =	0.52 U	0.52 U	0.29 J	0.15 J	0.52 U
Pit 03	X106DL	6	3.1 U	3.1 U	0.72 J	3.1 U	3.1 U	3.1 UJ	12 =	3.1 U	3.1 U	0.55 J	0.73 J	3.1 U	3.1 U	3.1 U	3.1 U	3.1 U
Pit 04	X107	3	3.4 =	4.2 =	0.46 U	0.11 J	0.46 U	0.46 U	0.39 J	0.46 U	0.13 J	4.6 =	0.46 U	0.46 U	1.2 =	0.16 J	0.46 U	0.46 U
Pit 04	X107DL	3	3.2 =	5.9 =	1.4 U	1.4 U	1.4 U	1.4 UJ	0.39 J	1.4 U	1.4 U	4.2 =	1.4 U	1.4 U	0.66 J	0.15 J	1.4 U	1.4 U
Pit 04	X108	8	0.072 J	0.49 U	0.49 U	0.49 U	0.49 U	0.49 U	1.6 =	0.49 U	0.49 U	0.49 U	0.49 U	0.49 U	0.49 U	0.49 U	0.49 U	0.49 U
Pit 05	X109	3	2.8 U	2.8 U	2.8 U	2.8 U	2.8 U	2.8 UJ	12 =	2.8 U	2.8 U	0.5 J	0.48 J	2.8 U	2.8 U	0.53 J	0.95 J	2.8 U
Pit 05	X110	3	0.15 J	0.54 =	0.46 U	0.84 =	0.46 U	0.46 U	4 =	0.46 U	0.46 U	0.52 =	0.46 U	0.46 U	0.063 J	0.8 =	0.46 U	0.46 U
Pit 05	X110DL	3	2.3 U	2.3 U	2.3 U	1.3 J	2.3 U	2.3 UJ	3.8 =	2.3 U	2.3 U	0.44 J	2.3 U	2.3 U	2.3 U	0.79 J	2.3 U	2.3 U
Pit 05	X111	8	0.12 J	0.5 J	0.11 J	0.077 J	0.66 U	0.66 U	27 =	0.66 U	0.096 J	0.45 J	0.99 =	0.66 U	0.66 U	0.1 J	0.086 J	0.14 J
Pit 05	X111DL	8	5.3 U	5.3 U	5.3 U	5.3 U	5.3 U	5.3 UJ	25 =	5.3 U	5.3 U	5.3 U	0.93 J	5.3 U	5.3 U	5.3 U	5.3 U	5.3 U
Pit 06	X112	3	1 =	4.5 =	0.064 J	0.08 J	0.52 U	0.52 U	7.9 =	0.52 U	0.76 =	2.6 =	0.066 J	0.52 U	0.46 J	0.56 =	0.52 U	0.52 U
Pit 06	X112DL	3	1.1 J	2 =	1.5 U	1.5 U	1.5 U	1.5 UJ	8.8 =	1.5 U	0.89 J	2.6 =	1.5 U	1.5 U	0.27 J	0.56 J	1.5 U	1.5 U
Pit 06	X113	8	0.52 U	0.52 U	0.52 U	0.52 U	0.52 U	0.52 U	3.9 =	0.52 U	0.52 U	0.071 J	0.52 U	0.56 =	0.52 U	0.52 U	0.52 U	0.52 U
Pit 07	X114	3	0.45 UJ	0.45 UJ	13 =	0.45 U	0.45 U	0.45 U	95 =	0.45 U	0.45 U	0.45 U	3.8 =	0.45 UJ	0.45 UJ	0.45 U	0.45 U	0.45 U
Pit 07	X115	8	0.22 J	0.34 J	0.54 U	0.54 U	0.54 U	0.54 U	19 =	0.54 U	0.28 J	0.8 =	0.42 J	0.54 U	0.057 J	0.16 J	0.49 J	0.54 U
Pit 07	X115DL	8	3.8 U	0.7 J	3.8 U	3.8 U	3.8 U	3.8 UJ	20 =	3.8 U	0.42 J	0.75 J	0.57 J	3.8 U	3.8 U	3.8 U	0.59 J	3.8 U
Pit 08	X116	3	0.97 =	1.3 =	0.048 J	0.41 U	0.41 U	0.41 UJ	0.91 =	0.41 U	0.14 J	1.4 =	0.41 U	0.41 U	0.38 J	0.068 J	0.41 U	0.41 U
Pit 08	X117	8	4.7 J	7.9 =	5.3 U	5.3 U	5.3 U	5.3 UJ	23 =	5.3 U	4.2 J	12 =	5.3 U	5.3 U	2.1 J	1.8 J	5.3 U	5.3 U
Pit 08	X117DL	8	4.7 J	7.9 =	5.3 U	5.3 U	5.3 U	5.3 UJ	23 =	5.3 U	4.2 J	12 =	5.3 U	5.3 U	2.1 J	1.8 J	5.3 U	5.3 U
Pit 09	X118	3	0.44 =	0.51 =	0.41 U	0.41 U	0.41 U	0.41 UJ	0.53 =	0.41 U	0.065 J	0.54 =	0.41 U	0.41 U	0.099 J	0.41 U	0.41 U	0.41 U
Pit 09	X119	8	0.67 =	1.1 =	0.21 J	0.54 U	0.54 U	0.54 UJ	2.6 =	0.54 U	0.1 J	1.1 =	0.54 U	0.54 U	0.18 J	0.095 J	0.54 U	0.54 U
Pit 10	X120	3	0.41 U	0.41 U	0.41 U	0.41 U	0.41 U	0.41 U	0.62 U	0.41 U	0.41 U	0.41 U	0.41 U	0.41 U	0.41 U	0.41 U	0.41 U	0.41 U
Pit 10	X121	8	12 =	43 =	0.15 J	0.56 J	1.4 U	1.4 UJ	3.7 =	0.48 J	10 =	28 =	0.21 J	1.4 U	5.8 =	7.3 =	1.7 =	1.4 U

Table E-9. SVOCs in Unnamed Parcel (mg/kg)

Station ID	Sample ID	Depth (ft.)	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Benzyl Butyl Phthalate	Biphenyl (Diphenyl)	Bis(2-Chloroethoxy) Methane	Bis(2-Chloroethyl) Ether	Bis(2-Ethylhexyl) Phthalate	Caprolactam	Carbazole	Chrysene	Di-N-Butyl Phthalate	Di-N-Octylphthalate	Dibenz(a,h)Anthracene	Dibenzofuran	Diethyl Phthalate	Dimethyl Phthalate
Industrial/ Commercial		*Ing*	*61000*	*78*	*410000*			*5*	*410*		*290*	*780*	*200000*	*41000*	*0.8*		*1000000*	
		Inh			*930*			*0.47*	*31000*				*2300*	*10000*			*2000*	
Construction Worker		*Ing*	*61000*	*1700*	*410000*			*75*	*4100*		*6200*	*17000*	*200000*	*4100*	*17*		*1000000*	
		Inh			*930*			*0.66*	*31000*			*800*	*2300*	*10000*			*2000*	
Soil Component of GW		*I*	*16000*	*49*	*930*			*0.0004*	*3600*		*0.6*	*160*	*2300*	*10000*	*2*		*470*	
		II	*81000*	*250*	*930*			*0.0004*	*31000*		*2.8*	*800*	*2300*	*10000*	*7.6*		*470*	
Pit 11	X122	3	0.23 J	0.27 J	0.14 J	0.39 U	0.39 U	0.39 UJ	0.27 J	0.39 UJ	0.39 U	0.28 J	0.39 U	0.39 U	0.39 U	0.39 U	0.39 U	0.39 U
Pit 11	X123	8	0.22 J	0.28 J	0.4 U	0.4 U	0.4 U	0.4 UJ	0.19 J	0.4 UJ	0.4 U	0.37 J	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
Pit 11	X125	30	0.55 =	0.64 =	0.39 U	0.39 U	0.39 U	0.39 UJ	2.9 =	0.39 UJ	0.12 J	1 =	0.39 U	0.39 U	0.39 U	0.076 J	0.39 U	0.39 U
Pit 12	X127	3	0.47 J	0.86 =	0.17 J	0.47 U	0.47 U	0.47 UJ	7.5 =	0.47 UJ	0.19 J	1.1 =	0.7 =	0.47 U	0.18 J	0.12 J	0.47 U	0.47 U
Pit 12	X128	6	0.87 U	0.87 U	0.87 U	0.25 J	0.87 U	0.87 UJ	33 =	1 J	0.42 J	0.26 J	0.12 J	0.87 U	0.87 U	0.25 J	0.87 U	0.87 U
Pit 13	X129	3	3 =	5.3 =	0.47 J	0.83 U	0.83 U	0.83 UJ	3.8 =	0.83 UJ	0.33 J	3.1 =	0.83 U	0.83 U	1.1 =	0.2 J	0.83 U	0.83 U
Pit 13	X130	8	0.28 J	1.1 =	0.74 =	0.13 J	0.69 U	0.69 UJ	27 =	0.69 UJ	0.19 J	0.72 =	0.2 J	0.69 U	0.11 J	0.69 U	0.69 U	0.69 U
Pit 14	X131	3	0.42 J	0.41 J	0.83 U	0.83 U	0.83 U	0.83 UJ	4.4 =	0.83 UJ	0.83 U	0.79 J	0.19 J	0.83 U	0.085 J	0.83 U	0.25 J	0.83 U
Pit 14	X132	8	0.16 J	0.25 J	0.51 U	0.51 U	0.51 U	0.51 UJ	43 =	0.51 UJ	0.51 U	0.3 J	0.14 J	0.25 J	0.51 U	0.066 J	0.31 J	0.51 U
Pit 15	X133	3	0.27 J	0.35 J	2.2 U	2.2 U	2.2 U	2.2 U	12 =	2.2 U	2.2 U	0.39 J	2.2 U	2.2 U	2.2 U	2.2 U	2.2 U	2.2 U
Pit 15	X134	8	0.4 J	0.75 =	1.5 =	0.13 J	0.52 U	0.52 UJ	14 =	0.52 UJ	0.12 J	0.81 =	0.35 J	0.52 U	0.11 J	0.11 J	0.14 J	0.52 U
Pit 16	X135	3	2.6 =	2.9 =	2.2 U	2.2 U	2.2 U	2.2 UJ	19 =	2.2 UJ	0.44 J	4.5 =	2.2 U	2.2 U	0.96 J	2.2 U	2.2 U	2.2 U
Pit 16	X136	6	1.6 =	2.6 =	1 =	0.27 J	0.75 U	0.75 UJ	33 =	0.75 U	0.47 J	3.3 =	1.2 =	0.75 U	0.62 J	0.81 =	0.1 J	0.75 U
Pit 17	X137	3	9.8 =	15 =	0.2 J	0.57 J	4 U	4 UJ	51 =	4 U	3.5 J	26 =	4 U	4 U	4.3 =	4.3 =	4 U	4 U
Pit 17	X138	11	3 J	8.4 =	4.3 U	0.72 J	4.3 U	4.3 UJ	7.3 =	4.3 U	4 J	6.7 =	4.3 U	4.3 U	1.4 J	4.4 =	4.3 U	4.3 U
Pit 18	X139	3	0.45 J	0.79 J	0.13 J	1 U	1 U	1 UJ	9 =	1 UJ	0.29 J	0.93 J	0.43 J	1 U	0.23 J	0.27 J	1 U	1 U
Pit 18	X140	10	0.82 =	1.2 =	0.47 U	0.47 U	0.47 U	0.47 UJ	2.6 =	0.47 U	0.12 J	1.1 =	2.5 =	0.47 U	0.3 J	0.083 J	0.078 J	0.47 U
Pit 19	X141	3	0.098 J	0.21 J	0.12 J	0.44 U	0.44 U	0.44 U	2.3 =	0.44 U	0.44 U	0.26 J	0.072 J	0.44 U	0.44 U	0.44 U	0.44 U	0.44 U
Pit 19	X142	14	0.93 =	1.5 =	0.53 U	0.53 U	0.53 U	0.53 U	3.4 =	0.53 U	0.61 =	1.8 =	0.14 J	0.53 U	0.46 J	0.37 J	0.53 U	0.53 U
Pit 20	X143	3	0.26 J	0.27 J	0.081 J	0.62 =	0.45 U	0.45 U	11 =	0.45 U	0.45 U	0.49 =	0.45 U	0.084 J	0.054 J	1.4 =	0.45 U	0.45 U
Pit 20	X144	3	0.32 J	0.38 J	0.13 J	0.49 U	0.49 U	0.49 U	19 =	0.49 U	0.49 U	0.94 =	0.49 U	0.14 J	0.11 J	1.9 =	0.49 U	0.49 U
Pit 20	X145	7	0.71 =	0.9 =	0.24 J	0.62 U	0.62 U	0.62 U	20 =	0.62 UJ	0.28 J	1.7 =	0.35 J	0.62 U	0.36 J	0.24 J	0.62 U	0.62 U
Pit 21	X146	3	0.54 J	0.52 J	2 U	2 U	2 U	2 U	2.7 =	2 U	2 U	1.9 J	2 U	2 U	2 U	2 U	2 U	2 U
Pit 21	X147	5	0.78 J	0.77 J	4.2 U	4.2 U	4.2 U	4.2 U	94 =	4.2 UJ	4.2 U	2 J	4.2 U	4.2 U	4.2 U	4.2 U	4.2 U	4.2 U
Pit 21	X148	10	1.7 J	2.2 J	14 UJ	14 U	14 U	14 UJ	17 =	14 UJ	14 U	2.2 J	14 U	14 U	14 U	14 U	14 U	14 U
Pit 22	X160	3	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.24 J	0.5 UJ	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U

Table E-9. SVOCs in Unnamed Parcel (mg/kg)

Station ID	Sample ID	Depth (ft.)	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Benzyl Butyl Phthalate	Biphenyl (Diphenyl)	Bis(2-Chloroethoxy) Methane	Bis(2-Chloroethyl) Ether	Bis(2-Ethylhexyl) Phthalate	Caprolactam	Carbazole	Chrysene	Di-N-Butyl Phthalate	Di-N-Octylphthalate	Dibenz(a,h)Anthracene	Dibenzofuran	Diethyl Phthalate	Dimethyl Phthalate
Industrial/ Commercial		*Ing*	*61000*	*78*	*410000*			*5*	*410*		*290*	*780*	*200000*	*41000*	*0.8*		*1000000*	
		Inh			*930*			*0.47*	*31000*				*2300*	*10000*			*2000*	
Construction Worker		*Ing*	*61000*	*1700*	*410000*			*75*	*4100*		*6200*	*17000*	*200000*	*4100*	*17*		*1000000*	
		Inh			*930*			*0.66*	*31000*			*800*	*2300*	*10000*			*2000*	
Soil Component of GW		*I*	*16000*	*49*	*930*			*0.0004*	*3600*		*0.6*	*160*	*2300*	*10000*	*2*		*470*	
		II	*81000*	*250*	*930*			*0.0004*	*31000*		*2.8*	*800*	*2300*	*10000*	*7.6*		*470*	
Pit 22	X161	10	0.066 J	0.068 J	0.62 U	0.11 J	0.62 U	0.62 U	3 =	0.62 UJ	0.62 U	0.13 J	0.11 J	0.62 U	0.62 U	0.074 J	0.11 J	0.62 U
Pit 22	X161DL	10	1.2 U	1.2 U	1.2 UJ	1.2 U	1.2 U	1.2 UJ	4.1 =	1.2 U	1.2 U	0.18 J	1.2 U	1.2 UJ	1.2 U	1.2 U	1.2 U	1.2 U
Pit 23	X158	3	15 U	15 U	2 J	15 U	15 U	15 U	92 =	15 U	15 U	15 U	15 U	15 U	15 U	15 U	15 U	15 U
Pit 23	X159	10	0.99 U	0.99 U	0.99 U	0.99 U	0.99 U	0.99 U	4.8 =	0.99 U	0.99 U	0.13 J	0.99 U	0.16 J	0.99 U	0.99 U	0.99 U	0.99 U
Pit 24	X156	3	0.16 J	0.21 J	0.75 U	0.75 U	0.75 U	0.75 U	29 =	0.75 UJ	0.081 J	0.43 J	0.12 J	0.75 U	0.75 U	0.19 J	0.75 U	0.75 U
Pit 24	X157	8	0.31 J	0.49 J	0.41 J	0.79 U	0.79 U	0.79 U	8.3 =	0.79 UJ	0.17 J	0.92 =	0.17 J	0.39 J	0.26 J	0.79 U	0.12 J	0.79 U
Pit 25	X154	3	0.23 J	0.24 J	0.073 J	0.41 U	0.41 U	0.41 U	2.9 =	0.41 UJ	0.081 J	0.3 J	0.091 J	0.19 J	0.058 J	0.048 J	0.41 U	0.41 U
Pit 25	X155	8	0.56 J	0.17 J	0.57 U	0.57 U	0.57 U	0.57 U	1.9 =	0.57 UJ	0.57 U	0.63 =	0.57 U	0.57 U	0.27 J	0.57 U	0.57 U	0.57 U
Pit 26	X152	3	1.8 =	2.8 =	0.46 U	0.057 J	0.46 U	0.46 U	0.62 =	0.46 UJ	0.58 =	4.1 =	0.46 U	0.46 U	0.99 =	0.45 J	0.46 U	0.46 U
Pit 26	X153	6	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.35 J	0.75 UJ	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
Pit 27	X149	3	1.7 J	1.2 J	2.7 U	2.7 U	2.7 U	2.7 U	14 =	2.7 UJ	2.7 U	2.1 J	2.7 U	2.7 U	0.65 J	2.7 U	2.7 U	2.7 U
Pit 27	X150	8	0.093 J	0.13 J	0.5 U	0.5 U	0.5 U	0.5 U	0.47 J	0.5 UJ	0.058 J	0.16 J	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Pit 27	X151	30	0.6 =	1.2 =	0.57 U	0.57 U	0.57 U	0.57 U	1.1 =	0.57 UJ	0.44 J	1.5 =	0.57 U	0.57 U	0.28 J	0.21 J	0.57 U	0.57 U
Pit 28	X175	3	1.1 =	1.5 =	0.088 J	0.058 J	0.44 U	0.44 UJ	2.6 =	0.44 U	0.31 J	3 =	0.44 U	0.44 UJ	0.42 J	0.66 =	0.44 U	0.44 U
Pit 28	X176	6	1.9 J	2.1 J	4.8 UJ	1.9 J	4.8 U	4.8 UJ	0.99 J	4.8 U	3.4 J	4.5 J	1.4 J	4.8 UJ	0.68 J	6.7 =	4.8 U	4.8 U
Pit 29	X173	3	2.6 =	3.6 =	0.44 J	1.8 U	1.8 U	1.8 UJ	3 =	1.8 U	0.78 J	5.4 =	0.54 J	1.8 U	0.85 J	0.63 J	1.8 U	1.8 U
Pit 29	X174	10	0.36 J	0.34 J	0.9 J	0.09 J	0.77 U	0.77 UJ	3.8 =	0.77 U	0.1 J	1 =	0.58 J	0.14 J	0.081 J	0.081 J	0.2 J	0.77 U
Pit 30	X171	3	0.17 J	0.73 =	0.098 J	0.51 U	0.51 U	0.51 U	0.79 =	0.51 U	0.51 U	0.39 J	0.12 J	0.51 U	0.063 J	0.51 U	0.14 J	0.51 U
Pit 30	X172	7.5	11 J	11 J	11 U	11 U	11 U	11 UJ	1.8 J	11 U	2.4 J	22 =	11 U	11 U	3.2 J	1.1 J	11 U	11 U
Pit 31	X169	2.5	0.65 J	0.6 J	2.5 U	2.5 U	2.5 U	2.5 U	3.1 =	2.5 U	2.5 U	1.2 J	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
Pit 31	X170	6	0.36 J	0.068 J	0.72 U	0.72 U	0.72 U	0.72 UJ	0.31 J	0.72 U	0.72 U	0.69 J	0.72 U	0.72 U	0.15 J	0.72 U	0.72 U	0.72 U
Pit 32	X167	3	0.34 J	0.95 =	0.7 U	0.7 U	0.7 U	0.7 U	0.39 J	0.7 U	0.074 J	1.1 =	0.7 U	0.7 U	0.16 J	0.7 U	0.7 U	0.7 U
Pit 32	X168	6	0.067 J	0.087 J	0.1 J	0.41 U	0.41 U	0.41 U	13 =	0.41 UJ	0.41 U	0.19 J	0.12 J	0.067 J	0.41 U	0.41 U	0.41 U	0.41 U
Pit 33	X165	3	0.88 U	0.88 U	0.88 U	0.17 J	0.88 U	0.88 UJ	0.17 J	0.88 U	0.24 J	0.26 J	0.88 U	0.88 U	0.88 U	0.76 J	0.88 U	0.88 U
Pit 33	X166	7	11 U	11 U	11 U	11 U	11 U	11 UJ	54 =	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U
Pit 34	X162	3	0.07 J	0.061 J	0.46 U	0.46 U	0.46 U	0.46 U	0.88 =	0.46 UJ	0.46 U	0.12 J	0.46 U	0.46 U	0.46 U	0.46 U	0.46 U	0.46 U

Table E-9. SVOCs in Unnamed Parcel (mg/kg)

Station ID	Sample ID	Depth (ft.)	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Benzyl Butyl Phthalate	Biphenyl (Diphenyl)	Bis(2-Chloroethoxy) Methane	Bis(2-Chloroethyl) Ether	Bis(2-Ethylhexyl) Phthalate	Caprolactam	Carbazole	Chrysene	Di-N-Butyl Phthalate	Di-N-Octylphthalate	Dibenz(a,h)Anthracene	Dibenzofuran	Diethyl Phthalate	Dimethyl Phthalate
Industrial/ Commercial		*Ing*	*61000*	*78*	*410000*			*5*	*410*		*290*	*780*	*200000*	*41000*	*0.8*		*1000000*	
		Inh			*930*			*0.47*	*31000*				*2300*	*10000*			*2000*	
Construction Worker		*Ing*	*61000*	*1700*	*410000*			*75*	*4100*		*6200*	*17000*	*200000*	*4100*	*17*		*1000000*	
		Inh			*930*			*0.66*	*31000*			*800*	*2300*	*10000*			*2000*	
Soil Component of GW		*I*	*16000*	*49*	*930*			*0.0004*	*3600*		*0.6*	*160*	*2300*	*10000*	*2*		*470*	
		II	*81000*	*250*	*930*			*0.0004*	*31000*		*2.8*	*800*	*2300*	*10000*	*7.6*		*470*	
Pit 34	X163	10	0.51 J	0.71 =	6 =	0.66 U	0.66 U	0.66 U	13 =	0.069 J	0.26 J	1.6 =	0.13 J	0.38 J	0.12 J	0.32 J	0.66 U	0.66 U
Pit 34	X164	30	3.3 J	3.9 J	0.51 J	0.83 J	4.3 U	4.3 UJ	19 =	4.3 U	3.3 J	7.6 =	.4 J	1.2 J	1.1 J	2.1 J	4.3 U	4.3 U
Pit 35	X185	4	0.094 J	0.27 J	0.3 J	0.05 J	0.43 U	0.43 U	2.9 =	0.43 U	0.43 U	0.28 J	0.15 J	0.43 U	0.43 U	0.43 U	0.068 J	0.43 U
Pit 35	X186	10	0.077 J	0.24 J	0.45 U	0.45 U	0.45 U	0.45 U	4.5 =	0.45 U	0.07 J	0.36 J	0.071 J	0.45 U	0.45 U	0.082 J	0.45 U	0.45 U
Pit 36	X183	3	0.087 J	0.15 J	43 =	0.57 U	0.57 U	0.57 U	54 =	0.57 U	0.57 U	0.32 J	0.78 =	0.57 U	0.033 J	0.57 U	0.57 U	0.57 U
Pit 36	X184	6	0.14 J	0.38 J	0.57 =	0.05 J	0.46 U	0.46 U	0.46 U	0.46 U	0.15 J	0.47 =	0.13 J	0.46 U	0.13 J	0.13 J	0.07 J	0.46 U
Pit 37	X181	4	0.28 J	1.3 =	3 =	0.72 U	0.72 U	0.72 U	3.7 =	0.72 U	0.43 J	1.8 =	0.72 U	0.72 U	0.13 J	0.46 J	0.15 J	0.72 U
Pit 37	X182	13	55 =	150 =	6.1 U	6.1 U	6.1 U	6.1 U	15 =	6.1 U	23 =	310 =	6.1 U	6.1 U	59 =	4.7 J	6.1 U	6.1 U
Pit 38	X179	4	5.5 U	5.5 U	5.5 UJ	5.5 U	5.5 U	5.5 UJ	42 =	5.5 U	5.5 U	0.68 J	5.5 U	5.5 UJ	5.5 U	5.5 U	5.5 U	5.5 U
Pit 38	X180	6.5	1.1 J	1.2 J	2.3 J	0.79 J	6.9 U	6.9 UJ	16 =	6.9 U	1.2 J	7 =	0.98 J	6.9 UJ	6.9 U	1.6 J	6.9 U	6.9 U
Pit 39	X177	3	2.9 U	2.9 U	2.9 U	2.9 U	2.9 U	2.9 UJ	13 =	2.9 U	2.9 U	2.9 U	2.9 U	2.9 U	2.9 U	2.9 U	2.9 U	2.9 U
Pit 39	X178	8	5 J	4.8 J	7.3 UJ	0.77 J	7.3 U	7.3 UJ	44 =	7.3 U	7.3 U	23 =	7.3 U	7.3 UJ	2.1 J	1.3 J	7.3 U	7.3 U
Pit 42	X124	3	0.071 J	0.065 J	0.39 U	0.39 U	0.39 U	0.39 UJ	0.14 J	0.39 UJ	0.39 U	0.11 J	0.39 U	0.39 U	0.39 U	0.39 U	0.39 U	0.39 U
Pit 42	X126	12	0.39 U	0.054 J	0.39 U	0.39 U	0.39 U	0.39 UJ	0.086 J	0.39 UJ	0.39 U	0.085 J	0.39 U	0.39 U	0.39 U	0.39 U	0.39 U	0.39 U

Notes:

- =: sample concentration is detected at level reported
- U: sample concentration is under detection limit
- J: sample concentration is estimated value
- R: sample concentration value is rejected
- DL: sample is diluted
- RE: sample is re-extracted
- Ing.: Ingestion
- Inh.: Inhalation
- I: Class I
- II: Class II

Table E-9. SVOCs in Unnamed Parcel (mg/kg)

Station ID	Sample ID	Depth (ft.)	Fluoranthene	Fluorene	Hexachlorobenzene	Hexachlorobutadiene	Hexachlorocyclopentadiene	Hexachloroethane	Indeno(1,2,3-CD)pyrene	Isophorone	N-Nitrosodi-N-Propylamine	N-Nitrosodiphenylamine	Naphthalene	Nitrobenzene	Pentachlorophenol	Phenanthrene	Phenol	Pyrene
Industrial/ Commercial		*Ing*	*82000*	*82000*	*4*		*14000*	*2000*	*8*	*410000*	*0.8*	*1200*	*82000*	*1000*	*24*	*61000*	*1000000*	*61000*
		Inh			*1.8*		*16*			*4600*				*140*				
Construction Worker		*Ing*	*82000*	*82000*	*78*		*14000*	*2000*	*170*	*410000*	*18*	*25000*	*8200*	*1000*	*520*	*61000*	*120000*	*61000*
		Inh			*2.6*		*1.1*			*4600*				*9.4*				
Soil Component of GW		*I*	*4300*	*560*	*2*		*400*	*0.5*	*14*	*8*	*0.00005*	*1*	*84*	*0.1*	*0.03*	*140*	*100*	*4200*
		II	*21000*	*2800*	*11*		*2200*	*2.6*	*69*	*8*	*0.00005*	*5.6*	*420*	*0.1*	*0.14*	*700*	*100*	*21000*
Pit 02	X103	3	5.1 =	1.2 =	0.42 U	0.42 U	0.42 U	0.42 U	1.1 =	0.42 U	0.42 U	0.42 U	79 =	0.42 U	1.1 U	3.8 =	0.42 U	3.5 =
Pit 02	X104	6	0.06 J	0.41 U	0.41 U	0.41 U	0.41 U	0.41 U	0.41 U	0.41 U	0.41 U	0.15 J	0.094 J	0.41 U	1 U	0.12 J	0.41 U	0.11 J
Pit 03	X105	3	1.5 =	0.14 J	0.4 U	0.4 U	0.4 U	0.4 U	0.43 =	0.4 U	0.4 U	0.4 U	0.07 J	0.4 U	1 U	1.1 =	0.4 U	1.2 =
Pit 03	X106	6	0.61 =	0.57 =	0.52 U	0.52 U	0.52 U	0.52 U	0.076 J	0.52 U	0.52 U	0.52 U	0.85 =	0.52 U	1.3 U	1.2 =	0.52 U	0.97 =
Pit 03	X106DL	6	0.43 J	0.51 J	3.1 U	3.1 UJ	3.1 U	3.1 U	3.1 U	3.1 U	3.1 UJ	3.1 U	0.73 J	3.1 U	7.8 UJ	0.97 J	3.1 U	0.57 J
Pit 04	X107	3	5.5 =	0.72 =	0.46 U	0.46 U	0.46 U	0.46 U	2.9 =	0.46 U	0.46 U	0.46 U	0.79 =	0.46 U	1.2 U	3.3 =	0.46 U	7.2 =
Pit 04	X107DL	3	4.8 =	0.77 J	1.4 U	1.4 UJ	1.4 U	1.4 U	2.6 =	1.4 U	1.4 UJ	1.4 U	0.77 J	1.4 U	3.5 UJ	3.1 =	1.4 U	6.5 =
Pit 04	X108	8	0.49 U	0.49 U	0.49 U	0.49 U	0.49 U	0.49 U	0.49 U	0.49 U	0.49 U	0.49 U	0.15 J	0.49 U	1.2 U	0.052 J	0.49 U	0.05 J
Pit 05	X109	3	0.92 J	0.92 J	2.8 U	2.8 UJ	2.8 U	2.8 U	2.8 U	2.8 U	2.8 UJ	2.8 U	2.8 J	2.8 U	7.1 UJ	3 =	2.8 U	0.76 J
Pit 05	X110	3	1.1 =	0.72 =	0.46 U	0.46 U	0.46 U	0.46 U	0.13 J	0.46 U	0.46 U	0.46 U	2.9 =	0.46 U	1.2 U	4.2 =	0.46 U	0.47 =
Pit 05	X110DL	3	0.84 J	0.94 J	2.3 U	2.3 UJ	2.3 U	2.3 U	2.3 U	2.3 U	2.3 UJ	2.3 U	2.6 =	2.3 U	5.8 UJ	3.7 =	2.3 U	0.76 J
Pit 05	X111	8	0.75 =	0.17 J	0.66 U	0.66 U	0.66 U	0.66 U	0.12 J	0.66 U	0.66 U	0.66 U	5.2 =	0.66 U	1.7 U	0.65 J	0.66 U	0.35 J
Pit 05	X111DL	8	0.54 J	5.3 U	5.3 U	5.3 UJ	5.3 U	5.3 U	5.3 U	5.3 U	5.3 UJ	5.3 U	4.8 J	5.3 U	13 UJ	0.6 J	5.3 U	5.3 U
Pit 06	X112	3	6.7 =	1.1 =	0.52 U	0.52 U	0.52 U	0.52 U	1.2 =	0.52 U	0.52 U	0.52 U	3.3 =	0.52 U	1.3 U	5.9 =	0.52 U	4.2 =
Pit 06	X112DL	3	5.6 =	1 J	1.5 U	1.5 UJ	1.5 U	1.5 U	1.2 J	1.5 U	1.5 UJ	1.5 U	3.4 =	1.5 U	3.9 UJ	5.5 =	1.5 U	4.4 =
Pit 06	X113	8	0.11 J	0.52 U	0.52 U	0.52 U	0.52 U	0.52 U	0.52 U	0.52 U	0.52 U	0.52 U	0.09 J	0.52 U	1.3 U	0.14 J	0.52 U	0.088 J
Pit 07	X114	3	0.43 J	0.45 U	0.45 U	0.45 U	0.45 U	0.45 U	0.45 UJ	0.45 U	0.45 U	0.45 U	9 =	0.45 U	1.1 U	1.1 =	0.45 U	0.74 =
Pit 07	X115	8	1.3 =	0.29 J	0.54 U	0.54 U	0.54 U	0.54 U	0.19 J	0.54 U	0.54 U	0.28 J	1.4 =	0.54 U	1.4 U	1.4 =	0.54 U	0.83 =
Pit 07	X115DL	8	1.5 J	3.8 U	3.8 U	3.8 UJ	3.8 U	3.8 U	3.8 U	3.8 U	3.8 UJ	3.8 U	1.5 J	3.8 U	9.5 UJ	1.6 J	3.8 U	1.1 J
Pit 08	X116	3	2.3 =	0.1 J	0.41 U	0.41 UJ	0.41 U	0.41 U	0.91 =	0.41 U	0.41 UJ	0.41 U	0.089 J	0.41 U	1 UJ	1.2 =	0.41 U	1.7 =
Pit 08	X117	8	28 =	3.6 J	5.3 U	5.3 UJ	5.3 U	5.3 U	4.9 J	5.3 U	5.3 UJ	1.5 J	2.9 J	5.3 U	13 UJ	23 =	1.3 J	20 =
Pit 08	X117DL	8	28 =	3.6 J	5.3 U	5.3 UJ	5.3 U	5.3 U	4.9 J	5.3 U	5.3 UJ	1.5 J	2.9 J	5.3 U	13 UJ	23 =	1.3 J	20 =
Pit 09	X118	3	0.75 =	0.41 U	0.41 U	0.41 UJ	0.41 U	0.41 U	0.34 J	0.41 U	0.41 UJ	0.41 U	0.41 U	0.41 U	1 UJ	0.36 J	0.41 U	0.61 =
Pit 09	X119	8	1.5 =	0.19 J	0.54 U	0.54 UJ	0.54 U	0.54 U	0.61 =	0.54 U	0.54 UJ	0.54 U	0.15 J	0.54 U	1.4 UJ	0.56 =	0.54 U	1 =
Pit 10	X120	3	0.41 U	0.41 U	0.41 U	0.41 U	0.41 U	0.41 U	0.41 U	0.41 U	0.41 U	0.41 U	0.41 U	0.41 U	1 U	0.065 J	0.41 U	0.41 U
Pit 10	X121	8	93 =	14 =	1.4 U	1.4 UJ	1.4 U	1.4 U	13 =	1.4 U	1.4 U	1.4 U	7.1 =	1.4 U	3.4 UJ	89 =	1.4 U	64 =

Table E-9. SVOCs in Unnamed Parcel (mg/kg)

Station ID	Sample ID	Depth (ft.)	Fluoranthene	Fluorene	Hexachlorobenzene	Hexachlorobutadiene	Hexachlorocyclopentadiene	Hexachloroethane	Indeno(1,2,3-CD)pyrene	Isophorone	N-Nitrosodi-N-Propylamine	N-Nitrosodiphenylamine	Naphthalene	Nitrobenzene	Pentachlorophenol	Phenanthrene	Phenol	Pyrene
Industrial/ Commercial		*Ing*	*82000*	*82000*	*4*		*14000*	*2000*	*8*	*410000*	*0.8*	*1200*	*82000*	*1000*	*24*	*61000*	*1000000*	*61000*
		Inh			*1.8*		*16*			*4600*				*140*				
Construction Worker		*Ing*	*82000*	*82000*	*78*		*14000*	*2000*	*170*	*410000*	*18*	*25000*	*8200*	*1000*	*520*	*61000*	*120000*	*61000*
		Inh			*2.6*		*1.1*			*4600*				*9.4*				
Soil Component of GW		*I*	*4300*	*560*	*2*		*400*	*0.5*	*14*	*8*	*0.00005*	*1*	*84*	*0.1*	*0.03*	*140*	*100*	*4200*
		II	*21000*	*2800*	*11*		*2200*	*2.6*	*69*	*8*	*0.00005*	*5.6*	*420*	*0.1*	*0.14*	*700*	*100*	*21000*
Pit 11	X122	3	0.47 =	0.39 U	0.39 U	0.39 UJ	0.39 U	0.39 U	0.22 J	0.39 U	0.39 U	0.39 U	0.39 U	0.39 U	0.98 UJ	0.29 J	0.39 U	0.63 =
Pit 11	X123	8	0.65 =	0.4 U	0.4 U	0.4 UJ	0.4 U	0.4 U	0.19 J	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	1 UJ	0.43 =	0.4 U	0.96 =
Pit 11	X125	30	1.7 =	0.13 J	0.39 U	0.39 UJ	0.39 U	0.39 U	0.45 =	0.39 U	0.39 U	0.39 U	0.39 U	0.39 U	0.98 UJ	1.2 =	0.39 U	2 =
Pit 12	X127	3	2.3 =	0.23 J	0.47 U	0.47 UJ	0.47 U	0.47 U	0.45 J	0.47 U	0.47 U	0.37 J	0.4 J	0.47 U	1.2 UJ	1.4 =	0.47 U	1.4 =
Pit 12	X128	6	0.48 J	0.37 J	0.87 U	0.87 UJ	0.87 U	0.87 U	0.87 U	0.87 U	0.87 U	0.87 U	81 =	0.87 U	2.2 UJ	1.1 =	0.87 U	0.45 J
Pit 13	X129	3	5.2 =	0.31 J	0.83 U	0.83 UJ	0.83 U	0.83 U	2.8 =	0.83 U	0.83 U	0.83 U	0.52 J	0.83 U	2.1 UJ	2.7 =	0.83 U	5 =
Pit 13	X130	8	3 =	0.69 U	0.69 U	0.69 UJ	0.69 U	0.69 U	0.25 J	0.69 U	0.69 U	0.69 U	1.2 =	0.69 U	1.7 UJ	2 =	0.69 U	3.9 =
Pit 14	X131	3	1 =	0.13 J	0.83 U	0.83 UJ	0.83 U	0.83 U	0.33 J	0.83 U	0.83 U	0.22 J	0.22 J	0.83 U	2.1 UJ	0.78 J	0.83 U	1.1 =
Pit 14	X132	8	0.5 J	0.094 J	0.51 U	0.51 UJ	0.51 U	0.51 U	0.11 J	0.51 U	0.51 U	0.2 J	0.14 J	0.51 U	1.3 UJ	0.37 J	0.51 U	0.38 J
Pit 15	X133	3	0.57 J	2.2 U	2.2 U	2.2 U	2.2 U	2.2 U	0.31 J	2.2 U	2.2 U	2.2 U	0.33 J	2.2 U	5.4 U	0.61 J	2.2 U	0.56 J
Pit 15	X134	8	1.6 =	0.23 J	0.52 U	0.52 UJ	0.52 U	0.52 U	0.33 J	0.52 U	0.52 U	0.41 J	1 =	0.52 U	1.3 UJ	1.2 =	0.52 U	1.1 =
Pit 16	X135	3	6.2 =	2.2 U	2.2 U	2.2 UJ	2.2 U	2.2 U	2.2 =	2.2 U	2.2 U	0.37 J	2.2 U	2.2 U	5.6 UJ	3.8 =	2.2 U	6 =
Pit 16	X136	6	8.9 =	1.6 =	0.75 U	0.75 UJ	0.75 UJ	0.75 U	1.4 =	0.75 U	0.75 U	0.67 J	1.1 =	0.75 U	1.9 UJ	5.5 =	0.75 U	5.4 =
Pit 17	X137	3	67 =	8.7 =	4 U	4 UJ	4 UJ	4 U	10 =	4 U	4 U	4 U	2.3 J	4 U	10 UJ	64 =	4 U	48 =
Pit 17	X138	11	19 =	6.8 =	4.3 U	4.3 UJ	4.3 UJ	4.3 U	2.8 J	4.3 U	4.3 U	4.3 U	11 =	4.3 U	11 UJ	27 =	4.3 U	16 =
Pit 18	X139	3	2.3 =	0.48 J	1 U	1 UJ	1 U	1 U	0.43 J	1 U	1 UJ	1 U	0.53 J	1 U	2.6 UJ	2 =	1 U	1.4 =
Pit 18	X140	10	1.5 =	0.15 J	0.47 U	0.47 UJ	0.47 UJ	0.47 U	0.72 =	0.47 U	0.47 U	0.47 U	0.39 J	0.47 U	1.2 UJ	0.88 =	0.47 U	1.4 =
Pit 19	X141	3	0.46 =	0.44 U	0.44 U	0.44 U	0.44 U	0.44 U	0.11 J	0.44 U	0.44 U	0.44 U	0.53 =	0.44 U	1.1 U	0.23 J	0.44 U	0.42 J
Pit 19	X142	14	3.9 =	0.54 =	0.53 U	0.53 U	0.53 U	0.53 U	1 =	0.53 U	0.53 U	0.53 U	0.99 =	0.53 U	1.3 U	4.2 =	0.53 U	3.4 =
Pit 20	X143	3	0.51 =	2.1 =	0.45 U	0.45 U	0.45 U	0.45 U	0.2 J	0.45 U	0.45 U	0.45 U	2.6 =	0.45 U	1.1 U	4 =	0.45 U	1.4 =
Pit 20	X144	3	0.91 =	2.1 =	0.49 U	0.49 U	0.49 U	0.49 U	0.28 J	0.49 U	0.49 U	0.49 U	2.8 =	0.49 U	1.2 U	6.3 =	0.49 U	2.7 =
Pit 20	X145	7	3.8 =	0.62 J	0.62 U	0.62 U	0.62 U	0.62 U	0.8 =	0.62 U	0.62 U	0.62 U	0.62 =	0.62 U	1.6 U	3 =	0.62 U	2.9 =
Pit 21	X146	3	2.1 =	0.67 J	2 U	2 U	2 U	2 U	0.6 J	2 U	2 U	2 U	7.9 =	2 U	9.6 =	8.6 =	2 U	1.4 J
Pit 21	X147	5	2.4 J	0.94 J	4.2 U	4.2 U	4.2 U	4.2 U	0.71 J	4.2 U	4.2 U	4.2 U	21 =	4.2 U	7.6 J	7.6 =	4.2 J	2.7 J
Pit 21	X148	10	4.6 J	14 U	14 U	14 UJ	14 UJ	14 U	1.4 J	14 U	14 UJ	14 U	27 =	14 U	36 UJ	5 J	97 =	5.4 J
Pit 22	X160	3	0.5 U	0.5 U	0.5 U	0.5 UJ	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UJ	0.5 U	0.5 U	1.3 U	0.5 U	0.5 U	0.5 U

Table E-9. SVOCs in Unnamed Parcel (mg/kg)

Station ID	Sample ID	Depth (ft.)	Fluoranthene	Fluorene	Hexachlorobenzene	Hexachlorobutadiene	Hexachlorocyclopentadiene	Hexachloroethane	Indeno(1,2,3-CD)pyrene	Isophorone	N-Nitrosodi-N-Propylamine	N-Nitrosodiphenylamine	Naphthalene	Nitrobenzene	Pentachlorophenol	Phenanthrene	Phenol	Pyrene
Industrial/ Commercial		*Ing*	*82000*	*82000*	*4*		*14000*	*2000*	*8*	*410000*	*0.8*	*1200*	*82000*	*1000*	*24*	*61000*	*1000000*	*61000*
		Inh			*1.8*		*16*			*4600*				*140*				
Construction Worker		*Ing*	*82000*	*82000*	*78*		*14000*	*2000*	*170*	*410000*	*18*	*25000*	*8200*	*1000*	*520*	*61000*	*120000*	*61000*
		Inh			*2.6*		*1.1*			*4600*				*9.4*				
Soil Component of GW		*I*	*4300*	*560*	*2*		*400*	*0.5*	*14*	*8*	*0.00005*	*1*	*84*	*0.1*	*0.03*	*140*	*100*	*4200*
		II	*21000*	*2800*	*11*		*2200*	*2.6*	*69*	*8*	*0.00005*	*5.6*	*420*	*0.1*	*0.14*	*700*	*100*	*21000*
Pit 22	X161	10	0.18 J	0.12 J	0.62 U	0.62 UJ	0.62 U	0.62 U	0.068 J	0.065 J	0.62 U	0.36 J	4.4 =	0.62 U	1.6 U	0.3 J	0.62 U	0.2 J
Pit 22	X161DL	10	0.22 J	1.2 U	1.2 U	1.2 UJ	1.2 U	1.2 U	1.2 U	1.2 U	1.2 UJ	1.2 U	5.2 =	1.2 U	3.1 U	0.37 J	1.2 U	0.29 J
Pit 23	X158	3	15 U	15 U	15 U	15 U	15 U	15 U	15 U	15 U	15 U	4.8 J	27 =	15 U	38 U	15 U	15 U	15 U
Pit 23	X159	10	0.24 J	0.99 U	0.99 U	0.99 U	0.99 U	0.99 U	0.99 U	0.99 U	0.99 U	0.99 U	0.35 J	0.99 U	2.5 U	0.26 J	0.99 U	0.24 J
Pit 24	X156	3	0.58 J	0.27 J	0.75 U	0.75 U	0.75 U	0.75 U	0.17 J	0.75 U	0.75 U	0.75 U	1.4 =	0.75 U	1.9 U	0.89 =	0.75 U	0.65 J
Pit 24	X157	8	2.1 =	0.18 J	0.79 U	0.79 U	0.79 U	0.79 U	0.37 J	0.79 U	0.79 U	0.79 U	0.27 J	0.79 U	2 U	1.1 =	0.79 U	1.7 =
Pit 25	X154	3	0.63 =	0.11 J	0.41 U	0.41 U	0.41 U	0.41 U	0.26 J	0.41 U	0.41 U	0.41 U	0.27 J	0.41 U	1 U	0.55 =	0.41 U	0.48 =
Pit 25	X155	8	0.29 J	0.074 J	0.57 U	0.57 U	0.57 U	0.57 U	0.21 J	0.57 U	0.57 U	0.57 U	0.27 J	0.57 U	1.4 U	0.34 J	0.57 U	0.41 J
Pit 26	X152	3	9.6 =	0.79 =	0.46 U	0.46 U	0.46 U	0.46 U	2 =	0.46 U	0.46 U	0.46 U	0.61 =	0.46 U	1.2 U	4.8 =	0.061 J	6.9 =
Pit 26	X153	6	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	1.9 U	0.75 U	0.75 U	0.75 U
Pit 27	X149	3	2.4 J	2.7 U	2.7 U	2.7 U	2.7 U	2.7 U	1.2 J	2.7 U	2.7 U	1.6 J	0.8 J	2.7 U	6.8 U	1.9 J	2.7 U	2.1 J
Pit 27	X150	8	0.33 J	0.07 J	0.5 U	0.5 U	0.5 U	0.5 U	0.11 J	0.5 U	0.5 U	0.5 U	0.11 J	0.5 U	1.3 U	0.34 J	0.19 J	0.26 J
Pit 27	X151	30	4 =	0.37 J	0.57 U	0.57 U	0.57 U	0.098 J	0.75 =	0.57 U	0.57 U	0.57 U	0.44 J	0.57 U	1.4 U	3.5 =	0.51 J	2.8 =
Pit 28	X175	3	8.4 =	1.3 =	0.44 U	0.44 UJ	0.44 U	0.44 U	1.4 =	0.44 U	0.44 UJ	0.44 U	1.9 =	0.44 U	1.1 UJ	4.1 =	0.44 U	6.9 J
Pit 28	X176	6	13 =	8.2 =	4.8 U	4.8 UJ	4.8 U	4.8 U	2.2 J	4.8 U	4.8 UJ	4.8 U	330 =	4.8 U	12 U	22 =	4.8 U	9.7 =
Pit 29	X173	3	9.5 =	1.1 J	1.8 UJ	1.8 UJ	1.8 U	1.8 U	3.1 =	1.8 U	1.8 U	1.8 U	2.1 =	1.8 U	4.5 U	5.6 =	1.8 U	13 =
Pit 29	X174	10	1.3 =	0.19 J	0.77 U	0.77 UJ	0.77 U	0.77 U	0.34 J	0.77 U	0.77 UJ	0.32 J	0.47 J	0.77 U	0.11 J	1 =	0.77 U	1.6 =
Pit 30	X171	3	0.42 J	0.51 U	0.51 U	0.51 U	0.51 U	0.51 U	0.26 J	0.51 U	0.51 U	0.51 U	0.51 U	0.51 U	1.3 U	0.17 J	0.51 U	0.45 J
Pit 30	X172	7.5	68 =	2.8 J	11 UJ	11 UJ	11 U	11 U	12 =	11 U	11 U	11 U	11 U	11 U	27 U	32 =	11 U	47 =
Pit 31	X169	2.5	1.4 J	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	0.6 J	2.5 U	2.5 U	0.37 J	160 =	2.5 U	6.4 U	1.1 J	2.5 U	1.5 J
Pit 31	X170	6	0.29 J	0.72 U	0.72 UJ	0.72 UJ	0.72 U	0.72 U	0.13 J	0.72 U	0.72 U	0.72 U	0.39 J	0.72 U	1.8 U	0.31 J	0.72 U	0.48 J
Pit 32	X167	3	1.8 =	0.093 J	0.7 U	0.7 U	0.7 U	0.7 U	0.52 J	0.7 U	0.7 U	0.7 U	0.7 U	0.7 U	1.8 U	0.84 =	0.7 U	1.9 =
Pit 32	X168	6	0.29 J	0.044 J	0.41 U	0.41 UJ	0.41 U	0.41 U	0.079 J	0.41 U	0.41 U	0.41 UJ	0.13 J	0.41 U	1 U	0.21 J	0.41 U	0.27 J
Pit 33	X165	3	1.1 =	0.78 J	0.88 UJ	0.88 UJ	0.88 U	0.88 U	0.88 U	0.88 U	0.88 U	0.88 U	4.9 =	0.88 U	2.2 U	2.3 =	0.88 U	0.63 J
Pit 33	X166	7	1.3 J	11 U	11 UJ	11 UJ	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U	26 U	1.3 J	11 U	1.1 J
Pit 34	X162	3	0.16 J	0.46 U	0.46 U	0.46 UJ	0.46 U	0.46 U	0.071 J	0.46 U	0.46 U	0.46 UJ	0.46 U	0.46 U	1.2 U	0.098 J	0.46 U	0.15 J

Table E-9. SVOCs in Unnamed Parcel (mg/kg)

Station ID	Sample ID	Depth (ft.)	Fluoranthene	Fluorene	Hexachlorobenzene	Hexachlorobutadiene	Hexachlorocyclopentadiene	Hexachloroethane	Indeno(1,2,3-CD)pyrene	Isophorone	N-Nitrosodi-N-Propylamine	N-Nitrosodiphenylamine	Naphthalene	Nitrobenzene	Pentachlorophenol	Phenanthrene	Phenol	Pyrene
Industrial/ Commercial		*Ing*	*82000*	*82000*	*4*		*14000*	*2000*	*8*	*410000*	*0.8*	*1200*	*82000*	*1000*	*24*	*61000*	*1000000*	*61000*
		Inh			*1.8*		*16*			*4600*				*140*				
Construction Worker		*Ing*	*82000*	*82000*	*78*		*14000*	*2000*	*170*	*410000*	*18*	*25000*	*3200*	*1000*	*520*	*61000*	*120000*	*61000*
		Inh			*2.6*		*1.1*			*4600*				*9.4*				
Soil Component of GW		*I*	*4300*	*560*	*2*		*400*	*0.5*	*14*	*8*	*0.00005*	*1*	*84*	*0.1*	*0.03*	*140*	*100*	*4200*
		II	*21000*	*2800*	*11*		*2200*	*2.6*	*69*	*8*	*0.00005*	*5.6*	*420*	*0.1*	*0.14*	*700*	*100*	*21000*
Pit 34	X163	10	3.8 =	0.66 U	0.66 U	0.66 UJ	0.66 U	0.66 U	0.61 J	0.66 U	0.66 U	0.66 UJ	0.31 J	0.66 U	1.7 U	1.3 =	0.66 U	3.4 =
Pit 34	X164	30	25 =	3.4 J	4.3 UJ	4.3 UJ	4.3 U	4.3 U	3.6 J	4.3 U	4.3 U	4.3 U	1.7 J	4.3 U	11 U	21 =	4.3 U	17 =
Pit 35	X185	4	0.51 =	0.088 J	0.43 U	0.43 U	0.43 U	0.43 U	0.19 J	0.43 U	0.43 U	0.43 U	0.24 J	0.43 U	1.1 U	0.48 =	0.43 U	0.48 =
Pit 35	X186	10	0.66 =	0.26 J	0.45 U	0.45 U	0.45 U	0.45 U	0.19 J	0.45 U	0.45 U	0.45 U	0.29 J	0.45 U	1.1 U	0.42 J	0.45 U	0.83 =
Pit 36	X183	3	0.36 J	0.57 U	0.57 U	0.57 U	0.57 U	0.57 U	0.11 J	0.57 U	0.57 U	0.57 U	0.085 J	0.57 U	1.4 U	0.45 J	0.57 U	0.48 J
Pit 36	X184	6	1.3 =	0.24 J	0.46 U	0.46 U	0.46 U	0.46 U	0.32 J	0.46 U	0.46 U	0.71 =	0.36 J	0.46 U	1.2 U	1.5 =	0.46 U	1 =
Pit 37	X181	4	3.2 =	0.69 J	0.72 U	0.72 U	0.72 U	0.72 U	0.77 =	0.72 U	0.72 U	0.72 U	1.1 =	0.72 U	1.8 U	1.5 =	0.72 U	2.6 J
Pit 37	X182	13	510 =	18 =	6.1 U	6.1 U	6.1 U	6.1 U	140 =	6.1 U	6.1 U	6.1 U	0.92 J	6.1 U	15 U	210 =	6.1 U	440 =
Pit 38	X179	4	1.2 J	0.9 J	5.5 U	5.5 UJ	5.5 U	5.5 U	5.5 U	5.5 U	5.5 UJ	5.5 U	1.5 J	5.5 U	14 U	2.2 J	5.5 U	1.1 J
Pit 38	X180	6.5	14 =	1.8 J	6.9 U	6.9 UJ	6.9 U	6.9 U	1.2 J	6.9 U	6.9 UJ	6.9 U	3.9 J	6.9 U	17 U	9.7 =	6.9 U	10 =
Pit 39	X177	3	0.7 J	0.34 J	2.9 UJ	2.9 UJ	2.9 U	2.9 U	2.9 U	2.9 U	2.9 U	2.9 U	0.41 J	2.9 U	7.2 U	1.5 J	2.9 U	0.54 J
Pit 39	X178	8	24 =	2.3 J	7.3 U	7.3 UJ	7.3 U	7.3 U	5.3 J	7.3 U	7.3 UJ	7.3 U	3.7 J	7.3 U	18 U	20 =	7.3 U	36 =
Pit 42	X124	3	0.17 J	0.39 U	0.39 U	0.39 UJ	0.39 U	0.39 U	0.057 J	0.39 U	0.39 U	0.39 U	0.39 U	0.39 U	0.99 UJ	0.17 J	0.39 U	0.23 J
Pit 42	X126	12	0.057 J	0.39 U	0.39 U	0.39 UJ	0.39 U	0.39 U	0.39 U	0.39 U	0.39 U	0.39 U	0.39 U	0.39 U	0.99 UJ	0.062 J	0.39 U	0.094 J

Notes:

=: sample concentration is detected at level reported
U: sample concentration is under detection limit
J: sample concentration is estimated value
R: sample concentration value is rejected
DL: sample is diluted
RE: sample is re-extracted
Ing.: Ingestion
Inh.: Inhalation
I: Class I
II: Class II

Table E-10. PCBs and Pesticides in Alburn (mg/kg)

			PCBs							Pesticides/Herbicides							
Station ID	Sample ID	Depth (ft.)	Arochlor 1016	Arochlor 1221	Arochlor 1232	Arochlor 1242	Arochlor 1248	Arochlor 1254	Arochlor 1260	Aldrin	alpha-BHC	alpha-Chlordane	alpha-Endosulfan	Atrazine	beta-BHC	beta-Endosulfan	delta-BHC
Industrial/ Commercial		*Ing*	*Sum of the Arochlors can be 1 mg/kg*							*0.3*	*0.9*			*72000*			
		Inh								*6.6*	*1.5*						
Construction Worker		*Ing*								*6.1*	*20*			*7100*			
		Inh								*9.3*	*2.1*						
Soil Component of GW		*I*								*0.5*	*0.0005*			*0.066*			
		II								*2.5*	*0.003*			*0.33*			
Pit 01	X101	2.5	0.038 U	0.077 U	0.038 U	0.038 U	0.038 U	0.038 U	0.038 U	0.002 U	0.002 U	0.00093 J	0.002 U	0.37 U	0.0012 J	0.0025 J	0.002 U
Pit 01	X101DL	2.5	0.19 U	0.38 U	0.19 U	0.19 U	0.19 U	0.22 =	0.19 U	0.0098 U	0.0098 U	0.00071 J	0.0098 U	1.5 U	0.0098 U	0.0025 J	0.0002 J
Pit 01	X102	7.5	0.038 U	0.076 U	0.038 U	0.038 U	0.038 U	0.15 =	0.038 U	0.0019 U	0.0019 U	0.0018 J	0.0019 U	0.38 U	0.0019 U	0.001 J	0.00016 J
Pit 01	X102DL	7.5												3.8 U			
Pit 01B	X101	3	0.04 U	0.082 U	0.04 U	0.04 U	0.04 U	0.09 J	0.04 U	0.0021 U	0.0014 J	0.0021 U	0.0021 U	0.4 U	0.0046 J	0.004 U	0.0021 U
Pit 01B	X101DL	3	0.2 U	0.41 U	0.2 U	0.2 U	0.2 U	0.085 J	0.2 U	0.01 U	0.01 U	0.01 U	0.01 U		0.01 U	0.02 U	0.01 U
Pit 01B	X102	6	0.044 U	0.089 U	0.044 U	0.044 U	0.044 U	0.044 U	0.057 J	0.0023 U	0.0023 U	0.0048 J	0.0023 U	0.44 U	0.014 J	0.0044 U	0.0023 U
Pit 01B	X102DL	6	0.22 U	0.45 U	0.22 U	0.22 U	0.45 J	0.22 U	0.11 J	0.011 U	0.011 U	0.007 J	0.011 U		0.016 J	0.022 U	0.011 U
Pit 02	X103	2	0.045 U	0.092 U	0.045 U	0.045 U	0.045 U	0.045 U	0.045 U	0.0023 U	0.0023 U	0.00029 J	0.0023 U	0.48 U	0.0023 U	0.0045 U	0.0023 U
Pit 02	X104	6	0.039 R	0.08 R	0.039 R	0.039 R	0.039 R	0.039 R	0.039 R	0.011 J	0.000078 J	0.00076 J	0.002 U	0.41 U	0.000074 J	0.0025 J	0.0019 J
Pit 02	X104RE	6												0.43 U			
Pit 03	X105	2.5	0.053 U	0.11 U	0.053 U	0.053 U	0.053 U	0.18 =	0.053 U	0.0027 U	0.0027 U	0.00046 J	0.0027 U	0.5 U	0.0027 U	0.003 J	0.0027 U
Pit 03	X105RE	2.5												0.54 U			
Pit 03	X106	0.5	0.055 U	0.11 U	0.055 U	0.055 U	0.055 U	0.081 =	0.055 U	0.0028 U	0.0028 U	0.00048 J	0.0028 U	0.57 U	0.0028 U	0.0055 U	0.0028 U
Pit 03	X107	6	0.059 UJ	0.12 UJ	0.059 UJ	0.059 UJ	0.059 UJ	0.059 UJ	0.059 UJ	0.003 UJ	0.04 J	0.003 UJ	0.003 UJ	0.56 U	0.003 UJ	0.0059 UJ	0.003 UJ
Pit 03	X107DL	6	0.29 UJ	0.59 UJ	0.29 UJ	0.29 UJ	0.29 UJ	0.82 J	0.29 UJ	0.015 UJ	0.034 J	0.0075 J	0.015 UJ	2.8 U	0.015 UJ	0.029 UJ	0.015 UJ
Pit 04	X108	3	0.037 U	0.075 U	0.037 U	0.037 U	0.037 U	0.037 U	0.037 U	0.0019 U	0.0019 U	0.0044 =	0.0053 =	0.37 U	0.0019 U	0.0011 J	0.0004 J
Pit 04	X109	3	0.035 U	0.071 U	0.035 U	0.035 U	0.035 U	0.035 U	0.035 U	0.0018 U	0.0018 U	0.004 =	0.0018 U	0.37 U	0.0018 U	0.0014 J	0.00038 J
Pit 04	X110	6	0.044 R	0.09 R	0.044 R	0.044 R	0.044 R	0.044 R	0.044 R	0.0023 R	0.0023 R	0.0095 J	0.011 J	8.9 U	0.0016 J	0.0044 R	0.0048 J
Pit 04	X110DL	6	0.44 UJ	0.9 UJ	0.44 UJ	0.44 UJ	0.44 UJ	0.44 UJ	0.44 UJ	0.023 UJ	0.023 UJ	0.11 J	0.14 J		0.00053 J	0.0057 J	0.011 J
Pit 05	X111	5	0.036 U	0.073 U	0.036 U	0.036 U	0.16 =	0.036 U	0.036 U	0.0019 U	0.0019 U	0.002 =	0.0029 =	0.39 U	0.0019 U	0.0036 U	0.0019 U
Pit 07	X112	3	0.038 U	0.077 U	0.038 U	0.038 U	0.038 U	0.038 U	0.038 U	0.002 U	0.000077 J	0.0066 =	0.0078 =	0.39 U	0.002 U	0.0014 J	0.0004 J
Pit 07	X112DL	3												2 U			
Pit 08	X113	2.5	0.043 U	0.087 U	0.043 U	0.043 U	0.043 U	0.043 U	0.043 U	0.0022 U	0.0022 U	0.005 =	0.0022 U	0.39 U	0.0022 U	0.0043 U	0.0022 U
Pit 08	X113RE	2.5												0.39 UJ			
Pit 08	X114	4	0.04 U	0.081 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.0021 U	0.0021 U	0.0038 J	0.0021 U	0.36 U	0.0021 U	0.0033 J	0.0021 U
Pit 08	X114DL	4	0.4 U	0.81 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.021 U	0.021 U	0.021 U	0.021 U	0.72 U	0.021 U	0.04 U	0.021 U
Pit 09	X115	2.5	0.037 U	0.074 U	0.037 U	0.037 U	0.19 =	0.11 =	0.037 U	0.0019 U	0.0019 U	0.0049 =	0.001 J	0.35 U	0.0019 U	0.0016 J	0.0019 U
Pit 09	X115DL	2.5												1.4 U			
Pit 09	X115RE	2.5												0.35 UJ			
Pit 09	X116	6	0.043 U	0.087 U	0.043 U	0.043 U	0.043 U	0.37 J	0.043 U	0.0022 U	0.0022 U	0.0022 U	0.0022 U	0.43 UJ	0.0022 U	0.0044 J	0.0022 U
Pit 09	X116DL	6	0.43 U	0.87 U	0.43 U	0.43 U	0.43 U	0.42 J	0.43 U	0.022 U	0.022 U	0.022 U	0.022 U	1.7 UJ	0.022 U	0.043 U	0.022 U

Table E-10. PCBs and Pesticides in Alburn (mg/kg)

			PCBs							Pesticides/Herbicides							
Station ID	Sample ID	Depth (ft.)	Arochlor 1016	Arochlor 1221	Arochlor 1232	Arochlor 1242	Arochlor 1248	Arochlor 1254	Arochlor 1260	Aldrin	alpha-BHC	alpha-Chlordane	alpha-Endosulfan	Atrazine	beta-BHC	beta-Endosulfan	delta-BHC
Industrial/ Commercial		*Ing*	*Sum of the Arochlors can be 1 mg/kg*							*0.3*	*0.9*			*72000*			
		Inh								*6.6*	*1.5*						
Construction Worker		*Ing*								*6.1*	*20*			*7100*			
		Inh								*9.3*	*2.1*						
Soil Component of GW		*I*								*0.5*	*0.0005*			*0.066*			
		II								*2.5*	*0.003*			*0.33*			
Pit 09	X116RE	6												0.43 U			
Pit 10	X117	2.5	0.37 U	0.75 U	0.37 U	0.37 U	0.37 U	0.49 J	0.37 U	0.019 U	0.019 U	0.019 U	0.019 U	0.39 UJ	0.019 U	0.014 J	0.019 U
Pit 10	X117DL	2.5	19 U	38 U	19 U	19 U	19 U	19 U	19 U	0.96 U	0.96 U	0.96 U	0.96 U	1.5 UJ	0.96 U	1.9 U	0.96 U
Pit 10	X117RE	2.5												0.39 U			
Pit 10	X118	6	0.51 U	1 U	0.51 U	0.51 U	7.8 J	4.1 J	0.51 U	0.026 U	0.041 J	0.026 U	0.026 U	0.5 UJ	0.026 U	0.014 J	0.026 U
Pit 10	X118DL	6	2.5 U	5.2 U	2.5 U	2.5 U	10 J	7.9 J	2.5 U	0.13 U	0.13 U	0.13 U	0.13 U	2 U	0.13 U	0.25 U	0.13 U
Pit 10	X118RE	6												0.5 U			
Pit 11	X119	2.5	0.039 U	0.08 U	0.039 U	0.039 U	0.075 J	0.066 J	0.039 U	0.002 U	0.002 U	0.002 U	0.002 U	0.39 U	0.0017 J	0.0039 U	0.002 U
Pit 11	X119DL	2.5												1.9 UJ			
Pit 11	X119RE	2.5												0.39 U			
Pit 11	X120	6	0.049 U	0.098 U	0.049 U	0.049 U	0.87 J	0.72 J	0.049 U	0.0025 U	0.0025 U	0.043 J	0.0025 U	0.44 UJ	0.0025 U	0.0041 J	0.0025 U
Pit 11	X120DL	6	0.24 U	0.49 U	0.24 U	0.24 U	0.76 J	0.76 J	0.24 U	0.012 U	0.012 U	0.033 J	0.012 U	1.8 UJ	0.012 U	0.024 U	0.012 U
Pit 11	X120RE	6												0.44 U			
Pit 12	X159	3	0.048 U	0.096 U	0.048 U	0.048 U	1.7 J	0.048 U	0.048 U	0.0025 U	0.037 J	0.0013 J	0.0017 J	4.7 U	0.061 J	0.0051 J	0.0014 J
Pit 12	X159DL	3	0.48 U	0.96 U	0.48 U	0.48 U	2.1 J	0.48 U	0.48 U	0.024 U	0.059 J	0.024 U	0.024 U		0.077 J	0.0052 J	0.024 U
Pit 12	X160	3	0.046 U	0.093 U	0.046 U	0.046 U	0.046 U	0.046 U	0.046 U	0.0024 U	0.04 J	0.0015 J	0.0024 U	0.47 UJ	0.054 J	0.0054 J	0.001 J
Pit 12	X160DL	3	0.46 U	0.93 U	0.46 U	0.46 U	0.46 U	0.46 U	0.46 U	0.024 U	0.063 J	0.024 U	0.024 U	2.3 U	0.062 J	0.0057 J	0.024 U
Pit 12	X160RE	3												0.47 UJ			
Pit 12	X161	9	0.039 U	0.08 U	0.039 U	0.039 U	0.098 =	0.039 U	0.039 U	0.002 U	0.003 =	0.002 U	0.002 U	0.4 U	0.00052 J	0.00022 J	0.002 U
Pit 13	X145	3	0.034 U	0.069 U	0.034 U	0.034 U	0.034 U	0.034 U	0.034 U	0.0018 U	0.0018 UJ	0.0018 U	0.0018 U	0.36 U	0.0018 U	0.0034 U	0.0018 UJ
Pit 13	X145RE	3												0.36 U			
Pit 13	X146	9	0.041 U	0.082 U	0.041 U	0.041 U	0.98 J	0.49 J	0.041 U	0.0021 U	0.012 J	0.0054 J	0.0032 J	4.2 U	0.0021 U	0.0041 U	0.0021 UJ
Pit 13	X146DL	9	0.41 U	0.82 U	0.41 U	0.41 U	1.4 =	0.75 =	0.41 U	0.021 U	0.021 UJ	0.021 U	0.021 U		0.021 U	0.041 U	0.021 UJ
Pit 14	X147	3	0.41 U	0.83 U	0.41 U	0.41 U	0.16 J	0.41 U	0.41 U	0.021 U	0.021 U	0.021 U	0.021 U	0.43 UJ	0.021 U	0.041 U	0.021 U
Pit 14	X147RE	3												0.43 UJ			
Pit 14	X148	9	0.88 U	1.8 U	0.88 U	0.88 U	1.3 =	0.88 U	0.88 U	0.045 U	0.045 U	0.045 U	0.045 U	4.3 U	0.045 U	0.088 U	0.045 U
Pit 14	X148DL	9												8.6 U			
Pit 14	X148RE	9												4.3 U			
Pit 15	X121	3	0.046 U	0.093 U	0.046 U	0.046 U	0.12 =	0.046 U	0.1 =	0.0024 U	0.0024 U	0.0031 =	0.0024 U	0.45 U	0.0024 U	0.0046 U	0.0024 U
Pit 16	X142	3	0.042 U	0.085 U	0.042 U	0.042 U	0.042 U	0.13 =	0.042 U	0.0029 =	0.0033 =	0.0066 =	0.0022 U	0.44 U	0.0022 U	0.0042 U	0.0022 U
Pit 16	X142DL	3	0.42 U	0.85 U	0.42 U	0.42 U	0.42 U	0.21 J	0.42 U	0.022 U	0.022 U	0.022 U	0.022 U	1.8 U	0.022 U	0.042 U	0.022 U
Pit 16	X142RE	3												0.44 U			

Table E-10. PCBs and Pesticides in Alburn (mg/kg)

			PCBs							Pesticides/Herbicides							
Station ID	Sample ID	Depth (ft.)	Arochlor 1016	Arochlor 1221	Arochlor 1232	Arochlor 1242	Arochlor 1248	Arochlor 1254	Arochlor 1260	Aldrin	alpha-BHC	alpha-Chlordane	alpha-Endosulfan	Atrazine	beta-BHC	beta-Endosulfan	delta-BHC
Industrial/ Commercial		*Ing*	*Sum of the Arochlors can be 1 mg/kg*							*0.3*	*0.9*			*72000*			
		Inh								*6.6*	*1.5*						
Construction Worker		*Ing*								*6.1*	*20*			*7100*			
		Inh								*9.3*	*2.1*						
Soil Component of GW		*I*								*0.5*	*0.0005*			*0.066*			
		II								*2.5*	*0.003*			*0.33*			
Pit 16	X143	3	0.041 U	0.083 U	0.041 U	0.041 U	0.15 =	0.11 =	0.041 U	0.0029 =	0.0035 =	0.0088 =	0.0021 U	0.4 U	0.0021 U	0.0041 U	0.0021 U
Pit 16	X143DL	3	0.41 U	0.83 U	0.41 U	0.41 U	0.41 U	0.2 J	0.41 U	0.021 U	0.021 U	0.021 U	0.021 U	0.8 U	0.021 U	0.041 U	0.021 U
Pit 16	X144	9	0.42 U	0.86 U	0.42 U	0.42 U	0.42 U	0.42 U	0.42 U	0.022 U	0.17 J	0.46 J	0.022 U	0.85 R	0.022 U	0.042 U	0.022 UJ
Pit 16	X144DL	9	4.2 U	8.6 U	4.2 U	4.2 U	4.2 U	4.2 U	4.2 U	0.22 U	0.22 UJ	0.67 =	0.22 U	4.3 U	0.22 U	0.42 U	0.22 UJ
Pit 16	X144RE	9												0.85 UJ			
Pit 17	X122	3	0.063 U	0.13 U	0.063 U	0.063 U	0.04 J	0.063 U	0.063 U	0.0033 U	0.0033 U	0.0033 U	0.0033 U	0.67 U	0.0033 U	0.0063 U	0.0033 U
Pit 17	X123	6	0.058 U	0.12 U	0.058 U	0.058 U	0.4 =	0.058 U	0.058 U	0.021 =	0.003 =	0.0084 =	0.003 U	0.58 U	0.003 U	0.0058 U	0.003 U
Pit 17	X123DL	6	0.58 U	1.2 U	0.58 U	0.58 U	0.53 J	0.58 U	0.58 U	0.032 =	0.03 U	0.011 J	0.03 U	2.9 U	0.03 U	0.058 U	0.03 U
Pit 18	X124	3	0.046 U	0.093 U	0.046 U	0.68 =	0.046 U	0.046 U	0.25 =	0.002 J	0.0068 =	0.009 =	0.0024 U	0.45 U	0.0024 U	0.0046 U	0.0024 U
Pit 18	X124DL	3	0.46 U	0.93 U	0.46 U	0.88 =	0.46 U	0.46 U	0.26 J	0.024 U	0.024 U	0.024 U	0.024 U	0.9 U	0.024 U	0.046 U	0.024 U
Pit 18	X125	6	0.048 U	0.097 U	0.048 U	1.7 J	0.048 U	0.048 U	0.41 J	0.0025 U	0.026 J	0.0025 U	0.0025 U	0.45 U	0.013 J	0.0048 U	0.0025 U
Pit 18	X125DL	6	0.48 U	0.97 U	0.48 U	2 J	0.48 U	0.48 U	0.46 J	0.025 U	0.036 J	0.025 U	0.025 U	2.3 U	0.025 U	0.048 U	0.025 U
Pit 19	X168	3	0.042 U	0.085 U	0.042 U	0.042 U	0.042 U	0.042 U	0.042 U	0.0022 U	0.0022 UJ	0.0022 U	0.0022 U	0.43 U	0.0022 U	0.0042 U	0.0022 UJ
Pit 19	X169	8	0.048 U	0.098 U	0.048 U	0.048 U	1.4 =	0.74 =	0.048 U	0.0025 U	0.0034 J	0.037 =	0.005 =	8.8 UJ	0.0025 U	0.0048 U	0.036 J
Pit 19	X169DL	8	0.48 U	0.98 U	0.48 U	0.48 U	0.48 U	0.48 U	0.48 U	0.025 U	0.025 UJ	0.025 U	0.025 =	88 UJ	0.025 U	0.048 U	0.025 UJ
Pit 20	X173	3	0.05 U	0.1 U	0.05 U	0.05 U	3 J	3.2 J	0.05 U	0.0026 U	0.017 J	0.16 J	0.014 J	0.49 U	0.017 J	0.0066 J	0.0026 UJ
Pit 20	X173DL	3	0.5 U	1 U	0.5 U	0.5 U	3.6 J	2.4 J	0.5 U	0.026 U	0.026 UJ	0.12 J	0.026 U	2.4 U	0.026 U	0.05 U	0.026 UJ
Pit 20	X173RE	3												0.49 U			
Pit 20	X174	8	0.045 R	0.092 R	0.045 R	0.045 R	0.6 J	0.63 J	0.045 R	0.0023 R	0.0023 R	0.021 J	0.0023 R	4.3 U	0.0028 J	0.0045 R	0.0023 R
Pit 20	X174DL	8	0.45 U	0.92 U	0.45 U	0.45 U	1.3 J	2.2 J	0.45 U	0.023 U	0.023 U	0.029 J	0.023 U	8.6 U	0.023 U	0.017 J	0.023 U
Pit 21	X170	3	0.043 UJ	0.088 UJ	0.043 UJ	0.043 UJ	0.043 UJ	0.043 UJ	0.043 UJ	0.0022 UJ	0.0022 UJ	0.0022 UJ	0.0022 UJ	4.5 U	0.0022 UJ	0.0043 UJ	0.0045 J
Pit 21	X171	3	0.043 U	0.088 U	0.043 U	0.043 U	0.29 J	0.043 U	0.043 U	0.0022 U	0.0022 UJ	0.0022 U	0.0022 U	4.3 U	0.0022 U	0.0043 U	0.0055 J
Pit 21	X172	11	0.049 U	0.099 U	0.049 U	0.049 U	0.049 U	0.049 U	0.049 U	0.0025 U	0.0025 UJ	0.0025 U	0.0025 U	0.53 U	0.0025 U	0.0049 U	0.0025 UJ
Pit 21	X172DL	11												1.1 U			
Pit 23	X126	3	0.041 U	0.084 U	0.041 U	0.15 =	0.041 U	0.088 =	0.041 U	0.0021 U	0.0021 U	0.0021 U	0.0021 U	0.39 UJ	0.0021 U	0.0041 U	0.0021 U
Pit 23	X126DL	3												1.9 UJ			
Pit 23	X126RE	3												0.39 U			
Pit 23	X127	7	0.048 U	0.097 U	0.048 U	0.3 =	0.048 U	0.048 U	0.14 =	0.0063 =	0.0025 U	0.0046 =	0.0025 U	0.5 UJ	0.0025 U	0.0048 U	0.0025 U
Pit 23	X127RE	7												0.5 U			
Pit 24	X138	3	0.49 U	0.99 U	0.49 U	0.49 U	2.1 J	1.9 J	0.49 U	0.029 J	0.017 J	0.013 J	0.016 J	4.9 U	0.023 J	0.015 J	0.025 U
Pit 24	X138DL	3												20 U			
Pit 24	X138RE	3												4.9 UJ			

Table E-10. PCBs and Pesticides in Alburn (mg/kg)

			PCBs							Pesticides/Herbicides							
Station ID	Sample ID	Depth (ft.)	Arochlor 1016	Arochlor 1221	Arochlor 1232	Arochlor 1242	Arochlor 1248	Arochlor 1254	Arochlor 1260	Aldrin	alpha-BHC	alpha-Chlordane	alpha-Endosulfan	Atrazine	beta-BHC	beta-Endosulfan	delta-BHC
Industrial/ Commercial		*Ing*	*Sum of the Arochlors can be 1 mg/kg*							*0.3*	*0.9*			*72000*			
		Inh								*6.6*	*1.5*						
Construction Worker		*Ing*								*6.1*	*20*			*7100*			
		Inh								*9.3*	*2.1*						
Soil Component of GW		*I*								*0.5*	*0.0005*			*0.066*			
		II								*2.5*	*0.003*			*0.33*			
Pit 24	X139	9	0.039 U	0.08 U	0.039 U	0.039 U	1 J	0.74 J	0.039 U	0.016 J	0.01 J	0.0043 J	0.002 U	0.82 UJ	0.0068 J	0.001 J	0.002 U
Pit 24	X139DL	9	0.39 U	0.8 U	0.39 U	0.39 U	1.2 J	0.79 J	0.39 U	0.012 J	0.013 J	0.02 U	0.02 U	8.2 U	0.02 U	0.007 J	0.02 U
Pit 24	X139RE	9												0.82 U			
Pit 25	X132	2.5	0.04 UJ	0.082 UJ	0.04 UJ	0.04 UJ	0.04 UJ	0.29 J	0.2 J	0.0021 UJ	0.0021 UJ	0.0021 UJ	0.0021 UJ	0.4 UJ	0.0021 UJ	0.004 UJ	0.0021 UJ
Pit 25	X132DL	2.5												0.8 UJ			
Pit 25	X132RE	2.5												0.4 R			
Pit 25	X133	8	0.037 U	0.075 U	0.037 U	0.037 U	0.037 U	0.037 U	0.037 U	0.0019 U	0.0019 UJ	0.0019 U	0.0019 U	3.4 U	0.0019 U	0.0037 U	0.0019 UJ
Pit 26	X140	3	0.035 U	0.071 U	0.035 U	0.035 U	0.08 =	0.042 =	0.035 U	0.0012 J	0.0018 U	0.0018 U	0.0018 U	0.37 U	0.0018 U	0.0035 U	0.0018 U
Pit 26	X141	9	0.071 UJ	0.14 UJ	0.071 UJ	0.071 UJ	0.47 J	0.071 UJ	0.071 UJ	0.0037 UJ	0.0027 J	0.0037 UJ	0.0037 UJ	7.2 U	0.0037 UJ	0.0071 UJ	0.0037 UJ
Pit 26	X141RE	9												7.2 U			
Pit 27	X136	9	0.21 U	0.43 U	0.21 U	0.21 U	3.4 =	4.5 =	0.21 U	0.0095 J	0.011 UJ	0.011 U	0.024 =	0.79 UJ	0.011 U	0.035 =	0.011 UJ
Pit 27	X136DL	9	2.1 U	4.3 U	2.1 U	2.1 U	2.1 U	7.1 =	2.1 U	0.11 U	0.11 UJ	0.11 U	0.11 U	1.6 U	0.11 U	0.21 U	0.11 UJ
Pit 27	X136RE	9												0.79 U			
Pit 27	X137	3	0.38 U	0.77 U	0.38 U	0.38 U	0.52 =	0.41 =	0.38 U	0.017 J	0.02 U	0.02 U	0.02 U	0.39 UJ	0.02 U	0.038 U	0.02 U
Pit 27	X137DL	3												3.9 U			
Pit 27	X137RE	3												0.39 UJ			
Pit 28	X164	3	0.4 U	0.81 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.027 J	0.012 J	0.075 J	0.021 U	0.37 U	0.013 J	0.0011 J	0.021 U
Pit 28	X164DL	3	4 U	8.1 U	4 U	4 U	4 U	4 U	4 U	0.21 U	0.21 U	0.11 J	0.21 U	1.9 U	0.21 U	0.4 U	0.21 U
Pit 28	X165	10	0.61 U	1.2 U	0.61 U	0.61 U	0.61 U	0.61 U	0.61 U	0.092 J	0.023 J	0.034 J	0.0067 J	6.2 U	0.085 J	0.025 J	0.031 U
Pit 28	X165DL	10	6.1 U	12 U	6.1 U	6.1 U	6.1 U	6.1 U	6.1 U	0.15 J	0.31 U	2 J	0.31 U	62 U	0.18 J	0.00009 J	0.31 U
Pit 29	X128	3	0.037 U	0.076 U	0.037 U	0.037 U	0.31 =	0.037 U	0.14 =	0.002 =	0.0019 U	0.0027 =	0.0019 U	0.41 U	0.0019 U	0.0037 U	0.0019 U
Pit 29	X129	4.5	0.039 U	0.08 U	0.039 U	0.039 U	1.7 =	1 =	0.38 =	0.013 =	0.0049 =	0.0047 =	0.002 U	4 U	0.002 U	0.0039 U	0.002 U
Pit 29	X129DL	4.5	0.39 U	0.8 U	0.39 U	0.39 U	3.8 J	2.2 J	0.8 J	0.02 U	0.02 U	0.02 U	0.02 U	7.9 U	0.02 U	0.039 U	0.02 U
Pit 30	X166	3	0.04 U	0.08 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.002 U	0.002 UJ	0.002 U	0.002 U	2 U	0.002 U	0.004 U	0.002 UJ
Pit 30	X166DL	3												4 U			
Pit 30	X167	9	0.045 U	0.092 U	0.045 U	0.045 U	0.045 U	0.045 U	0.045 U	0.0054 =	0.0023 UJ	0.0085 =	0.0023 U	0.5 U	0.0023 U	0.0045 U	0.0023 UJ
Pit 30	X167DL	9												0.99 U			
Pit 30	X167RE	9												0.5 U			
Pit 31	X130	3	0.039 U	0.08 U	0.039 U	0.039 U	0.76 =	0.039 U	1.1 =	0.002 U	0.002 U	0.002 U	0.002 U	0.38 U	0.002 U	0.0039 U	0.002 U
Pit 31	X130DL	3	0.39 U	0.8 U	0.39 U	0.39 U	1.1 =	0.39 U	1.6 =	0.02 U	0.02 U	0.02 U	0.02 U	1.5 U	0.02 U	0.039 U	0.02 U
Pit 31	X131	6	0.049 U	0.099 U	0.049 U	0.049 U	0.42 J	0.049 U	0.049 U	0.0025 U	0.019 J	0.0025 U	0.0025 U	0.43 U	0.0025 U	0.0049 U	0.0025 U
Pit 31	X131DL	6	0.49 U	0.99 U	0.49 U	0.49 U	0.7 J	0.49 U	0.49 U	0.025 U	0.024 J	0.025 U	0.025 U	1.7 U	0.025 U	0.049 U	0.025 U

Table E-10. PCBs and Pesticides in Alburn (mg/kg)

			PCBs							Pesticides/Herbicides							
Station ID	Sample ID	Depth (ft.)	Arochlor 1016	Arochlor 1221	Arochlor 1232	Arochlor 1242	Arochlor 1248	Arochlor 1254	Arochlor 1260	Aldrin	alpha-BHC	alpha-Chlordane	alpha-Endosulfan	Atrazine	beta-BHC	beta-Endosulfan	delta-BHC
Industrial/ Commercial		*Ing*	*Sum of the Arochlors can be 1 mg/kg*							*0.3*	*0.9*			*72000*			
		Inh								*6.6*	*1.5*						
Construction Worker		*Ing*								*6.1*	*20*			*7100*			
		Inh								*9.3*	*2.1*						
Soil Component of GW		*I*								*0.5*	*0.0005*			*0.066*			
		II								*2.5*	*0.003*			*0.33*			
Pit 31	X131RE	6												0.43 U			
Pit 33	X134	3	0.036 UJ	0.074 UJ	0.036 UJ	0.036 UJ	0.036 UJ	0.18 J	0.036 UJ	0.0019 UJ	0.0019 UJ	0.002 J	0.0019 UJ	0.37 R	0.0019 UJ	0.0036 UJ	0.0019 UJ
Pit 33	X134DL	3	0.36 U	0.74 U	0.36 U	0.36 U	0.36 U	1.2 J	0.36 U	0.019 U	0.019 UJ	0.019 U	0.019 U	7.4 U	0.019 U	0.036 U	0.019 UJ
Pit 33	X134RE	3												0.37 UJ			
Pit 33	X135	8	0.04 U	0.082 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.0021 U	0.0021 UJ	0.0021 U	0.0021 U	0.41 U	0.0021 U	0.004 U	0.0021 UJ
Pit 33	X135RE	8												0.41 U			
Pit 34	X162	3	0.043 U	0.088 U	0.043 U	0.043 U	0.35 =	0.043 U	0.043 U	0.0022 U	0.0017 J	0.0061 =	0.0022 U	0.43 U	0.0036 =	0.00074 J	0.0022 U
Pit 34	X162DL	3												2.1 U			
Pit 34	X162DLRE	3												2.1 UJ			
Pit 34	X163	9	0.04 UJ	0.081 UJ	0.04 UJ	0.094 J	0.04 UJ	0.04 UJ	0.04 UJ	0.0021 UJ	0.00024 J	0.001 J	0.0021 UJ	0.81 U	0.0021 UJ	0.00021 J	0.0021 UJ
Pit 34	X163DL	9	0.4 U	0.81 U	0.4 U	0.12 J	0.4 U	0.4 U	0.4 U	0.021 U	0.021 U	0.021 U	0.021 U		0.021 U	0.04 U	0.021 U
Pit 35	X149	3	0.037 U	0.075 U	0.037 U	0.037 U	0.037 U	0.037 U	0.037 U	0.0019 U	0.0019 U	0.0019 U	0.0019 U	0.41 UJ	0.0019 U	0.0037 U	0.0019 U
Pit 35	X149DL	3												12 U			
Pit 35	X149RE	3												0.41 UJ			
Pit 35	X150	9	0.76 U	1.5 U	0.76 U	0.76 U	0.57 J	0.76 U	0.76 U	0.039 U	0.039 U	0.039 U	0.039 U	0.78 R	0.039 U	0.076 U	0.039 U
Pit 35	X150DL	9												1.6 U			
Pit 35	X150RE	9												0.78 UJ			
Pit 37	X151	3	0.073 U	0.15 U	0.073 U	0.073 U	0.073 U	1.6 =	0.073 U	0.0014 J	0.00078 J	0.0085 =	0.0038 U	0.74 UJ	0.0038 U	0.0073 U	0.0011 J
Pit 37	X151DL	3	0.73 U	1.5 U	0.73 U	0.73 U	0.73 U	2 =	0.73 U	0.038 U	0.038 U	0.038 U	0.015 J	3 UJ	0.038 U	0.073 U	0.038 U
Pit 37	X151RE	3												0.74 UJ			
Pit 37	X152	9	0.04 U	0.081 U	0.04 U	0.04 U	0.04 U	0.082 =	0.04 U	0.0021 U	0.0021 U	0.0021 U	0.0021 U	4 U	0.00032 J	0.0004 J	0.0021 U
Pit 38	X157	3	0.038 U	0.077 U	0.038 U	0.038 U	0.038 U	0.038 U	0.038 U	0.002 U	0.002 U	0.002 U	0.002 U	0.38 U	0.002 U	0.0038 U	0.002 U
Pit 38	X158	9	0.041 R	0.082 R	0.041 R	0.041 R	0.041 R	0.041 R	0.041 R	0.00041 J	0.0034 J	0.00038 J	0.0018 J	4.1 U	0.0021 R	0.00082 J	0.0025 J
Pit 38	X158DL	9	0.41 U	0.82 U	0.41 U	0.41 U	0.41 U	0.41 U	0.41 U	0.021 U	0.021 U	0.021 U	0.021 U		0.021 U	0.041 U	0.021 U
Pit 39	X153	3	0.041 U	0.084 U	0.041 U	0.13 J	0.041 U	0.041 U	0.041 U	0.0021 U	0.001 J	0.00038 J	0.0021 U	0.42 UJ	0.0051 J	0.0013 J	0.0021 U
Pit 39	X153DL	3												0.84 U			
Pit 39	X153RE	3												0.42 U			
Pit 39	X154	9	0.039 U	0.08 U	0.039 U	0.039 U	0.039 U	0.039 U	0.039 U	0.002 U	0.00082 J	0.002 U	0.002 U	0.39 U	0.00087 J	0.0039 U	0.002 U
Pit 40	X155	3	0.039 U	0.079 U	0.039 U	0.039 U	0.039 U	0.039 U	0.032 J	0.002 U	0.002 U	0.002 U	0.002 U	0.39 UJ	0.002 U	0.00036 J	0.002 U
Pit 40	X155RE	3												0.39 UJ			
Pit 40	X156	10	0.039 U	0.079 U	0.039 U	0.039 U	0.039 U	0.039 U	0.039 U	0.002 U	0.00023 J	0.0028 =	0.002 U	0.39 U	0.002 U	0.0007 J	0.002 U
Pit 40	X156DL	10												1.6 U			

Table E-10. PCBs and Pesticides in Alburn (mg/kg)

			PCBs							Pesticides/Herbicides							
Station ID	Sample ID	Depth (ft.)	Arochlor 1016	Arochlor 1221	Arochlor 1232	Arochlor 1242	Arochlor 1248	Arochlor 1254	Arochlor 1260	Aldrin	alpha-BHC	alpha-Chlordane	alpha-Endosulfan	Atrazine	beta-BHC	beta-Endosulfan	delta-BHC
Industrial/ Commercial		*Ing*	*Sum of the Arochlors can be 1 mg/kg*							*0.3*	*0.9*			*72000*			
		Inh								*6.6*	*1.5*						
Construction Worker		*Ing*								*6.1*	*20*			*7100*			
		Inh								*9.3*	*2.1*						
Soil Component of GW		*I*								*0.5*	*0.0005*			*0.066*			
		II								*2.5*	*0.003*			*0.33*			
Pit 41	X181	9	0.044 R	0.09 R	0.044 R	0.044 R	0.044 R	0.086 J	0.044 R	0.0023 R	0.0023 R	0.0023 R	0.0023 R	0.43 U	0.0023 R	0.0044 R	0.0023 R
Pit 41	X182	3	0.043 U	0.086 U	0.043 U	0.043 U	0.1 =	0.043 U	0.043 U	0.0022 U	0.0024 =	0.0014 J	0.0022 U	0.44 UJ	0.0012 J	0.0043 U	0.0022 U
Pit 42	X179	3	0.04 UJ	0.081 UJ	0.04 UJ	0.04 UJ	0.86 J	0.04 UJ	0.04 UJ	0.0099 J	0.002 UJ	0.011 J	0.0093 J	4 UJ	0.0061 J	0.0086 J	0.002 UJ
Pit 42	X179DL	3	0.4 U	0.81 U	0.4 U	0.4 U	0.97 =	0.4 U	0.4 U	0.02 U	0.02 U	0.0086 J	0.0022 J		0.02 U	0.04 U	0.02 U
Pit 42	X180	9	0.042 R	0.086 R	0.042 R	0.042 R	0.042 R	0.093 J	0.042 R	0.0022 R	0.0022 R	0.0059 J	0.0016 J	0.44 U	0.0022 R	0.0042 R	0.0022 R
Pit 42	X180DL	9												4.4 U			
Pit 42	X180RE	9												0.44 U			
Pit 43	X175	3	0.04 UJ	0.081 UJ	0.04 UJ	0.04 UJ	0.04 UJ	0.04 UJ	0.04 UJ	0.0021 UJ	0.0021 UJ	0.0021 UJ	0.0028 J	7.3 UJ	0.0021 UJ	0.004 UJ	0.0021 UJ
Pit 43	X176	8	0.036 U	0.073 U	0.036 U	0.036 U	0.036 U	0.036 U	0.036 U	0.0018 U	0.0018 UJ	0.0018 U	0.0018 U	0.34 U	0.0018 U	0.0036 U	0.0018 UJ
Pit 43	X176DL	8												3.4 U			
Pit 44	X183	3	0.04 R	0.081 R	0.04 R	0.04 R	0.04 R	0.11 J	0.04 R	0.0042 J	0.0021 R	0.0021 R	0.0021 R	0.39 U	0.0021 R	0.004 R	0.0021 R
Pit 44	X183DL	3												0.78 U			
Pit 44	X184	8	0.056 U	0.11 U	0.056 U	0.056 U	0.21 J	0.056 U	0.056 U	0.0029 U	0.0029 U	0.0029 U	0.0029 U	0.55 UJ	0.0029 U	0.0056 U	0.0029 U
Pit 44	X184DL	8												5.5 U			
Pit 45	X177	3	0.063 U	0.13 U	0.063 U	0.063 U	0.063 U	0.063 U	0.063 U	0.0033 U	0.0033 UJ	0.0033 U	0.0033 U	0.64 U	0.0033 U	0.0063 U	0.0033 UJ
Pit 45	X178	8	0.03 U	0.062 U	0.03 U	0.03 U	0.03 U	0.03 U	0.03 U	0.0016 U	0.0016 UJ	0.0016 U	0.0016 U	0.3 U	0.0016 U	0.003 U	0.0016 UJ
Pit 52	X210	3	0.036 R	0.072 R	0.036 R	0.036 R	0.036 R	0.036 R	0.54 J	0.0018 R	0.0018 R	0.0018 R	0.0018 R	2.1 U	0.0018 R	0.0036 R	0.0018 R
Pit 52	X211	5	0.058 U	0.12 U	0.058 U	0.87 =	0.058 U	1.7 =	0.57 =	0.003 U	0.003 U	0.0032 =	0.003 U	2.3 U	0.003 U	0.0058 U	0.00061 J
Pit 53	X212	3	0.042 U	0.085 U	0.042 U	0.042 U	0.042 U	0.28 =	0.19 =	0.0022 U	0.0022 U	0.0098 =	0.0046 =	1.7 U	0.0022 U	0.0042 U	0.0022 U
Pit 53	X213	7	0.044 R	0.089 R	0.044 R	3.9 J	0.044 R	1.8 J	4.1 J	0.0023 R	0.0023 R	0.0037 J	0.037 J	1.8 U	0.0023 R	0.0044 R	0.0023 R
Pit 53	X213DL	7	0.22 U	0.45 U	0.22 U	5.9 J	0.22 U	3.4 J	5.5 J	0.011 U	0.011 U	0.0018 J	0.023 J	18 U	0.011 U	0.022 U	0.011 U

Notes:

=:	sample concentration is detected at level reported
U:	sample concentration is under detection limit
J:	sample concentration is estimated value
R:	sample concentration value is rejected
DL:	sample is diluted
RE:	sample is re-extracted
Ing.:	Ingestion
Inh.:	Inhalation
I:	Class I
II:	Class II

Table E-10. PCBs and Pesticides in Alburn (mg/kg)

			Pesticides/Herbicides													
Station ID	Sample ID	Depth (ft.)	Dieldrin	Endosulfan sulfate	Endrin	Endrin aldehyde	Endrin ketone	gamma-BHC	gamma-Chlordane	Heptachlor	Heptachlor epoxide	Methoxychlor	p,p'-DDD	p,p'-DDE	p,p'-DDT	Toxaphene
Industrial/ Commercial		*Ing*	*0.4*		*610*			*4*		*1*	*0.6*	*10000*	*24*	*17*	*17*	*5.2*
		Inh	*2.2*							*11*	*9.2*				*1500*	*170*
Construction Worker		*Ing*	*7.8*		*61*			*96*		*28*	*2.7*	*1000*	*520*	*370*	*100*	*110*
		Inh	*3.1*							*16*	*13*				*2100*	*240*
Soil Component of GW		*I*	*0.004*		*1*			*0.009*		*23*	*0.7*	*160*	*16*	*54*	*32*	*31*
		II	*0.02*		*5*			*0.047*		*110*	*3.3*	*780*	*80*	*270*	*160*	*150*
Pit 01	X101	2.5	0.0041 =	0.0038 U	0.0038 U	0.0017 J	0.0091 =	0.002 U	0.0023 U	0.002 U	0.0041 =	0.02 U	0.0076 =	0.0038 U	0.0045 =	0.2 U
Pit 01	X101DL	2.5	0.001 J	0.019 U	0.019 U	0.0065 J	0.0021 J	0.0098 U	0.0098 U	0.0098 U	0.0019 J	0.098 U	0.0064 J	0.017 J	0.019 U	0.98 U
Pit 01	X102	7.5	0.0019 J	0.0012 J	0.0038 U	0.0038 U	0.00096 J	0.0019 U	0.0019 U	0.0019 U	0.0019 U	0.019 U	0.005 =	0.026 =	0.0038 U	0.19 U
Pit 01	X102DL	7.5														
Pit 01B	X101	3	0.0034 J	0.0031 J	0.004 U	0.004 U	0.004 U	0.0021 U	0.0021 U	0.0021 U	0.0021 U	0.021 U	0.0012 J	0.0054 J	0.004 U	0.21 U
Pit 01B	X101DL	3	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.01 U	0.01 U	0.01 U	0.01 U	0.1 U	0.02 U	0.02 U	0.02 U	1 U
Pit 01B	X102	6	0.0063 J	0.0044 U	0.0044 U	0.0016 J	0.0053 J	0.001 J	0.0061 J	0.0023 U	0.00052 J	0.023 U	0.019 J	0.0098 J	0.0044 U	0.23 U
Pit 01B	X102DL	6	0.022 U	0.022 U	0.022 U	0.022 U	0.022 U	0.011 U	0.011 U	0.011 U	0.011 U	0.11 U	0.018 J	0.011 J	0.022 U	1.1 U
Pit 02	X103	2	0.0045 U	0.00049 J	0.0045 U	0.0021 J	0.0045 U	0.0023 U	0.0023 U	0.0032 U	0.0023 U	0.023 U	0.0045 U	0.0045 U	0.00054 J	0.23 U
Pit 02	X104	6	0.00051 J	0.0019 J	0.0011 J	0.0021 J	0.00037 J	0.0021 J	0.0044 U	0.0026 U	0.0037 J	0.0018 J	0.00096 J	0.0017 J	0.0039 R	0.2 R
Pit 02	X104RE	6														
Pit 03	X105	2.5	0.00088 J	0.0053 U	0.0053 U	0.0036 J	0.0053 U	0.0027 U	0.0047 U	0.0042 U	0.0021 J	0.027 U	0.0053 U	0.0031 J	0.0056 =	0.27 U
Pit 03	X105RE	2.5														
Pit 03	X106	0.5	0.0055 U	0.0055 U	0.0055 U	0.0038 J	0.0055 U	0.0028 U	0.0031 U	0.0066 U	0.0028 U	0.028 U	0.0055 U	0.0011 J	0.0055 U	0.28 U
Pit 03	X107	6	0.0059 UJ	0.0059 UJ	0.0059 UJ	0.0053 J	0.0059 UJ	0.003 UJ	0.003 UJ	0.003 UJ	0.029 J	0.03 UJ	0.013 J	0.011 J	0.12 J	0.3 UJ
Pit 03	X107DL	6	0.029 UJ	0.029 UJ	0.029 UJ	0.029 UJ	0.029 UJ	0.015 UJ	0.029 U	0.015 UJ	0.015 UJ	0.15 UJ	0.029 UJ	0.013 J	0.081 J	1.5 UJ
Pit 04	X108	3	0.00069 J	0.0037 U	0.00072 J	0.003 J	0.00046 J	0.0019 U	0.0058 =	0.0021 U	0.0019 U	0.019 U	0.035 =	0.0087 =	0.016 =	0.19 U
Pit 04	X109	3	0.0014 J	0.00052 J	0.00026 J	0.0035 U	0.0036 =	0.0018 U	0.0045 U	0.0021 U	0.00037 J	0.018 U	0.034 =	0.0081 =	0.012 =	0.18 U
Pit 04	X110	6	0.0032 J	0.00069 J	0.0062 J	0.0014 J	0.0044 R	0.0023 R	0.14 J	0.0023 R	0.008 J	0.023 R	0.13 J	0.027 J	0.0044 R	0.23 R
Pit 04	X110DL	6	0.0017 J	0.044 UJ	0.044 UJ	0.0074 J	0.044 UJ	0.023 UJ	0.16 J	0.023 U	0.023 UJ	0.23 UJ	0.21 J	0.053 J	0.044 UJ	2.3 UJ
Pit 05	X111	5	0.0048 =	0.0036 U	0.0036 U	0.0042 =	0.0036 U	0.0019 U	0.0064 =	0.0034 U	0.0019 U	0.018 U	0.0052 =	0.0033 J	0.023 =	0.18 U
Pit 07	X112	3	0.0009 J	0.00088 J	0.00018 J	0.0038 U	0.008 =	0.00012 J	0.01 =	0.0031 U	0.00078 J	0.02 U	0.017 =	0.0047 =	0.022 =	0.2 U
Pit 07	X112DL	3														
Pit 08	X113	2.5	0.0043 U	0.0043 U	0.0043 U	0.0043 U	0.01 =	0.0022 U	0.013 =	0.0049 U	0.0022 U	0.022 U	0.0043 U	0.0043 U	0.0043 U	0.22 U
Pit 08	X113RE	2.5														
Pit 08	X114	4	0.012 J	0.0059 J	0.018 J	0.0056 J	0.0081 J	0.0021 U	0.0055 J	0.0022 U	0.015 J	0.021 U	0.1 J	0.026 J	0.004 U	0.21 U
Pit 08	X114DL	4	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.021 U	0.021 U	0.021 U	0.014 J	0.21 U	0.077 J	0.026 J	0.04 U	2.1 U
Pit 09	X115	2.5	0.0037 U	0.0022 J	0.0031 J	0.0048 =	0.0037 U	0.0019 U	0.01 =	0.0019 U	0.0064 =	0.019 U	0.035 =	0.0025 J	0.0069 =	0.19 U
Pit 09	X115DL	2.5														
Pit 09	X115RE	2.5														
Pit 09	X116	6	0.0076 J	0.025 J	0.023 J	0.0049 J	0.0043 U	0.0022 U	0.0072 J	0.0031 U	0.0045 J	0.0082 J	0.0043 U	0.011 J	0.0043 U	0.22 U
Pit 09	X116DL	6	0.028 J	0.031 J	0.018 J	0.043 U	0.043 U	0.022 U	0.022 U	0.022 U	0.022 U	0.22 U	0.043 U	0.043 U	0.043 U	2.2 U

Table E-10. PCBs and Pesticides in Alburn (mg/kg)

			Pesticides/Herbicides													
Station ID	Sample ID	Depth (ft.)	Dieldrin	Endosulfan sulfate	Endrin	Endrin aldehyde	Endrin ketone	gamma-BHC	gamma-Chlordane	Heptachlor	Heptachlor epoxide	Methoxychlor	p,p'-DDD	p,p'-DDE	p,p'-DDT	Toxaphene
Industrial/ Commercial		*Ing*	*0.4*		*610*			*4*		*1*	*0.5*	*10000*	*24*	*17*	*17*	*5.2*
		Inh	*2.2*							*11*	*9.2*				*1500*	*170*
Construction Worker		*Ing*	*7.8*		*61*			*96*		*28*	*2.7*	*1000*	*520*	*370*	*100*	*110*
		Inh	*3.1*							*16*	*13*				*2100*	*240*
Soil Component of GW		*I*	*0.004*		*1*			*0.009*		*23*	*0.7*	*160*	*16*	*54*	*32*	*31*
		II	*0.02*		*5*			*0.047*		*110*	*3.3*	*780*	*80*	*270*	*160*	*150*
Pit 09	X116RE	6														
Pit 10	X117	2.5	0.018 J	0.048 J	0.037 U	0.021 J	0.037 U	0.019 U	0.019 U	0.019 U	0.0095 J	0.19 U	0.037 U	0.023 J	0.037 U	1.9 U
Pit 10	X117DL	2.5	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	0.96 U	0.96 U	0.96 U	0.96 U	9.6 U	1.9 U	1.9 U	1.9 U	96 U
Pit 10	X117RE	2.5														
Pit 10	X118	6	0.051 U	0.051 U	0.076 J	0.022 J	0.051 U	0.015 J	0.026 U	0.026 U	0.083 J	0.26 U	0.051 U	0.25 J	0.051 U	2.6 U
Pit 10	X118DL	6	0.058 J	0.25 U	0.25 U	0.25 U	0.25 U	0.13 U	0.13 U	0.13 U	0.096 J	1.3 U	0.25 U	0.099 J	0.25 U	13 U
Pit 10	X118RE	6														
Pit 11	X119	2.5	0.0022 J	0.024 J	0.012 J	0.00098 J	0.019 J	0.002 U	0.0086 J	0.0035 U	0.0011 J	0.033 J	0.0039 U	0.0022 J	0.0029 J	0.2 U
Pit 11	X119DL	2.5														
Pit 11	X119RE	2.5														
Pit 11	X120	6	0.03 J	0.0042 J	0.025 J	0.0082 J	0.0049 U	0.0025 U	0.045 J	0.0038 U	0.023 J	0.025 U	0.05 J	0.031 J	0.0049 U	0.25 U
Pit 11	X120DL	6	0.024 U	0.024 U	0.014 J	0.024 U	0.024 U	0.012 U	0.04 J	0.012 U	0.022 J	0.12 U	0.032 J	0.043 J	0.024 U	1.2 U
Pit 11	X120RE	6														
Pit 12	X159	3	0.046 J	0.0048 U	0.0048 U	0.021 J	0.0032 J	0.0034 J	0.01 J	0.0025 U	0.0029 J	0.17 J	0.002 J	0.098 J	0.14 J	0.24 U
Pit 12	X159DL	3	0.061 J	0.0083 J	0.018 J	0.03 J	0.048 U	0.0042 J	0.024 U	0.026 U	0.0038 J	0.24 U	0.048 U	0.097 J	0.21 J	2.4 U
Pit 12	X160	3	0.052 J	0.0046 U	0.0046 U	0.037 J	0.0042 J	0.0026 J	0.018 J	0.0024 U	0.0035 J	0.16 J	0.0038 J	0.12 J	0.16 J	0.24 U
Pit 12	X160DL	3	0.068 J	0.0073 J	0.029 J	0.035 J	0.046 U	0.0047 J	0.018 J	0.028 U	0.0063 J	0.24 U	0.046 U	0.12 J	0.25 J	2.4 U
Pit 12	X160RE	3														
Pit 12	X161	9	0.0016 J	0.00026 J	0.0008 J	0.00072 J	0.0039 U	0.002 U	0.002 U	0.002 U	0.00029 J	0.02 U	0.00064 J	0.0032 J	0.0063 =	0.2 U
Pit 13	X145	3	0.0028 J	0.0034 U	0.0034 U	0.0034 U	0.0034 U	0.0018 UJ	0.0018 U	0.0018 U	0.0018 J	0.018 U	0.0023 J	0.0067 =	0.0045 =	0.18 U
Pit 13	X145RE	3														
Pit 13	X146	9	0.022 J	0.0019 J	0.0043 J	0.0073 J	0.0041 U	0.0021 UJ	0.023 J	0.0021 U	0.012 J	0.021 U	0.044 J	0.063 J	0.051 J	0.21 U
Pit 13	X146DL	9	0.035 J	0.041 U	0.041 U	0.041 U	0.041 U	0.021 UJ	0.032 U	0.021 U	0.019 J	0.21 U	0.032 J	0.067 =	0.066 =	2.1 U
Pit 14	X147	3	0.041 U	0.041 U	0.041 U	0.041 U	0.041 U	0.021 U	0.021 U	0.021 U	0.021 U	0.21 U	0.041 U	0.041 U	0.041 U	2.1 U
Pit 14	X147RE	3														
Pit 14	X148	9	0.039 J	0.088 U	0.088 U	0.088 U	0.088 U	0.045 U	0.045 U	0.045 U	0.045 U	0.45 U	0.13 =	0.11 =	0.083 J	4.5 U
Pit 14	X148DL	9														
Pit 14	X148RE	9														
Pit 15	X121	3	0.0085 =	0.0046 U	0.0022 J	0.0065 =	0.0046 U	0.0024 U	0.0036 U	0.0024 U	0.0045 =	0.023 U	0.032 =	0.024 =	0.016 =	0.23 U
Pit 16	X142	3	0.0099 =	0.0036 J	0.0013 J	0.0042 J	0.0026 J	0.0022 U	0.011 =	0.0022 U	0.0062 =	0.022 U	0.13 =	0.045 =	0.018 =	0.22 U
Pit 16	X142DL	3	0.042 U	0.042 U	0.042 U	0.042 U	0.042 U	0.022 U	0.022 U	0.022 U	0.022 U	0.22 U	0.11 J	0.03 J	0.015 J	2.2 U
Pit 16	X142RE	3														

Table E-10. PCBs and Pesticides in Alburn (mg/kg)

			Pesticides/Herbicides													
Station ID	Sample ID	Depth (ft.)	Dieldrin	Endosulfan sulfate	Endrin	Endrin aldehyde	Endrin ketone	gamma-BHC	gamma-Chlordane	Heptachlor	Heptachlor epoxide	Methoxychlor	p,p'-DDD	p,p'-DDE	p,p'-DDT	Toxaphene
Industrial/		*Ing*	*0.4*		*610*			*4*		*1*	*0.6*	*10000*	*24*	*17*	*17*	*5.2*
Commercial		*Inh*	*2.2*							*11*	*9.2*				*1500*	*170*
		Ing	*7.8*		*61*			*96*		*28*	*2.7*	*1000*	*520*	*370*	*100*	*110*
Construction Worker		*Inh*	*3.1*							*16*	*13*				*2100*	*240*
Soil Component of		*I*	*0.004*		*1*			*0.009*		*23*	*0.7*	*160*	*16*	*54*	*32*	*31*
GW		*II*	*0.02*		*5*			*0.047*		*110*	*3.3*	*780*	*80*	*270*	*160*	*150*
Pit 16	X143	3	0.0073 =	0.0034 J	0.0017 J	0.0035 J	0.0024 J	0.001 J	0.011 =	0.0021 U	0.0054 =	0.021 U	0.14 =	0.029 =	0.017 J	0.21 U
Pit 16	X143DL	3	0.0077 J	0.041 U	0.041 U	0.041 U	0.041 U	0.021 U	0.01 J	0.021 U	0.021 U	0.21 U	0.1 =	0.019 J	0.042 J	2.1 U
Pit 16	X144	9	0.082 J	0.042 U	0.042 U	0.042 U	0.042 U	0.022 UJ	0.56 J	0.022 U	0.085 J	0.28 J	1 J	0.19 J	0.067 J	2.2 U
Pit 16	X144DL	9	0.42 U	0.42 U	0.42 U	0.42 U	0.42 U	0.22 UJ	0.52 =	0.22 U	0.22 U	2.2 U	1.9 =	0.46 =	0.42 U	22 U
Pit 16	X144RE	9														
Pit 17	X122	3	0.0063 U	0.0063 U	0.0063 U	0.0063 U	0.0063 U	0.0033 U	0.0033 U	0.0033 U	0.0033 U	0.033 U	0.0063 U	0.0082 =	0.0063 U	0.33 U
Pit 17	X123	6	0.021 =	0.0058 U	0.0044 J	0.0078 =	0.0036 J	0.0028 J	0.013 =	0.0031 U	0.015 =	0.03 U	0.12 =	0.071 =	0.11 =	0.3 U
Pit 17	X123DL	6	0.037 J	0.058 U	0.0084 J	0.011 J	0.058 U	0.03 U	0.03 U	0.03 U	0.027 J	0.3 U	0.12 =	0.08 =	0.12 =	3 U
Pit 18	X124	3	0.019 =	0.0048 =	0.0068 =	0.011 =	0.0046 U	0.0026 =	0.01 =	0.0024 U	0.016 =	0.012 J	0.087 =	0.083 =	0.056 =	0.24 U
Pit 18	X124DL	3	0.033 J	0.046 U	0.046 U	0.011 J	0.046 U	0.024 U	0.024 U	0.024 U	0.022 J	0.24 U	0.083 =	0.068 =	0.069 =	2.4 U
Pit 18	X125	6	0.04 J	0.0048 U	0.0048 U	0.016 J	0.0048 U	0.0025 U	0.03 J	0.0025 U	0.031 J	0.025 U	0.15 J	0.19 J	0.1 J	0.25 U
Pit 18	X125DL	6	0.062 J	0.048 U	0.048 U	0.025 J	0.048 U	0.025 U	0.054 J	0.025 U	0.04 J	0.25 U	0.14 J	0.17 J	0.15 J	2.5 U
Pit 19	X168	3	0.003 J	0.0042 U	0.0042 U	0.0042 U	0.0042 U	0.0022 UJ	0.0022 U	0.0015 J	0.0022 U	0.022 U	0.0049 =	0.0042 U	0.0065 =	0.22 U
Pit 19	X169	8	0.034 =	0.028 =	0.0071 =	0.023 =	0.0042 J	0.0025 UJ	0.06 =	0.0028 =	0.0025 U	0.025 =	0.052 =	0.057 =	0.075 =	0.25 U
Pit 19	X169DL	8	0.005 J	0.013 J	0.021 J	0.048 U	0.048 U	0.0087 J	0.0054 J	0.025 U	0.025 U	0.3 =	0.042 J	0.008 J	0.048 U	2.5 U
Pit 20	X173	3	0.086 J	0.005 J	0.024 J	0.029 J	0.005 U	0.011 J	0.2 J	0.0026 U	0.0026 U	0.053 J	0.54 J	0.21 J	0.23 J	0.26 U
Pit 20	X173DL	3	0.12 J	0.05 U	0.03 J	0.04 J	0.05 U	0.026 UJ	0.17 J	0.026 U	0.035 J	0.26 U	0.41 J	0.17 J	0.24 J	2.6 U
Pit 20	X173RE	3														
Pit 20	X174	8	0.039 J	0.065 J	0.0094 J	0.021 J	0.0062 J	0.0023 R	0.052 J	0.0023 R	0.0023 R	0.012 J	0.05 J	0.031 J	0.12 J	0.23 R
Pit 20	X174DL	8	0.097 J	0.055 J	0.15 J	0.019 J	0.045 U	0.023 U	0.023 U	0.0086 J	0.039 J	0.23 U	0.11 J	0.14 J	0.33 J	2.3 U
Pit 21	X170	3	0.0037 J	0.0043 UJ	0.0043 UJ	0.0038 J	0.0043 UJ	0.0022 UJ	0.0022 UJ	0.0027 J	0.012 J	0.022 UJ	0.0074 J	0.0029 J	0.011 J	0.22 UJ
Pit 21	X171	3	0.0052 J	0.0043 U	0.0043 U	0.0029 J	0.0043 U	0.0022 UJ	0.012 J	0.003 J	0.0033 J	0.014 J	0.018 J	0.017 J	0.014 J	0.22 U
Pit 21	X172	11	0.0049 U	0.0049 U	0.0049 U	0.0049 U	0.0049 U	0.0025 UJ	0.0025 U	0.0029 J	0.0025 U	0.025 U	0.0049 U	0.0049 U	0.0049 U	0.25 U
Pit 21	X172DL	11														
Pit 23	X126	3	0.0034 J	0.00074 J	0.0041 U	0.0016 J	0.0027 J	0.0021 U	0.0021 U	0.0022 U	0.0018 J	0.021 U	0.0075 =	0.0058 =	0.0083 =	0.21 U
Pit 23	X126DL	3														
Pit 23	X126RE	3														
Pit 23	X127	7	0.0099 =	0.0048 U	0.0048 U	0.0076 =	0.0028 J	0.0025 U	0.0049 U	0.0031 U	0.0078 =	0.025 U	0.038 =	0.034 =	0.022 =	0.25 U
Pit 23	X127RE	7														
Pit 24	X138	3	0.067 J	0.049 U	0.031 J	0.049 J	0.049 U	0.025 U	0.055 J	0.025 U	0.023 J	0.25 U	0.12 J	0.097 J	0.21 J	2.5 U
Pit 24	X138DL	3														
Pit 24	X138RE	3														

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			Pesticides/Herbicides													
Station ID	Sample ID	Depth (ft.)	Dieldrin	Endosulfan sulfate	Endrin	Endrin aldehyde	Endrin ketone	gamma-BHC	gamma-Chlordane	Heptachlor	Heptachlor epoxide	Methoxychlor	p,p'-DDD	p,p'-DDE	p,p'-DDT	Toxaphene
Industrial/ Commercial		*Ing*	*0.4*		*610*			*4*		*1*	*0.6*	*10000*	*24*	*17*	*17*	*5.2*
		Inh	*2.2*							*11*	*9.2*				*1500*	*170*
Construction Worker		*Ing*	*7.8*		*61*			*96*		*28*	*2.7*	*1000*	*520*	*370*	*100*	*110*
		Inh	*3.1*							*16*	*13*				*2100*	*240*
Soil Component of GW		*I*	*0.004*		*1*			*0.009*		*23*	*0.7*	*160*	*16*	*54*	*32*	*31*
		II	*0.02*		*5*			*0.047*		*110*	*3.3*	*780*	*80*	*270*	*160*	*150*
Pit 24	X139	9	0.084 J	0.014 J	0.0039 U	0.017 J	0.0039 U	0.0047 J	0.024 J	0.002 U	0.023 J	0.065 J	0.024 J	0.083 J	0.077 J	0.2 U
Pit 24	X139DL	9	0.074 J	0.017 J	0.014 J	0.017 J	0.039 U	0.02 U	0.025 U	0.02 U	0.024 J	0.2 U	0.024 J	0.064 J	0.087 J	2 U
Pit 24	X139RE	9														
Pit 25	X132	2.5	0.022 J	0.004 UJ	0.004 UJ	0.011 J	0.004 UJ	0.0021 UJ	0.0021 UJ	0.0021 UJ	0.0021 UJ	0.026 J	0.027 J	0.017 J	0.053 J	0.21 UJ
Pit 25	X132DL	2.5														
Pit 25	X132RE	2.5														
Pit 25	X133	8	0.0022 J	0.0074 J	0.003 J	0.0037 U	0.0037 U	0.0019 UJ	0.0019 U	0.0019 U	0.0019 U	0.019 U	0.0024 J	0.0029 J	0.0058 J	0.19 U
Pit 26	X140	3	0.0022 J	0.0035 U	0.0035 U	0.0035 U	0.0035 U	0.0018 U	0.0013 J	0.0018 U	0.0013 J	0.018 U	0.0081 =	0.0047 =	0.0064 =	0.18 U
Pit 26	X141	9	0.0071 UJ	0.0071 UJ	0.0071 UJ	0.0031 J	0.0071 UJ	0.003 J	0.0053 U	0.0042 U	0.0037 UJ	0.036 UJ	0.0063 J	0.0016 J	0.017 J	0.36 UJ
Pit 26	X141RE	9														
Pit 27	X136	9	0.18 =	0.021 U	0.062 =	0.039 =	0.021 U	0.011 UJ	0.15 =	0.011 U	0.066 =	0.16 =	0.12 =	0.12 =	0.59 =	1.1 U
Pit 27	X136DL	9	0.29 =	0.21 U	0.21 U	0.21 U	0.21 U	0.11 UJ	0.23 =	0.11 U	0.11 =	1.1 U	0.28 =	0.17 J	0.78 =	11 U
Pit 27	X136RE	9														
Pit 27	X137	3	0.018 J	0.038 U	0.038 U	0.0059 J	0.038 U	0.02 U	0.02 U	0.02 U	0.016 J	0.2 U	0.018 J	0.034 J	0.043 J	2 U
Pit 27	X137DL	3														
Pit 27	X137RE	3														
Pit 28	X164	3	0.05 J	0.0079 J	0.04 U	0.016 J	0.0062 J	0.0029 J	0.021 U	0.021 U	0.016 J	0.21 U	0.04 J	0.016 J	0.028 J	2.1 U
Pit 28	X164DL	3	0.055 J	0.4 U	0.4 U	0.4 U	0.4 U	0.21 U	0.21 U	0.21 U	0.01 J	2.1 U	0.4 U	0.017 J	0.026 J	21 U
Pit 28	X165	10	0.054 J	0.048 J	0.28 J	0.024 J	0.061 U	0.0056 J	0.031 U	0.032 U	0.018 J	0.16 J	0.11 J	0.017 J	0.099 J	3.1 U
Pit 28	X165DL	10	0.096 J	0.19 J	0.24 J	0.037 J	0.61 U	0.31 U	0.31 U	0.31 U	0.0672 J	3.1 U	0.11 J	0.027 J	0.36 J	31 U
Pit 29	X128	3	0.01 =	0.0037 U	0.0037 U	0.0051 =	0.0026 J	0.0019 U	0.0084 =	0.0019 U	0.0056 =	0.019 U	0.035 =	0.026 =	0.027 =	0.19 U
Pit 29	X129	4.5	0.035 =	0.0078 =	0.0039 U	0.014 =	0.0039 U	0.002 U	0.035 =	0.0021 U	0.05 =	0.027 =	0.024 =	0.068 =	0.1 =	0.2 U
Pit 29	X129DL	4.5	0.075 J	0.039 U	0.019 J	0.023 J	0.039 U	0.02 U	0.067 J	0.02 U	0.31 J	0.2 U	0.039 J	0.13 J	0.2 J	2 U
Pit 30	X166	3	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.002 UJ	0.002 U	0.0016 J	0.002 U	0.02 U	0.0035 J	0.004 U	0.0034 J	0.2 U
Pit 30	X166DL	3														
Pit 30	X167	9	0.033 =	0.0045 U	0.0045 U	0.0031 J	0.0045 U	0.0023 UJ	0.0089 =	0.0022 J	0.0043 =	0.023 U	0.055 =	0.017 =	0.02 =	0.23 U
Pit 30	X167DL	9														
Pit 30	X167RE	9														
Pit 31	X130	3	0.057 =	0.0039 U	0.0039 U	0.061 =	0.0039 U	0.002 U	0.016 =	0.002 U	0.0084 =	0.02 U	0.13 =	0.038 =	0.2 =	0.2 U
Pit 31	X130DL	3	0.086 =	0.039 U	0.029 J	0.093 =	0.039 U	0.02 U	0.025 U	0.02 U	0.014 J	0.2 U	0.039 U	0.055 =	0.31 =	2 U
Pit 31	X131	6	0.029 J	0.0049 U	0.0049 U	0.19 J	0.0049 U	0.0025 U	0.011 J	0.0025 U	0.013 J	0.025 U	0.02 J	0.047 J	0.07 J	0.25 U
Pit 31	X131DL	6	0.047 J	0.049 U	0.049 U	0.35 J	0.049 U	0.025 U	0.025 U	0.025 U	0.023 J	0.25 U	0.029 J	0.064 J	0.12 J	2.5 U

Table E-10. PCBs and Pesticides in Alburn (mg/kg)

			Pesticides/Herbicides													
Station ID	Sample ID	Depth (ft.)	Dieldrin	Endosulfan sulfate	Endrin	Endrin aldehyde	Endrin ketone	gamma-BHC	gamma-Chlordane	Heptachlor	Heptachlor epoxide	Methoxychlor	p,p'-DDD	p,p'-DDE	p,p'-DDT	Toxaphene
Industrial/		*Ing*	*0.4*		*610*			*4*		*1*	*0.6*	*10000*	*24*	*17*	*17*	*5.2*
Commercial		*Inh*	*2.2*							*11*	*9.2*				*1500*	*170*
		Ing	*7.8*		*61*			*96*		*28*	*2.7*	*1000*	*520*	*370*	*100*	*110*
Construction Worker		*Inh*	*3.1*							*16*	*13*				*2100*	*240*
Soil Component of		*I*	*0.004*		*1*			*0.009*		*23*	*0.7*	*160*	*16*	*54*	*32*	*31*
GW		*II*	*0.02*		*5*			*0.047*		*110*	*3.3*	*780*	*80*	*270*	*160*	*150*
Pit 31	X131RE	6														
Pit 33	X134	3	0.0093 J	0.0051 J	0.0037 J	0.0076 J	0.0036 UJ	0.0019 UJ	0.0051 J	0.0019 U	0.0019 UJ	0.019 J	0.0089 J	0.0024 J	0.026 J	0.19 UJ
Pit 33	X134DL	3	0.025 J	0.036 U	0.036 U	0.036 U	0.036 U	0.019 UJ	0.019 U	0.019 U	0.019 U	0.19 U	0.021 J	0.036 U	0.057 J	1.9 U
Pit 33	X134RE	3														
Pit 33	X135	8	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.0021 UJ	0.0021 U	0.0021 U	0.0021 U	0.021 U	0.004 U	0.004 U	0.004 U	0.21 U
Pit 33	X135RE	8														
Pit 34	X162	3	0.0035 J	0.0021 J	0.00054 J	0.0011 J	0.002 J	0.00075 J	0.004 =	0.0022 U	0.00086 J	0.022 U	0.0016 J	0.0038 J	0.004 J	0.22 U
Pit 34	X162DL	3														
Pit 34	X162DLRE	3														
Pit 34	X163	9	0.00099 J	0.004 UJ	0.004 UJ	0.004 UJ	0.004 UJ	0.0021 UJ	0.0021 U	0.0021 U	0.00063 J	0.021 UJ	0.0076 J	0.0022 J	0.004 UJ	0.21 UJ
Pit 34	X163DL	9	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.021 U	0.021 U	0.021 U	0.021 U	0.21 U	0.04 U	0.04 U	0.04 U	2.1 U
Pit 35	X149	3	0.0037 U	0.0037 U	0.0037 U	0.0037 U	0.0037 U	0.0019 U	0.00057 J	0.0019 U	0.0019 U	0.019 U	0.0037 U	0.0037 U	0.0037 U	0.19 U
Pit 35	X149DL	3														
Pit 35	X149RE	3														
Pit 35	X150	9	0.026 J	0.076 U	0.076 U	0.076 U	0.076 U	0.039 U	0.032 J	0.039 U	0.039 U	0.39 U	0.35 J	0.047 J	0.049 J	3.9 U
Pit 35	X150DL	9														
Pit 35	X150RE	9														
Pit 37	X151	3	0.048 =	0.00063 J	0.017 =	0.0062 J	0.0073 U	0.0038 U	0.012 =	0.0053 U	0.0035 J	0.015 J	0.034 =	0.078 =	0.16 =	0.38 U
Pit 37	X151DL	3	0.068 J	0.013 J	0.024 J	0.01 J	0.073 U	0.038 U	0.038 U	0.038 U	0.0063 J	0.38 U	0.026 J	0.09 =	0.28 =	3.8 U
Pit 37	X151RE	3														
Pit 37	X152	9	0.0027 J	0.004 U	0.004 U	0.004 U	0.004 U	0.0021 U	0.0021 U	0.0021 U	0.00041 J	0.02 U	0.00099 J	0.0025 J	0.0046 =	0.2 U
Pit 38	X157	3	0.0038 U	0.0038 U	0.0038 U	0.0038 U	0.0038 U	0.002 U	0.002 U	0.002 U	0.002 U	0.02 U	0.0038 U	0.0038 U	0.0038 U	0.2 U
Pit 38	X158	9	0.0059 J	0.00022 J	0.0038 J	0.002 J	0.0041 R	0.00036 J	0.0021 U	0.0021 U	0.0057 J	0.0098 J	0.009 J	0.034 J	0.029 J	0.21 R
Pit 38	X158DL	9	0.01 J	0.0026 J	0.0047 J	0.041 U	0.041 U	0.021 U	0.021 U	0.021 U	0.007 J	0.15 J	0.0067 J	0.026 J	0.055 J	2.1 U
Pit 39	X153	3	0.0015 J	0.0036 J	0.0022 J	0.0041 U	0.0041 U	0.0021 U	0.0021 U	0.0021 U	0.00018 J	0.13 J	0.0011 J	0.0024 J	0.0011 J	0.21 U
Pit 39	X153DL	3														
Pit 39	X153RE	3														
Pit 39	X154	9	0.00045 J	0.0039 U	0.0039 U	0.0039 U	0.0039 U	0.002 U	0.002 U	0.002 U	0.002 U	0.02 U	0.0011 J	0.0039 U	0.00091 J	0.2 U
Pit 40	X155	3	0.00084 J	0.0039 U	0.0012 J	0.00095 J	0.0039 U	0.002 U	0.002 U	0.002 U	0.002 U	0.02 U	0.0015 J	0.00062 J	0.0036 J	0.2 U
Pit 40	X155RE	3														
Pit 40	X156	10	0.00089 J	0.0021 J	0.00093 J	0.0005 J	0.0039 U	0.002 U	0.0062 =	0.002 U	0.00017 J	0.02 U	0.001 J	0.0012 J	0.0016 J	0.2 U
Pit 40	X156DL	10														

Table E-10. PCBs and Pesticides in Alburn (mg/kg)

			Pesticides/Herbicides													
Station ID	Sample ID	Depth (ft.)	Dieldrin	Endosulfan sulfate	Endrin	Endrin aldehyde	Endrin ketone	gamma-BHC	gamma-Chlordane	Heptachlor	Heptachlor epoxide	Methoxychlor	p,p'-DDD	p,p'-DDE	p,p'-DDT	Toxaphene
Industrial/ Commercial		*Ing*	*0.4*		*610*			*4*		*1*	*0.6*	*10000*	*24*	*17*	*17*	*5.2*
		Inh	*2.2*							*11*	*9.2*				*1500*	*170*
Construction Worker		*Ing*	*7.8*		*61*			*96*		*28*	*2.7*	*1000*	*520*	*370*	*100*	*110*
		Inh	*3.1*							*16*	*13*				*2100*	*240*
Soil Component of GW		*I*	*0.004*		*1*			*0.009*		*23*	*0.7*	*160*	*16*	*54*	*32*	*31*
		II	*0.02*		*5*			*0.047*		*110*	*3.3*	*780*	*80*	*270*	*160*	*150*
Pit 41	X181	9	0.0066 J	0.0054 J	0.005 J	0.0034 J	0.0044 R	0.0023 R	0.0015 J	0.0023 R	0.0027 J	0.019 J	0.013 J	0.0044 R	0.0099 J	0.23 R
Pit 41	X182	3	0.0051 =	0.00069 J	0.0011 J	0.0037 J	0.0043 U	0.0022 U	0.0019 J	0.0034 U	0.0014 J	0.004 J	0.0021 J	0.0051 =	0.012 =	0.22 U
Pit 42	X179	3	0.035 J	0.0083 J	0.0071 J	0.0086 J	0.0057 J	0.002 UJ	0.011 J	0.0042 U	0.002 UJ	0.039 J	0.02 J	0.042 J	0.089 J	0.2 UJ
Pit 42	X179DL	3	0.033 J	0.0085 J	0.0082 J	0.032 J	0.04 U	0.02 U	0.0079 J	0.02 U	0.007 J	0.039 J	0.013 J	0.035 J	0.086 =	2 U
Pit 42	X180	9	0.019 J	0.024 J	0.0099 J	0.003 J	0.0037 J	0.0022 R	0.0096 J	0.0025 J	0.0062 J	0.0073 J	0.0068 J	0.0021 J	0.015 J	0.22 R
Pit 42	X180DL	9														
Pit 42	X180RE	9														
Pit 43	X175	3	0.021 J	0.0083 J	0.0067 J	0.011 J	0.004 UJ	0.0021 UJ	0.0021 UJ	0.0021 UJ	0.0021 UJ	0.017 J	0.042 J	0.004 UJ	0.039 J	0.21 UJ
Pit 43	X176	8	0.0032 J	0.0036 U	0.0021 J	0.0036 J	0.0036 U	0.0018 UJ	0.0018 U	0.00098 J	0.0048 =	0.018 U	0.0013 J	0.0023 J	0.0071 =	0.18 U
Pit 43	X176DL	8														
Pit 44	X183	3	0.0013 J	0.0053 J	0.006 J	0.0023 J	0.0039 J	0.0021 R	0.0033 J	0.0021 R	0.0021 R	0.041 J	0.0078 J	0.0024 J	0.014 J	0.2 R
Pit 44	X183DL	3														
Pit 44	X184	8	0.0046 J	0.0056 U	0.0056 U	0.0049 J	0.0056 U	0.0029 U	0.0076 J	0.0055 U	0.0029 U	0.015 J	0.0041 J	0.0091 J	0.015 J	0.29 U
Pit 44	X184DL	8														
Pit 45	X177	3	0.0063 U	0.0024 J	0.0063 U	0.0063 U	0.0063 U	0.0033 UJ	0.0033 U	0.0027 J	0.0033 U	0.033 U	0.0063 U	0.0063 U	0.0063 U	0.33 U
Pit 45	X178	8	0.003 U	0.0038 =	0.0023 J	0.003 U	0.003 U	0.0016 UJ	0.0016 U	0.0012 J	0.0016 U	0.016 U	0.003 U	0.0014 J	0.0017 J	0.16 U
Pit 52	X210	3	0.0036 R	0.0036 R	0.0036 R	0.0036 R	0.0036 R	0.0018 R	0.0022 J	0.0018 R	0.0018 R	0.005 J	0.012 J	0.0036 R	0.0036 R	0.18 R
Pit 52	X211	5	0.0058 U	0.0058 U	0.0058 U	0.0058 U	0.0058 U	0.003 U	0.003 U	0.0073 =	0.003 U	0.03 U	0.056 =	0.0058 U	0.0058 U	0.3 U
Pit 53	X212	3	0.0042 U	0.0042 U	0.0042 U	0.0042 U	0.0042 U	0.0022 U	0.02 =	0.0022 U	0.0022 U	0.022 U	0.003 J	0.0042 U	0.0042 U	0.22 U
Pit 53	X213	7	0.0044 R	0.0044 R	0.0044 R	0.0044 R	0.078 J	0.0023 R	0.0023 R	0.042 J	0.0023 R	0.0046 J	0.02 J	0.026 J	0.0044 R	0.23 R
Pit 53	X213DL	7	0.022 U	0.022 U	0.022 U	0.022 U	0.022 U	0.011 U	0.011 U	0.064 J	0.011 U	0.0088 J	0.014 J	0.022 U	0.022 U	1.1 U

Notes:

=:	sample concentration is detected at level reported
U:	sample concentration is under detection limit
J:	sample concentration is estimated value
R:	sample concentration value is rejected
DL:	sample is diluted
RE:	sample is re-extracted
Ing.:	Ingestion
Inh.:	Inhalation
I:	Class I
II:	Class II

Table E-11. PCBs and Pesticides in U.S. Drum (mg/kg)

			PCBs							Pesticides/Herbicides							
Station ID	Sample ID	Depth (ft.)	Arochlor 1016	Arochlor 1221	Arochlor 1232	Arochlor 1242	Arochlor 1248	Arochlor 1254	Arochlor 1260	Aldrin	alpha-BHC	alpha-Chlordane	alpha-Endosulfan	Atrazine	beta-BHC	beta-Endosulfan	delta-BHC
Industrial/ Commercial		*Ing*	*Sum of the Arochlors can be 1 mg/kg*							*0.3*	*0.9*			*72000*			
		Inh								*6.6*	*1.5*						
Construction Worker		*Ing*								*6.1*	*20*			*7100*			
		Inh								*9.3*	*2.1*						
Soil Component of GW		*I*								*0.5*	*0.0005*			*0.066*			
		II								*2.5*	*0.003*			*0.33*			
Pit 01	X207	4	0.038 U	0.077 U	0.038 U	0.038 U	0.038 U	0.038 U	0.038 U	0.002 U	0.002 U	0.002 U	0.002 U	7.6 U	0.002 U	0.0038 U	0.002 U
Pit 01	X208	9	0.11 U	0.22 U	0.11 U	2.3 =	0.11 U	0.11 U	0.11 U	0.0055 U	0.0063 =	0.0055 U	0.017 =	85 U	0.0055 U	0.011 U	0.0055 U
Pit 01	X208DL	9	0.53 U	1.1 U	0.53 U	2.3 J	0.53 U	0.53 U	0.53 U	0.027 U	0.0072 J	0.027 U	0.02 J		0.027 U	0.053 U	0.027 U
Pit 01	X209	13	0.089 U	0.18 U	0.089 U	4.3 =	0.089 U	1.2 =	0.089 U	0.0046 U	0.0046 U	0.013 =	0.0063 =	14 UJ	0.0046 U	0.0089 U	0.0046 U
Pit 01	X209DL	13	0.45 UJ	0.91 UJ	0.45 UJ	7.1 J	0.45 UJ	1.6 J	0.45 UJ	0.023 UJ	0.023 UJ	0.016 J	0.023 UJ		0.023 UJ	0.045 UJ	0.023 UJ
Pit 02	X205	3	0.044 U	0.089 U	0.044 U	0.2 =	0.044 U	0.35 =	0.044 U	0.0023 U	0.0023 U	0.0023 U	0.0023 U	0.44 U	0.0023 U	0.0044 U	0.0023 U
Pit 02	X206	9	0.041 U	0.083 U	0.041 U	0.11 =	0.041 U	0.32 =	0.041 U	0.0021 U	0.0021 U	0.0021 U	0.0021 U	1.2 U	0.0021 U	0.0041 U	0.0021 U
Pit 03	X201	3	0.039 U	0.079 U	0.039 U	0.039 U	0.039 U	1.7 =	0.31 =	0.002 U	0.002 U	0.002 U	0.002 U	1.6 U	0.002 U	0.0039 U	0.002 U
Pit 03	X202	8	0.058 U	0.12 U	0.058 U	0.2 J	0.058 U	0.058 U	0.058 U	0.003 U	0.003 U	0.003 U	0.003 U	1.2 U	0.003 U	0.0058 U	0.003 U
Pit 04	X177	4	0.042 U	0.085 U	0.042 U	0.32 J	0.042 U	0.042 U	0.042 U	0.0022 U	0.0022 UJ	0.0022 U	0.0022 U	2.1 U	0.0022 UJ	0.022 J	0.0022 U
Pit 04	X178	8	7.9 U	16 U	7.9 U	7.9 U	7.9 U	7.9 U	7.9 U	0.4 U	0.4 UJ	0.4 U	5.6 =	0.79 U	0.4 UJ	0.79 U	0.4 U
Pit 04	X178DL	8	39 U	80 U	39 U	39 U	39 U	39 U	39 U	2 U	2 UJ	2 U	7.4 =	16 U	2 UJ	1.5 J	2 U
Pit 05	X198	2.5	0.04 U	0.082 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.0021 U	0.002 J	0.0037 =	0.0021 U	2 U	0.0021 UJ	0.004 U	0.0021 U
Pit 05	X198DL	2.5	0.2 U	0.41 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.01 U	0.0026 J	0.0036 J	0.01 U		0.01 UJ	0.02 U	0.01 U
Pit 05	X199	8	0.041 U	0.083 U	0.041 U	0.041 U	0.041 U	0.041 U	0.041 U	0.00064 J	0.0021 U	0.0006 J	0.0021 U	4.1 U	0.0021 U	0.0041 U	0.0021 U
Pit 05	X199DL	8	0.41 U	0.83 U	0.41 U	0.41 U	0.41 U	0.41 U	0.41 U	0.012 J	0.021 U	0.021 U	0.021 U		0.021 U	0.041 U	0.021 U
Pit 05	X200	8	0.038 U	0.078 U	0.038 U	0.038 U	0.038 U	0.038 U	0.038 U	0.002 U	0.002 U	0.002 U	0.002 U	1.9 U	0.002 U	0.0038 U	0.002 U
Pit 05	X200DL	8												7.7 U			
Pit 06	X196	3	0.04 U	0.081 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.0021 U	0.0021 U	0.00095 J	0.0021 U	0.4 U	0.0021 U	0.004 U	0.0021 U
Pit 06	X197	8	0.041 U	0.083 U	0.041 U	0.51 J	0.041 U	0.53 J	0.041 U	0.0021 U	0.0021 U	0.0013 J	0.0021 U	2 U	0.0021 U	0.0041 U	0.0021 U
Pit 06	X197DL	8	0.41 U	0.83 U	0.41 U	0.59 =	0.2 U	0.48 J	0.2 U	0.021 U	0.021 U	0.021 U	0.021 U	8.1 U	0.021 U	0.041 U	0.021 U
Pit 07	X175	3	0.053 U	0.11 U	0.053 U	0.053 U	0.053 U	0.14 J	0.053 U	0.0027 U	0.0027 UJ	0.0021 J	0.0027 U	1.6 U	0.0027 UJ	0.0053 U	0.0027 U
Pit 07	X176	8	0.043 U	0.088 U	0.043 U	0.043 U	0.043 U	0.071 J	0.043 U	0.0022 U	0.0022 UJ	0.002 J	0.0022 U	1.3 U	0.0022 UJ	0.0043 U	0.0022 U
Pit 08	X173	2.5	0.039 UJ	0.079 UJ	0.039 UJ	0.19 J	0.039 UJ	0.37 J	0.039 UJ	0.002 UJ	0.002 UJ	0.0099 J	0.002 UJ	0.39 U	0.002 UJ	0.0039 UJ	0.0015 J
Pit 08	X173DL	2.5	0.19 UJ	0.39 UJ	0.19 UJ	0.19 UJ	0.19 UJ	0.47 J	0.19 UJ	0.01 UJ	0.01 UJ	0.01 J	0.01 UJ	1.2 U	0.01 UJ	0.019 UJ	0.0014 J
Pit 08	X174	8	0.041 U	0.084 U	0.041 U	0.041 U	0.041 U	0.041 U	0.041 U	0.0021 U	0.0021 UJ	0.0012 J	0.0021 U	2.1 U	0.0021 UJ	0.0041 U	0.0021 U
Pit 09	X168	3	0.038 U	0.078 U	0.038 U	0.13 J	0.038 U	0.26 J	0.038 U	0.002 U	0.002 UJ	0.0067 J	0.0034 J	0.38 U	0.002 UJ	0.0038 U	0.00074 J
Pit 09	X169	6.5	0.042 U	0.085 U	0.042 U	0.042 U	0.042 U	0.042 U	0.042 U	0.0022 U	0.0022 UJ	0.0022 U	0.0022 U	0.42 U	0.0022 UJ	0.0042 U	0.0022 U
Pit 09	X170	6.5	0.041 U	0.084 U	0.041 U	0.041 U	0.041 U	0.041 U	0.041 U	0.0021 U	0.0021 UJ	0.0021 U	0.0021 U	0.41 U	0.0021 UJ	0.0041 U	0.0021 U
Pit 10	X171	3	0.05 U	0.1 U	0.05 U	0.74 J	0.05 U	0.68 J	0.05 U	0.0026 U	0.0043 J	0.0013 J	0.0026 U	1 U	0.0026 UJ	0.005 U	0.0026 U

Table E-11. PCBs and Pesticides in U.S. Drum (mg/kg)

			PCBs							Pesticides/Herbicides							
Station ID	Sample ID	Depth (ft.)	Arochlor 1016	Arochlor 1221	Arochlor 1232	Arochlor 1242	Arochlor 1248	Arochlor 1254	Arochlor 1260	Aldrin	alpha-BHC	alpha-Chlordane	alpha-Endosulfan	Atrazine	beta-BHC	beta-Endosulfan	delta-BHC
Industrial/ Commercial		*Ing*	*Sum of the Arochlors can be 1 mg/kg*							*0.3*	*0.9*			*72000*			
		Inh								*6.6*	*1.5*						
Construction Worker		*Ing*								*6.1*	*20*			*7100*			
		Inh								*9.3*	*2.1*						
Soil Component of GW		*I*								*0.5*	*0.0005*			*0.066*			
		II								*2.5*	*0.003*			*0.33*			
Pit 10	X171DL	3												5 U			
Pit 10	X172	8	0.065 U	0.13 U	0.065 U	3.6 =	0.065 U	1.7 J	0.065 U	0.0033 U	0.0033 UJ	0.0033 U	0.036 J	19 U	0.0033 UJ	0.0065 U	0.0033 U
Pit 10	X172DL	8	0.32 UJ	0.66 UJ	0.32 UJ	5 J	0.32 UJ	2 J	0.32 UJ	0.017 UJ	0.017 UJ	0.017 UJ	0.036 J		0.017 UJ	0.032 UJ	0.017 UJ
Pit 11	X190	2	0.049 R	0.099 R	0.049 R	1.7 J	0.049 R	0.49 J	0.049 R	0.0025 R	0.0025 R	0.0066 J	0.0025 R	2.4 U	0.0025 R	0.0049 R	0.0056 J
Pit 11	X190DL	2	0.49 U	0.99 U	0.49 U	3.2 =	0.49 U	0.73 =	0.49 U	0.025 U	0.025 U	0.0076 J	0.025 U	4.9 U	0.025 U	0.049 U	0.0077 J
Pit 11	X191	8	0.044 UJ	0.089 UJ	0.044 UJ	0.62 J	0.044 UJ	0.08 J	0.044 UJ	0.0023 UJ	0.0023 UJ	0.0023 UJ	0.0058 J	0.88 U	0.0023 UJ	0.0044 UJ	0.0023 UJ
Pit 11	X191DL	8	0.44 UJ	0.89 UJ	0.44 UJ	0.86 J	0.44 UJ	0.28 J	0.44 UJ	0.023 UJ	0.023 UJ	0.023 UJ	0.023 UJ		0.023 UJ	0.044 UJ	0.023 UJ
Pit 12	X192	3	0.038 U	0.076 U	0.038 U	0.58 =	0.038 U	0.063 =	0.038 U	0.0019 U	0.0019 U	0.0019 U	0.0019 U	0.38 UJ	0.0019 U	0.0038 U	0.0019 U
Pit 12	X193	8	0.04 U	0.082 U	0.04 U	0.18 J	0.04 U	0.13 =	0.04 U	0.0021 U	0.0021 U	0.0012 J	0.0021 U	0.8 U	0.0021 U	0.004 U	0.0021 U
Pit 12	X193DL	8	0.4 U	0.82 U	0.4 U	0.27 J	0.4 U	0.4 U	0.4 U	0.021 U	0.021 U	0.021 U	0.021 U		0.021 U	0.04 U	0.021 U
Pit 13	X194	3.5	0.039 U	0.079 U	0.039 U	0.67 =	0.039 U	0.093 J	0.046 J	0.002 U	0.002 U	0.002 U	0.002 U	1.9 U	0.002 U	0.0039 U	0.0017 J
Pit 13	X195	12	0.054 U	0.11 U	0.054 U	0.054 U	0.19 J	0.054 U	0.054 U	0.0028 U	0.0028 U	0.0028 U	0.0028 U	5.4 U	0.0028 U	0.0054 U	0.0028 U
Pit 13	X195DL	12												27 U			
Pit 14	X184	4	0.038 U	0.077 U	0.038 U	0.038 U	2.6 J	0.038 U	0.038 U	0.002 U	0.002 U	0.002 U	0.0015 J	0.76 U	0.002 U	0.0038 U	0.002 U
Pit 14	X184DL	4	0.38 U	0.77 U	0.38 U	0.38 U	3.7 J	0.38 U	0.38 U	0.02 U	0.02 U	0.02 U	0.02 U		0.02 U	0.038 U	0.02 U
Pit 14	X185	9	0.048 U	0.097 U	0.048 U	13 J	0.048 U	1.7 J	0.6 J	0.0025 U	0.0025 U	0.0025 U	0.0061 J	0.48 U	0.0025 U	0.0048 U	0.0025 U
Pit 14	X185DL	9	0.48 U	0.97 U	0.48 U	32 J	0.48 U	0.48 U	0.58 J	0.025 U	0.025 U	0.025 U	0.025 U	0.96 U	0.025 U	0.048 U	0.025 U
Pit 15	X186	4	0.04 U	0.082 U	0.04 U	0.04 U	1.8 J	0.44 J	0.04 U	0.0021 U	0.0013 J	0.0021 U	0.0021 U	2 U	0.0021 U	0.004 U	0.0021 U
Pit 15	X187	8	0.041 U	0.083 U	0.041 U	0.3 J	0.041 U	0.041 U	0.041 U	0.0021 U	0.0021 U	0.0021 U	0.0021 U	0.81 U	0.0021 U	0.0041 U	0.00083 J
Pit 16	X188	3	0.038 U	0.076 U	0.038 U	0.038 U	0.038 U	0.038 U	0.038 U	0.0019 U	0.0019 U	0.0019 U	0.0019 U	3.8 U	0.0019 U	0.0038 U	0.00084 J
Pit 16	X188DL	3												7.5 U			
Pit 16	X189	7	0.038 U	0.078 U	0.038 U	0.17 J	0.038 U	0.11 J	0.038 U	0.002 U	0.002 U	0.0067 J	0.002 U	1.2 U	0.002 U	0.0038 U	0.00079 J
Pit 16	X189DL	7	0.38 U	0.78 U	0.38 U	0.25 J	0.38 U	0.21 J	0.38 U	0.02 U	0.02 U	0.0069 J	0.02 U		0.02 U	0.038 U	0.02 U
Pit 17	X181	3.5	0.054 U	0.11 U	0.054 U	0.054 U	0.054 U	0.054 U	0.054 U	0.0028 U	0.0028 U	0.0028 U	0.0028 U	2.2 UJ	0.0028 U	0.0013 J	0.0028 U
Pit 17	X182	7	0.047 UJ	0.096 UJ	0.047 UJ	0.047 UJ	0.84 J	0.047 UJ	0.047 UJ	0.0024 UJ	0.0024 UJ	0.0024 UJ	0.0024 UJ	9.4 U	0.0024 UJ	0.0047 UJ	0.0024 UJ
Pit 17	X183	13	0.041 U	0.084 U	0.041 U	0.041 U	0.041 U	0.041 U	0.041 U	0.0021 U	0.0021 U	0.0058 =	0.0021 U	0.41 U	0.0021 U	0.0041 U	0.0015 J
Pit 18	X179	3.5	0.038 UJ	0.076 UJ	0.038 UJ	0.038 UJ	0.96 J	0.038 UJ	0.59 J	0.0019 R	0.0019 UJ	0.0019 UJ	0.0019 UJ	3.8 U	0.0019 UJ	0.0038 UJ	0.0019 UJ
Pit 18	X179DL	3.5												7.5 U			
Pit 18	X180	7	0.051 U	0.1 U	0.051 U	0.051 U	0.57 J	0.051 U	0.63 J	0.0026 U	0.0026 U	0.0017 J	0.0031 J	5.1 U	0.0026 U	0.0051 U	0.0044 J
Pit 18	X180DL	7												30 U			

Table E-11. PCBs and Pesticides in U.S. Drum (mg/kg)

			PCBs							Pesticides/Herbicides							
Station ID	Sample ID	Depth (ft.)	Arochlor 1016	Arochlor 1221	Arochlor 1232	Arochlor 1242	Arochlor 1248	Arochlor 1254	Arochlor 1260	Aldrin	alpha-BHC	alpha-Chlordane	alpha-Endosulfan	Atrazine	beta-BHC	beta-Endosulfan	delta-BHC
Industrial/ Commercial		*Ing*	*Sum of the Arochlors can be 1 mg/kg*							*0.3*	*0.9*			*72000*			
		Inh								*6.6*	*1.5*						
Construction Worker		*Ing*								*6.1*	*20*			*7100*			
		Inh								*9.3*	*2.1*						
Soil Component of GW		*I*								*0.5*	*0.0005*			*0.066*			
		II								*2.5*	*0.003*			*0.33*			
Pit 19	X166	3	0.04 U	0.082 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.0021 U	0.0021 UJ	0.0021 U	0.062 J	12 UJ	0.0021 UJ	0.004 U	0.0021 U
Pit 19	X166DL	3	0.2 U	0.41 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.01 U	0.01 UJ	0.01 U	0.18 J		0.01 UJ	0.02 U	0.01 U
Pit 19	X167	9	0.52 U	1.1 U	0.52 U	1.6 J	0.52 U	1.3 =	0.52 U	0.027 R	0.027 U	0.062 =	0.017 J	1.6 U	0.027 U	0.052 U	0.0088 J
Pit 19	X167DL	9	5.2 U	11 U	5.2 U	5.2 U	5.2 U	5.2 U	5.2 U	0.27 U	0.27 U	0.074 J	0.27 U		0.27 U	0.52 U	0.27 U
Pit 20	X164	3	0.041 U	0.083 U	0.041 U	3.1 =	0.041 U	3.3 =	0.041 U	0.0021 U	0.0021 UJ	0.0023 J	0.0021 U	2.4 U	0.0021 UJ	0.0041 U	0.0021 U
Pit 20	X164DL	3	0.2 U	0.41 U	0.2 U	5.3 =	0.2 U	5.7 J	0.2 U	0.01 U	0.01 UJ	0.0032 J	0.01 U		0.01 UJ	0.02 U	0.01 U
Pit 20	X165	9	0.045 U	0.092 U	0.045 U	0.96 J	0.045 U	0.045 U	0.045 U	0.0023 U	0.0023 UJ	0.0019 J	0.024 J	14 UJ	0.0023 UJ	0.0033 J	0.0023 U
Pit 20	X165DL	9	0.23 U	0.46 U	0.23 U	1.5 J	0.23 U	4.7 J	0.23 U	0.012 U	0.012 UJ	0.003 J	0.012 U		0.012 UJ	0.005 J	0.012 U
Pit 21	X162	2	0.069 R	0.14 R	0.069 R	13 J	0.069 R	4.7 J	0.069 R	0.0035 R	0.024 J	0.0027 J	0.022 J	3.4 U	0.0035 R	0.0042 J	0.0035 R
Pit 21	X162DL	2	0.34 U	0.7 U	0.34 U	29 J	0.34 U	8 J	0.34 U	0.018 U	0.018 UJ	0.018 U	0.018 U		0.018 UJ	0.034 U	0.018 U
Pit 21	X163	9	0.067 R	0.14 R	0.067 R	5.2 J	0.067 R	3.1 J	0.067 R	0.0035 R	0.0035 R	0.014 J	0.0035 R	48 UJ	0.0035 R	0.0033 J	0.0035 R
Pit 21	X163DL	9	0.34 U	0.68 U	0.34 U	9.5 =	0.34 U	5.8 J	0.34 U	0.017 U	0.017 UJ	0.02 J	0.017 U		0.017 UJ	0.034 U	0.017 U
Pit 22	X160	3.5	0.043 U	0.087 U	0.043 U	0.043 U	0.043 U	0.043 U	0.043 U	0.0022 U	0.0022 UJ	0.0022 U	0.0022 U	0.64 U	0.0022 UJ	0.0043 U	0.0022 U
Pit 22	X161	8	0.046 U	0.094 U	0.046 U	0.74 J	0.046 U	1.2 =	0.046 U	0.0024 U	0.0024 UJ	0.0018 J	0.0024 U	2.3 U	0.0024 UJ	0.0047 U	0.0024 U
Pit 22	X161DL	8	0.23 U	0.47 U	0.23 U	1 J	0.23 U	1.8 J	0.23 U	0.012 U	0.012 UJ	0.002 J	0.012 U		0.012 UJ	0.023 U	0.012 U
Pit 23	X157	2.5	0.039 U	0.08 U	0.039 U	0.039 U	0.039 U	0.039 U	0.039 U	0.002 U	0.002 U	0.002 U	0.002 U	0.39 U	0.002 U	0.0039 U	0.002 U
Pit 23	X158	9	0.063 U	0.13 U	0.063 U	0.76 J	0.063 U	0.87 J	0.063 U	0.0033 U	0.0033 U	0.0027 J	0.0031 J	19 U	0.0033 U	0.0064 U	0.0033 U
Pit 23	X158DL	9	0.63 U	1.3 U	0.63 U	0.95 U	0.63 U	1 J	0.32 U	0.033 U	0.033 U	0.033 U	0.033 U		0.033 U	0.063 U	0.033 U
Pit 23	X159	13	0.066 R	0.13 R	0.066 R	2.9 J	0.066 R	1.1 J	0.066 R	0.0034 R	0.0034 R	0.026 J	0.029 J	20 UJ	0.0034 R	0.0066 R	0.0042 J
Pit 23	X159DL	13	0.33 UJ	0.67 UJ	0.33 UJ	3.7 J	0.33 UJ	1.6 J	0.33 UJ	0.017 UJ	0.017 UJ	0.022 J	0.017 UJ		0.017 UJ	0.033 UJ	0.017 UJ
Pit 24	X155	2.5	0.087 R	0.18 R	0.087 R	8.7 J	0.087 R	4.4 J	0.087 R	0.0045 R	0.0045 R	0.067 J	0.12 J	26 U	0.0045 R	0.0087 R	0.0045 R
Pit 24	X155DL	2.5	0.87 U	1.8 U	0.87 U	11 J	0.87 U	5.9 J	0.87 U	0.045 U	0.045 U	0.071 =	0.085 J		0.045 U	0.087 U	0.045 U
Pit 24	X156	8.5	0.061 U	0.12 U	0.061 U	0.78 J	0.061 U	0.65 J	0.061 U	0.0032 U	0.0032 U	0.0032 U	0.00084 J	2.4 U	0.0032 U	0.0061 U	0.0032 U
Pit 25	X153	3	0.056 U	0.11 U	0.056 U	1.4 J	0.056 U	0.98 J	0.056 U	0.056 J	0.0029 U	0.06 =	0.046 J	17 U	0.0029 U	0.0056 U	0.018 J
Pit 25	X153DL	3	0.56 U	1.1 U	0.56 U	2 J	0.56 U	1.7 J	0.56 U	0.029 U	0.029 U	0.054 =	0.055 J		0.029 U	0.056 U	0.023 J
Pit 25	X154	9.5	0.044 U	0.089 U	0.044 U	1.2 J	0.044 U	2.7 =	0.044 U	0.0023 U	0.0023 U	0.0038 J	0.0063 J	1.3 U	0.0023 U	0.0033 J	0.0023 U
Pit 25	X154DL	9.5	0.44 U	0.89 U	0.44 U	1.4 J	0.44 U	3.5 =	0.44 U	0.023 U	0.023 U	0.023 U	0.0065 J	2.6 U	0.023 U	0.044 U	0.023 U
Pit 26	X151	3	0.04 R	0.082 R	0.04 R	0.65 J	0.04 R	0.31 J	0.04 R	0.0021 R	0.0021 R	0.0021 R	0.0021 R	12 U	0.0021 R	0.004 R	0.0021 R
Pit 26	X152	9	0.049 U	0.1 U	0.049 U	2.6 J	0.049 U	2.8 J	0.049 U	0.0025 U	0.0025 U	0.00092 J	0.0071 J	15 U	0.0025 U	0.0049 U	0.0025 U
Pit 26	X152DL	9	0.49 U	1 U	0.49 U	3.4 J	0.49 U	3.6 J	0.49 U	0.025 U	0.025 U	0.025 U	0.025 U		0.025 U	0.049 U	0.025 U

Table E-11. PCBs and Pesticides in U.S. Drum (mg/kg)

			PCBs							Pesticides/Herbicides							
Station ID	Sample ID	Depth (ft.)	Arochlor 1016	Arochlor 1221	Arochlor 1232	Arochlor 1242	Arochlor 1248	Arochlor 1254	Arochlor 1260	Aldrin	alpha-BHC	alpha-Chlordane	alpha-Endosulfan	Atrazine	beta-BHC	beta-Endosulfan	delta-BHC
Industrial/ Commercial		*Ing*	*Sum of the Arochlors can be 1 mg/kg*							*0.3*	*0.9*			*72000*			
		Inh								*6.6*	*1.5*						
Construction Worker		*Ing*								*6.1*	*20*			*7100*			
		Inh								*9.3*	*2.1*						
Soil Component of GW		*I*								*0.5*	*0.0005*			*0.066*			
		II								*2.5*	*0.003*			*0.33*			
Pit 27	X149	3.5	0.057 UJ	0.12 UJ	0.057 UJ	1.2 J	0.057 UJ	0.49 J	0.057 UJ	0.0029 UJ	0.0029 UJ	0.0032 J	0.01 J	0.57 U	0.0029 UJ	0.0057 UJ	0.0029 UJ
Pit 27	X150	10	0.063 U	0.13 U	0.063 U	0.063 U	0.063 U	0.063 U	0.063 U	0.0033 U	0.0033 U	0.0033 U	0.0033 U	19 U	0.0033 U	0.0064 U	0.0033 U
Pit 28	X147	3	0.045 U	0.091 U	0.045 U	0.23 J	0.045 U	0.19 J	0.045 U	0.0023 U	0.0023 U	0.0023 U	0.0023 U	0.45 U	0.0023 U	0.0045 U	0.0023 U
Pit 28	X147DL	3												1.8 U			
Pit 28	X148	8	0.075 U	0.15 U	0.075 U	2.8 J	0.075 U	1.2 J	0.075 U	0.0039 U	0.0039 U	0.0033 J	0.0052 J	23 U	0.0039 U	0.0075 U	0.0039 U
Pit 29	X145	4.5	0.04 U	0.081 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.0021 U	0.0021 U	0.0081 =	0.0021 U	0.8 U	0.0021 U	0.004 U	0.00058 J
Pit 29	X146	8	0.038 R	0.077 R	0.038 R	6.7 J	0.038 R	3.7 J	0.038 R	0.002 R	0.002 R	0.0017 J	0.013 J	11 U	0.002 R	0.0038 R	0.002 R
Pit 29	X146DL	8	0.38 U	0.77 U	0.38 U	11 J	0.38 U	5.9 J	0.38 U	0.02 U	0.02 U	0.0026 J	0.015 J		0.02 U	0.038 U	0.02 U
Pit 30	X143	4	0.1 U	0.21 U	0.1 U	8 J	0.1 U	3.2 J	0.1 U	0.0053 U	0.0053 U	0.0053 U	0.024 J	31 U	0.13 =	0.01 U	0.0053 U
Pit 30	X143DL	4	1 U	2.1 U	1 U	11 J	1 U	4.8 J	1 U	0.053 U	0.053 U	0.053 U	0.031 J		0.089 J	0.1 U	0.053 U
Pit 30	X144	6	0.058 UJ	0.12 UJ	0.058 UJ	1.4 J	0.058 UJ	1.4 J	0.058 UJ	0.003 UJ	0.003 UJ	0.063 J	0.028 J	17 U	0.003 UJ	0.0058 UJ	0.0077 J
Pit 30	X144DL	6	0.58 U	1.2 U	0.58 U	1.9 J	0.58 U	2 =	0.58 U	0.03 U	0.03 U	0.073 =	0.041 J		0.03 U	0.058 U	0.0091 J
Pit 31	X141	4	0.052 U	0.1 U	0.052 U	6.5 =	0.052 U	1.5 J	0.052 U	0.0027 U	0.0027 U	0.023 J	0.038 J	0.52 U	0.0027 U	0.0052 U	0.0027 U
Pit 31	X141DL	4	0.52 U	1 U	0.52 U	10 =	0.52 U	2 J	0.26 U	0.027 U	0.027 U	0.025 J	0.029 J	10 U	0.027 U	0.052 U	0.027 U
Pit 31	X142	9	0.04 UJ	0.081 UJ	0.04 UJ	1.7 J	0.04 UJ	2.8 J	0.04 UJ	0.0021 UJ	0.0021 UJ	0.0021 UJ	0.0036 J	0.4 U	0.0021 UJ	0.004 UJ	0.0021 UJ
Pit 31	X142DL	9	0.4 U	0.8 U	0.4 U	2.4 J	0.4 U	4.1 J	0.4 U	0.02 U	0.02 U	0.02 U	0.02 U		0.02 U	0.04 U	0.02 U
Pit 32	X139	3	0.047 U	0.096 U	0.047 U	1 =	0.047 U	0.51 =	0.047 U	0.0024 U	0.0024 U	0.0021 J	0.0024 U	14 U	0.0024 U	0.0047 U	0.0024 U
Pit 32	X140	9	0.1 U	0.21 U	0.1 U	2.7 J	0.1 U	2.1 J	0.1 U	0.0053 U	0.0053 U	0.0053 U	0.012 J	31 U	0.0053 U	0.01 U	0.0053 U
Pit 33	X137	3	0.26 U	0.52 U	0.26 U	1.2 =	0.26 U	0.92 =	0.77 =	0.013 U	0.013 U	0.007 J	0.013 U	1.2 U	0.013 U	0.026 U	0.013 U
Pit 33	X137DL	3	1.3 U	2.6 U	1.3 U	1.5 J	1.3 U	1.1 J	0.63 J	0.066 U	0.066 U	0.066 U	0.066 U	3.7 U	0.066 U	0.13 U	0.066 U
Pit 33	X138	9	0.043 U	0.087 U	0.043 U	0.25 =	0.043 U	0.13 =	0.043 U	0.0022 U	0.0022 U	0.0022 U	0.0022 U	13 U	0.0022 U	0.0043 U	0.0022 U
Pit 34	X135	3	0.056 U	0.11 U	0.056 U	0.75 =	0.056 U	0.18 =	0.11 =	0.0029 U	0.0029 U	0.00078 J	0.0029 U	0.56 U	0.00095 J	0.0056 U	0.0029 U
Pit 34	X136	10	0.055 U	0.11 U	0.055 U	4.3 =	0.055 U	0.62 =	0.65 =	0.0028 U	0.0028 U	0.0033 =	0.0028 U	17 U	0.0028 U	0.0055 U	0.0028 U
Pit 34	X136DL	10	0.28 U	0.56 U	0.28 U	6.3 J	0.28 U	0.92 J	0.76 J	0.014 U	0.014 U	0.004 J	0.014 U		0.014 U	0.028 U	0.014 U
Pit 35	X133	4	0.04 U	0.082 U	0.04 U	0.088 =	0.04 U	0.069 =	0.04 U	0.0021 U	0.0021 U	0.0021 U	0.0021 U	0.4 U	0.0021 U	0.004 U	0.0021 U
Pit 35	X133DL	4	0.2 U	0.41 U	0.2 U	0.11 J	0.2 U	0.2 U	0.2 U	0.01 U	0.01 U	0.01 U	0.01 U		0.01 U	0.02 U	0.01 U
Pit 35	X134	10	0.053 U	0.11 U	0.053 U	1.6 J	0.053 U	0.35 J	0.23 J	0.0027 U	0.0027 U	0.0018 J	0.0027 U	0.53 U	0.0027 U	0.0053 U	0.0027 U
Pit 35	X134DL	10	0.27 U	0.54 U	0.27 U	2.1 J	0.27 U	0.4 J	0.3 J	0.014 U	0.014 U	0.014 U	0.014 U		0.014 U	0.027 U	0.014 U
Pit 36	X131	4	0.14 R	0.28 R	0.14 R	4.5 J	0.14 R	1.9 J	0.14 R	0.0071 R	0.0071 R	0.0079 J	0.0071 R	41 R	0.0058 J	0.014 R	0.022 J
Pit 36	X132	11	0.045 R	0.091 R	0.045 R	1.1 J	0.045 R	0.045 R	0.045 R	0.0023 R	0.0023 R	0.0023 R	0.0023 R	13 U	0.0074 J	0.0045 R	0.0023 R

Table E-11. PCBs and Pesticides in U.S. Drum (mg/kg)

			PCBs							Pesticides/Herbicides							
Station ID	Sample ID	Depth (ft.)	Arochlor 1016	Arochlor 1221	Arochlor 1232	Arochlor 1242	Arochlor 1248	Arochlor 1254	Arochlor 1260	Aldrin	alpha-BHC	alpha-Chlordane	alpha-Endosulfan	Atrazine	beta-BHC	beta-Endosulfan	delta-BHC
Industrial/ Commercial		*Ing*	*Sum of the Arochlors can be 1 mg/kg*							*0.3*	*0.9*			*72000*			
		Inh								*6.6*	*1.5*						
Construction Worker		*Ing*								*6.1*	*20*			*7100*			
		Inh								*9.3*	*2.1*						
Soil Component of GW		*I*								*0.5*	*0.0005*			*0.066*			
		II								*2.5*	*0.003*			*0.33*			
Pit 37	X128	3	0.094 U	0.19 U	0.094 U	2 =	0.094 U	0.81 =	1.2 =	0.0049 U	0.0049 U	0.004 J	0.0049 U	28 U	0.0049 U	0.0094 U	0.0049 U
Pit 37	X129	3	0.073 U	0.15 U	0.073 U	2 =	0.073 U	0.93 =	1.6 =	0.0038 U	0.0038 U	0.0041 =	0.0038 U	1.5 U	0.011 =	0.0073 U	0.0038 U
Pit 37	X130	8	0.055 U	0.11 U	0.055 U	1.4 =	0.055 U	1.7 =	0.58 =	0.0028 U	0.0028 U	0.0016 J	0.0028 U	17 U	0.0028 U	0.0031 J	0.0028 U
Pit 38	X126	3	0.057 U	0.12 U	0.057 U	12 =	0.057 U	1.1 =	0.56 =	0.0029 U	0.0029 U	0.0077 =	0.0029 U	0.57 U	0.001 J	0.0057 U	0.0029 U
Pit 38	X126DL	3	0.28 U	0.58 U	0.28 U	19 =	0.28 U	1.7 =	0.47 =	0.015 U	0.015 U	0.0099 J	0.015 U	2.8 U	0.015 U	0.028 U	0.015 U
Pit 38	X127	10	0.075 U	0.15 U	0.075 U	6.3 =	0.075 U	1.1 =	0.87 =	0.0039 U	0.0039 J	0.0043 =	0.0039 J	23 U	0.0024 J	0.0075 U	0.0034 J
Pit 38	X127DL	10	0.38 U	0.76 U	0.38 U	9.4 =	0.38 U	1.2 =	0.38 U	0.019 U	0.0013 J	0.006 J	0.019 U		0.019 U	0.038 U	0.019 U
Pit 39	X124	3	0.039 U	0.079 U	0.039 U	0.26 J	0.039 U	0.22 J	0.73 J	0.002 U	0.002 U	0.00091 J	0.002 U	0.39 U	0.002 U	0.0039 U	0.002 U
Pit 39	X125	10	0.077 UJ	0.16 UJ	0.077 UJ	1.8 J	0.077 UJ	0.077 UJ	0.077 UJ	0.004 UJ	0.004 UJ	0.004 UJ	0.015 J	23 U	0.004 UJ	0.0077 UJ	0.004 UJ
Pit 39	X125DL	10	0.38 U	0.78 U	0.38 U	2.2 J	0.38 U	0.38 U	0.38 U	0.02 U	0.02 U	0.02 U	0.016 J		0.02 U	0.038 U	0.02 U
Pit 40	X122	4	0.063 U	0.13 U	0.063 U	4.9 =	0.063 U	1.6 =	1.2 =	0.0033 U	0.0033 U	0.0018 J	0.048 =	0.63 U	0.0033 U	0.0064 U	0.0033 U
Pit 40	X122DL	4	0.32 UJ	0.64 UJ	0.32 UJ	7.2 J	0.32 UJ	2 J	1.4 J	0.016 UJ	0.016 UJ	0.0022 J	0.016 UJ		0.016 UJ	0.032 UJ	0.016 UJ
Pit 40	X123	9	0.085 R	0.17 R	0.085 R	8.7 J	0.085 R	3.1 J	30 J	0.0044 R	0.0044 R	0.0083 J	0.011 J	25 U	0.0044 R	0.0085 R	0.0044 R
Pit 40	X123DL	9	0.42 U	0.86 U	0.42 U	14 J	0.42 U	3.9 J	55 J	0.022 U	0.022 U	0.01 J	0.044 J		0.022 U	0.042 U	0.022 U
Pit 41	X120	3	0.041 U	0.083 U	0.041 U	0.055 =	0.041 U	0.041 U	0.041 U	0.0021 U	0.0021 U	0.0021 U	0.0021 U	0.41 U	0.0021 U	0.0041 U	0.0021 U
Pit 41	X121	8	0.07 U	0.14 U	0.07 U	3.7 =	0.07 U	0.85 =	0.72 =	0.0036 U	0.0036 U	0.0016 J	0.0036 U	21 U	0.014 =	0.007 U	0.0036 U
Pit 42	X117	2	0.042 U	0.085 U	0.042 U	0.042 U	0.042 U	0.042 U	0.042 U	0.0022 U	0.0022 U	0.0022 U	0.0022 U	0.42 U	0.0022 U	0.0042 U	0.0022 U
Pit 42	X118	9	0.057 U	0.12 U	0.057 U	5 J	0.057 U	1.3 J	4.9 J	0.0029 U	0.0029 U	0.0029 U	0.0058 J	4.6 U	0.0029 U	0.0057 U	0.0029 U
Pit 42	X118DL	9	0.57 U	1.2 U	0.57 U	9.1 J	0.57 U	2 =	5.9 J	0.029 U	0.029 U	0.029 U	0.029 U	9.1 U	0.029 U	0.057 U	0.029 U
Pit 42	X119	15	0.056 R	0.11 R	0.056 R	1.1 J	0.056 R	0.46 J	0.31 J	0.0029 R	0.0029 R	0.0025 J	0.0029 J	0.56 U	0.0029 R	0.0056 R	0.0029 R
Pit 42	X119DL	15												11 U			
Pit 43	X115	3	0.054 U	0.11 U	0.054 U	0.44 J	0.054 U	0.054 U	0.054 U	0.0028 U	0.0028 U	0.0028 U	0.0028 U	2.7 U	0.0028 U	0.0054 U	0.0028 U
Pit 43	X116	9	0.054 UJ	0.11 UJ	0.054 UJ	0.25 J	0.054 UJ	0.24 J	0.43 J	0.0028 UJ	0.0028 UJ	0.0033 J	0.0028 UJ	1.6 U	0.0028 UJ	0.0054 UJ	0.0044 J
Pit 43	X116DL	9												5.4 U			
Pit 44	X113	3	0.043 U	0.087 U	0.043 U	0.55 J	0.043 U	0.88 J	0.85 J	0.0022 U	0.0022 U	0.004 J	0.0022 U	2.1 U	0.0022 U	0.0043 U	0.0017 J
Pit 44	X113DL	3	0.43 U	0.87 U	0.43 U	0.78 J	0.43 U	1.6 =	0.92 J	0.022 U	0.022 U	0.0055 J	0.022 U		0.022 U	0.043 U	0.022 U
Pit 44	X114	9	0.065 R	0.13 R	0.065 R	5.7 J	0.065 R	7.9 J	1 J	0.0033 R	0.0033 R	0.0033 R	0.036 J	13 U	0.0033 R	0.037 J	0.0033 R
Pit 44	X114DL	9	0.65 U	1.3 U	0.65 U	13 J	0.65 U	16 J	1.6 =	0.033 U	0.033 U	0.033 U	0.04 J		0.033 U	0.056 J	0.033 U
Pit 45	X111	3.5	0.047 U	0.096 U	0.047 U	1.6 J	0.047 U	0.63 J	0.37 J	0.0024 U	0.0024 U	0.00066 J	0.0024 U	14 U	0.0024 U	0.0047 U	0.0014 J
Pit 45	X112	10	0.061 U	0.12 U	0.061 U	1.9 J	0.061 U	1.9 =	1.5 =	0.0032 U	0.0032 U	0.0027 J	0.0032 U	2.4 U	0.0032 U	0.0035 J	0.00089 J

Table E-11. PCBs and Pesticides in U.S. Drum (mg/kg)

			PCBs							Pesticides/Herbicides							
Station ID	Sample ID	Depth (ft.)	Arochlor 1016	Arochlor 1221	Arochlor 1232	Arochlor 1242	Arochlor 1248	Arochlor 1254	Arochlor 1260	Aldrin	alpha-BHC	alpha-Chlordane	alpha-Endosulfan	Atrazine	beta-BHC	beta-Endosulfan	delta-BHC
Industrial/ Commercial		*Ing*	*Sum of the Arochlors can be 1 mg/kg*							*0.3*	*0.9*			*72000*			
		Inh								*6.6*	*1.5*						
Construction Worker		*Ing*								*6.1*	*20*			*7100*			
		Inh								*9.3*	*2.1*						
Soil Component of GW		*I*								*0.5*	*0.0005*			*0.066*			
		II								*2.5*	*0.003*			*0.33*			
Pit 45	X112DL	10	0.61 U	1.2 U	0.61 U	3.4 =	0.61 U	3.3 =	1.9 J	0.031 U	0.031 U	0.031 U	0.031 U		0.031 U	0.0055 J	0.0017 J
Pit 46	X109	4	0.053 U	0.11 U	0.053 U	0.053 U	0.053 U	0.21 =	0.3 J	0.0027 U	0.0027 U	0.0027 U	0.0027 U	0.53 U	0.0027 U	0.0053 U	0.0027 U
Pit 46	X110	9	0.06 U	0.12 U	0.06 U	0.98 J	0.06 U	0.66 J	0.3 J	0.0031 U	0.0031 U	0.0013 J	0.0031 U	2.4 U	0.0031 U	0.006 U	0.0015 J
Pit 47	X107	3.5	0.045 U	0.092 U	0.045 U	0.045 U	0.045 U	0.045 U	0.045 U	0.0023 U	0.0023 U	0.0023 U	0.0023 U	0.45 U	0.0023 U	0.0045 U	0.0023 U
Pit 47	X108	9	0.55 U	1.1 U	0.55 U	3.9 =	0.55 U	6.1 J	0.55 U	0.028 U	0.028 U	0.028 U	0.013 J	49 U	0.028 U	0.055 U	0.028 U
Pit 47	X108DL	9	5.5 U	11 U	5.5 U	6.6 =	5.5 U	12 =	5.5 U	0.28 U	0.28 U	0.28 U	0.28 U		0.28 U	0.55 U	0.28 U
Pit 48	X105	3	0.038 U	0.076 U	0.038 U	0.16 =	0.038 U	0.053 =	0.048 =	0.0019 U	0.0019 U	0.0019 U	0.0019 U	0.38 U	0.0019 U	0.0038 U	0.0019 U
Pit 48	X106	9	0.045 U	0.092 U	0.045 U	3.6 J	0.045 U	0.87 =	0.22 =	0.0023 U	0.0023 U	0.0023 U	0.0023 J	14 U	0.0023 U	0.0045 U	0.0023 U
Pit 48	X106DL	9	0.45 U	0.92 U	0.45 U	6.3 =	0.45 U	1.1 =	0.2 J	0.023 U	0.023 U	0.023 U	0.023 U		0.023 U	0.045 U	0.023 U
Pit 49	X103	3	0.038 U	0.078 U	0.038 U	0.23 J	0.038 U	0.36 J	0.64 J	0.002 U	0.002 U	0.0012 J	0.002 U	0.38 U	0.002 U	0.0038 U	0.002 U
Pit 49	X104	10	0.042 U	0.085 U	0.042 U	0.052 =	0.042 U	0.043 J	0.033 J	0.0022 U	0.0022 U	0.0022 U	0.0022 U	0.42 UJ	0.0022 U	0.0042 U	0.0022 U
Pit 50	X101	3	0.038 U	0.076 U	0.038 U	0.038 U	0.038 U	0.038 U	0.038 U	0.0019 U	0.0019 U	0.0019 U	0.0019 U	0.38 U	0.0019 U	0.0038 U	0.0019 U
Pit 50	X102	9	0.65 U	1.3 U	0.65 U	29 J	0.65 U	44 J	48 =	0.033 U	0.033 U	0.033 U	0.57 =	19 U	0.033 U	0.19 J	0.033 U
Pit 50	X102DL	9	6.5 U	13 U	6.5 U	45 J	6.5 U	64 J	64 =	0.33 U	0.33 U	0.33 U	0.67 J		0.33 U	0.24 J	0.33 U
Pit 51	X203	3	0.04 U	0.082 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.0021 U	0.0021 U	0.0045 J	0.0021 U	0.8 U	0.0021 U	0.004 U	0.0014 J
Pit 51	X203DL	3	0.2 U	0.41 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.01 U	0.01 U	0.0041 J	0.01 U		0.01 U	0.02 U	0.0021 J
Pit 51	X204	8	0.044 U	0.089 U	0.044 U	0.066 =	0.044 U	0.044 U	0.18 =	0.0023 U	0.0023 U	0.0023 U	0.0023 U	4.4 U	0.0023 U	0.0044 U	0.0023 U

Notes:

=:	sample concentration is detected at level reported
U:	sample concentration is under detection limit
J:	sample concentration is estimated value
R:	sample concentration value is rejected
DL:	sample is diluted
RE:	sample is re-extracted
Ing.:	Ingestion
Inh.:	Inhalation
I:	Class I
II:	Class II

Table E-11. PCBs and Pesticides in U.S. Drum (mg/kg)

			Pesticides/Herbicides														
Station ID	Sample ID	Depth (ft.)	Dieldrin	Endosulfan sulfate	Endrin	Endrin aldehyde	Endrin ketone	gamma-BHC	gamma-Chlordane	Heptachlor	Heptachlor epoxide	Methoxychlor	p,p'-DDD	p,p'-DDE	p,p'-DDT	Toxaphene
Industrial/		*Ing*	*0.4*		*610*			*4*		*1*	*0.6*	*10000*	*24*	*17*	*17*	*5.2*
Commercial		*Inh*	*2.2*							*11*	*9.2*				*1500*	*170*
Construction		*Ing*	*7.8*		*61*			*96*		*28*	*2.7*	*1000*	*520*	*370*	*100*	*110*
Worker		*Inh*	*3.1*							*16*	*13*				*2100*	*240*
Soil Component		*I*	*0.004*		*1*			*0.009*		*23*	*0.7*	*160*	*16*	*54*	*32*	*31*
of GW		*II*	*0.02*		*5*			*0.047*		*110*	*3.3*	*780*	*80*	*270*	*160*	*150*
Pit 01	X207	4	0.0038 U	0.0038 U	0.0038 U	0.0038 U	0.01 =	0.002 U	0.0019 J	0.002 U	0.002 U	0.02 U	0.0017 J	0.0038 U	0.0038 U	0.2 U
Pit 01	X208	9	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.0055 U	0.0055 U	0.0055 U	0.0055 U	0.055 U	0.21 =	0.082 =	0.011 U	0.55 U
Pit 01	X208DL	9	0.053 U	0.053 U	0.053 U	0.053 U	0.053 U	0.027 U	0.027 U	0.027 U	0.027 U	0.27 U	0.18 J	0.078 J	0.053 U	2.7 U
Pit 01	X209	13	0.0089 U	0.0089 U	0.0089 U	0.0089 U	0.0027 J	0.0046 U	0.035 =	0.074 =	0.0046 U	0.046 U	0.016 =	0.059 =	0.0089 U	0.46 U
Pit 01	X209DL	13	0.045 UJ	0.045 UJ	0.045 UJ	0.045 UJ	0.045 UJ	0.023 UJ	0.023 UJ	0.11 J	0.023 UJ	0.23 UJ	0.045 UJ	0.086 J	0.045 UJ	2.3 UJ
Pit 02	X205	3	0.0044 U	0.0044 U	0.0044 U	0.0044 U	0.0023 J	0.0023 U	0.0023 U	0.0023 U	0.0023 U	0.023 U	0.0043 J	0.0044 U	0.0044 U	0.23 U
Pit 02	X206	9	0.0041 U	0.0041 U	0.0041 U	0.0041 U	0.0019 J	0.0021 U	0.0021 U	0.0021 U	0.0021 U	0.021 U	0.0041 U	0.0041 U	0.0041 U	0.21 U
Pit 03	X201	3	0.0039 U	0.0039 U	0.0039 U	0.0039 U	0.0022 J	0.002 U	0.002 U	0.002 U	0.002 U	0.02 U	0.02 =	0.0039 U	0.0039 U	0.2 U
Pit 03	X202	8	0.0058 U	0.0058 U	0.0058 U	0.0058 U	0.003 J	0.003 U	0.003 U	0.003 U	0.003 U	0.03 U	0.0054 J	0.0045 J	0.0058 U	0.3 U
Pit 04	X177	4	0.0082 J	0.0042 U	0.0042 U	0.0042 U	0.0042 U	0.0022 U	0.0022 U	0.0022 U	0.0022 U	0.074 J	0.0042 U	0.0042 U	0.0042 U	0.22 U
Pit 04	X178	8	0.79 U	0.79 U	0.79 U	0.79 U	0.79 U	0.4 U	0.4 U	0.4 U	0.4 U	5.7 J	0.79 U	0.79 U	0.79 U	40 U
Pit 04	X178DL	8	3.9 U	3.9 U	3.9 U	3.9 U	3.9 U	2 U	2 U	2 U	2 U	7.3 J	3.9 U	3.9 U	3.9 U	200 U
Pit 05	X198	2.5	0.004 UJ	0.004 U	0.004 R	0.004 U	0.0014 J	0.0021 U	0.0021 U	0.0025 J	0.0021 U	0.0079 J	0.51 =	0.1 =	0.004 U	0.21 U
Pit 05	X198DL	2.5	0.02 UJ	0.02 U	0.02 R	0.09 J	0.02 U	0.01 U	0.01 U	0.0035 J	0.01 U	0.1 U	0.43 =	0.085 =	0.02 U	1 U
Pit 05	X199	8	0.0041 U	0.0041 U	0.0041 U	0.0041 U	0.024 J	0.0021 U	0.0021 U	0.0021 U	0.0065 J	0.021 U	0.067 J	0.086 J	0.013 J	0.21 U
Pit 05	X199DL	8	0.041 U	0.041 U	0.041 U	0.041 U	0.021 J	0.021 U	0.021 U	0.021 U	0.013 J	0.21 U	0.066 J	0.059 J	0.014 J	2.1 U
Pit 05	X200	8	0.0038 U	0.0038 U	0.0038 U	0.0038 U	0.0031 J	0.002 U	0.002 U	0.002 U	0.00075 J	0.02 U	0.013 =	0.014 =	0.0015 J	0.2 U
Pit 05	X200DL	8														
Pit 06	X196	3	0.004 U	0.004 U	0.004 U	0.004 U	0.0058 =	0.0021 U	0.0041 J	0.0021 U	0.0032 J	0.02 U	0.018 J	0.0018 J	0.0064 J	0.2 U
Pit 06	X197	8	0.0041 U	0.0041 U	0.0041 U	0.0041 U	0.038 J	0.0021 U	0.0021 U	0.0021 U	0.025 J	0.021 U	0.069 J	0.12 J	0.0041 U	0.21 U
Pit 06	X197DL	8	0.041 U	0.041 U	0.041 U	0.041 U	0.027 J	0.021 U	0.021 U	0.021 U	0.036 J	0.21 U	0.051 J	0.095 J	0.041 U	2.1 U
Pit 07	X175	3	0.0053 U	0.0053 U	0.0053 U	0.0053 U	0.0028 J	0.0027 U	0.0069 =	0.00067 J	0.005 J	0.027 U	0.083 J	0.0053 U	0.0053 U	0.27 U
Pit 07	X176	8	0.0043 U	0.0043 U	0.0043 U	0.0024 J	0.0011 J	0.0022 U	0.0011 J	0.0022 U	0.0022 U	0.022 U	0.05 J	0.01 J	0.02 J	0.22 U
Pit 08	X173	2.5	0.0039 UJ	0.0039 UJ	0.0039 UJ	0.0039 UJ	0.0022 J	0.002 UJ	0.0027 J	0.0028 J	0.002 UJ	0.02 UJ	0.17 J	0.09 J	0.0039 UJ	0.2 UJ
Pit 08	X173DL	2.5	0.019 UJ	0.019 UJ	0.019 UJ	0.019 UJ	0.0083 J	0.01 UJ	0.0022 J	0.0032 J	0.01 UJ	0.1 UJ	0.12 J	0.081 J	0.019 UJ	1 UJ
Pit 08	X174	8	0.0041 U	0.0041 U	0.0041 U	0.0041 U	0.0064 =	0.0021 U	0.0012 J	0.0021 U	0.0037 J	0.021 U	0.015 =	0.0056 J	0.0041 U	0.21 U
Pit 09	X168	3	0.0038 U	0.0038 U	0.0038 U	0.0038 U	0.0038 U	0.002 U	0.002 U	0.0036 J	0.002 U	0.02 U	0.0038 U	0.0038 U	0.0038 U	0.2 U
Pit 09	X169	6.5	0.0042 U	0.0042 U	0.0042 U	0.0042 U	0.0042 U	0.0022 U	0.0022 U	0.0022 U	0.0022 U	0.022 U	0.0042 U	0.0042 U	0.0042 U	0.22 U
Pit 09	X170	6.5	0.0041 U	0.0041 U	0.0041 U	0.0041 U	0.0041 U	0.0021 U	0.0021 U	0.0021 U	0.0021 U	0.021 U	0.0041 U	0.0041 U	0.0041 U	0.21 U
Pit 10	X171	3	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.0026 U	0.0026 U	0.0026 U	0.0026 U	0.026 U	0.056 =	0.042 =	0.005 U	0.26 U

Table E-11. PCBs and Pesticides in U.S. Drum (mg/kg)

			Pesticides/Herbicides													
Station ID	Sample ID	Depth (ft.)	Dieldrin	Endosulfan sulfate	Endrin	Endrin aldehyde	Endrin ketone	gamma-BHC	gamma-Chlordane	Heptachlor	Heptachlor epoxide	Methoxychlor	p,p'-DDD	p,p'-DDE	p,p'-DDT	Toxaphene
Industrial/		*Ing*	*0.4*		*610*			*4*		*1*	*0.6*	*10000*	*24*	*17*	*17*	*5.2*
Commercial		*Inh*	*2.2*							*11*	*9.2*				*1500*	*170*
Construction		*Ing*	*7.8*		*61*			*96*		*28*	*2.7*	*1000*	*520*	*370*	*100*	*110*
Worker		*Inh*	*3.1*							*16*	*13*				*2100*	*240*
Soil Component		*I*	*0.004*		*1*			*0.009*		*23*	*0.7*	*160*	*16*	*54*	*32*	*31*
of GW		*II*	*0.02*		*5*			*0.047*		*110*	*3.3*	*780*	*80*	*270*	*160*	*150*
Pit 10	X171DL	3														
Pit 10	X172	8	0.0065 U	0.0065 U	0.0065 U	0.0065 U	0.0065 U	0.0033 U	0.0033 U	0.055 =	0.0033 U	0.033 U	0.062 =	0.093 J	0.0065 U	0.33 U
Pit 10	X172DL	8	0.032 UJ	0.032 UJ	0.032 UJ	0.032 UJ	0.032 UJ	0.017 UJ	0.017 UJ	0.058 J	0.017 UJ	0.17 UJ	0.051 J	0.09 J	0.032 UJ	1.7 UJ
Pit 11	X190	2	0.0049 R	0.0049 R	0.0049 R	0.0049 R	0.018 J	0.0025 R	0.0025 R	0.034 J	0.027 J	0.025 R	0.12 J	0.18 J	0.0049 R	0.25 R
Pit 11	X190DL	2	0.049 U	0.049 U	0.049 U	0.049 U	0.019 J	0.025 U	0.025 U	0.041 J	0.06 J	0.25 UJ	0.14 =	0.17 =	0.049 U	2.5 U
Pit 11	X191	8	0.0044 UJ	0.0044 UJ	0.0044 UJ	0.0044 UJ	0.0044 UJ	0.0023 UJ	0.0023 UJ	0.0023 UJ	0.0023 UJ	0.023 UJ	0.083 J	0.047 J	0.063 J	0.23 UJ
Pit 11	X191DL	8	0.044 UJ	0.044 UJ	0.044 UJ	0.044 UJ	0.044 UJ	0.023 UJ	0.023 UJ	0.012 J	0.023 UJ	0.23 UJ	0.079 J	0.04 J	0.061 J	2.3 UJ
Pit 12	X192	3	0.0038 U	0.0038 U	0.0038 U	0.0038 U	0.0038 U	0.0019 U	0.0019 U	0.0098 J	0.0019 U	0.019 UJ	0.0038 U	0.0038 U	0.0038 U	0.19 U
Pit 12	X193	8	0.013 J	0.004 U	0.004 U	0.004 U	0.0041 J	0.0021 U	0.0021 U	0.0022 J	0.0085 J	0.021 UJ	0.13 J	0.043 J	0.004 U	0.21 U
Pit 12	X193DL	8	0.0099 J	0.04 U	0.04 U	0.04 U	0.04 U	0.021 U	0.021 U	0.021 U	0.016 J	0.21 UJ	0.11 J	0.042 J	0.04 U	2.1 U
Pit 13	X194	3.5	0.0039 U	0.0039 U	0.0039 U	0.0039 U	0.0039 U	0.002 U	0.002 U	0.0015 J	0.0073 J	0.02 UJ	0.013 J	0.0039 U	0.0039 U	0.2 U
Pit 13	X195	12	0.0054 U	0.0054 U	0.0054 U	0.0054 U	0.0054 U	0.0028 U	0.0028 U	0.0028 U	0.0028 U	0.028 UJ	0.0054 U	0.0054 U	0.0054 U	0.28 U
Pit 13	X195DL	12														
Pit 14	X184	4	0.0038 U	0.0038 U	0.0038 U	0.0038 U	0.0038 U	0.002 U	0.002 U	0.034 J	0.002 U	0.02 UJ	0.0038 U	0.0038 U	0.0038 U	0.2 U
Pit 14	X184DL	4	0.038 U	0.038 U	0.038 U	0.038 U	0.038 U	0.02 U	0.02 U	0.024 J	0.02 U	0.2 U	0.038 U	0.038 U	0.038 U	2 U
Pit 14	X185	9	0.0048 U	0.0048 U	0.0048 U	0.0048 U	0.0068 J	0.0025 U	0.0025 U	0.2 J	0.0025 U	0.025 UJ	0.11 J	0.0048 U	0.067 J	0.25 U
Pit 14	X185DL	9	0.048 U	0.048 U	0.048 U	0.048 U	0.048 U	0.025 U	0.025 U	0.64 J	0.025 U	0.25 UJ	0.069 J	0.048 U	0.066 J	2.5 U
Pit 15	X186	4	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.0021 U	0.0021 U	0.0021 U	0.0021 U	0.021 UJ	0.0022 J	0.004 U	0.004 U	0.21 U
Pit 15	X187	8	0.0041 U	0.0041 U	0.0041 U	0.0041 U	0.0041 U	0.0021 U	0.0021 U	0.0033 J	0.0021 U	0.021 UJ	0.013 J	0.0041 U	0.0041 U	0.21 U
Pit 16	X188	3	0.0038 U	0.0038 U	0.0038 U	0.0038 U	0.0038 U	0.0013 J	0.0019 U	0.0019 U	0.0019 U	0.019 UJ	0.038 =	0.0075 J	0.0068 J	0.19 U
Pit 16	X188DL	3														
Pit 16	X189	7	0.016 J	0.0038 U	0.0038 U	0.0038 U	0.0038 U	0.002 U	0.0097 J	0.0015 J	0.002 U	0.02 UJ	0.15 J	0.049 =	0.015 J	0.2 U
Pit 16	X189DL	7	0.013 J	0.038 U	0.038 U	0.038 U	0.038 U	0.02 U	0.038 J	0.02 U	0.02 U	0.2 UJ	0.15 =	0.044 J	0.038 U	2 U
Pit 17	X181	3.5	0.0054 U	0.0054 U	0.0054 U	0.0054 U	0.0054 U	0.0028 U	0.0028 U	0.0013 J	0.0028 U	0.028 UJ	0.0054 U	0.0017 J	0.0054 U	0.28 U
Pit 17	X182	7	0.0047 UJ	0.0047 UJ	0.0047 UJ	0.0047 UJ	0.019 J	0.0024 UJ	0.0024 UJ	0.0024 UJ	0.0024 UJ	0.024 UJ	0.0047 UJ	0.008 J	0.0047 UJ	0.24 UJ
Pit 17	X183	13	0.0041 U	0.0041 U	0.0041 U	0.0041 U	0.018 =	0.0021 U	0.0051 J	0.0021 U	0.0021 U	0.021 UJ	0.015 =	0.0019 J	0.0041 U	0.21 U
Pit 18	X179	3.5	0.0038 R	0.0038 UJ	0.0038 R	0.0038 UJ	0.0091 J	0.0019 R	0.0019 UJ	0.0019 R	0.0019 UJ	0.019 UJ	0.0031 J	0.014 J	0.0038 R	0.19 UJ
Pit 18	X179DL	3.5														
Pit 18	X180	7	0.0051 U	0.0051 U	0.0051 U	0.0051 U	0.04 J	0.0026 U	0.0026 U	0.018 J	0.0026 U	0.026 UJ	0.077 J	0.021 J	0.0051 U	0.26 U
Pit 18	X180DL	7														

Table E-11. PCBs and Pesticides in U.S. Drum (mg/kg)

			Pesticides/Herbicides													
Station ID	Sample ID	Depth (ft.)	Dieldrin	Endosulfan sulfate	Endrin	Endrin aldehyde	Endrin ketone	gamma-BHC	gamma-Chlordane	Heptachlor	Heptachlor epoxide	Methoxychlor	p,p'-DDD	p,p'-DDE	p,p'-DDT	Toxaphene
Industrial/ Commercial		*Ing*	*0.4*		*610*			*4*		*1*	*0.6*	*10000*	*24*	*17*	*17*	*5.2*
		Inh	*2.2*							*11*	*9.2*				*1500*	*170*
Construction Worker		*Ing*	*7.8*		*61*			*96*		*28*	*2.7*	*1000*	*520*	*370*	*100*	*110*
		Inh	*3.1*							*16*	*13*				*2100*	*240*
Soil Component of GW		*I*	*0.004*		*1*			*0.009*		*23*	*0.7*	*160*	*16*	*54*	*32*	*31*
		II	*0.02*		*5*			*0.047*		*110*	*3.3*	*780*	*80*	*270*	*160*	*150*
Pit 19	X166	3	0.048 J	0.004 U	0.004 U	0.004 U	0.042 J	0.0021 U	0.026 J	0.0025 J	0.0021 U	0.021 U	0.004 U	0.004 U	0.004 U	0.21 U
Pit 19	X166DL	3	0.067 J	0.02 U	0.02 U	0.02 U	0.091 J	0.01 U	0.028 J	0.0064 J	0.01 U	0.1 U	0.02 U	0.02 U	0.02 U	1 U
Pit 19	X167	9	0.052 U	0.052 U	0.052 U	0.052 U	0.052 U	0.027 UJ	0.081 J	0.024 J	0.027 U	0.27 U	0.93 =	0.15 J	0.068 J	2.7 U
Pit 19	X167DL	9	0.52 U	0.52 U	0.52 U	0.52 U	0.52 U	0.27 U	0.27 U	0.032 J	0.27 U	2.7 U	0.8 J	0.52 U	0.52 U	27 U
Pit 20	X164	3	0.0041 U	0.0041 U	0.0041 U	0.0041 U	0.0041 U	0.0021 U	0.0021 U	0.026 =	0.0021 U	0.021 U	0.028 J	0.0041 U	0.0041 U	0.21 U
Pit 20	X164DL	3	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.01 U	0.01 U	0.044 =	0.01 U	0.1 U	0.03 J	0.02 U	0.02 U	1 U
Pit 20	X165	9	0.0045 U	0.0045 U	0.0045 U	0.0045 U	0.0045 U	0.0023 U	0.0023 U	0.0092 J	0.0023 U	0.017 J	0.036 J	0.068 J	0.0045 U	0.23 U
Pit 20	X165DL	9	0.023 U	0.023 U	0.023 U	0.023 U	0.023 U	0.012 U	0.012 U	0.013 J	0.012 U	0.026 J	0.038 J	0.1 J	0.023 U	1.2 U
Pit 21	X162	2	0.0069 R	0.0069 R	0.0069 R	0.073 J	0.015 J	0.0035 R	0.0035 R	0.0035 R	0.0035 R	0.035 R	0.035 J	0.0069 R	0.0069 R	0.35 R
Pit 21	X162DL	2	0.034 U	0.034 U	0.034 U	0.095 J	0.034 U	0.018 U	0.018 U	0.4 J	0.018 U	0.18 U	0.04 J	0.034 U	0.034 U	1.8 U
Pit 21	X163	9	0.0067 R	0.0067 R	0.0067 R	0.0067 R	0.0067 R	0.0035 R	0.0035 R	0.077 J	0.0035 R	0.035 R	0.11 J	0.16 J	0.0067 R	0.35 R
Pit 21	X163DL	9	0.034 U	0.034 U	0.034 U	0.034 U	0.034 U	0.017 U	0.017 U	0.11 J	0.017 U	0.17 U	0.14 =	0.034 U	0.034 U	1.7 U
Pit 22	X160	3.5	0.0043 U	0.0043 U	0.0043 U	0.0043 U	0.0015 J	0.0022 U	0.0022 U	0.0022 U	0.0022 U	0.022 U	0.0026 J	0.0058 J	0.0043 U	0.22 U
Pit 22	X161	8	0.0047 U	0.0047 U	0.0047 U	0.0047 U	0.0047 U	0.0024 U	0.0024 U	0.0024 U	0.0024 U	0.024 U	0.093 =	0.049 =	0.0047 U	0.24 U
Pit 22	X161DL	8	0.023 U	0.023 U	0.023 U	0.023 U	0.023 U	0.012 U	0.012 U	0.012 U	0.012 U	0.12 U	0.086 J	0.06 J	0.023 U	1.2 U
Pit 23	X157	2.5	0.0039 U	0.0039 U	0.0039 U	0.0039 U	0.0039 U	0.002 U	0.002 U	0.002 U	0.002 U	0.02 U	0.0039 U	0.0039 U	0.0039 U	0.2 U
Pit 23	X158	9	0.0064 U	0.0064 U	0.0064 U	0.0064 U	0.0064 U	0.0033 U	0.0033 U	0.015 J	0.0033 U	0.033 U	0.0064 U	0.16 J	0.0064 U	0.33 U
Pit 23	X158DL	9	0.063 U	0.063 U	0.063 U	0.063 U	0.063 U	0.033 U	0.033 U	0.0099 J	0.033 U	0.33 U	0.36 =	0.15 J	0.063 U	3.3 U
Pit 23	X159	13	0.0066 R	0.0066 R	0.0066 R	0.0066 R	0.003 J	0.0034 R	0.046 J	0.043 J	0.0034 R	0.034 R	0.12 J	0.089 J	0.0066 R	0.34 R
Pit 23	X159DL	13	0.033 UJ	0.033 UJ	0.033 UJ	0.033 UJ	0.033 UJ	0.017 UJ	0.017 UJ	0.051 J	0.017 UJ	0.17 UJ	0.073 J	0.13 J	0.033 UJ	1.7 UJ
Pit 24	X155	2.5	0.0087 R	0.0087 R	0.0087 R	0.0087 R	0.0087 R	0.0045 R	0.016 J	0.11 J	0.0045 R	0.045 R	0.0087 R	0.16 J	0.0087 R	0.45 R
Pit 24	X155DL	2.5	0.087 U	0.087 U	0.087 U	0.087 U	0.087 U	0.045 U	0.045 U	0.14 J	0.045 U	0.45 U	0.057 J	0.17 J	0.087 U	4.5 U
Pit 24	X156	8.5	0.0061 U	0.0061 U	0.0061 U	0.0061 U	0.0061 U	0.0032 U	0.0032 U	0.011 =	0.0032 U	0.031 U	0.024 J	0.044 J	0.0061 U	0.31 U
Pit 25	X153	3	0.0056 U	0.0056 U	0.0056 U	0.0056 U	0.0056 U	0.0029 U	0.11 J	0.02 J	0.0029 U	0.029 U	0.051 =	0.048 J	0.0056 U	0.29 U
Pit 25	X153DL	3	0.056 U	0.056 U	0.056 U	0.056 U	0.056 U	0.029 U	0.093 J	0.019 J	0.029 U	0.29 U	0.056 U	0.048 J	0.056 U	2.9 U
Pit 25	X154	9.5	0.0044 U	0.0044 U	0.0044 U	0.0044 U	0.0044 U	0.0023 U	0.0023 U	0.0099 J	0.0023 U	0.023 U	0.0044 U	0.1 =	0.0044 U	0.23 U
Pit 25	X154DL	9.5	0.044 U	0.044 U	0.044 U	0.044 U	0.044 U	0.023 U	0.023 U	0.012 J	0.023 U	0.23 U	0.038 J	0.13 =	0.044 U	2.3 U
Pit 26	X151	3	0.004 R	0.004 R	0.004 R	0.004 R	0.0048 J	0.0021 R	0.0021 R	0.0023 J	0.0021 R	0.021 R	0.004 R	0.0011 J	0.004 R	0.21 R
Pit 26	X152	9	0.0049 U	0.0049 U	0.0049 U	0.0049 U	0.0049 U	0.0025 U	0.0025 U	0.023 =	0.0025 U	0.025 U	0.051 J	0.1 =	0.0049 U	0.25 U
Pit 26	X152DL	9	0.049 U	0.049 U	0.049 U	0.049 U	0.049 U	0.025 U	0.025 U	0.029 =	0.025 U	0.25 U	0.044 J	0.049 U	0.049 U	2.5 U

Table E-11. PCBs and Pesticides in U.S. Drum (mg/kg)

			Pesticides/Herbicides													
Station ID	Sample ID	Depth (ft.)	Dieldrin	Endosulfan sulfate	Endrin	Endrin aldehyde	Endrin ketone	gamma-BHC	gamma-Chlordane	Heptachlor	Heptachlor epoxide	Methoxychlor	p,p'-DDD	p,p'-DDE	p,p'-DDT	Toxaphene
Industrial/		*Ing*	*0.4*		*610*			*4*		*1*	*0.6*	*10000*	*24*	*17*	*17*	*5.2*
Commercial		*Inh*	*2.2*							*11*	*9.2*				*1500*	*170*
Construction		*Ing*	*7.8*		*61*			*96*		*28*	*2.7*	*1000*	*520*	*370*	*100*	*110*
Worker		*Inh*	*3.1*							*16*	*13*				*2100*	*240*
Soil Component		*I*	*0.004*		*1*			*0.009*		*23*	*0.7*	*160*	*16*	*54*	*32*	*31*
of GW		*II*	*0.02*		*5*			*0.047*		*110*	*3.3*	*780*	*80*	*270*	*160*	*150*
Pit 27	X149	3.5	0.0032 J	0.0057 UJ	0.0057 UJ	0.0057 UJ	0.0057 UJ	0.0029 UJ	0.0029 UJ	0.014 J	0.0029 UJ	0.029 UJ	0.057 J	0.029 J	0.004 J	0.29 UJ
Pit 27	X150	10	0.0064 U	0.0064 U	0.0064 U	0.0064 U	0.0064 U	0.0033 U	0.0033 U	0.0033 U	0.0033 U	0.033 U	0.0064 U	0.016 J	0.0064 U	0.33 U
Pit 28	X147	3	0.0045 U	0.0045 U	0.0045 U	0.0045 U	0.0045 U	0.0023 U	0.0058 =	0.0016 J	0.0023 U	0.023 U	0.019 =	0.047 =	0.0045 U	0.23 U
Pit 28	X147DL	3														
Pit 28	X148	8	0.0075 U	0.0075 U	0.0075 U	0.0075 U	0.0075 U	0.0039 U	0.029 J	0.029 J	0.0039 U	0.039 U	0.079 J	0.11 J	0.0075 U	0.39 U
Pit 29	X145	4.5	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.0021 U	0.0083 J	0.0016 J	0.0021 U	0.02 U	0.0062 J	0.0097 J	0.004 U	0.2 U
Pit 29	X146	8	0.0038 R	0.0038 R	0.0038 R	0.0038 R	0.0038 R	0.002 R	0.002 R	0.079 J	0.002 R	0.02 R	0.0038 R	0.14 J	0.0038 R	0.2 R
Pit 29	X146DL	8	0.038 U	0.038 U	0.038 U	0.038 U	0.038 U	0.02 U	0.02 U	0.12 =	0.02 U	0.2 U	0.14 J	0.22 =	0.038 U	2 U
Pit 30	X143	4	0.01 U	0.01 U	0.01 U	0.01 U	0.012 J	0.0053 U	0.0053 U	0.082 J	0.0053 U	0.053 U	0.01 U	0.73 =	0.01 U	0.53 U
Pit 30	X143DL	4	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.053 U	0.053 U	0.13 =	0.053 U	0.53 U	0.1 U	0.65 =	0.1 U	5.3 U
Pit 30	X144	6	0.0058 UJ	0.0058 UJ	0.0058 UJ	0.0058 UJ	0.0025 J	0.003 UJ	0.046 J	0.015 J	0.003 UJ	0.03 UJ	0.0058 UJ	0.094 J	0.0058 UJ	0.3 UJ
Pit 30	X144DL	6	0.058 U	0.058 U	0.058 U	0.058 U	0.058 U	0.03 U	0.051 J	0.023 J	0.03 U	0.3 U	0.2 =	0.11 J	0.058 U	3 U
Pit 31	X141	4	0.0052 U	0.0052 U	0.0052 U	0.0052 U	0.0043 J	0.0027 U	0.0027 U	0.13 J	0.0027 U	0.027 U	0.14 =	0.09 J	0.0052 U	0.27 U
Pit 31	X141DL	4	0.052 U	0.052 U	0.052 U	0.052 U	0.052 U	0.027 U	0.027 U	0.15 J	0.027 U	0.27 U	0.11 =	0.1 J	0.052 U	2.7 U
Pit 31	X142	9	0.004 UJ	0.004 UJ	0.004 UJ	0.004 UJ	0.01 J	0.0021 UJ	0.0021 UJ	0.018 J	0.0021 UJ	0.02 UJ	0.022 J	0.097 J	0.004 UJ	0.2 UJ
Pit 31	X142DL	9	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.02 U	0.02 U	0.026 =	0.02 U	0.2 U	0.018 J	0.04 U	0.04 U	2 U
Pit 32	X139	3	0.0047 U	0.0047 U	0.0047 U	0.0047 U	0.0036 J	0.0024 U	0.0024 U	0.0024 U	0.0024 U	0.024 U	0.023 =	0.044 =	0.0047 U	0.24 U
Pit 32	X140	9	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.0053 U	0.0053 U	0.037 J	0.0053 U	0.053 U	0.01 U	0.1 J	0.01 U	0.53 U
Pit 33	X137	3	0.026 U	0.026 U	0.026 U	0.026 U	0.011 J	0.013 U	0.013 U	0.012 J	0.013 U	0.13 U	1.1 =	0.096 =	0.026 U	1.3 U
Pit 33	X137DL	3	0.13 U	0.13 U	0.13 U	0.13 U	0.13 U	0.066 U	0.066 U	0.013 J	0.066 U	0.66 U	1 J	0.11 J	0.13 U	6.6 U
Pit 33	X138	9	0.0043 U	0.0043 U	0.0043 U	0.0043 U	0.0041 J	0.0022 U	0.0022 U	0.0026 =	0.0022 U	0.022 U	0.0052 =	0.0043 U	0.0043 U	0.22 U
Pit 34	X135	3	0.0056 U	0.0056 U	0.0056 U	0.0056 U	0.0056 U	0.0029 U	0.0029 U	0.0054 =	0.0029 U	0.029 U	0.034 =	0.02 =	0.0056 U	0.29 U
Pit 34	X136	10	0.0055 U	0.0055 U	0.0055 U	0.0055 U	0.0055 U	0.0028 U	0.0028 U	0.058 =	0.0028 U	0.028 U	0.12 =	0.05 =	0.096 =	0.28 U
Pit 34	X136DL	10	0.028 U	0.028 U	0.028 U	0.028 U	0.028 U	0.014 U	0.014 U	0.073 J	0.014 U	0.14 U	0.11 J	0.071 J	0.11 J	1.4 U
Pit 35	X133	4	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.0021 U	0.0021 U	0.00098 J	0.0021 U	0.021 U	0.078 =	0.007 =	0.016 =	0.21 U
Pit 35	X133DL	4	0.02 U	0.02 U	0.02 U	0.02 U	0.0015 J	0.01 U	0.01 U	0.0016 J	0.01 U	0.1 U	0.078 J	0.0049 J	0.02 U	1 U
Pit 35	X134	10	0.027 J	0.0053 U	0.0053 U	0.0053 U	0.0053 U	0.0027 U	0.0027 U	0.028 J	0.0027 U	0.027 U	0.098 J	0.05 J	0.0053 U	0.27 U
Pit 35	X134DL	10	0.027 U	0.027 U	0.027 U	0.027 U	0.027 U	0.014 U	0.014 U	0.034 J	0.014 U	0.14 U	0.081 J	0.068 J	0.027 U	1.4 U
Pit 36	X131	4	0.014 R	0.014 R	0.014 R	0.014 R	0.014 R	0.0071 R	0.0071 R	0.028 J	0.0071 R	0.071 R	0.022 J	0.19 J	0.014 R	0.71 R
Pit 36	X132	11	0.0045 R	0.0054 J	0.0045 R	0.0045 R	0.0045 R	0.0023 R	0.0023 R	0.018 J	0.0023 R	0.023 R	0.017 J	0.078 J	0.0045 R	R

Table E-11. PCBs and Pesticides in U.S. Drum (mg/kg)

			Pesticides/Herbicides													
Station ID	Sample ID	Depth (ft.)	Dieldrin	Endosulfan sulfate	Endrin	Endrin aldehyde	Endrin ketone	gamma-BHC	gamma-Chlordane	Heptachlor	Heptachlor epoxide	Methoxychlor	p,p'-DDD	p,p'-DDE	p,p'-DDT	Toxaphene
Industrial/ Commercial		*Ing*	*0.4*		*610*			*4*		*1*	*0.6*	*10000*	*24*	*17*	*17*	*5.2*
		Inh	*2.2*							*11*	*9.2*				*1500*	*170*
Construction Worker		*Ing*	*7.8*		*61*			*96*		*28*	*2.7*	*1000*	*520*	*370*	*100*	*110*
		Inh	*3.1*							*16*	*13*				*2100*	*240*
Soil Component of GW		*I*	*0.004*		*1*			*0.009*		*23*	*0.7*	*160*	*16*	*54*	*32*	*31*
		II	*0.02*		*5*			*0.047*		*110*	*3.3*	*780*	*80*	*270*	*160*	*150*
Pit 37	X128	3	0.0094 U	0.0094 U	0.0094 U	0.0094 U	0.0094 U	0.0049 U	0.0049 U	0.027 =	0.0049 U	0.049 U	0.099 =	0.0094 U	0.0094 U	0.49 U
Pit 37	X129	3	0.0073 U	0.0073 U	0.0073 U	0.0073 U	0.0073 U	0.0038 U	0.0038 U	0.028 =	0.0038 U	0.038 U	0.12 =	0.079 =	0.0073 U	0.38 U
Pit 37	X130	8	0.0055 U	0.0055 U	0.0055 U	0.0055 U	0.0055 U	0.0028 U	0.0028 U	0.015 =	0.0028 U	0.028 U	0.019 =	0.0055 U	0.0055 U	0.28 U
Pit 38	X126	3	0.0057 U	0.0057 U	0.0057 U	0.0057 U	0.0057 U	0.0029 U	0.0029 U	0.0029 U	0.0029 U	0.029 U	0.13 =	0.12 =	0.0057 U	0.29 U
Pit 38	X126DL	3	0.028 U	0.028 U	0.028 U	0.028 U	0.028 U	0.015 U	0.015 U	0.27 =	0.015 U	0.15 U	0.1 =	0.15 =	0.028 U	1.5 U
Pit 38	X127	10	0.0075 U	0.0075 U	0.0075 U	0.0075 U	0.0075 U	0.0039 U	0.0039 U	0.0039 U	0.0039 U	0.039 U	0.06 =	0.082 =	0.0075 U	0.39 U
Pit 38	X127DL	10	0.038 U	0.038 U	0.038 U	0.038 U	0.038 U	0.019 U	0.019 U	0.19 =	0.019 U	0.19 U	0.047 =	0.12 =	0.038 U	1.9 U
Pit 39	X124	3	0.0039 U	0.0039 U	0.0039 U	0.0039 U	0.0039 U	0.002 U	0.002 U	0.005 J	0.002 U	0.02 U	0.01 J	0.0039 U	0.0039 U	0.2 U
Pit 39	X125	10	0.0077 UJ	0.0077 UJ	0.0077 UJ	0.0077 UJ	0.18 J	0.004 UJ	0.0029 J	0.004 UJ	0.004 UJ	0.04 UJ	1.1 J	0.07 J	0.054 J	0.4 UJ
Pit 39	X125DL	10	0.038 U	0.038 U	0.038 U	0.038 U	0.21 J	0.02 U	0.02 U	0.02 U	0.02 U	0.2 U	1.1 J	0.071 J	0.061 J	2 U
Pit 40	X122	4	0.0064 U	0.0064 U	0.0064 U	0.0064 U	0.0064 U	0.0033 U	0.0033 U	0.012 =	0.0033 U	0.033 U	0.055 =	0.11 =	0.0064 U	0.33 U
Pit 40	X122DL	4	0.032 UJ	0.032 UJ	0.032 UJ	0.032 UJ	0.032 UJ	0.016 UJ	0.016 UJ	0.055 J	0.016 UJ	0.16 UJ	0.052 J	0.032 UJ	0.032 UJ	1.6 UJ
Pit 40	X123	9	0.0085 R	0.0085 R	0.0085 R	0.0085 R	0.0085 R	0.0044 R	0.0044 R	0.0044 R	0.0044 R	0.41 J	0.043 J	0.12 J	0.0085 R	0.44 R
Pit 40	X123DL	9	0.042 U	0.042 U	0.042 U	0.042 U	0.042 U	0.022 U	0.022 U	0.16 J	0.022 U	0.4 J	0.039 J	0.15 J	0.042 U	2.2 U
Pit 41	X120	3	0.0041 U	0.0041 U	0.0041 U	0.0041 U	0.0041 U	0.0021 U	0.0021 U	0.00091 J	0.0021 U	0.021 U	0.0041 U	0.0041 U	0.0041 U	0.21 U
Pit 41	X121	8	0.007 U	0.007 U	0.007 U	0.007 U	0.007 U	0.0036 U	0.0036 U	0.0036 U	0.0036 U	0.036 U	0.066 =	0.08 =	0.007 U	0.36 U
Pit 42	X117	2	0.0042 U	0.0042 U	0.0042 U	0.0042 U	0.0026 J	0.0022 U	0.0022 U	0.0022 U	0.0008 J	0.022 U	0.0029 J	0.0042 U	0.0042 U	0.22 U
Pit 42	X118	9	0.0057 U	0.0057 U	0.0057 U	0.0057 U	0.078 J	0.0029 U	0.0029 U	0.0029 U	0.0029 U	0.03 J	0.14 J	0.13 J	0.0057 U	0.29 U
Pit 42	X118DL	9	0.057 U	0.057 U	0.057 U	0.057 U	0.093 =	0.029 U	0.029 U	0.17 J	0.029 U	0.29 U	0.12 =	0.14 J	0.057 U	2.9 U
Pit 42	X119	15	0.0056 R	0.0056 R	0.0056 R	0.0056 R	0.0056 R	0.0029 R	0.0029 R	0.012 J	0.0029 R	0.029 R	0.047 J	0.061 J	0.0056 R	0.29 R
Pit 42	X119DL	15														
Pit 43	X115	3	0.0054 U	0.0054 U	0.0054 U	0.0054 U	0.0051 J	0.0028 U	0.0028 U	0.014 J	0.0028 U	0.028 U	0.016 =	0.013 J	0.0054 U	0.28 U
Pit 43	X116	9	0.0095 J	0.0054 UJ	0.0054 UJ	0.0054 UJ	0.013 J	0.0028 UJ	0.0028 UJ	0.0026 J	0.008 J	0.028 UJ	0.056 J	0.069 J	0.0054 UJ	0.28 UJ
Pit 43	X116DL	9														
Pit 44	X113	3	0.0043 U	0.0043 U	0.0043 U	0.0043 U	0.032 J	0.0022 U	0.0022 U	0.0022 U	0.023 J	0.022 U	0.16 J	0.0043 U	0.0043 U	0.22 U
Pit 44	X113DL	3	0.043 U	0.043 U	0.043 U	0.043 U	0.036 J	0.022 U	0.022 U	0.022 U	0.022 U	0.22 U	0.17 =	0.043 U	0.043 U	2.2 U
Pit 44	X114	9	0.0065 R	0.0065 R	0.0065 R	0.0065 R	0.019 J	0.0033 R	0.0033 R	0.1 J	0.0033 R	0.046 J	0.0073 J	0.0065 R	0.0065 R	0.33 R
Pit 44	X114DL	9	0.065 U	0.065 U	0.065 U	0.065 U	0.0065 J	0.033 U	0.033 U	0.11 J	0.033 U	0.33 U	0.065 U	0.065 U	0.065 U	3.3 U
Pit 45	X111	3.5	0.0047 U	0.0047 U	0.0047 U	0.0047 U	0.014 =	0.0024 U	0.0024 U	0.017 J	0.0024 U	0.024 U	0.015 J	0.07 =	0.0047 U	0.24 U
Pit 45	X112	10	0.0061 U	0.0061 U	0.0061 U	0.0061 U	0.003 J	0.0032 U	0.0032 U	0.0032 U	0.0032 U	0.031 U	0.019 =	0.11 =	0.0061 U	0.31 U

Table E-11. PCBs and Pesticides in U.S. Drum (mg/kg)

Station ID	Sample ID	Depth (ft.)	Pesticides/Herbicides													
			Dieldrin	Endosulfan sulfate	Endrin	Endrin aldehyde	Endrin ketone	gamma-BHC	gamma-Chlordane	Heptachlor	Heptachlor epoxide	Methoxychlor	p,p'-DDD	p,p'-DDE	p,p'-DDT	Toxaphene
Industrial/		*Ing*	*0.4*		*610*			*4*		*1*	*0.6*	*10000*	*24*	*17*	*17*	*5.2*
Commercial		*Inh*	*2.2*							*11*	*9.2*				*1500*	*170*
Construction		*Ing*	*7.8*		*61*			*96*		*28*	*2.7*	*1000*	*520*	*370*	*100*	*110*
Worker		*Inh*	*3.1*							*16*	*13*				*2100*	*240*
Soil Component		*I*	*0.004*		*1*			*0.009*		*23*	*0.7*	*160*	*16*	*54*	*32*	*31*
of GW		*II*	*0.02*		*5*			*0.047*		*110*	*3.3*	*780*	*80*	*270*	*160*	*150*
Pit 45	X112DL	10	0.061 U	0.061 U	0.061 U	0.061 U	0.0048 J	0.031 U	0.031 U	0.031 U	0.031 U	0.31 U	0.024 J	0.061 U	0.061 U	3.1 U
Pit 46	X109	4	0.0053 U	0.0053 U	0.0053 U	0.0053 U	0.0053 U	0.0027 U	0.0027 U	0.0027 U	0.0027 U	0.027 U	0.0017 J	0.0053 U	0.0053 U	0.27 U
Pit 46	X110	9	0.006 U	0.006 U	0.006 U	0.006 U	0.0041 J	0.0031 U	0.0031 U	0.0031 U	0.0031 U	0.031 U	0.0037 J	0.059 =	0.006 U	0.31 U
Pit 47	X107	3.5	0.0045 U	0.0045 U	0.0045 U	0.0045 U	0.0045 U	0.0023 U	0.0023 U	0.0023 U	0.0011 J	0.023 U	0.0052 J	0.02 =	0.02 =	0.23 U
Pit 47	X108	9	0.055 U	0.055 U	0.055 U	0.055 U	0.03 J	0.028 U	0.028 U	0.012 J	0.028 U	0.28 U	3.1 J	0.26 J	0.055 U	2.8 U
Pit 47	X108DL	9	0.55 U	0.55 U	0.55 U	0.55 U	0.028 J	0.28 U	0.28 U	0.041 J	0.28 U	0.28 U	3.7 =	0.38 J	0.55 U	28 U
Pit 48	X105	3	0.0038 U	0.0038 U	0.0038 U	0.0038 U	0.0038 U	0.0019 U	0.0019 U	0.0024 J	0.0019 U	0.019 U	0.0034 J	0.0038 U	0.0038 U	0.19 U
Pit 48	X106	9	0.0045 U	0.0045 U	0.0045 U	0.0045 U	0.0016 J	0.0023 U	0.0023 U	0.092 J	0.0023 U	0.023 U	0.0013 J	0.0045 U	0.0045 U	0.23 U
Pit 48	X106DL	9	0.045 U	0.045 U	0.045 U	0.045 U	0.045 U	0.023 U	0.023 U	0.1 J	0.023 U	0.23 U	0.045 U	0.045 U	0.045 U	2.3 U
Pit 49	X103	3	0.0038 U	0.0038 U	0.0038 U	0.0038 U	0.011 J	0.002 U	0.002 U	0.0095 J	0.002 U	0.02 U	0.0096 J	0.0038 U	0.0038 U	0.2 U
Pit 49	X104	10	0.0042 U	0.0042 U	0.0042 U	0.0042 U	0.0042 U	0.0022 U	0.0022 U	0.00085 J	0.0022 U	0.022 U	0.0042 U	0.0011 J	0.0042 U	0.22 U
Pit 50	X101	3	0.0038 U	0.0038 U	0.0038 U	0.0038 U	0.0011 J	0.0019 U	0.0019 U	0.0019 U	0.0019 U	0.019 U	0.0038 U	0.0038 U	0.0038 U	0.19 U
Pit 50	X102	9	0.065 U	0.065 U	0.065 U	0.065 U	0.065 U	0.033 U	0.033 U	0.054 J	0.033 U	0.33 U	0.23 J	0.065 U	0.065 U	3.3 U
Pit 50	X102DL	9	0.65 U	0.65 U	0.65 U	0.65 U	0.65 U	0.33 U	0.33 U	0.33 U	0.33 U	0.095 J	0.19 J	0.65 U	0.65 U	33 U
Pit 51	X203	3	0.004 U	0.004 U	0.004 U	0.004 U	0.0011 J	0.0021 U	0.0049 J	0.0021 U	0.0021 U	0.021 U	0.031 J	0.019 J	0.08 J	0.21 U
Pit 51	X203DL	3	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.01 U	0.01 U	0.01 U	0.01 U	0.1 U	0.025 J	0.017 J	0.069 J	1 U
Pit 51	X204	8	0.0044 U	0.0044 U	0.0044 U	0.0044 U	0.004 J	0.0023 U	0.0023 U	0.0023 U	0.0023 U	0.023 U	0.027 =	0.0081 =	0.0079 =	0.23 U

Notes:

=:	sample concentration is detected at level reported
U:	sample concentration is under detection limit
J:	sample concentration is estimated value
R:	sample concentration value is rejected
DL:	sample is diluted
RE:	sample is re-extracted
Ing.:	Ingestion
Inh.:	Inhalation
I:	Class I
II:	Class II

Table E-12. PCBs and Pesticides in Unnamed Parcel (mg/kg)

			PCBs							Pesticides/Herbicides								
Station ID	Sample ID	Depth (ft.)	Arochlor 1016	Arochlor 1221	Arochlor 1232	Arochlor 1242	Arochlor 1248	Arochlor 1254	Arochlor 1260	Aldrin	alpha-BHC	alpha-Chlordane	alpha-Endosulfan	Atrazine	beta-BHC	beta-Endosulfan	delta-BHC	Dieldrin
Industrial/ Commercial		*Ing*	*Sum of the Arochlors can be 1 mg/kg*							*0.3*	*0.9*			*72000*				*0.4*
		Inh								*6.6*	*1.5*							*2.2*
Construction Worker		*Ing*								*6.1*	*20*			*7100*				*7.8*
		Inh								*9.3*	*2.1*							*3.1*
Soil Component of GW		*I*								*0.5*	*0.0005*			*0.066*				*0.004*
		II								*2.5*	*0.003*			*0.33*				*0.02*
Pit 02	X103	3	0.042 R	0.085 R	0.042 R	0.042 R	0.042 R	2.2 J	2.7 J	0.0022 R	0.0022 R	0.0022 R	0.0021 J	0.42 U	0.095 J	0.0042 R	0.0022 R	0.063 J
Pit 02	X104	6	0.42 U	0.85 U	0.42 U	0.42 U	0.42 U	2.2 J	2.8 J	0.022 U	0.022 U	0.022 U	0.022 U		0.081 J	0.042 U	0.022 U	0.042 U
Pit 03	X106	6	0.041 R	0.083 R	0.041 R	0.041 R	0.041 R	0.041 R	0.036 J	0.0021 R	0.0021 R	0.0021 R	0.0021 R	0.41 U	0.0012 J	0.0041 R	0.0021 R	0.0041 R
Pit 03	X106DL	6	0.04 U	0.081 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.0021 U	0.0021 U	0.0021 U	0.002 U	0.4 U	0.025 J	0.004 U	0.0021 U	0.004 U
Pit 04	X107	3	0.08 U	0.16 U	0.08 U	0.08 U	0.08 U	0.08 U	0.08 U	0.0041 U	0.0041 U	0.0041 U	0.0041 U		0.022 J	0.008 U	0.0041 U	0.008 U
Pit 04	X107DL	3	0.052 R	0.1 R	0.052 R	0.052 R	0.052 R	0.052 R	0.19 J	0.0027 R	0.0027 R	0.0027 R	0.0027 R	0.52 U	0.0027 R	0.0052 R	0.0027 R	0.0052 R
Pit 04	X108	8												3.1 U				
Pit 05	X109	3	0.93 U	1.9 U	0.93 U	0.93 U	0.93 U	0.93 U	0.93 U	0.048 U	0.048 U	0.11 J	0.048 U	0.46 U	0.1 J	0.093 U	0.048 U	0.093 U
Pit 05	X110	3	0.93 U	1.9 U	0.93 U	0.93 U	0.93 U	0.93 U	0.93 U	0.048 U	0.048 U	0.11 J	0.048 U	1.4 U	0.1 J	0.093 U	0.048 U	0.093 U
Pit 05	X111	8	0.099 U	0.2 U	0.099 U	0.099 U	0.099 U	0.099 U	0.04 J	0.0051 U	0.0017 J	0.0051 U	0.0051 U	0.49 U	0.0013 J	0.0099 U	0.0051 U	0.0044 J
Pit 05	X111DL	8	0.099 U	0.2 U	0.099 U	0.099 U	0.099 U	0.099 U	0.04 J	0.0051 U	0.0017 J	0.0051 U	0.0051 U		0.0013 J	0.0099 U	0.0051 U	0.0044 J
Pit 06	X112	3	0.04 U	0.082 U	0.04 U	0.04 U	0.04 U	0.14 J	0.068 J	0.0021 U	0.0021 U	0.0021 U	0.0021 U	2.8 U	0.0033 =	0.004 U	0.0021 U	0.0066 =
Pit 06	X112DL	3	0.4 U	0.82 U	0.4 U	0.4 U	0.4 U	0.1 J	0.12 J	0.021 U	0.021 U	0.021 U	0.021 U		0.021 U	0.04 U	0.021 U	0.04 U
Pit 06	X113	8	0.046 U	0.094 U	0.046 U	0.046 U	0.046 U	0.091 J	0.077 J	0.0024 U	0.0024 U	0.0024 U	0.0024 U	0.46 U	0.0048 J	0.0047 U	0.0024 U	0.0047 U
Pit 07	X114	3	0.46 U	0.94 U	0.46 U	0.46 U	0.46 U	0.13 J	0.14 J	0.024 U	0.024 U	0.024 U	0.024 U	2.3 U	0.024 U	0.046 U	0.024 U	0.046 U
Pit 07	X115	8	0.066 U	0.13 U	0.066 U	0.51 J	0.066 U	0.09 J	0.063 J	0.0034 U	0.0034 U	0.0034 U	0.0034 U	0.66 U	0.0038 J	0.0066 U	0.0034 U	0.0066 U
Pit 07	X115DL	8												5.3 U				
Pit 08	X116	3	0.052 U	0.1 U	0.052 U	0.052 U	0.052 U	0.052 U	0.085 J	0.0027 U	0.0048 J	0.0076 J	0.0027 U	0.52 U	0.0076 J	0.0052 U	0.0027 U	0.0085 J
Pit 08	X117	8	0.1 U	0.21 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 J	0.0053 U	0.0053 U	0.007 J	0.0053 U	1.5 U	0.011 J	0.01 U	0.0053 U	0.0097 J
Pit 08	X117DL	8	0.052 R	0.1 R	0.052 R	0.052 R	0.052 R	0.15 J	0.11 J	0.014 J	0.0027 R	0.015 J	0.0027 R	0.52 U	0.0027 R	0.0052 R	0.0027 R	0.039 J
Pit 09	X118	3	4.5 U	9.1 U	4.5 U	4.5 U	4.5 U	4 J	4.5 U	0.21 J	0.23 U	0.23 U	0.53 J	0.45 U	0.37 J	0.45 U	0.23 U	0.17 J
Pit 09	X119	8	4.5 U	9.1 U	4.5 U	4.5 U	4.5 U	4 J	4.5 U	0.21 J	0.23 U	0.23 U	0.53 J		0.37 J	0.45 U	0.23 U	0.17 J
Pit 10	X121	8	0.27 U	0.55 U	0.27 U	0.88 J	0.27 U	0.92 J	0.27 U	0.014 U	0.014 U	0.014 U	0.01 J	0.54 U	0.013 J	0.027 U	0.014 U	0.031 J
Pit 11	X122	3	0.27 U	0.55 U	0.27 U	0.88 J	0.27 U	0.92 J	0.27 U	0.014 U	0.014 U	0.014 U	0.01 J	3.8 U	0.013 J	0.027 U	0.014 U	0.031 J
Pit 11	X123	8	0.2 U	0.41 U	0.2 U	0.2 U	0.2 U	0.23 J	0.18 J	0.01 U	0.01 U	0.019 J	0.0055 J	0.41 U	0.069 J	0.02 U	0.01 U	0.01 J
Pit 11	X125	30	0.2 U	0.41 U	0.2 U	0.2 U	0.2 U	0.23 J	0.18 J	0.01 U	0.01 U	0.019 J	0.0055 J		0.069 J	0.02 U	0.01 U	0.01 J
Pit 12	X128	6	0.27 U	0.54 U	0.27 U	0.54 J	0.27 U	0.27 U	0.18 J	0.014 U	0.014 U	0.0073 J	0.014 U	5.3 U	0.042 J	0.0053 U	0.014 U	0.017 J
Pit 13	X129	3	0.053 U	0.11 U	0.053 U	0.53 J	0.053 U	0.053 U	0.18 J	0.0027 U	0.0027 U	0.0073 J	0.0027 U	5.3 U	0.037 J	0.027 U	0.0027 U	0.0053 U
Pit 13	X130	8	0.041 U	0.084 U	0.041 U	0.041 U	1.1 J	0.45 J	0.18 J	0.0021 U	0.0021 U	0.0055 J	0.0024 J	0.41 U	0.014 J	0.0041 U	0.0021 U	0.0041 U

Table E-12. PCBs and Pesticides in Unnamed Parcel (mg/kg)

			PCBs							Pesticides/Herbicides								
Station ID	Sample ID	Depth (ft.)	Arochlor 1016	Arochlor 1221	Arochlor 1232	Arochlor 1242	Arochlor 1248	Arochlor 1254	Arochlor 1260	Aldrin	alpha-BHC	alpha-Chlordane	alpha-Endosulfan	Atrazine	beta-BHC	beta-Endosulfan	delta-BHC	Dieldrin
Industrial/ Commercial		*Ing*	*Sum of the Arochlors can be 1 mg/kg*							*0.3*	*0.9*			*72000*				*0.4*
		Inh								*6.6*	*1.5*							*2.2*
Construction Worker		*Ing*								*6.1*	*20*			*7100*				*7.8*
		Inh								*9.3*	*2.1*							*3.1*
Soil Component of GW		*I*								*0.5*	*0.0005*			*0.066*				*0.004*
		II								*2.5*	*0.003*			*0.33*				*0.02*
Pit 14	X132	8	0.054 U	0.11 U	0.054 U	0.054 U	3.4 J	0.054 U	0.35 J	0.0028 U	0.0028 U	0.0028 U	0.0083 J	0.54 U	0.0028 U	0.0054 U	0.0028 U	0.0054 U
Pit 15	X133	3	0.27 U	0.55 U	0.27 U	0.27 U	6.5 J	0.27 U	0.52 J	0.014 U	0.014 U	0.014 U	0.012 J		0.014 U	0.027 U	0.014 U	0.029 J
Pit 15	X134	8	0.041 U	0.084 U	0.041 U	0.041 U	0.041 U	0.041 U	0.041 U	0.0021 U	0.0021 U	0.0021 U	0.0021 U	0.41 U	0.0021 U	0.0041 U	0.0021 U	0.0041 U
Pit 16	X136	6	0.045 U	0.092 U	0.045 U	0.4 J	0.045 U	0.045 U	0.045 U	0.0018 J	0.0023 U	0.0056 J	0.001 J	1.4 U	0.041 J	0.0045 U	0.0023 U	0.02 J
Pit 17	X138	11	0.039 U	0.079 U	0.039 U	0.039 U	0.039 U	0.039 U	0.039 U	0.002 U	0.002 U	0.002 U	0.002 U	0.39 U	0.0037 J	0.0039 U	0.002 U	0.0039 U
Pit 18	X140	10	0.04 U	0.082 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.0021 U	0.0021 U	0.0021 U	0.0021 U	0.4 U	0.0022 =	0.004 U	0.0021 U	0.0074 =
Pit 19	X142	14	0.039 U	0.079 U	0.039 U	0.039 U	0.039 U	0.039 U	0.039 U	0.002 U	0.002 U	0.002 U	0.002 U	0.39 U	0.023 J	0.0039 U	0.002 U	0.0039 U
Pit 20	X144	3	0.047 U	0.096 U	0.047 U	0.047 U	0.047 U	0.047 U	0.29 J	0.0024 U	0.0024 U	0.0024 U	0.0024 U	0.47 U	0.015 J	0.0047 U	0.0024 U	0.0047 U
Pit 21	X146	3	0.087 U	0.18 U	0.087 U	0.88 J	0.087 U	0.63 J	0.087 U	0.0054 J	0.0045 U	0.0064 J	0.0045 U	0.87 U	0.0045 U	0.0087 U	0.0045 U	0.04 J
Pit 21	X147	5	0.21 U	0.42 U	0.21 U	0.21 U	0.21 U	0.93 J	0.61 J	0.011 U	0.011 U	0.017 J	0.011 U	0.83 U	0.051 J	0.021 U	0.011 U	0.036 J
Pit 21	X148	10	0.069 U	0.14 U	0.069 U	0.85 =	0.069 U	0.069 U	0.48 =	0.0077 =	0.0038 =	0.0029 J	0.0042 =	0.69 U	0.012 =	0.0069 U	0.0035 U	0.02 =
Pit 22	X160	3	0.083 U	0.17 U	0.083 U	0.083 U	0.083 U	0.27 J	0.12 J	0.016 J	0.0043 U	0.0037 J	0.0043 U	0.83 U	0.012 J	0.0083 U	0.0043 U	0.015 J
Pit 22	X161DL	10	0.051 U	0.1 U	0.051 U	0.83 J	0.051 U	0.19 J	0.12 J	0.0026 U	0.0021 J	0.0025 J	0.0026 U	0.51 U	0.0026 U	0.0051 U	0.0026 U	0.0056 J
Pit 23	X158	3	0.054 U	0.11 U	0.054 U	0.99 J	0.054 U	0.53 J	0.26 J	0.0028 J	0.0014 J	0.013 J	0.0028 U	2.2 U	0.0088 J	0.0054 U	0.0028 U	0.025 J
Pit 24	X156	3	0.052 U	0.1 U	0.052 U	0.63 J	0.052 U	0.3 J	0.21 J	0.0027 U	0.0099 J	0.006 J	0.0027 U	0.52 U	0.0085 J	0.0052 U	0.0027 U	0.013 J
Pit 24	X157	8	0.045 U	0.091 U	0.045 U	0.045 U	0.045 U	0.3 J	0.2 J	0.0067 J	0.0023 U	0.012 J	0.0023 U	2.2 U	0.027 J	0.0045 U	0.0016 J	0.11 J
Pit 25	X154	3	0.38 U	0.76 U	0.38 U	12 J	0.38 U	0.38 U	0.38 U	0.0079 J	0.019 U	0.0058 J	0.019 U	0.75 U	0.034 J	0.038 U	0.019 U	0.038 U
Pit 25	X155	8	0.04 U	0.082 U	0.04 U	0.04 U	0.04 U	1.1 J	0.78 J	0.0021 U	0.01 J	0.021 J	0.0021 U	4 U	0.052 J	0.004 U	0.0021 U	0.004 U
Pit 26	X152	3	0.043 U	0.087 U	0.043 U	0.043 U	0.043 U	0.22 J	0.14 J	0.0022 U	0.0022 U	0.0088 J	0.00026 J	4.3 U	0.033 J	0.0043 U	0.0022 U	0.019 J
Pit 27	X149	3	0.052 U	0.1 U	0.052 U	0.052 U	0.052 U	0.14 J	0.052 U	0.0027 U	0.0027 U	0.0028 J	0.0027 U	1 U	0.011 J	0.0052 U	0.0027 U	0.012 J
Pit 27	X150	8	0.47 U	0.96 U	0.47 U	0.47 U	0.47 U	0.47 U	0.35 J	0.046 J	0.024 J	0.01 J	0.001 J	0.47 U	0.038 J	0.047 U	0.024 U	0.045 J
Pit 27	X151	30	0.044 U	0.089 U	0.044 U	0.044 U	0.044 U	0.12 J	0.1 J	0.041 J	0.0058 J	0.038 J	0.00065 J	0.44 U	0.012 J	0.0044 U	0.0023 U	0.0051 J
Pit 28	X175	3	0.27 U	0.54 U	0.27 U	0.33 J	0.27 U	0.27 U	0.17 J	0.014 U	0.012 J	0.012 J	0.014 U	0.53 U	0.046 J	0.027 U	0.014 U	0.027 U
Pit 28	X176	6	0.045 U	0.092 U	0.045 U	0.045 U	0.045 U	0.51 J	0.34 J	0.0023 U	0.0071 J	0.012 J	0.0023 U	0.45 U	0.0023 U	0.0045 U	0.0023 U	0.0045 U
Pit 29	X173	3	0.49 U	0.99 U	0.49 U	0.49 U	0.49 U	0.94 J	0.5 J	0.025 U	0.008 J	0.021 J	0.025 U	0.49 U	0.025 U	0.049 U	0.025 U	0.049 U
Pit 30	X171	3	0.062 U	0.13 U	0.062 U	0.062 U	0.062 U	0.12 J	0.15 J	0.0032 U	0.0028 J	0.003 J	0.0032 U	0.62 U	0.058 J	0.0062 U	0.0032 U	0.018 J
Pit 30	X172	7.5	0.4 U	0.82 U	0.4 U	0.4 U	0.4 U	1.4 J	0.4 U	0.024 J	0.021 U	0.048 J	0.017 J	2 U	0.021 U	0.04 U	0.021 U	0.04 U

Table E-12. PCBs and Pesticides in Unnamed Parcel (mg/kg)

			PCBs							Pesticides/Herbicides								
Station ID	Sample ID	Depth (ft.)	Arochlor 1016	Arochlor 1221	Arochlor 1232	Arochlor 1242	Arochlor 1248	Arochlor 1254	Arochlor 1260	Aldrin	alpha-BHC	alpha-Chlordane	alpha-Endosulfan	Atrazine	beta-BHC	beta-Endosulfan	delta-BHC	Dieldrin
Industrial/ Commercial		*Ing*	*Sum of the Arochlors can be 1 mg/kg*							*0.3*	*0.9*			*72000*				*0.4*
		Inh								*6.6*	*1.5*							*2.2*
Construction Worker		*Ing*								*6.1*	*20*			*7100*				*7.8*
		Inh								*9.3*	*2.1*							*3.1*
Soil Component of GW		*I*								*0.5*	*0.0005*			*0.066*				*0.004*
		II								*2.5*	*0.003*			*0.33*				*0.02*
Pit 31	X169	2.5	0.42 U	0.86 U	0.42 U	0.42 U	0.42 U	2.5 J	0.42 U	0.022 U	0.022 U	0.0034 J	0.022 U	4.2 U	0.086 J	0.042 U	0.022 U	0.014 J
Pit 32	X167	3	0.47 U	0.96 U	0.47 U	0.47 U	0.47 U	2.1 J	0.47 U	0.072 J	0.012 J	0.024 U	0.043 J	14 U	0.024 U	0.047 U	0.066 J	0.021 J
Pit 33	X165	3	0.05 U	0.1 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.0026 U	0.0026 U	0.0026 U	0.0026 U	0.5 U	0.0031 J	0.005 U	0.0026 U	0.005 U
Pit 33	X166	7	0.31 U	0.63 U	0.31 U	1.5 =	0.31 U	0.31 U	0.41 J	0.008 J	0.02 J	0.016 U	0.016 U	0.62 U	0.026 J	0.031 U	0.016 U	0.021 J
Pit 34	X162	3												1.2 U				
Pit 34	X163	10	0.51 U	1 U	0.51 U	0.51 U	0.51 U	0.51 U	0.33 J	0.059 J	17 J	0.026 U	0.026 U	15 U	0.12 J	0.051 U	0.026 U	0.051 U
Pit 35	X185	4	0.49 U	1 U	0.49 U	0.49 U	0.49 U	0.49 U	0.12 J	0.025 U	0.039 J	0.071 J	0.025 U	0.99 U	0.025 U	0.049 U	0.025 U	0.0058 J
Pit 36	X183	3	0.075 U	0.15 U	0.075 U	1.4 J	0.075 U	0.33 J	0.11 J	0.0039 U	0.0025 J	0.0039 U	0.00069 J	0.75 U	0.013 J	0.0075 U	0.0039 U	0.0075 U
Pit 37	X181	4	0.079 U	0.16 U	0.079 U	0.079 U	0.079 U	0.15 =	0.067 J	0.0041 U	0.0032 J	0.0049 =	0.0041 U	0.79 U	0.0061 =	0.0079 U	0.0041 U	0.0079 U
Pit 38	X179	4	0.041 U	0.084 U	0.041 U	0.041 U	0.041 U	0.26 J	0.25 J	0.0021 U	0.0021 U	0.0021 U	0.0021 U	0.41 U	0.0048 J	0.0041 U	0.0021 U	0.0041 U
Pit 38	X180	6.5	0.057 U	0.12 U	0.057 U	0.057 U	0.057 U	0.077 J	0.057 U	0.0029 U	0.0029 U	0.0029 U	0.0029 U	0.57 U	0.056 J	0.0057 U	0.0029 U	0.025 J
Pit 39	X178	8	0.046 U	0.094 U	0.046 U	0.046 U	0.046 U	0.046 U	0.14 J	0.0024 U	0.0024 U	0.0024 U	0.0001 J	0.46 U	0.071 J	0.0047 U	0.0024 U	0.0047 U
Pit 42	X124	3	0.075 U	0.15 U	0.075 U	0.075 U	0.075 U	0.075 U	0.075 U	0.0039 U	0.0039 U	0.0039 U	0.0039 U	0.75 U	0.0062 =	0.0075 U	0.0039 U	0.0075 U
Pit 42	X126	12	0.054 R	0.11 R	0.054 R	0.054 R	0.054 R	0.45 J	0.38 J	0.0028 R	0.0068 J	0.0081 J	0.001 J	2.7 U	0.011 J	0.0054 R	0.0028 R	0.05 J

Notes:

=:	sample concentration is detected at level reported
U:	sample concentration is under detection limit
J:	sample concentration is estimated value
R:	sample concentration value is rejected
DL:	sample is diluted
RE:	sample is re-extracted
Ing.:	Ingestion
Inh.:	Inhalation
I:	Class I
II:	Class II

Table E-12. PCBs and Pesticides in Unnamed Parcel (mg/kg)

			Pesticides/Herbicides												
Station ID	Sample ID	Depth (ft.)	Endosulfan sulfate	Endrin	Endrin aldehyde	Endrin ketone	gamma-BHC	gamma-Chlordane	Heptachlor	Heptachlor epoxide	Methoxychlor	p,p'-DDD	p,p'-DDE	p,p'-DDT	Toxaphene
Industrial/ Commercial		*Ing*		*610*			*4*		*1*	*0.6*	*10000*	*24*	*17*	*17*	*5.2*
		Inh							*11*	*9.2*				*1500*	*170*
Construction Worker		*Ing*		*61*			*96*		*28*	*2.7*	*1000*	*520*	*370*	*100*	*110*
		Inh							*16*	*13*				*2100*	*240*
Soil Component of GW		*I*		*1*			*0.009*		*23*	*0.7*	*160*	*16*	*54*	*32*	*31*
		II		*5*			*0.047*		*110*	*3.3*	*780*	*80*	*270*	*160*	*150*
Pit 02	X103	3	0.0042 R	0.0042 R	0.021 J	0.022 J	0.0022 R	0.0022 R	0.0022 R	0.0022 R	0.11 J	0.0042 R	0.057 J	0.0042 R	0.22 R
Pit 02	X104	6	0.042 U	0.042 U	0.042 U	0.042 U	0.022 U	0.022 U	0.022 U	0.022 U	0.22 U	0.042 U	0.062 J	0.042 U	2.2 U
Pit 03	X106	6	0.0041 R	0.0041 R	0.0041 R	0.0041 R	0.0021 R	0.0034 J	0.0021 R	0.0021 R	0.0038 J	0.017 J	0.007 J	0.0041 R	0.21 R
Pit 03	X106DL	6	0.004 U	0.004 U	0.004 U	0.004 U	0.0021 U	0.0021 U	0.0021 U	0.0021 U	0.009 J	0.051 J	0.032 J	0.0093 J	0.2 U
Pit 04	X107	3	0.008 U	0.008 U	0.008 U	0.008 U	0.0041 U	0.0041 U	0.0041 U	0.0041 U	0.041 U	0.047 J	0.03 J	0.01 U	0.41 U
Pit 04	X107DL	3	0.0052 R	0.0052 R	0.0052 R	0.0052 R	0.0027 R	0.012 J	0.0027 R	0.0027 R	0.0067 J	0.057 J	0.028 J	0.042 J	0.27 R
Pit 04	X108	8													
Pit 05	X109	3	0.093 U	0.093 U	0.093 U	0.093 U	0.048 U	0.048 U	0.019 J	0.071 J	0.013 J	0.28 J	0.085 J	0.093 U	4.8 U
Pit 05	X110	3	0.093 U	0.093 U	0.093 U	0.093 U	0.048 U	0.048 U	0.019 J	0.071 J	0.48 U	0.28 J	0.085 J	0.093 U	4.8 U
Pit 05	X111	8	0.0099 U	0.0099 U	0.0099 U	0.0099 U	0.0051 U	0.0025 U	0.0051 U	0.0051 U	0.0024 J	0.011 J	0.0074 J	0.0099 U	0.51 U
Pit 05	X111DL	8	0.0099 U	0.0099 U	0.0099 U	0.0099 U	0.0051 U	0.0051 U	0.0051 U	0.0051 U	0.0024 J	0.011 J	0.0074 J	0.0099 U	0.51 U
Pit 06	X112	3	0.004 U	0.004 U	0.004 U	0.004 U	0.0021 U	0.0021 U	0.0021 U	0.0021 U	0.12 U	0.0078 =	0.0056 =	0.004 U	0.21 U
Pit 06	X112DL	3	0.04 U	0.04 U	0.04 U	0.04 U	0.021 U	0.021 U	0.021 U	0.021 U	0.21 U	0.04 U	0.01 J	0.04 U	2.1 U
Pit 06	X113	8	0.0047 U	0.0047 U	0.0047 U	0.0047 U	0.0024 U	0.0024 U	0.0024 U	0.0024 U	0.024 U	0.0079 J	0.0075 J	0.0047 U	0.24 U
Pit 07	X114	3	0.046 U	0.046 U	0.046 U	0.046 U	0.024 U	0.024 U	0.024 U	0.024 U	0.24 U	0.046 U	0.046 U	0.046 U	2.4 U
Pit 07	X115	8	0.0066 U	0.0066 U	0.0066 U	0.0066 U	0.0014 J	0.0043 U	0.0034 U	0.0034 U	0.034 U	0.0055 J	0.017 J	0.0066 U	0.34 U
Pit 07	X115DL	8													
Pit 08	X116	3	0.0052 U	0.0052 U	0.0052 U	0.0052 U	0.0027 U	0.0027 U	0.0027 U	0.0027 U	0.0097 J	0.02 J	0.028 J	0.0052 U	0.27 U
Pit 08	X117	8	0.01 U	0.01 U	0.01 U	0.01 U	0.0053 U	0.0064 U	0.0053 U	0.0053 U	0.053 U	0.018 J	0.03 J	0.01 U	0.53 U
Pit 08	X117DL	8	0.0086 J	0.0052 R	0.0052 R	0.0052 R	0.0027 R	0.029 J	0.0027 R	0.0026 R	0.027 R	0.12 J	0.043 J	0.0052 R	0.27 R
Pit 09	X118	3	0.48 J	0.45 U	0.45 U	0.45 U	0.23 U	0.23 U	0.23 U	0.063 J	2.3 U	0.19 J	0.13 J	0.45 U	23 U
Pit 09	X119	8	0.48 J	0.45 U	0.45 U	0.45 U	0.23 U	0.23 U	0.23 U	0.063 J	2.3 U	0.19 J	0.13 J	0.45 U	23 U
Pit 10	X121	8	0.051 J	0.027 U	0.02 J	0.028 J	0.014 U	0.014 U	0.014 U	0.014 U	0.14 U	0.087 J	0.04 J	0.027 U	1.4 U
Pit 11	X122	3	0.051 J	0.027 U	0.02 J	0.028 J	0.014 U	0.014 U	0.014 U	0.014 U	0.14 U	0.087 J	0.04 J	0.027 U	1.4 U
Pit 11	X123	8	0.02 U	0.02 U	0.02 U	0.02 U	0.01 U	0.01 U	0.01 U	0.01 U	0.1 U	0.025 J	0.021 J	0.02 U	1 U
Pit 11	X125	30	0.02 U	0.02 U	0.02 U	0.02 U	0.01 U	0.01 U	0.01 U	0.01 U	0.1 U	0.025 J	0.021 J	0.02 U	1 U
Pit 12	X128	6	0.0063 J	0.027 U	0.027 U	0.027 U	0.014 U	0.014 U	0.014 U	0.014 U	0.27 U	0.041 J	0.015 J	0.027 U	1.4 U
Pit 13	X129	3	0.0093 J	0.0053 U	0.0053 U	0.0053 U	0.0027 U	0.0027 U	0.0027 U	0.0027 U	0.14 U	0.04 J	0.014 J	0.0053 U	0.27 U
Pit 13	X130	8	0.0041 U	0.0041 U	0.0041 U	0.0041 U	0.0021 U	0.0021 U	0.0021 U	0.0021 U	0.021 U	0.037 J	0.02 J	0.0041 U	0.21 U

Table E-12. PCBs and Pesticides in Unnamed Parcel (mg/kg)

			Pesticides/Herbicides												
Station ID	Sample ID	Depth (ft.)	Endosulfan sulfate	Endrin	Endrin aldehyde	Endrin ketone	gamma-BHC	gamma-Chlordane	Heptachlor	Heptachlor epoxide	Methoxychlor	p,p'-DDD	p,p'-DDE	p,p'-DDT	Toxaphene
Industrial/ Commercial		*Ing*		*610*			*4*		*1*	*0.6*	*10000*	*24*	*17*	*17*	*5.2*
		Inh							*11*	*9.2*				*1500*	*170*
Construction Worker		*Ing*		*61*			*96*		*28*	*2.7*	*1000*	*520*	*370*	*100*	*110*
		Inh							*16*	*13*				*2100*	*240*
Soil Component of GW		*I*		*1*			*0.009*		*23*	*0.7*	*160*	*16*	*54*	*32*	*31*
		II		*5*			*0.047*		*110*	*3.3*	*780*	*80*	*270*	*160*	*150*
Pit 14	X132	8	0.015 J	0.0054 U	0.0054 U	0.0054 U	0.0028 U	0.0028 U	0.0028 U	0.0028 U	0.028 U	0.019 J	0.048 J	0.0054 U	0.28 U
Pit 15	X133	3	0.0054 U	0.027 U	0.027 U	0.027 U	0.014 U	0.014 U	0.014 U	0.014 U	0.027 U	0.021 J	0.053 J	0.027 U	1.4 U
Pit 15	X134	8	0.0041 U	0.0041 U	0.0041 U	0.0041 U	0.0012 J	0.0021 U	0.0021 U	0.0021 U	0.021 U	0.0015 J	0.00077 J	0.0041 U	0.21 U
Pit 16	X136	6	0.013 J	0.0045 U	0.008 J	0.04 J	0.0023 U	0.0065 J	0.0023 U	0.0023 U	0.057 J	0.21 J	0.091 J	0.0047 J	0.23 U
Pit 17	X138	11	0.0039 U	0.0039 U	0.0039 U	0.0039 U	0.002 U	0.002 U	0.002 U	0.002 U	0.0044 J	0.0039 U	0.00039 J	0.0039 U	0.2 U
Pit 18	X140	10	0.004 U	0.004 U	0.004 U	0.004 U	0.0021 U	0.00037 J	0.0021 U	0.0021 U	0.021 U	0.0012 J	0.0019 J	0.0022 J	0.21 U
Pit 19	X142	14	0.0039 U	0.0039 U	0.0011 J	0.0039 U	0.002 U	0.002 U	0.002 U	0.002 U	0.0038 J	0.0017 J	0.0039 U	0.002 J	0.2 U
Pit 20	X144	3	0.0047 U	0.019 J	0.0047 U	0.0047 U	0.00022 J	0.022 J	0.0024 U	0.0024 U	0.024 U	0.19 J	0.061 J	0.0047 U	0.24 U
Pit 21	X146	3	0.02 J	0.0087 U	0.0087 U	0.0087 U	0.0045 U	0.0045 U	0.0045 U	0.0045 U	0.0068 J	0.034 J	0.042 J	0.0087 U	0.45 U
Pit 21	X147	5	0.021 U	0.021 U	0.021 U	0.021 U	0.011 U	0.011 U	0.0036 J	0.011 U	0.11 U	0.069 J	0.032 J	0.021 U	1.1 U
Pit 21	X148	10	0.0069 U	0.0069 U	0.004 J	0.0069 U	0.0035 U	0.015 =	0.0035 U	0.0035 U	0.15 =	0.041 =	0.028 =	0.0069 U	0.35 U
Pit 22	X160	3	0.0083 U	0.0083 U	0.0083 U	0.0083 U	0.0027 J	0.0043 U	0.0043 U	0.0043 U	0.0063 J	0.16 J	0.088 J	0.0083 U	0.43 U
Pit 22	X161DL	10	0.0051 U	0.0051 U	0.0051 U	0.0051 U	0.0026 U	0.0026 U	0.0026 U	0.0026 U	0.026 U	0.042 J	0.026 J	0.0051 U	0.26 U
Pit 23	X158	3	0.0054 U	0.0054 U	0.0054 U	0.0054 U	0.0028 U	0.03 J	0.0028 U	0.0028 U	0.028 U	0.045 J	0.06 J	0.0054 U	0.28 U
Pit 24	X156	3	0.0052 U	0.0052 U	0.0052 U	0.0052 U	0.0027 U	0.0027 U	0.0027 U	0.0027 U	0.027 U	0.079 J	0.026 J	0.0052 U	0.27 U
Pit 24	X157	8	0.0045 U	0.0045 U	0.0045 U	0.0045 U	0.0023 U	0.0023 U	0.0023 U	0.0022 J	0.013 J	0.15 J	0.025 J	0.0045 U	0.23 U
Pit 25	X154	3	0.019 J	0.038 U	0.038 U	0.038 U	0.019 U	0.024 J	0.019 U	0.019 U	0.19 U	0.079 J	0.071 J	0.12 J	1.9 U
Pit 25	X155	8	0.004 U	0.0046 J	0.004 U	0.004 U	0.0021 U	0.0021 U	0.011 J	0.0021 U	0.026 J	0.21 J	0.062 J	0.004 U	0.21 U
Pit 26	X152	3	0.0043 U	0.0043 U	0.0043 U	0.019 J	0.0022 U	0.0022 U	0.0022 U	0.0022 U	0.021 J	0.081 J	0.087 J	0.0043 U	0.22 U
Pit 27	X149	3	0.015 J	0.0052 U	0.0052 U	0.0052 U	0.0027 U	0.0027 U	0.0027 U	0.0027 U	0.027 U	0.04 J	0.026 J	0.0052 U	0.27 U
Pit 27	X150	8	0.064 J	0.047 U	0.047 U	0.047 U	0.024 U	0.014 J	0.024 U	0.024 U	0.24 U	0.11 J	0.066 J	0.047 U	2.4 U
Pit 27	X151	30	0.0044 U	0.0044 U	0.0044 U	0.0044 U	0.0023 U	0.0023 U	0.0023 U	0.0023 U	0.0089 J	0.038 J	0.027 J	0.0044 U	0.23 U
Pit 28	X175	3	0.027 U	0.027 U	0.027 U	0.027 U	0.014 U	0.013 J	0.014 U	0.014 U	0.14 U	0.031 J	0.028 J	0.027 U	1.4 U
Pit 28	X176	6	0.0045 U	0.0045 U	0.0045 U	0.0045 U	0.0027 J	0.0023 U	0.0023 U	0.0023 U	0.0053 J	0.92 J	0.056 J	0.0045 U	0.23 U
Pit 29	X173	3	0.049 U	0.049 U	0.049 U	0.049 U	0.0056 J	0.025 U	0.025 U	0.025 U	0.0058 J	1.1 J	0.07 J	0.049 U	2.5 U
Pit 30	X171	3	0.0062 U	0.0062 U	0.0062 U	0.0062 U	0.007 J	0.0032 U	0.0032 U	0.0032 U	0.0046 J	0.016 J	0.021 J	0.0022 J	0.32 U
Pit 30	X172	7.5	0.1 J	0.04 U	0.04 U	0.04 U	0.021 U	0.021 U	0.021 U	0.021 U	0.21 U	0.076 J	0.12 J	0.04 U	2.1 U

Table E-12. PCBs and Pesticides in Unnamed Parcel (mg/kg)

			Pesticides/Herbicides												
Station ID	Sample ID	Depth (ft.)	Endosulfan sulfate	Endrin	Endrin aldehyde	Endrin ketone	gamma-BHC	gamma-Chlordane	Heptachlor	Heptachlor epoxide	Methoxychlor	p,p'-DDD	p,p'-DDE	p,p'-DDT	Toxaphene
Industrial/ Commercial		*Ing*		*610*			*4*		*1*	*0.6*	*10000*	*24*	*17*	*17*	*5.2*
		Inh							*11*	*9.2*				*1500*	*170*
Construction Worker		*Ing*		*61*			*96*		*28*	*2.7*	*1000*	*520*	*370*	*100*	*110*
		Inh							*16*	*13*				*2100*	*240*
Soil Component of GW		*I*		*1*			*0.009*		*23*	*0.7*	*160*	*16*	*54*	*32*	*31*
		II		*5*			*0.047*		*110*	*3.3*	*780*	*80*	*270*	*160*	*150*
Pit 31	X169	2.5	0.16 J	0.018 J	0.25 J	0.042 U	0.022 U	0.022 U	0.022 U	0.022 U	0.0044 J	0.042 U	0.051 J	0.042 U	2.2 U
Pit 32	X167	3	0.097 J	0.047 U	0.047 U	0.047 U	0.024 U	0.024 U	0.024 J	0.04 J	0.054 J	0.094 J	0.053 J	0.047 U	2.4 U
Pit 33	X165	3	0.005 U	0.005 U	0.005 U	0.005 U	0.0026 U	0.0026 U	0.0026 U	0.0026 U	0.026 U	0.00032 J	0.0024 J	0.005 U	0.26 U
Pit 33	X166	7	0.031 U	0.031 U	0.031 U	0.031 U	0.016 U	0.029 J	0.016 U	0.016 U	0.16 U	0.1 J	0.062 J	0.031 U	1.6 U
Pit 34	X162	3													
Pit 34	X163	10	0.051 U	0.051 U	0.051 U	0.051 U	0.026 U	0.062 J	2.8 J	0.026 U	0.0017 J	0.083 J	0.16 J	0.051 U	2.6 U
Pit 35	X185	4	0.049 U	0.049 U	0.049 U	0.049 U	0.025 U	0.096 J	0.025 U	0.0027 J	0.25 U	0.061 J	0.048 J	0.049 U	2.5 U
Pit 36	X183	3	0.0075 U	0.0075 U	0.0075 U	0.0075 U	0.0039 U	0.0039 U	0.0039 U	0.0039 U	0.0028 J	0.087 J	0.029 J	0.0075 U	0.39 U
Pit 37	X181	4	0.0079 U	0.0079 U	0.0079 U	0.0079 U	0.0017 J	0.0041 U	0.0041 U	0.0041 U	0.0048 J	0.042 =	0.026 =	0.0079 U	0.4 U
Pit 38	X179	4	0.0041 U	0.0041 U	0.0041 U	0.0041 U	0.0021 U	0.0021 U	0.0021 U	0.0026 J	0.0041 J	0.079 J	0.016 J	0.0041 U	0.21 U
Pit 38	X180	6.5	0.0057 U	0.0057 U	0.0057 U	0.0044 J	0.00065 J	0.0029 U	0.0029 U	0.0029 U	0.032 J	0.051 J	0.018 J	0.0057 U	0.29 U
Pit 39	X178	8	0.0047 U	0.0047 U	0.0047 U	0.0047 U	0.0024 U	0.0024 U	0.0024 U	0.0011 J	0.032 J	0.022 J	0.015 J	0.0047 U	0.24 U
Pit 42	X124	3	0.0018 J	0.0075 U	0.0075 U	0.0075 U	0.0039 U	0.0039 U	0.0039 U	0.0039 U	0.039 U	0.0075 U	0.0075 U	0.0075 U	0.39 U
Pit 42	X126	12	0.0054 R	0.0054 R	0.0054 R	0.0054 R	0.0028 R	0.029 J	0.0028 R	0.0028 R	0.028 R	0.22 J	0.048 J	0.0054 R	0.28 R

Notes:

=:	sample concentration is detected at level reported
U:	sample concentration is under detection limit
J:	sample concentration is estimated value
R:	sample concentration value is rejected
DL:	sample is diluted
RE:	sample is re-extracted
Ing.:	Ingestion
Inh.:	Inhalation
I:	Class I
II:	Class II

Table E-13. Dioxins and Furans in U.S.Drum and Unnamed Parcel (mg/kg)

	U.S. Drum (mg/kg)				*Unnamed Parcel (mg/kg)*			
Station ID	Pit 15	Pit 38	Pit 46	Pit 47	Pit 15	Pit 12	Pit 26	Pit 33
Sample ID	X186	X126	X110	X108	X186	X127	X152	X165
Depth (ft.)	4	3	9	9	4	3	3	3
Dioxins								
1,2,3,4,6,7,8-Heptachlorodibenzo-P-Dioxin	0.002455 =	0.003521 =	0.003726 =	0.003757 =	0.002455 =	0.001902 =	0.000901 =	0.001381 =
1,2,3,4,7,8-Hexachlorodibenzo-P-Dioxin	0.001655 U	0.002068 U	0.002189 U	0.002024 U	0.001655 U	0.001398 X	0.000566 =	0.000506 =
1,2,3,6,7,8-Hexachlorodibenzo-P-Dioxin	0.001583 X	0.001979 =	0.002095 =	0.001937 U	0.001583 X	0.001338 =	0.000541 =	0.000484 =
1,2,3,7,8,9-Hexachlorodibenzo-P-Dioxin	0.001556 =	0.001945 =	0.002059 X	0.001903 U	0.001556 =	0.001315 =	0.000532 =	0.000476 X
1,2,3,7,8-Pentachlorodibenzo-P-Dioxin	0.00179 U	0.00295 U	0.002445 U	0.003959 U	0.00179 U	0.002085 U	0.000826 U	0.000674 =
2,3,7,8-Tetrachlorodibenzo-P-Dioxin	0.000988 U	0.002201 U	0.00244 U	0.001872 U	0.000988 U	0.001358 U	0.000256 U	0.000535 U
Octachlorodibenzo-P-Dioxin	0.00239 B	0.002519 B	0.003116 B	0.004196 B	0.00239 B	0.002148 B	0.000941 B	0.000456 B
Furans								
1,2,3,4,6,7,8-Heptachlorodibenzofuran	0.001186 =	0.001927 =	0.001254 =	0.002171 =	0.001186 =	0.000376 =	0.000961 X	0.001187 =
1,2,3,4,7,8,9-Heptachlorodibenzofuran	0.00164 =	0.002667 =	0.001736 =	0.003003 =	0.00164 =	0.00052 X	0.00133 =	0.001642 =
1,2,3,4,7,8-Hexachlorodibenzofuran	0.001545 X	0.001607 =	0.002444 X	0.005505 X	0.001545 X	0.001433 I	0.002355 I	0.003178 I
1,2,3,6,7,8-Hexachlorodibenzofuran	0.001553 U	0.001615 U	0.002455 U	0.005531 =	0.001553 U	0.00144 =	0.002366 U	0.003193 X
1,2,3,7,8,9-Hexachlorodibenzofuran	0.001986 U	0.002065 U	0.00314 U	0.007074 U	0.001986 U	0.001841 U	0.003026 U	0.004083 =
1,2,3,7,8-Pentachlorodibenzofuran	0.001127 X	0.002038 X	0.002235 U	0.002478 U	0.001127 X	0.000926 U	0.000554 U	0.000337 =
2,3,4,6,7,8-Hexachlorodibenzofuran	0.001555 U	0.001617 =	0.002459 U	0.005539 X	0.001555 U	0.001442 =	0.002369 U	0.003197 =
2,3,4,7,8-Pentachlorodibenzofuran	0.001105 X	0.001998 X	0.002192 U	0.00243 U	0.001105 X	0.000908 =	0.000544 U	0.000331 =
2,3,7,8-Tetrachlorodibenzofuran	0.000938 U	0.00214 CX	0.001277 CX	0.002013 CX	0.000938 U	0.000271 C	0.000584 C	0.001677 C
Octachlorodibenzofuran	0.002756 B	0.004324 B	0.002891 B	0.009845 =	0.002756 B	0.001816 =	0.001747 =	0.000791 =

Notes:

=: sample concentration is detected at level reported

U: sample concentration is under detection limit

J: sample concentration is estimated value

R: sample concentration value is rejected

DL: sample is diluted

RE: sample is re-extracted

X: user define flag

C: sample concentration is confirmed

B: sample concentration is found in blank sample

Ing. = Ingestion

Inh. = Inhalation

I = Class I

II = Class II

APPENDIX C

COMPREHENSIVE SITE INVESTIGATION REPORT FOR INDIAN RIDGE MARSH *(Text Only)*

HARZA (JUNE 2001)

COMPREHENSIVE SITE INVESTIGATION REPORT

INDIAN RIDGE MARSH

Prepared for

City of Chicago Department of Environment

Chicago, Illinois

By

HARZA

Engineering Company

April 2001

COMPREHENSIVE SITE INVESTIGATION REPORT

TABLE OF CONTENTS

CHAPTER			PAGE
EXECUTIVE SUMMARY			ES-1
1.0	SITE CHARACTERIZATION		1
	1.1	INTRODUCTION	1
	1.2	SITE HISTORY	2
	1.3	SITE LOCATION	2
	1.4	SITE DESCRIPTION	2
	1.5	SITE GEOLOGY/HYDROGEOLOGY	3
		1.5.1 Regional Geology	3
		1.5.2 Regional Hydrogeology	4
		1.5.3 Site Geology	4
		1.5.4 Site Hydrogeology	5
	1.6	PREVIOUS INVESTIGATIONS	6
2.0	SITE-SPECIFIC SAMPLING PLAN		10
	2.1	LABORATORY ANALYSIS	10
	2.2	SUBSURFACE DRILLING AND SOIL SAMPLING	10
	2.3	GROUNDWATER SCREENING SAMPLE COLLECTION	11
	2.4	HAND AUGER SAMPLE COLLECTION	11
	2.5	SURFACE WATER SAMPLE COLLECTION	12
	2.6	SEDIMENT SAMPLE COLLECTION	12
	2.7	EQUIPMENT DECONTAMINATION	13
	2.8	LABORATORY ANALYSIS	13
	2.9	GPS SURVEYING	14
3.0	DOCUMENTATION OF FIELD ACTIVITIES		15
	3.1	DIRECT PUSH SOIL SAMPLING	15
	3.2	DIRECT PUSH GROUNDWATER SAMPLES	17
	3.3	ECOLOGICAL SAMPLES	17
	3.4	SURFACE WATER AND SEDIMENT SAMPLING	17
4.0	ENDANGERMENT ASSESSMENT		18

4.1 REMEDIATION OBJECTIVES 18
4.2 NATURE AND EXTENT OF SOIL IMPACT 18
4.2.1 Volatile Organic Compounds 20
4.2.2 Semi-Volatile Organic Compounds 20
4.2.3 Inorganics 23
4.3 NATURE AND EXTENT OF GROUNDWATER IMPACT 24
4.4 SURFACE WATER AND SEDIMENT 26
5.0 CONCLUSIONS 29

REFERENCES R-1

LIST OF FIGURES

FIGURE 1 SITE LOCATION MAP
FIGURE 2 REGIONAL GEOLOGY/HYDROSTRATIGRAPHICAL UNITS
FIGURE 3 SOIL BORING LOCATIONS
FIGURE 3A SURFACE WATER AND SEDIMENT SAMPLE LOCATIONS
FIGURE 4 WEST-EAST TRENDING GEOLOGIC CROSS-SECTION
FIGURE 5 NORTH-SOUTH TRENDING GEOLOGIC CROSS-SECTION
FIGURE 6 SAMPLE LOCATIONS FOR PHASE II BY EARTH TECH
FIGURE 7 ECOLOGICAL SAMPLE LOCATIONS
FIGURE 8 SAMPLE LOCATIONS WITH EXCEEDANCES OF TACO TIER 1 RESIDENTIAL SOIL REMEDIATION OBJECTIVES
FIGURE 9 TETRACHLOROETHENE IN FILL MATERIAL ABOVE RESIDENTIAL TIER 1 ROs
FIGURE 10 TRICHLOROETHENE IN FILL MATERIAL ABOVE RESIDENTIAL TIER 1 ROs
FIGURE 11 VINYL CHLORIDE IN FILL MATERIAL ABOVE RESIDENTIAL TIER 1 ROs
FIGURE 11A ESTIMATED AREA WITH VOCS IN GROUNDWATER EXCEEDING TIER 1 GROUNDWATER REMEDIATION OBJECTIVES
FIGURE 12 BENZO(A)ANTHRACENE IN FILL MATERIAL ABOVE RESIDENTIAL TIER 1 ROs
FIGURE 13 BENZO(A)PYRENE IN FILL MATERIAL ABOVE RESIDENTIAL TIER 1 ROs
FIGURE 14 BENZO(B)FLUORANTHENE IN FILL MATERIAL ABOVE RESIDENTIAL TIER 1 ROs
FIGURE 15 DIBENZO (A,H)ANTHRACENE IN FILL MATERIAL ABOVE RESIDENTIAL TIER 1 ROs
FIGURE 16 INDENO(1,2,3-CD)PYRENE IN FILL MATERIAL ABOVE RESIDENTIAL TIER 1 ROs
FIGURE 17 BENZO(K)FLUORANTHENE IN FILL MATERIAL ABOVE RESIDENTIAL TIER 1 ROs
FIGURE 18 ARSENIC IN FILL MATERIAL ABOVE RESIDENTIAL TIER 1 ROs
FIGURE 19 LEAD IN FILL MATERIAL ABOVE RESIDENTIAL TIER 1 ROs
FIGURE 20 MERCURY IN FILL MATERIAL ABOVE RESIDENTIAL TIER 1 ROs

LIST OF TABLES

TABLE 1-1. CHEMICAL EXCEEDANCES OF TACO TIER I RESIDENTIAL SOIL REMEDIATION OBJECTIVES (PHASE II, 1999)

TABLE 1-2. SUMMARY OF PHYSICAL ANALYTICAL RESULTS (PHASE II, 1999)

TABLE 4-1. CONTAMINANTS EXCEEDING RESIDENTIAL SOIL ROs (MG/KG)

TABLE 4-2. VOCS EXCEEDING TIER 1 RESIDENTIAL SOIL ROs (MG/KG)

TABLE 4-3. SVOCS EXCEEDING TIER 1 RESIDENTIAL SOIL ROs (MG/KG)

TABLE 4-4. INORGANICS EXCEEDING TIER 1 RESIDENTIAL SOIL ROs (MG/KG)

TABLE 4-5. VOCS AND SVOCS EXCEEDING TIER 1 ROs FOR CLASS I GROUNDWATER (MG/L)

TABLE 4-6. INORGANICS EXCEEDING TIER 1 ROs FOR CLASS I GROUNDWATER (MG/L)

TABLE 4-7. SURFACE WATER AND SEDIMENT SAMPLING STATIONS

TABLE 4-8. SUMMARY OF SURFACE WATER ANALYSES

TABLE 4-9. SUMMARY OF SEDIMENT ANALYSES

APPENDICES

APPENDIX A	SOIL BORING LOGS
APPENDIX B	PHOTOGRAPHIC LOGS
APPENDIX C	CHAIN OF CUSTODY
APPENDIX D	LABORATORY DATA
APPENDIX E	FIELD LOGS
APPENDIX F	ILLINOIS STATE WATER SURVEY LABORATORY DATA

EXECUTIVE SUMMARY

This report summarizes the site investigation activities conducted at Indian Ridge Marsh, Chicago, Illinois, which extends approximately one mile from 116th Street to 124th Street in the north-south direction and approximately one-quarter mile from Torrence Avenue west to the Norfolk and Western Railroad. The site is split into the northern section and southern section by 122nd Street. The Site Investigation (SI) was conducted to determine the nature and extent of environmental or public health concerns at the site at the request of the City of Chicago Department of Environment (DOE).

Chemical concentrations reported in soil samples collected at the site are screened against Tier 1 Residential Soil Remediation Objectives (SROs), Appendix B of Title 35 of the Illinois Administrative Code (IAC) Part 742, *Tiered Approach to Corrective Action Objectives* (TACO), effective January 6, 2001. Chemical concentrations in groundwater samples are screened against Tier I Groundwater Remediation Objectives (GRO) for Class I Groundwater Component of the Groundwater Ingestion Route, Appendix B, Table E of TACO. Chemical concentrations in surface water and sediment are screened against the highest concentration of a material to which an aquatic community can be exposed indefinitely without resulting in an unacceptable effect.

Chemical concentrations exceeding SROs were found in fill soil at the surface to approximately seven feet deep. Exceedances were generally low (same order of magnitude or one order of magnitude greater than the SRO) and no concentrations exceeded SROs by more than two orders of magnitude. No pesticide or polychlorinated biphenyl (PCB) concentrations exceeded SROs. The following is a summary of the volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), and inorganic compounds that exceeded SROs and the locations of the exceedances:

- VOCs: tetrachloroethene, trichloroethene, and vinyl chloride exceeded SROs in the fill in the eastern portion of the site just north of 122nd Street. These contaminants were not found in surface water and sediment collected north of the soil borings.
- SVOCs: The polyaromatic hydrocarbons (PAHs), benzo(a)anthracene, benzo(a)pyrene, benzo(b)anthracene, dibenzo(a,h)anthracene, indeno(1,2,3-cd)pyrene), benzo(k)fluoranthene, were present at concentrations above Tier I Soil ROs in various areas of the northern half of the site in samples collected from 1 to 7 ft below ground surface (bgs). In addition, benzo(a)pyrene was reported in one boring sample in the southern portion of the site, immediately south of 122nd

Street in the middle of the site. No other contaminants were reported above Tier I Soil ROs in the southern part of the site.

- Metals: Arsenic, lead, and mercury were found in concentrations exceeding SROs in the northern section of the site. All three metals exceeded their respective SRO in one boring in the eastern portion of the site (SB023). Mercury and lead also exceeded the SROs in an adjacent boring (SB028). In addition, lead exceeded its SRO in three boring in the eastern part of the site north of 122nd Street.

Natural biodegradation of tetrachloroethene and trichloroethene is evident along the 122nd causeway, based upon the occurrence of elevated levels of the degradation products cis-1,2-dichloroethene and vinyl chloride. Additional data will be collected. Based upon this additional data, the necessity of remedial action should be evaluated.

No pesticide or PCB concentrations exceeded GROs. Class I groundwater was only exceeded by approximately one order of magnitude or less for one VOC (vinyl chloride), six PAHs, and three inorganics (iron, manganese, and lead) at the southeast corner of the northern part of the site. The only other groundwater concentration exceedance was manganese, which was detected above the GRO in all samples. Non aqueous phase liquid (NAPL) was encountered at the water table, 2.5 ft below the surface, at the southeast corner just north of 122nd Street. Further delineation of the groundwater at the water table surface in the area of SB050 is advisable. Removal of the NAPL in this area is recommended.

Soil and groundwater contamination levels are generally low (not more than two orders of magnitude and most less than one order of magnitude above Residential SROs). A Tier 3 Risk Assessment is recommended for the chemicals exceeding Tier 1 Residential ROs to determine if remediation of soil is necessary at the site.

1.0 SITE CHARACTERIZATION

1.1 INTRODUCTION

This document summarizes the activities conducted and data obtained during the Site Investigation (SI) of Indian Ridge Marsh, located in Chicago, Cook County, Illinois. The Site Investigation was conducted to determine the nature and extent of environmental or public health concerns at the site at the request of the City of Chicago Department of Environment (DOE). The SI encompasses previous investigations at the site including:

- Everest Engineering Company, 1997. *Geotechnical Investigation Tunnel and Reservoir Plan, Torrence Avenue Leg, Calumet Tunnel System*, Volume I and II, Chicago, Illinois, December 1997.

- Harza Engineering Company, Inc. 1998. *Contract Plans for the Calumet Tunnel System, Torrence Avenue Leg, Tunnels, Shafts and Connecting Structures*, Chicago, Illinois, 1998.

- Mostardi-Platt Associates, Inc. 1999. *Phase I Environmental Site Assessment for Indian Ridge Marsh*, 122nd Street and Torrence Avenue, Chicago, Illinois, August 12, 1999.

- Earth Tech, Inc. 1999. *Phase II Environmental Site Investigation*, Indian Ridge Marsh, Chicago, Illinois, September 1999.

- Roadcap GS, and Kelly WR. 1994. *Shallow Ground-Water Quality and Hydrogeology of the Lake Calumet Area, Chicago, Illinois*. Illinois Department of Energy and Natural Resources and United States Environmental Protection Agency: Springfield, Ill. Interim Report.

- Roadcap GS, Wentzel MB, Lin SD, Herricks EE, Raman RK, Locke RL, and Hullinger DL. 1999. *An Assessment of the Hydrology and Water Quality of Indian Ridge Marsh and the Potential Effects of Wetland Rehabilitation on the Diversity of Wetland Plant Communities.* Illinois State Water Survey, Groundwater and Watershed Science Sections and University of Illinois, Department of Civil Engineering: Champaign, Ill. Contract Report 654.

The purpose of this SI Report is to: (1) fulfill the requirements of the comprehensive site investigation section of the Site Remediation Program, 35 Illinois Administrative Code (IAC) 740, Section 740.420, and (2) evaluate site data in accordance with 35 IAC 742, entitled *Tiered Approach to Corrective Action Objectives* (TACO), effective January 6, 2001.

1.2 SITE HISTORY

A review of historical aerial photographs and records by Mostardi Platt indicates Indian Ridge Marsh was apparently in use as one or more solid waste disposal sites from at least 1949 until after 1975. From 1980 to the present, Indian Ridge Marsh has been covered with vegetation and ponded areas. The use of the property prior to 1949 is unknown due to the lack of reasonably ascertainable information.

1.3 SITE LOCATION

Indian Ridge Marsh is located in the southeastern edge of Chicago, Illinois (Township 37 North, Range 14 East, NE1/4, SE1/4 of Section 24 and NE1/4 of Section 25). The site extends approximately one mile from 116th Street to 124th Street in the north-south direction and approximately one-quarter mile from Torrence Avenue west to the Norfolk and Western Railroad. A site location map is presented as Figure 1.

1.4 SITE DESCRIPTION

Indian Ridge Marsh is approximately 160 acres and is divided into north and south sections by 122nd Street. A channel runs along the western edge of the marsh and connects the north and south sections through a culvert under 122nd Street. The property consists of unimproved land with the exception of a natural-gas utility building just south of 122nd Street. The relatively flat marsh dips gently from west to east and is made up of wetland pools and dry upland areas covered with grasses, weeds, bushes, and trees. According to Roadcap et al. (1999), the property consists of 92 acres of wetlands. The Illinois State Water Survey (ISWS) has three monitoring wells located in Indian Ridge Marsh. Monitoring wells 17 and 18 are located in the northeast corner of the marsh and well 20 along the 122nd Street causeway. The City of Chicago Department of Environment is conducting two ecological studies on the property's southern section and the southeast corner of the northern section.

Acme Steel Company Chicago Coke Plant is located to the north of the property. The land east of Torrence Avenue is unimproved. The area west of the Norfolk and Western Railroad was apparently used for landfilling operations. Private residences are present northeast of the property and the Metropolitan Water Reclamation District of Greater Chicago occupies land to the south of the property.

1.5 SITE GEOLOGY/HYDROGEOLOGY

The following sections describe the regional and site-specific geology and hydrogeology at Indian Ridge Marsh. The regional information is derived from geologic literature and available water well drilling logs obtained from the Illinois State Water Survey (ISWS). The site-specific hydrogeology is based on information obtained from site activities including boring logs and monitoring well data.

1.5.1 Regional Geology

The site is located within the Chicago/Calumet Lacustrine Plain, which is a glacially formed, low, crescent-shaped flat surface that slopes gently to Lake Michigan. The Plain extends from the Wilmette, Illinois area to the Indiana-Michigan border and continues northward in a narrow band along the Michigan shore (Chrzastowski and Thompson, 1993). The Chicago/Calumet Lacustrine Plain surface is primarily a wave-scoured ground moraine with fine lake silts and clays covering the surface in former back-barrier settings. The prominent depositional features on the plain are sand and gravelly sand relict spits, mainland beaches, and beach-ridge/dune complexes. This lowland region drains into Lake Michigan. The bedrock geology of the region consists of Precambrian-age crystalline rock overlain by gently dipping Paleozoic sedimentary bedrock units. The uppermost bedrock unit consists of eastward gently dipping Silurian dolomite. The Racine formation, the youngest formation of the Silurian period, underlies the area due to the eastward dip of the rock strata. The Racine formation includes a number of organic reefs, which consist of a core of massive, high-purity dolomite flanked by dipping dolomite beds. The bedrock surface topography is an undulating plain as a result of glacial and some lake erosion, in which scattered steep valleys and low bedrock hills occur. Mapping by Piskin and Bergstrom (1975) indicates that the bedrock is overlain by approximately 50 to 100 feet of unconsolidated Quaternary age deposits. According to Chrzastowski and Thompson (1993), the site is filled with a dark gray, silty clay till that is correlative to the Wadsworth Formation. This till unit intertongues with bedded sands and silt, which are assigned to the Henry and Equality Formation.

1.5.2 Regional Hydrogeology

According to Suter et al. (1959), the four primary aquifers recognized in the Chicago area are the Sand and Gravel Aquifers within the glacial drift, the Shallow Bedrock Aquifers mainly Silurian in age, the Cambrian-Ordovician Aquifer, and the Mt. Simon Aquifer. The generalized relationship between regional geology and the above- mentioned hydrostratigraphic units is summarized in Figure 2.

The uppermost bedrock aquifer underlying the Indian Ridge Marsh is composed of Silurian dolomites. Suter et al. (1959) indicate that ground water in the shallow dolomite occurs in joints, fissures, and solution cavities, so yields at any given location are unpredictable. The openings in the dolomite mainly occur in the upper part of the rock. Therefore, it is likely there is good connection between the shallow bedrock aquifers and the overlying glacial drift. It follows that where fractured dolomite is overlain by sand and gravel deposits there will be more immediate recharge of the shallow dolomite aquifer than in areas where glacial till rests on the bedrock.

The uppermost aquifer system identified in the vicinity of the Indian Ridge Marsh is the glacial drift aquifer, composed of unconsolidated Quaternary deposits. In the vicinity of the site, the glacial drift aquifer consists of sands overlying and interbedded with glacial till.

1.5.3 Site Geology

Soil boring locations are shown on Figure 3. Based on the findings from the soil borings drilled at the site, the near surface geology consists of unconsolidated glacial deposits overlain by various fill materials over most of the site. From bottom to top, the following geologic materials, were encountered in investigative soil borings:

- Gray silty clay
- Brownish gray silty sand
- Fill

Figure 4 is an west to east trending geologic cross section and Figure 5 is a north to south geologic cross section that show the lateral and vertical relationships of these materials. All soil boring logs from the site investigation activities previously described are included in Appendix A.

The gray silty clay unit is the lowermost unit encountered at the site and is composed of silty clay with a trace of sand and pebbles. The gray silty clay is present at all locations beneath the site at depths ranging from 8.3 to 22 feet. The gray silty clay probably represents the Wadsworth Formation.

The sand unit is composed of varying percentages of medium to fine grained sand with silt, and exhibits brown to gray color variations. The sand is present at nearly all locations beneath the site at depths ranging from 3.5 to 12 feet. At SB037 the sand was at a maximum thickness of 11 feet. In four soil borings, SB026, SB039, SB046, and SB047, the sand unit was not encountered. The sand unit is probably representative of the Henry and Equality Formations.

Fill material is present at all soil borings except those located south of 122nd Street. The fill is composed of varying amounts of silty clay, wood, bricks, concrete, glass, slag, gravel, and sand. The thickness of the fill material ranges from 3 to 11.5 feet across the northern half of the site.

1.5.4 Site Hydrogeology

The uppermost water-bearing unit at the site is the medium to fine sand unit encountered below fill in all borings except SB039. During drilling groundwater was encountered essentially at the ground surface in borings SB001, SB003, and SB053, and up to 11 ft below ground surface in SB023. Groundwater was not found in shallow (up to 3 ft below surface) borings SB046, SB052, SB054, SB055, SB056, SB058, and SB059. The Illinois State Water Survey (ISWS) has three monitoring wells located in Indian Ridge Marsh. Monitoring wells 17 and 18 are located in the northeast corner of the marsh and well 20 is located along the 122nd Street causeway (Figure 3). According to Roadcap (et al., 1999) groundwater flow is generally north to south towards the Calumet River and the interaction between groundwater and the wetlands is very complicated due to the extreme heterogeneity of the fill material.

The underlying glacial clay till acts as an aquitard, defying the lower limits of the upper water-bearing unit. According to Piskin and Bergstrom (1975) and ISWS boring logs, the glacial till is 50 to 100 feet thick beneath the site and prevents vertical groundwater flow between the uppermost water-bearing unit and the uppermost bedrock aquifer (Silurian dolomite).

1.6 PREVIOUS INVESTIGATIONS

As listed in Section 1.0, several previous investigations were conducted at the site. The results of these investigations are summarized in the following paragraphs.

Since the mid 1980s the ISWS has been researching the environment of the Lake Calumet Area (Roadcap and Kelly, 1994). During April and August of 1991 the ISWS began studying interaction between the groundwater, the surface water, and wetlands by installing a total of 21 monitoring wells. One of the ISWS monitoring wells, well 20, is located along the 122nd causeway near Torrence Avenue within the Indian Ridge Marsh. The ISWS sampled monitoring well 20 in September 1991 and June 1992 for VOCs, SVOCs, major constituents, secondary constituents, and trace metals. Laboratory analysis of the samples detected vinyl chloride (VC), cis-1,2-dichloroethene (cis-1,2-DCE), trans-1,2-dichloroethene (trans-1,2-DCE), 1,1-dichloroethene (1,1-DCE), 1,1-dichloroethane (1,1-DCA), benzene, toluene, xylenes, and naphthalene. Five of these constituents were above the Tier 1 groundwater remediation objectives for Class I groundwater, VC, cis-1,2-DCE, trans-1,2-DCE, 1,1-DCE, and benzene. The analytical data for monitoring well 20 is tabulated in Appendix F.

In 1997, ISWS and the University of Illinois Department of Civil Engineering began to assess the hydrology and water quality of Indian Ridge Marsh (Roadcap et al., 1999, using surface water and groundwater samples collected from previous studies and surface water samples collected during a 1997 monitoring program. The analytical data collected in 1991 through 1992 from monitoring well 20 was used for the analysis along with groundwater samples from two additional monitoring wells installed by ISWS in the northeast corner of the site (monitoring wells 17 and 18). Surface water samples were collected in April 1995 and during the 1997-monitoring program from six locations, as shown on Figure 3A. All surface water samples were analyzed for VOCs, SVOCs, major constituents, secondary constituents, and trace metals. Results discussed in Roadcap (et al., 1999) are tabulated in Appendix F. However, the VOC and SVOC data from the three monitoring wells were not discussed except the statement that all organic analyses for surface water samples were below the laboratory detection limit.

Per discussion with George Roadcap (personal communication, October 2000), the integrity of monitoring wells 17 and 18 were in question. Problems with sample analyses

from these wells resulted in limited data. Additional direct push groundwater samples were taken in the mid 1990s to delineate the VOC plume in the area of well 20. Elevated cis-1,2-DCE and VC seemed to be localized to the area around well 20. Samples to the east, west, and south showed vinyl chloride only and at lower levels. Data for these direct push samples has been requested by Harza but not yet received. In a telephone conversation with George Roadcap (personal communication, April 12, 2001) additional sampling at monitoring well 20 will be completed by the ISWS in the near future.

Mostardi-Platt Associates, Inc. (1999) conducted a Phase I Environmental Site Assessment (ESA). Several potential sources of environmental concerns were identified including the following:

- Apparent historical use of the Property as a disposal site for one or more listed solid wastes;
- Presence of randomly dumped piles of slag and other unidentified materials on the property;
- Presence of elevated levels of arsenic, chromium, lead, manganese, benzo(a)anthracene, and chrysene in the sediment and surface water;
- Use of adjoining properties as one or more solid waste disposal sites; and
- Historical and current presence of an industrial facility on the northern adjoining property with outside storage of slag and coke materials.

Earth Tech, Inc. (1999) conducted a Phase II Environmental Site Investigation. The investigation consisted of three soil borings, B-01, B-02, and B-03, drilled to depths of 12, 10, and 12 feet, respectively; six shallow soil borings, with samples SB-01 through SB-06 collected two feet below grade; four surface samples SS-01/SS-02, SS-03/SS-04, SS-5, and SS-06 collected from six debris piles; two surface water samples, SW-01 and SW-02; and two sediment samples, S-01 and S-02. Soil samples were analyzed for VOCs, SVOCs, inorganics, target analyte list (TAL) metals, herbicides, pesticides and PCBs. One soil sample was analyzed for toxicity characteristic leaching procedure (TCLP) for VOCs, SVOCs, eight RCRA metals, and pesticides. Surface water and sediment samples were analyzed for TAL metals, pesticides, pH and fecal coliform. Sample locations are shown on Figure 6.

Analytical results for soil samples were compared to residential soil remediation objectives of the Tiered Approach to Corrective Objectives (TACO): 35 Ill. Adm. Code

Part 742. The Earth Tech report compared analytical results for surface water to IEPA Class I and Class II Groundwater Ingestion Exposure Route Remediation Objectives. Chemical exceedances of the remediation objectives chosen by Earth Tech for each media are listed in Table 1-1.

TABLE 1-1. Exceedances of TACO Tier I Residential SROs (Earth Tech Inc., 1999)

Sample Type	Analyte Group	Analyte (Sample ID)	Objective (pathway)	Range of Exceedances
Deep Soil	SVOC	Benzo(a)pyrene (B-02: 2-4ft)	0.9 mg/kg (ing)	0.21 mg/kg
	Metal	Arsenic (B-01: 4-6 ft, B-02*: 2-4 ft))	0.4 mg/kg (ing)	8.2 –35.7 mg/kg
	Metal	Lead (B-01: 4-6 ft)	400 mg/kg (ing)	968 mg/kg
Shallow Soil	Pesticide	Dieldrin (SB-06)	0.004 mg/kg (Class I)	0.0062-0.0067 mg/kg
	SVOC	Benzo(a)anthracene (SB-02, -05)	0.9 mg/kg (ing)	8.8-25 mg/kg
	SVOC	Benzo(a)pyrene (SB-01, -02,-03, -04, -05, -06)	0.09 mg/kg (ing)	0.11-22 mg/kg
	SVOC	Benzo(b)fluoranthene (SB-02, -05)	0.9 mg/kg (ing)	9.3-25 mg/kg
	SVOC	Benzo(k)fluoranthene (SB-02)	9 mg/kg (ing)	9 mg/kg
	SVOC	Carbazole (SB-02)	0.6 mg/kg (Class I)	4.4 mg/kg
	SVOC	Indeno(1,2,3-cd)pyrene (SB-02, -05)	0.9 mg/kg (ing)	4.7-11 mg/kg
	Metal	Arsenic* (SB-01, -02, -03, -04, -05, -06)	0.4 mg/kg (ing)	5.6-17.1 mg/kg
	Metal	Beryllium* (SB-01, -03, -05, -06)	0.1 mg/kg (ing)	0.62-1 mg/kg
Surficial Samples	SVOC	Benzo(a)pyrene (SS-01, -03, -05, -06)	0.9 mg/kg (ing)	0.19- 0.37 mg/kg
	SVOC	Dibenzo(a,h)anthracene (SS-06)	0.09 mg/kg (ing)	0.095 mg/kg
	Metal	Arsenic (SS-01, -05, -06*)	0.4 mg/kg (ing)	4.2-33.4 mg/kg
	Metal	Chromium (SS-01, -03)	270 mg/kg (inh)	338-4740 mg/kg
	Metal	Manganese (SS-01, -03)	3700 mg/kg (ing)	7460-14300 mg/kg
Sediment	Metal	Arsenic (S-01, -02*)	0.4 mg/kg (ing)	11.3-27.8 mg/kg
	Metal	Beryllium* (S-01, -02)	0.1 mg/kg (ing)	0.78-2.5 mg/kg
	Metal	Lead (S-01)	400 mg/kg (ing)	887 mg/kg
Surface Water	Metal	Arsenic (SW-02)	0.05 mg/L (Class I)	0.0656 mg/L
	Metal	Cadmium (SW-02)	0.005 mg/L (Class I)	0.0156 mg/L
	Metal	Chromium (SW-02)	0.1 mg/L (Class I)	0.169 mg/L
	Metal	Iron (SW-02)	5.0 mg/L (Class I, II)	110 mg/L
	Metal	Manganese (SW-02)	0.15 mg/L (Class I)	4.03 mg/L
	Metal	Nickel (SW-02)	0.1 mg/L (Class I)	0.13 mg/L
	Metal	Lead (SW-02)	0.0075 mg/L (Class I)	1.6 mg/L
	Metal	Antimony (SW-02)	0.006 mg/L (Class I)	0.0097 mg/L
	Metal	Vanadium (SW-02)	0.049 mg/L (Class I)	0.117 mg/L

*Concentration(s) in these samples did not exceed IEPA Metropolitan Statistical Area background values.
Ing = ingestion Inh = inhalation Class I, Class II = IEPA groundwater standards or soil migration to groundwater objectives

Fecal coliform was found in sediment sample S-01 (1,580 CFU/g) and in surface water sample SW-02 (6,500 CFU/100ml).

Geotechnical testing was also performed on selected soil samples. Results are presented in Table 1-2.

TABLE 1-2. Summary of Physical Analytical Results (Phase II, 1999)

Physical Test	Boring Results (Depth)		
	B-01 (6-10 ft)	B-02 (6-10 ft)	B-03 (0-4 ft)
Sieve Analysis	Sand, trace gravel	Sand	Sand, some gravel
Moisture Content	29.9%	29.2%	7.4%
Dry Unit Weight (pcf)	92.6	88.7	124.6
Organic Content	1.8%	1.4%	2.4%

2.0 SITE-SPECIFIC SAMPLING PLAN

Prior to the site investigation, Chicago DIGGER and other utilities and services were contacted to locate underground utilities. Harza conducted soil and groundwater investigations at the site on November 15, 2000, from November 29 to December 14, 2000, and January 31, 2001 and February 1, 2001. Samples were collected from areas with historical contamination, observed areas of potential contamination, and at other random locations to adequately characterize the property. Samples were collected in accordance with the *Work Plan, Indian Ridge Marsh Site, Chicago, Illinois, City of Chicago, Department of Environment, prepared by Harza Engineering Company (November 6, 2000)* approved by the City of Chicago Department of Environment, except as noted herein.

2.1 LABORATORY ANALYSIS

Samples were analyzed for the IEPA target compound list (TCL), which includes VOCs, SVOCs, polyaromatic hydrocarbons (PAHs), pesticides, polychlorinated biphenyls (PCBs), target analyte list (TAL) inorganic analytes, and cyanide. In addition, the soil and sediment samples were analyzed for pH, total organic carbon (TOC). Some surface samples were also analyzed for particle size, moisture content, chloride, total nitrogen, and salinity.

2.2 SUBSURFACE DRILLING AND SOIL SAMPLING

Borings were advanced using direct push Geoprobe® soil sampling methods by Mid-America Drilling Services Inc. of Elburn, Illinois. Each boring was sampled continuously using a decontaminated 1.5-inch-diameter, 48-inch-long macro core sampler. Each sample was collected for headspace screening to determine the presence of volatile organic vapors, physical description, and possible laboratory chemical analysis. Results of the headspace screening and visual descriptions were recorded in the field notebook. Based upon the results of the headspace screening and visual observation, one surface soil sample (0-3 feet below grade) and one subsurface soil sample (3-15 feet below grade) from each boring were retained for laboratory chemical analysis, in accordance with criteria specified in the Work Plan, and were analyzed for chemicals of concern.

Samples for VOC analyses were collected directly from the recovered sampler at the specified sample interval using two 5-gram Encores ™. The samples were immediately capped, labeled, and placed on ice. The remaining portion of the recovered sample from the specified sample interval was placed into sample containers for additional required analytical parameters. Once filled, sample containers were appropriately labeled and placed in a cooler with ice for shipment to the analytical laboratory. Required chain-of-custody procedures were maintained from the time of sample collection until delivery to the analytical laboratory.

Upon completion of drilling and sampling, each borehole was abandoned by backfilling with the soil cuttings. The location of the boring was flagged in the field for later identification and reference during surveying. Following completion of field activities, final boring logs were prepared and are provided in Appendix A.

2.3 GROUNDWATER SCREENING SAMPLE COLLECTION

Groundwater screening samples were collected for laboratory chemical analysis concurrently with subsurface soil sampling at selected borings and analyzed for the chemicals of concern. A PVC screen was pushed to the specified interval and groundwater was collected with a small diameter PVC bailer. Groundwater to be analyzed for VOCs analyses was transferred immediately to the appropriate sample containers assuring no headspace remained in the container. Followed by SVOCs, PAHs, PCBs, and TAL inorganics. Once filled, sample containers were appropriately labeled and placed in a cooler with ice for shipment to the analytical laboratory. Required chain-of-custody procedures were maintained from the time of sample collection until delivery to the analytical laboratory.

2.4 HAND AUGER SAMPLE COLLECTION

Hand auger samples were collected from areas where soil borings were unattainable with a Geoprobe® sampling system (see Figure 3). Each boring was sampled using a decontaminated stainless steel hand auger. Each sample was collected for headspace screening to determine the presence of volatile organic vapors, physical description, and possible laboratory chemical analysis. Results of the headspace screening and visual descriptions were recorded in the field notebook. One surface soil sample (0-3 feet below grade) from each boring was retained for laboratory chemical analysis, in

accordance with criteria specified in the Work Plan, and was analyzed for chemicals of concern.

Samples for VOC analyses were collected directly from the recovered sampler at the specified sample interval by using two 5-gram Encores™. The samples were immediately capped, labeled, and placed on ice. The remaining portion of the recovered sample from the specified sample interval was placed into sample containers for additional required analytical parameters. Once filled, sample containers were appropriately labeled and placed in a cooler with ice for shipment to the analytical laboratory. Required chain-of-custody procedures were maintained from the time of sample collection until delivery to the analytical laboratory.

Upon completion of sampling, each borehole was abandoned by backfilling with the soil cuttings. The location of the boring was flagged in the field for later identification and reference during surveying. Following completion of field activities, final boring logs were prepared and are provided in Appendix A. Photographic logs of sampling locations are presented in Appendix B.

2.5 SURFACE WATER SAMPLE COLLECTION

Surface water samples were collected from each surface water body on site. Surface water sampling at each location was completed before any sediment sampling to avoid introduction of sediment into the sample. Surface water samples were taken several feet below the surface of the water to minimize entrainment of surface films or bottom sediments. Once filled, sample containers were appropriately labeled and placed in a cooler with ice for shipment to the analytical laboratory. Required chain-of-custody procedures were maintained from the time of sample collection until delivery to the analytical laboratory.

2.6 SEDIMENT SAMPLE COLLECTION

Sediment samples were collected for laboratory chemical analysis and analyzed for the chemicals of concern. Sediment samples were grab samples collected using an Ekmann Dredge. Each sample was collected for physical description and laboratory chemical analysis. Results of the visual description of each sample were recorded in the field notebook.

Samples for VOC analyses were collected directly from the recovered sampler by using two 5-gram Encores™. The samples were immediately capped, labeled, and placed on ice. The remaining portion of the recovered sample from the specified sample interval was placed into sample containers for additional required analytical parameters using disposable stainless steel spoons. Once filled, sample containers were appropriately labeled and placed in a cooler with ice for shipment to the analytical laboratory. Required chain-of-custody procedures were maintained from the time of sample collection until delivery to the analytical laboratory. The tools used to collect the samples were decontaminated between each use.

2.7 EQUIPMENT DECONTAMINATION

Decontamination of all field and sampling equipment was conducted in accordance with the Work Plan for all sampling activities. Field equipment (e.g., macro samplers, hand augers, and Ekmann™ dredge) and sampling equipment (e.g., stainless steel bowls and spoons) were decontaminated before the equipment were used and between each sample location. Decontamination of field and sampling equipment was performed using a potable water and Alconox™ solution wash, followed by a potable water rinse, and a distilled water rinse.

2.8 LABORATORY ANALYSIS

Samples were analyzed for the IEPA target compound list (TCL), which includes VOCs, SVOCs, polyaromatic hydrocarbons (PAHs), pesticides, PCBs, TAL inorganic analytes, and cyanide. Soil and sediment samples also were analyzed for pH and total organic carbon (TOC). Some surface samples were also analyzed for particle size, moisture content, chloride, total nitrogen, and salinity.

All samples collected for chemical analysis were analyzed by STAT Analysis, Inc. (STAT) of Chicago, Illinois. Analytical methods used STAT are listed below:

Parameter	Method Number
TAL Inorganics	6010B/7471A
VOCs	5035B/8260B
SVOCs	8270C
PAH	8270SIM

Parameter	Method Number
Pesticides/PCBs	8081A/8082
Total Cyanide	9010B/9014
PH	9045C
Total Organic Carbon	ASTM D2974-87
Grain Size Analysis	ASTM D422
Water Content	ASTM D2216
Total Chloride	EPA 4110
Total Salinity	EPA 2520
Total Kjeldahl Nitrogen	EPA 4500-N_{ORG}

Results of analyses are presented in Section 4.0, Endangerment Assessment. Laboratory data provided by STAT are summarized in Appendix D.

2.9 GPS SURVEYING

Surveying was performed using a Global Positioning System (GPS) survey methods with differential correction. Coordinate locations for each boring were determined using GPS from Corvallis Microtechnology, Inc. model MC5GPSDRD3-CM-IC receivers capable of two to five feet of accuracy. GPS measurements were referenced to Illinois State Plane East (NAD23) coordinates.

Recorded field measurements were processed using PC-GPS 3.7 computer software to obtain Illinois State Plane East coordinates for each soil boring, surface water, and sediment location.

3.0 DOCUMENTATION OF FIELD ACTIVITIES

Harza conducted soil and groundwater investigation activities at Indian Ridge Marsh on November 15, 2000, and November 29 through December 14, 2000. The surface water and sediment investigation was conducted on January 31 and February 1, 2001. Except as noted herein, the field and laboratory activities were conducted in accordance with the approved Work Plan. Field activities consisted of:

- 93 direct push soil samples and associated quality control samples from 34 locations for laboratory chemical analysis;
- 26 hand auger (HA) soil samples and associated quality control samples from 14 locations for laboratory chemical analysis;
- Nine direct push (DP) groundwater samples and associated quality control samples were collected for chemical analysis;
- Eighteen near surface (0to 6 inches) and subsurface (6 to 12 inches) soil samples for ecological purposes were collected from 16 locations for chemical and physical analysis, and
- Ten surface water samples, ten sediment samples, and associated quality control samples for laboratory chemical analysis.

All samples collected for chemical analysis were delivered to STAT Analytical Laboratory of Chicago, Illinois using a laboratory courier. Samples were analyzed for the listed chemicals of concern. Laboratory results for all samples are presented in Appendix D.

3.1 DIRECT PUSH SOIL SAMPLING

Direct push soil sampling provides initial (screening) data on the presence, nature and extent of soil contamination and preliminary information on subsurface geology. A total of 93 soil samples were collected for chemical analysis from 34 boring locations (Figure 3) with the use of a Geoprobe® mounted on a bobcat. Continuous soil samples were collected from the borings using a 1.5-inch-diameter, 48-inch-long macro core sampler

equipped with a plastic sample retainer from which geologic logs were prepared (Appendix A). Each soil sample was screened for VOCs using the field headspace technique. At each boring location one soil sample was collected in the surface soils at a depth of 0 to 3 feet and one in the subsurface soils or gray silty clay at a depth of 10 to 16 feet for laboratory analysis. Subsurface soil samples were selected based on the results of the headspace screening and visual observation. When headspace screening did not indicate the presence of VOCs, the sample from the gray silty clay was selected. In addition three samples (SB011-10.5, SB038-8.0, and SB032-12) were collected and analyzed for the chemicals of concern from the sand unit at depths of 8 to 12 feet, directly above the gray silty clay. DP borings generally were abandoned after completion by backfilling with soil cuttings. Deviations from the Work Plan included:

- Ten planned borings (SB-005, SB-006, SB-008, SB-014, SB-034, SB-035, SB-041, SB-042, SB-044, and SB-045) could not be completed because the locations were under water.
- Five borings (SB-001, SB-002, SB-003, SB-046, and SB-047) were sampled with a stainless steel hand auger instead of a Geoprobe® because surface debris prevented access with the Geoprobe®.
- Planned boring location SB-040 was not sampled due to a 32-inch gas line that runs through the area. The gas company could not guarantee the line did not run under the berm where SB-040 was proposed.
- Soil borings SB016, SB020, SB025, SB026, and SB030 were moved eastward from the planned locations due to standing water.
- DP-050 was backfilled with bentonite chips due to obvious visual contamination.
- Nine borings in the southern portion of the site (SB-051, SB-052, SB-053, SB-054, SB-055, SB-056, SB-057, SB-058, and SB-059) could not be accessed by the direct push Bobcat due to two ongoing ecological studies being conducted by the City of Chicago. Therefore, the nine borings were sampled with a stainless steel hand auger.

Originally, a hand held direct push sampling device was to be used in areas inaccessible by the bobcat. Use of the hand held device was unsuccessful below depths of approximately 3 feet due to shallow groundwater, which caused sand heave.

3.2 DIRECT PUSH GROUNDWATER SAMPLES

DP groundwater samples provide screening data on the presence and nature and extent of groundwater contamination in the study area, and for locating permanent monitoring wells, if needed. A total of nine groundwater samples were collected from nine borings (SB010, SB011, SB013, SB022, SB025, SB029, SB032, SB043, and SB050) with the use of a Geoprobe® mounted on a bobcat. First continuous soil samples were collected from the borings using a 1.5-inch-diameter, 48-inch-long macro core sampler equipped with a plastic sample retainer until the gray silty clay and upper sand interface. At the clay/sand interface a polyvinyl chloride (PVC) slotted screen was inserted into the boring and a PVC bailer was used to collect the groundwater sample. Field logs are provided in Appendix E. Originally 19 direct push groundwater samples were planned. However, 10 could not be completed due to surface debris and the two ongoing ecological studies on the southern property.

3.3 ECOLOGICAL SAMPLES

Following a request from the DOE, eighteen ecological samples were collected for chemical analysis at locations (SB-01, SB-03, SB-10, SB-11, SB-13, SB-22, SB-25, SB-29, SB-32, SB-43, SB-46, SB-49, SB-51, SB-52, SB-53, and SB-55) shown on Figure 7. Ecological samples were collected to assist with a feasibility study being prepared for the DOE by others. A soil sample from the 0 to 6-inch depth and a soil sample from the 6 to 12-inch depth were collected and analyzed for pH, moisture content, TOC, total chloride, total Kjeldahl nitrogen, salinity, and grain size. Analytical results are presented in Appendix D.

3.4 SURFACE WATER AND SEDIMENT SAMPLING

A total of ten surface water and ten sediment samples were collected for chemical analysis at locations shown on Figure 3. Surface water and sediment samples were obtained through the use of a hand auger and an Eckmann dredge. The surface water and sediment samples were collected to further characterize potential contamination at the site.

4.0 ENDANGERMENT ASSESSMENT

4.1 REMEDIATION OBJECTIVES

Soil: Chemical concentrations reported in soil samples were screened against Tier 1 Soil Remediation Objectives (ROs), Appendix B of Title 35 of the Illinois Administrative Code (IAC) Part 742, *Tiered Approach to Corrective Action Objectives* (TACO), effective January 6, 2001. Since future land use at Indian Ridge Marsh has been identified as environmental/conservation, residential Tier 1 ROs for ingestion and inhalation values were used. The soil component of groundwater ingestion was eliminated because the City of Chicago enacted Ordinance 097990, which prohibits the installation of potable water supply wells, and entered into a Memorandum of Understanding with the IEPA, dated July 3, 1997, to implement and administer this ordinance.

Groundwater: Chemical concentrations in groundwater samples were screened against Tier I Groundwater Remediation Objectives (GRO) for Class I Groundwater Component of the Groundwater Ingestion Route, Appendix B, Table E of TACO.

Surface Water and Sediment: Chemical concentrations in surface water and sediment were screened against the highest concentration of a material to which an aquatic community can be exposed indefinitely without resulting in an unacceptable effect. For surface water, these values were compiled based on media specific No Observed Adverse Effect Level (NOAELs) and Lowest Observed Adverse Effect Level (LOAELs) available from EPA's Ecotox database (1996) and on EPA Region IV water quality level recommendations. In determining sediment criteria, equilibrium partitioning also was considered, whereby the criterion were estimated as the product of the water quality criterion, the fraction of organic carbon in sediment and the organic carbon partition coefficient.

4.2 NATURE AND EXTENT OF SOIL IMPACT

No impacts from pesticides or PCBs were found in site soils. Soil sampling locations with contaminants detected above SROs have been grouped together and summarized in Table 4-1. All samples with one or more chemicals exceeding Tier I ROs are shown grouped with other samples in the same area of concern on Figure 8.

TABLE 4-1. Contaminants Exceeding Residential Soil ROs (mg/kg)			
Location	**Depth (ft)**	**Contaminants (Concentrations)**	
		Area A	
SB002	2	Benzo(a)pyrene (0.22 mg/kg)	
SB004	0.5	Benzo(a)pyrene (0.11 mg/kg)	
		Area B	
SB009	3	Benzo(a)anthracene (3.62 mg/kg) Benzo(a)pyrene (3.13 mg/kg) Benzo(b)fluoranthene (3.41 mg/kg)	Dibenzo(a,h)anthracene (0.47 mg/kg) Indeno(1,2,3-cd)pyrene (1.49 mg/kg)
SB010	1	Benzo(a)pyrene (1.18 mg/kg) Benzo(b)fluoranthene (1.32 mg/kg)	Dibenzo(a,h)anthracene (0.19 mg/kg)
		Area C	
SB018	1	Benzo(a)anthracene (1.02 mg/kg) Benzo(a)pyrene (0.98 mg/kg) Benzo(b)fluoranthene (1.07 mg/kg)	Dibenzo(a,h)anthracene (0.24 mg/kg) Lead (425 mg/kg)
SB019	2.5	Benzo(a)pyrene (0.10 mg/kg)	
SB023	5.5	Benzo(a)anthracene (2.23 mg/kg) Benzo(a)pyrene (1.63 mg/kg) Benzo(b)fluoranthene (1.26 mg/kg) Dibenzo(a,h)anthracene (0.23 mg/kg)	Arsenic (20.9 mg/kg) Lead (1800 mg/kg) Mercury (81.3 mg/kg)
SB024	1	Benzo(a)pyrene (0.10 mg/kg)	
SB028	6.5	Benzo(a)anthracene (44.1mg/kg) Benzo(a)pyrene (29.5 mg/kg) Benzo(b)fluoranthene (26.8 mg/kg) Dibenzo(a,h)anthracene (8.0 mg/kg)	Indeno(1,2,3-cd)pyrene (12.9 mg/kg) Benzo(k)fluoranthene (31.8 mg/kg) Mercury (42.4 mg/kg)
SB029	2.5	Benzo(a)anthracene (18.0 mg/kg) Benzo(a)pyrene (12.8 mg/kg) Benzo(b)fluoranthene (8.43 mg/kg)	Dibenzo(a,h)anthracene (1.82 mg/kg) Indeno(1,2,3-cd)pyrene (3.09 mg/kg)
SB039	2	Benzo(a)anthracene (1.24 mg/kg) Benzo(a)pyrene (1.32 mg/kg)	Dibenzo(a,h)anthracene (0.18 mg/kg)
		Area D	
SB026	1	Benzo(a)pyrene (0.11 mg/kg)	
SB032	7	Benzo(a)pyrene (0.21 mg/kg)	
		Area E	
SB043	2	Lead (499 mg/kg)	
		Area F	
SB047	2	Benzo(a)pyrene (0.33 mg/kg)	
SB048	1	Tetrachloroethene (16.5 mg/kg)	Benzo(a)pyrene (0.12 mg/kg)
SB049	1	Trichloroethene (41.2 mg/kg)	Lead (648 mg/kg)
SB050	2	Tetrachloroethene (21.1 mg/kg) Vinyl chloride (0.64 mg/kg) Benzo(a)anthracene (2.60 mg/kg) Benzo(a)pyrene (1.23 mg/kg)	Benzo(b)fluoranthene (1.20 mg/kg) Dibenzo(a,h)anthracene (0.28 mg/kg) Lead (534 mg/kg)
SB052	2	Benzo(a)pyrene (0.15 mg/kg)	

4.2.1 Volatile Organic Compounds

Three VOC compounds, tetrachloroethene (PCE), trichloroethene (TCE), and vinyl chloride (VC) were detected above Tier 1 ROs for the ingestion and inhalation exposure pathways, as summarized in Table 4-2 and shown on Figures 9 to 11.

TABLE 4-2. VOCs Exceeding Tier 1 Residential Soil ROs (mg/kg)

Sample ID	Depth (feet)		Tetrachloroethene	Trichloroethene	Vinyl Chloride
Tier 1 Soil ROs, Residential Properties		*Ingestion*	*12*	*58*	*0.3*
		Inhalation	*11*	*5*	*0.03*
SB048-1.0	1.0		**16.5**	1.81	0.01U
SB049-1.0	1.0		0.005U	**41.2**	0.01U
SB050-2.0	2.0		**21.1**	2.02	**0.64**

Note: Bold numbers indicate samples above Tier 1 ROs for Residential Properties
U = Compound not detected above the reported quantitation limit.

All VOCs above SROs are located in Area F. PCE exceeded applicable ROs in samples SB48 and SB50. TCE exceeded the inhalation exposure pathway RO in sample SB49. VC exceeded the ingestion and inhalation exposure pathway ROs in sample SB50. The three samples were from the southeast corner of the northern half of the property, just north of 122nd Street. The samples were from fill at depths of one or two feet below ground surface. No samples were taken east of SB50. However, these detections appear localized laterally since PCE, TCE, and VC were not found in SB047, directly west of SB048, nor in SB053, southeast of SB050. No PCE, TCE, or VC was detected in surface or sediment samples (SW9/SD9) collected just north of SB050 (see Section 4.4). Vertically, PCE, TCE, and VC were not detected in any of the gray silty clay samples from a depth of 12 feet in SB48, SB49 and SB50.

4.2.2 Semi-Volatile Organic Compounds

Six PAHs (benzo(a)anthracene, benzo(b)fluoranthene, benzo(a)pyrene, dibenzo(a,h)anthracene, indeno(1,2,3-cd)pyrene, and benzo(k)fluoranthene) exceeded the Tier 1 ROs for the ingestion exposure route as summarized in Table 4-3 and shown on Figures 12 through 17.

TABLE 4-3. SVOC Exceeding Tier 1 Residential Soil ROs (mg/kg)

Sample ID	Depth (feet)		Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Dibenzo(a,h)anthracene	Indeno(1,2,3-cd)pyrene	Benzo(k)fluoranthene
Tier 1 Soil ROs, Residential Properties		*Ingestion*	*0.9*	*0.09*	*0.9*	*0.09*	*0.9*	*9*
		Inhalation	*NE*	*NE*	*NE*	*NE*	*NE*	*NE*
SB002-2.0	2.0		0.22	**0.22**	0.30	0.06	0.10	0.13
SB004-0.5	0.5		0.17	**0.11**	0.08	0.03	0.06	0.10
SB009-3.0	3.0		**3.62**	**3.13**	**3.41**	**0.47**	**1.49**	**2.74**
SB010-1.0	1.0		0.75	**1.18**	**1.32**	**0.19**	0.38	0.43
SB018-1.0	1.0		**1.02**	**0.98**	**1.07**	**0.24**	0.35	0.84
SB019-2.5	2.5		0.10	**0.10**	0.13	0.03	0.05	0.08
SB023-5.5	5.5		**2.23**	**1.63**	**1.26**	**0.23**	0.44	1.77
SB024-1.0	1.0		0.17	**0.10**	0.10	0.02	0.04	0.11
SB026-1.0	1.0		0.19	**0.11**	0.17	0.03U	0.05	0.07
SB028-6.5	6.5		**44.1**	**29.5**	**26.8**	**8.00**	**12.9**	**31.8**
SB029-2.5	2.5		**18.0**	**12.8**	**8.43**	**1.82**	**3.09**	7.86
SB032-7.0	7.0		0.24	**0.21**	0.17	0.05	0.10	0.19
SB039-2.0	2.0		**1.24**	**1.32**	0.70	**0.18**	0.28	0.91
SB047-2.0	2.0		0.33	**0.33**	0.20	0.07	0.13	0.26
SB047-2.0	2.0		0.43	**0.40**	0.36	0.08	0.15	0.25
SB048-1.0	1.0		0.12	**0.12**	0.12	0.05	0.09	0.12
SB050-2.0	2.0		**2.60**	**1.23**	**1.20**	**0.28**	0.70	1.59
SB052-2.0	2.0		0.14	**0.15**	0.16	0.03	0.07	0.08

Note: Bold numbers indicate samples above Tier 1 ROs for Residential Properties
NE =No toxicity criteria available for the route of exposure.
U = Compound not detected above the reported quantitation limit.

PAHs exceeded SROs in fill material in multiple samples. No PAHs were found in the gray silty clay. The five areas of concern with PAH exceedances above SROs are discussed below.

1. *Area A:* Benzo(a)pyrene slightly exceeds its SRO in SB002 and SB004. Concentrations in SB003, in between SB002 and SB004, do not exceed SROs. In addition, SB001, to the west, and SB007, to the south, do not exceed SROs.

2. *Area B:* Five PAHs exceed SROs by approximately an order of magnitude in SB009. Concentrations were two and a half to three times lower in SB010 to the east of SB009, along Torrence Avenue. Samples SB009 and SB010 are bounded to the east by Torrence Avenue and to the north and south by samples SB007 and SB015, which do not exceed SROs. No samples were taken to the west due to excessive water in the area.

3. *Area C:* The majority of PAH exceedances were along the east side of the property north of 122nd Street. Highest PAH concentrations were in SB028, with all six PAHs exceeding their respective SROs. Concentrations directly to the east along Torrence Avenue (SB029) were less than half the concentrations in SB028 and only five PAHs exceeded SROs. Concentrations in SB023, north of SB028, were lower by an order of magnitude or more and only four PAHs exceeded SROs. Concentrations in SB018, north of SB023, were lower than those in SB023 by about half. Only benzo(a)pyrene slightly exceeded SROs in SB024 and SB019, which are located along Torrence Avenue, east of SB023 and SB018, respectively. To the south, SB039 contains three PAHs above SROs at levels more than an order of magnitude lower than SB028 and SB029. These seven sample locations (SB018, -019, -023, -024, -028, -029, and –039) are bounded by Torrence Avenue on the east and samples with no SRO exceedances to the north and west (SB015, -013, -012, -017, -021, -022, -032, and –038).

4. *Area D:* Benzo(a)pyrene slightly exceeds its SRO in SB026 and SB032. No other PAHs exceed SROs in this area. These locations are bounded to the north, west, south and east by samples with no PAH exceedances (SB020, SB025, SB030, SB031, SB027, and SB021).

5. *Area F:* Four PAHs exceed SROs by in SB050 just north of 122nd Street near Torrence Avenue. Benzo(a)pyrene slightly exceeded its SRO in SB047 and SB048, just north of 122nd Street and in SB052, just south of 122nd Street. The benzo(a)pyrene in SB052 was the only contaminant that exceeded SROs in the southern part of the site.

4.2.3 Inorganics

Concentrations for three inorganics (arsenic, lead, and mercury) were reported above Tier 1 SROs for the ingestion and inhalation exposure pathways in seven borings as summarized in Table 4-4 and shown on Figures 18-20.

TABLE 4-4. Inorganics Exceeding Tier 1 Residential Soil ROs (mg/kg)

Sample ID	Depth (feet)		Arsenic	Lead	Mercury
Tier 1 Soil ROs, Residential Properties		*Ingestion*	*13*	*400*	*23*
		Inhalation	*750*	*NE*	*10*
SB018-1.0	1.0		4.89	**425**	0.478
SB023-3.0	3.0		**16**	62.6	0.048
SB023-5.5	5.5		**20.9**	**1800**	**81.3**
SB028-6.5	6.5		1.16	17.8	**42.4**
SB043-2.0	2.0		8.2	**499**	0.431
SB049-1.0	1.0		1.64	**648**	0.722
SB050-2.0	2.0		4.2	**534**	0.076

Note: Bold numbers indicate samples above Tier 1 ROs for Residential Properties
NE =No toxicity criteria available for the route of exposure.

Inorganics exceeded SROs in six samples. All inorganic contamination was found in fill material; no inorganics were found in the gray silty clay. Inorganics exceed SROs in three areas of concern and are discussed below.

1. *Area C:* Highest inorganic concentrations were in SB023 for all three inorganics, arsenic, lead and mercury. Lead exceeded its SRO to the north in SB018 and mercury exceeded its SRO to the south in SB028. There were no inorganic exceedances in samples to the east (SB019, -024, and -029), to the north (SB013), to the west (SB016, -017, -022, and –027), and to the south (SB032 and –039).

2. *Area E:* Lead exceeds its SRO in SB043. This sample is bounded by water on all sides.

3. *Area F:* Lead exceeds its SRO in SB049 and SB050. These samples are bounded on the north by water, on the east by Torrence Avenue and on the south by 122nd Street. Lead did not exceed its SRO in SB048, to the west of SB049.

4.3 NATURE AND EXTENT OF GROUNDWATER IMPACT

While drilling SB050, non-aqueous phase liquid (NAPL) was found at the water table at a depth of 2.5 feet. A sample was collected and analyzed for total petroleum hydrocarbons (TPH) gasoline, diesel, and oil. Results are reported below:

- TPH Gasoline – 12,100 mg/kg
- TPH Diesel – 459,000 mg/kg
- TPH Oil – 251,000 mg/kg

VOCs and SVOCs above Class 1 GROs were detected in one sample and inorganics were detected in all samples. No impacts from pesticides or PCBs were found in site groundwater.

As indicated in Table 4-5, one VOC (vinyl chloride) and six PAHs were detected above the Tier 1 GROs for the Class I groundwater pathway.

TABLE 4-5: VOCs and SVOCs Exceeding Tier 1 ROs for Class I Groundwater (mg/L)

Sample ID	Depth (feet)	Vinyl Chloride	Bis(2-ethylhexyl)phthalate	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(k)fluoranthene	Chrysene
Tier 1 Groundwater ROs, Class I		*0.07*	*0.002*	*0.00013*	*0.0002*	*0.00018*	*0.00017*	*0.0015*
SB050-10GW	10	**0.057**	**0.025**	**0.0015**	**0.0006**	**0.0004**	**0.0004**	**0.0037**

Note: Bold numbers indicate samples above Tier 1 ROs for Class I Groundwater/

VC exceeded the Class I GRO for sample SB050, located in the southeast corner of the northern half of the property. SB050 was collected from the sand/clay interface at a

depth of ten feet (Figure 11). No other VOC exceedances were detected in any groundwater samples collected by Harza. However, data obtained from ISWS (see Section 1.6) suggests the presence of vinyl chloride, cis-1,2-dichloroethene, trans-1,2-dichloroethene, 1,1-dichloroethene, and benzene above Class I GROs in a general area near SB048. VC was also found in geoprobes to the south, west and east (personal communication, October 2000). PCE and TCE were not detected in the groundwater but were detected in soil in SB048 and SB050 (PCE) and SB049 (TCE). The presence of cis-1,2-DCE and VC suggests degradation of PCE and TCE because PCE degrades to TCE, which degrades to cis-1,2-DCE, which degrades to VC. Using all available data, Figure 11a shows the approximate extent of VOCs in groundwater.

The concentrations of bis(2-ethylhexyl)phthalate, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, and chrysene were also above the Class I GRO for sample SB050.

Three inorganics, iron, manganese, and lead, were reported in nine soil borings above the Tier 1 GROs for Class I groundwater as summarized in Table 4-6.

TABLE 4-6. Inorganics Exceeding Tier 1 ROs for Class I Groundwater (mg/kg)

Sample ID	Depth (feet)		Iron	Manganese	Lead
Tier 1 Groundwater ROs		*Class I*	*5*	*0.15*	*0.0075*
SB010-14GW	14		0.157	**1.11**	0.005U
SB011-15GW	15		1.43	**0.284**	0.005U
SB013-15GW	15		0.673	**3.65**	0.005U
SB022-13GW	13		0.49	**0.983**	0.005U
SB025-14GW	14		0.53	**1.82**	0.005U
SB029-13GW	13		0.286	**1.19**	0.005U
SB032-13GW	13		1.41	**0.404**	0.006
SB043-13GW	13		0.251	**1.48**	0.005U
SB050-10GW	10		**16**	**1.8**	**2.56**

Note: Bold numbers indicate samples above Tier 1 ROs for Class 1 Groundwater.
U = Compound was not detected above reported quantitation limit.

Concentrations of iron and lead were above the Class I GROs for sample SB050 located in the southeast corner of the northern half of the property. SB050 was collected from

the sand/clay interface at a depth of ten feet. The lateral extent of contamination is bound on the north by SB043 where iron and lead were not detected above the reported detection limit. Manganese exceeded the applicable GRO in all nine groundwater samples.

4.4 SURFACE WATER AND SEDIMENT

A total of ten surface water and ten sediment samples were collected in this study. Sample locations are illustrated on Figure 3A and Table 4-7 provides site-specific information.

TABLE 4-7. Surface Water and Sediment Sampling Stations

Station	Description
SW/SD1	Near culvert connecting properties north of 116th Street
SW/SD2	Near large hole possibly a culvert connected with Lake Calumet Cluster Site
SW/SD3	Near a culvert connecting Indian Ridge Marsh to Lake Calumet Cluster Site
SW/SD4	North pool approximately 300 feet west of Torrence Ave.
SW/SD5	Northeast pool approximately 100 feet west of Torrence Ave.
SW/SD6	West pool, approximately 300 feet north of 122nd Street and next to the railroad
SW/SD7	East pool, approximately 300 feet north of 122nd Street and next to Torrence Ave.
SW/SD8	Southwest pool, approximately 200 feet north of 122nd Street and next to the railroad
SW/SD9	Southeast pool, approximately 200 feet north of 122nd Street and next to Torrence Ave.
SW/SD10	Southern pool, approximately 300 feet south of 122nd Street.

SW/SD4 through SW/SD10 were selected because they are representative of the main water bodies and SW/SD1 through SW/SD3 due to culverts or possible culverts connecting to the Coke plant north of the site and the Lake Calumet Cluster Site west of the site.

Surface water and sediment analytical results are summarized in Tables 4-8 and 4-9.

TABLE 4-8. Summary of Surface Water Analyses

Contaminant	Screening Value	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10
Inorganic (mg/L)											
Aluminum	87	.3U	.3U	0.336	.3U	.3U	.3U	.3U	.3U	.3U	.3U
Barium	3.9	0.051	0.083	0.076	0.116	0.079	0.081	0.073	0.075	0.121	0.052
Calcium	NA	89.3	90.2	89.4	82.9	54.9	59.1	51.5	61.5	58.3	74.3
Iron	1000	1.2	1.15	1.08	1.02	0.63	0.365	0.755	0.492	0.71	0.523
Magnesium	NA	32.5	40.3	41.7	46.6	26.4	46.3	36.7	41	43.8	33.8
Manganese	80	1.02	1.46	1.04	1.67	1.08	0.567	0.877	0.956	2.55	0.412
Potassium	NA	17.8	26.4	29.5	30.6	16.6	29.7	21.9	26.5	30.4	24.5
Sodium	NA	45.9	77.5	100	104	49.7	108	85.7	94.1	102	137
Zinc	5.2	0.036	0.022	0.026	0.029	0.057	0.018	0.025	0.032	0.014	0.019
Cyanide	5.2	0.011	0.011	.01U	.01U	.01U	.01U	.01U	.01U	.01U	.01U
SVOCs (mg/L)											
Bis(2-Ethylhexyl) Phthalate	0.12	.01U	0.044	.01U	.01U	.01U	.01U	.01U	.01U	.01U	.01U

Note: Bold numbers indicate samples above screening level for surface water.
U = Compound not detected above the reported quantitation limit.
NA = Screening value not available.

TABLE 4-9. Summary of Sediment Analyses

Contaminant	Screening Value	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10
Total Solids Percent		13.32	11.52	41.42	7.01	12.87	18.22	18.27	8.79	10.06	13.05
pH		7.51	7.6	7.35	7.32	7	7.39	7.24	7.56	7.48	8.16
Inorganics (mg/kg)											
Aluminum	NA	4840	6190	8480	3600	4650	4290	7150	4790	8950	6050
Antimony *	2	5U	5U	5U	5U	5U	5U	5U	**86.4**	5U	5U
Arsenic	7.2	**12.3**	**10.6**	5.76	**14.1**	**9.22**	7.12	7.19	**119**	**16**	**13.3**
Barium	NA	77.5	125	48.3	86.3	136	92.8	63.6	221	120	173
Beryllium	NA	0.353	0.582	0.546	0.257	0.489	0.527	0.526	108	1.14	0.421
Cadmium*	0.68	2.5U	**3.1**	**1.08**	2.5U	**3.75**	2.5U	2.5U	**117**	**4.16**	**3.13**
Calcium	NA	49900	87500	37700	23100	11400	51100	35100	12700	20900	104000
Chromium	52	28.1	28.8	20.8	35.8	41.8	15.5	45.6	**152**	**99.7**	**53.9**
Cobalt	50	7.12	8.45	8.33	3.98	3.78	4.9	8.19	**113**	4.89	9.3
Copper	18700	65.6	74.4	34	62.5	72.5	35.1	56	202	104	78.6
Iron	20000	**34000**	**32000**	18600	**43200**	14800	16200	**20300**	12300	**21600**	**31800**
Lead	30	**127**	**153**	**60.1**	**220**	**301**	**104**	**148**	**591**	**602**	**189**
Magnesium	NA	8560	12400	12600	4200	3660	11200	17200	3410	5960	10900
Manganese	NA	625	1290	550	428	224	587	484	357	554	1290
Nickel	16	**23.8**	**22.7**	**23.5**	**20.8**	**39.4**	13.6	**33.4**	**136**	**40.4**	**27.5**
Potassium	NA	1540	1770	1870	1410	803	830	1420	1120	1140	1960
Selenium	NA	5U	5U	2U	5U	5U	5U	5U	111	5U	5U

TABLE 4-9. Summary of Sediment Analyses

Contaminant	Screening Value	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10
Silver*	0.73	2.5U	2.5U	1U	2.5U	2.5U	2.5U	2.5U	52.7	2.5U	2.5U
Sodium	NA	2590	2700	735	3290	1670	1070	968	2370	2070	4680
Thallium	NA	5U	5U	2U	5U	5U	5U	5U	108	5U	5U
Vanadium	NA	26.2	22	18.9	27.3	31.3	17.9	24	138	50.3	26.1
Zinc	120	**788**	**906**	**260**	**588**	**926**	**357**	**393**	**1190**	**701**	**879**
Mercury*	0.13	.2U	**0.234**	**0.171**	**0.271**	**0.412**	.2U	.2U	**0.569**	**0.358**	**0.368**
Pesticides (mg/kg)											
p,p'-DDD	3.3	.08U	.08U	.032U	.08U	.08U	.08U	.08U	.08U	0.709	.08U
p,p'-DDT	3.3	.08U	.08U	.032U	.08U	.08U	.08U	.08U	.08U	0.112	.08U
VOCs (mg/kg)											
Acetone*	0.0091	**0.158**	.125U	0.05U	**0.672**	0.125U	0.125U	0.125U	**0.142**	**0.442**	**0.157**
Carbon disulfide*	0.00085	.025U	.025U	.01U	**0.029**	.025U	.025U	.025U	.025U	.025U	.025U
SVOCs (mg/kg)											
Chrysene	330	.125U	0.322	.05U	0.622	0.357	.125U	0.281	0.638	1.47	0.413
Fluoranthene	330	.125U	0.373	0.076	0.79	0.385	.125U	0.317	1.2	1.7	0.609
Acenaphthylene	330	.125U	.125U	.05U	.125U	.125U	.125U	.125U	.125U	0.782	.125U
Anthracene	330	.125U	.125U	.05U	.125U	.125U	.125U	.125U	.125U	0.343	.125U
Benzo(a)anthracene	330	.05U	0.193	.05U	0.567	.05U	.05U	0.228	0.621	1.28	0.293
Benzo(a)pyrene	0.089	.125U	.125U	.05U	0.642	.125U	.125U	0.319	0.474	1.45	0.147
Benzo(b)fluoranthene	655	.125U	0.176	.05U	.125U	.125U	.125U	.125U	.125U	0.659	0.276
Benzo(g,h,i)perylene	655	.125U	.125U	.05U	.125U	.125U	.125U	.125U	.125U	0.465	.125U
Benzo(k)fluoranthene	655	.125U	0.174	.05U	.125U	.125U	.125U	.125U	.125U	0.936	0.135
Indeno(1,2,3-cd)pyrene	655	.125U	.125U	.05U	.125U	.125U	.125U	.125U	.125U	0.577	.05U
Naphthalene	330	.125U	.125U	.05U	.125U	.125U	.125U	.125U	.125U	0.268	.125U
Phenanthrene	330	.125U	0.158	.05U	0.368	0.197	.125U	0.148	0.587	0.915	0.228
Pyrene	330	.125U	0.285	0.059	0.659	.125U	.125U	0.283	0.839	1.37	0.443

Note: Bold numbers indicate samples above screening level for surface water.
U = Compound not detected above the reported quantitation limit.
NA = Screening value not available.

No chemical concentrations were reported above screening values in surface water. There are no screening values for essential nutrients, calcium, magnesium, potassium, and sodium.

No SVOCs, pesticides or PCBs were reported above screening criteria in sediment. Inorganics above screening levels included antimony and cobalt (1 location), chromium (3 locations), cadmium and iron (6 locations), arsenic and mercury (7 locations), nickel (9 locations), and lead and zinc (10 locations). VOCs above screening levels included acetone (5 locations) and carbon disulfide (1 location).

5.0 CONCLUSIONS

The results of Indian Ridge Marsh Comprehensive Site Investigation are summarized below:

1. Fill ranges from the surface to 11.5 ft below ground surface. All soil contamination is in the fill material.
2. Areas of contamination have been delineated, except in some isolated areas covered with water at the time of the site investigation. VOC, SVOC, and metal concentrations have been detected in soil above the Tier 1 Residential SROs at various locations, almost exclusively in the northern section of the site. Soil concentrations above SROs were reported for:
   - three VOCs (tetrachloroethene, trichloroethene, and vinyl chloride) in the southeast corner of the northern part of the site.
   - six PAHs (benzo(a)anthracene, benzo(a)pyrene, benzo(b)anthracene, dibenzo(a,h)anthracene, indeno(1,2,3-cd)pyrene), benzo(k)fluoranthene). PAHs were somewhat elevated over a large part of the northern portion of the site. Benzo(a)pyrene was slightly above the SRO in one sample in the southern portion of the site, along 122nd Street.
   - three metals (arsenic, lead, and mercury) exceeded their respective SROs in one boring in the eastern portion of the site (SB023). Mercury and lead also exceeded the SROs in an adjacent boring (SB028) and lead in three borings in the eastern part of the site, north of 122nd Street.
3. Class I Groundwater Remediation Objectives were exceeded for one VOC (vinyl chloride) and non-aqueous phase liquid was found in the groundwater at location SB-050. Previous investigations showed exceedances for cis-1,2-DCE, trans-1,2-DCE and 1,1-DCE just west of SB-050 (monitoring well 20). In addition at SB-050, six PAHs (bis(2-ethylhexyl)phthalate, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, and chrysene) and three inorganics (iron, manganese, and lead) were detected above Class I groundwater standards. Manganese was exceeded in all the groundwater samples.

Further delineation of the groundwater at the water table surface in the area of SB050 is advisable. Removal of the NAPL in this area is recommended.

Natural biodegradation of PCE/TCE is evident along the 122nd causeway, based upon the occurrence of elevated levels of cis-1,2-DCE and VC. Planned sampling by ISWS at well 20 will provide additional data that will aid in understanding the rate of degradation of these chemicals. Based upon this additional data, the necessity of remedial action should be evaluated.

Soil and groundwater contamination levels are generally low (not more than two orders of magnitude and most less than one order of magnitude above Residential SROs). A Tier 3 Risk Assessment is recommended for the chemicals exceeding Tier 1 Residential ROs to determine if remediation of soil is necessary at the site.

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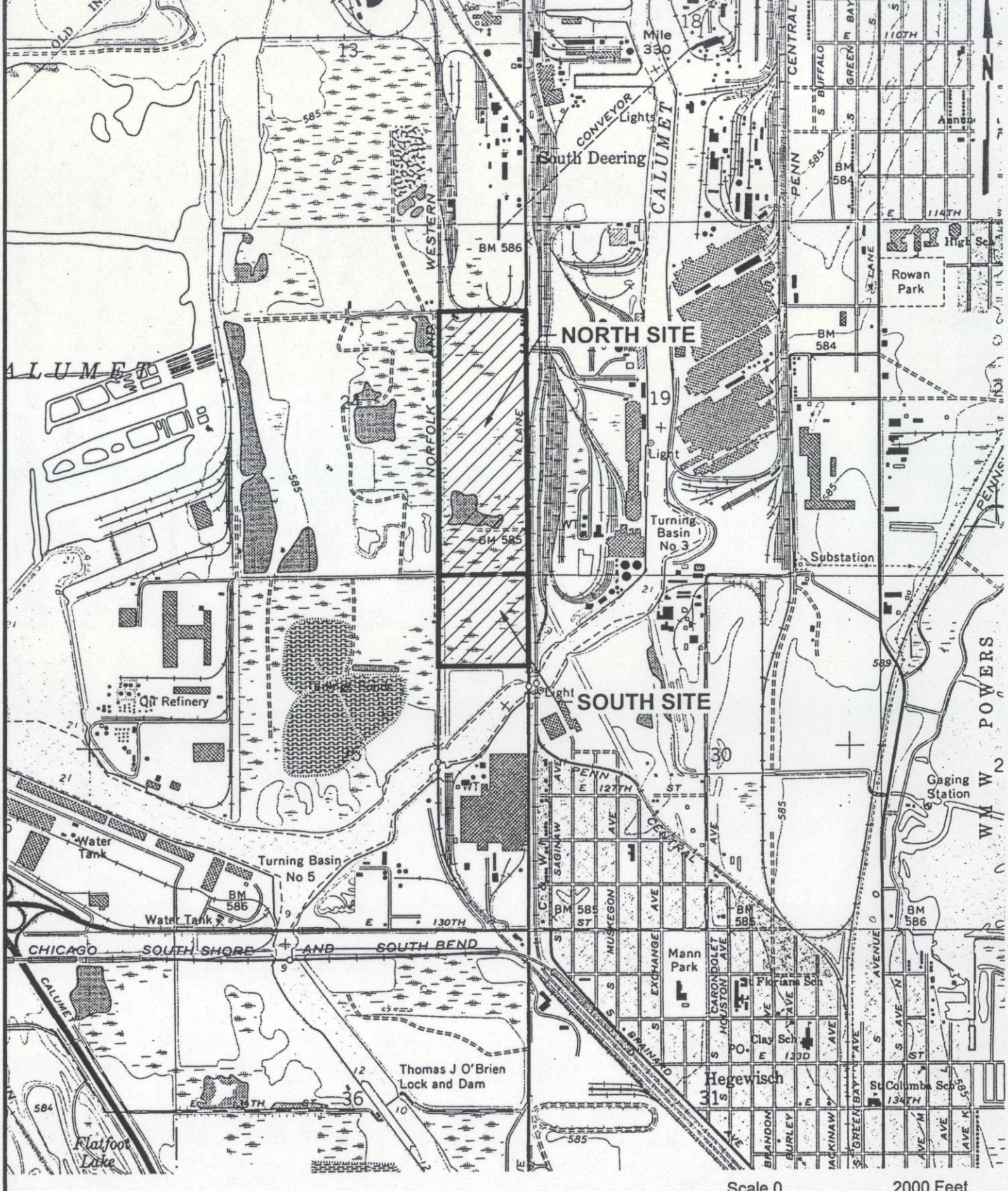
FIGURES



SOURCE:
USGS Lake Calumet, Illinois,
7.5 Minute Quadrangle, 1965 Revised 1973

HARZA ENGINEERING COMPANY
WATER & ENVIRONMENT

Figure 1
SITE LOCATION MAP
INDIAN RIDGE MARSH
Chicago, Illinois

O:\chicago\indian-ridge\locate-map.cdr

APPENDIX D

FINAL HUMAN HEALTH RISK ASSESSMENT REPORT FOR LAKE CALUMET CLUSTER SITE

MONTGOMERY WATSON HARZA (OCTOBER 2001)

HUMAN HEALTH RISK ASSESSMENT REPORT

LAKE CALUMET CLUSTER SITE: ALBURN, U.S. DRUM, AND UNNAMED PARCEL AREAS

FINAL REPORT

Prepared for

City of Chicago Department of Environment
Chicago, Illinois

By

MWH
MONTGOMERY WATSON HARZA

February 2002

TABLE OF CONTENT

LIST OF TABLES iii
LIST OF FIGURES iii
LIST OF ACRONYMS vi

EXECUTIVE SUMMARY ES-1

1.0 INTRODUCTION 1-1

2.0 BACKGROUND 2-1
2.1 Site Location 2-1
2.2 Site Description 2-1
2.3 Site History 2-1
2.4 Geology/Hydrogeology 2-1
2.4.1 Regional Geology 2-1
2.4.2 Regional Hydrogeology 2-2
2.4.3 Site Geology 2-2
2.4.4 Site Hydrogeology 2-2
2.5 Site Investigation 2-3
2.5.1 Phase I 2-3
2.5.2 Phase II 2-4
2.5.3 Phase III 2-4
2.5.4 IEPA Site Investigation (SI) 2-4

3.0 SELECTION OF CONTAMINANTS OF POTENTIAL CONCERNS 3-1
3.1 Soil 3-1
3.2 Sediments 3-1
3.3 Surface Water 3-2
3.4 Groundwater 3-2
3.5 Essential nutrients 3-2

4.0 EXPOSURE ASSESSMENT 4-1
4.1 Receptors 4-1
4.2 Exposure Pathway 4-1
4.3 Exposure Point Concentration 4-2
4.4 Quantification Of Exposure 4-2

5.0 TOXICITY ASSESSMENT 5-1
5.1 Carcinogenic Health Effects Criteria And Assessment 5-1
5.2 Noncarcinogenic Health Effects Criteria And Assessment 5-3

6.0 RISK CHARACTERIZATION 6-1
6.1 Carcinogenic Risks 6-1
6.2 Noncarcinogenic Hazards 6-2
6.3 Risk Characterization 6-2

6.3.1 Alburn....6-3
6.3.2 U.S. Drum....6-3
6.3.3 Unnamed Parcel....6-4

7.0 UNCERTAINTIES....7-1
7.1 Exposure Assessment....7-1
7.2 Toxicity Assessment....7-1
7.3 Risk Characterization....7-1

8.0 CONCLUSIONS....8-1

9.0 REFERENCES....9-1

LIST OF TABLES

Table 3-1 Contaminants of Potential Concern in Alburn
Table 3-2 Contaminants of Potential Concern in U.S. Drum
Table 3-3 Contaminants of Potential Concern in Unnamed Parcel
Table 4-1 Parameter Values for Exposure to Soil at the Lake Calumet Cluster Site
Table 4-2 Exposure Factors for Dermal Contact with Groundwater and Surface Water
Table 4-3 Exposure Factors for Dermal Contact with Sediment
Table 4-4 Dermal Adsorption Factors
Table 4-5 Permeability Constants
Table 5-1 Toxicity Factors for Chemicals of Potential Concern (COPCs)
Table 5-2 Critical Effects of Carcinogenic COPCs
Table 5-3 Critical Effects of Non-Carcinogenic COPCs
Table 6-1 Carcinogenic Risk and Noncarcinogenic Hazards for Each Media at Alburn
Table 6-2 Summary of Carcinogenic COPCs at Alburn
Table 6-3 Carcinogenic Risk and Noncarcinogenic Hazards for Each Media at U.S. Drum
Table 6-4 Summary of Carcinogenic COPCs at U.S. Drum
Table 6-5 Carcinogenic Risk and Noncarcinogenic Hazards for Soil and Groundwater at Unnamed Parcel
Table 6-6 Summary of Carcinogenic COPCs at Unnamed Parcel

LIST OF FIGURES

Figure 1 Site Location Map
Figure 2 Sample locations at the Cluster Site
Figure 3 Conceptual Site Model

APPENDICES

Appendix A UCL_{95} and EPC of Soil COPCs
Appendix B Air Concentration Model of Groundwater COPCs
Appendix C Risk Calculations Tables for Alburn, U. S. Drum and Unnamed Parcel

LIST OF ACRONYMS

ADD	Average Daily Dose
bgs	Below Ground Surface
COPCs	Chemicals of Potential Concern
CSM	Site Conceptual Model
DOE	City of Chicago Department of Environment
E & E	Ecology & Environment, Inc
EDQL	Ecological Data Quality Levels
ELCR	Excess Lifetime Cancer Risks
EPC	Exposure Point Concentration
GPS	Global Positioning System
HHRA	Human Health Risk Assessment
HI	Hazard Index
HQ	Hazard Quotient
IAC	Illinois Administrative Code
IEPA	Illinois Environmental Protection Agency
ISWS	Illinois State Water Survey
LADD	Life Average Daily Dose
LOAEL	Lowest Observed Adverse Effect Level
MF	Modifying Factor
NOAEL	No Observed Adverse Effect Level
PAHs	Polynuclear Aromatic Hydrocarbons
PCBs	Polychlorinated Biphenyls
RAGS	Risk Assessment Guidance for Superfund
RfDs	Reference Doses
RO	Remediation Objectives
SF	Slope Factor
SI	Site Investigation
SVOC	Semivolatile Organic Compound
TACO	Tiered Approach to Corrective Action
TCLP	Toxic Characteristic Leaching Procedure
UCL	Upper-bound Confidence Limit
UF	Uncertainty Factor
USEPA	United States Environmental Protection Agency
VOC	Volatile Organic Compound
XRF	X-Ray Fluorescence

EXECUTIVE SUMMARY

This report describes and summarizes a human health risk assessment (HHRA) conducted at Alburn Incinerator (Alburn), U.S. Drum II (U.S. Drum), and Unnamed Parcel areas, referred as the Lake Calumet Cluster Site (Cluster Site), in Chicago, Cook County, Illinois. Soil, sediment, surface water and groundwater data collected and analyzed during several investigations at the Cluster Site were used in the HHRA. These site investigations include Phase I, Phase II and Phase III samplings conducted by Ecology & Environment, Inc. (E & E) and Illinois Environmental Protection Agency (IEPA) in 1998 and 1999; and a comprehensive site investigation (SI) conducted by IEPA in 2000. All laboratory-generated data were complied and used in this risk assessment. The selection of Chemicals of Potential Concerns (COPCs) is based on different screening criteria in each media. For soil contaminants, the Tier I Soil Remediation Objectives (ROs) for residential scenario from IEPA's Tiered Approach to Corrective Action (TACO) were used as the screening criteria. Groundwater contaminants were screened against Class I groundwater ROs from TACO. The selection of COPCs in sediment and surface water were based on the evaluation conducted by E & E. The potential receptors for the Cluster Site include on-site workers, mowers, construction workers, industrial/commercial workers and landscape workers. Completed pathways for each potential receptor exposed to COPCs were identified. Carcinogenic risk and noncarcinogenic hazard for each potential receptor were quantitatively estimated. An excess lifetime cancer risk (ELCR) value and a hazard index (HI) value were estimated to evaluate the carcinogenic risks and noncarcinogenic hazards, respectively.

The risk characterization indicates that in Alburn, U.S. Drum and Unnamed Parcel, risks are primarily due to exposure to soil. Risks due to exposure to sediment, surface water and groundwater are insignificant. In Alburn, risks due to exposure to soil exceeds ELCR of 1E-06 for all receptors and the primary COPCs are arsenic, benzo(a)pyrene, total PCBs and vinyl chloride. For noncarnicogenic hazard, exposure to soil for construction workers exceed HI of 1 and the primary COPC is toluene. In U. S. Drum, the carcinogenic risk exceeds 1E-06 in soil for all receptors and the primary COPCs are arsenic, benzo(a)pyrene, dibenz(a,h)anthracene and total PCBs. In Unnamed Parcel, the carcinogenic risk due to exposure to contaminants in soil exceeds 1E-06 for on-site workers, industrial/commercial workers and mowers and the primary COPCs in soil for carcinogenic risk are arsenic and benzo(a)pyrene. No noncarcinogenic hazard exceeds 1 for all receptors due to exposure to contaminants in U. S. Drum and Unnamed Parcel.

1.0 INTRODUCTION

The City of Chicago Department of Environment (DOE) is currently investigating the Lake Calumet Cluster Site (Cluster Site), located in Chicago, Cook County, Illinois. The City has plans for developing this site. Future potential use of the Cluster Site includes use as a solar power generating station. Risk assessments are used to determine the need for remediation and to establish protective clean-up goals in the context of the desired end use for contaminated sites. This human health risk assessment (HHRA) addresses the potential risks associated with the Cluster site that could occur due to exposure to contaminants in the absence of remedial measures.

The HHRA was prepared in accordance with USEPA's "Risk Assessment Guidance for Superfund (RAGS), Volume I: Human Health Evaluation Manual, Part A" (USEPA, 1989), and other supplementary USEPA guidance documents, as listed below:

- Guidance for Data Usability in Risk Assessment, 1992a.
- Exposure Factors Handbook, 1997.
- Supplemental Guidance to RAGS: Calculating the Concentration Term, 1992b.

This HHRA report describes the methodology and assessment of human health risk. The report is organized as follows:

1.0 *Introduction:* Purpose and objectives of the HHRA

2.0 *Background:* Site characterization, description and history, site investigation

3.0 *Data Evaluation and Selection of Contaminants of Potential Concern*

4.0 *Exposure Assessment:* Identification of human receptors; description of the exposure pathways and quantification of exposure from each exposure pathway

5.0 *Toxicity assessment:* Identification of carcinogenic and noncarcinogenic health effects criteria and assessment

6.0 *Risk characterization:* Calculation of carcinogenic risks and noncarcinogenic hazards

7.0 *Uncertainties:* Discussion of uncertainties associated with the HHRA

8.0 *Conclusions:* Summary of the human health risk assessment

9.0 *References*

2.0 BACKGROUND

2.1 Site Location

The Cluster Site is located in the southeastern edge of Chicago, Illinois (Township 37 North Range 14 East, Section 24). The property is in the Lake Calumet region, a heavily industrialized area of southeast Chicago. Land and Lakes Landfill are located to the west of the property. Paxton I Landfill is to the north of the property. The Norfolk and Western Railroad right-of-way forms the eastern boundary, and 122nd Street forms the southern boundary of the site. A site location map is presented as Figure 1.

2.2 Site Description

The Cluster Site is approximately 87 acres and consists of unimproved upland with several depressional areas that are seasonally flooded. The National Wetland Inventory Map has identified approximately two acres within the lower depressional areas on site as permanently flooded open water wetlands. The relatively flat dry upland dips gently from west to east and is made up of grasses, weeds, bushes, trees, and paved roadways and yard areas.

2.3 Site History

The Lake Calumet region, prior to development in the late 1800s, was composed of wetlands, marshes, bogs, and shallow lakes. To make this region suitable for development, large areas of wetlands were filled in with slag wastes from steel production, dredgings from the Calumet River, fly ash, solid industrial wastes, demolition debris, and household trash (Roadcap and Kelly 1994).

2.4 Geology/Hydrogeology

This section describes the regional and site-specific geology and hydrogeology at the Cluster Site. The regional information is derived from geologic literature and available water well drilling logs obtained from the Illinois State Water Survey (ISWS). The site-specific geology and hydrogeology is based on test pits conducted during this site investigation and information obtained from previous site activities, including boring logs and monitoring well data.

2.4.1 Regional Geology

The Cluster Site is located within the Chicago/Calumet Lacustrine Plain, which is a glacially formed, low, crescent-shaped flat surface that slopes gently to Lake Michigan. The Plain extends from the Wilmette, Illinois area to the Indiana-Michigan border and continues northward in a narrow band along the Michigan shore (Chrzastowski and Thompson, 1993). The Chicago/Calumet Lacustrine Plain surface is primarily a wave-scoured ground moraine with fine lake silts and clays covering the surface in former back-barrier settings. The prominent depositional features on the plain are sand and gravelly sand spits, mainland beaches, and beach-ridge/dune complexes. This lowland region drains into Lake Michigan. The bedrock geology of the region consists of Precambrian-age crystalline rock overlain by gently dipping Paleozoic sedimentary bedrock units. The uppermost bedrock unit consists of eastward gently dipping Silurian dolomite. The Racine formation, the youngest formation of the Silurian period,

underlies the area due to the eastward dip of the rock strata. The Racine formation includes a number of organic reefs, which consist of a core of massive, high-purity dolomite flanked by dipping dolomite beds. The bedrock surface topography is an undulating plain as a result of glacial and some lake erosion, in which scattered steep valleys and low bedrock hills occur. Mapping by Piskin and Bergstrom (1975) indicates that the bedrock is overlain by approximately 50 to 100 feet of unconsolidated Quaternary age deposits. According to Chrzastowski and Thompson (1993), the site is filled with a dark gray, silty clay till that is correlative to the Wadsworth Formation. This till unit intertongues with bedded sands and silt, which are assigned to the Henry and Equality Formation.

2.4.2 Regional Hydrogeology

According to Suter et al. (1959), the four primary aquifers recognized in the Chicago area are the Sand and Gravel Aquifers within the glacial drift, the Shallow Bedrock Aquifers mainly Silurian in age, the Cambrian-Ordovician Aquifer, and the Mt. Simon Aquifer.

The uppermost bedrock aquifer underlying the Lake Calumet region is composed of Silurian dolomites. Suter et al. (1959) have indicated that groundwater in the shallow dolomite occurs in joints, fissures, and solution cavities. Therefore, yields at any given location are unpredictable. The openings in the dolomite mainly occur in the upper part of the rock. Therefore, it is likely there is good connection between the shallow bedrock aquifers and the overlying glacial drift. It follows that where fractured dolomite is overlain by sand and gravel deposits there will be more immediate recharge of the shallow dolomite aquifer than in areas where glacial till rests on the bedrock.

The uppermost aquifer system identified in the vicinity of the Cluster Site is the glacial drift aquifer, composed of unconsolidated Quaternary deposits. In the vicinity of the site, the glacial drift aquifer consists of sands overlying and interbedded with glacial till.

2.4.3 Site Geology

Based on site investigations, the near surface geology consists of unconsolidated glacial deposits overlain by various fill materials over most of the site. From bottom to top, the following geologic materials, were encountered: Gray/Brown silty clay; Gray silty sand and Fill.

The gray/brown silty clay unit is the lowermost unit encountered at the site and is composed of silty clay with a trace of fine sand and gravel. The silty clay was encountered only in wells at depths ranging from 14.5 to 24 feet. The sand unit is composed of varying percentages of medium to fine grained sand with silt, and exhibits brown to gray color variations. The fill material is composed of various household wastes.

2.4.4 Site Hydrogeology

The hydrogeology of the site was described using data collected during monitoring well installation performed by Ecology and Environment Inc. (E &E) in 1999 (E & E, 1999a). Groundwater was encountered in all twelve wells at different elevations.

Data collected during monitoring well installation suggest that the aquifer is semi-confined with a head between 1 to 4 feet. Slightly confined conditions may be the result of clay layers within the fill material.

Groundwater in monitoring wells installed by E & E and in test pits performed during a site investigation conducted by IEPA in 2000 stabilized between ground surface and 10 feet below ground surface. In some low areas, the water table in the pits was encountered about 2 feet above ground surface.

Generalized potentiometric contours for fill and sand were developed using data collected during monitoring well installation (MWH, 2001). The contours demonstrate that flow onto the site is from the west and flow within the site is northeast, east, and southeast. Groundwater probably discharges to Indian Ridge Marsh to the east and Big Marsh to the north. Two landfills located northwest and southwest of the site may influence groundwater flow direction. The interaction between groundwater and surface water on the site is very complicated due to the extreme heterogeneity of the fill material and local flow direction may differ from general flow direction on the site.

No hydraulic conductivity tests were performed on site. The value of hydraulic conductivity cited in the literature for fine and medium sand is between $1x10^{-3}$ cm/s and $1x10^{-2}$ cm.

2.5 Site Investigation

Samples from the Cluster Site were collected and analyzed during several site investigations. These investigations include Phase I, Phase II, and Phase III samplings conducted by EPA's contractor E & E, EPA and IEPA in 1998 and 1999; and a site investigation conducted by IEPA in 2000. Samplings were conducted at three areas at the Cluster Site: Alburn, U.S. Drum and Unnamed Parcel. The media sampled include soil, sediment, surface water and groundwater. Figure 2 shows the sample locations at the Cluster Site.

2.5.1 Phase I

Phase I sampling activities were conducted from August 24, 1998 to September 3, 1998 by E & E, USEPA, and IEPA. Sampling included determining the location of site features and potential sample locations using global positioning systems (GPS), screening metal concentrations in surface soils using X-ray fluorescence (XRF), and collecting samples of surface soils, subsurface soils, sediments, surface water, groundwater, and macroinvertebrates. Access to the Alburn area was not available to E & E, USEPA, and IEPA. Therefore, no samplings were conducted at Alburn at this time.

The geographic locations of site features, including parking lots, roads and fence lines, and potential sample locations were demarcated using GPS and screened using XRF. Screening was conducted for molybdenum, strontium, rubidium, lead, arsenic, mercury, zinc, copper, nickel, cobalt, manganese, and chromium.

Sampling included:

- Eighty four surface soil samples and four duplicate samples;
- Five subsurface soil samples and one duplicate;
- Three groundwater samples; and
- Eight surface water, sediment, and macroinvertebrate samples.

Samples were analyzed for total metals, toxicity characteristic leaching procedure (TCLP) metals, volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), pesticides, polychlorinated biphenyls (PCBs), pH, and percent moisture. Sample results indicated several discrete areas with contaminant concentrations exceeding human health standards and the ecological threshold.

2.5.2 Phase II

Twelve monitoring wells (LC01 to LC07 and LC09 to LC13) were installed in April 1999. Five wells were installed in October 1990 (P01 to P05). Wells were completed to depths of 14 to 16 feet below ground surface (bgs) except LC09 and LC11, which were completed to 20 feet bgs. Pairs of wells were constructed within five feet of each other creating nested well clusters at the following locations: LC09/LC10, and LC11/LC12. E & E (1999b) listed P05/LC07 as a well pair. No construction details are available in the report for P05; however, the other four wells constructed at the same time were placed 10 ft bgs or deeper. The nested wells allow groundwater to be collected from different depths in the same area.

The 12 new wells and 6 existing wells were sampled in May 1999 for total metals, VOCs, SVOCs, pesticides, PCBs, nitrogen, and pH. Field parameters were also collected including temperature, dissolved oxygen, specific conductivity, oxidation/reduction potential, and pH.

2.5.3 Phase III

Phase III sampling was performed in May-June 1999 and included: sampling at Alburn to address data gaps from Phase I; obtaining additional surface and subsurface soil data near areas of elevated concentrations identified in Phase I; collecting additional surface water and sediment samples at or near Alburn; and collecting nitrogen data from previous surface water locations. Soil samples included 39 surface samples, 15 subsurface samples between 2 and 3 ft bgs, and 15 subsurface samples between 4 and 6 ft bgs. Samples were analyzed for total metals, VOCs, SVOCs, pesticides, PCBs, pH, and percent moisture. Four surface water samples collected from ponded water in and near Alburn were analyzed for total metals, VOCs, SVOCs, pesticides, PCBs, and pH. Sixteen surface water samples were collected for nitrogen analysis (four in Alburn, eight in Indian Ridge Marsh, and four from large ponds). Seven sediment samples in and near Alburn were analyzed for total metals, VOCs, SVOCs, pesticides, PCBs, and percent moisture/percent solids.

2.5.4 IEPA Site Investigation (SI)

IEPA conducted site investigation activities at Alburn from June 19 through 22, 2000; Unnamed Parcel from July 17 through 20, 2000; and U.S. Drum from August 21 through 25, 2000. The investigative activities consisted of using a backhoe to sample a total of 134 test pits, including 44 test pits in Alburn, 39 test pits in Unnamed Parcel, and 51 test pits in U.S. Drum. The SI comprised sampling of soils from test pits. Two or more samples were collected from each of

134 test pit locations in the three areas. Samples were analyzed for inorganics, VOCs, SVOCs, pesticides/herbicides and PCBs. Dioxins were also analyzed in some locations.

3.0 SELECTION OF CONTAMINANTS OF POTENTIAL CONCERNS

The laboratory analytical data for samples collected during IEPA SI were generated following analytical procedures detailed in the United States Environmental Protection Agency (USEPA) and Illinois Environmental Protection Agency (IEPA) approved Quality Assurance Project Plans. Available analytical data from the SI were evaluated to determine usability in the risk assessment (EPA, 1992a). All laboratory generated analytical data were compiled and used in this risk assessment except for the screening level data generated during field investigations, which include metal data generated using XRF and groundwater samples collected using a geoprobe during Phase I. Data collected during Phase I, II and III were evaluated by E & E (1999b) and summarized in this section. The selection of contaminants of potential concern (COPCs), carcinogenic risk and noncarcinogenic hazard characterizations are discussed separately on Alburn, U.S. Drum and Unnamed Parcel areas in the Cluster Site.

3.1 Soil

Soil samples collected and analyzed during the comprehensive SI conducted by IEPA during 2000 are used in this HHRA. Metals are naturally occurring in soil. Metal concentrations that do not exceed background levels are not considered in estimating carcinogenic risks and noncarcinogenic hazards. Contaminant concentrations in soil were compared against soil background values. The soil background values were obtained from title 35 of the Illinois Administration Code (IAC) Part 742, *Tiered Approach to Corrective Action Objectives* (TACO)(IEPA 2001). Background concentrations specific for counties within Metropolitan Areas were used in this evaluation. Analytes that were found to be present at concentrations exceeding background concentrations were retained for further evaluation. Chemical concentrations in soils were then screened against the Tier I Soil Remediation Objectives (ROs) from IEPA (2001). The analytical results were compared to ROs for residential scenario. Chemicals detected in soil at concentrations exceeding the residential RO objectives were identified as COPCs.

3.2 Sediments

Seven sediment samples were collected in Alburn, two in U.S. Drum, six in ponds north of Alburn (LHL1) and north of U.S. Drum (LHL2), and eleven just east of the Cluster Site in Indian Ridge Marsh during Phase I, II and III investigations in 1998 and 1999. Sample locations are shown in Figure 2. The samples from the Alburn area (2SED1 through 2SED7) were composite samples scraped with a hand auger along an impenetrable surface suspected to be a former parking lot.

The sediment samples were evaluated by E & E (1999b). E & E (1999b) provided several sediment criteria including the Ontario Ministry of the Environment's guidelines for the protection and management of aquatic sediment quality (Persaud et al., 1993). Based on these evaluation criteria, four COPCs, arsenic, chromium, chrysene, and lead, were selected in Alburn.

3.3 Surface Water

Surface water samples were collected during Phase I and Phase III investigations in 1998 and 1999. E & E (1999b) evaluated the surface water analytical data and used the ecological and toxicological (EcoTox) thresholds (USEPA 1996a) as the screening criteria. The analytical result of each chemical was compared to the screening criteria. If it exceeded the screening criteria, the chemical was retained as COPC. In the Alburn area, barium, iron, lead, manganese, and heptachlor are retained as COPCs. The same COPCs exceeded ecological toxicity threshold values in the pond in the southeast corner of U.S. Drum, except iron. In addition, 4,4'-DDD, 4,4'-DDE and Endrin were selected as COPCs in U.S.Drum area.

3.4 Groundwater

Groundwater data in the E & E Report (1999b) were compared to TACO Class I Groundwater ROs. Chemicals exceeding the groundwater ROs included inorganic, VOCs and SVOCs. Based upon data collected in 1998 and 1999, benzene, lead, and manganese exceed Class I groundwater ROs in virtually the entire Cluster Site. Benzene, toluene, ethylbenzene, and xylenes are primary contaminations in LC07 (Alburn), which is near the former incinerator. SVOC and inorganic contaminants (iron, lead, and manganese) were also detected in this area. Groundwater in the Alburn area to the east of LC07, southern portions of U.S. Drum (LC06 and LC05) and Unnamed Parcel (LC13) areas also contain other elevated inorganics.

3.5 Essential nutrients

Calcium, potassium, magnesium, iron and sodium were detected in all media. Since these inorganic constituents are essential nutrients for human being and information regarding adverse impacts from these inorganic constituents is not available, these essential nutrients are eliminated from further considerations as COPCs.

COPCs selected for soil, sediment, surface water and groundwater for Alburn, U.S. Drum and Unnamed Parcel of the Cluster Site are listed in Tables 3-1 through Table 3-3.

Table 3-1. Contaminants of Potential Concern in Alburn

Soil	Sediment	Surface Water	Groundwater
Antimony	Arsenic	Barium	Antimony
Arsenic	Chromium	Lead	Arsenic
Barium	Chrysene	Manganese	Barium
Beryllium	Lead	Heptachlor	Beryllium
Cadmium			Cadmium
Chromium			Chromium
Lead			Lead
Manganese			Manganese
Benzene			Mercury
Benzo(a)anthracene			Nickel
Benzo(a)pyrene			Thallium
Benzo(b)fluoranthene			Vanadium
Bis(2-chloroethyl)ether			Zinc

Table 3-1. Contaminants of Potential Concern in Alburn

Soil	Sediment	Surface Water	Groundwater
Carbon disulfide Chlorobenzene Dibenzo(a,h)anthracene Ethylbenzene Heptachlor Methylene chloride Indeno(1,2,3-cd)pyrene Tetrachloroethene Trichloroethane Toluene Total PCBs Vinyl chloride Xylenes			Benzene Benzo(a)anthracene Benzo(b)fluoranthene Benzo(k)fluoranthene Benzo(a)pyrene Bis(2-chloroethyl)ether Bis(2-ethylhexyl)phthalate Chlorobenzene Chrysene Dibenzo(a,h)anthracene 2,4-dimethylphenol Ethylbenzene Indeno(1,2,3-cd)pyrene Methylene chloride Naphthalene N-Nitrochloroethene Toluene Xylene

Table 3-2. Contaminants of Potential Concern in U.S. Drum

Soil	Sediment	Surface Water	Groundwater
Antimony Arsenic Beryllium Chromium Lead Manganese Benzene Benzo(a)anthracene Benzo(a)pyrene Benzo(b)fluoranthene Bis(2-ethylhexyl)phthalate Chlorobenzene Chloroform Dibenzo(a,h)anthracene 1,2-Dichloroethane Ethylbenzene Indeno(1,2,3-cd)pyrene Tetrachloroethene Toluene, Total PCBs Vinyl chloride, Xylenes	None	Barium Lead Manganese 4,4'-DDD 4,4'-DDE Endrin Heptachlor	Antimony Arsenic Barium Beryllium Cadmium Chromium Lead Manganese Mercury Nickel Vanadium Benzene Benzo(a)anthracene Benzo(b)fluoranthene Benzo(k)fluoranthene Benzo(a)pyrene Chrysene Dibenzo(a,h)anthracene Indeno(1,2,3-cd)pyrene

Table 3-3. Contaminants of Potential Concern in Unnamed Parcel

Soil	Sediment	Surface Water	Groundwater
Arsenic, Beryllium Chromium Lead Manganese Benzo(a)anthracene Benzo(a)pyrene Benzo(b)fluoranthene Benzo(k)fluoranthene Chlorobenzene Dibenzo(a,h)anthracene 1,2-Dibromo-3-Chloropropane 1,1-Dichloroethane 1,2-Dichloroethane Ethylbenzene Indeno(1,2,3-cd)pyrene alpha-BHC, Heptachlor Methylene Chloride Trichloroethene, Toluene 1,1,1-Trichloroethane, Xylenes	None	None	Arsenic Cadmium Chromium Lead Manganese Mercury Nickel Vanadium Zinc Benzene Benzo(a)anthracene Benzo(b)fluoranthene Benzo(k)fluoranthene Benzo(a)pyrene Bis(2-ethylhexyl)phthalate Chrysene Indeno(1,2,3-cd)pyrene

4.0 EXPOSURE ASSESSMENT

The objective of the exposure assessment is to identify human receptors that are potentially exposed to site contaminants, to describe the exposure pathway, and the amount of the chemical intake resulting from such exposures, if any. The exposure assessment identifies the various media in which chemicals are found or transported, the location where exposure occurs, and the estimated magnitude, frequency, and duration of exposure.

4.1 Receptors

Future potential use of the Cluster Site includes use as a solar power generating station. Potential receptors for the Lake Calumet Cluster Site include on-site worker, mower, construction workers, industrial/commercial workers, and landscape worker. Specific activities of the receptors are discussed below.

- On-site Worker—Maintenance work on the solar panels.
- Mower—An adult mows the site twice a year.
- Landscape Maintenance Worker—Sows prairie grass or conducts other landscape maintenance work.
- Construction Worker—Typical construction work including grading and excavation of soils, building construction, and installment of solar panels.
- Industrial/Commercial Worker—Typical maintenance workers engaged in routine activities.

4.2 Exposure Pathway

An exposure pathway describes the course a chemical takes from the source to the receptor and is defined by four elements: 1) A source and mechanism of release; 2) An environmental transport medium; 3) A point of potential exposure with the contaminated medium; and 4) A route of exposure at the exposure point. When all these elements are present, a pathway is considered complete. Only complete exposure pathways are selected for evaluation in a risk assessment. A conceptual site model (CSM) has been developed to aid in identification of potential exposure pathways, as shown in Figure 3. The primary sources of contamination at the Cluster Site are past site activities and the existing landfills. Release mechanisms such as spills, leaks, runoff, percolation, and particulate emissions transfer contaminants to soil, air, and water. The complete and significant pathways are listed below.

- Dermal contact with groundwater by on-site workers, construction workers, and industrial/commercial workers
- Dermal contact with surface water and sediment by on-site workers, construction workers, and industrial/commercial workers
- Ingestion, inhalation (particulate and volatile emissions), and dermal contact of surface and subsurface soils by all potential receptors (It is assumed that due to construction

activities, subsurface soil will be brought up to the surface water and mixed with surface soil)

- Inhalation of groundwater by on-site workers, construction workers, and industrial/commercial workers.

4.3 Exposure Point Concentration

The Exposure Point Concentration (EPC) is defined as the concentration of a COPC that a human receptor can potentially come in contact with. EPCs were calculated using procedures described in Supplemental Guidance to RAGS: Calculating the Concentration Term (USEPA, 1992). EPCs are estimates of the arithmetic average concentration of a contaminant in a specific media. Due to uncertainties associated with estimating the true average concentration, the 95 percent upper-bound confidence limit (UCL) of the arithmetic mean concentration is used as a measure of the arithmetic average concentration.

EPCs are calculated for each of the soil areas of concern. For groundwater, each well represents an exposure point. Therefore, the highest concentration of each contaminant measured in groundwater was used as the EPC. For sediment and surface water, the maximum concentration of each COPC was used as the EPC due to insufficient data set for sediment and surface water.

The type of distribution of the data sets at each soil area of concern were first determined because equations used to calculate EPCs vary for normal and lognormal distributions. The Shapiro and Wilk's W-Test (Gilbert, 1987) was used to determine the distribution of the data sets. In all exposure areas and for all COPCs, the data sets were found to be distributed neither normally nor lognormally. Therefore, in accordance with USEPA guidance (USEPA, 1992), lognormal distribution was assumed as a default distribution.

Proxy values were assigned to non-detect samples. Although a chemical may be reported as non-detect, it may be present at a concentration below the quantitation limit. As a conservative measure, one half the value of the sample quantitation limit was used as a proxy value for non-detected samples.

EPCs then were calculated using equations presented in USEPA (1992b) for determining 95 percent UCL under lognormal distribution. Where the calculated 95 percent UCL value was higher than the maximum value in the data set, the maximum value was selected as the EPC. EPCs were calculated for each COPC using available analytical data from each exposure area. Calculation of UCL_{95} values and EPCs for each exposure area is presented in Appendix A.

4.4 Quantification Of Exposure

Exposure dose equations consider contact rate, receptor body weight, and frequency and duration of exposure. All exposures quantified in this HHRA are normalized for time and body weight and presented in units of milligram (mg) per kilogram (kg) of body weight per day. A lifetime average daily dose (LADD) and an average daily dose (ADD) were calculated to estimate carcinogenic risks and noncarcinogenic hazards, respectively.

Equations to calculate ADD and LADD via ingestion of soil are:

$$ADD\ (mg/kg\text{-}day) = EPC \times FI \times IRS \times EF \times ED \times CF/(BW \times ATn) \quad (1)$$

$$LADD\ (mg/kg\text{-}day) = EPC \times FI \times IRS \times EF \times ED \times CF/(BW \times ATc) \quad (2)$$

where:

EPC, mg/kg = Exposure Point Concentration
FI, unitless = Fraction Ingested from Contaminated Source
IRS, mg/day = Soil Ingestion Rate
EF, days/year = Exposure Frequency
ED, years = Exposure Duration
CF, 10^{-6} kg/mg = Conversion Factor
BW, kg = Body Weight
ATn, days = Averaging Time for Noncarcinogens
ATc, days = Averaging Time for Carcinogens

Equations to calculate ADD and LADD via inhalation of particulates are:

$$ADD\ (mg/kg\text{-}day) = EPCa \times IR \times ER \times EF \times ED/(BW \times ATn) \quad (3)$$

$$LADD\ (mg/kg\text{-}day) = EPCa \times IR \times ER \times EF \times ED/(BW \times ATc) \quad (4)$$

where:

EPCa, mg/m^3 = Exposure Point Concentration in air = EPC/PEF
IR, m^3/hr = Inhalation Rate
ER, hrs/day = Exposure Rate
PEF, kg/m^3 = Particulate Emission Factor

Equations to calculate ADD and LADD via inhalation of volatiles in soil are:

$$ADD\ (mg/kg\text{-}day) = EPCv \times IR \times ER \times EF \times ED/(BW \times ATn) \quad (5)$$

$$LADD\ (mg/kg\text{-}day) = EPCv \times IR \times ER \times EF \times ED/(BW \times ATc) \quad (6)$$

where:

EPCv, mg/m^3 = Exposure Point Concentration in air = EPC/VF
IR, m^3/hr = Inhalation Rate
ER, hrs/day = Exposure Rate
VF, kg/m^3 = Volatilization Factor

Equations to calculate ADD and LADD via dermal contact with soils and sediment are:

$$ADD\ (mg/kg\text{-}day) = EPC \times SA \times AF \times ABS \times EF \times ED \times CF/(BW \times ATn) \quad (7)$$

$$LADD\ (mg/kg\text{-}day) = EPC \times SA \times AF \times ABS \times EF \times ED \times CF/(BW \times Atc) \quad (8)$$

where:

SA, cm^2 = Body Surface Area
AF, mg/cm^2 = Soil Adherence Factor
ABS, unitless = Dermal Adsorption Factor

Equations to calculate ADD and LADD via dermal contact with water are:

$$ADD\ (mg/kg\text{-}day) = EPC \times SA \times PC \times ET \times EF \times ED \times CF/(BW \times ATn) \quad (9)$$

$$LADD\ (mg/kg\text{-}day) = EPC \times SA \times PC \times ET \times EF \times ED \times CF/(BW \times Atc) \quad (10)$$

where:

PC, cm/hour = Permeability Constant
ET, hours/day = Exposure Time

Equations to calculate ADD and LADD via inhalation of water are:

$$ADD\ (mg/kg\text{-}day) = EPC_{air} \times IR \times EF \times ED \times CF/(BW \times ATn) \quad (11)$$

$$LADD\ (mg/kg\text{-}day) = EPC_{air} \times IR \times EF \times ED \times CF/(BW \times ATc) \quad (12)$$

where:

EPC_{air}, g/m^3 = Air concentration of contaminants

The calculations discussed below are based on building a model for calculating the air concentration of the groundwater contaminants. The model is described in Appendix B.

Estimation of pathway-specific exposure doses requires development of parameter values. Parameter values for exposure to different media are proposed in Tables 4-1 through 4-3.

Table 4-1
Parameter Values for Exposure to Soil at the Lake Calumet Cluster Site

Exposure Factor	On-site Worker	Mower	Landscape Worker	Construction Worker	Industrial/ Commercial Worker
Soil Ingestion Rate[a] (mg/day)	50	480	50	480	50
Fraction Ingested[b] (unitless)	0.5	1	0.5	1	0.5
Inhalation Rate[c] (m^3/hour)	1.1	1.7	1.1	2.8	1.1
Exposure rate[d] (hours/day)	5[b]	8	8	8	8
Body Surface Area[e], (cm^2)	3,300	3,300	3,300	3,300	3,300
Soil Adherence Factor[e] (mg/cm^2)	0.2	0.2	0.2	0.2	0.2
Particulate Emission Factor (kg/m^3)	8.00E-10	8.00E-09	8.00E-10	8.00E-09	8.00E-10
Exposure Frequency (days/year)	50[b]	10[d]	20[b]	30[a]	250[a]
Exposure Duration[a] (years)	25[b]	25[b]	25[b]	1[a]	25[a]
Body Weight[a] (kg)	70	70	70	70	70
Averaging Time for Noncarcinogens (days)	9,125	9,125	9,125	40[a]	9,125

Notes:
[a] Tiered Approach to Corrective Action Objectives, IEPA, World Wide Web, 2000.
[b] Assumed based on activity patterns and time spent on-site
[c] U. S. EPA, Exposure Factors Handbook, 1997. Inhalation rates based on light, moderate, and heavy activities.
[d] Based on Expected working assignments at the Facility. Steve Hogan, Spire Corporation.
[e] U.S.EPA Region 9.

Table 4-2
Exposure Factors for Dermal Contact with Groundwater and Surface Water

Exposure Factor	On-site Worker	Construction Worker	Industrial/ Commercial Worker
Body Surface Area[a] (cm^2)	3,300	3,300	3,300
Exposure Frequency[b] (days/year)	5	5	5
Exposure Duration[c] (years)	25	1	25
Body Weight[d] (kg)	70	70	70
Averaging Time for Noncarcinogens (days)	9,125	40[d]	9,125

Notes:
[a] U.S.EPA Region 9, www, 2000.
[b] Mark Johnson, USEPA Region 5
[c] Assumed value based on activity patterns
[d] Tiered Approach to Corrective Action Objectives, IEPA, 2000

Table 4-3
Exposure Factors for Dermal Contact with Sediment

Exposure Factor	On-site Worker	Construction Worker	Industrial/ Commercial Worker
Body Surface Area[a] (cm^2)	3,300	3,300	3,300
Soil Adherence Factor[a] (mg/cm^2)	0.2	0.2	0.2
Exposure Frequency[c] (days/year)	5	5	5
Exposure Duration[d] (years)	25	1	25
Body Weight[d] (kg)	70	70	70
Averaging Time for Noncarcinogens (days)	9,125	40[c]	9,125

Notes:
[a] U.S.EPA Region 9, www, 2000.
[b] Mark Johnson, USEPA Region 5
[c] Assumed value based on activity patterns
[d] Tiered Approach to Corrective Action Objectives, IEPA, 2000

Dermal adsorption factors were developed following guidance in IEPA (1994). Dermal adsorption factor of 0.01 was selected for all inorganic constituents. For Polynuclear Aromatic Hydrocarbons (PAHs), exposure doses via dermal contact were assumed to be same as those via ingestion. Dermal adsorption factors for other organics are listed in Table 4-4.

Table 4-4. Dermal Adsorption Factors

COPC	Henry's Law Constant [a] (unitless)	Octanol/Water Partition Coefficient[a] (unitless)	Dermal Adsorption Factors[b] (unitless)
Inorganics	NA	NA	0.01
Bis(2-ethylhexyl)phthalate	4.2E-06	2E+08	0.4
Tetrachloroethene	7.5E-01	4.7E+02	0.03
Trichloroethene	4.2E-01	5.1E+02	0.03
Vinyl chloride	1.1E+0	3E+01	0.03

Notes:
a EPA (1996b)
b IEPA (1994)

Permeability constant were developed in an EPA document (1992c). Permeability constant of 0.001 was selected for all inorganic constituents and the value for organic constituents are listed in Table 4-5.

Table 4-5. Permeability Constants

COPC	Permeability Constants[c] (cm/hr)
Inorganics	1.0E-03
Bis(2-ethylhexyl)phthalate	3.3E-02
Benzene	2.1E-02
Benzo(a)pyrene	1.2E+00
Benzo(a)anthracene	8.0E-01
Benzo(b)fluoranthene	1.2E+00
Chrysene	8.1E-01
Dibenzo(a,h)anthracene	2.7E+00
1,1-Dichloroethene	1.6E-02
trans-1,2-dichloroethene	1.0E-02
Indeno(1,2,3-cd)pyrene	1.9E+00
Tetrachloroethene	4.8E-02
Trichloroethene	1.6E-02
Vinyl chloride	7.3E-03

Note:
c EPA (1992c)

For VOC contaminants in groundwater, the values of their diffusion coefficients in water are needed in the model for calculating the concentration of groundwater contaminants in air. The diffusion coefficients of these VOCs are available in (EPA 1996b) and listed in Table 4-6.

Table 4-6. Diffusion Coefficients in Water (cm^2/sec)

COPC	Diffusion Coefficients [a] (unitless)
Benzene	9.80E-06
Methylene Chloride	1.17E-05
Chlorobenzene	8.70E-06
Ethylbenzene	7.80E-06
Toluene	8.60E-06
Xylenes	2.20E-05

Notes:
a EPA (1996b)

5.0 TOXICITY ASSESSMENT

5.1 Carcinogenic Health Effects Criteria And Assessment

USEPA's Carcinogenic Assessment Group has estimated the excess lifetime cancer risks associated with various levels of exposure to potential human carcinogens by developing cancer slope factors (SFs). The SFs are generally derived using conservative (health protective) assumptions. Cancer SFs developed by USEPA were used in this risk assessment. The toxicity values for potential carcinogenic effects of the COPCs are listed in Table 5-1.

Table 5-1. Toxicity Factors for COPCs[a]

Chemical	Slope Factor (mg/kg-day)		Reference Dose (mg/kg-day)	
	Oral	Inhalation	Oral	Inhalation
Antimony	NA	NA	4.00E-04	NA
Arsenic	1.50E+00	NA	3.00 E-04	NA
Barium	NA	NA	7.00E-02	1.43E-04 [b]
Beryllium	NA	NA	2.00E-03	5.71E-06
Cadmium[b]	NA	NA	5.00E-04	NA
Chromium	NA	NA	1.50E+00	NA
Manganese	NA	NA	4.60E-02	1.43E-05
Mercury	NA	NA	NA	8.6E-05
Nickel	NA	NA	2.00E-02	NA
Thallium	NA	NA	8.00E-05	NA
Vanadium	NA	NA	7.00E-03[b]	NA
Zinc	NA	NA	3.00E-01	NA
alpha-BHC	6.30E+00	6.30E+00	NA	NA
Benzene	5.50E-02	2.90E-02	NA	NA
Benzo(a)anthracene	7.30E-01[c]	3.10E-01[c]	NA	NA
Benzo(b)fluoranthene	7.30E-01[c]	3.10E-01[c]	NA	NA
Benzo(k)fluoranthene	7.30E-02[c]	3.10E-02[c]	NA	NA
Benzo(a)pyrene	7.30E+00[c]	3.10E+00[c]	NA	NA
Bis(2-Chloroethyl) Ether	1.10E+00	1.16E+00[d]	NA	NA
Bis(2-ethylhexyl)phthalate	1.40E-02	NA	2.00E-02	NA
Chrysene	7.30E-03[c]	3.10E-03[c]	NA	NA
Carbon Disulfate	NA	NA	1.00E-01	2.00E-01
Chlorobenzene	NA	NA	2.00E-02	5.71E-03
Chloroform	6.10E-03	8.05E-02[d]	1.00E-02	NA
Dibenz(a,h)anthracene	7.30E+00[c]	3.10E+00[c]	NA	NA
1,2-Dibromo-3-Chrolopropane	1.4E+00[b]	2.40E-3[b]	NA	NA
1,1-Dichloroethane	NA	NA	1.00E-01[b]	1.43E-01
2,4 -Dimethylphenol	NA	NA	2.00E-02	NA
4,4'-DDD	2.40E-01	NA	NA	NA
4,4'-DDE	3.40E-01	NA	NA	NA
Ethylbenzene	NA	NA	1.00E-01	2.86E-01

Table 5-1. Toxicity Factors for COPCs[a]

Chemical	Slope Factor (mg/kg-day)		Reference Dose (mg/kg-day)	
	Oral	Inhalation	Oral	Inhalation
Heptachlor	4.50E+00	4.55E+00[d]	5.00E-04	4.50E+00
Indeno(1,2,3-cd)pyrene	7.30E-01[c]	3.10E-01[c]	NA	NA
Methylene Chloride	7.50E-03	1.65E-03[d]	6.00E-02	8.57E-01[b]
Naphthalene	NA	NA	2.00E-02	8.57E-04
N-Nitrosodiphenylamine	4.90E-03	NA	NA	NA
Tetrachloroethene[e]	5.2E-02	2.0E-03	1.00E-02[d]	NA
Toluene	NA	NA	2.00E-01	1.14E-01
1,1,1-Trichloroethane[e]	NA	NA	2.00E-02	6.29E-01
Trichloroethene[e]	1.1E-02	6.0E-03	NA	NA
Total PCBs	2.00E+00	2.00E+00	NA	NA
Vinyl chloride	7.2E-01	1.6E-02	3.0E-03	2.9E-02
Xylenes	2.00E+00	NA	NA	NA

Notes:
[a] Source: Integrated Risk Information System (IRIS)
[b] Source: Health Effects and Environmental Affects Summary Table (HEAST) as referenced in the Risk Assessment Information system (RAIS), Oak Ridge National Laboratory, 2001.
[c] USEPA Region 9 Preliminary Remediation Goals, 2001
[d] RAIS, Oak Ridge National Laboratory, 2001.
[e] Mark Johnson, USEPA, Region 5, Personal Communication with Pinaki Banerjee, MWH, 2000.

The critical effects of each carcinogenic COPC are listed in Table 5-2.

Table 5-2. Critical Effects of Carcinogenic COPCs[a]

COPCs	Effects/Target Organs
Benzo(a)anthracene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Benzo(a)pyrene, Chrysene, Dibenzo(a,h)anthracene, Indeno(1,2,3-cd)pyrene, 1,2-Dibromo-3-Chrolopropane (ingestion only)	Gastrointestinal System
1,2-Dibromo-3-Chrolopropane (ingestion only), Bis(2-Chloroethyl) Ether, Bis(2-ethylhexyl)phthalate, chloroform (ingestion only), DDD, DDE, Heptachlor, alpha-BHC, Methylene chloride, Tetrachloroethene, Trichloroethene, Vinyl chloride	Liver
Benzene	Circulatory System
Arsenic, Beryllium (Inhalation only), Cadmium (Inhalation only), Chromium (Inhalation only), Methylene chloride, Nickel, Vinyl chloride	Respiratory System (Lungs)

Note:
[a] Tiered Approach to Corrective Action Objectives (IEPA, 1997).

5.2 Noncarcinogenic Health Effects Criteria And Assessment

Health effects for chemicals exhibiting noncarcinogenic effects are generally developed using reference doses (RfDs). The RfD is an estimate of the daily exposure to the human population that is likely to be without an appreciable risk during a lifetime. The uncertainty associated with the RfD is at least one order of magnitude and may be as high as several orders of magnitude. RfDs are expressed in units of dose (mg/kg-day) and are developed by USEPA. Table 5-1 lists the RfDs for potential noncarcinogenic effects for the COPCs.

The RfDs are selected by identifying the lowest reliable no observed effect level (NOAEL) or lowest observed adverse effect level (LOAEL) in the scientific literature, then applying a suitable uncertainty factor (UF) and a modifying factor (MF), to allow differences between the study conditions and the human exposure situation to which the RfDs are to be applied.

Each COPC exerts noncarcinogenic effect on specific target organs or mode of action. For example, mercury is known to affect central nervous systems while barium affects the circulatory or reproductive systems. In evaluating health effects due to exposure to multiple COPCs, consideration is given to the COPCs with similar target organ effect. The critical effects of each non-carcinogenic COPC are listed in Table 5-3.

Table 5-3. Critical Effects of Non-Carcinogenic COPCs

COPC	Effects/Target Organs
Cadmium (ingestion only)[a], Chlorobenzene[a], 1,1-Dichloroethane[a], Ethylbenzene[a], Toluene (ingestion only)[a], Vanadium[b]	Kidney
2,4-Dimethylphenol[a], Toluene[a], Xylenes[a], Manganese[a], Mercury[a]	Central Nervous System
Carbon disulfide[a], Ethylbenzene(inhalation only)[a], Antimony, Barium[a], 2,4-Dimethylphenol[a], Zinc[a]	Circulatory System, Reproductive System
Naphthalene[a], Toluene[a], Vanadium[b], Nickel[b]	Respiratory System
Chlorobenzene(ingestion only), Ethylbenzene, Toluene	Liver

Notes:
[a] Tiered Approach to Corrective Action Objectives (IEPA, 1997).
[b] Agency for Toxic Substance and Disease Registry (www.ATSDR.gov , 2001).

Toxicity factors are not currently available for lead; therefore, exposure to lead was not evaluated in this HHRA. Health effects from exposure to lead are estimated based on blood-lead levels. Blood-lead levels are estimated based on lead uptake through diet and exposure to water, soil, and air. IEPA has set a remediation objective of 400 mg/kg for lead in soil for residents and workers (IEPA, 2001). Soil locations where lead concentrations exceed 400 mg/kg were identified in Harza (2001).

6.0 RISK CHARACTERIZATION

Carcinogenic risks and noncarcinogenic hazards were characterized for each chemical, multiple chemicals within each exposure pathway, and for exposures attributable to multiple pathways, as appropriate.

6.1 Carcinogenic Risks

Quantitative human risk estimates were derived by combining the estimates of chemical intake derived in Section 4.0 (Exposure Assessment) with the health effects criteria presented in Section 5.0 (Toxicity Assessment). For potential carcinogenic chemicals, excess lifetime cancer risks (ELCR) are estimated by multiplying the cancer slope factor by the estimated daily chemical intake. The estimated ELCR represents a high-end probability that an individual could contract cancer due to exposure to the potential carcinogen under the specified exposure conditions.

ELCRs are calculated using equation (13):

$$ELCR = LADD \times SF \quad (13)$$

The intake is assumed to occur by inhalation, ingestion, and dermal contact. Therefore, additivity of effects is assumed such that the total ELCR for each chemical is obtained by summing the chemical specific risk estimated for both pathways as it relates to a specific medium. The total ELCR for exposure to multiple chemicals is expressed as:

$$ELCR_e = ELCR1 + ELCR\ 2 + ELCR\ 3 + \ldots + ELCRi \quad (14)$$

where:

ELCRe = Total exposure via a specific pathway
ELCRi = ELCR estimate for the ith chemical

The total ELCR equals risks via all appropriate pathways, and is expressed as:

$$Total\ ELCR = ELCRe1 + ELCRe2 + \ldots + ELCRei \quad (15)$$

where:

ELCRei = ELCR resulting from the ith pathway.

Carcinogenic risks are expressed as a probability for a receptor to develop cancer. A risk level of 1×10^{-6} (1E-06) represents a high-end probability of 1 in 1,000,000. USEPA generally uses a potential upper-bound risk estimate of 1E-06 as a point of departure, while a risk range of 1E-04 to 1E-06 is used as a target range for making risk management decisions. USEPA (1991) states that the upper boundary of the risk range is not a discrete line at 1E-04. A specific risk estimate around 1E-04 may be acceptable at some sites.

6.2 Noncarcinogenic Hazards

Noncarcinogenic hazards are presented as the ratio of the daily intake to the RfD or Hazard Quotient (HQ). The HQ for a specific chemical is calculated using Equation (16):

$$HQ = ADD/RfD \quad (16)$$

Chemicals that cause noncarcinogenic hazards target specific organs within human. Noncarcinogenic hazard attributable to exposure to all chemicals that affect the same organ via a specific exposure pathway is expressed as hazard index (HI) as follows:

$$HIe = HQ1 + HQ2 + \ldots + Hqi \quad (17)$$

where:

HIe = hazard index via a specific pathway
HQi = hazard quotient for the ith chemical

The total noncarcinogenic hazard is calculated by:

$$\text{Total HI} = HIe1 + HIe2 + \ldots + Hiei \quad (18)$$

where:

HIei = hazard index via the ith pathway

The HI is useful as a reference point for gauging the potential effects of the environmental exposures to complex mixtures. HI greater than one suggests that human health effects would be possible if exposure occurred under the conditions evaluated in the assessment. In general, HI less than one is unlikely to be associated with any health risks. In this HHRA, HIs for all pathways and COPCs were summed to generate cumulative HI values.

6.3 Risk Characterization

Potential carcinogenic risks and noncarcinogenic hazards are estimated for each medium under exposure scenarios characterized in the CSM and under the assumptions used in calculating the daily doses. Carcinogenic and noncarcinogenic risks were calculated via ingestion, inhalation, and dermal contact pathways. Calculations of ADD, LADD, HI, and ELCR for Alburn, U.S. Drum and Unnamed Parcel are presented in Appendix C.

The carcinogenic risks and noncarcarcinogenic hazards for each of the site are summarized below.

6.3.1 Alburn

The carcinogenic risks and noncarcarcinogenic hazards for exposure to each of the media at Alburn area are presented in Table 6-1.

Table 6-1. Carcinogenic Risk and Noncarcinogenic Hazards for Each Media at Alburn

	On-site worker	Construction Worker	Industrial/Commercial Worker	Mower	Landscape Worker
Soil					
Total ELCR	5E-06	2E-06	2E-05	1E-05	2E-06
Total HI	2E-02	3E+00	2E-01	4E-02	8E-01
Groundwater					
Total ELCR	8E-07	3E-08	8E-07	NA	NA
Total HI	1E-02	1E-01	1E-02	NA	NA
Surface Water					
Total ELCR	3E-09	1E-10	3E-09	NA	NA
Total HI	4E-05	4E-04	4E-05	NA	NA
Sediment					
Total ELCR	2E-07	9E-09	2E-07	NA	NA
Total HI	1E-03	1E-02	1E-03	NA	NA

In Table 6-1, the shaded cells indicate that the total ELCR exceeds 1.0E-06 or total HI exceeds 1.0. Risks are primarily due to exposure to soil. Risk due to exposure to sediment, surface water and groundwater are insignificant. The carcinogenic risks represented by ELCR exceed 1E-06 for all receptors. The noncarcinogenic risks represented by HI are equal to or exceed 1E+00 for construction workers. COPC that contributed significantly to carcinogenic risks (risks exceeding 1E-06) and the corresponding receptors are listed in Table 6-2. For noncarcinogenic hazards exceeding 1, the primary COPC is toluene and the corresponding receptor is construction worker.

Table 6-2. Summary of Carcinogenic COPCs at Alburn

Carcinogenic COPCs	Receptors
Arsenic	Industrial/Commercial Worker, Mower
Benzene	Industrial/Commercial Worker
Benzo(a)pyrene	Industrial/Commercial Worker, Mower
Total PCBs	Industrial/Commercial Worker
Vinyl Chloride	Industrial/Commercial Worker, Mower

6.3.2 U.S. Drum

At the U.S. Drum area, no COPCs were selected in sediment samples. Therefore, only soil, surface water and groundwater are considered as the exposure media in the U.S. Drum. The carcinogenic risks and noncarcarcinogenic hazards for exposure to each media are presented in Table 6-3.

Table 6-3. Carcinogenic Risk and Noncarcinogenic Hazards for Each Media at U.S. Drum

	On-site worker	Construction Worker	Industrial/Commercial Worker	Mower	Landscape Worker
Soil					
Total ELCR	1E-05	3E-06	5E-05	3E-05	4E-06
Total HI	1E-02	9E-01	6E-02	3E-02	2E-01
Groundwater					
Total ELCR	4E-07	1E-08	4E-07	NA	NA
Total HI	3E-03	4E-02	5E-04	NA	NA
Surface Water					
Total ELCR	9E-10	4E-11	9E-10	NA	NA
Total HI	2E-05	3E-04	4E-06	NA	NA

In Table 6-3, the shaded cells indicate that the total ELCR exceeds 1.0E-06. Risks are primarily due to exposure to soil. Risk due to exposure to sediment, surface water and groundwater are insignificant. The carcinogenic risks exceed 1E-06 for all the receptors. The noncarcinogenic risks are less than1E+00 for all the receptors. COPCs that contributed significantly (risk exceeding 1E-06) to carcinogenic risks and the corresponding receptors are listed in Table 6-4.

Table 6-4. Summary of Carcinogenic COPCs at U.S. Drum

Carcinogenic COPCs	Receptors
Arsenic	Industrial/Commercial Worker, Mower
Benzo(a)pyrene	On-site Worker, Industrial/Commercial Worker, Mower
Dibenz(a,h)anthracene	On-site Worker, Industrial/Commercial Worker
Total PCBs	On-site Worker, Industrial/Commercial Worker, Mower, Landscape Worker

6.3.3 Unnamed Parcel

In the Unnamed Parcel area, COPCs are distributed in soil and groundwater media. No COPCs were selected in surface water and sediment samples. The carcinogenic risks and noncarcarcinogenic hazards for exposure to soil and groundwater at the Unnamed Parcel area are presented in Table 6-5.

Table 6-5. Carcinogenic Risk and Noncarcinogenic Hazards for Soil and Groundwater at Unnamed Parcel

	On-site worker	Construction Worker	Industrial/Commercial Worker	Mower	Landscape Worker
Soil					
Total ELCR	3E-06	1E-06	2E-05	1E-05	1E-06
Total HI	1E-02	6E-01	5E-02	2E-02	1E-01
Groundwater					
Total ELCR	2E-07	9E-09	2E-07	NA	NA
Total HI	4E-04	4E-03	4E-04	NA	NA

In Table 6-5, the shaded cells indicate that the total ELCR exceeds 1.0E-06. Risks are primarily due to exposure to soil. Risk due to exposure to sediment, surface water and groundwater are insignificant. The carcinogenic risks exceed 1E-06 for industrial/commercial workers, mowers, and on-site workers. The noncarcinogenic risks are less than1E+00 for all the receptors. COPCs that contributed significantly (risk exceeding 1E-06) to carcinogenic risks and the corresponding receptors are listed in Table 6-6.

Table 6-6. Summary of Carcinogenic COPCs at Unnamed Parcel

Carcinogenic COPCs	Receptors
Arsenic	Industrial/Commercial Worker, Mower
Benzo(a)pyrene	Industrial/Commercial Worker, Mower

7.0 UNCERTAINTIES

Uncertainties are introduced at various points throughout the HHRA process, a product of the uncertainties associated with all data and the assumptions used. Specific areas of uncertainty are related to data evaluation; exposure assessment; toxicity assessment; and risk characterization are discussed in this section.

7.1 Exposure Assessment

The exposure estimates used in this HHRA are conservative and, to be health protective, are designed to overestimate actual risks when there is an uncertainty. Several of the factors contributing to uncertainty result in probable overestimation of exposure:

- The directed (biased) nature of the sampling plan, which focuses on the most contaminated parts of the site;

- The use of maximum concentrations as EPCs for groundwater, sediment and surface water data available from multiple sampling rounds;

- The use of steady state assumptions for the source concentration estimates (i.e. the COPC concentrations are not subject to decrease due to attenuation and/or degradation for the duration of the exposure period);

- The exposure parameter values for receptors.

Another factor which could lead to over or underestimation of exposures is the use of one-half MDL to estimate the nondetects.

7.2 Toxicity Assessment

Basic uncertainties underlying the assessment of the toxicity of a chemical include:

- Uncertainties involved in extrapolating from underlying scientific studies to the exposure scenarios being evaluated, including variable responses to chemical exposures in human and species and between species.

These uncertainties could either under- or overestimate the true toxicity of chemicals present. The toxicity assessment process compensates for these uncertainties through the use of uncertainty factors and modifying factors when deriving RfDs for noncarcinogens, and the use of 95% confidence limit when deriving the SFs for carcinogens.

7.3 Risk Characterization

When discussing uncertainties associated with the overall risk assessment, the cumulative effect of conservative assumptions throughout the process and the likelihood of the exposures

postulated and estimated in the exposure assessment actually occurring should be considered. The cumulative effect of conservative assumptions may substantially overestimate true risks. The nature of risk estimation process ensures that the true risks are more likely to be overestimated than underestimated.

8.0 CONCLUSIONS

The HHRA was conducted to assess the potential adverse human health effects that could occur due to exposure to contaminants in each media (soil, sediment, surface water and groundwater) at the Cluster Site. The exposure and risk assessment of carcinogenic risk and noncarcinogenic hazard are performed separately at three areas in the Cluster site, which are Alburn, U.S. Drum and Unnamed Parcel. Carcinogenic risks and noncarcinogenic hazard due to exposure to contaminants in each media at the three areas are summarized below:

In Alburn area, exposures to soil, sediment, surface water and groundwater are discussed. Risk due to exposure to contaminants in soil exceeds carcinogenic risk of 1E-06 for all receptors. COPCs that contributed significantly to carcinogenic risks (exceeding 1E-06) are arsenic, benzene, benzo(a)pyrene, total PCBs and vinyl chloride. For noncarcinogenic hazard, among all receptors, the exposure to contaminants in soil for construction worker exceeds HI of 1E+00 and the primary contributed COPC is toluene. The exposure to contaminants in other media (including sediment, surface water and groundwater) do not exceed carcinogenic risk of 1E-06 or noncarcinogenic hazard of 1 for all receptors.

In U. S. Drum area, no COPCs were selected in sediment samples. Therefore, only exposure to contaminants in soil, surface water and groundwater are discussed. The carcinogenic risk exceeds 1E-06 in soil for all receptors and the primary COPCs are arsenic, benzo(a)pyrene, dibenz(a,h)anthracene and total PCBs. No noncarcinogenic hazard exceeds 1 for all receptors due to exposure to contaminants in soil. The exposures to contaminants in surface water and groundwater do not exceed carcinogenic risk of 1E-06 or noncarcinogenic hazard of 1 for all receptors.

In Unnamed Parcel area, no COPCs were selected in sediment and surface water. The carcinogenic risk due to exposure to contaminants in soil exceeds 1E-06 for on-site worker, industrial/commercial worker and mower. The primary COPCs in soil for carcinogenic risk are arsenic and benzo(a)pyrene. No noncarcinogenic hazard exceeds 1 for all receptors due to exposure to contaminants in soil. The exposures to contaminants in groundwater do not exceed carcinogenic risk of 1E-06 or noncarcinogenic hazard of 1 for all receptors.

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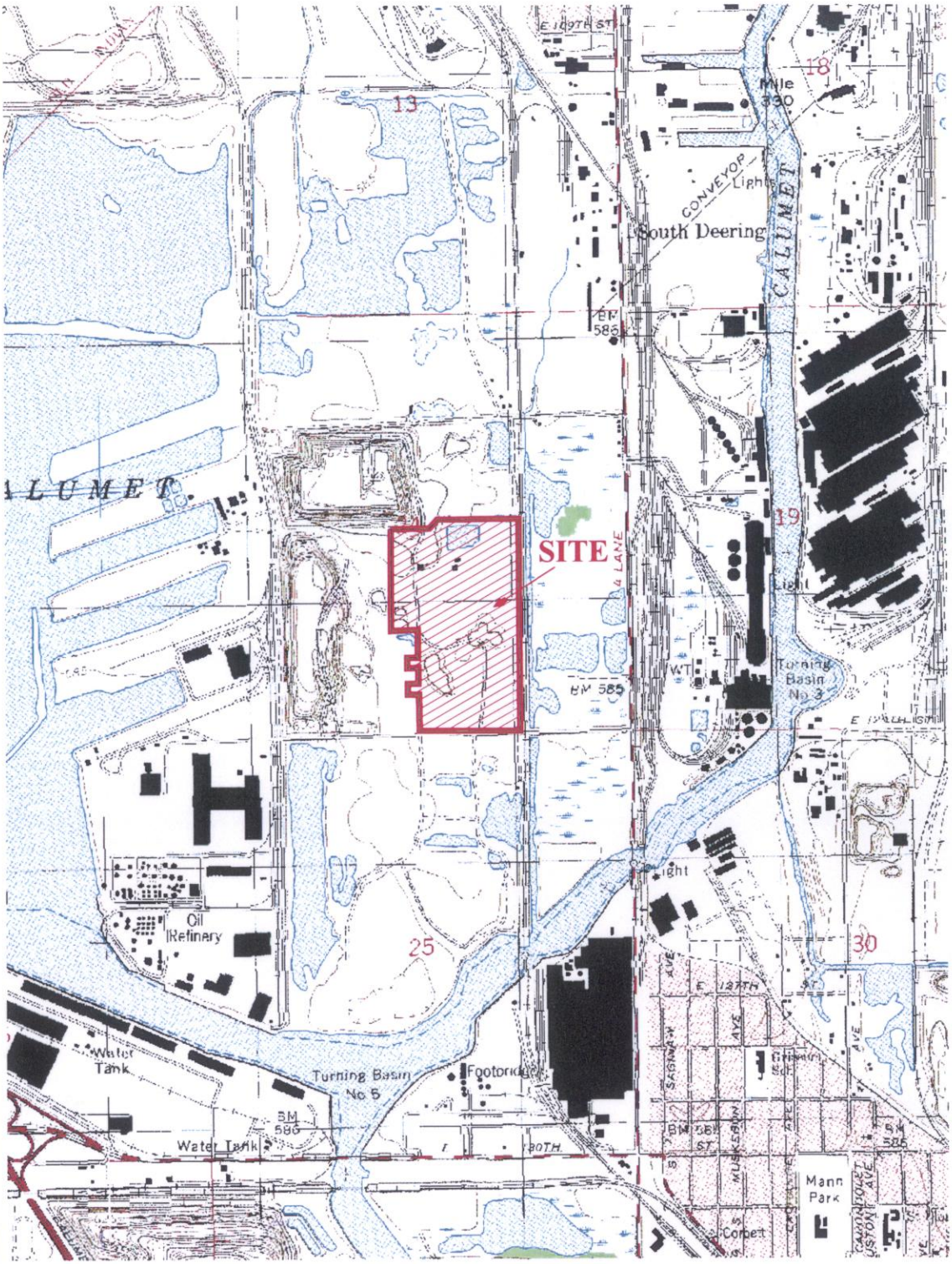

SOURCE:
USGS Lake Calumet, Illinois,
7.5 Minute Quadrangle, 1965, Revised 1997

Figure 1

SITE LOCATION MAP

LAKE CALUMET CLUSTER SITE
Chicago, Illinois

MWH
MONTGOMERY WATSON HARZA

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SED13, SW13
LC01
SED11, SW11
SED12, SW12
LC02
SED10, SW10
SED09, SW09
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GW3
pit 03
pit 02
SED08, SW08
LC03
pit 51
pit 04
pit 05
pit 08
pit 07
pit 06
SED07, SW07
pit 09
pit 10
pit 11
pit 12
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pit 15
pit 16
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G21S
pit 22
pit 21
pit 20
pit 18
pit 17
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GW1
LC10
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pit 24
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pit 26
pit 27
LC09
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LC12
LC11
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GW2
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pit 34
SED04, SW04
LC04
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SED03, SW03
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SED19, SW19
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SED01, SW01
SED18, SW18
LC06
LC05
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pit 53
2SED1
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2SED5
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2SED6
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P01
P02
P03
P04
P05
AW1
AW2
AW3
AW4
LC07
LC13
1B
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32B
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37B
38B
39B
42B

200 0 200 400 Feet

LEGEND

- Groundwater (E&E, November 1999)
- Sediment (E&E, November 1999)
- Sediment & Surface Water (E&E, November 1999)
- Surface Water (E&E, November 1999)
- Test Pit
- Area Boundaries (Alburn, U.S. Drum and Unnamed Parcel)

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Figure 2
TEST PITS, MONITORING WELLS, SOIL BORINGS, SEDIMENT AND SURFACE WATER SAMPLE LOCATIONS
LAKE CALUMET CLUSTER SITE
Chicago, Illinois

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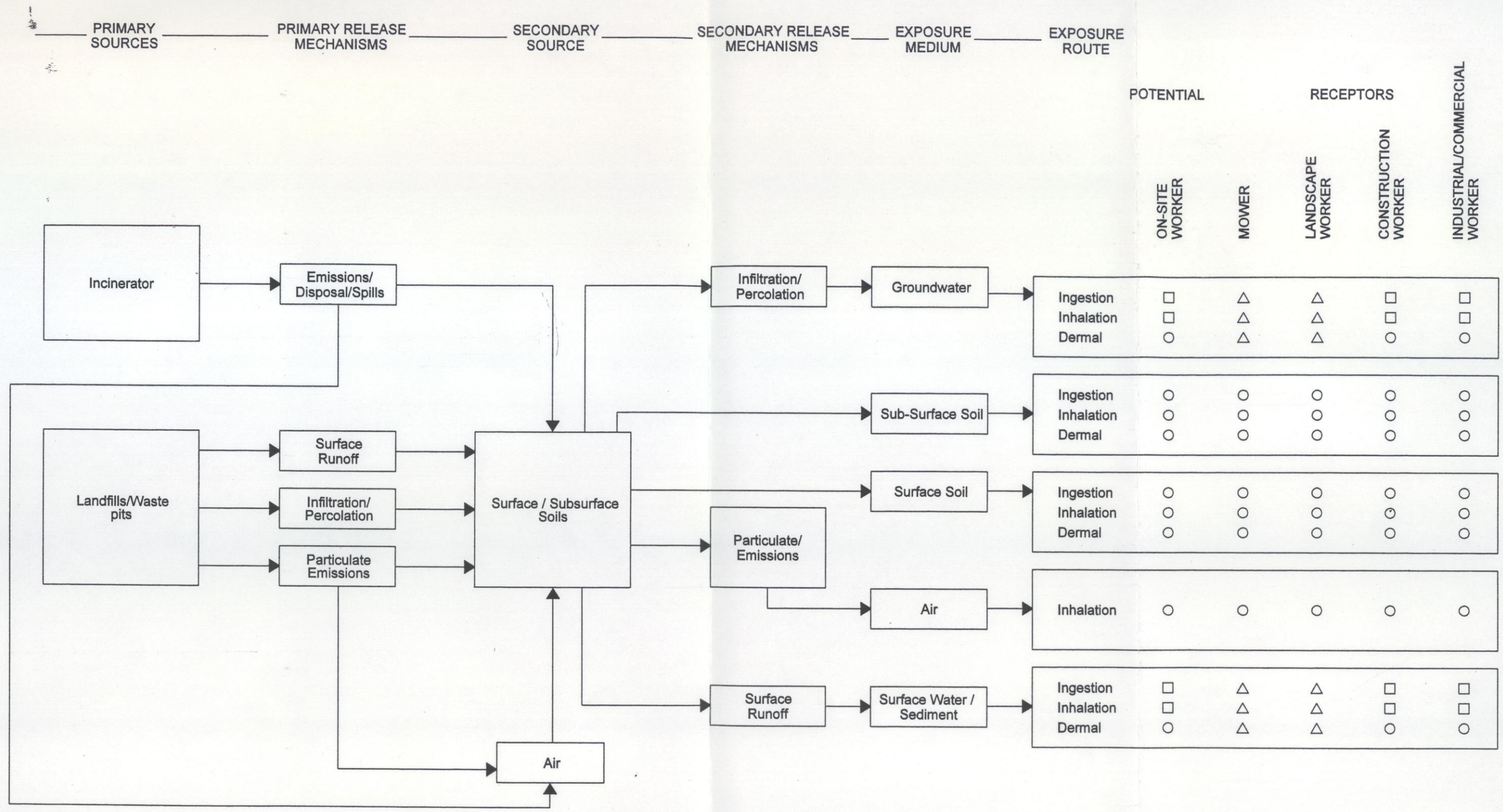

LEGEND:

- ○ Pathway Complete and Significant
- □ Pathway Complete but Insignificant
- △ Pathway Incomplete

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Figure 3
CONCEPTUAL SITE MODEL
LAKE CALUMET CLUSTER SITE
Chicago, Illinois

APPENDIX A

UCL_{95} and EPCs of Soil COPCs

Table 1. UCL 95 and EPCs For Soil COPCs in Alburn (unit: ug/kg)

Analyte Name	Max Value	Min Value	Average	Standard Deviation	ln Ave.	ln Standard Deviation	Number	NonDet	DetFreq	tStdDev	tStat	hStat	UCL	lnUCL	EPC
1,2,4-Trichlorobenzene	385000	3	8651.99	44187.423	5.59913	2.8781027	90	73	19	2.90	1.665	4.8	16406	73586.4	73586
1,2-Dibromo-3-Chloropropane	385000	4.5	8581.22	44194.76	5.75717	2.634513	90	60	33	2.65	1.665	4.44	16336	35187.2	35187
1,2-Dichlorobenzene	385000	1	8441	44214.881	5.44861	2.8241714	90	80	11	2.80	1.665	4.66	16200	50586.1	50586
1,2-Dichloroethane	385000	4.5	8481.46	44211.241	5.50256	2.7939762	90	89	1	2.80	1.665	4.66	16239	48321.8	48322
1,4-Dichlorobenzene	385000	1	8401.54	44222.645	5.36224	2.7989062	90	64	29	2.80	1.665	4.66	16162	42682.5	42683
2,2'-Oxybis(1-Chloro)Propane	8800	150	841.167	1397.7496	6.05268	1.0160839	90	77	14	1.00	1.665	2.31	1086	913.483	913.48
2,4,5-Trichlorophenol	22000	120	2070.06	3494.8716	6.91583	1.0514441	90	80	11	1.05	1.665	2.36	2683	2279.52	2279.5
2,4,6-Trichlorophenol	8800	150	834.833	1401.6117	6.02188	1.0330619	90	81	10	1.05	1.665	2.36	1081	910.509	910.51
2,4-Dichlorophenol	8800	150	806.167	1395.9903	5.9825	1.0193097	90	82	9	1.00	1.665	2.31	1051	855.04	855.04
2,4-Dimethylphenol	51000	27	1370.16	5469.9041	5.98959	1.2404864	90	61	32	1.25	1.665	2.58	2330	1209.83	1209.8
2,4-Dinitrophenol	22000	375	2775.27	4182.8211	7.20776	1.0875845	91	49	46	1.10	1.665	2.42	3505	3216.68	3216.7
2,4-Dinitrotoluene	8800	120	846.978	1429.4892	6.01354	1.0488653	91	78	14	1.05	1.665	2.36	1096	920.221	920.22
4-Methylphenol	29000	23	1400.39	3486.7151	6.11746	1.3784106	90	38	58	1.40	1.665	2.76	2012	1756.04	1756
4-Nitroaniline	22000	375	2178.42	3620.2585	6.96337	1.0461832	92	78	15	1.05	1.664	2.36	2807	2367.36	2367.4
4-Nitrophenol	22000	375	2192.72	3557.896	7.00871	1.0295713	90	72	20	1.05	1.665	2.36	2817	2431.74	2431.7
Acenaphthene	130000	22	3805.99	15719.637	6.44467	1.5818984	91	10	89	1.60	1.665	3.01	6549	3632.03	3632
Acenaphthylene	25000	21	1324.14	3537.4719	5.98336	1.3857354	90	17	81	1.40	1.665	2.76	1945	1554.62	1554.6
Acetone	385000	5	9018.43	44343.553	6.20465	2.3506628	90	50	44	2.35	1.665	4.02	16800	21354.1	21354
Acetophenone	8800	20	790.344	1416.8243	5.79498	1.22196	90	71	21	1.20	1.665	2.53	1039	961.652	961.65
Aldrin	150	0.41	6.24092	17.057114	0.82959	1.16978	87	59	32	1.15	1.665	2.47	9.286	6.20528	6.2053
alpha-BHC	170	0.077	8.82587	21.319347	0.99986	1.4246565	86	36	58	1.45	1.666	2.82	12.65	11.5949	11.595
alpha-Chlordane	2000	0.29	38.7469	225.23413	1.20939	1.5449323	87	33	62	1.55	1.665	2.94	78.96	18.0544	18.054
alpha-Endosulfan	37	0.8	4.39943	6.6374882	0.78023	1.0545876	87	62	29	1.05	1.665	2.36	5.585	4.97673	4.9767
Aluminum	35900000	2670000	1.1E+07	5631594.4	16.093	0.4616525	94	0	100	0.45	1.664	1.84	1E+07	1.2E+07	1E+07
Anthracene	56000	31	2562.97	7212.5883	6.62221	1.4710709	91	7	92	1.45	1.665	2.82	3821	3434.54	3434.5
Antimony	1020000	360	26579.8	130973.14	8.25393	1.4211826	94	5	95	1.40	1.664	2.76	49056	15845.5	15846
Arochlor 1016	440	15	63.7529	95.420829	3.55252	0.9285622	85	76	11	0.95	1.666	2.26	80.99	67.5047	67.505
Arochlor 1221	900	31	128.876	192.45476	4.25996	0.9261603	85	76	11	0.95	1.666	2.26	163.6	136.567	136.57
Arochlor 1232	440	15	63.7529	95.420829	3.55252	0.9285622	85	76	11	0.95	1.666	2.26	80.99	67.5047	67.505
Arochlor 1242	5900	15	182.094	679.2844	3.82207	1.278648	85	69	19	1.30	1.666	2.64	304.8	149.588	149.59
Arochlor 1248	10000	15	504.059	1293.8224	4.57624	1.7352889	85	44	48	1.75	1.666	3.2	737.8	802.498	802.5
Arochlor 1254	7900	15	498.142	1265.0058	4.53002	1.7123324	88	47	47	1.70	1.665	3.14	722.7	714.659	714.66
1,1,1-Trichloroethane	385000	1	14580.1	66902.384	5.50815	2.9414263	90	81	10	2.95	1.665	4.88	26320	85319.5	85320
1,1,2,2-Tetrachloroethane	385000	4.5	8485.34	44210.505	5.58713	2.7056453	90	81	10	2.70	1.665	4.52	16243	37890.5	37891
1,1,2-Trichloro-1,2,2-Trifluoroethane	385000	4.5	8503.68	44207.494	5.54092	2.791776	90	87	3	2.80	1.665	4.66	16261	49850.1	49850
1,1,2-Trichloroethane	385000	4.5	8483.96	44210.765	5.51631	2.7923738	90	89	1	2.80	1.665	4.66	16242	48733.5	48734
1,1-Dichloroethane	385000	2	8385.11	44203.45	5.48578	2.8038879	90	78	13	2.80	1.665	4.66	16142	49094.2	49094
1,1-Dichloroethene	385000	4.5	8485.04	44210.564	5.55633	2.7436898	90	85	6	2.75	1.665	4.59	16243	42379.9	42380
2,6-Dinitrotoluene	8800	150	825.165	1396.299	6.00603	1.0317168	91	83	9	1.05	1.665	2.36	1069	893.364	893.36
2-Chloronaphthalene	8800	150	834.611	1401.6265	6.02188	1.032457	90	81	10	1.05	1.665	2.36	1081	909.803	909.8
2-Chlorophenol	8800	150	821.556	1404.6725	5.99107	1.0340265	90	85	6	1.05	1.665	2.36	1068	883.981	883.98

Table 1. UCL 95 and EPCs For Soil COPCs in Alburn (unit: ug/kg)

Analyte Name	Max Value	Min Value	Average	Standard Deviation	ln Ave.	ln Standard Deviation	Number	NonDet	DetFreq	tStdDev	tStat	hStat	UCL	lnUCL	EPC
2-Hexanone	385000	2	9866.66	45519.462	5.98685	2.7440429	86	47	45	2.75	1.666	4.59	18042	67314	67314
2-Methylnaphthalene	95000	26	4710.24	13548.611	6.72061	1.8362894	90	2	98	1.85	1.665	3.33	7088	8564.56	8564.6
2-Methylphenol	8800	22	828.911	1504.4244	5.79245	1.2402673	90	62	31	1.25	1.665	2.58	1093	993.038	993.04
2-Nitroaniline	22000	375	2067.22	3497.3904	6.91629	1.0384581	90	84	7	1.05	1.665	2.36	2681	2242.52	2242.5
2-Nitrophenol	8800	150	828.278	1402.9846	6.00647	1.0345437	90	83	8	1.05	1.665	2.36	1074	898.299	898.3
3,3'-Dichlorobenzidine	8800	170	1076.59	1629.3154	6.33119	1.0235727	88	46	48	1.00	1.665	2.31	1366	1221.82	1221.8
3-Nitroaniline	22000	375	2106.59	3566.5421	6.91908	1.048116	91	84	8	1.05	1.665	2.36	2729	2273.72	2273.7
4,6-Dinitro-2-methylphenol	22000	375	2278.96	3661.7291	7.0329	1.0489486	91	71	22	1.05	1.665	2.36	2918	2550.59	2550.6
4-Bromophenyl phenyl ether	8800	150	860.11	1397.0405	6.07049	1.0347908	91	78	14	1.05	1.665	2.36	1104	956.61	956.61
4-Chloro-3-methylphenol	8800	150	820.22	1397.1349	5.99484	1.0327634	91	83	9	1.05	1.665	2.36	1064	884.607	884.61
4-Chloroanlline	8800	150	890.333	1515.196	6.03347	1.0626106	90	77	14	1.05	1.665	2.36	1156	957.14	957.14
4-Chlorophenyl phenyl ether	8800	150	830.278	1402.3999	6.01418	1.0302317	90	82	9	1.05	1.665	2.36	1076	900.252	900.25
Arochlor 1260	5500	15	182.186	620.4437	3.95139	1.2975059	86	64	26	1.30	1.666	2.64	293.6	174.988	174.99
Arsenic	151000	3000	15166	20218.46	9.32004	0.677644	94	0	100	0.70	1.664	2.03	18636	16186.5	16187
Atrazine	8800	150	871.111	1431.1604	6.06809	1.040135	90	75	17	1.05	1.665	2.36	1122	962.29	962.29
Barium	2860000	28900	305560	397103.09	12.1246	0.9953581	94	0	100	1.00	1.664	2.31	4E+05	383858	383858
Benzaldehyde	8800	40	703.589	1212.9062	5.84742	1.0407002	90	78	13	1.05	1.665	2.36	916.4	772.304	772.3
Benzene	385000	2	9341.45	43131.672	5.67872	2.8902396	90	34	62	2.90	1.665	4.8	16910	83033.3	83033
Benzo(a)anthracene	67000	30	3384.92	8317.2912	7.00853	1.4739825	90	5	94	1.45	1.665	2.82	4844	5092.73	5092.7
Benzo(a)pyrene	37000	22	2756.36	5944.6242	6.87294	1.4717994	90	4	96	1.45	1.665	2.82	3799	4429.79	4429.8
Benzo(b)fluoranthene	72000	31	4031.88	9881.1403	7.1782	1.4555737	90	4	96	1.45	1.665	2.82	5766	5841.66	5841.7
Benzo(g,h,I)perylene	26000	31	1938.93	3937.8977	6.62987	1.347698	90	5	94	1.35	1.665	2.7	2630	2762.2	2762.2
Benzo(k)fluoranthene	40000	34	2377.51	5690.6004	6.72196	1.338636	91	13	86	1.35	1.665	2.7	3370	2977.89	2977.9
Benzyl Butyl Phthalate	59000	23	2345.53	6981.9133	6.33121	1.5461681	89	38	57	1.55	1.665	2.94	3578	3016.64	3016.6
Beryllium	8400	350	1401.06	1194.1159	7.02269	0.6279639	94	0	100	0.65	1.664	1.99	1606	1554.88	1554.9
beta-BHC	180	0.074	7.27133	21.950143	0.79495	1.2684168	86	57	34	1.25	1.666	2.58	11.21	7.05928	7.0593
beta-Endosulfan	44	0.21	5.42733	8.1538103	1.07406	1.0390765	86	48	44	1.05	1.666	2.36	6.892	6.5533	6.5533
Biphenyl (Diphenyl)	26000	21	1150	3206.2108	5.84934	1.4532498	90	15	83	1.45	1.665	2.82	1713	1540.46	1540.5
Bis(2-Chloroethoxy) Methane	8800	150	821.056	1405.5627	5.98337	1.0407552	90	86	4	1.05	1.665	2.36	1068	884.832	884.83
Bis(2-Chloroethyl) Ether	8800	150	819.833	1405.6918	5.98243	1.0384316	90	87	3	1.05	1.665	2.36	1066	881.356	881.36
Bis(2-Ethylhexyl) Phthalate	93000	56	7989.29	15478.653	7.55462	1.8194062	90	42	53	1.80	1.665	3.27	10705	18764.5	18764
Bromodichloromethane	385000	4	8484.72	44210.627	5.51428	2.7978532	90	89	1	2.80	1.665	4.66	16243	49519.3	49519
Bromoform	385000	4.5	8417.4	43968.737	5.58396	2.7509219	91	85	7	2.75	1.665	4.59	16089	44267	44267
Bromomethane	385000	3	8485.62	44210.451	5.58235	2.7210155	90	82	9	2.70	1.665	4.52	16244	39605.8	39606
Cadmium	142000	110	5484.73	16800.504	7.1915	1.5638154	92	13	86	1.55	1.664	2.94	8400	7310.07	7310.1
Calcium	346000000	4870000	9.7E+07	71018952	18.1489	0.7394294	92	0	100	0.75	1.664	2.07	1E+08	1.2E+08	1E+08
Caprolactam	8800	38	965.244	1557.2586	6.12788	1.1051479	90	59	34	1.10	1.665	2.42	1239	1120.5	1120.5
Carbazole	35000	20	1444.92	4076.0525	6.11825	1.3862051	90	17	81	1.40	1.665	2.76	2160	1780.53	1780.5
Carbon disulfide	385000	1	8383.14	44183.132	5.37697	2.9707524	90	61	32	2.95	1.665	4.88	16136	82852.8	82853
Chlorobenzene	385000	3	6597.43	40850.408	5.46848	2.7643624	90	72	20	2.75	1.665	4.59	13766	41504.7	41505
Chloroethane	385000	4.5	8839.02	44166.354	5.74887	2.8979763	90	60	33	2.90	1.665	4.8	16589	91443	91443

Table 1. UCL 95 and EPCs For Soil COPCs in Alburn (unit: ug/kg)

Analyte Name	Max Value	Min Value	Average	Standard Deviation	ln Ave.	ln Standard Deviation	Number	NonDet	DetFreq	tStdDev	tStat	hStat	UCL	lnUCL	EPC
Chloromethane	385000	4.5	8484.81	44210.609	5.52755	2.7802586	90	88	2	2.80	1.665	4.66	16243	47364.2	47364
Chromium	1730000	13200	19841	317243.17	11.3665	1.2441442	94	0	100	1.25	1.664	2.58	3E+05	261271	261271
Chrysene	74000	31	3620.01	8893.4731	7.14024	1.4450911	90	4	96	1.45	1.665	2.82	5181	5521.9	5521.9
cis-1,2-Dichloroethene	385000	1	7456.41	41808.029	5.51848	2.8236627	90	63	30	2.80	1.665	4.66	14793	54155.1	54155
Cobalt	84200	235	9814.35	11612.76	8.77534	1.0445352	93	3	97	1.05	1.664	2.36	11818	14442.9	14443
Copper	5010000	14000	251135	596920.56	11.5145	1.2135896	94	0	100	1.20	1.664	2.53	4E+05	287401	287401
Cyanide	218000	90	6457.61	30331.153	7.13503	1.302213	90	3	97	1.30	1.665	2.64	11780	4218.96	4219
Cyclohexane	385000	1	8504.43	44207.213	5.60298	2.7625858	90	78	13	2.75	1.665	4.59	16262	47206.8	47207
delta-BHC	36	0.16	3.80581	5.960652	0.65554	1.0604652	86	50	42	1.05	1.666	2.36	4.876	4.43434	4.4343
Di-N-Butyl Phthalate	34000	16	1090.37	3732.502	5.53708	1.5743346	89	19	79	1.55	1.665	2.94	1749	1437.35	1437.4
Di-N-Octylphthalate	8800	21	1103.63	1760.1662	6.21719	1.195133	87	36	59	1.20	1.665	2.53	1418	1417.7	1417.7
Dibenz(a,h)Anthracene	11000	22	1049.79	1859.4188	5.99569	1.3667014	90	18	80	1.35	1.665	2.7	1376	1511.46	1511.5
Dibenzofuran	77000	23	2315.12	8622.7179	6.31194	1.4950343	91	16	82	1.50	1.665	2.88	3820	2653.2	2653.2
Dichlorodifluoromethane	385000	4.5	9199.85	44561.866	5.58713	2.8377398	90	81	10	2.85	1.665	4.73	17019	62111.8	62112
Dieldrin	290	0.45	22.3455	39.249834	2.0194	1.5158534	89	16	82	1.50	1.665	2.88	29.27	37.8581	37.858
Diethyl Phthalate	8800	30	813.1	1427.326	5.91405	1.1258529	90	70	22	1.15	1.665	2.47	1064	936.957	936.96
Dimethyl Phthalate	8800	150	817.5	1395.4622	6.00567	1.019485	90	81	10	1.00	1.665	2.31	1062	875.28	875.28
Endosulfan sulfate	190	0.26	9.87663	22.463489	1.41515	1.1811628	89	41	54	1.20	1.665	2.53	13.84	11.3666	11.367
Endrin	280	0.18	13.7189	34.779132	1.53757	1.3364549	89	39	56	1.35	1.665	2.7	19.86	16.699	16.699
Endrin aldehyde	350	0.5	14.0882	38.832268	1.68537	1.2121617	89	27	70	1.20	1.665	2.53	20.94	15.5854	15.585
Endrin ketone	78	0.37	7.30784	11.894515	1.34374	1.001623	88	54	39	1.00	1.665	2.31	9.419	8.10917	8.1092
Ethylbenzene	5000000	1	97775.2	558622.88	6.59097	3.6171507	90	17	81	3.60	1.665	5.83	2E+05	4723348	5E+06
Fluoranthene	230000	22	8491.31	26801.327	7.62817	1.6879303	91	3	97	1.70	1.665	3.14	13168	14924	14924
Fluorene	96000	28	3036.19	10882.73	6.64781	1.4792364	90	9	90	1.50	1.665	2.88	4946	3617.78	3617.8
gamma-BHC	220	0.12	6.12736	23.740534	0.7709	1.0957285	87	47	46	1.10	1.665	2.42	10.37	5.24161	5.2416
gamma-Chlordane	520	0.57	21.4013	64.469069	1.66832	1.4880237	90	39	57	1.50	1.665	2.88	32.71	25.2757	25.276
Heptachlor	64	0.9	3.91701	7.8097555	0.71512	0.9342149	87	70	20	0.95	1.665	2.26	5.311	3.97001	3.97
Heptachlor epoxide	110	0.17	10.5927	18.635213	1.31749	1.4714803	88	28	68	1.45	1.665	2.82	13.9	17.2037	17.204
Hexachlorobenzene	8800	150	841.222	1399.8861	6.03728	1.0321687	90	79	12	1.05	1.665	2.36	1087	923.584	923.58
Hexachlorobutadiene	8800	150	821.056	1405.5627	5.98337	1.0407552	90	86	4	1.05	1.665	2.36	1068	884.832	884.83
Hexachlorocyclopentadiene	8800	150	921.778	1445.3934	6.1374	1.0458963	90	66	27	1.05	1.665	2.36	1175	1039.07	1039.1
Hexachloroethane	8800	150	814.333	1407.2126	5.96797	1.039895	90	88	2	1.05	1.665	2.36	1061	870.341	870.34
Indeno(1,2,3-CD)pyrene	24000	20	1874.54	3382.9666	6.61401	1.3878428	90	6	93	1.40	1.665	2.76	2468	2931.22	2931.2
Iron	405000000	7970000	5.2E+07	55034274	17.4575	0.738418	92	0	100	0.75	1.664	2.07	6E+07	5.9E+07	6E+07
Isophorone	8800	33	801.7	1439.1721	5.90753	1.0846488	90	73	19	1.10	1.665	2.42	1054	874.358	874.36
Isopropylbenzene	170000	1	5898.31	20907.349	5.64583	2.9465667	90	37	59	2.95	1.665	4.88	9567	99670.7	99671
Lead	6730000	15300	549498	955779.1	12.4175	1.2874305	94	0	100	1.30	1.664	2.64	7E+05	805069	805069
Magnesium	52300000	883000	1.9E+07	10896983	16.5443	0.7545205	94	0	100	0.75	1.664	2.07	2E+07	2.4E+07	2E+07
Manganese	40500000	156000	3173261	5858092.5	14.1261	1.2088966	92	0	100	1.20	1.664	2.53	4E+06	3901427	4E+06
Mercury	3800	15	411.33	586.57617	5.44968	1.0294423	94	2	98	1.05	1.664	2.36	512	508.554	508.55
Methoxychlor	300	1.8	42.8978	65.424071	2.99067	1.120287	91	56	38	1.10	1.665	2.42	54.31	49.5731	49.573

Table 1. UCL 95 and EPCs For Soil COPCs in Alburn (unit: ug/kg)

Analyte Name	Max Value	Min Value	Average	Standard Deviation	ln Ave.	ln Standard Deviation	Number	NonDet	DetFreq	tStdDev	tStat	hStat	UCL	lnUCL	EPC
Methyl acetate	385000	5	8497.97	44208.657	5.55845	2.748912	90	84	7	2.75	1.665	4.59	16256	43192.9	43193
Methyl ethyl ketone	385000	4	8579.39	44205.664	5.66349	2.7017626	90	76	16	2.70	1.665	4.52	16336	40394.8	40395
Methyl isobutyl ketone	385000	4	8575.61	44195.265	5.66039	2.783009	90	74	18	2.80	1.665	4.66	16331	54583.1	54583
Methylcyclohexane	385000	1	12217.3	56967.219	5.63259	2.9173374	90	42	53	2.90	1.665	4.8	22214	86972.6	86973
Methylene chloride	400000	2	8884.02	47037.78	5.65414	2.785822	90	35	61	2.80	1.665	4.66	17138	54745.5	54745
N-Nitrosodi-N-Propylamine	8800	150	901.611	1485.93	6.07579	1.0560201	90	74	18	1.05	1.665	2.36	1162	989.937	989.94
N-Nitrosodiphenylamine	8800	150	864.663	1412.3376	6.07867	1.0276602	89	67	25	1.05	1.665	2.36	1114	958.47	958.47
Naphthalene	670000	24	19992.9	85370.447	7.51978	2.0881689	90	1	99	2.10	1.665	3.67	34973	36782.6	36783
Nickel	568000	10500	56988.3	88886.58	10.5223	0.7745366	94	0	100	0.80	1.664	2.11	72242	59392	59392
Nitrobenzene	8800	150	821.056	1405.5627	5.98337	1.0407552	90	86	4	1.05	1.665	2.36	1068	884.832	884.83
p,p'-DDD	1900	0.64	62.1799	211.14529	2.53283	1.7347316	90	16	82	1.75	1.665	3.2	99.23	102.095	102.09
p,p'-DDE	460	0.62	36.8025	66.324216	2.42728	1.5936549	88	13	85	1.60	1.665	3.01	48.58	67.4371	67.437
p,p'-DDT	780	0.54	56.929	111.82062	2.70677	1.6909835	88	20	77	1.70	1.665	3.14	76.78	110.504	110.5
Pentachlorophenol	22000	375	2419.28	3794.7343	7.05492	1.0920442	90	66	27	1.10	1.665	2.42	3085	2781.7	2781.7
Phenanthrene	360000	31	11193.7	41267.153	7.77697	1.6724867	90	1	99	1.65	1.665	3.07	18435	16651.6	16652
Phenol	17000	37	1245.99	2635.7526	6.12047	1.2493431	90	58	36	1.25	1.665	2.58	1709	1397.68	1397.7
Potassium	7980000	117000	1747133	1194743.8	14.1686	0.6719928	94	1	99	0.65	1.664	1.99	2E+06	2048851	2E+06
Pyrene	170000	20	8175.67	21517.183	7.79102	1.6225259	90	1	99	1.60	1.665	3.01	11951	15134.8	15135
Selenium	9700	255	2245.99	1840.766	7.36892	0.8972666	91	15	84	0.90	1.665	2.21	2567	2922.23	2922.2
Silver	37100	110	1882.07	4782.6861	6.30796	1.4460577	94	40	57	1.45	1.664	2.82	2703	2383.87	2383.9
Sodium	11900000	57600	1457464	1423093.3	13.9245	0.7747516	94	0	100	0.80	1.664	2.11	2E+06	1783953	2E+06
Styrene	385000	4.5	8489.74	44209.88	5.54303	2.7671367	90	86	4	2.75	1.665	4.59	16248	45122.4	45122
Tetrachloroethene	360000	3	7518.21	39793.45	5.52334	2.8298609	90	63	30	2.85	1.665	4.73	14501	56761.6	56762
Thallium	13700	240	2587.37	2882.7756	7.38929	0.9708415	93	14	85	0.95	1.664	2.26	3085	3258.1	3258.1
Toluene	3700000	2	71264.6	407745.43	6.32246	3.4480268	89	27	70	3.45	1.665	5.61	1E+05	1669512	2E+06
Toxaphene	2300	80	328.294	491.34204	5.19168	0.9284949	85	76	11	0.95	1.666	2.26	417.1	347.68	347.68
trans-1,2-Dichloroethene	385000	2	8468.59	44213.631	5.44979	2.8085616	90	85	6	2.80	1.665	4.66	16227	48095.1	48095
trans-1,3-Dichloropropene	385000	4.5	8484.79	44210.611	5.52552	2.7830762	90	89	1	2.80	1.665	4.66	16243	47706.6	47707
Trichloroethene	385000	1	13660	62290.349	5.53945	2.9260946	90	59	34	2.95	1.665	4.88	24590	83496.1	83496
Trichlorofluoromethane	385000	1	8484.74	44210.621	5.50658	2.8149909	90	88	2	2.80	1.665	4.66	16243	51998.8	51999
Vanadium	343000	11800	52691.5	64423.317	10.4905	0.7816688	94	0	100	0.80	1.664	2.11	63747	57942	57942
Vinyl chloride	385000	2	8477.01	44212.015	5.48747	2.8137394	90	86	4	2.80	1.665	4.66	16235	50804	50804
Xylenes	25000000	2	419816	2709426.6	7.45369	3.9429286	89	9	90	3.95	1.665	6.35	9E+05	5.9E+07	3E+07
Zinc	4350000	54400	681779	829308.2	12.888	1.0460711	92	0	100	1.05	1.664	2.36	8E+05	885607	885607

Table 2. UCL 95 and EPCs For Soil COPCs in U.S. Drum (unit: ug/kg)

Analyte Name	Max Value	Min Value	Average	Standard Deviation	ln Ave.	ln Standard Deviation	Number	NonDet	DetFreq	tStdDev	tStat	hStat	UCL	lnUCL	EPC
1,1,1-Trichloroethane	14500	5.5	730.7248	1798.094	4.7252	2.298826	109	97	11	2.30	1.6606	3.95	1016.7	3794.5	3794
1,1,2,2-Tetrachloroethane	15000	5.5	876.289	2554.705	4.7237	2.287159	109	104	5	2.30	1.6606	3.95	1282.6	3672.1	3672
1,1,2-Trichloro-1,2,2-Trifluoroethane	16000	5.5	976.6422	2866.942	4.7364	2.340501	109	102	6	2.35	1.6606	4.02	1432.6	4361.6	4362
1,1,2-Trichloroethane	15000	5.5	876.0459	2554.788	4.7046	2.306032	109	107	2	2.30	1.6606	3.95	1282.4	3789.4	3789
1,1-Dichloroethane	15000	1	873.9266	2558.351	4.612	2.443407	109	92	16	2.45	1.6606	4.159	1280.8	5296.6	5297
1,1-Dichloroethene	15000	5.5	887.0963	2553.616	4.7364	2.305867	109	102	6	2.30	1.6606	3.95	1293.3	3910.1	3910
1,2,3,4,6,7,8-Heptachlorodibenzo-P-Dioxin	3.757	2.455	3.36475	0.615473	1.199	0.202615	4	0	100	0.20	2.353	2.747	4.0889	4.6682	3.757
1,2,3,4,6,7,8-Heptachlorodibenzofuran	2.171	1.186	1.6345	0.489667	0.457	0.303352	4	0	100	0.30	2.353	3.256	2.2106	2.9247	2.171
1,2,3,4,7,8,9-Heptachlorodibenzofuran	3.003	1.64	2.2615	0.677413	0.7817	0.303367	4	0	100	0.30	2.353	3.256	3.0585	4.0468	3.003
1,2,3,4,7,8-Hexachlorodibenzofuran	5.505	1.545	2.77525	1.865439	0.8772	0.590029	4	0	100	0.60	2.353	5.547	4.9699	18.932	5.505
1,2,3,6,7,8-Hexachlorodibenzo-P-Dioxin	2.095	0.9685	1.656375	0.508276	0.4624	0.351068	4	1	75	0.35	2.353	3.596	2.2544	3.5	2.095
1,2,3,6,7,8-Hexachlorodibenzofuran	5.531	0.7765	2.085625	2.306108	0.3621	0.922404	4	3	25	0.90	2.353	8.109	4.7988	165.01	5.531
1,2,3,7,8,9-Hexachlorodibenzo-P-Dioxin	2.059	0.9515	1.627875	0.499695	0.445	0.351245	4	1	75	0.35	2.353	3.596	2.2158	3.4411	2.059
1,2,3,7,8-Pentachlorodibenzofuran	2.038	1.1175	1.380375	0.441875	0.2892	0.285682	4	2	50	0.30	2.353	3.256	1.9002	2.3798	2.038
1,2,4-Trichlorobenzene	15000	2	880.711	2556.394	4.668	2.364313	109	95	13	2.35	1.6606	4.02	1287.3	4347.8	4348
1,2-Dibromo-3-Chloropropane	15000	2	876.1514	2554.752	4.6964	2.325605	109	103	6	2.35	1.6606	4.02	1282.5	4024.3	4024
1,2-Dibromoethane	15000	5.5	876.289	2554.705	4.7237	2.287159	109	104	5	2.30	1.6606	3.95	1282.6	3672.1	3672
1,2-Dichlorobenzene	15000	1	885.2752	2564.522	4.8089	2.225292	109	80	27	2.25	1.6606	3.881	1293.2	3347.1	3347
1,2-Dichloroethane	14500	2	974.7523	2530.86	4.7582	2.393948	109	95	13	2.40	1.6606	4.089	1377.3	5248.3	5248
1,2-Dichloropropane	15000	5.5	876.078	2554.777	4.7085	2.301497	109	106	3	2.30	1.6606	3.95	1282.4	3758.4	3758
1,3-Dichlorobenzene	120000	1	2098.904	11722.31	4.7843	2.451737	109	98	10	2.45	1.6606	4.159	3963.4	6444.1	6444
1,4-Dichlorobenzene	130000	2	2424.936	12684.68	5.1253	2.468252	109	58	47	2.45	1.6606	4.159	4442.5	9500.6	9501
2,2'-Oxybis(1-Chloro)Propane	48000	190	4495.648	7493.723	7.3083	1.528418	108	89	18	1.55	1.6608	2.945	5693.2	7416.4	7416
2,3,4,6,7,8-Hexachlorodibenzofuran	5.539	0.7775	2.29075	2.192506	0.5368	0.83955	4	2	50	0.85	2.353	7.678	4.8702	100.55	5.539
2,3,4,7,8-Pentachlorodibenzofuran	1.998	1.096	1.3535	0.433059	0.2696	0.285556	4	2	50	0.30	2.353	3.256	1.863	2.3329	1.998
2,3,7,8-Tetrachlorodibenzofuran	2.14	0.469	1.47475	0.77091	0.2369	0.701615	4	1	75	0.70	2.353	6.391	2.3817	21.584	2.14
2,4,5-Trichlorophenol	120000	470	11085.42	18731.41	8.1513	1.574716	108	101	6	1.60	1.6608	3.009	14079	18943	18943
2,4,6-Trichlorophenol	48000	190	4427.5	7515.937	7.2441	1.560119	108	99	8	1.55	1.6608	2.945	5628.6	7370.5	7371
2,4-Dichlorophenol	48000	76	4421.907	7519.051	7.2206	1.588351	108	99	8	1.60	1.6608	3.009	5623.5	7661.5	7661
2,4-Dimethylphenol	48000	22	3968.074	6599.958	7.0023	1.748154	108	75	31	1.75	1.6608	3.2	5022.8	8700.6	8701
2,4-Dinitrophenol	210000	470	17741.11	30114.24	8.5813	1.617603	108	34	69	1.60	1.6608	3.009	22554	31574	31574
2,4-Dinitrotoluene	48000	190	4423.75	7518.013	7.2313	1.573189	108	101	6	1.55	1.6608	2.945	5625.2	7454.7	7455
2,6-Dinitrotoluene	48000	190	4419.861	7520.039	7.2237	1.578146	108	100	7	1.60	1.6608	3.009	5621.7	7539.9	7540
2-Chloronaphthalene	48000	37	4421.685	7519.197	7.2132	1.603436	108	100	7	1.60	1.6608	3.009	5623.3	7825.1	7825
2-Chlorophenol	48000	190	4441.343	7514.274	7.2377	1.575912	108	100	7	1.60	1.6608	3.009	5642.2	7614.5	7614
2-Hexanone	15000	5.5	878	2542.968	4.753	2.278131	110	104	5	2.30	1.6604	3.95	1280.6	3677	3677
2-Methylnaphthalene	76000	26	4267.472	10491.59	6.7591	1.826536	108	11	90	1.85	1.6608	3.333	5944.2	8231.7	8232
2-Methylphenol	48000	21	4330.657	7546.821	7.0907	1.689254	108	89	18	1.70	1.6608	3.136	5536.7	8347	8347
2-Nitroaniline	120000	470	11085.42	18731.41	8.1513	1.574716	108	101	6	1.60	1.6608	3.009	14079	18943	18943
2-Nitrophenol	48000	190	4423.75	7518.013	7.2313	1.573189	108	101	6	1.55	1.6608	2.945	5625.2	7454.7	7455
3,3'-Dichlorobenzidine	48000	190	4423.75	7518.013	7.2313	1.573189	108	101	6	1.55	1.6608	2.945	5625.2	7454.7	7455
3-Nitroaniline	120000	470	11085.42	18731.41	8.1513	1.574716	108	101	6	1.60	1.6608	3.009	14079	18943	18943

Table 2. UCL 95 and EPCs For Soil COPCs in U.S. Drum (unit: ug/kg)

Analyte Name	Max Value	Min Value	Average	Standard Deviation	ln Ave.	ln Standard Deviation	Number	NonDet	DetFreq	tStdDev	tStat	hStat	UCL	lnUCL	EPC
4,6-Dinitro-2-methylphenol	120000	180	11244.86	18877.15	8.1428	1.602874	108	99	8	1.60	1.6608	3.009	14262	19802	19802
4-Bromophenyl phenyl ether	48000	190	4488.565	7570.422	7.2377	1.581263	108	100	7	1.60	1.6608	3.009	5698.4	7691	7691
4-Chloro-3-methylphenol	48000	61	4348.759	7507.945	7.1975	1.586844	108	98	9	1.60	1.6608	3.009	5548.6	7465.6	7466
4-Chloroaniline	48000	28	4419.019	7539.464	7.129	1.691988	108	92	15	1.70	1.6608	3.136	5623.9	8720.6	8721
4-Chlorophenyl phenyl ether	48000	190	4400.138	7487.186	7.234	1.566138	109	102	6	1.55	1.6606	2.945	5591	7362.4	7362
4-Methylphenol	48000	20	4496.833	8302.411	6.9712	1.846778	108	54	50	1.85	1.6608	3.333	5823.7	10632	10632
4-Nitroaniline	120000	470	11085.42	18731.41	8.1513	1.574716	108	101	6	1.60	1.6608	3.009	14079	18943	18943
4-Nitrophenol	120000	470	13057.64	21247.57	8.2091	1.65457	108	92	15	1.65	1.6608	3.072	16453	23607	23607
Acenaphthene	48000	43	3717.815	7525.487	6.8365	1.703576	108	31	71	1.70	1.6608	3.136	4920.5	6661.7	6662
Acenaphthylene	48000	20	4240.481	7612.295	6.7607	1.982187	108	62	43	2.00	1.6608	3.533	5457	12116	12116
Acetone	31000	5.5	1982.991	5390.989	5.8837	1.932006	109	13	88	1.95	1.6606	3.466	2840.5	4422.6	4423
Acetophenone	48000	32	4346.019	7536.331	7.1069	1.698723	108	93	14	1.70	1.6608	3.136	5550.4	8645.5	8646
Aldrin	200	0.95	6.487019	24.0247	0.6821	1.054307	104	93	11	1.05	1.6617	2.361	10.402	4.4067	4.407
alpha-BHC	400	0.95	7.031429	38.99586	0.7467	0.966617	105	74	30	0.95	1.6615	2.256	13.354	4.1692	4.169
alpha-Chlordane	200	0.6	7.77028	22.77186	0.9623	1.155201	107	45	58	1.15	1.661	2.47	11.427	6.7312	6.731
alpha-Endosulfan	7400	0.84	84.22537	713.745	1.1954	1.608963	108	65	40	1.60	1.6608	3.009	198.29	19.254	19.25
Aluminum	2.3E+07	1060000	8793670	3769275	15.882	0.505713	109	0	100	0.50	1.6606	1.876	9E+06	1E+07	1E+07
Anthracene	68000	22	4245.324	8799.777	6.9898	1.79209	108	26	76	1.80	1.6608	3.267	5651.6	9523.4	9523
Antimony	218000	1100	12518.18	35054.42	8.2105	1.23042	55	0	100	1.25	1.6749	2.58	20435	12082	12082
Arochlor 1016	3950	19	91.15238	388.2896	3.5659	0.909984	105	95	10	0.90	1.6615	2.206	154.11	65.154	65.15
Arochlor 1221	8000	38	185.0429	786.5451	4.2745	0.910714	105	95	10	0.90	1.6615	2.206	312.58	132.45	132.5
Arochlor 1232	3950	19	91.15238	388.2896	3.5659	0.909984	105	95	10	0.90	1.6615	2.206	154.11	65.154	65.15
Arochlor 1242	45000	19	3125.28	6607.676	6.1293	2.307287	109	29	73	2.30	1.6606	3.95	4176.3	15805	15805
Arochlor 1248	3950	19	166.2333	559.5608	3.7653	1.199022	105	91	13	1.20	1.6615	2.525	256.96	119.23	119.2
Arochlor 1254	64000	19	1908.171	6485.509	5.7042	2.075019	108	31	71	2.10	1.6608	3.672	2944.6	5397.5	5398
Arochlor 1260	64000	19	1431.307	8149.737	4.462	1.794306	106	65	39	1.80	1.6613	3.267	2746.3	768	768
Arsenic	82500	840	14394.86	14122.15	9.2574	0.799268	109	0	100	0.80	1.6606	2.112	16641	16971	16971
Atrazine	48000	190	4488.565	7570.422	7.2377	1.581263	108	100	7	1.60	1.6608	3.009	5698.4	7691	7691
Barium	1740000	20500	284247.7	312374.1	12.087	0.978922	109	0	100	1.00	1.6606	2.306	333933	356099	4E+05
Benzaldehyde	48000	22	4516.333	7634.496	7.1947	1.651539	108	91	16	1.65	1.6608	3.072	5736.4	8510.6	8511
Benzene	20000	2	897.5963	2706.935	4.8309	2.104176	109	24	78	2.10	1.6606	3.672	1328.2	2411.8	2412
Benzo(a)anthracene	100000	37	5626.444	12407.75	7.387	1.70308	108	21	81	1.70	1.6608	3.136	7609.4	11541	11541
Benzo(a)pyrene	55000	25	5234.787	9798.884	7.2697	1.778284	108	22	80	1.80	1.6608	3.267	6800.8	12240	12240
Benzo(b)fluoranthene	71000	20	5381.944	10632.37	7.2617	1.821134	108	21	81	1.80	1.6608	3.267	7081.1	13294	13294
Benzo(g,h,i)perylene	48000	37	4274.315	7540.581	7.0332	1.797582	108	21	81	1.80	1.6608	3.267	5479.4	10062	10062
Benzo(k)fluoranthene	65000	30	5173.917	9768.715	7.2096	1.825215	108	27	75	1.85	1.6608	3.333	6735.1	12880	12880
Benzyl Butyl Phthalate	63000	24	4590.778	9207.154	7.1158	1.716947	108	61	44	1.70	1.6608	3.136	6062.2	9047.8	9048
Beryllium	2500	30	638.1651	470.3233	6.1583	0.860267	109	13	88	0.85	1.6606	2.159	712.97	818.17	818.2
beta-BHC	400	0.95	8.251887	40.58897	0.7938	1.059487	106	70	34	1.05	1.6613	2.361	14.801	4.9487	4.949
beta-Endosulfan	1500	1.3	21.8281	147.6765	1.3056	1.050499	105	84	20	1.05	1.6615	2.361	45.773	8.1706	8.171
Biphenyl (Diphenyl)	48000	21	3698.481	6756.238	6.6907	1.891932	108	47	56	1.90	1.6608	3.4	4778.2	8975.5	8975
Bis(2-Chloroethoxy) Methane	48000	190	4423.75	7518.013	7.2313	1.573189	108	101	6	1.55	1.6608	2.945	5625.2	7454.7	7455

Table 2. UCL 95 and EPCs For Soil COPCs in U.S. Drum (unit: ug/kg)

Analyte Name	Max Value	Min Value	Average	Standard Deviation	ln Ave.	ln Standard Deviation	Number	NonDet	DetFreq	tStdDev	tStat	hStat	UCL	lnUCL	EPC
Bis(2-Chloroethyl) Ether	48000	190	4423.75	7518.013	7.2313	1.573189	108	101	6	1.55	1.6608	2.945	5625.2	7454.7	7455
Bis(2-Ethylhexyl) Phthalate	480000	41	25327.25	66309.33	8.1731	2.142423	109	13	88	2.15	1.6606	3.742	35874	76068	76068
Bromodichloromethane	15000	4	876	2554.804	4.6971	2.315485	109	106	3	2.30	1.6606	3.95	1282.4	3858.2	3858
Bromoform	30000	5.5	1170.22	3662.728	4.8	2.404687	109	92	16	2.40	1.6606	4.089	1752.8	5638.6	5639
Bromomethane	30000	5.5	1223.183	4246.486	4.9208	2.315313	109	73	33	2.30	1.6606	3.95	1898.6	4823	4823
Cadmium	161000	90	5324.45	16218.94	7.3379	1.568977	109	17	84	1.55	1.6606	2.945	7904.2	8211.6	8212
Calcium	2.1E+08	2080000	61194128	46579755	17.647	0.798315	109	0	100	0.80	1.6606	2.112	7E+07	7E+07	7E+07
Caprolactam	48000	33	4266.87	7509.485	7.1479	1.616513	108	91	16	1.60	1.6608	3.009	5467	7514.5	7515
Carbazole	48000	23	3805.37	7425.866	6.7222	1.828845	108	39	64	1.85	1.6608	3.333	4992.1	7973.6	7974
Carbon disulfide	30000	2	1051.495	3539.53	4.9767	2.163225	109	68	38	2.15	1.6606	3.742	1614.5	3279.1	3279
Carbon tetrachlorlde	16000	5.5	976.6422	2866.942	4.7364	2.340501	109	102	6	2.35	1.6606	4.02	1432.6	4361.6	4362
Chlorobenzene	120000	2	2395.702	11941.09	5.0611	2.428013	109	61	44	2.45	1.6606	4.159	4295	7945.4	7945
Chloroethane	30000	5	1338.376	4395.59	4.8746	2.421207	109	79	28	2.40	1.6606	4.089	2037.5	6363.8	6364
Chloroform	15000	5.5	796.3486	2232.878	4.6751	2.286645	109	102	6	2.30	1.6606	3.95	1151.5	3493.2	3493
Chloromethane	29000	5.5	1036.06	3477.049	4.7576	2.358393	109	97	11	2.35	1.6606	4.02	1589.1	4678.7	4679
Chromium	1070000	3300	116278.9	182597	10.916	1.182847	109	0	100	1.20	1.6606	2.525	145322	147754	1E+05
Chrysene	100000	27	5503.102	12143.28	7.3567	1.739773	108	15	86	1.75	1.6608	3.2	7443.7	12190	12190
cis-1,2-Dichloroethene	15000	1	918.055	2589.043	4.5874	2.477045	109	79	28	2.50	1.6606	4.228	1329.9	5785	5785
cis-1,3-Dichloropropene	15000	5.5	876.0459	2554.788	4.7046	2.306032	109	107	2	2.30	1.6606	3.95	1282.4	3789.4	3789
Cobalt	52500	550	9642.661	6723.944	8.969	0.694693	109	2	98	0.70	1.6606	2.025	10712	11449	11449
Copper	6010000	10700	258911.9	650642.6	11.496	1.280329	109	0	100	1.30	1.6606	2.64	362401	308935	3E+05
Cyanide	14700	70	918.9216	2111.306	5.714	1.260589	102	31	70	1.25	1.6621	2.58	1266.4	927.18	927.2
Cyclohexane	15000	2	910.5046	2595.658	4.7322	2.301777	109	62	43	2.30	1.6606	3.95	1323.4	3851.1	3851
delta-BHC	200	0.58	4.946509	19.65667	0.665	0.953466	106	78	26	0.95	1.6613	2.256	8.1182	3.779	3.779
Di-N-Butyl Phthalate	48000	24	3873.556	6746.679	6.8269	1.8675	108	54	50	1.85	1.6608	3.333	4951.8	9628.2	9628
DI-N-Octylphthalate	50000	74	4802.796	8781.319	7.2391	1.611017	108	81	25	1.60	1.6608	3.009	6206.2	8146.5	8146
Dibenz(a,h)Anthracene	48000	20	3888.639	7392.38	6.7289	1.896069	108	40	63	1.90	1.6608	3.4	5070	9411.2	9411
Dibenzofuran	48000	21	3879.778	7380.215	6.7259	1.915476	108	36	67	1.90	1.6608	3.4	5059.2	9798.8	9799
Dibromochloromethane	30000	5.5	1054.991	3556.857	4.7364	2.346335	109	102	6	2.35	1.6606	4.02	1620.7	4431.7	4432
Dichlorodifluoromethane	15000	2	875.9817	2554.81	4.6908	2.325592	109	106	3	2.35	1.6606	4.02	1282.3	4001.6	4002
Dieldrin	395	1.9	10.36934	39.04617	1.3962	0.990541	106	91	14	1.00	1.6613	2.306	16.67	8.2461	8.246
Diethyl Phthalate	48000	21	4048.009	7271.366	7.0321	1.688544	108	82	24	1.70	1.6608	3.136	5210.1	7860.7	7861
Dimethyl Phthalate	48000	20	4406.231	7527.031	7.1694	1.653167	108	97	10	1.65	1.6608	3.072	5609.1	8323.7	8324
Endosulfan sulfate	395	1.9	9.090654	38.46238	1.2776	0.907664	107	96	10	0.90	1.661	2.206	15.267	6.5798	6.58
Endrin	395	1.9	9.237864	39.19742	1.2688	0.916931	103	94	9	0.90	1.6619	2.206	15.657	6.6158	6.616
Endrin aldehyde	395	1.9	10.70048	40.47026	1.3176	1.000947	105	92	12	1.00	1.6615	2.306	17.262	7.7285	7.728
Endrin ketone	395	1.1	14.43585	44.61628	1.5984	1.154907	106	53	50	1.15	1.6613	2.47	21.635	12.728	12.73
Ethylbenzene	260000	1	8914.454	33533.19	5.4836	3.0716	109	20	82	3.05	1.6606	5.02	14248	118753	1E+05
Fluoranthene	340000	21	10112.68	34807.38	7.9021	1.666916	109	11	90	1.65	1.6606	3.072	15649	17752	17752
Fluorene	48000	22	3826.514	7268.363	6.9545	1.741717	109	27	75	1.75	1.6606	3.2	4982.6	8164.8	8165
gamma-BHC	200	0.95	4.822115	19.86272	0.6111	0.927839	104	93	11	0.95	1.6617	2.256	8.0586	3.4826	3.483
gamma-Chlordane	200	0.95	8.44619	24.4258	0.9107	1.221819	105	79	25	1.20	1.6615	2.525	12.407	7.0966	7.097

Table 2. UCL 95 and EPCs For Soil COPCs in U.S. Drum (unit: ug/kg)

Analyte Name	Max Value	Min Value	Average	Standard Deviation	ln Ave.	ln Standard Deviation	Number	NonDet	DetFreq	tStdDev	tStat	hStat	UCL	lnUCL	EPC
Heptachlor	640	0.67	36.39339	84.53663	1.9284	1.835364	109	37	66	1.85	1.6606	3.333	49.84	66.774	66.77
Heptachlor epoxide	200	0.75	6.096667	20.67361	0.7871	1.069312	105	83	21	1.05	1.6615	2.361	9.4487	4.9844	4.984
Hexachlorobenzene	48000	69	4485.546	7572.135	7.2215	1.603008	108	99	8	1.60	1.6608	3.009	5695.7	7884.1	7884
Hexachlorobutadiene	48000	28	4393.083	7476.529	7.2244	1.595908	108	91	16	1.60	1.6608	3.009	5587.9	7801.6	7802
Hexachlorocyclopentadiene	85000	205	7731.378	12262.77	7.8449	1.562868	98	4	96	1.55	1.663	2.945	9791.4	13814	13814
Hexachloroethane	48000	190	4423.75	7518.013	7.2313	1.573189	108	101	6	1.55	1.6608	2.945	5625.2	7454.7	7455
Indeno(1,2,3-CD)pyrene	48000	28	4490.815	7672.909	7.0516	1.860214	108	31	71	1.85	1.6608	3.333	5717	11864	11864
Iron	2.6E+08	3700000	58171193	54597986	17.511	0.873347	109	0	100	0.85	1.6606	2.159	7E+07	7E+07	7E+07
Isophorone	48000	22	4351.602	7520.401	7.1468	1.656493	108	92	15	1.65	1.6608	3.072	5553.5	8191	8191
Isopropylbenzene	15000	1	1088.647	2461.064	5.0635	2.326423	109	34	69	2.35	1.6606	4.02	1480.1	5822.3	5822
Lead	5090000	10300	552611	839481.6	12.295	1.50751	109	0	100	1.50	1.6606	2.881	686136	1E+06	1E+06
Magnesium	6.4E+07	1170000	14029358	10022227	16.14	0.882509	109	0	100	0.90	1.6606	2.206	2E+07	2E+07	2E+07
Manganese	3.1E+07	110000	2287670	5499833	13.636	1.144567	109	0	100	1.15	1.6606	2.47	3E+06	2E+06	2E+06
Mercury	6000	25	506.422	843.5483	5.4454	1.27224	109	17	84	1.25	1.6606	2.58	640.59	713.78	713.8
Methoxychlor	7300	7.9	101.5562	711.371	3.0324	0.984501	105	73	30	1.00	1.6615	2.306	216.9	42.081	42.08
Methyl acetate	31000	3	1263.606	3957.613	4.8774	2.33024	109	47	57	2.35	1.6606	4.02	1893.1	4883.8	4884
Methyl ethyl ketone	30000	5	1057.518	3543.368	5.0568	2.047561	109	50	54	2.05	1.6606	3.603	1621.1	2598.9	2599
Methyl Isobutyl ketone	15000	1	879.867	2554.82	4.6276	2.45242	109	85	22	2.45	1.6606	4.159	1286.2	5519.7	5520
Methylcyclohexane	15000	1	911.8636	2560.235	4.7045	2.308438	110	36	67	2.30	1.6604	3.95	1317.2	3798.2	3798
Methylene chloride	15000	1	873.8991	2450.938	4.6753	2.337395	109	66	39	2.35	1.6606	4.02	1263.7	4068.5	4069
N-Nitrosodi-N-Propylamine	48000	190	4450.602	7510.609	7.2441	1.575967	108	99	8	1.60	1.6608	3.009	5650.9	7664.3	7664
N-Nitrosodiphenylamine	48000	24	4038.287	7205.214	6.9881	1.710335	108	72	33	1.70	1.6608	3.136	5189.8	7857.7	7858
Naphthalene	110000	27	7521.761	17568.94	7.114	2.009678	109	8	93	2.00	1.6606	3.533	10316	18336	18336
Nickel	470000	2600	49107.34	60018.02	10.415	0.838661	109	0	100	0.85	1.6606	2.159	58654	56435	56435
Nitrobenzene	48000	190	4425.046	7518.059	7.2274	1.578656	108	100	7	1.60	1.6608	3.009	5626.5	7575.2	7575
Octachlorodibenzo-P-Dioxin	4.196	2.39	3.05525	0.823635	1.0915	0.255617	4	0	100	0.25	2.353	3.001	4.0243	4.7923	4.196
Octachlorodibenzofuran	9.845	2.756	4.954	3.336962	1.4566	0.589258	4	0	100	0.60	2.353	5.547	8.8799	33.696	9.845
p,p'-DDD	3700	1.3	122.2028	392.0719	3.2335	1.78384	109	18	83	1.80	1.6606	3.267	184.56	218.16	218.2
p,p'-DDE	730	1.1	61.52339	95.83597	2.9149	1.797288	109	35	68	1.80	1.6606	3.267	76.767	163.2	163.2
p,p'-DDT	395	1.5	14.05524	41.6042	1.572	1.173508	105	82	22	1.15	1.6615	2.47	20.801	12.741	12.74
Pentachlorophenol	120000	310	16470.84	25380.21	8.4336	1.700087	107	57	47	1.70	1.661	3.136	20546	32748	32748
Phenanthrene	170000	40	7902.945	17864.05	7.8333	1.665623	109	8	93	1.65	1.6606	3.072	10744	16529	16529
Phenol	48000	30	4363.343	7503.011	7.1307	1.679365	108	80	26	1.70	1.6608	3.136	5562.4	8518.1	8518
Potassium	4410000	240000	1601165	898629.8	14.11	0.634286	109	0	100	0.65	1.6606	1.986	2E+06	2E+06	2E+06
Pyrene	160000	30	7108.752	18006.52	7.6808	1.678751	109	7	94	1.70	1.6606	3.136	9972.8	14714	14714
Selenium	11200	150	2277.294	1830.751	7.3965	0.899124	109	9	92	0.90	1.6606	2.206	2568.5	2956.1	2956
Silver	24200	135	3455.183	4267.507	7.4944	1.199629	109	21	81	1.20	1.6606	2.525	4134	4941.8	4942
Sodium	8530000	43150	1151001	1340175	13.563	0.857654	109	1	99	0.85	1.6606	2.159	1E+06	1E+06	1E+06
Styrene	15000	5.5	915.1881	2578.867	4.7629	2.299948	109	102	6	2.30	1.6606	3.95	1325.4	3952	3952
Tert-Butyl Methyl Ether	30000	5.5	1115.128	3572.252	4.8127	2.397853	109	90	17	2.40	1.6606	4.089	1683.3	5602.7	5603
Tetrachloroethene	28000	1	1094.005	3658.935	4.6351	2.448188	109	63	42	2.45	1.6606	4.159	1676	5494.9	5495
Thallium	3000	230	901.05	580.0476	6.6097	0.62761	100	49	51	0.65	1.6626	1.986	997.49	1024.4	1024

Table 2. UCL 95 and EPCs For Soil COPCs in U.S. Drum (unit: ug/kg)

Analyte Name	Max Value	Min Value	Average	Standard Deviation	ln Ave.	ln Standard Deviation	Number	NonDet	DetFreq	tStdDev	tStat	hStat	UCL	lnUCL	EPC
Toluene	730000	2	11654.45	74502.54	5.3254	2.616781	109	14	87	2.60	1.6606	4.372	23505	18958	18958
Toxaphene	20000	95	465.9524	1966.794	5.205	0.908605	105	95	10	0.90	1.6615	2.206	784.85	335.05	335.1
trans-1,2-Dichloroethene	15000	1	895.5183	2560.827	4.6456	2.420451	109	97	11	2.40	1.6606	4.089	1302.8	5050.4	5050
trans-1,3-Dichloropropene	15000	5.5	876.0459	2554.788	4.7046	2.306032	109	107	2	2.30	1.6606	3.95	1282.4	3789.4	3789
Trichloroethene	15000	1	807.7661	2229.338	4.6288	2.345331	109	74	32	2.35	1.6606	4.02	1162.4	3968.9	3969
Trichlorofluoromethane	30000	2	1413.055	4393.498	4.9013	2.544836	109	66	39	2.55	1.6606	4.3	2111.9	9821.2	9821
Vanadium	253000	1600	31255.96	43354	9.9366	0.830116	109	0	100	0.85	1.6606	2.159	38152	34670	34670
Vinyl chloride	30000	5.5	1053.5	3541.18	4.7697	2.347269	109	96	12	2.35	1.6606	4.02	1616.7	4593.5	4594
Xylenes	950000	2	39499.22	140287.9	6.3638	3.393862	109	10	91	3.40	1.6606	5.534	61813	1E+06	1E+06
Zinc	9250000	23600	871733.9	1457734	12.804	1.38248	109	0	100	1.40	1.6606	2.761	1E+06	1E+06	1E+06

Table 3. UCL 95 and EPCs For Soil COPCs in Unnamed Parcel (unit: ug/kg)

Analyte Name	Max Value	Min Value	Average	Standard Deviation	ln Ave.	ln Standard Deviation	Number	NonDet	DetFreq	tStdDev	tStat	hStat	UCL	lnUCL	EPC
1,2,3,4,7,8-Hexachlorodibenzo-P-Dioxin	1.398	0.27	0.685	0.4922046	-0.556	0.677574	4	1	75	0.70	2.353	6.391	1.2641	8.7893	1.398
1,2,3,4,7,8-Hexachlorodibenzofuran	3.178	0.291	1.81425	1.2406808	0.2845	1.064582	4	0	100	1.05	2.353	9.4151	3.2739	763.62	3.178
1,2,3,6,7,8-Hexachlorodibenzo-P-Dioxin	1.338	0.484	0.71975	0.4128263	-0.428	0.481364	4	0	100	0.50	2.353	4.721	1.2054	2.719	1.338
1,2,3,6,7,8-Hexachlorodibenzofuran	3.193	0.146	1.4905	1.2653449	-0.058	1.316321	4	2	50	1.30	2.353	11.604	2.9792	15181	3.193
1,2,3,7,8,9-Hexachlorodibenzo-P-Dioxin	1.315	0.476	0.70775	0.4054827	-0.444	0.480875	4	0	100	0.50	2.353	4.721	1.1848	2.6701	1.315
1,2,3,7,8,9-Hexachlorodibenzofuran	4.083	0.187	1.67588	1.6939224	0.0154	1.286819	4	3	25	1.30	2.353	11.604	3.6688	12897	4.083
1,2,3,7,8-Pentachlorodibenzo-P-Dioxin	1.0425	0.413	0.72388	0.2597609	-0.376	0.385185	4	3	25	0.40	2.353	3.9355	1.0295	1.7744	1.0425
1,2,3,7,8-Pentachlorodibenzofuran	0.463	0.277	0.34	0.086325	-1.101	0.23744	4	3	25	0.25	2.353	3.001	0.4416	0.5162	0.463
1,2,4-Trichlorobenzene	2000000	1	64308	331757.41	3.2857	2.564741	81	14	83	2.55	1.667	4.2999	125745	2459.3	2459.3
1,2-Dibromo-3-Chloropropane	1000000	5	27510	146718.61	3.1977	2.438309	81	51	37	2.45	1.667	4.1585	54680	1486.2	1486.2
1,2-Dibromoethane	1000000	5	32193.4	165871.13	3.0777	2.465325	81	64	21	2.45	1.667	4.1585	62910	1426.3	1426.3
1,2-Dichlorobenzene	2000000	2	64282.9	331762.22	3.1159	2.632227	81	6	93	2.65	1.667	4.4437	125720	2665	2665
Arochlor 1254	41000	19.5	925.926	4559.7681	5.2225	1.510458	81	35	57	1.50	1.667	2.881	1770.3	943.62	943.62
Arochlor 1260	2800	19.5	270.079	430.05175	4.9687	1.128843	82	34	59	1.15	1.666	2.4704	349.22	370.81	370.81
Arsenic	99900	1100	18854.2	13732.224	9.6163	0.737515	83	0	100	0.75	1.666	2.0685	21366	23313	23313
Barium	10800000	4000	715273	1649867.9	12.603	1.224828	83	0	100	1.25	1.666	2.58	1E+06	892895	892895
Benzaldehyde	7500	52	919.607	1474.3744	6.113	1.057917	84	76	10	1.05	1.666	2.3608	1187.6	1039.7	1039.7
Benzene	2000000	1	63564.9	329771.74	3.2975	2.761949	82	1	99	2.75	1.666	4.5875	124252	5011.4	5011.4
Benzo(a)anthracene	310000	81	6079.06	33915.926	6.7561	1.530133	84	9	89	1.55	1.666	2.9448	12244	4543.2	4543.2
Benzo(a)pyrene	250000	74	5238.27	27410.015	6.7413	1.50594	84	10	88	1.50	1.666	2.881	10221	4236.2	4236.2
Benzo(b)fluoranthene	350000	44	7158.49	38493.61	6.9122	1.570759	84	8	90	1.55	1.666	2.9448	14156	5730.7	5730.7
Benzo(g,h,i)perylene	55000	66	1980.61	6290.8802	6.3281	1.407916	84	13	85	1.40	1.666	2.7606	3124.1	2311.9	2311.9
Benzo(k)fluoranthene	150000	54	3953.37	16943.932	6.6957	1.487562	84	14	83	1.50	1.666	2.881	7033.4	3914.9	3914.9
Benzyl Butyl Phthalate	43000	48	1782.17	5165.8393	6.2162	1.383023	84	46	45	1.40	1.666	2.7606	2721.2	1981.6	1981.6
Beryllium	3000	140	1013.98	564.48863	6.7406	0.660045	83	8	90	0.65	1.666	1.9855	1117.2	1215.8	1215.8
beta-BHC	370	0.81	32.2279	50.346638	2.6613	1.367315	81	17	79	1.35	1.667	2.7004	41.551	55.084	55.084
Biphenyl (Diphenyl)	7500	50	805.083	1403.7012	5.9402	1.112017	84	59	30	1.10	1.666	2.4156	1060.2	947.01	947.01
Bis(2-Chloroethyl) Ether	14000	200	1553.04	2652.8789	6.4823	1.178338	84	46	45	1.20	1.666	2.5252	2035.3	1813.8	1813.8
1,1,1-Trichloroethane	52000000	1	773903	5806820.1	2.9179	2.954548	84	35	58	2.95	1.666	4.8751	2E+06	7069.8	7069.8
1,1,2,2-Tetrachloroethane	1000000	5	24542.8	139938.3	3.0883	2.417397	81	62	23	2.40	1.667	4.089	50457	1230.7	1230.7
1,1,2-Trichloro-1,2,2-Trifluoroethane	1000000	5	31417.5	163911.13	3.0379	2.439326	83	66	20	2.45	1.666	4.1585	61396	1253	1253
1,1,2-Trichloroethane	1000000	5	31417.1	163911.21	2.9973	2.451276	83	71	14	2.45	1.666	4.1585	61395	1245.7	1245.7
1,1-Dichloroethane	1000000	5	26477.4	143897.02	2.9966	2.415057	83	69	17	2.40	1.666	4.089	52795	1100.4	1100.4
1,1-Dichloroethene	1000000	5	31417	163911.22	2.9878	2.455152	83	72	13	2.45	1.666	4.1585	61395	1247.9	1247.9
1,2,3,4,6,7,8-Heptachlorodibenzo-P-Dioxin	1.902	0.901	1.3355	0.4255541	0.252	0.314019	4	0	100	0.30	2.353	3.2555	1.8362	2.4389	1.902
1,2,3,4,6,7,8-Heptachlorodibenzofuran	3.684	0.376	1.552	1.4618374	0.1144	0.937349	4	0	100	0.95	2.353	8.5433	3.2719	177.17	3.684
1,2,3,4,7,8,9-Heptachlorodibenzofuran	2.5485	0.52	1.51013	0.8383329	0.2657	0.670256	4	1	75	0.65	2.353	5.969	2.4964	16.447	2.5485
1,2-Dichloroethane	1000000	3	24074.1	137184.45	2.9856	2.431565	83	67	19	2.45	1.666	4.1585	49164	1162.7	1162.7
1,2-Dichloropropane	1000000	5	31417.2	163911.19	3.0057	2.44883	83	70	16	2.45	1.666	4.1585	61395	1247.2	1247.2
1,3-Dichlorobenzene	2000000	2	65990.9	335811.31	3.3386	2.64366	79	13	84	2.65	1.667	4.4437	128977	3509.5	3509.5
1,4-Dichlorobenzene	2000000	1	48062.1	288572.01	3.3568	2.686496	82	5	94	2.70	1.666	4.5156	101168	4078	4078

Table 3. UCL 95 and EPCs For Soil COPCs in Unnamed Parcel (unit: ug/kg)

Analyte Name	Max Value	Min Value	Average	Standard Deviation	ln Ave.	ln Standard Deviation	Number	NonDet	DetFreq	tStdDev	tStat	hStat	UCL	lnUCL	EPC
2,2'-Oxybis(1-Chloro)Propane	14000	170	1606.67	2628.5963	6.6258	1.093824	84	27	68	1.10	1.666	2.4156	2084.5	1833.6	1833.6
2,3,4,6,7,8-Hexachlorodibenzofuran	3.197	0.1465	1.4925	1.2668137	-0.056	1.315312	4	2	50	1.30	2.353	11.604	2.9829	15087	3.197
2,3,4,7,8-Pentachlorodibenzofuran	0.908	0.272	0.5165	0.2880654	-0.773	0.542221	4	1	75	0.55	2.353	5.134	0.8554	2.6671	0.908
2,3,7,8-Tetrachlorodibenzofuran	1.677	0.271	0.817	0.6051352	-0.408	0.750233	4	0	100	0.75	2.353	6.8185	1.5289	16.888	1.677
2,4-Dimethylphenol	7500	150	976.488	1520.1842	6.1757	1.048135	84	81	4	1.05	1.666	2.3608	1252.8	1093	1093
2,4-Dinitrophenol	38000	490	3589.52	6307.4679	7.4544	1.066735	84	40	52	1.05	1.666	2.3608	4736.1	4023.1	4023.1
2-Chloronaphthalene	120000	99	2277.61	13063.072	6.1821	1.163377	84	81	4	1.15	1.666	2.4704	4652.2	1305.4	1305.4
2-Hexanone	2000000	5.5	47460.3	277859.7	3.2279	2.571188	81	47	42	2.55	1.667	4.2999	98916	2367.4	2367.4
2-Methylnaphthalene	44000	55	2812.19	6310.3599	6.5495	1.590975	84	16	81	1.60	1.666	3.0086	3959.3	4190	4190
2-Methylphenol	68000	150	1667.98	7442.0539	6.1918	1.122083	84	82	2	1.10	1.666	2.4156	3020.8	1235	1235
3,3'-Dichlorobenzidine	11000	195	1208.99	2098.3232	6.3008	1.108883	84	68	19	1.10	1.666	2.4156	1590.4	1352.3	1352.3
3-Nitroaniline	19000	490	2401.43	3675.7289	7.1326	1.008031	84	79	6	1.00	1.666	2.306	3069.6	2686	2686
4,6-Dinitro-2-methylphenol	38000	490	3032.38	5293.3121	7.3059	1.046674	84	58	31	1.05	1.666	2.3608	3994.6	3377.4	3377.4
4-Bromophenyl phenyl ether	11000	195	1136.55	2059.8747	6.2265	1.099616	84	77	8	1.10	1.666	2.4156	1511	1239.7	1239.7
4-Chloro-3-methylphenol	7500	195	940.298	1477.6195	6.1617	1.023891	84	83	1	1.00	1.666	2.306	1208.9	1038	1038
4-Chloroaniline	7500	195	958.274	1470.8352	6.21	1.009403	84	79	6	1.00	1.666	2.306	1225.6	1069.5	1069.5
4-Chlorophenyl phenyl ether	11000	195	1136.55	2059.8747	6.2265	1.099616	84	77	8	1.10	1.666	2.4156	1511	1239.7	1239.7
4-Methylphenol	25000	42	1153.57	2977.0404	5.9828	1.276679	84	49	42	1.30	1.666	2.6402	1694.7	1296.9	1296.9
4-Nitroaniline	36000	500	3157.62	5088.8955	7.4381	0.982465	84	42	50	1.00	1.666	2.306	4082.7	3531.3	3531.3
4-Nitrophenol	27000	490	2963.93	5196.0202	7.1986	1.099417	84	71	15	1.10	1.666	2.4156	3908.4	3276.3	3276.3
Acenaphthene	11000	55	1097.64	1878.7714	6.109	1.245236	84	32	62	1.25	1.666	2.58	1439.2	1389.8	1389.8
Acenaphthylene	11000	48	997.369	1822.5576	6.0315	1.216112	84	60	29	1.20	1.666	2.5252	1328.7	1221.7	1221.7
Acetone	2000000	5	52049.5	285069.46	4.9583	2.269435	84	19	77	2.25	1.666	3.8805	103869	4915.1	4915.1
Acetophenone	7500	74	940.345	1477.8637	6.1533	1.040015	84	80	5	1.05	1.666	2.3608	1209	1057.4	1057.4
Aldrin	210	1	13.0125	27.690798	1.5751	1.325165	80	60	25	1.35	1.667	2.7004	18.173	17.387	17.387
alpha-BHC	17000	1	221.92	1899.671	1.5403	1.519708	80	49	39	1.50	1.667	2.881	575.95	24.231	24.231
alpha-Chlordane	115	1	14.1599	23.4967	1.8238	1.265103	81	39	52	1.25	1.667	2.58	18.511	19.865	19.865
alpha-Endosulfan	530	0.1	16.2935	66.225017	1.2174	1.478046	80	57	29	1.50	1.667	2.881	28.635	16.262	16.262
Aluminum	42500000	697000	9476386	7070022.4	15.839	0.721245	83	0	100	0.70	1.666	2.025	1E+07	1E+07	1E+07
Anthracene	75000	47	2365.08	8617.0583	6.2114	1.487931	84	24	71	1.50	1.666	2.881	3931.5	2413.6	2413.6
Antimony	33400	830	10834.2	8280.4986	8.9329	0.954988	83	0	100	0.95	1.666	2.256	12349	15166	15166
Arochlor 1242	38000	19.5	1476.83	5085.7857	5.1722	1.931108	80	51	36	1.95	1.667	3.4664	2424.6	2416.1	2416.1
Arochlor 1248	6500	19.5	256.885	794.16306	4.3598	1.316051	78	76	3	1.30	1.667	2.6402	406.81	276.39	276.39
Bis(2-Ethylhexyl) Phthalate	95000	86	13510.5	20479.374	8.3506	1.750942	84	2	98	1.75	1.666	3.2	17233	36262	36262
Bromodichloromethane	1000000	5	31800.1	164882.53	3.0055	2.465097	82	71	13	2.45	1.666	4.1585	62143	1316.7	1316.7
Bromoform	1000000	5	31417.1	163911.21	2.9973	2.451276	83	71	14	2.45	1.666	4.1585	61395	1245.7	1245.7
Bromomethane	1000000	5	31419.7	163910.72	3.1541	2.422652	83	51	39	2.40	1.666	4.089	61398	1316.5	1316.5
Cadmium	60800	110	5870.96	8735.5568	8.0383	1.259258	83	6	93	1.25	1.666	2.58	7468.6	9798.2	9798.2
Calcium	4.51E+08	7E+06	6.4E+07	73674150	17.598	0.812541	83	0	100	0.80	1.666	2.112	8E+07	7E+07	7E+07
Caprolactam	14000	69	1165.64	1956.9152	6.3948	1.036313	84	52	38	1.05	1.666	2.3608	1521.4	1339.9	1339.9
Carbazole	23000	58	1283.51	2991.2423	6.0591	1.31083	84	39	54	1.30	1.666	2.6402	1827.3	1477.5	1477.5

Table 3. UCL 95 and EPCs For Soil COPCs in Unnamed Parcel (unit: ug/kg)

Analyte Name	Max Value	Min Value	Average	Standard Deviation	ln Ave.	ln Standard Deviation	Number	NonDet	DetFreq	tStdDev	tStat	hStat	UCL	lnUCL	EPC
Carbon disulfide	1000000	1	31056.6	162954.26	3.0001	2.627113	84	24	71	2.65	1.666	4.4437	60678	2281	2281
Carbon tetrachloride	1000000	5.5	31417.2	163911.18	3.014	2.445189	83	69	17	2.45	1.666	4.1585	61395	1244.4	1244.4
Chlorobenzene	2000000	1	49247.8	291888.15	3.6688	2.68205	80	2	98	2.70	1.667	4.5156	103645	5586.5	5586.5
Chloroethane	1000000	6	31432.1	163908.38	3.3093	2.392552	83	35	58	2.40	1.666	4.089	61410	1410.7	1410.7
Chloroform	1000000	2	31416.9	163911.25	2.9653	2.467649	83	72	13	2.45	1.666	4.1585	61395	1265.4	1265.4
Chloromethane	1000000	3	31422.2	163910.22	3.2001	2.426185	83	46	45	2.45	1.666	4.1585	61400	1418.6	1418.6
Chromium	1620000	5900	151886	232148.63	11.297	1.123936	83	0	100	1.10	1.666	2.4156	194344	204520	204520
Chrysene	310000	71	6420.31	33955.709	6.9448	1.509124	84	8	90	1.50	1.666	2.881	12593	5222.6	5222.6
cis-1,2-Dichloroethene	1000000	1	31416.5	163911.33	2.8784	2.524851	83	63	24	2.55	1.666	4.2999	61395	1429	1429
cis-1,3-Dichloropropene	1000000	5	31417.1	163911.21	2.9973	2.451276	83	71	14	2.45	1.666	4.1585	61395	1245.7	1245.7
Cobalt	27200	600	11248.2	5360.3641	9.1886	0.611784	83	2	98	0.60	1.666	1.946	12229	13456	13456
Copper	6540000	3900	432372	844294.73	12.286	1.131709	83	0	100	1.15	1.666	2.4704	586788	559779	559779
Cyclohexane	5400000	1	83446.8	599800.03	3.2161	2.702551	84	34	60	2.70	1.666	4.5156	192477	3668.5	3668.5
delta-BHC	115	0.46	8.92833	18.026594	1.2889	1.234747	78	75	4	1.25	1.667	2.58	12.332	11.181	11.181
Di-N-Butyl Phthalate	7500	66	947.69	1487.2792	6.0678	1.179812	84	48	43	1.20	1.666	2.5252	1218	1200.8	1200.8
Di-N-Octylphthalate	7500	46	1072.76	1808.4589	6.1456	1.150595	84	66	21	1.15	1.666	2.4704	1401.5	1235.8	1235.8
Dibenz(a,h)Anthracene	59000	33	1592	6512.3757	6.0221	1.337977	84	36	57	1.35	1.666	2.7004	2775.8	1500.9	1500.9
Dibenzofuran	7500	48	1055.04	1728.4817	6.0823	1.260974	84	37	56	1.25	1.666	2.58	1369.2	1386.3	1386.3
Dibromochloromethane	1000000	5	31417.1	163911.21	2.9973	2.451276	83	71	14	2.45	1.666	4.1585	61395	1245.7	1245.7
Dichlorodifluoromethane	1000000	5	31430.7	163908.65	3.2407	2.407255	83	42	49	2.40	1.666	4.089	61408	1373.6	1373.6
Dieldrin	175	1.95	22.5821	30.698492	2.488	1.15571	81	36	56	1.15	1.667	2.4704	28.267	32.299	32.299
Diethyl Phthalate	7500	68	923.881	1490.7769	6.0308	1.15781	84	66	21	1.15	1.666	2.4704	1194.9	1113.3	1113.3
Dimethyl Phthalate	7500	140	940.238	1477.7802	6.1585	1.028882	84	83	1	1.05	1.666	2.3608	1208.9	1047.8	1047.8
Endosulfan sulfate	940	0.28	34.0312	117.03737	2.1313	1.437608	81	59	27	1.45	1.667	2.8208	55.705	37.263	37.263
Endrin	225	1.95	18.1051	34.735772	2.024	1.231803	79	74	6	1.25	1.667	2.58	24.62	23.163	23.163
Endrin aldehyde	1100	1.1	31.0944	126.88891	2.0175	1.340177	80	64	20	1.35	1.667	2.7004	54.742	27.735	27.735
Endrin ketone	225	1.95	17.6367	34.292104	2.0033	1.223888	79	70	11	1.20	1.667	2.5252	24.069	22.246	22.246
Ethylbenzene	1800000	1	46056.3	248761.95	3.1347	2.703214	81	12	85	2.70	1.667	4.5156	92123	3474.3	3474.3
Fluoranthene	510000	57	12042.4	56942.212	7.3893	1.697125	84	5	94	1.70	1.666	3.1362	22393	12255	12255
Fluorene	18000	44	1482.12	2972.5822	6.2442	1.337118	84	27	68	1.35	1.666	2.7004	2022.5	1871.5	1871.5
gamma-BHC	115	0.22	8.549	16.694184	1.3168	1.22622	80	65	19	1.25	1.667	2.58	11.66	11.297	11.297
gamma-Chlordane	115	0.37	14.9133	23.4209	1.7259	1.442438	84	49	42	1.45	1.666	2.8208	19.171	24.848	24.848
Heptachlor	2800	1	44.0462	314.49906	1.4148	1.405798	79	72	9	1.40	1.667	2.7606	103.03	17.157	17.157
Heptachlor epoxide	90	1	8.39231	15.297316	1.2834	1.197645	78	68	13	1.20	1.667	2.5252	11.28	10.436	10.436
Hexachlorobenzene	11000	195	1136.55	2059.8747	6.2265	1.099616	84	77	8	1.10	1.666	2.4156	1511	1239.7	1239.7
Hexachlorobutadiene	14000	200	1568.81	2645.9458	6.5236	1.157144	84	41	51	1.15	1.666	2.4704	2049.8	1820.4	1820.4
Hexachlorocyclopentadiene	14000	195	1082.5	1995.8719	6.21	1.071185	84	79	6	1.05	1.666	2.3608	1445.3	1166	1166
Hexachloroethane	7500	98	940.274	1477.8293	6.156	1.033951	84	83	1	1.05	1.666	2.3608	1208.9	1052	1052
Indeno(1,2,3-CD)pyrene	140000	57	3027.81	15317.846	6.3769	1.418759	84	15	82	1.40	1.666	2.7606	5812.2	2473.1	2473.1
Iron	4.3E+08	1E+06	9.5E+07	77809396	18.057	0.870047	83	0	100	0.85	1.666	2.159	1E+08	1E+08	1E+08
Isophorone	7500	65	939.583	1478.1911	6.1501	1.042847	84	83	1	1.05	1.666	2.3608	1208.3	1058	1058

Table 3. UCL 95 and EPCs For Soil COPCs in Unnamed Parcel (unit: ug/kg)

Analyte Name	Max Value	Min Value	Average	Standard Deviation	ln Ave.	ln Standard Deviation	Number	NonDet	DetFreq	tStdDev	tStat	hStat	UCL	lnUCL	EPC
Isopropylbenzene	2000000	1	47384.4	291530.07	4.11	2.538581	80	4	95	2.55	1.667	4.2999	101715	5220.4	5220.4
Lead	5710000	20400	880148	1019037.8	13.117	1.199868	83	0	100	1.20	1.666	2.5252	1E+06	1E+06	1E+06
Magnesium	1.38E+08	751000	1E+07	15703791	15.755	0.856729	83	0	100	0.85	1.666	2.159	1E+07	1E+07	1E+07
Manganese	13000000	112000	1270783	1740408.7	13.626	0.871117	83	0	100	0.85	1.666	2.159	2E+06	1E+06	1E+06
Mercury	3800	25	634.458	558.61546	6.0952	0.925245	83	2	98	0.95	1.666	2.256	736.62	857.25	857.25
Methoxychlor	1150	0.54	71.119	163.71989	3.1593	1.485786	81	40	51	1.50	1.667	2.881	101.44	114.62	114.62
Methyl acetate	1100000	5	31413.8	165761.36	3.179	2.421664	83	47	43	2.40	1.666	4.089	61730	1345.8	1345.8
Methyl ethyl ketone	2000000	1	57312.7	303872.65	3.9912	2.523816	84	5	94	2.50	1.666	4.228	112550	4218.7	4218.7
Methyl isobutyl ketone	480000	3	13018.9	68346.818	3.2026	2.4305	81	36	56	2.45	1.667	4.1585	25676	1460.1	1460.1
Methylcyclohexane	13000000	2	194151	1462879.7	3.6468	2.557092	83	16	81	2.55	1.666	4.2999	461701	3396.1	3396.1
Methylene chloride	1000000	5	28892	157284.5	3.061	2.398146	84	79	6	2.40	1.666	4.089	57483	1110.8	1110.8
N-Nitrosodi-N-Propylamine	14000	195	1241.13	2243.0996	6.276	1.12556	84	71	15	1.15	1.666	2.4704	1648.9	1359.2	1359.2
N-Nitrosodiphenylamine	7000	150	901.488	1340.5811	6.1812	0.983325	84	65	23	1.00	1.666	2.306	1145.2	1005.8	1005.8
Naphthalene	330000	70	10067	41254.105	6.8874	1.813666	84	15	82	1.80	1.666	3.2666	17566	9724.7	9724.7
Nickel	669000	4800	76598.8	94897.104	10.873	0.81362	83	0	100	0.80	1.666	2.112	93955	88764	88764
Octachlorodibenzo-P-Dioxin	2.148	0.456	1.055	0.7551702	-0.119	0.659047	4	0	100	0.65	2.353	5.969	1.9435	10.695	2.148
Octachlorodibenzofuran	1.816	0.791	1.32975	0.5272036	0.2211	0.419485	4	0	100	0.40	2.353	3.9355	1.95	3.5333	1.816
p,p'-DDD	1100	0.32	89.7101	164.20729	3.5244	1.599865	83	9	89	1.60	1.666	3.0086	119.74	207.63	207.63
p,p'-DDE	790	0.39	48.5721	88.816733	3.2408	1.245543	84	5	94	1.25	1.666	2.58	64.717	78.982	78.982
p,p'-DDT	570	1.95	25.4881	69.382141	2.1664	1.31251	80	63	21	1.30	1.667	2.6402	38.418	30.497	30.497
Pentachlorophenol	36000	110	3133.33	5210.2162	7.2998	1.117137	84	55	35	1.10	1.666	2.4156	4080.4	3714.7	3714.7
Phenanthrene	210000	52	7831.21	25797.881	7.3149	1.683282	84	3	96	1.70	1.666	3.1362	12521	11059	11059
Phenol	97000	61	2022.81	10573.837	6.1877	1.161476	84	78	7	1.15	1.666	2.4704	3944.9	1309.2	1309.2
Potassium	3380000	162000	945361	637223.68	13.559	0.646161	83	0	100	0.65	1.666	1.9855	1E+06	1E+06	1E+06
Pyrene	440000	50	10078.2	48688.998	7.3124	1.633955	84	4	95	1.65	1.666	3.0724	18929	9880.6	9880.6
Selenium	20000	230	2818.13	2682.44	7.5906	0.912938	83	9	89	0.90	1.666	2.206	3308.7	3750.9	3750.9
Silver	639000	110	10949.2	69932.081	7.486	1.446047	83	10	88	1.45	1.666	2.8208	23739	7958.1	7958.1
Sodium	23600000	563000	1656277	2623052.3	14.044	0.574127	83	0	100	0.55	1.666	1.911	2E+06	2E+06	2E+06
Styrene	2000000	5	66846.6	337898.23	3.5392	2.579577	78	13	83	2.60	1.667	4.3718	130637	3468.4	3468.4
Tert-Butyl Methyl Ether	1000000	5	31417	163911.22	2.9878	2.455152	83	72	13	2.45	1.666	4.1585	61395	1247.9	1247.9
Tetrachloroethene	1000000	1	31800.2	164882.52	2.8827	2.568481	82	55	33	2.55	1.666	4.2999	62143	1649.8	1649.8
Thallium	26000	355	6109.4	5228.6028	8.3613	0.910754	83	4	95	0.90	1.666	2.206	7065.7	8086.1	8086.1
Toluene	8900000	2	248928	1355421.7	3.1294	2.905797	84	41	51	2.90	1.666	4.8032	495313	7210.3	7210.3
trans-1,2-Dichloroethene	1000000	5	31416.9	163911.25	2.9768	2.458483	83	72	13	2.45	1.666	4.1585	61395	1246.2	1246.2
trans-1,3-Dichloropropene	1000000	5	31044	162956.68	3.0269	2.43291	84	67	20	2.45	1.666	4.1585	60666	1208.3	1208.3
Trichloroethene	460000	1	12982.7	69678.602	2.8176	2.398191	83	60	28	2.40	1.666	4.089	25726	876.69	876.69
Trichlorofluoromethane	1000000	1	30676.6	162019.21	2.5635	2.654188	85	34	60	2.65	1.666	4.4437	59950	1591.9	1591.9
Vanadium	73400	1800	24734.9	13373.421	9.9656	0.608229	83	0	100	0.60	1.666	1.946	27181	29182	29182
Vinyl chloride	1000000	1	31416.8	163911.27	2.9339	2.491264	83	67	19	2.50	1.666	4.228	61395	1339.8	1339.8
Xylenes	5600000	3	149996	796775.91	4.0799	2.911321	81	9	89	2.90	1.667	4.8032	297547	19560	19560
Zinc	9990000	18700	1333653	1732384.7	13.468	1.195292	83	0	100	1.20	1.666	2.5252	2E+06	2E+06	2E+06

APPENDIX B

Air Concentration Model of Groundwater COPCs

Air Concentration Model for Groundwater COPCs

Calculations of air concentrations are based on the assumption that during construction work, soil is excavated and groundwater is exposed to the air. The exposed area is modeled as a shallow pond with dimensions of 2 m x 2 m x 0.5 m. And EPC_{air} is calculated using a "box model" approach, described in U.S. EPA (1986), by using the following equation,

$$EPC_{air} = \frac{E}{W \times U \times H} \quad (1)$$

where:

H = Mixing height = 2 m (height of an average man)
U = Average wind speed within mixing zone = 4.6 m/s (U.S. Dept. of Commence 2000)
W = Width dimension of the pond = 2 m
E = Emission rate (g/s)

The emission rate is determined by using the following equations (Thomas, 1990):

$$E = K_l \times C \times A \quad (2)$$

where:

K_l = Liquid phase mass transfer coefficient (cm/hour)
C = Concentration of chemical in liquid phase (mg/L)
A = Contaminated area (cm^2) = 200 x 200 (cm^2)

K_l is calculated from:

$$(K_v^c)_{env} = \frac{K_l}{Z} \quad (3)$$

where:

$(K_v^c)_{env}$ = Overall liquid phase exchange coefficient ($hour^{-1}$)
Z = Depth of the pond (cm) = 50 cm

$(K_v^c)_{env}$ for ponds is estimated by the equation:

$$(K_v^c)_{env} = \frac{D^c}{D^o}(K_v^o)_{Ponds} \quad (4)$$

where:

D^c = Diffusion coefficient of the chemical in water (cm^2/sec)
D^o = Diffusion coefficient of oxygen in water (cm^2/sec)
= 2.20×10^{-5} cm^2/sec (Thomas, 1990 and EPA 1996)
$(K_v^o)_{Ponds}$ = Oxygen reaeration coefficient ($hour^{-1}$) = 0.008

References:

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Table B-1.
AIR CONCENTRATION OF GROUNDWATER CONTAMINANTS

COPC	C_{liquid} (mg/L)	Di,w (cm2/sec)	Do (cm2/sec)	$(Kv^o)_{ponds}$ (hr^{-1})	$(Kv^c)_{ponds}$ (hr^{-1})	KL (cm/hour)	E (g/sec)	C_{air} (g/m^3)
Benzene	2.4	9.80E-06	2.20E-05	8.00E-03	3.56E-03	1.78E-01	4.75152E-06	1.72E-07
Methylene chloride	0.2	1.17E-05	2.20E-05	8.00E-03	4.25E-03	2.13E-01	4.01818E-07	1.46E-08
Chlorobenzene	0.2	8.70E-06	2.20E-05	8.00E-03	3.16E-03	1.58E-01	2.98788E-07	1.08E-08
Ethylbenzene	5.8	7.80E-06	2.20E-05	8.00E-03	2.84E-03	1.42E-01	9.13939E-06	3.31E-07
Methylene chloride	0.2	1.17E-05	2.20E-05	8.00E-03	4.25E-03	2.13E-01	4.01818E-07	1.46E-08
Toluene	38.0	8.60E-06	2.20E-05	8.00E-03	3.13E-03	1.56E-01	6.60202E-05	2.39E-06
Xylenes	18.0	1.00E-05	2.20E-05	8.00E-03	3.64E-03	1.82E-01	3.63636E-05	1.32E-06

Parameters of model pond	
Length (m)	2
Width (m)	2
Depth (m)	0.5
Area (m^2)	4
CF(m/cm)	100
CF(hour/sec)	3600
H (Mixing Height of Man, m)	2
Average wind speed (m/s)	4.6

APPENDIX C

Risk Calculations Tables for Alburn, U. S. Drum and Unnamed Parcel

Table A-1.
TOXICITY FACTORS FOR CHEMICALS OF POTENTIAL CONCERN FOR LAKE CALUMET CLUSTER SITE: ALBURN

Carcinogenic Risk

COPC	Ingestion Slope Factor	EPC for Soil	EPC for Sediment	EPC for SW	EPC for GW	EPC for GW In air	Particulate Inhalation Slope Factor	Dermal Slope Factor	Volatile (URF) Inhalation Risk Factor
	(kg-day/mg)	(ug/kg)	(ug/kg)	(ug/L)	(ug/L)	(g/m^3)	(kg-day/mg)	(kg-day/mg)	(m^3/ug)
Arsenic	1.50E+00	1.62E+04	1.04E+05		1.22E+02			1.50E+00	4.30E-03
Beryllium		1.55E+03			6.30E+00			0.00E+00	0.00E+00
Benzene	5.50E-02	8.30E+04			2.40E+03	1.72E-07	2.90E-02	5.50E-02	8.29E-06
Benzo(a)anthracene	7.30E-01	5.09E+03			8.00E+00		3.10E-01	7.30E-01	8.86E-05
Benzo(b)flouranthene	7.30E-01	5.84E+03			1.00E+01		3.10E-01	7.30E-01	8.86E-05
Benzo(k)flouranthene	7.30E-02				9.00E+00		3.10E-02	7.30E-02	8.86E-06
Benzo(a)pyrene	7.30E+00	4.43E+03			8.00E+00		3.10E+00	7.30E+00	8.86E-04
Chrysene	7.30E-03		1.10E+03		8.00E+00		3.10E-03	7.30E-03	8.86E-07
Dibenz(a,h)anthracene	7.30E+00	1.51E+03			8.00E-01		3.10E+00	7.30E+00	8.86E-04
Indeno(1,2,3-cd)pyrene	7.30E-01	2.93E+03			2.00E+00		3.10E-01	7.30E-01	8.86E-05
Bis(2-Chloroethyl) Ether	1.10E+00	8.81E+02			2.60E+02		1.16E+00	1.10E+00	3.31E-04
Bis(2-ethylhexyl)phthalate	1.40E-02				7.90E+01			1.40E-02	
Heptachlor	4.50E+00			3.00E-01			4.50E+00	4.50E+00	1.29E-03
Methylene chloride	7.50E-03	5.47E+04			1.70E+02	1.46E-08	1.65E-03	7.50E-03	4.71E-07
N-Nitrosodiphenylamine	4.90E-03				6.00E+00			4.90E-03	0.00E+00
Tetrachloroethene	5.20E-02	5.68E+04					2.00E-03	5.20E-02	5.71E-07
Trichloroethene	1.10E-02	8.35E+04					6.00E-03	1.10E-02	1.71E-06
Vinyl Chloride	7.20E-01	5.08E+04					1.60E-02	7.20E-01	4.57E-06
Total PCBs	2.00E+00	1.94E+03					2.00E+00	2.00E+00	5.71E-04

Noncarcinogenic Risk

COPC	Ingestion Reference Dose	EPC for Soil	EPC for Sediment	EPC for SW	EPC for GW	EPC for GW In air	Inhalation Reference Dose	Dermal Reference Dose	Volatile Inhalation Ref. Dose
	(mg/kg-day)	(ug/kg)	(ug/kg)	(ug/L)	(ug/L)	(g/m3)	(mg/kg-day)	(mg/kg-day)	(ug/m^3)
Antimony	4.00E-04	1.58E+04			6.60E+00			4.00E-04	0.00E+00
Arsenic	3.00E-04	1.62E+04	1.04E+05		1.22E+02			3.00E-04	0.00E+00
Barium	7.00E-02	3.84E+05		3.58E+02	4.65E+03		1.43E-04	7.00E-02	5.01E-01
Beryllium	2.00E-03	1.55E+03			6.30E+00		5.71E-06	2.00E-03	2.00E-02
Cadmium	5.00E-04	7.31E+03			2.19E+01			5.00E-04	0.00E+00
Chromium	1.50E+00	2.61E+05	5.37E+05		3.52E+02			1.50E+00	0.00E+00
Manganese	4.60E-02	3.90E+06		2.79E+03	4.07E+03		1.43E-05	4.60E-02	5.01E-02
Mercury					3.60E+00		8.60E-05	0.00E+00	3.01E-01
Nickel	2.00E-02				2.16E+02			2.00E-02	0.00E+00
Thallium	8.00E-05				2.60E+00			8.00E-05	0.00E+00
Vanadium	7.00E-03				2.54E+02			7.00E-03	0.00E+00
Zinc	3.00E-01				6.94E+03			3.00E-01	0.00E+00
Bis(2-ethylhexyl)phthalate	2.00E-02				7.90E+01			2.00E-02	0.00E+00
Carbon disulfide	1.00E-01	8.29E+04					2.00E-01	1.00E-01	7.00E+02
Chlorobenzene	2.00E-02	4.15E+04			1.70E+02	1.08E-08	5.71E-03	2.00E-02	2.00E+01
2,4-Dimethylphenol	2.00E-02				3.20E+02			2.00E-02	0.00E+00
Ethylbenzene	1.00E-01	4.72E+06			5.80E+03	3.31E-07	2.86E-01	1.00E-01	1.00E+03
Heptachlor	5.00E-04	3.97E+00		3.00E-01				5.00E-04	0.00E+00
Methylene chloride	6.00E-02	5.47E+04			1.70E+02	1.46E-08	8.57E-01	6.00E-02	3.00E+03
Naphthalene	2.00E-02				4.20E+02		8.57E-04	2.00E-02	3.00E+00
Tetrachloroethene	1.00E-02	5.68E+04						1.00E-02	0.00E+00
Trichloroethene	6.00E-03	8.35E+04						6.00E-03	0.00E+00
Toluene	2.00E-01	1.67E+06			3.80E+04	2.39E-06	1.14E-01	2.00E-01	3.99E+02
Vinyl Chloride	3.00E-03	5.08E+04					2.90E-02	3.00E-03	1.02E+02
Xylenes	2.00E+00	2.50E+07			1.80E+04	1.32E-06		2.00E+00	0.00E+00

Table A-1.
TOXICITY FACTORS FOR CHEMICALS OF POTENTIAL CONCERN FOR LAKE CALUMET CLUSTER SITE: ALBURN

Note:
COPC: Contaminants of potential concern
EPC: Exposure point concentration

Table A-2.
SOIL INGESTION EXPOSURE FACTORS FOR LAKE CALUMET CLUSTER SITE: ALBURN

Carcinogenic Risk

LADD=EPCxFIxIRSxEFxEDxCF/(BWxATc)

EPC=exposure point concentration (ug/kg)
FI=fraction ingested from contaminated source
IRS=soil ingestion rate (mg/day)
EF=exposure frequency (days/year)
ED=exposure duration (years)
CF=conversion factor 10-9 kg/ug
BW=body weight (kg)
ATc=averaging time for carcinogens (days)

ELCR=LADDxSFo

SFo=oral cancer slope factor (kg-day/mg)
LADD=lifetime average daily dose (mg/kg-day)

Exposure Factor	On-site Worker	Construction Worker	Industrial / Commercial Worker	Mower	Landscape Worker
IRS (mg/day)	50	480	50	480	50
FI	0.5	1	0.5	1	0.5
EF (day/year)	50	30	250	10	20
ED (years)	25	1	25	25	25
BW (kg)	70	70	70	70	70
Atc (days)	25550	25550	25550	25550	25550
Conversion Factor (kg/ug)	1.00E-09	1.00E-09	1.00E-09	1.00E-09	1.00E-09

Noncarcinogenic Risk

ADD=EPCxFIxIRSxEFxEDxCF/(BWxATn)

EPC=exposure point concentration (ug/kg)
FI=fraction ingested from contaminated source
IRS=soil ingestion rate (mg/day)
EF=exposure frequency (days/year)
ED=exposure duration (years)
BW=body weight (kg)
ATn=averaging time for noncarcinogens (days)

HQ=ADD/RfDo

ADD-average daily dose (mg/kg-day)
RfDo=Injestion reference dose (mg/kg-day)

Exposure Factor	On-site Worker	Construction Worker	Industrial / Commercial Worker	Mower	Landscape Worker
IRS (mg/day)	50	480	50	480	50
FI	0.5	1	0.5	1	0.5
EF (day/year)	50	30	250	10	20
ED (years)	25	1	25	25	25
BW (kg)	70	70	70	70	70
ATn (days)	9125	40	9125	9125	9125
Conversion Factor (kg/ug)	1.00E-09	1.00E-09	1.00E-09	1.00E-09	1.00E-09

Table A-3.
SOIL INGESTION EXPOSURE EVALUATION FOR LAKE CALUMET CLUSTER SITE: ALBURN

Carcinogenic Risk

	On-site Worker		Construction Worker		Industrial / Commercial Worker		Mower		Landscape Worker	
COPC	LADD	ELCR	LADD	ELCR	LADD	ELCR	LADD	ELCR	LADD	ELCR
Arsenic	2.83E-07	4.24E-07	1.30E-07	1.95E-07	1.41E-06	2.12E-06	1.09E-06	1.63E-06	1.13E-07	1.70E-07
Beryllium	2.72E-08	0.00E+00	1.25E-08	0.00E+00	1.36E-07	0.00E+00	1.04E-07	0.00E+00	1.09E-08	0.00E+00
Benzene	1.45E-06	7.98E-08	6.69E-07	3.68E-08	7.25E-06	3.99E-07	5.57E-06	3.06E-07	5.80E-07	3.19E-08
Benzo(a)anthracene	8.90E-08	6.50E-08	4.10E-08	2.99E-08	4.45E-07	3.25E-07	3.42E-07	2.49E-07	3.56E-08	2.60E-08
Benzo(b)flouranthene	1.02E-07	7.45E-08	4.70E-08	3.43E-08	5.10E-07	3.73E-07	3.92E-07	2.86E-07	4.08E-08	2.98E-08
Benzo(a)pyrene	7.74E-08	5.65E-07	3.57E-08	2.60E-07	3.87E-07	2.83E-06	2.97E-07	2.17E-06	3.10E-08	2.26E-07
Dibenz(a,h)anthracene	2.64E-08	1.93E-07	1.22E-08	8.88E-08	1.32E-07	9.64E-07	1.01E-07	7.40E-07	1.06E-08	7.71E-08
Indeno(1,2,3-cd)pyrene	5.12E-08	3.74E-08	2.36E-08	1.72E-08	2.56E-07	1.87E-07	1.97E-07	1.44E-07	2.05E-08	1.50E-08
Bis(2-Chloroethyl) Ether	1.54E-08	1.69E-08	7.10E-09	7.81E-09	7.70E-08	8.47E-08	5.91E-08	6.50E-08	6.16E-09	6.78E-09
Methylene chloride	9.57E-07	7.17E-09	4.41E-07	3.31E-09	4.78E-06	3.59E-08	3.67E-06	2.75E-08	3.83E-07	2.87E-09
Tetrachloroethene	9.92E-07	5.16E-08	4.57E-07	2.38E-08	4.96E-06	2.58E-07	3.81E-06	1.98E-07	3.97E-07	2.06E-08
Trichloroethene	1.46E-06	1.60E-08	6.72E-07	7.39E-09	7.29E-06	8.02E-08	5.60E-06	6.16E-08	5.84E-07	6.42E-09
Vinyl Chloride	8.88E-07	6.39E-07	4.09E-07	2.95E-07	4.44E-06	3.20E-06	3.41E-06	2.45E-06	3.55E-07	2.56E-07
Total PCBs	3.39E-08	6.77E-08	1.56E-08	3.12E-08	1.69E-07	3.39E-07	1.30E-07	2.60E-07	1.35E-08	2.71E-08

Noncarcinogenic Risk

	On-site Worker		Construction Worker		Industrial / Commercial Worker		Mower		Landscape Worker	
COPC	ADD	HQ	ADD	HQ	ADD	HQ	ADD	HQ	ADD	HQ
Antimony	7.75E-07	1.94E-03	8.15E-05	2.04E-01	3.88E-06	9.69E-03	2.98E-06	7.44E-03	3.10E-07	7.75E-04
Arsenic	7.92E-07	2.64E-03	8.32E-05	2.77E-01	3.96E-06	1.32E-02	3.04E-06	1.01E-02	3.17E-07	1.06E-03
Barium	1.88E-05	2.68E-04	1.97E-03	2.82E-02	9.39E-05	1.34E-03	7.21E-05	1.03E-03	7.51E-06	1.07E-04
Beryllium	7.61E-08	3.80E-05	8.00E-06	4.00E-03	3.80E-07	1.90E-04	2.92E-07	1.46E-04	3.04E-08	1.52E-05
Cadmium	3.58E-07	7.15E-04	3.76E-05	7.52E-02	1.79E-06	3.58E-03	1.37E-06	2.75E-03	1.43E-07	2.86E-04
Chromium	1.28E-05	8.52E-06	1.34E-03	8.96E-04	6.39E-05	4.26E-05	4.91E-05	3.27E-05	5.11E-06	3.41E-06
Manganese	1.91E-04	4.15E-03	2.01E-02	4.36E-01	9.54E-04	2.07E-02	7.33E-04	1.59E-02	7.63E-05	1.66E-03
Carbon disulfide	4.05E-06	4.05E-05	4.26E-04	4.26E-03	2.03E-05	2.03E-04	1.56E-05	1.56E-04	1.62E-06	1.62E-05
Chlorobenzene	2.03E-06	1.02E-04	2.13E-04	1.07E-02	1.02E-05	5.08E-04	7.80E-06	3.90E-04	8.12E-07	4.06E-05
Ethylbenzene	2.31E-04	2.31E-03	2.43E-02	2.43E-01	1.16E-03	1.16E-02	8.87E-04	8.87E-03	9.24E-05	9.24E-04
Heptachlor	1.94E-10	3.88E-07	2.04E-08	4.08E-05	9.71E-10	1.94E-06	7.46E-10	1.49E-06	7.77E-11	1.55E-07
Methylene chloride	2.68E-06	4.46E-05	2.82E-04	4.69E-03	1.34E-05	2.23E-04	1.03E-05	1.71E-04	1.07E-06	1.79E-05
Tetrachloroethene	2.78E-06	2.78E-04	2.92E-04	2.92E-02	1.39E-05	1.39E-03	1.07E-05	1.07E-03	1.11E-06	1.11E-04
Trichloroethene	4.08E-06	6.81E-04	4.29E-04	7.16E-02	2.04E-05	3.40E-03	1.57E-05	2.61E-03	1.63E-06	2.72E-04
Toluene	8.17E-05	4.08E-04	8.59E-03	4.29E-02	4.08E-04	2.04E-03	3.14E-04	1.57E-03	3.27E-05	1.63E-04
Vinyl Chloride	2.49E-06	8.29E-04	2.61E-04	8.71E-02	1.24E-05	4.14E-03	9.54E-06	3.18E-03	9.94E-07	3.31E-04
Xylenes	1.22E-03	6.12E-04	1.29E-01	6.43E-02	6.12E-03	3.06E-03	4.70E-03	2.35E-03	4.89E-04	2.45E-04

Summary

	On-site Worker	Construction Worker	Industrial / Commercial Worker	Mower	Landscape Worker
ELCR for this pathway	2.24E-06	1.03E-06	1.12E-05	8.59E-06	8.95E-07
HI for this pathway	8.30E-03	8.72E-01	4.15E-02	3.19E-02	3.32E-03

Notes:

ELCR: Excess lifetime cancer risks

HI: Hazard index

COPC:Contaminants of potential concern

LADD: Lifetime average daily dose

ADD: Average daily dose

HQ: Hazard quotient

Bold shaded area indicated ELCR or HI exceedances for the receptor

Table A-4.
SOIL DERMAL EXPOSURE FACTORS FOR LAKE CALUMET CLUSTER SITE: ALBURN

Carcinogenic Risk					
	LADD=EPCsoilxSAxAFxABSxEFxEDxCF/(BWxATc)				
	EPC=exposure point concentration (ug/kg)				
	SA=body surface area (cm^2/day)				
	AF=soil adherence factor (mg/cm^2)				
	ABS=dermal adsorption factor (unitless)				
	EF=exposure frequency (days/year)				
	ED=exposure duration (years)				
	CF=conversion factor (10-9 kg/ug)				
	BW=body weight (kg)				
	ATc=averaging time for carcinogens (days)				
	ELCR=LADDxSFd				
	SFd=dermal cancer slope factor (kg-day/mg)				
	LADD=lifetime average daily dose (mg/kg-day)				
Exposure Factor	**On-site Worker**	**Mower**	**Landscape Worker**	**Construction Worker**	**Industrial / Commercial Worker**
SA (cm^2/day)	3300	3300	3300	3300	3300
AF(mg/cm^2)	0.2	0.2	0.2	0.2	0.2
ABS	Chemical Specific				
Inorganics	0.01	0.01	0.01	0.01	0.01
Bis(2-ethylhexyl)phthalate	0.4	0.4	0.4	0.4	0.4
Tetrachloroethene	0.03	0.03	0.03	0.03	0.03
Trichloroethene	0.03	0.03	0.03	0.03	0.03
Vinyl chloride	0.03	0.03	0.03	0.03	0.03
EF (day/year) for Soil	50	10	20	30	250
EF (day/year) for Sediment	5			5	5
ET (hour/day)	5	8	8	8	8
ED (years)	25	25	25	1	25
BW (kg)	70	70	70	70	70
Atc (days) - for Soil	25550	25550	25550	25550	25550
Atc (days) - for Sediment	25550			25550	25550
Conversion Factor (kg/ug)	1.00E-09	1.00E-09	1.00E-09	1.00E-09	1.00E-09

Table A-4.
SOIL DERMAL EXPOSURE FACTORS FOR LAKE CALUMET CLUSTER SITE: ALBURN

Noncarcinogenic Risk					
	ADD=EPCxSAxAFxABSxEFxEDxCF/(BWxATn)-Soil and Sediment				
	EPC=exposure point concentration (ug/kg)				
	SA=body surface area (cm^2/day)				
	AF=soil adherence factor (mg/cm^2)				
	ABS=dermal adsorption factor				
	EF=exposure frequency (days/year)				
	ED=exposure duration (years)				
	CF=conversion factor 10-9 kg/mg				
	BW=body weight (kg)				
	ATn =averaging time for noncarcinogens (days)				
	HQ=ADD/RfDo				
	ADD-average daily dose (mg/kg-day)				
	RfDd=dermal reference dose (mg/kg-day)				

Exposure Factor	On-site Worker	Mower	Landscape Worker	Construction Worker	Industrial / Commercial Worker
SA (cm^2/day)	3300	3300	3300	3300	3300
AF(mg/cm^2)	0.2	0.2	0.2	0.2	0.2
ABS	Chemical Specific				
Inorganics	0.01	0.01	0.01	0.01	0.01
Bis(2-ethylhexyl)phthalate	0.4	0.4	0.4	0.4	0.4
Tetrachloroethene	0.03	0.03	0.03	0.03	0.03
Trichloroethene	0.03	0.03	0.03	0.03	0.03
Vinyl chloride	0.03	0.03	0.03	0.03	0.03
Others	0	0	0	0	0
EF (day/year) for Soil	50	10	20	30	250
EF (day/year) for Sediment	5			5	5
ET (hour/day)	5	8	8	8	8
ED (years)	25	25	25	1	25
BW (kg)	70	70	70	70	70
Atn (days) - for Soil	9125	9125	9125	40	9125
Atn (days) - for Sediment	9125			40	9125
Conversion Factor kg/ug)	1.00E-09	1.00E-09	1.00E-09	1.00E-09	1.00E-09

Table A-5.
WATER DERMAL EXPOSURE FACTORS FOR LAKE CALUMET CLUSTER SITE: ALBURN

Carcinogenic Risk					
	LADD=EPCxSAxPCxETxEFxEDxCF/(BWxATc)				
	EPC=exposure point concentration (ug/L)				
	SA = skin surface area (cm^2)				
	PC = Permeability Constant (cm/hr)				
	EF=exposure frequency (days/year)				
	ET = exposure time (hour/day)				
	ED = exposure duration (years)				
	CF = conversion factor 10-6 (L-mg/cm^3-ug)				
	BW = body weight (kg)				
	Atc = averaging time for carcinogens (days)				
	ELCR=LADDxSFd				
	SFd=dermal cancer slope factor (kg-day/mg)				
	LADD=lifetime average daily dose (mg/kg-day)				

Exposure Factor	On-site Worker	Mower	Landscape Worker	Construction Worker	Industrial / Commercial Worker
SA (cm^2)	3300	3300	3300	3300	3300
PC(cm/hr)	Chemical Specific				
Inorganic	1.00E-03	1.00E-03	1.00E-03	1.00E-03	1.00E-03
Benzo(a)pyrene	1.20E+00	1.20E+00	1.20E+00	1.20E+00	1.20E+00
Benzo(a)anthracene	8.00E-01	8.00E-01	8.00E-01	8.00E-01	8.00E-01
Benzo(b)fluoranthene	1.20E+00	1.20E+00	1.20E+00	1.20E+00	1.20E+00
Dibenzo(a,h)anthracene	2.70E+00	2.70E+00	2.70E+00	2.70E+00	2.70E+00
Indeno(1,2,3-cd)pyrene	1.90E+00	1.90E+00	1.90E+00	1.90E+00	1.90E+00
Benzo(k)fluoranthene					
Chrysene	8.10E-01	8.10E-01	8.10E-01	8.10E-01	8.10E-01
Vinyl chloride	7.30E-03	7.30E-03	7.30E-03	7.30E-03	7.30E-03
bis(2-ethylhexyl)phthalate	3.30E-02	3.30E-02	3.30E-02	3.30E-02	3.30E-02
Tetrachloroethene	4.80E-02	4.80E-02	4.80E-02	4.80E-02	4.80E-02
Trichloroethene	1.60E-02	1.60E-02	1.60E-02	1.60E-02	1.60E-02
EF (day/year) for SW & GW	5			5	5
ET (hour/day)	1	1	1	1	1
ED (years)	25			1	25
BW (kg)	70	70	70	70	70
Atc (days) - for SW & GW	25550			25550	25550
Conversion Factor (L-mg/cm^3-ug)	1.00E-06	1.00E-06	1.00E-06	1.00E-06	1.00E-06

Table A-5.
WATER DERMAL EXPOSURE FACTORS FOR LAKE CALUMET CLUSTER SITE: ALBURN

Noncarcinogenic Risk					
	ADD=EPCxSAxPCxETxEFxEDxCF/(BWxATn)				
	EPC=exposure point concentration (ug/L)				
	SA = Skin surface area (cm^2)				
	PC=Permeability Constant (cm/hr)				
	EF=exposure frequency (days/year)				
	ED=exposure duration (years)				
	CF=conversion factor 10-6 (L-mg/cm^3-ug)				
	CF=conversion factor 10-6 (L-mg/cm^3-ug)				
	BW=body weight (kg)				
	ATn =averaging time for noncarcinogens (days)				
	HQ=ADD/RfDo				
	ADD-average daily dose (mg/kg-day)				
	RfDd=dermal reference dose (mg/kg-day)				

Exposure Factor	On-site Worker	Mower	Landscape Worker	Construction Worker	Industrial / Commercial Worker
SA (cm^2)	3300	3300	3300	3300	3300
PC (cm/hr)	Chemical Specific				
Inorganic	1.00E-03	1.00E-03	1.00E-03	1.00E-03	1.00E-03
Benzo(a)pyrene	1.20E+00	1.20E+00	1.20E+00	1.20E+00	1.20E+00
Benzo(a)anthracene	8.00E-01	8.00E-01	8.00E-01	8.00E-01	8.00E-01
Benzo(b)fluoranthene	1.20E+00	1.20E+00	1.20E+00	1.20E+00	1.20E+00
Dibenzo(a,h)anthracene	2.70E+00	2.70E+00	2.70E+00	2.70E+00	2.70E+00
Indeno(1,2,3-cd)pyrene	1.90E+00	1.90E+00	1.90E+00	1.90E+00	1.90E+00
Benzo(k)fluoranthene					
Chrysene	8.10E-01	8.10E-01	8.10E-01	8.10E-01	8.10E-01
Vinyl chloride	7.30E-03	7.30E-03	7.30E-03	7.30E-03	7.30E-03
bis(2-ethylhexyl)phthalate	3.30E-02	3.30E-02	3.30E-02	3.30E-02	3.30E-02
Tetrachloroethene	4.80E-02	4.80E-02	4.80E-02	4.80E-02	4.80E-02
Trichloroethene	1.60E-02	1.60E-02	1.60E-02	1.60E-02	1.60E-02
EF (day/year) for SW & GW	5			5	5
ET (hour/day)	1	8	8	1	1
ED (years)	25			1	25
BW (kg)	70	70	70	70	70
Atn (days) - for SW & GW	9125			40	9125
Conversion Factor (L-mg/cm^3-ug)	1.00E-06	1.00E-06	1.00E-06	1.00E-06	1.00E-06

Table A-6.
DERMAL EXPOSURE EVALUATION FOR SOIL FOR LAKE CALUMET CLUSTER SITE: ALBURN

Carcinogenic Risk

COPC	Dermal Adsorp. Factors (ABS)	On-site Worker		Mower		Landscape Worker		Contruction Worker		Industrial/Commercial Worker	
		LADD	ELCR	LADD	ELCR	LADD	ELCR	LADD	ELCR	LADD	ELCR
Arsenic	3.00E-02	2.24E-07	3.36E-07	4.48E-08	6.72E-08	8.96E-08	1.34E-07	5.38E-09	8.06E-09	1.12E-06	1.68E-06
Beryllium	1.00E-02	7.17E-09	0.00E+00	1.43E-09	0.00E+00	2.87E-09	0.00E+00	1.72E-10	0.00E+00	3.59E-08	0.00E+00
Benzene	3.00E-02	1.15E-06	6.32E-08	2.30E-07	1.26E-08	4.60E-07	2.53E-08	2.76E-08	1.52E-09	5.75E-06	3.16E-07
Bis(2-Chloroethyl) Ether	1.00E-02	4.07E-09	4.47E-09	8.13E-10	8.94E-10	1.63E-09	1.79E-09	9.76E-11	1.07E-10	2.03E-08	2.24E-08
Methylene chloride	3.00E-02	7.58E-07	5.68E-09	1.52E-07	1.14E-09	3.03E-07	2.27E-09	1.82E-08	1.36E-10	3.79E-06	2.84E-08
Tetrachloroethene	3.00E-02	7.85E-07	4.08E-08	1.57E-07	8.17E-09	3.14E-07	1.63E-08	1.89E-08	9.80E-10	3.93E-06	2.04E-07
Trichloroethene	3.00E-02	1.16E-06	1.27E-08	2.31E-07	2.54E-09	4.62E-07	5.08E-09	2.77E-08	3.05E-10	5.78E-06	6.35E-08
Vinyl Chloride	3.00E-02	7.03E-07	5.06E-07	1.41E-07	1.01E-07	2.81E-07	2.02E-07	1.69E-08	1.21E-08	3.52E-06	2.53E-06
Total PCBs	1.40E-01	1.25E-07	2.50E-07	2.50E-08	5.01E-08	5.01E-08	1.00E-07	3.00E-09	6.01E-09	6.26E-07	1.25E-06

Noncarcinogenic Risk

COPC	Dermal Adsorp. Factors (ABS)	On-site Worker		Mower		Landscape Worker		Contruction Worker		Industrial/Commercial Worker	
		ADD	HQ	ADD	HQ	ADD	HQ	ADD	HQ	ADD	HQ
Antimony	1.00E-02	2.05E-07	5.12E-04	4.09E-08	1.02E-04	8.19E-08	2.05E-04	1.12E-06	2.80E-03	1.02E-06	2.56E-03
Arsenic	3.00E-02	6.27E-07	2.09E-03	1.25E-07	4.18E-04	2.51E-07	8.36E-04	3.43E-06	1.14E-02	3.14E-06	1.05E-02
Barium	1.00E-02	4.96E-06	7.08E-05	9.92E-07	1.42E-05	1.98E-06	2.83E-05	2.71E-05	3.88E-04	2.48E-05	3.54E-04
Beryllium	1.00E-02	2.01E-08	1.00E-05	4.02E-09	2.01E-06	8.03E-09	4.02E-06	1.10E-07	5.50E-05	1.00E-07	5.02E-05
Cadmium	1.00E-02	9.44E-08	1.89E-04	1.89E-08	3.78E-05	3.78E-08	7.55E-05	5.17E-07	1.03E-03	4.72E-07	9.44E-04
Chromium	1.00E-02	3.37E-06	2.25E-06	6.75E-07	4.50E-07	1.35E-06	9.00E-07	1.85E-05	1.23E-05	1.69E-05	1.12E-05
Manganese	1.00E-02	5.04E-05	1.10E-03	1.01E-05	2.19E-04	2.02E-05	4.38E-04	2.76E-04	6.00E-03	2.52E-04	5.48E-03
Carbon disulfide	3.00E-02	3.21E-06	3.21E-05	6.42E-07	6.42E-06	1.28E-06	1.28E-05	1.76E-05	1.76E-04	1.61E-05	1.61E-04
Chlorobenzene	3.00E-02	1.61E-06	8.04E-05	3.22E-07	1.61E-05	6.43E-07	3.22E-05	8.80E-06	4.40E-04	8.04E-06	4.02E-04
Ethylbenzene	3.00E-02	1.83E-04	1.83E-03	3.66E-05	3.66E-04	7.32E-05	7.32E-04	1.00E-03	1.00E-02	9.15E-04	9.15E-03
Heptachlor	1.00E-01	5.13E-10	1.03E-06	1.03E-10	2.05E-07	2.05E-10	4.10E-07	2.81E-09	5.61E-06	2.56E-09	5.13E-06
Methylene chloride	3.00E-02	2.12E-06	3.54E-05	4.24E-07	7.07E-06	8.49E-07	1.41E-05	1.16E-05	1.94E-04	1.06E-05	1.77E-04
Tetrachloroethene	3.00E-02	2.20E-06	2.20E-04	4.40E-07	4.40E-05	8.80E-07	8.80E-05	1.20E-05	1.20E-03	1.10E-05	1.10E-03
Trichloroethene	3.00E-02	3.24E-06	5.39E-04	6.47E-07	1.08E-04	1.29E-06	2.16E-04	1.77E-05	2.95E-03	1.62E-05	2.70E-03
Toluene	3.00E-02	6.47E-05	3.23E-04	1.29E-05	6.47E-05	2.59E-05	1.29E-04	3.54E-04	1.77E-03	3.23E-04	1.62E-03
Vinyl Chloride	3.00E-02	1.97E-06	6.56E-04	3.94E-07	1.31E-04	7.87E-07	2.62E-04	1.08E-05	3.59E-03	9.84E-06	3.28E-03
Xylenes	3.00E-02	9.69E-04	4.84E-04	1.94E-04	9.69E-05	3.87E-04	1.94E-04	5.30E-03	2.65E-03	4.84E-03	2.42E-03

Summary

	On-site Worker	Mower	Landscape Worker	Contruction Worker	Industrial/Commercial Worker
ELCR for this pathway=	1.22E-06	2.44E-07	4.88E-07	2.93E-08	4.85E-06
HI for this pathway=	8.17E-03	1.63E-03	3.27E-03	4.47E-02	4.09E-02

Notes:

ELCR: Excess lifetime cancer risks

HI: Hazard index

COPC:Contaminants of potential concern

LADD: Lifetime average daily dose

ADD: Average daily dose

HQ: Hazard quotient

Table A-7.
DERMAL EXPOSURE EVALUATION FOR SEDIMENTS FOR LAKE CALUMET CLUSTER SITE: ALBURN

Carcinogenic Risk							
		On-site Worker		Contruction Worker		Industrial / Commercial Worker	
COPC	Dermal Adsorp. Factors	LADD	ELCR	LADD	ELCR	LADD	ELCR
Arsenic	3.00E-02	1.44E-07	2.16E-07	5.76E-09	8.64E-09	1.44E-07	2.16E-07
Chrysene	0.00E+00	1.92E-08	1.40E-10	8.86E-09	6.47E-11	9.61E-08	7.02E-10

Noncarcinogenic Risk							
	Dermal Adsorp. Factors	On-site Worker		Contruction Worker		Industrial / Commercial Worker	
COPC		ADD	HQ	ADD	HQ	ADD	HQ
Arsenic	3.00E-02	4.03E-07	1.34E-03	3.68E-06	1.23E-02	4.03E-07	1.34E-03
Chromium	1.00E-02	6.94E-07	4.62E-07	6.33E-06	4.22E-06	6.94E-07	4.62E-07

Summary				
		On-site Worker	Contruction Worker	Industrial / Commercial Worker
ELCR for this pathway=		2.16E-07	8.70E-09	2.17E-07
HI for this pathway=		1.34E-03	1.23E-02	1.34E-03

Notes:
ELCR: Excess lifetime cancer risks
HI: Hazard index
COPC:Contaminants of potential concern
LADD: Lifetime average daily dose
ADD: Average daily dose
HQ: Hazard quotient

Table A-8.
DERMAL EXPOSURE EVALUATION FOR SURFACE WATER
FOR LAKE CALUMET CLUSTER SITE: ALBURN

Carcinogenic Risk							
		On-site Worker		Contruction Worker		Industrial / Commercial Worker	
COPC	Permeability Constant cm/hr	LADD	ELCR	LADD	ELCR	LADD	ELCR
Heptachlor	1.10E-02	7.61E-10	3.43E-09	3.04E-11	1.37E-10	7.61E-10	3.43E-09

Noncarcinogenic Risk							
		On-site Worker		Contruction Worker		Industrial / Commercial Worker	
COPC	Permeability Constant cm/hr	ADD	HQ	ADD	HQ	ADD	HQ
Barium	1.00E-03	2.31E-07	3.30E-06	2.11E-06	3.01E-05	2.31E-07	3.30E-06
Manganese	1.00E-03	1.80E-06	3.92E-05	1.64E-05	3.57E-04	1.80E-06	3.92E-05

Summary				
		On-site Worker	Contruction Worker	Industrial / Commercial Worker
ELCR for this pathway=		3.43E-09	1.37E-10	3.43E-09
HI for this pathway=		4.25E-05	3.88E-04	4.25E-05

Notes:
ELCR: Excess lifetime cancer risks
HI: Hazard index
COPC:Contaminants of potential concern
LADD: Lifetime average daily dose
ADD: Average daily dose
HQ: Hazard quotient

Table A-9.
DERMAL EXPOSURE EVALUATION FOR GROUNDWATER
FOR LAKE CALUMET CLUSTER SITE: ALBURN

Carcinogenic Risk							
		On-site Worker		Contruction Worker		Industrial / Commercial Worker	
COPC	Permeability Constant cm/hr	LADD	ELCR	LADD	ELCR	LADD	ELCR
Arsenic	1.00E-03	2.81E-08	4.22E-08	1.13E-09	1.69E-09	2.81E-08	4.22E-08
Beryllium	1.00E-03	1.45E-09	0.00E+00	5.81E-11	0.00E+00	1.45E-09	0.00E+00
Benzene	2.10E-02	1.16E-05	6.39E-07	4.65E-07	2.56E-08	1.16E-05	6.39E-07
Bis(2-Chloroethyl) Ether	2.10E-03	1.26E-07	1.39E-07	5.04E-09	5.54E-09	1.26E-07	1.39E-07
Methylene chloride	4.50E-03	1.76E-07	1.32E-09	7.06E-09	5.29E-11	1.76E-07	1.32E-09
N-Nitrosodiphenylamine	2.00E-02	2.77E-08	1.36E-10	1.11E-09	5.42E-12	2.77E-08	1.36E-10

Noncarcinogenic Risk							
		On-site Worker		Contruction Worker		Industrial / Commercial Worker	
COPC	Permeability Constant cm/hr	ADD	HQ	ADD	HQ	ADD	HQ
Antimony	1.00E-03	4.26E-09	1.07E-05	3.89E-08	9.72E-05	4.26E-09	1.07E-05
Arsenic	1.00E-03	7.88E-08	2.63E-04	7.19E-07	2.40E-03	7.88E-08	2.63E-04
Barium	1.00E-03	3.00E-06	4.29E-05	2.74E-05	3.91E-04	3.00E-06	4.29E-05
Beryllium	1.00E-03	4.07E-09	2.03E-06	3.71E-08	1.86E-05	4.07E-09	2.03E-06
Cadmium	1.00E-03	1.41E-08	2.83E-05	1.29E-07	2.58E-04	1.41E-08	2.83E-05
Chromium	1.00E-03	2.27E-07	1.52E-07	2.07E-06	1.38E-06	2.27E-07	1.52E-07
Manganese	1.00E-03	2.63E-06	5.71E-05	2.40E-05	5.21E-04	2.63E-06	5.71E-05
Mercury	1.00E-03	2.32E-09		2.12E-08		2.32E-09	
Nickel	1.00E-03	1.39E-07	6.97E-06	1.27E-06	6.36E-05	1.39E-07	6.97E-06
Thallium	1.00E-03	1.68E-09	2.10E-05	1.53E-08	1.92E-04	1.68E-09	2.10E-05
Vanadium	1.00E-03	1.64E-07	2.34E-05	1.50E-06	2.14E-04	1.64E-07	2.34E-05
Zinc	1.00E-03	4.48E-06	1.49E-05	4.09E-05	1.36E-04	4.48E-06	1.49E-05
Bis(2-ethylhexyl)phthalate	3.30E-02	1.68E-06	8.42E-05	1.54E-05	7.68E-04	1.68E-06	8.42E-05
Chlorobenzene	4.10E-02	4.50E-06	2.25E-04	4.11E-05	2.05E-03	4.50E-06	2.25E-04
2,4-Dimethylphenol	1.50E-02	3.10E-06	1.55E-04	2.83E-05	1.41E-03	3.10E-06	1.55E-04
Ethylbenzene	7.40E-02	2.77E-04	2.77E-03	2.53E-03	2.53E-02	2.77E-04	2.77E-03
Methylene chloride	4.50E-03	4.94E-07	8.23E-06	4.51E-06	7.51E-05	4.94E-07	8.23E-06
Naphthalene	6.90E-02	1.87E-05	9.36E-04	1.71E-04	8.54E-03	1.87E-05	9.36E-04
Toluene	4.50E-02	1.10E-03	5.52E-03	1.01E-02	5.04E-02	1.10E-03	5.52E-03
Xylenes	8.00E-02	9.30E-04	4.65E-04	8.49E-03	4.24E-03	9.30E-04	4.65E-04

Summary				
		On-site Worker	Contruction Worker	Industrial / Commercial Worker
ELCR for this pathway=		8.22E-07	3.29E-08	8.22E-07
HI for this pathway=		1.06E-02	9.71E-02	1.06E-02

Notes:

ELCR: Excess lifetime cancer risks

HI: Hazard index

COPC:Contaminants of potential concern

LADD: Lifetime average daily dose

ADD: Average daily dose

HQ: Hazard quotient

Table A-10.
PARTICULATE INHALATION EXPOSURE FACTORS FOR LAKE CALUMET CLUSTER
SITE: ALBURN

Carcinogenic Risk

LADD=EPCaxERxIRxEFxED/(BWxATc)

EPCa=exposure point concentration in air (ug/m3) = EPCxPIF
ER=exposure rate (hrs/day)
IR=inhalation rate (m3/hour)
EF=exposure frequency (days/year)
ED=exposure duration (years)
BW=body weight (kg)
ATc=averaging time for carcinogens (days)
PIF= Particulate Inhalation factor (kg/m3)

ELCR=LADDxSFi

SFi=inhalation cancer slope factor (kg-day/mg)
LADD=lifetime average daily dose (mg/kg-day)

Exposure Factor	On-site Worker	Construction Worker	Industrial / Commercial Workers	Mower	Landscape Worker
IR (m3/hour)	1.1	2.8	1.1	1.7	1.1
ER (hr/day)	5	8	8	8	8
EF (days/year)	50	30	250	10	20
ED (years)	25	1	25	25	25
BW (kg)	70	70	70	70	70
Atc (days)	25550	25550	25550	25550	25550
Particulate Inhalation factor	8.00E-10	8.00E-09	8.00E-10	8.00E-09	8.00E-10
Conversion from ug to mg	1.00E-03	1.00E-03	1.00E-03	1.00E-03	1.00E-03

Noncarcinogenic Risk

ADD=EPCaxERxIRxEFxED/(BWxATn)

EPCa=exposure point concentration in air (ug/m3)
ER=exposure rate (hrs/day)
IR=inhalation rate (m3/hr)
EF=exposure frequency (days/year)
ED=exposure duration (years)
BW=body weight (kg)
ATn=averaging time for noncarcinogens (days)

HQ=ADD/RfDi

ADD=average daily dose (mg/kg-day)\
RfDi=inhalation reference dose (mg/kg-day)

Exposure Factor	On-site Worker	Construction Worker	Industrial / Commercial Workers	Mower	Landscape Worker
IR (m3/hour)	1.1	2.8	1.1	1.7	1.1
ER (hr/day)	5	8	8	8	8
EF (days/year)	50	30	250	10	20
ED (years)	25	1	25	25	25
BW (kg)	70	70	70	70	70
Atn (days)	9125	9125	9125	9125	40
Particulate Inhalation factor	8.00E-10	8.00E-09	8.00E-10	8.00E-10	8.00E-10

Table A-11.
PARTICULATE EXPOSURE EVALUATION FOR LAKE CALUMET CLUSTER SITE: ALBURN

Carcinogenic Risk

	On-site Worker		Construction Worker		Industrial / Commercial Worker		Mower		Landscape Worker	
COPC	LADD	ELCR	LADD	ELCR	LADD	ELCR	LADD	ELCR	LADD	ELCR
Arsenic	4.98E-11	0.00E+00	4.87E-11	0.00E+00	3.98E-10	0.00E+00	2.46E-10	0.00E+00	3.19E-11	0.00E+00
Beryllium	4.78E-12	0.00E+00	4.67E-12	0.00E+00	3.83E-11	0.00E+00	2.36E-11	0.00E+00	3.06E-12	0.00E+00
Benzene	2.55E-10	7.40E-12	2.50E-10	7.24E-12	2.04E-09	5.92E-11	1.26E-09	3.66E-11	1.63E-10	4.74E-12
Benzo(a)anthracene	1.57E-11	4.85E-12	1.53E-11	4.75E-12	1.25E-10	3.88E-11	7.75E-11	2.40E-11	1.00E-11	3.11E-12
Benzo(b)flouranthene	1.80E-11	5.57E-12	1.76E-11	5.44E-12	1.44E-10	4.46E-11	8.88E-11	2.75E-11	1.15E-11	3.56E-12
Benzo(a)pyrene	1.36E-11	4.22E-11	1.33E-11	4.13E-11	1.09E-10	3.38E-10	6.74E-11	2.09E-10	8.72E-12	2.70E-11
Dibenz(a,h)anthracene	4.65E-12	1.44E-11	4.54E-12	1.41E-11	3.72E-11	1.15E-10	2.30E-11	7.13E-11	2.97E-12	9.22E-12
Indeno(1,2,3-cd)pyrene	9.01E-12	2.79E-12	8.81E-12	2.73E-12	7.21E-11	2.24E-11	4.46E-11	1.38E-11	5.77E-12	1.79E-12
Bis(2-Chloroethyl) Ether	2.71E-12	3.14E-12	2.65E-12	3.07E-12	2.17E-11	2.52E-11	1.34E-11	1.55E-11	1.73E-12	2.01E-12
Methylene chloride	1.68E-10	2.78E-13	1.65E-10	2.72E-13	1.35E-09	2.22E-12	8.33E-10	1.37E-12	1.08E-10	1.78E-13
Tetrachloroethene	1.75E-10	3.49E-13	1.71E-10	3.41E-13	1.40E-09	2.79E-12	8.63E-10	1.73E-12	1.12E-10	2.23E-13
Trichloroethene	2.57E-10	1.54E-12	2.51E-10	1.51E-12	2.05E-09	1.23E-11	1.27E-09	7.62E-12	1.64E-10	9.86E-13
Vinyl Chloride	1.56E-10	2.50E-12	1.53E-10	2.44E-12	1.25E-09	2.00E-11	7.73E-10	1.24E-11	1.00E-10	1.60E-12
Total PCBs	5.96E-12	1.19E-11	5.83E-12	1.17E-11	4.77E-11	9.54E-11	2.95E-11	5.90E-11	3.81E-12	7.63E-12

Noncarcinogenic Risk

	On-site Worker		Construction Worker		Industrial / Commercial Worker		Mower		Landscape Worker	
COPC	ADD	HQ	ADD	HQ	ADD	HQ	ADD	HQ	ADD	HQ
Antimony	1.36E-10		1.33E-10		1.09E-09		6.75E-11		1.99E-08	
Arsenic	1.39E-10		1.36E-10		1.12E-09		6.89E-11		2.03E-08	
Barium	3.31E-09	2.31E-05	3.23E-09	2.26E-05	2.64E-08	1.85E-04	1.63E-09	1.14E-05	4.83E-07	3.37E-03
Beryllium	1.34E-11	2.34E-06	1.31E-11	2.29E-06	1.07E-10	1.88E-05	6.62E-12	1.16E-06	1.95E-09	3.42E-04
Cadmium	6.29E-11		6.15E-11		5.04E-10		3.11E-11		9.19E-09	
Chromium	2.25E-09		2.20E-09		1.80E-08		1.11E-09		3.28E-07	
Manganese	3.36E-08	2.35E-03	3.28E-08	2.30E-03	2.69E-07	1.88E-02	1.66E-08	1.16E-03	4.90E-06	3.43E-01
Carbon disulfide	7.13E-10	3.57E-09	6.97E-10	3.49E-09	5.71E-09	2.85E-08	3.53E-10	1.76E-09	1.04E-07	5.21E-07
Chlorobenzene	3.57E-10	6.26E-08	3.49E-10	6.12E-08	2.86E-09	5.01E-07	1.77E-10	3.10E-08	5.22E-08	9.14E-06
Ethylbenzene	4.07E-08	1.42E-07	3.98E-08	1.39E-07	3.25E-07	1.14E-06	2.01E-08	7.03E-08	5.94E-06	2.08E-05
Heptachlor	3.42E-14		3.34E-14		2.73E-13		1.69E-14		4.99E-12	
Methylene chloride	4.71E-10	5.50E-10	4.61E-10	5.38E-10	3.77E-09	4.40E-09	2.33E-10	2.72E-10	6.88E-08	8.03E-08
Tetrachloroethene	4.89E-10		4.78E-10		3.91E-09		2.42E-10		7.14E-08	
Trichloroethene	7.19E-10		7.03E-10		5.75E-09		3.56E-10		1.05E-07	
Toluene	1.44E-08	1.26E-07	1.41E-08	1.23E-07	1.15E-07	1.01E-06	7.11E-09	6.24E-08	2.10E-06	1.84E-05
Vinyl Chloride	4.37E-10	1.51E-08	4.28E-10	1.47E-08	3.50E-09	1.21E-07	2.16E-10	7.46E-09	6.39E-08	2.20E-06
Xylenes	2.15E-07		2.10E-07		1.72E-06		1.06E-07		3.14E-05	

Summary

	On-site Worker	Construction Worker	Industrial / Commercial Worker	Mower	Landscape Worker
ELCR for this pathway=	8.51E-11	8.32E-11	6.81E-10	4.21E-10	5.44E-11
HI for this pathway=	2.38E-03	2.32E-03	1.90E-02	1.17E-03	3.47E-01

Notes:

ELCR: Excess lifetime cancer risks

HI: Hazard index

COPC:Contaminants of potential concern

LADD: Lifetime average daily dose

ADD: Average daily dose

HQ: Hazard quotient

Table A-12.
GROUNDWATER VOLATILE INHALATON EXPOSURE FACTORS FOR LAKE CALUMET CLUSTER SITE: ALBURN

Carcinogenic Risk

LADD= (EPCairxIRxEFxED)/(BWxATc*CF)

EPC=exposure point concentration in air (g/m3))
IR = inhalation rate (m3/day)
EF=exposure frequency (days/year)
ED=exposure duration (years)
BW = body weight (kg)
ATc=averaging time for carcinogens (day)
CF=Conversion Factor

ELCR = LADDxSFi

SFi = Inhalation Slope Factor (kg-day/mg)
LADD=lifetime average daily dose (mg/kg-day)

Exposure Factor	On-site Worker	Construction Worker	Industrial / Commercial Worker	Mower	Landscape Worker
ED (years)	25	1	25	25	25
EF(days/year)	5	5	5		
ATc (days)	25550	25550	25550		
IR (m^3/day)	20	20	20	20	20
BW (kg)	70	70	70	70	70
CF(mg-g)	0.001	0.001	0.001	0.001	0.001

Noncarcinogenic Risk

ADD=EPCairxIRxEFxED/(BWxATn)

EPC=exposure point concentration in air (g/m^3)
IR = inhalation rate (m3/day)
EF=exposure frequency (days/year)
ED=exposure duration (years)
ATn=average time for noncarcinogens (years)
Conversion Factor = 1000

HQ=ADD/Rfd

ADD-average daily dose
Rfd = Volatile Inhalation Reference Dose (mg/kg-day)

Exposure Factor	On-site Worker	Construction Worker	Industrial / Commercial Worker	Mower	Landscape Worker
ED (years)	25	1	25	25	25
EF(days/year)	5	5	5		
ATn(days)	9125	40	9125		
IR (m^3/day)	20	20	20	20	20
BW (kg)	70	70	70	70	70
CF	0.001	0.001	0.001	0.001	0.001

Table A-13.
GROUNDWATER VOLATILE INHALATION EXPOSURE EVALUATION FOR LAKE CALUMET CLUSTER SITE: ALBURN

Carcinogenic Risk							
		On-site Worker		Construction Worker		Industrial / Commercial Worker	
COPC	Henry's Law Constant	LADD	ELCR	LADD	ELCR	LADD	ELCR
Benzene	2.28E-01	5.49E-08	1.59E-09	2.19E-09	6.36E-11	5.49E-08	1.59E-09
Methylene chloride	8.98E-02	1.83E-09	3.02E-12	7.31E-11	1.21E-13	1.83E-09	3.02E-12

Noncarcinogenic Risk							
		On-site Worker		Construction Worker		Industrial / Commercial Worker	
COPC	Henry's Law Constant	ADD	HQ	ADD	HQ	ADD	HQ
Chlorobenzene	1.52E-01	6.44E-09	1.13E-06	5.88E-08	1.03E-05	6.44E-09	1.13E-06
Ethylbenzene	3.23E-01	4.19E-07	1.46E-06	3.82E-06	1.34E-05	4.19E-07	1.46E-06
Methylene chloride	8.98E-02	5.12E-09	5.97E-09	4.67E-08	5.45E-08	5.12E-09	5.97E-09
Toluene	2.72E-01	2.55E-06	2.23E-05	2.32E-05	2.04E-04	2.55E-06	2.23E-05
Xylenes	2.15E-01	1.11E-06		1.01E-05		1.11E-06	

Summary				
		On-site Worker	Construction Worker	Industrial / Commercial Worker
ELCR for this pathway=		1.59E-09	6.38E-11	1.59E-09
HI for this pathway=		2.49E-05	2.28E-04	2.49E-05

Notes:
ELCR: Excess lifetime cancer risks
HI: Hazard index
COPC:Contaminants of potential concern
LADD: Lifetime average daily dose
ADD: Average daily dose
HQ: Hazard quotient

Table A-14.
SOIL VOLATILE INHALATON EXPOSURE FACTORS FOR LAKE CALUMET CLUSTER SITE: ALBURN

Carcinogenic Risk

LADD=(EPCxERxIRxEFxED)/(VFxBWxATc)

EPC = Exposure Point Concentration (ug/kg)
ER = Exposure Rate (hours/day)
IR = Inhalation Rate (m^3/hr)
EF = Exposure Frequency (days/year)
ED = Exposure Duration (years)
VF = Volatalization Factor (m^3/kg)
BW = Body Weight (kg)
Atc = Averaging Time for Carcinogens (day)

$VF = Q/C*(((3.14*D*T)^{0.5})/(2*Ro*D))*CF$

Q/C = Inverse of the mean concentration at the center of a square source = (g/m^2-s)/(kg/m^3)
D = Apparent Diffusivity (cm^2/s)
T = Exposure Interval (s)
Ro = Dry Soil Bulk Density = g/cm^3
Cf = Conversion factor (10 E-4 m^2/cm^2)

$D = ((O_a^{3.33} \times D_l \times H') + (O_w^{3.33} \times D_w)/n^2) \times (1/((p_b \times k_d)+O_w + (O_a \times H'))$

O_a = Air-Filled Soil Porosity	**0.13**	For Subsurface Soil
D_l = Diffusivity in Air (cm^2/s)	Chemical Specific	
H' = Henry's Law Constant	Chemical Specific	
O_w = Water-Filled Soil Porosity	**0.3**	For Subsurface Soil
D_w = Diffusivity in Water (cm^2/s)	Chemical Specific	
n = Total Soil Porosity	**0.43**	
p_b = Dry Soil Bulk Density (g/cm^3)	**1.5**	
K_d = Soil Water Partition Coeff =	$K_{oc} \times f_{oc}$	
Koc	Chemical Specific	
foc	**0.002**	

ELCR = LADD*URF

URF = Inhalation Unit Risk (m^3/ug)
LADD = lifetime average daily dose (ug/m^3)

Exposure Factor	On-site Worker	Construction Worker	Industrial / Commercial Worker	Mower	Landscape Worker
ED (years)	25	1	25	25	25
EF(days/year)	50	30	250	10	20
ATn(days)	9125	40	9125	9125	40
ATc (days)	25550	25550	25550	25550	25550
IR (m^3/hr)	1.1	2.8	1.1	1.7	1.1
ER (hr/day)	1	8	8	8	4
BW (kg)	70	70	70	70	70

Noncarcinogenic Risk

ADD=EPCvxIRxERxEFxED/(ATnxVFxBW)

EPC = exposure point concentration (ug/kg)
ER = exposure rate (hours/day)
IR = inhalation rate (m^3/hr)
EF = exposure frequency (days/year)
ED = exposure duration (years)
Atn = average time for noncarcinogens (years)
VF = Volatilization Factor (m^3/kg)
Conversion Factor = 1000

HQ=ADD/Rfc

ADD = average daily dose (m^3/ug)
Rfc = Volatile Inhalation Reference Dose (ug/m^3)

Table A-15.
SOIL VOLATILE INHALATION EXPOSURE EVALUATION FOR LAKE CALUMET CLUSTER SITE: ALBURN

	Q/C	DI	H'	Dw	Koc	Kd	D	T	Ro	VF	$T_{Construction}$	$VF_{Construction}$
COPC	g/sq.m/kg/cu.m)	(sq.cm/sec)		(sq.cm/sec)	cm^3/g	cu.cm/g	(sq.cm/sec)	Sec	g/ cu.cm	cu.m/kg	Sec	cu.m/kg
Tetrachloroethene	85.81	7.20E-02	7.54E-01	8.20E-06	1.55E+02	3.10E-01	3.82E-04	7.90E+08	1.50E+00	7.29E+03	3.60E+06	4.92E+02
Trichloroethene	85.81	7.90E-02	4.22E-01	9.10E-06	1.66E+02	3.32E-01	2.38E-04	7.90E+08	1.50E+00	9.24E+03	3.60E+06	6.23E+02
Vinyl Chloride	85.81	1.06E-01	1.11E+00	1.23E-06	1.86E+01	3.72E-02	1.43E-03	7.90E+08	1.50E+00	3.77E+03	3.60E+06	2.55E+02
Benzene	85.81	8.80E-02	2.28E-01	9.80E-06	5.89E+01	1.18E-01	2.42E-04	7.90E+08	1.50E+00	9.16E+03	3.60E+06	6.18E+02
Methylene chloride	85.81	1.01E-01	8.98E-02	1.17E-05	1.17E+01	2.34E-02	1.62E-04	7.90E+08	1.50E+00	1.12E+04	3.60E+06	7.56E+02
Carbon disulfide	85.81	1.04E-01	1.24E+00	1.00E-05	4.57E+01	9.14E-02	1.31E-03	7.90E+08	1.50E+00	3.94E+03	3.60E+06	2.66E+02
Chlorobenzene	85.81	7.30E-02	1.52E-01	8.70E-06	2.19E+02	4.38E-01	6.97E-05	7.90E+08	1.50E+00	1.71E+04	3.60E+06	1.15E+03
Ethylbenzene	85.81	7.50E-02	3.23E-01	7.80E-06	3.63E+02	7.26E-01	1.03E-04	7.90E+08	1.50E+00	1.40E+04	3.60E+06	9.47E+02
Toluene	85.81	8.70E-02	2.72E-01	8.60E-06	1.82E+02	3.64E-01	1.64E-04	7.90E+08	1.50E+00	1.11E+04	3.60E+06	7.52E+02
Xylenes	85.81	7.14E-02	2.15E-01	9.34E-06	3.74E+02	7.48E-01	6.48E-05	7.90E+08	1.50E+00	1.77E+04	3.60E+06	1.19E+03

Carcinogenic Risk										
	On-site Worker		Construction Worker		Industrial / Commercial Worker		Mower		Landscape Worker	
COPC	LADD	ELCR	LADD	ELCR	LADD	ELCR	LADD	ELCR	LADD	ELCR
Benzene	7.0E-03	5.8E-08	5.0E-02	4.2E-07	2.8E-01	2.3E-06	1.7E-02	1.4E-07	1.1E-02	9.2E-08
Methylene chloride	3.8E-03	1.8E-09	2.7E-02	1.3E-08	1.5E-01	7.1E-08	9.3E-03	4.4E-09	6.0E-03	2.8E-09
Tetrachloroethene	6.0E-03	3.4E-09	8.0E-02	4.6E-08	4.4E-01	2.5E-07	2.7E-02	1.6E-08	1.8E-02	1.0E-08
Trichloroethene	7.0E-03	1.2E-08	2.7E-02	4.7E-08	1.5E-01	2.6E-07	9.3E-03	1.6E-08	6.0E-03	1.0E-08
Vinyl Chloride	1.0E-02	4.7E-08	2.0E-02	9.2E-08	1.1E-01	5.1E-07	6.9E-03	3.1E-08	4.5E-03	2.0E-08

Noncarcinogenic Risk										
	On-site Worker		Construction Worker		Industrial / Commercial Worker		Mower		Landscape Worker	
COPC	ADD	HQ	ADD	HQ	ADD	HQ	ADD	HQ	ADD	HQ
Tetrachloroethene	1.7E-02		2.8E+01		6.7E-01		4.1E-02		6.1E+00	
Trichloroethene	1.9E-02		3.2E+01		7.8E-01		4.8E-02		7.1E+00	
Vinyl Chloride	2.9E-02	2.9E-04	4.8E+01	4.7E-01	1.2E+00	1.1E-02	7.2E-02	7.1E-04	1.1E+01	1.0E-01
Carbon disulfide	4.5E-02	6.5E-05	7.5E+01	1.1E-01	1.8E+00	2.6E-03	1.1E-01	1.6E-04	1.7E+01	2.4E-02
Chlorobenzene	5.2E-03	2.6E-04	8.6E+00	4.3E-01	2.1E-01	1.0E-02	1.3E-02	6.5E-04	1.9E+00	9.6E-02
Ethylbenzene	8.4E-03	2.8E-06	1.2E+03	4.0E-01	2.9E+01	9.7E-03	1.8E+00	6.0E-04	2.6E+02	8.8E-02
Methylene chloride	7.6E-07		1.1E+01		2.8E-01		1.7E-02		2.5E+00	
Toluene	3.2E-01	8.1E-04	5.3E+02	1.3E+00	1.3E+01	3.2E-02	8.0E-01	2.0E-03	1.2E+02	3.0E-01
Xylenes	3.0E+00		5.0E+03		1.2E+02		7.5E+00		1.1E+03	

	On-site Worker	Construction Worker	Industrial / Commercial Worker	Mower	Landscape Worker
ELCR for this pathway=	1.22E-07	6.16E-07	3.40E-06	2.10E-07	1.36E-07
HI for this pathway=	1.07E-03	2.17E+00	5.25E-02	3.25E-03	4.79E-01

Table A-15.
SOIL VOLATILE INHALATION EXPOSURE EVALUATION FOR LAKE CALUMET CLUSTER SITE: ALBURN

Notes:
ELCR: Excess lifetime cancer risks
HI: Hazard index
COPC:Contaminants of potential concern
LADD: Lifetime average daily dose
ADD: Average daily dose
HQ: Hazard quotient
Bold shaded area indicated ELCR or HI exceedances for the receptor

Table A-16.
SUMMARY OF HUMAN HEALTH RISK ASSESSMENT FOR LAKE CALUMET CLUSTER SITE: ALBURN

Summary of Human Risk Assessment for Soil, Sediment, Surface water and Groundwater

	On-site Worker	Construction Worker	Industrial / Commercial Worker	Mower	Landscape Worker
Total ELCR	6.E-06	2.E-06	3.E-05	1.E-05	2.E-06
Total HI	3.E-02	3.E+00	2.E-01	4.E-02	8.E-01

Summary of Human Risk Assessment for Soil, Sediment and Surface water

	On-site Worker	Construction Worker	Industrial / Commercial Worker	Mower	Landscape Worker
Total ELCR	5.E-06	2.E-06	2.E-05	1.E-05	2.E-06
Total HI	2.E-02	3.E+00	2.E-01	4.E-02	8.E-01

Summary of Human Risk Assessment for Soil

	On-site Worker	Construction Worker	Industrial / Commercial Worker	Mower	Landscape Worker
Total ELCR	5.E-06	2.E-06	2.E-05	1.E-05	2.E-06
Total HI	2.E-02	3.E+00	2.E-01	4.E-02	8.E-01

Table A-16.
SUMMARY OF HUMAN HEALTH RISK ASSESSMENT FOR LAKE CALUMET CLUSTER SITE: ALBURN

Summary of Human Risk Assessment for Groundwater

	On-site Worker	Construction Worker	Industrial / Commercial Worker	Mower	Landscape Worker
Total ELCR	8.E-07	3.E-08	8.E-07		
Total HI	1.E-02	1.E-01	1.E-02		

Summary of Human Risk Assessment for Surface water

	On-site Worker	Construction Worker	Industrial / Commercial Worker	Mower	Landscape Worker
Total ELCR	3.E-09	1.E-10	3.E-09		
Total HI	4.E-05	4.E-04	4.E-05		

Summary of Human Risk Assessment for Sediment

	On-site Worker	Construction Worker	Industrial / Commercial Worker	Mower	Landscape Worker
Total ELCR	2.E-07	9.E-09	2.E-07		
Total HI	1.E-03	1.E-02	1.E-03		

Notes:
ELCR: Excess lifetime cancer risks
HI: Hazard index
Bold shaded area indicated ELCR or HI exceedances for the receptor

Table A-17.
EXCEEDANCES SUMMARY OF CHEMICAL OF POTENTIAL CONCERN FOR LAKE CALUMET CLUSTER SITE: ALBURN

COPCs of Carcinogenic Risk in Soil

COPC	Receptors
Arsenic	Industrial/Commercial Worker, Mower
Benzene	Industrial/Commercial Worker
Benzo(a)pyrene	Industrial/Commercial Worker, Mower
Total PCBs	Industrial/Commercial Worker
Vinyl Chloride	Industrial/Commercial Worker, Mower

COPCs of Noncarcinogenic Risk in Soil

COPC	Receptors
Toluene	Construction Worker

Notes:
ELCR: Excess lifetime cancer risks
HI: Hazard index
Carcinogenic exceedances: ELCR is greater than 1.00E-06
Noncarcinogenic exceedances: HI is greater than 1.00E+00

Table B-1.
TOXICITY FACTORS FOR CHEMICALS OF POTENTIAL CONCERN FOR LAKE CALUMET CLUSTER SITE: USDRUM

Carcinogenic Risk									
							Particulate		Volatile (URF)
COPC	Ingestion Slope Factor	EPC for Soil	EPC for Sediment	EPC for SW	EPC for GW	EPC for GW In air	Inhalation Slope Factor	Dermal Slope Factor	Inhalation Risk Factor
	(kg-day/mg)	(ug/kg)	(ug/kg)	(ug/L)	(ug/L)	(g/m)	(kg-day/mg)	(kg-day/mg)	(m^3/ug)
Arsenic	1.50E+00	1.70E+04			5.20E+01			1.50E+00	0.00E+00
Beryllium		8.18E+02			5.00E+00			0.00E+00	0.00E+00
Benzene	5.50E-02	2.41E+03			7.20E+01	5.16E-09	2.90E-02	5.50E-02	8.29E-06
Benzo(a)anthracene	7.30E-01	1.15E+04			2.00E+00		3.10E-01	7.30E-01	8.86E-05
Benzo(b)flouranthene	7.30E-01	1.33E+04			2.00E+00		3.10E-01	7.30E-01	8.86E-05
Benzo(k)flouranthene	7.30E-02				2.00E+00		3.10E-02	7.30E-02	8.86E-06
Benzo(a)pyrene	7.30E+00	1.22E+04			2.00E+00		3.10E+00	7.30E+00	8.86E-04
Chloroform	6.10E-03	3.49E+03					8.10E-02	6.10E-03	2.31E-05
Chrysene	7.30E-03				2.00E+00		3.10E-03	7.30E-03	8.86E-07
Dibenz(a,h)anthracene	7.30E+00	9.41E+03					3.10E+00	7.30E+00	8.86E-04
1,2-Dichloroethane	9.10E-02	5.25E+03						9.10E-02	0.00E+00
4,4'-DDD	2.40E-01			3.00E-02				2.40E-01	0.00E+00
4,4'-DDE	3.40E-01			1.00E-02				3.40E-01	0.00E+00
Heptachlor	4.50E+00			2.00E-02			4.50E+00	4.50E+00	1.29E-03
Indeno(1,2,3-cd)pyrene	7.30E-01	1.19E+04			1.00E+00		3.10E-01	7.30E-01	8.86E-05
Tetrachloroethene	5.20E-02	5.49E+03					2.00E-03	5.20E-02	5.71E-07
Vinyl Chloride	7.20E-01	4.59E+03					1.60E-02	7.20E-01	4.57E-06
Total PCBs	2.00E+00	2.24E+04					2.00E+00	2.00E+00	

Noncarcinogenic Risk									
	Ingestion		EPC for	EPC for	EPC for	EPC for GW	Inhalation	Dermal	Volatile Inhalation Ref.
COPC	Reference Dose	EPC for Soil	Sediment	SW	GW	In air	Reference Dose	Reference Dose	Dose
	(mg/kg-day)	(ug/kg)	(ug/kg)	(ug/L)	(ug/L)	(g/m)	(mg/kg-day)	(mg/kg-day)	(ug/m^3)
Antimony	4.00E-04	1.21E+04			1.60E+02			4.00E-04	0.00E+00
Arsenic	3.00E-04	1.70E+04			5.20E+01			3.00E-04	0.00E+00
Barium	7.00E-02			1.53E+02	2.53E+03		1.43E-04	7.00E-02	5.01E-01
Beryllium	2.00E-03	8.18E+02			5.00E+00		5.71E-06	2.00E-03	2.00E-02
Cadmium	5.00E-04				1.10E+01			5.00E-04	0.00E+00
Chromium	1.50E+00	1.48E+05			2.88E+02			1.50E+00	0.00E+00
Manganese	4.60E-02	2.11E+06		1.45E+02	8.52E+03		1.43E-05	4.60E-02	5.01E-02
Mercury					2.80E+00		8.60E-05	0.00E+00	3.01E-01
Nickel	2.00E-02				1.11E+02			2.00E-02	0.00E+00
Vanadium	2.00E-02				1.92E+02			2.00E-02	0.00E+00
Bis(2-ethylhexyl)phthalate	8.00E-01	7.61E+04						8.00E-01	0.00E+00
Chlorobenzene	2.00E-02	7.95E+03					5.71E-03	2.00E-02	2.00E+01
Chloroform	1.00E-02	3.49E+03						1.00E-02	0.00E+00
Endrin	3.00E-04			2.00E-02				3.00E-04	0.00E+00
Ethylbenzene	1.00E-01	1.19E+05					2.86E-01	1.00E-01	1.00E+03
Heptachlor	5.00E-04			2.00E-02				5.00E-04	0.00E+00
Tetrachloroethene	1.00E-02	5.49E+03						1.00E-02	0.00E+00
Toluene	2.00E-01	1.90E+04					1.14E-01	2.00E-01	3.99E+02
Vinyl Chloride	3.00E-03	4.59E+03					2.90E-02	3.00E-03	1.02E+02
Xylenes	2.00E+00	9.50E+05						2.00E+00	0.00E+00

Note:
COPC: Contaminants of potential concern
EPC: Exposure point concentration

Table B-2.
SOIL INGESTION EXPOSURE FACTORS FOR LAKE CALUMET CLUSTER SITE: USDRUM

Carcinogenic Risk					
	LADD=EPCxFIxIRSxEFxEDxCF/(BWxATc)				
	EPC=exposure point concentration (ug/kg)				
	FI=fraction ingested from contaminated source				
	IRS=soil ingestion rate (mg/day)				
	EF=exposure frequency (days/year)				
	ED=exposure duration (years)				
	CF=conversion factor 10-9 kg/ug				
	BW=body weight (kg)				
	ATc=averaging time for carcinogens (days)				
	ELCR=LADDxSFo				
	SFo=oral cancer slope factor (kg-day/mg)				
	LADD=lifetime average daily dose (mg/kg-day)				

Exposure Factor	On-site Worker	Construction Worker	Industrial / Commercial Worker	Mower	Landscape Worker
IRS (mg/day)	50	480	50	480	50
FI	0.5	1	0.5	1	0.5
EF (day/year)	50	30	250	10	20
ED (years)	25	1	25	25	25
BW (kg)	70	70	70	70	70
Atc (days)	25550	25550	25550	25550	25550
Conversion Factor (kg/ug)	1.00E-09	1.00E-09	1.00E-09	1.00E-09	1.00E-09

Noncarcinogenic Risk					
	ADD=EPCxFIxIRSxEFxEDxCF/(BWxATn)				
	EPC=exposure point concentration (ug/kg)				
	FI=fraction ingested from contaminated source				
	IRS=soil ingestion rate (mg/day)				
	EF=exposure frequency (days/year)				
	ED=exposure duration (years)				
	BW=body weight (kg)				
	ATn=averaging time for noncarcinogens (days)				
	HQ=ADD/RfDo				
	ADD-average daily dose (mg/kg-day)				
	RfDo=Injestion reference dose (mg/kg-day)				

Exposure Factor	On-site Worker	Construction Worker	Industrial / Commercial Worker	Mower	Landscape Worker
IRS (mg/day)	50	480	50	480	50
FI	0.5	1	0.5	1	0.5
EF (day/year)	50	30	250	10	20
ED (years)	25	1	25	25	25
BW (kg)	70	70	70	70	70
ATn (days)	9125	40	9125	9125	9125
Conversion Factor (kg/ug)	1.00E-09	1.00E-09	1.00E-09	1.00E-09	1.00E-09

Table B-3.
SOIL INGESTION EXPOSURE EVALUATION FOR LAKE CALUMET CLUSTER SITE: USDRUM

Carcinogenic Risk

	On-site Worker		Construction Worker		Industrial / Commercial Worker		Mower		Landscape Worker	
COPC	LADD	ELCR	LADD	ELCR	LADD	ELCR	LADD	ELCR	LADD	ELCR
Arsenic	2.97E-07	4.45E-07	1.37E-07	2.05E-07	1.48E-06	2.22E-06	1.14E-06	1.71E-06	1.19E-07	1.78E-07
Beryllium	1.43E-08	0.00E+00	6.59E-09	0.00E+00	7.15E-08	0.00E+00	5.49E-08	0.00E+00	5.72E-09	0.00E+00
Benzene	4.21E-08	2.32E-09	1.94E-08	1.07E-09	2.11E-07	1.16E-08	1.62E-07	8.90E-09	1.69E-08	9.27E-10
Benzo(a)anthracene	2.02E-07	1.47E-07	9.29E-08	6.78E-08	1.01E-06	7.36E-07	7.74E-07	5.65E-07	8.07E-08	5.89E-08
Benzo(b)flouranthene	2.32E-07	1.70E-07	1.07E-07	7.81E-08	1.16E-06	8.48E-07	8.92E-07	6.51E-07	9.29E-08	6.78E-08
Benzo(a)pyrene	2.14E-07	1.56E-06	9.85E-08	7.19E-07	1.07E-06	7.81E-06	8.21E-07	5.99E-06	8.55E-08	6.24E-07
Chloroform	6.10E-08	3.72E-10	2.81E-08	1.72E-10	3.05E-07	1.86E-09	2.34E-07	1.43E-09	2.44E-08	1.49E-10
Dibenz(a,h)anthracene	1.64E-07	1.20E-06	7.58E-08	5.53E-07	8.22E-07	6.00E-06	6.31E-07	4.61E-06	6.58E-08	4.80E-07
1,2-Dichloroethane	9.17E-08	8.34E-09	4.23E-08	3.85E-09	4.59E-07	4.17E-08	3.52E-07	3.20E-08	3.67E-08	3.34E-09
Indeno(1,2,3-cd)pyrene	2.07E-07	1.51E-07	9.55E-08	6.97E-08	1.04E-06	7.57E-07	7.96E-07	5.81E-07	8.29E-08	6.05E-08
Tetrachloroethene	9.60E-08	4.99E-09	4.42E-08	2.30E-09	4.80E-07	2.50E-08	3.69E-07	1.92E-08	3.84E-08	2.00E-09
Vinyl Chloride	8.03E-08	5.78E-08	3.70E-08	2.66E-08	4.01E-07	2.89E-07	3.08E-07	2.22E-07	3.21E-08	2.31E-08
Total PCBs	3.91E-07	7.81E-07	1.80E-07	3.60E-07	1.95E-06	3.91E-06	1.50E-06	3.00E-06	1.56E-07	3.12E-07

Noncarcinogenic Risk

	On-site Worker		Construction Worker		Industrial / Commercial Worker		Mower		Landscape Worker	
COPC	ADD	HQ	ADD	HQ	ADD	HQ	ADD	HQ	ADD	HQ
Antimony	5.91E-07	1.48E-03	6.21E-05	1.55E-01	2.96E-06	7.39E-03	2.27E-06	5.67E-03	2.36E-07	5.91E-04
Arsenic	8.30E-07	2.77E-03	8.73E-05	2.91E-01	4.15E-06	1.38E-02	3.19E-06	1.06E-02	3.32E-07	1.11E-03
Beryllium	4.00E-08	2.00E-05	4.21E-06	2.10E-03	2.00E-07	1.00E-04	1.54E-07	7.69E-05	1.60E-08	8.01E-06
Chromium	7.23E-06	4.82E-06	7.60E-04	5.07E-04	3.61E-05	2.41E-05	2.78E-05	1.85E-05	2.89E-06	1.93E-06
Manganese	1.03E-04	2.25E-03	1.09E-02	2.36E-01	5.17E-04	1.12E-02	3.97E-04	8.63E-03	4.13E-05	8.99E-04
Bis(2-ethylhexyl)phthalate	3.72E-06	4.65E-06	3.91E-04	4.89E-04	1.86E-05	2.33E-05	1.43E-05	1.79E-05	1.49E-06	1.86E-06
Chlorobenzene	3.89E-07	1.94E-05	4.09E-05	2.04E-03	1.94E-06	9.72E-05	1.49E-06	7.46E-05	1.55E-07	7.77E-06
Chloroform	1.71E-07	1.71E-05	1.80E-05	1.80E-03	8.55E-07	8.55E-05	6.56E-07	6.56E-05	6.84E-08	6.84E-06
Ethylbenzene	5.81E-06	5.81E-05	6.11E-04	6.11E-03	2.90E-05	2.90E-04	2.23E-05	2.23E-04	2.32E-06	2.32E-05
Tetrachloroethene	2.69E-07	2.69E-05	2.83E-05	2.83E-03	1.34E-06	1.34E-04	1.03E-06	1.03E-04	1.08E-07	1.08E-05
Toluene	9.28E-07	4.64E-06	9.75E-05	4.87E-04	4.64E-06	2.32E-05	3.56E-06	1.78E-05	3.71E-07	1.86E-06
Vinyl Chloride	2.25E-07	7.49E-05	2.36E-05	7.87E-03	1.12E-06	3.75E-04	8.63E-07	2.88E-04	8.99E-08	3.00E-05
Xylenes	4.65E-05	2.32E-05	4.89E-03	2.44E-03	2.32E-04	1.16E-04	1.78E-04	8.92E-05	1.86E-05	9.30E-06

Summary

	On-site Worker	Construction Worker	Industrial / Commercial Worker	Mower	Landscape Worker
ELCR for this pathway	3.75E-06	1.73E-06	1.87E-05	1.44E-05	1.50E-06
HI for this pathway	6.75E-03	7.09E-01	3.37E-02	2.59E-02	2.70E-03

Notes:

ELCR: Excess lifetime cancer risks

HI: Hazard index

COPC:Contaminants of potential concern

LADD: Lifetime average daily dose

ADD: Average daily dose

HQ: Hazard quotient

Bold shaded area indicated ELCR or HI exceedances for the receptor

Table B-4.
SOIL DERMAL EXPOSURE FACTORS FOR LAKE CALUMET CLUSTER SITE: USDRUM

Carcinogenic Risk					
	LADD=EPCsoilxSAxAFxABSxEFxEDxCF/(BWxATc)				
	EPC=exposure point concentration (ug/kg)				
	SA=body surface area (cm^2/day)				
	AF=soil adherence factor (mg/cm^2)				
	ABS=dermal adsorption factor (unitless)				
	EF=exposure frequency (days/year)				
	ED=exposure duration (years)				
	CF=conversion factor (10-9 kg/ug)				
	BW=body weight (kg)				
	ATc=averaging time for carcinogens (days)				
	ELCR=LADDxSFd				
	SFd=dermal cancer slope factor (kg-day/mg)				
	LADD=lifetime average daily dose (mg/kg-day)				

Exposure Factor	On-site Worker	Mower	Landscape Worker	Construction Worker	Industrial / Commercial Worker
SA (cm^2/day)	3300	3300	3300	3300	3300
AF(mg/cm^2)	0.2	0.2	0.2	0.2	0.2
ABS	Chemical Specific				
Inorganics	0.01	0.01	0.01	0.01	0.01
Bis(2-ethylhexyl)phthalate	0.4	0.4	0.4	0.4	0.4
Tetrachloroethene	0.03	0.03	0.03	0.03	0.03
Trichloroethene	0.03	0.03	0.03	0.03	0.03
Vinyl chloride	0.03	0.03	0.03	0.03	0.03
Others	0	0	0	0	0
EF (day/year) for Soil	50	10	20	30	250
EF (day/year) for Sediment	5			5	5
ET (hour/day)	5	8	8	8	8
ED (years)	25	25	25	1	25
BW (kg)	70	70	70	70	70
Atc (days) - for Soil	25550	25550	25550	25550	25550
Atc (days) - for Sediment	25550			25550	25550
Conversion Factor (kg/ug)	1.00E-09	1.00E-09	1.00E-09	1.00E-09	1.00E-09

Table B-4.
SOIL DERMAL EXPOSURE FACTORS FOR LAKE CALUMET CLUSTER SITE: USDRUM

Noncarcinogenic Risk					
	ADD=EPCxSAxAFxABSxEFxEDxCF/(BWxATn)-Soil and Sediment				
	EPC=exposure point concentration (ug/kg)				
	SA=body surface area (cm^2/day)				
	AF=soil adherence factor (mg/cm^2)				
	ABS=dermal adsorption factor				
	EF=exposure frequency (days/year)				
	ED=exposure duration (years)				
	CF=conversion factor 10-9 kg/mg				
	BW=body weight (kg)				
	ATn =averaging time for noncarcinogens (days)				
	HQ=ADD/RfDo				
	ADD-average daily dose (mg/kg-day)				
	RfDd=dermal reference dose (mg/kg-day)				

Exposure Factor	On-site Worker	Mower	Landscape Worker	Construction Worker	Industrial / Commercial Worker
SA (cm^2/day)	3300	3300	3300	3300	3300
AF(mg/cm^2)	0.2	0.2	0.2	0.2	0.2
ABS	Chemical Specific				
Inorganics	0.01	0.01	0.01	0.01	0.01
Bis(2-ethylhexyl)phthalate	0.4	0.4	0.4	0.4	0.4
Tetrachloroethene	0.03	0.03	0.03	0.03	0.03
Trichloroethene	0.03	0.03	0.03	0.03	0.03
Vinyl chloride	0.03	0.03	0.03	0.03	0.03
Others	0	0	0	0	0
EF (day/year) for Soil	50	10	20	30	250
EF (day/year) for Sediment	5			5	5
ET (hour/day)	5	8	8	8	8
ED (years)	25	25	25	1	25
BW (kg)	70	70	70	70	70
Atn (days) - for Soil	9125	9125	9125	9125	9125
Atn (days) - for Sediment	9125			40	9125
Conversion Factor kg/ug)	1.00E-09	1.00E-09	1.00E-09	1.00E-09	1.00E-09

Table B-5.
WATER DERMAL EXPOSURE FACTORS FOR LAKE CALUMET CLUSTER SITE: USDRUM

Carcinogenic Risk					
	LADD=EPCxSAxPCxETxEFxEDxCF/(BWxATc)				
	EPC=exposure point concentration (ug/L)				
	SA = Skin surface area (cm^2)				
	PC=Permeability Constant (cm/hr)				
	EF=exposure frequency (days/year)				
	ED=exposure duration (years)				
	CF=conversion factor 10-6 (L-mg/cm^3-ug)				
	BW=body weight (kg)				
	ATc=averaging time for carcinogens (days)				
	ELCR=LADDxSFd				
	SFd=dermal cancer slope factor (kg-day/mg)				
	LADD=lifetime average daily dose (mg/kg-day)				

Exposure Factor	On-site Worker	Mower	Landscape Worker	Construction Worker	Industrial / Commercial Worker
SA (cm^2)	3300	3300	3300	3300	3300
PC(cm/hr)	**Chemical Specific**				
Inorganic	1.00E-03	1.00E-03	1.00E-03	1.00E-03	1.00E-03
Benzo(a)pyrene	1.20E+00	1.20E+00	1.20E+00	1.20E+00	1.20E+00
Benzo(a)anthracene	8.00E-01	8.00E-01	8.00E-01	8.00E-01	8.00E-01
Benzo(b)fluoranthene	1.20E+00	1.20E+00	1.20E+00	1.20E+00	1.20E+00
Dibenzo(a,h)anthracene	2.70E+00	2.70E+00	2.70E+00	2.70E+00	2.70E+00
Indeno(1,2,3-cd)pyrene	1.90E+00	1.90E+00	1.90E+00	1.90E+00	1.90E+00
Benzo(k)fluoranthene					
Chrysene	8.10E-01	8.10E-01	8.10E-01	8.10E-01	8.10E-01
Vinyl chloride	7.30E-03	7.30E-03	7.30E-03	7.30E-03	7.30E-03
bis(2-ethylhexyl)phthalate	3.30E-02	3.30E-02	3.30E-02	3.30E-02	3.30E-02
Tetrachloroethene	4.80E-02	4.80E-02	4.80E-02	4.80E-02	4.80E-02
Trichloroethene	1.60E-02	1.60E-02	1.60E-02	1.60E-02	1.60E-02
EF (day/year) for SW & GW	5			5	5
ET (hour/day)	1	8	8	1	1
ED (years)	25			1	25
BW (kg)	70	70	70	70	70
Atc (days) - for SW & GW	25550			25550	25550
Conversion Factor (L-mg/cm^3-ug)	1.00E-06	1.00E-06	1.00E-06	1.00E-06	1.00E-06

Table B-5.
WATER DERMAL EXPOSURE FACTORS FOR LAKE CALUMET CLUSTER SITE: USDRUM

Noncarcinogenic Risk					
	ADD=EPCxSAxPCxETxEFxEDxCF/(BWxATn)				
	EPC=exposure point concentration (ug/L)				
	SA = Skin surface area (cm^2)				
	PC=Permeability Constant (cm/hr)				
	EF=exposure frequency (days/year)				
	ED=exposure duration (years)				
	CF=conversion factor 10-6 (L-mg/cm^3-ug)				
	CF=conversion factor 10-6 (L-mg/cm^3-ug)				
	BW=body weight (kg)				
	ATn =averaging time for noncarcinogens (days)				
	HQ=ADD/RfDo				
	ADD-average daily dose (mg/kg-day)				
	RfDd=dermal reference dose (mg/kg-day)				

Exposure Factor	**On-site Worker**	**Mower**	**Landscape Worker**	**Construction Worker**	**Industrial / Commercial Worker**
SA (cm^2)	3300	3300	3300	3300	3300
PC (cm/hr)	**Chemical Specific**				
Inorganic	1.00E-03	1.00E-03	1.00E-03	1.00E-03	1.00E-03
Benzo(a)pyrene	1.20E+00	1.20E+00	1.20E+00	1.20E+00	1.20E+00
Benzo(a)anthracene	8.00E-01	8.00E-01	8.00E-01	8.00E-01	8.00E-01
Benzo(b)fluoranthene	1.20E+00	1.20E+00	1.20E+00	1.20E+00	1.20E+00
Dibenzo(a,h)anthracene	2.70E+00	2.70E+00	2.70E+00	2.70E+00	2.70E+00
Indeno(1,2,3-cd)pyrene	1.90E+00	1.90E+00	1.90E+00	1.90E+00	1.90E+00
Benzo(k)fluoranthene					
Chrysene	8.10E-01	8.10E-01	8.10E-01	8.10E-01	8.10E-01
Vinyl chloride	7.30E-03	7.30E-03	7.30E-03	7.30E-03	7.30E-03
bis(2-ethylhexyl)phthalate	3.30E-02	3.30E-02	3.30E-02	3.30E-02	3.30E-02
Tetrachloroethene	4.80E-02	4.80E-02	4.80E-02	4.80E-02	4.80E-02
Trichloroethene	1.60E-02	1.60E-02	1.60E-02	1.60E-02	1.60E-02
EF (day/year) for SW & GW	5			5	5
ET (hour/day)	5	8	8	8	1
ED (years)	25			1	25
BW (kg)	70	70	70	70	70
Atn (days) - for SW & GW	9125			40	9125
Conversion Factor (L-mg/cm^3-ug)	1.00E-06	1.00E-06	1.00E-06	1.00E-06	1.00E-06

Table B-6.
DERMAL EXPOSURE EVALUATION FOR SOIL FOR LAKE CALUMET CLUSTER SITE: USDRUM

Carcinogenic Risk

COPC	Dermal Adsorp. Factors (ABS)	On-site Worker		Mower		Landscape Worker		Contruction Worker		Industrial / Commercial Worker	
		LADD	ELCR	LADD	ELCR	LADD	ELCR	LADD	ELCR	LADD	ELCR
Arsenic	3.00E-02	2.35E-07	3.52E-07	4.70E-08	7.05E-08	9.39E-08	1.41E-07	5.64E-09	8.45E-09	1.17E-06	1.76E-06
Beryllium	1.00E-02	3.77E-09	0.00E+00	7.55E-10	0.00E+00	1.51E-09	0.00E+00	9.06E-11	0.00E+00	1.89E-08	0.00E+00
Benzene	3.00E-02	3.34E-08	1.84E-09	6.68E-09	3.67E-10	1.34E-08	7.34E-10	8.01E-10	4.41E-11	1.67E-07	9.18E-09
1,2-Dichloroethane	3.00E-02	7.26E-08	6.61E-09	1.45E-08	1.32E-09	2.91E-08	2.64E-09	1.74E-09	1.59E-10	3.63E-07	3.30E-08
Chloroform	1.00E-01	1.61E-07	9.83E-10	3.22E-08	1.97E-10	6.45E-08	3.93E-10	3.87E-09	2.36E-11	8.06E-07	4.91E-09
Tetrachloroethene	3.00E-02	7.60E-08	3.95E-09	1.52E-08	7.91E-10	3.04E-08	1.58E-09	1.82E-09	9.49E-11	3.80E-07	1.98E-08
Vinyl Chloride	3.00E-02	6.36E-08	4.58E-08	1.27E-08	9.15E-09	2.54E-08	1.83E-08	1.53E-09	1.10E-09	3.18E-07	2.29E-07
Total PCBs	1.40E-01	1.44E-06	2.89E-06	2.89E-07	5.77E-07	5.77E-07	1.15E-06	3.46E-08	6.93E-08	7.22E-06	1.44E-05

Noncarcinogenic Risk

COPC	Dermal Adsorp. Factors (ABS)	On-site Worker		Mower		Landscape Worker		Contruction Worker		Industrial / Commercial Worker	
		ADD	HQ	ADD	HQ	ADD	HQ	ADD	HQ	ADD	HQ
Antimony	1.00E-02	1.56E-07	3.90E-04	3.12E-08	7.80E-05	6.24E-08	1.56E-04	3.75E-09	9.36E-06	7.80E-07	1.95E-03
Arsenic	3.00E-02	6.58E-07	2.19E-03	1.32E-07	4.38E-04	2.63E-07	8.77E-04	1.58E-08	5.26E-05	3.29E-06	1.10E-02
Beryllium	1.00E-02	1.06E-08	5.28E-06	2.11E-09	1.06E-06	4.23E-09	2.11E-06	2.54E-10	1.27E-07	5.28E-08	2.64E-05
Chromium	1.00E-02	1.91E-06	1.27E-06	3.82E-07	2.54E-07	7.63E-07	5.09E-07	4.58E-08	3.05E-08	9.54E-06	6.36E-06
Manganese	1.00E-02	2.73E-05	5.93E-04	5.46E-06	1.19E-04	1.09E-05	2.37E-04	6.55E-07	1.42E-05	1.36E-04	2.97E-03
Bis(2-ethylhexyl)phthalate	1.00E-01	9.82E-06	1.23E-05	1.96E-06	2.46E-06	3.93E-06	4.91E-06	2.36E-07	2.95E-07	4.91E-05	6.14E-05
Chlorobenzene	3.00E-02	3.08E-07	1.54E-05	6.16E-08	3.08E-06	1.23E-07	6.16E-06	7.39E-09	3.69E-07	1.54E-06	7.70E-05
Chloroform	3.00E-02	1.35E-07	1.35E-05	2.71E-08	2.71E-06	5.41E-08	5.41E-06	3.25E-09	3.25E-07	6.77E-07	6.77E-05
Ethylbenzene	3.00E-02	4.60E-06	4.60E-05	9.20E-07	9.20E-06	1.84E-06	1.84E-05	1.10E-07	1.10E-06	2.30E-05	2.30E-04
Tetrachloroethene	3.00E-02	2.13E-07	2.13E-05	4.26E-08	4.26E-06	8.52E-08	8.52E-06	5.11E-09	5.11E-07	1.06E-06	1.06E-04
Toluene	3.00E-02	7.35E-07	3.67E-06	1.47E-07	7.35E-07	2.94E-07	1.47E-06	1.76E-08	8.82E-08	3.67E-06	1.84E-05
Vinyl Chloride	3.00E-02	1.78E-07	5.93E-05	3.56E-08	1.19E-05	7.12E-08	2.37E-05	4.27E-09	1.42E-06	8.90E-07	2.97E-04
Xylenes	3.00E-02	3.68E-05	1.84E-05	7.36E-06	3.68E-06	1.47E-05	7.36E-06	8.83E-07	4.42E-07	1.84E-04	9.20E-05

Summary

	On-site Worker	Mower	Landscape Worker	Contruction Worker	Industrial / Commercial Worker
ELCR for this pathway=	3.30E-06	6.60E-07	1.32E-06	7.92E-08	1.65E-05
HI for this pathway=	3.37E-03	6.74E-04	1.35E-03	8.09E-05	1.69E-02

Notes:

ELCR: Excess lifetime cancer risks

HI: Hazard index

COPC:Contaminants of potential concern

LADD: Lifetime average daily dose

ADD: Average daily dose

HQ: Hazard quotient

Bold shaded area indicated ELCR or HI exceedances for the receptor

Table B-7.
DERMAL EXPOSURE EVALUATION FOR SURFACE WATER
FOR LAKE CALUMET CLUSTER SITE: USDRUM

Carcinogenic Risk							
		On-site Worker		Contruction Worker		Industrial / Commercial Worker	
COPC	Permeability Constant cm/hr	LADD	ELCR	LADD	ELCR	LADD	ELCR
4,4'-DDD	2.80E-01	1.94E-09	4.65E-10	7.75E-11	1.86E-11	1.94E-09	4.65E-10
4,4'-DDE	2.40E-01	5.54E-10	1.88E-10	2.21E-11	7.53E-12	5.54E-10	1.88E-10
Heptachlor	1.10E-02	5.07E-11	2.28E-10	2.03E-12	9.13E-12	5.07E-11	2.28E-10

Noncarcinogenic Risk							
		On-site Worker		Contruction Worker		Industrial / Commercial Worker	
COPC	Permeability Constant cm/hr	ADD	HQ	ADD	HQ	ADD	HQ
Barium	1.00E-03	4.94E-07	7.06E-06	7.21E-06	1.03E-04	9.88E-08	1.41E-06
Manganese	1.00E-03	4.68E-07	1.02E-05	6.84E-06	1.49E-04	9.36E-08	2.04E-06
Endrin	1.60E-02	1.03E-09	3.44E-06	1.51E-08	5.03E-05	2.07E-10	6.89E-07
Heptachlor	1.10E-02	7.10E-10	1.42E-06	1.04E-08	2.07E-05	1.42E-10	2.84E-07

Summary				
		On-site Worker	Contruction Worker	Industrial / Commercial Worker
ELCR for this pathway=		8.82E-10	3.53E-11	8.82E-10
HI for this pathway=		2.21E-05	3.23E-04	4.42E-06

Notes:
ELCR: Excess lifetime cancer risks
HI: Hazard index
COPC:Contaminants of potential concern
LADD: Lifetime average daily dose
ADD: Average daily dose
HQ: Hazard quotient

Table B-8.
DERMAL EXPOSURE EVALUATION FOR GROUNDWATER
FOR LAKE CALUMET CLUSTER SITE: USDRUM

Carcinogenic Risk							
		On-site Worker		Contruction Worker		Industrial / Commercial Worker	
COPC	Permeability Constant cm/hr	LADD	ELCR	LADD	ELCR	LADD	ELCR
Arsenic	1.00E-03	1.20E-08	1.80E-08	4.80E-10	7.20E-10	1.20E-08	1.80E-08
Beryllium	1.00E-03	1.15E-09	0.00E+00	4.61E-11	0.00E+00	1.15E-09	0.00E+00
Benzene	2.10E-02	3.49E-07	1.92E-08	1.39E-08	7.67E-10	3.49E-07	1.92E-08
Indeno(1,2,3-cd)pyrene	1.90E+00	4.38E-07	3.20E-07	1.75E-08	1.28E-08	4.38E-07	3.20E-07

Noncarcinogenic Risk							
		On-site Worker		Contruction Worker		Industrial / Commercial Worker	
COPC	Permeability Constant cm/hr	ADD	HQ	ADD	HQ	ADD	HQ
Antimony	1.00E-03	5.17E-07	1.29E-03	7.54E-06	1.89E-02	1.03E-07	2.58E-04
Arsenic	1.00E-03	1.68E-07	5.60E-04	2.45E-06	8.17E-03	3.36E-08	1.12E-04
Barium	1.00E-03	8.17E-06	1.17E-04	1.19E-04	1.70E-03	1.63E-06	2.33E-05
Beryllium	1.00E-03	1.61E-08	8.07E-06	2.36E-07	1.18E-04	3.23E-09	1.61E-06
Cadmium	1.00E-03	3.55E-08	7.10E-05	5.19E-07	1.04E-03	7.10E-09	1.42E-05
Chromium	1.00E-03	9.30E-07	6.20E-07	1.36E-05	9.05E-06	1.86E-07	1.24E-07
Manganese	1.00E-03	2.75E-05	5.98E-04	4.02E-04	8.73E-03	5.50E-06	1.20E-04
Mercury	1.00E-03	9.04E-09		1.32E-07		1.81E-09	
Nickel	1.00E-03	3.58E-07	1.79E-05	5.23E-06	2.62E-04	7.17E-08	3.58E-06
Vanadium	1.00E-03	6.20E-07	3.10E-05	9.05E-06	4.53E-04	1.24E-07	6.20E-06

Summary				
		On-site Worker	Contruction Worker	Industrial / Commercial Worker
ELCR for this pathway=		3.57E-07	1.43E-08	3.57E-07
HI for this pathway=		2.69E-03	3.93E-02	5.39E-04

Notes:
ELCR: Excess lifetime cancer risks
HI: Hazard index
COPC:Contaminants of potential concern
LADD: Lifetime average daily dose
ADD: Average daily dose
HQ: Hazard quotient

Table B-9.
PARTICULATE INHALATION EXPOSURE FACTORS FOR LAKE CALUMET CLUSTER
SITE: USDRUM

Carcinogenic Risk					
	LADD=EPCaxERxIRxEFxED/(BWxATc)				
	EPCa=exposure point concentration in air (ug/m3) = EPCxPIF				
	ER=exposure rate (hrs/day)				
	IR=inhalation rate (m3/hour)				
	EF=exposure frequency (days/year)				
	ED=exposure duration (years)				
	BW=body weight (kg)				
	ATc=averaging time for carcinogens (days)				
	PIF= Particulate Inhalation factor				
	ELCR=LADDxSFi				
	SFi=inhalation cancer slope factor (kg-day/mg)				
	LADD=lifetime average daily dose (mg/kg-day)				
Exposure Factor	**On-site Worker**	**Construction Worker**	**Industrial / Commercial Workers**	**Mower**	**Landscape Worker**
IR (m3/hour)	1.1	2.8	1.1	1.7	1.1
ER (hr/day)	5	8	8	8	8
EF (days/year)	50	30	250	10	20
ED (years)	25	1	25	25	25
BW (kg)	70	70	70	70	70
Atc (days)	25550	25550	25550	25550	25550
Particulate Inhalation factor	8.00E-10	8.00E-09	8.00E-10	8.00E-09	8.00E-10
Conversion from ug to mg	1.00E-03	1.00E-03	1.00E-03	1.00E-03	1.00E-03
Noncarcinogenic Risk					
	ADD=EPCaxERxIRxEFxED/(BWxATn)				
	EPCa=exposure point concentration in air (ug/m3)				
	ER=exposure rate (hrs/day)				
	IR=inhalation rate (m3/hr)				
	EF=exposure frequency (days/year)				
	ED=exposure duration (years)				
	BW=body weight (kg)				
	ATn=averaging time for noncarcinogens (days)				
	HQ=ADD/RfDi				
	ADD=average daily dose (mg/kg-day)\				
	RfDi=inhalation reference dose (mg/kg-day)				
Exposure Factor	**On-site Worker**	**Construction Worker**	**Industrial / Commercial Workers**	**Mower**	**Landscape Worker**
IR (m3/hour)	1.1	2.8	1.1	1.7	1.1
ER (hr/day)	5	8	8	8	8
EF (days/year)	50	30	250	10	20
ED (years)	25	1	25	25	25
BW (kg)	70	70	70	70	70
Atn (days)	9125	9125	9125	9125	40
Particulate Inhalation factor	8.00E-10	8.00E-09	8.00E-10	8.00E-10	8.00E-10

Table B-10.
PARTICULATE EXPOSURE EVALUATION FOR LAKE CALUMET CLUSTER SITE: USDRUM

Carcinogenic Risk										
	On-site Worker		Construction Worker		Industrial / Commercial Worker		Mower		Landscape Worker	
COPC	LADD	ELCR	LADD	ELCR	LADD	ELCR	LADD	ELCR	LADD	ELCR
Arsenic	5.22E-11	0.00E+00	5.10E-11	0.00E+00	4.18E-10	0.00E+00	2.58E-10	0.00E+00	3.34E-11	0.00E+00
Beryllium	2.52E-12	0.00E+00	2.46E-12	0.00E+00	2.01E-11	0.00E+00	1.24E-11	0.00E+00	1.61E-12	0.00E+00
Benzene	7.42E-12	2.15E-13	7.25E-12	2.10E-13	5.93E-11	1.72E-12	3.67E-11	1.06E-12	4.75E-12	1.38E-13
Benzo(a)anthracene	3.55E-11	1.10E-11	3.47E-11	1.08E-11	2.84E-10	8.80E-11	1.76E-10	5.44E-11	2.27E-11	7.04E-12
Benzo(b)flouranthene	4.09E-11	1.27E-11	4.00E-11	1.24E-11	3.27E-10	1.01E-10	2.02E-10	6.27E-11	2.62E-11	8.11E-12
Benzo(a)pyrene	3.76E-11	1.17E-10	3.68E-11	1.14E-10	3.01E-10	9.33E-10	1.86E-10	5.77E-10	2.41E-11	7.47E-11
Chloroform	1.07E-11	8.70E-13	1.05E-11	8.51E-13	8.59E-11	6.96E-12	5.31E-11	4.30E-12	6.88E-12	5.57E-13
Dibenz(a,h)anthracene	2.89E-11	8.97E-11	2.83E-11	8.77E-11	2.32E-10	7.18E-10	1.43E-10	4.44E-10	1.85E-11	5.74E-11
1,2-Dichloroethane	1.61E-11	0.00E+00	1.58E-11	0.00E+00	1.29E-10	0.00E+00	7.98E-11	0.00E+00	1.03E-11	0.00E+00
Indeno(1,2,3-cd)pyrene	3.65E-11	1.13E-11	3.57E-11	1.11E-11	2.92E-10	9.05E-11	1.80E-10	5.59E-11	2.33E-11	7.24E-12
Tetrachloroethene	1.69E-11	3.38E-14	1.65E-11	3.30E-14	1.35E-10	2.70E-13	8.36E-11	1.67E-13	1.08E-11	2.16E-14
Vinyl Chloride	1.41E-11	2.26E-13	1.38E-11	2.21E-13	1.13E-10	1.81E-12	6.99E-11	1.12E-12	9.04E-12	1.45E-13
Total PCBs	6.87E-11	1.37E-10	6.72E-11	1.34E-10	5.50E-10	1.10E-09	3.40E-10	6.80E-10	4.40E-11	8.80E-11

Noncarcinogenic Risk										
	On-site Worker		Construction Worker		Industrial / Commercial Worker		Mower		Landscape Worker	
COPC	ADD	HQ	ADD	HQ	ADD	HQ	ADD	HQ	ADD	HQ
Antimony	1.04E-10		1.02E-10		8.32E-10		5.14E-11		1.52E-08	
Arsenic	1.46E-10		1.43E-10		1.17E-09		7.23E-11		2.13E-08	
Beryllium	7.04E-12	1.23E-06	6.89E-12	1.21E-06	5.64E-11	9.87E-06	3.48E-12	6.10E-07	1.03E-09	1.80E-04
Chromium	1.27E-09		1.24E-09		1.02E-08		6.29E-10		1.86E-07	
Manganese	1.82E-08	1.27E-03	1.78E-08	1.24E-03	1.46E-07	1.02E-02	9.00E-09	6.29E-04	2.66E-06	1.86E-01
Bis(2-ethylhexyl)phthalate	6.55E-10		6.40E-10		5.24E-09		3.24E-10		9.56E-08	
Chlorobenzene	6.84E-11	1.20E-08	6.69E-11	1.17E-08	5.47E-10	9.59E-08	3.38E-11	5.93E-09	9.99E-09	1.75E-06
Chloroform	3.01E-11		2.94E-11		2.41E-10		1.49E-11		4.39E-09	
Ethylbenzene	1.02E-09	3.58E-09	9.99E-10	3.49E-09	8.18E-09	2.86E-08	5.06E-10	1.77E-09	1.49E-07	5.22E-07
Tetrachloroethene	4.73E-11		4.62E-11		3.79E-10		2.34E-11		6.91E-09	
Toluene	1.63E-10	1.43E-09	1.60E-10	1.40E-09	1.31E-09	1.15E-08	8.07E-11	7.08E-10	2.38E-08	2.09E-07
Vinyl Chloride	3.96E-11	1.36E-09	3.87E-11	1.33E-09	3.16E-10	1.09E-08	1.96E-11	6.75E-10	5.77E-09	1.99E-07
Xylenes	8.18E-09		8.00E-09		6.54E-08		4.05E-09		1.19E-06	

Summary				
	On-site Worker	Construction Worker	Industrial / Commercial Worker	Mower	Landscape Worker
ELCR for this pathway=	2.43E-10	2.37E-10	1.94E-09	1.20E-09	1.55E-10
HI for this pathway=	1.27E-03	1.24E-03	1.02E-02	6.30E-04	1.86E-01

Notes:

ELCR: Excess lifetime cancer risks

HI: Hazard index

COPC:Contaminants of potential concern

LADD: Lifetime average daily dose

ADD: Average daily dose

HQ: Hazard quotient

Table B-11.
GROUNDWATER VOLATILE INHALATON EXPOSURE FACTORS FOR LAKE CALUMET CLUSTER SITE: USDRUM

Carcinogenic Risk

LADD= (EPCairxIRxEFxED)/(BWxATc*CF)

EPC=exposure point concentration in air (g/m3))
IR = inhalation rate (m3/day)
EF=exposure frequency (days/year)
ED=exposure duration (years)
BW = body weight (kg)
ATc=averaging time for carcinogens (day)
CF=Conversion Factor

ELCR = LADDxSFi

SFi = Inhalation Slope Factor (kg-day/mg)
LADD=lifetime average daily dose (mg/kg-day)

Exposure Factor	On-site Worker	Construction Worker	Industrial / Commercial Worker	Mower	Landscape Worker
ED (years)	25	1	25	25	25
EF(days/year)	5	5	5		
ATc (days)	25550	25550	25550		
IR (m^3/day)	20	20	20	20	20
BW (kg)	70	70	70	70	70
CF(mg-g)	0.001	0.001	0.001	0.001	0.001

Noncarcinogenic Risk

ADD=EPCairxIRxEFxED/(BWxATn)

EPC=exposure point concentration in air (g/m^3)
IR = inhalation rate (m3/day)
EF=exposure frequency (days/year)
ED=exposure duration (years)
ATn=average time for noncarcinogens (years)
Conversion Factor = 1000

HQ=ADD/Rfd

ADD-average daily dose
Rfd = Volatile Inhalation Reference Dose (mg/kg-day)

Exposure Factor	On-site Worker	Construction Worker	Industrial / Commercial Worker	Mower	Landscape Worker
ED (years)	25	1	25	25	25
EF(days/year)	5	5	5		
ATn(days)	9125	40	9125		
IR (m^3/day)	20	20	20	20	20
BW (kg)	70	70	70	70	70
CF	0.001	0.001	0.001	0.001	0.001

Table B-12.
GROUNDWATER VOLATILE INHALATION EXPOSURE EVALUATION FOR LAKE CALUMET CLUSTER SITE: USDRUM

Carcinogenic Risk							
		On-site Worker		Construction Worker		Industrial / Commercial Worker	
COPC	Henry's Law Constant	LADD	ELCR	LADD	ELCR	LADD	ELCR
Benzene	2.28E-01	1.65E-09	4.77E-11	6.58E-11	1.91E-12	1.65E-09	4.77E-11

Noncarcinogenic Risk							
		On-site Worker		Construction Worker		Industrial / Commercial Worker	
COPC	Henry's Law Constant	ADD	HQ	ADD	HQ	ADD	HQ

Summary				
		On-site Worker	Construction Worker	Industrial / Commercial Worker
ELCR for this pathway=		4.77E-11	1.91E-12	4.77E-11
HI for this pathway=		0.00E+00	0.00E+00	0.00E+00

Notes:
ELCR: Excess lifetime cancer risks
HI: Hazard index
COPC:Contaminants of potential concern
LADD: Lifetime average daily dose
ADD: Average daily dose
HQ: Hazard quotient

Table B-13.
SOIL VOLATILE INHALATON EXPOSURE FACTORS FOR LAKE CALUMET CLUSTER SITE: USDRUM

Carcinogenic Risk

LADD=(EPCxERxIRxEFxED)/(VFxBWxATc)

EPC = Exposure Point Concentration (ug/kg)
ER = Exposure Rate (hours/day)
IR = Inhalation Rate (m^3/hr)
EF = Exposure Frequency (days/year)
ED = Exposure Duration (years)
VF = Volatalization Factor (m^3/kg)
BW = Body Weight (kg)
Atc = Averaging Time for Carcinogens (day)

$VF = Q/C*(((3.14*D*T)^{0.5})/(2*Ro*D))*CF$

Q/C = Inverse of the mean concentration at the center of a square source = (g/m^2-s)/(kg/m^3)
D = Apparent Diffusivity (cm^2/s)
T = Exposure Interval (s)
Ro = Dry Soil Bulk Density = g/cm^3
Cf = Conversion factor (10 E-4 m^2/cm^2)

$D = ((O_a^{3.33} \times D_i \times H') + (O_w^{3.33} \times D_w)/n^2) \times (1/((p_b \times k_d)+O_w + (O_a \times H'))$

O_a = Air-Filled Soil Porosity	**0.13**	For Subsurface Soil
D_i = Diffusivity in Air (cm^2/s)	Chemical Specific	
H' = Henry's Law Constant	Chemical Specific	
O_w = Water-Filled Soil Porosity	**0.3**	For Subsurface Soil
D_w = Diffusivity in Water (cm^2/s)	Chemical Specific	
n = Total Soil Porosity	**0.43**	
p_b = Dry Soil Bulk Density (g/cm^3)	**1.5**	
K_d = Soil Water Partition Coeff =	$K_{oc} \times f_{oc}$	
Koc	Chemical Specific	
foc	**0.002**	

ELCR = LADD*URF

URF = Inhalation Unit Risk (m^3/ug)
LADD = lifetime average daily dose (ug/m^3)

Exposure Factor	On-site Worker	Construction Worker	Industrial / Commercial Worker	Mower	Landscape Worker
ED (years)	25	1	25	25	25
EF(days/year)	50	30	250	10	20
ATn(days)	9125	40	9125	9125	40
ATc (days)	25550	25550	25550	25550	25550
IR (m^3/hr)	1.1	2.8	1.1	1.7	1.1
ER (hr/day)	1	8	8	8	4
BW (kg)	70	70	70	70	70

Noncarcinogenic Risk

ADD=EPCvxIRxERxEFxED/(ATnxVFxBW)

EPC = exposure point concentration (ug/kg)
ER = exposure rate (hours/day)
IR = inhalation rate (m^3/hr)
EF = exposure frequency (days/year)
ED = exposure duration (years)
Atn = average time for noncarcinogens (years)
VF = Volatilization Factor (m^3/kg)
Conversion Factor = 1000

HQ=ADD/Rfc

ADD = average daily dose (m^3/ug)
Rfc = Volatile Inhalation Reference Dose (ug/m^3)

Table B-14.
SOIL VOLATILE INHALATION EXPOSURE EVALUATION FOR LAKE CALUMET CLUSTER SITE: USDRUM

	Q/C	Di	H'	Dw	Koc	Kd	D	T	Ro	VF	$T_{Construction}$	$VF_{Construction}$
COPC	g/sq.m/kg/cu.m)	(sq.cm/sec)		(sq.cm/sec)	cm^3/g	cu.cm/g	(sq.cm/sec)	Sec	g/ cu.cm	cu.m/kg	Sec	cu.m/kg
Benzene	8.58E+01	8.80E-02	2.28E-01	9.80E-06	5.89E+01	1.18E-01	2.42E-04	7.90E+08	1.50E+00	9.16E+03	3.60E+06	6.18E+02
1,2-Dichloroethane	8.58E+01	1.04E-01	4.01E-02	9.90E-06	1.74E+01	3.48E-02	7.34E-05	7.90E+08	1.50E+00	1.66E+04	3.60E+06	1.12E+03
Tetrachloroethene	8.58E+01	7.20E-02	7.54E-01	8.20E-06	1.55E+02	3.10E-01	3.82E-04	7.90E+08	1.50E+00	7.29E+03	3.60E+06	4.92E+02
Vinyl Chloride	8.58E+01	1.06E-01	1.11E+00	1.23E-06	1.86E+01	3.72E-02	1.43E-03	7.90E+08	1.50E+00	3.77E+03	3.60E+06	2.55E+02
Chlorobenzene	8.58E+01	7.30E-02	1.52E-01	8.70E-06	2.19E+02	4.38E-01	6.97E-05	7.90E+08	1.50E+00	1.71E+04	3.60E+06	1.15E+03
Ethylbenzene	8.58E+01	7.50E-02	3.23E-01	7.80E-06	3.63E+02	7.26E-01	1.03E-04	7.90E+08	1.50E+00	1.40E+04	3.60E+06	9.47E+02
Toluene	8.58E+01	8.70E-02	2.72E-01	8.60E-06	1.82E+02	3.64E-01	1.64E-04	7.90E+08	1.50E+00	1.11E+04	3.60E+06	7.52E+02
Xylenes	8.58E+01	7.14E-02	2.15E-01	9.34E-06	3.74E+02	7.48E-01	6.48E-05	7.90E+08	1.50E+00	1.77E+04	3.60E+06	1.19E+03

Carcinogenic Risk										
	On-site Worker		Construction Worker		Industrial / Commercial Worker		Mower		Landscape Worker	
COPC	LADD	ELCR	LADD	ELCR	LADD	ELCR	LADD	ELCR	LADD	ELCR
Benzene	2.02E-04	1.68E-09	1.47E-03	1.21E-08	8.10E-03	6.71E-08	5.01E-04	4.15E-09	3.24E-04	2.68E-09
1,2-Dichloroethane	2.43E-04	0.00E+00	1.76E-03	0.00E+00	9.71E-03	0.00E+00	6.00E-04	0.00E+00	3.88E-04	0.00E+00
Tetrachloroethene	5.80E-04	3.31E-10	4.20E-03	2.40E-09	2.32E-02	1.33E-08	1.43E-03	8.19E-10	9.28E-04	5.30E-10
Vinyl Chloride	9.36E-04	4.28E-09	6.78E-03	3.10E-08	3.74E-02	1.71E-07	2.31E-03	1.06E-08	1.50E-03	6.85E-09

Noncarcinogenic Risk										
	On-site Worker		Construction Worker		Industrial / Commercial Worker		Mower		Landscape Worker	
COPC	ADD	HQ	ADD	HQ	ADD	HQ	ADD	HQ	ADD	HQ
Tetrachloroethene	1.62E-03		2.68E+00		6.49E-02		4.01E-03		5.92E-01	
Vinyl Chloride	2.62E-03	2.58E-05	4.33E+00	4.27E-02	1.05E-01	1.03E-03	6.48E-03	6.39E-05	9.57E-01	9.43E-03
Chlorobenzene	1.00E-03	5.02E-05	1.66E+00	8.28E-02	4.01E-02	2.01E-03	2.48E-03	1.24E-04	3.66E-01	1.83E-02
Ethylbenzene	1.82E-02	1.82E-05	3.01E+01	3.01E-02	7.29E-01	7.28E-04	4.51E-02	4.50E-05	6.65E+00	6.64E-03
Toluene	3.66E-03	9.19E-06	6.05E+00	1.52E-02	1.47E-01	3.67E-04	9.06E-03	2.27E-05	1.34E+00	3.35E-03
Xylenes	1.16E-01		1.91E+02		4.62E+00		2.86E-01		4.22E+01	

	On-site Worker	Construction Worker	Industrial / Commercial Worker	Mower	Landscape Worker
ELCR for this pathway	4.61E-09	3.34E-08	1.84E-07	1.14E-08	7.38E-09
HI for this pathway=	1.03E-04	1.71E-01	4.13E-03	2.56E-04	3.77E-02

Table B-14.
SOIL VOLATILE INHALATION EXPOSURE EVALUATION FOR LAKE CALUMET CLUSTER SITE: USDRUM

Notes:
ELCR: Excess lifetime cancer risks
HI: Hazard index
COPC:Contaminants of potential concern
LADD: Lifetime average daily dose
ADD: Average daily dose
HQ: Hazard quotient

Table B-15.
SUMMARY OF HUMAN HEALTH RISK ASSESSMENT FOR LAKE CALUMET CLUSTER SITE: USDRUM

Summary of Human Risk Assessment for Soil, Sediment, Surface water and Groundwater

	On-site Worker	Construction Worker	Industrial / Commercial Worker	Mower	Landscape Worker
Total ELCR	1.E-05	3.E-06	5.E-05	3.E-05	4.E-06
Total HI	1.E-02	9.E-01	7.E-02	3.E-02	2.E-01

Summary of Human Risk Assessment for Soil, Sediment and Surface water

	On-site Worker	Construction Worker	Industrial / Commercial Worker	Mower	Landscape Worker
Total ELCR	1.E-05	3.E-06	5.E-05	3.E-05	4.E-06
Total HI	1.E-02	9.E-01	6.E-02	3.E-02	2.E-01

Summary of Human Risk Assessment for Soil

	On-site Worker	Construction Worker	Industrial / Commercial Worker	Mower	Landscape Worker
Total ELCR	1.E-05	3.E-06	5.E-05	3.E-05	4.E-06
Total HI	1.E-02	9.E-01	6.E-02	3.E-02	2.E-01

Table B-15.
SUMMARY OF HUMAN HEALTH RISK ASSESSMENT FOR LAKE CALUMET CLUSTER SITE: USDRUM

Summary of Human Risk Assessment for Groundwater

	On-site Worker	Construction Worker	Industrial / Commercial Worker	Mower	Landscape Worker
Total ELCR	4.E-07	1.E-08	4.E-07		
Total HI	3.E-03	4.E-02	5.E-04		

Summary of Human Risk Assessment for Surface water

	On-site Worker	Construction Worker	Industrial / Commercial Worker	Mower	Landscape Worker
Total ELCR	9.E-10	4.E-11	9.E-10		
Total HI	2.E-05	3.E-04	4.E-06		

Notes:
ELCR: Excess lifetime cancer risks
HI: Hazard index
Bold shaded area indicated ELCR or HI exceedances for the receptor

Table B-16.
EXCEEDANCES SUMMARY OF CHEMICAL OF POTENTIAL CONCERN FOR LAKE CALUMET CLUSTER SITE: USDRUM

COPCs of Carcinogenic Risk in Soil

COPC	Receptors
Arsenic	Industrial/Commercial Worker, Mower
Benzo(a)pyrene	On-site Worker, Industrial/Commercial Worker, Mower
Dibenz(a,h)anthracene	On-site Worker, Industrial/Commercial Worker, Mower
Total PCBs	On-site Worker, Industrial/Commercial Worker, Mower, Landscape worker

Notes:
ELCR: Excess lifetime cancer risks
HI: Hazard index
Carcinogenic exceedances: ELCR is greater than 1.00E-06
Noncarcinogenic exceedances: HI is greater than 1.00E+00

Table C-1.
TOXICITY FACTORS FOR CHEMICALS OF POTENTIAL CONCERN FOR LAKE CALUMET CLUSTER SITE: UNNAMED PARCEL

Carcinogenic Risk

COPC	Ingestion Slope Factor	EPC for Soil	EPC for Sediment	EPC for SW	EPC for GW	EPC for GW in air	Particulate Inhalation Slope Factor	Dermal Slope Factor	Volatile (URF) Inhalation Risk Factor
	(kg-day/mg)	(ug/kg)	(ug/kg)	(ug/L)	(ug/L)	(g/m)	(kg-day/mg)	(kg-day/mg)	(m^3/ug)
Arsenic	1.50E+00	2.33E+04			7.27E+01			1.50E+00	0.00E+00
Beryllium		1.22E+03						0.00E+00	0.00E+00
Benzene	5.50E-02				5.20E+01	3.73E-09	2.90E-02	5.50E-02	8.29E-06
Benzo(a)anthracene	7.30E-01	4.54E+03			2.00E+00		3.10E-01	7.30E-01	8.86E-05
Benzo(b)flouranthene	7.30E-01	5.73E+03			2.00E+00		3.10E-01	7.30E-01	8.86E-05
Benzo(k)flouranthene	7.30E-02	3.91E+03			1.00E+00		3.10E-02	7.30E-02	8.86E-06
Benzo(a)pyrene	7.30E+00	4.24E+03			2.00E+00		3.10E+00	7.30E+00	8.86E-04
Chrysene	7.30E-03				2.00E+00		3.10E-03	7.30E-03	8.86E-07
Dibenz(a,h)anthracene	7.30E+00	1.50E+03			0.00E+00		3.10E+00	7.30E+00	8.86E-04
1,2-Dibromo-3-Chloropropane	1.40E+00	1.49E+03					2.40E-03	1.40E+00	6.86E-07
1,2-Dichloroethane	9.10E-02	1.16E+03						9.10E-02	0.00E+00
Indeno(1,2,3-cd)pyrene	7.30E-01	2.47E+03			6.00E-01		3.10E-01	7.30E-01	8.86E-05
alpha-BHC	6.30E+00	2.42E+01					6.30E+00	6.30E+00	1.80E-03
Heptachlor	4.50E+00	1.72E+01					4.50E+00	4.50E+00	1.29E-03
Methylene chloride	7.50E-03	1.11E+03					1.65E-03	7.50E-03	4.71E-07
Trichloroethene	1.10E-02	8.77E+02					6.00E-03	1.10E-02	1.71E-06
Total PCBs	2.00E+00	2.69E+03					2.00E+00	2.00E+00	5.71E-04

Noncarcinogenic Risk

COPC	Ingestion Reference Dose	EPC for Soil	EPC for Sediment	EPC for SW	EPC for GW	EPC for GW in air	Inhalation Reference Dose	Dermal Reference Dose	Volatile Inhalation Ref. Dose
	(mg/kg-day)	(ug/kg)	(ug/kg)	(ug/L)	(ug/L)	(g/m)	(mg/kg-day)	(mg/kg-day)	(ug/m^3)
Arsenic	3.00E-04	2.33E+04			7.27E+01			3.00E-04	0.00E+00
Beryllium	2.00E-03	1.22E+03					5.71E-06	2.00E-03	2.00E-02
Cadmium	5.00E-04				1.48E+02			5.00E-04	0.00E+00
Chromium	1.50E+00	2.05E+05			2.99E+02			1.50E+00	0.00E+00
Manganese	4.60E-02	1.49E+06			2.29E+03		1.43E-05	4.60E-02	5.01E-02
Mercury					9.30E+00		8.60E-05	0.00E+00	3.01E-01
Nickel	2.00E-02				2.48E+02			2.00E-02	0.00E+00
Vanadium	2.00E-02				9.77E+01			2.00E-02	0.00E+00
Zinc	3.00E-01				1.02E+04			3.00E-01	0.00E+00
Bis(2-ethylhexyl)phthalate	8.00E-01				4.20E+01			8.00E-01	0.00E+00
Chlorobenzene	2.00E-02	5.59E+03					5.71E-03	2.00E-02	2.00E+01
1,1-Dichloroethane	1.00E-01	1.10E+03					1.43E-01	1.00E-01	5.01E+02
Ethylbenzene	1.00E-01	3.47E+03					2.86E-01	1.00E-01	1.00E+03
Heptachlor	5.00E-04	1.72E+01						5.00E-04	0.00E+00
Methylene chloride	6.00E-02	1.11E+03					8.57E-01	6.00E-02	3.00E+03
Toluene	2.00E-01	7.21E+03					1.14E-01	2.00E-01	3.99E+02
Trichloroethene	1.10E-02	8.77E+02					6.00E-03	1.10E-02	2.10E+01
1,1,1-Trichloroethane	2.00E-02	7.07E+03					6.29E-01	2.00E-02	2.20E+03
Xylenes	2.00E+00	1.96E+04						2.00E+00	0.00E+00

Note:
COPC: Contaminants of potential concern
EPC: Exposure point concentration

Table C-2.
SOIL INGESTION EXPOSURE FACTORS FOR LAKE CALUMET CLUSTER SITE: UNNAMED PARCEL

Carcinogenic Risk

LADD=EPCxFIxIRSxEFxEDxCF/(BWxATc)

EPC=exposure point concentration (ug/kg)
FI=fraction ingested from contaminated source
IRS=soil ingestion rate (mg/day)
EF=exposure frequency (days/year)
ED=exposure duration (years)
CF=conversion factor 10-9 kg/ug
BW=body weight (kg)
ATc=averaging time for carcinogens (days)

ELCR=LADDxSFo

SFo=oral cancer slope factor (kg-day/mg)
LADD=lifetime average daily dose (mg/kg-day)

Exposure Factor	On-site Worker	Construction Worker	Industrial / Commercial Worker	Mower	Landscape Worker
IRS (mg/day)	50	480	50	480	50
FI	0.5	1	0.5	1	0.5
EF (day/year)	50	30	250	10	20
ED (years)	25	1	25	25	25
BW (kg)	70	70	70	70	70
Atc (days)	25550	25550	25550	25550	25550
Conversion Factor (kg/ug)	1.00E-09	1.00E-09	1.00E-09	1.00E-09	1.00E-09

Noncarcinogenic Risk

ADD=EPCxFIxIRSxEFxEDxCF/(BWxATn)

EPC=exposure point concentration (ug/kg)
FI=fraction ingested from contaminated source
IRS=soil ingestion rate (mg/day)
EF=exposure frequency (days/year)
ED=exposure duration (years)
BW=body weight (kg)
ATn=averaging time for noncarcinogens (days)

HQ=ADD/RfDo

ADD-average daily dose (mg/kg-day)
RfDo=Injestion reference dose (mg/kg-day)

Exposure Factor	On-site Worker	Construction Worker	Industrial / Commercial Worker	Mower	Landscape Worker
IRS (mg/day)	50	480	50	480	50
FI	0.5	1	0.5	1	0.5
EF (day/year)	50	30	250	10	20
ED (years)	25	1	25	25	25
BW (kg)	70	70	70	70	70
ATn (days)	9125	40	9125	9125	9125
Conversion Factor (kg/ug)	1.00E-09	1.00E-09	1.00E-09	1.00E-09	1.00E-09

Table C-3.
SOIL INGESTION EXPOSURE EVALUATION FOR LAKE CALUMET CLUSTER SITE: UNNAMED PARCEL

Carcinogenic Risk										
	On-site Worker		Construction Worker		Industrial / Commercial Worker		Mower		Landscape Worker	
COPC	LADD	ELCR	LADD	ELCR	LADD	ELCR	LADD	ELCR	LADD	ELCR
Arsenic	4.07E-07	6.11E-07	1.88E-07	2.82E-07	2.04E-06	3.06E-06	1.56E-06	2.35E-06	1.63E-07	2.44E-07
Beryllium	2.12E-08	0.00E+00	9.79E-09	0.00E+00	1.06E-07	0.00E+00	8.16E-08	0.00E+00	8.50E-09	0.00E+00
Benzo(a)anthracene	7.94E-08	5.79E-08	3.66E-08	2.67E-08	3.97E-07	2.90E-07	3.05E-07	2.23E-07	3.18E-08	2.32E-08
Benzo(b)flouranthene	1.00E-07	7.31E-08	4.61E-08	3.37E-08	5.01E-07	3.65E-07	3.85E-07	2.81E-07	4.01E-08	2.92E-08
Benzo(k)flouranthene	6.84E-08	4.99E-09	3.15E-08	2.30E-09	3.42E-07	2.50E-08	2.63E-07	1.92E-08	2.74E-08	2.00E-09
Benzo(a)pyrene	7.40E-08	5.40E-07	3.41E-08	2.49E-07	3.70E-07	2.70E-06	2.84E-07	2.07E-06	2.96E-08	2.16E-07
Dibenz(a,h)anthracene	2.62E-08	1.91E-07	1.21E-08	8.82E-08	1.31E-07	9.57E-07	1.01E-07	7.35E-07	1.05E-08	7.66E-08
1,2-Dibromo-3-Chloropropane	2.60E-08	3.64E-08	1.20E-08	1.68E-08	1.30E-07	1.82E-07	9.97E-08	1.40E-07	1.04E-08	1.45E-08
1,2-Dichloroethane	2.03E-08	1.85E-09	9.36E-09	8.52E-10	1.02E-07	9.24E-09	7.80E-08	7.10E-09	8.13E-09	7.39E-10
Indeno(1,2,3-cd)pyrene	4.32E-08	3.15E-08	1.99E-08	1.45E-08	2.16E-07	1.58E-07	1.66E-07	1.21E-07	1.73E-08	1.26E-08
alpha-BHC	4.23E-10	2.67E-09	1.95E-10	1.23E-09	2.12E-09	1.33E-08	1.63E-09	1.02E-08	1.69E-10	1.07E-09
Heptachlor	3.00E-10	1.35E-09	1.38E-10	6.22E-10	1.50E-09	6.74E-09	1.15E-09	5.18E-09	1.20E-10	5.40E-10
Methylene chloride	1.94E-08	1.46E-10	8.94E-09	6.71E-11	9.70E-08	7.28E-10	7.45E-08	5.59E-10	7.76E-09	5.82E-11
Trichloroethene	1.53E-08	1.69E-10	7.06E-09	7.76E-11	7.66E-08	8.43E-10	5.88E-08	6.47E-10	6.13E-09	6.74E-11
Total PCBs	4.70E-08	9.41E-08	2.17E-08	4.34E-08	2.35E-07	4.70E-07	1.81E-07	3.61E-07	1.88E-08	3.76E-08

Noncarcinogenic Risk										
	On-site Worker		Construction Worker		Industrial / Commercial Worker		Mower		Landscape Worker	
COPC	ADD	HQ	ADD	HQ	ADD	HQ	ADD	HQ	ADD	HQ
Arsenic	1.14E-06	3.80E-03	1.20E-04	4.00E-01	5.70E-06	1.90E-02	4.38E-06	1.46E-02	4.56E-07	1.52E-03
Beryllium	5.95E-08	2.97E-05	6.25E-06	3.13E-03	2.97E-07	1.49E-04	2.28E-07	1.14E-04	2.38E-08	1.19E-05
Chromium	1.00E-05	6.67E-06	1.05E-03	7.01E-04	5.00E-05	3.34E-05	3.84E-05	2.56E-05	4.00E-06	2.67E-06
Manganese	7.28E-05	1.58E-03	7.65E-03	1.66E-01	3.64E-04	7.91E-03	2.79E-04	6.08E-03	2.91E-05	6.33E-04
Chlorobenzene	2.73E-07	1.37E-05	2.87E-05	1.44E-03	1.37E-06	6.83E-05	1.05E-06	5.25E-05	1.09E-07	5.47E-06
1,1-Dichloroethane	5.38E-08	5.38E-07	5.66E-06	5.66E-05	2.69E-07	2.69E-06	2.07E-07	2.07E-06	2.15E-08	2.15E-07
Ethylbenzene	1.70E-07	1.70E-06	1.79E-05	1.79E-04	8.50E-07	8.50E-06	6.53E-07	6.53E-06	6.80E-08	6.80E-07
Heptachlor	8.39E-10	1.68E-06	8.82E-08	1.76E-04	4.20E-09	8.39E-06	3.22E-09	6.45E-06	3.36E-10	6.71E-07
Methylene chloride	5.43E-08	9.06E-07	5.71E-06	9.52E-05	2.72E-07	4.53E-06	2.09E-07	3.48E-06	2.17E-08	3.62E-07
Toluene	3.53E-07	1.76E-06	3.71E-05	1.85E-04	1.76E-06	8.82E-06	1.35E-06	6.77E-06	1.41E-07	7.06E-07
Trichloroethene	4.29E-08	3.90E-06	4.51E-06	4.10E-04	2.14E-07	1.95E-05	1.65E-07	1.50E-05	1.72E-08	1.56E-06
1,1,1-Trichloroethane	3.46E-07	1.73E-05	3.64E-05	1.82E-03	1.73E-06	8.65E-05	1.33E-06	6.64E-05	1.38E-07	6.92E-06
Xylenes	9.57E-07	4.78E-07	1.01E-04	5.03E-05	4.78E-06	2.39E-06	3.67E-06	1.84E-06	3.83E-07	1.91E-07

Summary					
	On-site Worker	Construction Worker	Industrial / Commercial Worker	Mower	Landscape Worker
ELCR for this pathway	1.65E-06	7.59E-07	8.23E-06	6.32E-06	6.59E-07
HI for this pathway	5.46E-03	5.74E-01	2.73E-02	2.10E-02	2.18E-03

Notes:

ELCR: Excess lifetime cancer risks

HI: Hazard index

COPC:Contaminants of potential concern

LADD: Lifetime average daily dose

ADD: Average daily dose

HQ: Hazard quotient

Bold shaded area indicated ELCR or HI exceedances for the receptor

Table C-4.
SOIL DERMAL EXPOSURE FACTORS FOR LAKE CALUMET CLUSTER SITE: UNNAMED PARCEL

Carcinogenic Risk					
	LADD=EPCsoilxSAxAFxABSxEFxEDxCF/(BWxATc)				
	EPC=exposure point concentration (ug/kg)				
	SA=body surface area (cm^2/day)				
	AF=soil adherence factor (mg/cm^2)				
	ABS=dermal adsorption factor (unitless)				
	EF=exposure frequency (days/year)				
	ED=exposure duration (years)				
	CF=conversion factor (10-9 kg/ug)				
	BW=body weight (kg)				
	ATc=averaging time for carcinogens (days)				
	ELCR=LADDxSFd				
	SFd=dermal cancer slope factor (kg-day/mg)				
	LADD=lifetime average daily dose (mg/kg-day)				
Exposure Factor	**On-site Worker**	**Mower**	**Landscape Worker**	**Construction Worker**	**Industrial / Commercial Worker**
SA (cm^2/day)	3300	3300	3300	3300	3300
AF(mg/cm^2)	0.2	0.2	0.2	0.2	0.2
ABS	Chemical Specific				
Inorganics	0.01	0.01	0.01	0.01	0.01
Bis(2-ethylhexyl)phthalate	0.4	0.4	0.4	0.4	0.4
Tetrachloroethene	0.03	0.03	0.03	0.03	0.03
Trichloroethene	0.03	0.03	0.03	0.03	0.03
Vinyl chloride	0.03	0.03	0.03	0.03	0.03
Others	0	0	0	0	0
EF (day/year) for Soil	50	10	20	30	250
EF (day/year) for Sediment	5			5	5
ET (hour/day)	5	8	8	8	8
ED (years)	25	25	25	1	25
BW (kg)	70	70	70	70	70
Atc (days) - for Soil	25550	25550	25550	25550	25550
Atc (days) - for Sediment	25550			25550	25550
Conversion Factor (kg/ug)	1.00E-09	1.00E-09	1.00E-09	1.00E-09	1.00E-09

Table C-4.
SOIL DERMAL EXPOSURE FACTORS FOR LAKE CALUMET CLUSTER SITE: UNNAMED PARCEL

Noncarcinogenic Risk					
	ADD=EPCxSAxAFxABSxEFxEDxCF/(BWxATn)-Soil and Sediment				
	EPC=exposure point concentration (ug/kg)				
	SA=body surface area (cm^2/day)				
	AF=soil adherence factor (mg/cm^2)				
	ABS=dermal adsorption factor				
	EF=exposure frequency (days/year)				
	ED=exposure duration (years)				
	CF=conversion factor 10-9 kg/mg				
	BW=body weight (kg)				
	ATn =averaging time for noncarcinogens (days)				
	HQ=ADD/RfDo				
	ADD-average daily dose (mg/kg-day)				
	RfDd=dermal reference dose (mg/kg-day)				

Exposure Factor	On-site Worker	Mower	Landscape Worker	Construction Worker	Industrial / Commercial Worker
SA (cm^2/day)	3300	3300	3300	3300	3300
AF(mg/cm^2)	0.2	0.2	0.2	0.2	0.2
ABS	Chemical Specific				
Inorganics	0.01	0.01	0.01	0.01	0.01
Bis(2-ethylhexyl)phthalate	0.4	0.4	0.4	0.4	0.4
Tetrachloroethene	0.03	0.03	0.03	0.03	0.03
Trichloroethene	0.03	0.03	0.03	0.03	0.03
Vinyl chloride	0.03	0.03	0.03	0.03	0.03
Others	0	0	0	0	0
EF (day/year) for Soil	50	10	20	30	250
EF (day/year) for Sediment	5			5	5
ET (hour/day)	5	8	8	8	8
ED (years)	25	25	25	1	25
BW (kg)	70	70	70	70	70
Atn (days) - for Soil	9125	9125	9125	9125	9125
Atn (days) - for Sediment	9125			40	9125
Conversion Factor kg/ug)	1.00E-09	1.00E-09	1.00E-09	1.00E-09	1.00E-09

Table C-5.
WATER DERMAL EXPOSURE FACTORS FOR LAKE CALUMET CLUSTER SITE: UNNAMED PARCEL

Carcinogenic Risk					
	LADD=EPCxSAxPCxETxEFxEDxCF/(BWxATc)				
	EPC=exposure point concentration (ug/L)				
	SA = Skin surface area (cm^2)				
	PC=Permeability Constant (cm/hr)				
	EF=exposure frequency (days/year)				
	ED=exposure duration (years)				
	CF=conversion factor 10-6 (L-mg/cm^3-ug)				
	BW=body weight (kg)				
	ATc=averaging time for carcinogens (days)				
	ELCR=LADDxSFd				
	SFd=dermal cancer slope factor (kg-day/mg)				
	LADD=lifetime average daily dose (mg/kg-day)				

Exposure Factor	On-site Worker	Mower	Landscape Worker	Construction Worker	Industrial / Commercial Worker
SA (cm^2)	3300	3300	3300	3300	3300
PC(cm/hr)	Chemical Specific				
Inorganic	1.00E-03	1.00E-03	1.00E-03	1.00E-03	1.00E-03
Benzo(a)pyrene	1.20E+00	1.20E+00	1.20E+00	1.20E+00	1.20E+00
Benzo(a)anthracene	8.00E-01	8.00E-01	8.00E-01	8.00E-01	8.00E-01
Benzo(b)fluoranthene	1.20E+00	1.20E+00	1.20E+00	1.20E+00	1.20E+00
Dibenzo(a,h)anthracene	2.70E+00	2.70E+00	2.70E+00	2.70E+00	2.70E+00
Indeno(1,2,3-cd)pyrene	1.90E+00	1.90E+00	1.90E+00	1.90E+00	1.90E+00
Benzo(k)fluoranthene					
Chrysene	8.10E-01	8.10E-01	8.10E-01	8.10E-01	8.10E-01
Vinyl chloride	7.30E-03	7.30E-03	7.30E-03	7.30E-03	7.30E-03
bis(2-ethylhexyl)phthalate	3.30E-02	3.30E-02	3.30E-02	3.30E-02	3.30E-02
Tetrachloroethene	4.80E-02	4.80E-02	4.80E-02	4.80E-02	4.80E-02
Trichloroethene	1.60E-02	1.60E-02	1.60E-02	1.60E-02	1.60E-02
EF (day/year) for SW & GW	5			5	5
ET (hour/day)	1	1	1	1	1
ED (years)	25			1	25
BW (kg)	70	70	70	70	70
Atc (days) - for SW & GW	25550			25550	25550
Conversion Factor (L-mg/cm^3-ug)	1.00E-06	1.00E-06	1.00E-06	1.00E-06	1.00E-06

Table C-5.
WATER DERMAL EXPOSURE FACTORS FOR LAKE CALUMET CLUSTER SITE: UNNAMED PARCEL

Noncarcinogenic Risk					
	ADD=EPCxSAxPCxETxEFxEDxCF/(BWxATn)				
	EPC=exposure point concentration (ug/L)				
	SA = Skin surface area (cm^2)				
	PC=Permeability Constant (cm/hr)				
	EF=exposure frequency (days/year)				
	ED=exposure duration (years)				
	CF=conversion factor 10-6 (L-mg/cm^3-ug)				
	CF=conversion factor 10-6 (L-mg/cm^3-ug)				
	BW=body weight (kg)				
	ATn =averaging time for noncarcinogens (days)				
	HQ=ADD/RfDo				
	ADD-average daily dose (mg/kg-day)				
	RfDd=dermal reference dose (mg/kg-day)				

Exposure Factor	On-site Worker	Mower	Landscape Worker	Construction Worker	Industrial / Commercial Worker
SA (cm^2)	3300	3300	3300	3300	3300
PC (cm/hr)	Chemical Specific				
Inorganic	1.00E-03	1.00E-03	1.00E-03	1.00E-03	1.00E-03
Benzo(a)pyrene	1.20E+00	1.20E+00	1.20E+00	1.20E+00	1.20E+00
Benzo(a)anthracene	8.00E-01	8.00E-01	8.00E-01	8.00E-01	8.00E-01
Benzo(b)fluoranthene	1.20E+00	1.20E+00	1.20E+00	1.20E+00	1.20E+00
Dibenzo(a,h)anthracene	2.70E+00	2.70E+00	2.70E+00	2.70E+00	2.70E+00
Indeno(1,2,3-cd)pyrene	1.90E+00	1.90E+00	1.90E+00	1.90E+00	1.90E+00
Benzo(k)fluoranthene					
Chrysene	8.10E-01	8.10E-01	8.10E-01	8.10E-01	8.10E-01
Vinyl chloride	7.30E-03	7.30E-03	7.30E-03	7.30E-03	7.30E-03
bis(2-ethylhexyl)phthalate	3.30E-02	3.30E-02	3.30E-02	3.30E-02	3.30E-02
Tetrachloroethene	4.80E-02	4.80E-02	4.80E-02	4.80E-02	4.80E-02
Trichloroethene	1.60E-02	1.60E-02	1.60E-02	1.60E-02	1.60E-02
EF (day/year) for SW & GW	5			5	5
ET (hour/day)	1	1	1	1	1
ED (years)	25			1	25
BW (kg)	70	70	70	70	70
Atn (days) - for SW & GW	9125			40	9125
Conversion Factor (L-mg/cm^3-ug)	1.00E-06	1.00E-06	1.00E-06	1.00E-06	1.00E-06

Table C-6.
DERMAL EXPOSURE EVALUATION FOR SOIL FOR LAKE CALUMET CLUSTER SITE: UNNAMED PARCEL

Carcinogenic Risk

COPC	Dermal Adsorp. Factors (ABS)	On-site Worker		Mower		Landscape Worker		Contruction Worker		Industrial/Commercial Worker	
		LADD	ELCR	LADD	ELCR	LADD	ELCR	LADD	ELCR	LADD	ELCR
Arsenic	3.00E-02	3.23E-07	4.84E-07	6.45E-08	9.68E-08	1.29E-07	1.94E-07	7.74E-09	1.16E-08	1.61E-06	2.42E-06
Beryllium	1.00E-02	5.61E-09	0.00E+00	1.12E-09	0.00E+00	2.24E-09	0.00E+00	1.35E-10	0.00E+00	2.80E-08	0.00E+00
1,2-Dibromo-3-Chloropropane	1.00E-02	6.86E-09	9.60E-09	1.37E-09	1.92E-09	2.74E-09	3.84E-09	1.65E-10	2.30E-10	3.43E-08	4.80E-08
1,2-Dichloroethane	1.00E-02	5.36E-09	4.88E-10	1.07E-09	9.76E-11	2.15E-09	1.95E-10	1.29E-10	1.17E-11	2.68E-08	2.44E-09
alpha-BHC	3.00E-02	3.35E-10	2.11E-09	6.71E-11	4.22E-10	1.34E-10	8.45E-10	8.05E-12	5.07E-11	1.68E-09	1.06E-08
Heptachlor	3.00E-02	2.37E-10	1.07E-09	4.75E-11	2.14E-10	9.50E-11	4.27E-10	5.70E-12	2.56E-11	1.19E-09	5.34E-09
Methylene chloride	1.00E-02	5.12E-09	3.84E-11	1.02E-09	7.69E-12	2.05E-09	1.54E-11	1.23E-10	9.22E-13	2.56E-08	1.92E-10
Trichloroethene	3.00E-02	1.21E-08	1.33E-10	2.43E-09	2.67E-11	4.85E-09	5.34E-11	2.91E-10	3.20E-12	6.07E-08	6.67E-10
Total PCBs	3.00E-02	3.73E-08	7.45E-08	7.45E-09	1.49E-08	1.49E-08	2.98E-08	8.94E-10	1.79E-09	1.86E-07	3.73E-07

Noncarcinogenic Risk

COPC	Dermal Adsorp. Factors (ABS)	On-site Worker		Mower		Landscape Worker		Contruction Worker		Industrial/Commercial Worker	
		ADD	HQ	ADD	HQ	ADD	HQ	ADD	HQ	ADD	HQ
Arsenic	3.00E-02	9.03E-07	3.01E-03	1.81E-07	6.02E-04	3.61E-07	1.20E-03	2.17E-08	7.23E-05	4.52E-06	1.51E-02
Beryllium	1.00E-02	1.57E-08	7.85E-06	3.14E-09	1.57E-06	6.28E-09	3.14E-06	3.77E-10	1.88E-07	7.85E-08	3.93E-05
Chromium	1.00E-02	2.64E-06	1.76E-06	5.28E-07	3.52E-07	1.06E-06	7.04E-07	6.34E-08	4.23E-08	1.32E-05	8.81E-06
Manganese	1.00E-02	1.92E-05	4.18E-04	3.84E-06	8.35E-05	7.69E-06	1.67E-04	4.61E-07	1.00E-05	9.61E-05	2.09E-03
Chlorobenzene	1.00E-02	7.22E-08	3.61E-06	1.44E-08	7.22E-07	2.89E-08	1.44E-06	1.73E-09	8.66E-08	3.61E-07	1.80E-05
1,1-Dichloroethane	1.00E-02	1.42E-08	1.42E-07	2.84E-09	2.84E-08	5.68E-09	5.68E-08	3.41E-10	3.41E-09	7.11E-08	7.11E-07
Ethylbenzene	1.00E-02	4.49E-08	4.49E-07	8.97E-09	8.97E-08	1.79E-08	1.79E-07	1.08E-09	1.08E-08	2.24E-07	2.24E-06
Heptachlor	3.00E-02	6.65E-10	1.33E-06	1.33E-10	2.66E-07	2.66E-10	5.32E-07	1.60E-11	3.19E-08	3.32E-09	6.65E-06
Methylene chloride	1.00E-02	1.43E-08	2.39E-07	2.87E-09	4.78E-08	5.74E-09	9.56E-08	3.44E-10	5.74E-09	7.17E-08	1.20E-06
Toluene	1.00E-02	9.31E-08	4.66E-07	1.86E-08	9.31E-08	3.73E-08	1.86E-07	2.24E-09	1.12E-08	4.66E-07	2.33E-06
Trichloroethene	3.00E-02	3.40E-08	3.09E-06	6.79E-09	6.18E-07	1.36E-08	1.24E-06	8.15E-10	7.41E-08	1.70E-07	1.54E-05
1,1,1-Trichloroethane	3.00E-02	2.74E-07	1.37E-05	5.48E-08	2.74E-06	1.10E-07	5.48E-06	6.57E-09	3.29E-07	1.37E-06	6.85E-05
Xylenes	1.00E-02	2.53E-07	1.26E-07	5.05E-08	2.53E-08	1.01E-07	5.05E-08	6.06E-09	3.03E-09	1.26E-06	6.32E-07

Summary

	On-site Worker	Mower	Landscape Worker	Contruction Worker	Industrial/Commercial Worker
ELCR for this pathway=	5.72E-07	1.14E-07	2.29E-07	1.37E-08	2.86E-06
HI for this pathway=	3.46E-03	6.92E-04	1.38E-03	8.31E-05	1.73E-02

Notes:

ELCR: Excess lifetime cancer risks

HI: Hazard index

COPC:Contaminants of potential concern

LADD: Lifetime average daily dose

ADD: Average daily dose

HQ: Hazard quotient

Table C-7.
DERMAL EXPOSURE EVALUATION FOR GROUNDWATER
FOR LAKE CALUMET CLUSTER SITE: UNNAMED PARCEL

Carcinogenic Risk							
		On-site Worker		Contruction Worker		Industrial / Commercial Worker	
COPC	Permeability Constant cm/hr	LADD	ELCR	LADD	ELCR	LADD	ELCR
Arsenic	1.00E-03	1.68E-08	2.52E-08	6.71E-10	1.01E-09	1.68E-08	2.52E-08
Benzene	2.10E-02	2.52E-07	1.39E-08	1.01E-08	5.54E-10	2.52E-07	1.39E-08
Indeno(1,2,3-cd)pyrene	1.90E+00	2.63E-07	1.92E-07	1.05E-08	7.68E-09	2.63E-07	1.92E-07

Noncarcinogenic Risk							
		On-site Worker		Contruction Worker		Industrial / Commercial Worker	
COPC	Permeability Constant cm/hr	ADD	HQ	ADD	HQ	ADD	HQ
Arsenic	1.00E-03	4.69E-08	1.56E-04	4.28E-07	1.43E-03	4.69E-08	1.56E-04
Cadmium	1.00E-03	9.56E-08	1.91E-04	8.72E-07	1.74E-03	9.56E-08	1.91E-04
Chromium	1.00E-03	1.93E-07	1.29E-07	1.76E-06	1.17E-06	1.93E-07	1.29E-07
Manganese	1.00E-03	1.48E-06	3.21E-05	1.35E-05	2.93E-04	1.48E-06	3.21E-05
Mercury	1.00E-03	6.01E-09		5.48E-08		6.01E-09	
Nickel	1.00E-03	1.60E-07	8.01E-06	1.46E-06	7.31E-05	1.60E-07	8.01E-06
Vanadium	1.00E-03	6.31E-08	3.15E-06	5.76E-07	2.88E-05	6.31E-08	3.15E-06
Zinc	1.00E-03	6.59E-06	2.20E-05	6.01E-05	2.00E-04	6.59E-06	2.20E-05
Bis(2-ethylhexyl)phthalate	2.30E-02	6.24E-07	7.80E-07	5.69E-06	7.12E-06	6.24E-07	7.80E-07

Summary				
		On-site Worker	Contruction Worker	Industrial / Commercial Worker
ELCR for this pathway=		2.31E-07	9.24E-09	2.31E-07
HI for this pathway=		4.14E-04	3.78E-03	4.14E-04

Notes:
ELCR: Excess lifetime cancer risks
HI: Hazard index
COPC:Contaminants of potential concern
LADD: Lifetime average daily dose
ADD: Average daily dose
HQ: Hazard quotient

Table C-8.
PARTICULATE INHALATION EXPOSURE FACTORS FOR LAKE CALUMET CLUSTER
SITE: UNNAMED PARCEL

Carcinogenic Risk					
	LADD=EPCaxERxIRxEFxED/(BWxATc)				
	EPCa=exposure point concentration in air (ug/m3) = EPCxPIF				
	ER=exposure rate (hrs/day)				
	IR=inhalation rate (m3/hour)				
	EF=exposure frequency (days/year)				
	ED=exposure duration (years)				
	BW=body weight (kg)				
	ATc=averaging time for carcinogens (days)				
	PIF= Particulate Inhalation factor				
	ELCR=LADDxSFi				
	SFi=inhalation cancer slope factor (kg-day/mg)				
	LADD=lifetime average daily dose (mg/kg-day)				
Exposure Factor	**On-site Worker**	**Construction Worker**	**Industrial / Commercial Workers**	**Mower**	**Landscape Worker**
IR (m3/hour)	1.1	2.8	1.1	1.7	1.1
ER (hr/day)	5	8	8	8	8
EF (days/year)	50	30	250	10	20
ED (years)	25	1	25	25	25
BW (kg)	70	70	70	70	70
Atc (days)	25550	25550	25550	25550	25550
Particulate Inhalation factor	8.00E-10	8.00E-09	8.00E-10	8.00E-09	8.00E-10
Conversion from ug to mg	1.00E-03	1.00E-03	1.00E-03	1.00E-03	1.00E-03
Noncarcinogenic Risk					
	ADD=EPCaxERxIRxEFxED/(BWxATn)				
	EPCa=exposure point concentration in air (ug/m3)				
	ER=exposure rate (hrs/day)				
	IR=inhalation rate (m3/hr)				
	EF=exposure frequency (days/year)				
	ED=exposure duration (years)				
	BW=body weight (kg)				
	ATn=averaging time for noncarcinogens (days)				
	HQ=ADD/RfDi				
	ADD=average daily dose (mg/kg-day)\				
	RfDi=inhalation reference dose (mg/kg-day)				
Exposure Factor	**On-site Worker**	**Construction Worker**	**Industrial / Commercial Workers**	**Mower**	**Landscape Worker**
IR (m3/hour)	1.1	2.8	1.1	1.7	1.1
ER (hr/day)	5	8	8	8	8
EF (days/year)	50	30	250	10	20
ED (years)	25	1	25	25	25
BW (kg)	70	70	70	70	70
Atn (days)	9125	9125	9125	9125	40
Particulate Inhalation factor	8.00E-10	8.00E-09	8.00E-10	8.00E-10	8.00E-10

Table C-9.
PARTICULATE EXPOSURE EVALUATION FOR LAKE CALUMET CLUSTER SITE: UNNAMED PARCEL

Carcinogenic Risk										
	On-site Worker		Construction Worker		Industrial / Commercial Worker		Mower		Landscape Worker	
COPC	LADD	ELCR	LADD	ELCR	LADD	ELCR	LADD	ELCR	LADD	ELCR
Arsenic	7.17E-11	0.00E+00	7.01E-11	0.00E+00	5.74E-10	0.00E+00	3.55E-10	0.00E+00	4.59E-11	0.00E+00
Beryllium	3.74E-12	0.00E+00	3.65E-12	0.00E+00	2.99E-11	0.00E+00	1.85E-11	0.00E+00	2.39E-12	0.00E+00
Benzo(a)anthracene	1.40E-11	4.33E-12	1.37E-11	4.23E-12	1.12E-10	3.46E-11	6.91E-11	2.14E-11	8.94E-12	2.77E-12
Benzo(b)flouranthene	1.76E-11	5.46E-12	1.72E-11	5.34E-12	1.41E-10	4.37E-11	8.72E-11	2.70E-11	1.13E-11	3.50E-12
Benzo(k)flouranthene	1.20E-11	3.73E-13	1.18E-11	3.65E-13	9.63E-11	2.99E-12	5.95E-11	1.85E-12	7.71E-12	2.39E-13
Benzo(a)pyrene	1.30E-11	4.04E-11	1.27E-11	3.95E-11	1.04E-10	3.23E-10	6.44E-11	2.00E-10	8.34E-12	2.58E-11
Dibenz(a,h)anthracene	4.62E-12	1.43E-11	4.51E-12	1.40E-11	3.69E-11	1.14E-10	2.28E-11	7.08E-11	2.95E-12	9.16E-12
1,2-Dibromo-3-Chloropropane	4.57E-12	1.10E-14	4.47E-12	1.07E-14	3.66E-11	8.78E-14	2.26E-11	5.42E-14	2.93E-12	7.02E-15
1,2-Dichloroethane	3.58E-12	0.00E+00	3.49E-12	0.00E+00	2.86E-11	0.00E+00	1.77E-11	0.00E+00	2.29E-12	0.00E+00
Indeno(1,2,3-cd)pyrene	7.61E-12	2.36E-12	7.43E-12	2.30E-12	6.08E-11	1.89E-11	3.76E-11	1.17E-11	4.87E-12	1.51E-12
alpha-BHC	7.45E-14	4.69E-13	7.28E-14	4.59E-13	5.96E-13	3.76E-12	3.69E-13	2.32E-12	4.77E-14	3.00E-13
Heptachlor	5.28E-14	2.37E-13	5.16E-14	2.32E-13	4.22E-13	1.90E-12	2.61E-13	1.17E-12	3.38E-14	1.52E-13
Methylene chloride	3.42E-12	5.64E-15	3.34E-12	5.51E-15	2.73E-11	4.51E-14	1.69E-11	2.79E-14	2.19E-12	3.61E-15
Trichloroethene	2.70E-12	1.62E-14	2.64E-12	1.58E-14	2.16E-11	1.29E-13	1.33E-11	8.00E-14	1.73E-12	1.04E-14
Total PCBs	8.28E-12	1.66E-11	8.09E-12	1.62E-11	6.62E-11	1.32E-10	4.09E-11	8.19E-11	5.30E-12	1.06E-11

Noncarcinogenic Risk										
	On-site Worker		Construction Worker		Industrial / Commercial Worker		Mower		Landscape Worker	
COPC	ADD	HQ	ADD	HQ	ADD	HQ	ADD	HQ	ADD	HQ
Arsenic	2.01E-10		1.96E-10		1.61E-09		9.93E-11		2.93E-08	
Beryllium	1.05E-11	1.83E-06	1.02E-11	1.79E-06	8.37E-11	1.47E-05	5.18E-12	9.07E-07	1.53E-09	2.68E-04
Chromium	1.76E-09		1.72E-09		1.41E-08		8.71E-10		2.57E-07	
Manganese	1.28E-08	8.96E-04	1.25E-08	8.76E-04	1.02E-07	7.17E-03	6.33E-09	4.43E-04	1.87E-06	1.31E-01
Chlorobenzene	4.81E-11	8.42E-09	4.70E-11	8.23E-09	3.85E-10	6.74E-08	2.38E-11	4.17E-09	7.02E-09	1.23E-06
1,1-Dichloroethane	9.47E-12	6.63E-11	9.26E-12	6.48E-11	7.58E-11	5.30E-10	4.69E-12	3.28E-11	1.38E-09	9.67E-09
Ethylbenzene	2.99E-11	1.05E-10	2.92E-11	1.02E-10	2.39E-10	8.37E-10	1.48E-11	5.17E-11	4.37E-09	1.53E-08
Heptachlor	1.48E-13		1.44E-13		1.18E-12		7.31E-14		2.16E-11	
Methylene chloride	9.56E-12	1.12E-11	9.35E-12	1.09E-11	7.65E-11	8.93E-11	4.73E-12	5.52E-12	1.40E-09	1.63E-09
Toluene	6.21E-11	5.45E-10	6.07E-11	5.32E-10	4.97E-10	4.36E-09	3.07E-11	2.69E-10	9.06E-09	7.95E-08
Trichloroethene	7.55E-12	1.26E-09	7.38E-12	1.23E-09	6.04E-11	1.01E-08	3.73E-12	6.22E-10	1.10E-09	1.84E-07
1,1,1-Trichloroethane	6.09E-11	9.68E-11	5.95E-11	9.46E-11	4.87E-10	7.74E-10	3.01E-11	4.79E-11	8.89E-09	1.41E-08
Xylenes	1.68E-10		1.65E-10		1.35E-09		8.33E-11		2.46E-08	

Summary					
	On-site Worker	Construction Worker	Industrial / Commercial Worker	Mower	Landscape Worker
ELCR for this pathway=	8.45E-11	8.26E-11	6.76E-10	4.18E-10	5.41E-11
HI for this pathway=	8.98E-04	8.77E-04	7.18E-03	4.44E-04	1.31E-01

Notes:

ELCR: Excess lifetime cancer risks

HI: Hazard index

COPC:Contaminants of potential concern

LADD: Lifetime average daily dose

ADD: Average daily dose

HQ: Hazard quotient

Table C-10.
GROUNDWATER VOLATILE INHALATON EXPOSURE FACTORS FOR LAKE CALUMET CLUSTER SITE: UNNAMED PARCEL

Carcinogenic Risk

LADD= (EPCairxIRxEFxED)/(BWxATc*CF)

EPC=exposure point concentration in air (g/m3))
IR = inhalation rate (m3/day)
EF=exposure frequency (days/year)
ED=exposure duration (years)
BW = body weight (kg)
ATc=averaging time for carcinogens (day)
CF=Conversion Factor

ELCR = LADDxSFi

SFi = Inhalation Slope Factor (kg-day/mg)
LADD=lifetime average daily dose (mg/kg-day)

Exposure Factor	On-site Worker	Construction Worker	Industrial / Commercial Worker	Mower	Landscape Worker
ED (years)	25	1	25	25	25
EF(days/year)	5	5	5		
ATc (days)	25550	25550	25550		
IR (m^3/day)	20	20	20	20	20
BW (kg)	70	70	70	70	70
CF(mg-g)	0.001	0.001	0.001	0.001	0.001

Noncarcinogenic Risk

ADD=EPCairxIRxEFxED/(BWxATn)

EPC=exposure point concentration in air (g/m^3)
IR = inhalation rate (m3/day)
EF=exposure frequency (days/year)
ED=exposure duration (years)
ATn=average time for noncarcinogens (years)
Conversion Factor = 1000

HQ=ADD/Rfd

ADD-average daily dose
Rfd = Volatile Inhalation Reference Dose (mg/kg-day)

Exposure Factor	On-site Worker	Construction Worker	Industrial / Commercial Worker	Mower	Landscape Worker
ED (years)	25	1	25	25	25
EF(days/year)	5	5	5		
ATn(days)	9125	40	9125		
IR (m^3/day)	20	20	20	20	20
BW (kg)	70	70	70	70	70
CF	0.001	0.001	0.001	0.001	0.001

Table C-11.
GROUNDWATER VOLATILE INHALATION EXPOSURE EVALUATION FOR LAKE CALUMET CLUSTER SITE: UNNAMED PARCEL

Carcinogenic Risk							
		On-site Worker		Construction Worker		Industrial / Commercial Worker	
COPC	Henry's Law Constant	LADD	ELCR	LADD	ELCR	LADD	ELCR
Benzene	2.28E-01	1.19E-09	3.45E-11	4.76E-11	1.38E-12	1.19E-09	3.45E-11

Noncarcinogenic Risk							
		On-site Worker		Construction Worker		Industrial / Commercial Worker	
COPC	Henry's Law Constant	ADD	HQ	ADD	HQ	ADD	HQ

Summary				
		On-site Worker	Construction Worker	Industrial / Commercial Worker
ELCR for this pathway=		3.45E-11	1.38E-12	3.45E-11
HI for this pathway=		0.00E+00	0.00E+00	0.00E+00

Notes:
ELCR: Excess lifetime cancer risks
HI: Hazard index
COPC:Contaminants of potential concern
LADD: Lifetime average daily dose
ADD: Average daily dose
HQ: Hazard quotient

Table C-12.
SOIL VOLATILE INHALATON EXPOSURE FACTORS FOR LAKE CALUMET CLUSTER SITE: UNNAMED PARCEL

Carcinogenic Risk

LADD=(EPCxERxIRxEFxED)/(VFxBWxATc)

EPC = Exposure Point Concentration (ug/kg)
ER = Exposure Rate (hours/day)
IR = Inhalation Rate (m^3/hr)
EF = Exposure Frequency (days/year)
ED = Exposure Duration (years)
VF = Volatalization Factor (m^3/kg)
BW = Body Weight (kg)
Atc = Averaging Time for Carcinogens (day)

$VF = Q/C*(((3.14*D*T)^{0.5})/(2*Ro*D))*CF$

Q/C = Inverse of the mean concentration at the center of a square source = (g/m^2-s)/(kg/m^3)
D = Apparent Diffusivity (cm^2/s)
T = Exposure Interval (s)
Ro = Dry Soil Bulk Density = g/cm^3
Cf = Conversion factor (10 E-4 m^2/cm^2)

$D = ((O_a^{3.33} \times D_i \times H') + (O_w^{3.33} \times D_w)/n^2) \times (1/((p_b \times k_d)+O_w + (O_a \times H'))$

O_a = Air-Filled Soil Porosity	**0.13**	For Subsurface Soil
D_i = Diffusivity in Air (cm^2/s)	Chemical Specific	
H' = Henry's Law Constant	Chemical Specific	
O_w = Water-Filled Soil Porosity	**0.3**	For Subsurface Soil
D_w = Diffusivity in Water (cm^2/s)	Chemical Specific	
n = Total Soil Porosity	**0.43**	
p_b = Dry Soil Bulk Density (g/cm^3)	**1.5**	
K_d = Soil Water Partition Coeff =	$K_{oc} \times f_{oc}$	
Koc	Chemical Specific	
foc	**0.002**	

ELCR = LADD*URF

URF = Inhalation Unit Risk (m^3/ug)
LADD = lifetime average daily dose (ug/m^3)

Exposure Factor	On-site Worker	Construction Worker	Industrial / Commercial Worker	Mower	Landscape Worker
ED (years)	25	1	25	25	25
EF(days/year)	50	30	250	10	20
ATn(days)	9125	40	9125	9125	40
ATc (days)	25550	25550	25550	25550	25550
IR (m^3/hr)	1.1	2.8	1.1	1.7	1.1
ER (hr/day)	1	8	8	8	4
BW (kg)	52	70	70	70	70

Noncarcinogenic Risk

ADD=EPCvxIRxERxEFxED/(ATnxVFxBW)

EPC = exposure point concentration (ug/kg)
ER = exposure rate (hours/day)
IR = inhalation rate (m^3/hr)
EF = exposure frequency (days/year)
ED = exposure duration (years)
Atn = average time for noncarcinogens (years)
VF = Volatilization Factor (m^3/kg)
Conversion Factor = 1000

HQ=ADD/Rfc

ADD = average daily dose (m^3/ug)
Rfc = Volatile Inhalation Reference Dose (ug/m^3)

Table C-13.
SOIL VOLATILE INHALATION EXPOSURE EVALUATION FOR LAKE CALUMET CLUSTER SITE: UNNAMED PARCEL

	Q/C	Di	H'	Dw	Koc	Kd	D	T	Ro	VF	$T_{Construction}$	$VF_{Construction}$
COPC	g/sq.m/kg/cu.m)	(sq.cm/sec)		(sq.cm/sec)	cm^3/g	cu.cm/g	(sq.cm/sec)	Sec	g/ cu.cm	cu.m/kg	Sec	cu.m/kg
1,2-Dibromo-3-Chloropropane	85.81	2.12E-02	9.68E-04	7.02E-06	1.29E+02	2.58E-01	1.18E-06	7.90E+08	1.50E+00	1.31E+05	3.60E+06	8.84E+03
1,2-Dichloroethane	85.81	1.04E-01	4.01E-02	9.90E-06	1.74E+01	3.48E-02	7.34E-05	7.90E+08	1.50E+00	1.66E+04	3.60E+06	1.12E+03
Indeno(1,2,3-cd)pyrene	85.81	1.90E-02	6.56E-05	5.66E-06	3.47E+06	6.94E+03	5.41E-11	7.90E+08	1.50E+00	1.94E+07	3.60E+06	1.31E+06
alpha-BHC	85.81	1.42E-02	4.35E-04	7.34E-06	1.23E+03	2.46E+00	1.90E-07	7.90E+08	1.50E+00	3.27E+05	3.60E+06	2.21E+04
Heptachlor	85.81	1.10E-02	6.07E+01	5.69E-06	1.41E+06	2.82E+03	9.55E-07	7.90E+08	1.50E+00	1.46E+05	3.60E+06	9.84E+03
Methylene chloride	85.81	1.01E-01	8.98E-02	1.17E-05	1.17E+01	2.34E-02	1.62E-04	7.90E+08	1.50E+00	1.12E+04	3.60E+06	7.56E+02
Trichloroethene	85.81	7.90E-02	4.22E-01	9.10E-06	1.66E+02	3.32E-01	2.38E-04	7.90E+08	1.50E+00	9.24E+03	3.60E+06	6.23E+02
Chlorobenzene	85.81	7.30E-02	1.52E-01	8.70E-06	2.19E+02	4.38E-01	6.97E-05	7.90E+08	1.50E+00	1.71E+04	3.60E+06	1.15E+03
1,1-Dichloroethane	85.81	7.42E-02	2.30E-02	1.05E-05	3.16E+01	6.32E-02	2.86E-05	7.90E+08	1.50E+00	2.66E+04	3.60E+06	1.80E+03
Ethylbenzene	85.81	7.50E-02	3.23E-01	7.80E-06	3.63E+02	7.26E-01	1.03E-04	7.90E+08	1.50E+00	1.40E+04	3.60E+06	9.47E+02
Heptachlor	85.81	1.10E-02	6.07E+01	5.69E-06	1.41E+06	2.82E+03	9.55E-07	7.90E+08	1.50E+00	1.46E+05	3.60E+06	9.84E+03
Methylene chloride	85.81	1.01E-01	8.98E-02	1.17E-05	1.17E+01	2.34E-02	1.62E-04	7.90E+08	1.50E+00	1.12E+04	3.60E+06	7.56E+02
Toluene	85.81	8.70E-02	2.72E-01	8.60E-06	1.82E+02	3.64E-01	1.64E-04	7.90E+08	1.50E+00	1.11E+04	3.60E+06	7.52E+02
Trichloroethene	85.81	7.90E-02	4.22E-01	9.10E-06	1.66E+02	3.32E-01	2.38E-04	7.90E+08	1.50E+00	9.24E+03	3.60E+06	6.23E+02
1,1,1-Trichloroethane	85.81	7.80E-02	7.05E-01	8.80E-06	1.10E+02	2.20E-01	4.63E-04	7.90E+08	1.50E+00	6.62E+03	3.60E+06	4.47E+02
Xylenes	85.81	7.14E-02	2.15E-01	9.34E-06	3.74E+02	7.48E-01	6.48E-05	7.90E+08	1.50E+00	1.77E+04	3.60E+06	1.19E+03

Carcinogenic Risk										
	On-site Worker		Construction		Industrial /		Mower		Landscape Worker	
COPC	LADD	ELCR	LADD	ELCR	LADD	ELCR	LADD	ELCR	LADD	ELCR
1,2-Dibromo-3-Chloropropane	1.2E-05	8.1E-12	6.3E-05	4.3E-11	3.5E-04	2.4E-10	2.2E-05	1.5E-11	1.4E-05	9.6E-12
1,2-Dichloroethane	7.2E-05	0.0E+00	3.9E-04	0.0E+00	2.2E-03	0.0E+00	1.3E-04	0.0E+00	8.6E-05	0.0E+00
Indeno(1,2,3-cd)pyrene	1.3E-07	1.2E-11	7.1E-07	6.3E-11	3.9E-06	3.5E-10	2.4E-07	2.1E-11	1.6E-07	1.4E-11
alpha-BHC	7.7E-08	1.4E-10	4.1E-07	7.4E-10	2.3E-06	4.1E-09	1.4E-07	2.5E-10	9.1E-08	1.6E-10
Heptachlor	1.2E-07	1.6E-10	6.6E-07	8.4E-10	3.6E-06	4.7E-09	2.2E-07	2.9E-10	1.4E-07	1.9E-10
Methylene chloride	1.0E-04	4.8E-11	5.5E-04	2.6E-10	3.1E-03	1.4E-09	1.9E-04	8.9E-11	1.2E-04	5.8E-11
Trichloroethene	9.8E-05	1.7E-10	5.3E-04	9.1E-10	2.9E-03	5.0E-09	1.8E-04	3.1E-10	1.2E-04	2.0E-10

Noncarcinogenic Risk										
	On-site Worker		Construction		Industrial /		Mower		Landscape Worker	
COPC	ADD	HQ	ADD	HQ	ADD	HQ	ADD	HQ	ADD	HQ
Chlorobenzene	9.5E-04	4.7E-05	1.2E+00	5.8E-02	2.8E-02	1.4E-03	1.7E-03	8.7E-05	2.6E-01	1.3E-02
1,1-Dichloroethane	1.2E-04	2.4E-07	1.5E-01	2.9E-04	3.6E-03	7.1E-06	2.2E-04	4.4E-07	3.2E-02	6.5E-05
Ethylbenzene	7.2E-04	7.2E-07	8.8E-01	8.8E-04	2.1E-02	2.1E-05	1.3E-03	1.3E-06	1.9E-01	1.9E-04
Heptachlor	3.4E-07		4.2E-04		1.0E-05		6.3E-07		9.2E-05	
Methylene chloride	2.9E-04	9.6E-08	3.5E-01	1.2E-04	8.5E-03	2.8E-06	5.3E-04	1.8E-07	7.8E-02	2.6E-05
Toluene	1.9E-03	4.7E-06	2.3E+00	5.8E-03	5.6E-02	1.4E-04	3.4E-03	8.6E-06	5.1E-01	1.3E-03
Trichloroethene	2.8E-04	1.3E-05	3.4E-01	1.6E-02	8.2E-03	3.9E-04	5.1E-04	2.4E-05	7.5E-02	3.6E-03
1,1,1-Trichloroethane	3.1E-03	1.4E-06	3.8E+00	1.7E-03	9.2E-02	4.2E-05	5.7E-03	2.6E-06	8.4E-01	3.8E-04
Xylenes	3.2E-03		3.9E+00		9.5E-02		5.9E-03		8.7E-01	

Table C-13.
SOIL VOLATILE INHALATION EXPOSURE EVALUATION FOR LAKE CALUMET CLUSTER SITE: UNNAMED PARCEL

Summary					
	On-site Worker	Construction	Industrial /	Mower	Landscape Worker
ELCR for this pathway=	5.31E-10	2.86E-09	1.58E-08	9.76E-10	6.31E-10
HI for this pathway=	5.31E-05	6.52E-02	1.58E-03	9.76E-05	1.44E-02

Notes:
ELCR: Excess lifetime cancer risks
HI: Hazard index
COPC:Contaminants of potential concern
LADD: Lifetime average daily dose
ADD: Average daily dose
HQ: Hazard quotient

Table C-14.
SUMMARY OF HUMAN HEALTH RISK ASSESSMENT FOR LAKE CALUMET CLUSTER SITE: UNNAMED PARCEL

Summary of Human Risk Assessment for Soil, Sediment, Surface water and Groundwater

	On-site Worker	Construction Worker	Industrial / Commercial Worker	Mower	Landscape Worker
Total ELCR	**3.E-06**	**1.E-06**	**2.E-05**	**1.E-05**	**1.E-06**
Total HI	1.E-02	6.E-01	5.E-02	2.E-02	1.E-01

Summary of Human Risk Assessment for Soil, Sediment and Surface water

	On-site Worker	Construction Worker	Industrial / Commercial Worker	Mower	Landscape Worker
Total ELCR	**3.E-06**	**1.E-06**	**2.E-05**	**1.E-05**	**1.E-06**
Total HI	1.E-02	6.E-01	5.E-02	2.E-02	1.E-01

Summary of Human Risk Assessment for Soil

	On-site Worker	Construction Worker	Industrial / Commercial Worker	Mower	Landscape Worker
Total ELCR	**3.E-06**	**1.E-06**	**2.E-05**	**1.E-05**	**1.E-06**
Total HI	1.E-02	6.E-01	5.E-02	2.E-02	1.E-01

Summary of Human Risk Assessment for Groundwater

	On-site Worker	Construction Worker	Industrial / Commercial Worker	Mower	Landscape Worker
Total ELCR	2.E-07	9.E-09	2.E-07		
Total HI	4.E-04	4.E-03	4.E-04		

Table C-14.
SUMMARY OF HUMAN HEALTH RISK ASSESSMENT FOR LAKE CALUMET CLUSTER SITE: UNNAMED PARCEL

Notes:
ELCR: Excess lifetime cancer risks
HI: Hazard index
Bold shaded area indicated ELCR or HI exceedances for the receptor

Table C-15.
EXCEEDANCES SUMMARY OF CHEMICAL OF POTENTIAL CONCERN FOR LAKE CALUMET CLUSTER SITE: UNNAMED PARCEL

COPCs of Carcinogenic Risk in Soil

COPC	Receptors
Arsenic	Industrial/Commercial Worker, Mower
Benzo(a)pyrene	Industrial/Commercial Worker, Mower

Notes:
ELCR: Excess lifetime cancer risks
HI: Hazard index
Carcinogenic exceedances: ELCR is greater than 1.00E-06
Noncarcinogenic exceedances: HI is greater than 1.00E+00

APPENDIX E

ECOLOGICAL RISK ASSESSMENT
LAKE CALUMET CLUSTER SITE *(Text Only)*
LOCKHEED MARTIN REAC (NOVEMBER 2001)

FINAL REPORT
ECOLOGICAL RISK ASSESSMENT
LAKE CALUMET CLUSTER SITES
CHICAGO, ILLINOIS

NOVEMBER 2001

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SUBJECT: DOCUMENT TRANSMITTAL UNDER WORK ASSIGNMENT R1A 00053

Attached please find the following document prepared under this work assignment:

FINAL REPORT
ECOLOGICAL RISK ASSESSMENT
LAKE CALUMET CLUSTER SITES
CHICAGO, ILLINOIS

cc: Central File WA 0-0053 (w/attachment)
S. Clapp, REAC (w/o attachment)

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FINAL REPORT
ECOLOGICAL RISK ASSESSMENT
LAKE CALUMET CLUSTER SITES
CHICAGO, ILLINOIS
NOVEMBER 2001

U.S. EPA Work Assignment No.: 0-053
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TABLE OF CONTENTS

LIST OF TABLES v

LIST OF FIGURES vi

ACRONYMS AND ABBREVIATIONS vii

1.0 INTRODUCTION 1
1.1 Purpose 1
1.2 Background 1
1.3 Scope 1

2.0 TECHNICAL APPROACH 2
2.1 Screening Level Ecological Risk Assessment and Preliminary Problem Formulation . 2
2.2 Refined Problem Formulation 2
2.3 Selection of Assessment Endpoints 3
2.4 Measurement Endpoints 4
2.5 Conceptual Mode 4
2.6 Assessment Endpoint #1: Viability of Wetland Structure and Functioning 5
2.6.1 Testable Hypotheses for Assessment Endpoint #1 5
2.6.2 Measurement Endpoint for Assessment Endpoint #1 5
2.7 Assessment Endpoint #2: Fish Recruitment and Nursery Functioning 5
2.7.1 Testable Hypotheses for Assessment Endpoint #2 6
2.7.2 Measurement Endpoint for Assessment Endpoint #2 6
2.8 Assessment Endpoint #3: Viable and Functioning Benthic Invertebrate Communities . 6
2.8.1 Testable Hypotheses for Assessment Endpoint #3 6
2.8.2 Measurement Endpoint for Assessment Endpoint #3 6
2.9 Assessment Endpoint #4: Viable and Functioning Amphibian Populations 7
2.9.1 Testable Hypotheses for Assessment Endpoint #4 7
2.9.2 Measurement Endpoint for Assessment Endpoint #4 7
2.10 Assessment Endpoint #5: Viability and Recruitment of Insectivorous Birds 7
2.10.1 Testable Hypotheses for Assessment Endpoint #5 7
2.10.2 Measurement Endpoint for Assessment Endpoint #5 7
2.11 Assessment Endpoint #6: Viability and Recruitment of Omnivorous Waterfowl 8
2.11.1 Testable Hypotheses for Assessment Endpoint #6 8
2.11.2 Measurement Endpoint for Assessment Endpoint #6 8
2.12 Assessment Endpoint #7: Viability and Recruitment of Herbivorous Birds 8
2.12.1 Testable Hypotheses for Assessment Endpoint #7 8
2.12.2 Measurement Endpoint for Assessment Endpoint #7 8
2.13 Assessment Endpoint #8: Viability of Piscivorous Birds 9
2.13.1 Testable Hypotheses for Assessment Endpoint #8 9
2.13.2 Measurement Endpoint for Assessment Endpoint #8 9
2.14 Assessment Endpoint #9: Viability of Omnivorous Mammals 9
2.14.1 Testable Hypotheses for Assessment Endpoint #9 9
2.14.2 Measurement Endpoint for Assessment Endpoint #9 9
2.15 Assessment Endpoint #10: Viability of Carnivorous Mammals 10

2.15.1 Testable Hypotheses for Assessment Endpoint #10 10
2.15.2 Measurement Endpoint for Assessment Endpoint #10 10
2.16 Assessment Endpoint #11: Functioning of the Soil Macroinvertebrate Community .. 10
2.16.1 Testable Hypotheses for Assessment Endpoint #11 10
2.16.2 Measurement Endpoints for Assessment Endpoint #11 11
2.17 Assessment Endpoint #12: Viability of the Plant Community 11
2.17.1 Testable Hypotheses for Assessment Endpoint #12 11
2.17.2 Measurement Endpoints for Assessment Endpoint #12 11

3.0 METHODS 11
3.1 Aquatic Sampling 11
3.1.1 Sampling Locations 11
3.1.2 Surface Water Sampling 12
3.1.3 Surface Water Quality Measurements 12
3.1.4 Sediment Sampling 12
3.1.5 Fish and Crayfish Collection 12
3.1.6 Toxicity Evaluations 13
3.1.6.1 Amphipod Sediment Toxicity Test 13
3.1.6.2 Larval Fish Toxicity Test 13
3.1.7 Benthic Macroinvertebrate Sampling 13
3.2 Terrestrial Sampling 14
3.2.1 Terrestrial Sampling Locations 14
3.2.2 Soil Sampling 14
3.2.3 Terrestrial Plant Sampling 14
3.2.4 Toxicity Evaluations 14
3.2.4.1 Earthworm Soil Toxicity/Accumulation 14
3.2.4.2 Ryegrass Soil Toxicity/Accumulation 15
3.3 Sampling Equipment Decontamination 15
3.4 Standard Operating Procedures 15
3.5 Waste Disposal 15

4.0 RESULTS 16
4.1 Results of the Chemical Analysis of Surface Water 16
4.1.1 Target Analyte List Metals 16
4.1.2 Pesticides/Polychlorinated Biphenyls 16
4.1.3 Volatile Organic Compounds 16
4.1.4 Base, Neutral, and Acid Extractables 16
4.1.5 *In Situ* Water Quality 17
4.2 Results of the Chemical Analysis of Sediment 17
4.2.1 Target Analyte List Metals 17
4.2.2 Pesticides/Polychlorinated Biphenyls 17
4.2.3 Volatile Organic Compounds 17
4.2.4 Base, Neutral, and Acid Extractables 17
4.3 Results of the Chemical Analysis of Soil 17
4.3.1 Target Analyte List Metals 17
4.3.2 Pesticides/Polychlorinated Biphenyls 18
4.3.3 Volatile Organic Compounds 18
4.3.4 Base, Neutral, and Acid Extractables 18

4.4 Results of the Chemical Analysis of Fish, Crayfish, and Earthworm Tissue 18
4.4.1 Target Analyte List Metals 18
4.4.1.1 Fish Tissue 18
4.4.1.2 Crayfish Tissue 18
4.4.1.3 Earthworm Tissue 18
4.4.2 Pesticides/Polychlorinated Biphenyls 19
4.4.2.1 Fish Tissue 19
4.4.2.2 Crayfish Tissue 19
4.4.2.3 Earthworm Tissue 19
4.4.3 Base, Neutral, and Acid Extractables 19
4.4.3.1 Fish Tissue 19
4.4.3.2 Crayfish Tissue 19
4.5 Results of the Toxicity Evaluations 19
4.5.1 Amphipod (*Hyalella azteca*) 19
4.5.2 Fathead Minnow (*Pimephales promelas*) 20
4.5.3 Earthworm (*Eisenia foetida*) 20
4.5.4 Ryegrass (*Lolium perenne*) 20
4.6 Benthic Macroinvertebrate Community 20

5.0 BENCHMARK COMPARISONS OF SURFACE WATER, SOIL, AND SEDIMENT COPCs 21
5.1 Surface Water 21
5.2 Sediment 21
5.3 Soil 22

6.0 FOOD CHAIN MODELS 22
6.1 Methods 22
6.2 Results of Risk Calculations 24

7.0 EVALUATION OF ASSESSMENT ENDPOINTS 25
7.1 Assessment Endpoint #1: Viability of Wetland Structure and Functioning 25
7.2 Assessment Endpoint #2: Fish Recruitment and Nursery Functioning 25
7.3 Assessment Endpoint #3: Viable and Functioning Benthic Macroinvertebrate Community 26
7.4 Assessment Endpoint #4: Viable and Functioning Amphibian Populations 26
7.5 Assessment Endpoint #5: Viability and Recruitment of Insectivorous Birds 26
7.6 Assessment Endpoint #6: Viability and Recruitment of Omnivorous Waterfowl 26
7.7 Assessment Endpoint #7: Viability and Recruitment of Herbivorous Birds 26
7.8 Assessment Endpoint #8: Viability of Piscivorous Birds 26
7.9 Assessment Endpoint #9: Viability of Omnivorous Mammals 27
7.10 Assessment Endpoint #10: Viability of Carnivorous Mammals 27
7.11 Assessment Endpoint #11: Functioning of the Soil Macroinvertebrate Community 27
7.12 Assessment Endpoint #12: Viability of the Plant Community 27

8.0 ASSUMPTIONS AND SOURCES OF UNCERTAINTY 27
8.1 Assumptions 27
8.2 Sources of Uncertainty 28

9.0 CONCLUSIONS 30

10.0 LITERATURE CITED ..... 3[illegible]

APPENDIX A: Screening Level Ecological Risk Assessment

APPENDIX B: Validated Analytical Reports

APPENDIX C: Freshwater Amphipod (*Hyalella azteca*) Toxicity Test Report

APPENDIX D: Fathead Minnow (*Pimephales promelas*) Toxicity Test Report

APPENDIX E: Earthworm (*Eisenia foetida*) Toxicity Test Report

APPENDIX F: Ryegrass (*Lolium perenne*) Toxicity Test Report

APPENDIX G: Correlation Analysis Results

APPENDIX H: Input Parameters and Calculations of Food Chain Exposure Models

LIST OF TABLES

Table 1. List of Contaminants of Potential Concern
Table 2 Target Analyte List Metals Detected in Water
Table 3. Pesticides/PCBs Detected in Water
Table 4. Volatile Organic Compounds Detected in Water
Table 5. Base, Neutral, and Acid Extractable Compounds Detected in Water
Table 6. *In-Situ* Water Quality Data
Table 7. Target Analyte List Metals Detected in Sediment
Table 8. Pesticides/PCBs Detected in Sediment
Table 9. Volatile Organic Compounds Detected in Sediment
Table 10. Base, Neutral, and Acid Extractable Compounds Detected in Sediment
Table 11. Target Analyte List Metals Detected in Soil
Table 12. Pesticides/PCBs Detected in Soil
Table 13. Volatile Organic Compounds Detected in Soil
Table 14. Base, Neutral, and Acid Extractable Compounds Detected in Soil
Table 15. Target Analyte List Metals Detected in Fish and Crayfish Tissue
Table 16. Target Analyte List Metals Detected in Earthworms Exposed to Site Soil
Table 17. Pesticides/PCBs Detected in Fish and Crayfish Tissue
Table 18. PCBs Detected in Earthworms Exposed to Site Soil
Table 19. Base, Neutral, and Acid Extractable Compounds Detected in Fish and Crayfish Tissue
Table 20. Survival and Growth of Amphipods (*Hyalella azteca*) Exposed to Site Sediments
Table 21. Survival and Growth of Fathead Minnows (*Pimephales promelas*) Exposed to Site Water
Table 22. Survival and Growth of Earthworms (*Eisenia foetida*) Exposed to Site Soil
Table 23. Survival and Growth of Ryegrass (*Lolium perenne*) Exposed to Site Soil
Table 24. Hazard Quotient Calculation Summary for Food Chain Exposure Models

Table H-1. Hazard Quotient Calculations for an Insectivorous Bird (Yellow Headed Blackbird) Conservative Life History Parameters, Conservative Contaminant Concentrations, One Food Item (Worms)
Table H-2. Hazard Quotient Calculations for an Omnivorous Waterfowl (Mallard Duck) Conservative Life History Parameters, Conservative Contaminant Concentrations, Two Food Items (Fish and Worms)
Table H-3. Hazard Quotient Calculations for a Piscivorous Bird (Black-Crowned Night Heron) Conservative Life History Parameters, Conservative Contaminant Concentrations, One Food Item (Fish)
Table H-4. Hazard Quotient Calculations for a Piscivorous Bird (Black-Crowned Night Heron) Conservative Life History Parameters, Conservative Contaminant Concentrations, One Food Item (Worms)
Table H-5. Hazard Quotient Calculations for a Piscivorous Bird (Black-Crowned Night Heron) Conservative Life History Parameters, Conservative Contaminant Concentrations, Two Food Items (Fish and Worms)
Table H-6. Hazard Quotient Calculations for an Omnivorous Mammal (Raccoon) Conservative Life History Parameters, Conservative Contaminant Concentrations, Three Food Items (Fish, Crayfish, and Worms)
Table H-7. Hazard Quotient Calculations for a Carnivorous Mammal (Short-tailed Shrew) Conservative Life History Parameters, Conservative Contaminant Concentrations, One Food Item (Worms)

LIST OF FIGURES

Figure 1. Site Location Map

µg/kg	micrograms per kilogram
µg/L	micrograms per liter
Ag	silver
Alburn	Alburn Incinerator
As	arsenic
ASTM	American Society for Testing and Materials
Be	beryllium
BNA	base, neutral, and acid extractable compounds
BTAG	Biological Technical Advisory Group
Cd	cadmium
Co	cobalt
COPC	contaminant of potential concern
Cr	chromium
Cu	copper
DDD	dichloro diphenyl dichloroethane
DDE	dichloro diphenyl ethane
DO	dissolved oxygen
E&E	Ecology and Environment
ERA	ecological risk assessment
ERTC	Environmental Response Team Center
FBI	Family Biotic Index
Fe	iron
GPS	global positioning system
Hg	mercury
HMWPAH	high molecular weight polycyclic aromatic hydrocarbons
HQ	hazard quotient
IL	Illinois
LCC	Lake Calumet Cluster
LCC-1	Pond LHL1, north side.
LCC-2	Pond LHL1, south side.
LCC-3	Pond LHL2, north side
LCC-4	Pond LHL2, south side.
LCC-5	Southeast Pond, north side
LCC-6	Southeast Pond, south side
LCC-7	Alburn Depositional Area.
LL3	Land and Lakes #3
LMWPAH	low molecular weight polycyclic aromatic hydrocarbons
LOAEL	lowest observable adverse effect level
MDL	method detection limit
mg/kg	milligrams per kilogram
mg/L	milligrams per liter
Ni	nickel
NOAEL	no observable adverse effect level
PAH	polycyclic aromatic hydrocarbon
Pb	lead
PCB	polychlorinated biphenyl

RCRA	Resource Conservation and Recovery Act
REAC	Response Engineering and Analytical Contract
Sb	antimony
Se	selenium
SL	screening level
SLERA	screening level ecological risk assessment
SOIL-1	Paxton I, E&E soil sampling site ID #S14
SOIL-2	Alburn, E&E soil sampling site ID #S26
SOIL-3	Alburn, E&E soil sampling site ID #2S16
SOIL-4	U.S. Drum, E&E soil sampling site ID #S50
SOIL-5	U.S. Drum, E&E soil sampling site ID #61
SOIL-6	Unnamed Parcel, E&E soil sampling site ID #S66
SOP	standard operating procedure
SVOC	semi-volatile organic compound
TAL	target analyte list
Tl	thallium
TV	tolerance value
U.S. EPA	United States Environmental Protection Agency
USD	U.S. Drum II
V	vanadium
VOC	volatile organic compound
WA	work assignment
Zn	zinc

1.0 INTRODUCTION

1.1 Purpose

The objective of this project is to evaluate the ecological risks associated with the Lake Calumet Cluster Sites (LCC), located in Chicago, Illinois (IL). Encompassed in the project are steps 3 through 7 of the 8 step Ecological Risk Assessment (ERA) Guidance for Superfund: Process for Designing and Conducting Ecological Risk Assessments (U.S. EPA 1997).

1.2 Background.

The LCC site is located near the southeast corner of Lake Calumet, in Chicago, Cook County, IL (Figure 1). The site is approximately 200 acres, and is composed of seven individual properties: Paxton I, Paxton II, Paxton Lagoons, Alburn Incinerator (Alburn), U.S. Drum II (USD), Land and Lakes #3 (LL3), and an unnamed parcel. The site is bordered on the north by Interlake/Big Marsh, on the west by Stony Island Avenue, on the east by the Norfolk and Western Railroad right-of-way, and on the south by 122nd Street (Ecology and Environment 1999).

The Paxton properties, now inactive, were general use landfills in the early 1970s, accepting household and industrial wastes and sludge (Ecology and Environment 1999). Paxton II also accepted some hazardous and non-hazardous "special wastes" (Weston 1998).

The Alburn property was used as a trench landfill for ten years, until 1977, when its primary use was expanded to include hazardous waste storage, transfer, and incineration. Alburn handled a wide variety of organic chemicals and wastes. The facility had its waste permit revoked in 1982 for Resource Conservation and Recovery Act (RCRA) violations. Alburn continued to accept bulk waste until January, 1983. On July 5, 1985, two on-site drums exploded from heat expansion and a subsequent chemical reaction. The United States Environmental Protection Agency (U.S. EPA) ordered an immediate removal action of all visible sources of hazardous materials from the site. In addition, the top 6 inches of soil, assumed to be the most contaminated, were excavated (Ecology and Environment 1999).

The USD property was used for 30 years as a municipal and industrial dump site, until the mid-1970s. In 1979, the facility became a waste drum storage and transfer facility which was shut down later that same year. Over 34,000 gallons of liquid and semisolid wastes were removed after facility closure. In 1984 and 1985, a U.S. EPA removal action cleaned up 1,500 buried drums, which had been punctured to allow their contents to leak out. In addition, 435 cubic yards of soil and 62,000 gallons of contaminated water were removed (Ecology and Environment 1999).

The LL3 property is a permitted, active landfill. The unnamed parcel has been shown to be filled with household waste and industrial or construction debris (Ecology and Environment 1999).

1.3 Scope

The scope of this project included the collection of soil, sediment, and surface water for chemical and toxicological analysis; and tissue (fish, crayfish, and earthworm) for chemical analysis. The field investigations were conducted by U.S. EPA Environmental Response Team Center (ERTC) and personnel from the Response, Engineering, and Analytical Contract (REAC). Activities were

directed at both the aquatic and terrestrial aspects of the site. Water, sediment, and soil were collected the week of January 29, 2001; toxicity tests were conducted in February 2001; and fish and crayfish were collected the week of April 9, 2001.

2.0 TECHNICAL APPROACH

2.1 Screening Level Ecological Risk Assessment and Preliminary Problem Formulation

A screening level ecological risk assessment (SLERA) was conducted to determine if there was sufficient ecological risk associated with the exposure of biota to site-related contaminants to warrant a more intensive, site-specific ERA (Lockheed Martin 2000); Appendix A. The following steps were completed for this screening level risk assessment:

- A literature search was conducted to identify life history information for selected risk model indicator species, and to evaluate the potential for ecotoxicological effects from the site contaminants.
- A preliminary problem formulation was prepared to evaluate the risk to ecological receptors. This assessment consisted of the following steps:
  - Exposure scenarios were determined based on site contaminant levels, the extent and magnitude of contamination, and the toxicological mechanisms of the contaminants.
  - Model receptor species were selected based on species present, or potentially present on site, the availability of literature-based toxicity information, and the potential for exposure to contaminants based on habitat use or behavior.
  - Exposure pathways were determined for each model indicator species.
- 10 benchmarks were identified.
- The benchmarks were compared with levels of contaminants on site.
- 10 contaminants of potential concern (COPCs) were identified for this study.

The results of the SLERA were used to identify the COPCs for this ERA. Any contaminant that exceeded its benchmark value for soil, sediment, or water, or that was detected in a matrix for which a benchmark did not exist, was identified as a COPC. The SLERA assumed that receptors were exposed to the highest concentration detected in the considered media, and that the contaminant was biologically available and completely assimilated. On the basis of concentration and toxicity, the SLERA identified a total of 112 COPCs. Of these, 6 were low molecular weight polycyclic aromatic hydrocarbons (LMWPAHs), 11 were high molecular weight PAHs (HMWPAHs), 35 were semi-volatile organic compounds (SVOCs), 15 were volatile organic compounds (VOCs), 15 were pesticides, 7 were polychlorinated biphenyls (PCBs), and 23 were metals. A complete list of the COPCs can be found in Table 1. It should be noted that inclusion of a COPC on this list is simply an indication that the compound was present, but that based upon the available information, it could not be concluded that the chemical posed no ecological risk.

2.2 Refined Problem Formulation

A refined problem formulation was prepared using the parameters outlined in the preliminary problem formulation, and enhanced by gathering the following information:

- Exposure and effect profiles for each model receptor species, and each site COPC.
- A risk characterization was conducted which involved the calculation of hazard

quotients (HQ) for each model species for a range of exposure scenarios, as appropriate to refine the COPCs to specific assessment endpoints.

This completed the baseline ERA. Subsequent sections describe each assessment endpoint and the data requirements necessary to complete the assessment.

The problem formulation phase encompasses the development of assessment endpoints, risk questions directly related to the assessment endpoints, and the development of measures of effects (measurement endpoints). The latter are the means of answering risk questions, followed by the development of a sampling design for data acquisition. Based on these assessment endpoints, specific risk questions (testable hypotheses) were developed, and measures of effects were selected for the evaluation of the risks posed. The study design incorporated knowledge of existing literature on environmental investigations performed in and around the LCC Site, the relationship between a test response and the mechanism of environmental toxicity of site COPCs, and the generation of information which would facilitate the interpretation of testing results regarding the influence of toxicity versus non-contaminant related stress.

2.3 Selection of Assessment Endpoints

Refined assessment endpoints were developed for this site, based on habitat types present at or near the site, the type of contaminants, and the potentially present species. Following each assessment endpoint are the testable hypotheses and proposed measurement endpoints. For those assessment endpoints having multiple measurement endpoints, a weight-of-evidence approach was used in the ERA which allowed integration of all measurement endpoints into a single conclusion. A weight-of-evidence evaluation implies that there are multiple lines of evidence, but not all lines of evidence have equal strength. When multiple lines of evidence for a particular assessment endpoint lead to the same conclusion, the level of confidence in the risk estimate is increased. If multiple lines of evidence generated apparent conflicts, the evidence relative to the mechanisms of toxicity was used in evaluating the level of confidence in the risk estimate. Similarly, some measurement endpoints were used for multiple assessment endpoints (e.g., concentration of COPCs in soil, sediment, and surface water).

Assessment endpoints are explicit expressions of the actual ecological resources that are to be protected. Valuable ecological resources include those without which ecosystem function would be significantly impaired, or those providing critical components (e.g., habitat). Appropriate selection and definition of assessment endpoints are critical to the utility of a risk assessment, as they focus assessment design and analysis. It is not practical, or possible, to directly evaluate potential risks to all of the individual components of an ecosystem, so assessment endpoints are used to focus on particular components of the ecosystem that could be adversely affected by site specific contaminants. By evaluating and protecting these assessment endpoints, the ecosystem as a whole should also be protected. A review of the habitat of the LCC sites and its associated wetlands provided information for the selection of assessment endpoints. A variety of invertebrates, vertebrates, and plants inhabit the area. In addition, birds and mammals inhabiting this and adjacent areas could prey on the flora and fauna inhabiting the study area. Therefore, the assessment endpoints focused on these biological groups. In general, endpoints are aimed at the viability of terrestrial and aquatic populations.

2.4 Measurement Endpoints

Each of the testable hypotheses was evaluated using one or more measurement endpoints. The number of measurement endpoints chosen for each assessment endpoint was determined by the type of habitat, the mechanism(s) of toxicity, and the feasibility of collecting the supporting data. When more than one measurement endpoint was used to evaluate a single assessment endpoint, a weight-of-evidence approach was employed, whereby the measurement endpoints were treated as lines of evidence. The overall risk to each assessment endpoint was then determined based on the results of the evaluation of each line of evidence, having taken into consideration the degree of importance of each line of evidence.

The measurement endpoints were selected to represent the mechanisms of toxicity and exposure pathways for the assessment endpoints and to answer questions posed by the testable hypotheses for each assessment endpoint. Where adverse effects were observed, the measurement endpoints were also used in developing preliminary ecotoxicologically-based remedial goals. For this study, the following measurement endpoints, or lines of evidence, were identified for each of the assessment endpoints evaluated in this risk assessment.

2.5 Conceptual Model

The conceptual model is based on contaminant and habitat characteristics to identify critical exposure pathways to the selected assessment endpoints. At the LCC Site, contaminants in the water, sediment, and soil may come in contact with the aquatic, benthic, and terrestrial receptors inhabiting or using the area. Benthic invertebrates in LCC Site ponds may be exposed to site contaminants through direct contact with and/or ingestion of the sediment and overlying water. Aquatic vertebrates may be exposed to site contaminants via direct contact with water and sediment, ingestion of water, incidental ingestion of sediment adhered to food items, and ingestion of contaminated food. Mammals and birds may be exposed to site contaminants via ingestion of contaminated food, incidental ingestion of sediment or soil, and ingestion of surface water.

Based on this conceptual model, and dependent upon the availability of information, the following pathways will be considered in this risk assessment:

I. Fish
   - Direct contact with water
   - Direct contact with sediment

II. Benthic Invertebrates
   - Direct contact with water
   - Direct contact with sediment

III. Amphibians
   - Direct contact with water
   - Direct contact with sediment

IV. Insectivorous Bird
   - Ingestion of invertebrates

V. Omnivorous Waterfowl
   - Ingestion of invertebrates
   - Ingestion of fish

VI. Piscivorus Bird

Ingestion of fish

VII. Omnivorous Mammal
Ingestion of invertebrates
Ingestion of fish

VIII. Carnivorous Mammal
Ingestion of invertebrates

IX. Soil Macroinvertebrate
Direct contact with soil
Ingestion of soil

X. Plant Community
Direct contact with soil

2.6 Assessment Endpoint #1: Viability of Wetland Structure and Functioning

The health of the wetlands/ponds has a direct impact on the health of the entire ecosystem. The maintenance of the structure and function of the wetlands is important to the ecosystem since it provides critical habitat for many species of plants and animals. Wetlands also process energy, organic matter, and nutrients. Biota utilizing the wetland area often rely extensively on the resources (e.g., forage) provided by the ponds to support survival, growth, and reproduction. In addition to providing a stopover and/or breeding ground for migratory species, wetlands usually provide high quality edge habitat for a variety of relatively sedentary birds, reptiles, amphibians, and mammals, which in turn rely on the ponds to forage. The sedentary species that generally congregate near ponds due to habitat and food availability are in turn preyed upon by more far-ranging species that utilize the wetland. In this assessment, the term wetlands refers to both the open water habitat (ponds) and to traditional wetlands. In most instances, sampling was conducted in the ponds, and the results applied to both ponds and wetlands.

2.6.1 Testable Hypotheses for Assessment Endpoint #1:

Are levels of site contaminants in sediment, soil, and surface water sufficient to cause adverse alterations to the structure and viability of wetland communities?

2.6.2 Measurement Endpoint for Assessment Endpoint #1:

The overall functioning of the wetland communities on the site was inferred through the evaluation of measurement endpoints for assessment endpoints 2, 3, 4, 5, 6, 7, 8, 9, and 10. These components provide information regarding the trophic levels and habitats within the site and subsequently offer insights into the overall functioning of the habitat.

2.7 Assessment Endpoint #2: Fish Recruitment and Nursery Functioning

Fish function in the transfer of nutrients and energy within a pond, and as forage items for organisms that inhabit the pond and its feeder streams. Several predators rely solely or primarily on fish as forage. Fish typically provide a large proportion of the biomass utilizing a pond and are in a wide range of trophic positions (e.g., predators, bottom feeders, etc.) in pond communities. Due to these factors, impairment to fish communities would have strong impacts on nutrient and energy cycling in the pond and overall ecosystem health.

2.7.1 Testable Hypotheses for Assessment Endpoint #2:

Are levels of site contaminants sufficient to cause toxic effects or reproductive impairment in fish that inhabit the wetlands?

2.7.2 Measurement Endpoint for Assessment Endpoint #2:

Two lines of evidence were used to assess the effects of contamination within the site ponds on the fish communities that inhabit them.

Samples of surface water from the site were tested for aquatic toxicity using larval fathead minnows (*Pimephales promelas*). The results of the toxicity test were statistically analyzed to determine if survival or growth of fish were adversely affected, as compared with the laboratory control. The results were also correlated to the measured concentrations of the COPCs in the water to determine if a dose-response relationship exists between observed toxicity and the detected COPCs.

Fish were collected from site ponds and subjected to whole body tissue analysis for COPCs.

2.8 Assessment Endpoint #3: Viable and Functioning Benthic Invertebrate Communities

Benthic invertebrate communities constitute a significant portion of the base of the food chain for aquatic ecosystems. Impacts to benthic invertebrate communities may have significant direct and indirect effects (e.g., loss or reduction of forage) on higher trophic organisms (e.g., fish, birds, herpetiforms). Invertebrates process organic material, and play an important role in nutrient and energy transfer in pond and marsh ecosystems.

2.8.1 Testable Hypotheses for Assessment Endpoint #3:

Are levels of site contaminants in surface water and sediment sufficient to cause adverse alterations to the structure and function of aquatic invertebrate communities?

Are levels of site contaminants in sediment and/or water sufficient to cause toxic effects or reproductive impairment in aquatic invertebrates that inhabit the ponds and marshes on and adjacent to the site?

2.8.2 Measurement Endpoint for Assessment Endpoint #3:

Three lines of evidence were used to assess the effects of contamination within the site ponds on the benthic invertebrate communities that inhabit them.

A bioassessment survey of the benthic invertebrate community conducted August–September 1998 was used to determine the overall health of the benthic community in this ERA.

Sediment samples from ponds LHL1, LHL 2, and Southeast Pond were collected for use in sediment toxicity tests using the freshwater amphipod, *Hyalella azteca*. The results of the toxicity tests were statistically analyzed to determine if survival or growth of the

amphipod was adversely affected as compared with a reference area or the laboratory control. The results were then correlated to the measured concentrations of the COPCs in the sediment to determine if a dose-response relationship existed between the observed toxicity and any of the COPCs.

Sediment samples were collected and analyzed for PAHs, VOCs, SVOCs, PCBs, pesticides, and metals. Sediment contaminant levels were compared with literature-based benchmarks to determine whether the contamination was sufficient to cause adverse effects to benthic invertebrates.

2.9 Assessment Endpoint #4: Viable and Functioning Amphibian Populations

Embryo and larval stages are critical periods for amphibians and other species that share similar life histories. Examination of the effect of contaminants on amphibians during these stages provides a direct measure of reproductive success and a measure of recruitment success into the adult population. Amphibians represent a significant source of forage to higher trophic level organisms (e.g., birds, fish, and mammals). Amphibians are also considered to be sensitive to a wide range of contaminants and are considered to be a sensitive indicator species for adverse effects to the ecosystem.

2.9.1 Testable Hypotheses for Assessment Endpoint #4:

Are levels of site contaminants sufficient to cause adverse alterations to the development, growth or reproductive capacity of the amphibian community?

2.9.2 Measurement Endpoint for Assessment Endpoint #4:

Results of benthic invertebrate toxicity tests were used to evaluate the effects of contamination in the site ponds on amphibian populations. Since the developmental stages of some amphibians' life cycles are spent in close proximity to the sediment, the results of the *H. azteca* toxicity test were used to estimate whether amphibians are potentially at risk.

2.10 Assessment Endpoint #5: Viability and Recruitment of Insectivorous Birds

Insectivorous birds are important in the population regulation of insects, such as mosquitoes. Impacts to insectivorous birds would allow species of insects to obtain higher population levels than would typically occur in a system that was not impacted. In addition, insectivorous birds are important in nutrient processing and energy transfer between the aquatic and terrestrial environment.

2.10.1 Testable Hypotheses for Assessment Endpoint #5:

Are levels of site contaminants sufficient to cause toxic effects or reproductive impairment to insectivorous birds that utilize the site and adjacent areas?

2.10.2 Measurement Endpoint for Assessment Endpoint #5:

A food chain accumulation model based on the life history of the yellow headed blackbird (*Xanthocephalus xanthocephalus*) was employed using site specific data (invertebrate

contaminant concentrations) to estimate the dose of COPCs to which insectivorous birds are exposed. Estimated dosages were compared with literature values to determine if a risk to the survival and reproduction of insectivorous birds exists as a result of site contamination. The earthworm, *Eisenia foetida*, was used as a surrogate invertebrate to represent both soil invertebrates and emergent aquatic insects. Laboratory toxicity and bioaccumulation studies of site soil were performed, and the subsequent tissue analyses were used as site specific invertebrate contamination concentrations.

2.11 Assessment Endpoint #6: Viability and Recruitment of Omnivorous Waterfowl

Omnivorous waterfowl were selected for evaluation because of their diverse methods of foraging. Of the bird species utilizing the system, omnivorous waterfowl have been reported to have the greatest soil/sediment ingestion rates. Soil/sediment ingestion can account for substantial dietary exposure in accumulation models. Omnivorous waterfowl help regulate the growth of aquatic vegetation, algae, and benthic invertebrates. Omnivorous waterfowl are an important pathway by which nutrients and energy may be transferred between the aquatic and terrestrial environment.

2.11.1 Testable Hypotheses for Assessment Endpoint #6:

Are levels of site contaminants sufficient to cause toxic effects or reproductive impairment in omnivorous waterfowl that utilize the site and adjacent areas?

2.11.2 Measurement Endpoint for Assessment Endpoint #6:

A food chain accumulation model based on the life history of the mallard duck (*Anas platyrhynchos*) was employed using site specific data (invertebrate and fish contaminant concentrations) to estimate the dose of COPCs to which omnivorous waterfowl are exposed. Data from whole body tissue analysis of fish collected from the site ponds, and data from laboratory bioaccumulation testing with earthworms were used. The earthworm, *Eisenia foetida*, was used as a surrogate invertebrate to represent emergent aquatic insects. Estimated dosages were compared to literature values to determine if a risk to the survival and reproduction of omnivorous waterfowl exists as a result of exposure to site contaminants.

2.12 Assessment Endpoint #7: Viability and Recruitment of Herbivorous Birds

Herbivorous birds were selected for evaluation because of their method of foraging. Herbivorous birds have been reported to have high incidental soil ingestion rates, which can account for substantial dietary exposure in accumulation models. Herbivorous birds help regulate the growth and diversity of vegetation surrounding water bodies. Herbivorous birds are an important pathway by which nutrients and energy may be transferred between primary producers and consumers.

2.12.1 Testable Hypotheses for Assessment Endpoint #7:

Are levels of site contaminants sufficient to cause toxic effects or reproductive impairment in herbivorous birds that utilize the site and adjacent areas?

2.12.2 Measurement Endpoint for Assessment Endpoint #7:

A food chain accumulation model based on the life history of the American wigeon (*Anas americana*) was employed using site-specific data to estimate the dosages of COPCs to which herbivorous birds are exposed. Since suitable vegetation was not available on the site, data from laboratory bioaccumulation testing with plants was used in concert with field collected water and soil COPC concentrations. The ryegrass *Lolium perenne* was used to represent native vegetation. Estimated doses were compared to literature values to determine if a risk to the survival and reproduction of herbivorous birds exists as a result of exposure to site contaminants.

2.13 Assessment Endpoint #8: Viability of Piscivorous Birds

Piscivorous birds are an upper trophic-level organism that rely primarily on fish as forage. Foraging behavior of piscivorous birds represents a pathway by which nutrients and energy are transferred between aquatic and terrestrial ecosystems. Predators are often required to keep prey species in check, and impacts to predators could cause detrimental population increases in prey species.

2.13.1 Testable Hypotheses for Assessment Endpoint #8:

Are levels of site contaminants sufficient to cause toxic effects or reproductive impairment in piscivorous birds that utilize the site and adjacent areas?

2.13.2 Measurement Endpoint for Assessment Endpoint #8:

A food chain accumulation model based on the life history of the black-crowned night heron (*Nycticorax nycticorax*) was employed using site-specific data (invertebrate and fish tissue contaminant concentrations) to estimate dosages of COPCs to which piscivorous birds are exposed. Data from whole body tissue analysis of fish collected from the site ponds, and data from laboratory bioaccumulation testing with earthworms were used. Estimated doses were compared to literature values to determine if a risk to the survival and reproduction of piscivorous birds exists as a result of exposure to site contaminants.

2.14 Assessment Endpoint #9: Viability of Omnivorous Mammals

Omnivorous mammals help to regulate benthic invertebrate and fish populations. Omnivorous mammals are an important pathway by which nutrients and energy are transferred between the terrestrial and aquatic environment. In many urban and/or suburban ecosystems, these species typically represent the highest trophic levels and therefore, for contaminants that biomagnify, would be receiving the highest doses of contaminants from their forage.

2.14.1 Testable Hypotheses for Assessment Endpoint #9:

Are levels of site contaminants sufficient to cause toxic effects or reproductive impairment to omnivorous mammals that utilize the site and adjacent areas?

2.14.2 Measurement Endpoint for Assessment Endpoint #9:

A food chain accumulation model based on the life history of the raccoon (*Procyon lotor*) was developed using site-specific data (fish and invertebrate contaminant concentrations) to estimate the dosages of COPCs to which omnivorous mammals are exposed. Estimated doses were compared with literature values to determine if a potential risk to the survival and reproduction of omnivorous mammals exists as a result of exposure to site contaminants.

2.15 Assessment Endpoint #10: Viability of Carnivorous Mammals

Carnivorous mammals are upper trophic-level organisms that selectively forage on lower trophic level organisms such as small mammals. Foraging behavior of carnivorous mammals represents a pathway by which nutrients and energy are transferred to higher trophic levels within the terrestrial ecosystem. Predators also are often required to keep prey in check, and impacts to predators could cause detrimental population increases in prey species.

2.15.1 Testable Hypotheses for Assessment Endpoint #10:

Are levels of site contaminants sufficient to cause toxic effects or reproductive impairment in carnivorous mammals that utilize the site and adjacent areas?

2.15.2 Measurement Endpoint for Assessment Endpoint #10:

A food chain accumulation model based on the life history of the shrew (*Blarina brevicauda*) was employed using site-specific data (invertebrates) to estimate the dose of COPCs to which carnivorous mammals are exposed. Estimated doses were compared with literature values to determine if a potential risk to the survival and reproduction of carnivorous mammals exists as a result of exposure to site contamination.

2.16 Assessment Endpoint #11: Functioning of the Soil Macroinvertebrate Community

The soil macroinvertebrate community is typically diverse taxonomically, morphologically, and physiologically, and is often numerically abundant. Additionally, the soil macroinvertebrate community of a terrestrial ecosystem plays a key role in ecosystem functions such as nutrient cycling, organic matter processing, and is an important food resource for the terrestrial community including insectivorous mammals and birds. Moreover, there is a direct linkage between the macroinvertebrate community and other ecological communities, as well as between ecosystem functions.

This assessment endpoint focuses on the terrestrial portion of the study area, and is aimed at an ecologically fit and viable soil macroinvertebrate community. The habitat within the study area has been modified substantially as a result of the direct deposition of waste materials containing contaminants and the indirect translocation of contaminants via erosion and deposition.

2.16.1 Testable Hypotheses for Assessment Endpoint #11:

Are the levels of contaminants sufficient to cause adverse effects in soil macroinvertebrates?

2.16.2 Measurement Endpoints for Assessment Endpoint #11:

The toxicity and bioaccumulation potential of COPCs in soil was evaluated through solid-phase toxicity tests using earthworms (*Eisenia foetida*).

The soil function was evaluated through nutrient and COPC analyses. The level of nutrients in the soil was evaluated as one measure of the ability of the soil to support an ecologically healthy community consisting of plants and animals.

2.17 Assessment Endpoint #12: Viability of the Plant Community

Terrestrial plants provide nesting and cover habitat for wildlife. Trees, shrubs, and tall grasses provide materials and habitat for most species of birds, as well as many mammalian species such as squirrels, rabbits, and mice. These plants also provide the basis for the food production for the ecosystem generating fruit, seeds, and leaves.

2.17.1 Testable Hypotheses for Assessment Endpoint #12:

Are the levels of site contaminants sufficient to cause adverse effects to vegetation?

2.17.2 Measurement Endpoints for Assessment Endpoint #12:

The toxicity and bioaccumulation potential of COPCs in soil through solid-phase toxicity testing using ryegrass (*Lolium perenne*) was evaluated.

The soil function was evaluated through nutrient and COPC analyses. The level of nutrients in the soil was evaluated as one measure of the ability of the soil to support an ecologically healthy community consisting of plants and animals.

3.0 METHODS

A field investigation was necessary to collect the information described above for use in a baseline ERA. This investigation involved the collection of soil, surface water, sediment, and fish. In addition to physical and chemical analyses, samples were analyzed using toxicity testing. These tasks are described.

Field sampling was performed in January 2001 for soil, surface water, sediment, and fish tissue. No fish were caught during the January sampling trip, likely because of the temperature (the ponds were covered with approximately 8 inches of ice). Fish were successfully obtained during a follow-up sampling trip in April 2001.

3.1 Aquatic Sampling

3.1.1 Sampling Locations

The study area included three ponds, and a depositional area on the Alburn property that may have previously been used as a holding pond (Figure 1). For the three ponds, sampling locations were situated in areas exhibiting similar habitat characteristics including substrate composition, vegetation, topographic relief, and land use. In an effort to increase the

interpretive powers of the data collected, samples were collocated. A total of seven locations were chosen and established by the field investigators.

LCC-1	Pond LHL1, north side
LCC-2	Pond LHL1, south side
LCC-3	Pond LHL2, north side
LCC-4	Pond LHL2, south side.
LCC-5	Southeast Pond, east side
LCC-6	Southeast Pond, west side
LCC-7	Alburn Depositional Area

With the exception of location LCC-7, all aquatic sampling sites were sampled for surface water, sediment, and fish. LCC-7 was only sampled for sediment.

3.1.2 Surface Water Sampling

Two surface water samples were collected from each sampling location and composited into a single sample for analysis. Due to accumulation of ice on the ponds, holes were made in the ice using a pick axe. Surface water samples were collected from these holes directly into the appropriate containers by hand, per ERT/REAC standard operating procedure (SOP) #2013, *Surface Water Sampling*. To avoid the incidental incorporation of suspended sediment into the sample, water was collected prior to other sampling activities that may have disturbed the sediment. Water samples were collected at approximately half the water depth from each sampling location.

3.1.3 Surface Water Quality Measurements

Water quality parameters were measured *in-situ* at each sampling location using a Hydrolab 4a multi-parameter water quality meter. Temperature, pH, dissolved oxygen (DO), conductivity, and turbidity were measured. Hydrolab calibration was checked prior to data collection, and again after data collection was completed. The Hydrolab was used in accordance with the manufacturer's operating manual.

3.1.4 Sediment Sampling

Sediment was collected from each sampling location except LCC-4, using a decontaminated ponar dredge or shovel per ERT/REAC SOP #2016, *Sediment Sampling*. A volume of sediment sufficient to fulfill the analytical requirements was collected from several collocated grabs, placed into a 2-gallon plastic bucket, and homogenized with a stainless steel trowel. Aliquots for laboratory analyses were dispensed into appropriate sample containers.

3.1.5 Fish and Crayfish Collection

Forage fish (for this assessment, any fish less than approximately four inches were considered forage) were sampled for the evaluation of tissue residues of COPCs. Fish were captured using small fish traps baited with partially opened cans of cat food and bread. Three fish traps were placed at each location totaling six traps per pond. The fish from each

location were composited into one sample. Because of the need for tissue analysis to evaluate the potential transfer of COPCs to piscivorous birds (e.g., black-crowned night heron), whole fish were weighed, wrapped in aluminum foil, placed in a plastic bag, and placed on dry ice as per ERT/ REAC SOP# 2039 *Fish Handling and Processing*. No fish were captured from pond LHL2, or from the Southeast Pond. Crayfish were collected only from ponds LHL1 and LHL2. Fish and crayfish were shipped via overnight delivery to the appropriate laboratory.

3.1.6 Toxicity Evaluations

3.1.6.1 Amphipod Sediment Toxicity Test

Solid-phase sediment toxicity evaluations using *Hyalella azteca* were performed in accordance with the U.S. EPA document: *Methods for Measuring the Toxicity and Bioaccumulation of Sediment-associated Contaminants with Freshwater Invertebrates* (Ingersoll *et al.* 1994), and American Society for Testing and Materials method E1706-95 "Standard Test Methods for Measuring the Toxicity of Sediment-Associated Contaminants with Fresh Water Invertebrates" (ASTM 1995). Testing was designed to provide data concerning the availability and toxicity of contaminants present in the sediment (Nebeker *et al.* 1984, Nebeker *et al.* 1986). Sediment for the solid–phase toxicity evaluation was collected from all sampling locations except LCC-4.

3.1.6.2 Larval Fish Toxicity Test

Surface water was evaluated using *Pimephales promelas*, according to U.S. EPA methods (Lewis *et al.* 1994) and ERT/REAC SOP# 2026, *7-Day Static Toxicity Test using Larval Pimephales promelas*, to provide data concerning the availability and toxicity of contaminants present in the water. The toxicity test used 100% site water (no dilution), along with a laboratory control. Standard reference toxicant testing was performed concurrently.

3.1.7 Benthic Macroinvertebrate Sampling

No benthic macroinvertebrate sampling was conducted during this field effort. Ecology and Environment personnel collected benthic samples from August 24, 1998 through September 3, 1998 (Ecology and Environment 1999) and the methods and results of their study are reiterated here. E&E collected macroinvertebrate samples either from submerged objects or sieved from sediments collected with a ponar dredge. Macroinvertebrates were classified from Indian Ridge Marsh and the on-site ponds. Each location was evaluated for the total number of taxa found at that location, the total number of organisms, the lowest tolerance value (TV) assigned to organisms at that location, and the Family Biotic Index (FBI). Tolerance values ranged from 0 to 10, with 0 being the least pollution tolerant organism, and 10 being the most pollution tolerant organism. The FBI was calculated by multiplying the number of organisms in each taxon by the TV for that taxon, summing the products, and dividing by the total number of organisms in the sample. For taxa with ranges of TVs, the average was used, and taxa with no known TV (e.g., *Hemiptera*) were not included in the equation.

3.2 Terrestrial Sampling

3.2.1 Terrestrial Sampling Locations

A total of six soil sampling locations were sampled. Sample locations were specified, and marked by global positioning system (GPS) by the field investigators. They are as follows:

SOIL 1 Paxton I, Ecology and Environment (E&E) soil sampling site ID #S14.
SOIL 2 Alburn, E&E soil sampling site ID #S26.
SOIL 3 Alburn, E&E soil sampling site ID #2S16.
SOIL 4 U.S. Drum, E&E soil sampling site ID #S50.
SOIL 5 U.S. Drum, E&E soil sampling site ID #61.
SOIL 6 Unnamed Parcel, E&E soil sampling site ID #S66.

Ecology and Environment location numbers refer to a previous risk assessment performed at the site (Ecology and Environment 1999). These sampling locations were judged to be "hot spots" for COPCs.

3.2.2 Soil Sampling

Surficial soil (0 to 3 inches below ground surface) was collected from all locations using a decontaminated pick and shovel as per ERT/REAC SOP #2012, *Soil Sampling*. Individual grabs were placed into one 5-gallon plastic bucket and two 2-gallon plastic buckets and homogenized. Aliquots for laboratory analyses were dispensed into appropriate sample containers.

3.2.3 Terrestrial Plant Sampling

Because sampling was performed in the winter, none of the site vegetation was deemed appropriate for tissue analysis. Therefore, no vegetation samples were collected, as originally planned.

3.2.4 Toxicity Evaluations

3.2.4.1 Earthworm Soil Toxicity/Accumulation

Acute soil toxicity bioassays using the earthworm *Eisenia foetida* were performed according to American Society for Testing and Materials (ASTM) guide E1676-97, "Standard Guide for Conducting Laboratory Soil Toxicity or Bioaccumulation Tests with the Lumbricid Earthworm *Eisenia fetida*" (ASTM 1997). Testing provided data concerning the availability and toxicity of contaminants present in the soil (USEPA 1989). *E. foetida* is widely distributed in soil, is an important component of the terrestrial invertebrate community, and often comprises a significant proportion of the soil biomass. In addition to being in intimate physical contact with the substrate, *E. foetida* feeds on detrital matter and vegetative debris incorporated into the soil.

3.2.4.2 Ryegrass Soil Toxicity/Accumulation

Soil toxicity evaluations using the perrenial ryegrass *Lolium perenne* were performed in accordance with ASTM guide E1963-98 "Standard Guide for Conducting Terrestrial Plant Toxicity Tests" (ASTM 1998), and ASTM guide E1598-94 "Standard Practice for Conducting Early Seedling Growth Tests" (ASTM 1994). Testing provided data concerning the availability and toxicity of contaminants present in the soil (USEPA 1989). Soil samples that were found to be acutely toxic were not included in the tissue accumulation endpoint. *L. perenne* is a widely distributed monocot grass, that is commonly used as a surrogate laboratory test species.

3.3 Sampling Equipment Decontamination

The following sampling equipment decontamination procedure was employed prior and subsequent to sampling at each location per ERT/REAC SOP #2006, *Sampling Equipment Decontamination*:

1 physical removal
2 nonphosphate detergent wash (e.g., Liquinox)
3 potable water rinse
4 distilled/deionized water rinse
5 10 percent nitric acid rinse
6 distilled/deionized water rinse
7 acetone rinse
8 distilled/deionized water rinse
9 air dry

3.4 Standard Operating Procedures

Sample Documentation was completed per the following REAC SOPs:

- REAC SOP #2002, *Sample Documentation*
- REAC SOP #4005, *Chain of Custody Procedures*

Sample Packaging and Shipment was completed per the following REAC SOP:

- REAC SOP #2004, *Sample Packaging and Shipment*

Sampling Techniques and field activities were conducted per the following ERT/REAC SOPs:

- ERT/REAC SOP #2012, *Soil Sampling*
- ERT/REAC SOP #2013, *Surface Water Sampling*
- ERT/REAC SOP #2016, *Sediment Sampling*

3.5 Waste Disposal

Investigation derived waste (e.g., personal protective equipment) was disposed of in accordance with all state and federal regulations. All samples were maintained per the work plan.

4.0 RESULTS

Most sample matrices collected were analyzed for target analyte list (TAL) metals, Pesticides/PCBs, VOCs and base, neutral, and acid extractables (BNAs). Some of the components of the BNA analysis included HMWPAHs and LMWPAHs and SVOCs, which were identified in the SLERA as COPCs. In addition, certain groups of compounds (e.g., chlordanes, aroclors, HMWPAHs, etc.) are discussed as the sum of the concentration detected. In instances where an estimated value of an analyte is included in the total sum of a particular group of compounds, that group was considered estimated (an analyte which was detected, but was below the MDL was considered to be estimated).

Worm tissue from bioaccumulation testing was analyzed for PCBs and TAL metals. Worm tissue data must also be viewed with caution, because the tissue samples which had been frozen immediately after toxicity testing were inadvertently allowed to thaw, and were held at room temperature for several days prior to analysis. The samples were submitted for analysis after REAC data validators and the U.S. EPA ERT WAM agreed that PCBs and metals would not be significantly impacted (i.e., they would not have degraded) by the tissues not being frozen.

4.1 Results of the Chemical Analysis of Surface Water

Surface water samples collected from site ponds were analyzed for TAL metals, Pesticides/PCBs, VOCs, and BNAs. In addition, water quality parameters (temperature, DO, pH, conductivity, and turbidity) were measured at each location. The final validated analytical results can be found in Appendix B.

4.1.1 Target Analyte List Metals

Surface water collected from site ponds was analyzed for TAL metals (Table 2). Location LCC-5 & LCC-6 had the highest concentrations of metals.

4.1.2 Pesticides/Polychlorinated Biphenyls

Surface water collected from site ponds was analyzed for Pesticides/PCBs (Table 3). Aroclors 1242 and 1260 were detected at Location LCC-5 & LCC-6, but no other Pesticides/PCBs were measured above the MDL.

4.1.3 Volatile Organic Compounds

Surface water collected from site ponds was analyzed for VOCs (Table 4). Location LCC-5 & LCC-6 had the most VOCs detected (10 total). Concentrations were relatively low throughout the study area.

4.1.4 Base, Neutral, and Acid Extractables

Surface water collected from site ponds was analyzed for BNAs (Table 5). Location LCC-5 & LCC-6 had the most BNA compounds detected (4 total). Concentrations were relatively low throughout the study area.

4.1.5 *In Situ* Water Quality

Water quality parameters were measured at each sampling location (Table 6). Dissolved oxygen was low (< 3 milligrams per liter [mg/L]) at LCC-1, LCC-5, and LCC-6 and was not greater than 7 mg/L at any sampling location. There was a thick cover of ice (≈ 8 inches) on each of the ponds, and water temperatures were low (0–1 °C). There was a strong sulfur odor associated with the water from the Southeast Pond (Locations LCC-5 and LCC-6).

4.2 Results of the Chemical Analysis of Sediment

Sediment collected from site ponds was analyzed for TAL metals, Pesticides/PCBs, VOCs, and BNAs (which included HMWPAHs and LMWPAHs). The final validated analytical results can be found in Appendix B.

4.2.1 Target Analyte List Metals

Sediment collected from site ponds was analyzed for TAL metals (Table 7). Location LCC-7 had the highest concentrations of metals detected.

4.2.2 Pesticides/Polychlorinated Biphenyls

Sediment collected from site ponds was analyzed for Pesticides/PCBs (Table 8). Location LCC-7 had the most pesticides detected (10 total). Location LCC-5 had the highest total concentrations of PCBs detected. In general, Pesticides/PCBs were either below the MDL or were at relatively low concentrations.

4.2.3 Volatile Organic Compounds

Sediment collected from site ponds was analyzed for VOCs (Table 9). Location LCC-7 had the most VOCs detected (23 total) at typically the greatest concentrations. In general, the concentrations of VOCs detected throughout the study area were relatively low.

4.2.4 Base, Neutral, and Acid Extractables

Sediment collected from site ponds was analyzed for BNAs (Table 10). Location LCC-7 had the most BNAs detected (13 total).

4.3 Results of the Chemical Analysis of Soil

Soil collected from site was analyzed for TAL metals, Pesticides/PCBs, VOCs, and BNAs (which included HMWPAHs and LMWPAHs). The final validated analytical results can be found in Appendix B.

4.3.1 Target Analyte List Metals

Soil collected from the site was analyzed for TAL Metals (Table 11). Location SOIL-6 had the highest concentrations of As (14 mg/kg), Pb (2900 mg/kg), and Hg (3.0 mg/kg).

4.3.2 Pesticides/Polychlorinated Biphenyls

Soil collected from the site was analyzed for pesticides/PCBs (Table 12). Location SOIL-1 had the most pesticides/PCBs detected (9 total). Concentrations of pesticides/PCBs detected throughout the study area were relatively low, with the exception of 13,000 µg/kg aroclor 1242 at Location SOIL-6.

4.3.3 Volatile Organic Compounds

Soil collected from the site was analyzed for VOCs (Table 13). For those VOCs detected, concentrations throughout the study area were relatively low.

4.3.4 Base, Neutral, and Acid Extractables

Soil collected from the site was analyzed for BNAs (Table 14). Concentrations of BNAs detected throughout the study area were relatively low.

4.4 Results of the Chemical Analysis of Fish, Crayfish, and Earthworm Tissue

Fish and crayfish were collected from site ponds for TAL metals, Pesticides/PCBs, and BNAs (which included HMWPAHs and LMWPAHs). As stated above, earthworms from bioaccumulation tests were only analyzed for TAL metals and PCBs because the tissue samples were inadvertently thawed and maintained at room temperature for several days prior to analysis. Though PCB and metals analyses were thought to be largely unaffected, the analyzed concentrations are considered to be estimates. The final analytical results are in Appendix B. Because of the observed toxic effects of soils from all locations on *L. perenne*, contaminants were not measured in ryegrass tissue.

4.4.1 Target Analyte List Metals

4.4.1.1 Fish Tissue

Fish collected from site ponds were analyzed for TAL Metals (Table 15). Metals concentrations appeared to be consistent between samples.

4.4.1.2 Crayfish Tissue

Crayfish collected from site ponds were analyzed for TAL Metals (Table 15). Concentrations of most metals in crayfish tissue were typically greater than those measured in fish tissue. Tissue metals concentrations appeared to be consistent between crayfish samples.

4.4.1.3 Earthworm Tissue

Earthworms used in the bioaccumulation tests were analyzed for TAL Metals (Table 16). In general, concentrations of metals detected were consistent between samples.

4.4.2 Pesticides/Polychlorinated Biphenyls

4.4.2.1 Fish Tissue

Fish collected from site ponds were analyzed for Pesticides/PCBs (Table 17). Fish from both locations had measurable concentrations of DDT breakdown products, and Aroclor 1254 and 1260. Concentrations were similar between locations.

4.4.2.2 Crayfish Tissue

Crayfish collected from site ponds were analyzed for pesticides/PCBs (Table 17). No pesticides were measured above the MDL. Aroclor 1254 and 1260 were detected in crayfish from LHL1 Crayfish.

4.4.2.3 Earthworm Tissue

Tissue from earthworms used in bioaccumulation tests was analyzed for PCBs (Table 18). Earthworms exposed to soil from Location SOIL-6 had the greatest concentrations of PCBs.

4.4.3 Base, Neutral, and Acid Extractables

4.4.3.1 Fish Tissue

Fish collected from site ponds were analyzed for BNAs (Table 19). The only BNAs measured above the MDL in fish tissue were phthalates, which are typically associated with laboratory contamination (plasticizers) and were also detected in the laboratory blanks.

4.4.3.2 Crayfish Tissue

Crayfish collected from site ponds were analyzed for BNAs (Table 19). The only BNAs measured above the MDL in crayfish tissue were phthalates, which are typically associated with laboratory contamination (plasticizers) and were also detected in the laboratory blanks.

4.5 Results of the Toxicity Evaluations

4.5.1 Amphipod (*Hyalella azteca*)

The results of the amphipod toxicity test are summarized in Table 20, and the complete report may be found in Appendix C. Survival of *H. azteca* exposed to sediments from Locations LCC-2, LCC-5, and LCC-6 was significantly reduced compared with those exposed to laboratory control sediment. For Locations LCC-1, LCC-3, and LCC-7 survival was not affected, and the mean final weight of the test organisms was greater than that of the laboratory control.

4.5.2 Fathead Minnow (*Pimephales promelas*)

The results for the fathead minnow toxicity test are summarized in Table 21, and the complete report may be found in Appendix D. Survival of *P. promelas* exposed to site waters from locations LCC-5 & LCC-6 and LCC-3 & LCC-4 was significantly lower than those exposed to the laboratory control water. For Location LCC1 & LCC2, where survival was not affected, the mean final weight of the exposed minnows was not significantly different from that of the laboratory control.

4.5.3 Earthworm (*Eisenia foetida*)

The results for the earthworm bioaccumulation and toxicity test using *E. foetida* are summarized in Table 22. The complete report may be found in Appendix E. The initial 28 day bioaccumulation test was considered to be invalid due to poor survival in the laboratory control. The testing laboratory felt this was due to poor organism health. Therefore, a 14 day toxicity test was run, using *E. foetida* from a different supplier. The results of the 14 day test showed a significant difference in survival between the laboratory control (98%) and Soil-3 (78%). There were no significant differences between the control and the other locations. Correlation analysis was conducted on *E. foetida* toxicity parameters (survival and weight loss), and soil COPCs for locations SOIL-1, SOIL-2, SOIL-3, SOIL-4, SOIL-5, and SOIL-6. COPCs included in the analysis were TAL metals, pesticides, PCBs, VOCs, and BNAs. Methylene chloride was positively correlated with *E. foetida* weight loss (r=0.89).

4.5.4 Ryegrass (*Lolium perenne*)

The results of *L. perenne* testing are summarized in Table 23. The complete report may be found in Appendix F. Ryegrass survival was negatively affected in Soil-3. One or more sublethal parameters (e.g., shoot length, shoot weight, root weight) were negatively affected in all soil samples. Due to the observed toxicity associated with all soil samples, COPCs were not measured in ryegrass tissue. Correlation analysis was conducted on ryegrass toxicity parameters (survival, average shoot length, average shoot weight, average root weight) and soil COPCs for Locations SOIL-1, SOIL-2, SOIL-3, SOIL-4, SOIL-5, and SOIL-6. Significant positive correlations with shoot weight, shoot length, and root weight were found for Sb, Pb, and Zn. Correlation coefficients (r) ranged from 0.89 to 0.96. Magnesium resulted in statistically significant correlations with all three toxicity parameters as well, however, the data were negatively correlated with r ranging from -0.84 to -0.95. Barium was negatively correlated with ryegrass survival with r=-0.86. Calcium, Mn, and V were negatively correlated with ryegrass shoot weight and shoot length, with r ranging from -0.91 to -0.95. Of the VOCs, only 1,1-dichloroethane was negatively correlated with ryegrass survival (r=-0.83), and positively correlated with rye grass average root weight, (r=0.89). Of the BNAs, only naphthalene was negatively correlated with ryegrass survival (r=-0.84).

4.6 Benthic Macroinvertebrate Community

The following discussion is a brief summation of the benthic macroinvertebrate survey performed by Ecology and Environment during an earlier assessment of the LCC site (Ecology and

Environment 1999), consult the report for more details. Based on the tolerance values (TVs) and BFIs, pond LHL1 and the two most southern samples from Indian Ridge Marsh had the lowest number of organisms, and the lowest benthic species diversity. Only four organisms were found in samples collected from pond LHL1. Although pond LHL2 contained a higher number of organisms per sampling effort than pond LHL1, only two taxa were found in Pond LHL2. The southeast pond contained species diversity comparable to the Indian Ridge Marsh, with two samples having TV values of 6. The E&E report concluded that the macroinvertebrates with TVs lower than 5 may not have been able to survive in the sediment and water conditions existing in the ponds at that time. The authors also suggested that the fact that only more tolerant species existed on the LCC site confirmed the ecological impact that was suggested by the screening level exceedances.

5.0 BENCHMARK COMPARISONS OF SURFACE WATER, SOIL, AND SEDIMENT COPCs

Concentrations of COPCs detected in LCC site surface water, soil, and sediment were compared to screening level toxicity benchmarks published by U.S. EPA Region III Biological Technical Assistance Group (BTAG) (Davis 1995). Surface water analytical results were also compared to U.S. EPA Water Quality Criteria (WQC) (U.S. EPA 1999).

5.1 Surface Water

Location LCC-5 & LCC-6 had the highest concentrations of metals of all of the samples collected. Concentrations of Cr, Cu, Fe, Pb, V, and Zn in water from Location LCC-5 & LCC-6 and Pb at LCC-1 & LCC-2 exceeded U.S. EPA Region III BTAG Screening Levels (SL) for freshwater fauna (Davis 1995) (Table 2). Concentrations of Al and Pb exceeded U.S. EPA WQC at all locations. Concentrations of Cr and Zn were greater than WQC at Location LCC-5 & LCC-6. The MDLs for Cd, Hg, and arsenic (As) were greater than the BTAG SL values. The MDLs for Cd and Cu were greater than the WQC values.

Aroclors 1242 and 1260 exceeded the BTAG SL at Location LCC-5 & LCC-6 (Table 3).

Concentrations of BNAs in surface water did not exceed BTAG SLs (for those compounds for which SLs were available) (Table 5).

5.2 Sediment

Location LCC-7 had the highest concentrations of metals detected, except for Al (Table 7). BTAG SLs were exceeded most frequently at Location LCC-7 (As, Cd, Cr, Cu, Pb, Hg, Ni, and Zn) although all sampling locations exceeded the SLs for at least two metals.

Location LCC-5 had the highest concentrations of PCBs detected (Table 8). BTAG SLs were exceeded for dichloro diphenyl dichloroethane (DDD; 3 locations), DDE (dichloro diphenyl ethane; all locations), and PCBs (all locations). However, the exceedances at LCC-1, LCC-2, and LCC-3 for PCBs should be viewed with caution, as the MDL was greater than the SL value.

Concentrations of BNAs in site sediments were often greater than the BTAG SLs, however, the MDLs were generally greater than the SL value (Table 10).

5.3 Soil

Concentrations of Al and Cr exceeded BTAG SL values for flora at all locations (Table 11). Lead and Ag also exceeded BTAG SL values for flora at Location SOIL-6. Concentrations of Cr, Fe, and Pb exceeded the BTAG SL values for fauna at all locations.

Concentrations of aldrin, DDD, DDE, g-chlordane, and PCBs exceeded BTAG SL values for flora (and fauna when available) at SOIL-6 (Table 12). Locations SOIL-1, SOIL-2, SOIL-3, and SOIL-5 each had SL exceedences for flora.

Although concentrations of BNAs in site soils frequently exceeded BTAG SL values, the MDLs were almost always greater than the SL value (Table 14).

6.0 FOOD CHAIN MODELS

6.1 Methods

The hazard quotient (HQ) method (Barnthouse *et al.* 1986; USEPA 1997) was employed in this assessment. The HQ method compares exposure concentrations to toxicity reference values (TRVs) based on ecological endpoints such as mortality, reproductive failure, or reduced growth. These sublethal toxicity values are derived from the literature, and are intended to represent a lower dose over a longer duration of exposure. Such exposure would result in subtle effects, manifested at the population level over the long term. Both no observable adverse effect level (NOAEL) and lowest observable adverse effect level (LOAEL) values were used to determine HQs.

The comparison is expressed as a ratio of potential intake values to population effect levels:

$$\text{Hazard Quotient} = \frac{\text{Exposure Concentration (Maximum)}}{\text{Chronic Effect Level (e.g., NOAEL or LOAEL)}}$$

In this assessment, food chain models were used to determine whether a potential exists for exposure at a level that presents a risk to organisms inhabiting the site. Additionally, the results of the models and the bioaccumulation data were used to determine whether there is a plausible transport mechanism to off-site areas that could pose a risk.

The effect level values (NOAEL and LOAEL) for each COPC were based on studies published in the literature. Exposure concentrations were estimated by employing a food chain model for each receptor species (e.g., the black crowned night heron) associated with an assessment endpoint (e.g., viability of aquatic feeding birds). In these food chain models, ingestion rates of each COPC for each receptor species were determined based on measured concentrations of each contaminant in food items collected at the site. Concentrations of COPCs in soil, sediment, and water were not included in the food chain model calculations. The exposure concentrations and toxicity values were entered into the HQ equation, and a HQ was calculated. If the HQ was greater than 1.0, based on a chronic NOAEL, it was concluded that there was a chronic risk from that contaminant to the ecological receptor in question. If the hazard quotient was greater than 1.0, based on a chronic LOAEL for a particular contaminant, it was concluded that there was the potential to produce an actual adverse effect on survival, reproduction, or growth of the ecological receptor in question.

Receptor species from different trophic levels were used for food chain accumulation modeling. Organisms which are likely to be exposed to contaminants because of specific behaviors, patterns of habitat use, or feeding habits were selected for evaluation in this assessment. The availability of appropriate toxicity information on which risk calculations were based was also an important consideration. The surrogate receptor species selected for this assessment included the yellow-headed black bird, mallard, black crowned night heron, raccoon, and shrew.

One exposure scenario was evaluated for each receptor species. In general, the model used conservative life history parameters, and maximum concentrations of contaminants in one food item. In some instances, additional models were run using maximum COPC concentrations in multiple food items. Life history parameters from published literature were used in the food chain models. Conservative life history parameters included the lowest published adult body weight and the highest published ingestion rates for food. The following were calculated:

I. HQ for an insectivorous bird (yellow headed blackbird) using conservative life history parameters, conservative contaminant concentrations, and one food item (earthworms).

II. HQ for an omnivorous waterfowl (mallard duck) using conservative life history parameters, conservative contaminant concentrations, and two food items (fish and earthworms).

III. HQ for a piscivorous bird (black-crowned night heron) using conservative life history parameters, conservative contaminant concentrations, and one food item (fish).

IV. HQ for a piscivorous bird (black-crowned night heron) using conservative life history parameters, conservative contaminant concentrations, and one food item (earthworms).

V. HQ for a piscivorous bird (black-crowned night heron) using conservative life history parameters, conservative contaminant concentrations, and two food items (fish and earthworms).

VI. HQ for an omnivorous mammal (raccoon) using conservative life history parameters, conservative contaminant concentrations, and three food items (fish, crayfish, and earthworms).

VII. HQ for a carnivorous mammal (short-tailed shrew) using conservative life history parameters, conservative contaminant concentrations, and one food item (earthworms).

Model results may be biased. Samples were not collected from a reference area, and although the sampling design did not attempt to establish a contamination gradient, food items (fish and crayfish) were collected only from the "cleaner" part of the contaminated areas. Attempts were made to collect food items from the more contaminated areas of the site, but the efforts were not successful (no fish or crayfish were present in the more heavily contaminated ponds). Acute toxicity to earthworms occurred in soils from the more contaminated areas of the site, surviving organisms that had been exposed to toxic soils were not considered appropriate for tissue analyses. Therefore, no tissue data was available for the most contaminated areas of the site.

This assessment utilized simplifying assumptions in the food chain models, since it is difficult to mimic a complete diet. According to food chain dynamics, maximum stability results when a large

number of species eat a restricted diet, or when a smaller number of species eats a widely varied diet. The seasonal availability of prey also results in a prey specialization by the consumer. Given these factors and the conservative approach used in the food chain models, piscivorous and insectivorous receptor species were assumed to only consume a single food item at the LCC site.

The following sections summarize the model calculated risk for each receptor, documenting the environmental contamination levels that exceed the threshold for adverse effects to the assessment endpoints (U.S. EPA 1997). The boundary for the adverse effects threshold was the NOAEL-based HQ value.

6.2 Results of Risk Calculations

The results of the food chain exposure models are summarized in Table 24. Input parameters and calculations for the models may be found in Appendix H.

Total PCBs: The primary model calculated risk from the LCC site was from PCBs. There was model calculated risk to all receptor communities. NOAEL-based HQs ranged from 1.01 (black crowned night heron eating fish) to 148.76 (yellow-headed blackbird eating earthworms). Both the NOAEL and LOAEL-based HQs were greater than 1.0 for the yellow headed blackbird, the black-crowned night heron (eating earthworms), the raccoon, and the short-tailed shrew.

Total BNAs: There was model calculated risk to the omnivorous mammal community from total BNAs, as the NOAEL-based HQ was greater than 1.0.

Aluminum: There was model calculated risk to the insectivorous bird community from Al, as both the NOAEL and LOAEL-based HQs were greater than 1.0. There was also model calculated risk to the carnivorous mammal community from Al, as the NOAEL-based HQ was greater than 1.0.

Arsenic: There was model calculated risk to the carnivorous mammal community from As, as the NOAEL-based HQ was greater than 1.0.

Antimony: TRVs for Sb were not available for birds, therefore, no HQs were calculated. There was model calculated risk to the both the carnivorous and omnivorous mammal communities. Both the NOAEL and LOAEL-based HQs were greater than 1.0 for the carnivorous mammal community, while only the NOAEL-based HQ was greater than 1.0 for the omnivorous mammal community.

Barium: There was model calculated risk to the both the carnivorous and omnivorous mammal communities from Ba. Both the NOAEL and LOAEL-based HQs were greater than 1.0 for the carnivorous mammal community, while only the NOAEL-based HQ was greater than 1.0 for the omnivorous mammal community.

Cadmium: There was model calculated risk to the insectivorous bird and carnivorous mammal communities from Cd. The NOAEL-based HQ was greater than 1.0 for both groups.

Chromium: There was model calculated risk to insectivorous birds from Cr, where both the NOAEL and LOAEL-based HQs were greater than 1.0. There was model calculated risk to the black-crowned night heron (eating earthworms), as the NOAEL-based HQ was greater than 1.0.

Copper: There was model calculated risk to the insectivorous bird community from Cu, as the NOAEL-based HQ was greater than 1.0.

Iron: There was model calculated risk to the carnivorous mammal community from Fe, as the NOAEL-based HQ was greater than 1.0.

Lead: There was model calculated risk to the insectivorous bird community from Pb, as both the NOAEL and LOAEL-based HQs were greater than 1.0. There was model calculated risk to the black-crowned night heron eating a diet of 100% earthworms, and eating a diet of 50% fish and 50% earthworms. The NOAEL-based HQ was greater than 1.0. There was model calculated risk to the carnivorous mammal community, as the NOAEL-based HQ was greater than 1.0.

Mercury: There was model calculated risk to both the insectivorous bird and mammal communities from Hg. Both the NOAEL and LOAEL-based HQs were greater than 1.0 for both receptor species.

Selenium: After PCBs, Se posed the highest model calculated risk to communities inhabiting the LCC Site. There was model calculated risk to all receptors except the omnivorous mammal community from Se. The insectivorous bird and carnivorous mammal communities had both NOAEL and LOAEL-based HQs greater than 1.0, while the remaining receptors had only NOAEL-based HQs greater than 1.0.

Sodium: There was model calculated risk to the insectivorous bird community from Na, where both the NOAEL and LOAEL-based HQs were greater than 1.0. There was also risk to the carnivorous mammal community, as the NOAEL-based HQ was greater than 1.0.

Vanadium: There was model calculated risk to the carnivorous mammal community from V, as the NOAEL-based HQ was greater than 1.0.

Zinc: There was model calculated risk to the insectivorous bird community from Zn, where both the NOAEL and LOAEL-based HQs were greater than 1.0. There was also risk to the carnivorous mammal community, as the NOAEL-based HQ was greater than 1.0.

7.0 EVALUATION OF ASSESSMENT ENDPOINTS

Twelve assessment endpoints and their associated testable hypotheses and measurement endpoints were identified in the work plan for the LCC Site. Each of the assessment endpoints is described above, in Section 2, and are evaluated below.

7.1 Assessment Endpoint #1: Viability of Wetland Structure and Functioning

Based on the results of analyses supporting assessment endpoints 2, 3, 4, 5, 6, 7, 8, 9, and 10, the viability of LCC Site wetlands is at risk (see subsequent discussions for details).

7.2 Assessment Endpoint #2: Fish Recruitment and Nursery Functioning

There was risk to fish populations from site pond water. In laboratory toxicity tests, surface water from Location LCC-3 & LCC-4, and Location LCC-5 & LCC-6 significantly reduced the survival of larval fathead minnows (*P. promelas*).

Concentrations of six metals and PCBs in water from Location LCC-5 & LCC-6 exceeded U.S. EPA Region III BTAG SL values for freshwater fauna.

7.3 Assessment Endpoint #3: Viable and Functioning Benthic Macroinvertebrate Community

The benthic macroivertebrate community was impacted at the LCC Site. Macroinvertebrate samples from 20 wetland locations were sorted, identified, and enumerated by E&E in 1998 (Ecology and Environment 1999). Their results revealed assemblages typically associated with poor water quality conditions. There was low species diversity and richness, the benthic communities were dominated by species with high TVs, and the communities had high FBIs.

In laboratory toxicity tests, sediment from Locations LCC-2, LCC-5, and LCC-6 significantly reduced the survival of freshwater amphipods (*H. azteca*).

Region III BTAG SL values for fauna were often exceeded for metals (up to 8 analytes at Location LCC-7), DDT breakdown products, and PCBs.

7.4 Assessment Endpoint #4: Viable and Functioning Amphibian Populations

Survival of the surrogate species, *H. azteca,* exposed to sediment from Locations LCC-2, LCC-5, and LCC-6 was significantly reduced, as compared with the lab control. Therefore, certain life stages of the amphibian community which spend time in or near the sediment, may also be at risk.

7.5 Assessment Endpoint #5: Viability and Recruitment of Insectivorous Birds

Based on the results of a food chain accumulation model for the yellow headed blackbird (*Xanthocephalus xanthocephalus*), insectivorous birds are at risk from PCBs, Al, Cd, Cr, Cu, Pb, Hg, Se, Na, and Zn.

7.6 Assessment Endpoint #6: Viability and Recruitment of Omnivorous Waterfowl

Based on the results of a food chain accumulation model for the mallard duck (*Anas platyrhynchos*), omnivorous waterfowl are at risk from PCBs and Se.

7.7 Assessment Endpoint #7: Viability and Recruitment of Herbivorous Birds

Because of the acute and chronic toxic effects observed in the ryegrass (*L. perenne*) toxicity test, and because toxic effects were associated with all soil samples collected at the LCC site, investigators believed that tissue analysis for COPC concentrations was not appropriate. Furthermore, due to the winter sampling event, plant tissues could not be collected *in situ*. Therefore, there was insufficient data available to generate food chain exposure models for herbivorous birds.

7.8 Assessment Endpoint #8: Viability of Piscivorous Birds

Based on the results of a food chain accumulation model for the black-crowned night heron (*Nycticorax nycticorax*), the piscivorous avian community is at risk from PCBs and Se, regardless of the dietary input parameters. The piscivorous avian community is also at risk from Cr and Pb when eating earthworms, and from Pb when eating earthworms and fish.

7.9 Assessment Endpoint #9: Viability of Omnivorous Mammals

Based on the results of a food chain accumulation model for the raccoon (*Procyon lotor*), the omnivorous mammal community is at risk from PCBs, BNAs, Sb, and Ba.

7.10 Assessment Endpoint #10: Viability of Carnivorous Mammals

Based on the results of a food chain accumulation model for the shrew (*Blarina brevicauda*), the carnivorous mammal community is at risk from PCBs, Al, As, Sb, Ba, Cd, Fe, Pb, Hg, Se, Na, V, and Zn.

7.11 Assessment Endpoint #11: Functioning of the Soil Macroinvertebrate Community

The soil macroinvertebrate community at the LCC site is at risk. In laboratory toxicity tests, *E. foetida* survival was significantly lower at SOIL-3 than at other site locations or in the laboratory control. Concentrations of Cr, Fe, and Pb exceeded the Region III BTAG SL values for fauna at all locations. BNAs often exceeded the SL values, especially at Location SOIL-6.

7.12 Assessment Endpoint #12: Viability of the Plant Community

The plant community at the LCC Site is at risk. In laboratory toxicity tests, survival of the ryegrass, *L. perenne*, was significantly reduced in plants exposed to soil from Location Soil-3. One or more sublethal parameters negatively affected plant viability in all site soil samples. Concentrations of Al and Cr exceeded Region III SL values for flora at all locations. Lead and Ag also exceeded SL values for flora at Location SOIL-6. Concentrations of aldrin, DDD, DDE, g-chlordane, and PCBs exceeded Region III SL values for flora at SOIL-6. Locations SOIL-1, SOIL-2, SOIL-3, and SOIL-5 also exceeded the Region III BTAG SL for one or more analytes.

8.0 ASSUMPTIONS AND SOURCES OF UNCERTAINTY

8.1 Assumptions

A contaminant concentration was considered to exceed the threshold, and demonstrate model calculated risk to the given receptor if the NOAEL-based HQ was greater than 1.0.

If neither the NOAEL- nor the LOAEL-based HQs was greater than 1.0, it was concluded that there is no model calculated risk to the given receptor.

No adjustments were made to the receptor life history parameters to account for regional factors. Only information for adult organisms was used, with no gender differentiation. In instances where more than one data set was combined to derive a mean, each data set was assumed to be equally weighted. Where a data set was broken into males and females, those numbers were equally weighted and averaged before the data set was combined with another data set.

An area use factor (AUF) of 1 was assumed for all species using the site for feeding. Therefore, it was assumed that the receptors obtain 100% of their food from each location evaluated using the food chain model.

Contaminants in food items were assumed to exhibit 100% absorption efficiency and were assumed not to be metabolized and/or excreted during the life of the receptor.

COPC concentrations accumulated by earthworm and fish tissues were assumed to be at steady state.

Dietary ingestion information was obtained from the literature for the receptor species. However, simplifications of complex diets were performed for the receptors to utilize site specific tissue, sediment, and water data. In some cases, ingestion rates were based on information for a similar species or calculated from an allometric equation. It was assumed that these estimated ingestion rates were representative of the true ingestion rates for the receptor species in question.

A literature search was conducted to determine the chronic toxicity of the contaminants of concern when ingested by the indicator species. If no toxicity values could be located for the receptor species, values reported for a closely related species were used. All studies were critically reviewed to determine whether study design and methods were appropriate. When values for chronic toxicity were not available, LD_{50} (median lethal dose) values were used. For purposes of this risk assessment, a factor of 10 was used to convert the reported LD_{50} to a LOAEL. A factor of 10 was used to convert a reported LOAEL to a NOAEL. If several toxicity values were reported for a receptor species, the most conservative value was used in the risk calculations regardless of toxic mechanism. Toxicity values obtained from long-term feeding studies were used in preference to those obtained from single dose oral studies. No other safety factors were incorporated into this risk assessment.

If the only toxicity datum available in the literature was a NOAEL, a factor of 10 was used to convert it to a LOAEL.

In some cases, contaminant doses were reported as part per million contaminant in diet. These were converted to daily intake in milligrams per kilogram body weight per day (mg/kg BW/day), by using the formula:

Daily Intake (mg/kg/day) = Contaminant Dose (mg/kg diet) x Ingestion Rate (kg/day) x 1/Body Weight (kg)

Models were formulated using only the results for the COPC analytes. The results for individual analytes were summed for BNAs, PCBs, LMWPAHs, and HMWPAHs. Metals were evaluated individually, and therefore required no sum. To determine TRVs for these contaminant classes, the lowest appropriate toxicity value was chosen to represent the toxicity of the entire class of that type of contaminant. In doing so, it was assumed that the total concentration of each class of contaminant consisted entirely of the most toxic member of that class.

Body weight, food consumption, water consumption, and incidental sediment ingestion values reported in the U.S. EPA Handbook of Wildlife Exposures (U.S. EPA 1993) were assumed to be valid, and equally weighted.

8.2 Sources of Uncertainty

This risk assessment evaluates exposure to contaminants through food ingestion. There are factors inherent in the risk assessment process which contribute to uncertainty and need to be considered

when interpreting results. Major sources of uncertainty include natural variability, error, and insufficient knowledge. Natural variability is an inherent characteristic of ecological receptors, their stressors, and their combined behavior in the environment. Biotic and abiotic parameters in these systems may vary to such a degree that the exposure of similar ecological receptors within the same system may differ temporally and spatially. Factors that contribute to temporal and spatial variability may be differences in an individual organism's behavior (within the same species), changes in the weather or ambient temperature, unanticipated interference from other stressors, differences between microenvironments, and numerous other factors.

A major source of uncertainty arises from the use of toxicity values reported in the literature which are derived from single-species, single-contaminant laboratory studies. Prediction of ecosystem effects from laboratory studies is difficult. Laboratory studies cannot take into account the effects of environmental factors which may add to the effects of contaminant stress. NOAELs were generally selected from studies using single contaminant exposure scenarios. Species utilizing the LCC site and the surrounding wetland are exposed to a variety of contaminants.

When COPC concentrations in water, sediment, and biota were calculated to evaluate their potential risk, conservative assumptions were made to account for "non-detect" results. For example, when an inorganic COPC was not detected in a particular sample, it was assumed that the actual concentration of that COPC in that sample was one-half the detection limit. Similarly, if an organic COPC was not detected in a sample, it was assumed that the actual concentration of that COPC in that sample was one-tenth the detection limit. These assumptions were also made when chemicals belonging to a common class of chemicals (e.g., PCBs) were summed to get a "total" concentration, as described previously. For example, if PCB-1254 was detected in a sample, but PCB-1248 was not, the "total PCB" concentration of that sample was calculated by summing the PCB-1254 concentration detected in the sample plus one-tenth of the detection limit of PCB-1248 for that sample. Therefore, even if a particular contaminant of concern was not detected in any of the samples for a particular matrix, data for that contaminant in that matrix were still evaluated in this risk assessment by assuming that the contaminant is actually present in each sample of that matrix at one-tenth (for organics) or one-half (for inorganics) of the detection limit for that particular contaminant.

In cases where a toxicity value has been converted by a factor of 10, the uncertainty associated with the absence of a directly relevant literature value was compounded by the uncertainty associated with a subjective mathematical adjustment.

Point estimates of exposure such as NOAELs, LOAELs, LD_{50}s, and mathematical means that are presented in the literature also have inherent variability, which is incorporated into the risk assessment. Additionally, because these values are statistically determined, they do not represent absolute thresholds; they are reflective of the experimental design. A reported LOAEL may not represent the lowest toxicity threshold for a species simply because lower concentrations were not tested in a study.

In addition, uncertainty associated with variability is introduced from the use of literature values for food ingestion rates, dietary compositions, and body weights. These values reported in the literature are from studies that may have been conducted at a time of year or in a location that does not necessarily give an accurate representation of the life histories of the receptor species in the LCC site area.

This risk assessment did not examine the contribution of dermal absorption or inhalation exposure as part of the exposure pathway. In contrast to the use of conservative assumptions, the error introduced into this risk assessment by the omission of these routes of exposure may be on the side of a less protective outcome. The relative contribution of this error to alter the outcome of the risk assessment is unknown at this time.

Some of the TRVs utilized for determination of risk (water and sediment quality benchmarks) in this assessment are below the MDLs for their respective contaminants. This is a function of the sample matrix, and the analytical methodologies utilized. Future studies should ensure that the MDLs are lower than the benchmark values.

The fish that were analyzed for tissue concentrations of COPCs were caught in fish traps, using cat food as bait. None of the fish were depurated prior to whole body tissue analysis. Therefore, there is uncertainty associated with the potential for COPCs to have been present in the cat food that was entrained in the fish's digestive tract.

Error can be introduced by use of invalid assumptions in the conceptual model. Conservative assumptions were made in light of the uncertainty associated with the risk assessment process. This was done to minimize the possibility of concluding that no risk is present when a threat actually does exist (e.g., elimination of false negatives). Whenever possible, risk calculations were based on conservative values. For example, NOAELs used to calculate HQs were the lowest values found in the literature, regardless of toxic mechanism.

9.0 CONCLUSIONS

There is risk to the aquatic and terrestrial communities living on or near the LCC Site. Site pond water, sediment, and soil caused significant toxic effects to organisms exposed in laboratory tests. The benthic community was in poor health in a 1998 survey. Additionally, the results of the food chain exposure models calculated that there is risk to receptor communities. These models focused on risks to organisms using the site as a food source. Therefore, the HQs calculated using these models used only contaminant exposure from food sources. Contaminant concentrations in water, sediment, and soil were excluded from these models. The risk to receptor organisms living on the site is likely underestimated, and there is likely risk to off-site communities preying on organisms that use the site.

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Tables

Table 4. Volatile Organic Compounds Detected in Water
Lake Calumet Cluster Site
Chicago, Illinois
November 2001

	Location				Regions III BTAG SL	U.S. EPA
	LCC-1 & LCC-2	LCC-3 & LCC-4	LCC-5 & LCC-6	Lab Control **	Freshwater Fauna	WQC-CCC
Compound	Conc. (µg/L)	Conc. (µg/L)	Conc. (µg/L)	Conc. (µg/L)	µg/L	µg/L
1,1-Dichloroethane	U (1.0)	1.9	U (1.0)	U (5.0)	NA	NA
1,2,4-Trimethylbenzene	U (1.0)	U (1.0)	4.6	U (5.0)	NA	NA
1,3,5-Trimethylbenzene	U (1.0)	U (1.0)	1.3	U (5.0)	NA	NA
Acetone	17	U (8.0)	17	400	NA	NA
Benzene	U (1.0)	U (1.0)	1.8	U (5.0)	NA	NA
Chlorobenzene	U (1.0)	U (1.0)	1.0	U (5.0)	NA	NA
cis-1,2-Dichloroethene	U (1.0)	3.1	U (1.0)	U (5.0)	NA	NA
Ethylbenzene	U (1.0)	U (1.0)	5.7	U (5.0)	NA	NA
Naphthalene	U (1.0)	U (1.0)	4.0	U (5.0)	NA	NA
o-Xylene	U (1.0)	U (1.0)	8.8	U (5.0)	NA	NA
p&m-Xylene	U (1.0)	U (1.0)	20	U (5.0)	NA	NA
Toluene	U (1.0)	U (1.0)	6.2	U (5.0)	NA	NA
Vinyl Chloride	U (1.0)	1.9	U (1.0)	U (5.0)	NA	NA

µg/L - micrograms per liter
U - not detected
J - estimated value
** - toxicity laboratory control water
U.S. EPA Region III BTAG Screening Levels (SL) for Aquatic Freshwater Fauna.
WQC-CCC = Water Quality Criteria - Criterion Continuous Concentration for Freshwater
Data collected January 2001

Table 5. Base, Neutral, and Acid Extractable Compounds Detected in Water
Lake Calumet Cluster Site
Chicago, Illinois
November 2001

	Location				Regions III BTAG SL	U.S. EPA
	LCC-1 & LCC-2	LCC-3 & LCC-4	LCC-5 & LCC-6	Lab Control **	Freshwater Fauna	WQC-CCC
Compound	Conc. (µg/L)	Conc. (µg/L)	Conc. (µg/L)	Conc. (µg/L)	µg/L	µg/L
2,4-Dimethylphenol	U (10)	U (10)	19	U (10)	2120	NA
4-Methylphenol	U (10)	U (10)	10	U (10)	NA	NA
Bis(2-Ethylhexyl)phthalate	2.9 J	U (10)	17	2.8 J	NA	NA
Naphthalene	U (10)	U (10)	3.7 J	U (10)	100	NA

µg/L - micrograms per liter
U - not detected
J - estimated value
** - toxicity laboratory control water
U.S. EPA Region III BTAG Screening Levels (SL) for Aquatic Freshwater Fauna.
WQC-CCC = Water Quality Criteria Criterion Continuous Concentration for Freshwater
Data collected January 2001

Table 1. List of Contaminants of Potential Concern
Lake Calumet Cluster Site
Chicago, Illinois
November 2001

Contaminant	Surface Soil	Subsurface Soil	Sediment	Surface Water	Ground Water
Low Molecular Weight PAHs					
Acenaphthene	X	X	X		
Acenaphthylene	X	X	X		•
Anthracene	X	X	X		X
Fluorene	X	X	X		
Naphthalene	X	X	X		X
Phenanthrene	X	X	X		X
High Molecular Weight PAHs					
Benzo(a)anthracene	X	X	X		X
Benzo(a)pyrene	X	X	X		•
Benzo(b)fluoranthene	X	X			•
Benzo(g,h,i)perylene	X	X	X		•
Benzo(k)fluoranthene	X	X	•		•
Chrysene	X	X	X		•
Dibenzo(a,h)anthracene	X	X	X		•
Fluoranthene	X	X	X		
Indeno(1,2,3-CD)pyrene	X	X			•
Pyrene	X	X	X		•
2-Methylnaphthalene	•	•	X		•
Other Semi-Volatile Compounds					
1,1-Dichloroethane			•		
1,2-Dichlorobenzene	X	X	X		
1,2-Dichloroethene				•	•
1,2,4-Trichlorobenzene		X			
1,3-Dichlorobenzene	•	•			
1,4-Dichlorobenzene	X	X			
2-Methylphenol	X	X	X		•
2-Nitrophenol					•
2-Chloronaphthalene		•			
2,4-Dimethylphenol	X	X	X		
2,6-Dinitrotoluene		•			
4-Chloroaniline			•		
4-Chloro-3-methylphenol	•				
4-Methylphenol	X	X		•	•
4-Methyl-2-pentanone		•		•	•
4-Nitroaniline			•		
Benzoic acid			X		
Benzyl alcohol			X		
bis(2-Chloroethyl)ether	•	•		•	•
bis(2-Ethylhexyl)phthalate	•	•	•		•
Butylbenzylphthalate	•	•	•		X
Carbazole	•	•	•		•
Dibenzofuran	•	•			•
Diethylphthalate	•	•			X
Dimethylphthalate	•	•		X	
Di-n-butylphthalate	•	•	•	•	•
Di-n-octylphthalate	•	•	•		X
Hexachlorobenzene	•				
Hexachlorobutadiene	•	•			
Hexachlorocyclopentadiene		•			
Isophorone	•	•	•		
N-Nitrosodiphenylamine	•	•			
Nitrobenzene		•			
Pentachlorophenol	X	X	X		
Phenol	X	X	X		X
Volatile Organic Compounds					
1,1,1-Trichloroethane		X			
1,2-Dichloroethene	•	•			
2-Butanone	•		•	•	•
2-Chloroethane					•
Acetone	•	•	•		
Benzene		X	•		
Carbon Disulfide		•	•		
Chlorobenzene		X			X
Ethylbenzene		X			
Methylene Chloride		X			X
Styrene		X			•
Tetrachloroethene	•	•			
Toluene		X	•		X
Trichloroethene	•	•		•	•
Xylenes (Total)		X			X

X = Hazard Quotient of >1.0 for the contaminant, based on U.S. EPA Region III Screening Level benchmarks (U.S. EPA 1995)
• = Contaminant present, but no benchmark value available, based on U.S. EPA 1995.
Table contructed from Table 5 in Lake Calumet Cluster Site Screening Level Risk Assessment.

Table 1 (continued). List of Contaminants of Potential Concern
Lake Calumet Cluster Site
Chicago, Illinois
November 2001

Contaminant	Surface Soil	Subsurface Soil	Sediment	Surface Water	Ground Water
Pesticides/PCB					
4,4'-DDD	X	X	X		
4,4'-DDE	X	X	X		
4,4'-DDT	X	X	X	X	X
Aroclor 1242		X	X		
Aroclor 1248	X	X			
Aroclor 1254	X	X	X		
Aroclor 1260	X		X		
alpha-BHC	*	*	*		*
alpha-Chlordane		X	*	X	X
beta-BHC	*	*			*
delta-BHC	*	*	*	*	*
Dieldrin	X	X	*	X	X
Endosulfan I	*	*			X
Endosulfan II	*	*			X
Endosulfan Sulfate	*	*		*	*
Endrin				X	X
Endrin Aldehyde	*	*		*	*
Endrin Ketone	*	*			
gamma-Chlordane	X	X	*	X	X
Heptachlor	*	*		X	X
Heptachlor Epoxide		X	*		X
Methoxychlor	X	X			
Metals					
Aluminum			*	X	X
Antimony					X
Arsenic (total)			X		
Barium	X		*		
Beryllium			*		X
Cadmium	X	X	X	X	X
Calcium			*	*	*
Chromium (total)	X	X	X	*	*
Cobalt			*		
Copper			X	X	X
Iron			*	X	X
Lead	X	X	X	X	X
Magnesium			*	*	*
Manganese			*	X	X
Mercury	X	X	X		X
Nickel			X		X
Potassium			*	*	*
Selenium	X	X	*		X
Silver	X		X	X	X
Sodium			*	*	*
Thallium			*		
Vanadium			*		
Zinc				X	X

X = Hazard Quotient of >1.0 for the contaminant, based on U.S. EPA Region III Screening Level benchmarks (U.S. EPA 1995
* = Contaminant present, but no benchmark value available, based on U.S. EPA 1995.
Table constructed from Table 5 in Lake Calumet Cluster Site Screening Level Risk Assessment.

Table 2. Target Analyte List Metals Detected in Water
Lake Calumet Cluster Site
Chicago, Illinois
November 2001

	Location				Regions III BTAG SL	U.S. EPA
	LCC-1 & LCC-2	LCC-3 & LCC-4	LCC-5 & LCC-6	Lab Control **	Freshwater Fauna	WQC-CCC
Metal	Conc. (µg/L)	Conc. (µg/L)	Conc. (µg/L)	Conc. (µg/L)	µg/L	µg/L
Aluminum	460	350	2700	U (50)	25	87
Arsenic	U (2.2)	U (2.2)	8.7	U (2.2)	874	150
Barium	32	59	160	U (5.0)	10000	NA
Calcium	46000 J	70000 J	81000 J	14000 J	NA	NA
Chromium	U (5.0)	6.3	59 J	U (5.0)	11	11
Cobalt	U (10)	U (10)	13	U (10)	35000	NA
Copper	U (10)	U (10)	21	U (10)	6.5	9
Iron	460 J	380	4600 J	U (25)	900	1000
Lead	4.6	3.2	23	U (2.2)	3.2	2.5
Magnesium	28000 J	46000 J	79000 J	12000 J	NA	NA
Manganese	130 J	82	480 J	U (5.0)	14500	NA
Nickel	U (10)	11	50	U (10)	160	52
Potassium	8100	26000	240000	2100	NA	NA
Sodium	20000 J	120000 J	1200* J	26000 J	NA	NA
Vanadium	U (10)	U (10)	19	U (10)	10	NA
Zinc	62 J	50	130 J	U (10)	110	120

* - concentration reported in milligrams per liter (mg/L)
µg/L - micrograms per liter
U - not detected
J - estimated value
** - toxicity laboratory control water (BT1-1a in analytical report)
U.S. EPA Region III BTAG Screening Levels (SL) for Aquatic Freshwater Fauna.
The Cr SL value assumes that all Cr is in the form Cr^{+6}
The Fe SL value is for fish
WQC-CCC = Water Quality Criteria - Criterion Continuous Concentration for Freshwater
Data collected January 2001

Table 3. Pesticides/PCBs Detected in Water
Lake Calumet Cluster Site
Chicago, Illinois
November 2001

	Location				Regions III BTAG SL	U.S. EPA
	LCC-1 & LCC-2	LCC-3 & LCC-4	LCC-5 & LCC-6	Lab Control **	Freshwater Fauna	WQC-CCC
Compound	Conc. (µg/L)	Conc. (µg/L)	Conc. (µg/L)	Conc. (µg/L)	µg/L	µg/L
Aroclor 1242	U (0.3)	U (0.3)	3.5	U (0.3)	0.014	0.014
Aroclor 1260	U (0.3)	U (0.3)	0.21 J	U (0.3)	0.014	0.014

µg/L - micrograms per liter
U - not detected
J - estimated value
** - toxicity laboratory control water
U.S. EPA Region III BTAG Screening Levels (SL) for Aquatic Freshwater Fauna.
WQC-CCC = Water Quality Criteria - Criterion Continuous Concentration for Freshwater
Data collected January 2001

Table 6. *In-Situ* Water Quality Data
Lake Calumet Cluster Site
Chicago, Illinois
November 2001

Location	Temperature (°C)	pH (SU)	DO (mg/L)	Turbidity (NTU)	Conductivity (µS/cm)
LCC-1	0.5	7.1	2.7	7	681
LCC-2	0.0	7.3	6.7	25	486
LCC-3	0.0	7.0	5.0	35	1460
LCC-4	1.0	7.2	4.5	10	1639
LCC-5	0.0	7.9	2.5	51	8924
LCC-6	0.0	7.7	2.2	187	8934

°C = degrees Celsius
SU = standard units
DO = dissolved oxygen
mg/L = milligrams per liter
NTU = Nephelometric Turbidity Units
µS/cm = micro Siemens per centimeter
Data collected January 2001

Table 7. Target Analyte List Metals Detected in Sediment
Lake Calumet Cluster Site
Chicago, Illinois
November 2001

	Location							Region III BTAG SL
	LCC-1	LCC-2	LCC-3	LCC-5	LCC-6	LCC-7	Lab Control **	Fauna
Metal	Conc. (mg/kg)	Conc. (mg/kg)	Conc. (mg/kg)	Conc. (mg/kg)	Conc. (mg/kg)	Conc. (mg/kg)	Conc. (mg/kg)	mg/kg
Aluminum	30000	8300	8700	13000	8200	6400	180	NA
Antimony	U (8.5)	U (6.0)	U (4.4)	U (15)	U (8.2)	17 J	U (5.2)	150
Arsenic	5.6	6.6	5.0	6.5	5.3	41	U (2.3)	8.2
Barium	350	51	78	100	56	710	U (0.86)	NA
Beryllium	4.9	0.65	0.93	U (1.3)	U (0.68)	0.92	U (0.43)	NA
Cadmium	1.4	U (0.50)	U (0.37)	1.4	0.70	9.4	U (0.43)	1.2
Calcium	130000	49000	60000	82000	53000	140000	70	NA
Chromium	63	31	74	67	47	320	U (0.43)	260
Cobalt	6.4	10	8.0	13	10	15	U (0.86)	NA
Copper	47 J	47 J	31 J	85 J	59 J	150 J	1.2	34
Iron	34000	22000	25000	27000	19000	69000	170	NA
Lead	170	83	75	140	70	960	U (3.4)	46.7
Magnesium	13000	25000	24000	21000	21000	13000	U (43)	NA
Manganese	4500	610	1200	950	530	7200	0.88	NA
Mercury	0.16	0.13	0.07	0.20	0.12	2.5	U (0.04)	0.15
Nickel	20 J	31 J	22 J	43 J	33 J	33 J	U (0.86)	20.9
Potassium	2000	2100	1700	5700	3000	1100	U (170)	NA
Selenium	2.0 J	U (1.1)	U (0.90)	U (2.9)	U (1.8)	U (1.4)	U (2.3)	NA
Sodium	880	220 J	400	5600 J	2600 J	860	U (43)	NA
Vanadium	31 J	26 J	25 J	47 J	30 J	83 J	U (1.7)	NA
Zinc	390	220	110	310	170	730	3.4	150

mg/kg - milligrams per kilogram (dry weight)
U - not detected
J - estimated value
** - toxicity laboratory control sediment
U.S. EPA Region III BTAG Screening Levels (SL) for Fauna.
Data collected January 2001

Table 8. Pesticides/PCBs Detected in Sediment
Lake Calumet Cluster Site
Chicago, Illinois
November 2001

	Location							Region III BTAG SL
	LCC-1	LCC-2	LCC-3	LCC-5	LCC-6	LCC-7	Lab Control **	Fauna
Compound	Conc. (µg/kg)	Conc. (µg/kg)	Conc. (µg/kg)	Conc. (µg/kg)	Conc. (µg/kg)	Conc. (µg/kg)	Conc. (µg/kg)	µg/kg
Aldrin	U (8.1)	U (6.0)	U (4.5)	U (15)	U (9.0)	37	U (4.4)	NA
g-Chlordane	15	U (6.0)	2.0 J	U (15)	U (9.0)	110	U (4.4)	NA
a-Chlordane	U (8.1)	U (6.0)	U (4.5)	U (15)	U (9.0)	90 J	U (4.4)	NA
Dieldrin	18	8.8	7.1	5.0 J	U (9.0)	3700	U (4.4)	NA
p,p'-D D D	3600	15	4.1	21	14	4900 J	U (4.4)	16
p,p'-D D E	1100	6.8	2.7	33 J	17	140	U (4.4)	2.2
p,p'-D D T	68 J	U (6.0)	2.5 J	U (15)	U (9.0)	U (8.0)	U (4.4)	1.58
Endrin	U (8.1)	U (6.0)	U (4.5)	U (15)	U (9.0)	4.8	U (4.4)	NA
Endosulfan (I)	U (8.1)	U (6.0)	U (4.5)	36	U (9.0)	22	U (4.4)	NA
Aroclor 1242	U (100)	U (74)	U (56)	3500	1300	670	U (55)	22.7
Aroclor 1260	U (100)	U (74)	U (56)	530	310	360	U (55)	22.7

µg/kg - micrograms per kilogram (dry weight)
U - not detected
J - estimated value
** - toxicity laboratory control sediment
U.S. EPA Region III BTAG Screening Levels (SL) for Fauna.
Data collected January 2001

Table 9. Volatile Organic Compounds Detected in Sediment
Lake Calumet Cluster Site
Chicago, Illinois
November 2001

	Location							Region III BTAG SL
	LCC-1	LCC-2	LCC-3	LCC-5	LCC-6	LCC-7	Lab Control **	Fauna
Compound	Conc. (µg/kg)	Conc. (µg/kg)	Conc. (µg/kg)	Conc. (µg/kg)	Conc. (µg/kg)	Conc. (µg/kg)	Conc. (µg/kg)	µg/kg
1,1,1-Trichloroethane	U (2.0)	U (1.8)	2.8	U (4.5)	U (2.4)	U (2.1)	U (1.3)	NA
1,1-Dichloroethane	U (2.0)	U (1.8)	33	U (4.5)	U (2.4)	33	U (1.3)	NA
1,2,4-Trimethylbenzene	U (2.0)	U (1.8)	2.0	120	U (2.4)	15	U (1.3)	NA
1,2-Dichlorobenzene	U (2.0)	U (1.8)	U (1.3)	9.0	U (2.4)	3.1	U (1.3)	NA
1,2-Dichloroethane	U (2.0)	U (1.8)	U (1.3)	U (4.5)	U (2.4)	4.0	U (1.3)	NA
1,2-Dichloropropane	U (2.0)	U (1.8)	U (1.3)	U (4.5)	U (2.4)	2.2	U (1.3)	NA
1,3,5-Trimethylbenzene	U (2.0)	U (1.8)	1.6	34	U (2.4)	U (2.1)	U (1.3)	NA
1,4-Dichlorobenzene	U (2.0)	U (1.8)	U (1.3)	14	U (2.4)	U (2.1)	U (1.3)	NA
2-Butanone	U (8.0)	U (7.1)	U (5.3)	17	U (9.8)	410	U (5.2)	NA
4-Methyl-2-Pentanone	U (4.0)	U (3.6)	U (2.6)	U (9.1)	U (4.9)	310	U (2.6)	NA
Acetone	U (16)	U (14)	U (11)	U (36)	U (20)	990 J	420	NA
Benzene	U (2.0)	U (1.8)	7.7	15	5.4	89	U (1.3)	NA
Carbon Disulfide	2.2	U (1.8)	U (1.3)	5.6	U (2.4)	U (2.1)	U (1.3)	NA
Chlorobenzene	U (2.0)	U (1.8)	U (1.3)	14	U (2.4)	13	U (1.3)	NA
Chloroethane	U (2.0)	U (1.8)	3.9 J	U (4.5)	U (2.4)	13	U (1.3)	NA
cis-1,2-Dichloroethene	U (2.0)	U (1.8)	56	U (4.5)	U (2.4)	38	U (1.3)	NA
Dichlorodifluoromethane	U (2.0)	U (1.8)	U (1.3)	U (4.5)	U (2.4)	U (2.1)	1.5	NA
Ethylbenzene	U (2.0)	U (1.8)	21	120	2.9	310	U (1.3)	NA
Isopropylbenzene	U (2.0)	U (1.8)	U (1.3)	13	U (2.4)	15	U (1.3)	NA
Methylene Chloride	U (2.0)	U (1.8)	2.4	U (4.5)	U (2.4)	32	U (1.3)	NA
Naphthalene	U (2.0)	U (1.8)	U (1.3)	64	U (2.4)	3.3	U (1.3)	NA
n-Propylbenzene	U (2.0)	U (1.8)	U (1.3)	9.4	U (2.4)	3.4	U (1.3)	NA
o-Xylene	U (2.0)	U (1.8)	19	150	4.7	180	U (1.3)	NA
p&m-Xylene	U (2.0)	U (1.8)	53	280	9.3	210	U (1.3)	NA
Toluene	U (2.0)	U (1.8)	180	12	2.5	360	U (1.3)	NA
trans-1,2-Dichloroethene	U (2.0)	U (1.8)	2.0	U (4.5)	U (2.4)	2.1	U (1.3)	NA
Trichloroethene	U (2.0)	U (1.8)	2.4	U (4.5)	U (2.4)	11	U (1.3)	NA
Vinyl Chloride	U (2.0)	U (1.8)	22 J	U (4.5)	U (2.4)	79 J	U (1.3)	NA

µg/kg - micrograms per kilogram (dry weight)
U - not detected
J - estimated value
** - toxicity laboratory control sediment
U.S. EPA Region III BTAG Screening Levels (SL) for Fauna.
Data collected January 2001

Table 10. Base, Neutral, and Acid Extractable Compounds Detected in Sediment
Lake Calumet Cluster Site
Chicago, Illinois
November 2001

	Location							Regions III BTAG SL
	LCC-1	LCC-2	LCC-3	LCC-5	LCC-6	LCC-7	Lab Control **	Fauna
Compound	Conc. (µg/kg)	Conc. (µg/kg)	Conc. (µg/kg)	Conc. (µg/kg)	Conc. (µg/kg)	Conc. (µg/kg)	Conc. (µg/kg)	µg/kg
2-Methylnaphthalene	U (4100)	U (3000)	U (2200)	U (7500)	U (4500)	4200 J	U (2200)	NA
Benzo(a)anthracene	1100 J	1800 J	740 J	U (7500)	U (4500)	U (8000)	U (2200)	NA
Benzo(a)pyrene	1300 J	2400 J	930 J	U (7500)	1300 J	2700 J	U (2200)	NA
Benzo(b)fluoranthene	1200 J	2000 J	860 J	U (7500)	U (4500)	3400 J	U (2200)	3200
Benzo(g,h,i)perylene	U (4100)	1600 J	670 J	U (7500)	U (4500)	2900 J	U (2200)	670
Benzo(k)fluoranthene	1100 J	1900 J	940 J	U (7500)	U (4500)	2900 J	U (2200)	NA
Bis(2-Ethylhexyl)phthalate	U (4100)	940 J	6100	6200 J	4700	14000	650 J	NA
Butylbenzylphthalate	U (4100)	U (3000)	U (2200)	U (7500)	U (4500)	6900 J	U (2200)	NA
Chrysene	1300 J	2100 J	880 J	U (7500)	2100 J	2600 J	U (2200)	384
Fluoranthene	1700 J	3500	1400 J	2600 J	U (4500)	3500 J	U (2200)	600
Indeno(1,2,3-cd)pyrene	U (4100)	1300 J	590 J	U (7500)	U (4500)	2400 J	U (2200)	600
Isophorone	U (4100)	U (3000)	U (2200)	U (7500)	U (4500)	13000	U (2200)	NA
Naphthalene	U (4100)	1100 J	U (2200)	U (7500)	U (4500)	2900 J	U (2200)	160
Phenanthrene	U (4100)	2200 J	U (2200)	U (7500)	U (4500)	U (8000)	U (2200)	240
Pyrene	1400 J	3200	1200 J	2300 J	U (4500)	2800 J	U (2200)	665

µg/kg - micrograms per kilogram (dry weight)
U - not detected
J - estimated value
** - toxicity laboratory control sediment
U.S. EPA Region III BTAG Screening Levels (SL) for Fauna.
Data collected January 2001
Totals were calculated using 1/10 of MDL for U values

Table 11. Target Analyte List Metals Detected in Soil
Lake Calumet Cluster Site
Chicago, Illinois
November 2001

	Location							Regions III BTAG SL	Region III BTAG SL
	SOIL-1	SOIL-2	SOIL-3	SOIL-4	SOIL-5	SOIL-6	Lab Control **	Flora	Fauna
Metal	Concentration (mg/kg)							mg/kg	mg/kg
Aluminum	10000	10000	6900	22000	11000	8900	840	1000	NA
Antimony	U (6.0)	U (5.0)	8.2	U (4.6)	U (4.3)	7.9	U (6.8)	480	NA
Arsenic	7.7	5.8	8.9 J	7.1	7.3	14	U (2.9)	328	NA
Barium	280	76	810	250	120	190	12	440000	440000
Beryllium	0.90	0.74	1.1	4.0	1.4	1.7	U (0.57)	20	NA
Cadmium	0.67	0.86	5.2	0.44	1.3	6.9	U (0.57)	2500	NA
Calcium	63000	69000	86000	150000	82000	9000	3300	NA	NA
Chromium	140	360	480	710	780	42 J	1.9	20	7.5
Cobalt	6.9	8.8	13	4.1	9.1	9.1 J	U (1.1)	100	200
Copper	45	89	300	38	230	290	3.9	15000	NA
Iron	18000	57000 J	44000	59000 J	81000	53000 J	720	3260000	12
Lead	270	350	1300	53	160	2900	U (4.6)	2000	10
Magnesium	21000	26000	14000	43000	25000	1600	120	0.44%	0.44%
Manganese	1500	7700	7300	14000	8300	430	7.7	330000	330000
Mercury	0.25	0.09	1.8	0.04	0.25	3.0	U (0.04)	58	58
Nickel	22	64	33	28	280	54 J	U (1.1)	2000	NA
Potassium	1700	1300	870	720	1400	480	U (230)	NA	NA
Silver	U (0.50)	U (0.42)	U (0.44)	U (0.38)	U (0.36)	0.77	U (0.57)	0.0098	NA
Sodium	570	230	420	690	400	560	U (57)	NA	NA
Vanadium	31	110	110 J	250	240	22	4.0	500	58000
Zinc	330	200	840	120	190	1800	17	10000	NA

mg/kg - milligrams per kilogram (dry weight)
U - not detected
J - estimated value
** - toxicity laboratory control soil
U.S. EPA Region III BTAG Screening Levels (SL) for Flora
Magnesium SL is measured in percent
Data collected January 2001

Table 12. Pesticides/PCBs Detected in Soil
Lake Calumet Cluster Site
Chicago, Illinois
November 2001

	Location							Regions III BTAG SL	Regions III BTAG SL
	SOIL-1	SOIL-2	SOIL-3	SOIL-4	SOIL-5	SOIL-6	Lab Control **	Flora	Fauna
Compound	Concentration (µg/kg)							µg/L	µg/L
Pesticides									
Aldrin	U (4.4)	1.7 J	U (5.0)	U (4.4)	3.4 J	430 J	U (3.8)	100	100
d-BHC	4.3 J	U (4.2)	U (5.0)	U (4.4)	U (4.1)	U (5.0)	U (3.8)	NA	NA
p,p'-D D D	3100	2.1 J	25	U (4.4)	9.1	200 J	U (3.8)	100	100
p,p'-D D E	75	2.7	68	1.4 J	5.2	330 J	U (3.8)	100	100
p,p'-D D T	36 J	6.3 J	U (5.0)	U (4.4)	U (4.1)	U (5.0)	U (3.8)	100	100
Dieldrin	49	5.6	59	1.0 J	4.5	20	U (3.8)	100	100
Endosulfan (I)	U (4.4)	4.6	U (5.0)	U (4.4)	4.7	U (5.0)	U (3.8)	NA	NA
Endosulfan (II)	9.3	U (4.2)	U (5.0)	U (4.4)	U (4.1)	U (5.0)	U (3.8)	NA	NA
a-Chlordane	54	U (4.2)	23	U (4.4)	U (4.1)	14	U (3.8)	100	100
g-Chlordane	53	U (4.2)	56	U (4.4)	U (4.1)	280 J	U (3.8)	100	100
Heptachlor Epoxide	U (4.4)	U (4.2)	U (5.0)	U (4.4)	U (4.1)	U (5.0)	U (3.8)	100	100
PCBs									
Aroclor 1242	U (55)	120	540	26 J	99	13000	U (48)	100	NA
Aroclor 1260	140	120	590	19 J	170	1700	U (48)	100	NA

µg/kg - micrograms per kilogram (dry weight)
U - not detected
J - estimated value
** - toxicity laboratory control soil
U.S. EPA Region III BTAG Screening Levels (SL) for Flora and Fauna
Data collected January 2001

Table 13. Volatile Organic Compounds Detected in Soil
Lake Calumet Cluster Site
Chicago, Illinois
November 2001

	Location							Regions III BTAG SL
	SOIL-1	SOIL-2	SOIL-3	SOIL-4	SOIL-5	SOIL-6	Lab Control	Flora
Compound	Conc. (µg/kg)	Conc. (µg/kg)	Conc. (µg/kg)	Conc. (µg/kg)	Conc. (µg/kg)	Conc. (µg/kg)	Conc. (µg/kg)	µg/kg
1,1-Dichloroethane	U (1.3)	U (1.3)	2.7	U (1.3)	U (1.2)	U (1.4)	U (1.2)	NA
Acetone	11	24	2.5	51	3.5	U (11)	5.7 J	NA
Dichlorodifluoromethane	U (1.3)	U (1.3)	U (1.3)	U (1.3)	U (1.2)	U (1.4)	1.7	NA
Methylene Chloride	6.5	1.6	2.2	1.4	U (1.2)	U (1.4)	U (1.2)	NA
Trichlorofluoromethane	U (1.3)	U (1.3)	U (1.3)	U (1.3)	U (1.2)	U (1.4)	1.6	NA

µg/kg - micrograms per kilogram (dry weight)
U - not detected
J - estimated value
** - toxicity laboratory control soil
U.S. EPA Region III BTAG Screening Levels (SL) for Flora
Data collected January 2001

Table 14. Base, Neutral, and Acid Extractable Compounds Detected in Soil
Lake Calumet Cluster Site
Chicago, Illinois
November 2001

	Location							Regions III BTAG SL
	SOIL-1	SOIL-2	SOIL-3	SOIL-4	SOIL-5	SOIL-6	Lab Control **	Flora
Compound	Concentration (µg/kg)							µg/kg
BNAs								
3,3'-Dichlorobenzidine	U (2200)	U (2100)	1100 J	U (2200)	U (2100)	U (2500)	U (1900)	NA
Bis(2-Ethylhexyl)phthalate	820 J	15000	15000	U (2200)	1100 J	1600 J	1100 J	NA
Butylbenzylphthalate	U (2200)	U (2100)	1900 J	U (2200)	U (2100)	U (2500)	U (1900)	NA
Di-n-butylphthalate	U (2200)	U (2100)	2900 J	U (2200)	U (2100)	650 J	U (1900)	NA
Isophorone	U (2200)	U (2100)	6200	U (2200)	U (2100)	U (2500)	U (1900)	NA
Phenol	U (2200)	U (2100)	1500 J	U (2200)	U (2100)	U (2500)	U (1900)	NA
HMWPAHs								
Benzo(a)anthracene	5900	1500 J	U (5000)	U (2200)	880 J	700 J	U (1900)	100
Benzo(a)pyrene	7100	2000 J	U (5000)	U (2200)	1300 J	910 J	U (1900)	100
Benzo(b)fluoranthene	6600	1800 J	U (5000)	U (2200)	1200 J	870 J	U (1900)	100
Benzo(g,h,i)perylene	4400	1700 J	U (5000)	U (2200)	1100 J	700 J	U (1900)	100
Benzo(k)fluoranthene	6300	1900 J	U (5000)	U (2200)	1200 J	810 J	U (1900)	100
Chrysene	6300	1600 J	U (5000)	U (2200)	1100 J	930 J	U (1900)	100
Fluoranthene	13000	2400	2200 J	U (2200)	1400 J	1100 J	U (1900)	100
Indeno(1,2,3-cd)pyrene	4000	1400 J	U (5000)	U (2200)	890 J	U (2500)	U (1900)	100
Pyrene	10000	2000 J	U (5000)	U (2200)	1300 J	990 J	U (1900)	100
LMWPAHs								
2-Methylnaphthalene	U (2200)	U (2100)	1500 J	U (2200)	U (2100)	U (2500)	U (1900)	NA
Acenaphthylene	880 J	U (2100)	1100 J	U (2200)	U (2100)	U (2500)	U (1900)	100
Anthracene	1800 J	U (2100)	U (5000)	U (2200)	U (2100)	U (2500)	U (1900)	100
Carbazole	740 J	U (2100)	U (5000)	U (2200)	U (2100)	U (2500)	U (1900)	NA
Fluorene	870 J	U (2100)	U (5000)	U (2200)	U (2100)	U (2500)	U (1900)	NA
Naphthalene	U (2200)	U (2100)	1900 J	U (2200)	U (2100)	U (2500)	U (1900)	100
Phenanthrene	7600	1100 J	1300 J	U (2200)	730 J	U (2500)	U (1900)	100

µg/kg - micrograms per kilogram (dry weight)
U - not detected
J - estimated value
** - toxicity laboratory control soil
U.S. EPA Region III BTAG Screening Levels (SL) for Flora
Data collected January 2001

Table 15. Target Analyte List Metals Detected in Fish and Crayfish Tissue
Lake Calumet Cluster Site
Chicago, Illinois
November 2001

Metal	Fish		Crayfish	
	LHL1 East mg/kg	LHL1 West mg/kg	LHL1 Crayfish mg/kg	LHL2 N&S mg/kg
Aluminum	190	580	550	1300
Antimony	U (0.58)	U (0.56)	U (0.42)	U (0.45)
Arsenic	U (1.2)	U (1.1)	1.2 J	2 J
Barium	44	46	130	240
Beryllium	U (0.58)	U (0.56)	U (0.42)	U (0.45)
Cadmium	U (1.5)	U (1.4)	U (1.1)	U (1.1)
Calcium	42000	40000	91000	130000
Chromium	1.9	2.6	2.6	6.0
Cobalt	U (2.9)	U (2.8)	U (2.1)	2.3
Copper	5.7	5.8	110	140
Iron	370	680	880	1500
Lead	2.0	3.1	5.3	9.8
Magnesium	1900	2100	3400	3500
Manganese	30 J	46 J	330 J	390 J
Mercury	U (0.21)	U (0.20)	U (0.15)	U (0.21)
Nickel	U (2.9)	U (2.8)	3.3	3.8
Potassium	13000	13000	9700	7900
Selenium	2.4	2.4	1.1	1.3
Silver	U (1.5)	U (1.4)	U (1.1)	U (1.1)
Sodium	5700	5600	8700	7000
Thallium	U (1.2)	U (1.1)	U (0.84)	U (0.89)
Vanadium	U (2.9)	U (2.8)	2.4	4.7
Zinc	250	250	140	130

mg/kg - milligrams per kilogram (dry weight)
U - not detected

Data collected April 2001

Table 16. TAL Metals Detected in Earthworms Exposed to Site Soil
Lake Calumet Cluster Site
Chicago, Illinois
November 2001

Metal	Location							
	TIME-0	LC	SOIL-1	SOIL-2	SOIL-3	SOIL-4	SOIL-5	SOIL-6
	Conc mg/kg	Conc mg/kg	Conc mg/kg	Conc mg/kg	Conc mg/kg	Conc mg/kg	Conc mg/kg	Conc mg/kg
Aluminum	56	430	1000	960	760	400	240	2000
Antimony	U (0.97)	U (0.77)	U (0.78)	0.81	3.9	U (0.78)	U (0.83)	1.6
Arsenic	4.7	18	27	27	29	27	30	21
Barium	2.4	2.0	24	9.6	110	8.4	5.6	54
Beryllium	U (0.97)	U (0.77)	U (0.78)	U (0.77)	U (0.76)	U (0.78)	U (0.83)	U (0.83)
Cadmium	U (2.4)	5.4	5.7	5.1	5.2	6.0	5.5	13
Calcium	4300	4200	7900	6800	12000	6500	5000	5800
Chromium	U (2.4)	8.4	5.6	11	46	12	4.9	15
Cobalt	U (4.8)	7.2	6.8	7.1	7.2	6.7	6.5	7.0
Copper	10	18	27	50	57	32	30	160
Iron	300	540	1900	2500	3500	1500	1000	7400
Lead	U (0.97)	1.3	22	26	170	2.5	4.8	120
Magnesium	1400	910	2800	2800	2600	2000	1900	1500
Manganese	24	15	95	140	290	220	120	120
Mercury	U (0.25)	U (0.2)	U (0.19)	0.44	0.53	U (0.19)	U (0.21)	6.2
Nickel	U (4.8)	U (3.9)	4.7	6.7	10	U (3.9)	7.9	18
Potassium	12000	12000	12000	12000	12000	11000	12000	13000
Selenium	2.9	8.8	9.0	8.9	8.5	9.3	8.7	8.9
Silver	U (2.4)	U (1.9)	U (2.0)	U (1.9)	U (1.9)	U (1.9)	U (2.1)	U (2.1)
Sodium	7700	6700	6900	6800	7200	6700	6900	8200
Thallium	U (0.97)	U (0.77)	U (0.78)	U (0.77)	U (0.76)	U (0.78)	U (0.83)	U (0.83)
Vanadium	U (4.8)	U (3.9)	U (3.9)	U (3.8)	6.0	4.6	U (4.2)	6.3
Zinc	170	140	160	170	260	140	150	610

mg/kg - milligrams per kilogram (dry weight)
U - not detected
LC - Laboratory Control earthworms
Tissue values for SOIL-1, SOIL-2, SOIL-3, SOIL-4, SOIL-5, and SOIL-6 are mean values from test replicates A through E.

Table 17. Pesticides/PCBs Detected in Fish and Crayfish Tissue
Lake Calumet Cluster Site
Chicago, Illinois
November 2001

Parameter	Fish		Crayfish	
	LHL1 EAST	LHL1 WEST	LHL1	LHL2 N&S
	Conc. µg/kg	Conc. µg/kg	Conc. µg/kg	Conc. µg/kg
p,p'-D D E	69	79	U (16)	U (14)
p,p'-D D D	55	62	U (16)	U (14)
Aroclor 1254	1900	1900	860	U (180)
Aroclor 1260	740	890	160 J	U (180)

µg/kg - micrograms per kilogram (dry weight)
U - not detected
J - estimated value
Data collected April 2001

Table 18. PCBs Detected in Earthworms Exposed to Site Soil
Lake Calumet Cluster Site
Chicago, Illinois
November 2001

Compound	Location							
	Time 0	LC	SOIL 1	SOIL 2	SOIL 3	SOIL 4	SOIL 5	SOIL 6
	Conc.	Conc.	Conc.	Conc.	Conc.	Conc.	Conc.	Conc.
	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg
Aroclor 1248	U (1300)	U (530)	U (470)	U (510)	1100	U (490)	U (580)	48000
Aroclor 1254	U (1300)	U (530)	U (470)	U (510)	1000	160 J	330 J	22000

µg/kg - micrograms per kilogram (dry weight)
U - not detected
LC - Laboratory Control earthworms
J - estimated value

Table 19. Base, Nuetral, and Acid Extractable Compounds Detected in Fish and Crayfish Tissue
Lake Calumet Cluster Site
Chicago, Illinois
November 2001

Tissue Type	Fish		Crayfish	
Location	LHL1 East	LHL1 West	LHL1	LHL2 N&S
Compound	µg/kg	µg/kg	µg/kg	µg/kg
Diethylphthalate	3500	U (9500)	U (8000)	U (7100)
Bis(2-Ethylhexyl)phthalate	4900	3600	1700	2600

Data collected April 2001
µg/kg - micrograms per kilogram (dry weight)
U - not detected

Table 20. Survival and Growth of Amphipods (*Hyalella azteca*) Exposed to Site Sediments
Lake Calumet Cluster Site
Chicago, Illinois
November 2001

Sample Location	% Survival	Mean Dry Weight (mg)	OET
Laboratory Control	88.75	0.052	N/A
LCC-1	83.75	0.113	no
LCC-2	31.25	0.045	yes
LCC-3	70	0.060	no
LCC-5	40	0.101	yes
LCC-6	1.25	0.005	yes
LCC-7	95	0.118	no

mg = milligrams
OET = Observed Effect Treatment
N/A = not applicable
Test conducted February 2001

Table 21. Survival and Growth of Fathead Minnows (*Pimephales promelas)* Exposed to Site Water
Lake Calumet Cluster Site
Chicago, Illinois
November 2001

Sample Location	% Survival	Mean Dry Weight (mg)	OET
Laboratory Control	97.5	0.273	N/A
Aerated Control	95	0.249	no
LCC-5 & LCC-6	0	N/A	yes
LCC-1 & LCC-2	100	0.231	no
LCC-3 & LCC-4	67.5	0.275	yes

mg = milligrams
OET = Observed Effect Treatment
N/A = not applicable
Test conducted February 2001

Table 22. Survival and Growth of Earthworms (*Eisenia foetida*) Exposed to Site Soil
Lake Calumet Cluster Site
Chicago, Illinois
November 2001

Sample Location	% Survival	OET for Survival	Avg. Weight Loss (mg)	OET for Growth
Artifical Soil	98	N/A	843.2	N/A
Soil-1	98	no	1144.32	no
Soil-2	92	no	1142.04	no
Soil-3	78	yes	1169.09	N/A
Soil-4	91	no	910.7	no
Soil-5	92	no	630.95	no
Soil-6	93	no	210.87	no

mg = milligrams
OET = Observed Effect Treatment
N/A = not applicable
Test conducted February 2001

Table 23. Survival and Growth of Ryegrass (*Lolium perenne*) Exposed to Site Soil
Lake Calumet Cluster Site
Chicago, Illinois
November 2001

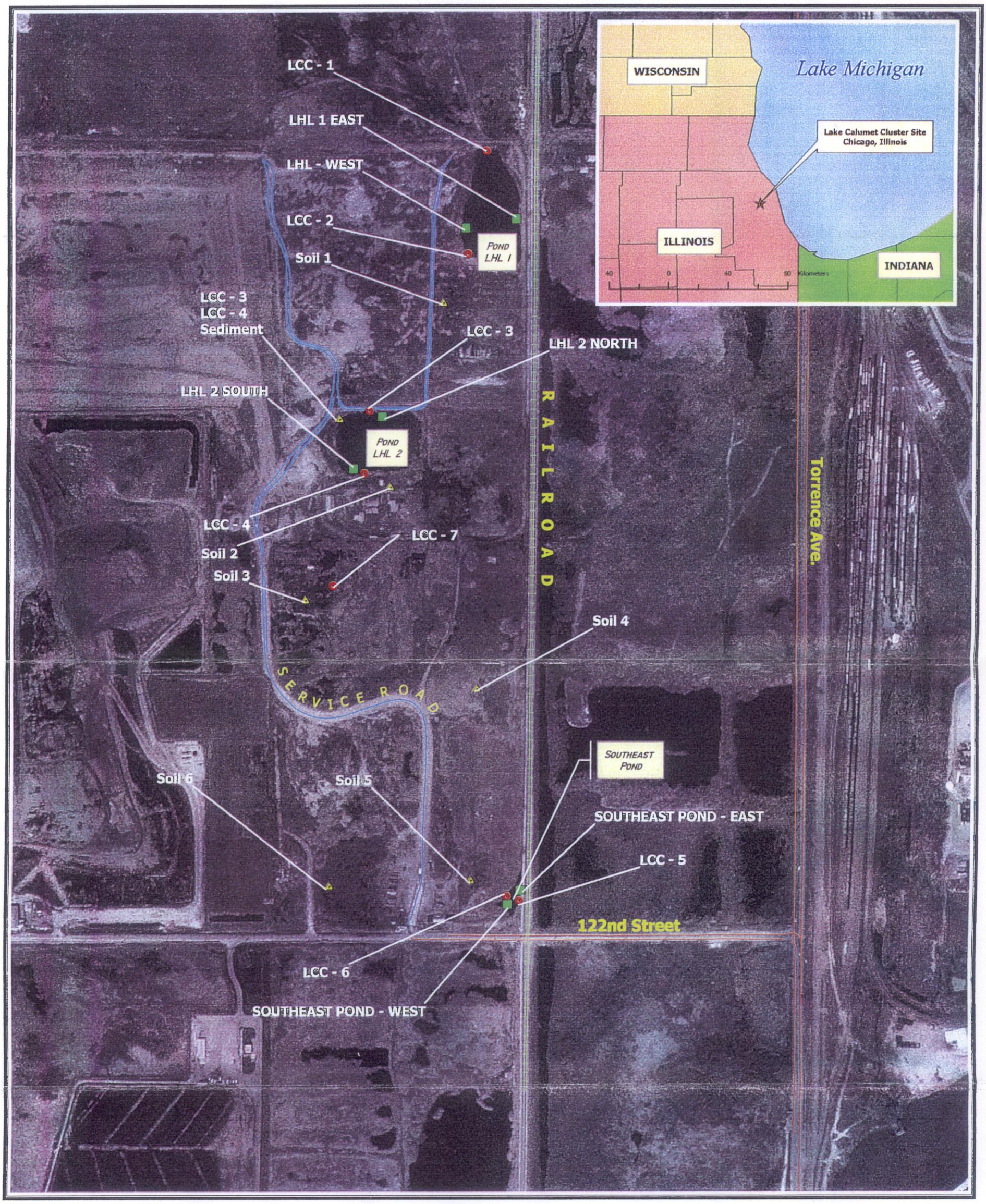
Sample Location	Parameter	Effect
	% Survival	*OET*
Artificial Soil	100	N/A
Soil-1	96	no
Soil-2	96	no
Soil-3	24	yes
Soil-4	84	no
Soil-5	100	no
Soil-6	92	no
	Avg. Shoot Lenth (mm)	*OET*
Artificial Soil	141.88	N/A
Soil-1	89.08	yes
Soil-2	81.71	yes
Soil-3	N/A	N/A
Soil-4	52.42	yes
Soil-5	61.35	yes
Soil-6	116.26	yes
	Avg. Shoot Wet Weight (mg)	*OET*
Artificial Soil	405.3	N/A
Soil-1	76.7	yes
Soil-2	80.9	yes
Soil-3	N/A	N/A
Soil-4	36.3	yes
Soil-5	44.1	yes
Soil-6	143.5	no
	Avg. Shoot Dry Weight (mg)	*OET*
Artificial Soil	81.2	N/A
Soil-1	25.5	no
Soil-2	20.9	no
Soil-3	N/A	N/A
Soil-4	11.3	yes
Soil-5	16.2	yes
Soil-6	34	no
	Avg. Root Wet Weight (mg)	*OET*
Artificial Soil	637.5	N/A
Soil-1	101.5	yes
Soil-2	76.7	yes
Soil-3	N/A	N/A
Soil-4	84.4	yes
Soil-5	101.7	yes
Soil-6	286	yes
	Avg. Root Dry Weight (mg)	*OET*
Artificial Soil	53.5	N/A
Soil-1	16	yes
Soil-2	13.2	yes
Soil-3	N/A	N/A
Soil-4	12.2	yes
Soil-5	10.4	yes
Soil-6	34.5	no

% = percent
Avg. = average
OET = Observed Effect Treatment
mm = millimeters
mg = milligrams
N/A = not applicable
Test conducted February 2001

COPC	Yellow Headed		Shrew	
	HQ LOAEL	) EL	HQ LOAEL	HQ NOAEL
Total Pesticides	NA	١	NA	NA
Total PCBs	***14.88***	***0***	***52.14***	***104.28***
Total BNAs	0.00	*6*	0.00	0.00
Total LMW PAHs	0.00	0	0.00	0.00
Total HMW PAHs	0.00	0	0.00	0.00
Total Chlordanes	0.00	0	0.00	0.00
Total DDE, DDD, DDT	0.00	0	0.00	0.00
Dieldrin	0.00	0	0.00	0.00
BHC	NA	١	NA	NA
Aluminum	***3.14***	2	0.95	***1.89***
Arsenic	0.14	3	0.27	***2.72***
Antimony	NA	*5*	***3.82***	***38.19***
Barium	0.07	*6*	***1.76***	***17.61***
Beryllium	NA	1	0.01	0.05
Cadmium	0.36	8	0.38	***3.83***
Calcium	NA	١	NA	NA
Chromium	***2.40***	0	0.04	0.08
Cobalt	0.04	1	0.03	0.12
Copper	0.76	6	0.33	0.49
Iron	NA	0	0.55	***1.56***
Lead	***2.96***	8	0.17	***1.74***
Magnesium	NA	1	0.02	0.04
Manganese	0.01	4	0.08	0.27
Mercury	***1.70***	9	***2.86***	***14.28***
Nickel	0.04	0	0.02	0.03
Potassium	NA	١	NA	NA
Selenium	***2.83***	6	***2.39***	***3.94***
Silver	0.01	4	0.03	0.31
Sodium	***1.62***	4	0.10	***1.96***
Thallium	0.09	0	0.04	0.45
Vanadium	0.01	8	0.23	***2.33***
Zinc	***1.10***	5	0.20	***9.99***

NA = not available: one or more critical pi
PCB=polychlorinated biphenyl
BNA=base, neutral, and acid extractable
LMW PAH=low molecular weight polycy
HMW PAH=high molecular weight polyc
DDE, DDD, DDT=dichlorodiphenyl-trichl
COPC=contaminant of potential concern
LOAEL=lowest observed adverse effect le
NOAEL=no observable adverse effect leve

Lake Calumet Cluster Site



U.S. EPA Environmental Response Team Center
Response Engineering and Analytical Contract
68-C99-223
W.A.# R1A00053

Figure 1
Site Location Map
Lake Calumet Cluster Site
Chicago, Illinois
November, 2001

APPENDIX F

PRESENTATION BY GEORGE ROADCAP

Why I never need to leave Calumet:

The geochemical complexity of a man-made aquifer and its impacts on monitoring, remediation, and biodiversity.

Topics for discussion:

Why is the Calumet Region fundamentally different?

The need for new approaches to site investigation

The continuing geochemical evolution

The biodiversity paradox

Developing the Ecological Management Strategy
Preserve – Enhance- Protect

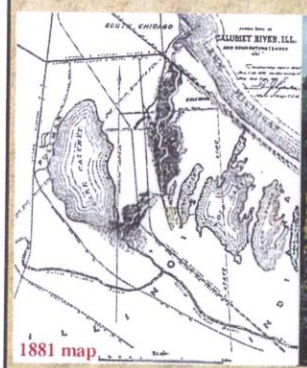
Conclusions

- The wastes used to fill in the wetlands has created a man-made aquifer
- The fill is dissolving and releasing contaminants
- The geochemistry of the ground-water is extremely variable on all scales (regional, site, well screen, grain)
  - Monitoring well data can be misleading
  - Need to prioritize monitoring of discharges
- Discharges can be toxic to aquatic life (plants, fish, bacteria)
- Problems can be mitigated through "12 Step Program"

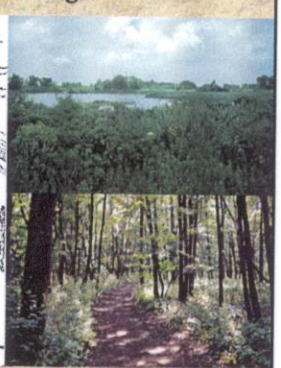
Presentation Outline

- What is the Calumet region
- Geology
  - Fill
- Hydrology
  - Calumet River
  - Wetlands
  - Ground Water
- Ground water quality
  - Variation
  - Geochemical evolution
  - Discharge to wetlands
- Impacts on biodiversity
- "12 Step Program" for remediation

What the Calumet Region was



1881 map



What the Calumet Region became

BULLDOZER SPREADING REFUSE AND CONVEYOR-LOADER (IN BACKGROUND) EMPTYING REFUSE; CITY OF CHICAGO REFUSE DISPOSAL SITE, 103D STREET AND LAKE CALUMET

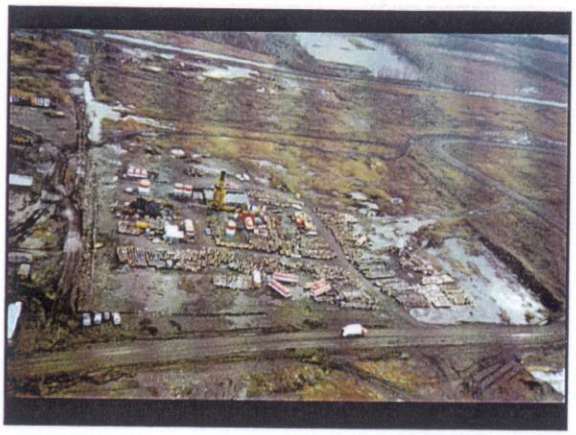
Illinois
Department of
Natural Resources

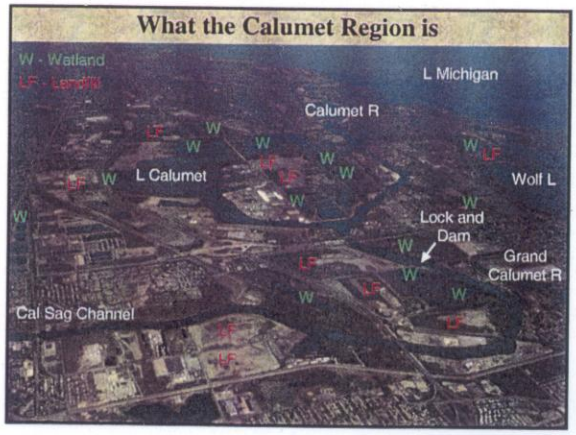
Illinois
State
Water
Survey

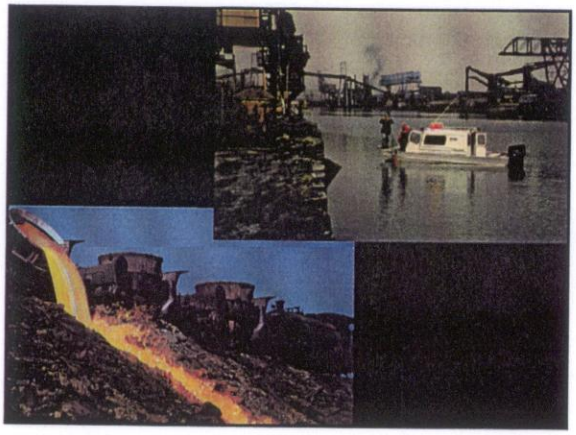
George S. Roadcap
Associate Hydrogeologist
Ground-Water Section

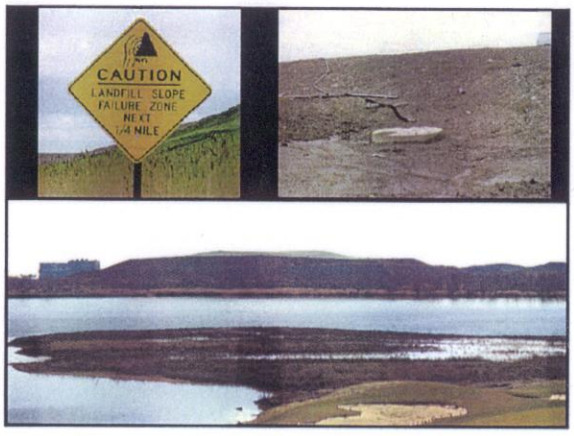
2204 Griffith Dr.
Champaign, IL 61820-7495
Phone (217) 333-7951
FAX (217) 244-0777
TDD (217) 782-9175

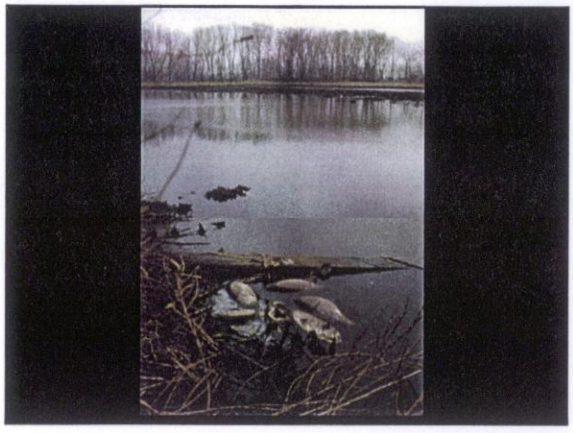
e-mail: roadcap@uiuc.edu

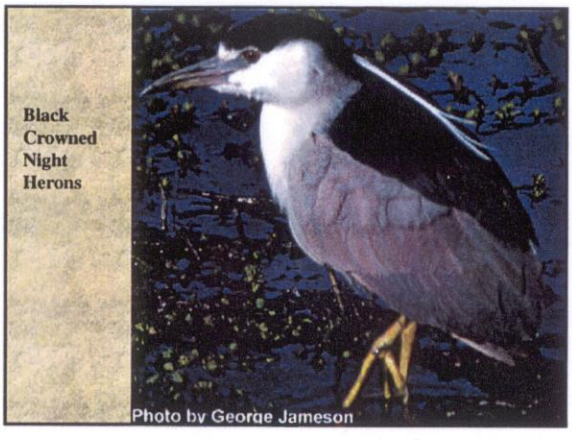


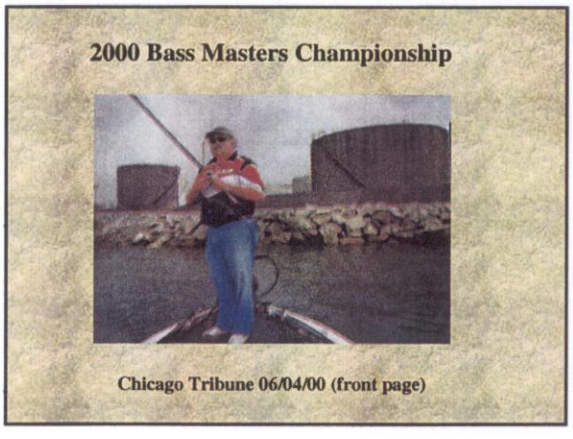

What the Calumet Region is
W - Wetland
LF - Landfill
L Michigan
Calumet R
L Calumet
Wolf L
Lock and
Dam
Grand
Calumet R
Cal Sag Channel




CAUTION
LANDFILL SLOPE
FAILURE ZONE
NEXT
1/4 MILE



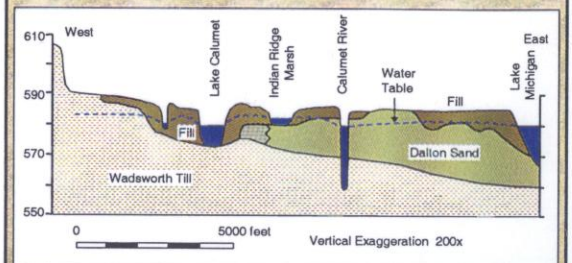

Black
Crowned
Night
Herons
Photo by George Jameson


2000 Bass Masters Championship
Chicago Tribune 06/04/00 (front page)

- What major water problems have been largely addressed
  - ✓ Direct industrial discharge
  - ✓ Overflow of sewers into streams
  - ✓ Infilling of wetlands and lakes
  - ✓ Creation of new hazardous waste sites
- What major water problems remain
  - X Discharge of contaminated ground water from the fill
  - X Restoration of aquatic and terrestrial habitats
  - X Clean up and stabilization of landfills and other sites

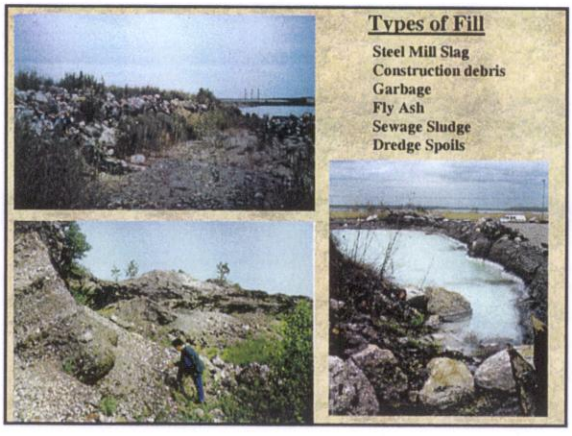
Geology

- Large amounts of fill used to raise land surface
- Fill forms an aquifer where it is below the water table



Types of Fill

Steel Mill Slag
Construction debris
Garbage
Fly Ash
Sewage Sludge
Dredge Spoils

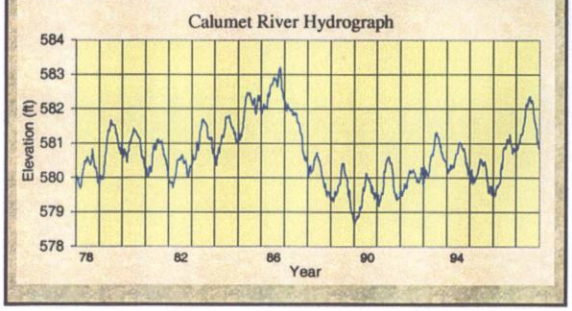


Why is the fill a problem?

- Not a soil
  - No structure
  - High levels of metals and high pH
  - Nutrient levels too high or too low
- Disrupts natural flow patterns and function of wetlands
  - Restricts the interaction with rivers and lakes
  - Reduces the size of watersheds
  - Changes surface runoff volumes and quality
- Reacts with ground water
  - High concentration of dissolved solids, ammonia
  - Elevated levels of many metals
  - pH values as high as 12.8
  - Creation of toxic conditions at discharge points

Hydrology

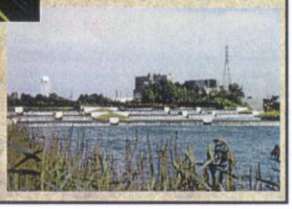
- Water levels are controlled by Lake Michigan



Hydrologic and water quality structures

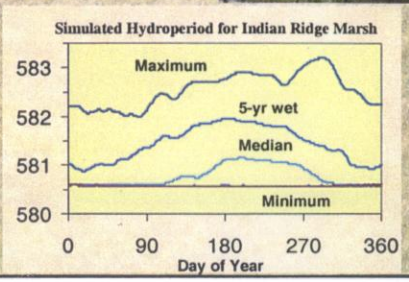
Cal-Sag Channel
Combined sewer system
Cooling water discharges
TARP tunnels
SEPA stations

"Streams in the Calumet Area are generally characterized by unsightly appearance, in the form of floating debris, oil, discoloration, and turbidity. Malodorous conditions are prevalent"
U.S. Public Health Service (1965)



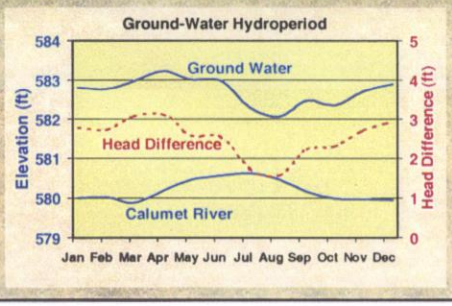
Wetland Hydrology

- Highly altered flow patterns
- Outflows go through culverts that are often blocked
- Existing hydrology could support diverse plant communities



Ground-Water Hydrology

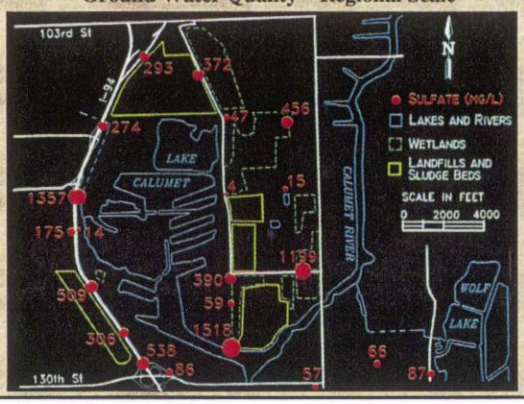
- Seasonal ground-water elevation trend opposite of Lake Michigan
- Ground-water discharge greatest in winter and spring



Ground-Water Hydrology

- Grain-size variations within the fill can cause preferential flow paths that discharge at springs

Ground Water Quality – Regional Scale

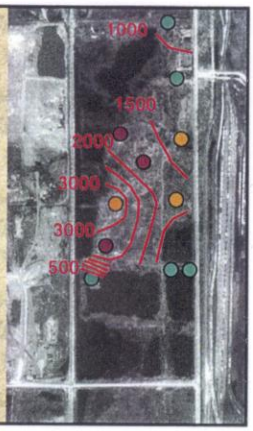


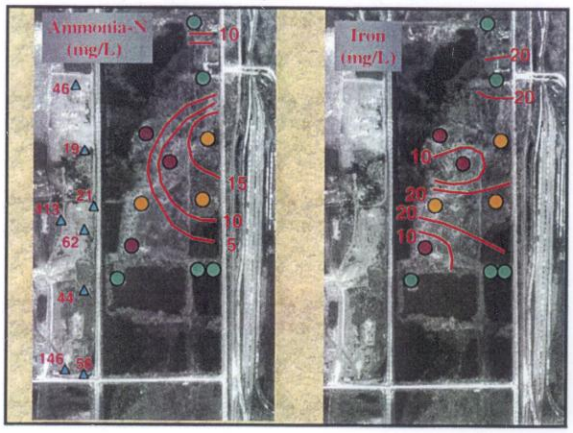
Collection of data from test pits

Site-Scale Variability

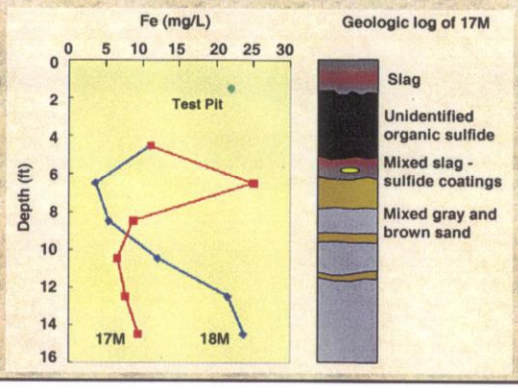
Fill type at test pit sites

- Predominately dredge spoil
- Dredge spoil with some construction debris, garbage, or slag
- Slag and construction debris
- Total Dissolved Solids (mg/L)



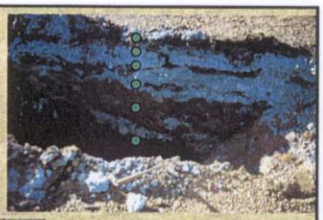


Iron Variations with Depth



Geochemical Evolution

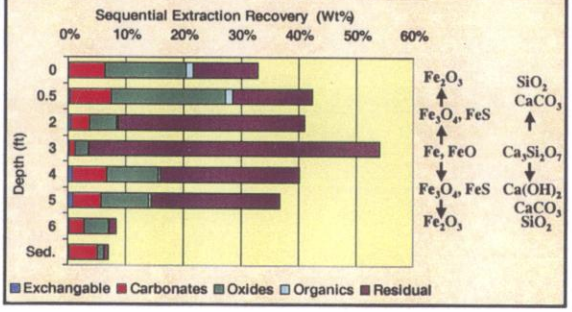
- What reactions are taking place within the fill, especially at pH>12.5?
- Where are the metals going?
- How stabile are the weathering products?



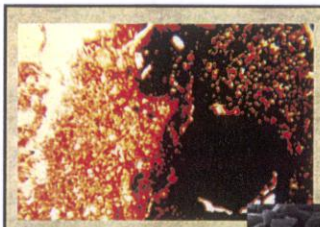
- Sampling location for sequential extraction and mineralogical analysis

Geochemical Evolution

- Reduced slag is reacting with air and water to form oxides and carbonates
- Heavy metals get coprecipitated with calcite and iron oxides

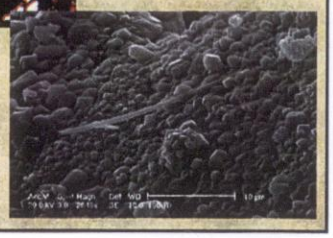


Grain-Scale Variability

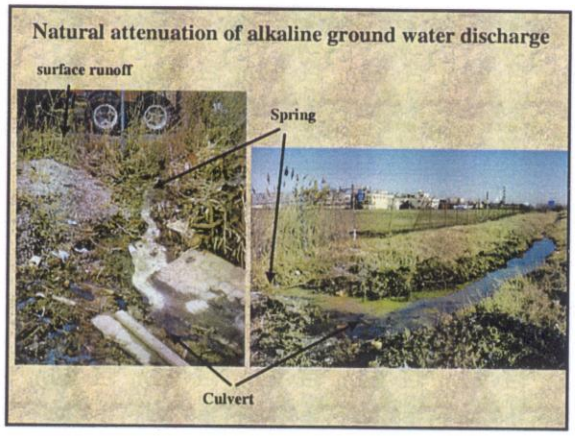


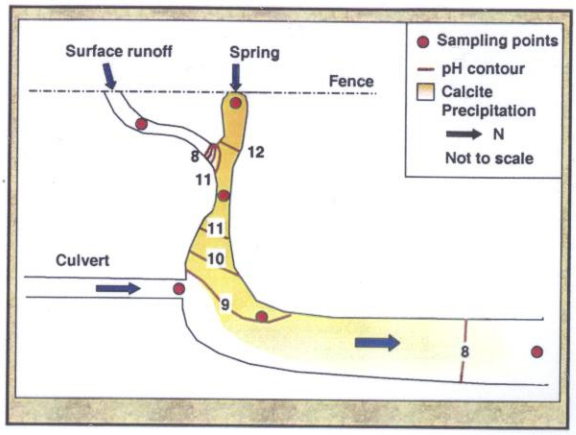
Unweathered core (metallic iron, rankinite)

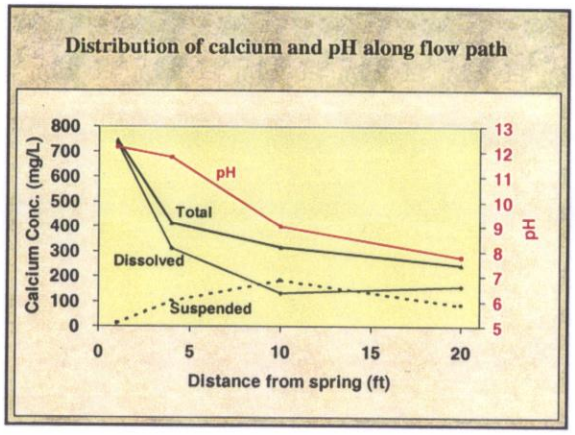
weathering rind (calcite, quartz)

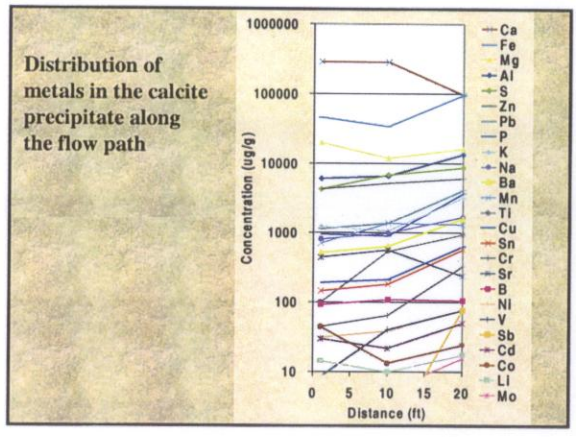


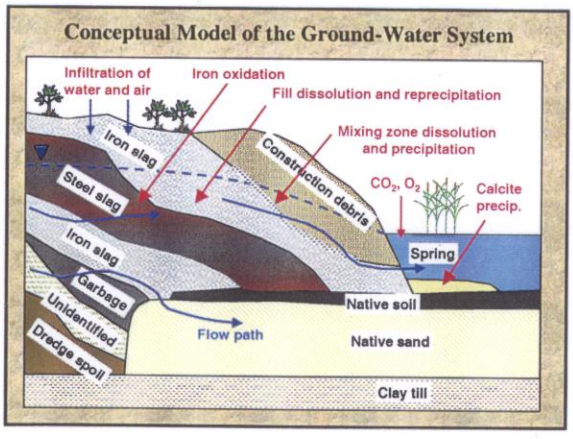
Calcite surface of slag (ESEM)

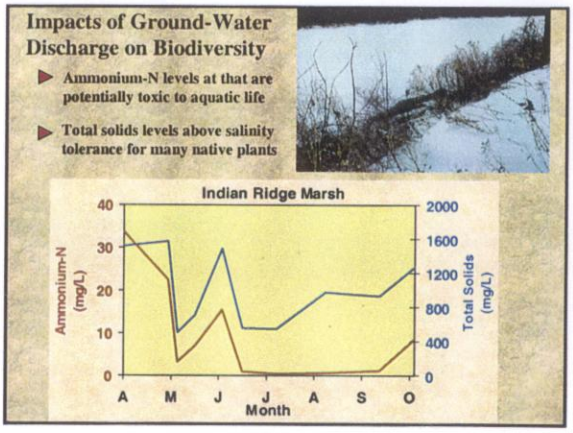

Natural attenuation of alkaline ground water discharge
surface runoff
Spring
Culvert

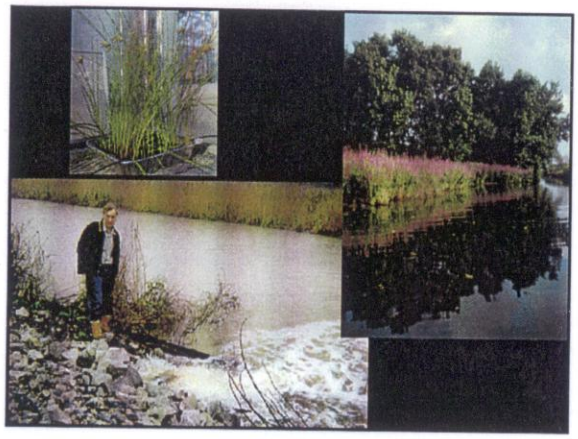

Surface runoff
Spring
Fence
Sampling points
pH contour
Calcite Precipitation
N
Not to scale
8
12
11
11
10
Culvert
9
8


Distribution of calcium and pH along flow path
Calcium Conc. (mg/L)
pH
Total
Dissolved
Suspended
Distance from spring (ft)


Distribution of metals in the calcite precipitate along the flow path
Concentration (ug/g)
Distance (ft)
Ca
Fe
Mg
Al
S
Zn
Pb
P
K
Na
Ba
Mn
Tl
Cu
Sn
Cr
Sr
B
Ni
V
Sb
Cd
Co
Li
Mo

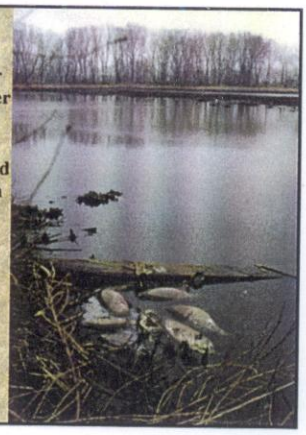

Conceptual Model of the Ground-Water System
Infiltration of water and air
Iron oxidation
Fill dissolution and reprecipitation
Mixing zone dissolution and precipitation
Iron slag
Steel slag
Construction debris
Calcite precip.
Spring
Iron slag
Garbage
Unidentified
Dredge spoil
Native soil
Flow path
Native sand
Clay till


Impacts of Ground-Water Discharge on Biodiversity
Ammonium-N levels at that are potentially toxic to aquatic life
Total solids levels above salinity tolerance for many native plants
Indian Ridge Marsh
Ammonium-N (mg/L)
Total Solids (mg/L)
Month
A
M
J
J
A
S
O



Impact on fish

- Fish may over-winter and/or spawn at warm ground-water discharges
- Fish may spawn and/or spend extensive amounts of time on contaminated sediment beds
- Fishery could be improved focusing remediation at these sites
- Let the fish determine the sampling sites



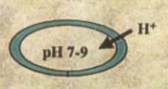
Impact on Anglers

<u>Critical need for:</u>

- Creel Surveys
  - Where they fish
  - What they catch
  - How much they eat
- Fish contaminant analyses

What is living in a pH 12+ environment?

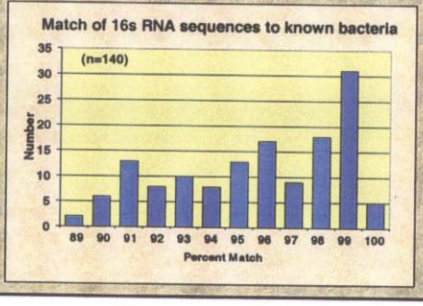
- Culturing and PCR (Polymerase Chain Reaction) analyses show that bacteria is surviving
- What geochemical reactions are the bacteria participating in?
- Associated bacteria with plant roots visibly surviving
- What are the adaptation mechanisms?



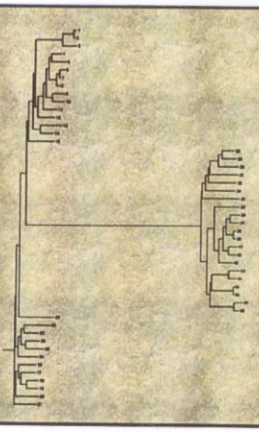
- How will adaptation affect the environment in the future?

Polymerase Chain Reaction (PCR) Results

- 42% of PCR identifications were unique species or strains
- *Leptothrix mobilis* and an uncultered bacteria most common



Phylogenetic Analysis



12 Steps to a Cleaner Calumet

Objective:

To feasibly improve the water and habitat quality of the Calumet region

I. Direct Water Treatment

1. Natural Attenuation/In Situ Treatment
2. Ground-Water Extraction/Interception
3. Geochemical Treatment of Ground-Water Discharge
4. Hydraulic Control and Mixing
5. Phytoremediation

II. Contaminant Source Removal

6. Fill Removal
7. Fill Consolidation
8. Slag Mining

III. Contaminant Source Isolation

9. Engineered Cap
10. Native Materials and Reservoir Dredgings
11. Biosolids
12. "Clean" Fill

1. Natural Attenuation/In Situ Treatment

Many contaminants are naturally attenuated as water flows through different microenvironments

- Clean up of the ground water should be focused on discharges to surface waters
- Plant roots can short circuit the natural attenuation processes

Abundant metallic iron particles will help breakdown organics

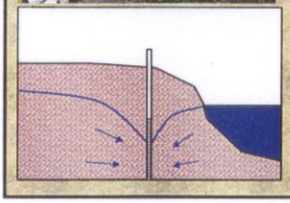
In situ treatment, such as adding of phosphates to the soil or injecting air may not be feasible

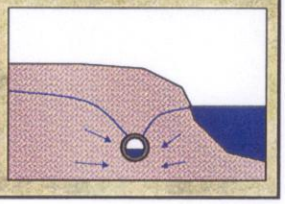
2. Ground-Water Extraction/Interception

Extraction Wells – require treatment facilities, long term maintenance

Drainage Tiles – channel discharge into treatment wetland or sewer

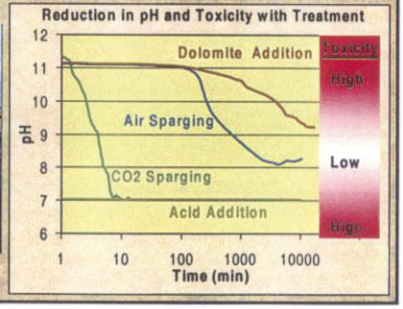
Interceptor Ditches – also control surface water runoff



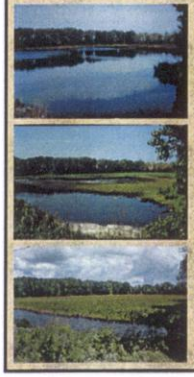


3. Geochemical Treatment of Ground-Water Discharge

- Many springs have pH values between 10 and 13
- Lowering pH causes calcite precipitation and metal coprecip.
- Aeration is very effective at lowering the MicroTox toxicity

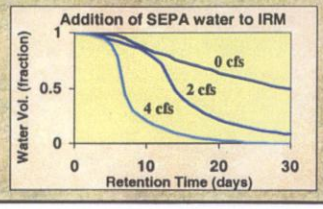


4. Hydraulic Control and Mixing



Improve hydrologic controls:
- Add weirs and diversion structures
- Add and improve culverts
- Remove causeways

Improve water quality:
- Mix cleaner water into problem areas
- Control surface runoff, add curbs
- Add deep settling basins



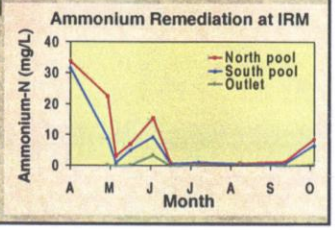
5. Phytoremediation

Extensive phytoremediation taking place with the existing vegetation during the growing season

May be possible to extend growing season by building bioreactors over contaminated springs

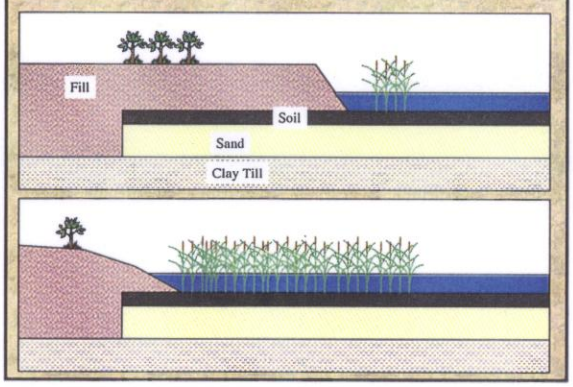
Use dependent on type of contaminant, depth to water, and other factors

May require a harvesting plan if contaminants are transferred to biomass and not destroyed

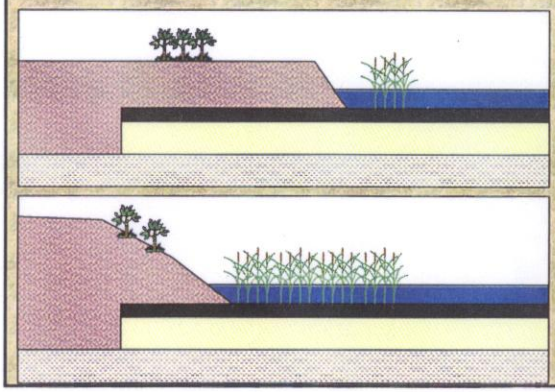


II. Contaminant Source Removal

6. Fill Removal



7. Fill Consolidation

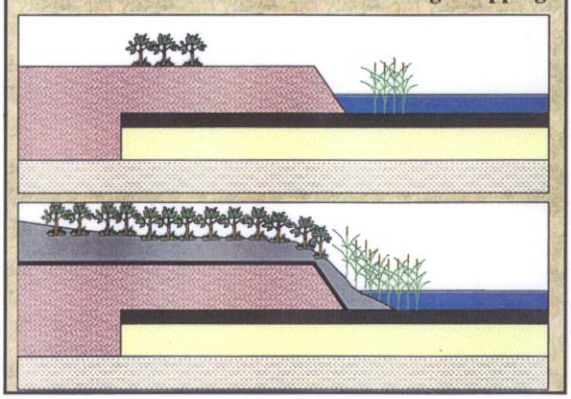


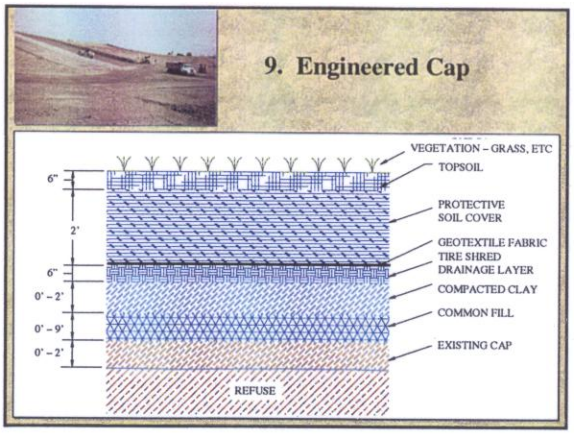
8. Slag Mining

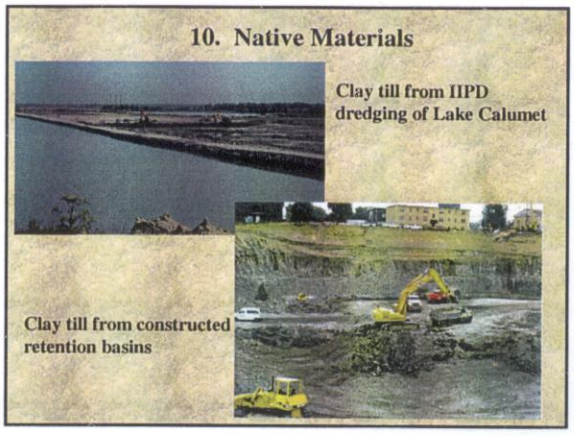
Considerations:

- Type of slag, steel vs iron
- Percent Iron
- Percentage of ingots or large chunks
- Hardness of slag
- Grain size
- Price of scrap iron

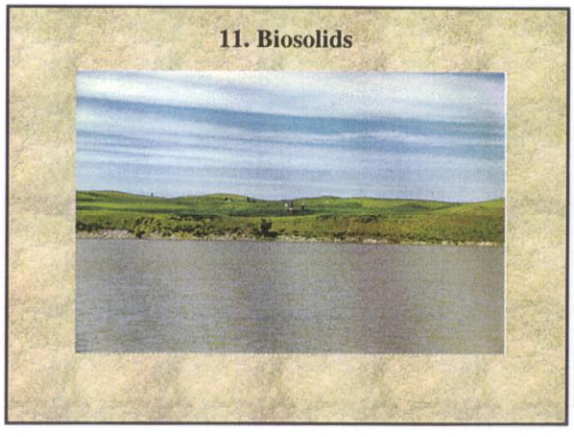
III. Contaminant Source Isolation Through Capping



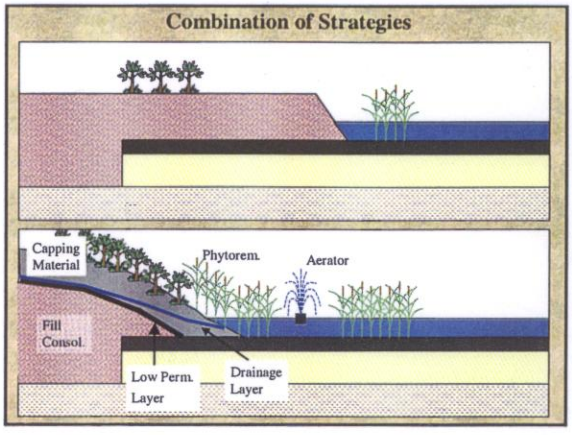

9. Engineered Cap
VEGETATION – GRASS, ETC
TOPSOIL
PROTECTIVE SOIL COVER
GEOTEXTILE FABRIC
TIRE SHRED DRAINAGE LAYER
COMPACTED CLAY
COMMON FILL
EXISTING CAP
REFUSE
6"
2'
6"
0' – 2'
0' – 9'
0' – 2'

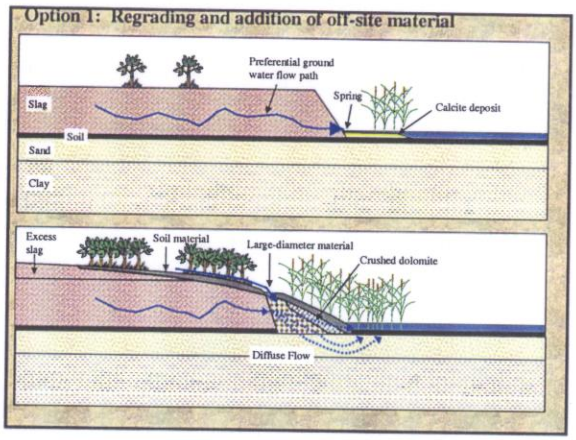

10. Native Materials
Clay till from IIPD dredging of Lake Calumet
Clay till from constructed retention basins

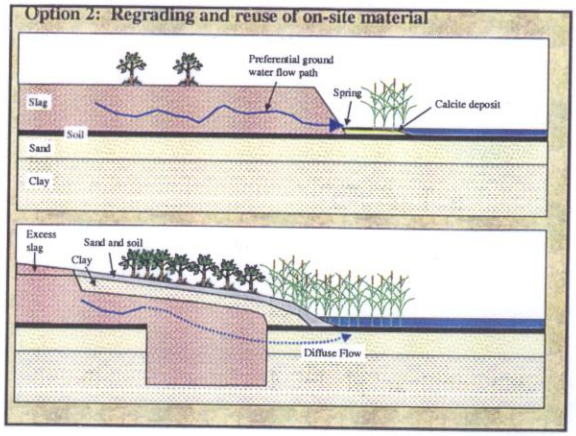
10 cont. Dredgings from Reservoirs


11. Biosolids

12. "Clean" Fill


Combination of Strategies
Capping Material
Phytorem.
Aerator
Fill Consol.
Low Perm. Layer
Drainage Layer





Conclusions

- The wastes used to fill in the wetlands has created a man-made aquifer
- The fill is dissolving and releasing contaminants
- The geochemistry of the ground-water is extremely variable on all scales (regional, site, well screen, grain)
  - Monitoring well data can be misleading
  - Need to prioritize monitoring of discharges
- Discharges can be toxic to aquatic life (plants, fish, bacteria)
- Problems can be mitigated through "12 Step Program"

APPENDIX G

DETAILED REMEDIAL OPTION COST ESTIMATES

Remedial Option Cost Estimate

Lake Calumet Cluster Sites
Chicago, Illinois

Option 2A - Excavate to 3 Feet, Offsite Disposal at Landfill, Clay Cap

ITEM DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	COST	SUBTOTAL
SITE PREPARATION					
Clear and grub	76	AC	$ 3,325	$ 252,700	
Temporary storm water management	1	LS	$ 200,000	$ 200,000	
Erosion Controls (silt fence)	11,280	LF	$ 1.10	$ 12,408	$ 465,108
EXCAVATION *(Level C)*					
Rip subsurface	3,222,000	SF	$ 0.35	$ 1,127,700	
Excavate & load	476,200	CY	$ 2.40	$ 1,142,880	
Construction dewatering		LS		$ 200,000	
Dust/Odor suppresant	3,222,000	SF	$ 0.22	$ 708,840	
Haul & place clean fill	476,200	CY	$ 9.42	$ 4,485,804	$ 7,665,224
SOILS DISPOSAL					
Transport to non-hazardous landfill	476,200	CY	$ 2.92	$ 1,390,504	
Non-hazardous landfill disposal	476,200	CY	$ 27	$12,857,400	
Hazardous waste disposal	2,000	CY	$ 115	$ 230,000	$ 14,477,904
SOIL CAP & VEGETATION					
Clean fill for drainage grading	634,900	CY	$ 9.42	$ 5,980,758	
Topsoil	358,000	SY	$ 3.81	$ 1,363,980	
Vegetation of cover (prairie)	76	AC	$ 1,700	$ 129,200	
Storm sewer to Calumet River n(if needed)	4,500	LF	$ 77	$ 346,500	
Construction of detention pond	1	LS	$ 126,000	$ 126,000	
Surface drainage structures	1	LS	$ 6,000	$ 6,000	$ 7,952,438
ACCESS ROADS/SECURITY FENCING					
Restore onsite access roads	4,000	LF	$ 10.25	$ 41,000	
Security fencing	8,000	LF	$ 14	$ 112,000	$ 153,000
ADDITIONAL GROUNDWATER INVESTIGATION					
Monitoring wells (2 inch diameter x 15 feet deep)	20	EA	$ 1,500	$ 30,000	
Surveying wells	1	LS	$ 3,000	$ 3,000	
Groundwater elevation measurement	20	EA	$ 150	$ 3,000	
Groundwater sampling/analysis	20	EA	$ 3,000	$ 60,000	$ 96,000
CONSTRUCTION SUBTOTAL					**$ 30,344,566**
ENGINEERING & DESIGN (1% of Construction Cost)	1	LS	$ 303,446		$ 303,446
MOBILIZATION/DEMOB (0.5% of Construction Cost)	1	LS	$ 151,723		$ 151,723
HEALTH & SAFETY (2% of Construction Cost)	1	LS	$ 606,891		$ 606,891
CONSTRUCTION OVERSIGHT (2% of Construction Cost)	1	LS	$ 606,891		$ 606,891
CONTINGENCIES (5% of Construction Cost)	1	LS	$ 1,517,228		$ 1,517,228
CLOSURE/DECOMISSIONING (1% of Construction Cost)	1	LS	$ 303,446		$ 303,446
TOTAL CAPITAL COST					**$ 33,834,191**
GROUNDWATER COLLECTION SYSTEM					
Construction Cost	1	LS	$ 3,277,068	$ 3,277,068	
ANNUAL O&M COSTS					
Annual Groundwater System O & M	30	YR	$ 153,584	$ 4,607,520	
Annual Prarie O & M Costs	30	YR	$ 10,000	$ 300,000	
GRAND TOTAL COST					**$ 42,018,779**

Remedial Option Cost Estimate

Lake Calumet Cluster Sites
Chicago, Illinois

Option 2B - Excavate to 3 Feet, Offsite Disposal at Landfill, Clay Cap, Integrated Wetlands

ITEM DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	COST	SUBTOTAL
SITE PREPARATION					
Clear and grub	76	AC	$ 3,325	$ 252,700	
Temporary storm water management	1	LS	$ 200,000	$ 200,000	
Erosion Controls (silt fence)	11,280	LF	$ 1.10	$ 12,408	$ 465,108
EXCAVATION *(Level C)*					
Rip subsurface	358,000	SY	$ 3.15	$ 1,127,700	
Construction dewatering		LS		$ 200,000	
Excavate & load	476,180	CY	$ 2.40	$ 1,142,832	
Dust/Odor suppresant	358,000	SY	$ 1.98	$ 708,840	
Haul & place clean fill	476,180	CY	$ 9.42	$ 4,485,616	$ 7,664,988
SOILS DISPOSAL					
Transport to non-hazardous landfill	476,180	CY	$ 2.92	$ 1,390,446	
Non-hazardous landfill disposal	476,180	CY	$ 27	$ 12,856,860	
Hazardous waste disposal	2,000	CY	$ 115	$ 230,000	$ 14,477,306
SOIL CAP & VEGETATION					
Clean fill for drainage grading	634,900	CY	$ 9.42	$ 5,980,758	
Topsoil	358,000	SY	$ 3.81	$ 1,363,980	
Vegetation of cover (prairie)	46	AC	$ 1,700	$ 78,200	
Surface drainage structures	1	LS	$ 6,000	$ 6,000	$ 7,428,938
ACCESS ROADS/SECURITY FENCING					
Restore onsite access roads	4,000	LF	$ 10.25	$ 41,000	
Security fencing	8,000	LF	$ 14	$ 112,000	$ 153,000
ADDITIONAL GROUNDWATER INVESTIGATION					
Monitoring wells (2 inch diameter x 15 feet deep)	20	EA	$ 1,500	$ 30,000	
Surveying wells	1	LS	$ 3,000	$ 3,000	
Groundwater elevation measurement	20	EA	$ 150	$ 3,000	
Groundwater sampling/analysis	20	EA	$ 3,000	$ 60,000	$ 96,000
INTEGRATED WETLANDS					
Pre-planting & site preparation	30	AC	$ 500	$ 15,000	
Seed install	30	AC	$ 2,500	$ 75,000	
Plug install	30	AC	$ 3,100	$ 93,000	$ 183,000
CONSTRUCTION SUBTOTAL					**$ 30,003,231**
ENGINEERING & DESIGN (1% of Construction Cost)	1	LS	$ 300,032		$ 300,032
MOBILIZATION/DEMOB (0.5% of Construction Cost)	1	LS	$ 150,016		$ 150,016
HEALTH & SAFETY (2% of Construction Cost)	1	LS	$ 600,065		$ 600,065
CONSTRUCTION OVERSIGHT (2% of Construction Cost)	1	LS	$ 600,065		$ 600,065
CONTINGENCIES (5% of Construction Cost)	1	LS	$ 1,500,162		$ 1,500,162
CLOSURE/DECOMISSIONING (1% of Construction Cost)	1	LS	$ 300,032		$ 300,032
TOTAL CAPITAL COST					**$ 33,453,603**
GROUNDWATER COLLECTION SYSTEM					
Construction Cost	1	LS	$ 3,277,068	$ 3,277,068	
ANNUAL O&M COSTS					
Annual Operation & Maintenance	30	YR	$ 153,584	$ 4,607,520	
Annual Wetlands/Prarie O & M Costs	30	YR	$ 15,000	$ 450,000	
GRAND TOTAL COST					**$ 41,788,191**

Remedial Option Cost Estimate
Lake Calumet Cluster Sites
Chicago, Illinois

Option 2C - Excavate to 10 Feet, Offsite Disposal at Landfill, Clay Cap

ITEM DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	COST	SUBTOTAL
SITE PREPARATION					
Clear and grub	76	AC	$ 3,325	$ 252,700	
Temporary storm water management	1	LS	$ 200,000	$ 200,000	
Erosion Controls (silt fence)	11,280	LF	$ 1.10	$ 12,408	$ 465,108
EXCAVATION *(Level C)*					
Rip subsurface	358,000	SY	$ 3.15	$ 1,127,700	
Construction dewatering		LS		$ 500,000	
Excavate & load	1,587,250	CY	$ 1.60	$ 2,539,600	
Dust/Odor suppresant	358,000	SY	$ 1.98	$ 708,840	
Haul & place clean fill	1,587,250	CY	$ 9.07	$ 14,396,358	$ 19,272,498
SOILS DISPOSAL					
Transport to non-hazardous landfill	1,587,250	CY	$ 3.00	$ 4,761,750	
Non-hazardous landfill disposal	1,587,250	CY	$ 27	$ 42,855,750	
Hazardous waste disposal	2,000	CY	$ 115	$ 230,000	$ 47,847,500
SOIL CAP & VEGETATION					
Clean fill for drainage grading	634,900	CY	$ 9.42	$ 5,980,758	
Topsoil	358,000	SY	$ 3.81	$ 1,363,980	
Vegetation of cover (prairie)	76	AC	$ 1,700	$ 129,200	
Storm sewer to Calumet River (if needed)	4,500	LF	$ 77	$ 346,500	
Construction of detention pond	1	LS	$ 126,000	$ 126,000	
Surface drainage structures	1	LS	$ 6,000	$ 6,000	$ 7,952,438
ACCESS ROADS/SECURITY FENCING					
Restore onsite access roads	4,000	LF	$ 10.25	$ 41,000	
Security fencing	8,000	LF	$ 14	$ 112,000	$ 153,000
ADDITIONAL GROUNDWATER INVESTIGATION					
Monitoring wells (2 inch diameter x 15 feet deep)	20	EA	$ 1,500	$ 30,000	
Surveying wells	1	LS	$ 3,000	$ 3,000	
Groundwater elevation measurement	20	EA	$ 150	$ 3,000	
Groundwater sampling/analysis	20	EA	$ 3,000	$ 60,000	$ 96,000
CONSTRUCTION SUBTOTAL					**$ 75,321,436**
ENGINEERING & DESIGN (0.5% of Construction Cost)	1	LS	$ 376,607		$ 376,607
MOBILIZATION/DEMOB (0.5% of Construction Cost)	1	LS	$ 376,607		$ 376,607
HEALTH & SAFETY (1% of Construction Cost)	1	LS	$ 753,214		$ 753,214
CONSTRUCTION OVERSIGHT (1% of Construction Cost)	1	LS	$ 753,214		$ 753,214
CONTINGENCIES (5% of Construction Cost)	1	LS	$ 1,506,429		$ 1,506,429
CLOSURE/DECOMISSIONING (0.5% of Construction Cost)	1	LS	$ 376,607		$ 376,607
TOTAL CAPITAL COST					**$ 79,464,114**
GROUNDWATER COLLECTION SYSTEM					
Construction Cost	1	LS	$ 3,277,068	$ 3,277,068	
ANNUAL O&M COSTS					
Annual Groundwater System O & M	30	YR	$ 153,584	$ 4,607,520	
Annual Prarie O & M Costs	30	YR	$ 10,000	$ 300,000	
GRAND TOTAL COST					**$ 87,648,703**

Remedial Option Cost Estimate

Lake Calumet Cluster Sites
Chicago, Illinois

Option 2D - Excavate to 10 Feet, Offsite Disposal at Landfill, Clay Cap, Integrated Wetlands

ITEM DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	COST	SUBTOTAL
SITE PREPARATION					
Clear and grub	76	AC	$ 3,325	$ 252,700	
Temporary storm water management	1	LS	$ 200,000	$ 200,000	
Erosion Controls (silt fence)	11,280	LF	$ 1.10	$ 12,408	$ 465,108
EXCAVATION *(Level C)*					
Rip subsurface	358,000	SY	$ 3.15	$ 1,127,700	
Construction dewatering		LS		$ 500,000	
Excavate & load	1,587,260	CY	$ 1.60	$ 2,539,616	
Dust/Odor suppresant	358,000	SY	$ 1.98	$ 708,840	
Haul & place clean fill	1,587,260	CY	$ 9.07	$ 14,396,448	$ 19,272,604
SOILS DISPOSAL					
Transport to non-hazardous landfill	1,587,260	CY	$ 3.00	$ 4,761,780	
Non-hazardous landfill disposal	1,587,260	CY	$ 27	$ 42,856,020	
Hazardous waste disposal	2,000	CY	$ 115	$ 230,000	$ 47,847,800
SOIL CAP & VEGETATION					
Clean fill for drainage grading	634,900	CY	$ 9.42	$ 5,980,758	
Topsoil	358,000	SY	$ 3.81	$ 1,363,980	
Vegetation of cover (prairie)	46	AC	$ 1,700	$ 78,200	
Surface drainage structures	1	LS	$ 6,000	$ 6,000	$ 7,428,938
ACCESS ROADS/SECURITY FENCING					
Restore onsite access roads	4,000	LF	$ 10.25	$ 41,000	
Security fencing	8,000	LF	$ 14	$ 112,000	$ 153,000
ADDITIONAL GROUNDWATER INVESTIGATION					
Monitoring wells (2 inch diameter x 15 feet deep)	20	EA	$ 1,500	$ 30,000	
Surveying wells	1	LS	$ 3,000	$ 3,000	
Groundwater elevation measurement	20	EA	$ 150	$ 3,000	
Groundwater sampling/analysis	20	EA	$ 3,000	$ 60,000	$ 96,000
INTEGRATED WETLANDS					
Pre-planting & site preparation	30	AC	$ 500	$ 15,000	
Seed install	30	AC	$ 2,500	$ 75,000	
Plug install	30	AC	$ 3,100	$ 93,000	$ 183,000
CONSTRUCTION SUBTOTAL					**$ 74,981,342**
ENGINEERING & DESIGN (0.5% of Construction Cost)	1	LS	$ 374,907		$ 374,907
MOBILIZATION/DEMOB (0.5% of Construction Cost)	1	LS	$ 374,907		$ 374,907
HEALTH & SAFETY (1% of Construction Cost)	1	LS	$ 749,813		$ 749,813
CONSTRUCTION OVERSIGHT (1% of Construction Cost)	1	LS	$ 749,813		$ 749,813
CONTINGENCIES (5% of Construction Cost)	1	LS	$ 1,499,627		$ 1,499,627
CLOSURE/DECOMISSIONING (0.5% of Construction Cost)	1	LS	$ 374,907		$ 374,907
TOTAL CAPITAL COST					**$ 79,105,316**
GROUNDWATER COLLECTION SYSTEM					
Construction Cost	1	LS	$ 3,277,068	$ 3,277,068	
ANNUAL O&M COSTS					
Annual Groundwater System O & M	30	YR	$ 153,584	$ 4,607,520	
Annual Wetlands/Prarie O & M Costs	30	YR	$ 15,000	$ 450,000	
GRAND TOTAL COST					**$ 87,439,904**

Remedial Option Cost Estimate
Lake Calumet Cluster Sites
Chicago, Illinois

Option 3A - Consolidate Waste Materials, Clean Fill for Grading, Clay Cap

ITEM DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	COST	SUBTOTAL
SITE PREPARATION					
Clear and grub	76	AC	$ 3,325	$ 252,700	
Temporary storm water management	1	LS	$ 200,000	$ 200,000	
Erosion Controls (silt fence)	11,280	LF	$ 1.10	$ 12,408	$ 465,108
WASTE CONSOLIDATION					
Rip subsurface	3,222,000	SF	$ 0.35	$ 1,127,700	
Excavate for reconsolidation	358,000	CY	$ 2.92	$ 1,045,360	
Dust/Odor suppresant	3,222,000	SF	$ 0.22	$ 708,840	
Relocate for grading	358,000	CY	$ 2.80	$ 1,002,400	
Hazardous waste excavate, transport, dispose	2,000	CY	$ 212	$ 424,000	
Final Grade	358,000	CY	$ 1.75	$ 626,500	$ 4,934,800
SOIL CAP & VEGETATION					
Clean fill for drainage grading	317,450	CY	$ 9.42	$ 2,990,379	
Topsoil	358,000	SY	$ 3.81	$ 1,363,980	
Vegetation of cover (prairie)	76	AC	$ 1,700	$ 129,200	
Storm sewer to Calumet River (if needed)	4,500	LF	$ 77	$ 346,500	
Construction of detention pond	1	LS	$ 126,000	$ 126,000	
Surface drainage structures	1	LS	$ 6,000	$ 6,000	$ 4,962,059
ACCESS ROADS/SECURITY FENCING					
Restore onsite access roads	4,000	LF	$ 10.25	$ 41,000	
Security fencing	8,000	LF	$ 14	$ 112,000	$ 153,000
ADDITIONAL GROUNDWATER INVESTIGATION					
Monitoring wells (2 inch diameter x 15 feet deep)	20	EA	$ 1,500	$ 30,000	
Surveying wells	1	LS	$ 3,000	$ 3,000	
Groundwater elevation measurement	20	EA	$ 150	$ 3,000	
Groundwater sampling/analysis	20	EA	$ 3,000	$ 60,000	$ 96,000
CONSTRUCTION SUBTOTAL					**$ 10,610,967**
ENGINEERING & DESIGN (2% of Construction Cost)	1	LS	$ 212,219		$ 212,219
MOBILIZATION/DEMOB (1% of Construction Cost)	1	LS	$ 106,110		$ 106,110
HEALTH & SAFETY (2% of Construction Cost)	1	LS	$ 212,219		$ 212,219
CONSTRUCTION OVERSIGHT (8% of Construction Cost)	1	LS	$ 848,877		$ 848,877
CONTINGENCIES (10% of Construction Cost)	1	LS	$ 1,061,097		$ 1,061,097
CLOSURE/DECOMISSIONING (2% of Construction Cost)	1	LS	$ 212,219		$ 212,219
TOTAL CAPITAL COST					**$ 13,263,709**
GROUNDWATER COLLECTION SYSTEM					
Construction Cost	1	LS	$ 3,277,068	$ 3,277,068	
ANNUAL O&M COSTS					
Annual Groundwater System O & M	30	YR	$ 153,584	$ 4,607,520	
Annual Prarie O & M Costs	30	YR	$ 10,000	$ 300,000	
GRAND TOTAL COST					**$ 21,448,297**

Remedial Option Cost Estimate

Lake Calumet Cluster Sites
Chicago, Illinois

Option 3B - Consolidate Waste Materials, Clay Cap, Integrated Wetlands

ITEM DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	COST	SUBTOTAL
SITE PREPARATION					
Clear and grub	76	AC	$ 3,325	$ 252,700	
Temporary storm water management	1	LS	$ 200,000	$ 200,000	
Erosion Controls (silt fence)	11,280	LF	$ 1.10	$ 12,408	$ 465,108
WASTE CONSOLIDATION					
Rip subsurface	3,222,000	SF	$ 0.35	$ 1,127,700	
Excavate for reconsolidation	358,000	CY	$ 2.92	$ 1,045,360	
Dust/Odor suppresant	3,222,000	SF	$ 0.22	$ 708,840	
Relocate for grading	358,000	CY	$ 2.80	$ 1,002,400	
Hazardous waste excavate, transport, dispose	2,000	CY	$ 212	$ 424,000	
Final Grade	358,000	CY	$ 1.75	$ 626,500	$ 4,934,800
SOIL CAP & VEGETATION					
Clean fill for drainage grading	317,450	CY	$ 9.42	$ 2,990,379	
Topsoil	358,000	SY	$ 3.81	$ 1,363,980	
Vegetation of cover (prairie)	46	AC	$ 1,700	$ 78,200	
Surface drainage structures	1	LS	$ 6,000	$ 6,000	$ 4,438,559
ACCESS ROADS/SECURITY FENCING					
Restore onsite access roads	4,000	LF	$ 10.25	$ 41,000	
Security fencing	8,000	LF	$ 14	$ 112,000	$ 153,000
ADDITIONAL GROUNDWATER INVESTIGATION					
Monitoring wells (2 inch diameter x 15 feet deep)	20	EA	$ 1,500	$ 30,000	
Surveying wells	1	LS	$ 3,000	$ 3,000	
Groundwater elevation measurement	20	EA	$ 150	$ 3,000	
Groundwater sampling/analysis	20	EA	$ 3,000	$ 60,000	$ 96,000
INTEGRATED WETLANDS					
Pre-planting & site preparation	30	AC	$ 500	$ 15,000	
Seed install	30	AC	$ 2,500	$ 75,000	
Plug install	30	AC	$ 3,100	$ 93,000	$ 183,000
CONSTRUCTION SUBTOTAL					**$ 10,270,467**
ENGINEERING & DESIGN (2% of Construction Cost)	1	LS	$ 205,409		$ 205,409
MOBILIZATION/DEMOB (1% of Construction Cost)	1	LS	$ 102,705		$ 102,705
HEALTH & SAFETY (2% of Construction Cost)	1	LS	$ 205,409		$ 205,409
CONSTRUCTION OVERSIGHT (8% of Construction Cost)	1	LS	$ 821,637		$ 821,637
CONTINGENCIES (10% of Construction Cost)	1	LS	$ 1,027,047		$ 1,027,047
CLOSURE/DECOMISSIONING (2% of Construction Cost)	1	LS	$ 205,409		$ 205,409
TOTAL CAPITAL COST					**$ 12,838,084**
GROUNDWATER COLLECTION SYSTEM					
Construction Cost	1	LS	$ 3,277,068	$ 3,277,068	
ANNUAL O&M COSTS					
Annual Groundwater System O & M	30	YR	$ 153,584	$ 4,607,520	
Annual Wetlands/Prarie O & M Costs	30	YR	$ 15,000	$ 450,000	
GRAND TOTAL COST					**$ 21,172,672**

Remedial Option Cost Estimate

Lake Calumet Cluster Sites
Chicago, Illinois

Option 3C - Consolidate Waste Materials, Geosythetic Clay Liner (GCL) Cap

ITEM DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	COST	SUBTOTAL
SITE PREPARATION					
Clear and grub	76	AC	$ 3,325	$ 252,700	
Temporary storm water management	1	LS	$ 200,000	$ 200,000	
Erosion Controls (silt fence)	11,280	LF	$ 1.10	$ 12,408	$ 465,108
WASTE CONSOLIDATION					
Rip subsurface	3,222,000	SF	$ 0.35	$ 1,127,700	
Excavate for reconsolidation	358,000	CY	$ 2.92	$ 1,045,360	
Dust/Odor suppresant	3,222,000	SF	$ 0.22	$ 708,840	
Relocate for grading	358,000	CY	$ 2.80	$ 1,002,400	
Hazardous waste excavate, transport, dispose	2,000	CY	$ 212	$ 424,000	
Final Grade	358,000	CY	$ 1.75	$ 626,500	$ 4,934,800
SOIL CAP & VEGETATION					
Topsoil	358,000	SY	$ 3.81	$ 1,363,980	
Vegetation of cover (prairie)	76	AC	$ 1,700	$ 129,200	
Geosythetic clay liner	3,222,000	SF	$ 1.35	$ 4,349,700	
Sand bedding layer (6-inches)	358,000	SY	$ 1.96	$ 701,680	
Geotextile layer (6 oz)	358,000	SY	$ 1.07	$ 383,060	
Clay Layer above drainage layer	358,000	SY	$ 12.40	$ 4,439,200	
Storm sewer to Calumet River (if needed)	4,500	LF	$ 77	$ 346,500	
Construction of detention pond	1	LS	$ 126,000	$ 126,000	
Surface drainage structures	1	LS	$ 6,000	$ 6,000	$ 11,845,320
ACCESS ROADS/SECURITY FENCING					
Restore onsite access roads	4,000	LF	$ 10.25	$ 41,000	
Security fencing	8,000	LF	$ 14	$ 112,000	$ 153,000
ADDITIONAL GROUNDWATER INVESTIGATION					
Monitoring wells (2 inch diameter x 15 feet deep)	20	EA	$ 1,500	$ 30,000	
Surveying wells	1	LS	$ 3,000	$ 3,000	
Groundwater elevation measurement	20	EA	$ 150	$ 3,000	
Groundwater sampling/analysis	20	EA	$ 3,000	$ 60,000	$ 96,000
CONSTRUCTION SUBTOTAL					**$ 17,494,228**
ENGINEERING & DESIGN (2% of Construction Cost)	1	LS	$ 349,885		$ 349,885
MOBILIZATION/DEMOB (1% of Construction Cost)	1	LS	$ 174,942		$ 174,942
HEALTH & SAFETY (2% of Construction Cost)	1	LS	$ 349,885		$ 349,885
CONSTRUCTION OVERSIGHT (8% of Construction Cost)	1	LS	$ 1,399,538		$ 1,399,538
CONTINGENCIES (10% of Construction Cost)	1	LS	$ 1,749,423		$ 1,749,423
CLOSURE/DECOMISSIONING (2% of Construction Cost)	1	LS	$ 349,885		$ 349,885
TOTAL CAPITAL COST					**$ 21,867,785**
GROUNDWATER COLLECTION SYSTEM					
Construction Cost	1	LS	$ 3,277,068	$ 3,277,068	
ANNUAL O&M COSTS					
Annual Groundwater System O & M	30	YR	$ 153,584	$ 4,607,520	
Annual Prarie O & M Costs	30	YR	$ 10,000	$ 300,000	
GRAND TOTAL COST					**$ 30,052,373**

Remedial Option Cost Estimate

Lake Calumet Cluster Sites
Chicago, Illinois

Option 3D - Consolidate Waste Materials, Flexible Membrane Liner (FML) Cap

ITEM DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	COST	SUBTOTAL
SITE PREPARATION					
Clear and grub	76	AC	$ 3,325	$ 252,700	
Temporary storm water management	1	LS	$ 200,000	$ 200,000	
Erosion Controls (silt fence)	11,280	LF	$ 1.10	$ 12,408	$ 465,108
WASTE CONSOLIDATION					
Rip subsurface	3,222,000	SF	$ 0.35	$ 1,127,700	
Excavate for reconsolidation	358,000	CY	$ 2.92	$ 1,045,360	
Dust/Odor suppresant	3,222,000	SF	$ 0.22	$ 708,840	
Relocate for grading	358,000	CY	$ 2.80	$ 1,002,400	
Hazardous waste excavate, transport, dispose	2,000	CY	$ 212	$ 424,000	
Final Grade	358,000	CY	$ 1.75	$ 626,500	$ 4,934,800
SOIL CAP & VEGETATION					
Topsoil	358,000	SY	$ 3.81	$ 1,363,980	
Vegetation of cover (prairie)	76	AC	$ 1,700	$ 129,200	
Flexible membrane liner	3,222,000	SF	$ 2.89	$ 9,311,580	
Sand bedding layer (6-inches)	358,000	SY	$ 1.96	$ 701,680	
Geotextile layer (6 oz)	358,000	SY	$ 1.07	$ 383,060	
Clay Layer above drainage layer	358,000	SY	$ 12.40	$ 4,439,200	
Storm sewer to Calumet River (if needed)	4,500	LF	$ 77	$ 346,500	
Construction of detention pond	1	LS	$ 126,000	$ 126,000	
Surface drainage structures	1	LS	$ 6,000	$ 6,000	$ 16,807,200
ACCESS ROADS/SECURITY FENCING					
Restore onsite access roads	4,000	LF	$ 10.25	$ 41,000	
Security fencing	8,000	LF	$ 14	$ 112,000	$ 153,000
ADDITIONAL GROUNDWATER INVESTIGATION					
Monitoring wells (2 inch diameter x 15 feet deep)	20	EA	$ 1,500	$ 30,000	
Surveying wells	1	LS	$ 3,000	$ 3,000	
Groundwater elevation measurement	20	EA	$ 150	$ 3,000	
Groundwater sampling/analysis	20	EA	$ 3,000	$ 60,000	$ 96,000
CONSTRUCTION SUBTOTAL					**$ 22,456,108**
ENGINEERING & DESIGN (2% of Construction Cost)	1	LS	$ 449,122		$ 449,122
MOBILIZATION/DEMOB (1% of Construction Cost)	1	LS	$ 224,561		$ 224,561
HEALTH & SAFETY (2% of Construction Cost)	1	LS	$ 449,122		$ 449,122
CONSTRUCTION OVERSIGHT (8% of Construction Cost)	1	LS	$ 1,796,489		$ 1,796,489
CONTINGENCIES (10% of Construction Cost)	1	LS	$ 2,245,611		$ 2,245,611
CLOSURE/DECOMISSIONING (2% of Construction Cost)	1	LS	$ 449,122		$ 449,122
TOTAL CAPITAL COST					**$ 28,070,135**
GROUNDWATER COLLECTION SYSTEM					
Construction Cost	1	LS	$ 3,277,068	$ 3,277,068	
ANNUAL O&M COSTS					
Annual Operation & Maintenance	30	YR	$ 153,584	$ 4,607,520	
Annual Prarie O & M Costs	30	YR	$ 10,000	$ 300,000	
GRAND TOTAL COST					**$ 36,254,723**

Remedial Option Cost Estimate

Lake Calumet Cluster Sites
Chicago, Illinois

Option 3E - Consolidate Waste Materials, Flexible Membrane Liner (FML) Cap, Integrated Wetlands

ITEM DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	COST	SUBTOTAL
SITE PREPARATION					
Clear and grub	76	AC	$ 3,325	$ 252,700	
Temporary storm water management	1	LS	$ 200,000	$ 200,000	
Erosion Controls (silt fence)	11,280	LF	$ 1.10	$ 12,408	$ 465,108
WASTE CONSOLIDATION					
Rip subsurface	3,222,000	SF	$ 0.35	$ 1,127,700	
Excavate for reconsolidation	358,000	CY	$ 2.92	$ 1,045,360	
Dust/Odor suppresant	3,222,000	SF	$ 0.22	$ 708,840	
Relocate for grading	358,000	CY	$ 2.80	$ 1,002,400	
Hazardous waste excavate, transport, dispose	2,000	CY	$ 212	$ 424,000	
Final Grade	358,000	CY	$ 1.75	$ 626,500	$ 4,934,800
SOIL CAP & VEGETATION					
Topsoil	358,000	SY	$ 3.81	$ 1,363,980	
Vegetation of cover (prairie)	46	AC	$ 1,700	$ 78,200	
Flexible membrane liner	3,222,000	SF	$ 2.89	$ 9,311,580	
Sand bedding layer (6-inches)	358,000	SY	$ 1.96	$ 701,680	
Geotextile layer (6 oz)	358,000	SY	$ 1.07	$ 383,060	
Clay Layer above drainage layer	358,000	SY	$ 12.40	$ 4,439,200	
Surface drainage structures	1	LS	$ 6,000	$ 6,000	$ 16,283,700
ACCESS ROADS/SECURITY FENCING					
Restore onsite access roads	4,000	LF	$ 10.25	$ 41,000	
Security fencing	8,000	LF	$ 14	$ 112,000	$ 153,000
ADDITIONAL GROUNDWATER INVESTIGATION					
Monitoring wells (2 inch diameter x 15 feet deep)	20	EA	$ 1,500	$ 30,000	
Surveying wells	1	LS	$ 3,000	$ 3,000	
Groundwater elevation measurement	20	EA	$ 150	$ 3,000	
Groundwater sampling/analysis	20	EA	$ 3,000	$ 60,000	$ 96,000
INTEGRATED WETLANDS					
Pre-planting & site preparation	30	AC	$ 500	$ 15,000	
Seed install	30	AC	$ 2,500	$ 75,000	
Plug install	30	AC	$ 3,100	$ 93,000	$ 183,000
CONSTRUCTION SUBTOTAL					**$ 22,115,608**
ENGINEERING & DESIGN (2% of Construction Cost)	1	LS	$ 442,312		$ 442,312
MOBILIZATION/DEMOB (1% of Construction Cost)	1	LS	$ 221,156		$ 221,156
HEALTH & SAFETY (2% of Construction Cost)	1	LS	$ 442,312		$ 442,312
CONSTRUCTION OVERSIGHT (8% of Construction Cost)	1	LS	$ 1,769,249		$ 1,769,249
CONTINGENCIES (10% of Construction Cost)	1	LS	$ 2,211,561		$ 2,211,561
CLOSURE/DECOMISSIONING (2% of Construction Cost)	1	LS	$ 442,312		$ 442,312
TOTAL CAPITAL COST					**$ 27,644,510**
GROUNDWATER COLLECTION SYSTEM					
Construction Cost	1	LS	$ 3,277,068	$ 3,277,068	
ANNUAL O&M COSTS					
Annual Operation & Maintenance	30	YR	$ 153,584	$ 4,607,520	
Annual Wetlands/Prarie O & M Costs	30	YR	$ 15,000	$ 450,000	
GRAND TOTAL COST					**$ 35,979,098**

Remedial Option Cost Estimate
Lake Calumet Cluster Sites
Chicago, Illinois

Option 4A - Cover Existing Waste Materials, Clean Fill for Grading, Clay Cap

ITEM DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	COST	SUBTOTAL
SITE PREPARATION					
Clear and grub	76	AC	$ 3,325	$ 252,700	
Temporary storm water managemen	1	LS	$ 200,000	$ 200,000	
Erosion Controls (silt fence)	11,280	LF	$ 1.10	$ 12,408	$ 465,108
WASTE CONSOLIDATION					
Rip subsurface	387,000	SF	$ 0.35	$ 135,450	
Excavate for reconsolidation	43,000	CY	$ 2.92	$ 125,560	
Dust/Odor suppresant	387,000	SF	$ 0.22	$ 85,140	
Relocate for grading	43,000	CY	$ 2.80	$ 120,400	
Hazardous waste excavate, transport, dispose	2,000	CY	$ 212	$ 424,000	
Final Grade	43,000	CY	$ 1.75	$ 75,250	$ 965,800
SOIL CAP & VEGETATION					
Clean fill for drainage grading	475,200	CY	$ 9.42	$ 4,476,384	
Topsoil	358,000	SY	$ 3.81	$ 1,363,980	
Vegetation of cover (prairie)	76	AC	$ 1,700	$ 129,200	
Storm sewer to Calumet River (if needed)	4,500	LF	$ 77	$ 346,500	
Construction of detention pond	1	LS	$ 126,000	$ 126,000	
Surface drainage structures	1	LS	$ 6,000	$ 6,000	$ 6,448,064
ACCESS ROADS/SECURITY FENCING					
Restore onsite access roads	4,000	LF	$ 10.25	$ 41,000	
Security fencing	8,000	LF	$ 14	$ 112,000	$ 153,000
ADDITIONAL GROUNDWATER INVESTIGATION					
Monitoring wells (2 inch diameter x 15 feet deep)	20	EA	$ 1,500	$ 30,000	
Surveying wells	1	LS	$ 3,000	$ 3,000	
Groundwater elevation measurement	20	EA	$ 150	$ 3,000	
Groundwater sampling/analysis	20	EA	$ 3,000	$ 60,000	$ 96,000
CONSTRUCTION SUBTOTAL					**$ 8,127,972**
ENGINEERING & DESIGN (2% of Construction Cost)	1	LS	$ 162,559		$ 162,559
MOBILIZATION/DEMOB (1% of Construction Cost)	1	LS	$ 81,280		$ 81,280
HEALTH & SAFETY (2% of Construction Cost)	1	LS	$ 162,559		$ 162,559
CONSTRUCTION OVERSIGHT (8% of Construction Cost)	1	LS	$ 650,238		$ 650,238
CONTINGENCIES (10% of Construction Cost)	1	LS	$ 812,797		$ 812,797
CLOSURE/DECOMISSIONING (2% of Construction Cost)	1	LS	$ 162,559		$ 162,559
TOTAL CAPITAL COST					**$ 10,159,965**
GROUNDWATER COLLECTION SYSTEM					
Construction Cost	1	LS	$ 3,277,068	$ 3,277,068	
ANNUAL O&M COSTS					
Annual Groundwater System O & M	30	YR	$ 153,584	$ 4,607,520	
Annual Prarie O & M Costs	30	YR	$ 10,000	$ 300,000	
GRAND TOTAL COST					**$ 18,344,553**

Remedial Option Cost Estimate

Lake Calumet Cluster Sites
Chicago, Illinois

Option 4B - Cover Existing Waste Materials, Clay Cap, Integrated Wetlands

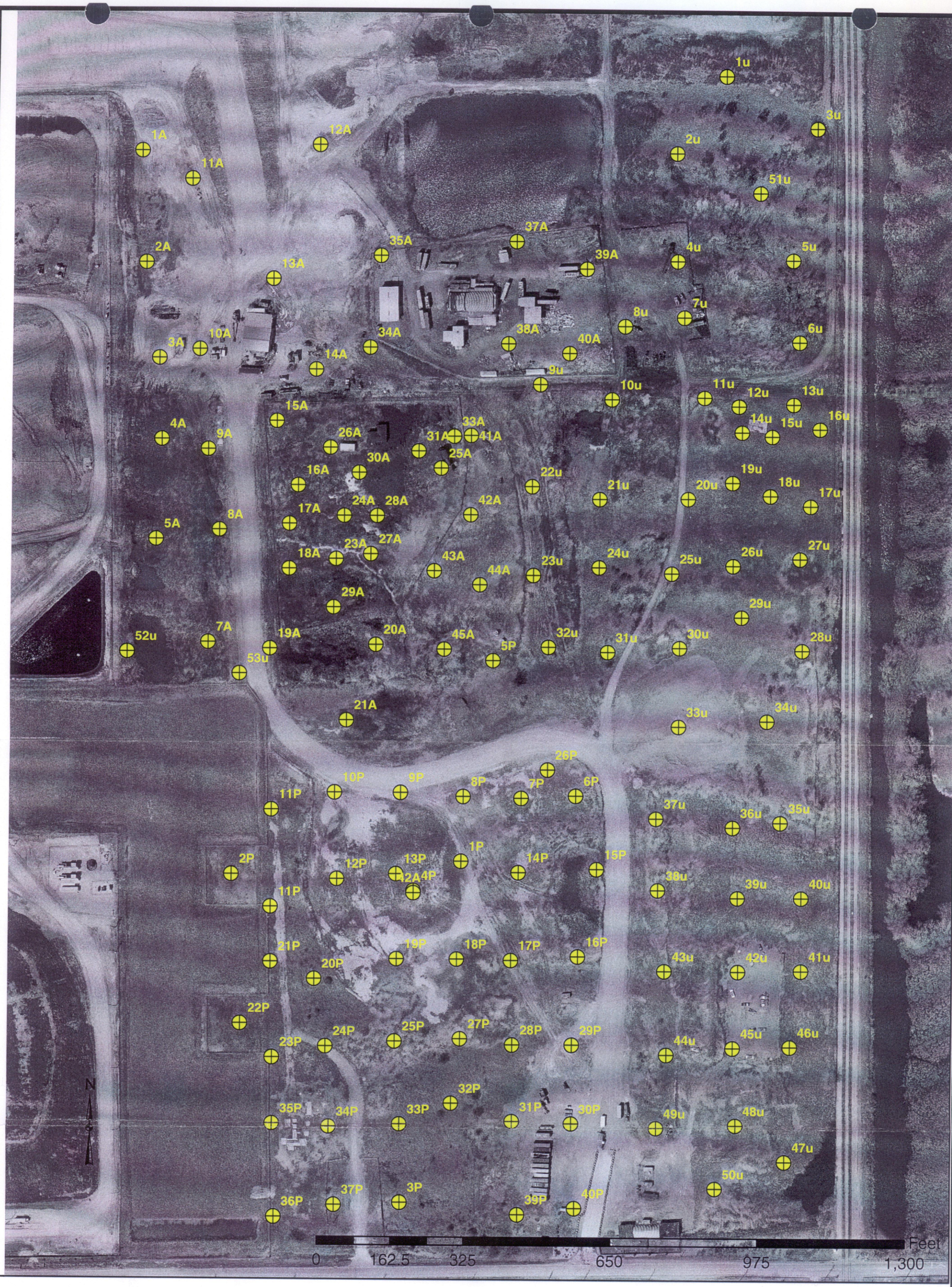
ITEM DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	COST	SUBTOTAL
SITE PREPARATION					
Clear and grub	76	AC	$ 3,325	$ 252,700	
Temporary storm water management	1	LS	$ 200,000	$ 200,000	
Erosion Controls (silt fence)	11,280	LF	$ 1.10	$ 12,408	$ 465,108
WASTE CONSOLIDATION					
Rip subsurface	387,000	SF	$ 0.35	$ 135,450	
Excavate for reconsolidation	43,000	CY	$ 2.92	$ 125,560	
Dust/Odor suppresant	387,000	SF	$ 0.22	$ 85,140	
Relocate for grading	43,000	CY	$ 2.80	$ 120,400	
Hazardous waste excavate, transport, dispose	2,000	CY	$ 212	$ 424,000	
Final Grade	43,000	CY	$ 1.75	$ 75,250	$ 965,800
SOIL CAP & VEGETATION					
Clean fill for drainage grading	475,920	CY	$ 9.42	$ 4,483,166	
Topsoil	358,000	SY	$ 3.81	$ 1,363,980	
Vegetation of cover (prairie)	46	AC	$ 1,700	$ 78,200	
Surface drainage structures	1	LS	$ 6,000	$ 6,000	$ 5,931,346
ACCESS ROADS/SECURITY FENCING					
Restore onsite access roads	4,000	LF	$ 10.25	$ 41,000	
Security fencing	8,000	LF	$ 14	$ 112,000	$ 153,000
ADDITIONAL GROUNDWATER INVESTIGATION					
Monitoring wells (2 inch diameter x 15 feet deep)	20	EA	$ 1,500	$ 30,000	
Surveying wells	1	LS	$ 3,000	$ 3,000	
Groundwater elevation measurement	20	EA	$ 150	$ 3,000	
Groundwater sampling/analysis	20	EA	$ 3,000	$ 60,000	$ 96,000
INTEGRATED WETLANDS					
Pre-planting & site preparation	30	AC	$ 500	$ 15,000	
Seed install	30	AC	$ 2,500	$ 75,000	
Plug install	30	AC	$ 3,100	$ 93,000	$ 183,000
CONSTRUCTION SUBTOTAL					**$ 7,794,254**
ENGINEERING & DESIGN (2% of Construction Cost)	1	LS	$ 155,885		$ 155,885
MOBILIZATION/DEMOB (1% of Construction Cost)	1	LS	$ 77,943		$ 77,943
HEALTH & SAFETY (2% of Construction Cost)	1	LS	$ 155,885		$ 155,885
CONSTRUCTION OVERSIGHT (8% of Construction Cost)	1	LS	$ 623,540		$ 623,540
CONTINGENCIES (10% of Construction Cost)	1	LS	$ 779,425		$ 779,425
CLOSURE/DECOMISSIONING (2% of Construction Cost)	1	LS	$ 155,885		$ 155,885
TOTAL CAPITAL COST					**$ 9,742,818**
GROUNDWATER COLLECTION SYSTEM					
Construction Cost	1	LS	$ 3,277,068	$ 3,277,068	
ANNUAL O&M COSTS					
Annual Groundwater System O & M	30	YR	$ 153,584	$ 4,607,520	
Annual Wetlands/Prarie O & M Costs	30	YR	$ 15,000	$ 450,000	
GRAND TOTAL COST					**$ 18,077,406**

Remedial Option Cost Estimate
Lake Calumet Cluster Sites
Chicago, Illinois

Groundwater Containment System

ITEM DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	COST	SUBTOTAL
SLURRY WALL CONSTRUCTION					
Slurry Wall Construction (3' x 30' deep)	5,640	LF	$ 254.00	$ 1,432,560	
Relocate Trench Spoils for Grading	18,800	CY	$ 2.80	$ 52,640	$ 1,485,200
GROUNDWATER COLLECTION TRENCH					
Rip subsurface	1,880	SY	$ 3.15	$ 5,922	
Trench Construction (2' x 15' deep)	5,640	LF	$ 11.96	$ 67,437	
Construction dewatering		L.S.		$ 75,000	
Pea gravel backfill	5,076	CY	$ 23	$ 116,748	
Sumps/Concrete Covers	28	EA	$ 2,500	$ 70,500	
Geotextile cover for pea gravel	11,280	SF	$ 0.26	$ 2,933	
Clean soil backfill	1,410	CY	$ 9.07	$ 12,789	$ 345,407
GROUNDWATER RECOVERY SYSTEM					
Submersible pumps (5 gpm each)	28	EA	$ 2,600	$ 73,320	
HDPE discharge piping (2-inch diameter) to lift station	6,140	LF	$ 11.50	$ 70,610	
HDPE force main to POTW (6-inch diameter)	4,740	LF	$ 15.00	$ 71,100	
Valves & fittings	141	EA	$ 25.00	$ 3,525	
Lift Station/Transfer Pump	1	EA	$ 120,000	$ 120,000	
Electrical System & Connection	1	LS	$ 75,000	$ 75,000	
Control Building & Concrete slab	2	LS	$ 40,000	$ 80,000	$ 493,555
CONSTRUCTION SUBTOTAL					**$ 2,324,162**
ENGINEERING & DESIGN (5% of Construction Cost)	1	LS	$ 116,208		$ 116,208
MOBILIZATION/DEMOB (1% of Construction Cost)	1	LS	$ 23,242		$ 23,242
HEALTH & SAFETY (2% of Construction Cost)	1	LS	$ 46,483		$ 46,483
CONSTRUCTION OVERSIGHT (10% of Construction Cost)	1	LS	$ 232,416		$ 232,416
CONTINGENCIES (20% of Construction Cost)	1	LS	$ 464,832		$ 464,832
CLOSURE/DECOMISSIONING (3% of Construction Cost)	1	LS	$ 69,725		$ 69,725
TOTAL CAPITAL COST					**$ 3,277,068**
ANNUAL OPERATION & MAINTENANCE					
Operation, Maintenance & Monitoring	30	YR	$ 25,000	$ 750,000	
Utilities - Electricity	30	YR	$ 30,000	$ 900,000	
Discharge of Water to POTW ($0.1/100 gallons)	30	YR	$ 73,584	$ 2,207,520	
Periodic Repair & Maintenance	30	YR	$ 10,000	$ 300,000	
Project Management/Reporting	30	YR	$ 15,000	$ 450,000	$ 4,607,520
GRAND TOTAL COST					**$ 7,884,588**

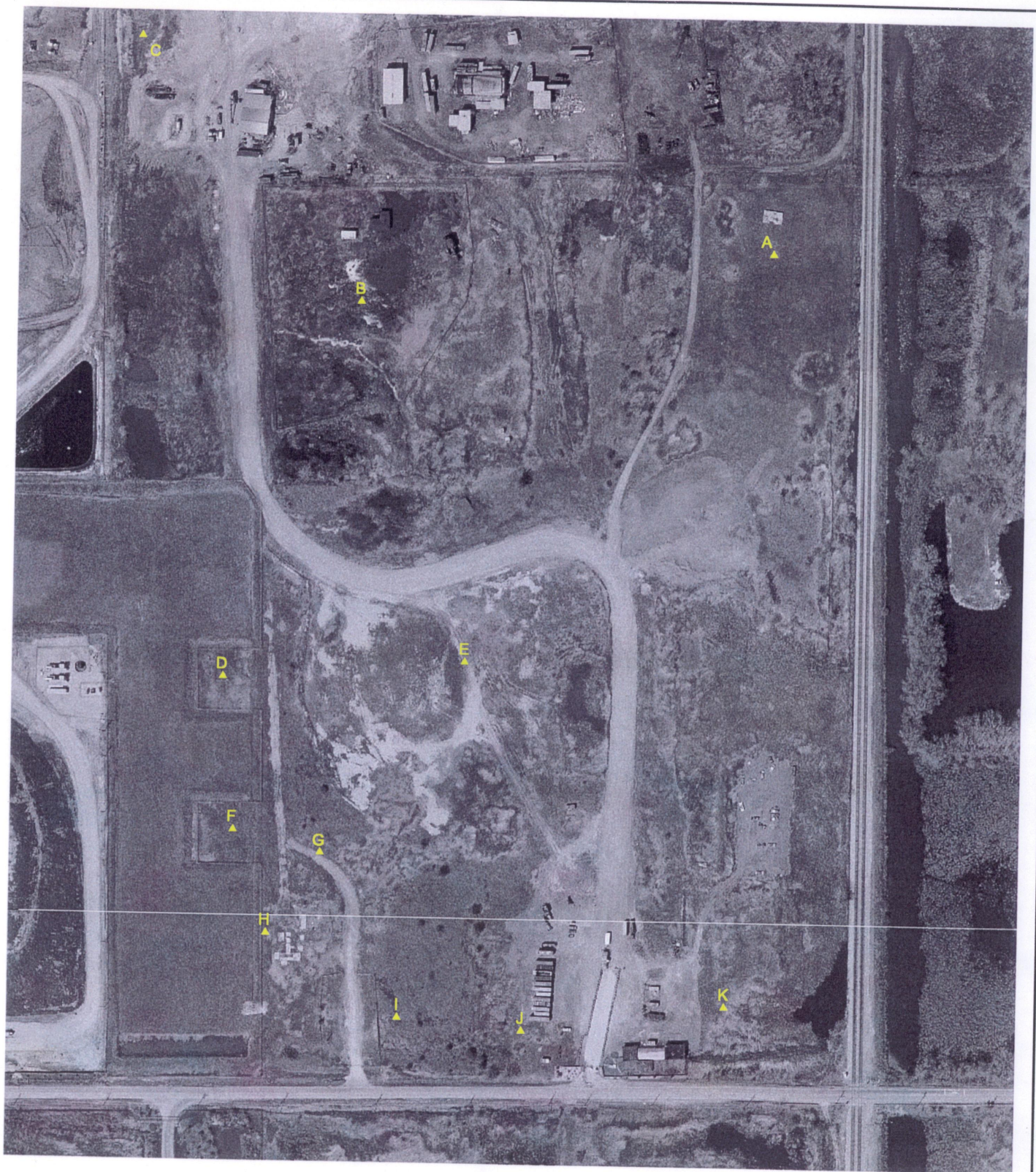
FIGURES



Southeast Chicago Cluster Site
TEST PIT LOCATIONS
Figure 2-1

Clayton GROUP SERVICES

PAXTON_TOLUENE_FNL_0-10FT.MXD
DATE: 02/26/02
Data Source: IEPA Spreadsheet



300 0 300 Feet

N

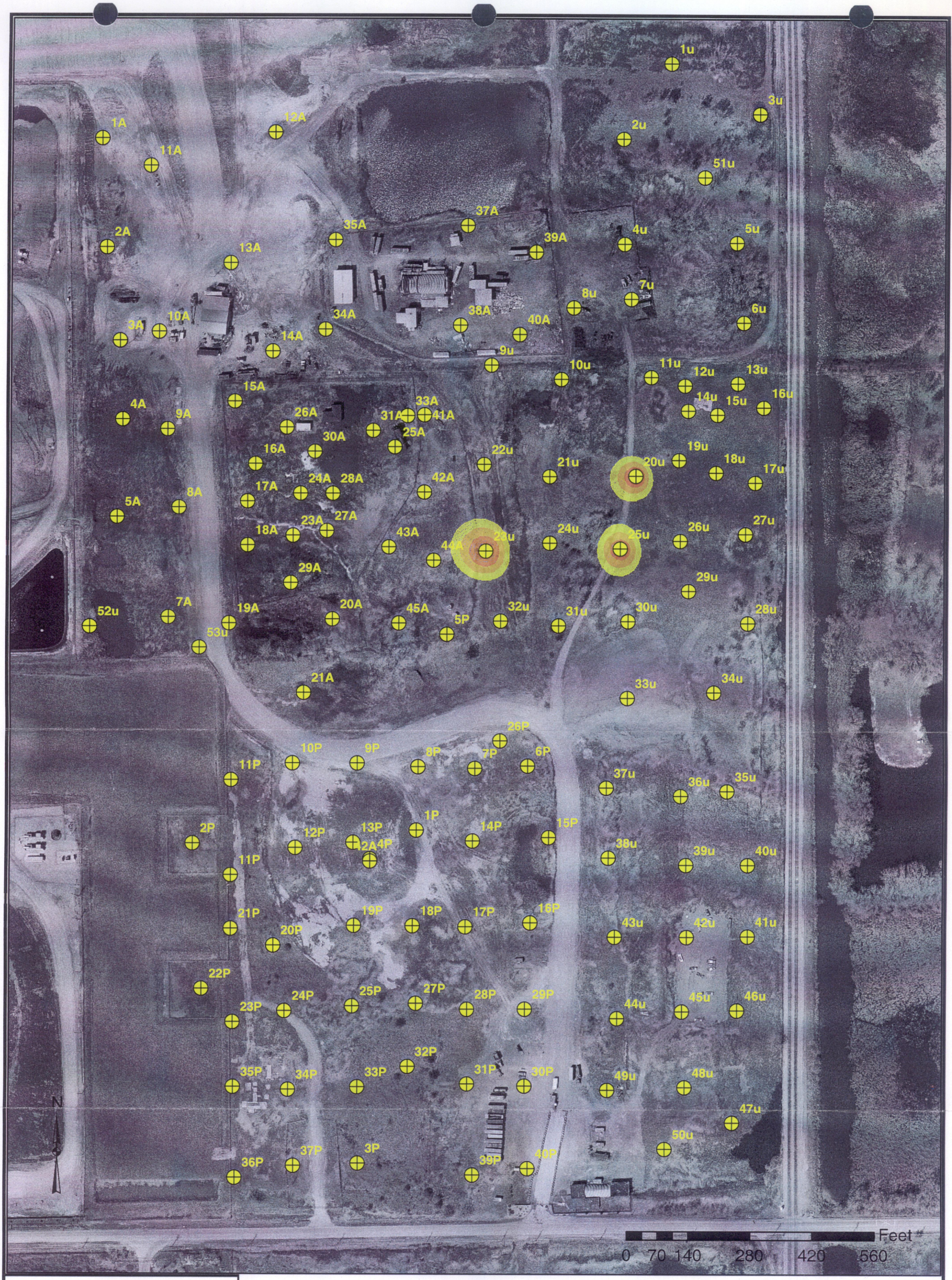
Clayton - Illinois EPA Test
Pit Location Map (May 11, 2001)

Southeast Chicago Cluster Site
Chicago, Illinois

Note:

Aerial photography - Cook County, Illinois.
Map Projection is Illinois State Plane - East
NAD 83

CHECKED BY:	Clayton Group Services
DRAWN BY: SRS	
DATE: 2/27/02	
SCALE: AS SHOWN	
MAP ID.: Test Pit.apr	
PROJECT NO.: 15-01019	Figure: 2-2



Legend

CONCENTRATION

(≥ 61 mg/kg) - TACO Tier 1
Construction Worker Ingestion SRO

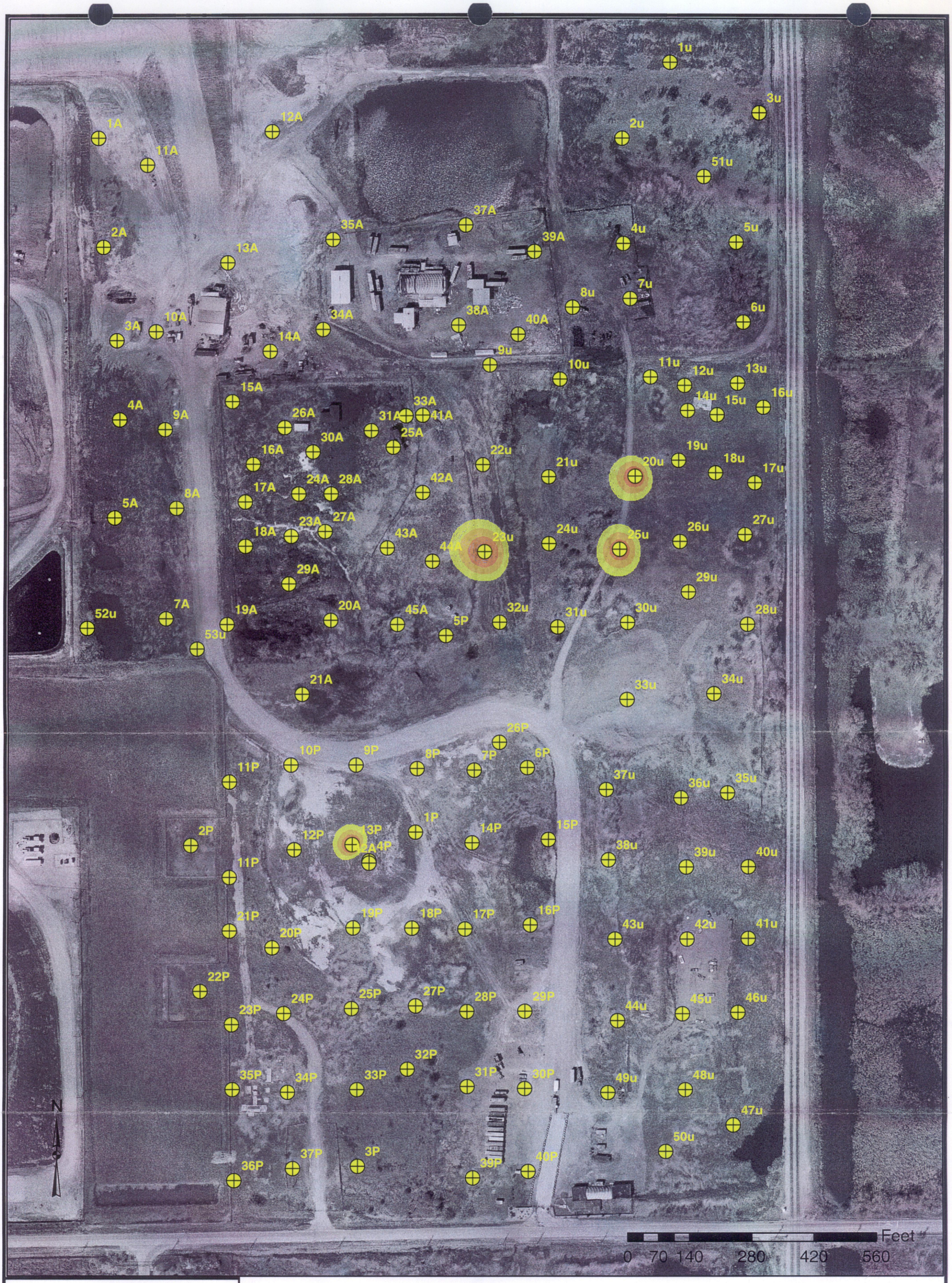
- 61 - 69
- 70 - 79
- 80 - 89
- 90 - 99

Southeast Chicago Cluster Site
ARSENIC: 0 to 3 FEET
Figure 2-3

TOTAL CUBIC YARDS: 489.05

Clayton GROUP SERVICES

PAXTON_ARSENIC_FNL_3FT.MXD
DATE: 02/26/02
Data Source: IEPA Spreadsheet



Legend

CONCENTRATION

(≥ 61 mg/kg) - TACOTier 1 Construction Worker Ingestion SRO

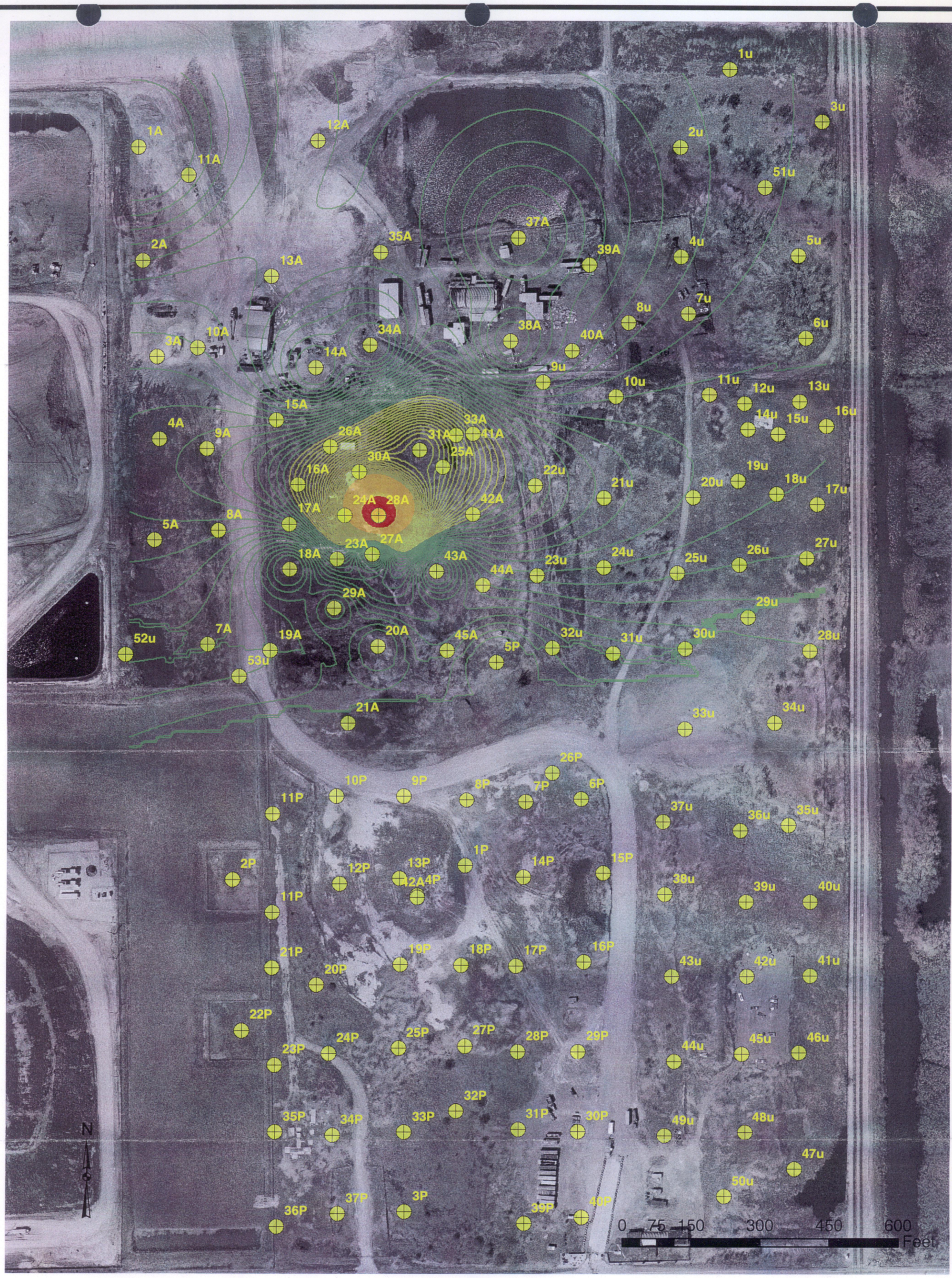
- 61 - 69
- 70 - 79
- 80 - 89
- 90 - 99

Southeast Chicago Cluster Site
ARSENIC: 0 to 10 FEET
Figure 2-4

TOTAL CUBIC YARDS: 1,630.15

Clayton GROUP SERVICES

PAXTON_ARSENIC_FNL_3FT.MXD
DATE: 02/26/02
Data Source: IEPA Spreadsheet



Legend

CONCENTRATION

(≥ 1,600 ug/kg) - TACO Tier 1
Industrial-Commercial Inhalation SRO

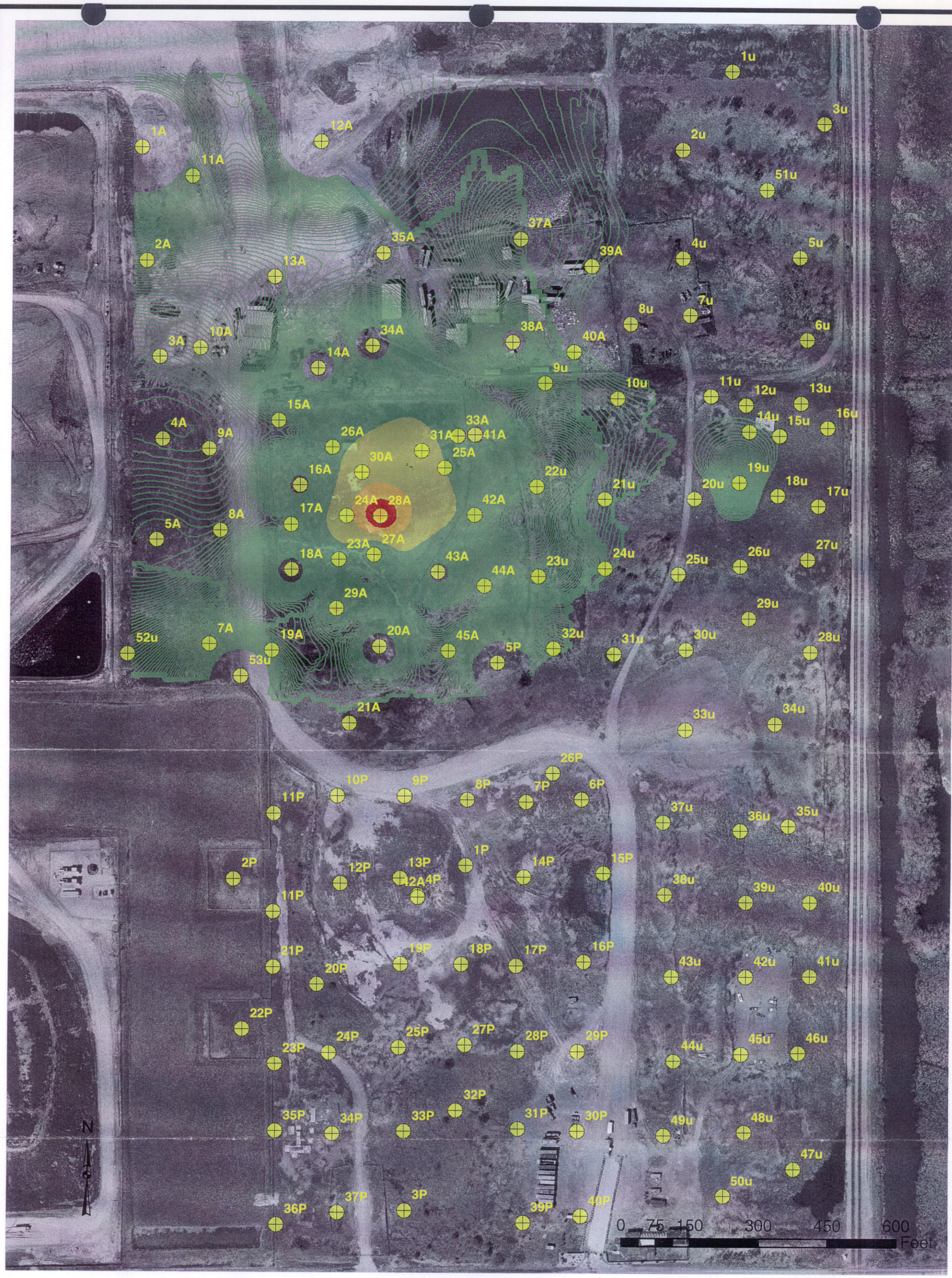
- 1600 - 18000
- 18001 - 42800
- 42801 - 67200
- 67201 - 91500

Southeast Chicago Cluster Site
BENZENE: 0 to 3 FEET
Figure 2-5

TOTAL CUBIC YARDS: 220,845.51

Clayton GROUP SERVICES

PAXTON_BENZENE_FNL_3FT.MXD
DATE: 02/26/02
Data Source: IEPA Spreadsheet



Legend

CONCENTRATION
(≥ 1,600 ug/kg) - TACO Tier 1
Industrial-Commercial Inhalation SRO

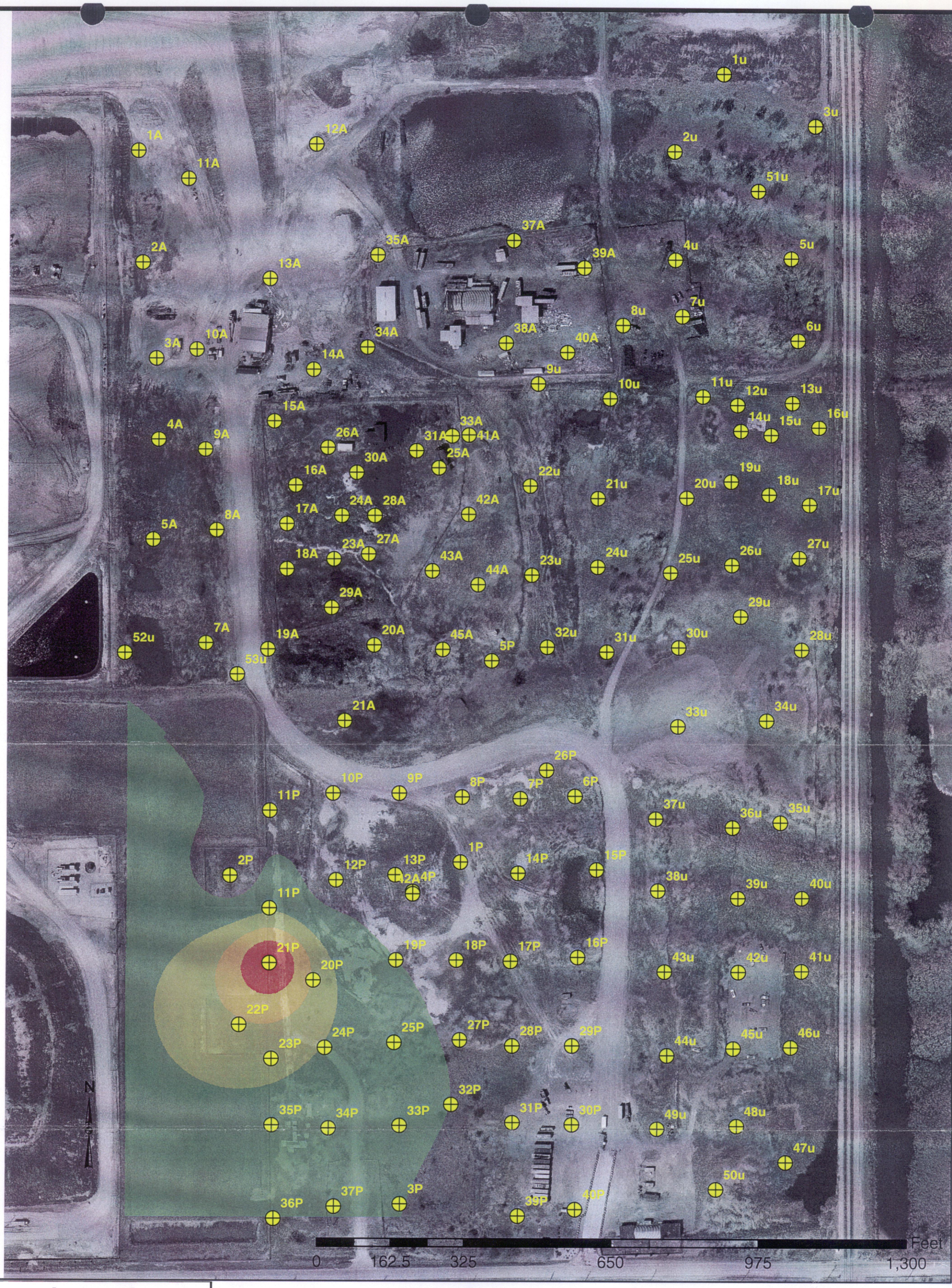
- 1600 - 18000
- 18001 - 42800
- 42801 - 67200
- 67201 - 91500

Southeast Chicago Cluster Site
BENZENE: 0 to 10 FEET
Figure 2-6

TOTAL CUBIC YARDS: 683,453.65

Clayton GROUP SERVICES

PAXTON_BENZENE_FNL_3FT.MXD
DATE: 02/26/02
Data Source: IEPA Spreadsheet



Legend

CONCENTRATION
(≥ 650,000 ug/kg) - TACO Tier 1
Industrial-Commercial Ingestion SRO

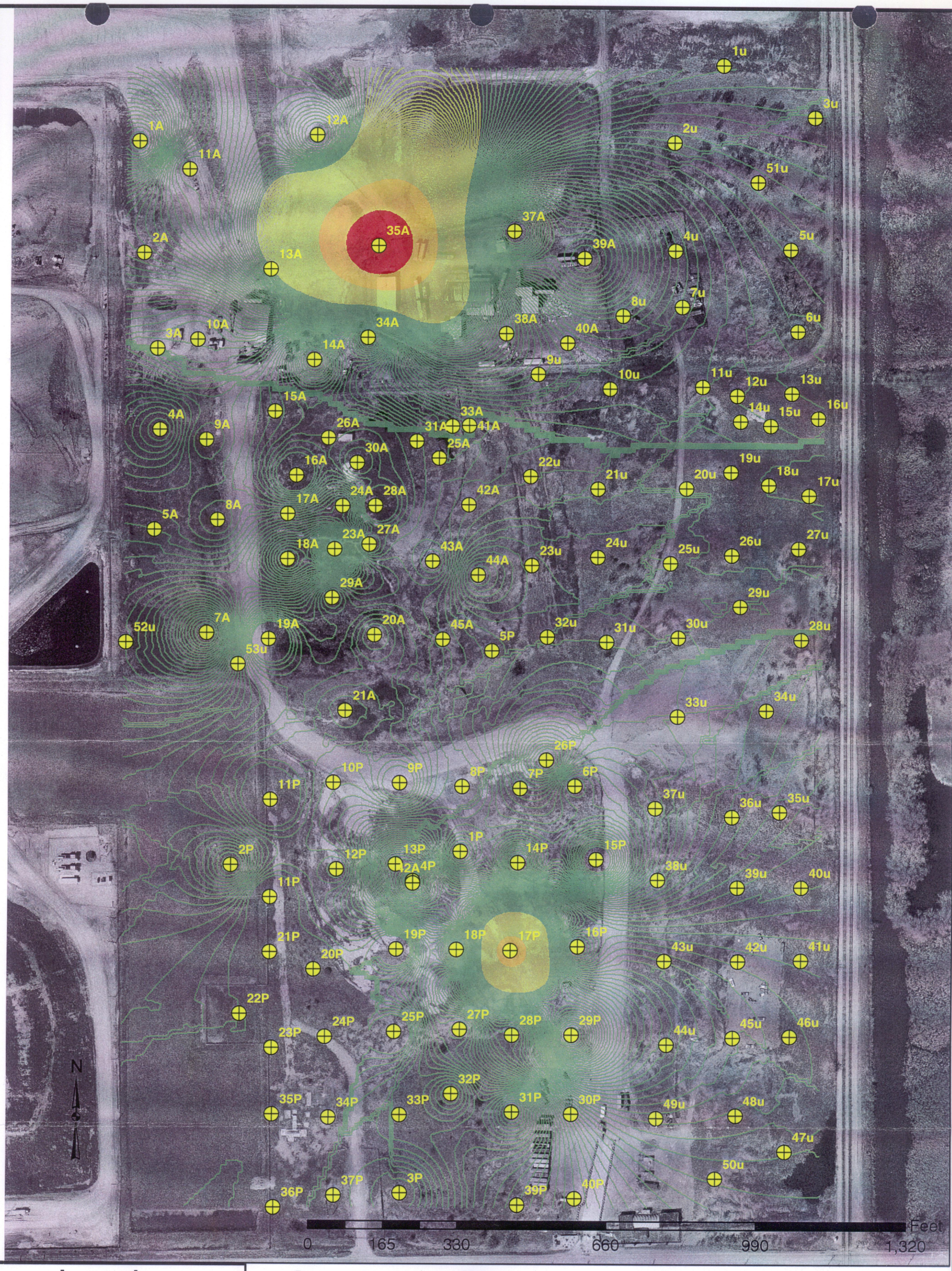
- 650000 - 2698000
- 2698001 - 4760000
- 4760001 - 6821000
- 6821001 - 8881000

Southeast Chicago Cluster Site
TOLUENE: 0 to 10 FEET
Figure 2-7

TOTAL CUBIC YARDS: 22,013.69

Clayton GROUP SERVICES

PAXTON_TOLUENE_FNL_0-10FT.MXD
DATE: 02/26/02
Data Source: IEPA Spreadsheet



Legend

CONCENTRATION
(≥ 800 ug/kg) - TACO Tier 1
Industrial-Commercial Ingestion SRO

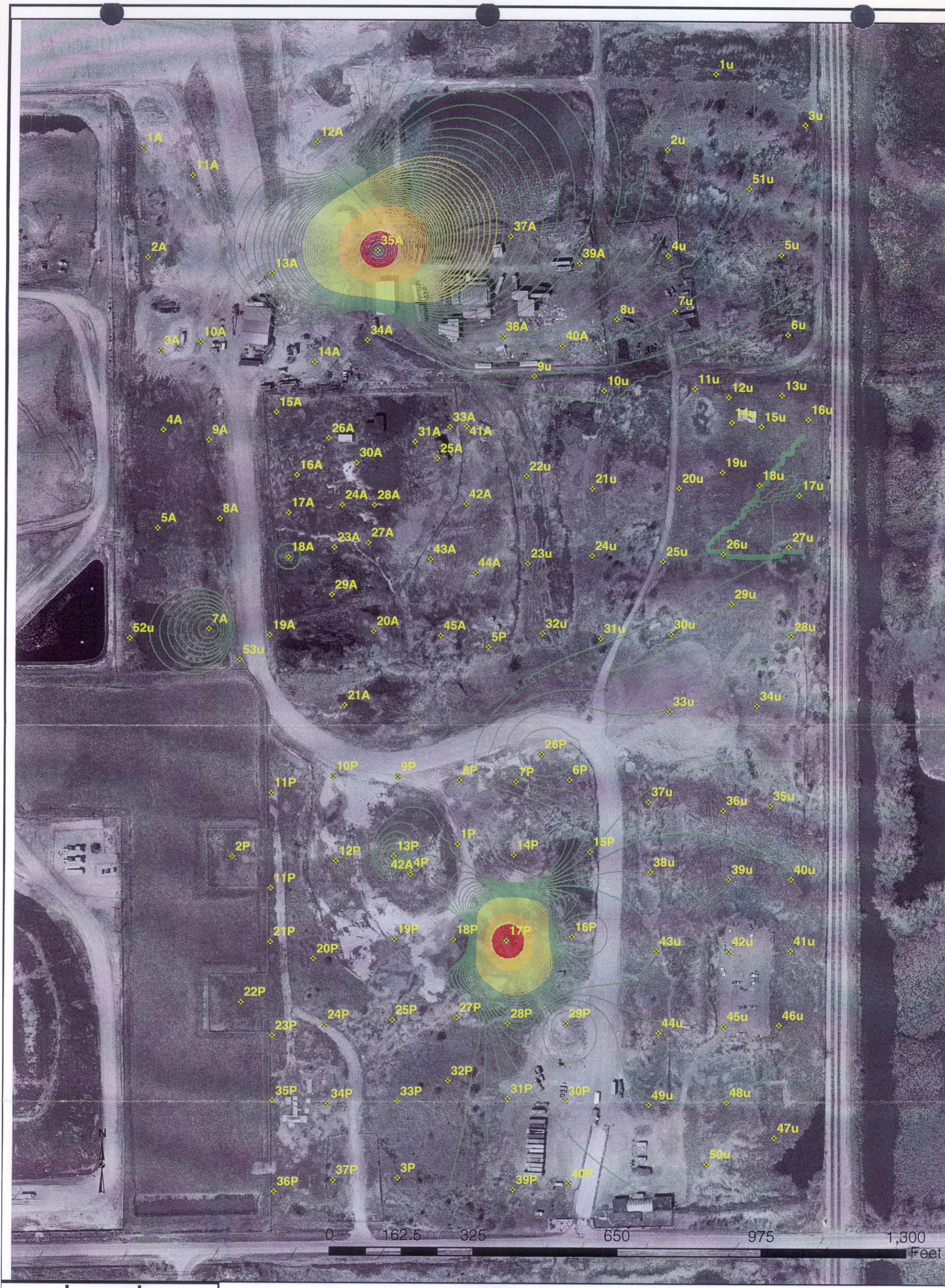
- 800 - 6700
- 6701 - 14500
- 14501 - 23900
- 23901 - 34900

Southeast Chicago Cluster Site
BENZO (a) PYRENE: 0 to 3 FEET
Figure 2-8

Total Cubic Yards: 397,533.15

Clayton GROUP SERVICES

PAXTON_BAPYRENE_FNL_3FT.MXD
DATE: 02/26/02
Data Source: IEPA Spreadsheet



Legend

CONCENTRATION

(≥ 800 ug/kg) - TACO Tier 1
Industrial-Commercial Ingestion SRO

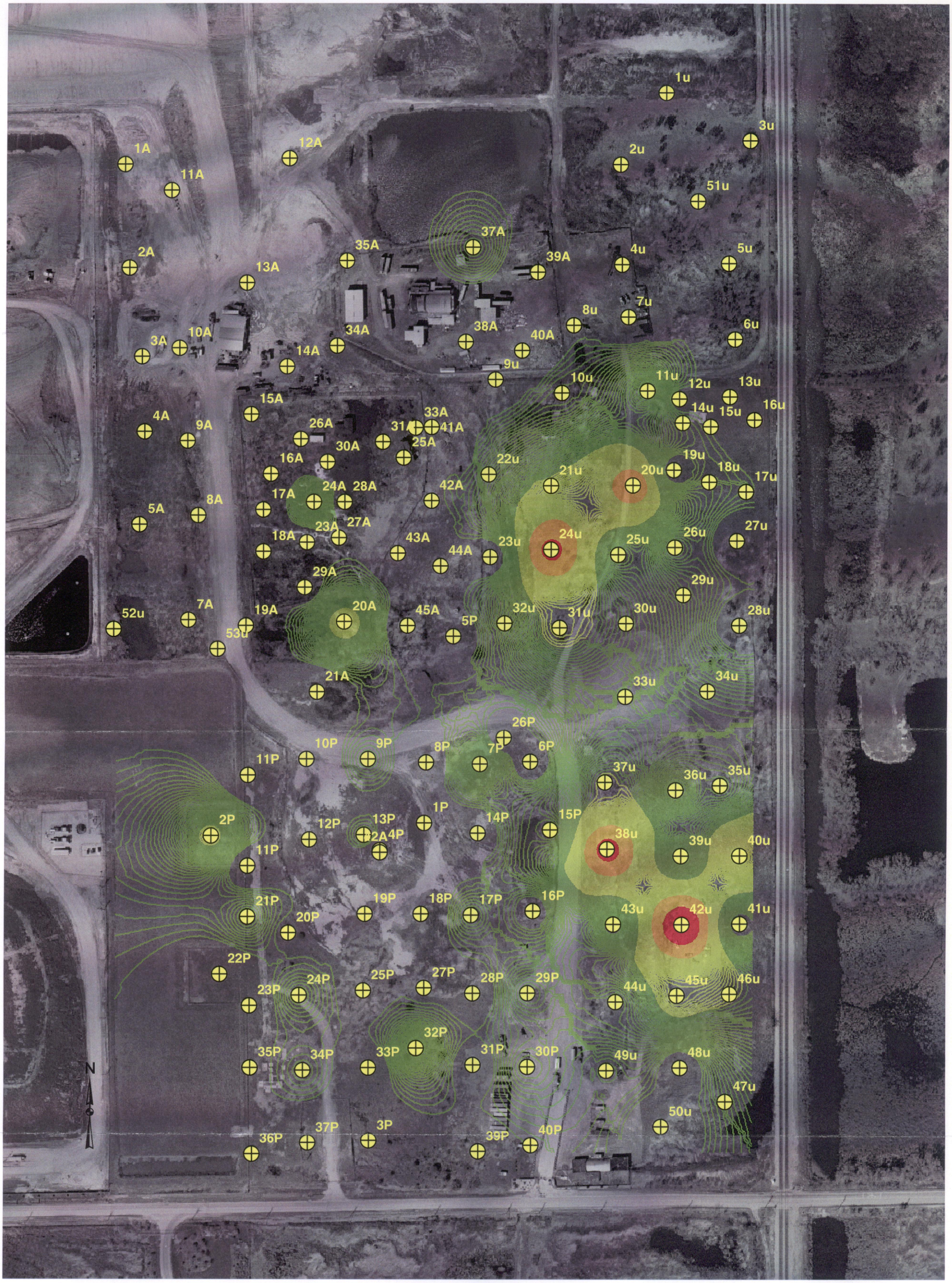
- 800 - 1450
- 1451 - 2400
- 2401 - 3250
- 3251 - 4250

Southeast Chicago Cluster Site
DIBENZO(a,h,)ANTHRACENE: 0 to 3 FEET
Figure 2-9

TOTAL CUBIC YARDS: 252,501.78

Clayton GROUP SERVICES

PAXTON_DIBENZE_3FT.MXD
DATE: 11/29/01
Data Source: IEPA Spreadsheet



Southeast Chicago Cluster Site
TOTAL PCBS: 0 to 3 FEET

Figure: 2 -10

CUBIC YARDS: 168,079

Legend

CONCENTRATION
ug/kg

- 1,000 - 4,300
- 4,301 - 8,000
- 8,001 - 11,700
- 11,701 - 16,900

0 225 450 675 Feet

Clayton SM GROUP SERVICES

Cluster_PCB_0_3.MXD
DRAWN BY: SFS DATE: 08/12/02
Data Source: IEPA Spreadsheet

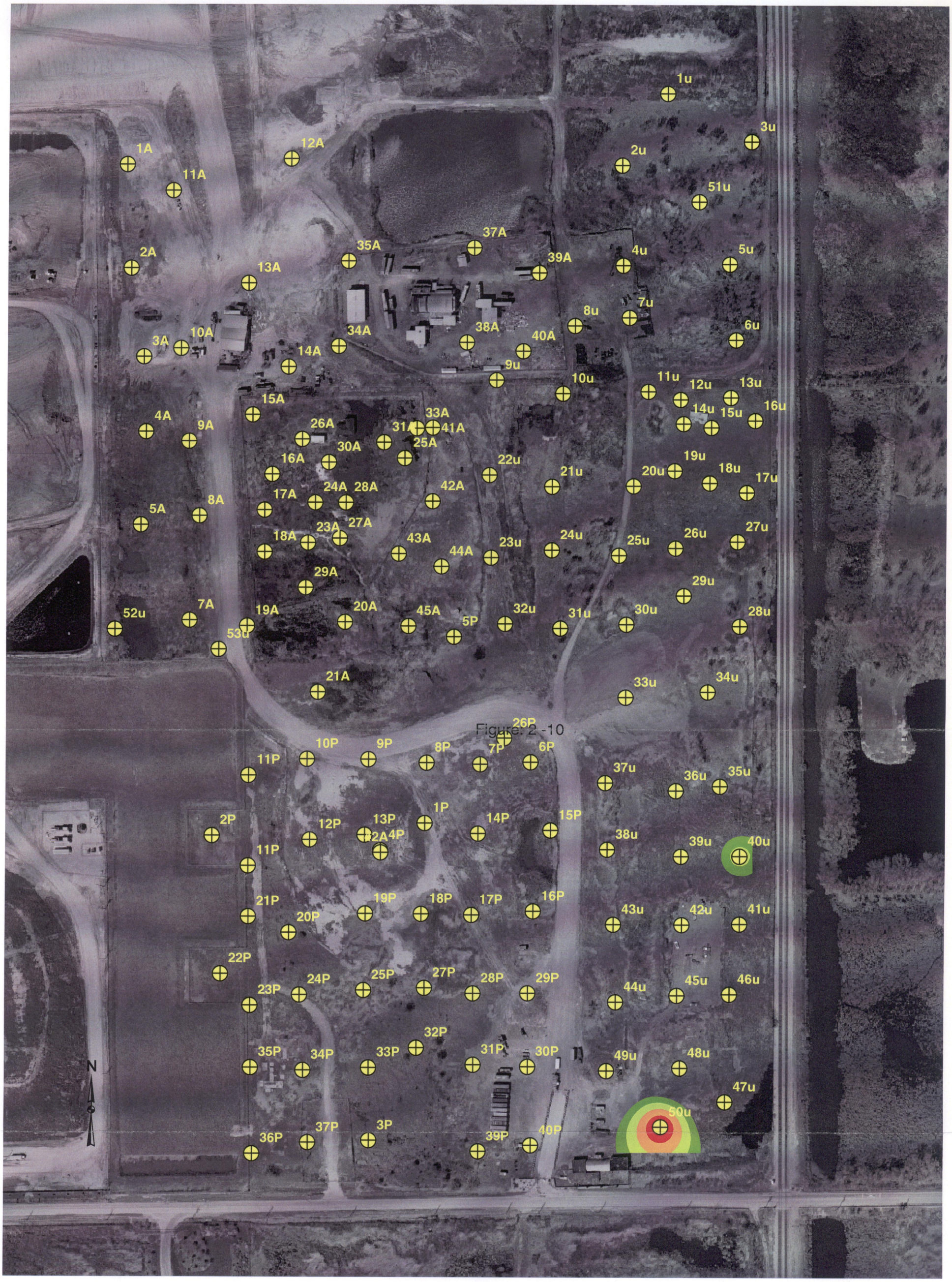


Figure: 2 -10

Legend

CONCENTRATION

ug/kg

- 50,000 - 64,000
- 64,001 - 81,000
- 81,001 - 101,000
- 101,001 - 120,000

Southeast Chicago Cluster Site
TOTAL PCBS: 3 to 10 FEET

Figure: 2 -11

CUBIC YARDS: 6,943

0 225 450 675 Feet

Clayton SM GROUP SERVICES

Cluster_PCB_0_3.MXD

DRAWN BY: SFS DATE: 08/12/02

Data Source: IEPA Spreadsheet

PAXTON II LANDFILL

PAXTON I LANDFILL

W.L. 587.4

W.L. 598.3

W.L. 586.5

TANK

TANKS

DEBRIS

STORAGE

STORAGE

PAXTON LAGOONS SITE

LAND & LAKES LANDFILL

SOUTHEAST CHICAGO CLUSTER SITE

P01

P02

P03

P04

P05

G21S

LC03

LC04

LC05

LC06

LC07

LC09

LC10

LC11

LC12

LC13

590

585

600

LEGEND

6 MONITORING WELLS (20–24 FEET BGS)
SCREEN: 5 FT. STAINLESS (LC09 & LC11); 10 FT. PVC (P01–P04)

8 MONITORING WELLS (14–16 FEET BGS)
SCREEN: 10 FT. STAINLESS

2 MONITORING WELLS (P05 & G21S)
NO DRILLING LOG RECORDS FOUND

INFERRED DIRECTION OF GROUNDWATER FLOW

SCALE IN FEET

0 100 200 400

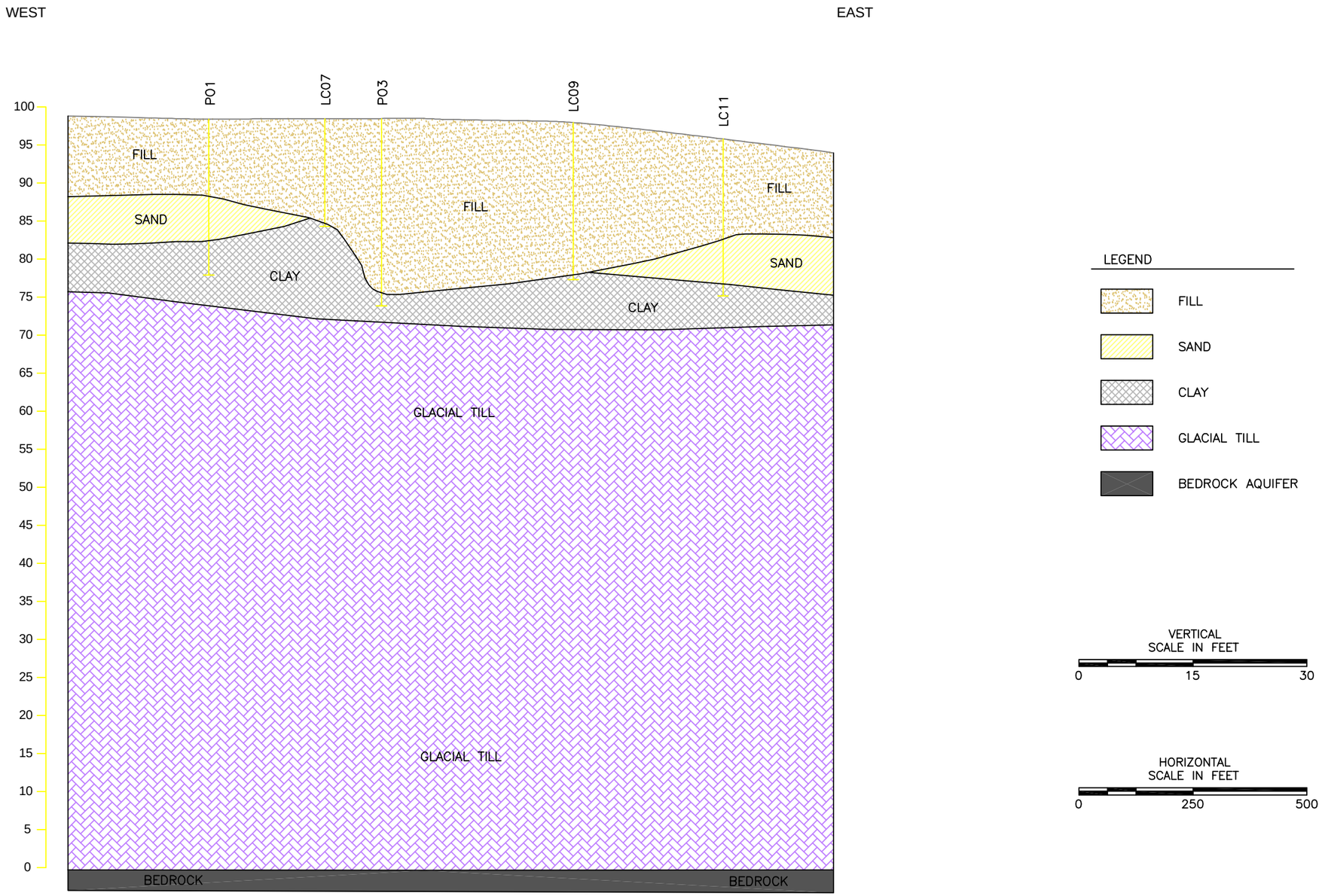
CHECK BY	JJR
DRAWN BY	BCP
DATE	2/27/02
SCALE	AS SHOWN
CAD NO.	0101902B
PRJ NO.	15–01019

SOUTHEAST CHICAGO CLUSTER SITES

MONITORING WELL LOCATIONS

Clayton GROUP SERVICES

FIGURE 2–12



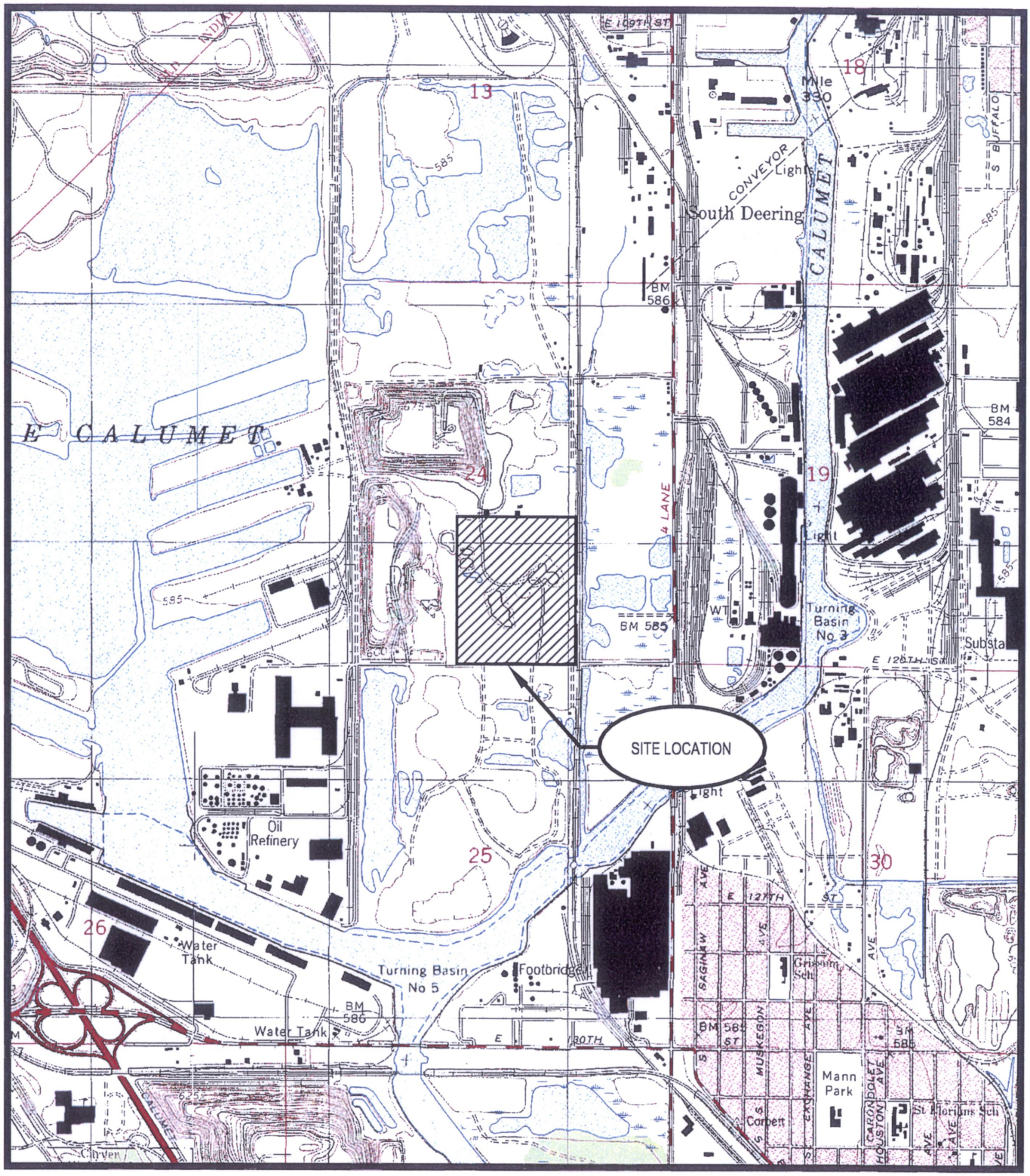
CHECK BY	JJR
DRAWN BY	OS
DATE	3–11–02
SCALE	AS SHOWN
CAD NO.	0101901r
PRJ NO.	15–01019

GENERALIZED GEOLOGIC CROSS SECTION

SOUTHEAST CHICAGO CLUSTER SITES

Clayton GROUP SERVICES

FIGURE
2–13



Scale 1:24000

0 1/2 1 MILE

1000 0 1000 2000 3000 FEET

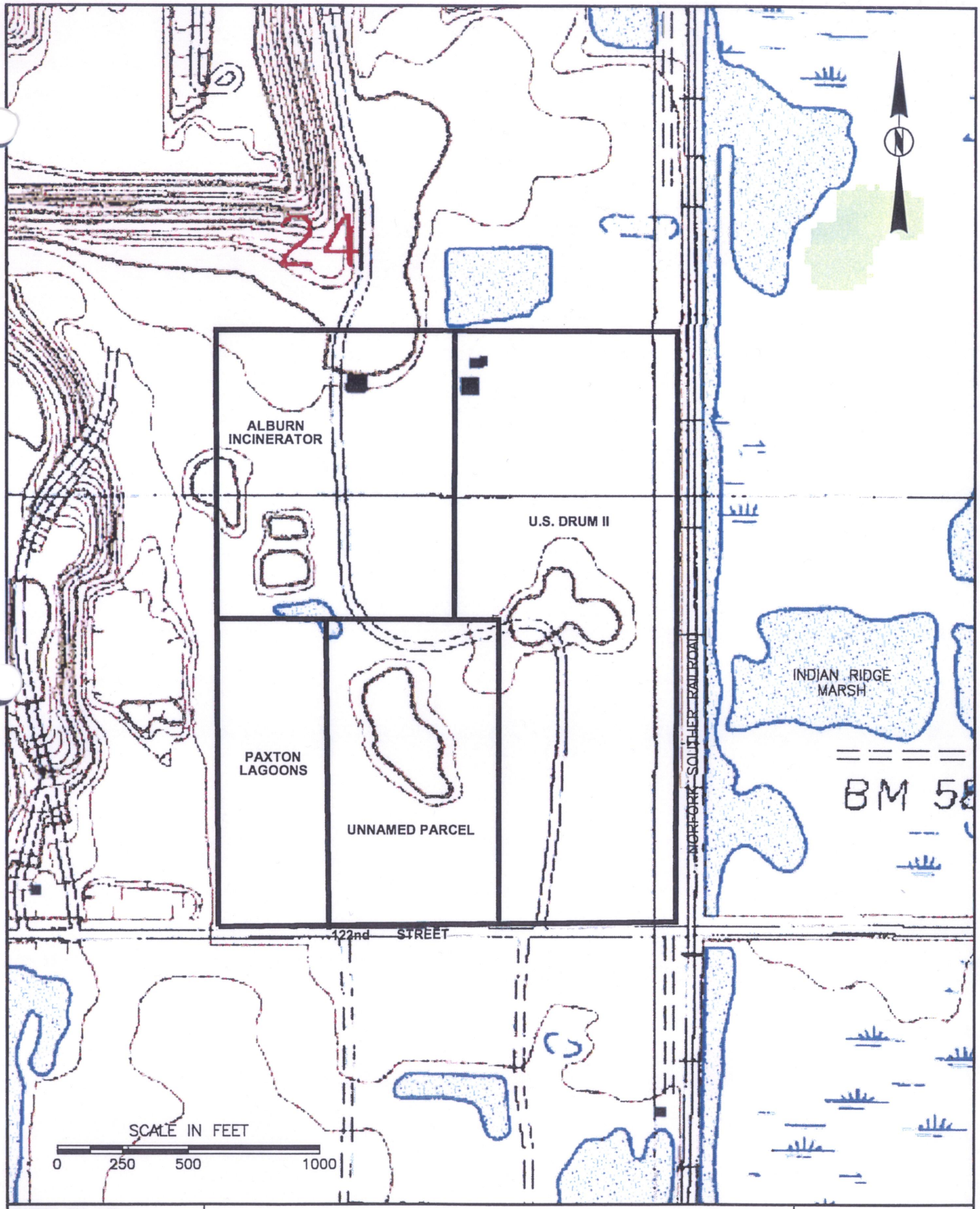
QUADRANGLE LOCATION

FIGURE 1-1

SITE LOCATION MAP

SOUTHEAST CHICAGO CLUSTER SITE
LAKE CALUMET, ILLINOIS

(SOURCE OF MAP IS USGS 7.5 MINUTE QUADRANGLE MAP, LAKE CALUMET, ILLINOIS)



CHECK BY	JJR
DRAWN BY	OS
DATE	3-1-02
SCALE	AS SHOWN
CAD NO.	0101901p
PRJ NO.	15-01019

SITE FEATURES MAP

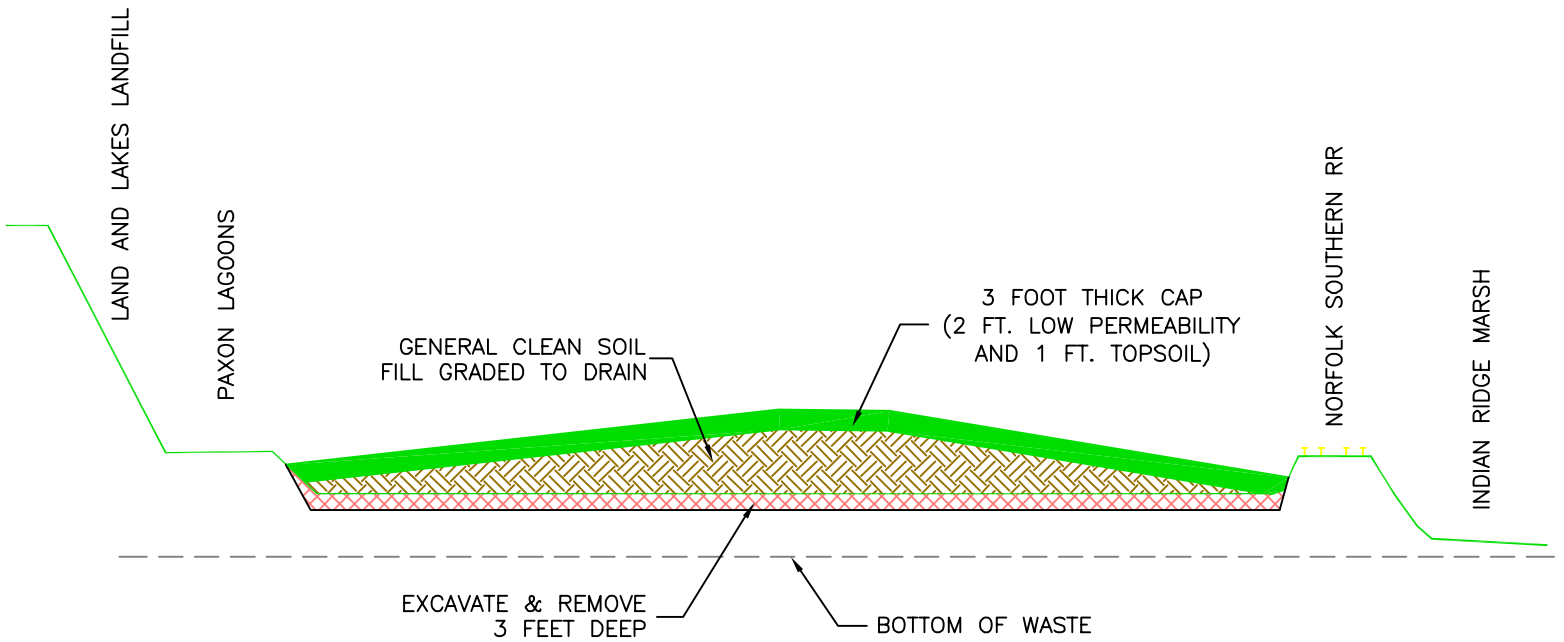
SOUTHEAST CHICAGO CLUSTER SITE
LAKE CALUMET, ILLINOIS

Clayton GROUP SERVICES

FIGURE
1-2

WEST

EAST



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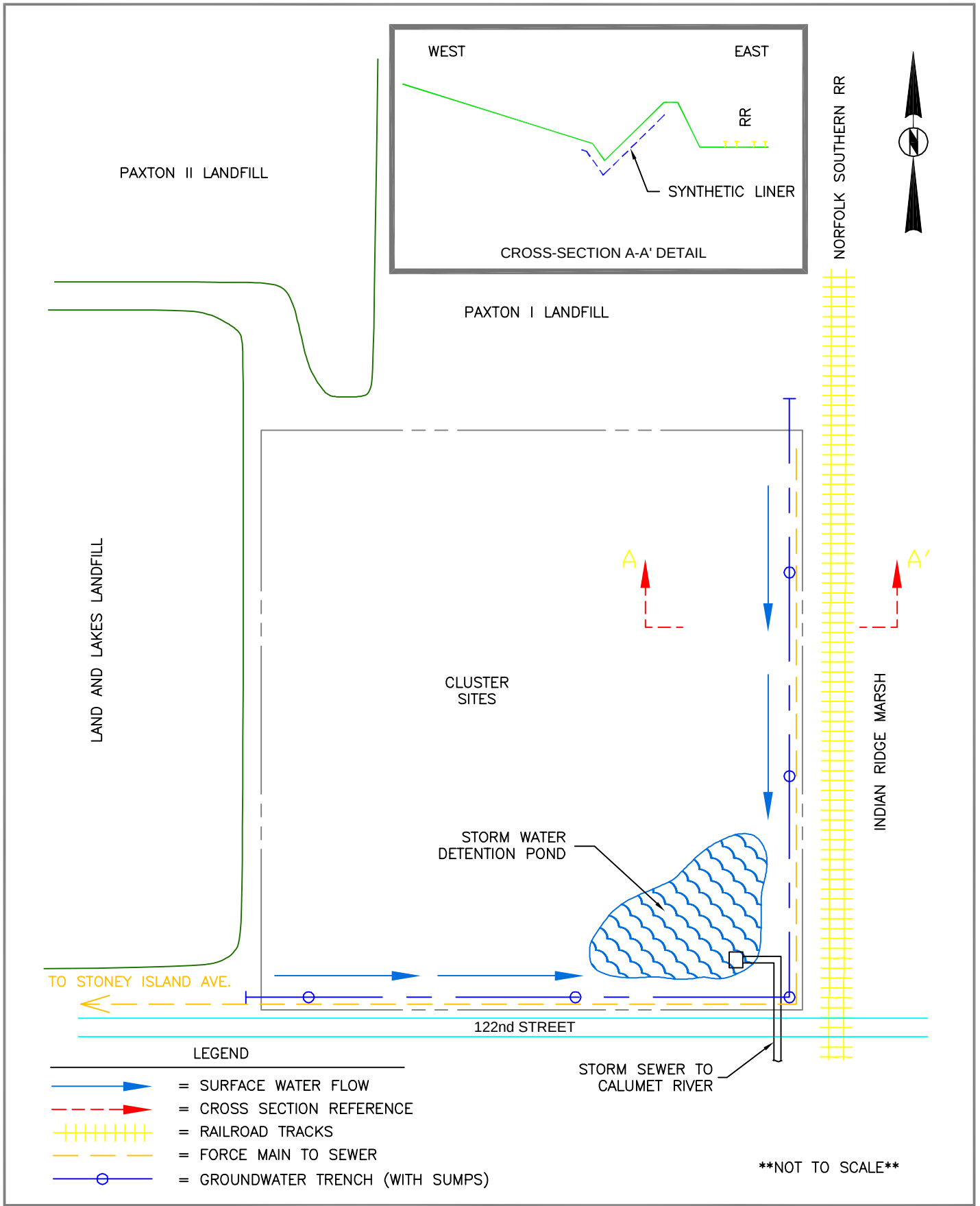
DWN BY	OS
DATE	2–20–02
SCALE	NONE
CAD NO.	0101901L
PRJ NO.	15–01019

SOUTHEAST CHICAGO CLUSTER SITE
TYPICAL EAST–WEST CROSS–SECTION
EXCAVATE 3 FEET OF WASTE & CAPPING

OPTIONS 1 & 9

Clayton GROUP SERVICES

FIGURE
4–1

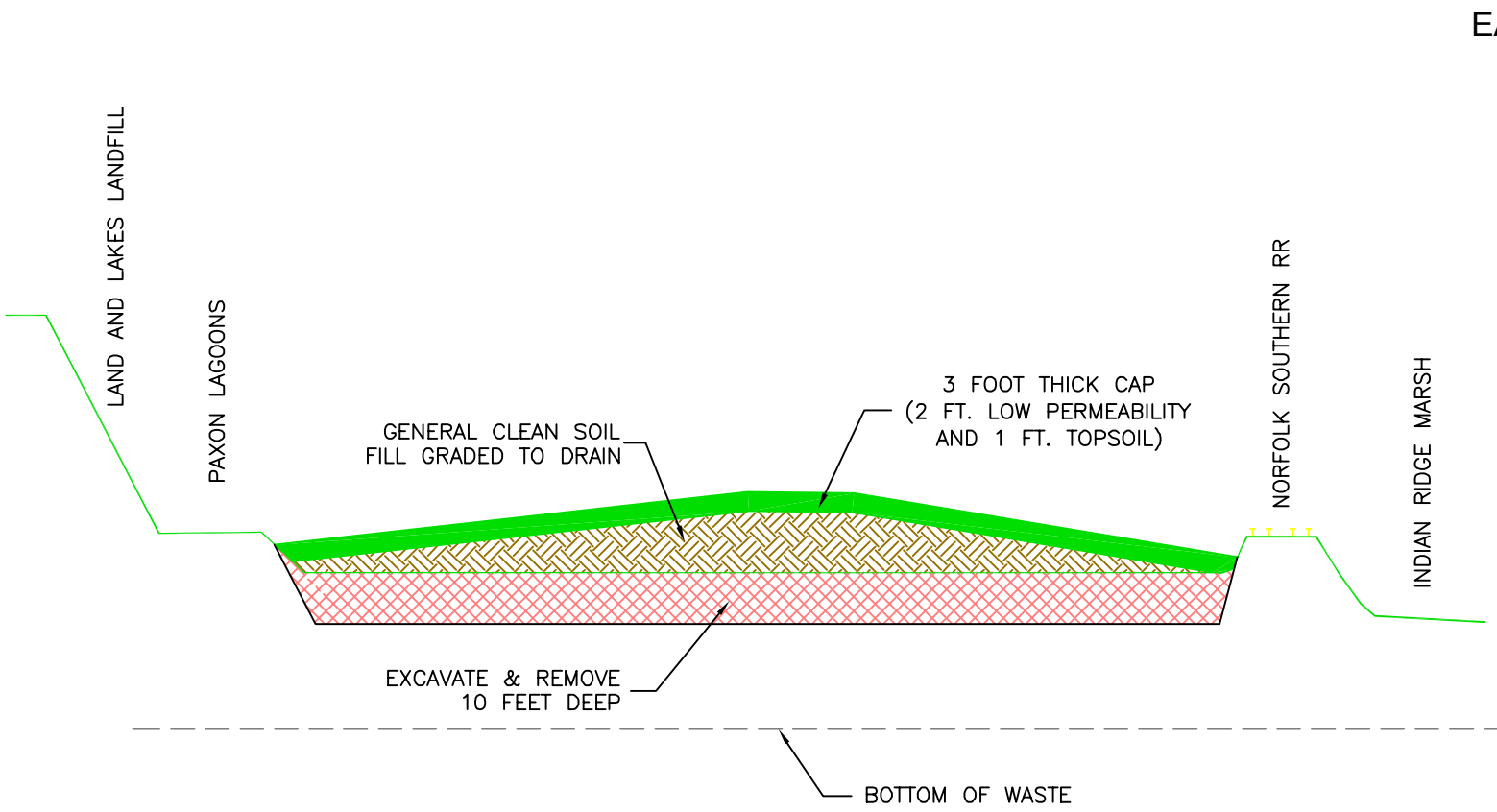


CHECK BY	JB
DRAWN BY	OS
DATE	10-31-01
SCALE	NONE
CAD NO.	0101901n
PRJ NO.	15-01019

SOUTHEAST CHICAGO CLUSTER SITE
POTENTIAL POST REMEDIAL PLAN
WITHOUT WETLANDS

Clayton GROUP SERVICES

FIGURE
4-2



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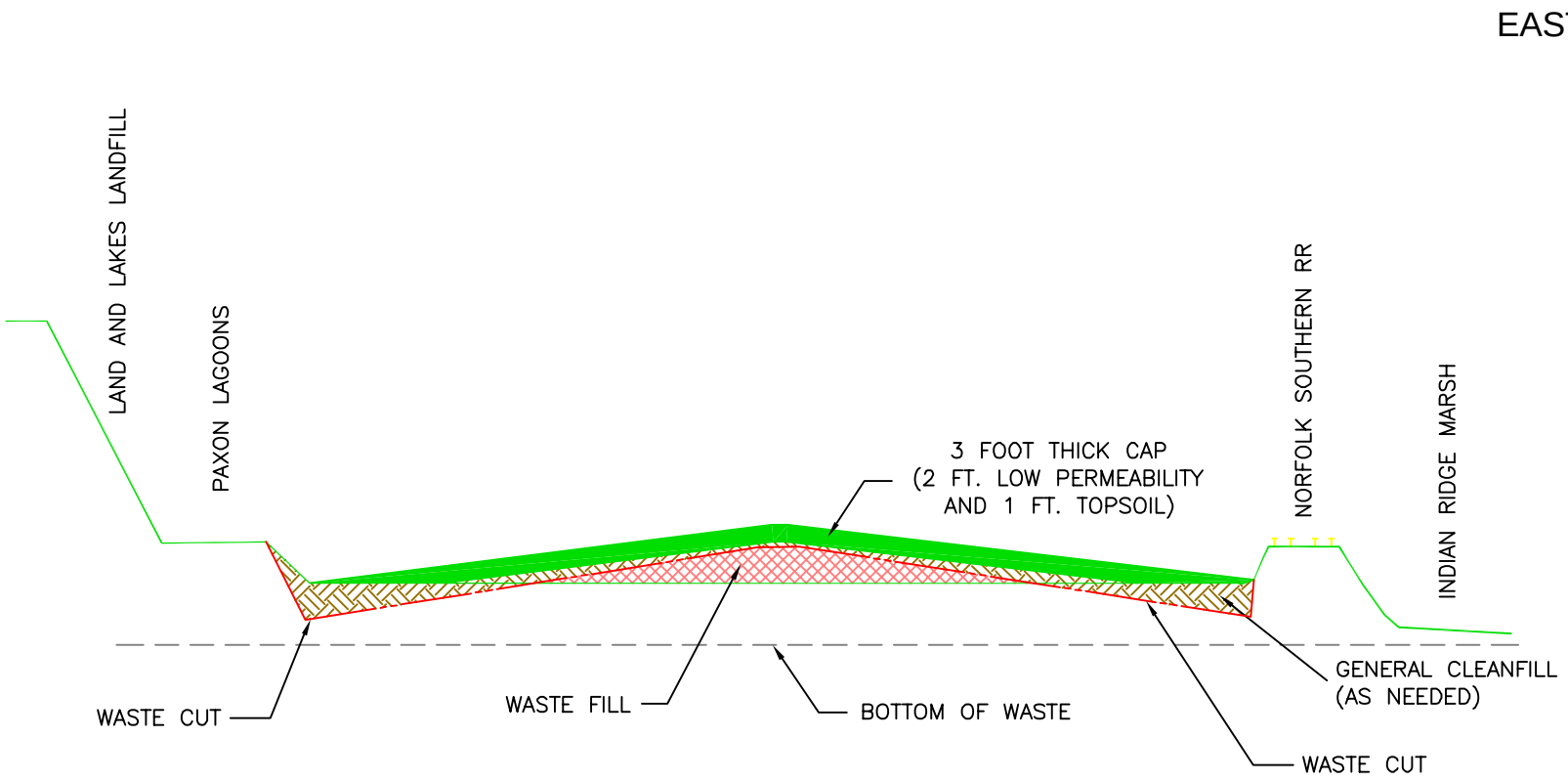
PRJ NO.	15-01019

SOUTHEAST CHICAGO CLUSTER SITE
TYPICAL EAST-WEST CROSS-SECTION
EXCAVATE 10 FEET OF WASTE & CAPPING

OPTIONS 2 & 10

Clayton GROUP SERVICES

FIGURE
4-3



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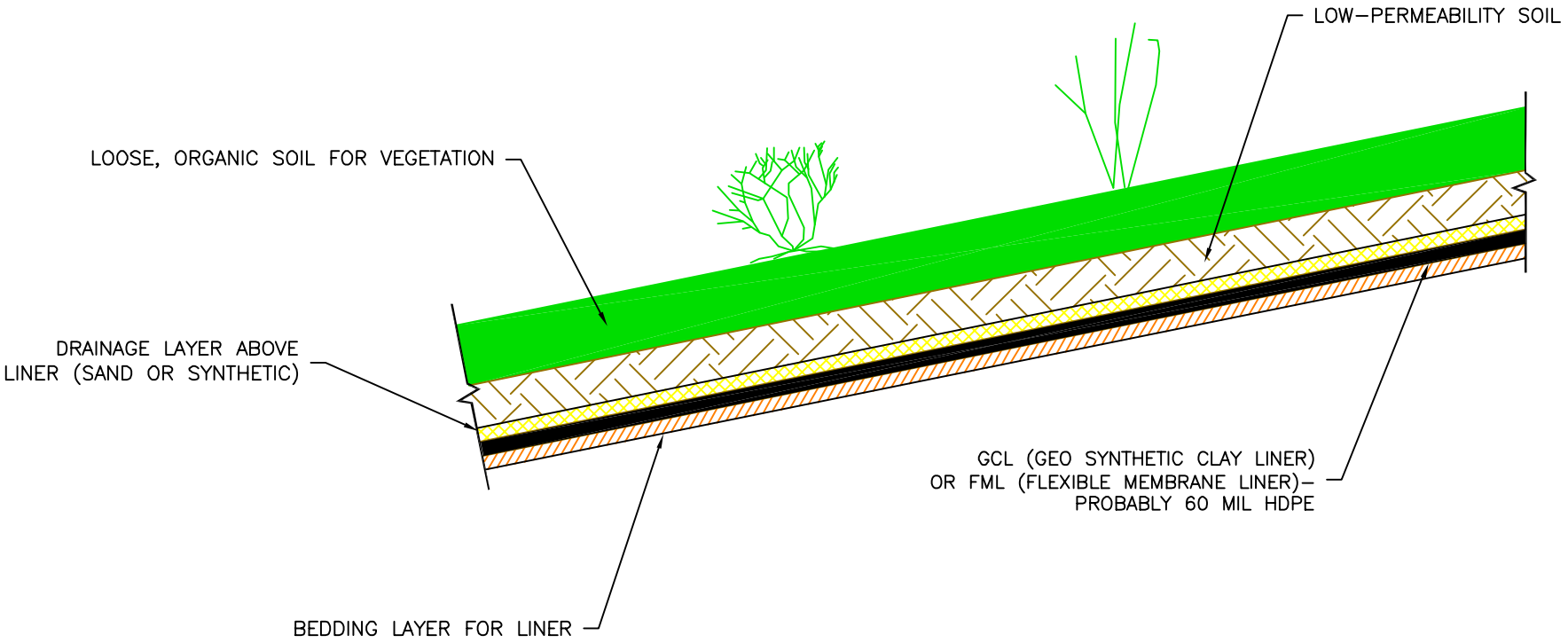
PRJ NO.	15-01019

SOUTHEAST CHICAGO CLUSTER SITE
TYPICAL EAST-WEST CROSS-SECTION
REGRADING WASTE AND CAPPING

OPTIONS 3, 7, & 8

Clayton GROUP SERVICES

FIGURE
4-4



CHK BY	JB
DWN BY	OS
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PRJ NO.	15–01019

SOUTHEAST CHICAGO CLUSTER SITE
GCL OR FML CAP

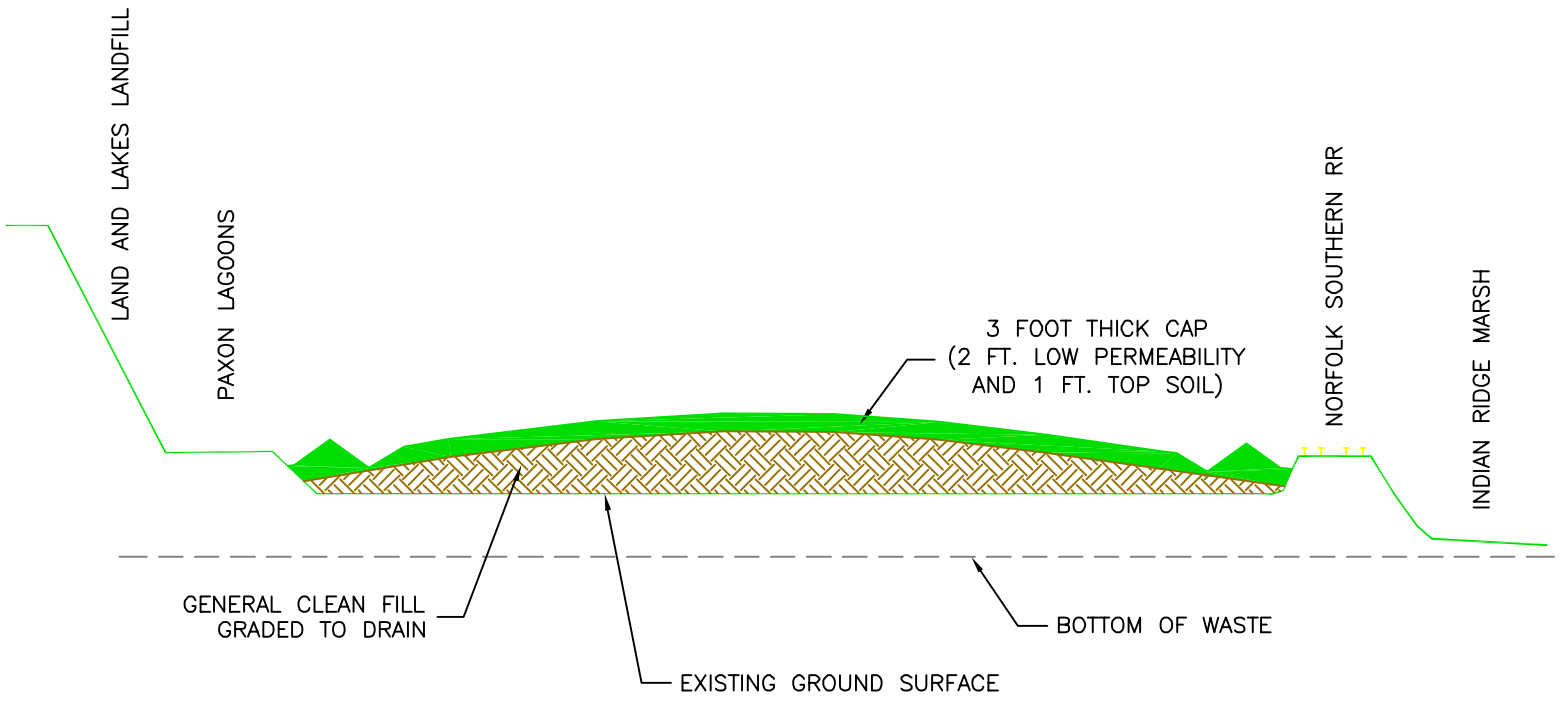
OPTIONS 4, 5, & 8

Clayton GROUP SERVICES

FIGURE
4–5

WEST

EAST



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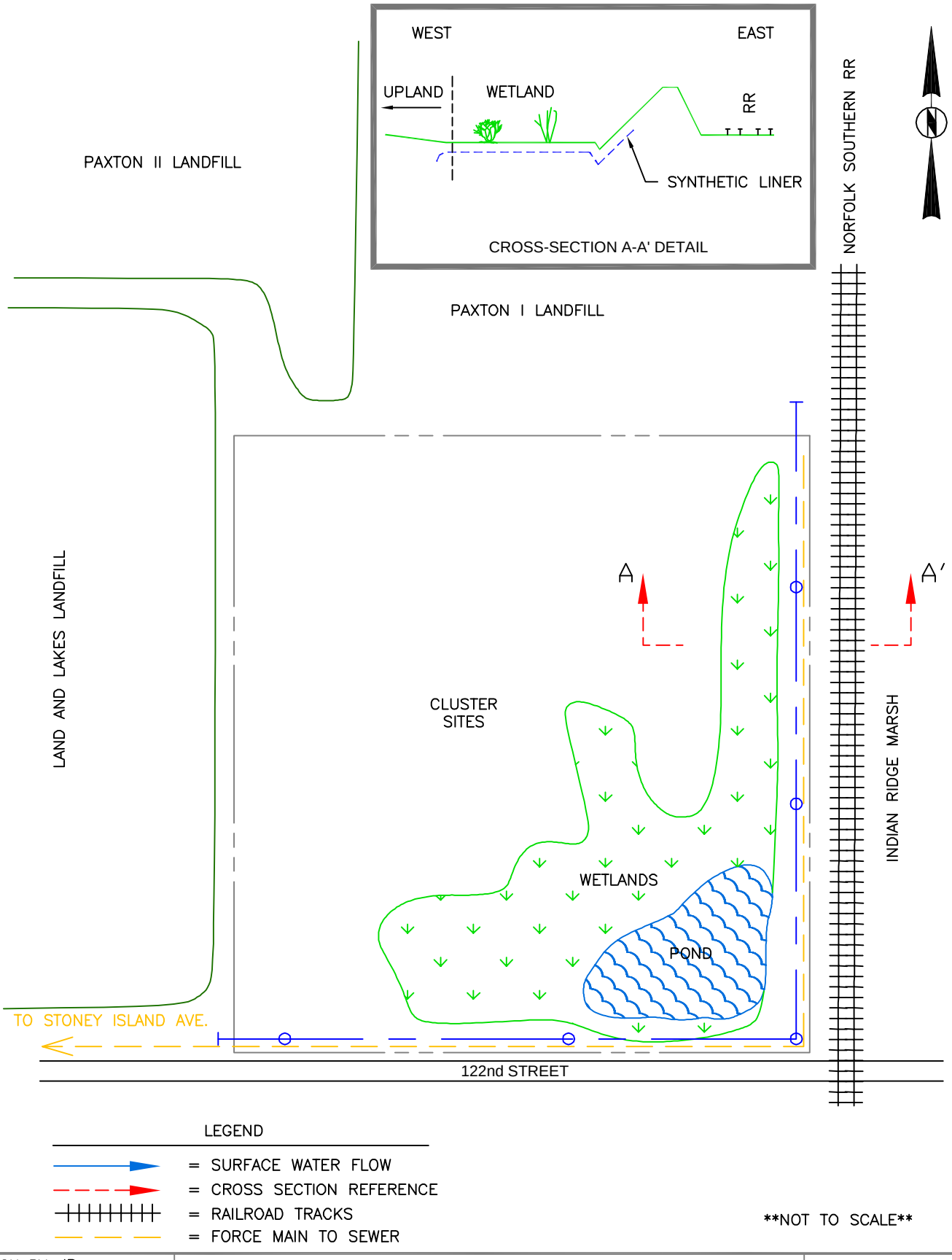
SOUTHEAST CHICAGO CLUSTER SITE
TYPICAL EAST-WEST CROSS-SECTION
CAPPING WASTE IN-PLACE

OPTIONS 6 & 11

Clayton GROUP SERVICES

FIGURE
4-6



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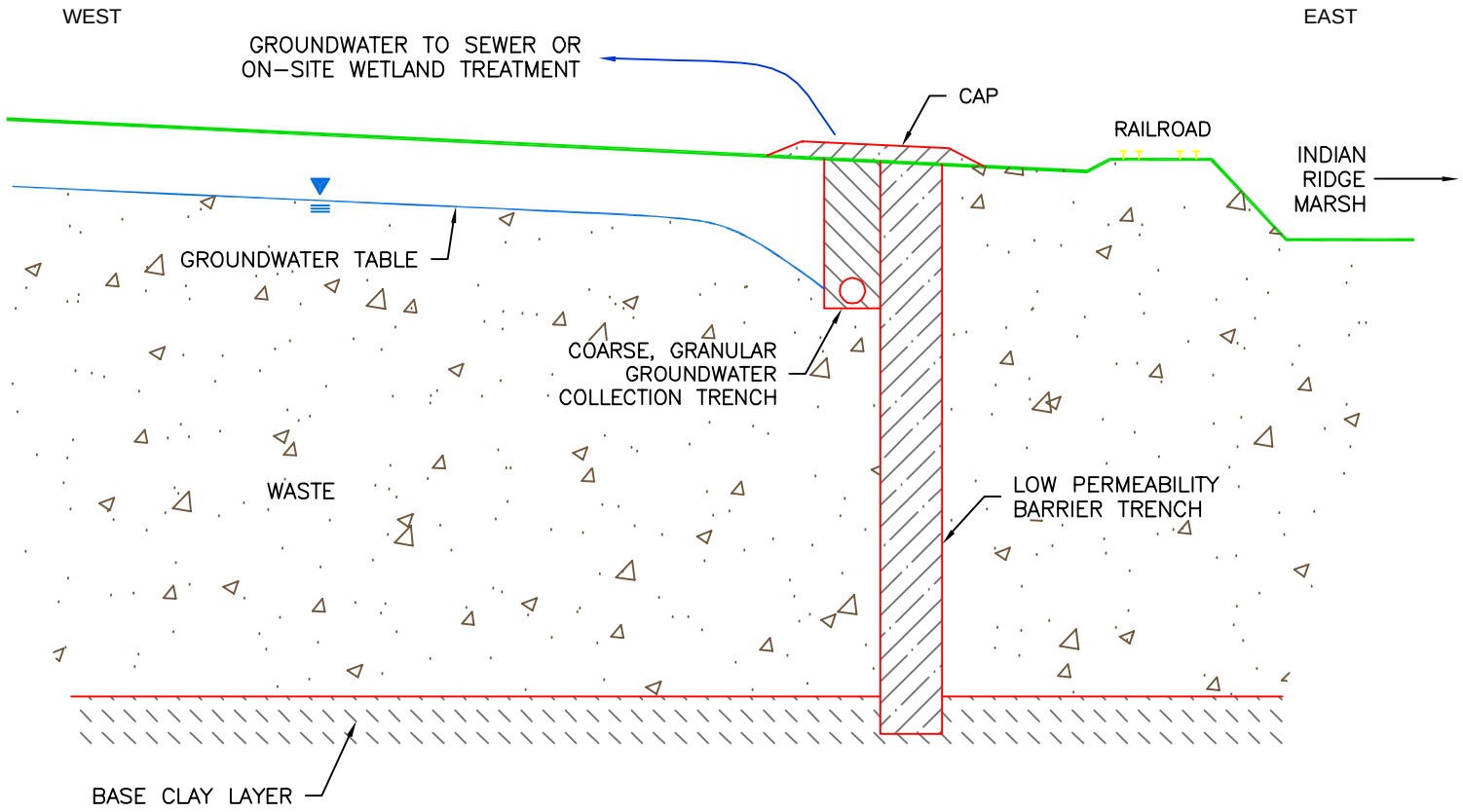
PRJ NO.	15-01019

SOUTHEAST CHICAGO CLUSTER SITE
POTENTIAL POST REMEDIAL PLAN
WITH WETLANDS

Clayton GROUP SERVICES

FIGURE
4-7



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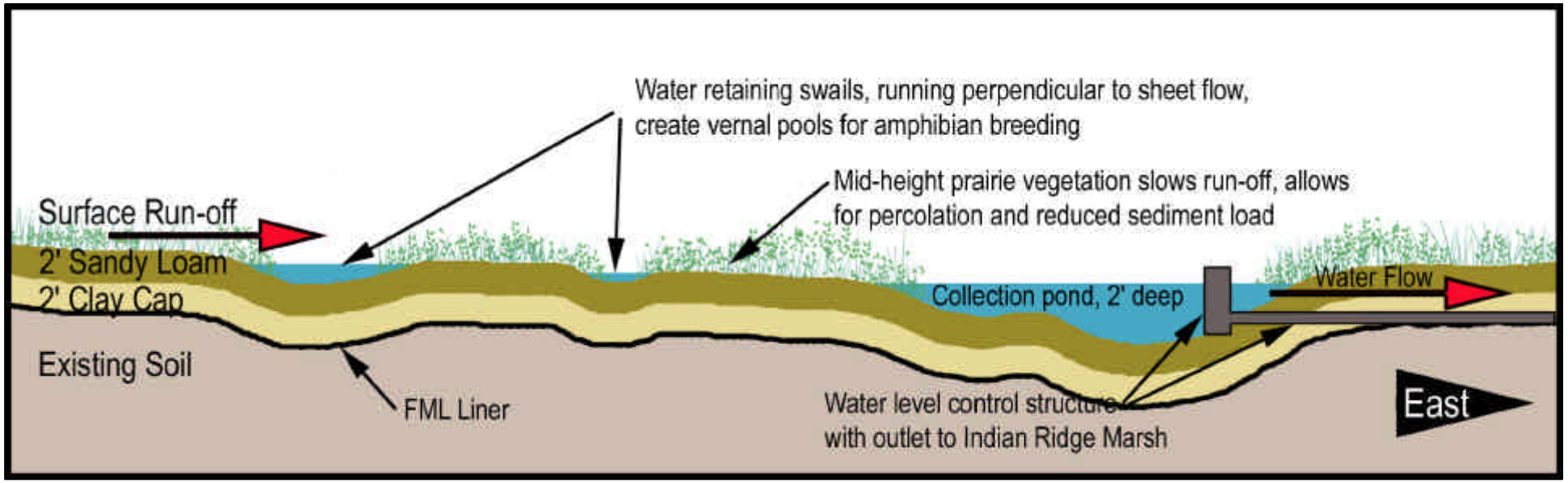
PRJ NO.	15–01019

SOUTHEAST CHICAGO CLUSTER SITE
GROUNDWATER MANAGEMENT SYSTEM

ALL OPTIONS

Clayton GROUP SERVICES

FIGURE
4–8



CHK BY	JJR
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DATE	3–1–02
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PRJ NO.	15–01019

TYPICAL CONSTRUCTED WETLANDS CROSS–SECTION

SOUTHEAST CHICAGO CLUSTER SITE

Clayton GROUP SERVICES

FIGURE

4–9

TABLES

TABLE 3-2
Ecological Risk: Assessment Endpoints, Exposure Pathways, and Food Chain Model Results

Southeast Chicago Cluster Site / Chicago, Illinois

Assessment Endpoint Receptor	Exposure Pathway	Food Chain Model - Hazard Quotients (HQ)	
		NOAEL-based HQ > 1.0	LOAEL-based HQ > 1.0
Benthic Macroinvertebrate Community	Direct adsorption of chemical contaminants from sediments and surface water.	Low macroinvertebrate species diversity associated with poor water quality conditions: metals, DDT breakdown products, and PCBs above screening level toxicity benchmarks.	
Soil Macroinvertebrate Community	Direct adsorption of chemical contaminants from soil. Earthworms were used to represent soil invertebrates	Screening level toxicity benchmarks exceeded: Cr, Fe, Pb, PAHs	
Plant Community - Ryegrass	Direct adsorption of chemical contaminants from soil samples taken from the site.	Screening level toxicity benchmarks exceeded: Al, Cr, Pb, Ag Aldrin, DDD, DDE, g-Chlordane PCBs, PAHs	
Fish Larval Fathead Minnows	Surface water and insects in ponds and marshes.	Screening level toxicity benchmarks exceeded: Al, Cr, Fe, Pb, V, Zn PCBs	
Amphibian Populations Freshwater Amphipod	Surface water and sediments in ponds and marshes.	Screening level toxicity benchmarks exceeded: Al, Cr, Fe, Pb, V, Zn PCBs	
Insectivorous Birds Yellow-Headed Blackbird	Ingestion of insects.	Al, Cd, Cr, Cu, Pb, Hg, Se, Na, Zn PCBs	Al, Cr, Pb, Hg, Se, Na, Zn PCBs
Omnivorous Waterfowl Mallard Duck	Ingestion of earthworms used to represent soil invertebrates and emergent aquatic insects	Se - Selenium PCBs	
Herbivorous Birds American Wigeon	Ingestion of plants.	Insufficient data since plant tissues could not be collected during the winter sampling event.	
Piscivorous Birds Black-Crowned Night Heron	Ingestion of fish.	Cr, Pb, Se PCBs	 PCBs
Omivorous Mammals Raccoon	Ingestion of fish and invertebrates.	Sb - Antimony, Ba, Hg, Se PCBs, PAHs	Hg PCBs
Carnivorous Mammals Shrew	Ingestion of small mammals.	Al, As, Sb, Ba, Cd, Fe, Pb, Hg, Se, Na, V, Zn PCBs	Sb, Ba, Se, Hg PCBs

Screening Level Toxicity Benchmarks: U.S. EPA Region III Biological Technical Assistance Group (BTAG) for Flora and Fauna (Davis 1995)

NOAEL-based HQ > 1.0 (No Observable Adverse Effect Level - Hazard Quotient > 1.0): predicted chronic risk from contaminant to receptor

LOAEL-based HQ > 1.0 (Lowest Observable Adverse Effect Level - Hazard Quotient > 1.0): potential actual adverse effect on survival, reproduction, or growth of the receptor

TABLE 3-1
Human Health Carcinogenic Risk and Noncarcinogenic Hazards

Southeast Chicago Cluster Site / Chicago, Illinois

Area	Soil Exposure Carcinogenic Risk Excess Lifetime Cancer Risk (ELCR) >10^{-6}		Soil Exposure Noncarcinogenic Hazard Hazard Index (HI) > 1.0		Insignificant Exposure Risks
	Chemicals	**Receptors**	**Chemicals**	**Receptors**	
Alburn Incinerator	Arsenic Benzene Benzo(a)pyrene Total PCBs Vinyl Chloride	All receptors	Toluene	Construction workers	Sediment Surface Water Groundwater
Unnamed Parcel	Arsenic Benzo(a)pyrene	Onsite Workers Mowers Industrial/Commerical Workers	None	None	Groundwater
U.S. Drum II	Arsenic Benzo(a)pyrene Dibenz(a,h)anthracene Total PCBs	All receptors	None	None	Surface Water Groundwater

Based on *Draft Human Health Risk Assessment (HHRA) Report, Lake Calumet Cluster Site, prepared by Montgomery Watson Harza, October 2001.*

TABLE 2-1
Summary of Soil Analytical Results - Clayton/IEPA Test Pit Sampling

Southeast Chicago Cluster Site / Chicago, Illinois

CHEMICAL NAME	SAMPLE NUMBER												
	D105092 * ug/g	D105093 ** ug/kg	D105094*** ug/kg	D105095*** ug/kg	D105096 ** ug/kg	D105097 ** ug/kg	D105098 ** ug/kg	D105099 ** ug/kg	D105100 ** ug/kg	D105100 ug/L	B107556 mg/L	B107557 mg/L	B107558 mg/L
SVOCs													
Naphthalene	0.12	NT	NT	NT	NT	NT	NT	NT	NT				
2-Methylnaphthalene	0.08	NT	NT	NT	NT	NT	NT	NT	NT				
Acenaphthylene	0.13	NT	NT	NT	NT	NT	NT	NT	NT				
Dibenzofuran	0.07	NT	NT	NT	NT	NT	NT	NT	NT				
Fluorene	0.07	NT	NT	NT	NT	NT	NT	NT	NT				
Benzo(k)fluoranthene	0.86	NT	NT	NT	NT	NT	NT	NT	NT				
Phenanthrene	0.59	NT	NT	NT	NT	NT	NT	NT	NT				
Anthracene	0.19	NT	NT	NT	NT	NT	NT	NT	NT				
Fluoranthene	1.0	NT	NT	NT	NT	NT	NT	NT	NT				
Pyrene	1.1	NT	NT	NT	NT	NT	NT	NT	NT				
Butyl benzyl phthalate	0.11	NT	NT	NT	NT	NT	NT	NT	NT				
Benzo(a)anthracene	0.62	NT	NT	NT	NT	NT	NT	NT	NT				
Chrysene	0.66	NT	NT	NT	NT	NT	NT	NT	NT				
Bis-(2-ethylhexyl)phthalate	0.95	NT	NT	NT	NT	NT	NT	NT	NT				
Benzo(b)fluoranthene	1.0	NT	NT	NT	NT	NT	NT	NT	NT				
Benzo(k)fluoranthene	0.86	NT	NT	NT	NT	NT	NT	NT	NT				
Benzo(a)pyrene	0.85	NT	NT	NT	NT	NT	NT	NT	NT				
Indeno(1,2,3-*c,d*)pyrene	0.42	NT	NT	NT	NT	NT	NT	NT	NT				
Dibenzo(a,h)anthracene	0.07	NT	NT	NT	NT	NT	NT	NT	NT				
Benzo(g,h,i)Perylene	0.38	NT	NT	NT	NT	NT	NT	NT	NT				
VOCs													
Chloroethane	NT	<2.4	NT	NT	<2.4	5.5	<2.2	<2.7	<0.4				
Methylene Chloride	NT	<6.0	NT	NT	<6.0	<7.5	<5.5	5.1	8.1				
Carbon disulfide	NT	3	NT	NT	9.4	11	4.9	15	0.6				
1,1-Dichloroethene	NT	27	NT	NT	22	<3.0	<2.2	<2.7	20				
1,1-Dichloroethane	NT	12	NT	NT	7.9	3.1	<2.2	4.3	140				
trans-1,3-Dichloroethene	NT	<2.4	NT	NT	<2.4	<3.0	<2.2	4.4	<0.4				
cis-1,2-Dichloroethene	NT	<2.4	NT	NT	<2.4	<3.0	<2.2	14	1.2				
Chloroform	NT	<2.4	NT	NT	<2.4	<3.0	<2.2	<2.7	0.4				
1,2-Dichloroethane	NT	<2.4	NT	NT	<2.4	<2.4	3.0	11	<0.4				
2-Butanone	NT	4.0	NT	NT	5.3	14	5.8	11	2.5				
1,1,1-Trichloroethane	NT	340	NT	NT	240	21	<2.2	24	11000				
Trichloroethene	NT	66	NT	NT	78	8.3	<2.2	64	11000				
Benzene	NT	4.5	NT	NT	24	23	<2.2	150	1.2				
4-Methyl-2-Pentanone	NT	<2.4	NT	NT	<2.4	<3.0	4.8	4.4	<0.4				
Tetrachloroethene	NT	<2.4	NT	NT	<2.4	<3.0	6.1	14	44				
Toluene	NT	13	NT	NT	17	17	18	71	3000				
Chlorobenzene	NT	<2.4	NT	NT	<2.4	4.9	<2.2	<2.7	<0.4				
Ethylbenzene	NT	2.4	NT	NT	3.6	4.3	34	59	420				
Styrene	NT	<2.4	NT	NT	<2.4	<3.0	<2.2	<2.7	41				
Xylenes	NT	6.8	NT	NT	15	14	280	150	1400				
Pesticides/PCBs													
Aldrin	NT	NT	13	<83	NT	NT	NT	NT	NT				
Gamma-Chordane	NT	NT	<10	23	NT	NT	NT	NT	NT				
P,P' - DDE	NT	NT	23	91	NT	NT	NT	NT	NT				
Cyanazine	NT	NT	<25	110	NT	NT	NT	NT	NT				
Methoxychlor	NT	NT	41	90	NT	NT	NT	NT	NT				
Total PCBs	NT	NT	1100	4200	NT	NT	NT	NT	NT				
TCLP VOCs													
Vinyl Chloride										6.2			
Methylene Chloride										250			
Carbon disulfide										46			
1,1-Dichloroethene										300			
1,1-Dichloroethane										2800			
Cis-1,2-Dichloroethene										27			
Chloroform										8.9			
2-Butanone										220			
1,1,1-Trichloroethane										87000			
Trichloroethene										**74000**			
Benzene										16			
4-Methyl-2-Pentanone										120			
Tetrachloroethene										86			
Toluene										16000			
Ethylbenzene										680			
Styrene										240			
Xylenes										2600			
TCLP Metals													
Antimony											0.016	0.012	0.034
Barium											0.46	1.1	1.0
Cadmium											<0.005	0.0067	<0.005
Lead											0.39	0.082	0.020
Selenium											0.011	<0.010	<0.010
Nickel											0.24	0.099	0.021
Vanadium											<0.005	<0.005	0.0053

NOTES:
* TCLP SVOCs were not detected above regulatory limits
**TCLP VOCs were not detected above regulatory limits
***TCLP Pesticides were not detected above regulatory limits
NT = Not Tested

TABLE 4-1
Remedial Option Cost Estimate Summary
Lake Calumet Cluster Sites
Chicago, Illinois

Option Number	Option Description	Subtotal Construction	Subtotal Design, Oversight & Contingencies	Groundwater Containment System	Operation & Maintenance (30 years)	Estimated Cost
2A	Excavate to 3 feet, Offsite Disposal at Landfill, Clay Cap	$ 30,344,566	$ 3,489,625	$ 3,277,068	$ 4,907,520	**$ 42,020,000**
2B	Excavate to 3 feet, Offsite Disposal at Landfill, Clay Cap, Integrated Wetlands	$ 30,003,231	$ 3,450,372	$ 3,277,068	$ 5,057,520	**$ 41,790,000**
2C	Excavate to 10 feet, Offsite Disposal at Landfill, Clay Cap	$ 75,321,436	$ 4,142,679	$ 3,277,068	$ 4,907,520	**$ 87,650,000**
2D	Excavate to 10 feet, Offsite Disposal at Landfill, Clay Cap, Integrated Wetlands	$ 74,981,342	$ 4,123,974	$ 3,277,068	$ 5,057,520	**$ 87,440,000**
3A	Consolidate Waste, Clean Fill for Grading, Clay Cap	$ 10,610,967	$ 2,652,742	$ 3,277,068	$ 4,907,520	**$ 21,450,000**
3B	Consolidate Waste, Clay Cap, Integrated Wetlands	$ 10,270,467	$ 2,567,617	$ 3,277,068	$ 5,057,520	**$ 21,170,000**
3C	Consolidate Waste, Geosynthetic Clay Liner (GCL) Cap	$ 17,494,228	$ 4,373,557	$ 3,277,068	$ 4,907,520	**$ 30,050,000**
3D	Consolidate Waste, Flexible Membrane Liner (FML) Cap	$ 22,456,108	$ 5,614,027	$ 3,277,068	$ 4,907,520	**$ 36,250,000**
3E	Consolidate Waste, Flexible Membrane Liner (FML) Cap, Integrated Wetlands	$ 22,115,608	$ 5,528,902	$ 3,277,068	$ 5,057,520	**$ 35,980,000**
4A	Cover Existing Waste, Clean Fill for Grading, Clay Cap	$ 8,127,972	$ 2,031,993	$ 3,277,068	$ 4,907,520	**$ 18,340,000**
4B	Cover Existing Waste, Clean Fill for Grading, Clay Cap, Integrated Wetlands	$ 7,794,254	$ 1,948,564	$ 3,277,068	$ 5,057,520	**$ 18,080,000**